CAROLINA CROSSROADS
I-20/26/126 Corridor Project

F&ME CONSULTANTS

GEOTECHNICAL BASE LINE REPORT

Carolina Crossroads
Richland/Lexington County, South Carolina

PREPARED FOR
HDR, Inc.
3955 Faber Place Drive, Suite 300
North Charleston, South Carolina 29405

PREPARED BY
F&ME Consultants, Inc.
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SCDOT Project ID: P027662
F&ME Project #: G5662.01

NOVEMBER 9, 2018

F&ME CONSULTANTS

November 9, 2018

Mr. David Kinard, P.E.
HDR, Inc.
3955 Faber Place Drive, Suite 300
North Charleston, South Carolina 29405

Re: Geotechnical Base Line Report
Carolina Crossroads
Richland/Lexington County, South Carolina
SCDOT Project ID P027662
F&ME File No. G5662.01

Dear Mr. Kinard:

Submitted herein is the geotechnical base line report for the above referenced project. Included is a summary of the subsurface data, the subsurface findings, the soil laboratory test results, and our preliminary evaluation for the conceptual bridge foundation systems and bridge/roadway embankments.

It has been a pleasure working with you on this project, and we appreciate the opportunity to be of service. Please notify us if there are any questions.

Respectfully Submitted,

F&ME CONSULTANTS

SOUTH CAROLINA LICENSED PROFESSIONAL ENGINEER No. 30374 JOHN FRANCIS HAMILTON

SOUTH CAROLINA F&ME CONSULTANTS, INC. No. 4891 CERTIFICATE OF AUTHORIZATION

Digitally signed by John Hamilton
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John F. Hamilton, P.E.
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Attachments

BMF:JFH/jfh:zwa

EXECUTIVE SUMMARY

A limited geotechnical investigation was completed for the proposed Carolina Crossroads project. The geotechnical investigation was completed by two (2) geotechnical firms: F&ME and S&ME. The project is located just northeast of the City of Columbia, South Carolina. The geotechnical investigations were performed in general accordance with the Scope of Services and Schedule Contract Modification Number 2, dated January 11, 2018. The objective of the geotechnical investigations was to collect subsurface information and laboratory test data to be distributed to design-build teams for their use in pursuit of the construction contract. The project is planned to be procured though the SCDOT Design-Build process.

The following is a broad summary of the findings and our general interpretation of the subsurface conditions. This summary is presented for the convenience of the reader. The report text and data, provided herein, should be studied and understood before preparing any estimation of quantities or design.

1. As provided to F&ME by HDR, alternative RA1 was utilized to develop the geotechnical investigation plan. RA1 was included with several other alternatives in the NEPA submittal and was selected as the Recommended Preferred Alternative (RPA). The RPA concept primarily consists of adding capacity to Interstate 26, Interstate 20, Interstate 126, and the adjacent roadways by adding additional travel lanes and constructing new bridges. The RPA alternative consists of forty-six (46) new or replacement bridges and several retaining walls and sound walls. The RPA alignment was used as a reference on the boring locations plans and generalized subsurface profiles provided in the Appendix.
2. Two hundred nineteen (219) soil test borings, ten (10) cone penetrometer (CPT) soundings, and two (2) dilatometer soundings were performed along the proposed RPA alignment.
3. Six (6) major geologic units were identified: existing embankment fill, alluvium, Piedmont residuum, Coastal Plain soils, partially weathered rock, and bedrock.
4. The predominant rock type at the project is a fine-grained Phyllite, Schist, or Amphibolite. The fine-grained rock typically varies from moderately weathered to highly weathered and is considered weak to medium strong with unconfined compressive strengths generally less than 5,000 psi. At various depths within the rock mass, the fine-grained rock is considered extremely strong with a maximum recorded unconfined compressive strength of 70,000 psi. Granite was also encountered, but the location of the Granite is generally confined to the eastern extent of the project near the Saluda River. The Granite was classified as extremely strong rock with a maximum Unconfined Compressive strength of 40,000 psi.
5. F&ME and S&ME performed a qualitative geotechnical assessment for each bridge site proposed in the RPA alignment. The qualitative assessment consists of reviewing the boring logs, applying our experience on similar bridge projects, and developing conceptual foundation suggestions to assist the D-B Teams. No actual geotechnical analysis or design was performed during this phase of the project.
6. Six (6) downhole seismic borings were performed at select locations across the project. Subsurface shear wave velocity profiles were developed from the performed testing. This information was provided to SCDOT for development of the project's seismic design parameters. The seismic design information will be provided by SCDOT and is not included with this report.

7. Based on the results from the subsurface investigation and subsequent laboratory testing, most of the bridge embankments will likely meet the requirements of the SCDOT Geotechnical Design Manual (GDM) for the static and the seismic design events without ground improvement. At select sites where appreciable alluvium or Coastal Plain soils are present, the probability for ground improvement increases.
8. Driven pile foundations are considered the preferred bridge substructure element across the project. Driven piles will likely be used at bridge end bents but may also be used at bridge interior bent pile footings, retaining walls, sound walls, and overhead structures. We anticipate the Strength limit state will govern the geotechnical pile design at most sites. The driven pile foundations will develop the required axial resistance through skin friction in the residuum and/or end bearing on PWR/bedrock. Predrilling to advance the pile below the minimum tip elevation for lateral stability is expected at some locations.
9. Drilled shaft foundations will most likely be used for support of the bridge interior bents but may also be used in retaining walls, sound walls, and overhead structures. The Strength limit state axial loading conditions are expected to govern the geotechnical drilled shaft design. For the Strength limit state, drilled shaft foundations will develop the required axial resistance through skin resistance in residuum, PWR, and/or hard rock and/or end resistance in the PWR and hard rock.
10. Given the appropriate site and geotechnical conditions, shallow foundations are considered a viable foundation option for this project. The Structural and Geotechnical Engineers should coordinate their designs such that all performance criteria are met. Shallow foundations are considered most appropriate at new bridge locations where an existing embankment does not impact the design or where existing traffic will not be impacted by the foundation excavation requirements.

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APPENDIX C S&ME Geotechnical Subsurface Data Report

1. PROJECT DESCRIPTION

The project is located just northeast of the City of Columbia, South Carolina. A site location plan is presented in Section 1 of Appendix A.

The project will consist of widening Interstate 26, Interstate 126, and Interstate 20 near the intersection of Interstate 26 and Interstate 20. In addition, several existing overpass bridges are designated for replacement to facilitate the interstate widenings, and new bridge construction is planned to accommodate the proposed turbine interchange. In total, the project extends approximately nine (9) miles along I-26, two (2) miles along I-20, and just over one (1) mile on I-126. Based on the Recommended Preferred Alternative (RPA) alignment, a total of forty-six (46) bridges are planned for construction. Based on the conceptual drawings, the proposed bridge and roadway construction will mostly require fill placement, but there are locations where large cuts are required to meet the planned roadway grade. The cuts are mostly confined to the I-26/I-20 intersection. Furthermore, several retaining walls, sound walls, and overhead sign foundations are planned throughout the corridor. Each of these roadway structures contains a component that will require geotechnical design.

The geotechnical investigations were completed as a joint effort by F&ME and S&ME. The geotechnical field investigations were performed in accordance with the SCDOT Geotechnical Design Manual and the Scope of Services and Schedule Contract Modification Number 2, dated January 11, 2018.

2. SUBSURFACE INVESTIGATION

2.1. F&ME Subsurface Investigation

From January 3 to July 2, 2018, thirty-one (31) bridge soil test borings (designated as B-1 through B-28, B-6A, B-14A, and B-63), twenty (20) wall soil test borings (designated as W-1 through W-17, W-20, W-21, and W-26), thirty-five (35) roadway embankment soil test borings (designated as RW-1 through RW-34, and RW-28A), four (4) soil test borings for downhole seismic testing (designated as DH-1 through DH-3, and DH-3A), twenty-one (21) auger borings (designated as AP-1 through AP-21), and twenty (20) bulk soil samples were performed along the RPA corridor.

The soil test borings were advanced utilizing a CME 550 ATV mounted drill rig and a CME 45B trailer mounted drill rig. Rotary wash drilling techniques were used to maintain a stable borehole. Standard Penetration Tests (SPT) tests were continuously obtained in the top ten (10) feet of each test boring. Following the continuous sampling, SPT samples were obtained at regular, five (5) foot intervals throughout the remaining depths of the borings. SPT samples were performed in general accordance with ASTM D-1586 to determine the relative densities and consistencies of the subsurface soils and to collect subsurface soil samples. An automatic hammer was used to perform the borings. The measured energy ratio for the CME 550 hammer is 81%. The measured energy ratio for the CME 45B hammer is 84%.

The bridge borings and wall borings were advanced to either a target depth or tri-cone roller bit drilling refusal, whichever was shallower. Where a drilling refusal condition was encountered, the borings were subsequently advanced into rock using NQ sized rock coring equipment. The roadway embankment borings were advanced to either a target depth or tri-cone roller bit drilling refusal, whichever was shallower, and were subsequently terminated. The downhole seismic borings were advanced to a minimum depth of approximately 120 feet to facilitate the geophysical testing in the upper 100 feet. Within the seismic borings and where a drilling refusal condition was encountered, the borings were subsequently advanced into rock using NQ sized rock coring equipment to the minimum depth. DH-3 was terminated near the ground surface on an apparent shallow boulder. DH-3A was offset approximately five (5) feet from DH-3 and did not encounter shallow refusal.

The auger borings were performed for the primary purpose of collecting intact, Shelby Tube samples. SPT testing was not performed within the auger borings. The auger borings were advanced to target depths and subsequently terminated.

The bulk soil samples were collected for laboratory testing to provide soil strength parameters for the existing embankment soils or soil strength parameters in areas designated for excavation. The bulk soil samples were collected and composited from borings to an approximate depth of five (5) feet to ten (10) feet below the existing ground surface and subsequently terminated.

2.2. S&ME Subsurface Investigation

From January 4 to June 6, 2018, thirty-five (35) bridge soil test borings (designated as B-29 through B-62, and B-36A), twelve (12) wall soil test borings (designated as W-18, W-19, W-22 through W-25, and W-27 through W-32), nine (9) roadway embankment soil test borings (designated as RW-35 through RW-43), seventy (70) pavement soil test borings (designated as P-1 through P-71), three (3) soil test borings for downhole seismic testing (designated as DH-4 through DH-6), eight (8) auger borings, and thirty (30) bulk soil samples were performed along the RPA alignment.

The soil test borings were advanced utilizing a Diedrich D-50 ATV mounted drill rig, a CME 55 truck mounted drill rig, and a CME 750 ATV mounted drill rig. Bridge, retaining wall, embankment, and seismic borings were advanced using rotary wash drilling techniques. The pavement borings utilized hollow stem auger drilling techniques to maintain a stable borehole. Standard Penetration Tests (SPT) tests were continuously obtained in the top ten (10) feet of each test boring. Following the continuous sampling, SPT samples were obtained at regular, five (5) foot intervals throughout the remaining depths of the borings. SPT samples were performed in general accordance with ASTM D-1586 to determine the relative densities and consistencies of the subsurface soils and to collect subsurface soil samples. An automatic hammer was used to perform the SPTs. The measured energy ratio for the Diedrich D-50 hammer is 87%. The measured energy ratio for the CME 55 hammer is 84%. The measured energy ratio for the CME 750 hammer is 86%.

The bridge borings and wall borings were advanced to either a target depth or tri-cone roller bit drilling refusal, whichever was shallower. Where a drilling refusal condition was encountered, the borings were subsequently advanced into rock using NQ sized rock coring equipment. The roadway embankment borings were advanced to either a target depth or tri-cone roller bit drilling refusal, whichever was shallower, and were subsequently terminated. The pavement borings extended to a target depth of approximately ten (10) feet and were subsequently terminated. The downhole seismic borings were advanced to a minimum depth of 120 feet to facilitate the geophysical testing in the upper 100 feet. Within the seismic borings and where a drilling refusal condition was encountered, the borings were subsequently advanced into rock using HQ sized rock coring equipment to the minimum depth.

The auger borings were performed for the primary purpose of collecting intact, Shelby Tube samples. The auger borings were advanced to target depths and subsequently terminated.

The bulk soil samples were collected for laboratory testing to provide soil strength parameters for the existing embankment soils or soil strength parameters in areas designated for excavation. The bulk soil samples were collected and composited from borings to an approximate depth of ten (10) feet below the existing ground surface and subsequently terminated.

2.3. Geotechnical Investigation Summary

In total, 219 soil test borings were performed along the project: 66 bridge borings, 32 wall borings, 44 roadway embankment borings, 7 downhole seismic borings, and 71 pavement borings. In addition, 50 bulk soil samples were collected, and 41 auger borings were performed along the project corridor. The geotechnical investigation performed by F&ME and S&ME during this phase of the project is summarized in Section 2 of Appendix A.

We have provided Boring Location Plans in Section 3 of Appendix A. The boring location plans display the locations of the borings performed by both F&ME and S&ME during the subsurface investigation(s). A summary of the lithology symbols shown on the subsurface profiles and the boring nomenclature used by F&ME and S&ME for this project are provided before the profiles in Section 4 of Appendix A. Individual boring logs are provided in Appendix B and Appendix C.

3. LABORATORY TESTING PROGRAM

Select soil samples from the borings were tested in either F&ME's or S&ME's AASHTO certified laboratory to determine physical and engineering soil properties. These tests were used to identify the strength and behavioral characteristics of the soils as well as to verify the field classifications by the AASHTO classification system and the Unified Soil Classification System (USCS). The laboratory testing program is summarized in the following table. These quantities represent tests performed by both F&ME and S&ME.

Laboratory Testing Table	
Test Type	Quantity
Moisture Content	607
Grain Size w/ Wash #200	621
Atterberg Limits	616
CU Triaxial	40
UU Triaxial	2
Consolidation	8
Unconfined Compression - Rock	124
Standard Proctor	50
Electro-Chemical Series	60
Ignition Loss	13
Organic Content	9
California Bearing Ratio	21

All soil testing was conducted in general accordance with applicable ASTM/AASHTO standards. Data sheets presenting the results of F&ME's laboratory test program are provided in Appendix B. Data sheets presenting the results of S&ME's laboratory test program are provided in Appendix C.

4. REGIONAL SITE GEOLOGY

The project is situated mostly in the Piedmont Physiographic Province at the South Carolina Fall Line zone. More specifically, the site is located within the Carolina Terrane (formerly referred to as the Carolina Slate Belt). The Piedmont unit is characterized by gently rolling topography, weathered bedrock, and few hard rock outcrops. The site subsurface conditions generally consist of existing embankment fill, residual soils, alluvial soils, Coastal Plain soils, partially weathered rock (PWR), and bedrock. Being so close to the Fall Line, the degree of weathering of the bedrock is highly variable, and the depth to sound, unweathered bedrock varies greatly across the project area.

At the Saluda River crossings along the I-126 corridor and at Stoop Creek near the St. Andrews Rd. over I-26 intersection, Quaternary, alluvial soils were encountered below the existing embankment fill. Due to their recent deposition, the relative densities of this material will be lower and their proximity to the water could potentially lend them to problems relative to seismic quaking. In general, SPT N-values suggest loose to medium dense sands and soft to firm silts and clays. Residual soils were encountered below the alluvium, where present.

In general, coastal plain soils were encountered north of the I-26/I-20 interchange and gradually terminates just southwest of the interchange. The extent of the coastal plain material generally follows the limits shown on the publicly available geologic mapping (SCDNR 1972). These soils are considered Cretaceous-aged. The relative densities of this material will be lower compared to the underlying residuum and their proximity to the water could potentially lend them to problems relative to seismic quaking. In general, SPT N-values suggest loose to medium dense sands and firm to stiff clays. Residual soils were encountered below the coastal plain soils, where present.

The encountered Piedmont residuum generally consists of varying amounts of sand and silt. The thickness of the residual soils will vary across the project. At some locations, the residuum was on the order of ten (10) feet thick, and at other locations the thickness was on the order of fifty (50) feet. In general, SPT N-values suggest medium dense to dense sands and very stiff to hard silts.

Below the residual soils, partially weathered rock (PWR) was typically encountered. PWR is an intermediate geo-material (IGM) that is experiencing a transition from the parent bedrock to weathered in-place, residuum. By definition, PWR is a soil exhibiting SPT N-values in excess of one hundred (100) blows per foot (bpf). Moving away from the Fall Line, the PWR is thinner and is on the order of ten (10) to twenty (20) feet thick. At the I-20/I-26 intersection, the PWR thickness is greater than 100 feet thick. Borings were terminated in PWR at depths of 120 feet without encountering hard bedrock. PWR will likely be the primary bearing stratum for driven piles foundations and/or drilled shaft foundations at most bridge sites.

Below the PWR, bedrock was encountered. Rocks of the Carolina Terrane typically consist of metamorphosed volcanic and sedimentary rocks. The rocks encountered along this project consist of Phyllite, Schist, and Amphibolite. The Phyllite/Schist/Amphibolite extends from the west to the east and generally dips below a hard granite pluton as it moves east near the Saluda River. Granitic bedrock associated with the aforementioned pluton was encountered at boring locations along I-126 and in the vicinity of the I-26 bridge over the Saluda River that is generally consistent with the published geologic mapping (SCDNR 1972).

5. SUBSURFACE CONDITIONS

5.1. Soil Stratigraphy

The soil borings indicate six (6) main strata underlying the project. The following table provides a very generalized summary of the encountered soils across the project. Due to the lateral extent and variable topography of the project, depths and elevations of the stratigraphy may vary greatly. Refer to the boring location plans and the individual boring logs for more accurate subsurface information at a particular location.

Soil Stratification Table

Geologic Formation	Approx. Layer Thickness (ft)	USCS Soil Type	AASHTO Soil Classification	Avg. SPT N-Value (bpf)	Average CPT Tip Resistance (tsf)	Comments
Existing Embankment Fill	2-30	SM/ML/ CL/CH/SC	A-2-4/ A-2-6/ A-4/A-6/A-7	13	41	
Alluvium	0-30	GC/SM/SC/ ML/MH/CL/ CH	A-1/A-2-4/ A-2-6/A-4/ A-5/A-6/A-7	14	46	@ bridges over Saluda River, I-126, and @ Stoop Creek near St. Andrews Rd.
Coastal Plain (Pleistocene)	0-40	SM/SC/SP/ MH/CL/CH	A-2-4/A-2-6/ A-3/A-5/ A-6/A-7	15	52	Generally north of I-26/ I-20 intersection
Residuum	5-80	SM/ML	A-2-4/A-4	33	42	
PWR	10-100+	SM/ML	A-2-4/A-4	100+	N/A	
Bedrock	--	--	--	--	--	See Section 5.2

5.2. Rock Conditions

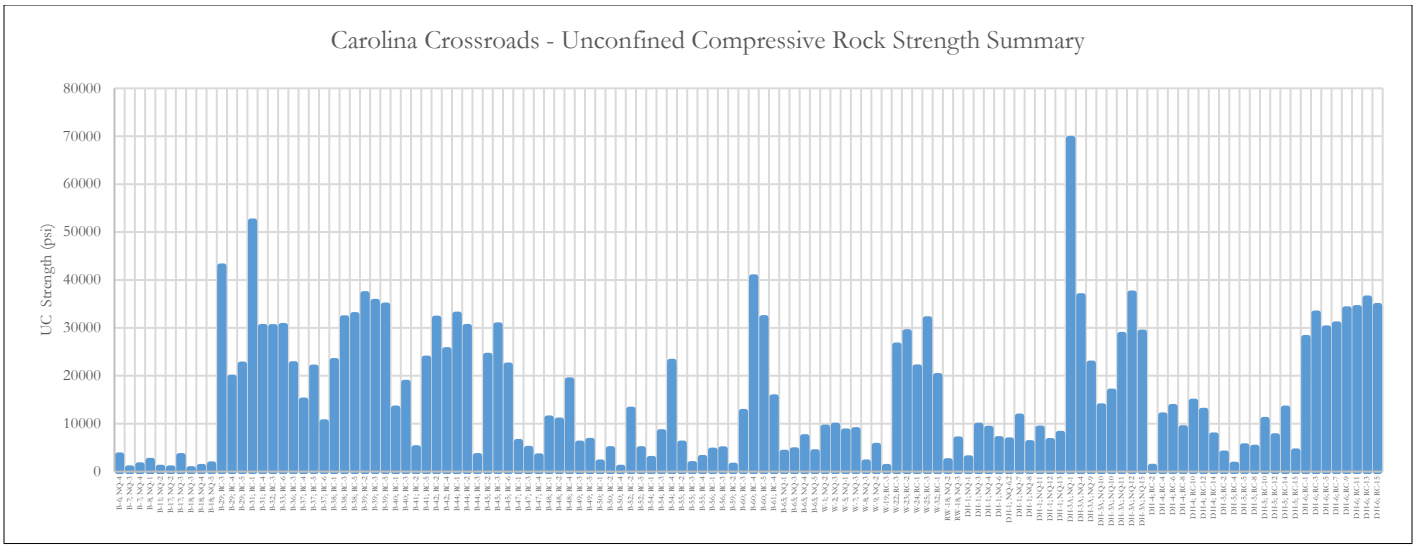
Following auger refusal conditions encountered in the test borings, rock coring operations were conducted. The core depths vary from ten (10) feet to eighty (80) feet. The greater core depths are at the downhole seismic borings for acquiring subsurface shear wave velocity data to a depth of 100+ feet. F&ME utilized diamond NQ rock coring techniques to recover the rock core samples in general accordance with ASTM D2113. S&ME utilized diamond NQ rock coring techniques in borings other than the downhole seismic borings in general accordance with ASTM D2113. For the downhole seismic borings, S&ME utilized HQ sized rock coring equipment.

At a majority of the boring locations, the rock type is fine-grained and is generally classified as phyllite, schist, or amphibolite. Towards the eastern extent of the project near the Saluda River, the rock is classified as extremely strong (ie. > 30,000 psi) granite. The fine-grained rock is classified as weak to medium-strong and highly weathered to moderately weathered. The in-situ rock has numerous, wide joints. At many locations, the joints are nearly vertical, and the geotechnical drilling was slow and difficult. The core recovery (REC) ranges from zero percent (0%) to one hundred percent (100%), and the rock-quality designation (RQD) for the lengths

recovered ranges from zero percent (0%) to one hundred percent (100%). UC strengths of the intact fine-grained rock samples generally range from 500 to greater than 30,000 pounds per square inch (psi) with a maximum recorded strength of almost 70,000 psi. Several of the UC strength tests indicate a shear failure along a visually discernable bedding plane. As such, the indicated UC rock strengths may not be representative of the actual rock strength. Further in-situ or laboratory testing may be employed to investigate this condition.

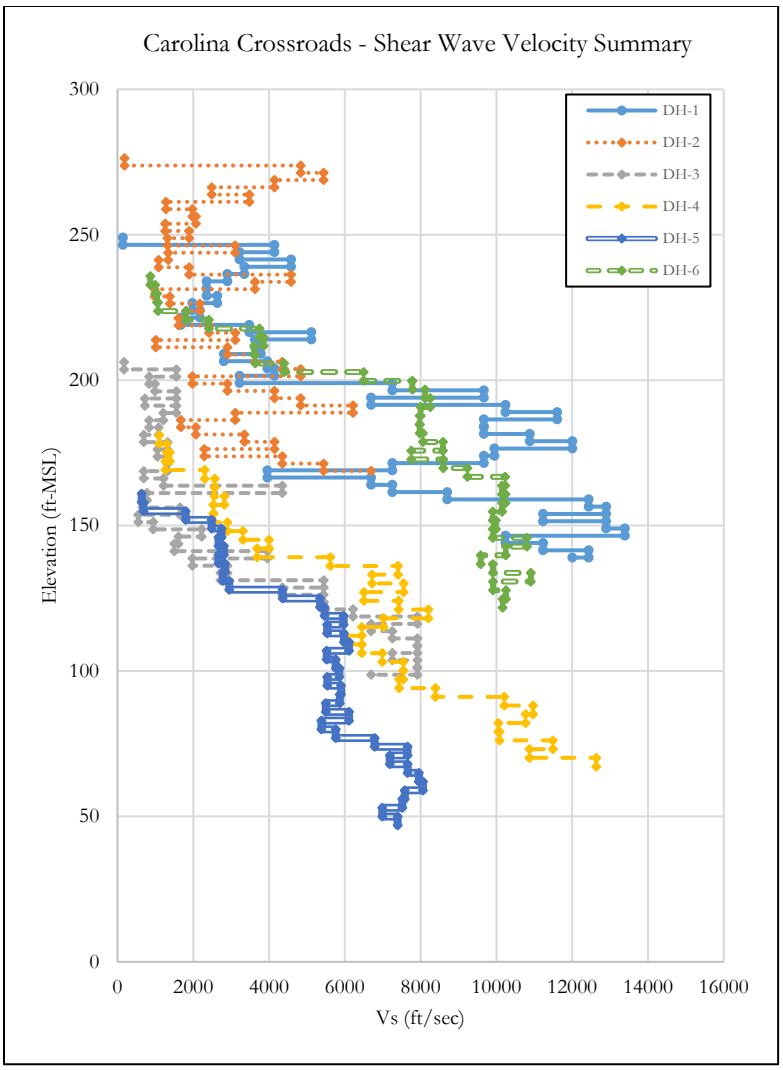
The granite is classified as very strong to extremely strong and highly weathered to fresh. The in-situ rock has numerous, very tight joints. Joints are dipping at low to high angles (0 to 90 degrees) with a majority of the joints dipping between 0 and 50 degrees. The core recovery (REC) ranges from six percent (6%) to one hundred percent (100%), and the rock-quality designation (RQD) for the lengths recovered ranges from zero percent (0%) to one hundred percent (100%). UC strengths of the intact rock samples generally range from 3,000 to greater than 30,000 psi.

A summary of the rock core compressive strength testing is provided in Appendix B and Appendix C. A graphical summary of all of the rock strengths performed by F&ME and S&ME is provided in the chart below.



5.3. Subsurface Shear Wave Velocity

Six (6) downhole seismic borings were performed along the project. The shear wave velocity measurements recorded within these boreholes are summarized in the following chart.



The shear wave velocity information was submitted to SCDOT for development of the project seismic design data.

5.4. Groundwater Conditions

Groundwater table measurements were recorded immediately following completion of the borings and/or 24-hours following completion of the borings. The depth to the groundwater table is highly variable across the project. The depth to the groundwater table ranged from approximately one (1) to fifty (50) feet. Groundwater elevations along this project will fluctuate with climactic events. During and following periods of rainfall, the water table may be encountered at higher elevations than identified on the field testing logs. In addition, the project is conducive to perched groundwater conditions. We would expect that water from recent rainfall would sit atop the denser, fine-grained residuum. Perched groundwater is not indicative of the true, static groundwater table. The Design-Build team should evaluate the groundwater conditions at discrete locations and exercise engineering judgement to assign an appropriate groundwater table for design purposes.

6. CONCEPTUAL GEOTECHNICAL ASSESSMENT

The geotechnical information, provided herein, is conceptual and is based on limited geotechnical data. The information provided should be supplemented and evaluated relative to the SCDOT GDM and Team specific design and construction requirements for preliminary and final design purposes. Following the collection of additional subsurface data, these recommendations may change or become invalid. For each bridge site, we have provided very general and conceptual geotechnical information based on the subsurface information collected by F&ME and S&ME during this phase of the project. The conceptual bridge foundation information is provided in tabular form in Section 6 of Appendix A.

6.1. Site Preparation

Based on the subsurface conditions encountered during the field investigations, the soil subgrade below the planned embankment areas appear to be adequate for embankment construction. The embankment subgrade soils may contain appreciable silt and mica content that, when wet, would perform unsatisfactorily. The shear strength of these soils tends to deteriorate during wet conditions as they are re-worked by construction equipment. For this condition, localized mucking, bridge lifts, and/or soil reinforcement may be required to achieve acceptable performance for normal, static conditions. During and following periods of rainfall, mucking operations may be more prevalent. Depending on the locations and composition of the subgrade soils, mucking may be minimized if the soils are allowed to dry.

Earthwork excavation will be required to meet the proposed roadway grade at select locations based on the D-B Team's roadway design. These excavations could encounter hard soils or rock near the ground surface that may require non-typical earthwork construction equipment. In general, shallow rock was encountered at locations near the western extent of the project along I-26. Shallow rock and/or PWR may be encountered at other locations throughout the project that were not explored during the investigations that were performed under this scope of work. In addition, boulders of varying sizes may be encountered in the existing embankments. We anticipate that the presence of boulders increases moving towards the eastern extent of the project along I-26.

At locations across the project, cut sections are indicated on the concept plans to meet the planned roadway grades. At these locations, there may be appreciable mica content in these soils. Mica in soils can affect the engineering properties of the soil, especially the compaction properties. The Design-Build team should carefully evaluate the soils in the locations designated for excavation if these soils are planned to be reused as fill in new embankment construction.

Earthwork activities will impact a variety of other construction elements associated with the project. The cut/fill and the depth to rock/PWR relative to the cut/fill depths should be addressed for, at a minimum, new and existing pipe culverts, new and existing box culverts, jack-and-bore installations, and temporary shoring. If existing pipe or box culverts are expected to support additional loading from fill placement or increased live loading from reduced cover, the culverts should be structurally and geotechnically evaluated for the additional loading.

6.2. Buried Elements

During previous vintages of highway construction along this corridor, a variety of buried elements have been discovered or are known to exist. These elements consist of boulders, construction and demolition waste, etc. Specifically, we understand that the previous Piney Grove Rd. bridge debris is buried in the vicinity of the I-26 EB off-ramp. We have identified several locations where buried structures exist that may impact roadway and/or bridge construction. We have not attempted to identify all the buried elements along the project, and the Contractor should be prepared to deal with buried elements when performing earthwork activities along the corridor.

6.3. Geotechnical Seismic Hazard Potential

Geotechnical seismic hazards consist of a loss in a soil's shear strength through cyclic ground motions induced by earthquakes. In sand-like soils, this phenomenon is typically referred to as soil liquefaction. Cyclic-softening is the typical terminology for fine grained soils. Liquefaction of sand-like soils is considered the most devastating seismically induced geotechnical hazard.

Liquefaction is the loss of a soil's shear strength due to a rapid increase in pore water pressure resulting from soil particle contraction induced by seismic vibrations. Soils most susceptible to liquefaction generally consist of saturated, loose, "clean" (i.e., Plasticity Indexes less than 7), fine (10% particle size ranging from 0.07 millimeters to 0.25 millimeters) sands. Soil softening occurs in moderate to high plasticity silts and clays.

Based on a qualitative review of the collected subsurface information, seismic Soil Strength Loss (SSL) is not expected for most of the sites across the project. Localized pockets of material susceptible to SSL may be encountered at the sites where alluvium and Coastal Plain soils were encountered. In general, structures near St. Andrews Rd., Broad River Rd., and the Saluda River, may have soils that are susceptible to SSL. Depending on the location of these soils relative to the existing and final grades, ground improvement may be required to meet acceptable performance during and following the design seismic event.

6.4. Seismic Induced Settlement

At locations where SSL triggering may be present, a seismic deformation analysis should be performed to calculate the vertical settlement from the sand-like soil particle re-distribution. In addition, the lateral displacements should also be calculated from lateral spreading of the liquefied soils and their impact on foundations should be addressed.

Following the acquisition of additional subsurface information, the Design-Build Team should carefully evaluate the liquefaction potential at each site and determine if ground improvement is necessary to accommodate seismically induced settlement. The potential for seismically induced settlements appears to be low across the majority of the project. However, structures near St. Andrews Rd., Broad River Rd., and the Saluda River may have soils that are susceptible to seismically induced settlement.

6.5. Static Settlement

In general, the proposed bridge and roadway embankment subgrade soils consist of moderate density/consistency sand and silt above the static, groundwater table. Fill placement along the project will result in deformation of the subgrade soils. We anticipate that any problematic soils near the ground surface, would be removed and replaced prior to fill placement, since these soils would be difficult to stabilize prior to embankment construction. We anticipate that a majority of the settlement across the project would occur rapidly with fill placement. The potential for extensive, long-term consolidation settlements appears to be low across the project. We did not identify a specific geographic location across the project where appreciable long-term settlements would be an issue.

6.6. Embankment Slope Stability

Static and seismic stability analyses are required at the bridge embankments and the retaining wall locations regardless of the Roadway Operational Classification (ROC). Only static stability analyses are required at the ROC IV roadway embankment locations. From reviewing the boring logs, we anticipate that most of the static and seismic slope stability analyses will yield resistance factors that meet the GDM criteria without ground improvement. In certain locations, soil reinforcement may be necessary to achieve the desired resistance factor. In general, embankments and walls near the Saluda River and Broad River Rd. may present challenging global stability soil conditions.

6.7. Ground Improvement

In general, the potential for ground improvement for this project appears to be low. At various bridge embankment and retaining wall locations, ground improvement to mitigate seismic instability and/or excessive seismic deformations may be required. If ground improvement is required to achieve acceptable seismic performance, we would anticipate that it would be limited to those structures with appreciable coastal plain and alluvial soils below the ground water table. In general, these locations are expected to be mostly confined to bridges and/or walls near the Saluda River and Broad River Rd. We anticipate that the ground improvement would target increasing shear strength as opposed to mitigating settlement. These types of ground improvements would include, but are not limited to, geogrid, geotextile, and discrete elements that would densify, add strength, and/or improve drainage. Deeper, in-situ ground improvements such as stone columns and deep soil mixing may require penetration into hard soil and/or rock and would likely present constructability issues.

6.8. Foundation Corrosion and Deterioration

Per AASHTO, the following soil or site conditions are considered indicative of a potential for steel corrosion and/or concrete deterioration.

- Resistivity less than 2,000 ohm-cm;
- pH less than 5.5;
- pH between 5.5 and 8.5 in soils with high organic content;
- Sulfate concentrations greater than 1,000 ppm;
- Landfills and cinder fills;
- Soils subject to mine or industrial discharge; and,
- Areas with a mixture of high resistivity soils and low resistivity high alkaline soils.

Per AASHTO, the following water conditions are considered indicative of a potential for steel corrosion and/or concrete deterioration.

- Chloride content greater than 500 ppm;
- Sulfate concentration greater than 500 ppm;
- Mine or industrial runoff;
- High organic content;
- pH less than 5.5;
- Marine borers; and,
- Piles exposed to wet/dry cycles.

Electrochemical testing was performed on select soils collected along the project corridor. Electrochemical test results are provided in Appendix B and Appendix C. Based on the pH test results, the potential for steel corrosion is indicated to be moderate across the project. Several of the test results indicated pH levels less than 5.5. Sulfate levels were generally less than the allowable limits, and the potential for subsurface concrete degradation is indicated to be low. Following additional subsurface testing, the D-B team should carefully evaluate the geotechnical conditions relative to corrosion and degradation and provide mitigation measures, as necessary.

6.9. Pile Foundations

Pile foundations are anticipated for support of the bridge end bents and may be used for support of bridge interior bents depending on the site geometry and subsurface conditions. Pile foundations may also be used to support retaining walls, sound walls, and overhead signs. Driven pile installations would be preferred, and we anticipate that most locations can utilize driven pile techniques. Some locations may require pre-drilling in order to meet the minimum pile tip elevations for lateral stability. The potential for predrilling is higher along I-26, west of St. Andrews Rd. In general, pile foundations are considered preferable for the anticipated construction. Specific pile foundation design issues are discussed in the following sections.

6.9.1. Axial Resistance

The Strength limit state axial loading conditions are likely to govern the geotechnical pile designs at most of the bridge sites.

Driven piles will develop a majority of the required driving resistance through end bearing on PWR or bedrock. We expect that medium to large pile hammers will be required to advance piles through the denser residuum to the bearing stratum. For a majority of the pile installations, the pile driving termination criteria may consist of driving the piles to a refusal condition. The Contractor should exercise care to not over-drive, over-stress, and damage piles on an impenetrable bearing stratum.

If the pile tip elevations are placed above a location where a pile driving practical refusal condition exists, then the D-B Contractor may elect to perform Pile Dynamic Analyses (PDA) testing with CAPWAP measurements to monitor pile driving stresses during driving and to verify the in-place, driven pile resistance. If the required driving resistance is not attained during initial drive, then a wait period may be implemented to allow for pile freeze. Following the wait period, pile driving re-strikes should be performed. Continuous PDA testing should be considered during both the initial drive and the re-strikes, as necessary. The number of required PDA tests shall be in accordance with the GDM.

6.9.2. Lateral Resistance

For the Strength limit state, Service limit state, and the Extreme Event limit state, we anticipate that the driven piles will develop the required lateral stability in the existing embankment fill and the upper residual, alluvial, or coastal plain soils. SSL should be evaluated to determine if foundations should be extended below the depths needed to satisfy the Strength and Service limit states. At the end bents, the seismic bridge abutment backwall passive pressure shall be calculated in accordance with Chapter 14 of the GDM for the existing embankment fill material or the selected embankment fill material.

6.9.3. Drivability

Driven piles will likely use a diesel pile hammer. We anticipate that non-displacement piles (ie. steel H-piles or steel open-ended pipe piles) will be utilized at the end bents and may be utilized at interior bents depending on the site geometry and subsurface conditions. The anticipated pile length for non-displacement piles could vary from ten (10) feet to ninety (90) feet across the project. Pre-stressed concrete (PSC) piles may be used where appreciable alluvium and/or coastal plain soils are present. We do not expect the subsurface conditions at most sites along the project would be conducive to PSC piling.

Based primarily on experience, large boulders may exist in the alluvial soils and near the Saluda River. In addition, some boulders may exist in the existing embankments from previous vintages of road construction. We anticipate that shallow rock or boulders may have been removed under the travel lanes at the time of construction, disposed of in the existing embankment side slopes, and covered with fill material. During our field investigation, only a few boreholes encountered material that was considered a potential boulder, but we expect that more boulders would exist than is indicated in the provided test borings. The probability of encountering boulders increases moving east along I-26, towards Columbia. If boulders are discovered during pile installations, predrilling and/or rock coring may be required to bypass the impenetrable layer and achieve pile lateral stability.

Based on the anticipated pile lengths, we expect that most steel pile foundations will require a pile splice and will be driven in two (2) sequences. When pile driving in the dense residuum and when pile tip elevations are above the minimum tip elevations, the Contractor should be careful to minimize the time between sequences to avoid substantial pile freeze such that the piles cannot be further advanced to a minimum tip elevation requirement. We anticipate that a medium/large pile hammer will be required to advance the piles through the dense residuum to the bearing stratum. We expect that most piles will be driven to a practical refusal condition on PWR or bedrock. The Contractor should exercise care to not over-drive, over-stress, and damage piles on an impenetrable bearing stratum after encountering a practical refusal condition. Assuming that pile installations will terminate on a practical refusal condition and due to the proximity of commercial and residential structures relative to the proposed construction, the Contractor should develop a strategy to manage and limit the generated earth-borne vibrations from pile installations.

For a properly selected driving system, we do not anticipate unusual pile driving issues for successful installation of the driven piles. The selected driving system shall address driving compressive and tensile stresses to conform to the SCDOT criteria.

6.10. Drilled Shaft Foundations

We anticipate that drilled shaft foundations would primarily be used at the bridge interior bents. Drilled shafts may also be used for support of retaining walls, sounds walls, and overhead signs. We anticipate that drilled shaft sizes could range from 36 inch to 84 inch diameter shafts. Specific drilled shaft design issues are discussed in the following sections.

6.10.1. Axial Resistance

The Strength limit state axial loading conditions are expected to govern the geotechnical design of drilled shafts.

Depending on the approach taken by the Design-Build team, we expect that a majority of the drilled shafts will develop the required axial resistance through skin friction in the residuum, IGM and bedrock and/or through end bearing on PWR or bedrock. Since drilled shafts mobilize shaft resistance and end resistance at different displacements, it is difficult to predict the load transfer from skin resistance to tip resistance. The Design-Build Team should exercise caution when using a drilled shaft design including both skin friction and end bearing in PWR and rock.

Construction casing will be required to facilitate drilled shaft construction. It is anticipated that the casing would either be socketed in stable, residual soils or advanced to the top of PWR or bedrock. We anticipate that casing lengths would be on the order of ten (10) to forty (40) feet long. The drilled shaft design methodology does not allow for resistance development in the cased portion of the drilled shaft. As such, the drilled shaft design will generate the required resistance in the uncased portion below the casing tip elevation. The anticipated drilled shaft lengths below the casing tip elevations may range from ten (10) feet to eighty (80) feet.

6.10.2. Lateral Resistance

For the Strength limit state and Extreme Event I limit state, the drilled shafts will develop most of the required lateral stability in dense residuum, PWR, and/or rock. Most sites do not cross waterways and are not impacted by scour, but the bridges over the Saluda River will likely scour to PWR or rock. The lateral resistance will be developed below the scour elevation. At the river crossings where the rock is extremely strong, the geotechnical drilled shaft design may be governed by lateral stability requirements. At other locations, we expect the axial loading condition will govern the geotechnical design.

6.10.3. Constructability

Drilled shaft construction will likely require excavation of hard soil (SPT N-values in excess of 100 bpf) or rock. In general, the measured rock strengths along the project suggest weak to extremely strong rock conditions. The extremely strong rock conditions are generally confined to the eastern extent of the project near the Saluda River. Rock strengths at these locations may exceed 30,000 psi with maximum measured values of 70,000 psi and will be difficult and time-consuming to excavate. In addition, the softer, fine-grained rock has nearly vertical joints at several locations. The vertical jointing will affect the Contractor's drilling advancement rate. The Contractor should be prepared to deal with jointed and

fractured rock in their drilled shaft installation plan. Specialized drilling equipment may be required to excavate through the PWR and into the bedrock. This may include, but not be limited to, rock augers, core barrels, or pneumatic equipment. The Contractor should be prepared to provide equipment capable of drilling through rock with compressive strengths on the order of 70,000 psi.

Drilled shaft excavations in PWR may require other equipment beyond a standard soil auger. In addition, drilling in this material without a mineral slurry may result in sloughing of the sides of the excavation. The sloughed material may fall to the bottom of the excavation, and, if not properly cleaned prior to concreting, may result in defects at the bottom of the drilled shaft.

6.11. Shallow Foundations

Shallow foundations are not typically utilized on SCDOT bridges due to the difficulty with balancing both settlement and bearing capacity requirements. At select locations where the site geometry and the soils conditions allow, shallow foundations may be suitable as a bridge substructure element. Shallow foundations may be desired for support of retaining walls but may also be used for sound walls and overhead signs if the conditions allow. Specific shallow foundation design issues are discussed in the following sections.

6.11.1. Bearing Capacity and Settlement

Where hard residuum, PWR, or bedrock is shallow and where the groundwater table is below the bearing elevation, shallow foundations may be an appropriate foundation option for bridges, walls, and/or signs. If SSL and/or soft soils are present below the proposed bottom of footing elevation and if shallow groundwater is present above the proposed bottom of footing elevation, then shallow foundations should not be considered. The Structural Engineer and Geotechnical Engineer should coordinate their designs such that all performance criteria are met.

6.11.2. Constructability

The ability to utilize shallow foundations may be limited by the site geometry. For example, shallow foundations will likely not be appropriate for the bridges over the interstates due to the proximity of existing traffic relative to the available space in the median. The footings would likely need to extend below the interstate pavement section. Depending on the construction sequencing and maintenance of traffic concept, temporary shoring may be implemented to facilitate the shallow foundation construction. We anticipate that shallow foundations would be suitable at the new bridge sites where an existing embankment does not impact the design and where construction would not need to accommodate existing traffic. Open excavations, without the use of temporary shoring, may be allowed to provide clearing for the proposed shallow foundation geometry and to access the bearing elevation. The shallow foundation subgrade soils will likely be moisture sensitive, and surface water should be directed away from any excavation to avoid undercutting.

Given the appropriate site and soil conditions, we see no unusual constructability conditions that would inhibit the use of shallow foundations for this project.

7. EXISTING INTERSTATE PAVED SHOULDERS

Seventy (70) pavement cores and subsequent shallow soil test borings were performed along the existing interstate paved shoulders. Charts are provided in Section 5 of Appendix A that graphically summarizes the existing paved shoulder thickness and AASHTO soil classification of the subgrade material. From observations of the extracted cores, the existing I-26 shoulder asphalt thickness generally varies from six (6) inches to twenty (20) inches, the I-20 shoulder asphalt thickness generally varies from twelve (12) inches to fifteen (15) inches, and the I-126 shoulder asphalt thickness generally varies from one (1) inch to ten (10) inches. The thin asphalt shoulder sections encountered along I-126 are confined to areas near the existing Colonial Life Blvd. interchange.

From the soil test borings and subsequent CBR testing, we note that the quality of the subgrade material below the existing paved shoulders varies from fair to poor. Several borings along I-26, I-20, and I-126 indicated subgrade material with an AASHTO classification higher than A-4. The following table summarizes the existing paved shoulder data along the interstates.

Existing Interstate Paved Shoulder Data								
Interstate ID	Pavement Thickness (in)				CBR @ 95% Compaction			
	No. Data Points	Max	Min	Avg	No. Data Points	Max	Min	Avg
I-26	59	22	4	11	11	18.3	1.8	8.0
I-20	20	31	8	14	7	12.8	2.5	7.7
I-126	8	11	1	7	3	8.5	5.9	7.4

8. LIMITATIONS OF REPORT

This report has been prepared in accordance with generally accepted geotechnical engineering practice for specific application to the referenced project. The conclusions and recommendations contained herein are based upon the provided test borings and testing result data, contained within, and applicable standards in this geographic area at the time this report was prepared. No other warranty, expressed or implied, is made.

9. REFERENCES

South Carolina Department of Transportation. Geotechnical Design Manual, Version 1.1, (2010)

South Carolina Department of Natural Resources, S.C Geological Survey. Geologic Map of the Columbia North Quadrangle. Johnson T. J., 1972.

South Carolina Department of Natural Resources, S.C Geological Survey. Geologic Map of the Irmo Quadrangle. Heron, S.D. and Johnson H.S., Jr., 1958.

APPENDIX A

SECTION 1 SITE LOCATION PLAN
SECTION 2 GEOTECHNICAL INVESTIGATION SUMMARY
SECTION 3 BORING LOCATION PLANS
SECTION 4 GENERALIZED SUBSURFACE PROFILES
SECTION 5 EXISTING PAVED SHOULDER DATA
SECTION 6 PRELIMINARY BRIDGE FOUNDATION CONCEPTS

APPENDIX B

F&ME GEOTECHNICAL DATA REPORT

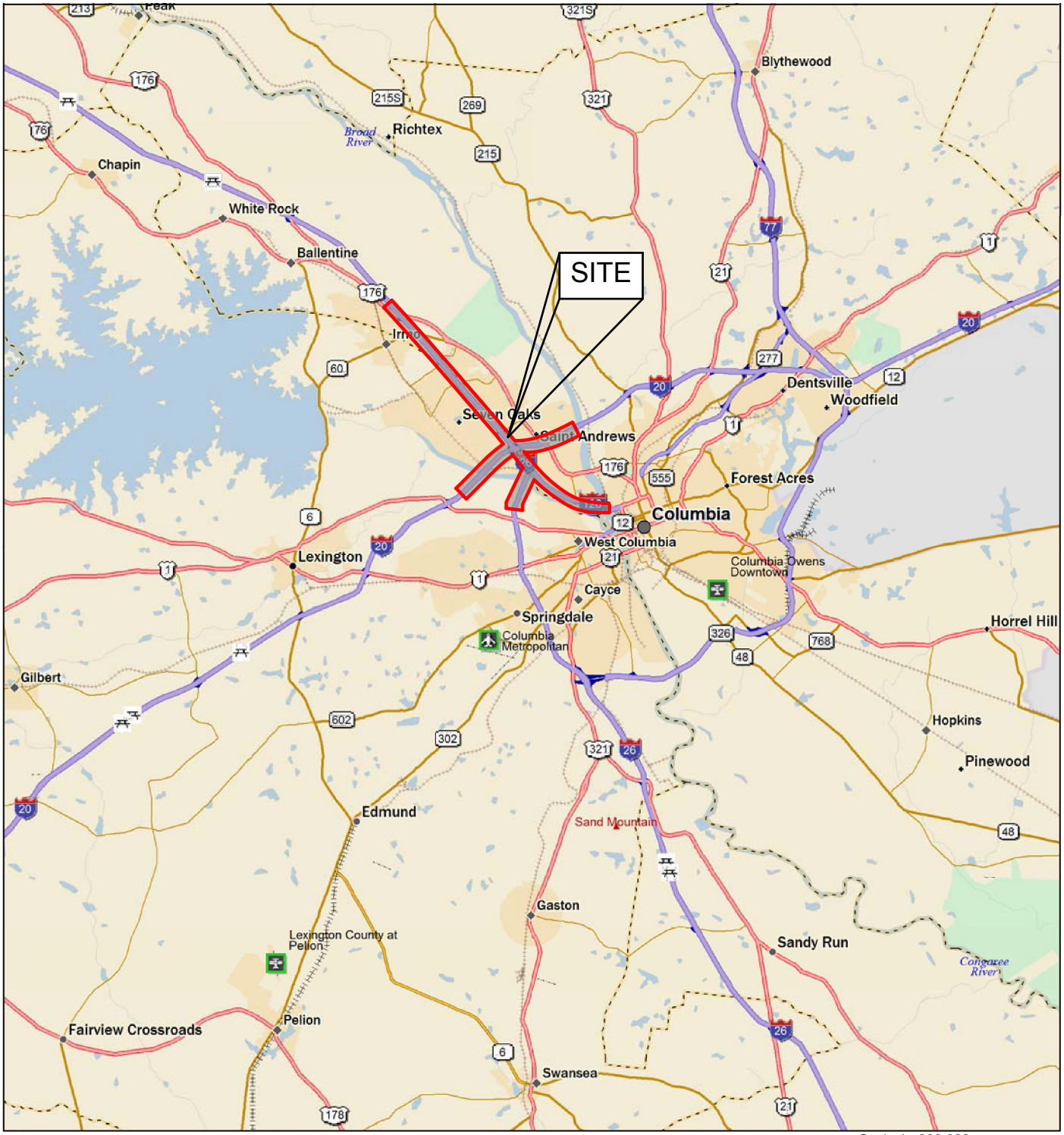
APPENDIX C

S&ME GEOTECHNICAL DATA REPORT

APPENDIX A

SECTION 1 SITE LOCATION PLAN

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	LEX/RICH		I-26/20/126	



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TN
MN (7.3°W)

Scale 1 : 300,000

0 1 2 3 4 5 mi
0 2 4 6 8 10 km

1" = 4.73 mi Data Zoom 9-4

F&ME
CONSULTANTS
GEOTECHNICAL – ENVIRONMENTAL – MATERIALS
COLUMBIA, SOUTH CAROLINA

REV. NO.	BY	DATE	DESCRIPTION OF REVISION
4			
3			
2			
1			

TOPO. _____ DATE _____
DWG. CTC DATE 7/20/2018 GROUP ____ - _____
R/W _____ DATE _____

CAROLINA CROSSROADS PHASE 2B
RICHLAND/LEXINGTON COUNTY, SOUTH CAROLINA

SITE LOCATION PLAN

SCALE: AS NOTED | FIGURE 1

APPENDIX A

SECTION 2 GEOTECHNICAL INVESTIGATION SUMMARY

	Test Hole Locale	Alignment	Station	Offset from CL	Northing	Easting	Latitude	Longitude	Elevation	Depth
				ft	*ft*	*ft*			*ft-MSL*	*ft*
B-1	Bridge	Harbison Blvd.	40+96	27 L	816654	1953702	34.077821	-81.152916	315.9	56.0
B-2	Bridge	Harbison Blvd.	42+18	75 R	816697	1953855	34.07794	-81.152411	313.8	74.3
B-3	Bridge	Tram Rd/Beatty Rd. Overpass	119+10	69 L	808844	1960339	34.056383	-81.130962	308.4	83.8
B-4	Bridge	Tram Rd/Beatty Rd. Overpass	122+15	82 L	808918	1960635	34.056587	-81.129985	312.7	98.6
B-5	Bridge	St. Andrews Rd.	28+24	185 L	804665	1964045	34.044909	-81.118709	218.8	68.7
B-6	Bridge	St. Andrews Rd.	27+96	104 R	804384	1964120	34.044138	-81.118461	225.9	78.6
B-6A	Bridge	St. Andrews Rd.	27+96	104 R	804384	1964120	34.044138	-81.118461	225.9	89.7
B-7	Bridge	St. Andrews Rd.	31+21	161 R	804444	1964443	34.044305	-81.117392	209.1	63.6
B-8	Bridge	126CDW1	7332+07	17 R	802558	1966150	34.039125	-81.11175	271.7	102.8
B-9	Bridge	I26RDB	6389+63	155 L	802039	1965895	34.037698	-81.112592	259.9	86.0
B-10	Bridge	I-26	339+52	78 R	801746	1966361	34.036894	-81.111053	247.4	96.0
B-11	Bridge	I-26	341+66	78 L	801677	1966616	34.036706	-81.110209	254.0	105.8
B-12	Bridge	I20RC1	5161+53	52 L	801210	1966755	34.035422	-81.10975	271.0	98.8
B-13	Bridge	I20RCA	5164+15	36 L	801253	1966998	34.03554	-81.108946	272.8	88.7
B-14	Bridge	I26RBD	4353+87	96 L	801094	1966915	34.035105	-81.109222	269.6	55.0
B-14A	Bridge	I26RBD	4353+85	92 L	801090	1966915	34.035092	-81.109222	269.6	88.8
B-15	Bridge	I20RC2	5163+92	14 L	800754	1966969	34.034225	-81.108953	275.3	100.0
B-16	Bridge	I20CDW2	7149+55	55 R	801464	1965386	34.036116	-81.11427	217.9	103.6
B-17	Bridge	I20RAC	3150+78	17 L	801575	1965771	34.036423	-81.112998	233.1	104.5
B-18	Bridge	I-20	154+03	100 R	801410	1965914	34.035968	-81.112527	236.5	95.1
B-19	Bridge	I20RC1	5152+72	7 R	801091	1965879	34.03511	-81.112637	238.6	98.6
B-20	Bridge	I20RC1	5154+37	55 L	801163	1966040	34.035292	-81.112109	240.5	98.6
B-21	Bridge	I20RAC	3166+23	9 L	802171	1966972	34.038065	-81.109037	285.4	73.9
B-22	Bridge	I20RAC	3168+53	8 L	802210	1967172	34.038048	-81.108284	283.9	88.6
B-23	Bridge	Burning Tree	9344+08	43 R	802357	1967282	34.038575	-81.108015	312.2	99.1
B-24	Bridge	I26RDB	6371+79	36 L	801858	1967156	34.037204	-81.108429	279.0	98.6
B-25	Bridge	I20RCA	5172+68	17 L	801917	1967345	34.037368	-81.107803	284.1	98.6
B-26	Bridge	I26RBD	4358+24	21 L	801288	1967277	34.035638	-81.108026	269.8	98.6
B-27	Bridge	I20RCA	5168+49	39 L	801530	1967285	34.036302	-81.108	281.3	98.7
B-28	Bridge	Burning Tree	9352+16	1 R	801702	1967660	34.036778	-81.106763	297.0	54.9
B-29	Bridge	Bush River Rd.	78+45	38 L	799581	1967990	34.030949	-81.105665	225.1	76.8
B-30	Bridge	Bush River Rd.	87+38	42 L	799422	1968869	34.030514	-81.102766	234.2	98.6
B-31	Bridge	I-126 C/D E	8379+66	43 L	798614	1968802	34.028294	-81.102982	205.7	55.5
B-32	Bridge	I-126 C/D E	8382+97	19 R	798319	1968958	34.027484	-81.102468	194.7	85.7
B-33	Bridge	I-26	385+33	3 L	798082	1968924	34.026832	-81.102580	183.3	74.6
B-34	Bridge	I-26	389+21	14 L	797694	1968897	34.025765	-81.102667	196.8	74.6
B-35	Bridge	I-126 Ramp CA	7388+26	146 L	797943	1969288	34.026450	-81.101378	185.2	55.0
B-36	Bridge	I-126 Ramp CA	7387+14	11 L	798093	1969190	34.026863	-81.101700	216.5	77.2
B-36A	Bridge	I-126 Ramp CA	7387+06	9 L	798101	1969190	34.026884	-81.101700	217.2	78.6
B-37	Bridge	I-126 Ramp DB	6013+18	10 L	797642	1970075	34.025625	-81.098778	185.2	64.3
B-38	Bridge	Colonial Life Ramp A	3027+51	55 R	796497	1970910	34.022482	-81.096018	184.6	31.7
B-39	Bridge	I-26 Ramp C	5027+19	10 L	796309	1970609	34.021963	-81.097012	177.1	32.2
B-40	Bridge	Colonial Life	11+56	7 L	795908	1971184	34.020864	-81.095111	193.8	94.0
B-41	Bridge	Colonial Life	12+63	52 R	795928	1971304	34.020919	-81.094715	192.8	78.5
B-42	Bridge	Colonial Life	15+15	71 L	796181	1971424	34.021612	-81.094321	218.6	87.0
B-43	Bridge	I-26	395+13	35 R	797148	1968669	34.024263	-81.103418	181.0	73.0
B-44	Bridge	I-26	398+36	99 L	796798	1968667	34.023303	-81.103422	165.5	26.2
B-45	Bridge	I-26	401+11	76 L	796553	1968540	34.022629	-81.103841	183.3	47.0
B-46	Bridge	I-126 Ramp DB	5987+48	49 L	796524	1968194	34.022548	-81.104982	168.9	48.6
B-47	Bridge	I-20	86+31	46 L	797947	1961317	34.026437	-81.127687	198.1	66.9
B-48	Bridge	I-20	80+48	76 R	797446	1960995	34.025058	-81.128747	173.3	34.7
B-49	Bridge	I-20	84+09	42 L	797786	1961164	34.025993	-81.128191	194.4	58.3
B-50	Bridge	I-20	91+54	47 R	798255	1961751	34.027285	-81.126258	212.6	92.2
B-51	Bridge	I-20	93+59	160 L	798545	1961746	34.028083	-81.126273	214.8	59.7
B-52	Bridge	Bush River Rd.	27+51	38 L	799928	1963107	34.031889	-81.121786	247.7	93.2
B-53	Bridge	Bush River Rd.	31+09	38 L	799770	1963428	34.031454	-81.120726	246.2	102.8
B-54	Bridge	Executive Center Dr.	9138+99	8 L	800825	1964119	34.034356	-81.118449	226.4	90.6
B-55	Bridge	Executive Center Dr.	9140+90	24 L	800694	1964259	34.033997	-81.117986	222.3	76.6
B-56	Bridge	I-20	201+61	183 L	802731	1971322	34.039615	-81.094676	305.8	101.4
B-57	Bridge	I-20	203+12	117 R	802509	1971574	34.039007	-81.093844	311.6	105.2
B-58	Bridge	I-20	204+86	130 L	802806	1971629	34.039822	-81.093664	318.6	102.4
B-59	Bridge	I-20	206+15	155 R	802608	1971871	34.039279	-81.092863	322.4	119.6
B-60	Bridge	I-26 Ramp C	5022+83	81 L	796684	1970397	34.022994	-81.097713	173.8	26.7
B-61	Bridge	I-26 Ramp C	5012+33	8 L	797478	1969704	34.025174	-81.100002	171.5	42.5
B-62	Bridge	I-126 Ramp DB	5996+62	83 L	797410	1968510	34.024985	-81.103943	167.2	45.7
B-63	Bridge	St. Andrews Rd.	30+38	99 L	804657	1964271	34.044894	-81.117949	211.1	65.4

	Test Hole Locale	Alignment	Station	Offset from CL	Northing	Easting	Latitude	Longitude	Elevation	Depth
				ft	*ft*	*ft*			*ft-MSL*	*ft*
W-1	Wall	I-26	31+13	94 L	825261	1946429	34.101444	-81.176987	314.6	30.7
W-2	Wall	I-26	40+35	56 R	824478	1946936	34.099295	-81.175308	329.3	24.0
W-3	Wall	I-26	43+71	61 L	824309	1947249	34.098831	-81.174273	330.1	21.3
W-4	Wall	I-26	80+48	66 R	821510	1949637	34.091152	-81.166366	297.3	43.6
W-5	Wall	I-26	84+21	67 L	821326	1949988	34.090647	-81.165209	295.2	24.5
W-6	Wall	I-26	165+87	87 R	814948	1955093	34.073138	-81.148315	254.9	58.7
W-7	Wall	I-26	177+11	101 R	814071	1955798	34.070732	-81.14598	245.9	40.6
W-8	Wall	I-26	180+57	99 L	813932	1956172	34.070351	-81.144744	247.0	41.2
W-9	Wall	I-26	192+74	57 R	812895	1956827	34.067504	-81.142577	255.5	49.2
W-10	Wall	I-26	194+70	58 L	812817	1957041	34.067289	-81.141871	257.3	53.6
W-11	Wall	I-26	236+42	108 R	809569	1959663	34.058374	-81.133196	310.2	38.6
W-12	Wall	I-26	244+17	108 R	808994	1960183	34.056795	-81.131476	317.9	45.0
W-13	Wall	I-26	298+70	86 R	804948	1963829	34.045687	-81.119423	229.4	59.9
W-14	Wall	St. Andrews Rd.	36+24	212 L	804987	1964717	34.045796	-81.116491	227.1	53.6
W-15	Wall	I-26	314+37	75 R	803724	1964807	34.042325	-81.11619	214.3	43.6
W-16	Wall	I-26	320+94	180 R	803142	1965130	34.040728	-81.115119	215.3	68.9
W-17	Wall	I-26	330+80	313 R	802286	1965636	34.038376	-81.113448	248.6	79.9
W-18	Wall	I-20 C/C W2	3144+04	36 R	801270	1964835	34.035582	-81.116087	194.2	34.3
W-19	Wall	I-20 C/C W2	5148+30	38 R	800941	1965443	34.034679	-81.114079	201.9	54.8
W-20	Wall	I20RC2	5160+07	6 R	800832	1966617	34.034383	-81.110204	266.5	79.9
W-21	Wall	Burning Tree	9359+70	50 R	800946	1967554	34.034699	-81.107111	274.1	58.7
W-22	Wall	I-26	407+19	77 L	795992	1968313	34.021085	-81.104590	185.9	79.1
W-23	Wall	I-126 Ramp DB	6022+73	53 L	796966	1970751	34.023770	-81.096544	185.6	28.6
W-24	Wall	I-26	443+21	120 L	792639	1966989	34.011868	-81.108948	277.3	39.2
W-25	Wall	I-26	448+02	158 R	792304	1966546	34.010945	-81.110409	275.7	36.2
W-26	Wall	I20CDW1	7175+80	33 R	802274	1967879	34.038351	-81.106044	282.0	58.7
W-27	Wall	I-20	182+21	134 R	802157	1968593	34.038030	-81.103686	275.3	74.1
W-28	Wall	I-20	196+37	79 R	802228	1969995	34.038228	-81.099057	319.9	69.8
W-29	Wall	I-20	205+84	192 R	802230	1970979	34.038238	-81.095809	284.2	59.9
W-30	Wall	I-20	226+17	110 L	803339	1972737	34.041290	-81.090007	292.4	64.0
W-31	Wall	I-20	240+69	167 R	803742	1974160	34.042401	-81.085312	224.7	64.5
W-32	Wall	I-20	252+84	60 L	804490	1975143	34.044459	-81.082066	189.8	54.7

	Test Hole Locale	Alignment	Station	Offset from CL	Northing	Easting	Latitude	Longitude	Elevation	Depth
				ft	*ft*	*ft*			*ft-MSL*	*ft*
RW-1	Embankment	I-26	16+31	48 R	826293	1945357	34.104277	-81.180534	317.1	23.2
RW-2	Embankment	I-26	45+49	286 R	823943	1947113	34.097827	-81.174719	330.6	35.0
RW-3	Embankment	I-26	61+96	106 R	822849	1948357	34.094826	-81.170602	317.9	28.8
RW-4	Embankment	I-26	84+58	105 R	821182	1949885	34.09025	-81.165545	294.7	6.0
RW-5	Embankment	I-26	96+28	47 L	820399	1950765	34.088101	-81.162637	290.9	24.1
RW-6	Embankment	I-26	116+31	44 R	818796	1951970	34.083703	-81.158647	278.7	16.6
RW-7	Embankment	I-26	136+32	93 L	817340	1953350	34.079706	-81.154082	316.1	29.3
RW-8	Embankment	Harbison Blvd.	45+22	177 L	817090	1953820	34.079021	-81.152529	299.0	19.5
RW-9			**Not Performed**							
RW-10	Embankment	Harbison Blvd.	37+67	262 R	816219	1953753	34.076626	-81.152744	309.1	30.0
RW-11	Embankment	I-26	156+29	64 R	815701	1954501	34.075205	-81.150273	279.6	18.6
RW-12	Embankment	I-26	216+33	78 R	811079	1958337	34.062518	-81.137582	286.1	30.0
RW-13	Embankment	I-26	236+31	48 L	809682	1959772	34.058683	-81.132839	304.4	23.8
RW-14	Embankment	I-26	256+29	55 R	808131	1961035	34.054426	-81.128661	298.0	50.0
RW-15	Embankment	I-26	276+32	46 L	806714	1962454	34.050536	-81.123970	238.7	44.3
RW-16	Embankment	St. Andrews Rd.	26+81	249 L	804682	1963902	34.044957	-81.119181	225.3	48.5
RW-17	Embankment	St. Andrews Rd.	30+75	269 L	804832	1964251	34.045368	-81.118030	212.2	23.5
RW-18	Embankment	St. Andrews Rd.	29+98	539 R	804047	1964460	34.043214	-81.117335	207.3	85.8
RW-19	Embankment	St. Andrews Rd.	32+12	241 R	804401	1964557	34.044186	-81.117017	216.7	39.3
RW-20	Embankment	126CDW1	7330+08	9 R	802647	1965970	34.039370	-81.112346	267.9	40.0
RW-21	Embankment	I26RDB	6391+19	118 L	801955	1965785	34.037467	-81.112953	248.3	40.0
RW-22	Embankment	I26RBD	4342+46	33 L	801298	1965993	34.035662	-81.112265	240.1	44.2
RW-23	Embankment	I20RC2	5161+62	8 R	800811	1966768	34.034325	-81.109706	273.6	73.9
RW-24	Embankment	I-26	336+30	61 L	802085	1966270	34.037826	-81.111352	275.6	40.0
RW-25	Embankment	I20RAC	3160+88	69 L	802287	1966438	34.038380	-81.110800	277.8	44.9
RW-26	Embankment	126CDW1	7339+86	15 R	802446	1966921	34.038820	-81.109205	294.1	45.0
RW-27	Embankment	I-20	165+58	84 L	801958	1966947	34.037479	-81.109119	272.6	45.0
RW-28	Embankment	I20RCA	5171+07	29 L	801762	1967350	34.036941	-81.107787	280.0	9.0
RW-28A	Embankment	I20RCA	5171+26	22 L	801780	1967357	34.036991	-81.107763	280.1	43.7
RW-29	Embankment	I20RCA	5165+86	38 L	801337	1967135	34.035772	-81.108495	278.1	50.0
RW-30	Embankment	I26RDB	6364+52	15 R	801160	1967364	34.035287	-81.107738	275.5	48.9
RW-31	Embankment	Burning Tree	9357+06	18 L	801216	1967610	34.035440	-81.106928	296.2	60.0
RW-32	Embankment	I-26	356+26	78 R	800479	1967462	34.033417	-81.107412	250.4	40.0
RW-33	Embankment	126CDW1	7347+76	7 L	802293	1967688	34.038403	-81.106673	294.6	45.0
RW-34	Embankment	I26RBD	4366+82	44 R	801923	1967832	34.037385	-81.106195	293.0	50.0
RW-35	Embankment	I-26	375+95	182 L	799068	1968906	34.029541	-81.102643	210.8	49.3
RW-36	Embankment	I-126 Ramp CA	8389+86	0.3 R	797898	1969505	34.026327	-81.100660	188.5	30.1
RW-37	Embankment	I-126	45+98	85 R	794576	1972826	34.017205	-81.089689	191.1	32.3
RW-38	Embankment	I-126 Ramp DB	5985+51	74 L	796335	1968136	34.022027	-81.105175	169.5	16.6
RW-39	Embankment	I-26	420+96	67 L	794717	1967790	34.017580	-81.106312	199.3	35.2
RW-40	Embankment	I-20	69+86	61 L	796143	1959522	34.021474	-81.133604	238.9	20.8
RW-41	Embankment	I-20 Ramp C1	5148+49	22 L	801090	1965456	34.035089	-81.114037	211.1	41.6
RW-42	Embankment	I-20	199+05	149 L	802463	1970253	34.038875	-81.098205	312.4	50.0
RW-43	Embankment	I-20	223+94	137 L	803018	1972649	34.040407	-81.090298	304.1	50.0

	Test Hole Locale	Alignment	Station	Offset from CL	Northing	Easting	Latitude	Longitude	Elevation	Depth
				ft	*ft*	*ft*			*ft-MSL*	*ft*
DH-1	Downhole Seismic	I-26	164+44	85 L	815167	1955135	34.073742	-81.148177	251.5	120.3
DH-2	Downhole Seismic	I20RAC	3159+24	78 L	802270	1966257	34.038335	-81.111397	278.8	118.6
DH-3	Downhole Seismic	I26RCA	5383+63	119 R	798494	1969146	34.027965	-81.101848	209.3	8.2
DH-3A	Downhole Seismic	I26RCA	5383+53	113 R	798503	1969152	34.027991	-81.101829	208.7	120.7
DH-4	Downhole Seismic	I-20	76+09	87 R	797125	1960696	34.024177	-81.129735	185.7	120.2
DH-5	Downhole Seismic	I-20	262+96	138 R	804767	1976137	34.045222	-81.078785	165.7	120.6
DH-6	Downhole Seismic	I-26	438+20	100 R	793186	1966981	34.013371	-81.108977	241.1	120.6

	Test Hole Locale	Alignment	Station	Offset from CL	Northing	Easting	Latitude	Longitude	Elevation	Depth
				ft	*ft*	*ft*			*ft-MSL*	*ft*
P-1	Pavement	I-26	9+96	54 R	826771	1944940	34.105588	-81.181915	322.7	10.5
P-2	Pavement	I-26	21+90	60 L	825938	1945803	34.103304	-81.179059	313.3	11.0
P-3	Pavement	I-26	29+68	52 R	825274	1946223	34.101481	-81.177665	316.4	5.3
P-4	Pavement	I-26	39+32	49 L	824625	1946943	34.099699	-81.175284	328.7	3.6
P-5	Pavement	I-26	49+45	51 R	823809	1947553	34.097461	-81.173264	325.5	10.4
P-6	Pavement	I-26	64+47	63 L	822779	1948651	34.094634	-81.169631	329.5	9.5
P-7	Pavement	I-26	69+68	52 R	822317	1948918	34.093365	-81.168746	333.3	11.0
P-8	Pavement	I-26	79+93	55 L	821633	1949690	34.091489	-81.166193	299.1	10.8
P-9	Pavement	I-26	89+92	49 R	820822	1950281	34.089262	-81.164236	300.8	10.7
P-10	Pavement	I-26	103+56	52 L	819840	1951233	34.086569	-81.161088	286.8	5.0
P-11	Pavement	I-26	109+94	63 R	819276	1951550	34.085019	-81.160037	273.9	11.5
P-12	Pavement	I-26	120+00	49 L	818571	1952277	34.083085	-81.157632	285.9	9.6
P-13	Pavement	I-26	130+35	43 R	817714	1952865	34.080732	-81.155686	305.6	11.5
P-14	Pavement	I-26	139+93	51 L	817035	1953547	34.078869	-81.153429	320.6	10.7
P-15	Pavement	I-26	149+94	47 R	816201	1954109	34.076580	-81.151569	298.4	11.0
P-16	Pavement	I-26	159+98	50 L	815489	1954824	34.074625	-81.149206	269.5	9.1
P-17	Pavement	I-26	169+97	48 R	814656	1955384	34.072338	-81.147351	248.8	10.7
P-18	Pavement	I-26	187+82	50 L	813342	1956597	34.068731	-81.143340	251.6	10.2
P-19	Pavement	I-26	189+85	53 R	813120	1956646	34.068123	-81.143175	253.3	11.3
P-20	Pavement	I-26	200+10	49 L	812394	1957377	34.066130	-81.140758	265.7	11.4
P-21	Pavement	I-26	202+81	52 R	812121	1957472	34.065378	-81.140443	276.7	11.4
P-22	Pavement	I-26	220+14	48 L	810881	1958687	34.061975	-81.136427	280.6	10.8
P-23	Pavement	I-26	229+97	51 R	810085	1959273	34.059791	-81.134487	289.0	10.9
P-24	Pavement	I-26	240+01	48 L	809407	1960020	34.057929	-81.132018	313.4	9.1
P-25	Pavement	I-26	250+12	51 R	808592	1960625	34.055690	-81.130018	306.6	9.8
P-26	Pavement	I-26	259+75	49 L	807944	1961345	34.053912	-81.127638	290.6	10.6
P-27	Pavement	I-26	270+00	50 R	807118	1961959	34.051643	-81.125605	253.7	11.1
P-28	Pavement	I-26	280+09	50 L	806436	1962710	34.049773	-81.123124	244.9	10.7
P-29	Pavement	I-26	299+17	49 R	804934	1963887	34.045648	-81.119233	229.0	11.3
P-30	Pavement	I-26	300+28	50 L	804908	1964034	34.045576	-81.118747	223.6	10.7
P-31	Pavement	I-26	307+53	62 R	804268	1964394	34.043821	-81.117556	211.8	11.2
P-32	Pavement	I-26	320+03	73 L	803370	1965273	34.041355	-81.114649	220.4	10.9
P-33	Pavement	I-26	329+96	61 R	802507	1965782	34.038983	-81.112965	261.0	11.3
P-34	Pavement	I-26	350+08	61 R	800951	1967064	34.034713	-81.108729	269.3	10.7
P-35	Pavement	I-26	360+72	72 L	800247	1967871	34.032778	-81.106063	234.3	10.8
P-36	Pavement	I-26	370+82	51 R	799408	1968442	34.030475	-81.104174	214.3	10.9
P-37	Pavement	I-26	379+07	289 L	798778	1969120	34.028745	-81.101935	209.6	6.0
P-38	Pavement	I-126	5+99	47 R	797413	1970040	34.024996	-81.098892	184.0	10.8
P-39	Pavement	I-126	9+60	51 L	797185	1970337	34.024369	-81.097912	184.1	10.8
P-40	Pavement	I-126	19+02	46 R	796376	1970830	34.022148	-81.096282	186.3	10.9
P-41	Pavement	I-126	28+97	61 L	795664	1971526	34.020192	-81.093984	199.1	10.0
P-42	Pavement	I-126	38+95	46 R	794943	1972219	34.018214	-81.091694	212.0	10.8
P-43	Pavement	I-126	49+19	70 L	794574	1973182	34.017202	-81.088513	184.4	10.5
P-44	Pavement	I-20	74+76	48 L	796483	1959876	34.022409	-81.132440	220.3	11.1
P-45	Pavement	I-20	84+69	47 R	797125	1960639	34.024176	-81.129923	193.4	11.0
P-46			**Not Performed**							
P-47	Pavement	I-20	104+83	46 R	798561	1962051	34.028128	-81.125269	220.7	11.4
P-48	Pavement	I-20	115+75	50 L	799407	1962748	34.030453	-81.122970	217.0	11.0
P-49	Pavement	I-20	125+37	59 R	800016	1963500	34.032131	-81.120490	232.7	11.0
P-50	Pavement	I-20	135+36	60 L	800783	1964155	34.034242	-81.118330	228.6	11.0
P-51	Pavement	I-20	145+03	56 R	801154	1965053	34.035264	-81.115367	209.7	12.6
P-52	Pavement	I-20	153+63	49 L	801538	1965828	34.036320	-81.112812	233.5	11.2
P-53	Pavement	I-20	166+97	49 L	801970	1967089	34.037513	-81.108649	278.2	10.6
P-54	Pavement	I-20	170+50	51 R	801990	1967455	34.037569	-81.107440	287.5	10.7
P-55	Pavement	I-20	180+25	47 L	802313	1968378	34.038459	-81.104394	289.1	10.9
P-56	Pavement	I-20	191+76	50 R	802260	1969534	34.038316	-81.100580	314.9	10.9
P-57	Pavement	I-20	201+47	50 L	802387	1970497	34.038666	-81.097399	311.6	11.1
P-58	Pavement	I-20	211+11	45 R	802536	1971451	34.039080	-81.094251	306.2	11.1
P-59	Pavement	I-20	221+44	50 L	803073	1972342	34.040557	-81.091312	308.6	11.4
P-60	Pavement	I-20	230+48	62 R	803378	1973199	34.041399	-81.088482	276.7	11.0
P-61	Pavement	I-20	241+06	61 L	803963	1974090	34.043008	-81.085541	234.0	11.4
P-62	Pavement	I-20	249+59	45 R	804251	1974901	34.043800	-81.082867	200.3	11.1
P-63	Pavement	I-20	261+07	50 L	804850	1975883	34.045449	-81.079624	179.2	11.3
P-64	Pavement	I-20	269+93	46 R	805162	1976719	34.046308	-81.076867	177.4	11.1
P-65	Pavement	I-26	377+80	89 L	798851	1968889	34.028944	-81.102697	207.9	10.8
P-66	Pavement	I-26	391+69	89 L	797430	1968908	34.025039	-81.102628	188.3	10.8
P-67	Pavement	I-26	404+20	39 R	796312	1968316	34.021965	-81.104580	184.7	10.6
P-68	Pavement	I-26	425+91	49 R	794301	1967497	34.016436	-81.107275	196.3	11.1
P-69	Pavement	I-26	425+91	49 R	794301	1967497	34.016435	-81.107275	196.1	11.0
P-70	Pavement	I-26	435+45	60 L	793378	1967235	34.013898	-81.108136	225.1	10.6
P-71	Pavement	I-26	445+04	50 R	792536	1966761	34.011584	-81.109698	265.1	11.3

	Test Hole Locale	Alignment	Station	Offset from CL	Northing	Easting	Latitude	Longitude	Elevation	Depth
				ft	*ft*	*ft*			*ft-MSL*	*ft*
CPT-B41	Bridge	Colonial Life Pkwy.	12+59	55 R	795924	1971303	34.020907	81.094718	192.5	37.0
DMT-B41	Bridge	Colonial Life Pkwy.	12+29	50 R	795928	1971300	34.020917	81.094728	192.4	35.0
CPT-RW42	Embankment	I-20	190+07	92 L	802407	1970259	34.038721	81.098185	313.3	49.9
CPT-B34	Bridge	I-26	7392+29	10 R	797619	1968988	34.025558	81.102365	195.5	39.6
DMT-B34	Bridge	I-26	7392+25	10 R	797622	1968990	34.025567	81.102360	195.7	40.0
CPT-RW17	Embankment	I-26	302+09	217 L	804869	1964277	34.045472	81.117945	213.0	18.1
CPT-B12	Bridge	I-20 Ramp C	5161+13	18 L	801173	1966717	34.035320	81.109875	270.2	19.8
CPT-B56	Bridge	I-20	201+60	175 L	802723	1971325	34.039592	81.094669	305.7	50.1
CPT-B58	Bridge	I-20	204+85	130 L	802806	1971628	34.039821	81.093666	318.1	50.0
CPT-RW6	Embankment	I-26	116+07	262 R	818805	1951943	34.083726	81.158735	277.2	14.6
CPT-RW24	Embankment	I-26	335+71	71 L	802137	1966242	34.037969	81.111446	274.9	30.0
CPT-RW32	Embankment	I-26	356+46	78 R	800464	1967476	34.033375	81.107367	249.7	40.1

	Test Hole Locale	Alignment	Station	Offset from CL	Northing	Easting	Latitude	Longitude	Elevation	Depth
				ft	*ft*	*ft*			*ft-MSL*	*ft*
AP-1	W-4	I-26	80+48	66 R	821510	1949637	34.091152	-81.166366	297.3	8.3
AP-2	RW-5	I-26	96+28	47 L	820399	1950765	34.088101	-81.162637	290.9	16.3
AP-3	RW-6	I-26	116+31	44 R	818796	1951970	34.083703	-81.158647	278.7	8.3
AP-4	RW-15	I-26	276+32	46 L	806714	1962454	34.050536	-81.12397	238.7	10.5
AP-5	W-13	I-26	298+72	86 R	804947	1963830	34.045687	-81.119423	229.5	10.3
AP-6	RW-17	St. Andrews Rd.	30+75	269 L	804832	1964251	34.045368	-81.11803	212.2	10.5
AP-7	W-14	St. Andrews Rd.	36+24	212 L	804987	1964717	34.045796	-81.116491	227.1	12.3
AP-8	RW-18	St. Andrews Rd.	29+98	539 R	804047	1964460	34.043214	-81.117335	207.3	8.5
AP-9	W-15	I-26	314+37	88 R	803716	1964796	34.042325	-81.11619	212.8	14.2
AP-10	W-15	I-26	314+41	88 R	803712	1964799	34.042325	-81.11619	212.8	13.2
AP-11	W-17	I-26	330+80	313 R	802286	1965636	34.038376	-81.113448	248.6	26.5
AP-12	RW-24	I-26	336+30	61 L	802085	1966270	34.037826	-81.111352	275.6	20.4
AP-13	B-21	I20RAC	3166+23	9 L	802171	1966972	34.038065	-81.109037	285.4	113.5
AP-14	B-17	I20RAC	3150+78	17 L	801575	1965771	34.036423	-81.112998	233.1	20.5
AP-15	B-10	I-26	339+53	84 R	801742	1966356	34.036894	-81.111053	247.7	91.2
AP-16	B-25	I20RCA	5172+65	23 L	801914	1967340	34.038065	-81.109037	284.1	38.3
AP-17	B-27	I20RCA	5168+49	39 L	801530	1967285	34.036302	-81.108	281.3	72.5
AP-18	B-13	I20RCA	5164+15	36 L	801253	1966998	34.03554	-81.108946	272.8	18.3
AP-19	B-12	I20RC1	5161+53	52 L	801210	1966755	34.035422	-81.10975	271.0	8.5
AP-20	RW-23	I20RC2	5161+62	8 R	800811	1966768	34.034325	-81.109706	273.6	40.5
AP-21	RW-32	I-26	356+26	78 R	800479	1967462	34.033417	-81.107412	250.4	20.5
B-34UD	B-34	I-26	389+16	15 L	797699	1968899	34.02577797	-81.10266133	196.7	39.5
B-41UD	B-41	Executive Center Dr.	12+61	58 R	795923	1971307	34.02090368	-81.09470637	192.5	24.5
B-50UD	B-50	I-20	91+52	49 R	798252	1961751	34.02727689	-81.12625825	212.3	42.5
B-56UD	B-56	I-20	201+60	193 L	802740	1971318	34.03963907	-81.09469147	305.8	32.0
RW-42UD	RW-42	I-20	190+15	90 L	802405	1970267	34.03871512	-81.09815873	313.7	42.0
W-18UD	W-18	I-20 CD W2	3143+99	35 R	801269	1964830	34.03557829	-81.11610295	194.3	12.0
W-23UD	W-23	I-126 Ult. Flyover	6022+78	49 L	796960	1970751	34.02375235	-81.09654606	185.8	10.5
W-27UD	W-27	I-20	173+18	137 R	802153	1968591	34.03801933	-81.10369185	275.2	27.0

	Test Hole Locale	Alignment	Station	Offset from CL	Northing	Easting	Latitude	Longitude	Elevation	Depth
				ft	*ft*	*ft*			*ft-MSL*	*ft*
BS-1	Ex. Embankment	I26	56+45	99 L	823395	1948136	34.096324	-81.171336	319.2	1.0
BS-2	Ex. Embankment	I26	80+48	66 R	821510	1949637	34.091152	-81.166366	297.3	5.0
BS-3	Ex. Embankment	I26	136+32	93 L	817340	1953350	34.079706	-81.154082	316.1	5.0
BS-4	Ex. Embankment	I26	168+46	67 R	814761	1955273	34.072625	-81.147717	247.2	3.0
BS-5	Ex. Embankment	I26	194+70	58 L	812817	1957041	34.067289	-81.141871	257.3	5.0
BS-6	Ex. Embankment	I26	244+56	69 R	808991	1960238	34.056787	-81.131297	313.9	4.0
BS-7	Ex. Embankment	I26	282+30	61 L	804444	1964443	34.049344	-81.122606	248.0	5.0
BS-8	Ex. Embankment	St. Andrews Rd.	26+91	134 L	804575	1963944	34.044662	-81.119042	222.8	5.0
BS-9	Ex. Embankment	I26	314+37	75 R	803724	1964807	34.042325	-81.11619	214.3	5.0
BS-10	Cut Section	Burning Tree	9344+66	7 L	802363	1967357	34.038593	-81.107765	306.7	5.0
BS-11	Ex. Embankment	I20	168+67	91 L	802065	1967236	34.037774	-81.108164	285.7	5.0
BS-12	Cut Section	Burning Tree	9352+16	5 R	801702	1967656	34.036777	-81.106777	297.0	5.0
BS-13	New Embankment	I26RBD	4358+24	21 L	801288	1967277	34.035638	-81.108026	269.8	8.0
BS-14	Ex. Embankment	I26RBD	4353+87	96 L	801094	1966915	34.035105	-81.109222	269.6	5.0
BS-15	Ex. Embankment	I20RAC	3150+78	17 L	801575	1965771	34.036423	-81.112998	233.1	5.0
BS-16	Cut Section	Burning Tree	9318+00	1 R	803697	1965183	34.042253	-81.114948	223.1	5.0
BS-17	Cut Section	Burning Tree	9329+00	1 R	802881	1965911	34.040013	-81.112541	271.7	3.0
BS-18	Cut Section	Burning Tree	9357+06	18 L	801214	1967606	34.03544	-81.106928	296.2	5.0
BS-19	Cut Section	I26RBD	4333+02	16 R	802207	1965882	34.038159	-81.112633	283.9	3.0
BS-20	Cut Section	I26CDE	8352+58	49 R	800609	1967013	34.033771	-81.108896	273.2	5.0
P-1BS	Ex. Embankment	I-26	9+96	54 R	826771	1944940	34.105588	-81.181915	322.7	10.5
P-5BS	Ex. Embankment	I-26	49+45	51 R	823809	1947553	34.097461	-81.173264	325.5	10.4
P-10BS	Ex. Embankment	I-26	103+56	52 L	819840	1951233	34.086569	-81.161088	286.8	5.0
P-15BS	Ex. Embankment	I-26	149+94	47 R	816201	1954109	34.076580	-81.151569	298.4	11.0
P-20BS	Ex. Embankment	I-26	200+10	49 L	812394	1957377	34.066130	-81.140758	265.7	11.4
P-25BS	Ex. Embankment	I-26	250+12	51 R	808592	1960625	34.055690	-81.130018	306.6	9.8
P-30BS	Ex. Embankment	I-26	300+28	50 L	804908	1964034	34.045576	-81.118747	223.6	10.7
P-35BS	Ex. Embankment	I-26	360+72	72 L	800247	1967871	34.032778	-81.106063	234.3	10.8
P-41BS	Ex. Embankment	I-126	28+97	61 L	795664	1971526	34.020192	-81.093984	199.1	10.0
P-42BS	Ex. Embankment	I-126	38+95	46 R	794943	1972219	34.018214	-81.091694	212.0	10.8
P-43BS	Ex. Embankment	I-126	49+19	70 L	794574	1973182	34.017202	-81.088513	184.4	10.5
P-44BS	Ex. Embankment	I-20	74+76	48 L	796483	1959876	34.022409	-81.132440	220.3	11.1
P-47BS	Ex. Embankment	I-20	104+83	46 R	798561	1962051	34.028128	-81.125269	220.7	11.4
P-50BS	Ex. Embankment	I-20	135+36	60 L	800783	1964155	34.034242	-81.118330	228.6	11.0
P-53BS	Ex. Embankment	I-20	166+97	49 L	801970	1967089	34.037513	-81.108649	278.2	10.6
P-56BS	Ex. Embankment	I-20	191+76	50 R	802260	1969534	34.038316	-81.100580	314.9	10.9
P-58BS	Ex. Embankment	I-20	211+11	45 R	802536	1971451	34.039080	-81.094251	306.2	11.1
P-63BS	Ex. Embankment	I-20	261+07	50 L	804850	1975883	34.045449	-81.079624	179.2	11.3
P-65BS	Ex. Embankment	I-26	377+80	89 L	798851	1968889	34.028944	-81.102697	207.9	10.8
P-67BS	Ex. Embankment	I-26	404+20	39 R	796312	1968316	34.021965	-81.104580	184.7	10.6
P-70BS	Ex. Embankment	I-26	435+45	60 L	793378	1967235	34.013898	-81.108136	225.1	10.6
RW-35BS	Ex. Embankment	I-26	375+95	182 L	799068	1968906	34.029541	-81.102643	210.8	10.0
RW-36BS	New Embankment	I-126 Ramp CA	8389+86	0.3 R	797898	1969505	34.026327	-81.100660	188.5	10.0
RW-37BS	Ex. Embankment	I-126	45+98	85 R	794576	1972826	34.017205	-81.089689	191.1	10.0
RW-38BS	Ex. Embankment	I-126 Ramp DB	5985+51	74 L	796335	1968136	34.022027	-81.105175	169.5	10.0
RW-39BS	Ex. Embankment	I-26	420+96	67 L	794717	1967790	34.017580	-81.106312	199.3	10.0
RW-40BS	Ex. Embankment	I-20	69+86	61 L	796143	1959522	34.021474	-81.133604	238.9	10.0
RW-41BS	Ex. Embankment	I-20 Ramp C1	5148+49	22 L	801090	1965456	34.035089	-81.114037	211.1	10.0
RW-42BS	Ex. Embankment	I-20	199+05	149 L	802463	1970253	34.038875	-81.098205	312.4	10.0
RW-43BS	Ex. Embankment	I-20	223+94	137 L	803018	1972649	34.040407	-81.090298	304.1	10.0

APPENDIX A

SECTION 3 BORING LOCATION PLAN

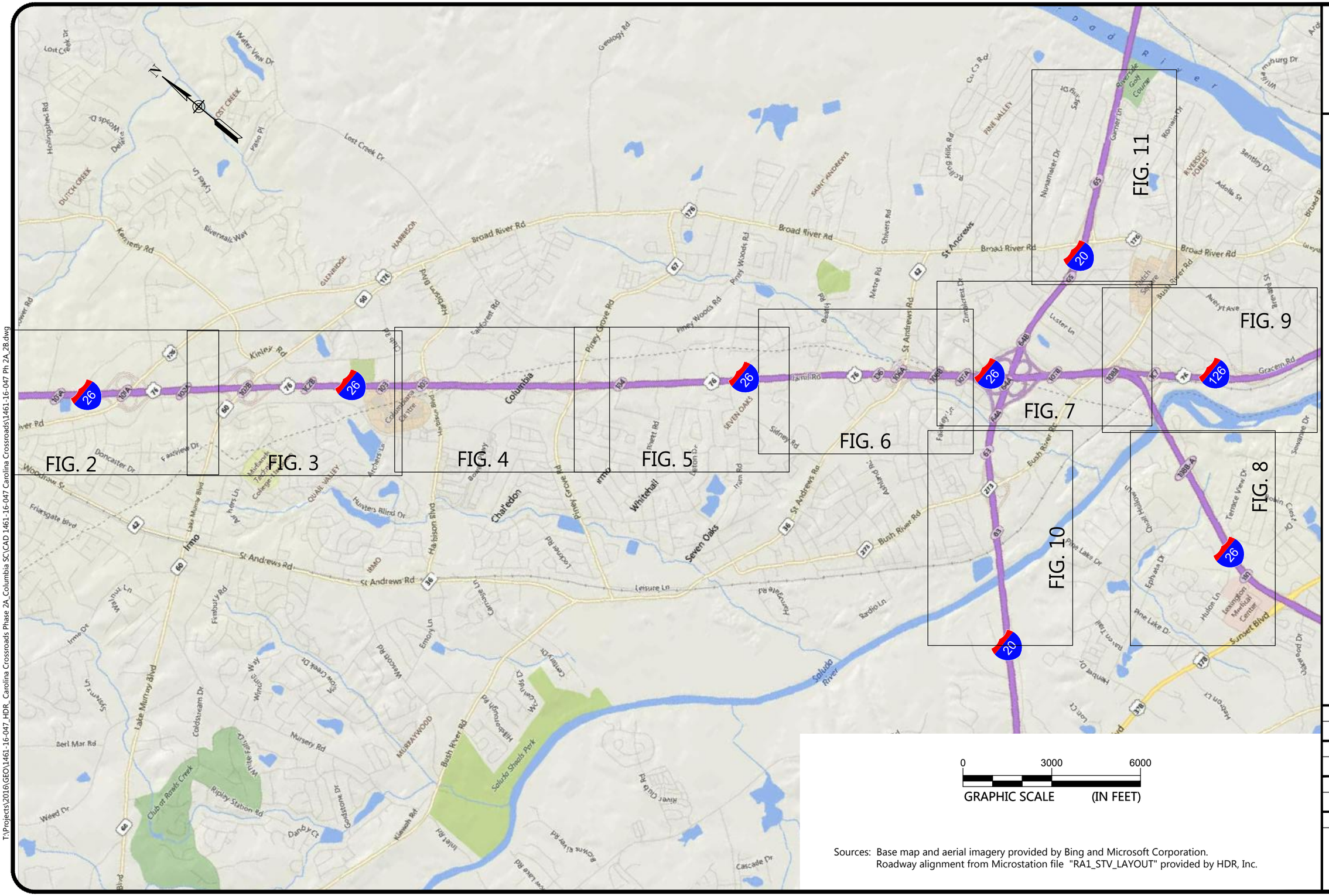
FIG. 2
FIG. 3
FIG. 4
FIG. 5
FIG. 6
FIG. 7
FIG. 8
FIG. 9
FIG. 10
FIG. 11
Broad River Rd
St Andrews Rd
Kinley Rd
Columbia
Irmo
Lake Murray Blvd
Bush River Rd
Harbison Blvd
Piney Grove Rd
Piney Woods Rd
Fairforest Rd
Sunset Blvd
Soluda River
Soluda Shoals Park
Chat'edon
Seven Oaks
Whitehall
Lexington Medical Center
Riverside Golf Course
Dutch Fork
Dutch Square
Columbiana Centre
Harbison Blvd
Lake Murray
Saint Andrews
Riverwalk Way
Lost Creek Dr
Geology Rd
Water View Dr
Kennerly Rd
Glenridge
Habersham
Pine Valley
Riverside Forest
Adella St
Bentley Dr
Nursemaster Dr
Garner Ln
Romaine Dr
Shivers Rd
Metze Rd
Beasley Rd
Zimalcrest Dr
Luster Ln
Averyt Ave
Gracern Rd
Bush River Rd
Pine Lake Dr
Ephrata Dr
Hilon Ln
Terrace View Dr
Chanel Meadow Ln
Sawbrae Dr
Lake Dr
Hendrix Ct
Fairbanks Rd
Irmo Dr
Sycamore Ln
Beri Mar Rd
Coldstream Dr
Nursery Rd
Weed Dr
Ripley Station Rd
Club at Rawls Creek
Dandy Ct
Goldstone Dr
Kiowah Rd
Inlet Rd
Bayne Loop Rd
Cascade Dr
Leisure Ln
Radio Ln
Fashaway Ln
Sidney Rd
Rivett Rd
Lorick Rd
Ashland Rd
Hunters Blind Dr
Quail Valley
Friarsgate Blvd
Woodrow St
Doncaster Dr
Fairview Dr
Lake Murray Blvd
Hollingshed Rd
Deltaire Dr
Lakes Ln
Dutch Creek
Lost Creek Dr
Pass Pl
Water View Dr
Geology Rd
Cu C3 Rd
Pine Valley
Riverside Golf Course
Garner Ln
Romaine Dr
Nursemaster Dr
Saint Andrews
Riverwalk Way
Kennerly Rd
Glenridge
Habersham
Broad River Rd
Pinewood Rd

TEST LOCATION PLAN
PHASE 2A & 2B

I-26 STATION 10+00 TO STATION 80+00
I-20,26,126 CORRIDOR IMPROVEMENT PROJECT - PHASE 2A & 2B
COLUMBIA, SOUTH CAROLINA

SCALE:
AS SHOWN

DATE:
8-03-2018

PROJECT NUMBER
1461-16-047

FIGURE NO.
2

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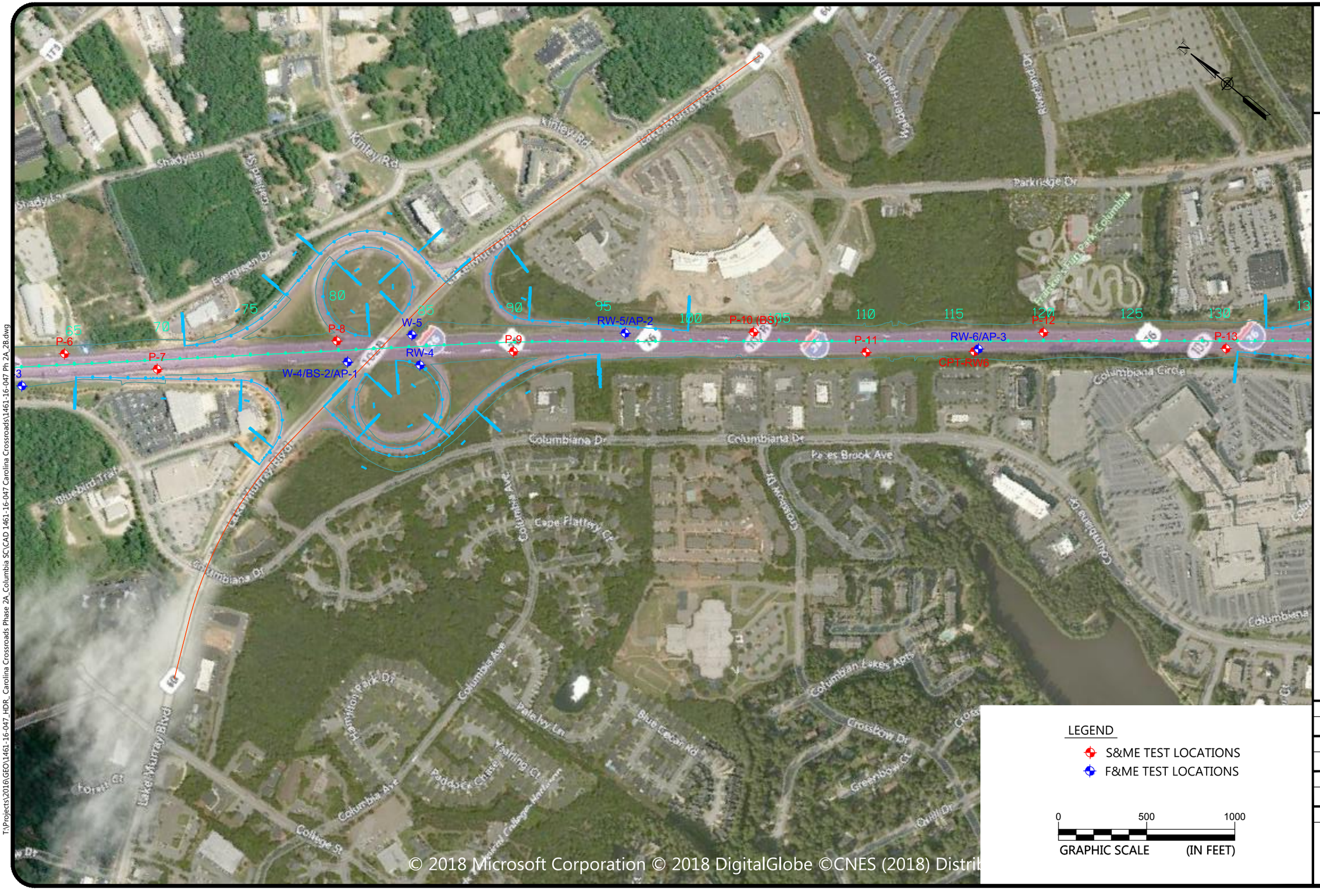

LEGEND

- S&ME TEST LOCATIONS
- F&ME TEST LOCATIONS

0 500 1000

GRAPHIC SCALE (IN FEET)

TEST LOCATION PLAN
PHASE 2A & 2B

I-26 STATION 70+00 TO STATION 140+00
I-20,26,126 CORRIDOR IMPROVEMENT PROJECT - PHASE 2A & 2B
COLUMBIA, SOUTH CAROLINA

SCALE:	AS SHOWN
DATE:	8-03-2018
PROJECT NUMBER	1461-16-047
FIGURE NO.	3

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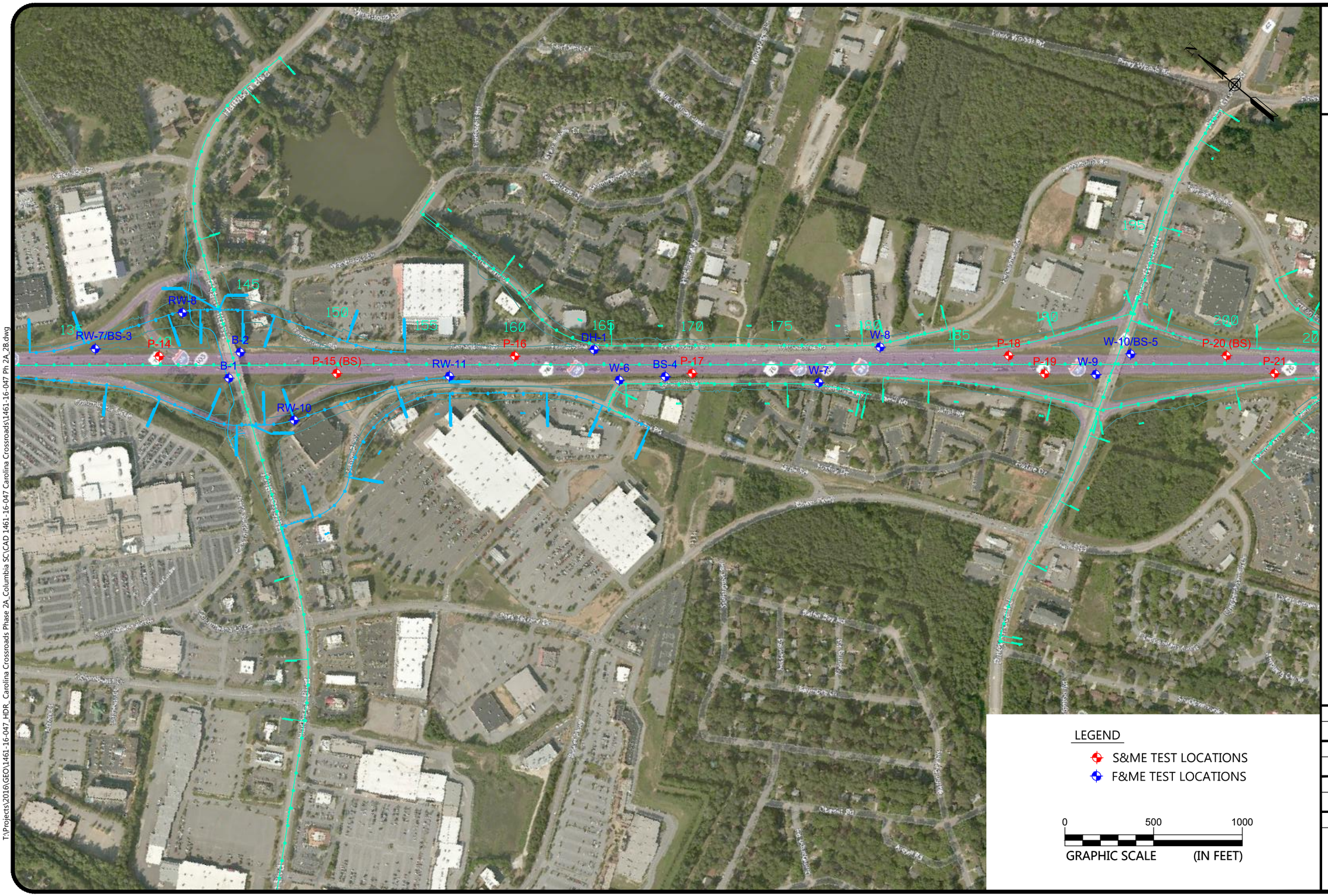

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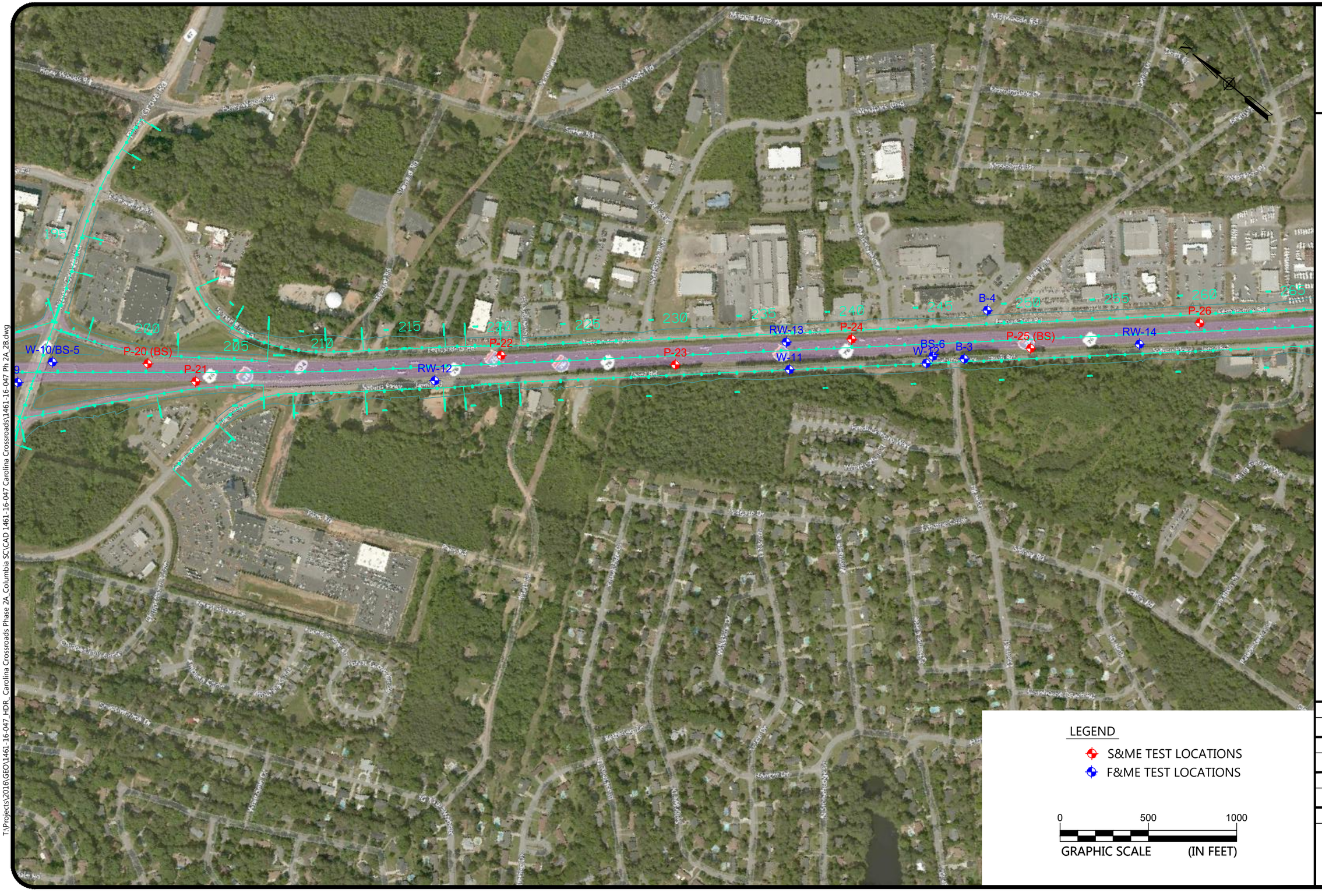
TEST LOCATION PLAN
PHASE 2A & 2B

I-26 STATION 135+00 TO STATION 200+00
I-20,26,126 CORRIDOR IMPROVEMENT PROJECT - PHASE 2A & 2B
COLUMBIA, SOUTH CAROLINA

SCALE:	AS SHOWN
DATE:	8-03-2018
PROJECT NUMBER	1461-16-047
FIGURE NO.	4



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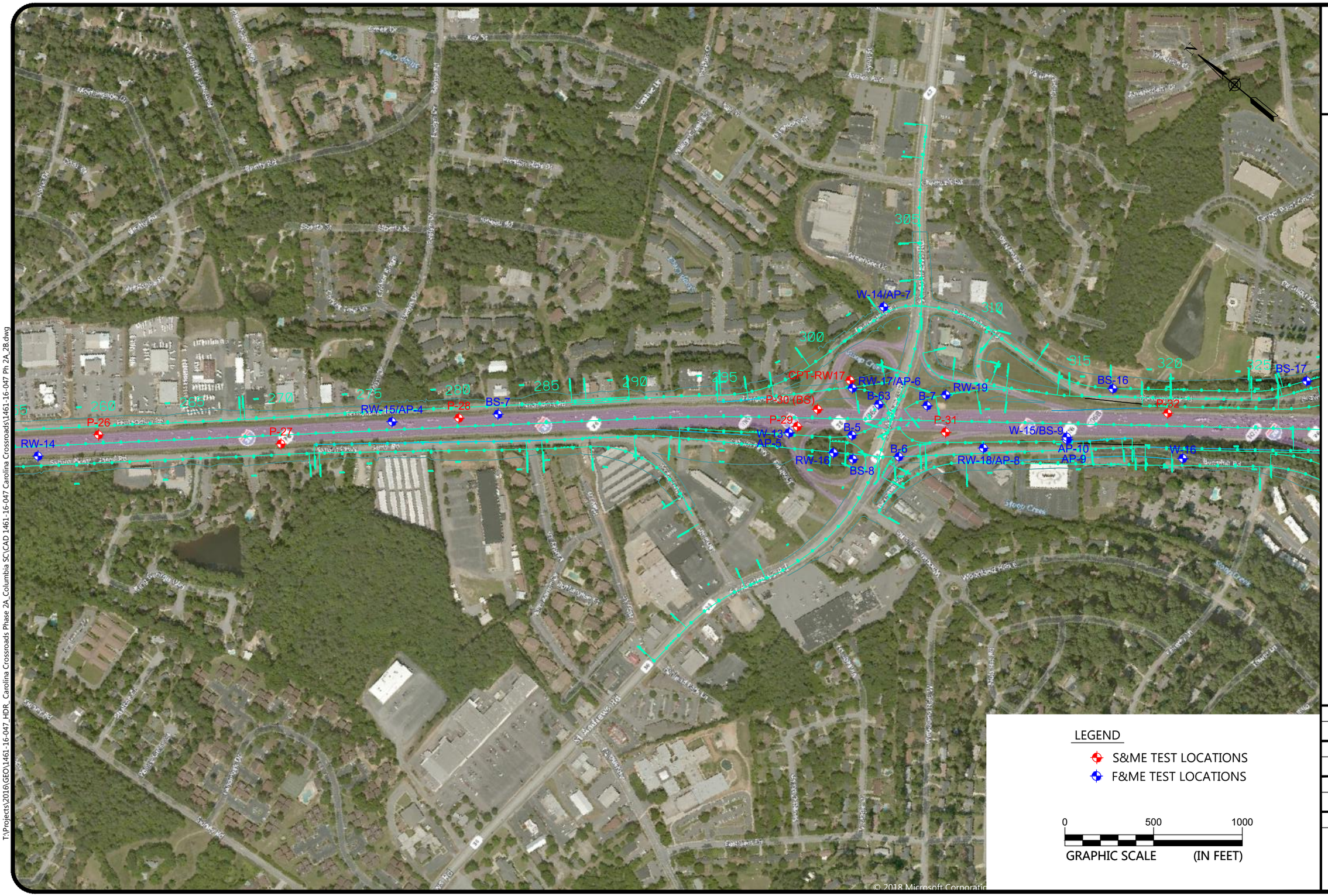
TEST LOCATION PLAN
PHASE 2A & 2B

I-26 STATION 155+00 TO STATION 265+00
I-20,26,126 CORRIDOR IMPROVEMENT PROJECT - PHASE 2A & 2B
COLUMBIA, SOUTH CAROLINA

SCALE:
AS SHOWN
DATE:
8-03-2018
PROJECT NUMBER
1461-16-047
FIGURE NO.
5



TEST LOCATION PLAN
PHASE 2A & 2B

I-26 STATION 260+00 TO STATION 325+00
I-20,26,126 CORRIDOR IMPROVEMENT PROJECT - PHASE 2A & 2B
COLUMBIA, SOUTH CAROLINA

SCALE: AS SHOWN

DATE: 8-03-2018

PROJECT NUMBER 1461-16-047

FIGURE NO. 6

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TEST LOCATION PLAN
PHASE 2A & 2B

I-26 STATION 320+00 TO STATION 385+00
I-20,26,126 CORRIDOR IMPROVEMENT PROJECT - PHASE 2A & 2B
COLUMBIA, SOUTH CAROLINA

SCALE:	AS SHOWN
DATE:	8-03-2018
PROJECT NUMBER	1461-16-047
FIGURE NO.	7

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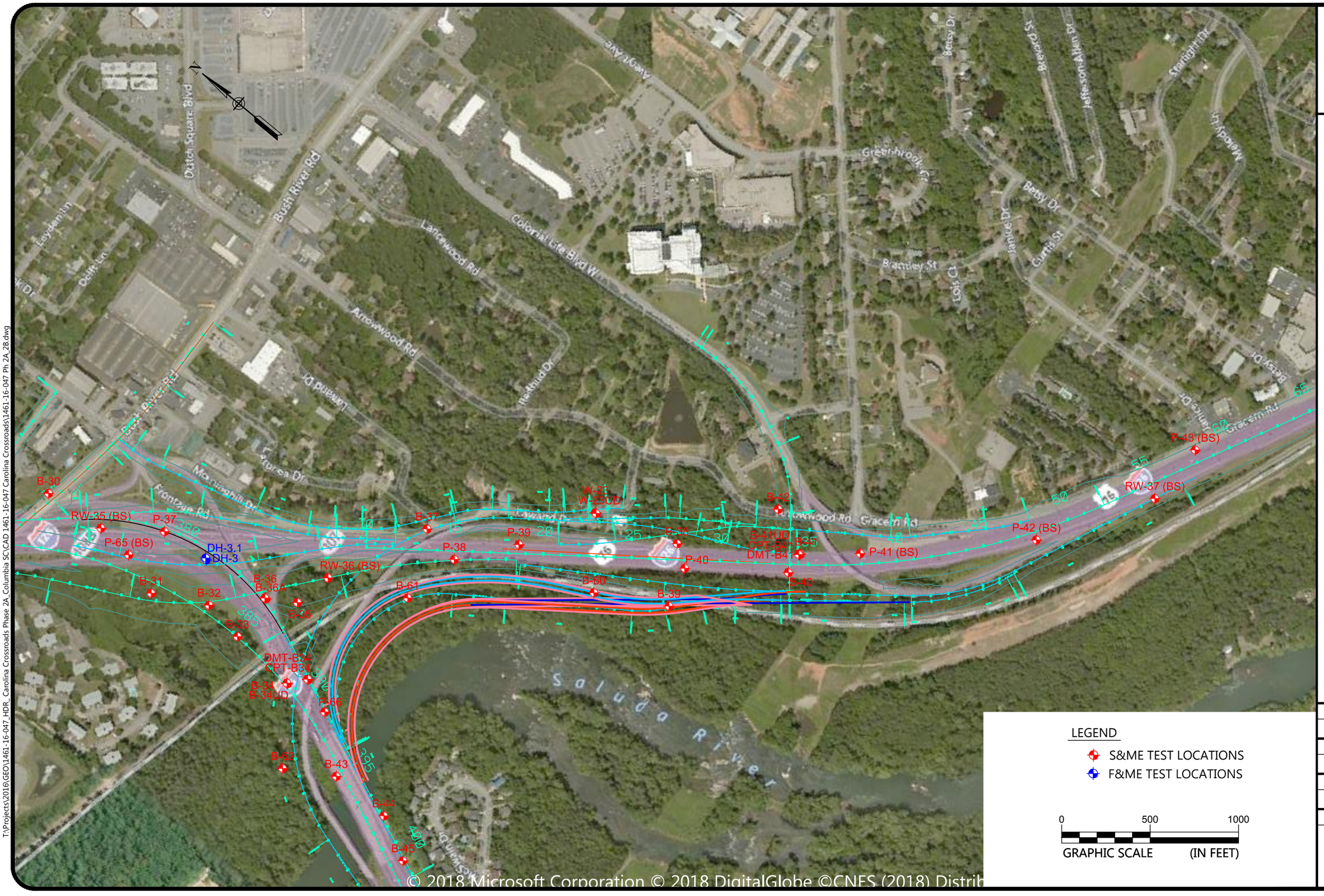
TEST LOCATION PLAN
PHASE 2A & 2B

I-26 STATION 405+00 TO STATION 465+00
I-20,26,126 CORRIDOR IMPROVEMENT PROJECT - PHASE 2A & 2B
COLUMBIA, SOUTH CAROLINA

SCALE:	AS SHOWN
DATE:	8-03-2018
PROJECT NUMBER	1461-16-047
FIGURE NO.	8



LEGEND

- S&ME TEST LOCATIONS
- F&ME TEST LOCATIONS

0 500 1000

GRAPHIC SCALE (IN FEET)

TEST LOCATION PLAN
PHASE 2A & 2B

I-126 STATION 0+00 TO STATION 65+00
I-20,26,126 CORRIDOR IMPROVEMENT PROJECT - PHASE 2A & 2B
COLUMBIA, SOUTH CAROLINA

SCALE:	AS SHOWN
DATE:	8-03-2018
PROJECT NUMBER	1461-16-047
FIGURE NO.	9

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LEGEND

- S&ME TEST LOCATIONS
- F&ME TEST LOCATIONS

0 500 1000

GRAPHIC SCALE (IN FEET)

TEST LOCATION PLAN
PHASE 2A & 2B

I-20 STATION 70+00 TO STATION 135+00
I-20,26,126 CORRIDOR IMPROVEMENT PROJECT - PHASE 2A & 2B
COLUMBIA, SOUTH CAROLINA

SCALE:	AS SHOWN
DATE:	8-03-2018
PROJECT NUMBER	1461-16-047
FIGURE NO.	10

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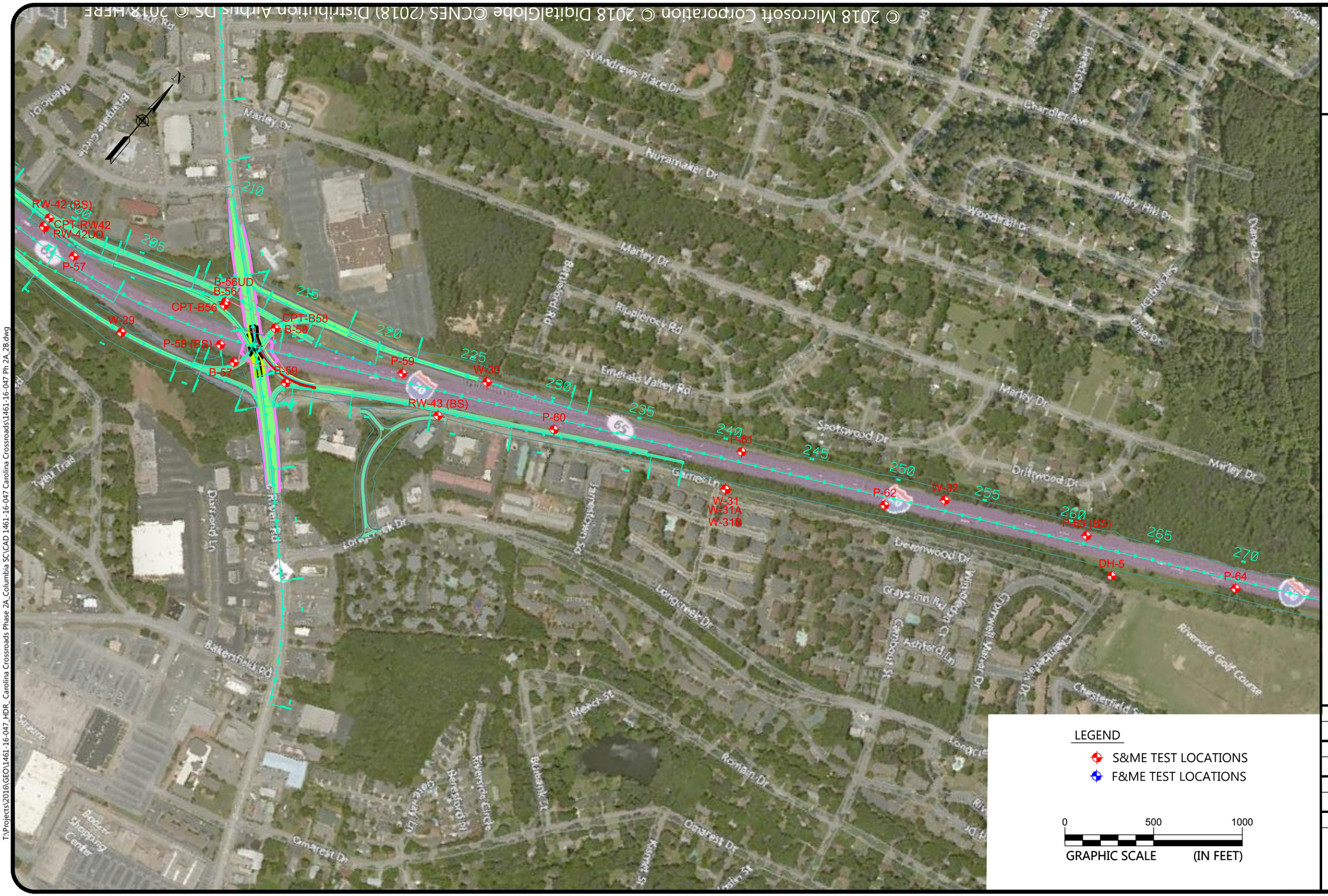

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TEST LOCATION PLAN
PHASE 2A & 2B

I-20 STATION 200+00 TO STATION 270+00
I-20,26,126 CORRIDOR IMPROVEMENT PROJECT - PHASE 2A & 2B
COLUMBIA, SOUTH CAROLINA

SCALE:	AS SHOWN
DATE:	8-03-2018
PROJECT NUMBER	1461-16-047
FIGURE NO.	11

APPENDIX A

SECTION 4 GENERALIZED SUBSURFACE PROFILES

KEY TO SYMBOLS

PROJECT NAME Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington

F&ME CONSULTANTS

LITHOLOGIC SYMBOLS
(Unified Soil Classification System)

ASPHALT

PWR: Partially Weathered Rock

BEDROCK: Bedrock

CH: USCS High Plasticity Clay

CL: USCS Low Plasticity Clay

CL-ML: USCS Low Plasticity Silty Clay

CLS: USCS Low Plasticity Sandy Clay

GC: USCS Clayey Gravel

GM: USCS Silty Gravel

GP: USCS Poorly-graded Gravel

GP-GM: USCS Poorly-graded Gravel with Silt

GPS: USCS Poorly-graded Sandy Gravel

MH: USCS Elastic Silt

ML: USCS Silt

MLG: USCS Gravelly Silt

MLS: USCS Sandy Silt

SOIL TEST ID'S

B-#	BRIDGE SOIL TEST BORING
W-#	RETAINING WALL/SOUND WALL SOIL TEST BORING
RW-#	ROADWAY EMBANKMENT SOIL TEST BORING
P-#	PAVEMENT SOIL TEST BORING
DH-#	DOWNHOLE SEISMIC SOIL TEST BORING (INCLUDES SHEAR WAVE VELOCITY MEASUREMENTS TO 100 FT)
CPT-#	CONE PENETROMETER SOUNDING
DMT-#	DILATOMETER SOUNDING
AP-#	AUGER BORING
B-#UD	AUGER BORING
RW-#UD	AUGER BORING
W-#UD	AUGER BORING
BS-#	BULK SOIL SAMPLE
P-#BS	BULK SOIL SAMPLE
RW-#BS	BULK SOIL SAMPLE

ABBREVIATIONS

LL	- LIQUID LIMIT (%)
PL	- PLASTIC LIMIT (%)
PI	- PLASTIC INDEX (%)
NMC	- MOISTURE CONTENT (%)
NP	- NON PLASTIC
%#200	- PERCENT PASSING NO. 200 SIEVE

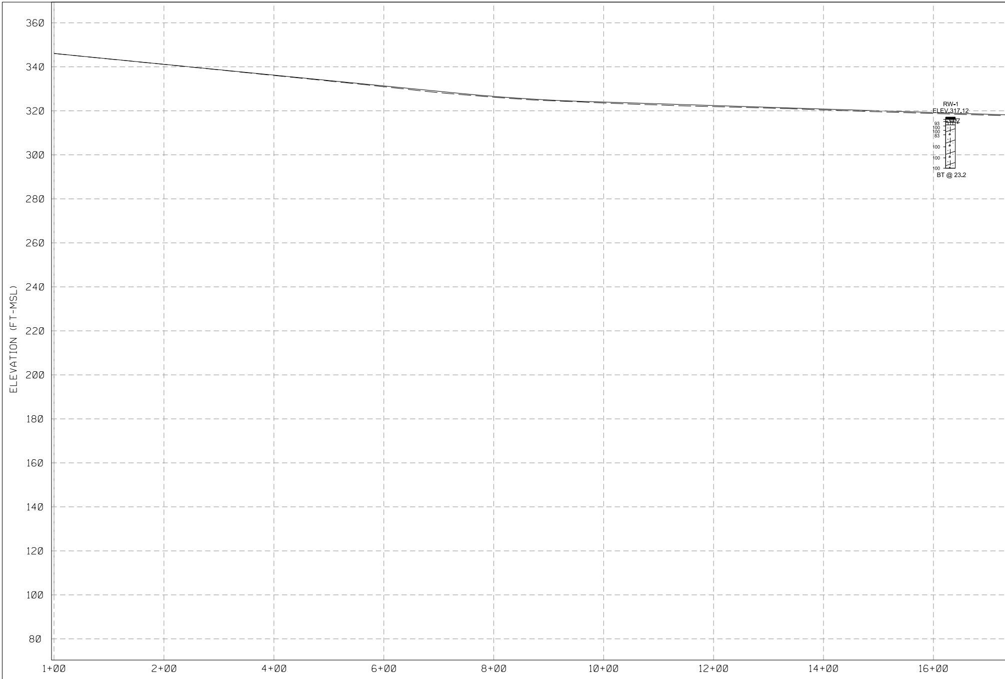
Water Level at Time Drilling, or as Shown

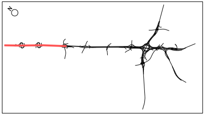
Water Level at End of Drilling, or as Shown

NOTES

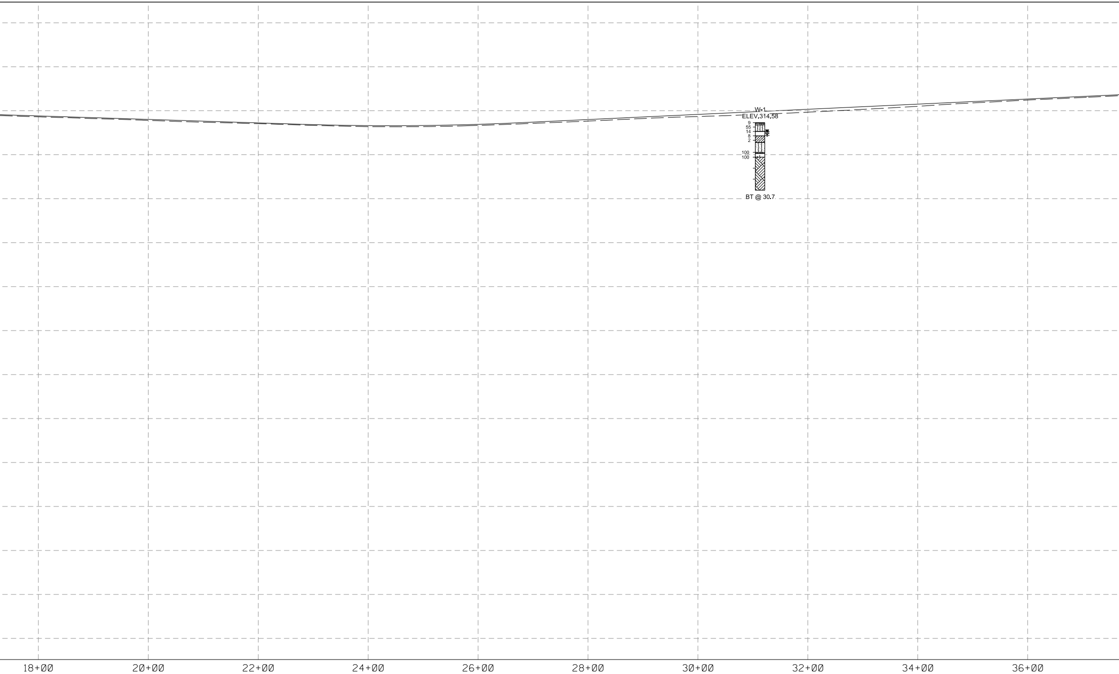
1. THE NOMENCLATURE FOR EACH REFERENCED ALIGNMENT ON THE SUBSURFACE PROFILE DRAWINGS WAS DERIVED FROM THE HDR DRAWINGS RELATIVE TO THE RECOMMENDED PREFERRED ALTERNATIVE.

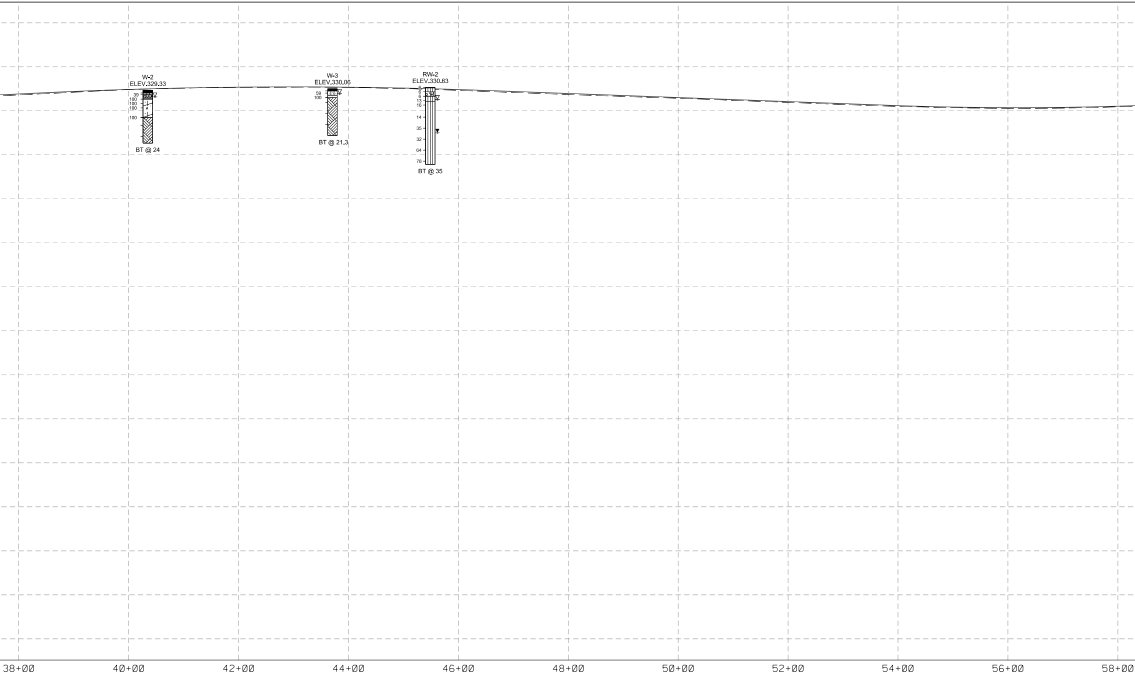
2. THE GENERALIZED SUBSURFACE PROFILES ARE PROVIDED ONLY FOR ILLUSTRATIVE PURPOSES. THE INTENT OF THESE DRAWINGS IS TO PROVIDE THE READER WITH VERY GENERAL INFORMATION ON SOILS, CUTS, AND FILLS. VARIATIONS IN THE INDICATED SUBSURFACE CONDITIONS WILL BECOME EVIDENT ONCE ADDITIONAL BORINGS ARE PERFORMED.

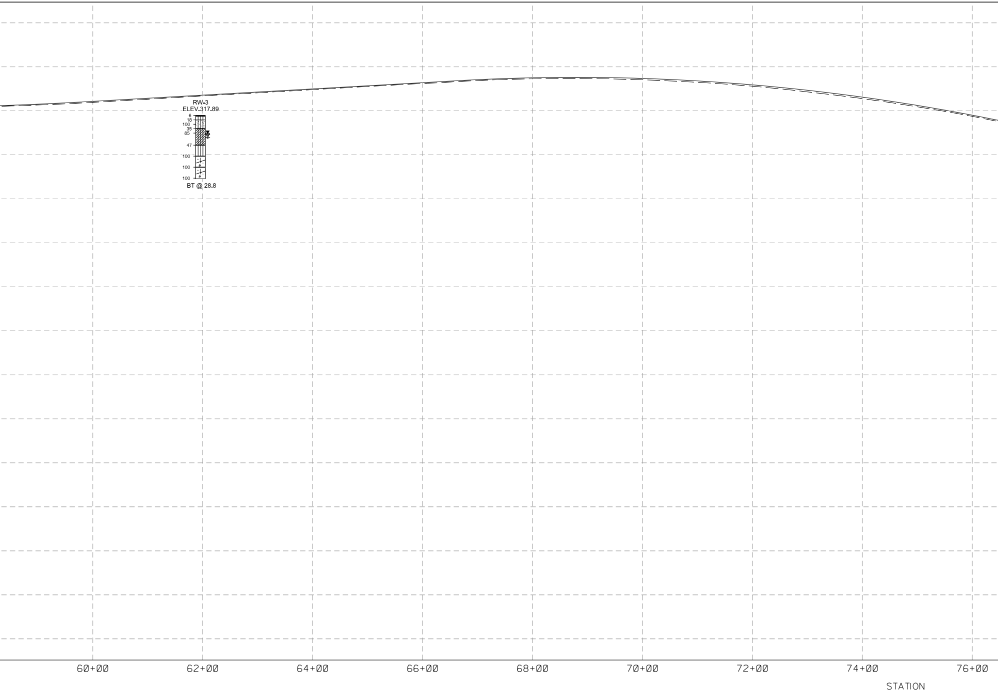

360
340
320
300
280
260
240
220
200
180
160
140
120
100
80
ELEVATION (FT-MSL)
RW-1
ELEV.317.12
93
100
100
83
100
100
100
BT @ 23.2
1+00
2+00
4+00
6+00
8+00
10+00
12+00
14+00
16+00

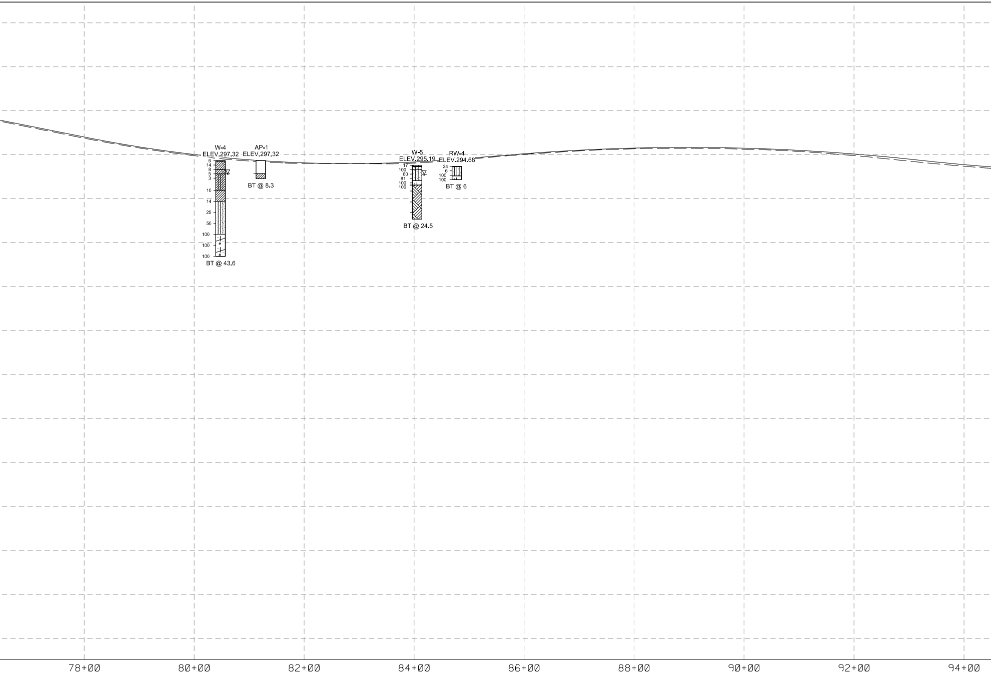


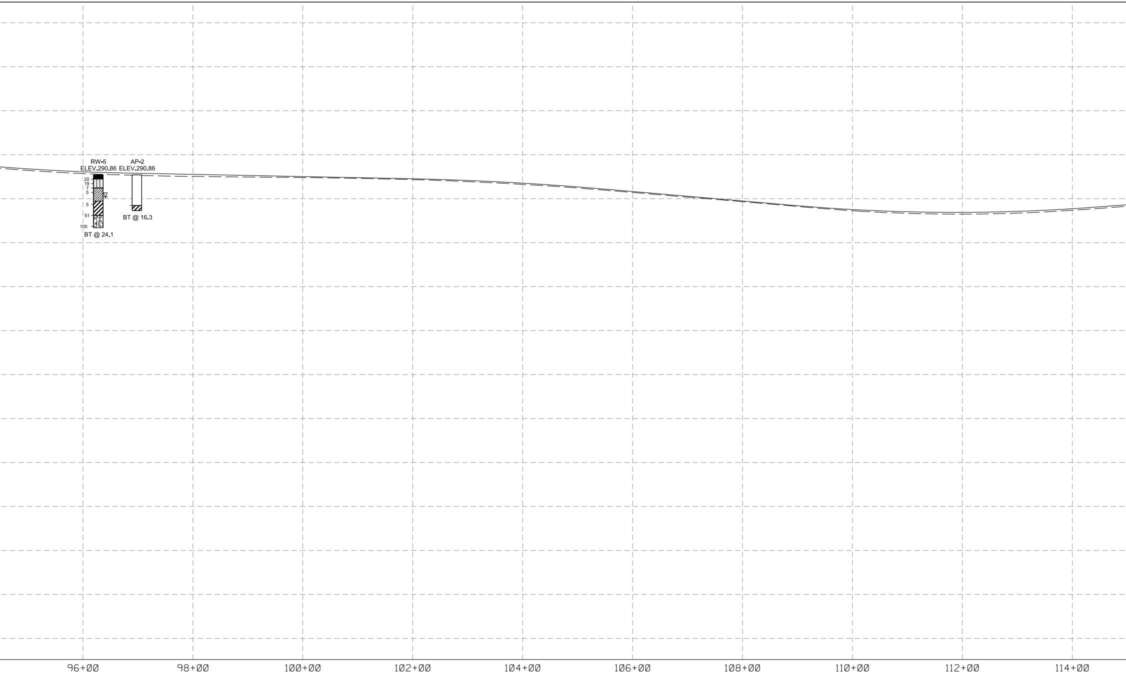
The generalized subsurface profiles are provided only for illustrative purposes. The intent of these drawings is to provide the reader with very general information on soils, cuts, and fills. Variations in the indicated subsurface conditions will become evident once additional borings are performed.

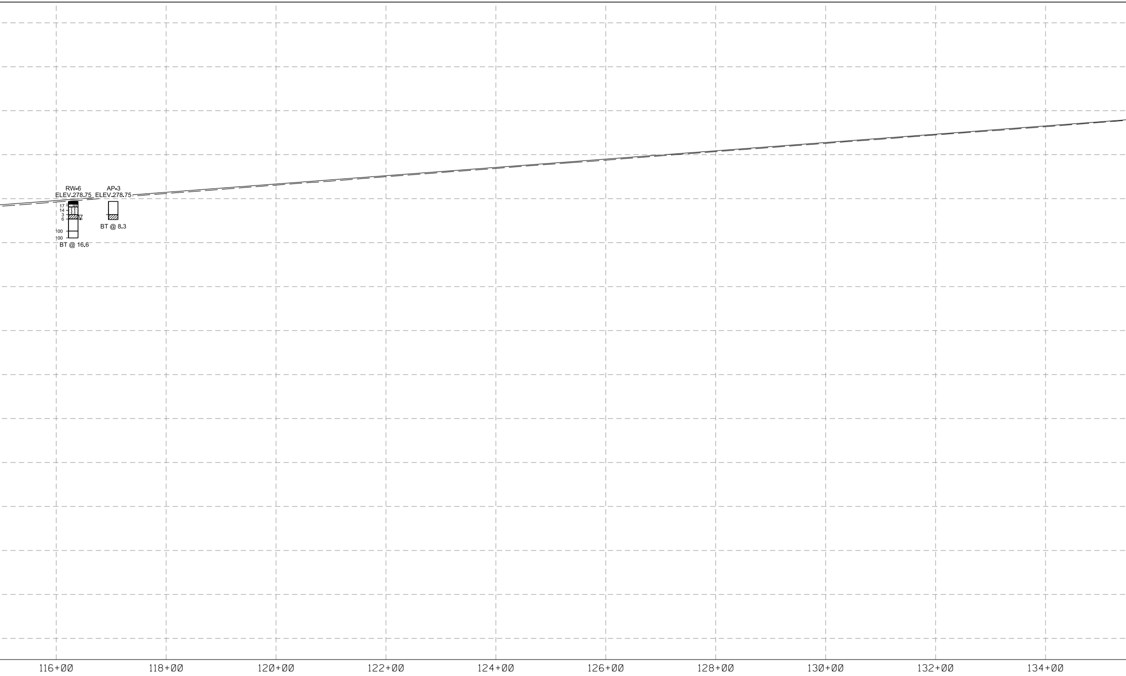

W-1
ELEV.314.58
9
55
14
8
2
100
100
BT @ 30.7
18+00
20+00
22+00
24+00
26+00
28+00
30+00
32+00
34+00
36+00

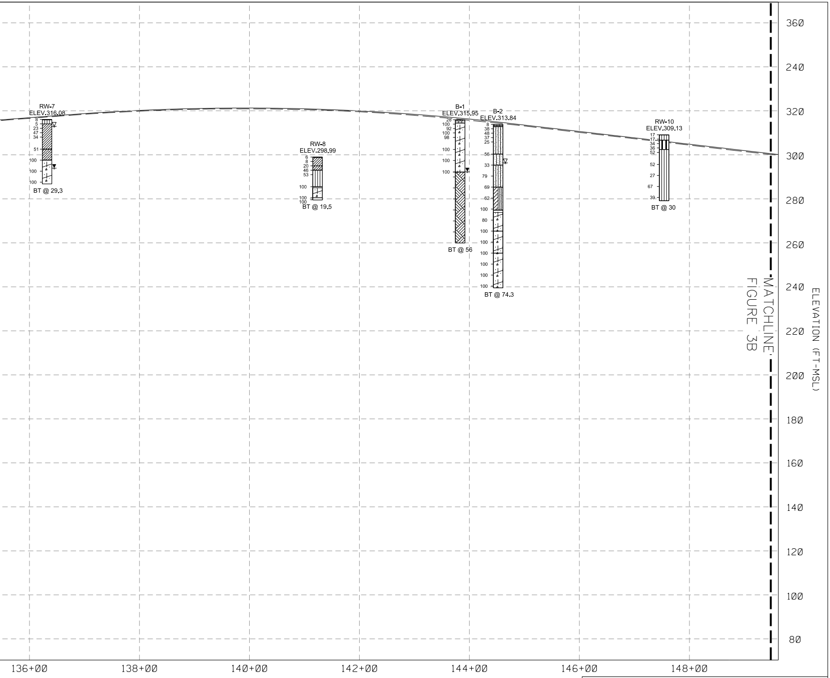

W-2
ELEV.329.33
39
100
100
100
100
BT @ 24
W-3
ELEV.330.06
59
100
BT @ 21.3
RW-2
ELEV.330.63
6
6
6
13
16
14
35
32
64
78
BT @ 35
38+00
40+00
42+00
44+00
46+00
48+00
50+00
52+00
54+00
56+00
58+00


RW-3
ELEV.317.89
6
18
100
35
85
47
100
100
100
BT @ 28.8
60+00
62+00
64+00
66+00
68+00
70+00
72+00
74+00
76+00
STATION


W-4
ELEV.297.32
6
14
8
5
3
10
14
25
50
100
100
100
BT @ 43.6
AP-1
ELEV.297.32
BT @ 8.3
W-5
ELEV.295.19
17
100
60
81
100
100
BT @ 24.5
RW-4
ELEV.294.68
24
6
100
100
BT @ 6
78+00
80+00
82+00
84+00
86+00
88+00
90+00
92+00
94+00


RW-5
ELEV.290.86
20
19
7
5
5
51
100
BT @ 24.1
AP-2
ELEV.290.86
BT @ 16.3
96+00
98+00
100+00
102+00
104+00
106+00
108+00
110+00
112+00
114+00


RW-6
ELEV.278.75
17
14
3
6
100
100
BT @ 16.6
AP-3
ELEV.278.75
BT @ 8.3
116+00
118+00
120+00
122+00
124+00
126+00
128+00
130+00
132+00
134+00


RW-7
ELEV.316.08
8
5
23
47
34
51
100
100
100
BT @ 29.3
RW-8
ELEV.298.99
6
8
20
46
53
100
100
100
BT @ 19.5
B-1
ELEV.315.95
28
100
92
100
98
100
100
100
BT @ 56
B-2
ELEV.313.84
8
38
48
37
25
56
33
79
69
62
100
80
100
100
100
100
100
100
BT @ 74.3
RW-10
ELEV.309.13
17
17
34
36
52
52
27
67
39
BT @ 30
MATCHLINE
FIGURE 3B
360
240
320
300
280
260
240
220
200
180
160
140
120
100
80
ELEVATION (FT-MSL)
136+00
138+00
140+00
142+00
144+00
146+00
148+00

4			
3			
2			
1	BMF	10.17.18	REVIEW COMMENTS
REV. NO.	BY	DATE	DESCRIPTION OF REVISION

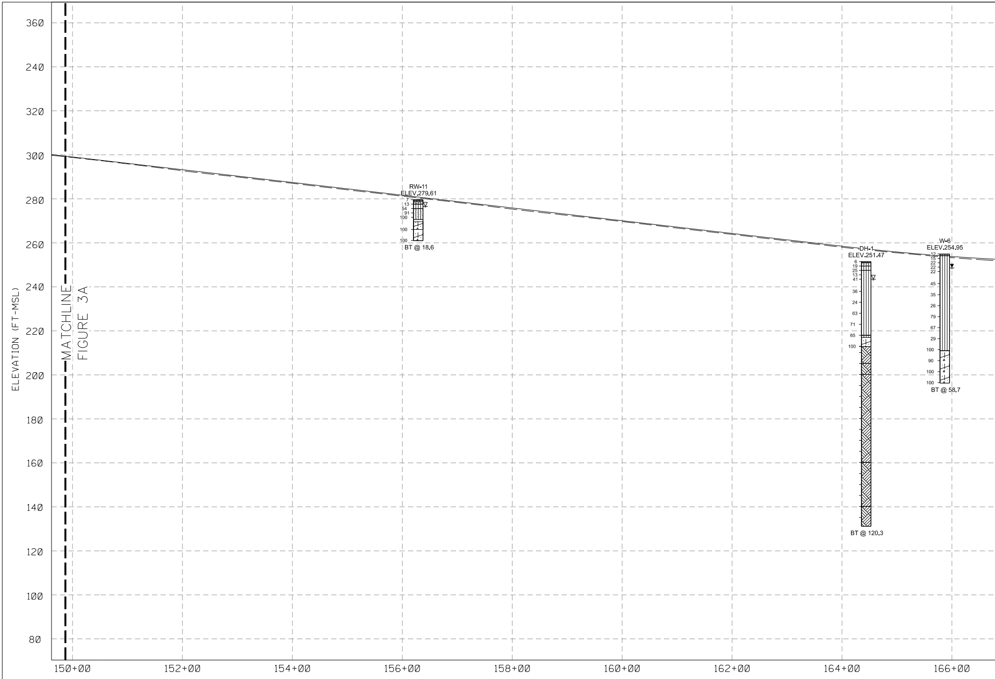
TOPO. ________ DATE ________
DWG. BMF DATE 7.5.18
R/W ________ DATE ________
GROUP ____ – ____

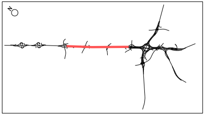
F&ME
CONSULTANTS
GEOTECHNICAL - ENVIRONMENTAL - MATERIALS
COLUMBIA, SOUTH CAROLINA

I-20/26/126 CORRIDOR IMPROVEMENTS
LEXINGTON/RICHLAND COUNTY, SOUTH CAROLINA

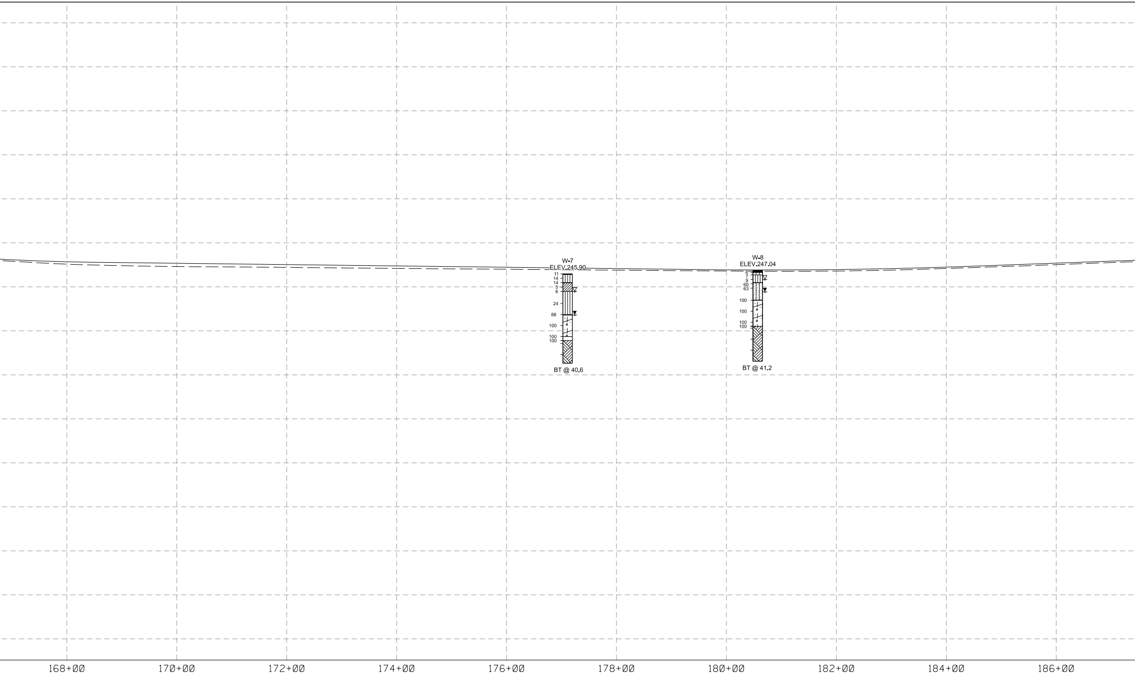
I-26 ALIGNMENT
GENERALIZED SUBSURFACE PROFILE

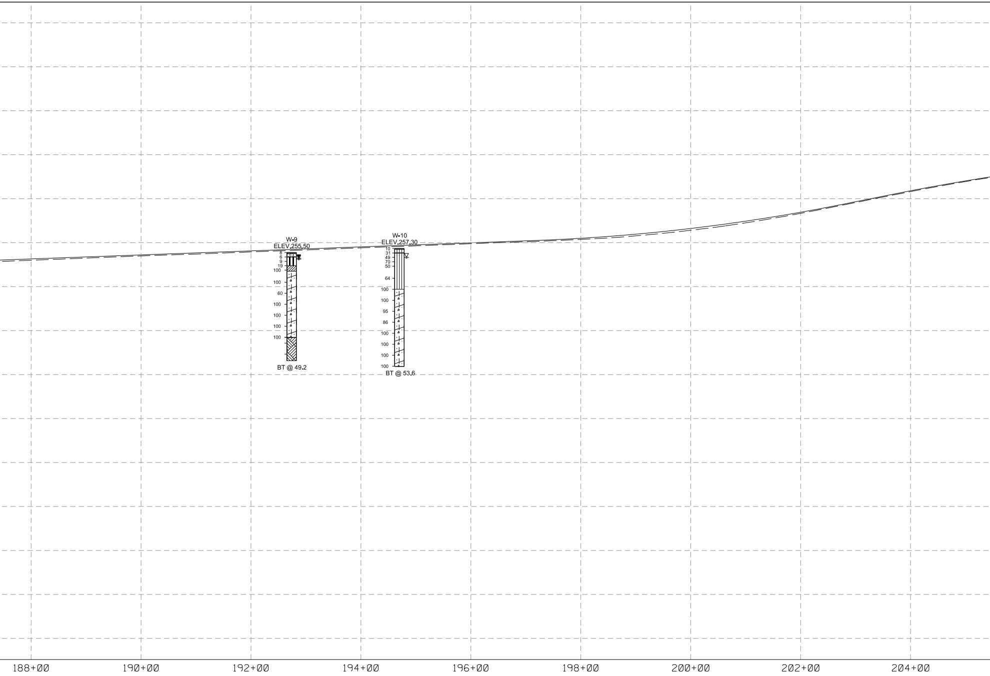
HRZ SCALE = NTS	F&ME JOB NO. G5662.01
VRT SCALE = NTS	FIGURE 3A

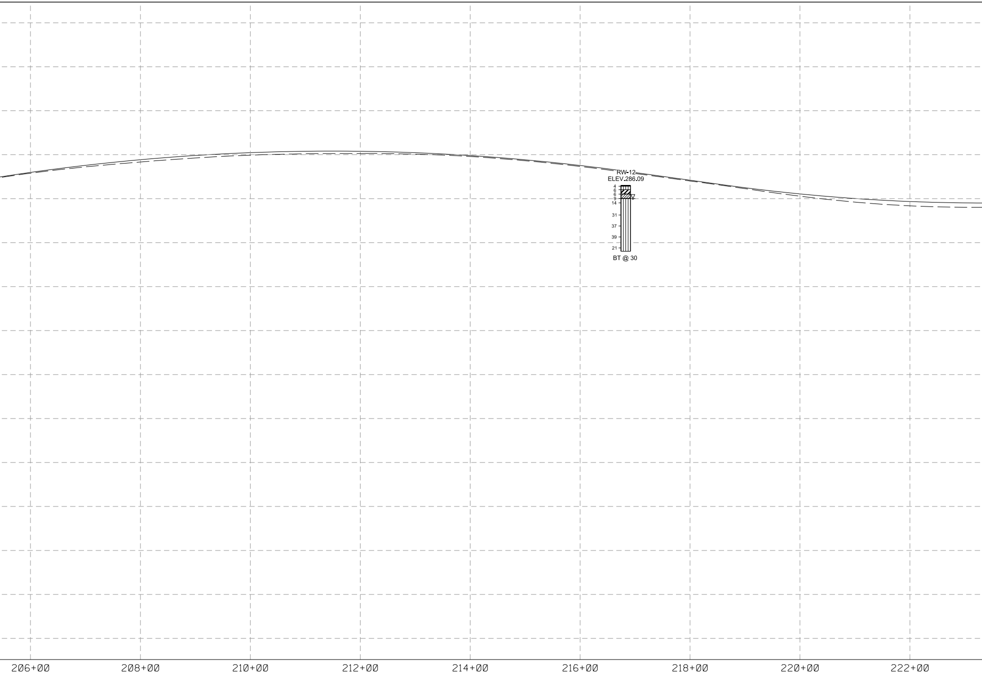

360
240
320
300
280
260
240
220
200
180
160
140
120
100
80
ELEVATION (FT-MSL)
MATCHLINE
FIGURE 3A
RW-11
ELEV.279.61
7
13
54
91
100
100
100
BT @ 18.6
DH-1
ELEV.251.47
6
19
25
13
41
36
24
63
71
65
100
BT @ 120.3
W-6
ELEV.254.95
12
15
22
22
22
45
35
26
79
67
29
100
90
100
100
BT @ 58.7
150+00
152+00
154+00
156+00
158+00
160+00
162+00
164+00
166+00

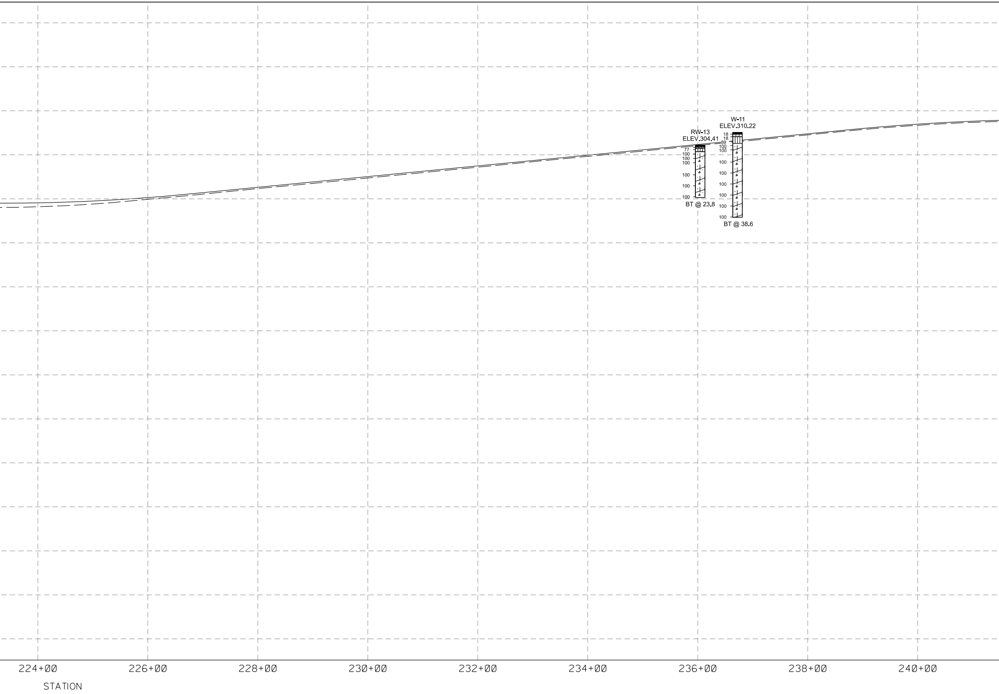


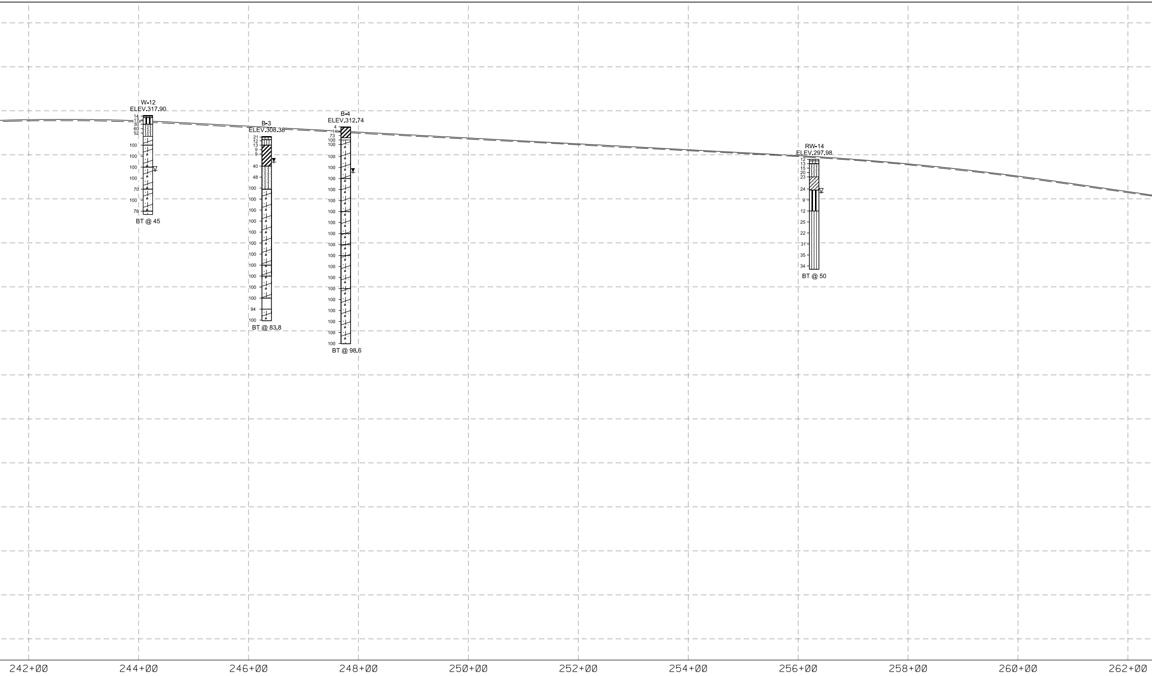
The generalized subsurface profiles are provided only for illustrative purposes. The intent of these drawings is to provide the reader with very general information on soils, cuts, and fills. Variations in the indicated subsurface conditions will become evident once additional borings are performed.

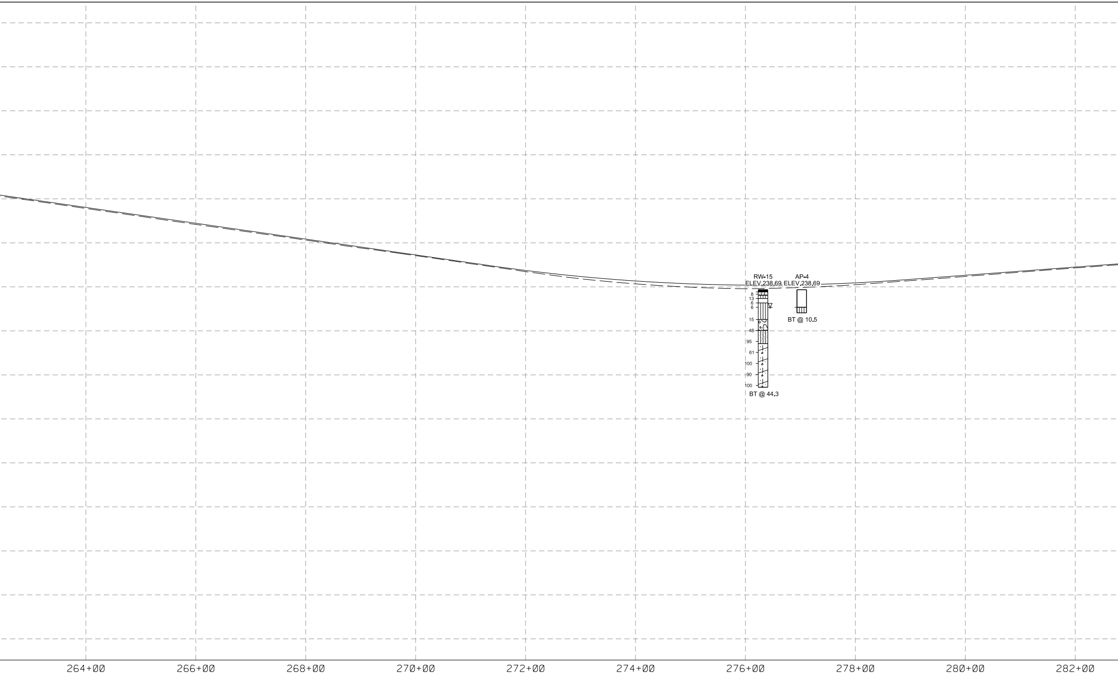

W-7
ELEV.245.90
11
14
14
5
8
24
88
100
100
100
BT @ 40.6
W-8
ELEV.247.04
6
7
9
60
63
100
100
100
100
BT @ 41.2
168+00
170+00
172+00
174+00
176+00
178+00
180+00
182+00
184+00
186+00

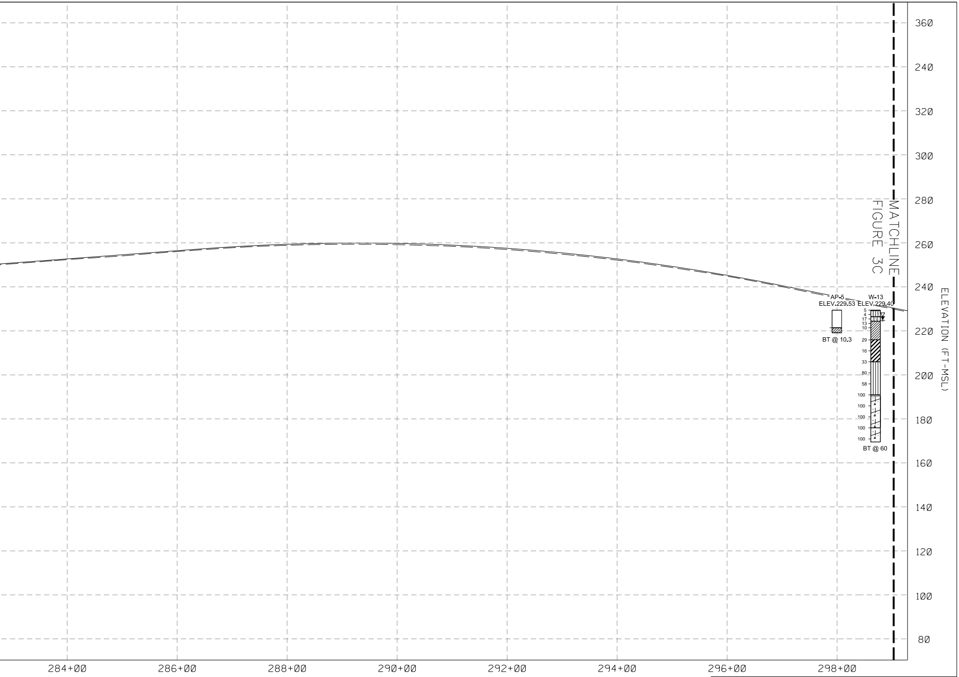

W-9
ELEV.255.50
8
6
9
19
100
100
60
100
100
100
100
BT @ 49.2
W-10
ELEV.257.30
10
31
49
70
50
64
100
100
95
86
100
100
100
100
BT @ 53.6
188+00
190+00
192+00
194+00
196+00
198+00
200+00
202+00
204+00


RW-12
ELEV.286.09
4
6
6
9
14
31
37
39
21
BT @ 30
206+00
208+00
210+00
212+00
214+00
216+00
218+00
220+00
222+00


W-11
ELEV.310.22
18
18
89
100
100
100
100
100
100
100
100
100
BT @ 38.6
RW-13
ELEV.304.41
77
100
100
100
100
100
100
BT @ 23.8
224+00
226+00
228+00
230+00
232+00
234+00
236+00
238+00
240+00
STATION


W-12
ELEV.317.90
14
17
30
60
52
100
100
100
100
70
100
78
BT @ 45
B-3
ELEV.308.38
21
12
13
9
9
40
48
100
100
100
100
100
100
100
100
100
100
100
94
100
BT @ 83.8
B-4
ELEV.312.74
4
14
73
100
100
100
100
100
100
100
100
100
100
100
100
100
100
100
100
100
100
100
100
BT @ 98.6
RW-14
ELEV.297.98
12
13
15
20
23
24
9
12
25
22
31
35
34
BT @ 50
242+00
244+00
246+00
248+00
250+00
252+00
254+00
256+00
258+00
260+00
262+00


RW-15
ELEV.238.69
AP-4
ELEV.238.69
8
13
6
6
15
48
95
61
100
90
100
BT @ 44.3
BT @ 10.5
264+00
266+00
268+00
270+00
272+00
274+00
276+00
278+00
280+00
282+00


360
240
320
300
280
260
240
220
200
180
160
140
120
100
80
ELEVATION (FT-MSL)
MATCHLINE
FIGURE 3C
AP-5
ELEV.229.53
BT @ 10.3
W-13
ELEV.229.40
5
4
17
13
10
29
16
33
80
58
100
100
100
100
100
BT @ 60
284+00
286+00
288+00
290+00
292+00
294+00
296+00
298+00

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COLUMBIA, SOUTH CAROLINA

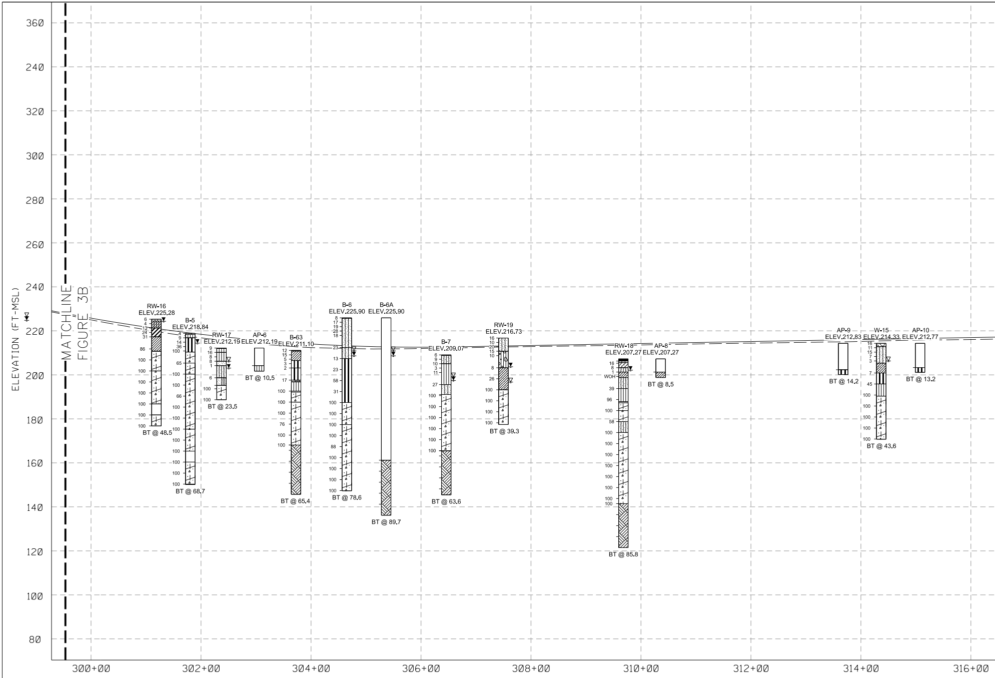
I-20/26/126 CORRIDOR IMPROVEMENTS
LEXINGTON/RICHLAND COUNTY, SOUTH CAROLINA

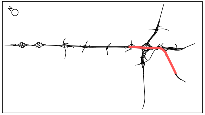
I-26 ALIGNMENT
GENERALIZED SUBSURFACE PROFILE

4			
3			
2			
1	BMF	10.17.18	REVIEW COMMENTS
REV. NO.	BY	DATE	DESCRIPTION OF REVISION

TOPO. ______ DATE ______
DWG. BMF DATE 7.5.18
R/W ______ DATE ______
GROUP ____ – ____

HRZ SCALE = NTS	F&ME JOB NO. G5662.01
VRT SCALE = NTS	FIGURE 3B


ELEVATION (FT-MSL)
360
240
320
300
280
260
240
220
200
180
160
140
120
100
80
MATCHLINE FIGURE 3B
RW-16 ELEV.225.28
BT @ 48.5
B-5 ELEV.218.84
BT @ 68.7
RW-17 ELEV.212.19
BT @ 23.5
AP-6 ELEV.212.19
BT @ 10.5
B-63 ELEV.211.10
BT @ 65.4
B-6 ELEV.225.90
BT @ 78.6
B-6A ELEV.225.90
BT @ 89.7
B-7 ELEV.209.07
BT @ 63.6
RW-19 ELEV.216.73
BT @ 39.3
RW-18 ELEV.207.27
BT @ 85.8
AP-8 ELEV.207.27
BT @ 8.5
AP-9 ELEV.212.83
BT @ 14.2
W-15 ELEV.214.33
BT @ 43.6
AP-10 ELEV.212.77
BT @ 13.2
300+00
302+00
304+00
306+00
308+00
310+00
312+00
314+00
316+00



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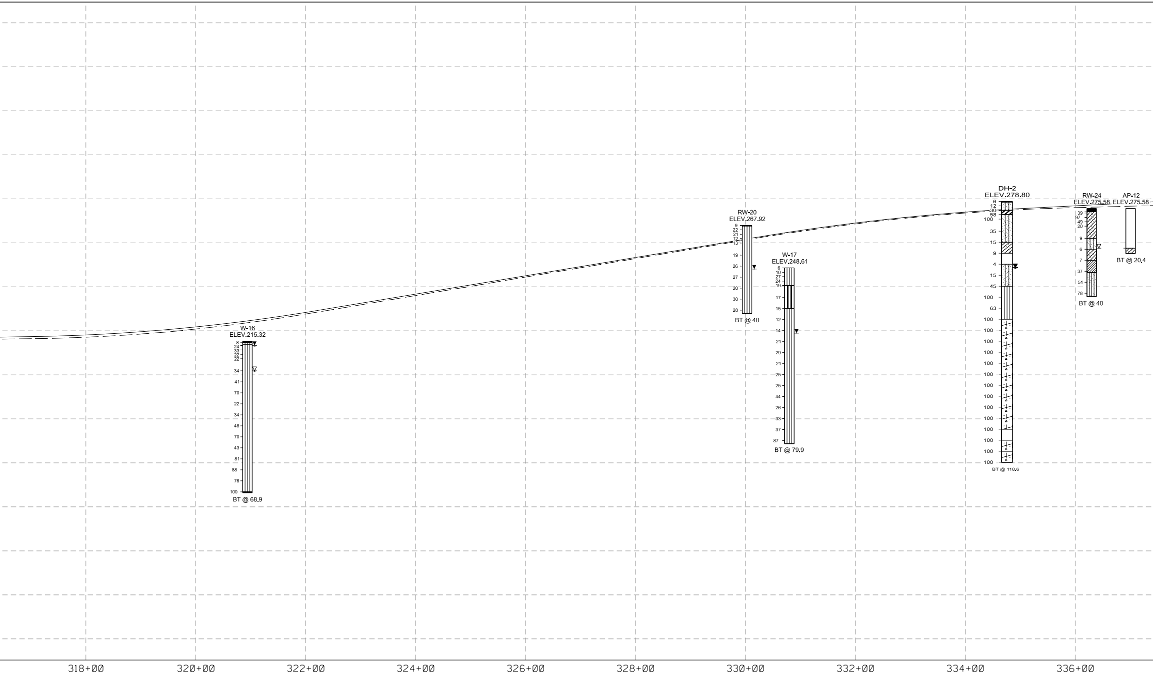
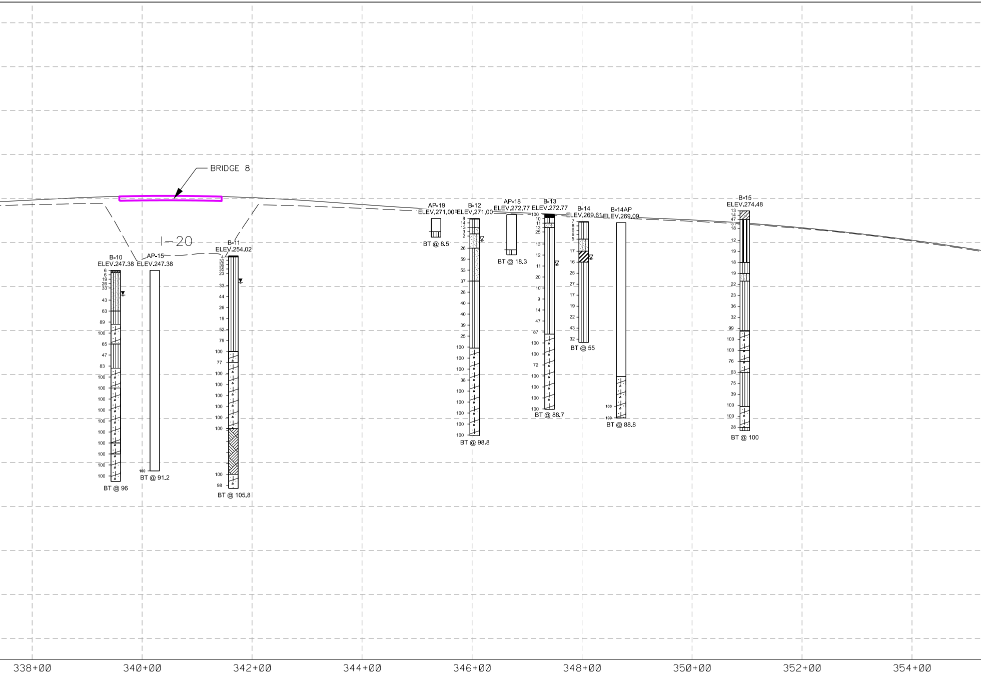
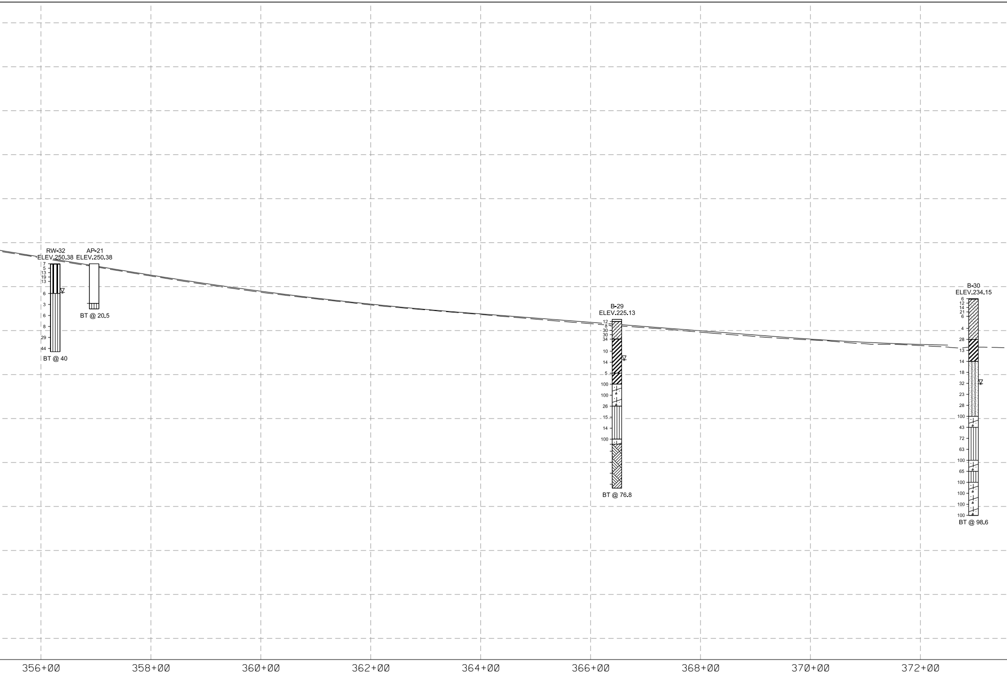
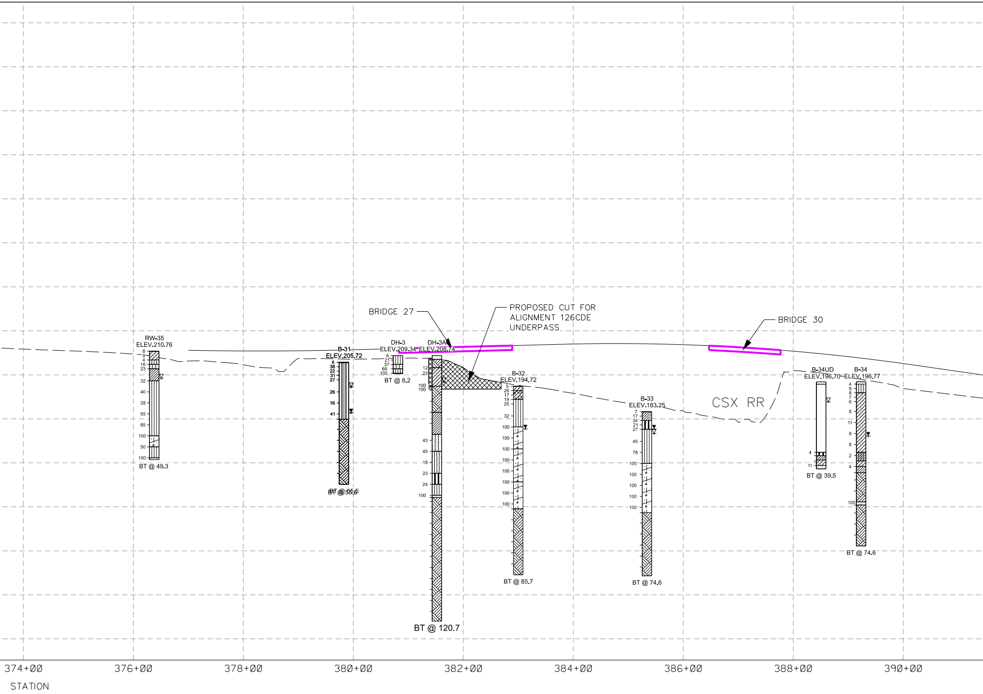
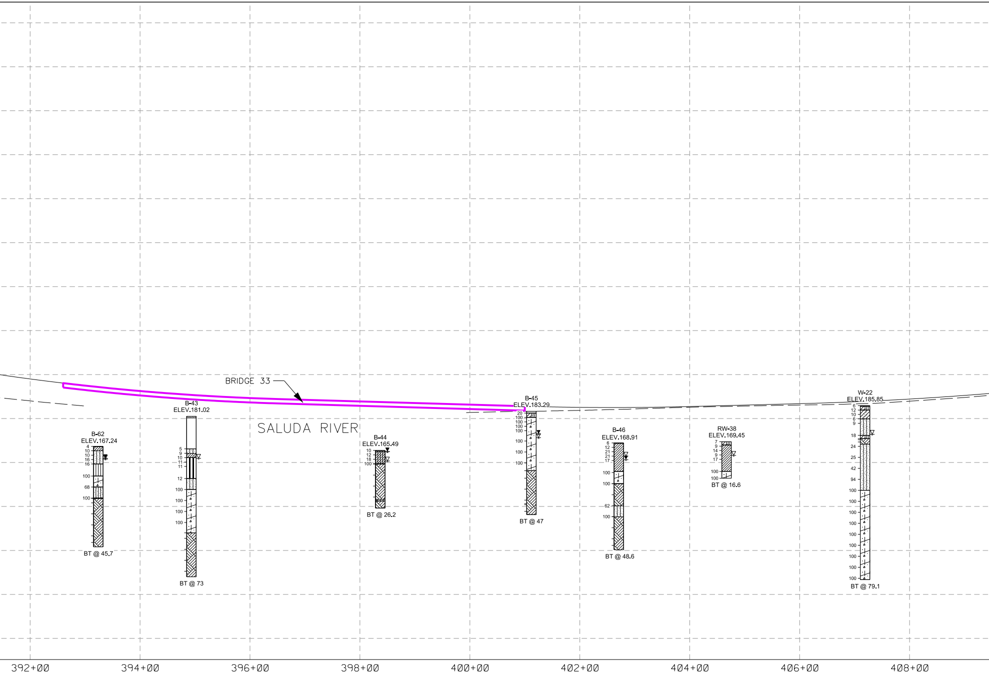
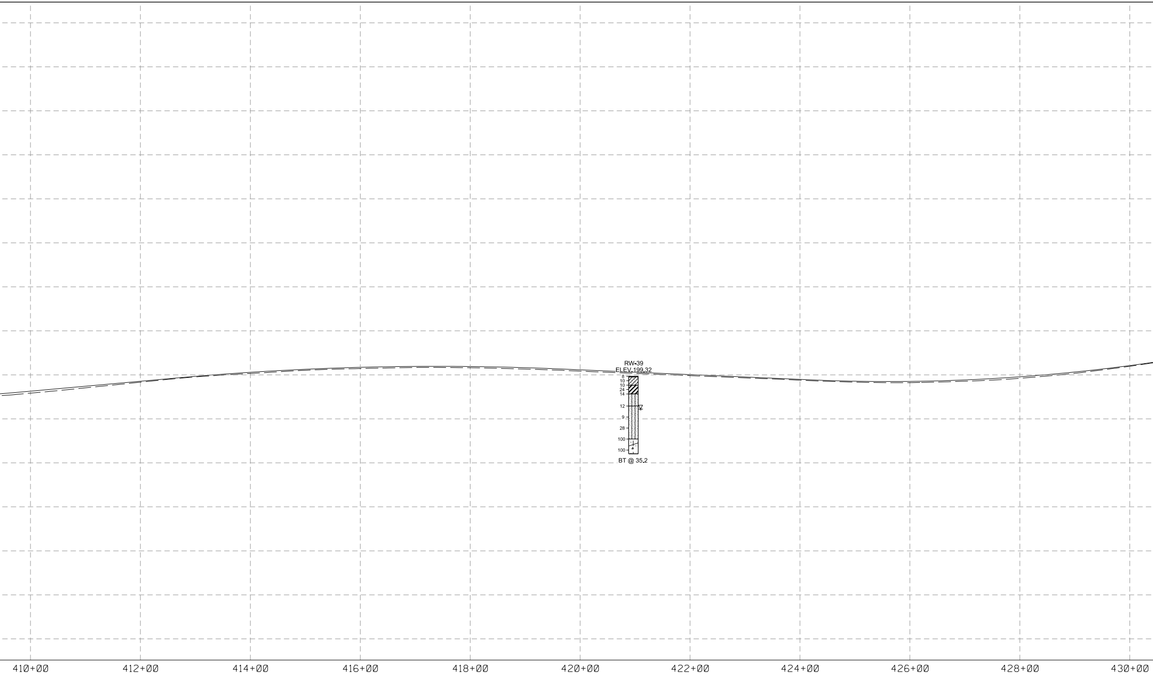

W-16
ELEV.215.32
8
24
33
22
22
34
41
70
22
34
48
70
43
81
88
76
100
BT @ 68.9
RW-20
ELEV.267.92
9
22
21
12
13
19
26
27
20
30
28
BT @ 40
W-17
ELEV.248.61
6
10
27
24
19
17
15
12
14
21
29
21
25
25
44
26
33
37
87
BT @ 79.9
DH-2
ELEV.278.80
6
12
30
58
100
35
15
9
4
15
45
100
63
100
100
100
100
100
100
100
100
100
100
100
100
100
100
100
BT @ 118.6
RW-24
ELEV.275.58
39
97
49
20
9
6
7
37
51
78
BT @ 40
AP-12
ELEV.275.58
BT @ 20.4
318+00
320+00
322+00
324+00
326+00
328+00
330+00
332+00
334+00
336+00

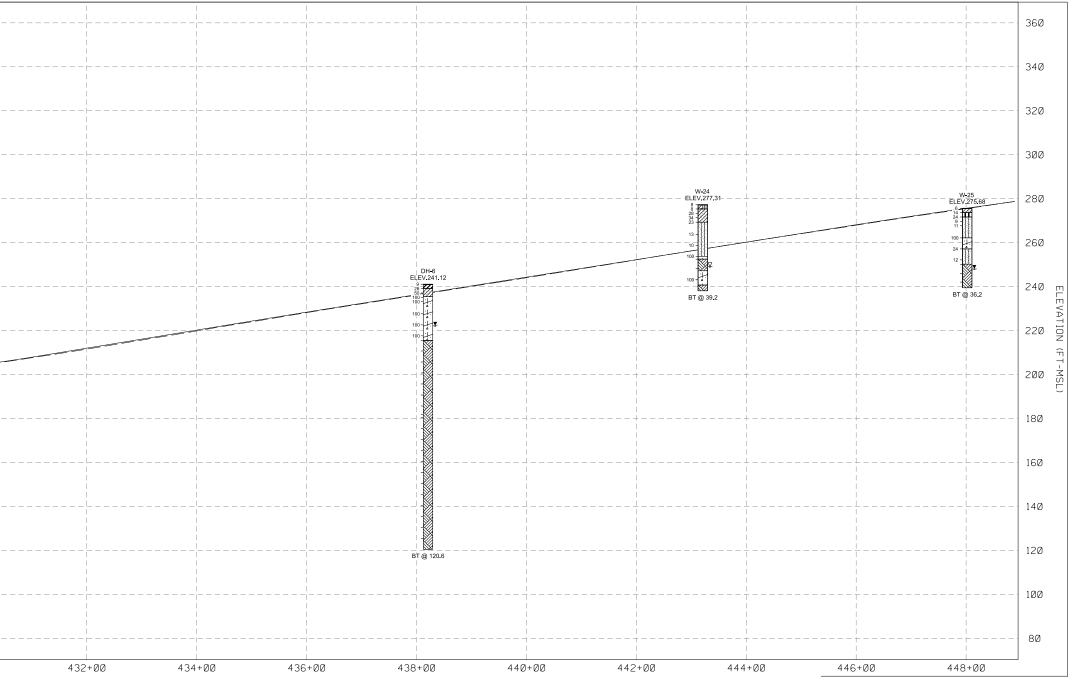

BRIDGE 8
I-20
B-10
ELEV.247.38
BT @ 96
AP-15
ELEV.247.38
BT @ 91.2
B-11
ELEV.254.02
BT @ 105.8
AP-19
ELEV.271.00
BT @ 8.5
B-12
ELEV.271.00
BT @ 98.8
AP-18
ELEV.272.77
BT @ 18.3
B-13
ELEV.272.77
BT @ 88.7
B-14
ELEV.269.61
BT @ 55
B-14AP
ELEV.269.09
BT @ 88.8
B-15
ELEV.274.48
BT @ 100
338+00
340+00
342+00
344+00
346+00
348+00
350+00
352+00
354+00


RW-32
ELEV.250.38
7
5
13
19
13
6
3
6
8
29
44
BT @ 40
AP-21
ELEV.250.38
BT @ 20.5
B-29
ELEV.225.13
12
8
30
30
34
10
14
5
100
100
26
15
14
100
BT @ 76.8
B-30
ELEV.234.15
6
12
14
21
6
4
28
13
14
18
32
23
28
100
43
72
63
100
65
100
100
100
100
BT @ 98.6
356+00
358+00
360+00
362+00
364+00
366+00
368+00
370+00
372+00


BRIDGE 27
PROPOSED CUT FOR ALIGNMENT 126CDE UNDERPASS
BRIDGE 30
CSX RR
RW-35
ELEV.210.76
8 9 4 16 23 32 40 28 55 85 100 50 100
BT @ 49.3
B-31
ELEV.205.72
8 38 22 31 27 26 16 41
BT @ 55.5
BT @ 55.6
DH-3
ELEV.209.34
6 21 37 68 100
BT @ 8.2
DH-3A
ELEV.208.74
12 23 100 100 43 45 18 23 24 100
BT @ 120.7
B-32
ELEV.194.72
5 26 17 19 20 32 100 100 100 100 100 100 100 100
BT @ 85.7
B-33
ELEV.183.25
7 17 34 21 27 45 78 100 100 100 100 100
BT @ 74.6
B-34UD
ELEV.196.70
4 11
BT @ 39.5
B-34
ELEV.196.77
4 9 8 7 6 8 11 8 8 2 4 100
BT @ 74.6
374+00
376+00
378+00
380+00
382+00
384+00
386+00
388+00
390+00
STATION


BRIDGE 33
SALUDA RIVER
B-62
ELEV.167.24
4
10
10
16
16
100
68
100
BT @ 45.7
B-43
ELEV.181.02
5
9
10
11
11
12
100
100
100
100
BT @ 73
B-44
ELEV.165.49
10
12
18
100
BT @ 26.2
B-45
ELEV.183.29
20
100
100
100
100
100
100
100
BT @ 47
B-46
ELEV.168.91
6
12
21
21
17
100
100
62
100
BT @ 48.6
RW-38
ELEV.169.45
7
9
14
9
17
100
100
BT @ 16.6
W-22
ELEV.185.85
6
12
10
6
9
18
24
25
42
94
100
100
100
100
100
100
100
100
100
BT @ 79.1
392+00
394+00
396+00
398+00
400+00
402+00
404+00
406+00
408+00


RW-39
ELEV 199.32
8
10
10
24
14
12
9
28
100
100
BT @ 35.2
410+00
412+00
414+00
416+00
418+00
420+00
422+00
424+00
426+00
428+00
430+00


DH-6
ELEV.241.12
9
26
50
100
100
100
100
100
BT @ 120.6
W-24
ELEV.277.31
8
8
28
34
23
13
10
100
100
BT @ 39.2
W-25
ELEV.275.68
6
14
24
9
11
100
24
12
BT @ 36.2
360
340
320
300
280
260
240
220
200
180
160
140
120
100
80
ELEVATION (FT-MSL)
432+00
434+00
436+00
438+00
440+00
442+00
444+00
446+00
448+00

F&ME
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GEOTECHNICAL - ENVIRONMENTAL - MATERIALS
COLUMBIA, SOUTH CAROLINA

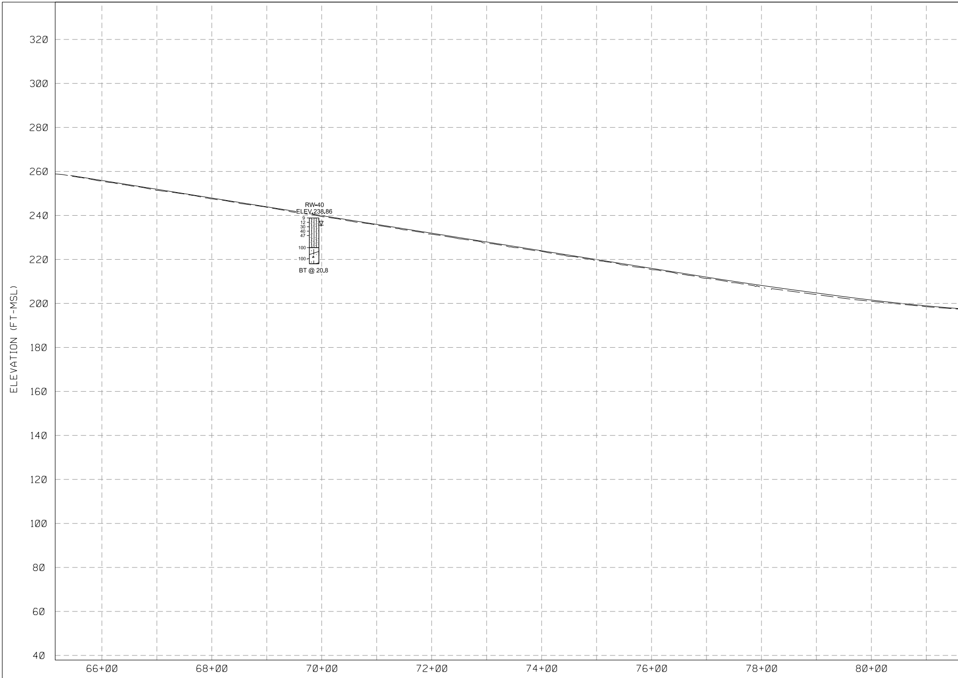
I-20/26/126 CORRIDOR IMPROVEMENTS
LEXINGTON/RICHLAND COUNTY, SOUTH CAROLINA

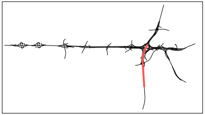
I-26 ALIGNMENT
GENERALIZED SUBSURFACE PROFILE

REV. NO.	BY	DATE	DESCRIPTION OF REVISION
4			
3			
2			
1	BMF	10.17.18	REVIEW COMMENTS

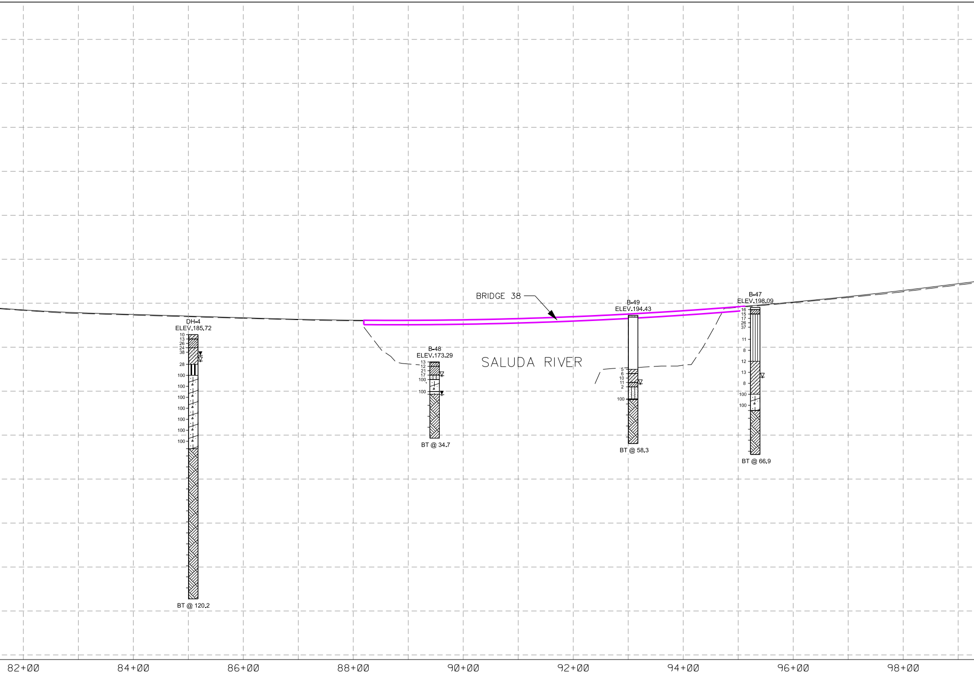
TOPO. ______ DATE ______
DWG. BMF DATE 7.5.18
R/W ______ DATE ______
GROUP ____ – _____

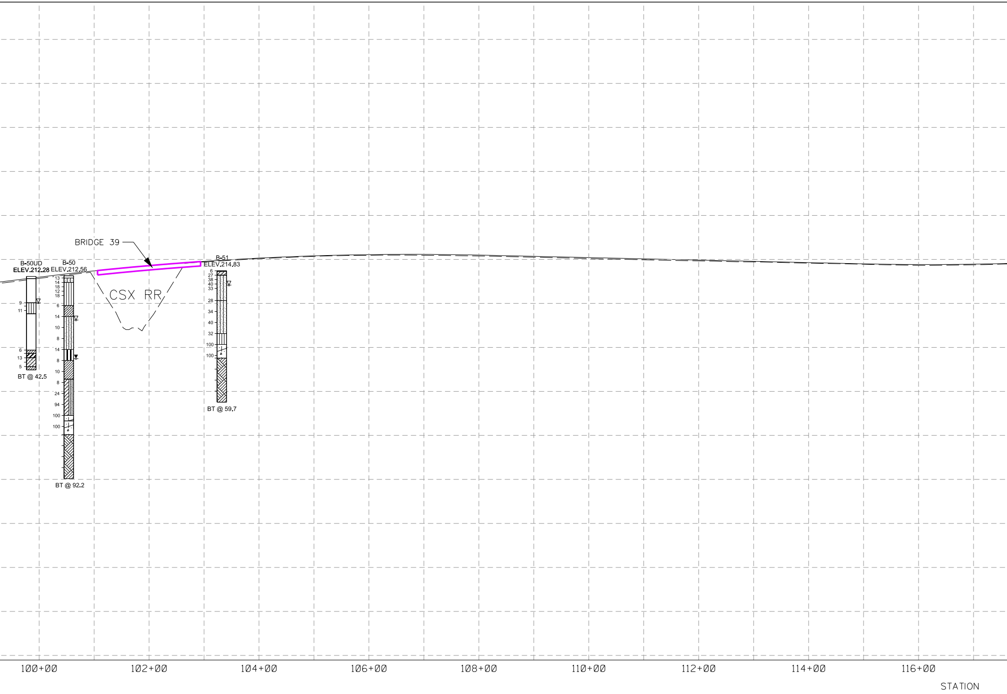
HRZ SCALE = NTS	F&ME JOB NO. G5662.01
VRT SCALE = NTS	FIGURE 3C

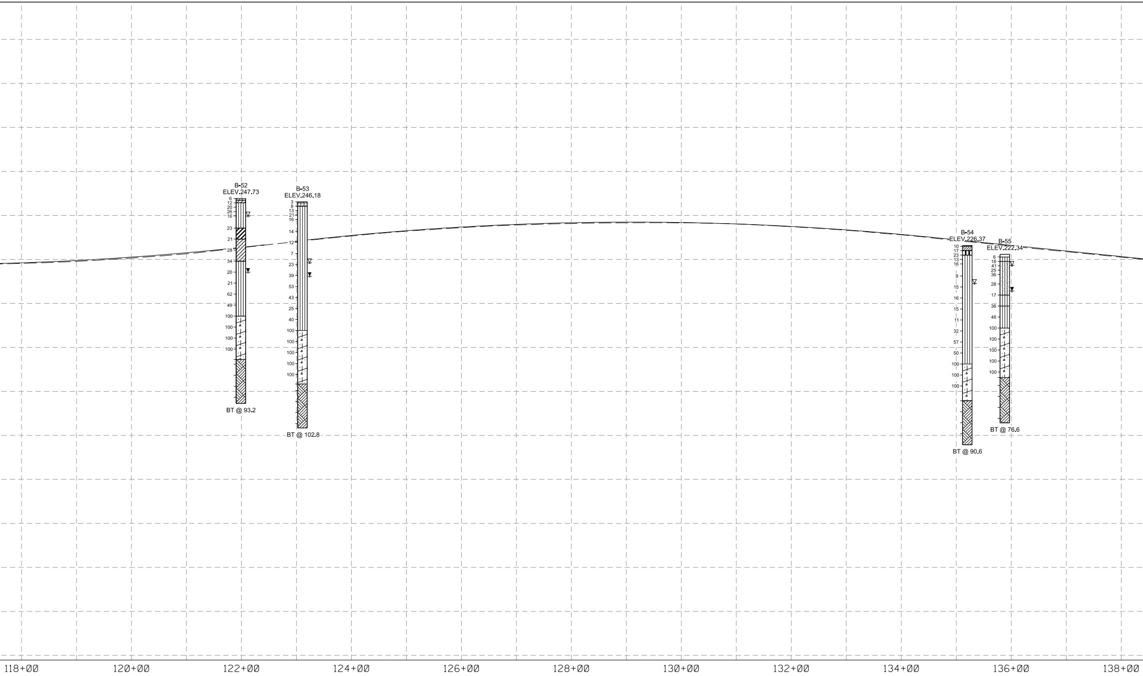


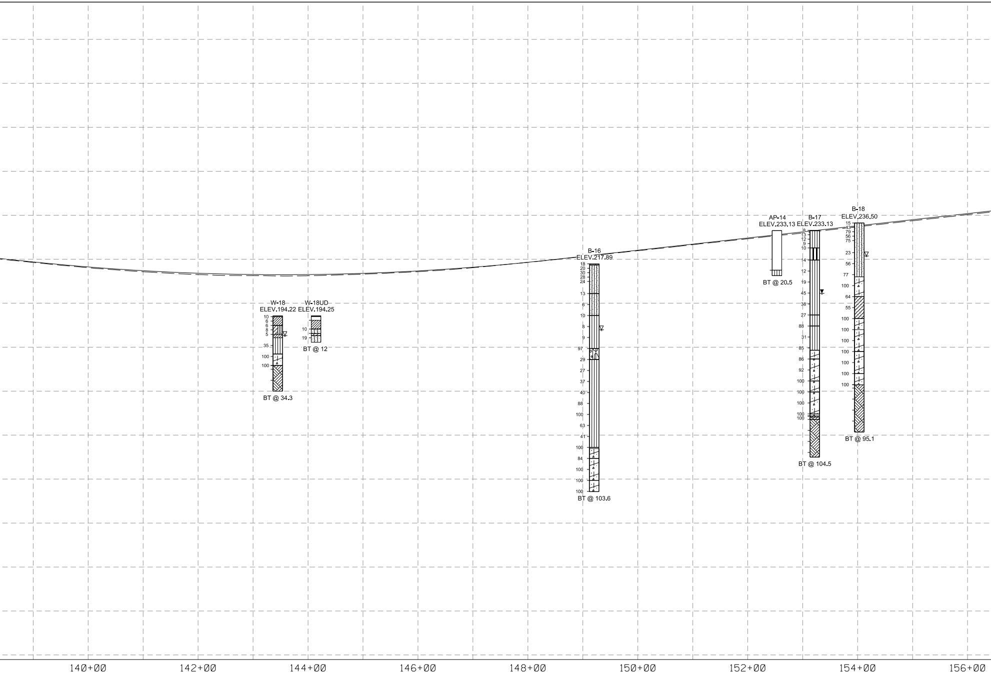


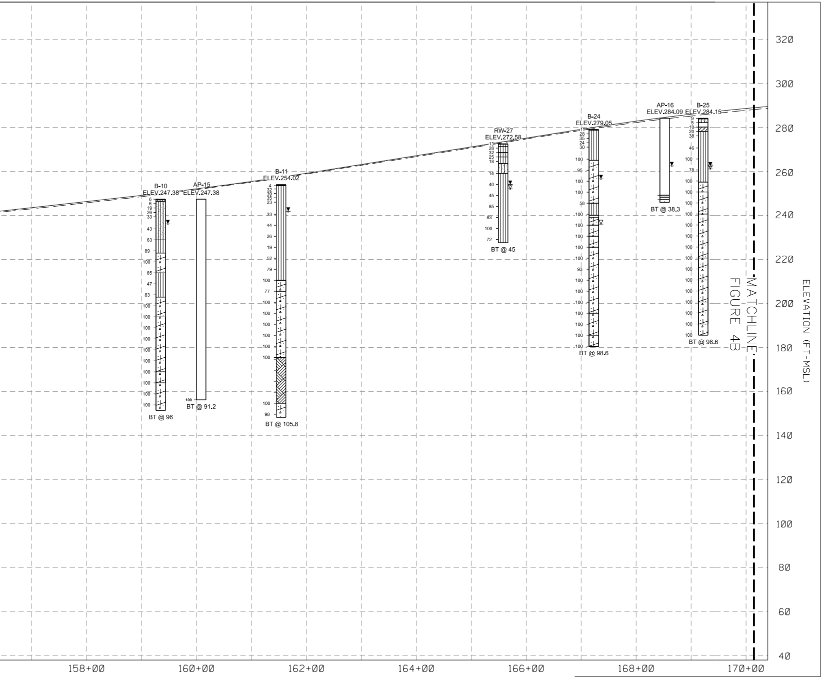
The generalized subsurface profiles are provided only for illustrative purposes. The intent of these drawings is to provide the reader with very general information on soils, cuts, and fills. Variations in the indicated subsurface conditions will become evident once additional borings are performed.


BRIDGE 38
SALUDA RIVER
DH-4
ELEV.185.72
10
13
26
24
38
28
100
100
100
100
100
100
100
BT @ 120.2
B-48
ELEV.173.29
13
12
21
17
100
100
BT @ 34.7
B-49
ELEV.194.43
5
6
10
11
2
100
BT @ 58.3
B-47
ELEV.198.09
16
15
17
26
37
11
8
12
13
8
100
100
BT @ 66.9
82+00
84+00
86+00
88+00
90+00
92+00
94+00
96+00
98+00


BRIDGE 39
CSX RR
B-50UD
ELEV.212.28
9
11
6
13
5
BT @ 42.5
B-50
ELEV.212.56
13
14
18
12
18
6
14
10
8
14
8
10
8
24
94
100
100
BT @ 92.2
B-51
ELEV.214.83
6
27
38
40
33
28
34
40
32
100
100
BT @ 59.7
100+00
102+00
104+00
106+00
108+00
110+00
112+00
114+00
116+00
STATION


B-52
ELEV.247.73
6
12
20
26
16
23
21
28
34
20
21
62
49
100
100
100
100
BT @ 93.2
B-53
ELEV.246.18
3
8
13
21
16
14
12
7
23
39
53
43
25
40
100
100
100
100
100
BT @ 102.8
B-54
ELEV.226.37
10
17
23
13
16
9
15
16
15
11
32
57
50
100
100
100
BT @ 90.6
B-55
ELEV.222.34
6
18
41
25
36
28
17
36
48
100
100
100
100
100
BT @ 76.6
118+00
120+00
122+00
124+00
126+00
128+00
130+00
132+00
134+00
136+00
138+00


W-18
ELEV.194.22
10
6
6
8
5
35
100
100
BT @ 34.3
W-18UD
ELEV.194.25
10
19
BT @ 12
B-16
ELEV.217.89
18
20
30
28
24
13
6
10
8
9
97
29
27
37
40
88
100
63
41
100
84
100
100
100
BT @ 103.6
AP-14
ELEV.233.13
BT @ 20.5
B-17
ELEV.233.13
8
13
12
9
10
14
12
19
45
38
27
88
31
85
86
92
100
100
100
100
100
BT @ 104.5
B-18
ELEV.236.50
15
43
79
56
75
23
56
77
100
64
55
100
100
100
100
100
100
100
BT @ 95.1
140+00
142+00
144+00
146+00
148+00
150+00
152+00
154+00
156+00


B-10
ELEV.247.38
6
6
19
26
33
43
63
89
100
65
47
83
100
100
100
100
100
100
100
100
100
100
BT @ 96
AP-15
ELEV.247.38
100
BT @ 91.2
B-11
ELEV.254.02
4
32
39
35
23
33
44
26
19
52
79
100
77
100
100
100
100
100
100
100
98
BT @ 105.8
RW-27
ELEV.272.58
13
28
32
25
18
14
40
45
85
83
100
72
BT @ 45
B-24
ELEV.279.05
11
28
35
24
30
100
95
100
100
58
100
100
100
100
100
93
100
100
100
100
100
100
100
BT @ 98.6
AP-16
ELEV.284.09
BT @ 38.3
B-25
ELEV.284.15
9
5
10
20
38
46
100
78
100
100
100
100
100
100
100
100
100
100
100
100
100
100
BT @ 98.6
MATCHLINE
FIGURE 4B
ELEVATION (FT-MSL)
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
158+00
160+00
162+00
164+00
166+00
168+00
170+00

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COLUMBIA, SOUTH CAROLINA

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TOPO. ____ DATE ____
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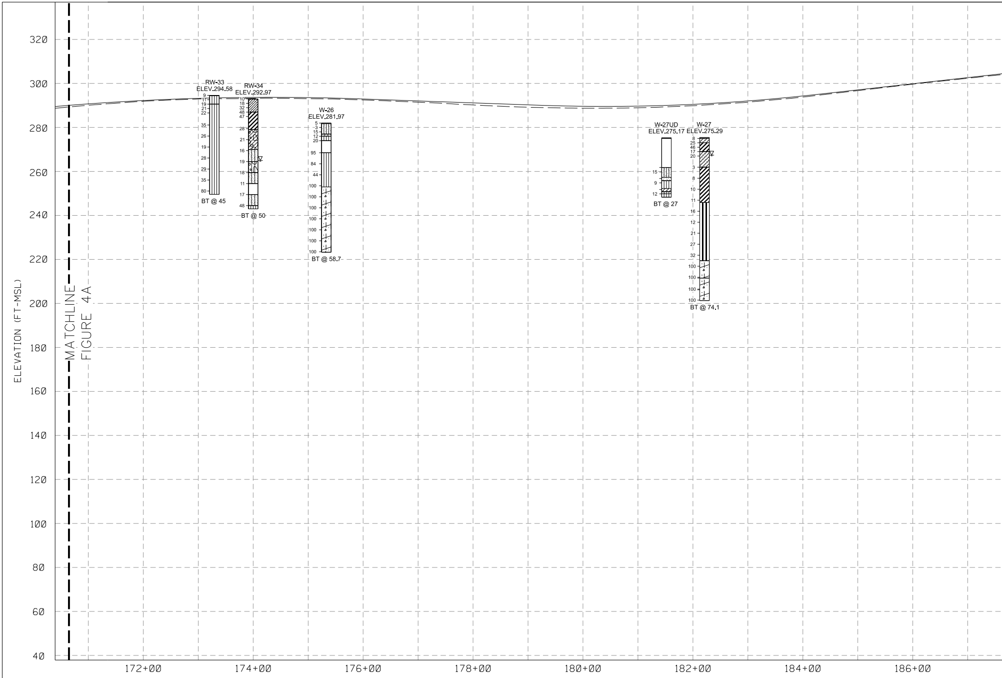
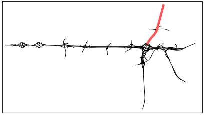
GROUP ____ – ____

I-20/26/126 CORRIDOR IMPROVEMENTS
LEXINGTON/RICHLAND COUNTY, SOUTH CAROLINA

I-20 ALIGNMENT
GENERALIZED SUBSURFACE PROFILE

HRZ SCALE = NTS
VRT SCALE = NTS
F&ME JOB NO. G5662.01
FIGURE 4A


ELEVATION (FT-MSL)
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
MATCHLINE
FIGURE 4A
RW-33
ELEV.294.58
9
11
19
21
22
35
26
19
28
29
35
80
BT @ 45
RW-34
ELEV.292.97
10
18
32
48
47
28
21
16
19
18
11
17
48
BT @ 50
W-26
ELEV.281.97
5
3
15
12
20
95
84
44
100
100
100
100
100
100
100
BT @ 58.7
W-27UD
ELEV.275.17
15
9
12
BT @ 27
W-27
ELEV.275.29
8
25
46
17
20
3
8
10
11
16
12
21
27
32
100
100
100
100
BT @ 74.1
172+00
174+00
176+00
178+00
180+00
182+00
184+00
186+00



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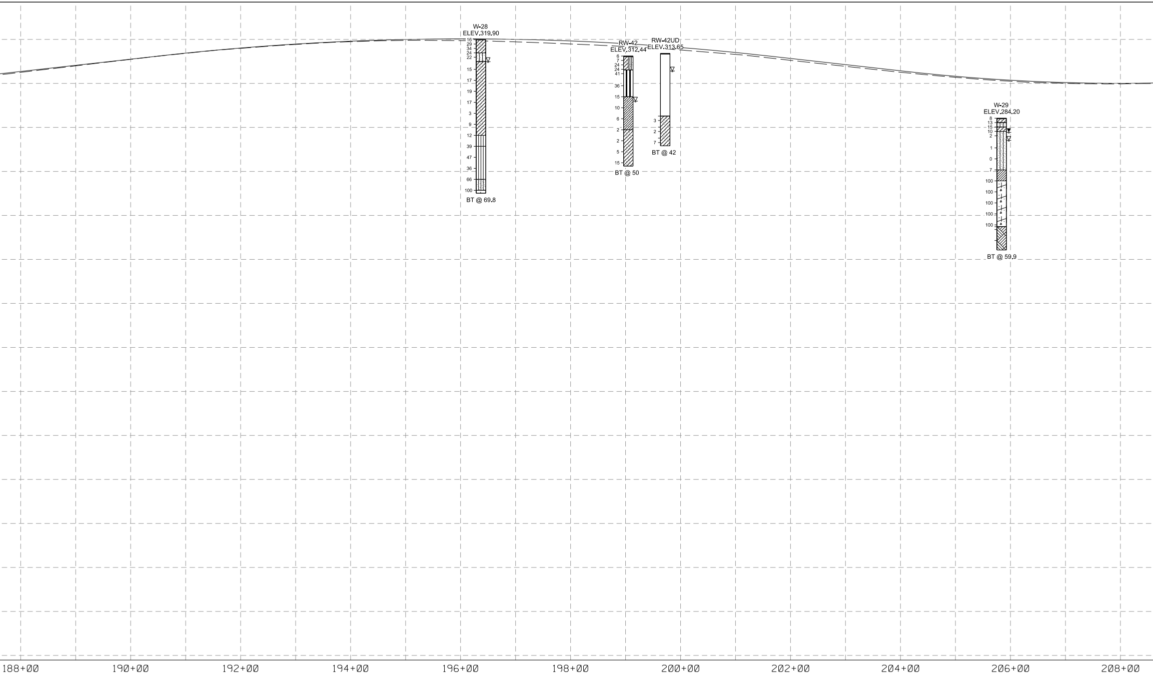
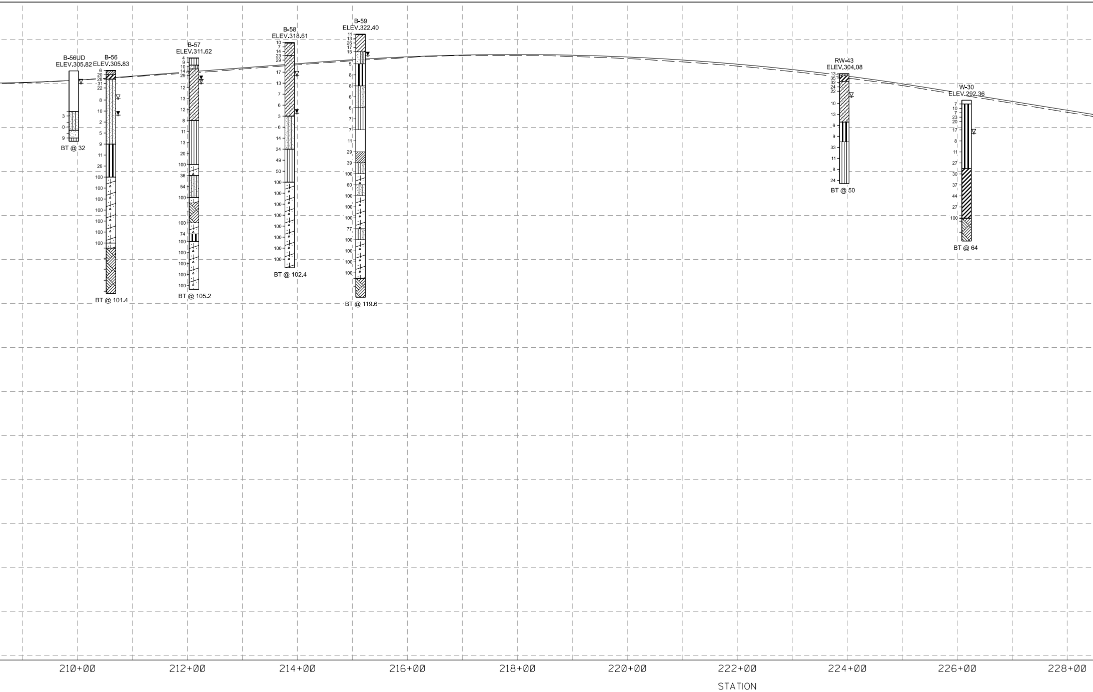
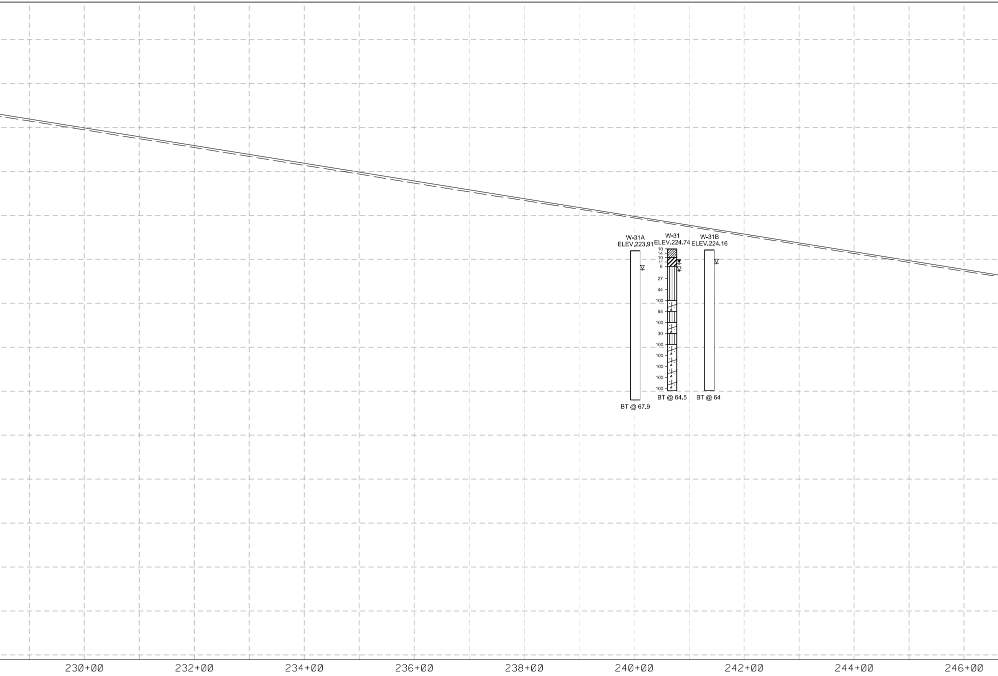
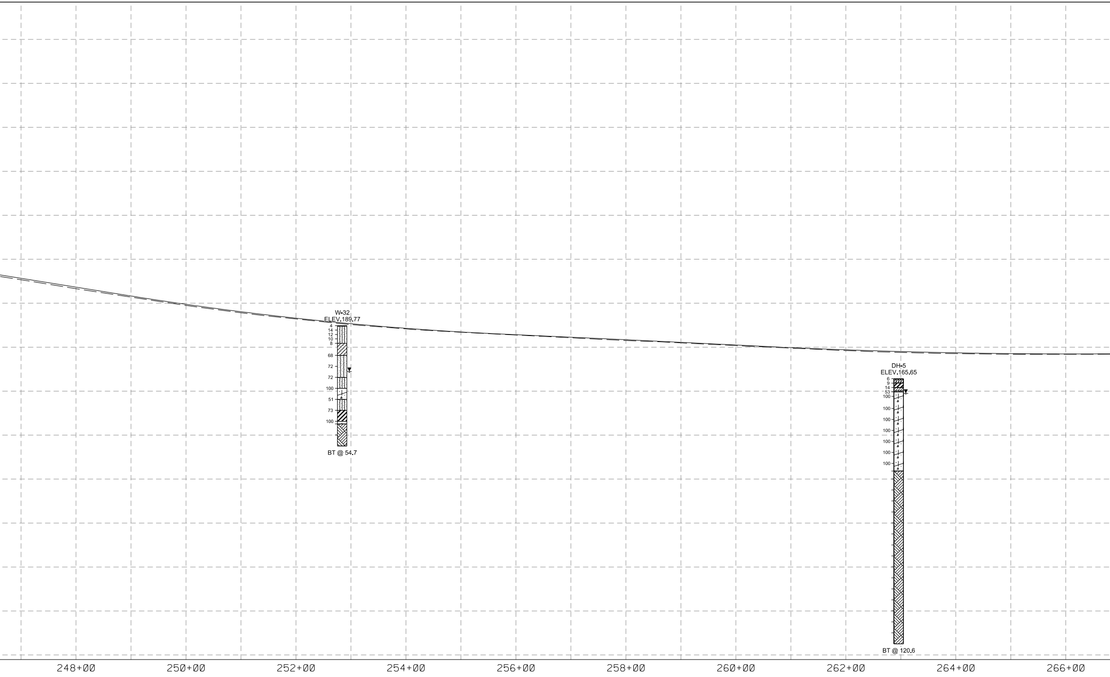
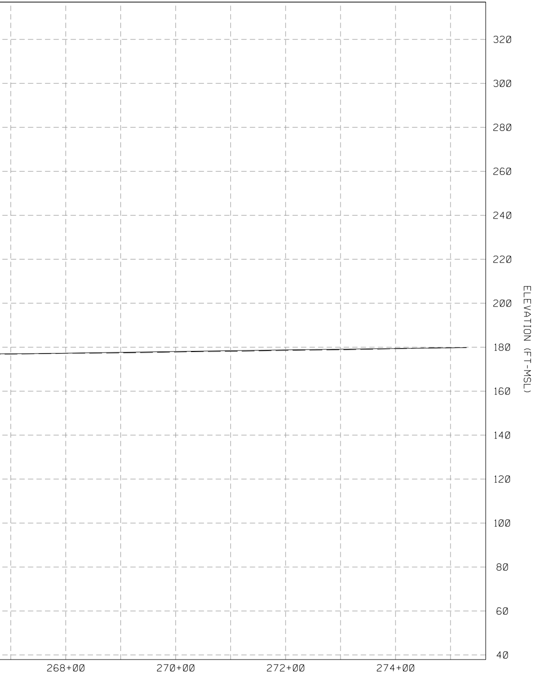

W-28
ELEV.319.90
16
29
34
24
22
15
17
19
17
3
9
12
39
47
36
66
100
BT @ 69.8
RW-42
ELEV.312.44
6
7
24
24
41
36
15
10
6
2
2
5
15
BT @ 50
RW-42UD
ELEV.313.65
3
2
7
BT @ 42
W-29
ELEV.284.20
8
13
15
10
2
1
0
7
100
100
100
100
100
BT @ 59.9
188+00
190+00
192+00
194+00
196+00
198+00
200+00
202+00
204+00
206+00
208+00


B-56UD
ELEV.305.82
3
0
9
BT @ 32
B-56
ELEV.305.83
6
20
28
31
22
8
10
2
5
9
11
26
100
100
100
100
100
100
100
BT @ 101.4
B-57
ELEV.311.62
4
9
10
14
29
12
13
12
8
11
13
20
100
36
54
100
100
74
100
100
100
100
100
BT @ 105.2
B-58
ELEV.318.61
10
7
14
23
29
17
13
7
6
3
6
14
34
49
50
100
100
100
100
100
100
100
100
BT @ 102.4
B-59
ELEV.322.40
11
13
26
17
15
5
8
8
6
6
7
7
11
29
39
100
60
100
100
100
77
100
100
100
100
BT @ 119.6
RW-43
ELEV.304.08
13
35
32
24
22
10
13
6
9
33
11
8
24
BT @ 50
W-30
ELEV.292.36
7
10
7
23
20
17
8
11
27
30
37
44
27
100
BT @ 64
210+00
212+00
214+00
216+00
218+00
220+00
222+00
224+00
226+00
228+00
STATION


W-31A
ELEV.223.91
BT @ 67.9
W-31
ELEV.224.74
10
14
10
11
9
27
44
100
65
100
30
100
100
100
100
100
BT @ 64.5
W-31B
ELEV.224.16
BT @ 64
230+00
232+00
234+00
236+00
238+00
240+00
242+00
244+00
246+00


W-32
ELEV.189.77
4
14
12
10
8
68
72
72
100
51
73
100
BT @ 54.7
DH-5
ELEV.165.65
6
9
14
53
100
100
100
100
100
100
100
BT @ 120.6
248+00
250+00
252+00
254+00
256+00
258+00
260+00
262+00
264+00
266+00



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GEOTECHNICAL - ENVIRONMENTAL - MATERIALS
COLUMBIA, SOUTH CAROLINA

REV. NO.	BY	DATE	DESCRIPTION OF REVISION
4			
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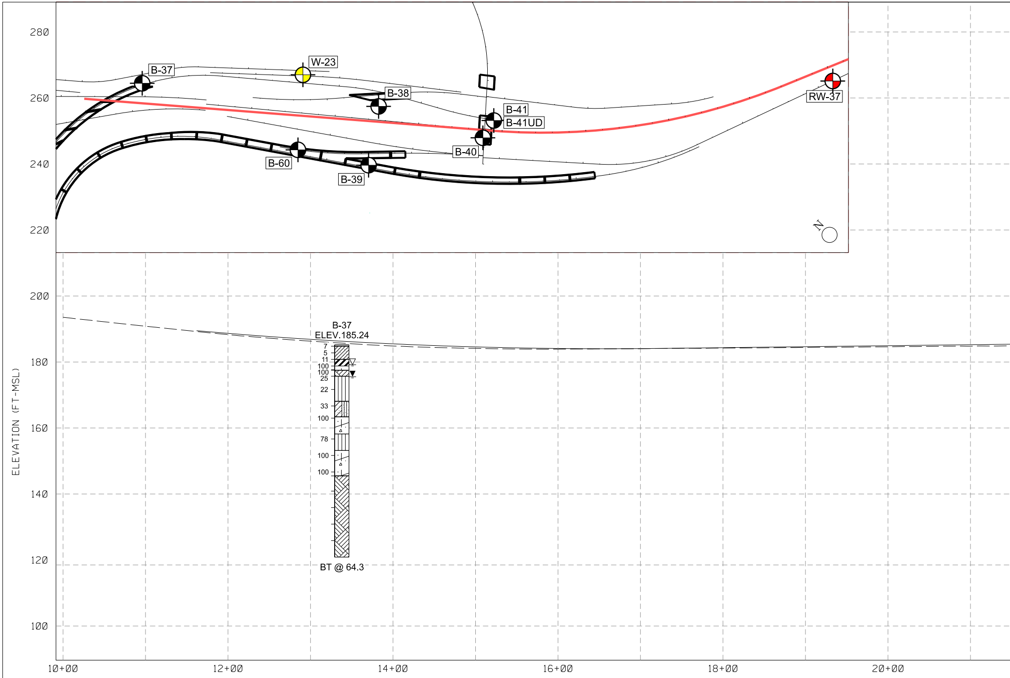
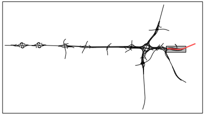
I-20/26/126 CORRIDOR IMPROVEMENTS
LEXINGTON/RICHLAND COUNTY, SOUTH CAROLINA

I-20 ALIGNMENT
GENERALIZED SUBSURFACE PROFILE

HRZ SCALE = NTS	F&ME JOB NO. G5662.01
VRT SCALE = NTS	FIGURE 4B


B-37
W-23
B-38
B-41
B-41UD
B-40
B-60
B-39
RW-37
N
280
260
240
220
200
180
160
140
120
100
ELEVATION (FT-MSL)
B-37
ELEV.185.24
7
5
11
100
100
25
22
33
100
78
100
100
BT @ 64.3
10+00
12+00
14+00
16+00
18+00
20+00



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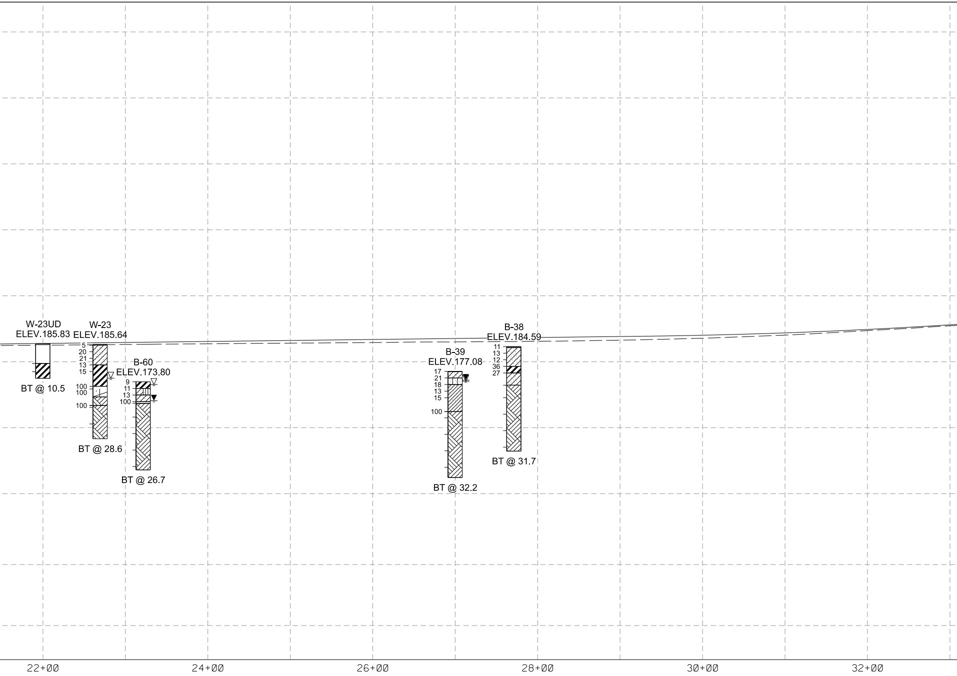
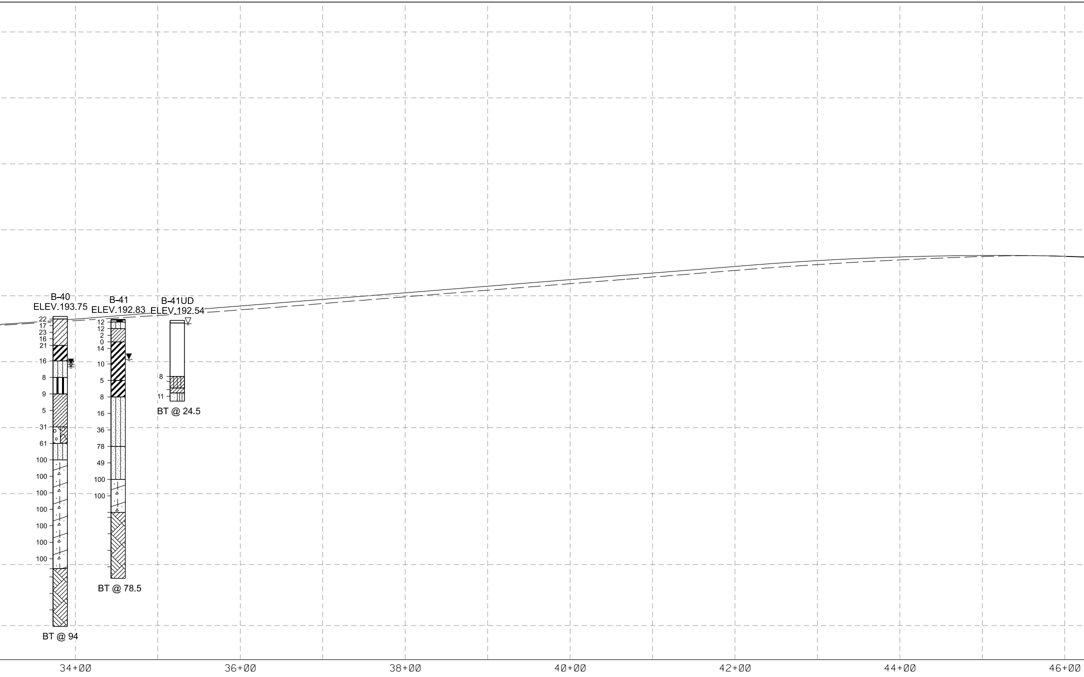
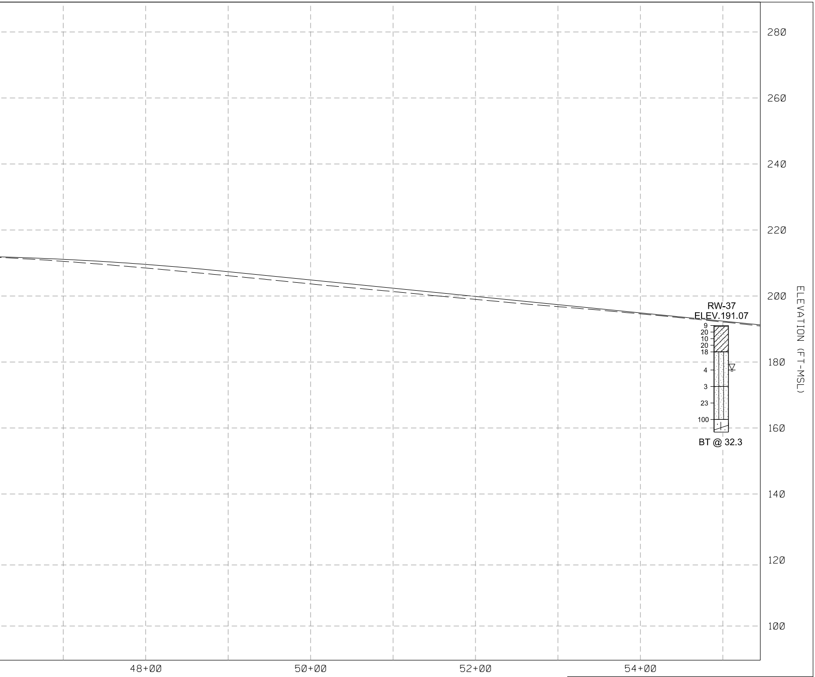

W-23UD
ELEV.185.83
BT @ 10.5
W-23
ELEV.185.64
5
20
21
13
15
100
100
100
BT @ 28.6
B-60
ELEV.173.80
9
11
13
100
BT @ 26.7
B-39
ELEV.177.08
17
21
18
13
15
100
BT @ 32.2
B-38
ELEV.184.59
11
13
12
36
27
BT @ 31.7
22+00
24+00
26+00
28+00
30+00
32+00


B-40
ELEV.193.75
22
17
23
16
21
16
8
9
5
31
61
100
100
100
100
100
100
100
BT @ 94
B-41
ELEV.192.83
12
12
2
0
14
10
5
8
16
36
78
49
100
100
BT @ 78.5
B-41UD
ELEV.192.54
8
11
BT @ 24.5
34+00
36+00
38+00
40+00
42+00
44+00
46+00


280
260
240
220
200
180
160
140
120
100
ELEVATION (FT-MSL)
RW-37
ELEV.191.07
9
20
10
20
18
4
3
23
100
BT @ 32.3
48+00
50+00
52+00
54+00

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COLUMBIA, SOUTH CAROLINA

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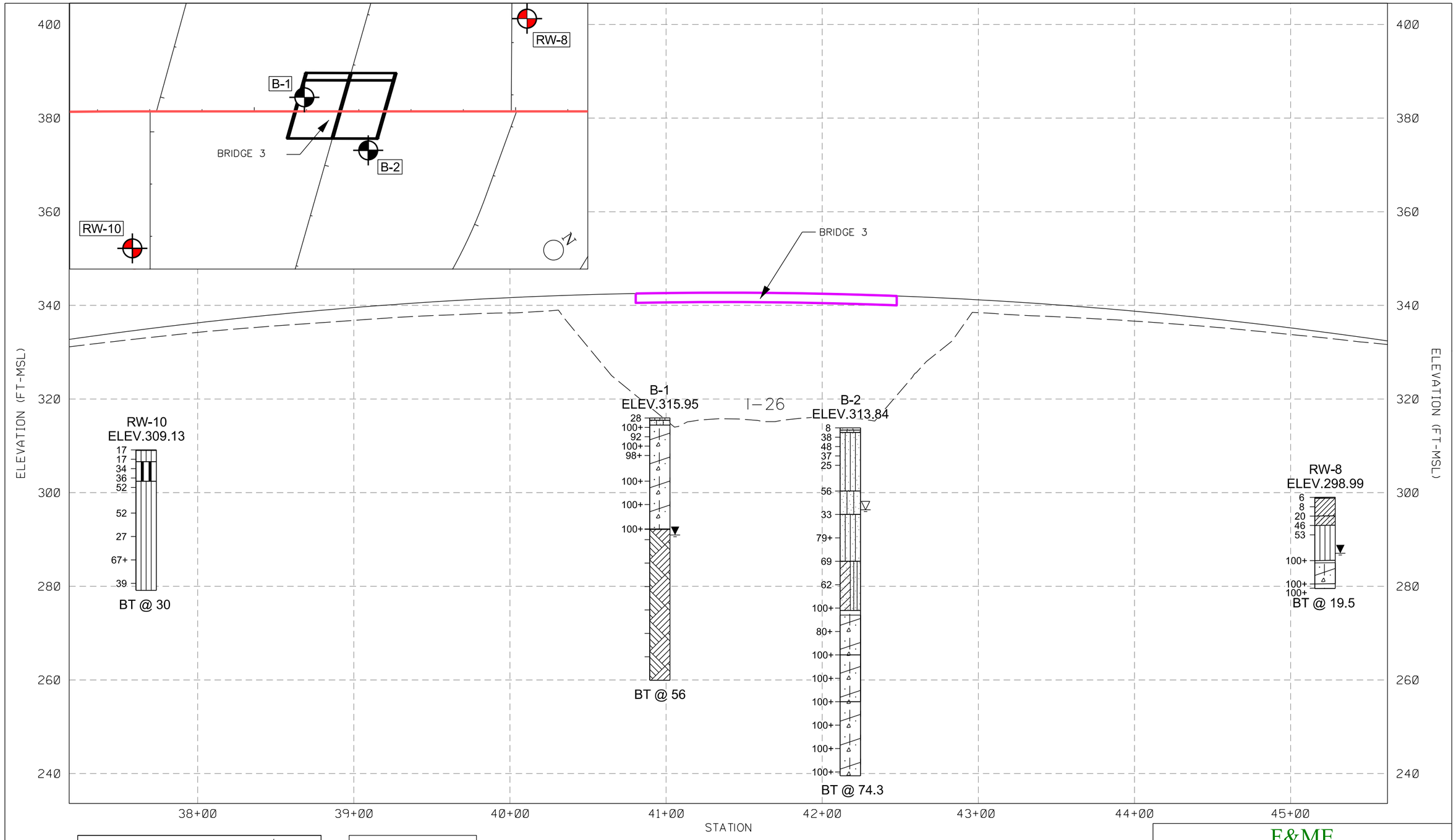
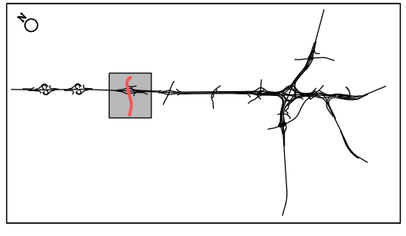
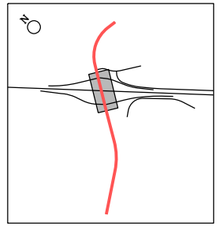
I-20/26/126 CORRIDOR IMPROVEMENTS
LEXINGTON/RICHLAND COUNTY, SOUTH CAROLINA

I-126 ALIGNMENT
GENERALIZED SUBSURFACE PROFILE

HRZ SCALE = NTS	F&ME JOB NO. G5662.01
VRT SCALE = NTS	FIGURE 5







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REV. NO.	BY	DATE	DESCRIPTION OF REVISION
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3			
2			
1			

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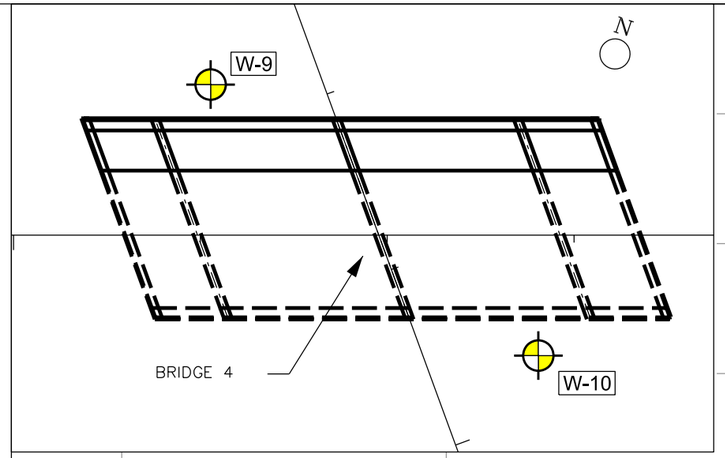
COLUMBIA, SOUTH CAROLINA

I-20/26/126 CORRIDOR IMPROVEMENTS
LEXINGTON/RICHLAND COUNTY, SOUTH CAROLINA

S-757 (HARBISON BLVD) ALIGNMENT
GENERALIZED SUBSURFACE PROFILE

HRZ SCALE = NTS	F&ME JOB NO. G5662.01
VRT SCALE = NTS	FIGURE 6



ELEVATION (FT-MSL)

340
320
300
280
260
240
220
200
180
160

BRIDGE 4

I-26

W-9
ELEV.255.50

8
6
9
19
100+
100+
60
100+
100+
100+
100+

BT @ 49.2

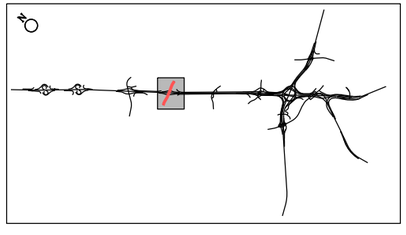
W-10
ELEV.257.30

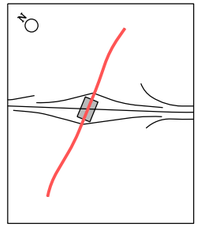
10
31
49
70
50
64
100+
100+
95+
86+
100+
100+
100+
100+
100+

BT @ 53.6

25+50
26+00
26+50
27+00
27+50
28+00
28+50

STATION





The generalized subsurface profiles are provided only for illustrative purposes. The intent of these drawings is to provide the reader with very general information on soils, cuts, and fills. Variations in the indicated subsurface conditions will become evident once additional borings are performed.

REV. NO.	BY	DATE	DESCRIPTION OF REVISION
4			
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TOPO. ____ DATE ____
DWG. BMF DATE 7.5.18 GROUP ____ - ____
R/W ____ DATE ____

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COLUMBIA, SOUTH CAROLINA

I-20/26/126 CORRIDOR IMPROVEMENTS
LEXINGTON/RICHLAND COUNTY, SOUTH CAROLINA

S-671 (PINEY GROVE RD)
GENERALIZED SUBSURFACE PROFILE

HRZ SCALE = NTS	F&ME JOB NO. G5662.01
VRT SCALE = NTS	FIGURE 7

ELEVATION (FT-MSL)

360
340
320
300
280
260
240
220

BRIDGE 9

I-26

B-3
ELEV.308.38

21
12
13
9
9
40
48
100+
100+
100+
100+
100+
100+
100+
94+
100+

BT @ 83.8

B-4
ELEV.312.74

4
14
73+
100+
100+
100+
100+
100+
100+
100+
100+
100+
100+
100+
100+
100+
100+
100+
100+
100+
100+

BT @ 98.6

116+00 117+00 118+00 119+00 120+00 121+00 122+00

STATION

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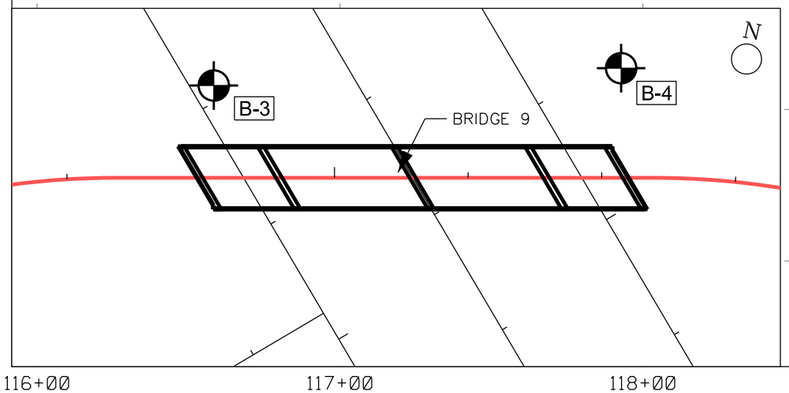

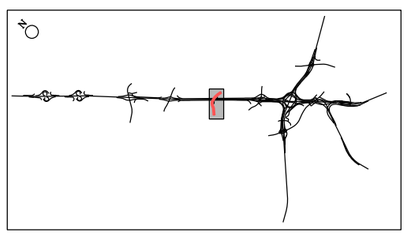

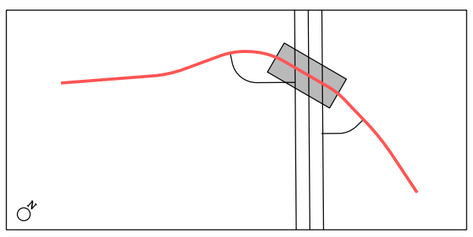

REV. NO.	BY	DATE	DESCRIPTION OF REVISION
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TOPO. _____ DATE _____
DWG. BMF DATE 7.5.18 GROUP ____ - ____
R/W _____ DATE _____

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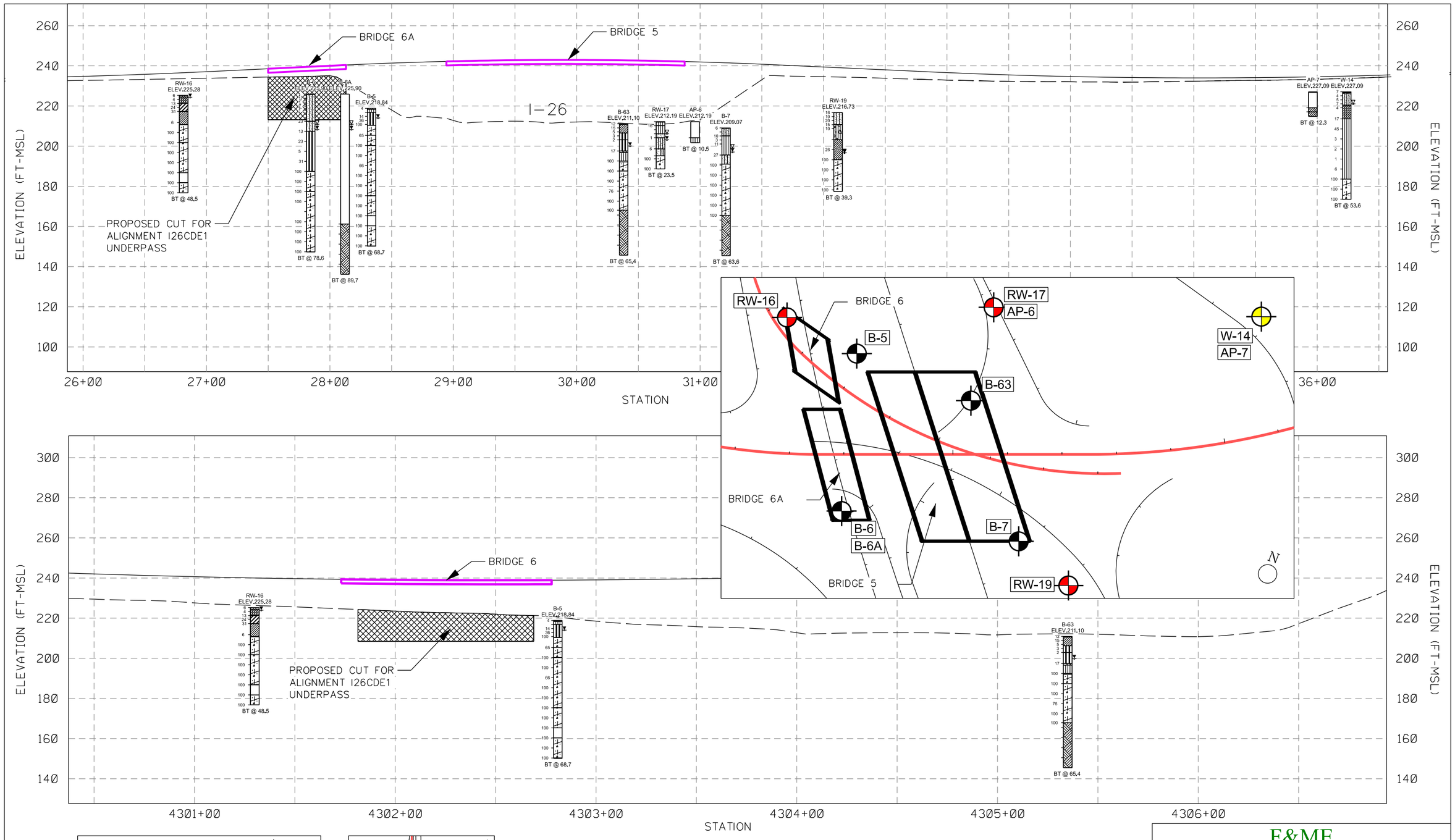
I-20/26/126 CORRIDOR IMPROVEMENTS
LEXINGTON/RICHLAND COUNTY, SOUTH CAROLINA

TRAM/BEATTY RD ALIGNMENT
GENERALIZED SUBSURFACE PROFILE

HRZ SCALE = NTS	F&ME JOB NO. G5662.01
VRT SCALE = NTS	FIGURE 8



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REV. NO.	BY	DATE	DESCRIPTION OF REVISION
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1	BF	10.17.18	REVIEW COMMENTS

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DWG. BMF DATE 7.5.18 GROUP ____ - ____
R/W _____ DATE _____

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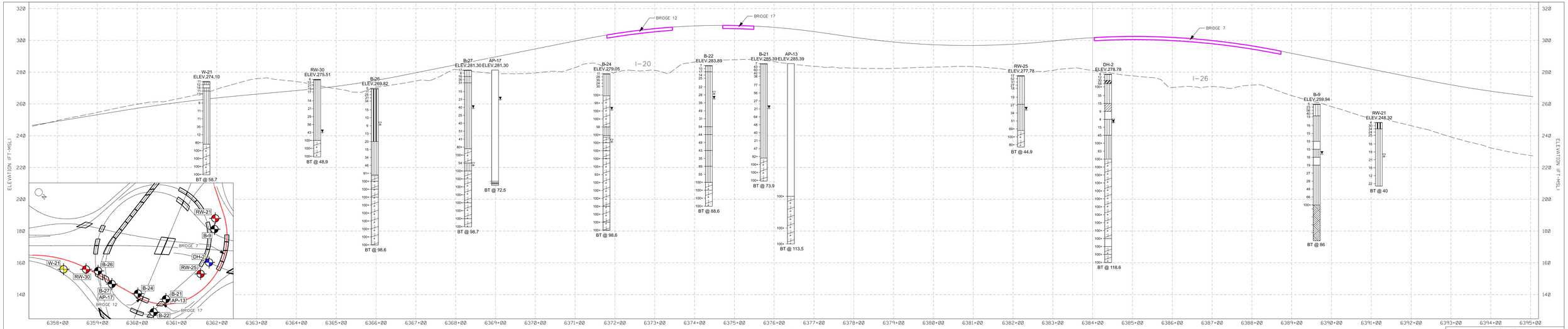
I-20/26/126 CORRIDOR IMPROVEMENTS
LEXINGTON/RICHLAND COUNTY, SOUTH CAROLINA

ST. ANDREWS ROAD/ RAMP B
GENERALIZED SUBSURFACE PROFILES

HRZ SCALE = NTS	F&ME JOB NO. G5662.01
VRT SCALE = NTS	FIGURE 9



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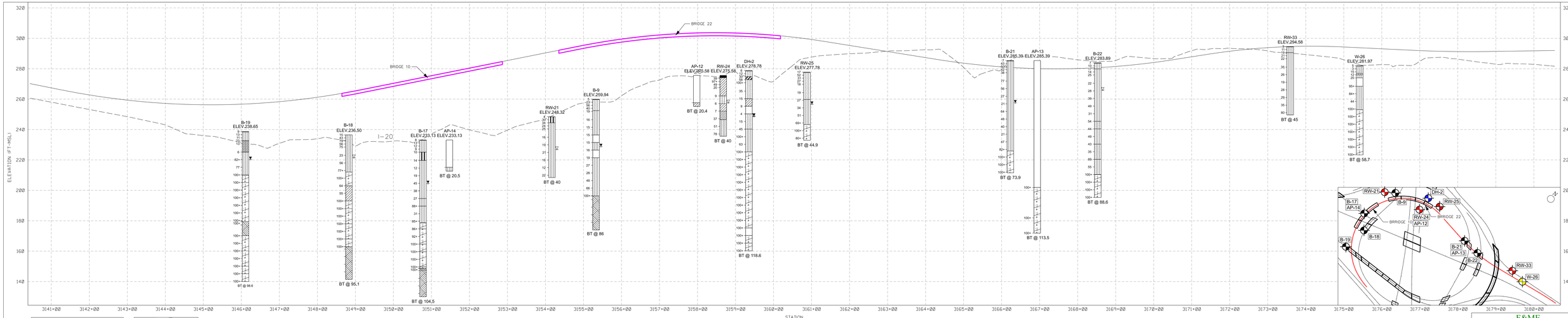
2			
1	BMF	10/7/19	REVISION COMMENTS
REV. NO.	BY	DATE	DESCRIPTION OF REVISION

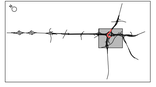
TOPO DATE
ENG BMF DATE 7/1/19
R/W DATE

GROUP ____ - ____

I-20/26/126 CORRIDOR IMPROVEMENTS
LEXINGTON/RICHLAND COUNTY, SOUTH CAROLINA
I-26 RDB ALIGNMENT
GENERALIZED SUBSURFACE PROFILE

HRZ SCALE = NTS	F&ME JOB NO. C5662.01
VRT SCALE = NTS	FIGURE 10





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REV. NO.	BY	DATE	DESCRIPTION OF REVISION

DES. ____ DATE ____
DWG. BMF DATE 7.5.18
CHK. ____ DATE ____

GROUP ____ - ____

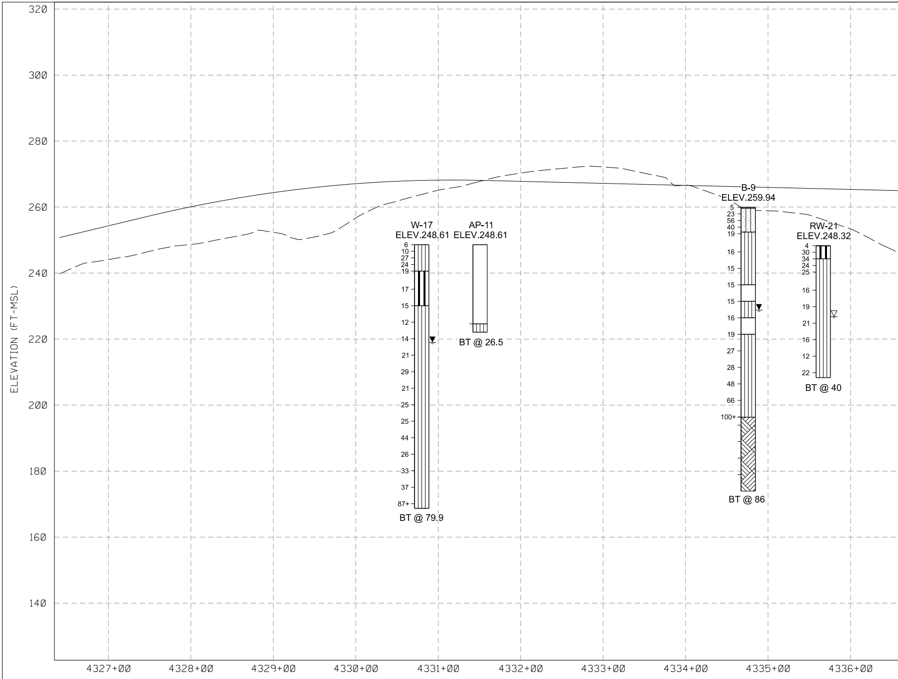
I-20/26/126 CORRIDOR IMPROVEMENTS
LEXINGTON/RICHLAND COUNTY, SOUTH CAROLINA

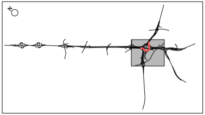
I-20 RAC ALIGNMENT
GENERALIZED SUBSURFACE PROFILE

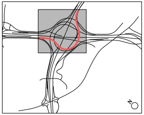
HRZ SCALE = NTS
VRT SCALE = NTS

F&ME JOB NO. 05662.01

FIGURE 11


320
300
280
260
240
220
200
180
160
140
ELEVATION (FT-MSL)
4327+00
4328+00
4329+00
4330+00
4331+00
4332+00
4333+00
4334+00
4335+00
4336+00
W-17
ELEV.248.61
6
10
27
24
19
17
15
12
14
21
29
21
25
25
44
26
33
37
87+
BT @ 79.9
AP-11
ELEV.248.61
BT @ 26.5
B-9
ELEV.259.94
5
23
56
40
19
16
15
15
15
16
19
27
28
48
66
100+
BT @ 86
RW-21
ELEV.248.32
4
30
34
24
25
16
19
21
16
12
22
BT @ 40





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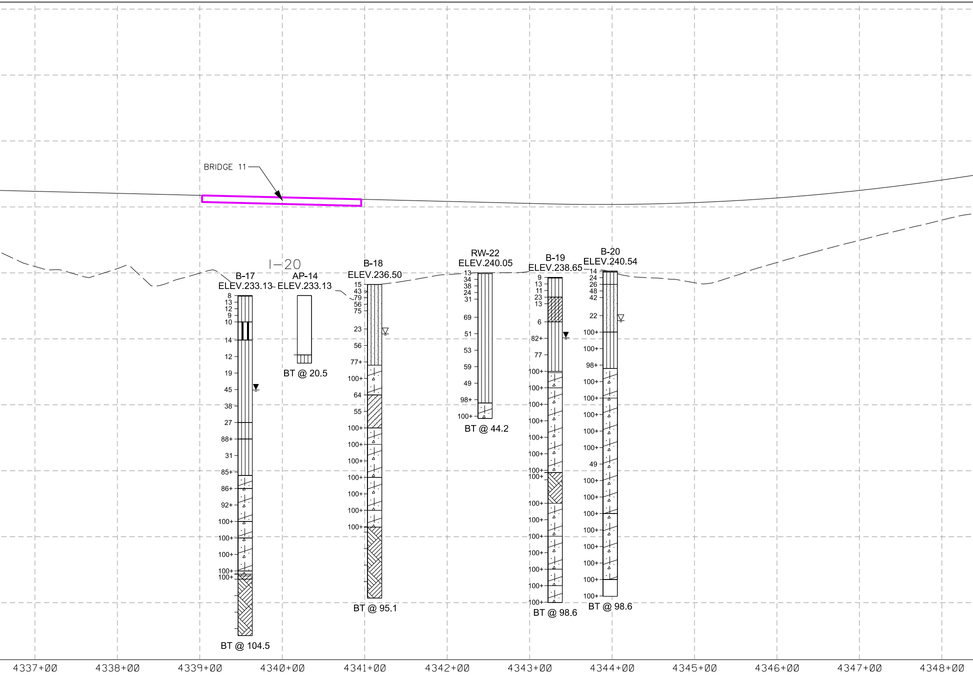
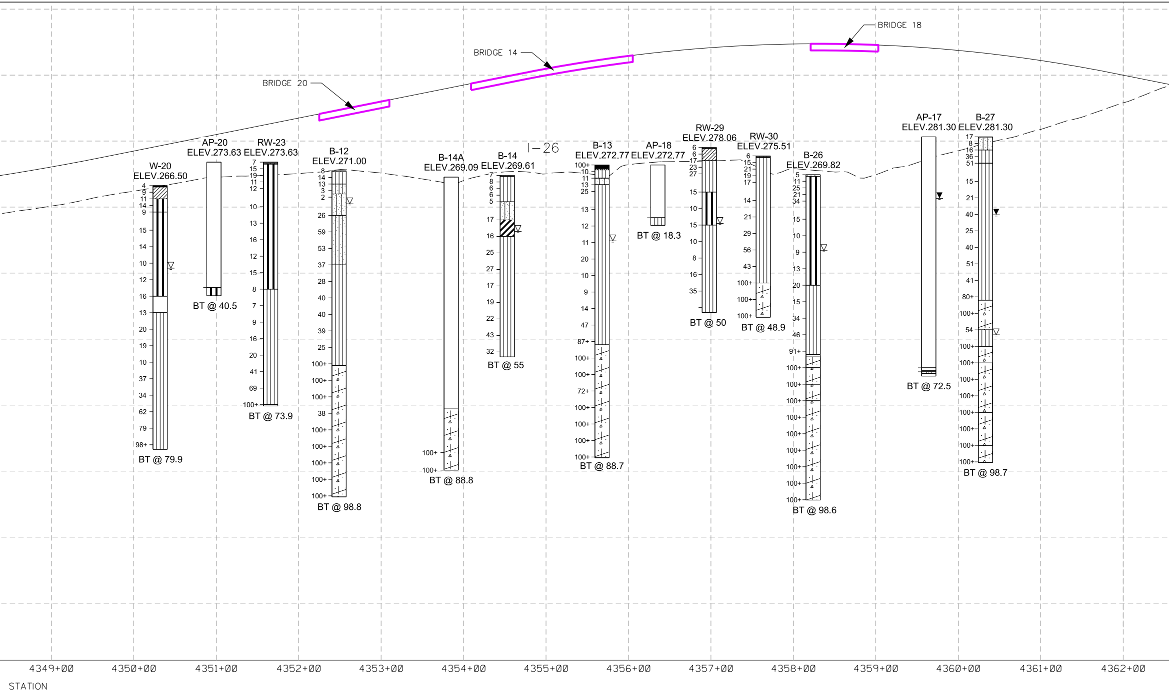
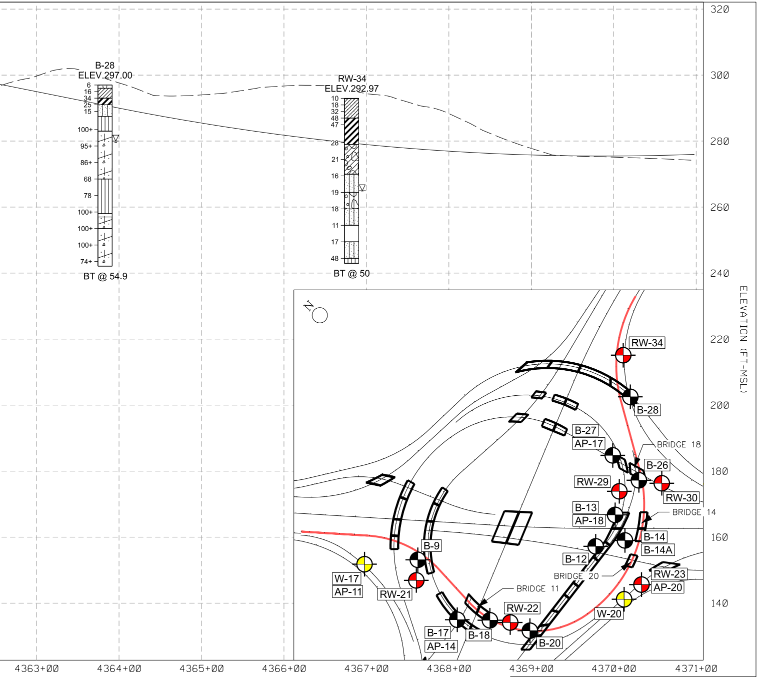

BRIDGE 11
I–20
B-17
ELEV.233.13
8
13
12
9
10
14
12
19
45
38
27
88+
31
85+
86+
92+
100+
100+
100+
100+
100+
BT @ 104.5
AP-14
ELEV.233.13
BT @ 20.5
B-18
ELEV.236.50
15
43
79
56
75
23
56
77+
100+
64
55
100+
100+
100+
100+
100+
100+
100+
BT @ 95.1
RW-22
ELEV.240.05
13
34
38
24
31
69
51
53
59
49
98+
100+
BT @ 44.2
B-19
ELEV.238.65
9
13
11
23
13
6
82+
77
100+
100+
100+
100+
100+
100+
100+
100+
100+
100+
100+
100+
100+
100+
100+
BT @ 98.6
B-20
ELEV.240.54
14
24
26
48
42
22
100+
100+
98+
100+
100+
100+
100+
100+
49
100+
100+
100+
100+
100+
100+
100+
100+
BT @ 98.6
4337+00
4338+00
4339+00
4340+00
4341+00
4342+00
4343+00
4344+00
4345+00
4346+00
4347+00
4348+00


BRIDGE 20
BRIDGE 14
BRIDGE 18
I-26
W-20
ELEV.266.50
4 9 11 14 9 15 14 10 12 16 13 20 19 10 37 34 62 79 98+
BT @ 79.9
AP-20
ELEV.273.63
BT @ 40.5
RW-23
ELEV.273.63
7 15 19 11 12 10 13 16 12 15 8 7 9 16 20 41 69 100+
BT @ 73.9
B-12
ELEV.271.00
8 14 13 3 2 26 59 53 37 28 40 40 39 25 100+ 100+ 100+ 38 100+ 100+ 100+ 100+ 100+
BT @ 98.8
B-14A
ELEV.269.09
100+ 100+
BT @ 88.8
B-14
ELEV.269.61
7 8 6 6 5 17 16 25 27 17 19 22 43 32
BT @ 55
B-13
ELEV.272.77
100+ 10 11 13 25 13 12 11 20 10 9 14 47 87+ 100+ 100+ 72+ 100+ 100+ 100+ 100+
BT @ 88.7
AP-18
ELEV.272.77
BT @ 18.3
RW-29
ELEV.278.06
6 6 17 23 27 15 10 15 10 8 16 35
BT @ 50
RW-30
ELEV.275.51
6 15 21 19 17 14 21 29 56 43 100+ 100+ 100+
BT @ 48.9
B-26
ELEV.269.82
5 11 25 21 34 15 10 9 13 20 15 34 46 91+ 100+ 100+ 100+ 100+ 100+ 100+ 100+ 100+ 100+
BT @ 98.6
AP-17
ELEV.281.30
BT @ 72.5
B-27
ELEV.281.30
17 8 16 36 51 15 21 40 25 40 51 41 80+ 100+ 54 100+ 100+ 100+ 100+ 100+ 100+ 100+ 100+
BT @ 98.7
4349+00
4350+00
4351+00
4352+00
4353+00
4354+00
4355+00
4356+00
4357+00
4358+00
4359+00
4360+00
4361+00
4362+00
STATION


B-28
ELEV.297.00
6
16
34
25
15
100+
95+
86+
68
78
100+
100+
100+
74+
BT @ 54.9
RW-34
ELEV.292.97
10
18
32
48
47
28
21
16
19
18
11
17
48
BT @ 50
320
300
280
260
240
220
200
180
160
140
ELEVATION (FT-MSL)
4363+00
4364+00
4365+00
4366+00
4367+00
4368+00
4369+00
4370+00
4371+00
N
RW-34
B-28
B-27
AP-17
BRIDGE 18
B-26
RW-29
RW-30
B-13
AP-18
BRIDGE 14
B-14
B-14A
B-12
B-9
RW-23
AP-20
BRIDGE 20
W-17
AP-11
RW-21
BRIDGE 11
RW-22
W-20
B-17
AP-14
B-18
B-20

REV. NO.	BY	DATE	DESCRIPTION OF REVISION
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1	BMF	10.17.18	REVIEW COMMENTS

TOPO. ______ DATE ______

DWG. BMF DATE 7.5.18

R/W ______ DATE ______

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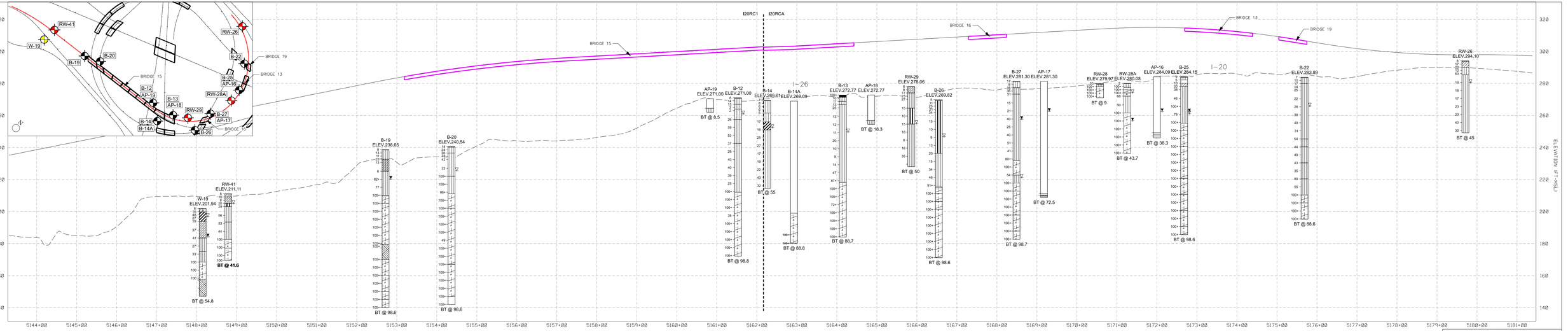
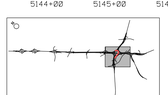
I-20/26/126 CORRIDOR IMPROVEMENTS
LEXINGTON/RICHLAND COUNTY, SOUTH CAROLINA

I-26 RBD ALIGNMENT
GENERALIZED SUBSURFACE PROFILE

HRZ SCALE = NTS
F&ME JOB NO. G5662.01
VRT SCALE = NTS
FIGURE 12





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REV. NO.	BY	DATE	DESCRIPTION OF REVISION
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1	DMF	12/17/18	REVIEW COMMENTS

DES. ____ DATE ____
DRC DMF DATE 7/3/18
R/W ____ DATE ____
GROUP ____ – ____

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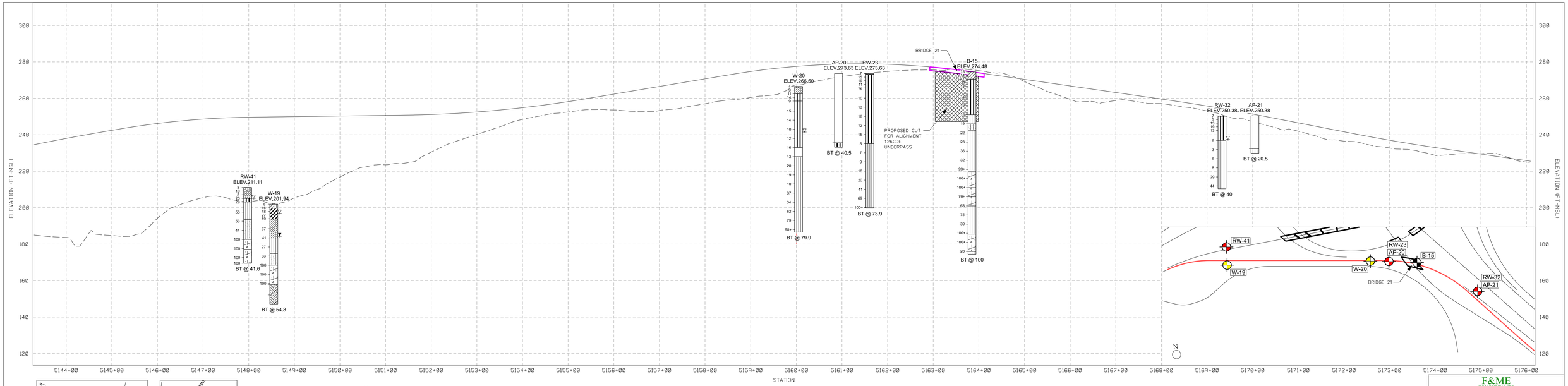
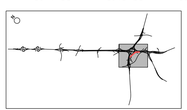
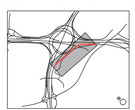
I-20/26/126 CORRIDOR IMPROVEMENTS
LEXINGTON/RICHLAND COUNTY, SOUTH CAROLINA

I-20 RC1/I-20 RCA ALIGNMENTS
GENERALIZED SUBSURFACE PROFILE

HRZ SCALE = NTS | F&ME JOB NO. 05662.01
VRT SCALE = NTS | FIGURE 13







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REV. NO.	BY	DATE	DESCRIPTION OF REVISION
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1	BMF	10.17.18	REVIEW COMMENTS

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DWG BMF DATE 7.3.18 GROUP ____ – ____
R/W ____ DATE ____

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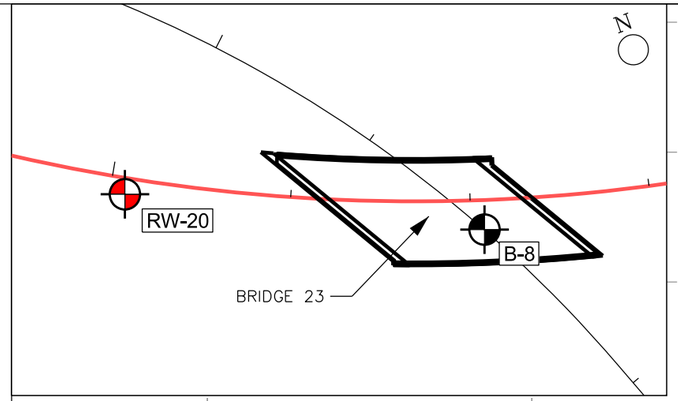
I-20/26/126 CORRIDOR IMPROVEMENTS
LEXINGTON/RICHLAND COUNTY, SOUTH CAROLINA

I-20 RC2 ALIGNMENT
GENERALIZED SUBSURFACE PROFILE

HRZ SCALE = NTS	F&ME JOB NO. 05662.01
VRT SCALE = NTS	FIGURE 14



ELEVATION (FT-MSL)

360 340 320 300 280 260 240 220 200 180

BRIDGE 23

RW-20
ELEV.267.92

B-8
ELEV.271.66

PROPOSED CUT FOR
ST. ANDREWS RAMP
D UNDERPASS

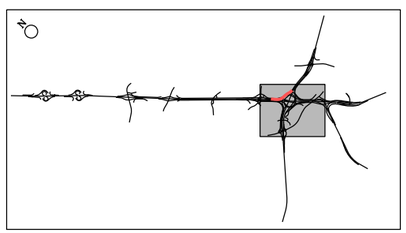
RW-20: 9, 22, 21, 12, 13, 19, 26, 27, 20, 30, 28

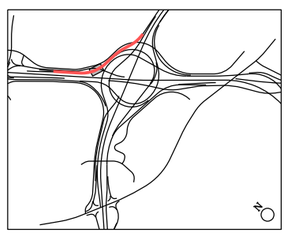
BT @ 40

B-8: 18, 17, 12, 26, 40, 24, 31, 26, 36, 30, 29, 57, 76, 68, 54, 35, 60, 42, 98+, 92+, 100+, 100+

BT @ 102.8

7330+00 7330+50 7331+00 7331+50 7332+00 7332+50





STATION

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REV. NO.	BY	DATE	DESCRIPTION OF REVISION
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TOPO. _____ DATE _____
DWG. BMF DATE 7.5.18 GROUP ____ – ____
R/W _____ DATE _____

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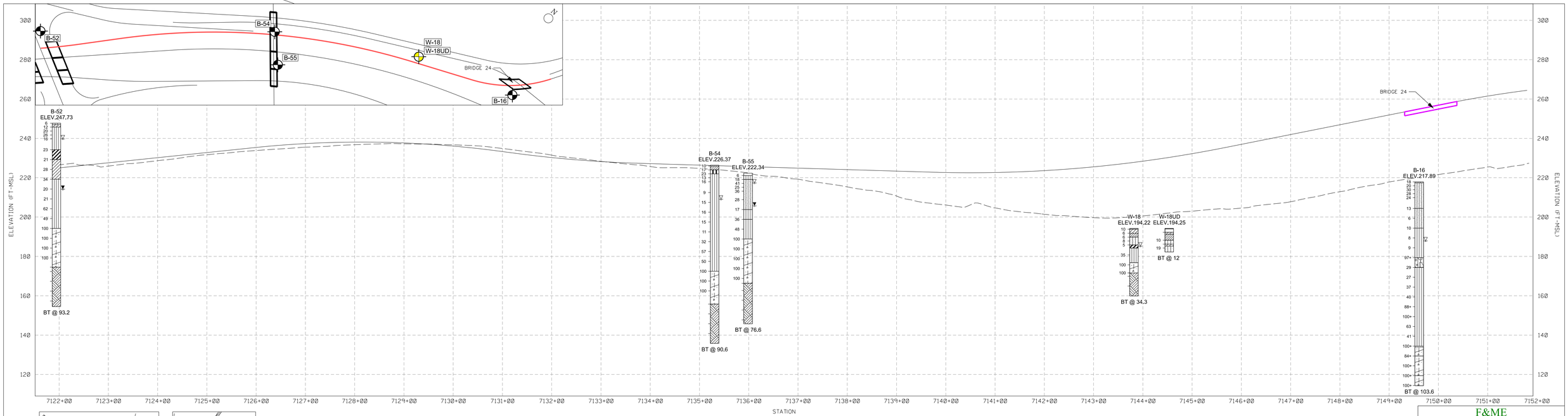
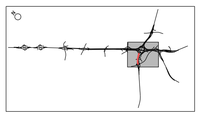
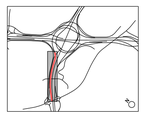
I–20/26/126 CORRIDOR IMPROVEMENTS
LEXINGTON/RICHLAND COUNTY, SOUTH CAROLINA

I–126 CDW1 ALIGNMENT
GENERALIZED SUBSURFACE PROFILE

HRZ SCALE = NTS	F&ME JOB NO. G5662.01
VRT SCALE = NTS	FIGURE 15







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REV. NO.	BY	DATE	DESCRIPTION OF REVISION
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1	BMF	10.17.18	REVIEW COMMENTS

TOPO _____ DATE _____
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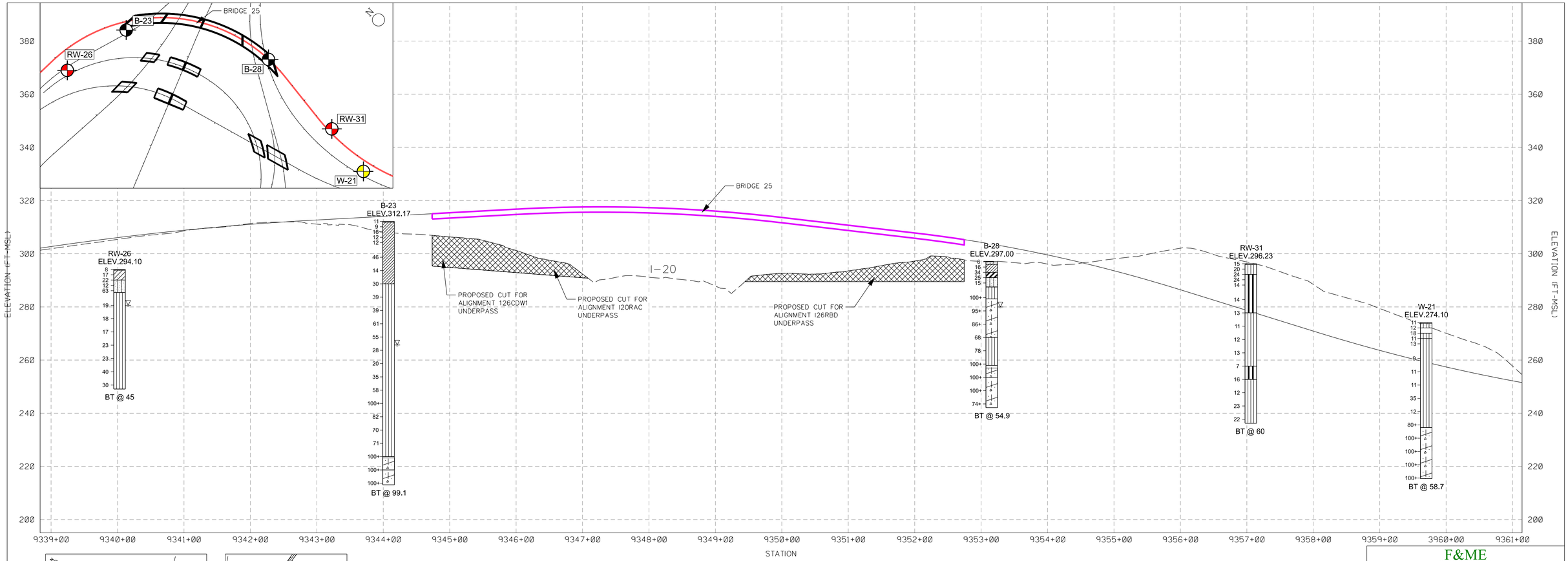
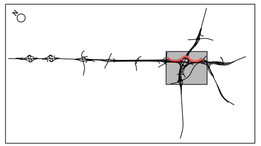
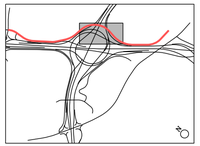
I-20 CDW2 ALIGNMENT
GENERALIZED SUBSURFACE PROFILE

HRZ SCALE = NTS	F&ME JOB NO. G5662.01
VRT SCALE = NTS	FIGURE 16







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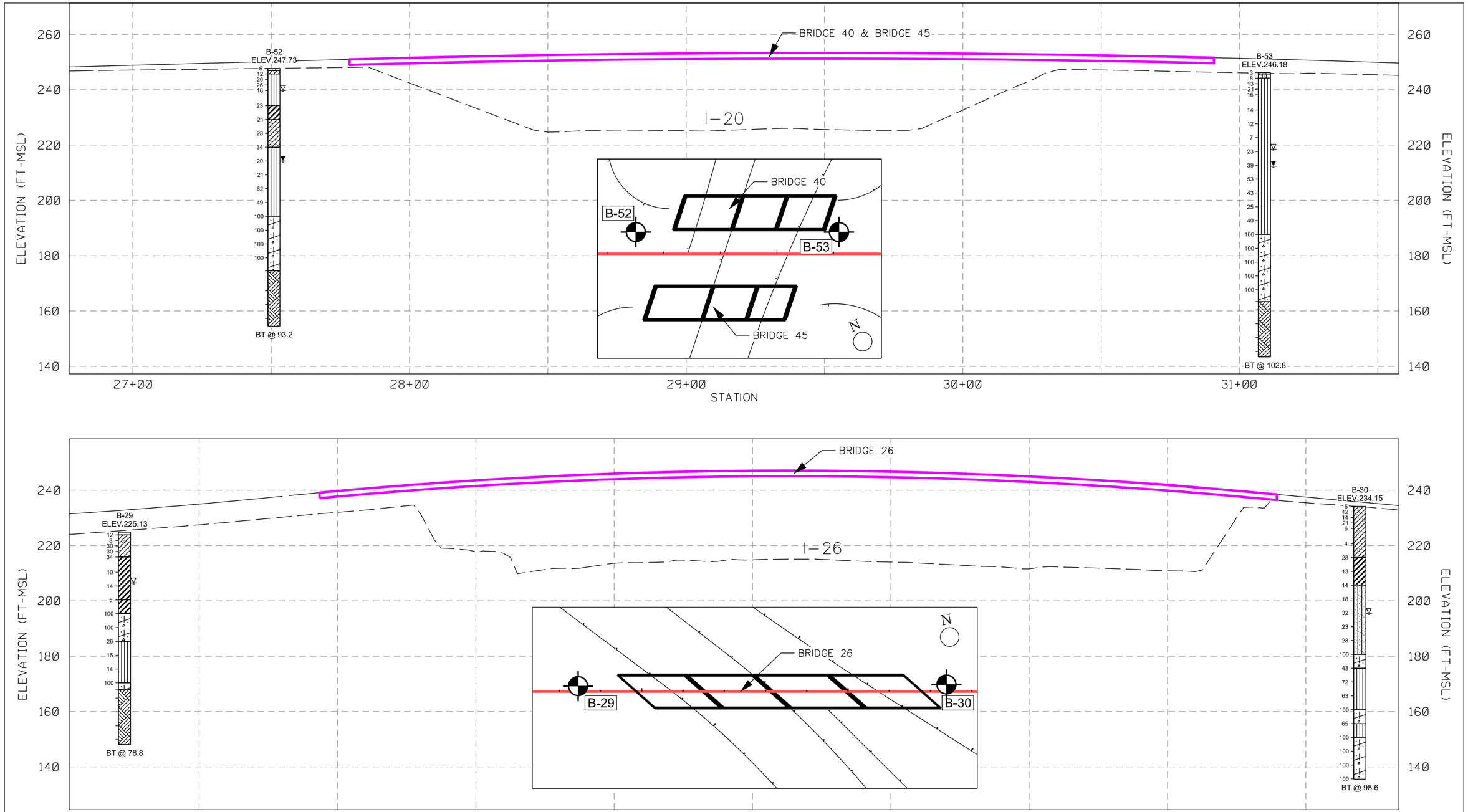
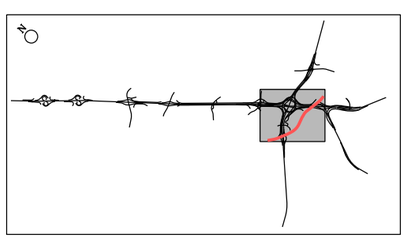
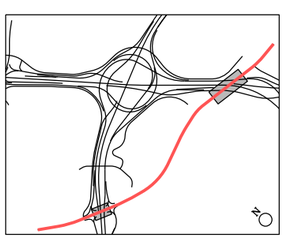
I-20/26/126 CORRIDOR IMPROVEMENTS
LEXINGTON/RICHLAND COUNTY, SOUTH CAROLINA

BURNING TREE ALIGNMENT
GENERALIZED SUBSURFACE PROFILE

HRZ SCALE = NTS	F&ME JOB NO. G5662.01
VRT SCALE = NTS	FIGURE 17







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REV. NO.	BY	DATE	DESCRIPTION OF REVISION
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DWG. BMF DATE 7.5.18 GROUP ____ - ____
R/W _____ DATE _____

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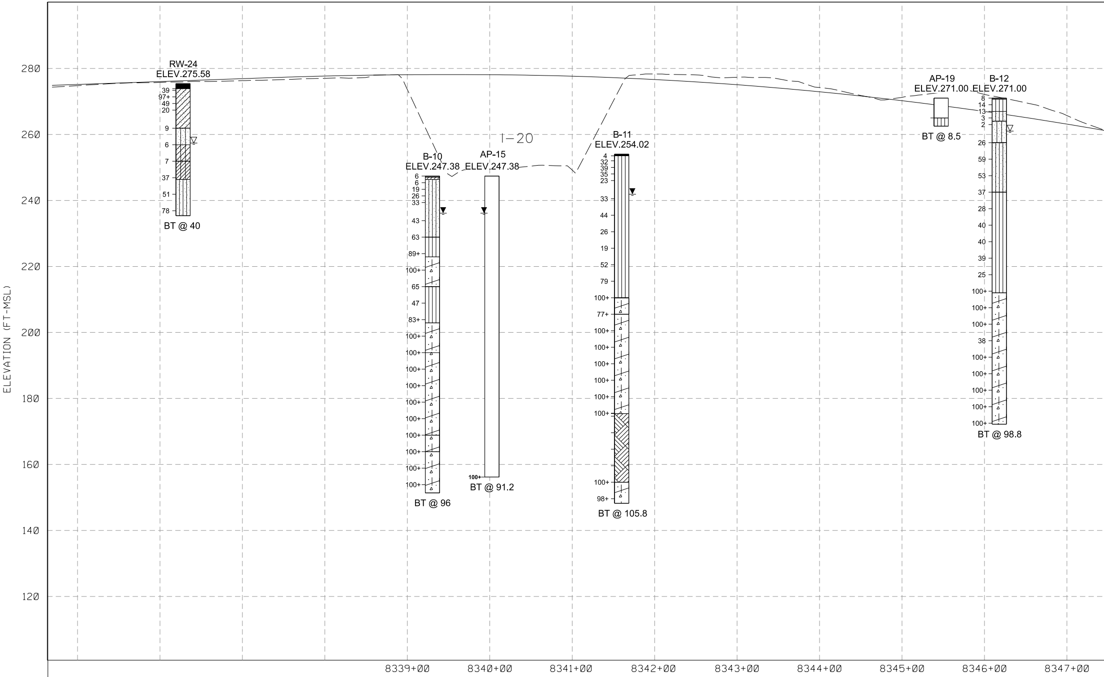
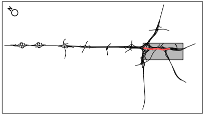
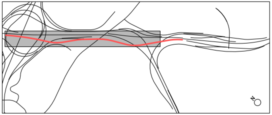
I-20/26/126 CORRIDOR IMPROVEMENTS
LEXINGTON/RICHLAND COUNTY, SOUTH CAROLINA

BUSH RIVER ROAD ALIGNMENT
GENERALIZED SUBSURFACE PROFILES

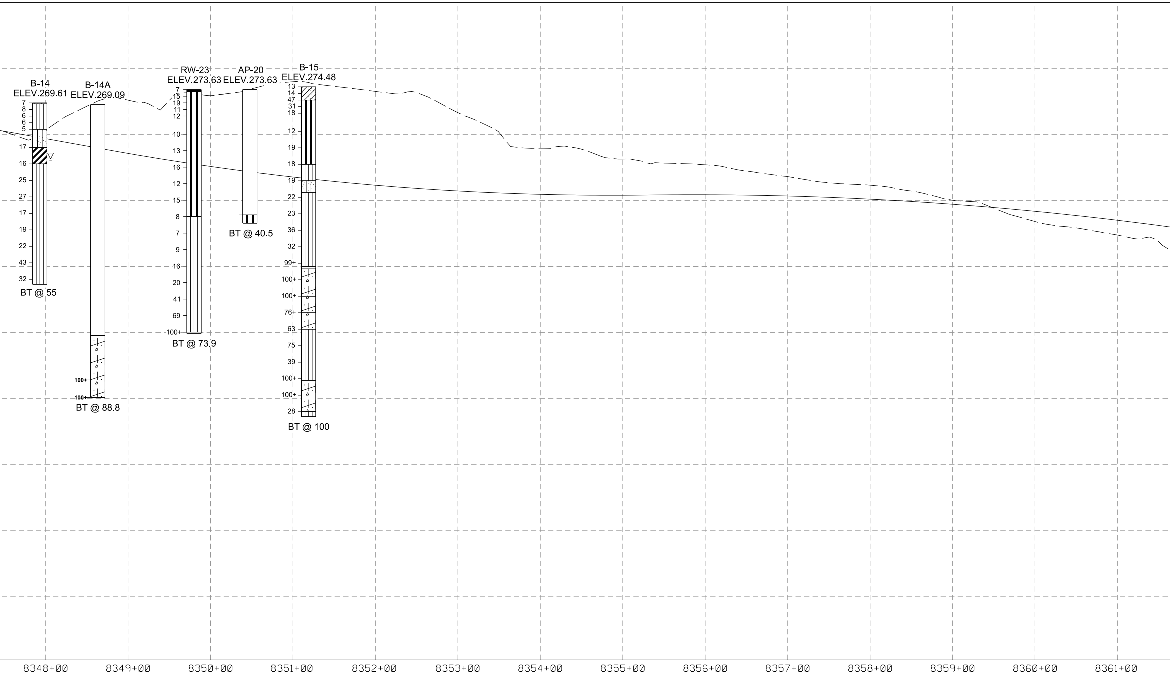
HRZ SCALE = NTS	F&ME JOB NO. G5662.01
VRT SCALE = NTS	FIGURE 18

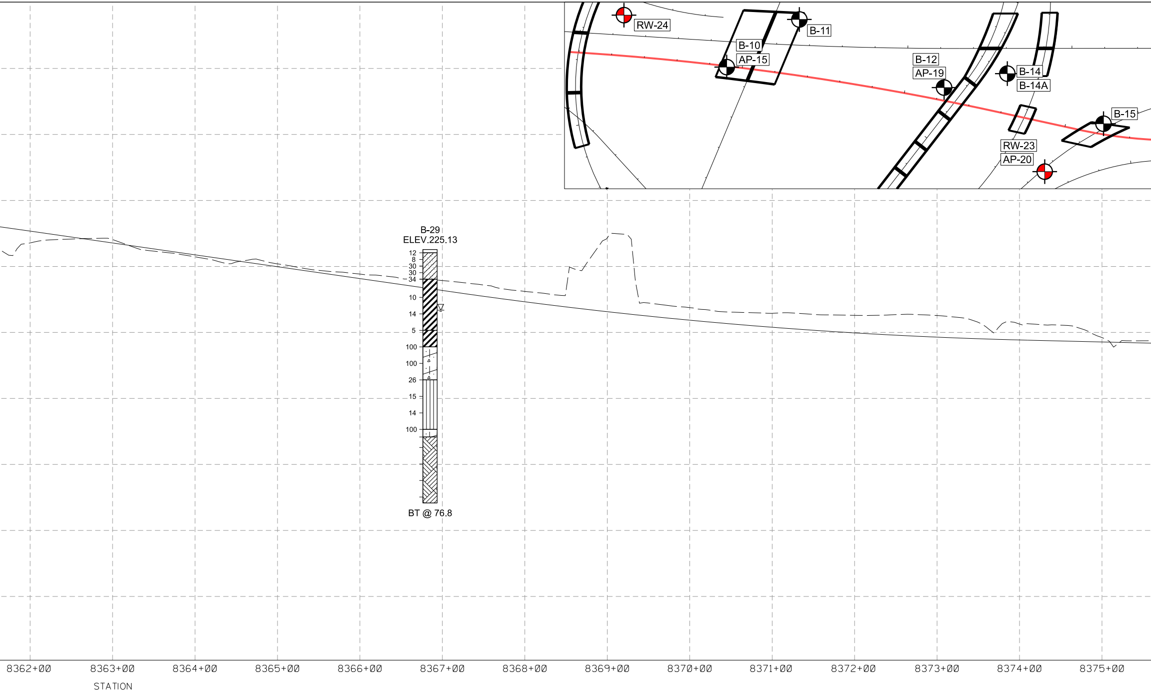

ELEVATION (FT-MSL)
280
260
240
220
200
180
160
140
120
RW-24
ELEV.275.58
39
97+
49
20
9
6
7
37
51
78
BT @ 40
I-20
B-10
ELEV.247.38
6
6
19
26
33
43
63
89+
100+
65
47
83+
100+
100+
100+
100+
100+
100+
100+
100+
100+
100+
BT @ 96
AP-15
ELEV.247.38
100+
BT @ 91.2
B-11
ELEV.254.02
4
32
39
35
23
33
44
26
19
52
79
100+
77+
100+
100+
100+
100+
100+
100+
100+
98+
BT @ 105.8
AP-19
ELEV.271.00
BT @ 8.5
B-12
ELEV.271.00
8
14
13
3
2
26
59
53
37
28
40
40
39
25
100+
100+
100+
38
100+
100+
100+
100+
100+
BT @ 98.8
8339+00
8340+00
8341+00
8342+00
8343+00
8344+00
8345+00
8346+00
8347+00

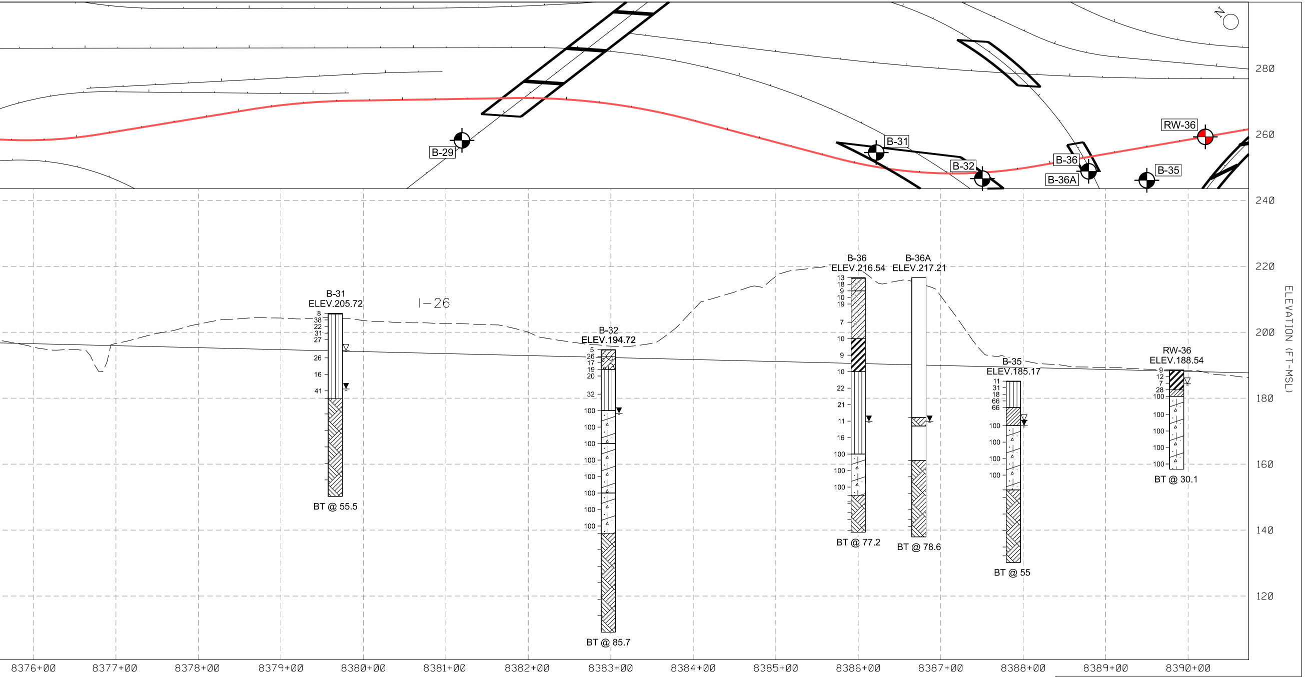




The generalized subsurface profiles are provided only for illustrative purposes. The intent of these drawings is to provide the reader with very general information on soils, cuts, and fills. Variations in the indicated subsurface conditions will become evident once additional borings are performed.


B-14
ELEV.269.61
7
8
6
6
5
17
16
25
27
17
19
22
43
32
BT @ 55
B-14A
ELEV.269.09
100+
100+
BT @ 88.8
RW-23
ELEV.273.63
7
15
19
11
12
10
13
16
12
15
8
7
9
16
20
41
69
100+
BT @ 73.9
AP-20
ELEV.273.63
BT @ 40.5
B-15
ELEV.274.48
13
14
47
31
18
12
19
18
19
22
23
36
32
99+
100+
100+
76+
63
75
39
100+
100+
28
BT @ 100
8348+00
8349+00
8350+00
8351+00
8352+00
8353+00
8354+00
8355+00
8356+00
8357+00
8358+00
8359+00
8360+00
8361+00


RW-24
B-11
B-10
AP-15
B-12
AP-19
B-14
B-14A
B-15
RW-23
AP-20
B-29
ELEV.225.13
12
8
30
30
34
10
14
5
100
100
26
15
14
100
BT @ 76.8
8362+00
8363+00
8364+00
8365+00
8366+00
8367+00
8368+00
8369+00
8370+00
8371+00
8372+00
8373+00
8374+00
8375+00
STATION


N
B-29
B-31
B-32
B-36
B-36A
B-35
RW-36
I-26
B-31
ELEV.205.72
8
38
22
31
27
26
16
41
BT @ 55.5
B-32
ELEV.194.72
5
26
17
19
20
32
100
100
100
100
100
100
100
100
BT @ 85.7
B-36
ELEV.216.54
13
18
9
10
19
7
10
9
10
22
21
11
16
100
100
100
BT @ 77.2
B-36A
ELEV.217.21
BT @ 78.6
B-35
ELEV.185.17
11
31
18
66
66
100
100
100
100
BT @ 55
RW-36
ELEV.188.54
9
12
7
28
100
100
100
100
100
BT @ 30.1
280
260
240
220
200
180
160
140
120
ELEVATION (FT-MSL)
8376+00
8377+00
8378+00
8379+00
8380+00
8381+00
8382+00
8383+00
8384+00
8385+00
8386+00
8387+00
8388+00
8389+00
8390+00

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REV. NO.	BY	DATE	DESCRIPTION OF REVISION
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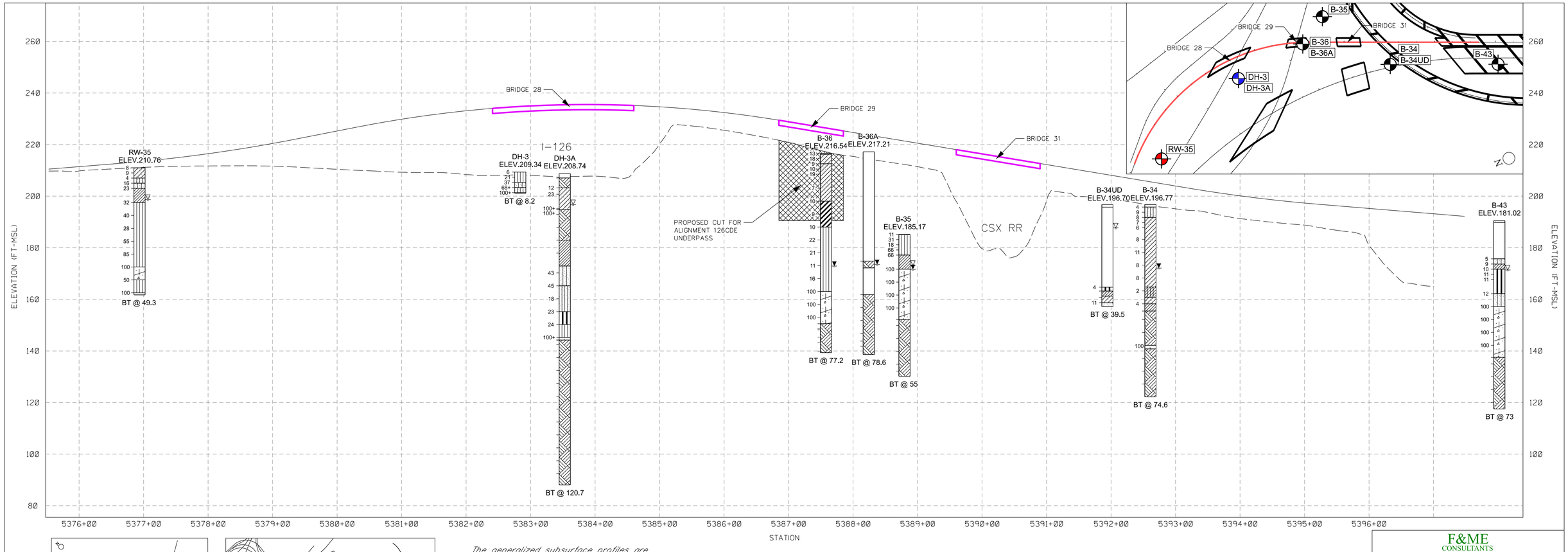
1	BMF	10.17.18	REVIEW COMMENTS

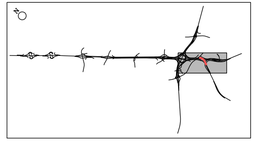
TOPO. ______ DATE ______
DWG. BMF DATE 7.5.18
R/W ______ DATE ______
GROUP ____ - ____

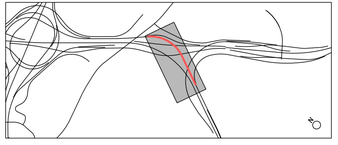
I-20/26/126 CORRIDOR IMPROVEMENTS
LEXINGTON/RICHLAND COUNTY, SOUTH CAROLINA

I-126 CDE ALIGNMENT
GENERALIZED SUBSURFACE PROFILE

HRZ SCALE = NTS	F&ME JOB NO. G5662.01
VRT SCALE = NTS	FIGURE 19







The generalized subsurface profiles are provided only for illustrative purposes. The intent of these drawings is to provide the reader with very general information on soils, cuts, and fills. Variations in the indicated subsurface conditions will become evident once additional borings are performed.

REV. NO.	BY	DATE	DESCRIPTION OF REVISION
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1	BMF	10.17.18	REVIEW COMMENTS

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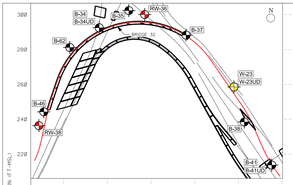
I-26 RCA ALIGNMENT
GENERALIZED SUBSURFACE PROFILE

HRZ SCALE = NTS	F&ME JOB NO. G5662.01
VRT SCALE = NTS	FIGURE 20



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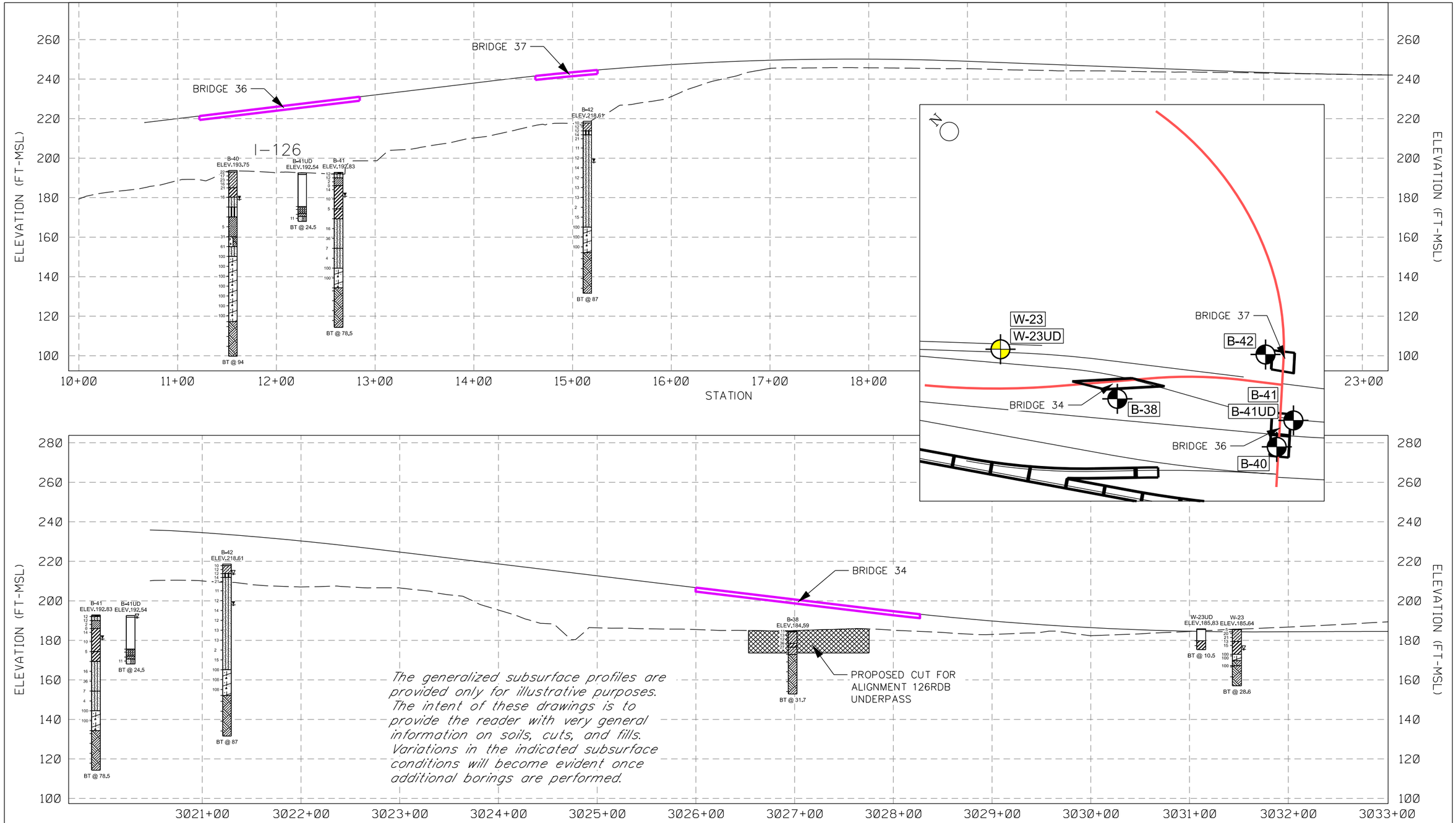
I-126 ROAD ALIGNMENT

GENERALIZED SUBSURFACE PROFILE

HRZ SCALE: = N.T.S.
VRT SCALE: = N.T.S.

F&ME JOB NO. G5662.01
FIGURE 21



REV. NO.	BY	DATE	DESCRIPTION OF REVISION
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1	BMF	10.17.18	REVIEW COMMENTS

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DWG. BMF DATE 7.5.18 GROUP ____ - ____
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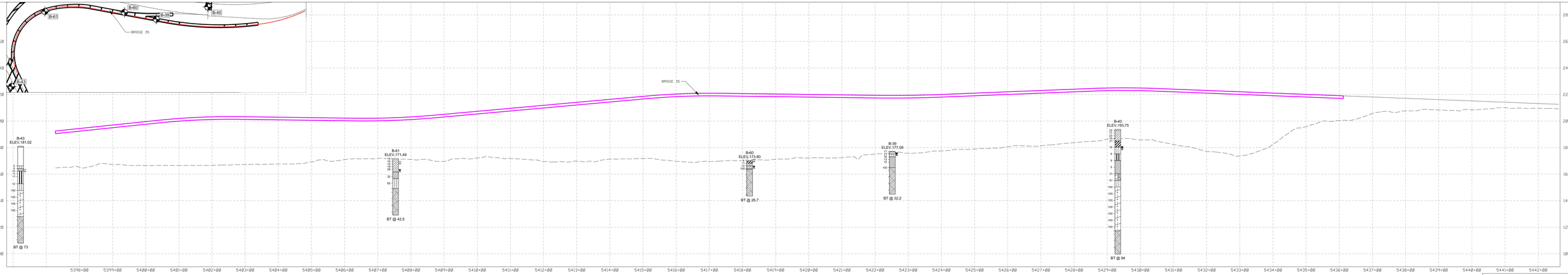
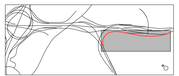
LEXINGTON/RICHLAND COUNTY, SOUTH CAROLINA

COLONIAL LIFE PARKWAY / RAMP A
GENERALIZED SUBSURFACE PROFILES

HRZ SCALE = NTS | F&ME JOB NO. G5662.01
VRT SCALE = NTS | FIGURE 22





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1	JMF	10/18	KCKEN COMMENTS
NO.	BY	DATE	DESCRIPTION OF REVISION

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CHK JMF DATE 10/18
QA ____ DATE ____

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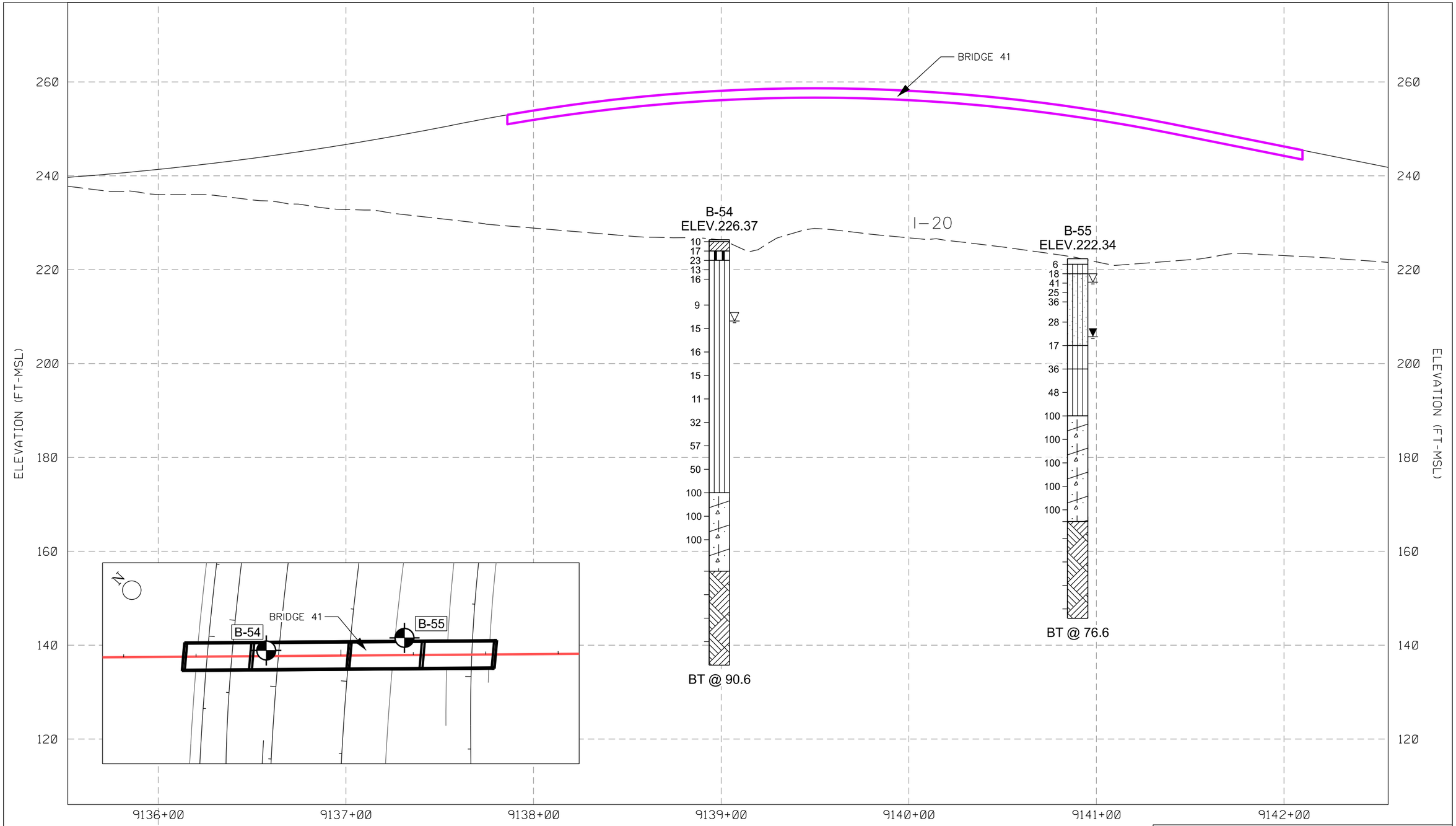
I-26 RC ALIGNMENT
GENERALIZED SUBSURFACE PROFILE

HRZ SCALE = NTS | F&ME JOB NO. 03662.01
VRT SCALE = NTS | FIGURE 23



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REV. NO.	BY	DATE	DESCRIPTION OF REVISION
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1	BMF	10.17.18	REVIEW COMMENTS

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R/W _____ DATE _____

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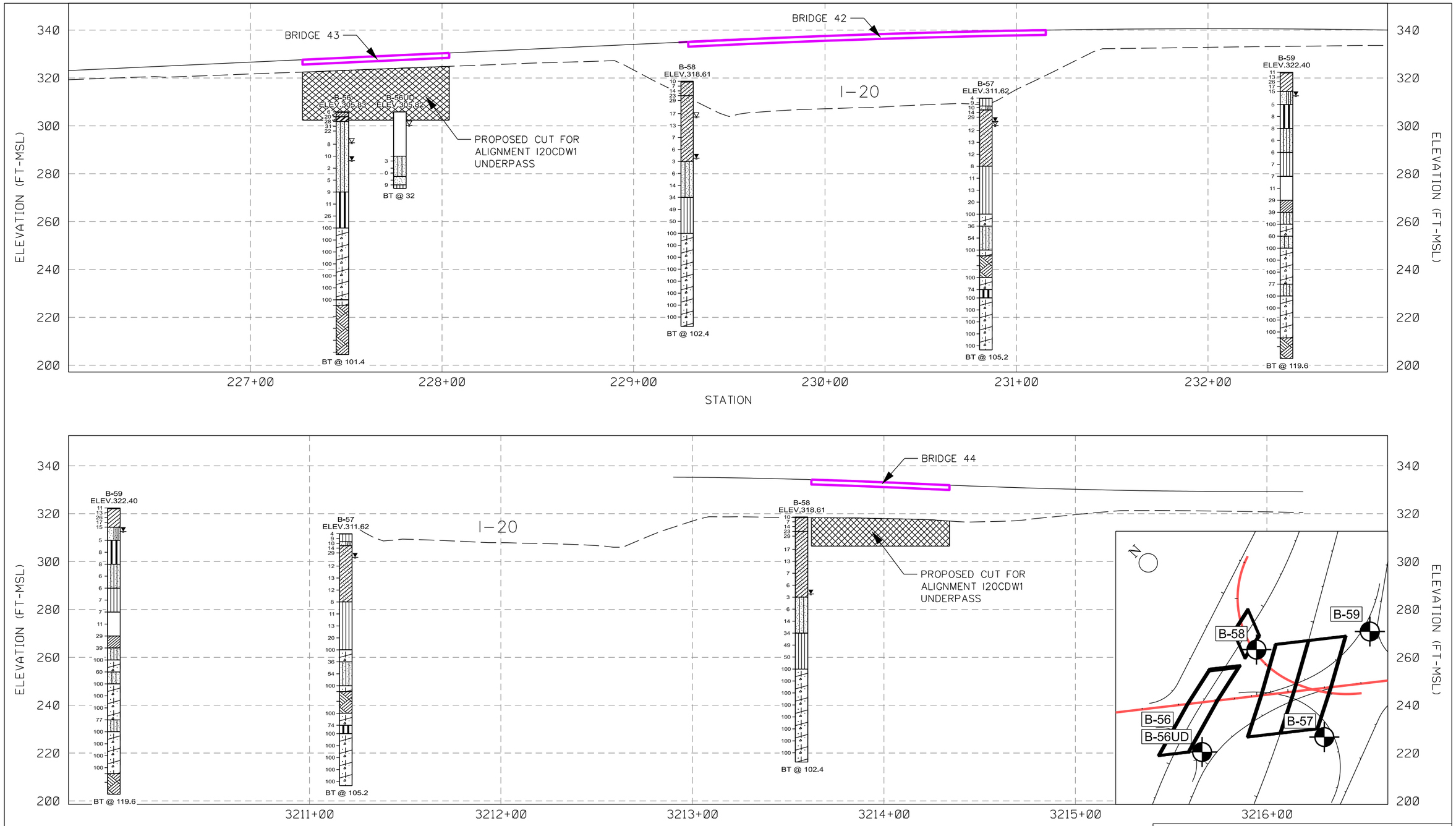
I-20/26/126 CORRIDOR IMPROVEMENTS
LEXINGTON/RICHLAND COUNTY, SOUTH CAROLINA

EXECUTIVE CENTER DRIVE
GENERALIZED SUBSURFACE PROFILE

HRZ SCALE = NTS	F&ME JOB NO. G5662.01
VRT SCALE = NTS	FIGURE 24



The generalized subsurface profiles are provided only for illustrative purposes. The intent of these drawings is to provide the reader with very general information on soils, cuts, and fills. Variations in the indicated subsurface conditions will become evident once additional borings are performed.

REV. NO.	BY	DATE	DESCRIPTION OF REVISION
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1	BMF	10.17.18	REVIEW COMMENTS

TOPO. _____ DATE _____
DWG. BMF DATE 7.5.18 GROUP ____ - ____
R/W _____ DATE _____

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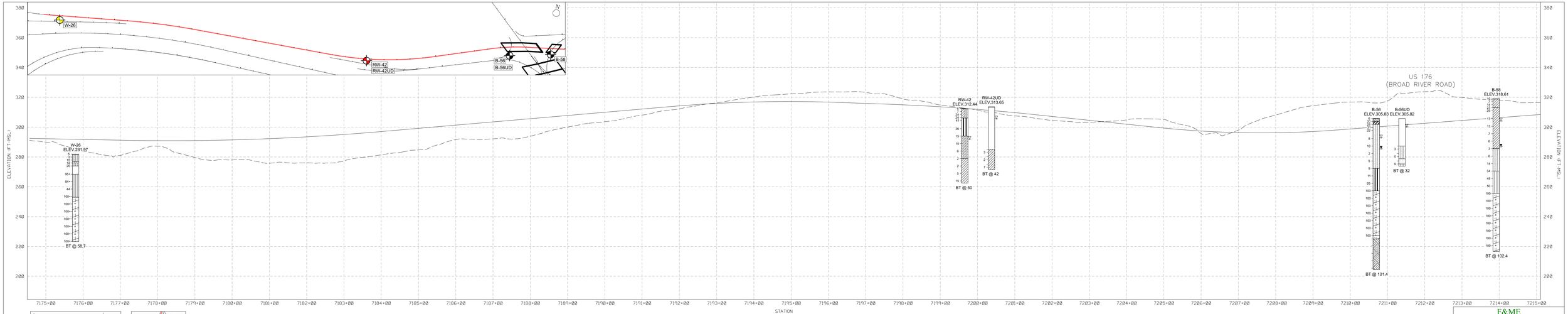
I-20/26/126 CORRIDOR IMPROVEMENTS
LEXINGTON/RICHLAND COUNTY, SOUTH CAROLINA

BROAD RIVER RD/RAMP E1 ALIGNMENTS
GENERALIZED SUBSURFACE PROFILES

HRZ SCALE = NTS	F&ME JOB NO. G5662.01
VRT SCALE = NTS	FIGURE 25



The generalized subsurface profiles are provided only for illustrative purposes. The intent of these drawings is to provide the reader with very general information on soils, cuts, and fills. Variations in the indicated subsurface conditions will become evident once additional borings are performed.

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1	BAF	10/18	REVIEW COMMENTS
NO.	BY	DATE	DESCRIPTION OF REVISION

TPG DATE
DRL BAF DATE 11/18
R/W DATE

GROUP ____ - ____

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I-20/26/126 CORRIDOR IMPROVEMENTS
LEXINGTON/RICHLAND COUNTY, SOUTH CAROLINA

I-20 CDWI ALIGNMENT
GENERALIZED SUBSURFACE PROFILE

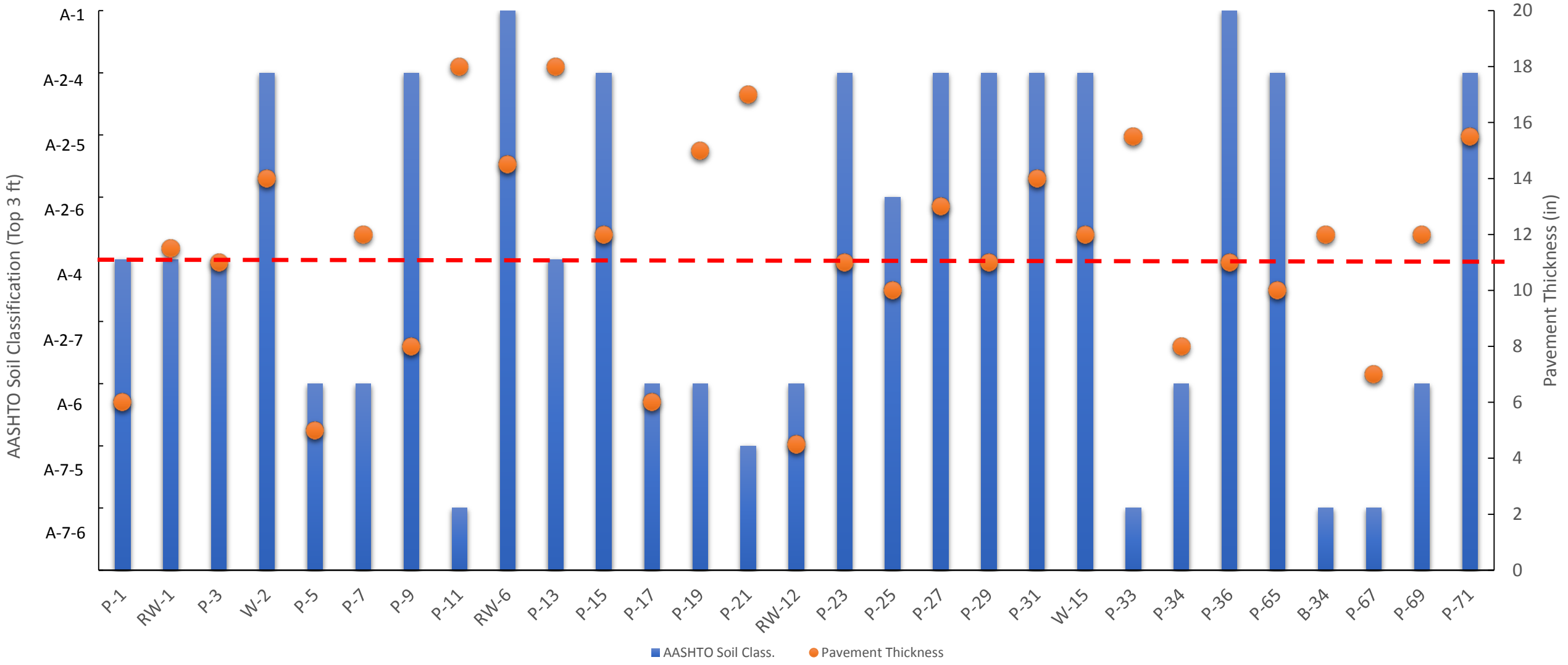
HRZ SCALE = NTS | F&ME JOB NO. 05662.01
VRT SCALE = NTS | FIGURE 26

APPENDIX A

SECTION 5 EXISTING PAVED SHOULDER DATA

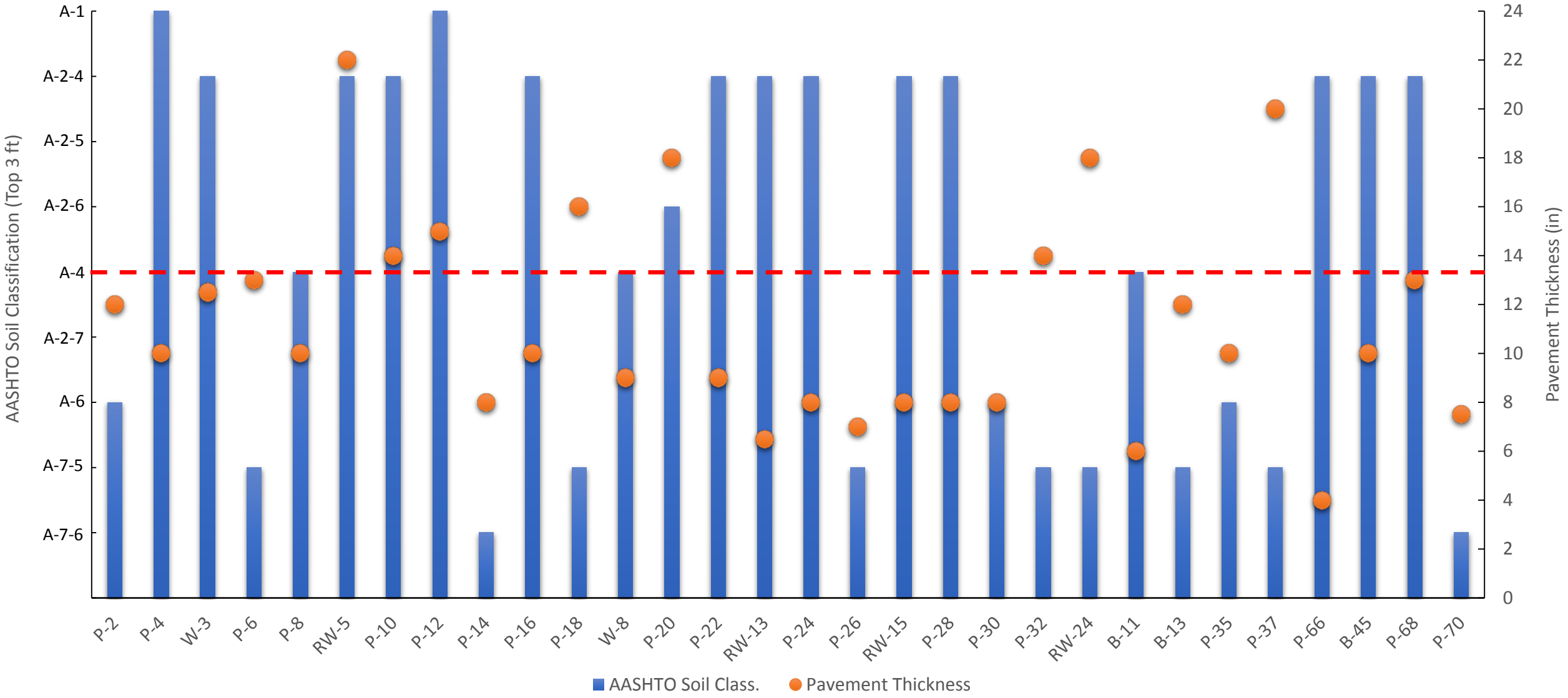
Carolina Crossroads
Existing Paved Shoulder Data

I-26 EB



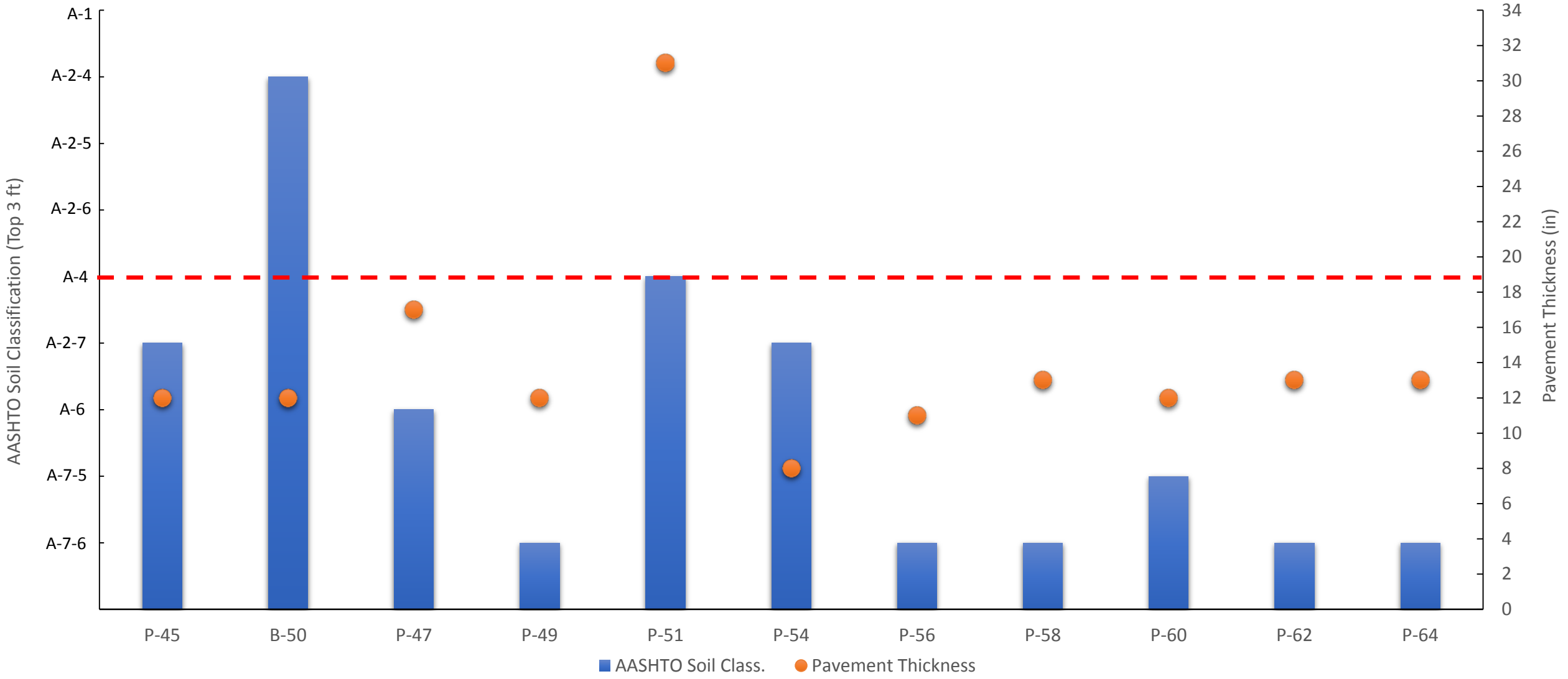
Carolina Crossroads
Existing Paved Shoulder Data

I-26 WB



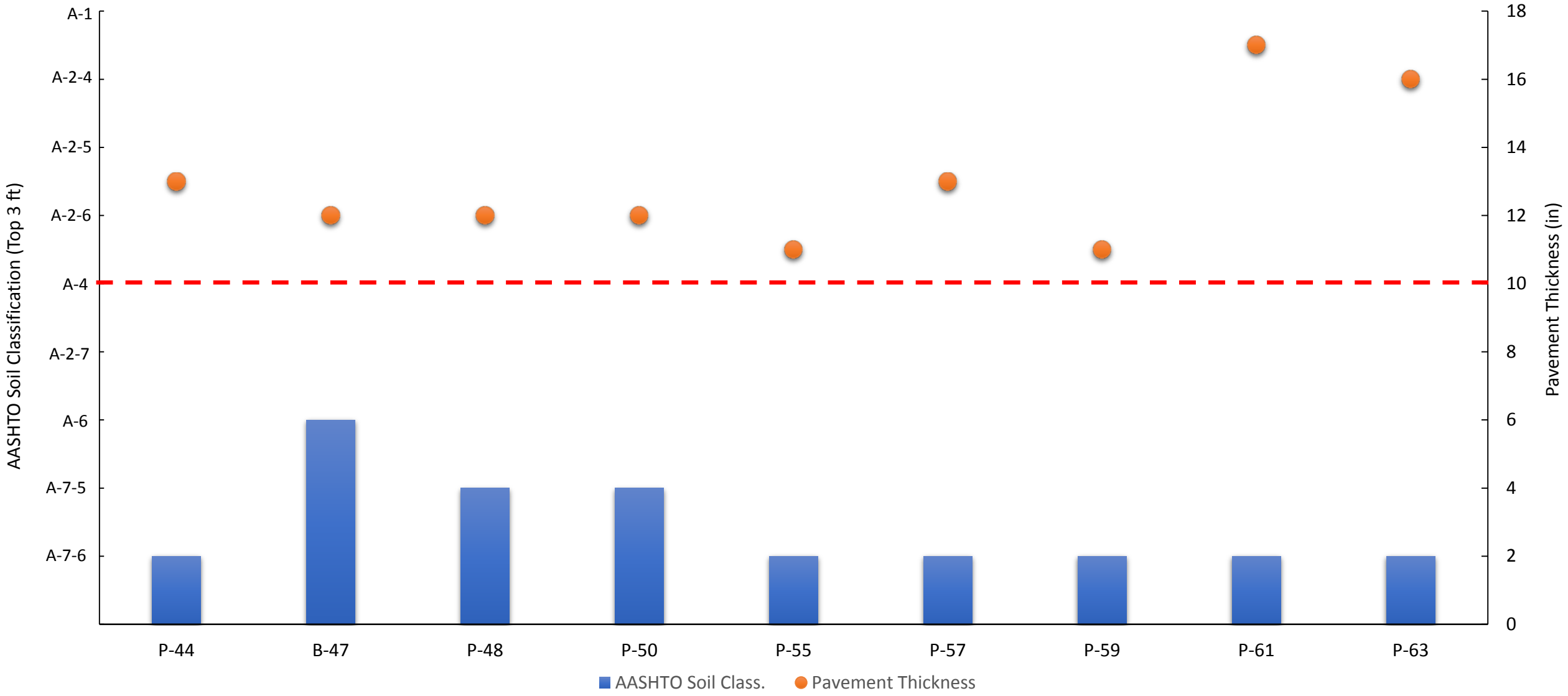
Carolina Crossroads
Existing Paved Shoulder Data

I-20 EB



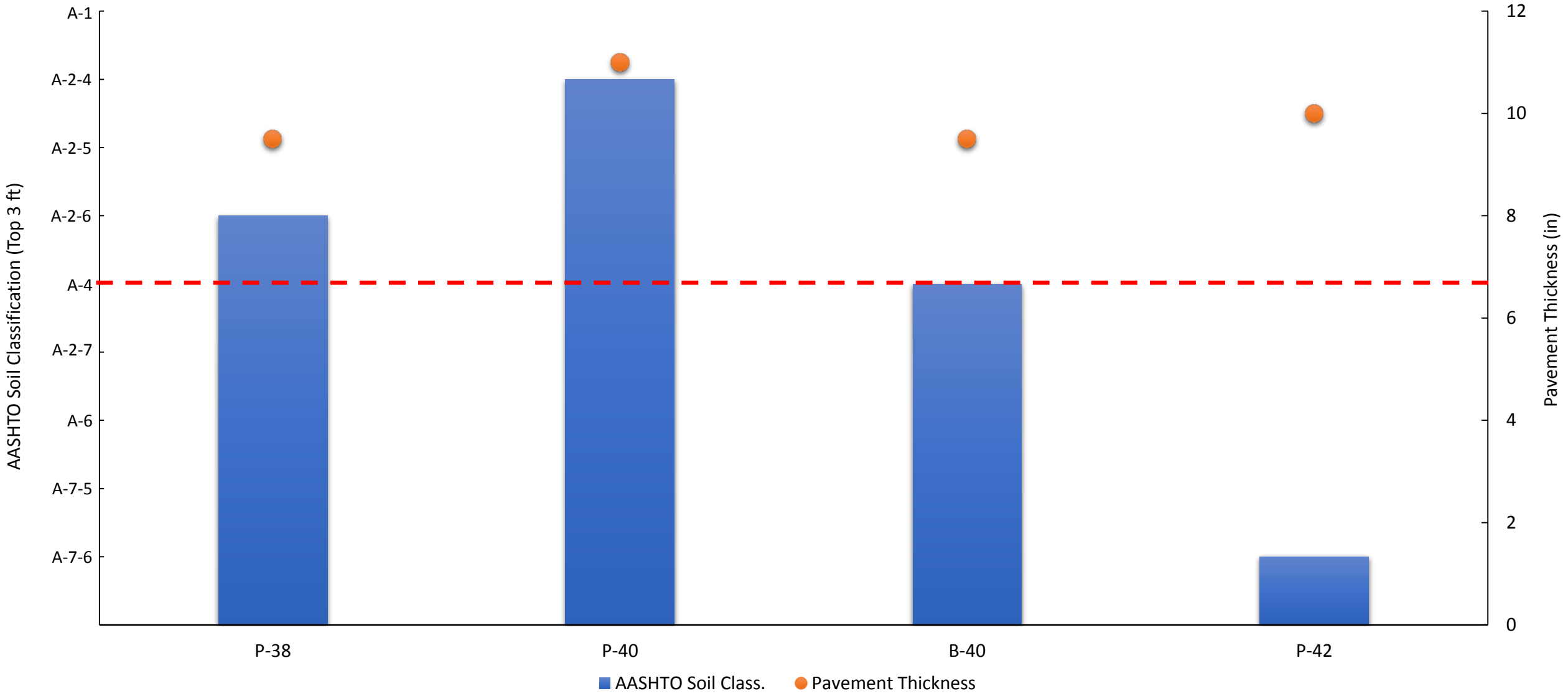
Carolina Crossroads
Existing Paved Shoulder Data

I-20 WB



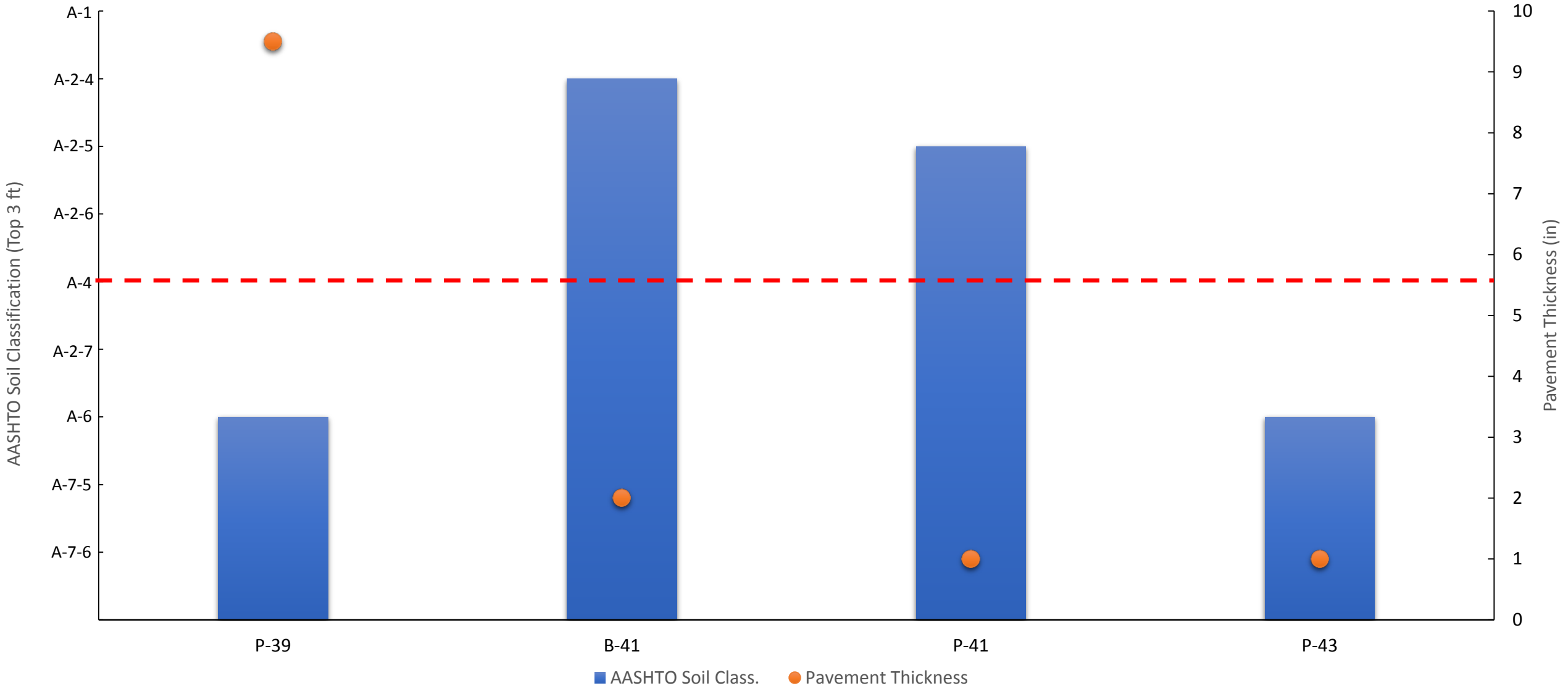
Carolina Crossroads
Existing Paved Shoulder Data

I-126 EB



Carolina Crossroads
Existing Paved Shoulder Data

I-126 WB



APPENDIX A

SECTION 6 PRELIMINARY BRIDGE FOUNDATION CONCEPTS

Carolina Crossroads

Richland/Lexington County, South Carolina

Preliminary Bridge Foundation Concepts

F&ME CONSULTANTS

				End Bents						Interior Bents													
				Pile Bent						Pile Footing						Drilled Shaft				Spread Footing			
Structure No.	Structure Name	Conceptual # Spans	Boring ID	Est. Fill Ht. (ft) [1]	Driven/Drilled?	Depth to PWR (ft) [4]	Depth to Rock (ft) [3]	Bearing Stratum	Comments	Driven/Drilled?	Depth to PWR (ft) [5,6]	Depth to Rock (ft) [5,6]	Bearing Stratum	Comments	Bearing Stratum	Depth to PWR (ft) [5,6]	Depth to Rock (ft) [5,6]	Comments	Depth to Bearing EL (ft) [5,6]	Depth to Water (ft) [5,6]	Bearing Stratum	Comments
1	Broad River Rd over I-26 **(RETAIN)**	N/A		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2	Lake Murray Blvd over I-26 **(RETAIN)**	N/A		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3	Harbison Blvd over I-26	2	B-1/B-2	25-30	Drilled?? (B-1) Driven (B-2)	30-70	50-70	PWR	Piles will develop the required driving resistance primarily through end bearing on PWR or soft rock. Potential issues with lateral stability; may require predrilling.	??	0-40	24-40	PWR/Soft Rock	B-1 shows PWR near the ground surface. B-2 shows PWR ~40 ft from the ground surface and did not encounter hard rock to the depths explored. Piles will likely require some predrilling to achieve the minimum embedment for lateral stability.	PWR/Soft Rock	0-40	24-40	Construction casing is anticipated to top of PWR. Below the casing tips, the shafts will develop the required resistance through either skin friction in PWR/soft rock and/or end bearing on PWR/soft rock.	0-10	20	PWR/Hard Residuum	Spread footings may be suitable at this site. For B-1 subsurface conditions, the spread footings would bear on PWR and should have sufficient bearing capacity realtive to settlement. For B-2 soil conditions, the spread footings would bear on hard residuum and settlement and bearing capacity would be more of an issue. Groundwater issues are considered low risk.
4	Piney Grove Rd over I-26 **(RETAIN)**	N/A		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
5	St. Andrews Rd over I-26	2	B-5/B-6/ B-6A/B-7/B-65	25-30	Driven	40-50	70-80	PWR	Piles will develop the required driving resistance primarily through end bearing on PWR or soft rock.	Drilled	20	40	PWR	PWR profile is relatively consistent without much elevation change.		20	45	Construction casing is anticipated to top of PWR. Below the casing tips, the shafts will develop the required resistance through either skin friction in PWR/soft rock and/or end bearing on PWR/soft rock.	15	5	PWR	Spread footings will be difficult to design/build due to shallow groundwater and depth to a stable bearing stratum.
6	St. Andrews Ramp B over I-26CD	1	B-5/RW-16	20	Driven	30	NE	PWR	Piles will develop the required driving resistance primarily through end bearing on PWR or soft rock.	Drilled	10	45	PWR	Piles will develop the required driving resistance primarily through end bearing on PWR or soft rock.	PWR	10	45	Construction casing is anticipated in the top 10 ft. Below the casing tips, the shafts will develop the required resistance through either skin friction in PWR and/or end bearing on PWR.	10	0-5	PWR	Spread footings will be difficult to design/build due to shallow groundwater and depth to a stable bearing stratum.
6A	St. Andrews Rd over I-26CD	1	B-5/B-6	20	Driven	30	70	PWR	Piles will develop the required driving resistance primarily through end bearing on PWR or soft rock.	Drilled	10	45	PWR	Piles will develop the required driving resistance primarily through end bearing on PWR or soft rock.	PWR	10	45	Construction casing is anticipated in the top 10 ft. Below the casing tips, the shafts will develop the required resistance through either skin friction in PWR and/or end bearing on PWR.	10	0-5	PWR	Spread footings will be difficult to design/build due to shallow groundwater and depth to a stable bearing stratum.
7	I-26 Ramp DB over St. Andrews Ramp D, I-26, & I-26 Ramp BD	4	B-9/DH-2	30	Driven	80 (DH-2) NE (B-9)	NE (DH-2) 90 (B-9)	PWR/Soft Rock	Piles will develop the required driving resistance primarily through end bearing on PWR or soft rock.	Driven	60 (DH-2) N/A (B-9)	N/A (DH-2) 60 (B-9)	PWR/Soft Rock	Piles will develop the required driving resistance primarily through end bearing on PWR or soft rock.	PWR/Soft Rock	60 (DH-2) N/A (B-9)	N/A (DH-2) 60 (B-9)	Construction casing is anticipated to top of PWR. Below the casing tips, the shafts will develop the required resistance through either skin friction in PWR/soft rock and/or end bearing on PWR/soft rock.	60	20-30	PWR	Spread footings will be difficult to design/build due to shallow groundwater and depth to a stable bearing stratum.
8	I-26 over I-20	1	B-10/B-11	30	Driven	80 (B-10) 70 (B-11)	NE	PWR	Piles will develop the required driving resistance primarily through end bearing on PWR or soft rock.	Driven	50	N/A	PWR	Piles will develop the required driving resistance primarily through end bearing on PWR or soft rock.	PWR	50	N/A	Construction casing is anticipated to top of PWR. Below the casing tips, the shafts will develop the required resistance through either skin friction in PWR/soft rock and/or end bearing on PWR/soft rock.	20-30	15	Hard Residuum	Spread footings will be difficult to design/build due to groundwater at or near the stable bearing stratum elevation. On residuum, spread footing concept may yield bearing capacity and settlement issues.
9	Beatty Rd & Tram Rd over I-26	4	B-3/B-4	30	Driven	50 (B-3) 4 (B-4)	NE	PWR	Piles will develop the required driving resistance primarily through end bearing on PWR or soft rock. On the B-4 side, predrilling may be required to achieve the required lateral stability.	Drilled	25 (B-3) 4 (B-4)	N/A	PWR	Piles will develop the required driving resistance primarily through end bearing on PWR or soft rock. For B-3 subsurface conditions, piles may be driven, but will likely require hard driving conditions to advance the piles to the minimum tip EL for lateral stability.	PWR	25 (B-3) 4 (B-4)	N/A	Construction casing is anticipated to top of PWR. Below the casing tips, the shafts will develop the required resistance through either skin friction in PWR/soft rock and/or end bearing on PWR/soft rock.	5-10	10-20	Residuum/PWR	Spread footings may be suitable at this site. In the absence of using temp. shoring, the spread footings would bear on hard residuum or PWR. At this depth, settlement and bearing capacity would likely govern the spread footing design.
10	I-20 Ramp AC over I-20	3	B-17	40	Driven	100	130	Residuum	Piles will develop the required driving resistance through a combintaion of skin friction and end bearing on hard residuum.	Driven	55	85	PWR	Piles will develop the required driving resistance primarily through end bearing on PWR or soft rock.	PWR & Rock	55	85	Construction casing is anticipated in the top 10 ft in residuum. Below the casing tips, the shafts will develop the required resistance through either skin friction in PWR/soft rock and/or end bearing on PWR/soft rock.	30	30	Hard Residuum	Spread footings will be difficult to design/build due to groundwater at or near the stable bearing stratum elevation. On residuum, spread footing concept may yield bearing capacity and settlement issues.
11	I-26 Ramp BD over I-20	2	B-17/B-18	30	Driven	85 (B-17) 70 (B-18)	155 (B-17) 100 (B-18)	PWR	Piles will develop the required driving resistance primarily through end bearing on PWR or soft rock.	Driven	50	80	PWR	Piles will develop the required driving resistance primarily through end bearing on PWR or soft rock.	PWR & Rock	50	80	Construction casing is anticipated in the top 10 ft in residuum. Below the casing tips, the shafts will develop the required resistance through either skin friction in PWR/soft rock and/or end bearing on PWR/soft rock.	30	30	Hard Residuum	Spread footings will be difficult to design/build due to groundwater at or near the stable bearing stratum elevation. On residuum, spread footing concept may yield bearing capacity and settlement issues.
12	I-26 Ramp DB over I-20	2	B-24	25	Driven	40	NE	PWR	Piles will develop the required driving resistance primarily through end bearing on PWR or soft rock.	Drilled	15	N/A	PWR	Assuming a 10 ft depth to allow for proper footing thickness and footing embedment below final grades, about of 5 ft of soil is present above PWR. Predrilling operations are likely to achieve lateral stability.	PWR	15	N/A	Construction casing is anticipated to top of PWR. Below the casing tips, the shafts will develop the required resistance through either skin friction in PWR/soft rock and/or end bearing on PWR/soft rock.	15	20	PWR	Spread footings will be difficult to design/build due to depth to a stable bearing stratum. Bearing capacity may be achieved at a higher depth in the hard residuum, but brings on more risk.
13	I-20 Ramp CA over I-20	2	B-25	30	Driven	60	NE	PWR	Piles will develop the required driving resistance primarily through end bearing on PWR or soft rock.	Driven	30	N/A	PWR	Piles will develop the required driving resistance primarily through end bearing on PWR or soft rock. Some hard driving may be required to advance the piles to the minimum tip EL for lateral stability.	PWR	30	N/A	Construction casing is anticipated to top of PWR. Below the casing tips, the shafts will develop the required resistance through either skin friction in PWR/soft rock and/or end bearing on PWR/soft rock.	15	20	PWR	Spread footings will be difficult to design/build due to depth to a stable bearing stratum. Bearing capacity may be achieved at a higher depth in the hard residuum, but brings on more risk.
14	I-26 Ramp BD over I-26	2	B-14/B-14A	30	Driven	100	NE	Residuum/PWR	Piles will develop the required driving resistance through a combintaion of skin friction and end bearing on hard residuum and/or PWR.	Driven	70	N/A	PWR	Piles will develop the required driving resistance through a combintaion of skin friction and end bearing on hard residuum and/or PWR.	Residuum & PWR	70	N/A	Construction casing is anticipated in the top 10-20 ft in residuum. Below the casing tips, the shafts will develop the required resistance through either skin friction in residuum/PWR and/or end bearing on PWR.	40-50	15	Hard Residuum	Spread footings are not likely to be used at this site due to soft soils near the ground surface. Significant cuts and temp. shoring below the groundwater table would be required to find a stable bearing elevation.
15	I-20 Ramp C1 over I-20 Ramp AC, I-26 Ramp BD, I-126 CD E & I-26	10	B-19/B-20/ 12/B-13	50 (B-19) 30 (B-13)	Driven	70 (B-19) 85 (B-13)	NE	PWR	Piles will develop the required driving resistance primarily through end bearing on PWR or soft rock.	Driven & Drilled	10-60	N/A	PWR	Shallow groundwater may inhibit the ability to excavate for the pile footing. Top of PWR varies along the profile. At some locations, the top of PWR is shallow relative to the existing grade and may require predrilling to achieve lateral stability requirements.	PWR	10-60	N/A	Construction casing is anticipated in the top 10-15 ft in residuum or on top of PWR. Below the casing tips, the shafts will develop the required resistance through either skin friction in residuum/PWR and/or end bearing on PWR.	10-15	10-15	PWR/Hard Residuum	Spread footings will be difficult to design/build due to groundwater at or near the stable bearing stratum elevation. On residuum, spread footing concept may yield bearing capacity and settlement issues.
16	I-20 Ramp CA over I-26 Ramp DB	1	B-26/B-27	35	Driven	95 (B-26) 80 (B-27)	NE	Residuum/PWR	Piles will develop the required driving resistance through a combintaion of skin friction and end bearing on hard residuum and/or PWR.	Driven	40-50	N/A	PWR	Piles will develop the required driving resistance primarily through end bearing on PWR or soft rock.	PWR	40-50	N/A	Construction casing is anticipated in the top 20-30 ft in residuum. Below the casing tips, the shafts will develop the required resistance through either skin friction in residuum/PWR and/or end bearing on PWR.	20-50	20-30	Hard Residuum	Spread footings may be suitable above the stable bearing stratum elevation.
17	I-26 Ramp DB over I-20 Ramp AC	1	B-21/B-22	20	Driven	80 (B-21) 90 (B-22)	NE	Residuum/PWR	Piles will develop the required driving resistance through a combintaion of skin friction and end bearing on hard residuum and/or PWR.	Driven	80-90	N/A	Residuum/PWR	Bridge is located in a proposed cut section. Piles will develop the required driving resistance through a combintaion of skin friction and end bearing on hard residuum and/or PWR.	Residuum & PWR	80-90	N/A	Construction casing is anticipated in the top 10-20 ft in residuum. Below the casing tips, the shafts will develop the required resistance through either skin friction in residuum/PWR and/or end bearing on PWR.	10-15	20-30	Hard Residuum	Spread footings will be difficult to design/build due to groundwater at or near the stable bearing stratum elevation. On residuum, spread footing concept may yield bearing capacity and settlement issues.
18	I-20 Ramp BD over I-26 Ramp DB	1	B-26/B-27	35	Driven	95 (B-26) 80 (B-27)	NE	Residuum/PWR	Piles will develop the required driving resistance through a combintaion of skin friction and end bearing on hard residuum and/or PWR.	Driven	40-50	N/A	PWR	Piles will develop the required driving resistance primarily through end bearing on PWR or soft rock.	PWR	40-50	N/A	Construction casing is anticipated in the top 20-30 ft in residuum. Below the casing tips, the shafts will develop the required resistance through either skin friction in residuum/PWR and/or end bearing on PWR.	20-50	20-30	Hard Residuum	Spread footings may be suitable above the stable bearing stratum elevation.
19	I-20 Ramp CA over I-20 Ramp AC	1	B-22	20	Driven	70	NE	Residuum/PWR	Bridge is located in a proposed cut section. Piles will develop the required driving resistance through a combintaion of skin friction and end bearing on hard residuum and/or PWR.	Driven	55-65	N/A	Residuum/PWR	Bridge is located in a proposed cut section. Piles will develop the required driving resistance through a combintaion of skin friction and end bearing on hard residuum and/or PWR.	Residuum & PWR	55-65	N/A	Construction casing is anticipated in the top 10-20 ft in residuum. Below the casing tips, the shafts will develop the required resistance through either skin friction in residuum/PWR and/or end bearing on PWR.	10-15	15-25	Hard Residuum	Spread footings may be suitable at this site. In the absence of using temp. shoring, the spread footings would bear on hard residuum or PWR. At this depth, settlement and bearing capacity would likely govern the spread footing design.
20	I-26 Ramp BD over I-126 CD E	1	B-14/B-14A	30	Driven	100	NE	Residuum/PWR	Piles will develop the required driving resistance through a combintaion of skin friction and end bearing on hard residuum and/or PWR.	Driven	70	N/A	PWR	Piles will develop the required driving resistance through a combintaion of skin friction and end bearing on hard residuum and/or PWR.	Residuum & PWR	70	N/A	Construction casing is anticipated in the top 10-20 ft in residuum. Below the casing tips, the shafts will develop the required resistance through either skin friction in residuum/PWR and/or end bearing on PWR.	40-50	15	Hard Residuum	Spread footings are not likely to be used at this site due to soft soils near the ground surface. Significant cuts and temp. shoring below the groundwater table would be required to find a stable bearing elevation.
21	I-20 Ramp C2 over I-126 CD E	1	B-15	0	Driven	55	NE	Residuum/PWR	Bridge is located in a proposed cut section. Piles will develop the required driving resistance through a combintaion of skin friction and end bearing on hard residuum and/or PWR.	Drilled/Driven	25	N/A	PWR	Bridge is located in a proposed cut section. The excavation will leave the finished grade ~25 ft above PWR. Piles may require predrilling for lateral stability.	PWR	25	N/A	Construction casing is anticipated to top of PWR. Below the casing tips, the shafts will develop the required resistance through either skin friction in PWR/soft rock and/or end bearing on PWR/soft rock.	20-30	10-20	Hard Residuum	Spread footings will be difficult to design/build due to groundwater at or near the stable bearing stratum elevation. On residuum, spread footing concept may yield bearing capacity and settlement issues.
22	I-20 Ramp AC over St. Andrews Ramp D, I-26 & I-26 Ramp BD	4	RW-21/B-9/ RW-24/ DH-2/RW-25	40 (RW-21) 12 (R-25)	Driven	100 (B-9) 60 (RW-25)	NE	Residuum/PWR	Piles will develop the required driving resistance through a combintaion of skin friction and end bearing on hard residuum and/or PWR.	Driven	35-60	N/A	PWR	Piles will develop the required driving resistance through a combintaion of skin friction and end bearing on hard residuum and/or PWR.	PWR	35-60	N/A	Construction casing is anticipated in the top 10-20 ft in residuum. Below the casing tips, the shafts will develop the required resistance through either skin friction in residuum/PWR and/or end bearing on PWR/soft rock.	50-60	20-30	Hard Residuum	Spread footings will be difficult to design/build due to depth of the bearing layer. Large excavations would be required to reach this depth.
23	I-26 CD W1 over St. Andrews Ramp D	1	B-8	0	Driven	80	90	Residuum/PWR	St. Andrews Ramp D alignment will be cut significantly to create the vertical clearance for the bridge. Piles will develop the required driving resistance through a combintaion of skin friction and end bearing on hard residuum and/or PWR.	Driven	40	50	PWR	Bridge is located in a proposed cut section. The excavation will leave the finished grade ~40 ft above PWR.	Residuum, PWR, & Rock	40	50	Construction casing is anticipated in the top 10 ft in residuum. Below the casing tips, the shafts will develop the required resistance through either skin friction in residuum/PWR/rock and/or end bearing on PWR/soft rock.	5-10	25	Hard Residuum	Spread footings may be suitable at this site. In the absence of using temp. shoring, the spread footings would bear on hard residuum. At this depth, settlement and bearing capacity would likely govern the spread footing design. The Contractor would have to drain/manage the perceived perched water at the site.
24	I-20 CD W2 over Bush River Ramp E	1	B-16	35	Driven	120	NE	Residuum	Some soft/firm silts under the water table that may experience strength loss under the design seismic event. Piles will develop the required driving resistance through a combintaion of skin friction and end bearing in/on residuum.	Driven	90	N/A	Residuum/PWR	Piles will develop the required driving resistance through a combintaion of skin friction and end bearing on hard residuum and/or PWR.	Residuum & PWR	90	N/A	Construction casing is anticipated to ~40 ft in residuum. Below the casing tips, the shafts will develop the required resistance through either skin friction in residuum/PWR and/or end bearing on PWR/soft rock.	40	35	Hard Residuum	Spread footings will be difficult to design/build due to depth of the bearing layer. Large excavations would be required to reach this depth. Soft/firm fine-grained soils underly a hard surficial crust. These soils would likely create settlement/bearing capacity issues.
25	Burning Tree Rd Over I-20	4	B-23/B-28	10	Driven (B-23) Drilled?? (B-28)	90 (B-23) 20 (B-28)	NE	Residuum/PWR	If subsurface conditions are as indicated by B-23, then piles can likely be driven with a properly sized hammer. The subsurface conditions from B-28 may require predrilling to achieve lateral stability requirements. Under B-28 subsiface conditions, pile driving will likely deal with some drivability concerns. Piles will develop the required driving resistance through either or both skin friction and end bearing in residuum/PWR.	Driven & Drilled	5-75	N/A	Residuum/PWR	Given B-28 subsurface conditions, predrilling operations are likely to achieve lateral stability requirements. For B-28 subsurface conditions, pile driving will likely have to deal with drivability issues. Piles will develop the required driving resistance through either or both skin friction and end bearing in residuum/PWR.		5-75	N/A	Construction casing is anticipated in the top 10 ft in residuum and/or PWR. Below the casing tips, the shafts will develop the required resistance through either skin friction in residuum/PWR and/or end bearing on PWR/soft rock.	5-10	20-40	Hard Residuum/PWR	Spread footings may be suitable at this site. In the absence of using temp. shoring, the spread footings would bear on hard residuum. At this depth, settlement and bearing capacity would likely govern the spread footing design. Settlement and bearing capacity would likely govern the design.
26	Bush River Rd over I-26 & I-126	4	B-29/B-30	30	Driven/Drilled	70-80	70 to >100	PWR or Rock	Piles will develop the required driving resistance primarily through end bearing on PWR or soft rock. Lenses of PWR encountered from approximately 42 to 85 feet below planned finished grade. Pre-drilling may be required to achieve planned pile tip elevation. Note that rock was not encountered in boring B-30 on the east side of the bridge within about 100 feet below planned finished grade.	Driven/Drilled	40-55	40-70+	PWR or Rock	Lenses of PWR encountered from approximately 13 to 55 feet below grade. Pre-drilling may be required to achieve planned pile tip elevation. Note that rock was not encountered in boring B-30 on the east side of the bridge within about 100 feet below planned finished grade. A core barrel may be required to excavate the rock socket.	PWR/Rock	40-55	40-75+	Construction casing is anticipated in the top 30-60 ft in residuum and PWR. Lenses of PWR encountered from approximately 13 to 55 feet below grade. Rock auger or core barrel may be required to penetrate PWR lenses or isolated boulders to achieve shaft bearing elevation. Preliminary boring data suggests shafts may bear in either sound rock or PWR. Longer rock sockets may be required for shafts bearing in PWR. A core barrel may be required to excavate the rock socket.	N/A	7 to 20	Existing Fill or Residuum.	Shallow Foundation not recommendend. Settlement and Bearing Capacity Issues likely due to anticipated loading.
27	I-26 over I-126 CD E	1		20-May	Driven/Drilled	NE-37	30 to 75	PWR or Rock	Piles will develop the required driving resistance primarily through end bearing on PWR or soft rock. Pre-drilling may be required to penetrate lenses of PWR or isolated rock boulders above planned tip elevations. Pre-drilling into rock may also be required to achieve lateral fixity due to shallow rock.	Driven/Drilled	NE-20	25-55	PWR or Rock	Pre-drilling may be required to penetrate lenses of PWR or isolated rock boulders above planned tip elevations. Pre-drilling into rock may also be required to achieve lateral fixity due to shallow rock.	Rock	NE-20	25-55	Construction casing is anticipated in the top 20 ft in residuum. Rock Auger or core barrel may be required to penetrate PWR lenses or isolated boulders. Longer rock socket may be required due to low quality weathered and foliated schist bedrock. A core barrel may be required to excavate the rock socket.	N/A	20 to 23	Alluvium or Residuum	Shallow Foundation not recommendend. Settlement and Bearing Capacity Issues likely due to anticipated loading.
28	I-26 Ramp CA over I-26 Ramp BD2	1	DH-3	20-Oct	Driven	80	80	Bedrock	Potential for boulders at this site. If boulders are encountered at shallow depths, the predrilling operations may need to be employed. Piles will develop the required driving resistance through either or both skin friction and end bearing on bedrock.	Driven	60	60	Bedrock	Potential for boulders at this site. If boulders are encountered at shallow depths, the predrilling operations may need to be employed. Piles will develop the required driving resistance through either or both skin friction and end bearing on bedrock.	Residuum/Rock	60	60	Potential for boulders at this site. Construction casing is anticipated in the top 20 ft in residuum. Below the casing tips, the shafts will develop the required resistance through either skin friction in residuum/rock and/or end bearing on rock. A core barrel may be required to excavate the rock socket.	20+	5-10	Residuum	Spread footings will be difficult to design/build due to groundwater above the stable bearing stratum elevation.
29	I-26 Ramp CA over I-126 CD E	1	B-36/B-36A	10	Driven/Drilled	60-70	80	PWR or Rock	Pre-drilling may be required to penetrate lenses of PWR or isolated rock boulders above planned tip elevations. Possible rock boulder encountered in boring B-36A at approx. 49 feet below planned finished grade.	Driven/Drilled	50-60	70	PWR or Rock	Estimated pile length accounts for proposed estimated cut depths for underpass. Pre-drilling may be required to penetrate lenses of PWR or isolated rock boulders above planned tip elevations. Pre-drilling into rock may also be required to achieve lateral fixity due to shallow rock.	Rock	50-60	70	Construction casing is anticipated in the top 20-30 ft in residuum. Estimated shaft length accounts for estimated cut depths for underpass. Rock Auger or core barrel may be required to penetrate PWR lenses or isolated boulders. Longer rock socket may be required due to low quality weathered and foliated schist bedrock. A core barrel may be required to excavate the rock socket.	N/A	15	Alluvium or Residuum	Shallow Foundation not recommendend. Settlement and Bearing Capacity Issues likely due to anticipated loading.

Carolina Crossroads

Richland/Lexington County, South Carolina

Preliminary Bridge Foundation Concepts

F&ME CONSULTANTS

				Pile Bent						Pile Footing					Drilled Shaft				Spread Footing			
Structure No.	Structure Name	Conceptual # Spans	Boring ID	Est. Fill Ht. (ft) [1]	Driven/Drilled?	Depth to PWR (ft) [2]	Depth to Rock (ft) [2]	Bearing Stratum	Comments	Driven/Drilled?	Depth to PWR (ft) [3,4]	Depth to Rock (ft) [3,4]	Bearing Stratum	Comments	Bearing Stratum	Depth to PWR (ft) [3,4]	Depth to Rock (ft) [3,4]	Comments	Depth to Bearing EL (ft) [3,4]	Depth to Water (ft) [3,4]	Bearing Stratum	Comments
30	I-26 over CSX	1	B-33/B-34	30-45	Driven/Drilled	NE-55	55-80	PWR or Rock	Pre-drilling may be required to penetrate lenses of PWR or isolated rock boulders above planned tip elevations. Pre-drilling into rock may also be required to achieve lateral fixity due to loose/soft existing fill and alluvium. Possible SSL in existing fill and alluvium.	Driven/Drilled	NE-25	20-40	PWR or Rock	Pre-drilling may be required to penetrate lenses of PWR or isolated rock boulders above planned tip elevations. Pre-drilling into rock may also be required to achieve lateral fixity due to shallow rock and loose/soft alluvium and existing fill.	PWR/Rock	NE-25	20-40	Construction casing is anticipated in the top 20-30 ft in residuum. Rock Auger or core barrel may be required to penetrate PWR lenses or isolated boulders. Longer rock socket may be required due to low quality weathered and foliated schist bedrock. A core barrel may be required to excavate the rock socket.	N/A	5-10	Alluvium or Existing Fill	Shallow Foundation not recommendend. Settlement and Bearing Capacity Issues likely due to anticipated loading.
31	I-26 Ramp CA over CSX	1	B-35/B-34	40	Driven/Drilled	NE-50	60-70	PWR or Rock	Pre-drilling may be required to penetrate lenses of PWR or isolated rock boulders above planned tip elevations. Pre-drilling into rock may also be required to achieve lateral fixity due to loose/soft existing fill and alluvium. Possible SSL in existing fill and alluvium.	Driven/Drilled	10-15	25	PWR or Rock	Pre-drilling may be required to penetrate lenses of PWR or isolated rock boulders above planned tip elevations. Pre-drilling into rock may also be required to achieve lateral fixity due to shallow rock and loose/soft alluvium and existing fill.	PWR	10-15	25	Construction casing is anticipated in the top 10-30 ft in residuum. Rock Auger or core barrel may be required to penetrate PWR lenses or isolated boulders. Longer rock socket may be required due to low quality weathered and foliated schist bedrock.	N/A	5	Alluvium or Residuum	Shallow Foundation not recommendend. Settlement and Bearing Capacity Issues likely due to anticipated loading.
32	I-126 Ultimate Flyover	15	B-37/B-46/B-62	15-30	Driven/Drilled	30-40	50-75	PWR or Rock	Assumed end berts at B-46 and B-37. Remainder of Flyover is elevated with interior berts.Pre-drilling may be required to penetrate lenses of PWR or isolated rock boulders above planned tip elevations. Rock boulders and/or PWR lenses encountered in B-46 and B-37. Possible SSL in existing fill and alluvium.	Driven/Drilled	0-40	5-45	PWR or Rock	Pre-drilling may be required to penetrate lenses of PWR or isolated rock boulders above planned tip elevations. Pre-drilling into rock will be required in areas to achieve lateral fixity due to shallow rock and loose/soft alluvium. Possible shallow ground water issues and rock excavation issues for interior bent pile cap construction.	PWR/Rock	0-40	5-45	Construction casing is anticipated in the top 10-30 ft in residuum. Rock Auger or core barrel may be required to penetrate PWR lenses or isolated boulders. Longer rock socket may be required due to low quality weathered and foliated schist bedrock.Possible shallow ground water issues and rock excavation issues for interior bent pile cap construction. A core barrel may be required to excavate the rock socket.	5 to 10	0 to 19 feet	PWR or Rock	Shallow Foundations bearing on PWR or weathered rock may be possible in isolated interior bent areas along the alignment. Shallow groundwater and Saluda River levels may require de-watering or coffer dams to excavate and construct footings. Rock anchors for uplift resistance may be required depending on final loading configurations.
33	I-26 over Saluda River	7	B-43/B-44/ B-45/B-46/B-62	5-30	Driven/Drilled	5-45	30-65	PWR or Rock	Pre-drilling may be required to penetrate lenses of PWR or isolated rock boulders above planned tip elevations. Pre-drilling into rock may also be required to achieve lateral fixity due to shallow rock and PWR. Possible SSL in existing fill and alluvium.	Driven/Drilled	0-20	0-40	PWR or Rock	Pre-drilling may be required to penetrate lenses of PWR or isolated rock boulders above planned tip elevations. Pre-drilling into rock may also be required to achieve lateral fixity due to shallow rock and/or loose/soft alluvium. Shallow granitic bedrock indicated by borings on south side of bridge. Rock outcrops observed in river bed on south side of bridge. Rock excavation may be required for pile caps.	PWR/Rock	0-20	0-40	Construction casing is anticipated in the top 20-40 ft in residuum and PWR. Rock Auger or core barrel may be required to penetrate PWR lenses or isolated boulders. Longer rock socket may be required due to low quality weathered and foliated schist bedrock or fractured granitic bedrock. A core barrel may be required to excavate the rock socket.	5 to 10	0 or higher (depending on river level and location)	PWR or Rock	Shallow Foundations bearing on PWR or rock may be possible in isolated interior bent areas on the south side of the bridge. Shallow groundwater and Saluda River levels may require de-watering or coffer dams to excavate and construct footings. Rock anchors for uplift resistance may be required depending on final loading configurations.
34	Colonial Life Pkwy Ramp A over I-126 Ramp DB	1	B-38	10-20	Driven/Drilled	NE	20-35	Rock	Pre-drilling may be required to penetrate lenses of PWR or isolated rock boulders above planned tip elevations. Pre-drilling into rock may also be required to achieve lateral fixity due to shallow rock.	Drilled	0	0	Rock	Pre-Drilling into granitic bedrock is likely. PWR/Rock depths adjusted for planned cut for underpass.	Rock	10	0	Construction casing is anticipated in the top 10 ft in residuum. Estimated shaft length accounts for estimated cut depths for underpass. Core barrel will be required for rock socket into underlying granitic bedrock. A core barrel may be required to excavate the rock socket.	5 to 10	NE	Rock	Depth to bearing statum adjusted for proposed cut for underpass. Shallow foundation bearing on rock may be possible. Rock anchors for uplift resistance may be required depending on final loading configurations. Rock excavation may be required.
35	I-26 Ramp C over Wetlands to Colonial Life Pkwy	32	B-39/B-60/B-61	40-45	Driven/Drilled	55-60	55-60	PWR or Rock	Assume one end bent between B-39 and B-40. Remainder of bridge is elevated interior bents. Ties into Saluda River Bridge. Pre-drilling may be required to penetrate lenses of PWR or isolated rock boulders above planned tip elevations. Possible SSL in existing fill and alluvium.	Driven/Drilled	5-20	5-40	Rock or PWR	Pre-drilling may be required to penetrate lenses of PWR or isolated rock boulders above planned tip elevations. Pre-drilling into rock will be required in areas to achieve lateral fixity due to shallow rock and loose/soft alluvium.	Rock	5-20	5-40	Construction casing is anticipated in the top 20-40 ft in residuum. Rock Auger or core barrel may be required to penetrate PWR lenses or isolated boulders. Longer rock socket may be required due to low quality weathered and foliated schist bedrock or fractured granite bedrock. A core barrel may be required to excavate the rock socket.	6 to 10	3 to 10	Rock or PWR	Shallow Foundations bearing on PWR or weathered rock may be possible in isolated interior bent areas along the alignment. Shallow groundwater and Saluda River levels may require de-watering or coffer dams to excavate and construct footings. Rock anchors for uplift resistance may be required depending on final loading configurations.
36	Colonial Life Pkwy over I-126	2	B-40/B-41	20-35	Driven/Drilled	70-95	100-110	PWR or Rock	Pre-drilling may be required to penetrate lenses of PWR or isolated rock boulders above planned tip elevations. Possible SSL in alluvium.	Driven/Drilled	50-60	60-80	Rock or PWR	Pre-drilling may be required to penetrate lenses of PWR or isolated rock boulders above planned tip elevations.	Rock	40-50	60-80	Construction casing is anticipated in the top 30-70 ft in residuum. Rock Auger or core barrel may be required to penetrate PWR lenses or isolated boulders. Longer rock socket may be required due to low quality weathered or fractured granitic bedrock.	N/A	12 to 15	Existing Fill or Alluvium	Shallow Foundation not recommendend. Settlement and Bearing Capacity Issues likely due to anticipated loading.
37	Colonial Life Pkwy over Arrowwood Rd	1	B-42	20-25	Driven/Drilled	80	90	PWR or Rock	Pre-drilling may be required to penetrate lenses of PWR or isolated rock boulders above planned tip elevations.	Driven/Drilled	50-55	65-70	Rock or PWR	Pre-drilling may be required to penetrate lenses of PWR or isolated rock boulders above planned tip elevations.	PWR/Rock	50-55	65-70	Construction casing is anticipated in the top 40-60 ft in residuum. Rock Auger or core barrel may be required to penetrate PWR lenses or isolated boulders. Longer rock socket may be required due to low quality weathered or fractured granitic bedrock.	N/A	20 to 25	Alluvium or Residuum	Shallow Foundation not recommendend. Settlement and Bearing Capacity Issues likely due to anticipated loading.
38	I-20 over Saluda River	6	B-47/D81-4/ B-48/B-49	20-30 (mostly cut embankment slopes based on borings)	Driven/Drilled	25-40	40-50	PWR or Rock	Pre-drilling may be required to penetrate lenses of PWR or isolated rock boulders above planned tip elevations. Pre-drilling into rock may also be required to achieve lateral fixity due to shallow rock and PWR. Possible SSL in alluvium.	Driven/Drilled	0-20	0-20	Rock	Pre-drilling may be required to penetrate lenses of PWR or isolated rock boulders above planned tip elevations. Pre-drilling into rock may be required in areas to achieve lateral fixity due to shallow rock and loose/soft alluvium.	Rock	0-10	0-20	Construction casing is anticipated in the top 20 ft in residuum. Rock Auger or core barrel may be required to penetrate PWR lenses or isolated boulders. Longer rock socket may be required due to low quality weathered and foliated schist bedrock. A core barrel may be required to excavate the rock socket.	N/A	0 to 20	Existing Fill or Residuum	Shallow Foundation not recommendend. Settlement and Bearing Capacity Issues likely due to anticipated loading.
39	I-20 over CSX	3	B-50/B-51	30 (mostly cut slope on north side of bridge at B-51)	Driven/Drilled	40-65	45-70	PWR or Rock	Piles will develop the required driving resistance primarily through end bearing on PWR or soft rock. Possible SSL in alluvium.	Driven/Drilled	20-40	30-45	PWR or Rock	Pre-drilling may be required to penetrate lenses of PWR or isolated rock boulders above planned tip elevations. Pre-drilling into rock will be required in areas to achieve lateral fixity due to shallow rock and loose/soft alluvium.	PWR/Rock	20-40	30-45	Construction casing is anticipated in the top 20-35 ft in residuum. Rock Auger or core barrel may be required to penetrate PWR lenses or isolated boulders. Longer rock socket may be required due to low quality weathered and foliated schist bedrock. A core barrel may be required to excavate the rock socket.	N/A	12 to 40	Existing Fill or Residuum	Shallow Foundation not recommendend. Settlement and Bearing Capacity Issues likely due to anticipated loading.
40	Bush River Rd Eastbound over I-20	3	B-52/B-53	30 (mostly cut slopes based on borings)	Driven	60-65	80-90	PWR or Rock	Piles will develop the required driving resistance primarily through end bearing on PWR or soft rock.	Driven/Drilled	30-40	50-60	PWR or Rock	Pre-drilling may be required to penetrate lenses of PWR or isolated rock boulders above planned tip elevations.	PWR/Rock	30-40	50-60	Construction casing is anticipated in the top 20-50 ft in residuum. Rock Auger or core barrel may be required to penetrate PWR lenses or isolated boulders. Longer rock socket may be required due to low quality weathered and foliated schist bedrock. A core barrel may be required to excavate the rock socket.	N/A	10 to 15	Residuum	Shallow Foundation not recommendend. Settlement and Bearing Capacity Issues likely due to anticipated loading.
41	Executive Center Dr over I-20	4	B-54/B-55	25	Driven	50-60	65-85	PWR or Rock	Piles will develop the required driving resistance primarily through end bearing on PWR or soft rock.	Driven/Drilled	30-60	50-80	PWR or Rock	Pre-drilling may be required to penetrate lenses of PWR or isolated rock boulders above planned tip elevations. Pre-drilling into rock may be required in areas to achieve lateral fixity due to shallow rock.	PWR/Rock	30-60	50-80	Construction casing is anticipated in the top 20-70 ft in residuum. Rock Auger or core barrel may be required to penetrate PWR lenses or isolated boulders. Longer rock socket may be required due to low quality weathered and foliated schist bedrock. A core barrel may be required to excavate the rock socket.	N/A	13 to 20	Existing Fill or Residuum	Shallow Foundation not recommendend. Settlement and Bearing Capacity Issues likely due to anticipated loading.
42	Broad River Rd over I-20	2	B-57/B-59	30	Driven	75-85	95+	PWR or Rock	Pre-drilling may be required to penetrate lenses of PWR or isolated rock boulders above planned tip elevations. Possible SSL in Coastal Plain soils.	Driven/Drilled	35-50	60+	PWR or Rock	Pre-drilling may be required to penetrate lenses of PWR or isolated rock boulders above planned tip elevations.	PWR/Rock	35-50	60+	Construction casing is anticipated in the top 25-60 ft in residuum. Rock Auger or core barrel may be required to penetrate PWR lenses or isolated boulders. Longer rock socket may be required due to low quality weathered and foliated schist bedrock. A core barrel may be required to excavate the rock socket.	N/A	9 to 15	Coastal Plain	Shallow Foundation not recommendend. Settlement and Bearing Capacity Issues likely due to anticipated loading.
43	Broad River Rd & Broad River Rd Ramp F1 over I-20 CD W1	1	B-56	5	Driven	70-75	100-110	PWR or Rock	Piles will develop the required driving resistance primarily through end bearing on PWR or soft rock. Pre-drilling may be required to achieve planned pile tip elevation. Possible SSL in Coastal Plain soils.	N/A - Assumed no interior bents					N/A - Assumed no interior bents				N/A - Assumed no interior bents			
44	Broad River Rd Ramp E1 over I-20 CD W1	1	B-58	25	Driven	75-85	NE	PWR	Piles will develop the required driving resistance primarily through end bearing on PWR or soft rock. Possible SSL in Coastal Plain soils.	Driven/Drilled	60-70	NE	PWR	Pre-drilling may be required to penetrate lenses of PWR or isolated rock boulders above planned tip elevations.	PWR	60-70	NE	Construction casing is anticipated in the top 50-60 ft in residuum. Rock Auger or core barrel may be required to penetrate PWR lenses or isolated boulders. Longer rock socket will be required due to PWR.	N/A	20 to 30	Existing Fill	Shallow Foundation not recommendend. Settlement and Bearing Capacity Issues likely due to anticipated loading.
45	Bush River Rd Westbound over I-20	3	B-52/B-53	30 (mostly cut slopes based on borings)	Driven	60-65	80-90	PWR or Rock	Piles will develop the required driving resistance primarily through end bearing on PWR or soft rock.	Driven/Drilled	30-40	50-60	PWR or Rock	Pre-drilling may be required to penetrate lenses of PWR or isolated rock boulders above planned tip elevations.	PWR/Rock	30-40	50-60	Construction casing is anticipated in the top 20-50 ft in residuum. Rock Auger or core barrel may be required to penetrate PWR lenses or isolated boulders. Longer rock socket may be required due to low quality weathered and foliated schist bedrock. A core barrel may be required to excavate the rock socket.	N/A	10 to 15	Residuum	Shallow Foundation not recommendend. Settlement and Bearing Capacity Issues likely due to anticipated loading.

[1] Includes Existing Embankment Height and Anticipated Fill Height

[2] Assumes 10 ft from bottom of pile cap to finished grade

[3] The indicated pile lengths assume no MSE wall abutments

[4] Referenced to estimated proposed grade

[5] Referenced to existing grade

[6] Where estimated proposed grade is below the existing grade, the listed value is referenced to estimated proposed grade

NE = Not Encountered

APPENDIX B

F&ME GEOTECHNICAL DATA REPORT

F&ME
CONSULTANTS

October 17, 2018

Mr. David Kinard, P.E.
HDR, Inc.
3955 Faber Place Drive, Suite 300
North Charleston, South Carolina 29405

Re: Geotechnical Subsurface Data Report: Revision 1
Carolina Crossroads
Richland/Lexington County, South Carolina
SCDOT Project ID P027662
F&ME File No. G5662.01

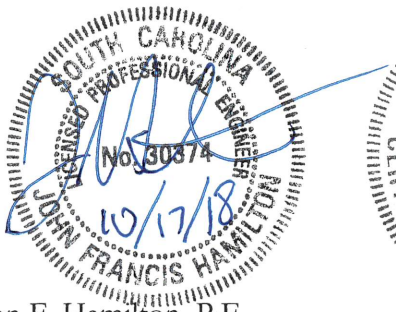
Mr. Kinard:

Submitted herein is the geotechnical subsurface data report for the above referenced project. Included is a summary of F&ME's subsurface data and the laboratory test results.

It has been a pleasure working with you on this project, and we appreciate the opportunity to be of service. Please notify us if there are any questions.

Sincerely,

F&ME CONSULTANTS



John F. Hamilton, P.E.
Geotechnical Design Manager

Bradley M. Fischer, E.I.T.
Geotechnical Staff Professional

Attachments

BMF:JFH/bmf:jfh:zwa

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1. PROJECT DESCRIPTION 1
2. SUBSURFACE INVESTIGATION 1
3. LABORATORY TESTING PROGRAM 2
4. LIMITATIONS OF REPORT 3
5. REFERENCES 3

APPENDIX

Section 1	Site Location Plan
Section 2	Boring Location Plans
Section 3	Boring Logs
Section 4	Geophysical Test Results
Section 5	Rock Core Photos
Section 6	UD Preparation Logs
Section 7	Laboratory Test Results

1. PROJECT DESCRIPTION

The project is located just outside the City of Columbia, South Carolina. A site location plan is presented in the Section 1 of the Appendix.

It is our understanding that the project will consist of widening Interstate 26, Interstate 126, and Interstate 20 near the intersection of Interstate 26 and Interstate 20. In addition, select existing overpass bridges are designated for replacement to facilitate the interstate widenings, and new bridge construction is planned to accommodate the proposed turbine interchange. In total, the project extends approximately nine (9) miles along I-26, two (2) miles along I-20, and just over one (1) mile on I-126. Based on the RA1 alignment, a total of forty-six (46) bridges are planned for construction. Based on the conceptual drawings, the proposed bridge and roadway construction will mostly require fill placement, but there are locations where large cuts are required to meet the planned roadway grade. The cuts are mostly confined to the I-26/I-20 intersection. Furthermore, several retaining walls, sound walls, and overhead sign foundations are planned throughout the corridor. Each of these roadway structures contains a component that will require geotechnical design.

The geotechnical field investigation was performed by F&ME in general accordance with the 2010 SCDOT Geotechnical Design Manual (GDM) version 1.1 and the Scope of Services agreement. The information contained in this subsurface data report pertains to only the testing performed by F&ME. For the results from the testing performed by S&ME, refer to the S&ME Geotechnical Subsurface Data Report. S&ME's report is provided as Appendix C in the project's Geotechnical Base Line Report.

2. SUBSURFACE INVESTIGATION

From January 3 to July 2, 2018, thirty-one (31) bridge soil test borings (designated as B-1 through B-28, B-6A, B-14A, and B-63), twenty (20) wall soil test borings (designated as W-1 through W-17, W-20, W-21, and W-26), thirty-five (35) roadway embankment soil test borings (designated as RW-1 through RW-34, and RW-28A), four (4) soil test borings for downhole seismic testing (designated as DH-1 through DH-3, and DH-3A), twenty-one (21) auger borings (designated as AP-1 through AP-21), and twenty (20) bulk soil samples were performed along the conceptual RA1 corridor.

The soil test borings were advanced utilizing a CME 550 drill rig and a CME 45B drill rig. Rotary wash drilling techniques were used to maintain a stable borehole. Standard Penetration Tests (SPT) tests were continuously obtained in the top ten (10) feet of each test boring. Following the continuous sampling, SPT samples were obtained at regular, five (5) foot intervals throughout the remaining depths of the borings. SPT samples were performed in general accordance with ASTM D-1586 to determine the relative densities and consistencies of the subsurface soils and to collect subsurface soil samples. An automatic hammer was used to perform the SPTs. The measured energy ratio for the CME 550 hammer is 81%. The measured energy ratio for the CME 45B hammer is 84%. The bridge borings and wall borings were advanced to either a target depth or tri-cone roller bit drilling refusal, whichever was shallower. Where a drilling refusal condition was encountered, the borings were subsequently advanced into rock using NQ sized rock coring equipment. The roadway embankment borings were advanced to either a target depth or tri-cone roller bit drilling refusal, whichever was

shallower, and were subsequently terminated. The downhole seismic borings were advanced to a minimum depth of 120 feet to facilitate the geophysical testing in the upper 100 feet. Within the seismic borings and where a drilling refusal condition was encountered, the borings were subsequently advanced into rock using NQ sized rock coring equipment to the minimum depth.

The auger borings were performed for the primary purpose of collecting intact, Shelby Tube samples. SPT testing was not performed within the auger borings. The auger borings were advanced to target depths and subsequently terminated.

The bulk soil samples were performed to either provide soil strength parameters for the existing embankment soils or provide soil strength parameters in areas designated for excavation. The bulk soil samples were collected to a depth of five (5) feet below the existing ground surface and subsequently terminated.

The soil samples collected during the subsurface investigation were examined and logged in the field by F&ME personnel, sealed in plastic bags, and transported to F&ME's laboratory for further examination and analyses.

Rock cores collected from the subsurface investigation were also transported to the laboratory for visual inspection and for selecting specimens for laboratory testing. Photos of the recovered rock core specimens are provided in Section 5 of the Appendix.

We have provided Boring Location Plans in Section 2 of the Appendix. The boring location plans display the locations of the borings performed during F&ME's subsurface investigation(s). Individual boring logs are provided in Section 3 of the Appendix.

3. LABORATORY TESTING PROGRAM

Select soil and rock samples from the borings were tested in F&ME's AASHTO certified laboratory to determine physical and engineering properties. These tests were used to identify the strength and behavioral characteristics of the soils as well as to verify the field classifications by the AASHTO classification system and the Unified Soil Classification System (USCS). The laboratory testing program is summarized in the following table. These quantities represent tests performed only by F&ME.

Laboratory Testing Table	
Test Type	Quantity
Moisture Content	297
Grain Size w/ Wash #200	311
Atterberg Limits	313
CU Triaxial	33
UU Triaxial	1
Consolidation	4
Unconfined Compression - Rock	40
Standard Proctor	20
Electro-Chemical Series	28
Ignition Loss	4
Organic Content	5

All soil testing was conducted in general accordance with applicable ASTM/AASHTO standards. Data sheets presenting the results of F&ME's laboratory test program are provided in Section 7 of the Appendix.

4. LIMITATIONS OF REPORT

This report has been prepared in accordance with generally accepted geotechnical engineering practice for specific application to the referenced project. The soil descriptions, strata depths, and consistencies indicated on the provided documents are generalized and were interpreted by F&ME based on the subsurface conditions as encountered in the test borings. We have included the soil test boring logs in the Appendix for detailed descriptions of the encountered soil conditions. As with any geologic formation, the depth and thickness of the soil strata will vary across the site. Although the test borings designate strata changes at specific depths in the description of the soil stratigraphy on the soil test boring logs, transitions between soil strata are generally gradual. Therefore, the outlined subsurface profile shown on the soil test boring logs should only be considered general on-site soil conditions and should not be utilized as an absolute indicator.

5. REFERENCES

South Carolina Department of Transportation. Geotechnical Design Manual, Version 1.1, (2010)

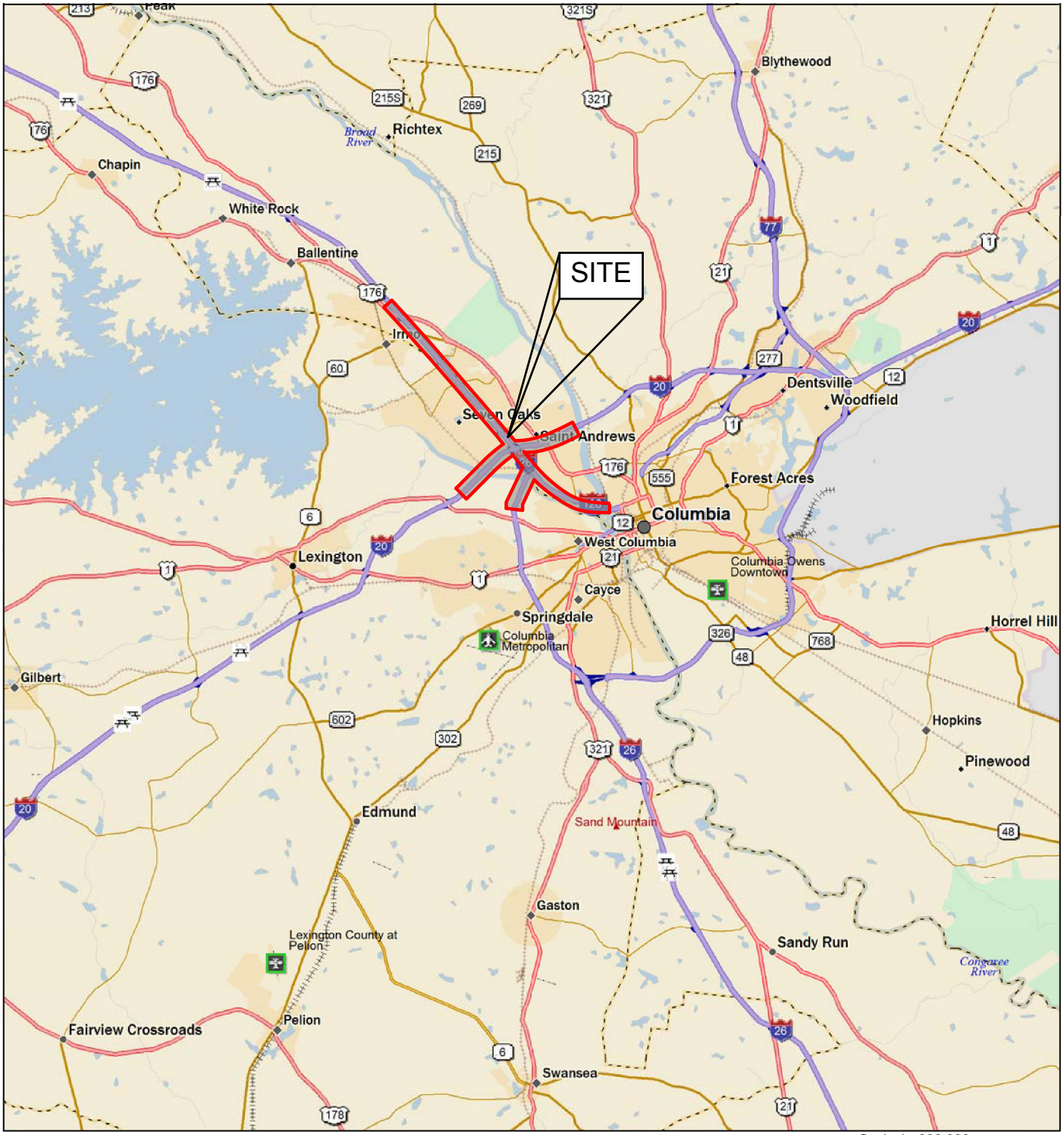
APPENDIX

SECTION 1 SITE LOCATION PLAN
SECTION 2 BORING LOCATION PLANS
SECTION 3 BORING LOGS
SECTION 4 GEOPHYSICAL TEST RESULTS
SECTION 5 ROCK CORE PHOTOS
SECTION 6 UD PREPARATION LOGS
SECTION 7 LABORATORY TEST RESULTS

APPENDIX

SECTION 1 SITE LOCATION PLAN

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	LEX/RICH		I-26/20/126	



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www.delorme.com

TN
MN (7.3°W)

Scale 1 : 300,000

0 1 2 3 4 5 mi
0 2 4 6 8 10 km

1" = 4.73 mi Data Zoom 9-4

F&ME
CONSULTANTS
GEOTECHNICAL – ENVIRONMENTAL – MATERIALS
COLUMBIA, SOUTH CAROLINA

REV. NO.	BY	DATE	DESCRIPTION OF REVISION
4			
3			
2			
1			

TOPO. _____ DATE _____
DWG. CTC DATE 7/20/2018 GROUP ____ - _____
R/W _____ DATE _____

CAROLINA CROSSROADS PHASE 2B
RICHLAND/LEXINGTON COUNTY, SOUTH CAROLINA

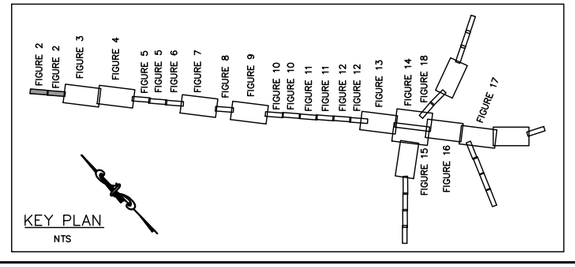
SITE LOCATION PLAN

SCALE: AS NOTED | FIGURE 1

APPENDIX

SECTION 2 BORING LOCATION PLANS

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	LEX/RICH		I-26/20/126	



LEGEND:

- ROADWAY BORING
- WALL BORING
- BRIDGE BORING
- AUGER PROBE
- BULK SAMPLE
- DOWNHOLE SEISMIC TEST

REV. NO.	BY	DATE	DESCRIPTION OF REVISION
4			
3			
2			
1			

TOPO. DATE
DWG. CTC DATE 7/20/2018 GROUP ___ - ___
R/W DATE

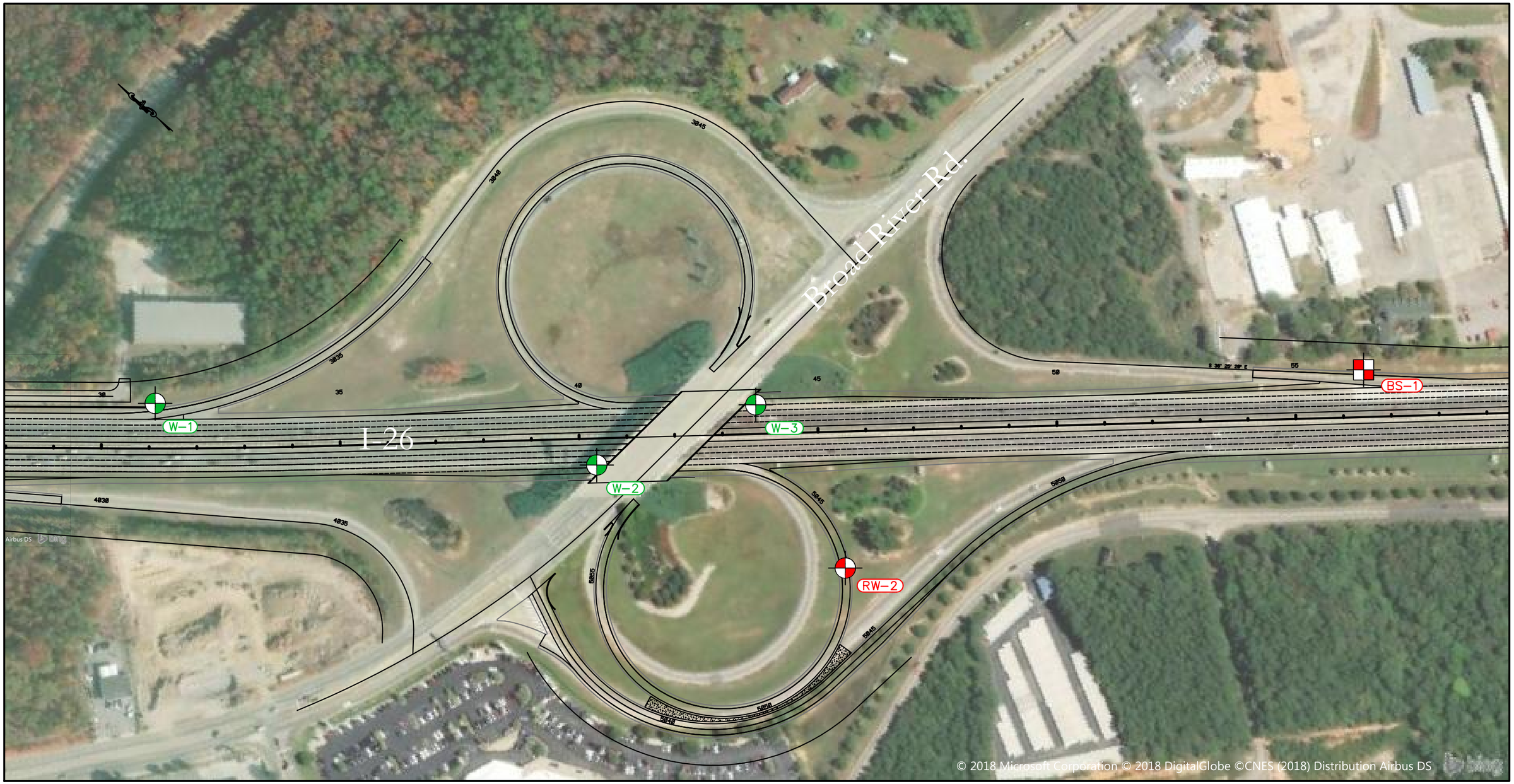
F&ME CONSULTANTS
GEOTECHNICAL – ENVIRONMENTAL – MATERIALS
COLUMBIA, SOUTH CAROLINA

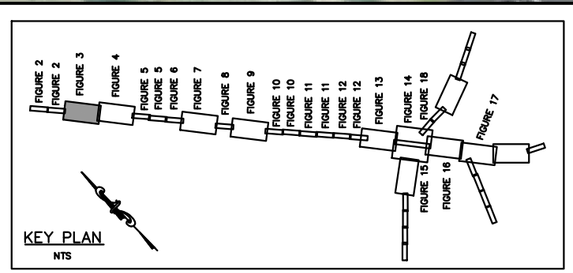
CAROLINA CROSSROADS PHASE 2B
RICHLAND/LEXINGTON COUNTY, SOUTH CAROLINA

BORING LOCATION PLAN

SCALE = 1"=100' | FIGURE 2

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	LEX/RICH		I-26/20/126	





LEGEND:

- ROADWAY BORING
- BRIDGE BORING
- BULK SAMPLE
- WALL BORING
- AUGER PROBE
- DOWNHOLE SEISMIC TEST

REV. NO.	BY	DATE	DESCRIPTION OF REVISION
4			
3			
2			
1			

TOPO. ____ DATE ____
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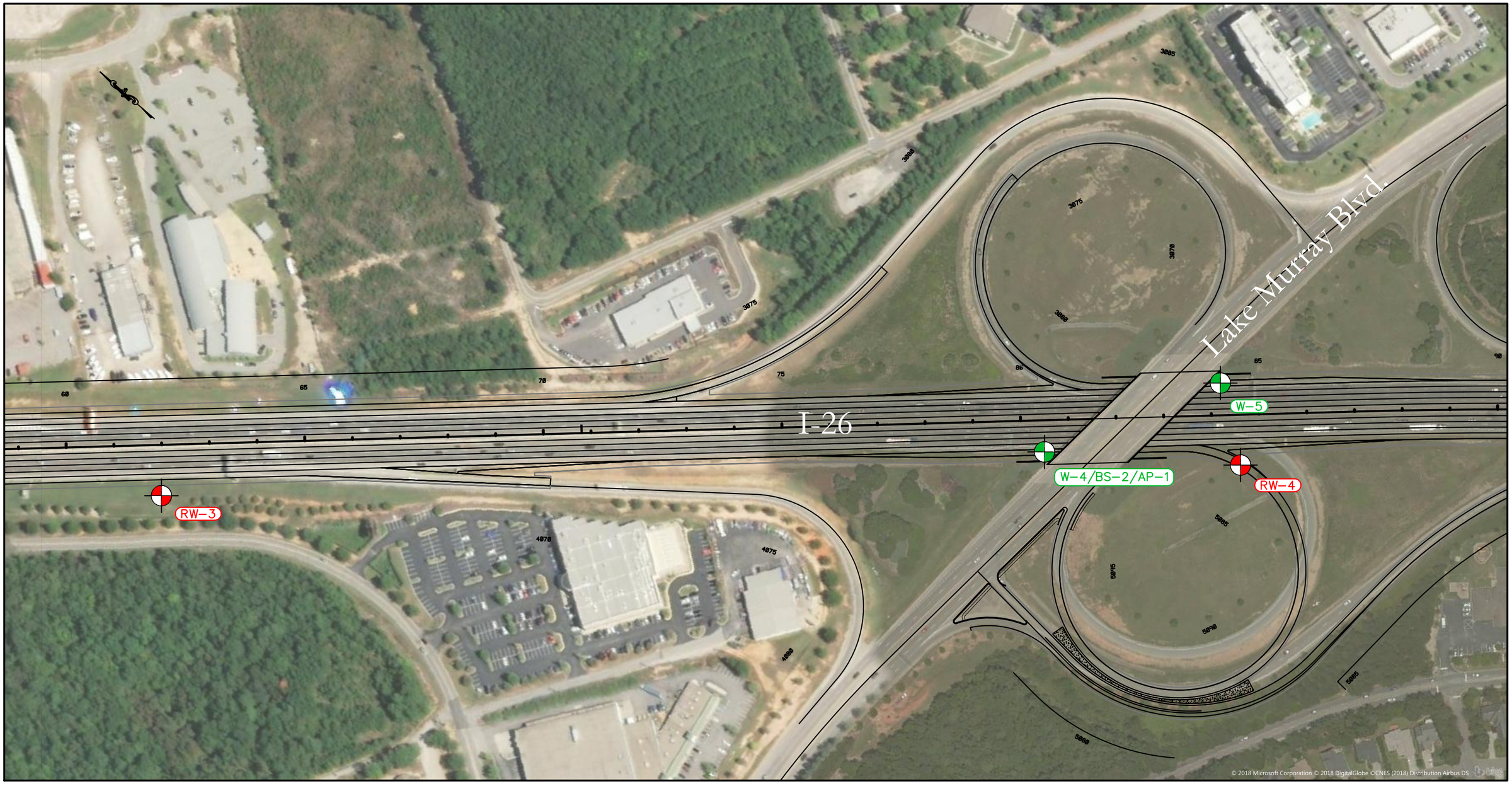
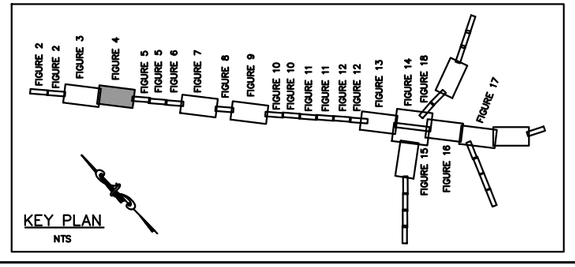
CAROLINA CROSSROADS PHASE 2B
RICHLAND/LEXINGTON COUNTY, SOUTH CAROLINA

BORING LOCATION PLAN

SCALE = 1"=200' | FIGURE 3

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	LEX/RICH		I-26/20/126	





LEGEND:

- ROADWAY BORING
- WALL BORING
- BRIDGE BORING
- AUGER PROBE
- BULK SAMPLE
- DOWNHOLE SEISMIC TEST

REV. NO.	BY	DATE	DESCRIPTION OF REVISION
4			
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TOPO. ____ DATE ____
DWG. CTC DATE 7/20/2018 GROUP ___ - ___
R/W ____ DATE ____

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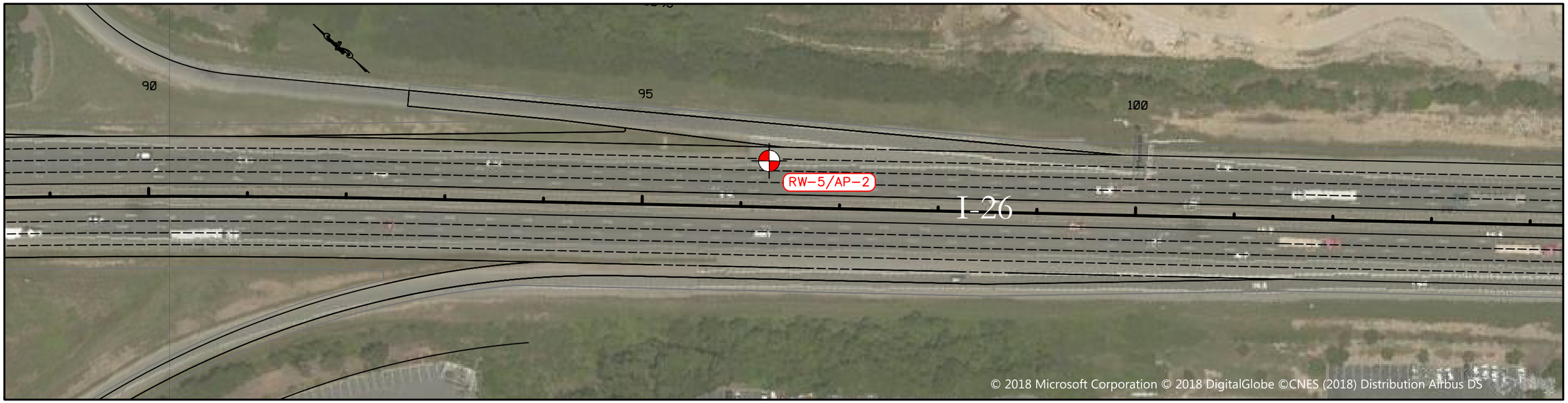
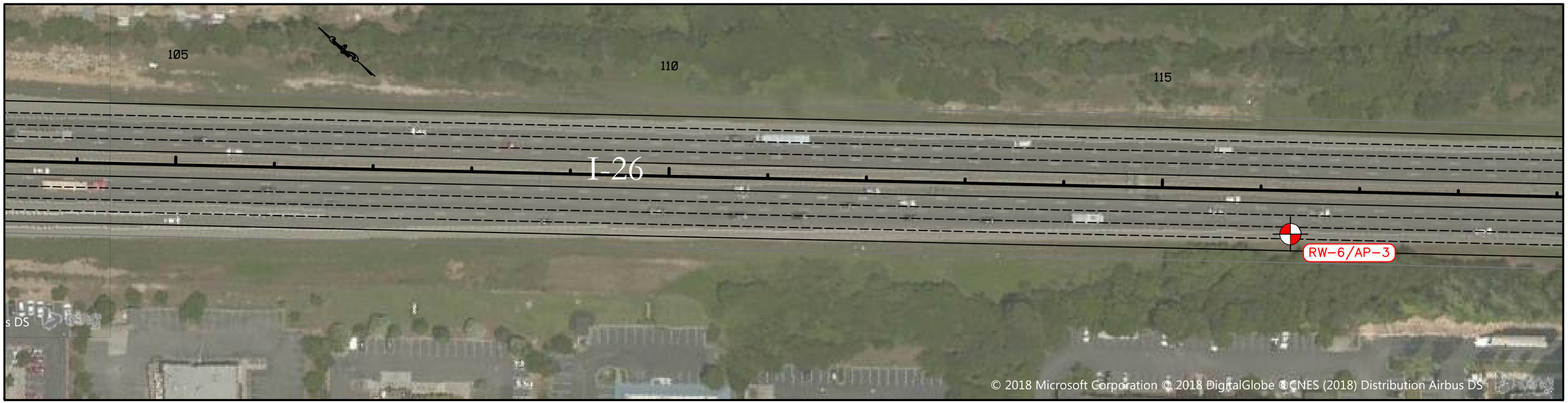
CAROLINA CROSSROADS PHASE 2B
RICHLAND/LEXINGTON COUNTY, SOUTH CAROLINA

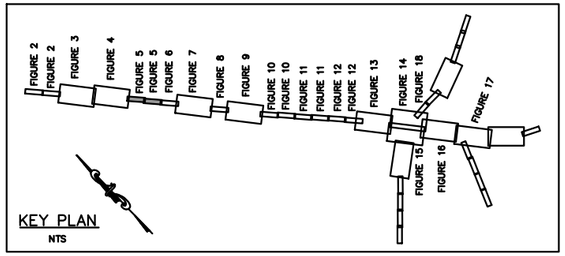
BORING LOCATION PLAN

SCALE = 1"=200' | FIGURE 4

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	LEX/RICH		I-26/20/126	







LEGEND:

- ROADWAY BORING
- BRIDGE BORING
- BULK SAMPLE
- WALL BORING
- AUGER PROBE
- DOWNHOLE SEISMIC TEST

REV. NO.	BY	DATE	DESCRIPTION OF REVISION
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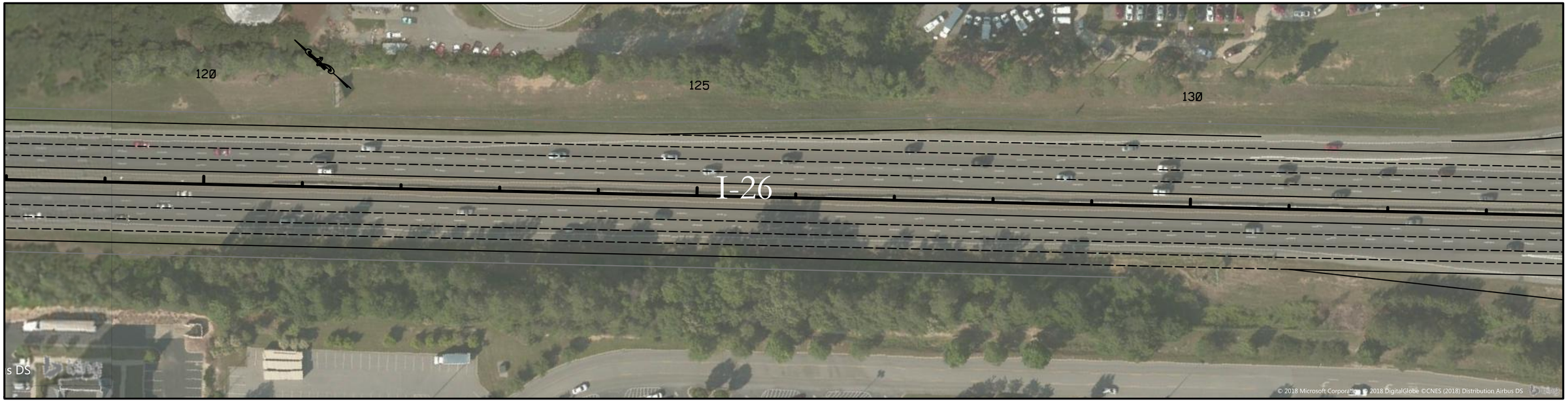
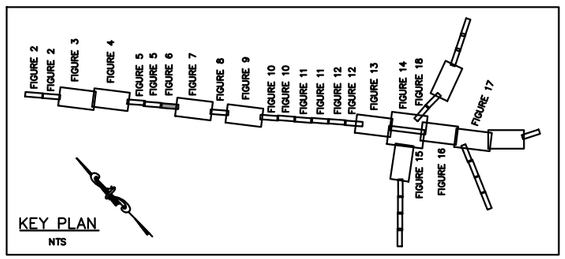
CAROLINA CROSSROADS PHASE 2B
RICHLAND/LEXINGTON COUNTY, SOUTH CAROLINA

BORING LOCATION PLAN

SCALE = 1"=100' | FIGURE 5

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	LEX/RICH		I-26/20/126	





LEGEND:

- ROADWAY BORING
- WALL BORING
- BRIDGE BORING
- AUGER PROBE
- BULK SAMPLE
- DOWNHOLE SEISMIC TEST

REV. NO.	BY	DATE	DESCRIPTION OF REVISION
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DWG. CTC DATE 7/20/2018 GROUP ___ - ____
R/W _____ DATE _____

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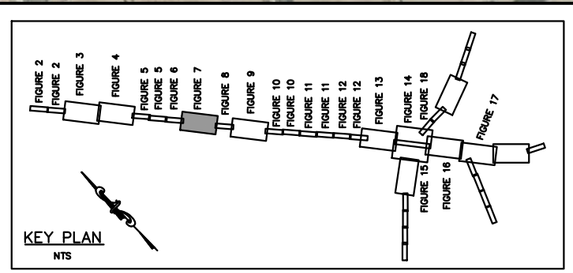
CAROLINA CROSSROADS PHASE 2B
RICHLAND/LEXINGTON COUNTY, SOUTH CAROLINA

BORING LOCATION PLAN

SCALE = 1"=100'

FIGURE 6

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	LEX/RICH		I-26/20/126	



LEGEND:

- ROADWAY BORING
- BRIDGE BORING
- BULK SAMPLE
- WALL BORING
- AUGER PROBE
- DOWNHOLE SEISMIC TEST

REV. NO.	BY	DATE	DESCRIPTION OF REVISION
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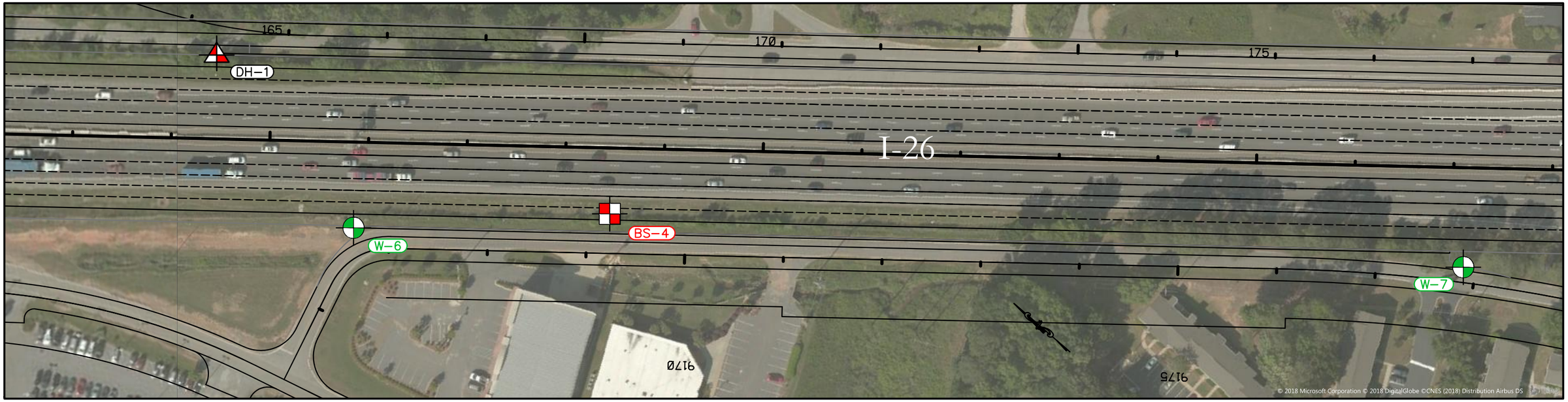
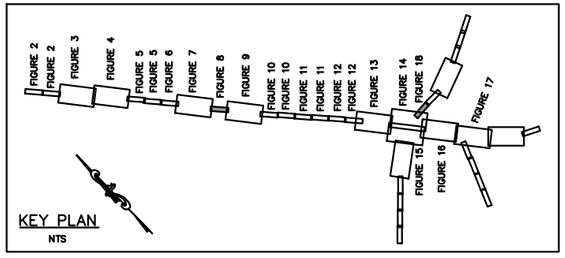
CAROLINA CROSSROADS PHASE 2B
RICHLAND/LEXINGTON COUNTY, SOUTH CAROLINA

BORING LOCATION PLAN

SCALE = 1"=200' | FIGURE 7

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	LEX/RICH		I-26/20/126	





LEGEND:

- ROADWAY BORING
- WALL BORING
- BRIDGE BORING
- AUGER PROBE
- BULK SAMPLE
- DOWNHOLE SEISMIC TEST

REV. NO.	BY	DATE	DESCRIPTION OF REVISION
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DWG. CTC DATE 7/20/2018 GROUP ___ - ____
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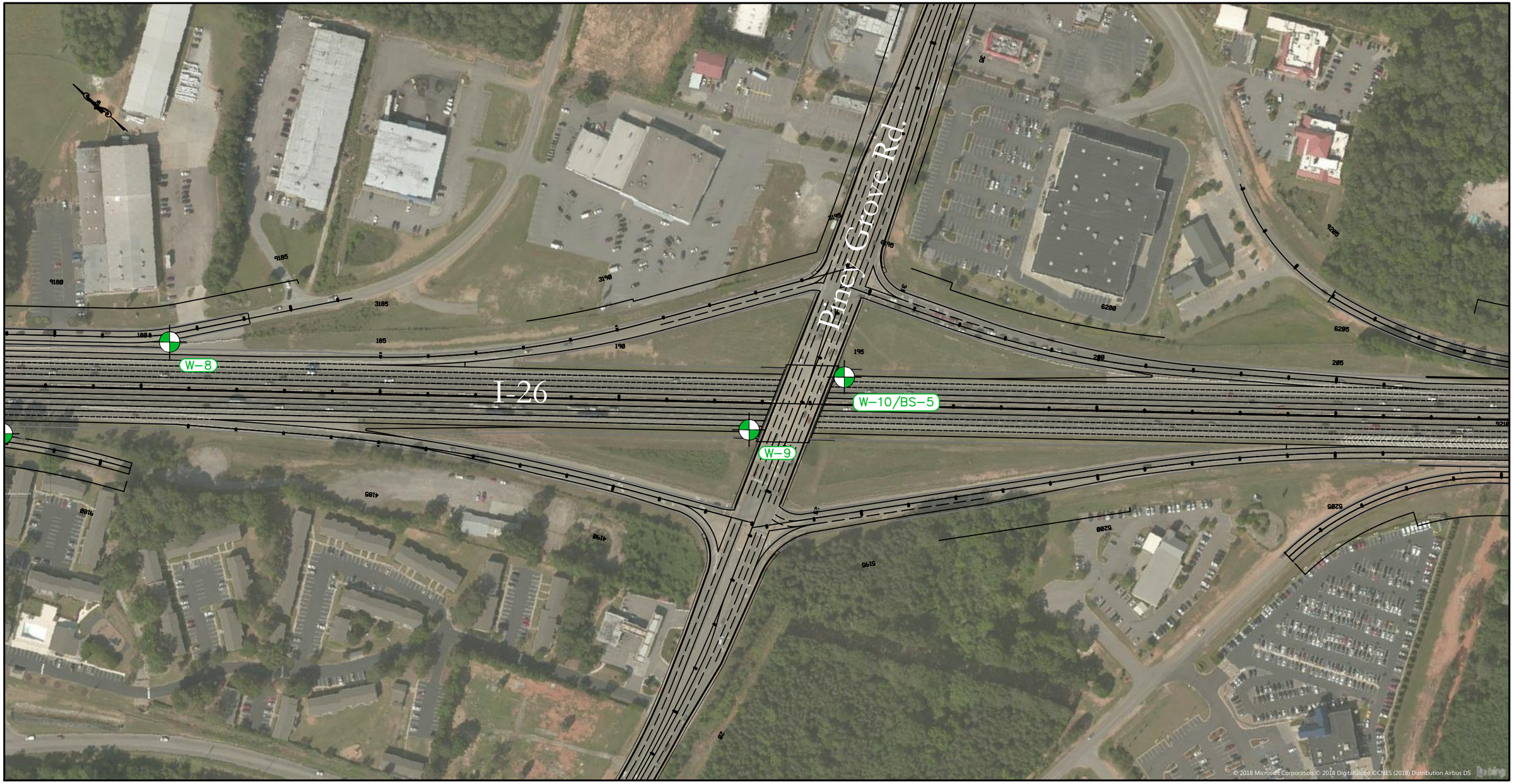
CAROLINA CROSSROADS PHASE 2B
RICHLAND/LEXINGTON COUNTY, SOUTH CAROLINA

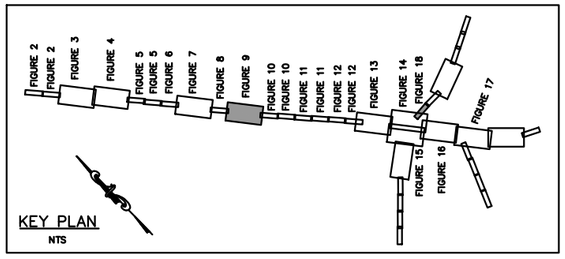
BORING LOCATION PLAN

SCALE = 1"=100'

FIGURE 8

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	LEX/RICH		I-26/20/126	





LEGEND:

- ROADWAY BORING
- BRIDGE BORING
- BULK SAMPLE
- WALL BORING
- AUGER PROBE
- DOWNHOLE SEISMIC TEST

REV. NO.	BY	DATE	DESCRIPTION OF REVISION
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TOPO. ____ DATE ____
DWG. CTC DATE 7/20/2018 GROUP ___ - ___
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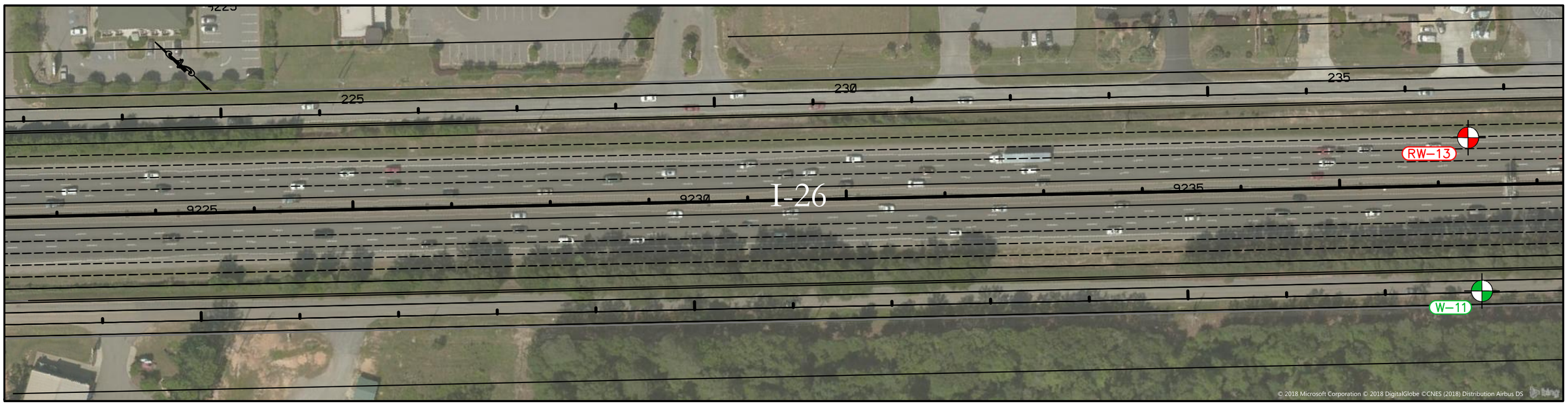
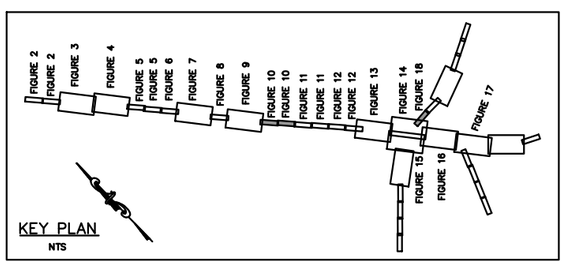
CAROLINA CROSSROADS PHASE 2B
RICHLAND/LEXINGTON COUNTY, SOUTH CAROLINA

BORING LOCATION PLAN

SCALE = 1"=200' | FIGURE 9

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	LEX/RICH		I-26/20/126	





LEGEND:

- ROADWAY BORING
- WALL BORING
- BRIDGE BORING
- AUGER PROBE
- BULK SAMPLE
- DOWNHOLE SEISMIC TEST

REV. NO.	BY	DATE	DESCRIPTION OF REVISION
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DWG. CTC DATE 7/20/2018 GROUP ___ - ___
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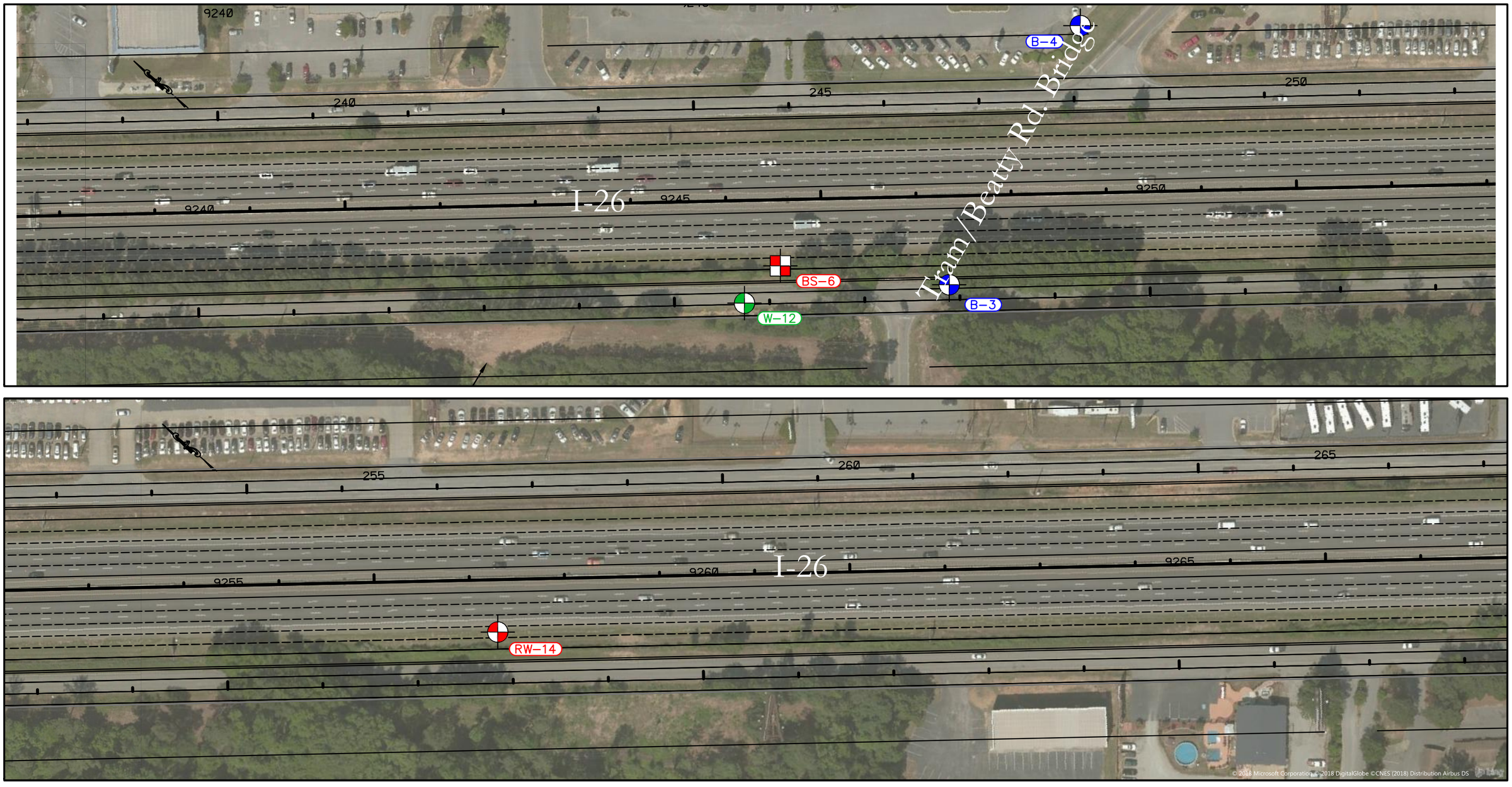
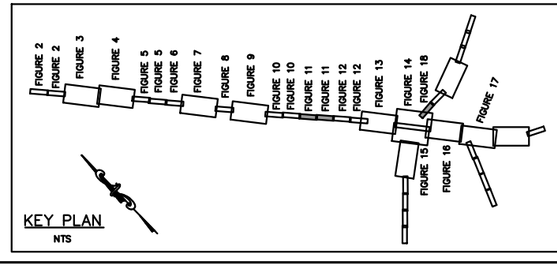
CAROLINA CROSSROADS PHASE 2B
RICHLAND/LEXINGTON COUNTY, SOUTH CAROLINA

BORING LOCATION PLAN

SCALE = 1"=100' | FIGURE 10

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	LEX/RICH		I-26/20/126	





LEGEND:

- ROADWAY BORING
- WALL BORING
- BRIDGE BORING
- AUGER PROBE
- BULK SAMPLE
- DOWNHOLE SEISMIC TEST

REV. NO.	BY	DATE	DESCRIPTION OF REVISION
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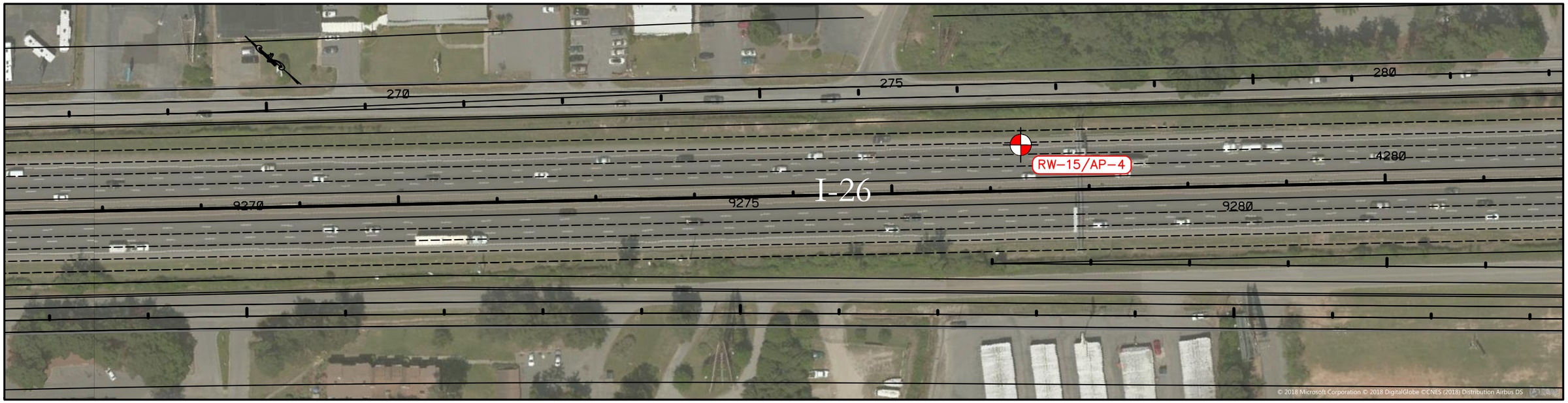
CAROLINA CROSSROADS PHASE 2B
RICHLAND/LEXINGTON COUNTY, SOUTH CAROLINA

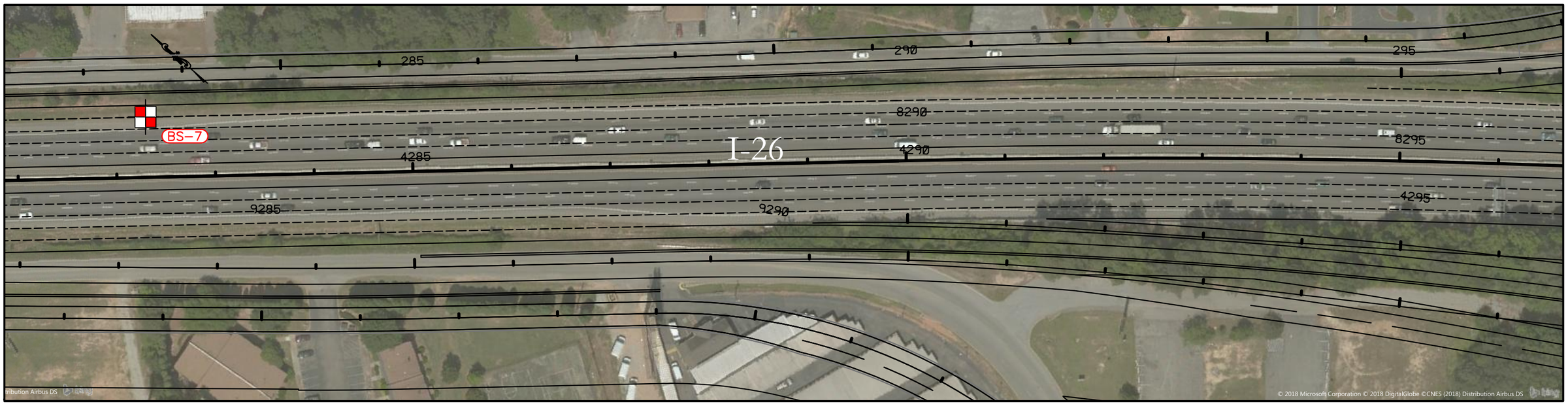
BORING LOCATION PLAN

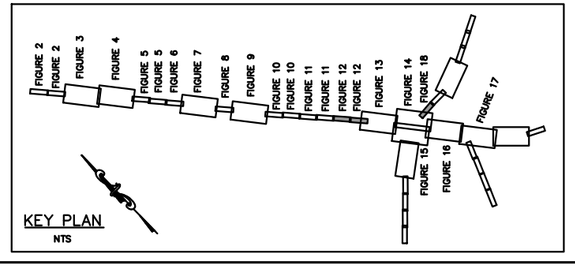
SCALE = 1"=100'

FIGURE 11

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	LEX/RICH		I-26/20/126	







LEGEND:

- ROADWAY BORING
- WALL BORING
- BRIDGE BORING
- AUGER PROBE
- BULK SAMPLE
- DOWNHOLE SEISMIC TEST

REV. NO.	BY	DATE	DESCRIPTION OF REVISION
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TOPO. _____ DATE _____
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CAROLINA CROSSROADS PHASE 2B
RICHLAND/LEXINGTON COUNTY, SOUTH CAROLINA

BORING LOCATION PLAN

SCALE = 1"=100'

FIGURE 12

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	LEX/RICH		I-26/20/126	

W-14/AP-7
RW-17/AP-6
B-63
B-7
RW-19
BS-16
B-5
W-13/AP-5
W-15/BS-9
AP-9
AP-10
B-6/B-6A
RW-18/AP-8
RW-16
BS-8
W-16
I-26
St. Andrews Rd.

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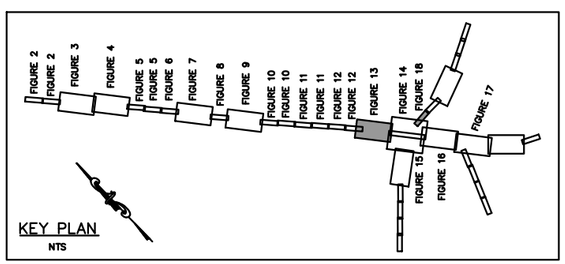

LEGEND:

- ROADWAY BORING
- BRIDGE BORING
- BULK SAMPLE
- WALL BORING
- AUGER PROBE
- DOWNHOLE SEISMIC TEST

REV. NO.	BY	DATE	DESCRIPTION OF REVISION
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CAROLINA CROSSROADS PHASE 2B
RICHLAND/LEXINGTON COUNTY, SOUTH CAROLINA

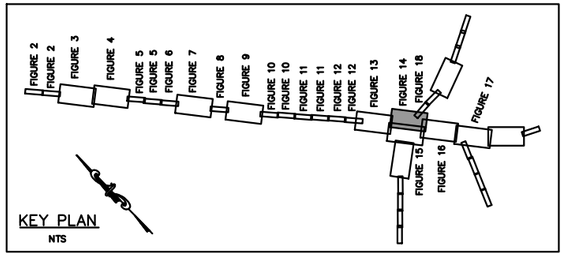
BORING LOCATION PLAN

SCALE = 1"=200'

FIGURE 13

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	LEX/RICH		I-26/20/126	

RW-33
RW-34
BS-10
B-23
B-28/BS-12
B-22
BS-11
B-25/AP-16
RW-26
RW-28A
B-21/AP-13
RW-28
B-24
RW-31/BS-18
RW-27
B-27/AP-17
B-26/BS-13
RW-30
RW-25
BS-17
B-8
RW-20
DH-2
RW-29
B-13/AP-18
I-20
RW-24/AP-12
B-11
I-26
B-14/BS-14
B-10/AP-15
B-12/AP-19
B-14A
BS-19
B-15
W-16



LEGEND:

- ROADWAY BORING
- BRIDGE BORING
- BULK SAMPLE
- WALL BORING
- AUGER PROBE
- DOWNHOLE SEISMIC TEST

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RICHLAND/LEXINGTON COUNTY, SOUTH CAROLINA

BORING LOCATION PLAN

REV. NO.	BY	DATE	DESCRIPTION OF REVISION
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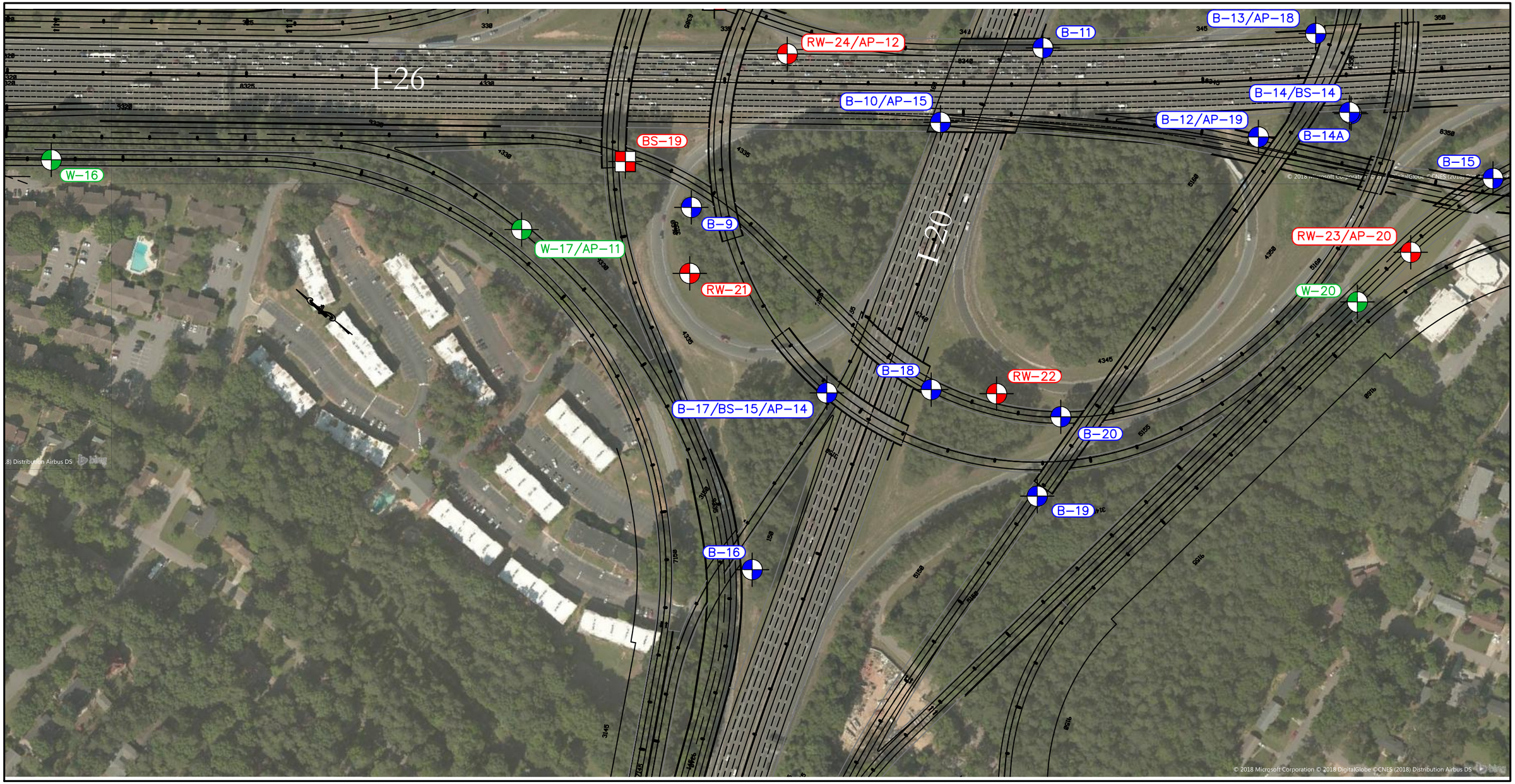
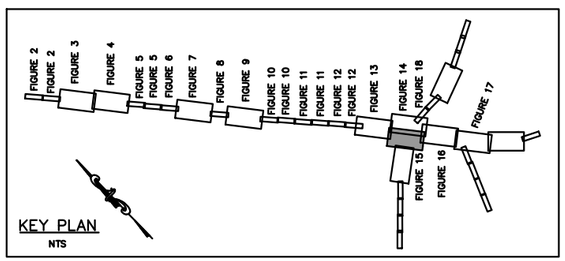
TOPO. _____ DATE _____
DWG. CTC DATE 7/20/2018 GROUP ___ - ___
R/W _____ DATE _____

SCALE = 1"=200' | FIGURE 14

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	LEX/RICH		I-26/20/126	





LEGEND:

- ROADWAY BORING
- BRIDGE BORING
- BULK SAMPLE
- WALL BORING
- AUGER PROBE
- DOWNHOLE SEISMIC TEST

REV. NO.	BY	DATE	DESCRIPTION OF REVISION
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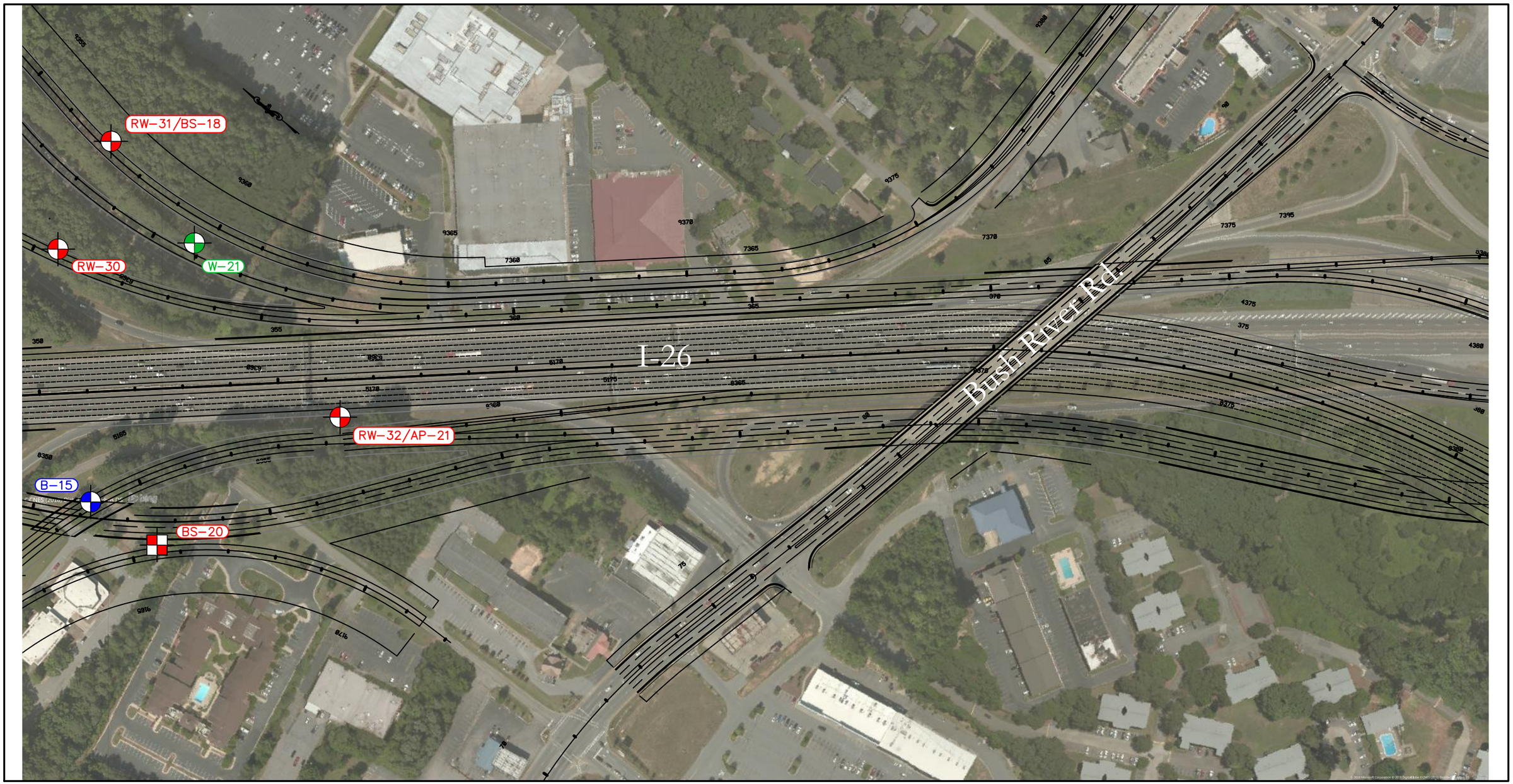
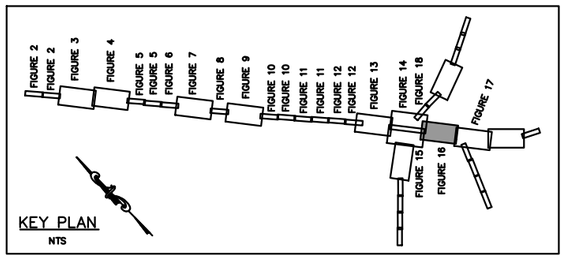
RICHLAND/LEXINGTON COUNTY, SOUTH CAROLINA

BORING LOCATION PLAN

SCALE = 1"=200' | FIGURE 15

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	LEX/RICH		I-26/20/126	





LEGEND:

- ROADWAY BORING
- WALL BORING
- BRIDGE BORING
- AUGER PROBE
- BULK SAMPLE
- DOWNHOLE SEISMIC TEST

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COLUMBIA, SOUTH CAROLINA

REV. NO.	BY	DATE	DESCRIPTION OF REVISION
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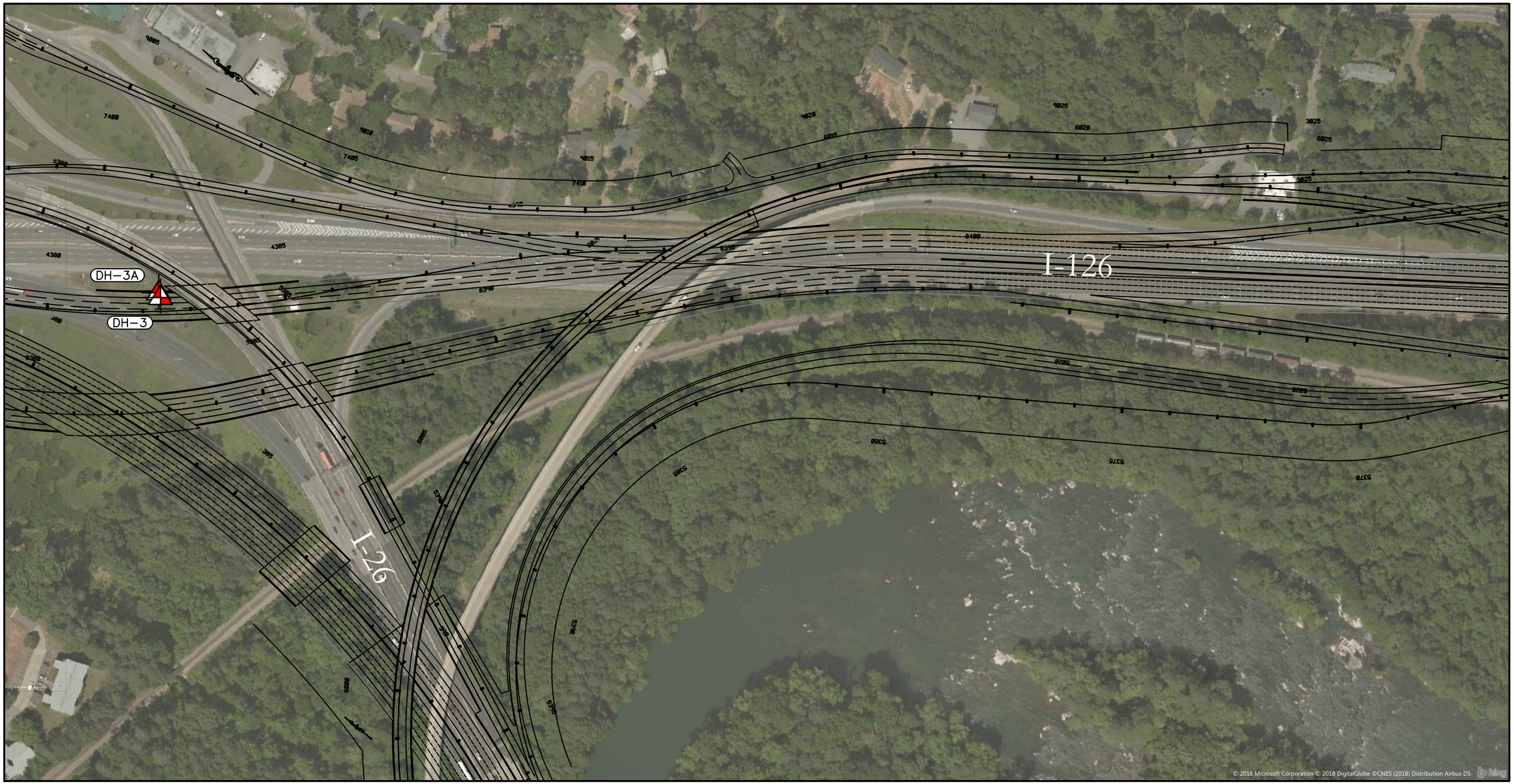
R/W ____ DATE ____

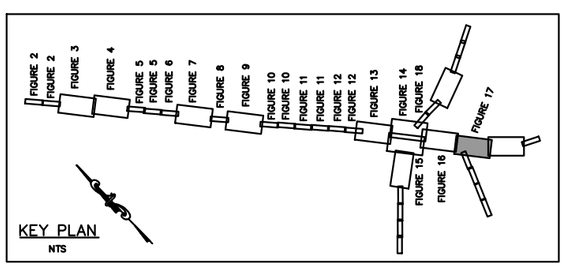
CAROLINA CROSSROADS PHASE 2B
RICHLAND/LEXINGTON COUNTY, SOUTH CAROLINA

BORING LOCATION PLAN

SCALE = 1"=200' | FIGURE 16

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	LEX/RICH		I-26/20/126	





LEGEND:

- ROADWAY BORING
- WALL BORING
- BRIDGE BORING
- AUGER PROBE
- BULK SAMPLE
- DOWNHOLE SEISMIC TEST

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COLUMBIA, SOUTH CAROLINA

REV. NO.	BY	DATE	DESCRIPTION OF REVISION
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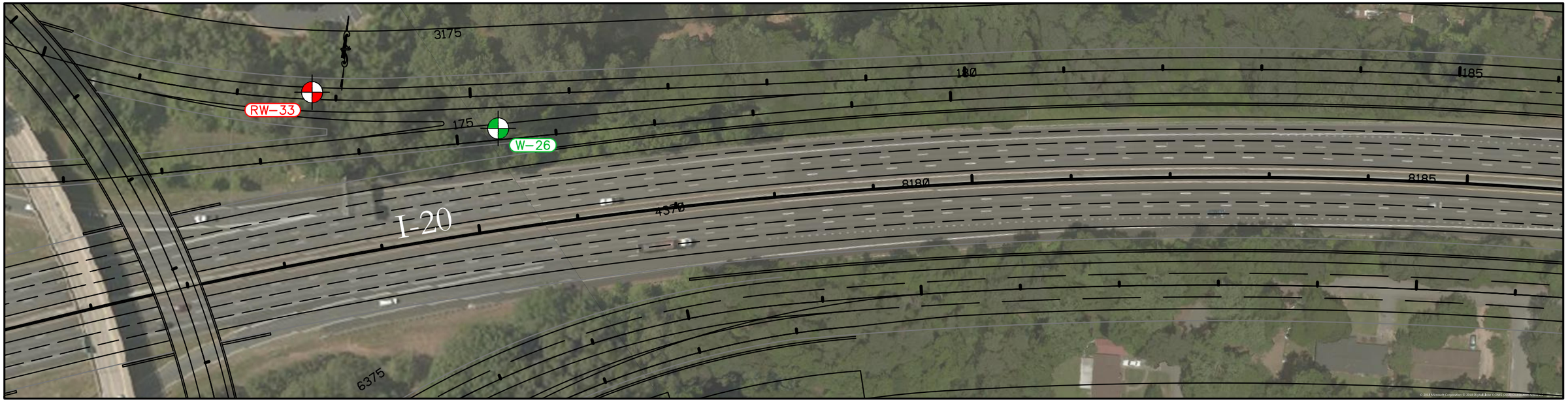
CAROLINA CROSSROADS PHASE 2B
RICHLAND/LEXINGTON COUNTY, SOUTH CAROLINA

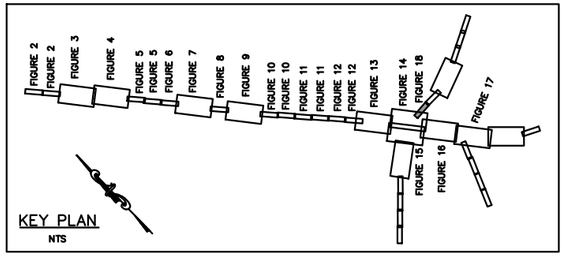
BORING LOCATION PLAN

SCALE = 1"=200'

FIGURE 17

FED. RD. DIV. NO.	STATE	COUNTY	PROJECT ID	ROAD / ROUTE NO.	SHEET NO.
3	SC	LEX/RICH		I-26/20/126	





LEGEND:

- ROADWAY BORING
- WALL BORING
- BRIDGE BORING
- AUGER PROBE
- BULK SAMPLE
- DOWNHOLE SEISMIC TEST

REV. NO.	BY	DATE	DESCRIPTION OF REVISION
4			
3			
2			
1			

TOPO. _____ DATE _____
DWG. CTC DATE 7/20/2018 GROUP ___ - ___
R/W _____ DATE _____

F&ME
CONSULTANTS
GEOTECHNICAL – ENVIRONMENTAL – MATERIALS
COLUMBIA, SOUTH CAROLINA

CAROLINA CROSSROADS PHASE 2B
RICHLAND/LEXINGTON COUNTY, SOUTH CAROLINA

BORING LOCATION PLAN

SCALE = 1"=100'

FIGURE 18

APPENDIX

SECTION 3 BORING LOGS

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-1
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	S-757 (Harbison Blvd)
Eng./Geo.:	R. Wessinger	**Boring Location:**	40+96	**Offset:**	27 L	**Alignment:**	Mainline
Elev.:	315.9 ft	**Latitude:**	34.077821	**Longitude:**	-81.152916	**Date Started:**	3/4/2018
Total Depth:	56 ft	**Soil Depth:**	23.8 ft	**Core Depth:**	32.2 ft	**Date Completed:**	3/5/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	24.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.5	**FILL**		0.0	SS-1	2	8	20	50/3.3"	28
	1.5	Very Stiff, Moist to Dry, Reddish Yellow, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), Munsell=7.5YR 7/8		2.0	SS-2	50/4"				100+
		RESIDUUM		4.0						
310.9		Medium Dense, Moist to Dry, White, Non-Plastic, Silty Fine to Coarse SAND (SM/A-2), Munsell=10YR 8/1			SS-3	24	42	50/6"		92
		PARTIALLY WEATHERED ROCK (PWR)		6.0	SS-4	37	50/5"			100+
		SAMPLED AS: Very Dense, Moist to Dry, Light Gray, Non-Plastic, Silty Fine to Coarse SAND (SM/A-2), Munsell=5Y 7/1		8.0	SS-5	29	47	50/4"		97+
305.9		@2-ft: Dry @4-ft: Moist to Dry, with Gravel @8-ft: Moist, White, Munsell=5Y 8/1								
		@13.5-ft: Dry		13.5	SS-6	50/1.5"				100+
300.9										
				18.5	SS-7	50/2"				100+
295.9										
	23.8	@SS-8: No Recovery		23.7	SS-8	50/1"				100+
		PHYLLITE		23.8						
290.9		@NQ-1: No Recovery			NQ-1					
		@NQ-2: Metamorphic, Gray, Fine to Medium Grained, Laminated Foliations, Quartz, Moderately Weathered, Joints Dip from 5° to 50°, Few Joints, Moderately Wide, Surface Stain (Iron Oxide), Irregular, Very Close, Slightly Rough to Rough		26.0	NQ-2					
285.9	31.0			31.0						

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

%REC=0, %RQD=0

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-1
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	S-757 (Harbison Blvd)
Eng./Geo.:	R. Wessinger	**Boring Location:**	40+96	**Offset:**	27 L	**Alignment:**	Mainline
Elev.:	315.9 ft	**Latitude:**	34.077821	**Longitude:**	-81.152916	**Date Started:**	3/4/2018
Total Depth:	56 ft	**Soil Depth:**	23.8 ft	**Core Depth:**	32.2 ft	**Date Completed:**	3/5/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	24.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		PHYLLITE with Quartz Vein Metamorphic, White/Light Gray, Very Fine to Coarse Grained, Thinly Laminated Foliations, Quartz/Feldspar/Sericite, Moderately to Highly Weathered, Joints Dip from 20° to 45°, Numerous Joints, Moderately Wide to Narrow, No Infilling, Planar/Irregular, Very Close, Smooth to Slightly Rough			NQ-3			%REC=20, %RQD=0, RMR=N/A, GSI=12-17
280.9				36.0				
		@NQ-4: Very Fine Grained, Joints Dip from 10° to 60°, Numerous Joints, Moderately Wide to Very Narrow, No Infilling, Planar/Irregular, Very Close, Smooth to Slightly Rough			NQ-4			%REC=67, %RQD=7, RMR=N/A, GSI=12-17
275.9				41.0				
		@NQ-5: Joints Dip from 5° to 70°, Numerous Joints, Moderately Wide to Narrow, Surface Stain (Iron Oxide), Planar/Irregular, Very Close, Smooth to Slightly Rough			NQ-5			%REC=90, %RQD=17, RMR=N/A, GSI=14-19
270.9				46.0				
		@NQ-6: Joints Dip from 20° to 70°, Numerous Joints, Moderately Wide to Very Narrow, Surface Stain (Iron Oxide), Planar/Stepped/Irregular, Very Close, Smooth to Slightly Rough			NQ-6			%REC=95, %RQD=40, RMR=N/A, GSI=16-21
265.9				51.0				
		@NQ-7: Light Gray/White/Pink, Joints Dip from 15° to 85°, Numerous Joints, Moderately Wide to Narrow, Surface Stain (Iron Oxide), Planar/Stepped/Irregular, Very Close, Smooth to Rough			NQ-7			%REC=90, %RQD=25, RMR=N/A, GSI=17-22
260.9	56.0							
		Coring Terminated at 56.0 feet						
255.9								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-2
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	S-757 (Harbison Blvd)
Eng./Geo.:	R. Wessinger	**Boring Location:**	42+18	**Offset:**	75 R	**Alignment:**	Mainline
Elev.:	313.8 ft	**Latitude:**	34.07794	**Longitude:**	-81.152411	**Date Started:**	3/22/2018
Total Depth:	74.3 ft	**Soil Depth:**	74.3 ft	**Core Depth:**	0 ft	**Date Completed:**	3/22/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 17.5 ft	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.5	TOPSOIL (6")		0.0						
	1.0	**FILL** Loose, Moist, Red/Yellow, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-2), Munsell=2.5YR 5/8 & 10YR 8/6			SS-1	2	3	5	9	8
				2.0	SS-2	11	16	22	21	38
		RESIDUUM Hard to Very Stiff, Moist to Dry, Light Yellowish Brown, Low Plasticity, Sandy SILT (ML/A-4(3)), Munsell=2.5R 7/4		4.0	SS-3	20	23	25	17	48
308.8		@SS-2: LL=33, PL=25, PI=8, NMC=14.4%, %#200=58.1		6.0	SS-4	13	17	20	22	37
		@6-ft: Moist, Pale Red, Micaceous, Munsell=10R 6/4		8.0	SS-5	9	11	14	15	25
303.8										
	13.5	Very Dense, Moist, Pale Red, Non-Plastic, Silty Fine to Medium SAND (SM/A-4(0)), Munsell=10R 6/4		13.5	SS-6	8	17	39		56
298.8		@SS-6: LL=NP, PL=NP, PI=NP, NMC=20.5%, %#200=49.8								
	18.5	Hard, Moist to Wet, Pinkish Gray, Non-Plastic, Sandy SILT (ML/A-4(0)), Munsell=10R 7/1		18.5	SS-7	13	17	16		33
293.8		@SS-7: LL=NP, PL=NP, PI=NP, NMC=23.7%, %#200=54.5								
				23.5	SS-8	15	29	50/5.5"		79+
288.8										
	28.5			28.5						

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-2
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	S-757 (Harbison Blvd)
Eng./Geo.:	R. Wessinger	**Boring Location:**	42+18	**Offset:**	75 R	**Alignment:**	Mainline
Elev.:	313.8 ft	**Latitude:**	34.07794	**Longitude:**	-81.152411	**Date Started:**	3/22/2018
Total Depth:	74.3 ft	**Soil Depth:**	74.3 ft	**Core Depth:**	0 ft	**Date Completed:**	3/22/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 17.5 ft	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
283.8		Very Dense, Moist to Wet, Pale Red, Low Plasticity, Silty, Clayey Fine to Coarse SAND (SC-SM/A-2-4), Munsell=10R 7/2			SS-9	34	38	31		69
		@SS-9: LL=29, PL=22, PI=7, NMC=15.8%, %#200=27.2								
				33.5						
		@33.5-ft: Light Red, Munsell=7.5R 6/6			SS-10	21	29	33		62
278.8										
				38.5						
	39.0				SS-11	31	50/5"			100+
		PARTIALLY WEATHERED ROCK (PWR)								
273.8		SAMPLED AS: Very Dense, Moist to Wet, Yellow/White, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2-4), Munsell=10YR 8/6 & 10YR 8/1								
				43.5						
		@SS-12: LL=NP, PL=NP, PI=NP, NMC=17.4%, %#200=30.8			SS-12	19	30	50/3"		80+
268.8										
	48.5			48.5	SS-13	50/3.5"				100+
		SAMPLED AS: Hard, Moist to Wet, Yellow/White, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), Munsell=10YR 8/6 & 10YR 8/1								
263.8										
				53.5						
		@53.5-ft: Light Gray/Yellow, Munsell=10YR 7/1 & 10YR 7/6			SS-14	50/4"				100+
258.8										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-2
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	S-757 (Harbison Blvd)
Eng./Geo.:	R. Wessinger	**Boring Location:**	42+18	**Offset:**	75 R	**Alignment:**	Mainline
Elev.:	313.8 ft	**Latitude:**	34.07794	**Longitude:**	-81.152411	**Date Started:**	3/22/2018
Total Depth:	74.3 ft	**Soil Depth:**	74.3 ft	**Core Depth:**	0 ft	**Date Completed:**	3/22/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 17.5 ft	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
	58.5	SAMPLED AS: Very Dense, Moist to Wet, Light Gray, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-2), Munsell=10YR 7/1		58.5	SS-15	50/3.5"	100+
253.8							
		@63.5-ft: Light Brownish Gray, Munsell=10YR 6/7		63.5	SS-16	50/2.5"	100+
248.8							
		@68.5-ft: Light Gray, Fine Sand, Munsell=10YR 7/1		68.5	SS-17	50/3.5"	100+
243.8							
	74.3	@73.5-ft: Light Bluish Gray, Munsell=GLEY2 5PB/8		73.5	SS-18	42 50/4"	100+
238.8		Boring Terminated at 74.3 feet					
233.8							
228.8							

SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/24/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-3
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	Tram/Beatty Rd.
Eng./Geo.:	R. Wessinger	**Boring Location:**	119+10	**Offset:**	69 L	**Alignment:**	Mainline
Elev.:	308.4 ft	**Latitude:**	34.056383	**Longitude:**	-81.130962	**Date Started:**	1/31/2018
Total Depth:	83.8 ft	**Soil Depth:**	83.8 ft	**Core Depth:**	0 ft	**Date Completed:**	1/31/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	12.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Asphalt Roadway								
	0.3	ASPHALT (3.5")		0.3						
	1.5	**FILL** Medium Dense, Moist, Reddish Yellow, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-2)		2.0	SS-1	8	13	8		21
				4.0	SS-2	5	6	6	7	12
303.4	4.0	**RESIDUUM** Very Stiff to Stiff, Moist, Reddish Yellow, Non-Plastic to Low Plasticity, SILT (ML/A-4) with Sand & Gravel, Munsell=7.5YR 6/8		4.0	SS-3	8	7	6	6	13
				6.0	SS-4	5	3	6	8	9
				8.0	SS-5	3	4	5	8	9
298.4		Stiff, Moist, Strong Brown, High Plasticity, Fat CLAY (CH/A-7-5(20)) with Fine Sand, Munsell=7.5YR 5/8								
	13.5	@6-ft: Strong Brown/White, Micaceous, Munsell=7.5YR 5/8 & 8/1		13.5	SS-6	9	13	27		40
293.4		@SS-4: LL=61, PL=30, PI=31, NMC=25.8%, %#200=77.2								
		Dense to Very Dense, Strong Brown/White, Non-Plastic, Silty Fine to Medium SAND (SM/A-4(0)), Munsell=7.5YR 5/8 & 7.5YR 8/1		18.5	SS-7	13	18	30		48
288.4		@SS-6: LL=NP, PL=NP, PI=NP, NMC=16.5%, %#200=42.5								
	24.0	**PARTIALLY WEATHERED ROCK (PWR)** SAMPLED AS: Very Dense, Moist, Dusky Red/Reddish Gray, Non-Plastic, Silty Fine to Medium SAND (SM/A-4(0)), Micaceous, Munsell=10R 3/4 & 10R 6/1		23.5	SS-8	43	50/5"			100+
283.4				28.5	SS-9	26	50/4.5"			100+
278.4		@28.5-ft: Bluish Gray/Olive Yellow, Munsell=10B 5/1 & 2.5Y 6/6								
				33.5	SS-10		50/3.5"			100+
273.4										
				38.5	SS-11	23	50/5.5"			100+
268.4		@SS-11: LL=NP, PL=NP, PI=NP, NMC=19.6%, %#200=40.6								
				43.5						

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90

Continued Next Page

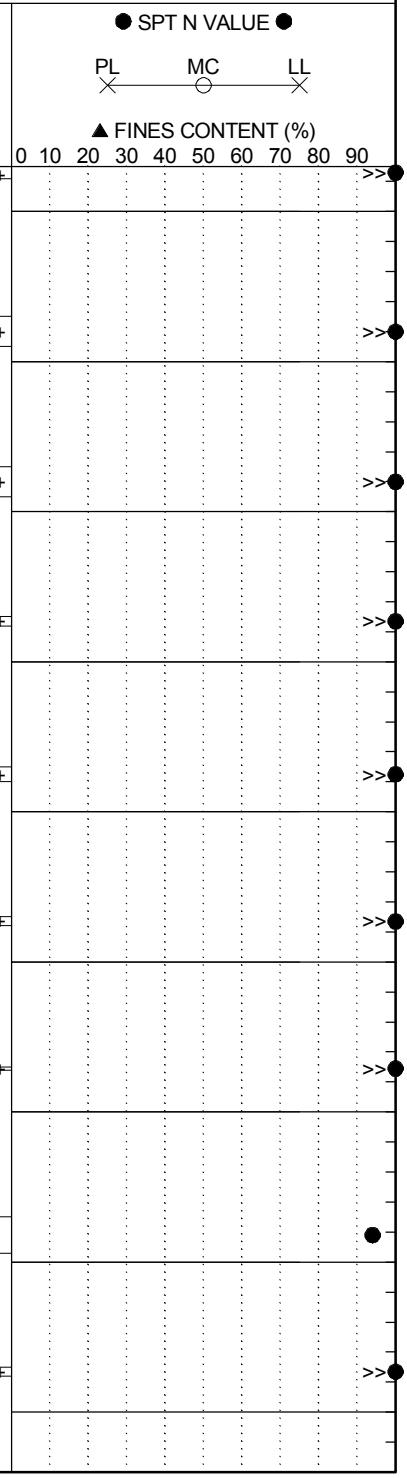
LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-3
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	Tram/Beatty Rd.
Eng./Geo.:	R. Wessinger	**Boring Location:**	119+10	**Offset:**	69 L	**Alignment:**	Mainline
Elev.:	308.4 ft	**Latitude:**	34.056383	**Longitude:**	-81.130962	**Date Started:**	1/31/2018
Total Depth:	83.8 ft	**Soil Depth:**	83.8 ft	**Core Depth:**	0 ft	**Date Completed:**	1/31/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	12.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6" 2nd 6" 3rd 6" 4th 6"	N Value
263.4		@43.5-ft: Light Bluish Gray/Black, Munsell=5PR 7/1 & 10YR 2/1		SS-12	50/4.5"	100+
			48.5			
258.4		@48.5-ft: Light Bluish Gray/Olive Yellow, Munsell=5PR 7/1 & 2.5Y 6/6		SS-13	49 50/3.5"	100+
			53.5			
253.4		@53.5-ft: Light Bluish Gray/Black, Munsell=5PR 7/1 & 10Yr 2/1		SS-14	49 50/5.5"	100+
	58.5		58.5			
248.4		SAMPLED AS: Very Dense, Moist, Light Bluish Gray, Non-Plastic, GRAVEL (GP/A-1) (Quartz Seam) with Sand, Munsell=10B 8/1		SS-15	50/3"	100+
	63.5		63.5			
243.4		SAMPLED AS: Hard, Moist, Olive Yellow/Black/Gray, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), Micaceous, Munsell=2.5Y 6/8, 2.5Y 2.5/1 & 2.5Y 5/1		SS-16	50/6"	100+
			68.5			
238.4				SS-17	50/3"	100+
	73.5		73.5			
233.4		@SS-18: No Recovery		SS-18	50/1.5"	100+
	78.5		78.5			
228.4		SAMPLED AS: Hard, Moist, Light Bluish Gray/Olive Yellow, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), Micaceous, Munsell=5PB 8/1 & 2.5Y 6/6		SS-19	34 44 50/2.5"	94+
	83.8		83.5			
223.4		Boring Terminated at 83.8 feet		SS-20	50/3"	100+



LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-4
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	Tram/Beatty Rd.
Eng./Geo.:	C. Piercy	**Boring Location:**	122+15	**Offset:**	82 L	**Alignment:**	Mainline
Elev.:	312.7 ft	**Latitude:**	34.056587	**Longitude:**	-81.129985	**Date Started:**	4/16/2018
Total Depth:	98.6 ft	**Soil Depth:**	98.6 ft	**Core Depth:**	0 ft	**Date Completed:**	4/17/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	21.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.3	TOPSOIL (3")		0.0	SS-1	1	1	3	4	4
		FILL Soft, Moist, Reddish Yellow, High Plasticity, Fat CLAY (CH/A-7-6(20)) with Sand, Munsell=7.5YR 6/6		2.0	SS-2	4	5	9	12	14
		@2-ft: Stiff, Red/Brownish Yellow (Mottled), Munsell=2.5YR 5/6 & 10YR 6/8		4.0	SS-3	13	23	50/5.5"		73+
307.7	5.0	@SS-2: LL=51, PL=26, PI=25, NMC=27.4%, %#200=79.0		6.0	SS-4	50/5"				100+
		PARTIALLY WEATHERED ROCK (PWR) SAMPLED AS: Hard, Moist, Pale Red/Light Gray, Low Plasticity, SILT (ML/A-4(2)) with Sand, Munsell=10YR 7/8 & 10YR 7/1		8.0	SS-5	50/5.5"				100+
		@6-ft: Red, Munsell=7.5YR 5/6								
302.7		@8-ft: Light Gray/Light Red, Munsell=10YR 7/1 & 10R 6/6								
		@13.5-ft: Light Gray, Munsell=10R 7/1		13.5	SS-6	50/4"				100+
297.7										
		@SS-7: LL=27, PL=23, PI=4, NMC=18.5%, %#200=76.6		18.5	SS-7	50/3.5"				100+
292.7										
	23.5			23.5	SS-8	50/2"				100+
		SAMPLED AS: Hard, Moist, Light Gray, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), Munsell=10R 7/1								
287.7				28.5						

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

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LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-4
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	Tram/Beatty Rd.
Eng./Geo.:	C. Piercy	**Boring Location:**	122+15	**Offset:**	82 L	**Alignment:**	Mainline
Elev.:	312.7 ft	**Latitude:**	34.056587	**Longitude:**	-81.129985	**Date Started:**	4/16/2018
Total Depth:	98.6 ft	**Soil Depth:**	98.6 ft	**Core Depth:**	0 ft	**Date Completed:**	4/17/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	21.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
282.7					SS-9	50/2.5"				100+
				33.5	SS-10	50/1.5"				100+
277.7										
	38.5	SAMPLED AS: Very Dense, Moist, Light Gray, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-2), Munsell=10R 7/1		38.5	SS-11	50/1.5"				100+
272.7										
		@43.5-ft: Light Gray, Munsell=5Y 7/1		43.5	SS-12	50/1.5"				100+
267.7										
	48.5	SAMPLED AS: Hard, Moist, Light Gray, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), Munsell=5Y 7/1		48.5	SS-13	50/2"				100+
262.7										
	53.5	SAMPLED AS: Very Dense, Moist, Light Gray, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2), Munsell=5Y 7/1		53.5	SS-14	50/2"				100+
257.7										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Very Hard Drilling

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-4
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	Tram/Beatty Rd.
Eng./Geo.:	C. Piercy	**Boring Location:**	122+15	**Offset:**	82 L	**Alignment:**	Mainline
Elev.:	312.7 ft	**Latitude:**	34.056587	**Longitude:**	-81.129985	**Date Started:**	4/16/2018
Total Depth:	98.6 ft	**Soil Depth:**	98.6 ft	**Core Depth:**	0 ft	**Date Completed:**	4/17/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	21.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
	58.5	SAMPLED AS: Hard, Moist, Light Gray, Non-Plastic to Low Plasticity, SILT (ML/A-4), with Sand, Munsell=5Y 7/1	58.5	SS-15	50/1.5"	100+
252.7			63.5	SS-16	50/2"	100+
247.7			68.5	SS-17	50/1.5"	100+
		@63.5-ft: Light Gray/Light Red, Munsell=5Y 7/1 & 7.5R 6/6				
242.7	73.5	SAMPLED AS: Very Dense, Moist, Gray, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2), Munsell=5Y 6/1	73.5	SS-18	50/2"	100+
237.7			78.5	SS-19	50/2"	100+
232.7			83.5	SS-20	50/1.5"	100+
227.7						

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90

Continued Next Page

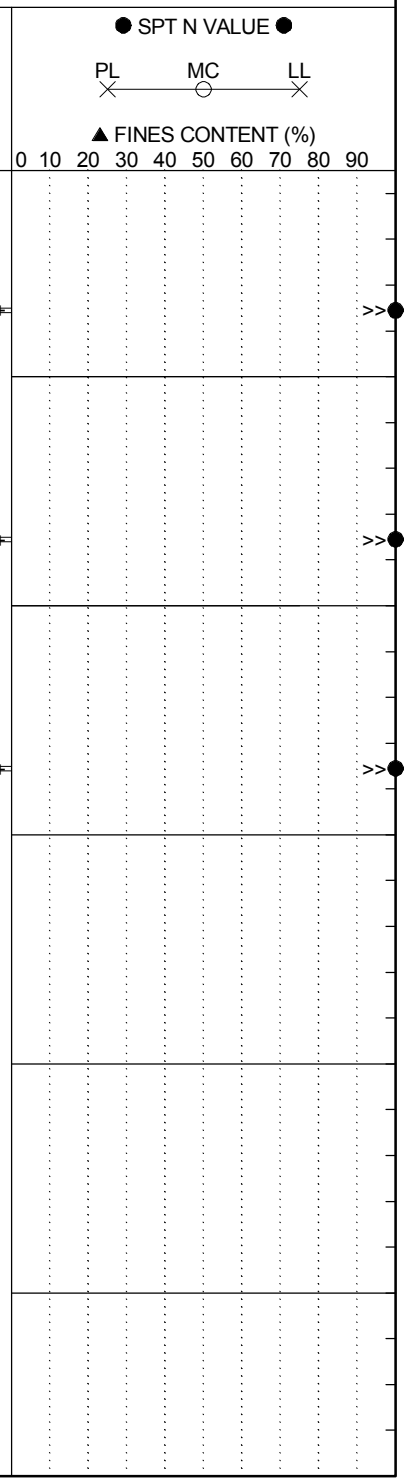
LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-4
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	Tram/Beatty Rd.
Eng./Geo.:	C. Piercy	**Boring Location:**	122+15	**Offset:**	82 L	**Alignment:**	Mainline
Elev.:	312.7 ft	**Latitude:**	34.056587	**Longitude:**	-81.129985	**Date Started:**	4/16/2018
Total Depth:	98.6 ft	**Soil Depth:**	98.6 ft	**Core Depth:**	0 ft	**Date Completed:**	4/17/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	21.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
222.7				88.5	SS-21	50/1.5"				100+
217.7				93.5	SS-22	50/1.5"				100+
	98.6	Boring Terminated at 98.6 feet Due to Drilling Refusal at Top of Rock		98.5	SS-23	50/1"				100+
212.7										
207.7										
202.7										



LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-5
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	S-36 (St Andrews Rd)
Eng./Geo.:	R. Wessinger	**Boring Location:**	28+24	**Offset:**	185 L	**Alignment:**	Mainline
Elev.:	218.8 ft	**Latitude:**	34.044909	**Longitude:**	-81.118709	**Date Started:**	2/12/2018
Total Depth:	68.7 ft	**Soil Depth:**	68.7 ft	**Core Depth:**	0 ft	**Date Completed:**	2/13/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	89%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	4.8 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.5	TOPSOIL (6")		0.0	SS-1	1	2	2	3	4
	2.0	**FILL** Soft, Moist, Red, Non-Plastic to Low Plasticity, SILT (ML/A-4) with Gravel, Munsell=2.5YR 4/8		2.0	SS-2	2	3	6	7	9
213.8		**RESIDUUM** Stiff, Moist, Red/Yellow, Medium Plasticity, Elastic SILT (MH/A-7-5(20)), Micaceous, Munsell=2.5YR & 2.5Y 8/8		4.0	SS-3	5	7	7	7	14
	8.5	@SS-2: LL=52, PL=34, PI=18, NMC=33.8%,%#200=98.2		6.0	SS-4	9	15	21	50/5.5"	36
208.8		=> Hard, Gray/Strong Brown, A-7-5(18), Munsell=5Y 5/1 & 7.5YR 5/8		8.0	SS-5	27	50/5"			100+
		@SS-5: LL=52, PL=35, PI=17, NMC=19.2%,%#200=85.3		13.5	SS-6	17	32	33		65
203.8		**PARTIALLY WEATHERED ROCK (PWR)** SAMPLED AS: Hard, Moist, Gray/Dark Brown, Low Plasticity, Lean CLAY (CL/A-4(6)) with Sand, Micaceous, Munsell=5Y 5/1 & 7.5YR 3/4		18.5	SS-7	50/1.5"				100+
	18.5	@SS-6: LL=31, PL=22, PI=9, NMC=15.3%, %#200=77.7		23.5	SS-8	50/2.5"				100+
198.8		SAMPLED AS: Hard, Moist to Dry, Bluish Gray, High Plasticity, SILT (ML/A-7-6(13)) with Sand, Munsell=5B 5/1		28.5	SS-9	15	37	29		66
193.8				33.5	SS-10	50/4"				100+
		@SS-9: LL=44, PL=15, PI=29, NMC=14.4%,%#200=78.7								
188.8										
183.8				38.5						

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

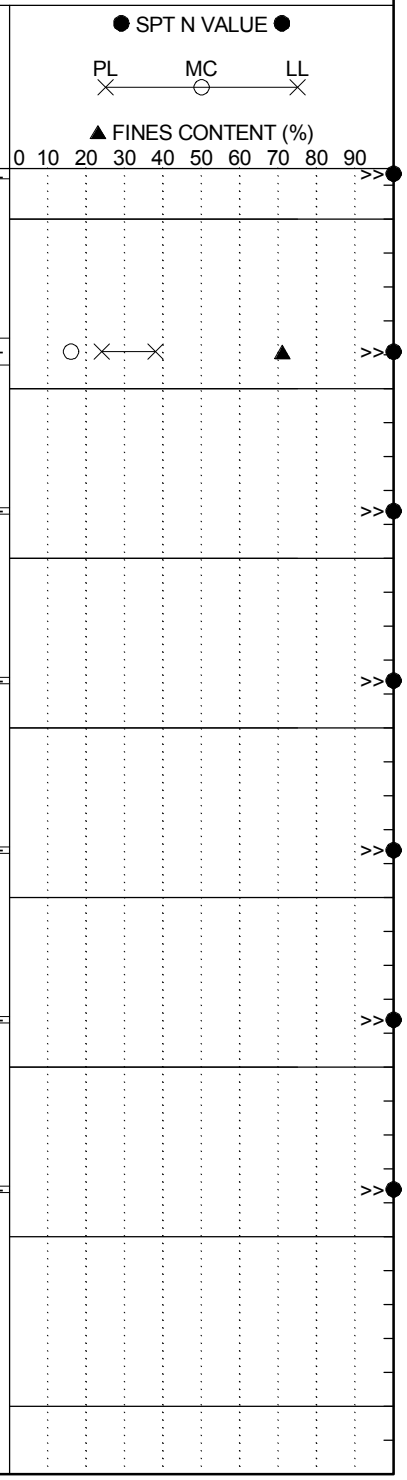
LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-5
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	S-36 (St Andrews Rd)
Eng./Geo.:	R. Wessinger	**Boring Location:**	28+24	**Offset:**	185 L	**Alignment:**	Mainline
Elev.:	218.8 ft	**Latitude:**	34.044909	**Longitude:**	-81.118709	**Date Started:**	2/12/2018
Total Depth:	68.7 ft	**Soil Depth:**	68.7 ft	**Core Depth:**	0 ft	**Date Completed:**	2/13/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	89%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	4.8 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
178.8				SS-11	50/4"				100+
	43.5	SAMPLED AS: Hard, Moist to Dry, Greenish Gray/Light Bluish Gray, Medium Plasticity, Lean CLAY (CL/A-6(9)) with Sand, Munsell=10BG 6/1 & 10B 7/1	43.5	SS-12	37	50/4"			100+
173.8		@SS-12: PL=38, PL=24, PI=14, NMC=16.0%, %#200=70.9							
			48.5	SS-13	50/2.5"				100+
168.8									
		@SS-14: No Recovery	53.5	SS-14	50/1.25"				100+
163.8									
	58.5	SAMPLED AS: Hard, Moist to Dry, Bluish Gray/Olive Yellow, Non-Plastic, SILT (ML/A-4) with Sand & Gravel, Munsell=10B 6/1 & 5Y 6/6	58.5	SS-15	50/1.5"				100+
158.8									
			63.5	SS-16	50/1.5"				100+
153.8									
	68.7	@SS-17: No Recovery	68.5	SS-17	50/2"				100+
		Boring Terminated at 68.7 feet							
148.8									
143.8									



LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-6
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	S-36 (St Andrews Rd)
Eng./Geo.:	R. Wessinger	**Boring Location:**	27+96	**Offset:**	104 R	**Alignment:**	Mainline
Elev.:	225.9 ft	**Latitude:**	34.044138	**Longitude:**	-81.118461	**Date Started:**	2/13/2018
Total Depth:	78.6 ft	**Soil Depth:**	78.6 ft	**Core Depth:**	25 ft	**Date Completed:**	2/14/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	89%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** 15.0 ft	**24HR**	17.6 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.2	TOPSOIL (2")		0.0	SS-1	2	3	5	7	8
		FILL		2.0						
		Loose to Medium Dense, Moist, Yellowish Red, Low Plasticity, Silty Fine to Medium SAND (SM/A-2-4), Munsell=5YR 5/6		4.0	SS-2	7	8	9	9	17
220.9					SS-3	6	9	10	10	19
		@SS-3: LL=20, PL=18, PI=2, NMC=9.8%, %#200=19.0		6.0	SS-4	8	12	16	15	28
		@8-ft: Reddish Yellow, Munsell=10YR 6/8		8.0	SS-5	7	9	9	6	18
215.9										
	13.5	**RESIDUUM**		13.5	SS-6	9	12	11		23
210.9		Medium Dense, Moist to Wet, Grayish Brown, Non-Platic, Silty Fine to Medium SAND (SM/A-2-4), Munsell=10YR 5/2								
	18.5	@SS-6: LL=NP, PL=NP, PI=NP, NMC=10.4%, %#200=18.5		18.5	SS-7	4	6	7		13
205.9		Stiff to Very Stiff, Moist, Red, High Plasticity, Elastic SILT (MH/A-7-5(20)), Munsell=2.5YR 4/8		23.5	SS-8	7	10	13		23
200.9		@SS-7: LL=62, PL=34, PI=28, NMC=29.0%, %#200=92.7								
		@23.5-ft: Light Gray/Black/Strong Brown, Munsell=10YR 7/1, 10YR 2/1 & 7.5YR 5/6		28.5	SS-9	13	23	35		58
195.9		@28.5-ft: Greenish Gray, Medium Plasticity, Munsell=GLEY1_5GY 6/1								
		@SS-9: LL=50, PL=34, PI=16, NMC=18.4%, %#200=95.6		33.5	SS-10	10	13	18		31
190.9		@33.5-ft: Moist to Wet, Greenish Gray/Red, Munsell=GLEY1_5GY 6/1 & 10R 4/8								
	38.5	**PARTIALLY WEATHERED ROCK (PWR)**		38.5	SS-11	50/4"				100+
185.9		SAMPLED AS: Hard, Moist to Wet, Greenish Gray/Red, Non-Plastic, SILT (ML/A-4) with Sand, Micaceous, Munsell=GLEY1_5GY 6/1 & 10R 4/8		43.5	SS-12	50/3"				100+
180.9		@43.5-ft: Bluish Gray, Munsell=GLEY2 10B								
	48.5			48.5						

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-6
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	S-36 (St Andrews Rd)
Eng./Geo.:	R. Wessinger	**Boring Location:**	27+96	**Offset:**	104 R	**Alignment:**	Mainline
Elev.:	225.9 ft	**Latitude:**	34.044138	**Longitude:**	-81.118461	**Date Started:**	2/13/2018
Total Depth:	78.6 ft	**Soil Depth:**	78.6 ft	**Core Depth:**	25 ft	**Date Completed:**	2/14/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	89%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** 15.0 ft	**24HR**	17.6 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
175.9		SAMPLED AS: Hard, Moist, Bluish Gray/Yellowish Brown, Non-Plastic, SILT (ML/A-4), Micaceous, Munsell=GLEY2 10B & 10YR 5/8		SS-13	50/5.5"				100+
			53.5	SS-14	50/4"				100+
170.9			58.5						
		@58.5-ft: Pale Red/Bluish Gray, Moist to Dry, Munsell=7.5R 6/4 & GLEY2 6/1		SS-15	21	38	50/4.5"		88+
165.9			63.5	SS-16	50/2"				100+
		@63.5-ft: Light Bluish Gray, Munsell=GLEY2 7/10B							
160.9			68.5	SS-17	50/2"				100+
155.9			73.5	SS-18	50/1.75"				100+
		@73.5-ft: Bluish Gray, Munsell=GLEY2 5/5B							
150.9									
	78.6		78.5	SS-19	50/0.5"				100+
		SEE BORING 6A							
145.9									
140.9									
135.9									
130.9									

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/24/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-6A
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	S-36 (St Andrews Rd)
Eng./Geo.:	R. Wessinger	**Boring Location:**	27+96	**Offset:**	104 R	**Alignment:**	Mainline
Elev.:	225.9 ft	**Latitude:**	34.044138	**Longitude:**	-81.118461	**Date Started:**	2/13/2018
Total Depth:	89.7 ft	**Soil Depth:**	64.7 ft	**Core Depth:**	25 ft	**Date Completed:**	2/14/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RC	**Hammer Type:**	Automatic	**Energy Ratio:**	89%
Core Size:	NQ	**Driller:**	D. Harris	**Groundwater:**	**TOB** 15.0 ft	**24HR**	17.6 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Grassed Shoulder						
		CASING FOR ROCK CORING COULD ONLY BE ADVANCED TO 64.7-FT AFTER PRIOR DRILLING REFUSAL WAS ENCOUNTERED AT 78.6-FT						
220.9								
215.9								
210.9		▽						
		▼						
205.9								
200.9								
195.9								
190.9								
185.9								
180.9								

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-6A
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	S-36 (St Andrews Rd)
Eng./Geo.:	R. Wessinger	**Boring Location:**	27+96	**Offset:**	104 R	**Alignment:**	Mainline
Elev.:	225.9 ft	**Latitude:**	34.044138	**Longitude:**	-81.118461	**Date Started:**	2/13/2018
Total Depth:	89.7 ft	**Soil Depth:**	64.7 ft	**Core Depth:**	25 ft	**Date Completed:**	2/14/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RC	**Hammer Type:**	Automatic	**Energy Ratio:**	89%
Core Size:	NQ	**Driller:**	D. Harris	**Groundwater:**	**TOB** 15.0 ft	**24HR**	17.6 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
175.9								
170.9								
165.9								
	64.7	**BEGIN ROCK CORING AT 64.7-ft**		64.7				
160.9		**PHYLLITE** Metamorphic, Gray, Fine Grained, Thinly Laminated to Laminated Foliations, Quartz/Feldspar/Sericite, Moderately to Highly Weathered, Joints Dip from 20° to 85°, Numerous Joints/Foliations, Moderately Wide to Very Narrow, Spotty (Iron Oxide), Planar/Stepped/Irregular, Very Close, Smooth to Slightly Rough			NQ-1			%REC=66, %RQD=0, RMR=N/A, GSI=0-5
155.9				69.7	NQ-2			%REC=34, %RQD=0, RMR=N/A, GSI=0-5
150.9		@NQ-2: Joints Dip from 10° to 85°, Numerous Joints/Foliations, Moderately Wide to Very Narrow, Spotty (Iron Oxide), Planar/Stepped/Irregular, Very Close, Smooth to Slightly Rough		74.7	NQ-3			%REC=74, %RQD=18, RMR=N/A, GSI=2-7
145.9		@NQ-3: Joints Dip from 10° to 85°, Numerous Joints/Foliations, Moderately Wide to Very Narrow, Surface Stain (Iron Oxide), Planar/Stepped, Very Close, Smooth to Slightly Rough		79.7	NQ-4			@81.9-ft: UC Strength=3,460 psi %REC=81, %RQD=35 RMR=15, GSI=0-15
140.9		@NQ-4: Slightly to Highly Weathered, Weak Rock, Joints Dip from 10° to 80°, Numerous Joints/Foliations, Moderately Wide to Very Narrow, Surface Stain (Iron Oxide), Planar/Stepped/Irregular, Very Close, Smooth to Slightly Rough		84.7	NQ-5			%REC=63, %RQD=0, RMR=N/A, GSI=2-7
135.9	89.7	@NQ-5: Moderately to Highly Weathered, Joints Dip from 15° to 80°, Numerous Joints/Foliations, Moderately Wide to Very Narrow, Surface Stain (Iron Oxide), Planar/Stepped/Irregular, Very Close, Smooth to Slightly Rough						
130.9		Coring Terminated at 89.7 feet						

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-7
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	S-36 (St Andrews Rd)
Eng./Geo.:	R. Wessinger	**Boring Location:**	31+21	**Offset:**	161 R	**Alignment:**	Mainline
Elev.:	209.1 ft	**Latitude:**	34.044305	**Longitude:**	-81.117392	**Date Started:**	1/23/2018
Total Depth:	63.6 ft	**Soil Depth:**	43.6 ft	**Core Depth:**	20 ft	**Date Completed:**	1/24/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	89%
Core Size:	NQ	**Driller:**	D. Harris	**Groundwater:**	**TOB** 10.0 ft	**24HR**	12.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Grassed Shoulder									
	0.2	TOPSOIL (2")		0.0	SS-1	2	3	3	5	6	
		FILL									
		Firm to Stiff, Moist to Wet, Reddish Yellow, Medium Plasticity, Sandy SILT (ML/A-6(7)), Munsell=7.5YR 6/6		2.0	SS-2	3	4	5	9	9	
	4.0	@SS-1: LL=37, PL=25, PI=12, NMC=19.4%, %#200=65.2		4.0	SS-3	5	5	5	5	10	
204.1		@2-ft: with Gravel		6.0	SS-4	WOH/12"		3	5	3	
		Stiff, Moist, Light Olive Brown, Low Plasticity, SILT (ML/A-4(8)), Munsell=2.5Y 5/6		8.0	SS-5	5	4	7	7	11	
		@6-ft: Soft, Wet, Light Yellowish Brown									
199.1		@SS-4: LL=31, PL=23, PI=8, NMC=27.5%, %#200=93.5, Organics=4.01%									
		@8-ft: Stiff, Greenish Gray/Olive, Munsell=GLEY1 6/10GY & 5Y 4/4									
	13.5	**ALLUVIUM**		13.5	SS-6	9	12	15		27	
194.1		Medium Dense, Wet, Light Brown, Non-Plastic, Silty Fine to Coarse SAND (SM/A-1-b) with Gravel, Munsell=7.5YR 6/4									
		@SS-6: LL=NP, PL=NP, PI=NP, NMC=10.4%, %#200=18.4									
	18.0			18.0							Hard Drilling at 18-ft.
		PARTIALLY WEATHERED ROCK (PWR)		18.5	SS-7	50/5"				100+	>>
189.1		SAMPLED AS: Hard, Moist, Dark Red/Reddish Gray, Non-Plastic to Low Plasticity, Sandy SILT (ML), Micaceous, Munsell=10R 3/6 & 10R 5/1									
		@23.5-ft: Moist to Dry, Bluish Gray, Munsell=GLEY2 6/5B		23.5	SS-8	50/5"				100+	>>
184.1											
				28.5	SS-9	50/2"				100+	>>
179.1											
				33.5							

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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-7
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	S-36 (St Andrews Rd)
Eng./Geo.:	R. Wessinger	**Boring Location:**	31+21	**Offset:**	161 R	**Alignment:**	Mainline
Elev.:	209.1 ft	**Latitude:**	34.044305	**Longitude:**	-81.117392	**Date Started:**	1/23/2018
Total Depth:	63.6 ft	**Soil Depth:**	43.6 ft	**Core Depth:**	20 ft	**Date Completed:**	1/24/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	89%
Core Size:	NQ	**Driller:**	D. Harris	**Groundwater:**	**TOB** 10.0 ft	**24HR**	12.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
174.1		@33.5-ft: Dry			SS-10	50/1"	100+	>>
				38.5	SS-11	50/5"	100+	>>
169.1								
	43.6			43.5	SS-12	50/0.75"	100+	>>
		PHYLLITE		43.6				
164.1		Metamorphic, Gray/Purple, Fine Grained, Thinly Laminated to Laminated Foliations, Quartz/Feldspar/Sericite, Moderately to Highly Weathered, Joints Dip from 10° to 70°, Numerous, Moderately Wide to Tight, Surface Stain (Iron Oxide), Planar/Stepped/Irregular, Very Close, Smooth			NQ-1			%REC=89, %RQD=41, RMR=N/A, GSI=10-15
				45.9				
					NQ-2			%REC=87, %RQD=32, RMR=N/A, GSI=8-13
159.1		@NQ-2: Joints Dip from 10° to 80°, Numerous Joints, Moderately Wide to Tight, Surface Stain (Iron Oxide), Planar/Stepped/Irregular, Very Close, Smooth to Slightly Rough		50.9				
					NQ-3			@52.7-ft: UC Strength=740 psi %REC=88, %RQD=37, RMR=17, GSI=10-15
154.1		@NQ-3: Weak Rock, Joints Dip from 5° to 55°, Numerous Joints, Moderately Wide to Tight, Surface Stained/Filled (Calcite/Iron Oxide/Healed), Planar/Stepped/Irregular, Very Close, Smooth to Rough		55.9				
		@NQ-4: Gray, Weak Rock, Joints Dip from 10° to 80°, Numerous Joints, Moderately Wide to Tight, Spotty/Filled (Calcite/Healed), Planar/Stepped/Irregular, Very Close, Smooth to Rough			NQ-4			%REC=95, %RQD=18, RMR=12, GSI=10-15 @59.2-ft: UC Strength=1,360 psi
149.1				60.9				
		@NQ-5: Slightly to Highly Weathered, Joints Dip from 25° to 70°, Numerous Joints, Moderately Wide to Tight, Spotty/Filled (Calcite/Healed), Planar/Irregular, Very Close, Smooth to Rough			NQ-5			%REC=97, %RQD=33, RMR=N/A, GSI=12-17
	63.6							
144.1		Coring Terminated at 63.6 feet						

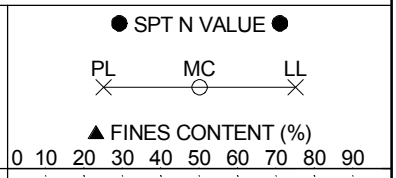
LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-8
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	126CDW1
Eng./Geo.:	C. Piercy/M. Miller	**Boring Location:**	7332+07	**Offset:**	17 R	**Alignment:**	Mainline
Elev.:	271.7 ft	**Latitude:**	34.039125	**Longitude:**	-81.11175	**Date Started:**	4/3/2018
Total Depth:	102.8 ft	**Soil Depth:**	92.5 ft	**Core Depth:**	10.3 ft	**Date Completed:**	4/4/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	NQ	**Driller:**	D. Harris	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	22.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.1	TOPSOIL (1")		0.0	SS-1	5	9	9	8	18
		FILL								
		Medium Dense, Dry to Moist, Red, High Plasticity, Silty Fine to Coarse SAND (SM/A-2-7(1)), Munsell=10R 5/8		2.0	SS-2	8	7	10	10	17
		@2-ft: Red/Yellow, Munsell=10R 5/8 & 2.5Y 7/8		4.0						
	4.5				SS-3	8	5	7	7	12
266.7		@SS-2: LL=50, PL=29, PI=21, NMC=10.6%, %#200=26.0		6.0						
		RESIDUUM			SS-4	4	8	18	20	26
		Stiff to Very Stiff, Moist, Very Pale Brown, Non-Plastic, SILT (ML/A-4(0)), Munsell=10YR 8/4		8.0						
		@5-ft: Red/Reddish Yellow, Munsell=2.5YR 5/6 & 7.5YR 6/8			SS-5	4	16	24	22	40
261.7		@6.5-ft: Red/Brownish Yellow, Munsell=10R 4/8 & 10YR 6/6								
		@SS-4: LL=NP, PL=NP, PI=NP, NMC=27.2%, %#200=97.7								
		@8-ft: Hard to Very Stiff		13.5						
		@13.5-ft: Dark Red, Munsell=7.5YR 3/6			SS-6	8	11	13		24
256.7										
	18.5			18.5						
		Hard to Very Stiff, Moist, Red, Non-Plastic, Sandy SILT (ML/A-4(0)), Munsell=7.5R 5/8			SS-7	11	16	15		31
251.7		@SS-7: LL=NP, PL=NP, PI=NP, NMC=20.8%, %#200=69.5								
		@19.0-ft.: Weathered Quartz Vein								
		▼		23.5						
		@23.5-ft:Brown, with Gravel, Munsell=7.5YR 5/4			SS-8	11	13	13		26
246.7										
				28.5						



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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-8
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	126CDW1
Eng./Geo.:	C. Piercy/M. Miller	**Boring Location:**	7332+07	**Offset:**	17 R	**Alignment:**	Mainline
Elev.:	271.7 ft	**Latitude:**	34.039125	**Longitude:**	-81.11175	**Date Started:**	4/3/2018
Total Depth:	102.8 ft	**Soil Depth:**	92.5 ft	**Core Depth:**	10.3 ft	**Date Completed:**	4/4/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	NQ	**Driller:**	D. Harris	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	22.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
241.7		@28.5-ft: Brownish Yellow/Light Gray/Red, Munsell=10YR 6/8, 10YR 7/1 & 10R 4/6			SS-9	9	16	20		36
	33.5			33.5						
		Very Stiff to Hard, Moist, Reddish Yellow/Red, Low Plasticity, SILT (ML/A-4(5)) with Sand, Munsell=7.5YR 7/8 & 10R 5/8			SS-10	9	14	16		30
236.7		@SS-10: LL=32, PL=25, PI=7, NMC=25.5%, %#200=77.0								
				38.5						
		@38.5-ft: Yellow, Munsell=10YR 7/8			SS-11	7	11	18		29
231.7										
				43.5						
		@43.5-ft: Yellow, Non-Plastic, A-4(0), Munsell=10YR 7/6			SS-12	24	24	33		57
226.7		@SS-12: LL=NP, PL=NP, PI=NP, NMC=24.8%, %#200=89.5								
				48.5						
		@48.5-ft: Red/Brownish Yellow, Munsell=2.5YR 5/8 & 10YR 6/6			SS-13	15	32	44		76
221.7		@49.5-ft: Weathered Quartz Vein								
				53.5						
		@53.5-ft: Reddish Yellow, with Sand, Munsell=7.5YR 6/8			SS-14	38	31	37		68
216.7										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

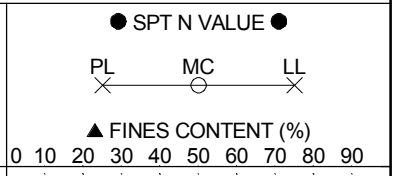
Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-8
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	126CDW1
Eng./Geo.:	C. Piercy/M. Miller	**Boring Location:**	7332+07	**Offset:**	17 R	**Alignment:**	Mainline
Elev.:	271.7 ft	**Latitude:**	34.039125	**Longitude:**	-81.11175	**Date Started:**	4/3/2018
Total Depth:	102.8 ft	**Soil Depth:**	92.5 ft	**Core Depth:**	10.3 ft	**Date Completed:**	4/4/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	NQ	**Driller:**	D. Harris	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	22.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
				58.5						
		@58.5-ft: Very Pale Brown, Munsell=10YR 7/4			SS-15	11	21	33		54
211.7										
				63.5						
		@63.5-ft: Yellow/Reddish Yellow, Munsell=2.5Y 7/6 & 7.5YR 6/8			SS-16	13	17	18		35
206.7		@SS-16: LL=NP, PL=NP, PI=NP, NNC=24.4%, %#200=70.5								
				68.5						
		@68.5-ft: Olive Yellow/Yellowish Red, Munsell=2.5Y 6/6 & 5YR 5/8			SS-17	17	26	34		60
201.7										
				73.5						
		@73.5-ft: Pale Brown/Light Brownish Gray, Munsell=2.5Y 7/4 & 2.5Y 6/2			SS-18	16	18	24		42
196.7										
				78.5						
	79.5				SS-19	16	48	50/3.5"		98+
191.7		**PARTIALLY WEATHERED ROCK (PWR)** SAMPLED AS: Hard, Moist, Brownish Yellow, Non-Plastic, SILT (ML/A-4(0)) with Sand, Munsell=10YR 6/6								
		@SS-19: LL=NP, PL=NP, PI=NP, NMC=24.0%, %#200=75.7								
				83.5						
		@83.5-ft: Pale Olive, Micaceous, Munsell=5Y 6/3			SS-20	28	42	50/4"		92+
186.7										



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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-8
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	126CDW1
Eng./Geo.:	C. Piercy/M. Miller	**Boring Location:**	7332+07	**Offset:**	17 R	**Alignment:**	Mainline
Elev.:	271.7 ft	**Latitude:**	34.039125	**Longitude:**	-81.11175	**Date Started:**	4/3/2018
Total Depth:	102.8 ft	**Soil Depth:**	92.5 ft	**Core Depth:**	10.3 ft	**Date Completed:**	4/4/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	NQ	**Driller:**	D. Harris	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	22.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%)
			88.5	SS-21	50/5"	100+	>>
181.7							
	92.5	**PHYLLITE**	92.5	SS-22	50/0.5"	100+	>>
		Metamorphic, Gray/Light Gray, Fine Grained, Thinly Laminated to Laminated Foliations, Quartz/Feldspar/Sericite, Fresh to Moderately Weathered, Weak Rock, Joints Dip from 5° to 10°, Occasional Joints, Moderately Wide to Very Narrow, Surface Stain (Iron Oxide), Planar/Stepped/Irregular, Very Close, Smooth to Slightly Rough					@93.8-ft: UC Strength=2,310 psi
				NQ-1			%REC=93, %RQD=80, RMR=27, GSI=23-27
176.7			95.9				
		@NQ-2: Fresh to Slightly Weathered, Joints Dip from 15° to 80°, Occasional Joints, Narrow to Very Narrow, Partially Filled/Filled (Calcite), Wavy/Planar/Irregular, Very Close, Smooth to Rough		NQ-2			%REC=66, %RQD=38, RMR=N/A, GSI=25-29
171.7			100.1				
		@NQ-3: Slightly to Moderately Weathered, Joints Dip from 20° to 80°, Few Joints, Narrow to Very Narrow, Partially Filled/Filled (Calcite/Quartz), Wavy/Stepped/Irregular, Very Close, Smooth to Slightly Rough		NQ-3			%REC=100, %RQD=0, RMR=N/A, GSI=23-27
	102.8	=> with Quartz Veins	101.4	NQ-4			%REC=100, %RQD=59, RMR=N/A, GSI=15-19
166.7		@NQ-4: Dark Gray/Gray, Slightly to Highly Weathered, Joints Dip from 40° to 80°, Numerous Joints, Narrow to Very Narrow, Filled (Quartz), Wavy/Planar/Irregular, Very Close, Smooth to Rough					
		Coring Terminated at 102.8 feet					
161.7							

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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-9
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I26RDB
Eng./Geo.:	C. Piercy	**Boring Location:**	6389+63	**Offset:**	155 L	**Alignment:**	Mainline
Elev.:	259.9 ft	**Latitude:**	34.037698	**Longitude:**	-81.112592	**Date Started:**	4/10/2018
Total Depth:	86 ft	**Soil Depth:**	63.6 ft	**Core Depth:**	22.4 ft	**Date Completed:**	4/11/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	NQ	**Driller:**	D. Harris	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	31.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Edge of Woods								
	0.3	TOPSOIL (3")		0.0	SS-1	2	2	3	4	5
		COASTAL PLAIN		2.0						
		Loose to Medium Dense, Moist, Brownish Yellow/Yellowish Red, Non-Plastic, Silty Fine to Coarse SAND (SM/A-2) with Gravel, Munsell=10YR 6/6 & 5YR 5/8			SS-2	6	10	13	25	23
	4.0			4.0						
254.9		@2-ft: Very Stiff			SS-3	19	28	28	33	56
		RESIDUUM		6.0						
	7.5	Very Dense to Dense, Moist, Red/Yellow, Non-Plastic, SIlty Fine to Coarse SAND (SM/A-2-4) with Gravel, Munsell=2.5YR 5/8 & 2.5Y 7/6, with Gravel		8.0	SS-4	13	22	18	12	40
					SS-5	4	8	11	15	19
249.9		@6-ft: Yellowish Red, Munsell=5YR 5/8								
		@SS-4: LL=NP, PL=NP, PI=NP, NMC=12.9%, %#200=32.1								
		Very Stiff, Moist, Reddish Yellow, Low Plasticity, SILT (ML/A-5(10)) with Sand, Munsell=7.5YR 6/8		13.5	SS-6	5	7	9		16
244.9		@8-ft: Brownish Yellow/Red, Munsell=10YR 6/8 & 2.5YR 4/8								
		@13.5-ft: Red/Yellow, Munsell=2.5Y 4/6 & 10YR 7/6								
				18.5	SS-7	5	6	9		15
		@18.5-ft: Stiff, Reddish Yellow/Weak Red, Munsell=7.5YR 6/8 & 7.5R 4/4								
239.9		@SS-7: LL=41, PL=31, PI=10, NMC=26.5%, %#200=84.4								
	23.5			23.5						
		@SS-8: No Recovery			SS-8	4	7	8		15
234.9										
	28.5			28.5						
		Stiff, Moist, Yellowish Red, Non-Plastic, SILT (ML/A-4(0)) with Gravel, Munsell=5YR 5/8			SS-9	4	6	9		15
229.9		@SS-9: LL=NP, PL=NP, PI=NP, NMC=31.3%, %#200=78.3								
	33.5			33.5						

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-9
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I26RDB
Eng./Geo.:	C. Piercy	**Boring Location:**	6389+63	**Offset:**	155 L	**Alignment:**	Mainline
Elev.:	259.9 ft	**Latitude:**	34.037698	**Longitude:**	-81.112592	**Date Started:**	4/10/2018
Total Depth:	86 ft	**Soil Depth:**	63.6 ft	**Core Depth:**	22.4 ft	**Date Completed:**	4/11/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	NQ	**Driller:**	D. Harris	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	31.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
224.9		@SS-10: No Recovery			SS-10	5	7	9		16	
	38.5			38.5							
219.9		Very Stiff to Hard, Moist, Yellowish Red/Red, Low Plasticity, SILT (ML/A-5(5)), Munsell=5YR 5/8 & 7.5R 4/6			SS-11	7	8	11		19	
				43.5							
214.9		@43.5-ft: Brownish Yellow/Red, with Sand, Munsell=10YR 6/8 & 10R 5/8			SS-12	6	12	15		27	
				48.5							
209.9		@48.5-ft: Brownish Yellow/Light Gray, Munsell=10YR 6/8 & 2.5Y 7/1			SS-13	8	11	17		28	
				53.5							
204.9		=> Brownish Yellow, Munsell=10YR 7/6 @SS-14: LL=41, PL=36, PI=5, NMC=23.4%, %#200=75.2			SS-14	14	23	25		48	
				58.5							
199.9		@58.5-ft: Light Grayish Green, Munsell=5GY 6/2			SS-15	14	21	45		66	
	63.6			63.5	SS-16	50/1"				100+	>>
194.9		@63.5-ft: Greenish Gray, Munsell=10GY 6/1 **PHYLLITE** Metamorphic, Gray/Greenish Gray, Very Fine to Fine Grained, Thinly Laminated to		63.6	NQ-1						%REC=16, %RQD=0, RMR=N/A, GSI=0-5
				66.0							

LEGEND

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SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-9
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I26RDB
Eng./Geo.:	C. Piercy	**Boring Location:**	6389+63	**Offset:**	155 L	**Alignment:**	Mainline
Elev.:	259.9 ft	**Latitude:**	34.037698	**Longitude:**	-81.112592	**Date Started:**	4/10/2018
Total Depth:	86 ft	**Soil Depth:**	63.6 ft	**Core Depth:**	22.4 ft	**Date Completed:**	4/11/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	NQ	**Driller:**	D. Harris	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	31.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
189.9		Laminated Foliations, Quartz/Feldspar/Sericite, Highly Weathered, Numerous Joints, Moderately Wide, Filled (Clay), Planar/Irregular, Very Close, Smooth to Slightly Rough			NQ-2			%REC=44, %RQD=8, RMR=N/A, GSI=12-17
		=> with Quartz Veins		71.0				
		@NQ-2: Coarse to Very Fine Grained, Moderately to Highly Weathered, Joints Dip from 25° to 65°, Numerous Joints, Moderately Wide to Very Narrow, No Infilling, Stepped/Irregular, Very Close, Smooth to Slightly Rough			NQ-3			%REC=51, %RQD=0, RMR=N/A, GSI=12-17
184.9				76.0				
		@NQ-3: Fine to Very Fine Grained, Joints Dip from 10° to 70°, Numerous Joints, Moderately Wide to Narrow, Surface Stain (Chlorite), Planar/Irregular, Very Close, Smooth to Slightly Rough			NQ-4			%REC=36, %RQD=0, RMR=N/A, GSI=10-15
179.9		@NQ-4: Joints Dip from 20° to 80°, Numerous Joints, Moderately Wide to Very Narrow, Surface Stain (Chlorite), Planar/Stepped/Irregular, Very Close, Smooth to Slightly Rough		81.0				
		@NQ-5: Joints Dip from 20° to 80°, Numerous Joints, Moderately Wide to Very Narrow, Surface Stain (Chlorite), Planar/Stepped/Irregular, Very Close, Smooth to Slightly Rough			NQ-5			%REC=36, %RQD=0, RMR=N/A, GSI=10-15
174.9	86.0							
		Coring Terminated at 86.0 feet						
169.9								
164.9								
159.9								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-10
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	C. Piercy	**Boring Location:**	339+52	**Offset:**	78 R	**Alignment:**	Median CL
Elev.:	247.4 ft	**Latitude:**	34.036894	**Longitude:**	-81.111053	**Date Started:**	4/4/2018
Total Depth:	96 ft	**Soil Depth:**	96 ft	**Core Depth:**	0 ft	**Date Completed:**	4/5/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	11.6 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.3	TOPSOIL (4")		0.0	SS-1	1	3	3	1	6
	1.0	**FILL** Firm, Dry to Moist, Very Dark Brown, Low to Medium Plasticity, CLAY (CL/A-6), with Sand and Asphalt, Munsell=10YR 2/2		2.0	SS-2	4	3	3	3	6
242.4		**RESIDUUM** Firm, Moist, Yellow/Light Gray, Low Plasticity, Sandy SILT (ML/A-4(1)), Munsell=10YR 7/8 & 10YR 7/1		4.0	SS-3	5	7	12	15	19
		@4-ft: Very Stiff to Hard		6.0	SS-4	6	11	15	21	26
		@SS-3: LL=30, PL=28, PI=2, NMC=19.5%, %#200=66.9		8.0	SS-5	10	15	18	22	33
237.4		▼								
		@13.5-ft: Yellow, Munsell=2.5Y 7/8		13.5	SS-6	13	21	22		43
232.4										
	18.5	Hard, Moist, Yellow, Non-Plastic, SILT (ML/A-4(0)), Munsell=2.5Y 7/8		18.5	SS-7	15	27	36		63
227.4		@SS-7: LL=NP, PL=NP, PI=NP, NMC=22.9%, %#200=85.1								
				23.5	SS-8	21	39	50/4"		89+
	24.5	**PARTIALLY WEATHERED ROCK (PWR)**								
222.4		SAMPLED AS: Hard, Moist, Pale Brown/Light Gray, Non-Plastic to Low Plasticity, SILT (ML/A-4) with Sand, Munsell=2.5Y 7/4 & 2.5Y 7/1		28.5	SS-9	25	50/5.75"			100+
217.4										
	33.5			33.5						

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-10
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	C. Piercy	**Boring Location:**	339+52	**Offset:**	78 R	**Alignment:**	Median CL
Elev.:	247.4 ft	**Latitude:**	34.036894	**Longitude:**	-81.111053	**Date Started:**	4/4/2018
Total Depth:	96 ft	**Soil Depth:**	96 ft	**Core Depth:**	0 ft	**Date Completed:**	4/5/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	11.6 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
212.4		**RESIDUUM** Hard, Moist, Pale Brown/Light Gray, Non-Plastic to Low Plasticity, SILT (ML/A-4) with Sand, Munsell=2.5Y 7/4 & 2.5Y 7/1			SS-10	17	29	36		65
				38.5	SS-11	11	20	27		47
207.4										
				43.5	SS-12	18	33	50/5"		83+
	44.5									
202.4		**PARTIALLY WEATHERED ROCK (PWR)** SAMPLED AS: Hard, Moist, Pale Brown/Light Gray, Non-Plastic, SILT (ML/A-4(0)) with Sand, Munsell=2.5Y 7/4 & 2.5Y 7/1		48.5	SS-13	50/5"				100+
197.4										
				53.5	SS-14	50/4"				100+
192.4										
		@SS-15: LL=NP, PL=NP, PI=NP, NMC=23.5%, %#200=76.3		58.5	SS-15	45	50/4"			100+
187.4										
				63.5	SS-16	50/4.5"				100+
182.4										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-10
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	C. Piercy	**Boring Location:**	339+52	**Offset:**	78 R	**Alignment:**	Median CL
Elev.:	247.4 ft	**Latitude:**	34.036894	**Longitude:**	-81.111053	**Date Started:**	4/4/2018
Total Depth:	96 ft	**Soil Depth:**	96 ft	**Core Depth:**	0 ft	**Date Completed:**	4/5/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	11.6 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
177.4		@68.5-ft: with Gravel	68.5	SS-17	50/2"				100+
172.4			73.5	SS-18	50/2.5"				100+
167.4	78.5	SAMPLED AS: Hard, Moist, Gray, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), Munsell=2.5Y 6/1	78.5	SS-19	50/2"				100+
162.4	83.5	SAMPLED AS: Hard, Moist, Dark Gray, Non-Plastic to Low Plasticity, SILT (ML/A-4), with Sand, Munsell=2.5Y 4/1	83.5	SS-20	50/1.25"				100+
157.4			88.5	SS-21	50/2"				100+
152.4	96.0	Boring Terminated at 96.0 feet Due to Drilling Refusal at Top of Rock	93.5	SS-22	50/1.25"				100+
147.4									

SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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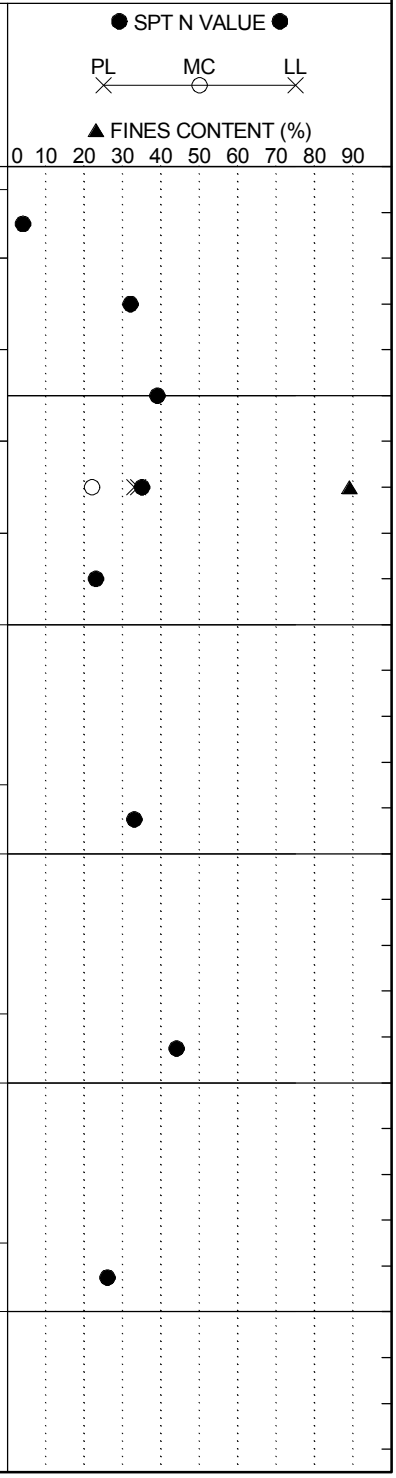
SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-11
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	341+66	**Offset:**	78 L	**Alignment:**	Median CL
Elev.:	254.0 ft	**Latitude:**	34.036706	**Longitude:**	-81.110209	**Date Started:**	4/9/2018
Total Depth:	105.8 ft	**Soil Depth:**	78.6 ft	**Core Depth:**	27.2 ft	**Date Completed:**	4/10/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	12.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Asphalt Ditch								
	0.5	ASPHALT (6")		0.5						
		FILL			SS-1	1	3	7		4
	2.0	Soft, Moist, Reddish Yellow/Very Pale Brown, Low Plasticity, SILT (ML/A-4), Micaceous, Munsell=5YR 6/6 & 10YR 7/4		2.0	SS-2	14	16	16	21	32
		RESIDUUM		4.0						
249.0		Very Stiff to Hard, Moist, Reddish Yellow/Very Pale Brown, Low Plasticity, SILT (ML/A-4(3)), Micaceous, Munsell=5YR 6/6 & 10YR 7/4			SS-3	17	19	20	24	39
		@SS-4: LL=34, PL=33, PI=1, NMC=22.1%, %#200=88.8		6.0	SS-4	7	17	18	20	35
				8.0	SS-5	6	9	14	18	23
244.0										
				13.5						
		@13.5-ft: Pink/Light Gray, Munsell=5YR 7/3 & 5YR 7/1			SS-6	9	16	17		33
239.0										
				18.5						
					SS-7	9	19	25		44
234.0										
				23.5						
					SS-8	9	10	16		26
229.0										
				28.5						



LEGEND

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SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-11
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	341+66	**Offset:**	78 L	**Alignment:**	Median CL
Elev.:	254.0 ft	**Latitude:**	34.036706	**Longitude:**	-81.110209	**Date Started:**	4/9/2018
Total Depth:	105.8 ft	**Soil Depth:**	78.6 ft	**Core Depth:**	27.2 ft	**Date Completed:**	4/10/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	12.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
		@28.5-ft: A-4(5)								
224.0		@SS-9: LL=34, PL=29, PI=5, NMC=27.3%, %#200=87.1			SS-9	5	8	11		19
				33.5						
		@33.5-ft: Reddish Yellow/Light Reddish Brown, Munsell=5YR 6/6 & 2.5YR 6/4			SS-10	12	21	31		52
219.0										
				38.5						
		@38.5-ft: Non-Plastic, A-4(0)			SS-11	15	30	49		79
		@SS-11: LL=NP, PL=NP, PI=NP, NMC=23.2%, %#200=78.2								
214.0										
	43.5	**PARTIALLY WEATHERED ROCK (PWR)**		43.5	SS-12	50/6"				100+
		SAMPLED AS: Very Dense, Moist, Light Brownish Gray, Non-Plastic, Sandy, Silty GRAVEL (GM/A-1), Munsell=2.5Y 6/2								
209.0										
	48.5			48.5						
		SAMPLED AS: Hard, Moist to Wet, Light Brownish Gray, Non-Plastic, SILT (ML/A-4(0)) with Sand, Micaceous, Munsell=2.5Y 6/2			SS-13	20	27	50/5"		77+
204.0		@SS-13: LL=NP, PL=NP, PI=NP, NMC=22.2%, %#200=72.0								
				53.5						
					SS-14	25	50/5.5"			100+
199.0										

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-11
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	341+66	**Offset:**	78 L	**Alignment:**	Median CL
Elev.:	254.0 ft	**Latitude:**	34.036706	**Longitude:**	-81.110209	**Date Started:**	4/9/2018
Total Depth:	105.8 ft	**Soil Depth:**	78.6 ft	**Core Depth:**	27.2 ft	**Date Completed:**	4/10/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	12.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
194.0				58.5	SS-15	50/4"	100+	>>
189.0				63.5	SS-16	50/2.5"	100+	>>
184.0				68.5	SS-17	50/4"	100+	>>
179.0				73.5	SS-18	50/1"	100+	>>
	78.6			78.5	SS-19	50/0.75"	100+	>>
		PHYLLITE		78.6				
		Metamorphic, White/Gray, Very Fine Grained, Laminated Foliation, Quartz/Feldspar/Sericite, Slightly to Moderately Weathered, Joints Dip from 15° to 70°, Few Joints, Moderately Wide to Very Narrow, No Infilling, Planar/Irregular, Very Close, Smooth to Slightly Rough		79.4	NQ-1			%REC=56, %RQD=0, RMR=N/A, GSI=18-23
174.0		@NQ-2: Weak Rock, Joints Dip from 10° to 70°, Few Joints, Very Narrow to Tight, Surface Stain/Partially Infilled (Clay/ Calcite), Wavy/Planar, Very Close, Smooth to Slightly Rough			NQ-2			@81.2-ft: UC Strength=860 psi %REC=83, %RQD=63, RMR=46, GSI=18-23
169.0				84.4				

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-11
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	341+66	**Offset:**	78 L	**Alignment:**	Median CL
Elev.:	254.0 ft	**Latitude:**	34.036706	**Longitude:**	-81.110209	**Date Started:**	4/9/2018
Total Depth:	105.8 ft	**Soil Depth:**	78.6 ft	**Core Depth:**	27.2 ft	**Date Completed:**	4/10/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	12.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" 2nd 6" 3rd 6" 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		@NQ-3: Slightly to Highly Weathered, Few Joints, Moderately Wide, No Infilling, Planar, Very Close, Smooth			NQ-3			%REC=3, %RQD=0, RMR=N/A, GSI=16-21
				89.4				
164.0		@NQ-4: Few Joints, Moderately Wide, No Infilling, Planar, Very Close, Smooth			NQ-4			%REC=3, %RQD=0, RMR=N/A, GSI=16-21
				94.4				
159.0		@NQ-5: Few Joints, Moderately Wide, No Infilling, Planar, Very Close, Smooth			NQ-5			%REC=5, %RQD=0, RMR=N/A, GSI=16-21
	99.4			99.4				
154.0		**PARTIALLY WEATHERED ROCK (PWR)** SAMPLED AS: Very Dense, Moist to Dry, Light Brownish Gray, Low Plasticity, Sandy SILT (ML/A-4(2)), Micaceous, Munsell=2.5Y 6/2			SS-20	38 50/4.5"	100+	>>
				104.4				
149.0		@SS-21: LL=30, PL=26, PI=4, NMC=13.7%, %#200=64.6			SS-21	11 48 50/5"	98+	
	105.8	Boring Terminated at 105.8 feet						
144.0								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-12
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RC1
Eng./Geo.:	R. Wessinger	**Boring Location:**	5161+53	**Offset:**	52 L	**Alignment:**	Mainline
Elev.:	271.0 ft	**Latitude:**	34.035422	**Longitude:**	-81.10975	**Date Started:**	4/17/2018
Total Depth:	98.8 ft	**Soil Depth:**	98.8 ft	**Core Depth:**	0 ft	**Date Completed:**	4/18/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** 10.0 ft	**24HR**	Cave

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Grassed Shoulder									
	0.3	TOPSOIL (4")		0.0	SS-1	2	3	5	7	8	
		FILL		2.0							
		Firm to Stiff, Moist, Light Red, Low Plasticity, SILT (ML/A-4(4)) with Sand, Micaceous, Munsell=10R 6/8			SS-2	4	5	9	6	14	
	4.0	@SS-1: LL=29, PL=23, PI=6, NMC=17.3%, %#200=77.2		4.0							
266.0					SS-3	6	7	6	5	13	
		@2-ft: with Gravel		6.0							
	7.0	Stiff, Moist, Light Red/Reddish Yellow, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4(1)), Micaceous, with Gravel, Munsell=2.5YR 7/8 & 5YR 7/8			SS-4	3	2	1	2	3	
				8.0							
					SS-5	WOH	1	1	1	2	
261.0		@6-ft: Soft									
		@SS-4: LL=27, PL=23, PI=4, NMC=20.6%, %#200=63.9									
		RESIDUUM									
	13.5	Very Loose, Moist to Wet, Brown/Reddish Yellow, Low Plasticity, Silty Fine SAND (SM/A-4(0)), Munsell=7.5YR 5/3 & 7.5YR 6/8		13.5	SS-6	9	11	15		26	
256.0		@SS-5: LL=30, PL=25, PI=5, NMC=20.2%, %#200=48.3									
				18.5							
		Very Stiff to Hard, Moist, Red/Reddish Yellow, Non-Plastic, Sandy SILT (ML/A-4(0)), Munsell=2.5YR 5/8 & 5YR 6/8			SS-7	16	25	34		59	
251.0		@18.5-ft: Reddish Yellow/Light Gray, Micaceous, Munsell=5YR 6/8 & 5YR 7/1									
				23.5							
		@SS-8: LL=NP, PL=NP, PI=NP, NMC=18.2%,%#200=58.9			SS-8	11	22	31		53	
246.0											
	28.5			28.5							
		Hard to Very Stiff, Moist, Olive Yellow, Low Plasticity, SILT (ML/A-5(10)), Munsell=2.5Y 6/8			SS-9	10	14	23		37	
241.0											
				33.5							

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-12
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RC1
Eng./Geo.:	R. Wessinger	**Boring Location:**	5161+53	**Offset:**	52 L	**Alignment:**	Mainline
Elev.:	271.0 ft	**Latitude:**	34.035422	**Longitude:**	-81.10975	**Date Started:**	4/17/2018
Total Depth:	98.8 ft	**Soil Depth:**	98.8 ft	**Core Depth:**	0 ft	**Date Completed:**	4/18/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** 10.0 ft	**24HR**	Cave

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
236.0		@33.5-ft: Olive Yellow/Light Gray, Munsell=2.5Y 6/8 & 2.5Y 7/1			SS-10	10	12	16		28
				38.5	SS-11	7	15	25		40
231.0										
				43.5	SS-12	13	17	23		40
226.0		@43.5-ft: Light Bluish Gray/Brownish Yellow, Munsell=GLEY2 7/10B & 10YR 6/6								
				48.5	SS-13	12	19	20		39
221.0		@48.5-ft: Light Bluish Gray, Munsell=GLEY2 7/10B @SS-13: LL=41, PL=31, PI=10, NMC=22.8%, %#200=86.2								
				53.5	SS-14	10	12	13		25
216.0		@53.5-ft: Light Olive Gray/Strong Brown, Munsell=5Y 6/2 & 7.5YR 5/8								
	59.0	**PARTIALLY WEATHERED ROCK (PWR)**		58.5	SS-15	24	50/6"			100+
211.0		SAMPLED AS: Hard, Moist, Light Olive Gray/Strong Brown, Non-Plastic to Low Plasticity, SILT (ML/A-4), Micaceous, Munsell=5Y 6/2 & 7.5YR 5/8								
				63.5	SS-16	29	50/3.5"			100+
206.0		@63.5-ft: Light Bluish Gray, Munsell=GLEY2 7/10B								

SPT N VALUE ●

PL ✕ MC ○ LL ✕

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

SS-15: >>

SS-16: >>

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-12
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RC1
Eng./Geo.:	R. Wessinger	**Boring Location:**	5161+53	**Offset:**	52 L	**Alignment:**	Mainline
Elev.:	271.0 ft	**Latitude:**	34.035422	**Longitude:**	-81.10975	**Date Started:**	4/17/2018
Total Depth:	98.8 ft	**Soil Depth:**	98.8 ft	**Core Depth:**	0 ft	**Date Completed:**	4/18/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** 10.0 ft	**24HR**	Cave

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
		@68.5-ft: Moist to Dry		68.5	SS-17	50/5"				100+
201.0										
		@73.5-ft: Very Stiff to Hard, Moist to Wet		73.5	SS-18	5	13	25		38
196.0										
		@78.5-ft: Gray, Munsell=5Y 6/1		78.5	SS-19	40	50/3.5"			100+
191.0										
		@83.5-ft: Gray, Munsell=5Y 5/1		83.5	SS-20	48	50/2.5"			100+
186.0										
				88.5	SS-21	42	50/2.5"			100+
181.0										
		@93.5-ft: Olive/Black, Munsell=5Y 4/3 & 5Y 2.5/1		93.5	SS-22	50/2.75"				100+
176.0										
	98.8			98.5	SS-23	50/4"				100+
		Boring Terminated at 98.8 feet								
171.0										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Overnight Soaking

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/25/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-13
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RCA
Eng./Geo.:	R. Wessinger	**Boring Location:**	5164+15	**Offset:**	36 L	**Alignment:**	Mainline
Elev.:	272.8 ft	**Latitude:**	34.03554	**Longitude:**	-81.108946	**Date Started:**	3/18/2018
Total Depth:	88.7 ft	**Soil Depth:**	88.7 ft	**Core Depth:**	0 ft	**Date Completed:**	3/19/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 23.0 ft	**24HR**	Cave 39.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.1	TOPSOIL (1")								
	1.1	ASPHALT (12")		1.6	SS-1	50/5"				100+
	1.5	GABC (5")		2.0						
		RESIDUUM			SS-2	5	4	6	7	10
	4.0	Stiff, Moist, Grayish Brown, Medium Plasticity, SILT (ML/A-7-5(12)), with Sand, Munsell=10YR 5/2		4.0	SS-3	5	6	5	8	11
267.8	6.0	@SS-2: LL=45, PL=33, PI=12, NMC=26.4%, %#200=80.6		6.0	SS-4	8	6	7	10	13
		Medium Dense, Moist, Yellowish Brown, Non-Plastic to Low Plasticity, Silty Fine SAND (SM), Munsell=10YR 5/4		8.0	SS-5	6	11	14	19	25
262.8		Stiff to Very Stiff, Moist, Red, Non-Plastic to Medium Plasticity, SILT (ML/A-4(0)), Munsell=10R 4/8		13.5	SS-6	4	6	7		13
		@13.5-ft: Micaceous								
257.8		@SS-6: LL=NP, PL=NP, PI=NP, NMC=29.1%, %#200=84.6		18.5	SS-7	4	6	6		12
		@18.5-ft: Yellow, Munsell=10YR 7/6								
252.8				23.5	SS-8	4	5	6		11
		@SS-8: LL=NP, PL=NP, PI=NP, NMC=32.8%, %#200=81.0								
247.8				28.5	SS-9	5	10	10		20
		@28.5-ft: Moist to Wet, Very Pale Brown, Munsell=10YR 7/3								
242.8				33.5						

SPT N VALUE ●

PL ✕ MC ○ LL ✕

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-13
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RCA
Eng./Geo.:	R. Wessinger	**Boring Location:**	5164+15	**Offset:**	36 L	**Alignment:**	Mainline
Elev.:	272.8 ft	**Latitude:**	34.03554	**Longitude:**	-81.108946	**Date Started:**	3/18/2018
Total Depth:	88.7 ft	**Soil Depth:**	88.7 ft	**Core Depth:**	0 ft	**Date Completed:**	3/19/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 23.0 ft	**24HR**	Cave 39.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
237.8		@33.5-ft: White/Reddish Yellow, Munsell=10YR 8/1 & 7.5YR 7/8			SS-10	3	4	6		10
				38.5						
		@38.5-ft: Low Plasticity, (A-5(9))			SS-11	3	4	5		9
232.8		@SS-11: LL=42, PL=34, PI=8, NMC=43.2%, %#200=81.6								
				43.5						
					SS-12	4	6	8		14
227.8										
				48.5						
		@48.5-ft: Hard, (A-4(3))			SS-13	5	17	30		47
222.8		@SS-13: LL=32, PL=27, PI=5, NMC=25.8%, %#200=72.6								
				53.5						
	54.5				SS-14	13	37	50/4.5"		87+
217.8		**PARTIALLY WEATHERED ROCK (PWR)** SAMPLED AS: Hard, Moist to Wet, Brownish Yellow/White, Non-Plastic, Sandy SILT (ML/A-4(0)), Micaceous, Munsell=10YR 6/6 & 10YR 8/1								
				58.5	SS-15	50/2"				100+
		@58.5-ft: Moist to Dry, Gray, Munsell=5Y 6/1								
212.8										
				63.5	SS-16	50/3"				100+
207.8										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-13
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RCA
Eng./Geo.:	R. Wessinger	**Boring Location:**	5164+15	**Offset:**	36 L	**Alignment:**	Mainline
Elev.:	272.8 ft	**Latitude:**	34.03554	**Longitude:**	-81.108946	**Date Started:**	3/18/2018
Total Depth:	88.7 ft	**Soil Depth:**	88.7 ft	**Core Depth:**	0 ft	**Date Completed:**	3/19/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 23.0 ft	**24HR**	Cave 39.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
202.8		@SS-17: LL=NP, PL=NP, PI=NP, NMC=18.6%, %#200=68.4		68.5	SS-17	23	22	50/2.5"		72+
197.8		@73.5-ft: Moist to Wet, White, Munsell=5Y 8/1		73.5	SS-18	50/3.5"				100+
192.8		@78.5-ft: White, Munsell=2.5Y 8.5/1		78.5	SS-19	50/5"				100+
187.8		@83.5-ft: Moist, Light Gray, Munsell=5Y 7/1		83.5	SS-20	50/4.5"				100+
182.8	88.7	@88.5-ft: Bluish Gray, Munsell=10B 6/1 Boring Terminated at 88.7 feet		88.5	SS-21	50/2.5"				100+
177.8										
172.8										

SPT N VALUE ●

PL ✕ MC ○ LL ✕

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/24/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-14
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I26RBD
Eng./Geo.:	R. Wessinger	**Boring Location:**	4353+87	**Offset:**	96 L	**Alignment:**	Mainline
Elev.:	269.6 ft	**Latitude:**	34.035105	**Longitude:**	-81.109222	**Date Started:**	3/14/2018
Total Depth:	55 ft	**Soil Depth:**	55 ft	**Core Depth:**	0 ft	**Date Completed:**	3/14/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 17.0 ft	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.3	TOPSOIL (4")		0.0	SS-1	4	4	3	3	7
		FILL								
		Firm, Moist, Light Reddish Brown, Medium Plasticity, SILT (ML/A-7-5(12)), Munsell=2.5YR 7/2		2.0	SS-2	4	4	4	5	8
		@2-ft: Pale Red, Munsell=2.5YR 7/2								
264.6		@4-ft: Red, Munsell=10R 5/8		4.0	SS-3	3	3	3	2	6
		@6-ft: Moist to Wet								
		@SS-4: LL=43, PL=32, PI=11, NMC=30.5%, %#200=88.5		6.0	SS-4	2	2	4	4	6
	8.0			8.0	SS-5	1	2	3	2	5
		RESIDUUM								
259.6		Loose, Moist, Dark Reddish Gray, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-2), Munsell=2.5YR 3/1								
	13.5			13.5	SS-6	5	7	10		17
254.6		Very Stiff, Moist to Wet, Dark Reddish Gray, High Plasticity, Fat CLAY (CH/A-7-6(20)) with Sand, Munsell=2.5YR 3/1								
		@SS-6: LL=52, PL=26, PI=26, NMC=23.2%, %#200=82.6								
	18.5			18.5	SS-7	4	7	9		16
249.6		Very Stiff to Hard, Moist to Wet, Dark Reddish Gray, Low Plasticity, SILT (ML/A-4(8)), Munsell=2.5YR 3/1								
		@SS-7: LL=39, PL=30, PI=9, NMC=26.3%, %#200=87.3								
				23.5	SS-8	8	11	14		25
		@23.5-ft: Moist to Dry, Non-Plastic A-4(0)								
244.6		@SS-8: LL=NP, PL=NP, PI=NP, NMC=21.7%, %#200=96.5								
				28.5	SS-9	5	12	15		27
		@28.5-ft: Very Pale Brown/White, Munsell=10R 8/2 & 10YR 8/1								
239.6										
				33.5						

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

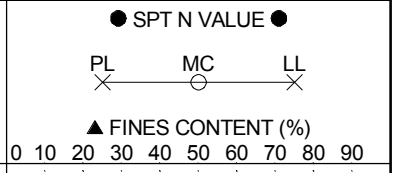
Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-14
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I26RBD
Eng./Geo.:	R. Wessinger	**Boring Location:**	4353+87	**Offset:**	96 L	**Alignment:**	Mainline
Elev.:	269.6 ft	**Latitude:**	34.035105	**Longitude:**	-81.109222	**Date Started:**	3/14/2018
Total Depth:	55 ft	**Soil Depth:**	55 ft	**Core Depth:**	0 ft	**Date Completed:**	3/14/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 17.0 ft	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
234.6					SS-10	5	7	10		17
				38.5						
		@38.5-ft: Low Plasticity, A-4(8)			SS-11	6	9	10		19
229.6		@SS-11: LL=38, PL=31, PI=7, NMC=28.5%, %#200=94.0								
				43.5						
		@43.5-ft: Very Pale Brown, Munsell=10YR 8/2			SS-12	7	8	14		22
224.6										
				48.5						
		@48.5-ft: White, Munsell=7.5YR 8/1			SS-13	11	19	24		43
219.6										
				53.5						
		@53.5-ft: White, Munsell=10YR 8/1			SS-14	9	13	19		32
214.6	55.0	Boring Terminated at 55.0 feet								
209.6										
204.6										



LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-14A
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I26RBD
Eng./Geo.:	R. Wessinger	**Boring Location:**	4353+85	**Offset:**	92 L	**Alignment:**	Mainline
Elev.:	269.6 ft	**Latitude:**	34.035092	**Longitude:**	-81.109222	**Date Started:**	5/14/2018
Total Depth:	88.8 ft	**Soil Depth:**	88.8 ft	**Core Depth:**	0 ft	**Date Completed:**	5/14/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Grassed Shoulder									
		DRILL TO 83.5-FT WITHOUT SPLIT SPOON SAMPLING									
264.6											
259.6											
254.6											
249.6											
244.6											
239.6											
234.6											
229.6											
224.6											

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-14A
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I26RBD
Eng./Geo.:	R. Wessinger	**Boring Location:**	4353+85	**Offset:**	92 L	**Alignment:**	Mainline
Elev.:	269.6 ft	**Latitude:**	34.035092	**Longitude:**	-81.109222	**Date Started:**	5/14/2018
Total Depth:	88.8 ft	**Soil Depth:**	88.8 ft	**Core Depth:**	0 ft	**Date Completed:**	5/14/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
219.6										
214.6										
209.6										
204.6										
199.6	70.0	**PARTIALLY WEATHERED ROCK (PWR)** *Estimated PWR Based on Hard Drilling/Previous Holes*								
194.6										
189.6				83.5	SS-1	50/1.25"				100+
184.6										
179.6	88.8	Boring Terminated at 88.8 feet Due to Drilling Refusal at Top of Rock		88.8	SS-2	50/0.25"				100+

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/25/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-15
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RC2
Eng./Geo.:	M. Miller/C. Piercy	**Boring Location:**	5163+92	**Offset:**	14 L	**Alignment:**	Mainline
Elev.:	275.3 ft	**Latitude:**	34.034225	**Longitude:**	-81.108953	**Date Started:**	4/20/2018
Total Depth:	100 ft	**Soil Depth:**	100 ft	**Core Depth:**	0 ft	**Date Completed:**	4/24/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	Cave 51.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
		FILL		0.0	SS-1	6	7	6	5	13
		Medium Dense to Dense, Moist, Dark Yellowish Brown, Low to Medium Plasticity, Clayey Fine to Medium SAND (SC/A-4), with Gravel, Munsell=10YR 4/4		2.0						
	4.0			4.0	SS-2	5	6	8	13	14
270.3		@2.5-ft: Red, Munsell=2.5YR 4/6			SS-3	15	21	26	30	47
		RESIDUUM		6.0						
		Hard to Very Stiff, Moist, Red, Medium Plasticity, Elastic SILT (MH/A-7-5(20)), Munsell=10YR 4/6			SS-4	8	13	18	20	31
				8.0						
					SS-5	5	8	10	11	18
265.3		@SS-4: LL=67, PL=47, PI=20, NMC=31.2%, %#200=96.5								
				13.5						
		@13.5-ft: Dry, Red, Low Plasticity, A-5(12), Munsell=2.5YR 5/6			SS-6	3	4	8		12
260.3		@SS-6: LL=51, PL=42, PI=9, NMC=31.8%, %#200=93.1								
				18.5						
					SS-7	5	8	11		19
255.3										
	23.5			23.5						
		Very Stiff, Dry, Red, Non-Plastic to Low Plasticity, SILT (ML/A-4), Munsell=2.5YR 5/6			SS-8	4	7	11		18
250.3										
	28.5			28.5						
		Medium Dense, Moist, Light Olive Brown, Low Plasticity, Silty Coarse SAND (SM/A-5(2)) with Gravel, Munsell=2.5Y 5/3			SS-9	8	8	11		19
245.3		@SS-9: LL=42, PL=35, PI=7, NMC=18.2%, %#200=49.7								
	32.0			33.5						
		Very Stiff to Hard, Dry, Light Olive Brown, Low Plasticity, SILT (ML/A-4(6)), Munsell=2.5Y 5/3			SS-10	5	8	14		22
240.3										
				38.5						

SPT N VALUE ●

PL ✕ MC ○ LL ✕

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-15
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RC2
Eng./Geo.:	M. Miller/C. Piercy	**Boring Location:**	5163+92	**Offset:**	14 L	**Alignment:**	Mainline
Elev.:	275.3 ft	**Latitude:**	34.034225	**Longitude:**	-81.108953	**Date Started:**	4/20/2018
Total Depth:	100 ft	**Soil Depth:**	100 ft	**Core Depth:**	0 ft	**Date Completed:**	4/24/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	Cave 51.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
235.3		@38.5-ft: with Rock Fragments (Quartz)		SS-11	4	8	15		23
			43.5						
230.3		@43.5-ft: Moist, Light Brownish Gray/Yellowish Red, Munsell=2.5Y 6/2 & 5YR 5/6		SS-12	10	16	20		36
			48.5						
225.3		@SS-13: LL=33, PL=28, PI=5, NMC=28.1%, %#200=92.5		SS-13	7	13	19		32
			53.5						
	54.5			SS-14	31	49	50/3"		99+
220.3		**PARTIALLY WEATHERED ROCK (PWR)** SAMPLED AS: Hard, Moist, Light Brownish Gray/Yellowish Red, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), Munsell=2.5Y 6/2 & 5YR 5/6	58.5	SS-15	50/3.5"				100+
215.3									
	63.5		63.5	SS-16	21	50/3.5"			100+
210.3		SAMPLED AS: Very Dense, Moist, Grayish Olive, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2), Munsell=10Y 5/2							
	68.5		68.5	SS-17	17	26	50/5"		76+
205.3		**RESIDUUM** Hard, Moist, Grayish Olive, Non-Plastic to Low Plasticity, SILT (ML/A-4), with Sand, Munsell=10Y 5/2							
			73.5						
200.3		@73.5-ft: Light Grayish Olive, Munsell=10Y 6/2		SS-18	20	26	37		63

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-15
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RC2
Eng./Geo.:	M. Miller/C. Piercy	**Boring Location:**	5163+92	**Offset:**	14 L	**Alignment:**	Mainline
Elev.:	275.3 ft	**Latitude:**	34.034225	**Longitude:**	-81.108953	**Date Started:**	4/20/2018
Total Depth:	100 ft	**Soil Depth:**	100 ft	**Core Depth:**	0 ft	**Date Completed:**	4/24/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	Cave 51.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		@78.5-ft: Light Grayish Olive/Light Yellowish Brown, Munsell=10Y 6/2 & 2.5Y 6/4		78.5	SS-19	17	27	48		75	
195.3											
		@83.5-ft: Light Yellowish Brown/Gray/Reddish Yellow, Munsell=2.5Y 6/4, 2.5Y 6/1 & 7.5YR 6/6		83.5	SS-20	10	18	21		39	
190.3											
	89.0	**PARTIALLY WEATHERED ROCK (PWR)**		88.5	SS-21	33	50/4"			100+	*Slow Drilling* >>
185.3		SAMPLED AS: Hard, Moist, Light Gray Olive/Yellow, Non-Plastic to Low Plasticity, SILT (ML/A-4), Munsell=10Y 6/2 & 10YR 7/6		93.5	SS-22	33	50/3.25"			100+	>>
180.3											
	98.5	**RESIDUUM**		98.5	SS-23	6	12	16		28	
175.3	100.0	Very Stiff, Moist, Brownish Yellow/Greenish Gray, Non-Plastic, SILT (ML/A-4), with Sand, Munsell=10YR 6/8 & 5GY 5/1									
		Boring Terminated at 100.0 feet									
170.3											
165.3											
160.3											

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-16
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20CDW2
Eng./Geo.:	R. Wessinger	**Boring Location:**	7149+55	**Offset:**	55 R	**Alignment:**	Mainline
Elev.:	217.9 ft	**Latitude:**	34.036116	**Longitude:**	-81.11427	**Date Started:**	5/15/2018
Total Depth:	103.6 ft	**Soil Depth:**	103.6 ft	**Core Depth:**	0 ft	**Date Completed:**	5/16/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 30.0 ft	**24HR**	40.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.5	TOPSOIL (6")		0.0	SS-1	8	9	9	9	18
		FILL		2.0						
		Very Stiff, Dry to Moist, Light Reddish Brown, Non-Plastic, Sandy SILT (ML/A-4(0)), with Quartz Fragments, Munsell=2.5YR 7/4			SS-2	7	9	11	16	20
212.9		@ SS-2: LL=NP, PL=NP, PI=NP, NMC=7.3%, %#200=66.0		4.0	SS-3	11	14	16	18	30
		@4-ft: Pink, Munsell=7.5YR 7/4		6.0	SS-4	12	14	14	20	28
		@6-ft: Red/Pink, with Sand, Micaceous, Munsell=10R 5/6 & 10R 8/4		8.0	SS-5	6	10	14	15	24
207.9		@8-ft: Moist, Red/White, Munsell=10R 5/6 & 10R 8/1								
	13.5	**RESIDUUM**		13.5	SS-6	4	6	7		13
202.9		Stiff to Firm, Moist, Brownish Yellow, Non-Plastic, Sandy SILT (ML/A-4(0)) with Gravel, Munsell=10YR 6/6								
		@SS-6: LL=NP, PL=NP, PI=NP, NMC=17.0%, %#200=61.3		18.5	SS-7	2	2	4		6
197.9		@18.5-ft: Moist to Wet, Gray, Low Plasticity, Munsell=10YR 5/1								
		@SS-7: LL=17, PL=15, PI=2, NMC=12.8%, %#200=50.5								
	23.5	Stiff to Firm, Moist, Yellowish Brown/White, Non-Plastic, SILT (ML/A-4(0)) with Sand, Micaceous, Munsell=10YR 5/8 & 10YR 8/1		23.5	SS-8	2	4	6		10
192.9		@SS-8: LL=NP, PL=NP, PI=NP, NMC=27.1%, %#200=74.2								
		@28.5-ft: Strong Brown, Munsell=7.5YR 5/6		28.5	SS-9	2	3	5		8
187.9		▽								
		@33.5-ft: Reddish Yellow, Low Plasticity, A-5(4), Munsell=7.5YR 7/8		33.5	SS-10	1	2	7		9
182.9		@SS-10: LL=41, PL=39, PI=2, NMC=46.9%, %#200=79.7								
	38.5			38.5						

SPT N VALUE ●

PL ✕ MC ○ LL ✕

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-16
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20CDW2
Eng./Geo.:	R. Wessinger	**Boring Location:**	7149+55	**Offset:**	55 R	**Alignment:**	Mainline
Elev.:	217.9 ft	**Latitude:**	34.036116	**Longitude:**	-81.11427	**Date Started:**	5/15/2018
Total Depth:	103.6 ft	**Soil Depth:**	103.6 ft	**Core Depth:**	0 ft	**Date Completed:**	5/16/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 30.0 ft	**24HR**	40.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
177.9		Very Dense, Moist to Wet, Reddish Yellow, Non-Plastic to Low Plasticity, Silty, Sandy GRAVEL (GM/A-1), (Quartz Seam), Munsell=7.5YR 7/8			SS-11	20	47	50/5.5"		97+
	43.5			43.5	SS-12	12	11	18		29
172.9		Very Stiff to Hard, Moist, Very Pale Brown/White, Non-Plastic, SILT (ML/A-4(0)) with Sand, Micaceous, Munsell=10YR 8/4 & 10YR 8/1								
				48.5	SS-13	9	11	16		27
167.9		@SS-13: LL=NP, PL=NP, PI=NP, NMC=28.7%, %#200=81.5								
				53.5	SS-14	11	15	22		37
162.9										
				58.5	SS-15	11	17	23		40
157.9		@58.5-ft: White/Reddish Yellow, Munsell=7.5YR 8/1 & 7.5YR 7/8								
				63.5	SS-16	14	38	50/5"		88+
152.9										
				68.5	SS-17	31	50/5.5"			100+
147.9										
				73.5	SS-18	17	31	32		63
142.9										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-16
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20CDW2
Eng./Geo.:	R. Wessinger	**Boring Location:**	7149+55	**Offset:**	55 R	**Alignment:**	Mainline
Elev.:	217.9 ft	**Latitude:**	34.036116	**Longitude:**	-81.11427	**Date Started:**	5/15/2018
Total Depth:	103.6 ft	**Soil Depth:**	103.6 ft	**Core Depth:**	0 ft	**Date Completed:**	5/16/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 30.0 ft	**24HR**	40.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
137.9		@78.5-ft: Light Gray/Brownish Yellow, Munsell=10YR 7/1 & 10YR 6/8 @SS-19: LL=NP, PL=NP, PI=NP, NMC=24.6%, %#200=80.4		78.5	SS-19	8	18	23		41
	83.5	**PARTIALLY WEATHERED ROCK (PWR)**		83.5	SS-20	50/4"				100+
132.9		SAMPLED AS: Hard, Moist, Light Gray/Brownish Yellow, Non-Plastic to Low Plasticity, SILT (ML/A-4), Munsell=10YR 7/1 & 10YR 6/8								
	88.5			88.5	SS-21	21	34	50/4"		84+
127.9		SAMPLED AS: Hard, Moist, Strong Brown/White, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), Munsell=7.5YR 5/8 & 7.5YR 8/1								
				93.5	SS-22	50/5.5"				100+
122.9										
	98.5			98.5	SS-23	50/3.5"				100+
117.9		SAMPLED AS: Hard, Moist, White/Light Brown, Non-Plastic to Low Plasticity, SILT (ML/A-4) with Sand, Micaceous, Munsell=10YR 7.5YR 8/1 & 7.5YR 6/4								
	103.6			103.5	SS-24	50/0.75"				100+
		Boring Terminated at 103.6 feet Due to Drilling Refusal at Top of Rock								
112.9										
107.9										
102.9										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/25/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-17
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RAC
Eng./Geo.:	C. Piercy	**Boring Location:**	3150+78	**Offset:**	17 L	**Alignment:**	Mainline
Elev.:	233.1 ft	**Latitude:**	34.036423	**Longitude:**	-81.112998	**Date Started:**	418/2018
Total Depth:	104.5 ft	**Soil Depth:**	84.5 ft	**Core Depth:**	20 ft	**Date Completed:**	4/19/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	29.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.2	TOPSOIL (2")		0.0	SS-1	1	4	4	6	8
		RESIDUUM		2.0						
		Firm to Stiff, Moist, Very Pale Brown/Pale Red, Low Plasticity, SILT (ML/A-4(3)) with Sand, Munsell=10YR 8/4 & 10R 7/4			SS-2	5	7	6	6	13
228.1		@2-ft: Very Pale Brown/Light Gray, Munsell=10YR 8/4 & 10YR 7/1		4.0	SS-3	7	6	6	7	12
		@SS-2: LL=32, PL=27, PI=5, NMC=14.2%, %#200=70.8		6.0	SS-4	4	4	5	6	9
	8.0			8.0	SS-5	2	4	6	9	10
223.1		Stiff, Moist, Yellow/Gray, Medium Plasticity, Elastic SILT (MH/A-7-5(16))) with Sand , Munsell=10YR 7/6 & 10YR 6/1								
		@SS-5: LL=53, PL=35, PI=18, NMC=22.9%, %#200=76.5								
	13.5			13.5	SS-6	5	6	8		14
218.1		Stiff to Very Stiff, Moist, Reddish Yellow/Pink, Low Plasticity, SILT (ML/A-4(3)), Munsell=7.5YR 6/8 & 5YR 7/4								
		@18.5-ft: Gray/Yellow, Munsell=2.5Y 6/1 & 10YR 7/6		18.5	SS-7	3	5	7		12
213.1		@SS-7: LL=38, PL=37, PI=1, NMC=30.0%, %#200=87.4								
		@23.5-ft: Reddish Yellow/Bluish Gray, with Weathered Rock (Phyllite) Fragments, Munsell=7.5YR 6/6 & 5PB 6/1		23.5	SS-8	5	9	10		19
208.1										
		@28.5-ft: Pale Yellow, Munsell=5Y 8/3		28.5	SS-9	10	20	25		45
203.1										
		@33.5-ft: Hard to Very Stiff, Light Bluish Gray, Munsell=5PB 7/1		33.5	SS-10	7	16	22		38
198.1										
	38.5			38.5						

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

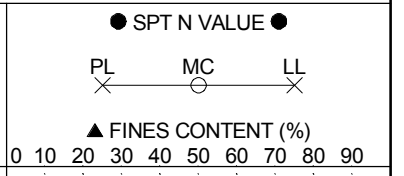
Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-17
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RAC
Eng./Geo.:	C. Piercy	**Boring Location:**	3150+78	**Offset:**	17 L	**Alignment:**	Mainline
Elev.:	233.1 ft	**Latitude:**	34.036423	**Longitude:**	-81.112998	**Date Started:**	418/2018
Total Depth:	104.5 ft	**Soil Depth:**	84.5 ft	**Core Depth:**	20 ft	**Date Completed:**	4/19/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	29.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
193.1		Very Stiff, Moist Light Bluish Gray/Light Yellowish Brown, Low Plasticity, Gravelly SILT (ML/A-4(4)) with Sand, Munsell=5PB 7/1 & 10YR 6/4		SS-11	11	13	14		27
		@SS-11: LL=37, PL=27, PI=10, NMC=20.4%, %#200=58.4							
	43.5		43.5						
188.1		Hard to Very Stiff, Moist, Light Gray/Reddish Yellow, Non-Plastic to Low Plasticity, SILT (ML/A-4), Munsell=7.5YR 7/1 & 7.5YR 6/6		SS-12	24	38	50/5"		88+
			48.5						
		@48.5-ft: Strong Brown/Light Gray, Munsell=7.5YR 5/8 & 7.5YR 7/1		SS-13	7	12	19		31
183.1									
		@53-ft: Light Gray, Munsell=5Y 7/1	53.5						
	54.5			SS-14	20	35	50/5"		85+
178.1		**PARTIALLY WEATHERED ROCK (PWR)** SAMPLED AS: Very Dense, Moist, Light Reddish Brown/Light Yellowish Brown, Low Plasticity, Silty SAND (SM/A-4(0)) with Gravel, Munsell=2.5YR 7/4 & 2.5Y 6/3							
	58.5		58.5						
		@SS-14: LL=28, PL=26, PI=2, NMC=18.5%, %#200=45.4		SS-15	22	36	50/5"		86+
173.1									
		SAMPLED AS: Hard, Moist, Light Gray, Low Plasticity, Sandy, Silty CLAY (CL-ML/A-4(1)), Munsell=5Y 7/1	63.5						
		@SS-16: LL=24, PL=19, PI=5, NMC=21.1%, %#200=63.8		SS-16	31	42	50/4.5"		92+
168.1		@63.5-ft: Light Gray, Munsell=5Y 6/1							
	68.5		68.5	SS-17	50/4"				100+
163.1		SAMPLED AS: Very Dense, Moist, Gray/Very Pale Brown, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2), Munsell=5Y 5/1 & 10YR 7/4							
	73.5		73.5	SS-18	50/3"				100+
158.1		SAMPLED AS: Hard, Moist, Light Gray, Non-Plastic to Low Plasticity, SILT (ML/A-4), with Sand, Munsell=10YR 7/1							



LEGEND

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SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-17
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RAC
Eng./Geo.:	C. Piercy	**Boring Location:**	3150+78	**Offset:**	17 L	**Alignment:**	Mainline
Elev.:	233.1 ft	**Latitude:**	34.036423	**Longitude:**	-81.112998	**Date Started:**	418/2018
Total Depth:	104.5 ft	**Soil Depth:**	84.5 ft	**Core Depth:**	20 ft	**Date Completed:**	4/19/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	29.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%)
153.1			78.5	SS-19	34 50/4.5"	100+	>>
	83.5		83.5	SS-20	50/1"	100+	>>
	84.5	SAMPLED AS: Very Dense, Moist, Gray/Yellow, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2), Munsell=10YR 6/1 & 10YR 7/6	84.4	SS-21	50/0.75"	100+	>>
148.1	86.0	**QUARTZ/FELDSPAR VEIN** Metamorphic, Light Gray/Pink, Coarse to Fine Grained, Laminated Foliation, Quartz/Feldspar/Sericite, Highly to Slightly Weathered, Joints Dip from 10° to 60°, Numerous Joints, Moderately Wide to Narrow, Surface Stain (Clay/Iron Oxide), Irregular, Very Close, Smooth to Rough	84.5	NQ-1			%REC=33, %RQD=0, RMR=N/A, GSI=5-10
			86.0	NQ-2			%REC=100, %RQD=77, RMR=45, GSI=20-25 @88.8-ft: UC Strength=730 psi
143.1			91.0	NQ-3			%REC=100, %RQD=95, RMR=62, GSI=20-25
138.1		**PHYLLITE** Metamorphic, Light Gray, Fine to Very Fine Grained, Laminated Foliation, Quartz/Feldspar/Sericite, Moderately to Slightly Weathered, Weak Rock, Joints Dip from 20° to 60°, Occasional Joints, Very Narrow to Tight, Spotty (Calcite/Iron Oxide), Wavy/Planar, Very Close, Smooth to Slightly Rough	96.0				@95.6-ft: UC Strength=3,300 psi
				NQ-4			%REC=92, %RQD=82, RMR=N/A, GSI=20-25
133.1		@NQ-3: Weak Rock, Joints Dip from 20° to 60°, Few Joints, Very Narrow to Tight, Spotty (Clay/Calcite), Wavy/Planar, Very Close, Smooth to Slightly Rough	101.0	NQ-5			%REC=100, %RQD=71, RMR=N/A, GSI=20-25
	104.5	@NQ-4: Joints Dip from 10° to 40°, Occasional Joints, Moderately Wide to Very Narrow, No Infilling, Planar/Stepped/Irregular, Very Close, Slightly Rough					
128.1		@NQ-5: Joints Dip from 20° to 75°, Occasional Joints, Narrow to Very Narrow, No Infilling, Planar/Irregular, Very Close, Smooth to Slightly Rough					
123.1		Coring Terminated at 104.5 feet					
118.1							

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-18
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-20
Eng./Geo.:	R. Wessinger	**Boring Location:**	154+03	**Offset:**	100 R	**Alignment:**	Median CL
Elev.:	236.5 ft	**Latitude:**	34.035968	**Longitude:**	-81.112527	**Date Started:**	4/20/2018
Total Depth:	95.1 ft	**Soil Depth:**	73.6 ft	**Core Depth:**	21.5 ft	**Date Completed:**	4/25/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	NQ	**Driller:**	D. Harris	**Groundwater:**	**TOB** 15.0 ft	**24HR**	17.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
		RESIDUUM		0.0	SS-1	4	6	9	11	15
		Stiff, Dry to Moist, Pink/White, Low Plasticity, Sandy SILT (ML/A-4(5)), Micaceous, Munsell=2.5YR 8/4 & 2.5YR 8/1		2.0	SS-2	12	19	24	30	43
		@SS-1: LL=35, PL=27, PI=8, NMC=11.3%, %#200=66.9		4.0	SS-3	26	33	46	50	79
231.5		@-2-ft: Hard to Very Stiff, Dry, Light Gray, Munsell=5Y 7/1		6.0	SS-4	17	23	33	40	56
		@4-ft: Very Pale Brown, Munsell=10YR 7/4		8.0	SS-5	9	28	47	50/5"	75
		@6-ft: Moist, Brownish Yellow, Munsell=10YR 6/6								
226.5										
				13.5						
		@13.5-ft: Non-Plastic, A-4(0)			SS-6	5	15	8		23
221.5		▽@SS-6: LL=NP, PL=NP, PI=NP, NMC=23.4%, %#200=69.7								
				18.5						
		@18.5-ft: Moist to Wet, Light Bluish Gray, Munsell=10B 7/1			SS-7	26	27	29		56
216.5										
				23.5						
	24.5				SS-8	15	27	50/4.5"		77+
211.5		**PARTIALLY WEATHERED ROCK (PWR)**								
		SAMPLED AS: Hard, Moist, Light Bluish Gray, Non-Plastic to Low Plasticity, SILT (ML/A-4), Micaceous, Munsell=10B 7/1		28.5	SS-9	15	50/6"			100+
206.5										
	33.5			33.5						

SPT N VALUE ●

PL ✕ MC ○ LL ✕

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-18
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-20
Eng./Geo.:	R. Wessinger	**Boring Location:**	154+03	**Offset:**	100 R	**Alignment:**	Median CL
Elev.:	236.5 ft	**Latitude:**	34.035968	**Longitude:**	-81.112527	**Date Started:**	4/20/2018
Total Depth:	95.1 ft	**Soil Depth:**	73.6 ft	**Core Depth:**	21.5 ft	**Date Completed:**	4/25/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	NQ	**Driller:**	D. Harris	**Groundwater:**	**TOB** 15.0 ft	**24HR**	17.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
201.5		**RESIDUUM** Hard, Moist, Light Bluish Gray, Low Plasticity, Clayey Coarse SAND (SC/A-4(1)) with Gravel, Munsell=5B 7/1 @SS-10: LL=33, PL=23, PI=10, NMC=16.6%, %#200=38.9			SS-10	20	23	41		64
				38.5						
196.5		@38.5-ft: Yellowish Red/Light Gray, Munsell=5YR 5/8 & 5YR 7/1			SS-11	11	16	39		55
	43.5	**PARTIALLY WEATHERED ROCK (PWR)** SAMPLED AS: Very Dense, Moist, Gray, Non-Plastic to Low Plasticity, Silty Fine SAND (SM/A-2), Munsell=5Y 6/1		43.5	SS-12	50/2"				100+
191.5										
		@48.5-ft: Light Gray, Munsell=5Y 7/1		48.5	SS-13	50/2.25"				100+
186.5										
				53.5	SS-14	50/1.5"				100+
181.5										
	58.5	SAMPLED AS: Hard, Moist, Light Gray/Very Pale Brown, Non-Plastic to Low Plasticity, SILT (ML/A-4), Micaceous, Munsell=10YR 7/1 & 10YR 8/4		58.5	SS-15	50/3"				100+
176.5										
		@63.5-ft: with Sand and Gravel		63.5	SS-16	50/1.5"				100+
171.5										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-18
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-20
Eng./Geo.:	R. Wessinger	**Boring Location:**	154+03	**Offset:**	100 R	**Alignment:**	Median CL
Elev.:	236.5 ft	**Latitude:**	34.035968	**Longitude:**	-81.112527	**Date Started:**	4/20/2018
Total Depth:	95.1 ft	**Soil Depth:**	73.6 ft	**Core Depth:**	21.5 ft	**Date Completed:**	4/25/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	NQ	**Driller:**	D. Harris	**Groundwater:**	**TOB** 15.0 ft	**24HR**	17.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	68.5	SAMPLED AS: Very Dense, Moist, Bluish Gray, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2), Munsell=10PB 6/1	68.5	SS-17	50/1.5"	100+	>>
166.5							
	73.6	**PHYLLITE**	73.5	SS-18	50/<1"	100+	>>
			73.6	NQ-1			%REC=67, %RQD=44, RMR=N/A, GSI=13-18
161.5		Metamorphic, White/Pale Yellowish Red, Very Fine Grained, Laminated Foliation, Quartz/Feldspar/Sericite, Slightly to Highly Weathered, Joints Dip from 10° to 70°, Occasional Joints, Moderately Wide to Narrow, Surface Stain (Iron Oxide), Planar/Stepped, Very Close, Smooth to Slightly Rough	75.1				
				NQ-2			%REC=98, %RQD=42, RMR=N/A, GSI=13-18
156.5		@NQ-2: Joints Dip from 10° to 75°, Numerous Joints, Moderately Wide to Very Narrow, Surface Stain (Iron Oxide), Planar/Irregular, Very Close, Smooth to Slightly Rough	80.1				
				NQ-3			@81.6-ft: UC Strength=580 psi %REC=42, %RQD=32, RMR=41, GSI=13-18 @83.5-85.0-ft: Mud Seam
151.5		@NQ-3: White/Reddish Yellow, Coarse to Very Fine Grained, Moderately to Highly Weathered, Very Weak Rock, Joints Dip from 10° to 70°, Few Joints/Foliations, Very Narrow to Tight, Surface Stain/Partially Filled (Iron Oxide/Quartz), Wavy/Planar, Very Close, Smooth to Slightly Rough	85.1				
				NQ-4			@86.2-ft: UC Strength=1,030 psi %REC=80, %RQD=53, RMR=36, GSI=13-18
146.5		@NQ-4: Light Brown/Yellowish Red, Weak Rock, Joints Dip from 20° to 70°, Numerous Joints/Foliations/Veins, Narrow to Tight, Partially Filled (Calcite/Quartz), Wavy/Planar, Very Close, Smooth to Slightly Rough	90.1				
				NQ-5			%RQD=97, %REC=88, RMR=46, GSI=15-20 @93.8-ft: UC Strength=1,590 psi
		@NQ-5: Slightly to Highly Weathered, Weak Rock, Joints Dip from 20° to 65°, Few Shear/Foliations, Very Narrow to Tight, Partially Filled (Clay/Calcite), Wavy/Planar, Very Close, Smooth to Slightly Rough					
141.5	95.1	Coring Terminated at 95.1 feet					
136.5							

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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-19
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RC1
Eng./Geo.:	C. Piercy	**Boring Location:**	5152+72	**Offset:**	7 R	**Alignment:**	Mainline
Elev.:	238.6 ft	**Latitude:**	34.03511	**Longitude:**	-81.112637	**Date Started:**	4/25/2018
Total Depth:	98.6 ft	**Soil Depth:**	91.3 ft	**Core Depth:**	7.3 ft	**Date Completed:**	4/25/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	18.7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.2	TOPSOIL (2")		0.0	SS-1	2	3	6	5	9
		FILL Stiff, Moist, Brown/Yellowish Red/Pink, Non-Plastic to Low Plasticity, SILT (ML/A-4), Munsell=10YR 4/3, 5YR 5/6 & 5YR 7/4		2.0	SS-2	6	6	7	6	13
		@2-ft: Reddish Yellow/Red, Munsell=7.5YR 6/8 & 2.5YR 4/8		4.0	SS-3	5	4	7	9	11
233.6	6.0	@4-ft: Yellow/Red/Yellowish Red, Munsell=10YR 7/8, 2.5YR 4/8 & 5YR 5/6		6.0	SS-4	4	11	12	7	23
		RESIDUUM Very Stiff to Stiff, Moist, Light Yellowish Brown, Low Plasticity, Sandy, Silty CLAY (CL-ML/A-4(1)), Munsell=2.5Y 5/6		8.0	SS-5	2	4	9	11	13
		@SS-4: LL=22, PL=17, PI=5, NMC=19.2%, %#200=68.6, Organics=2.05%								
228.6		@9-ft: Light Yellowish Brown/Yellowish Red, Munsell=2.5Y 5/6 & 5YR 5/8								
	13.5	Firm, Moist, Brownish Yellow/Light Gray, Low Plasticity, SILT (ML/A-4(5)) with Sand, Munsell=10YR 6/8 & 10YR 7/1		13.5	SS-6	4	2	4	8	6
223.6		@SS-6: LL=33, PL=26, PI=7, NMC=22.2%, %#200=73.7								
		@18.5-ft: Hard, Yellow/Light Gray, Munsell=2.5Y 7/6 & 2.5Y 7/1		18.5	SS-7	25	32	50/5.5"		82+
218.6										
		@23.5-ft: Light Grayish Olive, A-4(3), Munsell=10Y 6/2		23.5	SS-8	20	34	43		77
213.6		@SS-8: LL=34, PL=31, PI=3, NMC=14.8%, %#200=76.2								
	28.5			28.5						

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90

LEGEND

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SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-19
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RC1
Eng./Geo.:	C. Piercy	**Boring Location:**	5152+72	**Offset:**	7 R	**Alignment:**	Mainline
Elev.:	238.6 ft	**Latitude:**	34.03511	**Longitude:**	-81.112637	**Date Started:**	4/25/2018
Total Depth:	98.6 ft	**Soil Depth:**	91.3 ft	**Core Depth:**	7.3 ft	**Date Completed:**	4/25/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	18.7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
208.6		**PARTIALLY WEATHERED ROCK (PWR)** SAMPLED AS: Hard, Moist, Light Grayish Olive/Brownish Yellow, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), Munsell=10Y 6/2 & 10YR 6/8			SS-9	50/5.5"	100+
	33.5			33.5	SS-10	23 50/5.5"	100+
203.6		SAMPLED AS:Hard, Moist, Gray/Brownish Yellow, Non-Plastic to Low Plasticity, SILT (ML/A-4), Munsell=10YR 6/1 & 10YR 6/8					
				38.5	SS-11	50/5.75"	100+
198.6							
				43.5	SS-12	50/3"	100+
193.6							
				48.5	SS-13	40 50/3"	100+
188.6							
				53.5	SS-14	50/5.75"	100+
		@53.5-ft: Light Gray, Munsell=5Y 7/1					
183.6							

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-19
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RC1
Eng./Geo.:	C. Piercy	**Boring Location:**	5152+72	**Offset:**	7 R	**Alignment:**	Mainline
Elev.:	238.6 ft	**Latitude:**	34.03511	**Longitude:**	-81.112637	**Date Started:**	4/25/2018
Total Depth:	98.6 ft	**Soil Depth:**	91.3 ft	**Core Depth:**	7.3 ft	**Date Completed:**	4/25/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	18.7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		@56.6-ft: Quartz Vein					
			58.5	SS-15	50/<1"	100+	>>
	59.2	@SS-15: No Recovery	59.2	SS-16	50/0.5"	100+	>>
178.6		**QUARTZ VEIN** Igneous, Gray, Coarse Grained, No Lamination, Quartz, Slightly Weathered, Joints Dip from 20° to 70°, Numerous Joints, Moderately Wide, Surface Stain (Iron Oxide), Irregular, Very Close, Slightly Rough		NQ-1			%REC=22, %RQD=0, RMR=N/A, GSI=N/A
			61.4				
				NQ-2			%REC=1, %RQD=0, RMR=N/A, GSI=N/A
173.6							
	66.5	@66.5-ft: *NQ Drilling to 68.5-ft without Sampling*					
	68.5	**PARTIALLY WEATHERED ROCK (PWR)** SAMPLED AS: Hard, Moist, Light Gray, Non-Plastic to Low Plasticity, SILT (ML/A-4), Munsell=2.5Y 7/1	68.5	SS-17	50/5.5"	100+	>>
168.6							
			73.5	SS-18	46 50/3"	100+	>>
163.6							
			78.5	SS-19	50/4"	100+	>>
		@78.5-ft: Gray/Yellow, Munsell=2.5Y 6/1 & 2.5Y 7/6					
158.6							
			83.5	SS-20	50/5"	100+	>>
153.6							

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-19
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RC1
Eng./Geo.:	C. Piercy	**Boring Location:**	5152+72	**Offset:**	7 R	**Alignment:**	Mainline
Elev.:	238.6 ft	**Latitude:**	34.03511	**Longitude:**	-81.112637	**Date Started:**	4/25/2018
Total Depth:	98.6 ft	**Soil Depth:**	91.3 ft	**Core Depth:**	7.3 ft	**Date Completed:**	4/25/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	18.7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
	88.5	SAMPLED AS: Hard, Moist, Gray/Yellow, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), Munsell=2.5Y 6/1 & 2.5Y 7/6		88.5	SS-21	50/2"	100+
148.6							
	93.5	SAMPLED AS: Very Dense, Moist, Gray/Yellow, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2), Munsell=2.5Y 6/1 & 2.5Y 7/6		93.5	SS-22	50/1"	100+
143.6							
	98.6	@SS-23: No Recovery		98.5	SS-23	50/1.75"	100+
		Boring Terminated at 98.6 feet					
138.6							
133.6							
128.6							

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/25/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-20
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RC1
Eng./Geo.:	R. Wessinger	**Boring Location:**	5154+37	**Offset:**	55 L	**Alignment:**	Mainline
Elev.:	240.5 ft	**Latitude:**	34.035292	**Longitude:**	-81.112109	**Date Started:**	4/18/2018
Total Depth:	98.6 ft	**Soil Depth:**	98.6 ft	**Core Depth:**	0 ft	**Date Completed:**	4/19/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** 15.0 ft	**24HR**	26.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Grassed Shoulder									
	0.3	TOPSOIL (3")		0.0	SS-1	4	7	7	9	14	
		FILL Stiff to Very Stiff, Moist to Dry, Reddish Yellow/White, Non-Plastic to Low Plasticity, SILT (ML/A-4), Munsell=5YR 6/6 & 5YR 8/1		2.0							
	4.0			4.0	SS-2	11	12	12	13	24	
235.5		@2-ft: Reddish Yellow, with Wood Fragments, Munsell=7.5YR 8/6			SS-3	14	14	12	11	26	
		RESIDUUM Very Stiff to Hard, Moist to Dry, Reddish Yellow, Non-Plastic, Sandy SILT (ML/A-4(0)), Munsell=7.5YR 6/6		6.0							
					SS-4	13	20	28	40	48	
				8.0							
					SS-5	9	20	22	29	42	
230.5		@6-ft: Moist, Red/Light Red, Munsell=2.5YR 4/8 & 2.5YR 6/8									
		@SS-4: LL=NP, PL=NP, PI=NP, NMC=19.6%, %#200=68.6									
				13.5							
					SS-6	6	10	12		22	
225.5		▽									
	18.5			18.5							
		Hard, Moist, Brownish Yellow, Non-Plastic to Low Plasticity, SILT (ML/A-4) with Sand, Munsell=10YR 6/8			SS-7	20	50/2.5"			100+	*False High N-Value Due to Gravel* >>
220.5											
				23.5							
		@23.5-ft: Pale Red, Micaceous, Munsell=10R 7/4			SS-8	24	50/3.5"			100+	*False High N-Value Due to Gravel* >>
215.5		▼									
				28.5							
	29.5				SS-9	34	48	50/5"		98+	
210.5		**PARTIALLY WEATHERED ROCK (PWR)** SAMPLED AS: Hard, Moist, Pale Red, Low Plasticity, SILT (ML/A-4(4)) with Sand, Micaceous, Munsell=10R 6/3 @SS-9: LL=33, PL=29, PI=4, NMC=22.3%, %#200=80.0		33.5							

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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-20
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RC1
Eng./Geo.:	R. Wessinger	**Boring Location:**	5154+37	**Offset:**	55 L	**Alignment:**	Mainline
Elev.:	240.5 ft	**Latitude:**	34.035292	**Longitude:**	-81.112109	**Date Started:**	4/18/2018
Total Depth:	98.6 ft	**Soil Depth:**	98.6 ft	**Core Depth:**	0 ft	**Date Completed:**	4/19/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** 15.0 ft	**24HR**	26.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" 2nd 6" 3rd 6" 4th 6"	N Value
					SS-10	50/5.5"	100+
205.5				38.5	SS-11	50/5.5"	100+
		@38.5-ft: Weak Red, Munsell=7.5R 5/4					
200.5				43.5	SS-12	37 50/2.5"	100+
		@43.5-ft: Pink, Munsell=7.5YR 7/3					
195.5				48.5	SS-13	35 50/5"	100+
		@48.5-ft: Light Brown, Munsell=7.5YR 6/4 @SS-13: LL=29, PL=25, PI=4, NMC=19.9%, %#200=78.2					
190.5				53.5	SS-14	50/5"	100+
185.5				58.5	SS-15	27 21 28	49
		@58.5-ft: Yellow/White, Munsell=10YR 7/6 & 10YR 8/1					
180.5				63.5	SS-16	50/3.5"	100+
		@63.5-ft: Light Gray/Brownish Yellow, Munsell=10YR 7/1 & 10YR 6/6					
175.5							

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-20
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RC1
Eng./Geo.:	R. Wessinger	**Boring Location:**	5154+37	**Offset:**	55 L	**Alignment:**	Mainline
Elev.:	240.5 ft	**Latitude:**	34.035292	**Longitude:**	-81.112109	**Date Started:**	4/18/2018
Total Depth:	98.6 ft	**Soil Depth:**	98.6 ft	**Core Depth:**	0 ft	**Date Completed:**	4/19/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** 15.0 ft	**24HR**	26.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
170.5				68.5	SS-17	50/3.5"	100+
	73.5	SAMPLED AS: Very Dense, Moist, Light Gray, Non-Plastic to Low Plasticity, Silty Fine SAND (SM/A-2), Micaceous, Munsell=10YR 7/1		73.5	SS-18	50/2"	100+
165.5				78.5	SS-19	50/3"	100+
160.5		@83.5-ft: Light Gray/Light Bluish Gray, Munsell=5Y 7/1 & 10B 7/1		83.5	SS-20	50/3"	100+
155.5		@88.5-ft: Light Olive Gray/Black, Munsell=5Y 6/2 & 5Y 2.5/1		88.5	SS-21	50/4"	100+
150.5		@SS-22: No Recovery		93.5	SS-22	50/1"	100+
145.5		@SS-23: No Recovery		98.5	SS-23	50/1"	100+
140.5	98.6	Boring Terminated at 98.6 feet Due to Drilling Refusal at Top of Rock					

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

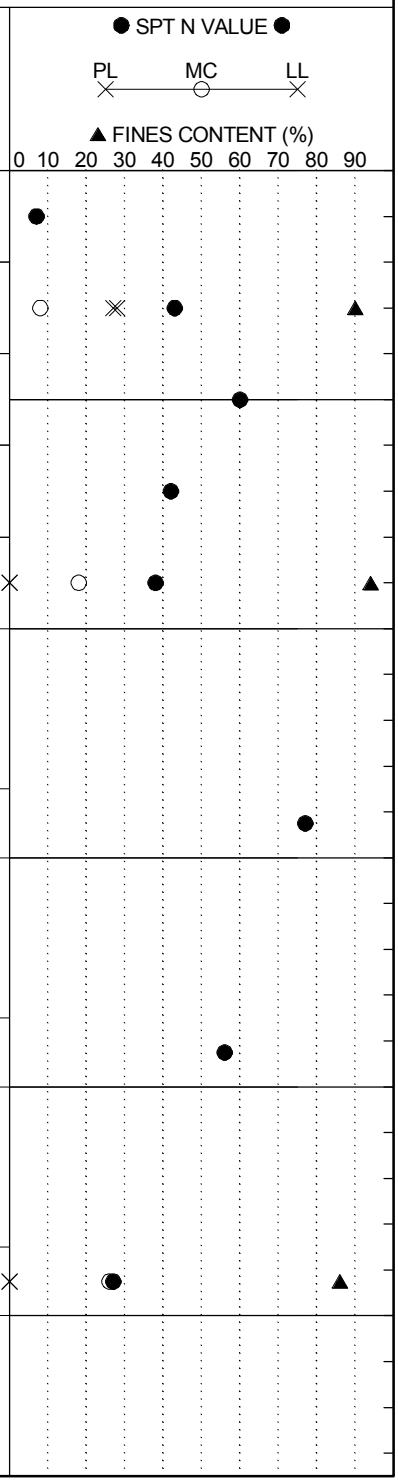
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/25/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-21
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RAC
Eng./Geo.:	R. Wessinger	**Boring Location:**	3166+23	**Offset:**	9 L	**Alignment:**	Mainline
Elev.:	285.4 ft	**Latitude:**	34.038065	**Longitude:**	-81.109037	**Date Started:**	3/26/2018
Total Depth:	73.9 ft	**Soil Depth:**	73.9 ft	**Core Depth:**	0 ft	**Date Completed:**	3/27/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	28.2 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.3	TOPSOIL (4")		0.0	SS-1	3	3	4	4	7
		RESIDUUM								
		Firm, Moist to Dry, Yellow/White, Low Plasticity, SILT (ML/A-4(1)), Munsell=10YR 7/6 & 10YR 8/1		2.0	SS-2	10	20	23	29	43
		@2-ft: Hard to Very Stiff, Red/White, Munsell=2.5YR 5/6 & 2.5YR 8/1		4.0						
280.4		@SS-2: LL=28, PL=27, PI=1, NMC=7.9%, %#200=89.9			SS-3	19	26	34	36	60
		@2.5-ft: White, Munsell=2.5YR 8/1		6.0	SS-4	12	18	24	29	42
		@8-ft: Yellow, Moist to Wet, Non-Plastic, A-4(0), Munsell=10YR 8/6		8.0	SS-5	14	15	23	33	38
275.4		@SS-5: LL=NP, PL=NP, PI=NP, NMC=18.4%, %#200=93.8								
		@13.5-ft: Moist		13.5	SS-6	21	33	44		77
270.4										
		@18.5-ft: Yellow, Micaceous, Munsell=10YR 7/6		18.5	SS-7	22	27	29		56
265.4										
		@23.5-ft: Brownish Yellow, Moist to Wet, Munsell=10YR 6/6		23.5	SS-8	10	12	15		27
260.4		@SS-8: LL=NP, PL=NP, PI=NP, NMC=25.7%, %#200=86.2								
		▼		28.5						



LEGEND

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SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-21
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RAC
Eng./Geo.:	R. Wessinger	**Boring Location:**	3166+23	**Offset:**	9 L	**Alignment:**	Mainline
Elev.:	285.4 ft	**Latitude:**	34.038065	**Longitude:**	-81.109037	**Date Started:**	3/26/2018
Total Depth:	73.9 ft	**Soil Depth:**	73.9 ft	**Core Depth:**	0 ft	**Date Completed:**	3/27/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	28.2 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
255.4					SS-9	9	9	12		21
				33.5						
		@33.5-ft: Moist, Brownish Yellow/Bluish Gray, Munsell=10YR 6/6 & GLEY2 6/10B			SS-10	10	22	42		64
250.4		@SS-10: LL=NP, PL=NP, PI=NP, NMC=21.0%, %#200=76.1								
				38.5						
		@38.5-ft: Moist to Wet, with Rock Fragments (Quartz)			SS-11	16	25	23		48
245.4										
				43.5						
		@43.5-ft: Pale Red/White, Munsell=10R 6/4 & 10R 8/1			SS-12	21	19	21		40
240.4										
				48.5						
		@SS-13: LL=NP, PL=NP, PI=NP, NMC=29.8%, %#200=88.5			SS-13	8	9	12		21
235.4										
				53.5						
		@53.5-ft: Yellow/White, Munsell=10YR 7/8 & 10YR 8/1			SS-14	12	15	32		47
230.4										

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-21
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RAC
Eng./Geo.:	R. Wessinger	**Boring Location:**	3166+23	**Offset:**	9 L	**Alignment:**	Mainline
Elev.:	285.4 ft	**Latitude:**	34.038065	**Longitude:**	-81.109037	**Date Started:**	3/26/2018
Total Depth:	73.9 ft	**Soil Depth:**	73.9 ft	**Core Depth:**	0 ft	**Date Completed:**	3/27/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	28.2 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
				58.5						
	59.5				SS-15	20	32	50/5.5"		82+
225.4		**PARTIALLY WEATHERED ROCK (PWR)** SAMPLED AS: Hard, Moist, Yellow/White, Non-Plastic, SILT (ML/A-4(0)) with Sand, Munsell=10YR 7/8 & 10YR 8/1								
		@SS-16: LL=NP, PL=NP, PI=NP, NMC=20.4%, %#200=77.9		63.5	SS-16	19	50/6"			100+
220.4										
		@68.5-ft: Yellow/Light Gray, Munsell=2.5Y 7/6 & 2.5Y 7/1		68.5	SS-17	29	50/3.5"			100+
215.4										
	73.9	@73.5-ft: Light Gray, Munsell=2.5Y 7/1		73.5	SS-18		50/4.5"			100+
		Boring Terminated at 73.9 feet								
210.4										
205.4										
200.4										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/24/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-22
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RAC
Eng./Geo.:	R. Wessinger	**Boring Location:**	3168+53	**Offset:**	8 L	**Alignment:**	Mainline
Elev.:	283.9 ft	**Latitude:**	34.038048	**Longitude:**	-81.108284	**Date Started:**	3/29/2018
Total Depth:	88.6 ft	**Soil Depth:**	88.6 ft	**Core Depth:**	0 ft	**Date Completed:**	3/29/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 18.0 ft	**24HR**	21.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Grassed Shoulder									
	0.3	TOPSOIL (3")		0.0	SS-1	3	3	4	4	7	
		FILL									
		Firm to Stiff, Moist, Pale Brown, Low Plasticity, SILT (ML/A-4(1)) with Sand, Munsell=10YR 6/3		2.0							
	4.0	@SS-1: LL=30, PL=29, PI=1, NMC=16.8%, %#200=78.2			SS-2	3	4	6	8	10	
278.9		@2-ft: with Asphalt		4.0	SS-3	6	7	10	9	17	
		RESIDUUM		6.0	SS-4	4	6	8	8	14	
		Very Stiff to Stiff, Moist, Very Pale Brown/Light Bluish Gray, Non-Plastic, SILT (ML/A-4(0)) with Sand, Munsell=10YR 7/3 & GLEY2 7/5PB		8.0	SS-5	9	13	12	12	25	
273.9		@8-ft: Light Brown, with Sand and Gravel, Munsell=7.5YR 6/3									
		@13.5-ft: Yellow, Munsell=10YR 7/6		13.5	SS-6	8	9	13		22	
268.9											
		@SS-7: LL=NP, PL=NP, PI=NP, NMC=23.4%, %#200=82.7		18.5	SS-7	7	13	15		28	
263.9											
		@23.5-ft: Hard, Pale Red/Reddish Yellow, Munsell=10R 7/4 & 7.5YR 8/6		23.5	SS-8	12	20	19		39	
258.9											
		@28.5-ft: Red, Low Plasticity, A-4(1), Munsell=10R 5/6		28.5	SS-9	12	18	31		49	
253.9		@SS-9: LL=29, PL=28, PI=1, NMC=24.1%, %#200=83.1		33.5							

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-22
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RAC
Eng./Geo.:	R. Wessinger	**Boring Location:**	3168+53	**Offset:**	8 L	**Alignment:**	Mainline
Elev.:	283.9 ft	**Latitude:**	34.038048	**Longitude:**	-81.108284	**Date Started:**	3/29/2018
Total Depth:	88.6 ft	**Soil Depth:**	88.6 ft	**Core Depth:**	0 ft	**Date Completed:**	3/29/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 18.0 ft	**24HR**	21.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
248.9					SS-10	13	12	19		31
	38.5	Hard, Moist, Red/White, Non-Plastic, Sandy SILT (ML/A-4(0)), Munsell=10R 5/6 & 10R 8/1		38.5	SS-11	16	25	29		54
243.9		@SS-11: LL=NP, PL=NP, PI=NP, NMC=17.9%, %#200=53.7								
	43.5	Hard, Moist, Red, Non-Plastic, SILT (ML/A-4(0)) with Sand, Munsell=5R 5/6		43.5	SS-12	13	18	26		44
238.9										
		@48.5-ft: Reddish Gray, Munsell=5R 6/1		48.5	SS-13	16	21	28		49
233.9		@SS-13: LL=NP, PL=NP, PI=NP, NMC=22.1%, %#200=74.3								
	53.5	Hard, Moist to Wet, Reddish Yellow, Non-Plastic, Sandy SILT (ML/A-4(0)), Munsell=7.5YR 8/6		53.5	SS-14	9	17	26		43
228.9										
		@58.5-ft: Moist to Wet		58.5	SS-15	16	16	19		35
223.9		@SS-15: LL=NP, PL=NP, PI=NP, NMC=21.9%, %#200=67.5								
	63.5	Hard, Moist to Wet, Light Bluish Gray/Brownish Yellow, Non-Plastic, SILT (ML/A-4(0)) with Sand, Munsell=GLEY2 7/5PB & 10YR 6/6		63.5	SS-16	21	42	47		89
218.9										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

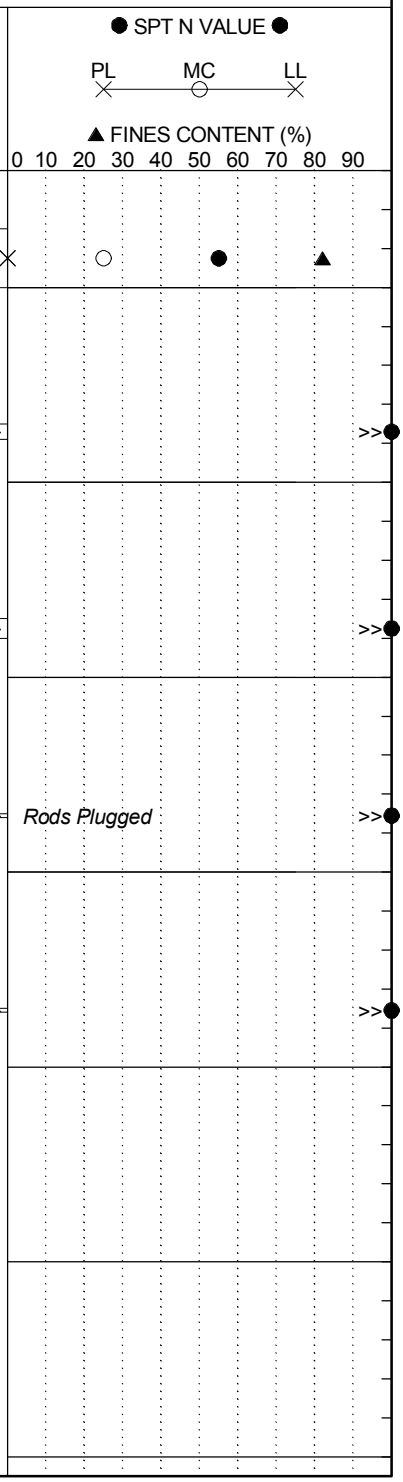
Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-22
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RAC
Eng./Geo.:	R. Wessinger	**Boring Location:**	3168+53	**Offset:**	8 L	**Alignment:**	Mainline
Elev.:	283.9 ft	**Latitude:**	34.038048	**Longitude:**	-81.108284	**Date Started:**	3/29/2018
Total Depth:	88.6 ft	**Soil Depth:**	88.6 ft	**Core Depth:**	0 ft	**Date Completed:**	3/29/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 18.0 ft	**24HR**	21.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
		@SS-17: LL=NP, PL=NP, PI=NP, NMC=25.3%, %#200=82.1	68.5	SS-17	30	27	28		55
213.9	73.5	**PARTIALLY WEATHERED ROCK (PWR)** SAMPLED AS: Very Dense, Moist to Wet, Strong Brown, Non-Plastic, Silty GRAVEL (GM/A-1) (Quartz Seam), Munsell=7.5YR 5/6	73.5	SS-18	50/5"				100+
208.9	78.5	SAMPLED AS: Hard, Moist to Wet, Light Gray, Non-Plastic to Low Plasticity, SILT (ML/A-4), Munsell=2.5Y 7/1	78.5	SS-19	50/5.5"				100+
203.9		@83.5-ft: with Sand	83.5	SS-20	50/1"				100+
198.9									
	88.6	Boring Terminated at 88.6 feet Due to Drilling Refusal at Top of Rock	88.5	SS-21	50/1"				100+
193.9									
188.9									
183.9									



LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/25/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-23
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	Burning Tree
Eng./Geo.:	C. Piercy	**Boring Location:**	9344+08	**Offset:**	43 R	**Alignment:**	Mainline
Elev.:	312.2 ft	**Latitude:**	34.038575	**Longitude:**	-81.108015	**Date Started:**	5/7/2018
Total Depth:	99.1 ft	**Soil Depth:**	99.1 ft	**Core Depth:**	0 ft	**Date Completed:**	5/8/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** 46.5 ft	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.3	TOPSOIL (3")		0.0	SS-1	7	8	3	6	11
		COASTAL PLAIN		2.0						
		Stiff to Very Stiff, Dry to Moist, Red/Reddish Yellow, Medium Plasticity, Sandy Lean CLAY (CL/A-7-6(8)), Munsell=10R 4/6 & 7.5YR 6/8			SS-2	3	5	4	6	9
		@2-ft: Moist		4.0						
307.2		@SS-2: LL=42, PL=24, PI=18, NMC=19.1%, %#200=55.2			SS-3	7	7	9	12	16
		@4-ft: Red/Light Yellowish Brown, Munsell=2.5YR 4/8 & 10YR 6/4		6.0						
		@6-ft: Red/Brownish Yellow, with Gravel, Munsell=10R 4/6			SS-4	5	5	7	8	12
302.2		@8-ft: Red, Munsell=2.5YR 5/6		8.0						
					SS-5	5	5	7	10	12
				13.5						
		@13.5-ft: Hard, Red, Munsell=2.5YR 4/8			SS-6	6	14	32		46
297.2										
				18.5						
		@18.5-ft: Stiff, Light Red/Brownish Yellow, A-6(6), Munsell=2.5YR 6/8 & 10YR 6/6			SS-7	4	6	8		14
292.2		@SS-7: LL=40, PL=23, PI=17, NMC=22.3%, %#200=53.0								
	23.5			23.5						
		RESIDUUM			SS-8	7	13	17		30
287.2		Very Stiff to Hard, Moist, Yellow/Strong Brown, Non-Plastic, SILT (ML/A-4(0)), Munsell=10YR 7/8 & 7.5YR 5/8								
				28.5						
		@28.5-ft: Pale Red/Gray, Munsell=7.5YR 6/4 & 7.5YR 6/1			SS-9	9	17	22		39
282.2		@SS-9: LL=NP, PL=NP, PI=NP, NMC=21.8%, %#200=91.8								
				33.5						

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-23
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	Burning Tree
Eng./Geo.:	C. Piercy	**Boring Location:**	9344+08	**Offset:**	43 R	**Alignment:**	Mainline
Elev.:	312.2 ft	**Latitude:**	34.038575	**Longitude:**	-81.108015	**Date Started:**	5/7/2018
Total Depth:	99.1 ft	**Soil Depth:**	99.1 ft	**Core Depth:**	0 ft	**Date Completed:**	5/8/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** 46.5 ft	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
277.2		@33.5-ft: Pale Red/Reddish Gray, Munsell=7.5YR 6/4 & 7.5R 6/1			SS-10	12	15	24		39
272.2		@38.5-ft: Light Red/Pinkish Gray/Brownish Yellow, Munsell=7.5R 6/6, 7.5R 7/1 & 10YR 6/8		38.5	SS-11	14	28	33		61
267.2		@43.5-ft: Gray/Brownish Yellow, Munsell=5Y 6/1 & 10YR 6/8		43.5	SS-12	13	25	30		55
262.2		@48.5-ft: Yellow/Light Gray, Munsell=10YR 7/8 & 10YR 7/1		48.5	SS-13	11	16	12		28
257.2		@53.5-ft: Red/Pinkish Gray, Munsell=7.5R 5/6 & 7.5R 7/1		53.5	SS-14	7	8	12		20
252.2		@58.5-ft:Yellow, Munsell=10YR 7/6 @SS-15: LL=NP, PL=NP, PI=NP, NMC=25.9%, %#200=86.2		58.5	SS-15	10	14	21		35
247.2		@63.5-ft: Yellow/Brownish Yellow, Munsell=2.5Y 7/8 & 10YR 6/8		63.5	SS-16	12	22	36		58

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

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SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-23
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	Burning Tree
Eng./Geo.:	C. Piercy	**Boring Location:**	9344+08	**Offset:**	43 R	**Alignment:**	Mainline
Elev.:	312.2 ft	**Latitude:**	34.038575	**Longitude:**	-81.108015	**Date Started:**	5/7/2018
Total Depth:	99.1 ft	**Soil Depth:**	99.1 ft	**Core Depth:**	0 ft	**Date Completed:**	5/8/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** 46.5 ft	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" 2nd 6" 3rd 6" 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				68.5				
					SS-17	17 28 50/5.5"	100+	>>
242.2								
				73.5				
		@73.5-ft: Yellow/Light Gray, Munsell=10YR 7/6 & 10YR 7/1			SS-18	16 32 50	82	
237.2								
				78.5				
		@78.5-ft: Yellow/Light Gray/Pale Red, Munsell=10YR 7/6, 10YR 7/1 & 10R 7/4			SS-19	12 23 47	70	
232.2								
				83.5				
		@83.5-ft: Yellow/Light Gray, Munsell=2.5Y 7/8 & 2.5Y 7/1			SS-20	14 25 46	71	
227.2								
	88.5	**PARTIALLY WEATHERED ROCK (PWR)**		88.5	SS-21	50/3"	100+	>>
222.2		SAMPLED AS: Very Dense, Moist, Yellow/Yellowish Brown, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2), with Gravel, Munsell=2.5Y 7/8 & 10YR 5/6						
	93.5	SAMPLED AS: Hard, Moist, Gray, Non-Plastic to Low Plasticity, SILT (ML/A-4), with Sand, Munsell=5Y 6/1		93.5	SS-22	22 47 50/2.5"	100+	
217.2								
	99.1	@98.5-ft: Grayish Olive, Munsell=10Y 5/2		98.5	SS-23	44 50/1.5"	100+	>>
212.2		Boring Terminated at 99.1 feet Due to Drilling Refusal at Top of Rock						

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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-24
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I26RDB
Eng./Geo.:	R. Wessinger	**Boring Location:**	6371+79	**Offset:**	36 L	**Alignment:**	Mainline
Elev.:	279.0 ft	**Latitude:**	34.037204	**Longitude:**	-81.108429	**Date Started:**	4/26/2018
Total Depth:	98.6 ft	**Soil Depth:**	98.6 ft	**Core Depth:**	0 ft	**Date Completed:**	4/27/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** 43.0 ft	**24HR**	22.8 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.3	TOPSOIL (3")		0.0	SS-1	2	4	7	8	11
		RESIDUUM								
		Stiff to Very Stiff, Dry, Pinkish Gray, Non-Plastic, SILT (ML/A-4(0)) with Sand, Micaceous, Munsell=5YR 7/2		2.0	SS-2	11	14	14	16	28
274.0		@2-ft: Red/White, Munsell=10R 5/8 & 10R 8/1		4.0	SS-3	16	17	18	19	35
		@SS-2: LL=NP, PL=NP, PI=NP, NMC=1.0%, %#200=75.3		6.0	SS-4	9	10	14	20	24
		@4-ft: Hard to Very Stiff, Red/Pink, Munsell=10R 7/6 & 10R 8/4		8.0	SS-5	3	11	19	28	30
269.0		@6-ft: Moist, White/Very Pale Brown, Munsell=10YR 8/1 & 10YR 8/2								
		@8-ft: Very Pale Brown, Low Plasticity, A-4(6), Munsell=10YR 7/4								
		@SS-5: LL=33, PL=26, PI=7, NMC=13.1%, %#200=83.5		13.5	SS-6	27	50/4.5"			100+
	14.0	**PARTIALLY WEATHERED ROCK (PWR)**								
264.0		SAMPLED AS: Hard, Reddish Yellow, Moist, Non-Plastic, SILT (ML/A-4(0)), Micaceous, Munsell=5YR 6/6		18.5	SS-7	18	45	50/4"		95+
		@18.5-ft: Red/White, Munsell=7.5R 8/6 & 7.5R 8/1								
259.0		@SS-7: LL=NP, PL=NP, PI=NP, NMC=10.8%, %#200=87.6		23.5	SS-8	29	50/5"			100+
		@23.5-ft: Pale Red, Munsell=7.5R 6/3		28.5	SS-9		50/6"			100+
254.0										
249.0										
	33.5			33.5						

SPT N VALUE ● — PL × — MC ○ — LL × — ▲ FINES CONTENT (%) — 0 10 20 30 40 50 60 70 80 90

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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-24
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I26RDB
Eng./Geo.:	R. Wessinger	**Boring Location:**	6371+79	**Offset:**	36 L	**Alignment:**	Mainline
Elev.:	279.0 ft	**Latitude:**	34.037204	**Longitude:**	-81.108429	**Date Started:**	4/26/2018
Total Depth:	98.6 ft	**Soil Depth:**	98.6 ft	**Core Depth:**	0 ft	**Date Completed:**	4/27/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** 43.0 ft	**24HR**	22.8 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
244.0		**RESIDUUM** Hard, Moist, Light Red, Light Reddish Brown, Non-Plastic to Low Plasticity, SILT (ML/A-4), Micaceous, Munsell=2.5YR 6/6 & 2.5YR 6/3			SS-10	20	25	33		58
	39.0			38.5	SS-11	19	50/5.5"			100+
239.0		**PARTIALLY WEATHERED ROCK (PWR)** SAMPLED AS: Hard, Moist, Light Bluish Gray/Light Red, Non-Plastic to Low Plasticity, SILT (ML/A-4) with Sand, Munsell=5PB 7/1 & 2.5YR 6/6								
	43.5	SAMPLED AS: Very Dense, Wet, Light Bluish Gray/Light Red, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2), with Gravel, Munsell=5PB 7/1 & 2.5YR 6/6		43.5	SS-12	22	50/5"			100+
234.0										
	48.5	SAMPLED AS: Very Dense, Wet, Light Bluish Gray/Light Red, Non-Plastic, Silty GRAVEL (GM/A-1), Munsell=5PB 7/1 & 2.5YR 6/6		48.5	SS-13	50/3.5"				100+
229.0										
	53.5	SAMPLED AS: Hard, Wet to Moist, Red, Non-Plastic to Low Plasticity, SILT (ML/A-4), with Sand, Munsell=5R 5/6		53.5	SS-14	50/5"				100+
224.0										
		@58.5-ft: Red/Pinkish Gray, Munsell=5R 5/6 & 5R 7/1		58.5	SS-15	50/5.5"				100+
219.0										
				63.5	SS-16	18	43	50/3"		93+
214.0										

SPT N VALUE ●

PL ✕ MC ○ LL ✕

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-24
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I26RDB
Eng./Geo.:	R. Wessinger	**Boring Location:**	6371+79	**Offset:**	36 L	**Alignment:**	Mainline
Elev.:	279.0 ft	**Latitude:**	34.037204	**Longitude:**	-81.108429	**Date Started:**	4/26/2018
Total Depth:	98.6 ft	**Soil Depth:**	98.6 ft	**Core Depth:**	0 ft	**Date Completed:**	4/27/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** 43.0 ft	**24HR**	22.8 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
		@68.5-ft: Moist, Pale Red/Reddish Gray, Munsell=5R 6/2 & 5R 6/1	68.5	SS-17	40 50/4.5"	100+
209.0			73.5	SS-18	50/4.5"	100+
204.0			78.5	SS-19	50/5"	100+
		@78.5-ft: Light Olive Gray, Munsell=5Y 6/2				
199.0			83.5	SS-20	50/1"	100+
	83.5	SAMPLED AS: Very Dense, Wet, Light Bluish Gray, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2), Munsell=10B 7/1				
194.0			88.5	SS-21	50/1"	100+
	88.5	@SS-21: No Recovery				
189.0			93.5	SS-22	50/5.5"	100+
	93.5	SAMPLED AS: Hard, Moist, Light Gray, Non-Plastic to Low Plasticity, SILT (ML/A-4), Micaceous, Munsell=2.5Y 7/1				
184.0			98.5	SS-23	50/1.5"	100+
	98.6	Boring Terminated at 98.6 feet Due to Drilling Refusal at Top of Rock				
179.0						

SPT N VALUE ●

PL ⨯ MC ○ LL ⨯

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

>>

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/24/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-25
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RCA
Eng./Geo.:	R. Wessinger	**Boring Location:**	5172+68	**Offset:**	17 L	**Alignment:**	Mainline
Elev.:	284.1 ft	**Latitude:**	34.037368	**Longitude:**	-81.107803	**Date Started:**	4/30/2018
Total Depth:	98.6 ft	**Soil Depth:**	98.6 ft	**Core Depth:**	0 ft	**Date Completed:**	5/1/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** 23.0 ft	**24HR**	22.1 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.3	TOPSOIL (3")		0.0	SS-1	4	5	4	4	9
		RESIDUUM								
	2.0	Loose, Dry, Light Red/White, Low Plasticity, Silty Fine to Medium SAND (SM/A-4(0)), with Gravel, Munsell=5R 6/6 & 5R 8/1		2.0	SS-2	3	3	2	2	5
	4.0	@SS-1: LL=29, PL=26, PI=3, NMC=7.7%, %#200=49.7		4.0	SS-3	2	5	5	5	10
279.1	6.0	@SS-2: No Recovery		6.0	SS-4	5	8	12	19	20
		Loose, Moist to Dry, Light Red/White, Low Plasticity, Clayey Fine SAND (SC/A-4(1)), Munsell=5R 6/6 & 5R 8/1		8.0	SS-5	5	14	24	41	38
274.1		@SS-3: LL=29, PL=21, PI=8, NMC=13.7%, %#200=48.7								
		Very Stiff to Hard, Moist, Pinkish Red/Pinkish Gray, Non-Plastic, SILT (ML/A-4(0)) with Sand, Micaceous, Munsell=5R 5/4 & 5R 6/1								
		@SS-4: LL=NP, PL=NP, PI=NP, NMC=8.0%, %#200=76.8		13.5	SS-6	15	22	24		46
269.1		@13.5-ft: Red, Low Plasticity, A-4(5), Munsell=10R 5/6								
		@SS-6: LL=32, PL=26, PI=6, NMC=11.9%, %#200=85.3								
				18.5	SS-7	33	50/3"			100+
		@18.5-ft: Light Red, Munsell=7.5R 6/6								
264.1										
		▼								
		▽		23.5	SS-8	20	32	46		78
		@23.5-ft: Moist to Wet, Red/Strong Brown, Munsell=7.5R 4/8 & 7.5YR 5/8								
259.1										
				28.5	SS-9	22	50/5"			100+
	29.0	**PARTIALLY WEATHERED ROCK (PWR)**								
254.1		SAMPLED AS: Hard, Moist to Wet, Reddish Yellow/Light Gray, Non-Plastic to Low Plasticity, SILT (ML/A-4), Micaceous, Munsell=7.5YR 7/8 & 7.5YR 7/1		33.5						

SPT N VALUE ●

PL ✕ MC ○ LL ✕

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-25
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RCA
Eng./Geo.:	R. Wessinger	**Boring Location:**	5172+68	**Offset:**	17 L	**Alignment:**	Mainline
Elev.:	284.1 ft	**Latitude:**	34.037368	**Longitude:**	-81.107803	**Date Started:**	4/30/2018
Total Depth:	98.6 ft	**Soil Depth:**	98.6 ft	**Core Depth:**	0 ft	**Date Completed:**	5/1/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** 23.0 ft	**24HR**	22.1 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
		@33.5-ft: Greenish Gray, Munsell=10Y 5/1		SS-10	50/3.5"				100+
249.1									
			38.5	SS-11	50/3"				100+
244.1									
	43.5		43.5	SS-12	50/3"				100+
		SAMPLED AS: Hard, Moist to Wet, Light Greenish Gray, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), Micaceous, Munsell=10Y 7/1							
239.1									
		@48.5-ft: Moist, Dark Greenish Gray, Munsell=5GY 4/1	48.5	SS-13	50/3.5"				100+
234.1									
		@53.5-ft: with Gravel	53.5	SS-14	50/4.5"				100+
229.1									
		@58.5-ft: Moist to Dry	58.5	SS-15	50/5"				100+
224.1									
	63.5		63.5	SS-16	50/3"				100+
		SAMPLED AS: Very Dense, Moist, Dark Greenish Gray, Non-Plastic, Silty, Sandy GRAVEL (GM/A-1), Munsell=5GY 4/1							
219.1									

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-25
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RCA
Eng./Geo.:	R. Wessinger	**Boring Location:**	5172+68	**Offset:**	17 L	**Alignment:**	Mainline
Elev.:	284.1 ft	**Latitude:**	34.037368	**Longitude:**	-81.107803	**Date Started:**	4/30/2018
Total Depth:	98.6 ft	**Soil Depth:**	98.6 ft	**Core Depth:**	0 ft	**Date Completed:**	5/1/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** 23.0 ft	**24HR**	22.1 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
214.1	73.5	SAMPLED AS: Hard, Moist, Bluish Gray, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), Micaceous, with Gravel, Munsell=10B 6/1	68.5	SS-17	50/3"				100+
209.1			73.5	SS-18	50/1.25"				100+
204.1			78.5	SS-19	50/1.5"				100+
199.1	83.5	SAMPLED AS: Very Dense, Moist to Dry, Light Bluish Gray;, Non-Plastic, GRAVEL (GP/A-1), [Quartz Seams], Munsell=5GY 4/1	83.5	SS-20	50/1.25"				100+
194.1			88.5	SS-21	50/1.5"				100+
189.1	93.5	SAMPLED AS: Hard, Moist, Greenish Gray, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), Micaceous, with Gravel, Munsell=10Y 5/1	93.5	SS-22	50/1.25"				100+
184.1	98.6	Boring Terminated at 98.6 feet Due to Drilling Refusal at Top of Rock	98.5	SS-23	50/1.5"				100+

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

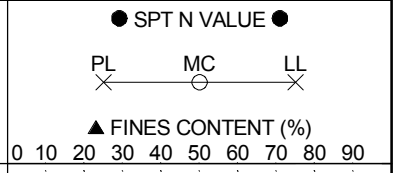
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/24/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-26
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I26RBD
Eng./Geo.:	R. Wessinger	**Boring Location:**	4358+24	**Offset:**	21 L	**Alignment:**	Mainline
Elev.:	269.8 ft	**Latitude:**	34.035638	**Longitude:**	-81.108026	**Date Started:**	5/3/2018
Total Depth:	98.6 ft	**Soil Depth:**	98.6 ft	**Core Depth:**	0 ft	**Date Completed:**	5/4/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** 23.0 ft	**24HR**	Cave 25.4 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.5	TOPSOIL (6")		0.0	SS-1	2	2	3	5	5
		RESIDUUM		2.0						
		Firm to Stiff, Moist, Red/Pale Brown, Medium Plasticity, Elastic SILT (MH/A-7-5(20)), Micaceous, Munsell=10R 5/8 & 2.5Y 8/4			SS-2	3	5	6	8	11
		@SS-2: LL=59, PL=45, PI=14, NMC=28.8%, %#200=91.9		4.0						
264.8					SS-3	10	12	13	16	25
		@4-ft: Very Stiff to Hard, Red/Light Gray, Munsell=10R 5/8 & 5Y 7/1		6.0						
		@6-ft: Pale Red, Munsell=7.5R 6/4			SS-4	5	9	12	15	21
		@8-ft: Pale Red, Munsell=10R 7/4		8.0						
					SS-5	13	15	19	18	34
259.8										
				13.5						
		@13.5-ft: Stiff to Very Stiff, Strong Brown/Light Gray, Munsell=7.5YR 5/6 & 7.5YR 7/1			SS-6	5	7	8		15
254.8										
				18.5						
		@18.5-ft: Moist to Wet			SS-7	3	4	6		10
249.8										
		▽		23.5						
		@23.5-ft: Gray, Munsell=5Y 6/1			SS-8	3	4	5		9
		@SS-8: LL=57, PL=37, PI=20, NMC=41.3%, %#200=90.6								
244.8										
				28.5						
					SS-9	4	6	7		13
239.8										
	33.5			33.5						



LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-26
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I26RBD
Eng./Geo.:	R. Wessinger	**Boring Location:**	4358+24	**Offset:**	21 L	**Alignment:**	Mainline
Elev.:	269.8 ft	**Latitude:**	34.035638	**Longitude:**	-81.108026	**Date Started:**	5/3/2018
Total Depth:	98.6 ft	**Soil Depth:**	98.6 ft	**Core Depth:**	0 ft	**Date Completed:**	5/4/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** 23.0 ft	**24HR**	Cave 25.4 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
234.8		Very Stiff to Stiff, Moist to Wet, Gray, Non-Plastic, SILT (ML/A-4(0)), Munsell=5Y 6/1			SS-10	8	9	11		20
		@SS-10: LL=NP, PL=NP, PI=NP, NMC=30.8%, %#200=96.3								
				38.5						
		@38.5-ft: Dark Olive Gray, Munsell=10YR 4/2			SS-11	6	7	8		15
229.8										
				43.5						
		@43.5-ft: Hard, Olive Gray, Medium Plasticity, A-7-5(11), Micaceous, Munsell=5Y 4/2			SS-12	9	14	20		34
224.8		@SS-12: LL=44, PL=33, PI=11, NMC=25.1%, %#200=84.1								
				48.5						
		@48.5-ft: Olive Gray/Strong Brown, Munsell=5Y 4/2 & 7.5YR 5/6			SS-13	12	19	27		46
219.8										
				53.5						
	54.5				SS-14	28	41	50/5.5"		91+
214.8		**PARTIALLY WEATHERED ROCK (PWR)** SAMPLED AS: Hard, Moist, Bluish Gray, Non-Plastic to Low Plasticity, SILT (ML/A-4), Micaceous, Munsell=5PB 6/1								
	58.5			58.5	SS-15		50/5"			100+
209.8		SAMPLED AS: Very Dense, Moist, Dark Bluish Gray, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2), Micaceous, Munsell=10B 4/1								
	63.5			63.5						
204.8		SAMPLED AS: Hard, Moist, Light Gray, Non-Plastic to Low Plasticity, SILT (ML/A-4), Micaceous, Munsell=5Y 7/1			SS-16	34	50/6"			100+

SPT N VALUE ●

PL ✕ MC ○ LL ✕

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

SS-15: >>●

SS-16: >>●

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-26
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I26RBD
Eng./Geo.:	R. Wessinger	**Boring Location:**	4358+24	**Offset:**	21 L	**Alignment:**	Mainline
Elev.:	269.8 ft	**Latitude:**	34.035638	**Longitude:**	-81.108026	**Date Started:**	5/3/2018
Total Depth:	98.6 ft	**Soil Depth:**	98.6 ft	**Core Depth:**	0 ft	**Date Completed:**	5/4/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** 23.0 ft	**24HR**	Cave 25.4 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
	68.5		68.5	SS-17	46 50/6"	100+
199.8		SAMPLED AS: Hard, Moist, White, Low to Medium Plasticity, Elastic SILT (MH/A-7), Micaceous, Munsell=10YR 9.5/1	73.5	SS-18	50/4.5"	100+
194.8			78.5	SS-19	50/5"	100+
189.8		@78.5-ft: Moist to Dry, Light Gray, Munsell=5Y 7/1	83.5	SS-20	50/3"	100+
184.8		@83.5-ft: Moist, White, Munsell=5Y 8/1	88.5	SS-21	50/1.5"	100+
179.8			93.5	SS-22	50/1.25"	100+
174.8		@SS-22: No Recovery @SS-23: No Recovery	98.5	SS-23	50/<1"	100+
169.8	98.6	Boring Terminated at 98.6 feet Due to Drilling Refusal at Top of Rock				

SPT N VALUE ● — PL × — MC ○ — LL × — ▲ FINES CONTENT (%) — 0 10 20 30 40 50 60 70 80 90 — >>

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/24/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-27
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RCA
Eng./Geo.:	R. Wessinger	**Boring Location:**	5168+49	**Offset:**	39 L	**Alignment:**	Mainline
Elev.:	281.3 ft	**Latitude:**	34.036302	**Longitude:**	-81.108	**Date Started:**	5/7/2018
Total Depth:	98.7 ft	**Soil Depth:**	98.7 ft	**Core Depth:**	0 ft	**Date Completed:**	5/8/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 60.0 ft	**24HR**	24.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.3	TOPSOIL (3")		0.0	SS-1	7	8	9	6	17
		FILL								
		Medium Dense to Loose, Dry, Pale Red, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-2), with Gravel, Munsell=7.5YR 7/2		2.0	SS-2	4	4	4	3	8
	4.0			4.0						
276.3		@2-ft: Light Red, Munsell=10R 6/8			SS-3	3	3	13	21	16
		Very Stiff to Hard, Dry, Reddish Yellow, Non-Plastic, SILT (ML/A-4(0)) with Sand, Micaceous, Munsell=7.5YR 6/8		6.0						
	8.0				SS-4	13	16	20	22	36
		@6-ft: Moist, Reddish Yellow/Light Red, Munsell=7.5YR 6/8 & 10R 6/8		8.0						
		@SS-4: LL=NP, PL=NP, PI=NP, NMC=20.0%, %#200=83.1			SS-5	10	19	32	33	51
271.3										
		RESIDUUM								
		Hard, Moist, Pale Red/White, Non-Plastic, SILT (ML/A-4(0)), Micaceous, Munsell=10R 7/3 & 10R 8/1		13.5						
		@13.5-ft: Stiff to Very Stiff			SS-6	4	6	9		15
266.3		@SS-6: LL=NP, PL=NP, PI=NP, NMC=29.3%, %#200=94.2								
				18.5						
					SS-7	6	8	13		21
261.3										
				23.5						
		@23.5-ft: Hard to Very Stiff			SS-8	9	17	23		40
256.3										
				28.5						
		@28.5-ft: Greenish Gray/Yellowish Red, Munsell=10Y 5/1 & 5YR 5/8			SS-9	9	12	13		25
251.3										
				33.5						

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-27
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RCA
Eng./Geo.:	R. Wessinger	**Boring Location:**	5168+49	**Offset:**	39 L	**Alignment:**	Mainline
Elev.:	281.3 ft	**Latitude:**	34.036302	**Longitude:**	-81.108	**Date Started:**	5/7/2018
Total Depth:	98.7 ft	**Soil Depth:**	98.7 ft	**Core Depth:**	0 ft	**Date Completed:**	5/8/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 60.0 ft	**24HR**	24.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
246.3				SS-10	10	20	20		40
			38.5						
		@38.5-ft: Greenish Gray, with Sand, Munsell=10Y 5/1		SS-11	15	27	24		51
241.3									
			43.5						
		@SS-12: LL=NP, PL=NP, PI=NP, NMC=30.0%, %#200=74.9		SS-12	6	14	27		41
236.3									
			48.5						
	49.5			SS-13	17	30	50/5.5"		80+
231.3		**PARTIALLY WEATHERED ROCK (PWR)** SAMPLED AS: Hard, Moist, Greenish Gray, Non-Plastic to Low Plasticity, SILT (ML/A-4), Micaceous, Munsell=10Y 5/1							
			53.5	SS-14	37	50/2.5"			100+
226.3									
			58.5						
		▽		SS-15	14	25	29		54
221.3									
			63.5						
				SS-16		50/5.5"			100+
216.3									

SPT N VALUE ●

PL ✕ MC ○ LL ✕

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-27
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RCA
Eng./Geo.:	R. Wessinger	**Boring Location:**	5168+49	**Offset:**	39 L	**Alignment:**	Mainline
Elev.:	281.3 ft	**Latitude:**	34.036302	**Longitude:**	-81.108	**Date Started:**	5/7/2018
Total Depth:	98.7 ft	**Soil Depth:**	98.7 ft	**Core Depth:**	0 ft	**Date Completed:**	5/8/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 60.0 ft	**24HR**	24.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
		@68.5-ft: White, Munsell=10YR 8/1	68.5	SS-17	50/6"				100+
211.3									
		@73.5-ft: Light Greenish Gray/White, Munsell=10Y 7/1 & 5Y 8/1	73.5	SS-18	50/4"				100+
206.3									
			78.5	SS-19	18	50/1.5"			100+
201.3									
	83.5	SAMPLED AS: Very Dense, Moist, White/Light Greenish Gray, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2), Micaceous, Munsell=10YR 8/1 & 10Y 7/1	83.5	SS-20	50/2.25"				100+
196.3									
		@88.5-ft: White, Munsell=10YR 8/1	88.5	SS-21	50/2"				100+
191.3									
	93.5	SAMPLED AS: Hard, Moist, White, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), Micaceous, Munsell=10YR 8/1	93.5	SS-22	35	50/2"			100+
186.3									
	98.7	Boring Terminated at 98.7 feet	98.5	SS-23	50/2"				100+
181.3									

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-28
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	Burning Tree
Eng./Geo.:	R. Ressinger	**Boring Location:**	9352+16	**Offset:**	1 R	**Alignment:**	Mainline
Elev.:	297.0 ft	**Latitude:**	34.036778	**Longitude:**	-81.106763	**Date Started:**	3/14/2018
Total Depth:	54.9 ft	**Soil Depth:**	54.9 ft	**Core Depth:**	0 ft	**Date Completed:**	3/15/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 17.0 ft	**24HR**	Cave 27.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	1.0	TOPSOIL (12")		0.0	SS-1	1	3	3	3	6
		COASTAL PLAIN		2.0						
		Firm, Moist, Red, Medium Plasticity, CLAY (CL/A-7-6(10)), Munsell=2.5YR 5/6			SS-2	6	7	9	11	16
		@2-ft: Very Stiff to Hard, Micaceous								
	4.0	@SS-2: LL=46, PL=26, PI=20, NMC=20.2%, %#200=59.2		4.0						
292.0					SS-3	9	16	18	21	34
	6.0	Hard, Moist, Red, High Plasticity, Sandy Fat CLAY (CH/A-7-6(18)), Munsell=10YR 5/8		6.0						
		@SS-3: LL=52, PL=25, PI=27, NMC=21.0%, %#200=68.5			SS-4	8	12	13	15	25
				8.0						
	9.5	Medium Dense, Moist, Light Red, Non-Plastic, Silty Fine to Medium SAND (SM/A-4(0)), Munsell=10YR 6/8			SS-5	5	6	9	15	15
287.0		@SS-5: LL=NP, PL=NP, PI=NP, NMC=19.2%, %#200=38.2								
		RESIDUUM								
		Stiff, Moist, Light Brown, Non-Plastic to Low Plasticity, SILT (ML/A-4), Micaceous, Munsell=7.5YR 6/4		13.5						
	14.0				SS-6	40		50/4"		100+
		PARTIALLY WEATHERED ROCK (PWR)								
282.0		SAMPLED AS: Hard, Moist, Pale Red, Non-Plastic, SILT (ML/A-4(0)) with Sand, Micacous, Munsell=10R 7/2								
				18.5						
					SS-7	16	45	50/5"		95+
277.0										
				23.5						
		@SS-8: LL=NP, PL=NP, PI=NP, NMC=16.4%, %#200=82.3			SS-8	16	36	50/5"		86+
272.0										
				28.5						

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-28
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	Burning Tree
Eng./Geo.:	R. Ressinger	**Boring Location:**	9352+16	**Offset:**	1 R	**Alignment:**	Mainline
Elev.:	297.0 ft	**Latitude:**	34.036778	**Longitude:**	-81.106763	**Date Started:**	3/14/2018
Total Depth:	54.9 ft	**Soil Depth:**	54.9 ft	**Core Depth:**	0 ft	**Date Completed:**	3/15/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 17.0 ft	**24HR**	Cave 27.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
		@28.5-ft: Light Reddish Brown, Munsell=2.5YR 7/3		SS-9	19	24	44		68
267.0			33.5						
		@SS-10: LL=NP, PL=NP, PI=NP, NMC=18.1%, %#200=75.6		SS-10	34	33	45		78
262.0			38.5						
	39.0	SAMPLED AS: Very Dense, Moist, Light Yellowish Brown, Non-Plastic, Silty GRAVEL (GM/A-1) (Quartz Seam), Munsell=10YR 6/4		SS-11	36	50/5.5"			100+
257.0			43.5						
	43.5	SAMPLED AS: Hard, Moist, Light Yellowish Brown, Medium Plasticity, SILT (ML/A-6(10)) with Sand, Micaceous, Munsell=10YR 6/4		SS-12	26	50/5.5"			100+
252.0		@SS-12: LL=40, PL=26, PI=14, NMC=18.2%, %#200=73.1	48.5						
				SS-13	18	50/4.5"			100+
247.0			53.5						
				SS-14	11	24	50/5"		74+
242.0	54.9	Boring Terminated at 54.9 feet							

SPT N VALUE ●

PL ✕ MC ○ LL ✕

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/25/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-63
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	S-36 (St Andrews Rd)
Eng./Geo.:	C. Piercy	**Boring Location:**	30+38	**Offset:**	99 L	**Alignment:**	Mainline
Elev.:	211.1 ft	**Latitude:**	34.044894	**Longitude:**	-81.117949	**Date Started:**	5/16/2018
Total Depth:	65.4 ft	**Soil Depth:**	65.4 ft	**Core Depth:**	0 ft	**Date Completed:**	5/18/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	11.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.3	TOPSOIL (3")		0.0	SS-1	2	6	6	6	12
		FILL								
		Stiff to Firm, Dry, Reddish Yellow, Medium Plasticity, Lean CLAY (A-7-6(16)) with Sand, Munsell=7.5YR 7/6		2.0	SS-2	6	8	7	7	15
	4.6	@SS-1: LL=44, PL=25, PI=19, NMC=18.2%, %#200=81.5		4.0	SS-3	3	3	2	1	5
206.1		@2-ft: Moist, Reddish Yellow, Munsell=7.5YR 6/8		6.0	SS-4	2	1	2	2	3
		@4-ft: Reddish Yellow, Munsell=7.5YR 6/6		8.0	SS-5	WOH/12"		2	2	2
		ALLUVIUM								
201.1		Firm to Soft, Moist, Reddish Yellow, High Plasticity, Sandy Elastic SILT (MH/A-7-5(18)), Munsell=5YR 6/6								
		@6-ft: Reddish Yellow, Munsell=7.5YR 6/6								
		@SS-4: LL=58, PL=33, PI=25, NMC=25.4%, %#200=67.7								
	13.5			13.5	SS-6	9	9	8		17
	14.3	@8-ft: Very Soft, Moist to Wet, Yellowish Red, A-7-5(20), Munsell=5Y 5/6								
196.1		@SS-5: LL=62, PL=35, PI=27, NMC=34.5%, %#200=85.8								
	18.5	Medium Dense, Wet, Light Gray, Non-Plastic to Low Plasticity, GRAVEL (GP-GM) with Sand and Silt, Munsell=5YR 7/1		18.5	SS-7	50/4"				100+
191.1		**RESIDUUM**								
		Very Stiff, Wet, Light Gray, Non-Plastic to Low Plasticity, SILT (ML/A-4) with Sand, Munsell=5Y 7/1		23.5	SS-8	50/2"				100+
	23.5	**PARTIALLY WEATHERED ROCK (PWR)**								
186.1		SAMPLED AS: Hard, Moist, Greenish Gray, Non-Plastic to Low Plasticity, SILT (ML/A-4), Munsell=5G 6/1		28.5	SS-9	50/2"				100+
		SAMPLED AS: Hard, Dry, Light Gray/Greenish Gray, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), Munsell=5GY 6/1		33.5						
181.1										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	B-63
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	S-36 (St Andrews Rd)
Eng./Geo.:	C. Piercy	**Boring Location:**	30+38	**Offset:**	99 L	**Alignment:**	Mainline
Elev.:	211.1 ft	**Latitude:**	34.044894	**Longitude:**	-81.117949	**Date Started:**	5/16/2018
Total Depth:	65.4 ft	**Soil Depth:**	65.4 ft	**Core Depth:**	0 ft	**Date Completed:**	5/18/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	11.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
176.1					SS-10	20	26	50/5.5"		76+	●
	38.5	SAMPLED AS: Hard, Dry, Light Gray, Non-Plastic to Low Plasticity, SILT (ML/A-4), Munsell=GLEY1 7/5G		38.5	~~SS-11~~	~~50/1.75"~~				~~100+~~	>>●
171.1											
	43.0	**PHYLLITE** Metamorphic, Gray/Light Gray, Fine to Very Fine Grained, Thinly Laminated to Laminated Foliation, Quartz/Feldspar/Sericite, Moderately to Slightly Weathered, Medium Strong Rock, Joints Dip from 20° to 70°, Few Joints, Narrow to Very Narrow, Partially Filled (Sand), Planar/Irregular, Very Close, Smooth to Slightly Rough		43.0	~~SS-12~~	~~50/0.5"~~				~~100+~~	>>●
				43.0	NQ-1						@44.0-ft: UC Strength=4,020 psi, %REC=100, %RQD=76, RMR=37, GSI=18-23
166.1				45.4							
		@NQ-2: Highly to Slightly Weathered, Joints Dip from 5° to 80°, Numerous Joints, Narrow to Very Narrow, Spotty (Calcite/Healed), Wavy/Stepped/Irregular, Very Close, Smooth to Slightly Rough			NQ-2						%REC=73, %RQD=24, RMR=N/A, GSI=15-20
161.1				50.4							
		@NQ-3: Medium Strong Rock, Joints Dip from 5° to 85°, Numerous Joints, Moderately Wide to Very Narrow, Partially Filled (Calcite), Wavy/Planar/Stepped, Very Close, Smooth to Slightly Rough			NQ-3						@50.5-ft: UC Strength=4,510 psi, %REC=91, %RQD=63, RMR=28, GSI=15-20
156.1				55.4							
		@NQ-4: Strong Rock, Joints Dip from 15° to 85°, Numerous Joints, Moderately Wide to Very Narrow, Spotty/Filled (Clay/Calcite), Wavy/Stepped, Very Close, Smooth to Slightly Rough			NQ-4						@57.4-ft: UC Strength=7,270 psi, %REC=100, %RQD=68, RMR=28, GSI=15-20
151.1				60.4							
		@NQ-5: Moderately to Slightly Weathered, Medium Strong Rock, Joints Dip from 20° to 85°, Numerous Joints, Narrow to Very Narrow, Spotty (Calcite), Wavy, Very Close, Smooth to Slightly Rough			NQ-5						@61.4-ft: UC Strength=4,110 psi, %REC=99, %RQD=68, RMR=28, GSI=20-25
146.1	65.4	Coring Terminated at 65.4 feet									

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	DH-1
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	164+44	**Offset:**	85 L	**Alignment:**	Median CL
Elev.:	251.5 ft	**Latitude:**	34.073742	**Longitude:**	-81.148177	**Date Started:**	1/3/2018
Total Depth:	120.3 ft	**Soil Depth:**	38.6 ft	**Core Depth:**	81.7 ft	**Date Completed:**	1/5/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	89%
Core Size:	NQ	**Driller:**	D. Harris	**Groundwater:**	**TOB** 8.0 ft	**24HR**	7.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.5	TOPSOIL (6")		0.0	SS-1	2	3	3	3	6
		FILL								
	2.0	Firm, Moist, Reddish Yellow, Non-Plastic, Sandy SILT (ML/A-6), Munsell=5YR 6/6		2.0	SS-2	5	9	10	10	19
	4.0	Very Stiff, Moist, Gray, Non-Plastic, SILT (ML/A-6), Munsell=5YR 5/1		4.0	SS-3	10	11	14	24	25
246.5		**RESIDUUM**								
		Very Stiff to Stiff, Moist, Yellowish Brown, Medium Plasticity, SILT (ML/A-6(14)), Munsell=10YR 5/4		6.0	SS-4	6	5	8	10	13
		@6-ft: Moist to Wet, Yellowish Brown/Gray, Munsell=10YR 5/4 & 2.5Y 6/1		8.0	SS-5	8	16	25	33	41
241.5		@SS-4: LL=40, PL=27, PI=13, NMC=23.8%, %#200=95.2								
		@8-ft: Hard to Very Stiff, Moist		13.5	SS-6	13	17	19		36
		@13.5-ft: Olive Yellow/Greenish Gray, Munsell=2.5Y 6/6 & 10GY 6/1								
236.5										
				18.5	SS-7	9	13	11		24
		@18.5-ft: Olive Yellow/Greenish Gray/ Black, A-7-6(17), Munsell=2.5Y 6/6 & 10GY 6/1 & 2.5Y 2.5/1								
231.5		@SS-7: LL=42, PI=27, PI=15, NMC=19.0%, %#200=97.0								
				23.5	SS-8	17	22	41		63
		@23.5-ft: Light Gray/Olive Yellow, Munsell=2.5Y 7/1 & 2.5Y 6/6								
226.5										
				28.5	SS-9	46	21	50/4.5"		71+
221.5										
	33.5			33.5						

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	DH-1
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	164+44	**Offset:**	85 L	**Alignment:**	Median CL
Elev.:	251.5 ft	**Latitude:**	34.073742	**Longitude:**	-81.148177	**Date Started:**	1/3/2018
Total Depth:	120.3 ft	**Soil Depth:**	38.6 ft	**Core Depth:**	81.7 ft	**Date Completed:**	1/5/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	89%
Core Size:	NQ	**Driller:**	D. Harris	**Groundwater:**	**TOB** 8.0 ft	**24HR**	7.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
216.5	34.5	@33.5-ft: Hard, Moist, Greenish Gray, Non-Plastic, Sandy SILT (ML/A-6) with Gravel, Munsell=5GY 6/1		SS-10	16	15	50/3"		65+	
		PARTIALLY WEATHERED ROCK (PWR) SAMPLED AS: Hard, Moist, Greenish Gray, Non-Plastic, Sandy SILT (ML/A-6) with Gravel, Munsell=5GY 6/1								
	38.6		38.5	SS-11	50/1"				100+	>>
211.5		**PHYLLITE** Metamorphic, Gray/Dark Gray, Quartz/Feldspar/Sericite, Fine Grained, Thinly Laminated to Laminated Foliation, Slightly Weathered, Joints Dip from 25° to 60°, Occasional Joints, Narrow to Tight, Surface Stained (Iron Oxide), Planar/Irregular, Very Close, Smooth to Very Rough	38.6	NQ-1						%REC=88, %RQD=69, RMR=28, GSI=18-23 @40.6-ft.: UC Strength=2,830 psi
			41.3	NQ-2						%REC=90, %RQD=62, RMR=N/A, GSI=10-15
206.5		@NQ-2: Highly to Slightly Weathered, Joints Dip from 5° to 75°, Numerous Joints, Moderately Wide to Tight, Surface Stained (Iron Oxide)/Partially Filled (Clay), Planar/Stepped/Irregular, Slightly Rough to Very Rough	46.3	NQ-3						@46.6-ft.: UC Strength=9,650 psi %REC=99, %RQD=77, RMR=37, GSI=20-25
201.5		@NQ-3: Gray/Dark Gray/White, Fine to Coarse Grained, Highly Weathered to Slightly Weathered, Joints Dip from 0° to 45°, Occasional Joints, Moderately Wide to Tight, Surface Stained (Iron Oxide), Wavy/Planar/Stepped/Irregular, Very Close, Slightly Rough to Rough	51.3	NQ-4						@51.4-ft.: UC Strength=9,020 psi %REC=95, %RQD=95, RMR=34, GSI=20-25
196.5		@NQ-4: Gray/Dark Gray/White, Fine Grained, Thinly Laminated to Laminated Foliation, Fresh to Slightly Weathered, Joints Dip from 10° to 70°, Few Joints, Tight, Surface Stained (Iron Oxide), Stepped/Irregular, Very Close, Slightly Rough to Rough	56.3	NQ-5						%REC=99, %RQD=99, RMR=N/A, GSI=20-25
191.5		@NQ-5: Fresh, Joint Dips 45°, Tight, Spotty (Calcite), Planar/Stepped, Close, Rough	61.3	NQ-6						@62.6-ft.: UC Strength=6,850 psi %REC=100, %RQD=100, RMR=53, GSI=20-25 @64.6-ft.: UC Strength=6,600 psi
186.5		@NQ-6: Joints Dip from 55° to 60°, Few Joints, Very Narrow to Tight, Partially Filled (Calcite), Wavy/Planar, Very Close, Slightly Rough to Rough	66.3							

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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	DH-1
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	164+44	**Offset:**	85 L	**Alignment:**	Median CL
Elev.:	251.5 ft	**Latitude:**	34.073742	**Longitude:**	-81.148177	**Date Started:**	1/3/2018
Total Depth:	120.3 ft	**Soil Depth:**	38.6 ft	**Core Depth:**	81.7 ft	**Date Completed:**	1/5/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	89%
Core Size:	NQ	**Driller:**	D. Harris	**Groundwater:**	**TOB** 8.0 ft	**24HR**	7.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
181.5		@NQ-7: Joints Dip from 20° to 70°, Few Joints, Very Narrow to Tight, Surface Stained/Filled (Healed/Calcite/Iron Oxide), Planar/Stepped/Irregular, Very Close, Smooth to Rough		71.3	NQ-7			@66.4-ft.: UC Strength=11,560 psi %REC=97, %RQD=92, RMR=41, GSI=18-23
176.5		@NQ-8: Joints Dip 60° to 70°, Few Joints, Narrow to Tight, Filled (Calcite), Wavy/Planar, Very Close, Rough		76.3	NQ-8			@72.2-ft.: UC Strength=6,020 psi %REC=100, %RQD=100, RMR=53, GSI=19-24
171.5		@NQ-9: Joint Dips 40°, Tight, Spotty/Partially Filled (Calcite/Healed), Planar/Irregular, Close, Rough		81.3	NQ-9			%REC=99, %RQD=99, RMR=N/A, GSI=20-25
166.5		@NQ-10: Joints Dip from 50° to 70°, Few Joints, Narrow to Tight, Partially Filled (Calcite/Healed), Wavy/Irregular, Smooth to Rough		86.3	NQ-10			%REC=100, %RQD=97, RMR=N/A, GSI=20-25
161.5		@NQ-11: Fair, Fine to Coarse Grained, 2 Joints, Joints Dip from 50° to 60°, Very narrow, Filled (Healed), Wavy/Planar, Non-Rough Joints		91.3	NQ-11			%REC=98, %RQD=98, RMR=42, GSI=20-25 @89.7-ft.: UC Strength=9,060 psi
156.5		=> with Quartz Veins @NQ-12: Fine to Coarse Grained, Fresh, Joints Dip from 15° to 60°, Few Joints, Moderately Wide to Tight, Surface Stained/Partially Filled (Calcite/Iron Oxide), Irregular, Very Close, Slightly Rough to Rough		96.3	NQ-12			@93.0-ft.: UC Strength=6,460 psi %REC=98, %RQD=95, RMR=37, GSI=20-25
151.5		@NQ-13: Joint Dips 45°, Very Narrow, Partially Filled (Calcite), Wavy/Planar, Close, Smooth			NQ-13			@97.0-ft.: UC Strength=7,950 psi %REC=98, %RQD=98, RMR=40, GSI=20-25

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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	DH-1
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	164+44	**Offset:**	85 L	**Alignment:**	Median CL
Elev.:	251.5 ft	**Latitude:**	34.073742	**Longitude:**	-81.148177	**Date Started:**	1/3/2018
Total Depth:	120.3 ft	**Soil Depth:**	38.6 ft	**Core Depth:**	81.7 ft	**Date Completed:**	1/5/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	89%
Core Size:	NQ	**Driller:**	D. Harris	**Groundwater:**	**TOB** 8.0 ft	**24HR**	7.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		@NQ-14: Joints Dip from 10° to 85°, Numerous Joints, Narrow to Tight, Surface Stained/Partially Filled (Calcite/Iron Oxide), Wavy/Irregular, Very Close, Smooth to Rough		101.3	NQ-14			%REC=97, %RQD=87, RMR=N/A, GSI=19-24
146.5		@NQ-15: Joints Dip from 20° to 85°, Few Joints, Very Narrow to Tight, Spotty (Calcite/Healed), Very Close, Slightly Rough to Rough		106.3	NQ-15			%REC=92, %RQD=92, RMR=N/A, GSI=20-25
141.5		@NQ-16: Fresh to Slightly Weathered, Fine Grained, Joints Dip from 35° to 85°, Numerous Joints, Narrow to Tight, Spotty/Partially Filled/Filled (Calcite), Wavy/Setpped/Irregular, Very Close, Slightly Rough to Rough		111.3	NQ-16			%REC=95, %RQD=53, RMR=N/A, GSI=18-23
136.5		@NQ-17: Fresh, Joint Dips 70°, Moderately Wide to Very Narrow, Filled (Calcite/Healed), Planar, Close, Rough		116.3	NQ-17			%REC=100, %RQD=100, RMR=N/A, GSI=20-25
131.5	120.3	Coring Terminated at 120.3 feet						
126.5								
121.5								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	DH-2
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RAC
Eng./Geo.:	R. Wessinger	**Boring Location:**	3159+24	**Offset:**	78 L	**Alignment:**	Mainline
Elev.:	278.8 ft	**Latitude:**	34.038335	**Longitude:**	-81.111397	**Date Started:**	1/8/2018
Total Depth:	118.6 ft	**Soil Depth:**	118.6 ft	**Core Depth:**	0 ft	**Date Completed:**	1/10/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 30.0 ft	**24HR**	30.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.3	TOPSOIL (3")		0.0	SS-1	2	3	3	4	6
		FILL		2.0						
		Loose to Medium Dense, Moist, Yellowish Red, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-4) with Gravel, Munsell=5YR 5/6			SS-2	7	6	6	8	12
273.8	4.0			4.0	SS-3	9	12	18	24	30
	6.0	Very Stiff, Moist, Red, High Plasticity, Sandy Fat CLAY (CH/A-7-6(12)), Munsell=2.5YR 4/8		6.0	SS-4	15	25	33	49	58
		@SS-3: LL=51, PL=22, PI=29, NMC=16.3%, %#200=54.5		8.0	SS-5	32	47	50/4"		97+
268.8		**COASTAL PLAIN**								
		Very Dense to Dense, Red/Reddish Yellow, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-4), Munsell=2.5YR 4/8 & 7.5YR 6/8		13.5	SS-6	8	12	23		35
263.8		@8-ft: with Gravel								
	18.5			18.5	SS-7	2	8	7		15
258.8		Medium Dense, Moist, Reddish Yellow/Red, Medium Plasticity, Clayey Fine to Coarse SAND (SC/A-6(3)), Munsell=7.5YR 6/8 & 2.5YR 4/8								
	23.5	@SS-7: LL=39, PL=22, PI=17, NMC=21.8%, %#200=39.5		23.5	SS-8	3	5	4		9
253.8		@SS-8: No Recovery								
	28.5			28.5	SS-9	3	2	2		4
248.8		Very Loose, Wet, Yellow, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-4) with Gravel, Munsell=10YR 7/6								
		@33.5-ft: Medium Dense to Dense, Yellow/Brown, Munsell=10YR 7/6 & 10YR 4/2		33.5	SS-10	6	6	9		15
243.8		@37-ft: Ironstone Lense (6")								
	38.5	**RESIDUUM**		38.5	SS-11	6	17	28		45
238.8		Dense to Very Dense, Moist to Wet, Reddish Yellow/Yellowish Red, Non-Plastic, SILT (ML/A-4(0)), Micaceous, Munsell=7.5YR 7/8 & 5YR 5/8		43.5						

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	DH-2
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RAC
Eng./Geo.:	R. Wessinger	**Boring Location:**	3159+24	**Offset:**	78 L	**Alignment:**	Mainline
Elev.:	278.8 ft	**Latitude:**	34.038335	**Longitude:**	-81.111397	**Date Started:**	1/8/2018
Total Depth:	118.6 ft	**Soil Depth:**	118.6 ft	**Core Depth:**	0 ft	**Date Completed:**	1/10/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 30.0 ft	**24HR**	30.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6" 2nd 6" 3rd 6" 4th 6"	N Value
233.8		@SS-11: LL=NP, PL=NP, PI=NP, NMC=32.5%, %#200=93.3		SS-12	15 50/5"	100+
		@43.5-ft: Red/Reddish Yellow, Munsell=7.5YR 5/8 & 7.5YR 7/8	48.5			
228.8		@48.5-ft: Light Gray, Munsell=GLEY1 7/10		SS-13	28 30 33	63
	53.5	**PARTIALLY WEATHERED ROCK (PWR)**	53.5	SS-14	50/5"	100+
223.8		SAMPLED AS: Hard, Moist to Wet, Light Gray, Non-Plastic, Sandy SILT (ML/A-4(0)), Micaceous, Munsell=GLEY1 7/10				
			58.5	SS-15	50/5"	100+
218.8						
			63.5	SS-16	47 50/2.5"	100+
213.8		@SS-16: LL=NP, PL=NP, PI=NP, NMC=19.5%, %#200=65.1				
			68.5	SS-17	50/4.5"	100+
208.8						
		@73.5-ft: Gray, Munsell=GLEY1 6/1	73.5	SS-18	39 50/1.5"	100+
203.8						
			78.5	SS-19	50/4"	100+
198.8						
		@83.5-ft: Dark Gray, Munsell=GLEY1 4/1	83.5	SS-20	50/4"	100+
193.8						

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	DH-2
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RAC
Eng./Geo.:	R. Wessinger	**Boring Location:**	3159+24	**Offset:**	78 L	**Alignment:**	Mainline
Elev.:	278.8 ft	**Latitude:**	34.038335	**Longitude:**	-81.111397	**Date Started:**	1/8/2018
Total Depth:	118.6 ft	**Soil Depth:**	118.6 ft	**Core Depth:**	0 ft	**Date Completed:**	1/10/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 30.0 ft	**24HR**	30.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
188.8			88.5	SS-21	29	40	50/4"		90+
183.8		@93.5-ft: Moist	93.5	SS-22	28	50/2.5"			100+
178.8			98.5	SS-23	50/1.5"				100+
173.8	103.5	@SS-24: No Recovery	103.5	SS-24	50/<1"				100+
168.8	108.5	SAMPLED AS: Very Dense, Moist, Dark Greenish Gray, Sandy SILT (ML/A-4) with Gravel, Micaceous, Munsell=GLEY1 4/10Y	108.5	SS-25	50/1"				100+
163.8	113.5	SAMPLED AS: Very Dense, Moist to Dry, Dark Greenish Gray, SILT (ML/A-4) with Sand, Micaceous, Munsell=GLEY1 4/10Y	113.5	SS-26	50/2"				100+
158.8	118.6	Boring Terminated at 118.6 feet	118.5	SS-27	50/1.5"				100+
153.8									
148.8									

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	DH-3
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I26RCA
Eng./Geo.:	R. Wessinger	**Boring Location:**	5383+63	**Offset:**	119 R	**Alignment:**	Mainline
Elev.:	209.3 ft	**Latitude:**	34.027965	**Longitude:**	-81.101848	**Date Started:**	1/11/2018
Total Depth:	8.2 ft	**Soil Depth:**	8.2 ft	**Core Depth:**	0 ft	**Date Completed:**	1/11/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
		Firm, Moist, Greenish Gray, Medium Plasticity, SILT (ML/A-7-5(12)) with Fine to Medium Sand, Munsell=10GY 6/1		0.0						
		@SS-1: LL=45, PL=31, PI=14, NMC=27.8%, %#200=75.5			SS-1	2	3	3	2	6
		@2-ft: Very Stiff		2.0						
					SS-2	13	9	12	12	21
	4.0			4.0						
		Dense, Moist, Greenish Gray, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2), Munsell=GLEY1 4/10GY								
204.3					SS-3	14	18	19	28	37
	6.0			6.0						
		Hard, Moist, Dark Greenish Gray, Low Plasticity, Sandy SILT (ML/A-4(3)), Munsell=GLEY1 4/10GY								
		@SS-4: LL=32, PL=26, PI=6, NMC=26.4%, %#200=63.9			SS-4	14	18	50/6"		68+
	8.0			8.0						
	8.2	Very Dense, Moist, Non-Plastic, GRAVEL (GP-GM/A-1) with Silt and Sand, Munsell=GLEY1 4/10GY			SS-5	50/2"				100+
		Boring Terminated at 8.2 feet Due to Drilling Refusal in Boulder; SEE BORING DH-3A								
199.3										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/24/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	DH-3A
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I26RCA
Eng./Geo.:	R. Wessinger	**Boring Location:**	5383+53	**Offset:**	113 R	**Alignment:**	Mainline
Elev.:	208.7 ft	**Latitude:**	34.027991	**Longitude:**	-81.101829	**Date Started:**	1/11/2018
Total Depth:	120.7 ft	**Soil Depth:**	64.5 ft	**Core Depth:**	56.2 ft	**Date Completed:**	1/22/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 12.0 ft	**24HR**	38.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Grassed Shoulder									
		Boulders Encountered in Upper Twenty-Five feet									
	1.7	Drill to 1.7 feet		1.7							
		HORNFELS with Quartz Vein Metamorphic, Gray/Dark Gray, Fine Grained, No Foliation, Hornblende/Olivine, Slightly Weathered to Fresh, Joints Dip from 25° to 85°, Numerous Joints, Wide to Tight, Surface Stained (Iron Oxide), Planar/Irregular, Very Close, Slightly Rough to Rough			NQ-1						@2.9-ft.: UC Strength=69,510 psi %REC=53, %RQD=38, RMR=28, GSI=53-58
203.7	5.5			5.5	SS-1	2	5	7	9	12	
				8.0							
		Medium Dense, Moist, Clayey Fine to Coarse SAND (SC), with Gravel, Munsell=GLEY1 4/10GY			SS-2	11	11	12	11	23	
198.7		▽									
	13.9	@13.5-ft: Very Dense		13.5	SS-3	50/3"				100+	
				13.9	SS-4	10/0"				100+	
193.7		**HORNFELS** Metamorphic, Dark Gray, Fine Grained, No Folation, Hornblende/Olivine, Fresh to Slightly Weathered, Joints Dip from 10° to 15°, Few Joints, Narrow to Tight, No Infilling, Irregular/Planar, Very Close, Slightly Rough		13.9	NQ-2						%REC=61, %RQD=43, RMR=N/A, GSI=62-67
		@NQ-3: Highly to Slightly Weathered, Joints Dip from 5° to 80°, Numerous Joints, Moderately Wide to Very Narrow, Surface Stained/Partially Infilled (Calcite/Chlorite), Planar/Irregular, Very Close, Slightly Rough to Rough		15.8	NQ-3						%REC=18, %RQD=0, RMR=N/A, GSI=30-35
188.7		@NQ-4: Joints Dip from 20° to 70°, Numerous Joints, Wide to Narrow, Surface Stained/Filled (Clay/Chlorite/Iron Oxide), Irregular, Very Close, Slightly Rough to Rough		20.8	NQ-4						@21.1-ft.: UC Strength=36,670 psi %REC=50, %RQD=23, RMR=20, GSI=30-35 @23.0-25.8-ft: Mud Seam
183.7	25.8			25.8	NQ-5						%REC=5, %RQD=0, RMR=N/A, GSI=N/A
		RESIDUUM SAMPLED AS: Moist, Pale Olive/Very Dark Grayish Green, Low Plasticity, Clay (CL/A-6) with Gravel, Munsell=5Y 6/4 & 5GY 3/2		30.8	NQ-6						%REC=2, %RQD=0, RMR=N/A, GSI-N/A
178.7											

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	DH-3A
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I26RCA
Eng./Geo.:	R. Wessinger	**Boring Location:**	5383+53	**Offset:**	113 R	**Alignment:**	Mainline
Elev.:	208.7 ft	**Latitude:**	34.027991	**Longitude:**	-81.101829	**Date Started:**	1/11/2018
Total Depth:	120.7 ft	**Soil Depth:**	64.5 ft	**Core Depth:**	56.2 ft	**Date Completed:**	1/22/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 12.0 ft	**24HR**	38.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
173.7	35.8	Dense, Moist, Pale Olive/Very Dark Grayish Green, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2) with Gravel, Munsell=5Y 6/4 & 5GY 3/2	38.5	SS-5	36	21	22		43
168.7	43.5	Hard to Very Stiff, Moist, Pale Olive/Very Dark Grayish Green, Medium Plasticity, Sandy SILT (ML/A-7-5(8)), Munsell=5Y 6/4 & 5GY 3/2	43.5	SS-6	11	20	25		45
163.7		@SS-6: LL=42, PL=31, PI=11, NMC=28.2%, %#200=68.5							
		@48.5-ft: Moist to Wet	48.5	SS-7	18	12	6		18
158.7	53.5	Very Stiff, Moist to Wet, Pale Olive, Medium Plasticity, Elastic SILT (MH/A-7-5(17)) with Fine to Medium Sand, Munsell=5Y 6/4	53.5	SS-8	7	8	15		23
153.7		@SS-8: LL=53, PL=36, PI=17, NMC=47.2%, %#200=82.3							
	58.5	Very Stiff, Moist to Wet, Pale Olive/Reddish Yellow, Non-Plastic to Low Plasticity, SILT (ML/A-4), Munsell=5Y 6/4	58.5	SS-9	5	12	12		24
148.7	63.5	**PARTIALLY WEATHERED ROCK (PWR)**	63.5	SS-10	49	50/4"			100+
143.7	64.5	SAMPLED AS: Very Dense, Moist, Dark Greenish Gray, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), Munsell=5GY 4/2	64.5	SS-11	10/0"				100+
			66.3	NQ-7					

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

%REC=68, %RQD=23, RMR=N/A, GSI=30-35

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	DH-3A
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I26RCA
Eng./Geo.:	R. Wessinger	**Boring Location:**	5383+53	**Offset:**	113 R	**Alignment:**	Mainline
Elev.:	208.7 ft	**Latitude:**	34.027991	**Longitude:**	-81.101829	**Date Started:**	1/11/2018
Total Depth:	120.7 ft	**Soil Depth:**	64.5 ft	**Core Depth:**	56.2 ft	**Date Completed:**	1/22/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 12.0 ft	**24HR**	38.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
138.7		**HORNFELS** @NQ-7: Metamorphic, Dark Gray, Fine Grained, No Foliation, Hornblende/Olivine, Moderately Weathered to Fresh, Joints Dip from 10° to 50°, Occasional Joints, Wide to Very Narrow, Surface Stained (Chlorite), Planar/Irregular, Very Close, Smooth to Rough		71.3	NQ-8			%REC=32, %RQD=7, RMR=N/A, GSI=30-35
133.7		@NQ-8: Highly to Slightly Weathered, Joints Dip from 3° to 85°, Numerous Joints, Moderately Wide to Very Narrow, Surface Stained (Chlorite/Iron Oxide), Planar/Irregular, Very Close, Smooth to Rough		76.3	NQ-9			@72.3-ft.: UC Strength=22,610 psi %REC=87, %RQD=62, RMR=26, GSI=30-35
128.7		@NQ-9: Joints Dip from 5° to 80°, Numerous Joints/Faults, Moderately Wide to Very Narrow, Surface Stained (Iron Oxide), Planar, Very Close, Smooth to Rough @NQ-10: Slightly Weathered to Fresh, Joints Dip from 20° to 70°, Occasional Joints, Narrow to Very Narrow, Surface Stained (Chlorite/Iron Oxide)/Spotty (Calcite)/Filled (Healed), Planar/Irregular, Very Close, Smooth to Rough		81.3	NQ-10			@76.5-ft.: UC Strength=13,710 psi %REC=99, %RQD=95, RMR=41, GSI=30-40
123.7		@NQ-11: Joints Dip from 20° to 60°, Few Joints, Surface Stained/Partially Filled/Filled (Calcite/Chlorite/Iron Oxide), Planar/Irregular, Very Close, Slightly Rough to Rough		86.3	NQ-11			@80.6-ft.: UC Strength=16,760 psi %REC=93, %RQD=85, RMR=43, GSI=30-40 @84.6-ft.: UC Strength=28,600 psi
118.7		@NQ-12: Fresh, Joints Dip from 20° to 55°, Few Joints, Narrow to Tight, Surface Stained/Filled (Calcite/Chlorite/Iron Oxide/Healed), Planar/Irregular, Very Close, Slightly Rough to Rough		91.3	NQ-12			%REC=98, %RQD=98, RMR=43, GSI=30-40 @89.6-ft.: UC Strength=37,260 psi
113.7		@NQ-13: Joints Dip from 15° to 70°, Few Joints, Narrow to Tight, Surface Stained/Spotty (Calcite/Chlorite/Healed), Planar, Very Close, Smooth/Rough		96.3	NQ-13			%REC=99, %RQD=99, RMR=N/A, GSI=30-40
108.7		@NQ-14: Joints Dip from 10° to 85°, Few Joints, Narrow to Tight, Surface Stained/Filled (Calcite/Chlorite/Healed), Planar/Irregular, Very Close, Slightly Rough to Rough			NQ-14			%REC=98, %RQD=95, RMR=N/A, GSI=30-40

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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	DH-3A
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I26RCA
Eng./Geo.:	R. Wessinger	**Boring Location:**	5383+53	**Offset:**	113 R	**Alignment:**	Mainline
Elev.:	208.7 ft	**Latitude:**	34.027991	**Longitude:**	-81.101829	**Date Started:**	1/11/2018
Total Depth:	120.7 ft	**Soil Depth:**	64.5 ft	**Core Depth:**	56.2 ft	**Date Completed:**	1/22/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 12.0 ft	**24HR**	38.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" 2nd 6" 3rd 6" 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		@NQ-15: Joints Dip from 55° to 80°, Few Joints, Very Narrow, Filled (Calcite/Healed), Planar, Very Close, Slightly Rough		101.3	NQ-15			@103.3-ft.: UC Strength=29,080 psi %REC=98, %RQD=98, RMR=47, GSI=40-45
103.7		@NQ-16: Joints Dip from 65° to 75°, Few Joints, Narrow to Very Narrow, Filled (Calcite/Healed), Planar, Very Close, Slightly Rough		106.3	NQ-16			%REC=98, %RQD=98, RMR=N/A, GSI=40-45
98.7		@NQ-17: Joints Dip from 5° to 85°, Few Joints, Very Narrow to Tight, Filled (Calcite/Healed), Planar/Irregular, Rough		111.3	NQ-17			%REC=95, %RQD=98, RMR=N/A, GSI=40-50
93.7		@NQ-18: No Joints		116.3	NQ-18			%REC=100, %RQD=100, RMR=N/A, GSI=80-90
88.7	120.7	Coring Terminated at 120.7 feet						
83.7								
78.7								

LEGEND

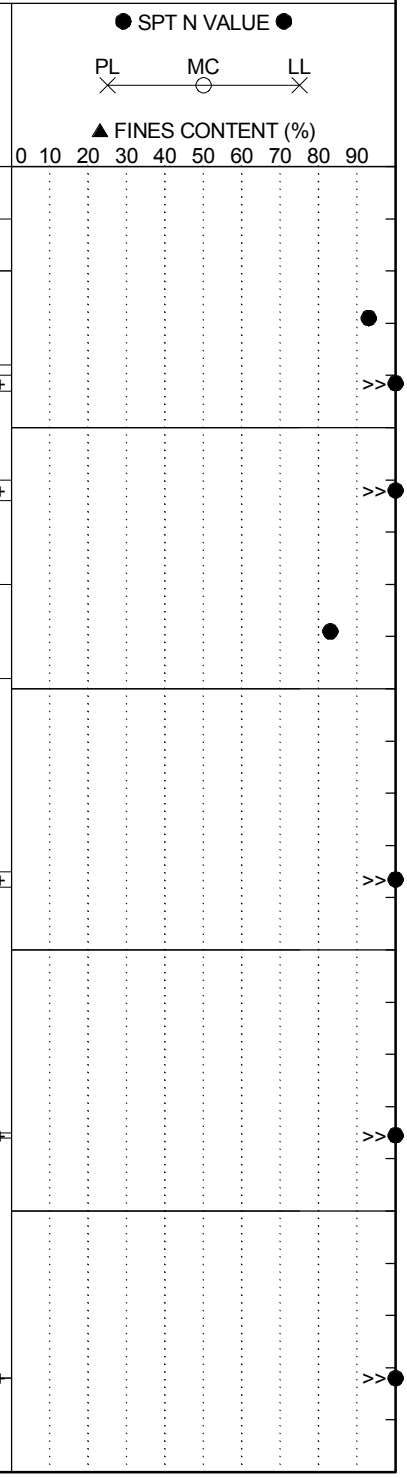
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/25/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-1
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	16+31	**Offset:**	48 R	**Alignment:**	Median CL
Elev.:	317.1 ft	**Latitude:**	34.104277	**Longitude:**	-81.180534	**Date Started:**	2/26/2018
Total Depth:	23.2 ft	**Soil Depth:**	23.2 ft	**Core Depth:**	0 ft	**Date Completed:**	2/26/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 2.5 ft	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Asphalt Shoulder								
		ASPHALT (11.5")								
	1.0	**FILL**		1.0						
		Moist, Grayish Brown, Non-Plastic, GRAVEL (GP-GM/A-1) with Silt, Munsell=2.5Y 5/2		2.0	SS-1	9	5			X
	2.3				SS-2	8	8	43	50/3"	93+
	3.5	@2-ft: Very Dense, Brownish Gray, Munsell=2.5Y 6/2		4.0	SS-3	50/3"				100+
312.1		**RESIDUUM**								
		Hard, Dry, Light Olive Brown, Non-Plastic to Low Plasticity, SILT (ML/A-4), Munsell=2.5Y 5/3		6.0	SS-4	50/5"				100+
		PARTIALLY WEATHERED ROCK (PWR)								
		SAMPLED AS: Hard, Dry, Light Olive Brown, Non-Plastic to Low Plasticity, SILT (ML/A-4), Munsell=2.5Y 5/6		8.0	SS-5	22	25	33	50/4"	83+
307.1										
				13.5	SS-6	50/3.5"				100+
		@13.5-ft: Light Yellowish Brown, Micaceous, Munsell=2.5Y 6/4								
302.1										
				18.5	SS-7	50/1"				100+
		@18.5-ft: Olive, Munsell=5Y 5/3								
297.1										
	23.2			23.2	SS-8	50/<0.5"				100+
		Boring Terminated at 23.2 feet Due to Drilling Refusal at Top of Rock								



LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/24/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-2
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	C. Piercy	**Boring Location:**	45+49	**Offset:**	286 R	**Alignment:**	Median CL
Elev.:	330.6 ft	**Latitude:**	34.097827	**Longitude:**	-81.174719	**Date Started:**	2/20/2018
Total Depth:	35 ft	**Soil Depth:**	35 ft	**Core Depth:**	0 ft	**Date Completed:**	2/20/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 5.4 ft	**24HR**	21.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.2	TOPSOIL (2")		0.0	SS-1	2	2	4	5	6
	2.0	**FILL** Firm, Moist, Red/Brown, Non-Plastic to Low Plasticity, SILT (ML/A-4) with Sand & Gravel, Munsell=2.5YR 5/6 & 7.5YR 5/4		2.0	SS-2	7	3	3	2	6
	4.0			4.0	SS-3	2	2	4	3	6
325.6		Loose, Moist, Pale Brown, Non-Plastic, GRAVEL (GP-GM/A-1) (Disc Shaped Pieces of Weathered Phyllite) with Silt & Sand, Munsell=2.5Y 7/3		6.0	SS-4	3	5	8	10	13
	6.5			8.0	SS-5	3	6	10	12	16
		Firm to Stiff, Dry to Moist, Light Yellowish Brown, Low Plasticity, SILT (ML/A-4) with Sand and Organics, Munsell=10YR 4/3								
320.6		**RESIDUUM** Stiff to Very Stiff, Moist, Brownish Yellow/Light Greenish Gray, Low Plasticity, SILT (ML/A-4(8)), Munsell=10YR 6/8 & 5GY 8/1		13.5	SS-6	4	5	9		14
315.6		@SS-5: LL=39, PL=29, PI=10, NMC=26.9%, %#200=92.3								
		@13.5-ft: Yellowish Brown/Light Greenish Gray, Munsell=10YR 5/8 & 5GY 2/1		18.5	SS-7	11	15	20		35
		@18.5-ft: Hard, Olive Yellow, (A-4(7)),Munsell=2.5Y 6/6								
310.6		@SS-7: LL=32, PL=24, PI=8, NMC=22.1%, %#200=87.8		23.5	SS-8	8	12	20		32
305.6										
		@28.5-ft: Medium Plasticity, (A-6(11))		28.5	SS-9	14	25	39		64
300.6		@SS-9: LL=38, PL=26, PI=12, NMC=22.4%, %#200=86.5								
		@33.5-ft: Olive Yellow/Pinkish Gray, Munsell=2.5Y 6/6 & 5YR 7/2		33.5	SS-10	25	41	37		78
295.6	35.0	Boring Terminated at 35.0 feet								

SPT N VALUE ● — PL × — MC ○ — LL × — ▲ FINES CONTENT (%) — 0 10 20 30 40 50 60 70 80 90

LEGEND

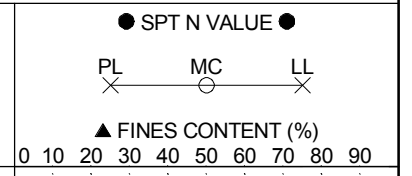
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/24/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-3
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	C. Piercy	**Boring Location:**	61+96	**Offset:**	106 R	**Alignment:**	Median CL
Elev.:	317.9 ft	**Latitude:**	34.094826	**Longitude:**	-81.170602	**Date Started:**	2/21/2018
Total Depth:	28.8 ft	**Soil Depth:**	28.8 ft	**Core Depth:**	0 ft	**Date Completed:**	2/21/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 10.0 ft	**24HR**	9.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.3	TOPSOIL (3")		0.0	SS-1	1	3	3	3	6
	2.0	**FILL** Firm, Moist, Red/Reddish Yellow, Non-Plastic to Low Plasticity, SILT (ML/A-4), Munsell=2.5YR 5/8 & 5YR 6/8		2.0	SS-2	5	9	9	12	18
				4.0	SS-3	17	29	50/3"		100+
312.9	6.0	**RESIDUUM** Very Stiff to Hard, Moist, Very Pale Brown, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), Munsell=10YR 7/4		6.0	SS-4	32	16	19	50	35
		Hard, Moist, Light Olive Brown, Low Plasticity, Sandy, Silty CLAY (CL-ML/A-4(2)), Micaceous, Munsell=2.5Y 5/6		8.0	SS-5	21	35	50/5"		85+
307.9		@SS-4: LL=28, PL=21, PI=7, NMC=9.5%, %#200=55.0								
	13.5	Hard, Moist to Wet, Brownish Yellow, Low Plasticity, SILT (ML/A-4(4)), Micaceous, Munsell=10YR 6/6		13.5	SS-6	23	24	23		47
302.9		@SS-6: LL=33, PL=26, PI=7, NMC=16.5%, %#200=66.0								
	18.5	**PARTIALLY WEATHERED ROCK (PWR)** SAMPLED AS: Hard, Moist to Dry, Pale Brown, Non-Plastic to Low Plasticity, SILT (ML/A-4), Micaceous, Munsell=2.5Y 7/4		18.5	SS-7	50/2"				100+
297.9										
	23.5	SAMPLED AS: Very Dense, Moist, Olive/Gray, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4) with Gravel, Munsell=5Y 5/4		23.5	SS-8	50/1"				100+
292.9										
	28.8	Boring Terminated at 28.8 feet		28.5	SS-9	50/2.5"				100+
287.9										



LEGEND

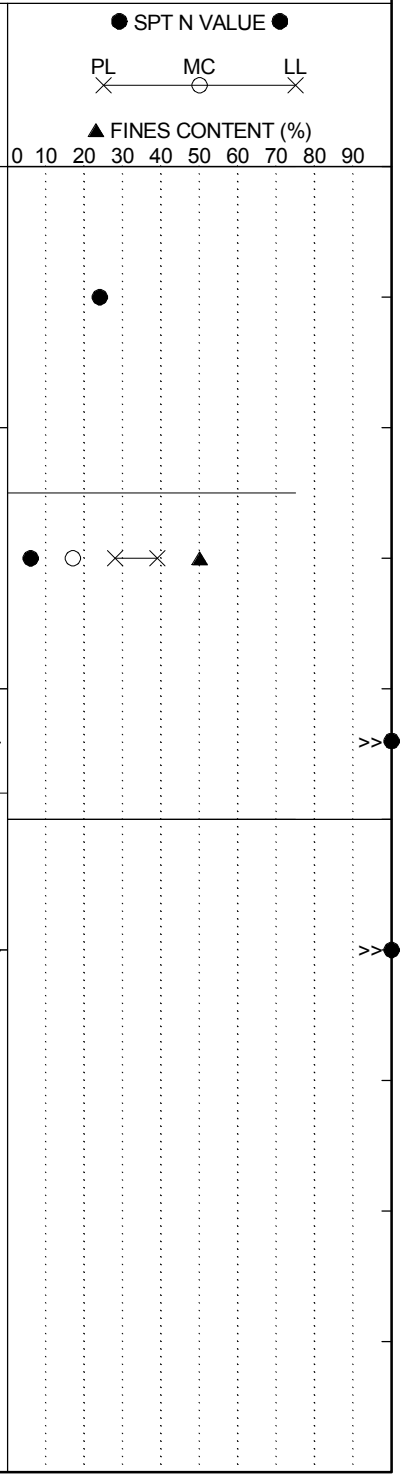
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/24/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-4
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	C. Piercy	**Boring Location:**	84+58	**Offset:**	105 R	**Alignment:**	Median CL
Elev.:	294.7 ft	**Latitude:**	34.09025	**Longitude:**	-81.165545	**Date Started:**	2/21/2018
Total Depth:	6 ft	**Soil Depth:**	6 ft	**Core Depth:**	0 ft	**Date Completed:**	2/21/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	Cave 2.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Area								
	0.1	TOPSOIL (0.5")		0.0						
		FILL Very Stiff, Moist, Yellowish Red/Yellowish Brown, Medium Plasticity, Sandy SILT (ML/A-6(3)), Munsell=5YR 5/8 & 10YR 6/4			SS-1	3	13	11	7	24
		@2-ft: Firm, Moist to Dry, Yellowish Red, Munsell=5YR 5/8 @SS-2: LL=39, PL=28, PI=11, NMC=17.4%, %#200=50.4 @3-ft: Light Yellowish Brown, Munsell=2.5Y 6/3		2.0	SS-2	4	3	3	35	6
		@4-ft: Dry, Very Dense		4.0						
	4.3	**PARTIALLY WEATHERED ROCK (PWR)** SAMPLED AS: Very Dense, Dry, Light Olive Gray/Gray, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2) with Gravel, Munsell=5Y 6/2			SS-3	41	50/4"			100+
289.7										
	6.0	Boring Terminated at 6.0 feet Due to Drilling Refusal at Top of Rock		6.0	SS-4	50/0"				100+



LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-5
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	96+28	**Offset:**	47 L	**Alignment:**	Median CL
Elev.:	290.9 ft	**Latitude:**	34.088101	**Longitude:**	-81.162637	**Date Started:**	4/2/2018
Total Depth:	24.1 ft	**Soil Depth:**	24.1 ft	**Core Depth:**	0 ft	**Date Completed:**	4/2/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 10.0 ft	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Asphalt Roadway								
		ASPHALT (22")								
	1.9	**FILL**		2.0						
		Medium Dense, Moist, Yellowish Brown/Greenish Gray, Non-Plastic, Silty Fine SAND (SM/A-2-4) with Gravel, Munsell=10YR 5/6 & 5GY 6/1			SS-1	11	11	9	12	20
285.9				4.0						
		@SS-1: LL=NP, PL=NP, PI=NP, NMC=12.4%, %#200=30.2			SS-2	12	11	8	8	19
	6.0			6.0						
		Firm, Moist, Olive/Light Yellowish Brown, Medium Plasticity, Sandy Lean CLAY (CL/A-6(5)), Munsell=5Y 4/3 & 10YR 6/4			SS-3	2	3	4	6	7
		@8-ft: Moist to Wet, Light Olive Brown, with Gravel, Munsell=2.5Y 5/4		8.0						
					SS-4	2	2	3	4	5
280.9		@SS-4: LL=35, PL=20, PI=15, NMC=21.5%, %#200=53.6								
	12.0	**RESIDUUM**								
		Firm, Wet, Light Olive Brown, Medium to High Plasticity, Fat CLAY (CH/A-7), Munsell=2.5Y 5/4		13.5						
					SS-5	2	2	3		5
275.9		@13.5-ft: Olive Brown/Dark Gray, Munsell=2.5Y 6/6 & 2.5Y 4/1								
	18.5			18.5						
		Very Dense, Moist to Wet, Olive Brown, Non-Plastic , Silty, Sandy GRAVEL (GM/A-1), Munsell=2.5Y 4/4			SS-6	18	23	28		51
270.9										
				23.5						
	24.1	@23.5-ft: Yellowish Brown/Olive Brown, Munsell=10YR 5/8 & 2.5Y 6/6			SS-7	29	50/1.5"			100+
265.9		Boring Terminated at 24.1 feet Due to Drilling Refusal at Top of Rock								

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 8/1/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-6
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	116+31	**Offset:**	44 R	**Alignment:**	Median CL
Elev.:	278.7 ft	**Latitude:**	34.083703	**Longitude:**	-81.158647	**Date Started:**	2/27/2018
Total Depth:	16.6 ft	**Soil Depth:**	16.6 ft	**Core Depth:**	0 ft	**Date Completed:**	2/27/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 8.0 ft	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Asphalt Shoulder								
		ASPHALT (14.5")								
	1.2	**FILL**		1.2						
		Loose to Medium Dense, Moist, Red, Non-Plastic, Fine to Medium SAND (SP-SM/A-2) with Silt, Munsell=2.5Y 5/6			SS-1	3	8			
	2.5	Medium Dense, Moist to Dry, Light Yellowish Brown, Non-Plastic, Silty Fine to Coarse SAND (SM/A-4(0)) with Gravel, Munsell=2.5Y 6/3		2.0	SS-2	6	7	10	10	17
		@SS-2: LL=NP, PL=NP, PI=NP, NMC=14.9%, %#200=41.0		4.0	SS-3	6	7	7	5	14
273.7	6.0	**RESIDUUM**		6.0						
		Soft, Moist to Wet, Gray, Low Plastcity, Sandy CLAY (CL/A-6), with Gravel, Munsell=5Y 5/1			SS-4	2	1	2	2	3
	8.0 ▽	@SS-4: No Recovery		8.0	SS-5	3	3	3	4	6
268.7										
	13.5	**PARTIALLY WEATHERED ROCK (PWR)**		13.5	SS-6	50/<1"				100+
		@SS-6: No Recovery								
263.7										
	16.6	Boring Terminated at 16.6 feet Due to Drilling Refusal at Top of Rock		16.6	SS-7	50/<1"				100+

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/25/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-7
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	C. Piercy	**Boring Location:**	136+32	**Offset:**	93 L	**Alignment:**	Median CL
Elev.:	316.1 ft	**Latitude:**	34.079706	**Longitude:**	-81.154082	**Date Started:**	2/21/2018
Total Depth:	29.3 ft	**Soil Depth:**	29.3 ft	**Core Depth:**	0 ft	**Date Completed:**	2/21/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 3.1 ft	**24HR**	22.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.2	TOPSOIL (2")		0.0	SS-1	2	3	5	4	8
	2.0	**FILL**								
		Firm, Moist, Reddish Yellow/Red, Non-Plastic to Low Plasticity, SILT (ML/A-4), Munsell=7.5YR 5/8 & 2.5YR 4/8		2.0	SS-2	3	2	3	5	5
311.1		**RESIDUUM**		4.0	SS-3	8	11	12	23	23
		Firm, Moist, White, Medium Plasticity, Lean CLAY (CL/A-6(9)) with Sand, Munsell=2.5YR 8/1		6.0	SS-4	8	21	26	28	47
		@4-ft: Very Stiff to Hard, Reddish Yellow/White, Munsell=2.5YR 5/8 & 2.5YR 8/1		8.0	SS-5	10	14	20	32	34
306.1		@SS-3: LL=35, PL=22, PI=13, NMC=20.5%, %#200=74.4								
		@6-ft: Very Pale Yellow/Yellow, Munsell=10YR 8/4 & 10YR 7/8								
	13.5	@8-ft: with Quartz Fragments		13.5	SS-6	15	14	37		51
		Hard, Moist to Dry, Very Pale Brown/Black, Medium Plasticity, Sandy Lean CLAY (CL/A-6(6)), Munsell=10YR 8/4 & 10YR 2/1								
301.1		@SS-6: LL=36, PL=24, PI=12, NMC=24.1%, %#200=61.8								
	18.5	**PARTIALLY WEATHERED ROCK (PWR)**		18.5	SS-7	50/2.5"				100+
296.1		SAMPLED AS: Hard, Dry, Very Pale Brown, Non-Plastic to Low Plasticity, Sandy SILT (ML), Munsell=10YR 8/4		23.5	SS-8	50/2"				100+
291.1				28.5	SS-9	22	50/3"			100+
	29.3	@28.5-ft: Moist to Dry								
286.1		Boring Terminated at 29.3 feet								

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/24/18

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-8
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	S-757 (Harbison Blvd)
Eng./Geo.:	C. Piercy	**Boring Location:**	45+22	**Offset:**	177 L	**Alignment:**	Mainline
Elev.:	299.0 ft	**Latitude:**	34.079021	**Longitude:**	-81.152529	**Date Started:**	5/15/2018
Total Depth:	19.5 ft	**Soil Depth:**	19.5 ft	**Core Depth:**	0 ft	**Date Completed:**	5/15/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	12 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.2	ROOT MAT/TOPSOIL (2")		0.0	SS-1	2	3	3	5	6
		RESIDUUM Firm, Moist, Light Yellowish Brown, Low Plasticity, Lean CLAY (CL/A-4(5)) with Sand, Munsell=10YR 6/4		2.0	SS-2	8	6	2	2	8
		@2-ft: Pale Brown, Munsell=2.5Y 7/4								
	4.0	@SS-2: LL=27, PL=18, PI=9, NMC=13.4%, %#200=75.6		4.0	SS-3	3	8	12	17	20
294.0		@2.5-ft: Olive Yellow, Munsell=2.5Y 6/6								
	6.0	Very Stiff, Moist, Yellow/Light Gray, High Plasticity, Sandy Lean CLAY (CL/A-7-6(8)) with Gravel, Munsell=10YR 7/8 & 10YR 7/1		6.0	SS-4	11	21	25	37	46
		@SS-3: LL=43, PL=20, PI=23, NMC=9.1%, %#200=50.1		8.0	SS-5	8	26	27	31	53
		Hard, Moist, Pale Brown, Non-Plastic to Low Plasticity, SILT (ML/A-4), Munsell=2.5Y 7/4								
289.0		@8-ft: Pale Brown/Brownish Yellow/Light Greenish Gray, Munsell=2.5Y 7/4, 10YR 6/6 & 10Y 8/1								
		@SS-5: NMC=12.7%								
	13.5	**PARTIALLY WEATHERED ROCK (PWR)** SAMPLED AS: Hard, Moist, Light Gray, Non-Plastic to Low Plasticity, SILT (ML/A-4) with Sand, Munsell=2.5Y 7/2		13.5	SS-6	50/4.5"				100+
284.0										
	18.5			18.5	SS-7	50/1.5"				100+
	19.5	SAMPLED AS: Very Dense, Moist, Gray, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2), with Gravel, Munsell=5Y 6/1		19.4	SS-8	50/1"				100+
279.0		Boring Terminated at 19.5 feet Due to Drilling Refusal at Top of Rock								

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90

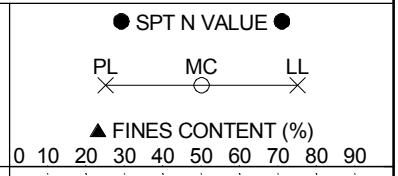
LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-10
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	S-757 (Harbison Blvd)
Eng./Geo.:	C. Piercy	**Boring Location:**	37+67	**Offset:**	262 R	**Alignment:**	Mainline
Elev.:	309.1 ft	**Latitude:**	34.076626	**Longitude:**	-81.152744	**Date Started:**	5/15/2018
Total Depth:	30 ft	**Soil Depth:**	30 ft	**Core Depth:**	0 ft	**Date Completed:**	5/15/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	Cave 17.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.1	TOPSOIL (1")		0.0	SS-1	5	7	10	11	17
		RESIDUUM								
	2.5	Very Stiff, Dry, Pale Brown, Non-Plastic to Low Plasticity, SILT (ML/A-4) with Sand, Munsell=2.5Y 7/3		2.0						
					SS-2	7	9	8	11	17
				4.0						
304.1		Very Stiff to Hard, Dry to Moist, Pale Brown/Reddish Yellow, High Plasticity, Elastic SILT (MH/A-7-6(20)), Munsell=2.5Y 7/4 & 5YR 6/8			SS-3	10	14	20	25	34
	6.7			6.0						
		@SS-2: LL=52, PL=29, PI=23, NMC=17.8%, %#200=89.3			SS-4	8	14	22	30	36
		@4-ft: Moist		8.0						
299.1		@6-ft: Red/Light Gray, Munsell=2.5YR 5/6 & 5YR 7/1			SS-5	5	25	27	41	52
		Hard to Very Stiff, Moist, Very Pale Brown, Non-Plastic, SILT (ML/A-4(0)), Munsell=10YR 7/3								
		@8-ft: Pale Brown, Munsell=2.5Y 7/3		13.5						
					SS-6	10	19	33		52
294.1		@SS-5: LL=NP, PL=NP, PI=NP, NMC=15.9%, %#200=85.1								
		@13.5-ft: Brownish Yellow/Light Gray, Munsell=10YR 6/6 & 10YR 7/1								
				18.5						
		@18.5-ft: Pink, Low Plasticity, A-4(4), with Sand, Munsell=7.5YR 7/3			SS-7	9	13	14		27
289.1		@SS-7: LL=34, PL=29, PI=5, NMC=22.8%, %#200=77.9								
				23.5						
		@23.5-ft: Light Gray, Munsell=7.5YR 7/1			SS-8	9	17	50/5"		67+
284.1										
				28.5						
		@28.5-ft: Gray, Munsell=7.5YR 6/1			SS-9	13	18	21		39
279.1	30.0	Boring Terminated at 30.0 feet								



LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-11
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	156+29	**Offset:**	64 R	**Alignment:**	Median CL
Elev.:	279.6 ft	**Latitude:**	34.075205	**Longitude:**	-81.150273	**Date Started:**	3/7/2018
Total Depth:	18.6 ft	**Soil Depth:**	18.6 ft	**Core Depth:**	0 ft	**Date Completed:**	3/1/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 3.0 ft	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.5	TOPSOIL (6")		0.0						
	1.0	**FILL**			SS-1	3	4	3	2	7
	2.0	Loose, Moist, Red, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2), Munsell=2.5 YR 4/8		2.0	SS-2	4	6	7	14	13
	4.0	Firm, Moist, Red, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), Munsell=2.5YR 4/8		4.0	SS-3	32	4	4	50/4"	54+
274.6		**RESIDUUM** Stiff, Moist to Dry, Light Gray, Low Plasticity, SILT (ML/A-4(4)), Micaceous, Munsell=10YR 7/2 @SS-2: LL=28, PL=23, PI=5, NMC=20.9%, %#200=87.8		6.0	SS-4	26	44	47	49	91
	9.0	Hard, Dry, Brownish Yellow, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), Micaceous, Munsell=10YR 6/6		8.0	SS-5	20	30	50/2"		100+
269.6		**PARTIALLY WEATHERED ROCK (PWR)** SAMPLED AS: Very Dense, Moist, Grayish Brown, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2), with Gravel, Munsell=2.5Y 5/2								
	13.5	SAMPLED AS: Hard, Moist, Gray, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), Micaceous, Munsell=10YR 6/1		13.5	SS-6	50/4.5"				100+
264.6										
	18.6	Boring Terminated at 18.6 feet Due to Drilling Refusal at Top of Rock		18.5	SS-7	50/0.5"				100+
259.6										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-12
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	C. Piercy	**Boring Location:**	216+33	**Offset:**	78 R	**Alignment:**	Median CL
Elev.:	286.1 ft	**Latitude:**	34.062518	**Longitude:**	-81.137582	**Date Started:**	5/1/2018
Total Depth:	30 ft	**Soil Depth:**	30 ft	**Core Depth:**	0 ft	**Date Completed:**	5/1/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 6.0 ft	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Asphalt Shoulder								
	0.4	ASPHALT (4.5")		0.4						
		FILL								
	2.0	Soft, Moist, Red, Medium Plasticity, SILT (ML/A-7-5(12)), with Sand, Munsell=2.5YR 5/6		2.0	SS-1	1	2	2		4
	4.0	@SS-1: LL=45, PL=33, PI=12, NMC=19.7%, %#200=84.3		4.0	SS-2	2	3	3	3	6
281.1					SS-3	3	3	3	3	6
	6.0	Firm, Moist, Pale Olive, High Plasticity, Fat CLAY (CH/A-7-6(20)), Munsell=5Y 6/3		6.0	SS-4	1	2	7	9	9
		@SS-2: LL=56, PL=23, PI=33, NMC=32.0%, %#200=96.8		8.0	SS-5	5	6	8	11	14
276.1		Firm, Moist, Pale Olive/Greenish Gray, Medium Plasticity, Lean CLAY (CL/A-7-6(19)), Munsell=5Y 6/3 & 5BG 6/1								
		@SS-3: LL=42, PL=25, PI=17, NMC=20.6%, %#200=96.8		13.5	SS-6	7	12	19		31
		RESIDUUM								
271.1		Firm to Stiff, Moist, Yellowish Brown/Greenish Gray, Medium Plasticity, SILT (ML/A-7-6(15)), Munsell=10YR 5/6 & 5GY 6/1		18.5	SS-7	10	16	21		37
		@8-ft: Yellowish Brown/Light Greenish Gray, Munsell=10YR 5/4 & 10GB 7/1								
		@SS-5: LL=41, PL=27, PI=14, NMC=29.7%, %#200=93.2								
266.1		@13.5-ft: Hard to Very Stiff, Light Olive Brown/Greenish Gray, Munsell=2.5Y 5/4 & 5G 6/1		23.5	SS-8	10	17	22		39
261.1										
				28.5	SS-9	5	8	13		21
256.1	30.0	Boring Terminated at 30.0 feet								

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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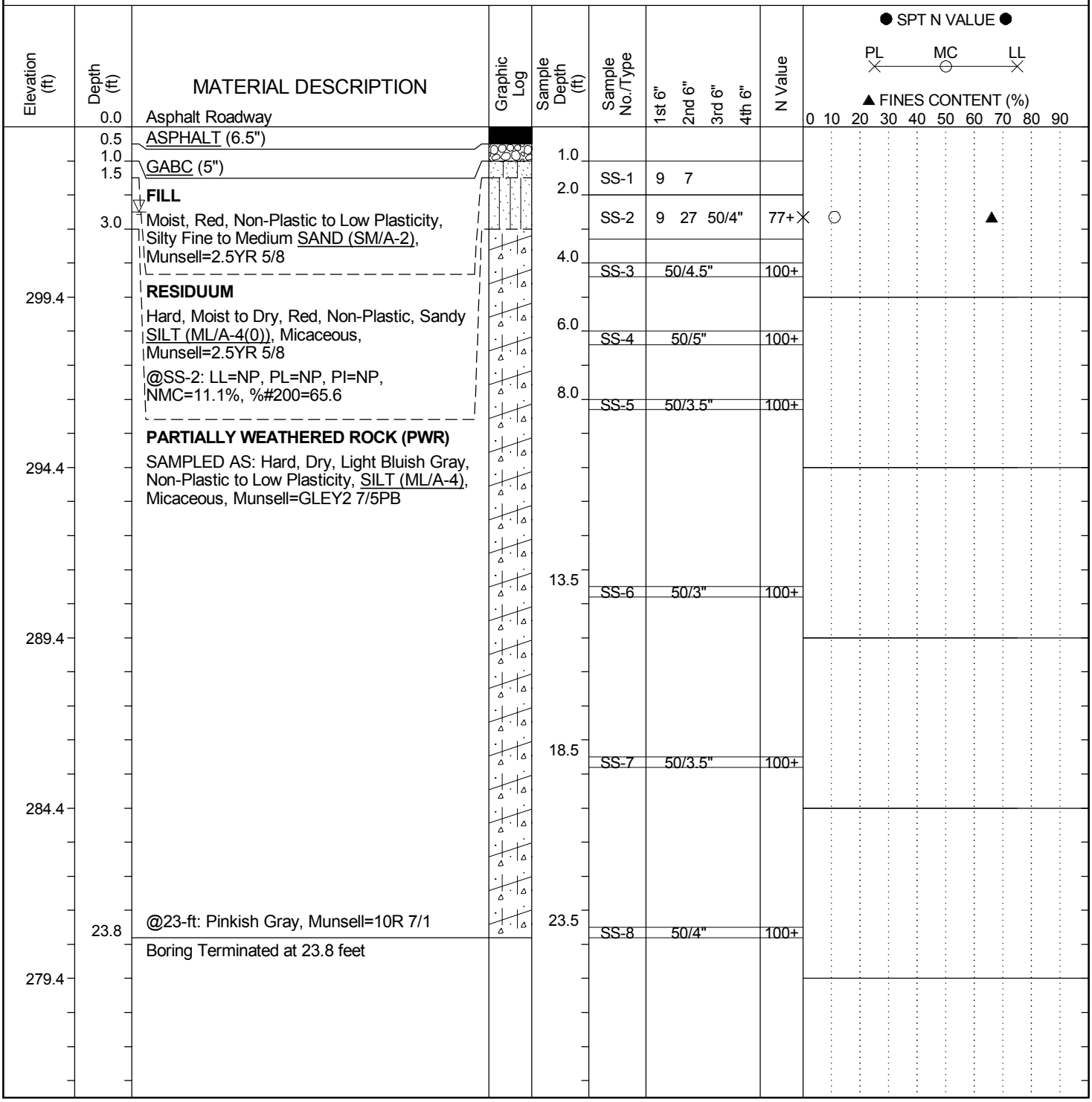
SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-13
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	236+31	**Offset:**	48 L	**Alignment:**	Median CL
Elev.:	304.4 ft	**Latitude:**	34.058683	**Longitude:**	-81.132839	**Date Started:**	3/21/2018
Total Depth:	23.8 ft	**Soil Depth:**	23.8 ft	**Core Depth:**	0 ft	**Date Completed:**	3/21/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 2.5 ft	**24HR**	Backfilled



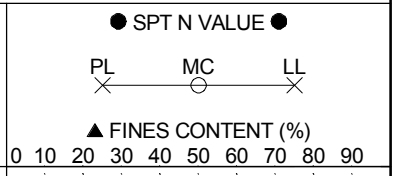
LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-14
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	256+29	**Offset:**	55 R	**Alignment:**	Median CL
Elev.:	298.0 ft	**Latitude:**	34.054426	**Longitude:**	-81.128661	**Date Started:**	3/9/2018
Total Depth:	50 ft	**Soil Depth:**	50 ft	**Core Depth:**	0 ft	**Date Completed:**	3/9/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 15.0 ft	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.7	TOPSOIL (8")		0.0	SS-1	3	6	6	5	12
	2.0	**FILL** Medium Dense, Moist, Strong Brown, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-2), Munsell=7.5YR 5/8		2.0	SS-2	6	7	6	7	13
				4.0	SS-3	6	7	8	13	15
293.0		**RESIDUUM** Stiff to Very Stiff, Moist, Red, Medium Plasticity, Sandy SILT (ML/A-7-6(7)), Munsell=10R 5/8		6.0	SS-4	8	11	9	11	20
	8.0	@SS-4: LL=41, PL=26, PI=15, NMC=22.9%, %#200=58.1		8.0	SS-5	7	11	12	13	23
288.0		Medium Dense, Moist, Red, Medium Plasticity, Clayey Fine SAND (SC/A-6(1)), Munsell=2.5YR 4/8 @SS-5: LL=34, PL=23, PI=11, NMC=16.6%, %#200=36.4								
	14.0			13.5	SS-6	4	9	15		24
283.0		Very Stiff to Stiff, Moist to Wet, Reddish Yellow, Medium Plasticity, Elastic SILT (MH/A-7-5(16)), Micaceous, Munsell=7.5YR 6/8								
		@SS-7: LL=51, PL=39, PI=12, NMC=34.0%, %#200=90.3		18.5	SS-7	2	4	5		9
278.0										
	23.5			23.5	SS-8	3	4	8		12
273.0		Stiff to Very Stiff, Moist to Wet, Pink, Non-Plastic, SILT (ML/A-4(0)), Munsell=7.5YR 7/4								
		@28.5-ft: Red, Munsell=2.5YR 5/6		28.5	SS-9	6	10	15		25
268.0										
				33.5						



LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-14
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	256+29	**Offset:**	55 R	**Alignment:**	Median CL
Elev.:	298.0 ft	**Latitude:**	34.054426	**Longitude:**	-81.128661	**Date Started:**	3/9/2018
Total Depth:	50 ft	**Soil Depth:**	50 ft	**Core Depth:**	0 ft	**Date Completed:**	3/9/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 15.0 ft	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
263.0		@SS-10: LL=NP, PL=NP, PI=NP, NMC=30.6%, %#200=98.6			SS-10	4	9	13		22
				38.5						
258.0		@38.5-ft: Hard, Pale Red, Munsell=10R 6/3			SS-11	8	11	20		31
				43.5						
253.0		@43.5-ft: Pale Red, Munsell=10R 7/3			SS-12	7	15	20		35
				48.5						
248.0		@48-ft: Brownish Yellow, Munsell=10YR 6/6			SS-13	5	8	26		34
	50.0	Boring Terminated at 50.0 feet								
243.0										
238.0										
233.0										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-15
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	276+32	**Offset:**	46 L	**Alignment:**	Median CL
Elev.:	238.7 ft	**Latitude:**	34.050536	**Longitude:**	-81.12397	**Date Started:**	3/21/2018
Total Depth:	44.3 ft	**Soil Depth:**	44.3 ft	**Core Depth:**	0 ft	**Date Completed:**	3/21/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 8.0 ft	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Asphalt Roadway								
	0.8	ASPHALT (8")								
	1.0	GABC (4")		1.0						
		FILL			SS-1	5	8			
	2.5	Loose, Moist, Reddish Yellow, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-2), Munsell=5YR 6/8		2.0	SS-2	5	3	5	8	8
	4.0			4.0	SS-3	7	7	6	7	13
233.7		**RESIDUUM**								
	6.0	Firm, Moist, Reddish Yellow, Non-Plastic to Low Plasticity, SILT (ML/A-4), Munsell=5YR 6/8		6.0	SS-4	2	3	3	5	6
		@SS-3: No Recovery		8.0	SS-5	2	3	3	3	6
		Firm, Moist to Wet, Reddish Yellow, Medium Plasticity, SILT (ML/A-7-6(18)), Micaceous, Munsell=7.5YR 6/8								
228.7		@SS-5: LL=46, PL=29, PI=17, NMC=27.5%, %#200=90.8								
	13.5	Medium Dense, Moist to Wet, Reddish Yellow, Non-Plastic, Sandy GRAVEL (GP/A-1), Munsell=7.5YR 7/6		13.5	SS-6	6	10	5		15
223.7										
	18.5	Hard, Moist to Wet, Yellow, Non-Plastic, Sandy SILT (ML/A-4(0)), Micaceous, Munsell=10YR 7/6		18.5	SS-7	7	16	32		48
218.7		@SS-7: LL=NP, PL=NP, PI=NP, NMC=19.2%, %#200=65.3								
				23.5						
	24.5				SS-8	12	45	50/3.5"		95+
213.7		Hard, Moist, Yellow, Non-Plastic, SILT (ML/A-4(0)), Micaceous, Munsell=10YR 7/6								
				28.5						

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

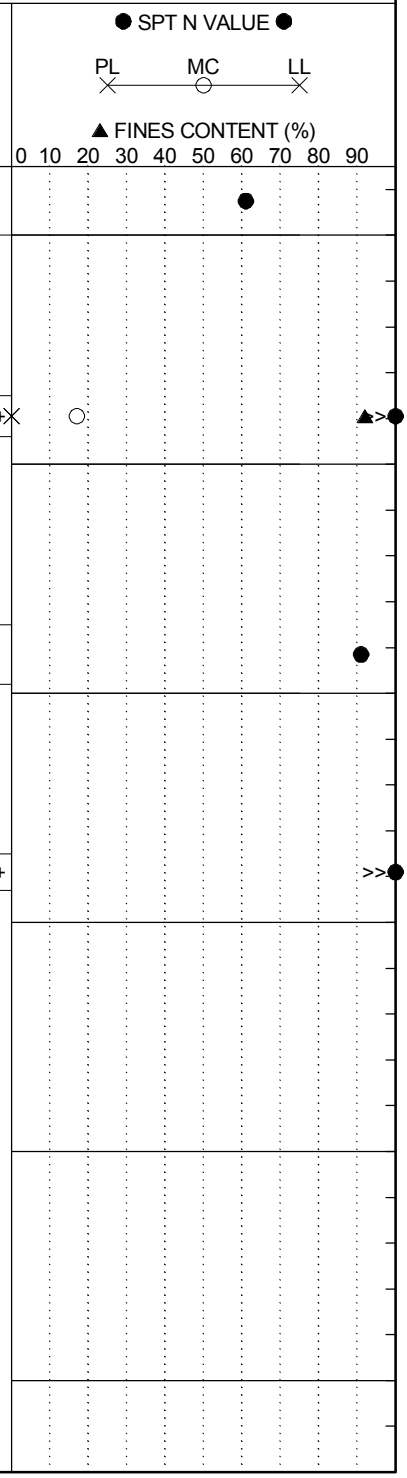
Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-15
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	276+32	**Offset:**	46 L	**Alignment:**	Median CL
Elev.:	238.7 ft	**Latitude:**	34.050536	**Longitude:**	-81.12397	**Date Started:**	3/21/2018
Total Depth:	44.3 ft	**Soil Depth:**	44.3 ft	**Core Depth:**	0 ft	**Date Completed:**	3/21/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 8.0 ft	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
		@28.5-ft: Olive Yellow, Munsell=2.5Y 6/6			SS-9	16	27	34		61
208.7										
				33.5						
	34.0				SS-10	36	50/4.5"			100+
		PARTIALLY WEATHERED ROCK (PWR)								
203.7		SAMPLED AS: Hard, Moist, Olive Yellow, Non-Plastic, SILT (ML/A-4(0)), Micaceous, Munsell=2.5Y 6/6								
		@SS-10: LL=NP, PL=NP, PI=NP, NMC=17.1%, %#200=92.4								
				38.5						
		@38.5-ft: Light Olive Gray, Munsell=5Y 6/2			SS-11	20	40	50/4"		90+
198.7										
				43.5						
	44.3	@43.5-ft: Bluish Gray, Munsell=GLEY2 6/10B			SS-12	45	50/3"			100+
193.7		Boring Terminated at 44.3 feet								
188.7										
183.7										



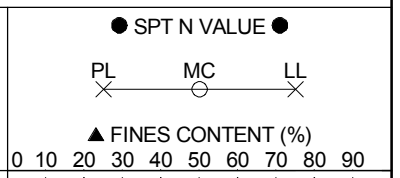
LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-16
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	S-36 (St Andrews Rd)
Eng./Geo.:	R. Wessinger	**Boring Location:**	26+81	**Offset:**	249 L	**Alignment:**	Mainline
Elev.:	225.3 ft	**Latitude:**	34.044957	**Longitude:**	-81.119181	**Date Started:**	2/12/2018
Total Depth:	48.5 ft	**Soil Depth:**	48.5 ft	**Core Depth:**	0 ft	**Date Completed:**	2/12/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	89%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** Dry	**24HR**	1.3 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Cleared Woods								
	0.8	TOPSOIL (8")		0.0						
		RESIDUUM			SS-1	2	3	3	3	6
		Firm to Soft, Moist, Strong Brown, Medium to High Plasticity, Sandy CLAY (CL/A-6), Micaceous, Munsell=7.5YR 4/6		2.0						
	4.0				SS-2	2	2	2	4	4
220.3		Stiff to Very Stiff, Moist, Pale Brown, Very Plastic, Fat CLAY (CH/A-7-6(20)), Micaceous, Munsell=2.5Y 7/3		4.0	SS-3	4	5	8	10	13
		@SS-3: LL=81, PL=18, PI=63, NMC=20.1%, %#200=98.3		6.0	SS-4	10	10	14	19	24
	8.0	@6-ft: Pale Brown/White, Munsell=2.5Y 7/3 & 2.5Y 8/1		8.0	SS-5	10	14	17	20	31
215.3		Hard, Moist, Light Olive Gray/Yellow, Medium Plasticity, Lean CLAY (CL/A-7-6(18)), Munsell=5Y 6/2 & 10YR 7/8								
		@SS-6: LL=42, PL=24, PI=18, NMC=17.3%, %#200=93.4		13.5	SS-6	15	36	50/5.5"		86+
	14.5	**PARTIALLY WEATHERED ROCK (PWR)**								
210.3		SAMPLED AS: Hard, Moist, Gray/Strong Brown, Non-Plastic, SILT (ML/A-4), Micaceous, Munsell=10Yr 6/1 & 7.5YR 5/8		18.5	SS-7	50/5.5"				100+
205.3										
	23.5			23.5	SS-8	50/2.5"				100+
		SAMPLED AS: Hard, Moist, Light Bluish Gray, Low Plasticity, Sandy SILT (ML/A-6(10)), Munsell=GLEY2_5B 7/1								
200.3				28.5						



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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-16
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	S-36 (St Andrews Rd)
Eng./Geo.:	R. Wessinger	**Boring Location:**	26+81	**Offset:**	249 L	**Alignment:**	Mainline
Elev.:	225.3 ft	**Latitude:**	34.044957	**Longitude:**	-81.119181	**Date Started:**	2/12/2018
Total Depth:	48.5 ft	**Soil Depth:**	48.5 ft	**Core Depth:**	0 ft	**Date Completed:**	2/12/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	89%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** Dry	**24HR**	1.3 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
195.3		@28.5-ft: Moist to Dry @SS-9: LL=35, PL=25, PI=10, NMC=14.2%, %#200=57.4			SS-9	50/3"	100+
				33.5	SS-10	50/3"	100+
190.3							
				38.5	SS-11	50/0.5"	100+
		@SS-11: No Recovery					
185.3							
				43.5	SS-12	50/1"	100+
		@43.5-ft: Bluish Gray, Munsell=5B 5/1					
180.3							
		@47.5-ft: Greenish Gray, Munsell=5BG 5/1					
	48.5			48.5	SS-13	50/0.5"	100+
		Boring Terminated at 48.5 feet Due to Drilling Refusal at Top of Rock					
175.3							
170.3							

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-17
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	S-36 (St Andrews Rd)
Eng./Geo.:	R. Wessinger	**Boring Location:**	30+75	**Offset:**	269 L	**Alignment:**	Mainline
Elev.:	212.2 ft	**Latitude:**	34.045368	**Longitude:**	-81.11803	**Date Started:**	1/25/2018
Total Depth:	23.5 ft	**Soil Depth:**	23.5 ft	**Core Depth:**	0 ft	**Date Completed:**	1/25/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	89%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** 6.0 ft	**24HR**	9.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.2	TOPSOIL (2")		0.0	SS-1	3	4	5	8	9
		FILL Stiff to Very Stiff, Moist, Yellowish Red, Medium Plasticity, SILT (ML/A-7-5(12)) with Sand, Munsell=5YR 5/8		2.0	SS-2	4	7	9	6	16
		=> Olive Yellow, Munsell=2.5Y 6/6 @4-ft: Firm		4.0	SS-3	4	4	4	4	8
207.2	6.0	@SS-3: LL=48, PL=34, PI=14, NMC=24.5%, %#200=74.3		6.0	SS-4	2	4	4	4	8
		Loose, Wet, Pale Brown, Non-Plastic, Fine to Medium SAND (SP/A-3), Munsell=2.5Y 8/3		8.0	SS-5	1	1	WOH/12"		1
	8.0	**ALLUVIUM** Very Soft, Wet, Pale Brown, Low Plasticity, Sandy SILT (ML/A-4(3)), Munsell=2.5Y 8/3								
202.2		@SS-5: LL=33, PL=24, PI=9, NMC=26.9%, %#200=52.7								
	13.5	**RESIDUUM** Loose, Wet, Olive Gray, Non-Plastic, Fine to Coarse SAND (SP-SM/A-2) with Silt and Gravel, Munsell=5Y 5/2		13.5	SS-6	4	3	3		6
197.2	17.0	**PARTIALLY WEATHERED ROCK (PWR)** SAMPLED AS: Hard, Moist, Greenish Gray, Sandy SILT (ML/A-4) with Gravel, Munsell=10Y 6/1		17.0						
				18.5	SS-7	50/2"				100+
192.2										
	23.5	Boring Terminated at 23.5 feet Due to Drilling Refusal at Top of Rock		23.5	SS-8	50/0.25"				100+
187.2										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Hard Drilling at 17-ft.

>>

>>

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/25/18

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-18
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	S-36 (St Andrews Rd)
Eng./Geo.:	C. Piercy	**Boring Location:**	29+98	**Offset:**	539 R	**Alignment:**	Mainline
Elev.:	207.3 ft	**Latitude:**	34.043214	**Longitude:**	-81.117335	**Date Started:**	5/1/2018
Total Depth:	85.8 ft	**Soil Depth:**	65.8 ft	**Core Depth:**	20 ft	**Date Completed:**	5/3/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	5.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Asphalt Roadway								
		ASPHALT (11")								
	1.0			1.0						
	1.7	**FILL** Moist, Grayish Brown/Yellowish Brown, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-2), Munsell=10YR 5/2 & 10YR 5/4		2.0	SS-1	3	4			
	4.0	Medium Dense, Moist Brown, Clayey Fine to Medium SAND (SC/A-4), Munsell=10YR 5/3		4.0	SS-2	1	8	8	7	16
202.3		@2.3-ft: Reddish Brown/Brown, with Gravel, Munsell=5YR 5/4 & 10YR 4/3			SS-3	4	4	4	3	8
	6.0	**ALLUVIUM** Firm, Moist, Light Olive Brown, Non-Plastic, Sandy SILT (ML/A-4(0)), with Gravel, Munsell=2.5Y 5/4		6.0	SS-4	1/12"		1/12"		1
	8.5	@SS-3: LL=NP, PL=NP, PI=NP, NMC=8.7%, %#200=56.7		8.0	SS-5	WOH/24"				WOH
197.3		Very Soft, Moist, Pale Olive, Medium Plasticity, Sandy Lean CLAY (CL/A-6(9)), Munsell=5Y 6/3 @SS-4: LL=40, PL=23, PI=17, NMC=13.6%, %#200=64.5								
	13.5	Very Soft, Wet, Pale Olive, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), with Gravel, Munsell=5Y 6/3 @SS-5: LL=26, PL=19, PI=7		13.5	SS-6	7	15	24		39
192.3		**RESIDUUM** Hard, Moist, Brown/Gray, Non-Plastic to Low Plasticity, SILT (ML/A-4), Micaceous, Munsell=10YR 5/3 & 2.5Y 5/1		18.5	SS-7	30	46	50/4"		96+
187.3	19.5	**PARTIALLY WEATHERED ROCK (PWR)** SAMPLED AS: Hard, Moist, Gray, Non-Plastic to Low Plasticity, SILT (ML/A-4), with Sand and Gravel, Munsell=10YR 5/1								
	23.5			23.5						

SPT N VALUE ●
PL × MC ○ LL ×
▲ FINES CONTENT (%)
0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-18
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	S-36 (St Andrews Rd)
Eng./Geo.:	C. Piercy	**Boring Location:**	29+98	**Offset:**	539 R	**Alignment:**	Mainline
Elev.:	207.3 ft	**Latitude:**	34.043214	**Longitude:**	-81.117335	**Date Started:**	5/1/2018
Total Depth:	85.8 ft	**Soil Depth:**	65.8 ft	**Core Depth:**	20 ft	**Date Completed:**	5/3/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	5.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" 2nd 6" 3rd 6" 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
182.3		SAMPLED AS: Very Dense, Moist, White/Dark Bluish Gray, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2), with Gravel, Munsell=5Y 8/1 & 10B 4/1			SS-8	27 50/3"	100+	>>
	28.5	**RESIDUUM**		28.5				
177.3		Hard, Moist, Gray/White, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), with Gravel, Munsell=5Y 5/1 & 5Y 8/1			SS-9	45 39 19	58	
	33.5	**PARTIALLY WEATHERED ROCK (PWR)**		33.5	SS-10	50/3"	100+	>>
172.3		SAMPLED AS: Hard, Moist, Gray/White, Non-Plastic to Low Plasticity, SILT (ML/A-4), with Sand and Gravel, Munsell=5Y 5/1 & 5Y 8/1						
		@38.5-ft: Dark Gray/Bluish Gray, Munsell=5Y 4/1 & 10BG 5/1		38.5	SS-11	50/6"	100+	>>
167.3								
	43.5	**RESIDUUM**		43.5				
162.3		Hard, Moist, Dark Bluish Gray, Non-Plastic to Low Plasticity, SILT (ML/A-4), Munsell=10B 4/1			SS-12	7 27 43	70	

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-18
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	S-36 (St Andrews Rd)
Eng./Geo.:	C. Piercy	**Boring Location:**	29+98	**Offset:**	539 R	**Alignment:**	Mainline
Elev.:	207.3 ft	**Latitude:**	34.043214	**Longitude:**	-81.117335	**Date Started:**	5/1/2018
Total Depth:	85.8 ft	**Soil Depth:**	65.8 ft	**Core Depth:**	20 ft	**Date Completed:**	5/3/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	5.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
	48.5	**PARTIALLY WEATHERED ROCK (PWR)** SAMPLED AS: Hard, Moist, Dark Bluish Gray, Non-Plastic to Low Plasticity, SILT (ML/A-4), with Sand and Gravel, Munsell=10B 4/1		48.5	SS-13	50/4"	100+
157.3				53.5	SS-14	50/3.5"	100+
152.3				58.5	SS-15	22 50/3.5"	100+
147.3				63.5	SS-16	50/3"	100+
142.3	65.8	**PHYLLITE** Metamorphic, Gray, Very Fine Grained, Thinly Laminated to Laminated Foliation, Quartz/Feldspar/Sericite, Highly to Slightly Weathered, Joints Dip from 30° to 70°, Numerous Joints, Moderately Wide to Very Narrow, Spotty (Calcite), Planar/Stepped/Irregular, Very Close, Smooth to Slightly Rough		65.8	SS-17	50/<1"	100+
137.3					NQ-1	%REC=50, %RQD=7, RMR=N/A, GSI=14-19	

SPT N VALUE ● — PL × — MC ○ — LL ×

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-18
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	S-36 (St Andrews Rd)
Eng./Geo.:	C. Piercy	**Boring Location:**	29+98	**Offset:**	539 R	**Alignment:**	Mainline
Elev.:	207.3 ft	**Latitude:**	34.043214	**Longitude:**	-81.117335	**Date Started:**	5/1/2018
Total Depth:	85.8 ft	**Soil Depth:**	65.8 ft	**Core Depth:**	20 ft	**Date Completed:**	5/3/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	5.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		=> with Quartz Vein @NQ-2: Weak Rock, Joints Dip from 20° to 65°, Numerous Joints, Moderately Wide to Very Narrow, Surface Stain (Iron Oxide), Planar/Stepped/Irregular, Very Close, Smooth to Rough	70.8	NQ-2			@71.8-ft: UC Strength=2,240 psi %REC=92, %RQD=51, RMR=26, GSI=14-19
132.3		=> with Quartz Vein @NQ-3: Very Fine to Coarse Grained, Medium Strong Rock, Joints Dip from 10° to 80°, Numerous Joints, Moderately Wide to Very Narrow, Surface Stain (Iron Oxide), Wavy/Planar/Irregular, Very Close, Smooth to Rough	75.8	NQ-3			@76.5-ft: UC Strength=6,800 psi %REC=79, %RQD=8, RMR=18, GSI=12-17
127.3		@NQ-4: Very Fine to Fine Grained, Joints Dip from 10° to 75°, Numerous Joints, Moderately Wide to Very Narrow, No Infilling, Wavy/Planar/Stepped/Irregular, Very Close, Smooth to Slightly Rough	80.8	NQ-4			%REC=61, %RQD=8, RMR=N/A, GSI=12-17
122.3	85.8	Coring Terminated at 85.8 feet					
117.3							

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-19
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	S-36 (St Andrews Rd)
Eng./Geo.:	R. Wessinger	**Boring Location:**	32+12	**Offset:**	241 R	**Alignment:**	Mainline
Elev.:	216.7 ft	**Latitude:**	34.044186	**Longitude:**	-81.117017	**Date Started:**	1/23/2018
Total Depth:	39.3 ft	**Soil Depth:**	39.3 ft	**Core Depth:**	0 ft	**Date Completed:**	1/23/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	89%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** 20.0 ft	**24HR**	20.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Grassed Shoulder									
		FILL		0.0							
		Medium Dense to Loose, Moist, Reddish Yellow, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-2) with Trace of Asphalt, Munsell=5YR 6/6			SS-1	2	10	6	6	16	
		@2-ft: Moist to Dry, Fine to Coarse Sand, Micaceous		2.0	SS-2	3	5	5	8	10	
				4.0	SS-3	10	10	10	12	20	
211.7	6.0	**RESIDUUM**		6.0							
		Stiff, Moist, Light Yellowish Brown, Low Plasicity, Gravelly SILT (ML/A-4(4)) with Sand, Munsell=2.5Y 6/4			SS-4	6	7	8	8	15	
		@SS-4: LL=37, PL=27, PI=10, NMC=17.0%, %#200=56.4		8.0	SS-5	4	5	5	7	10	
206.7		@8-ft: Light Yellowish Brown/Reddish Yellow, Munsell=2.5Y 6/4 & 5YR 6/8									
	13.5			13.5							
		Firm, Moist, Light Yellowish Brown/Black, Medium Plasticity, Sandy Lean CLAY (CL/A-6(6)), Micaceous, Munsell=2.5Y 6/4 & 2.5Y 2.5/1			SS-6	4	3	5		8	
201.7		@SS-6: LL=37, PL=21, PI=16, NMC=18.3%, %#200=56.4									
				18.5							
		@18.5-ft: Very Stiff, Moist to Wet, Light Yellowish Brown/Dark Gray, Munsell=2.5Y 6/4 & 2.5Y 4/1			SS-7	6	11	15		26	
196.7		▼									
	23.5			23.5							

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-19
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	S-36 (St Andrews Rd)
Eng./Geo.:	R. Wessinger	**Boring Location:**	32+12	**Offset:**	241 R	**Alignment:**	Mainline
Elev.:	216.7 ft	**Latitude:**	34.044186	**Longitude:**	-81.117017	**Date Started:**	1/23/2018
Total Depth:	39.3 ft	**Soil Depth:**	39.3 ft	**Core Depth:**	0 ft	**Date Completed:**	1/23/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	89%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** 20.0 ft	**24HR**	20.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
191.7		**PARTIALLY WEATHERED ROCK (PWR)** SAMPLED AS: Hard, Moist, Gray, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), Micaceous, Munsell=5Y 5/1			SS-8	50/4.5"	100+
				28.5	SS-9	50/4.5"	100+
186.7							
				33.5	SS-10	50/3.5"	100+
		@33.5-ft: Bluish Gray, Munsell=GLEY2 5B 6/1					
181.7							
				38.5	SS-11	27 50/3.5"	100+
	39.3	Boring Terminated at 39.3 feet					
176.7							
171.7							

SPT N VALUE ●

PL ✕ MC ○ LL ✕

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

>>●

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-20
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	126CDW1
Eng./Geo.:	M. Miller	**Boring Location:**	7330+08	**Offset:**	9 R	**Alignment:**	Mainline
Elev.:	267.9 ft	**Latitude:**	34.03937	**Longitude:**	-81.112346	**Date Started:**	4/5/2018
Total Depth:	40 ft	**Soil Depth:**	40 ft	**Core Depth:**	0 ft	**Date Completed:**	4/5/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	20.2 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Cleared Woods								
	0.3	TOPSOIL & PINE NEEDLES (3")		0.0	SS-1	2	3	6	8	9
		RESIDUUM		2.0						
		Stiff to Very Stiff, Dry, Light Red, Low Plasticity, SILT (ML/A-5(11)), Munsell=2.5YR 6/6			SS-2	5	11	11	12	22
262.9		@SS-1: LL=43, PL=35, PI=8, NMC=17.8%, %#200=92.0		4.0	SS-3	10	10	11	13	21
		@2-ft: Light Red, Munsell=2.5YR 4/8		6.0	SS-4	6	6	6	10	12
		@6-ft: Moist, Red, Munsell=2.5YR 5/8		8.0	SS-5	6	5	8	11	13
257.9		@8-ft: Red, Munsell=2.5YR 5/6								
		@13.5-ft: Light Red, Munsell=2.5YR 6/6		13.5	SS-6	5	8	11		19
252.9				18.5	SS-7	8	10	16		26
		@18.5-ft: Yellowish Red, Munsell=5YR 5/8								
247.9		▼		23.5	SS-8	10	13	14		27
		@23.5-ft: Red, Non-Plastic, A-4(0), Munsell=10R 5/8								
242.9		@SS-8: LL=NP, PL=NP, PI=NP, NMC=25.6%, %#200=87.7		28.5	SS-9	5	8	12		20
		@28.5-ft: Red, Munsell=2.5Y 5/8								
237.9				33.5	SS-10	9	13	17		30
		@33.5-ft: Red, Munsell=10R 5/8								
232.9				38.5	SS-11	8	10	18		28
		@38.5-ft: Weak Red, Munsell=7.5YR 5/4								
227.9	40.0	Boring Terminated at 40.0 feet								

SPT N VALUE ●

PL ✕ MC ○ LL ✕

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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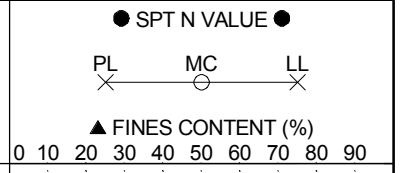
SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-21
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I26RDB
Eng./Geo.:	C. Piercy	**Boring Location:**	6391+19	**Offset:**	118 L	**Alignment:**	Mainline
Elev.:	248.3 ft	**Latitude:**	34.037467	**Longitude:**	-81.112953	**Date Started:**	4/10/2018
Total Depth:	40 ft	**Soil Depth:**	40 ft	**Core Depth:**	0 ft	**Date Completed:**	4/10/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** 21.5 ft	**24HR**	Cave 22.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.1	TOPSOIL (1")		0.0	SS-1	2	1	3	6	4
		RESIDUUM		2.0						
		Soft, Moist, Very Pale Brown, High Plasticity, Elastic SILT (MH/A-7-5(20)), Munsell=10YR 7/4			SS-2	9	14	16	21	30
	4.0			4.0						
243.3		@2-ft: Very Stiff, Red/Brownish Yellow, Munsell=10R 5/6 & 10YR 6/6			SS-3	15	17	17	23	34
		@SS-2: LL=63, PL=35, PI=28, NMC=23.6%, %#200=76.4		6.0						
					SS-4	7	11	13	19	24
				8.0						
					SS-5	6	11	14	19	25
238.3		Hard to Very Stiff, Moist, Red/Brownish Yellow, Non-Plastic, SILT (ML/A-4(0)), Munsell=10R 5/6 & 10YR 6/6								
		@6-ft: Red/Pale Brown, Munsell=10R 5/6 & 2.5Y 84		13.5						
					SS-6	4	8	8		16
233.3		@8-ft: Reddish Yellow/Red, Munsell=7.5YR 7/6 & 10R 5/6								
		@13.5-ft: Yellow, Munsell=10YR 7/8								
		@SS-6: LL=NP, PL=NP, PI=NP, NMC=27.1%, %#200=92.4		18.5						
					SS-7	6	8	11		19
228.3		@18.5-ft: Light Red, Munsell=2.5YR 6/8								
		▽								
				23.5						
		@23.5-ft: Light Red/Brownish Yellow, Munsell=2.5YR 6/6 & 10YR 6/8			SS-8	6	8	13		21
223.3										
				28.5						
		@28.5-ft: Red/Brownish Yellow, Munsell=10R 4/6 & 10YR 6/8			SS-9	5	6	10		16
218.3										
				33.5						
		@33.5-ft: Stiff to Very Stiff, Brownish Yellow/Light Red, Munsell=10YR 6/8 & 10R 6/6			SS-10	4	6	6		12
213.3		@SS-10: LL=NP, PL=NP, PI=NP, NMC=35.8%, %#200=90.6		38.5						
					SS-11	6	10	12		22
208.3	40.0									
		Boring Terminated at 40.0 feet								



LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-22
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I26RBD
Eng./Geo.:	R. Wessinger	**Boring Location:**	4342+46	**Offset:**	33 L	**Alignment:**	Mainline
Elev.:	240.1 ft	**Latitude:**	34.035662	**Longitude:**	-81.112265	**Date Started:**	4/20/2018
Total Depth:	44.2 ft	**Soil Depth:**	44.2 ft	**Core Depth:**	0 ft	**Date Completed:**	4/20/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	23.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.3	TOPSOIL (4")		0.0	SS-1	3	5	8	12	13
		RESIDUUM Stiff, Moist to Dry, Weak Red, Low Plasticity, SILT (ML/A-4(4)), Micaceous, Munsell=7.5YR 5/4		2.0	SS-2	9	15	19	21	34
		@2-ft: Hard to Very Stiff		4.0						
235.1		@SS-2: LL=33, PL=29, PI=4, NMC=8.2%, %#200=86.3			SS-3	15	17	21	24	38
		@4-ft: Yellow/Very Pale Brown, Munsell=10R 8/6 & 10YR 8/3		6.0	SS-4	10	11	13	18	24
		@6-ft: with Sand and Gravel		8.0	SS-5	8	13	18	22	31
		@8-ft: Moist, Brownish Yellow, A-4(7), with Sand, Munsell=10YR 6/8								
230.1		@SS-5: LL=35, PL=27, PI=8, NMC=23.0, %#200=82.3		13.5	SS-6	10	28	41		69
225.1										
				18.5	SS-7	10	19	32		51
220.1		@18.5-ft: Yellow/Brownish Yellow, Munsell=10YR 8/8 & 10YR 6/6								
		▼		23.5	SS-8	10	12	41		53
215.1		@23.5-ft: Yellow/Brown, Munsell=10YR 8/8 & 10YR 4/3		28.5						

SPT N VALUE ●

PL ✕ MC ○ LL ✕

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-22
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I26RBD
Eng./Geo.:	R. Wessinger	**Boring Location:**	4342+46	**Offset:**	33 L	**Alignment:**	Mainline
Elev.:	240.1 ft	**Latitude:**	34.035662	**Longitude:**	-81.112265	**Date Started:**	4/20/2018
Total Depth:	44.2 ft	**Soil Depth:**	44.2 ft	**Core Depth:**	0 ft	**Date Completed:**	4/20/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	23.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
210.1					SS-9	14	23	36		59
				33.5						
		@33.5-ft: Yellow/White, with Sand, Munsell=10YR 8/8 & 10YR 8/1			SS-10	6	18	31		49
205.1										
				38.5						
	39.5				SS-11	21	48	50/5"		98+
200.1		**PARTIALLY WEATHERED ROCK (PWR)** SAMPLED AS: Very Dense, Moist, Grayish Brown, Non-Plastic to Low Plasticity, Silty Medium to Coarse SAND (SM/A-2), with Gravel, Munsell=2.5Y 5/2								
				43.5						
	44.2	@43.5-ft: Light Gray, Munsell=2.5Y 7/1			SS-12	44	50/2.5"			100+
195.1		Boring Terminated at 44.2 feet								
190.1										
185.1										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/25/18

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-23
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RC2
Eng./Geo.:	C. Piercy	**Boring Location:**	5161+62	**Offset:**	8 R	**Alignment:**	Mainline
Elev.:	273.6 ft	**Latitude:**	34.034325	**Longitude:**	-81.109706	**Date Started:**	4/30/2018
Total Depth:	73.9 ft	**Soil Depth:**	73.9 ft	**Core Depth:**	0 ft	**Date Completed:**	4/30/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.3	TOPSOIL (3")		0.0	SS-1	1	3	4	5	7
	0.6	**RESIDUUM** Firm, Moist, Red, Non-Plastic to Low Plasticity, SILT (ML/A-4), Munsell=2.5YR 5/6		2.0	SS-2	6	7	8	9	15
		Stiff to Very Stiff, Moist, Red/Greenish Gray, Medium Plasticity, Elastic SILT (MH/A-7-5(20)), Munsell=2.5YR 5/6 & 10Y 6/1		4.0	SS-3	9	9	10	10	19
268.6		@SS-2: LL=57, PL=38, PI=19, NMC=25.8%, %#200=97.9		6.0	SS-4	3	4	7	9	11
		@4-ft: Yellowish Red/Very Pale Brown, Munsell=5YR 5/6 & 10YR 8/4		8.0	SS-5	3	5	7	10	12
		@8-ft: Red/Pale Brown, Munsell=2.5YR 5/8 & 2.5Y 7/3								
263.6				13.5	SS-6	2	4	6		10
		@13.5-ft: Red/Brownish Yellow, A-7-5(19), Munsell=7.5R 5/6 & 10YR 6/6								
258.6		@SS-6: LL=58, PL=47, PI=11, NMC=29.7%, %#200=97.3		18.5	SS-7	3	5	8		13
		@18.5-ft: Red, Munsell=10R 4/6								
253.6				23.5	SS-8	3	6	10		16
		@23.5-ft: Pale Brown/Reddish Yellow, Munsell=2.5Y 7/4 & 7.5YR 6/8								
248.6				28.5						

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-23
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RC2
Eng./Geo.:	C. Piercy	**Boring Location:**	5161+62	**Offset:**	8 R	**Alignment:**	Mainline
Elev.:	273.6 ft	**Latitude:**	34.034325	**Longitude:**	-81.109706	**Date Started:**	4/30/2018
Total Depth:	73.9 ft	**Soil Depth:**	73.9 ft	**Core Depth:**	0 ft	**Date Completed:**	4/30/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		@28.5-ft: Very Pale Brown, Munsell=10YR 7/4			SS-9	3	5	7		12	
243.6		@SS-9: LL=50, PL=41, PI=9, NMC=33.8%, %#200=93.4									
				33.5							
		@33.5-ft: Reddish Yellow/Gray, Munsell=7.5YR 6/8 & 7.5YR 6/1			SS-10	3	6	9		15	
238.6											
	38.5			38.5							
		Firm to Stiff, Moist, Brownish Yellow, Medium Plasticity, SILT (ML/A-7-5(16)), Munsell=10YR 6/8			SS-11	2	3	5		8	
233.6		@SS-11: LL=48, PL=34, PI=14, NMC=27.6%, %#200=88.7									
				43.5							
		@43.5-ft: Pale Olive/Light Grayish Green, A-7-5(15), Munsell=10Y 6/4 & 5GY 6/2			SS-12	2	2	5		7	
228.6		@SS-12: LL=45, PL=34, PI=11, NMC=26.0%, %#200=95.8									
				48.5							
					SS-13	2	3	6		9	
223.6											
				53.5							
		@53.5-ft: Very Stiff to Hard, Light Olive, Munsell=10Y 5/4			SS-14	3	5	11		16	
218.6											

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662	**County:**	Richland/Lexington	**Boring No.:**	RW-23		
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	I20RC2		
Eng./Geo.:	C. Piercy	**Boring Location:**	5161+62	**Offset:**	8 R	**Alignment:**	Mainline
Elev.:	273.6 ft	**Latitude:**	34.034325	**Longitude:**	-81.109706	**Date Started:**	4/30/2018
Total Depth:	73.9 ft	**Soil Depth:**	73.9 ft	**Core Depth:**	0 ft	**Date Completed:**	4/30/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
				58.5						
		@58.5-ft: Pale Olive/Grayish Green, Munsell=10Y 6/4 & 10Y 5/2			SS-15	4	8	12		20
213.6										
				63.5						
					SS-16	11	19	22		41
208.6										
				68.5						
					SS-17	18	26	43		69
203.6										
	73.5			73.5						
	73.9	**PARTIALLY WEATHERED ROCK (PWR)**			SS-18	50/4.5"				100+
		SAMPLED AS: Hard, Moist, Pale Olive/Grayish Green, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), Munsell=10Y 6/4 & 10Y 5/2								
198.6		Boring Terminated at 73.9 feet								
193.6										
188.6										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Slow Drilling at 66.0-ft

>>

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/24/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-24
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	336+30	**Offset:**	61 L	**Alignment:**	Median CL
Elev.:	275.6 ft	**Latitude:**	34.037826	**Longitude:**	-81.111352	**Date Started:**	3/20/2018
Total Depth:	40 ft	**Soil Depth:**	40 ft	**Core Depth:**	0 ft	**Date Completed:**	3/20/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 18.0 ft	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Asphalt Roadway								
	1.5	ASPHALT (18")		1.5						
		COASTAL PLAIN		2.0	SS-1	4				
		Dense to Very Dense, Moist, Yellowish Red, Non-Plastic to Low Plasticity, Clayey Fine to Medium SAND (SC/A-7-5(7)), with Gravel, Munsell=5YR 5/6		4.0	SS-2	5	16	23	33	39
270.6					SS-3	26	47	50/5.5"		97+
		@2-ft: Red, Munsell=2.5YR 5/6		6.0	SS-4	22	24	25	20	49
		@4-ft: Red/White, Munsell=2.5YR 5/6 & 2.5YR 8/1		8.0	SS-5	2	9	11	12	20
265.6		@6-ft: Reddish Yellow, Munsell=5YR 6/6								
		@8-ft: Medium Dense								
		@SS-5: LL=58, PL=30, PI=28, NMC=21.6%, %#200=41.7								
	13.5			13.5	SS-6	3	4	5		9
260.6		Loose, Moist to Wet, Reddish Yellow, Non-Plastic, Silty Fine to Medium SAND (SM/A-4(0)), Munsell=5YR 6/6								
		@SS-6: LL=NP, PL=NP, PI=NP, NMC=20.2%, %#200=36.9								
	18.5			18.5	SS-7	3	3	3		6
255.6		Loose, Moist to Wet, Reddish Yellow, High Plasticity, Clayey Fine to Medium SAND (SC/A-2-7(1)) with Gravel, Munsell=5YR 7/8								
		@SS-7: LL=51, PL=25, PI=26, NMC=14.3%, %#200=19.4								
	23.5			23.5	SS-8	1	3	4		7
250.6		Firm, Wet, Reddish Yellow, Low Plasticity, Lean CLAY (CL/A-4(6)) with Sand, Munsell=7.5YR 7/8								
		@SS-8: LL=32, PL=22, PI=10, NMC=27.7%, %#200=72.4		28.5	SS-9	6	15	22		37
	29.0									
245.6		**RESIDUUM**								
		Hard, Moist to Wet, Light Gray, Low Plasticity, Sandy SILT (ML/A-4(2)), Micaceous, Munsell=2.5Y 7/1		33.5	SS-10	11	19	32		51
		@SS-9: LL=35, PL=27, PI=8, NMC=21.4%, %#200=52.1								
240.6										
				38.5	SS-11	15	33	45		78
		@38.5-ft: Yellow, Munsell=10YR 8/6								
235.6	40.0	Boring Terminated at 40.0 feet								

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/24/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-25
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RAC
Eng./Geo.:	M. Miller	**Boring Location:**	3160+88	**Offset:**	69 L	**Alignment:**	Mainline
Elev.:	277.8 ft	**Latitude:**	34.03838	**Longitude:**	-81.1108	**Date Started:**	4/5/2018
Total Depth:	44.9 ft	**Soil Depth:**	44.9 ft	**Core Depth:**	0 ft	**Date Completed:**	4/5/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	21.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.3	TOPSOIL (4")		0.0	SS-1	4	6	11	18	17
		COASTAL PLAIN		2.0	SS-2	17	26	26	33	52
		Medium Dense, Dry to Moist, Red, Medium Plasticity, Silty Fine to Medium SAND (SM/A-7-5(3)), Munsell=2.5YR 5/6		4.0	SS-3	13	14	17	20	31
272.8		@2-ft: Very Dense to Dense, Red, Munsell=10YR 5/6		6.0	SS-4	10	13	14	15	27
		@SS-3: LL=61, PL=42, PI=19, NMC=14.9%, %#200=39.0		8.0	SS-5	7	9	9	9	18
		@6-ft: Medium Dense, Yellowish Red, Munsell=5YR 5/8								
267.8		@8-ft: Moist to Wet, A-2-7(1)		13.5	SS-6	6	9	10		19
		@SS-5: LL=54, PL=36, PI=18, NMC=16.6%, %#200=25.3								
262.8		@13.5-ft: Moist, Reddish Yellow, Munsell=10YR 6/8		18.5	SS-7	9	11	16		27
	18.0	**RESIDUUM**								
257.8		Very Stiff to Hard, Moist, Reddish Yellow, Non-Plastic, SILT (ML/A-4(0)), Munsell=5YR 6/6		23.5	SS-8	14	17	17		34
		@SS-7: LL=NP, PL=NP, PI=NP, NMC=28.8%, %#200=91.2								
252.8		@23.5-ft: Reddish Yellow, Munsell=5YR 7/8		28.5						

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

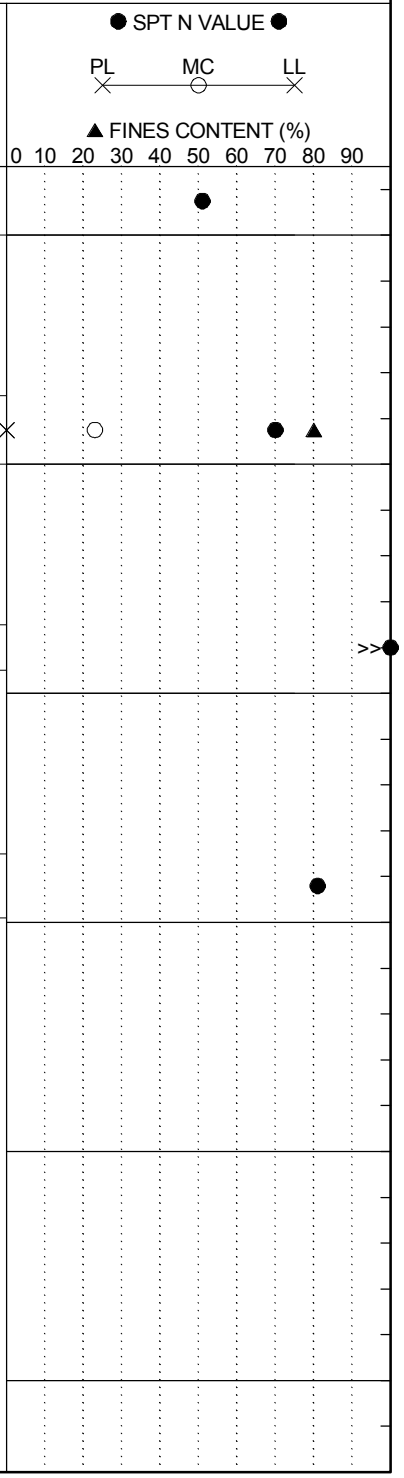
Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-25
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RAC
Eng./Geo.:	M. Miller	**Boring Location:**	3160+88	**Offset:**	69 L	**Alignment:**	Mainline
Elev.:	277.8 ft	**Latitude:**	34.03838	**Longitude:**	-81.1108	**Date Started:**	4/5/2018
Total Depth:	44.9 ft	**Soil Depth:**	44.9 ft	**Core Depth:**	0 ft	**Date Completed:**	4/5/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	21.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
		@28.5-ft: Wet, Reddish Yellow, with Rock Fragments (Quartz), Munsell=7.5YR 6/6			SS-9	9	18	33		51
247.8										
				33.5						
	34.5	@33.5-ft: Moist to Dry, Yellowish Brown, with Sand, Munsell=10YR 5/4			SS-10	7	19	50/5.75"		69+
242.8		@SS-10: LL=NP, PL=NP, PI=NP, NMC=23.3%, %#200=79.9								
		PARTIALLY WEATHERED ROCK (PWR)								
		SAMPLED AS: Hard, Moist to Dry, Bluish Gray, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), Munsell=5PB 6/1		38.5	SS-11	17	50/6"			100+
237.8										
				43.5						
		@43.5-ft: Bluish Gray, Munsell=5B 6/1			SS-12	22	30	50/5"		80+
	44.9									
232.8		Boring Terminated at 44.9 feet								
227.8										
222.8										



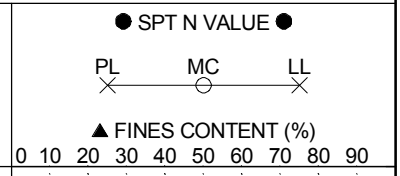
LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-26
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	126CDW1
Eng./Geo.:	R. Wessinger	**Boring Location:**	7339+86	**Offset:**	15 R	**Alignment:**	Mainline
Elev.:	294.1 ft	**Latitude:**	34.03882	**Longitude:**	-81.109205	**Date Started:**	4/2/2018
Total Depth:	45 ft	**Soil Depth:**	40 ft	**Core Depth:**	0 ft	**Date Completed:**	4/2/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 13.5 ft	**24HR**	Cave 20.8 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Cleared Woods								
	0.3	TOPSOIL (4")		0.0	SS-1	1	3	5	8	8
		FILL								
		Loose to Medium Dense, Moist, Red/Reddish Yellow, High Plasticity, Clayey Fine to Medium SAND (SC/A-2-7(4)), Munsell=2.5YR 4/8 & 7.5YR 6/6		2.0	SS-2	6	7	10	11	17
	4.0	@SS-2: LL=64, PL=28, PI=36, NMC=14.4%, %#200=33.4		4.0	SS-3	10	10	12	15	22
289.1		**COASTAL PLAIN**								
		Medium Dense, Moist, Yellow/Red, Silty Fine to Medium SAND (SM/A-7-6(2)), Munsell=10YR 7/8 & 10R 5/8		6.0	SS-4	5	6	6	7	12
	8.7	@SS-4: LL=48, PL=29, PI=19, NMC=19.1%, %#200=37.5		8.0	SS-5	13	29	34	32	63
284.1		@8-ft: Very Dense, Reddish Yellow, Munsell=7.5YR 6/6								
		@8.4-ft: Strong Brown, Munsell=7.5YR 5/8								
		RESIDUUM								
		Hard to Very Stiff, Moist, Reddish Yellow, Non-Plastic, SILT (ML/A-4(0)), Munsell=7.5YR 6/8		13.5	SS-6	7	8	11		19
279.1		@9-ft: Quartz Vein								
		@13.5-ft: with Sand								
		@18.5-ft: Yellow/Red, Munsell=10YR 7/8 & 2.5YR 5/8		18.5	SS-7	8	8	10		18
274.1		@SS-7: LL=NP, PL=NP, PI=NP, NMC=28.9%, %#200=92.4								
		@23.5-ft: Brownish Yellow, Munsell=10YR 6/8		23.5	SS-8	7	9	8		17
269.1		@24.5-ft: Brown, with Gravel, Munsell=7.5YR 4/3		28.5						



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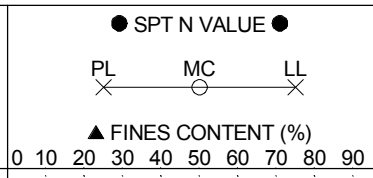
LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-26
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	126CDW1
Eng./Geo.:	R. Wessinger	**Boring Location:**	7339+86	**Offset:**	15 R	**Alignment:**	Mainline
Elev.:	294.1 ft	**Latitude:**	34.03882	**Longitude:**	-81.109205	**Date Started:**	4/2/2018
Total Depth:	45 ft	**Soil Depth:**	40 ft	**Core Depth:**	0 ft	**Date Completed:**	4/2/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 13.5 ft	**24HR**	Cave 20.8 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
264.1		@28.5-ft: Brownish Yellow, Munsell=10YR 6/6			SS-9	7	9	14		23
				33.5						
		@SS-10: LL=NP, PL=NP, PI=NP, NMC=27.6%, %#200=88.8			SS-10	6	7	16		23
259.1										
				38.5						
		@38.5-ft: Brownish Yellow/Light Gray, Munsell=10YR 6/6 & 10YR 7/1			SS-11	10	17	23		40
254.1										
				43.5						
		@43.5-ft: Brownish Yellow/Gray, Munsell=10YR 6/6 & 10YR 6/1			SS-12	9	13	17		30
249.1	45.0	Boring Terminated at 45.0 feet								
244.1										
239.1										



LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-27
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-20
Eng./Geo.:	R. Wessinger	**Boring Location:**	165+58	**Offset:**	84 L	**Alignment:**	Median CL
Elev.:	272.6 ft	**Latitude:**	34.037479	**Longitude:**	-81.109119	**Date Started:**	4/2/2018
Total Depth:	45 ft	**Soil Depth:**	45 ft	**Core Depth:**	0 ft	**Date Completed:**	4/2/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 20.5 ft	**24HR**	18.9 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.2	TOPSOIL (2")		0.0						
	1.2	**FILL** Stiff, Dry, Pink, Non-Plastic to Low Plasticity, SILT (ML/A-4), Munsell=7.5YR 7/4			SS-1	3	6	7	9	13
		RESIDUUM		2.0						
		Stiff to Very Stiff, Moist, Light Gray, Low Plasticity, SILT (ML/A-4(0)) with Sand, Munsell=7.5YR 7/1			SS-2	9	12	16	20	28
	4.0			4.0						
267.6		@SS-2: LL=32, PL=28, PI=4, NMC=10.7%, %#200=83.3			SS-3	13	15	17	16	32
	6.0	@2-ft: Light Gray/Reddish Yellow, Munsell=7.5YR 7/1 & 7.5YR 6/6		6.0						
		Hard, Moist, Light Gray/Reddish Yellow/Weak Red, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), Munsell=7.5YR 7/1, 7.5YR 6/6 & 7.5YR 4/4			SS-4	7	11	14	18	25
	9.0			8.0						
		Very Stiff, Moist, Weak Red, Low Plasticity, SILT (ML/A-4(8)), Munsell=5R 5/4			SS-5	5	8	10	14	18
262.6		@SS-4: LL=38, PL=32, PI=6, NMC=23.9%, %#200=91.9								
		@8-ft: Reddish Yellow/Weak Red/Light Gray, Munsell=7.5YR 6/8, 5R 5/4 & 7.5YR 7/1								
	13.5	Medium Dense, Moist, Pale Red, Non-Plastic to Low Plasticity, Silty Fine SAND (SM/A-2), Munsell=10R 7/2		13.5	SS-6	6	6	8		14
257.6		Stiff, Moist, Brownish Yellow/Light Gray, Non-Plastic, SILT (ML/A-4(0)), Munsell=10YR 6/8 & 10YR 7/1								
		@SS-6: LL=NP, PL=NP, PI=NP, NMC=25.6%, %#200=87.8								
				18.5						
		▼@18.5-ft: Hard, Pale Red/Yellow, Munsell=5R 6/4 & 10YR 7/6			SS-7	11	16	24		40
252.6		@SS-7: LL=NP, PL=NP, PI=NP, NMC=21.2%, %#200=80.3 ▽								
				23.5						

SPT N VALUE ●

PL ✕ MC ○ LL ✕

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

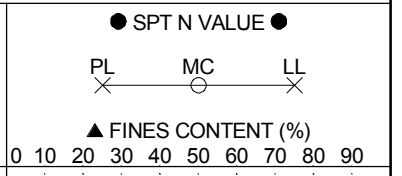
Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-27
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-20
Eng./Geo.:	R. Wessinger	**Boring Location:**	165+58	**Offset:**	84 L	**Alignment:**	Median CL
Elev.:	272.6 ft	**Latitude:**	34.037479	**Longitude:**	-81.109119	**Date Started:**	4/2/2018
Total Depth:	45 ft	**Soil Depth:**	45 ft	**Core Depth:**	0 ft	**Date Completed:**	4/2/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 20.5 ft	**24HR**	18.9 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
		@23.5-ft: Yellow/Light Gray, Munsell=10YR 7/6 & 10YR 7/1			SS-8	11	20	25		45
247.6				28.5	SS-9	24	38	47		85
242.6				33.5	SS-10	23	33	50/5"		83+
	34.5	**PARTIALLY WEATHERED ROCK (PWR)**								
237.6		SAMPLED AS: Hard, Moist, Yellow/Light Gray, Non-Plastic, SILT (ML/A-4(0)), Munsell=10YR 7/6 & 10YR 7/1								
		@SS-10: LL=NP, PL=NP, PI=NP, NMC=21.4%, %#200=82.0								
		@38.5-ft: Quartz Seam		38.5	SS-11	26	50/4.5"			100+
232.6										
		@43.5-ft: Yellow/Light Gray, Munsell=2.5Y 7/6 & 2.5Y 7/1		43.5	SS-12	13	20	50/5.5"		72+
227.6	45.0	Boring Terminated at 45.0								



LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/25/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-28
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RCA
Eng./Geo.:	C. Piercy	**Boring Location:**	5171+07	**Offset:**	29 L	**Alignment:**	Mainline
Elev.:	280.0 ft	**Latitude:**	34.036941	**Longitude:**	-81.107787	**Date Started:**	4/27/2018
Total Depth:	9 ft	**Soil Depth:**	9 ft	**Core Depth:**	0 ft	**Date Completed:**	4/27/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.3	TOPSOIL (3")		0.0						
		FILL								
	0.8	Very Stiff, Moist, Reddish Yellow, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), Munsell=5YR 6/6			SS-1	2	2	18	41	20
		RESIDUUM								
	2.0	Very Stiff, Moist, Reddish Yellow/Red, Sandy SILT (ML/A-4), with Quartz Gravel, Munsell=5YR 6/6 & 10R 5/8		2.0	SS-2	50/5.75"				100+
		PARTIALLY WEATHERED ROCK (PWR)								
		SAMPLED AS: Hard, Moist, Pale Red/Light Gray, Non-Plastic to Low Plasticity, SILT (ML/A-4), with Sand and Quartz Gravel, Munsell=10R 6/4 & 10R 7/1								
		=> Pale Brown, Munsell=2.5Y 8/2		4.0	SS-3	50/5.75"				100+
275.0										
		=> Light Red, Munsell=2.5YR 6/6		6.0	SS-4	50/5"				100+
				8.0	SS-5	50/5.5"				100+
	9.0	Boring Terminated at 9.0 feet Due to Drilling Refusal in Very Hard PWR; **SEE BORING RW-28A**								

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/25/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-28A
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RCA
Eng./Geo.:	C. Piercy	**Boring Location:**	5171+26	**Offset:**	22 L	**Alignment:**	Mainline
Elev.:	280.1 ft	**Latitude:**	34.036991	**Longitude:**	-81.107763	**Date Started:**	4/27/2018
Total Depth:	43.7 ft	**Soil Depth:**	43.7 ft	**Core Depth:**	0 ft	**Date Completed:**	4/27/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 5.8 ft	**24HR**	23.7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.2	TOPSOIL (2")		0.0	SS-1	1	1	1	3	2
		RESIDUUM								
	2.5	Very Loose, Moist, Light Red, Low Plasticity, Silty Fine to Medium SAND (SM/A-4(1)), Munsell=2.5YR 6/6		2.0	SS-2	16	50/3"			100+
		@SS-1: LL=33, PL=26, PI=7, NMC=11.8%, %#200=49.9		4.0	SS-3	50/5"				100+
275.1		**PARTIALLY WEATHERED ROCK (PWR)**								
		SAMPLED AS: Hard, Moist, Very Pale Brown, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), Munsell=10YR 7/3		6.0	SS-4	50/1.75"				100+
	8.0	@4-ft: Pinkish Gray, Munsell=5YR 7/2		8.0						
		@6-ft: Pink, Munsell=7.5YR 7/4			SS-5	12	29	39	45	68
		RESIDUUM								
270.1		Hard, Moist, Pale Red, Non-Plastic, SILT (ML/A-4(0)) with Sand, Munsell=10R 6/4								
		@SS-5: LL=NP, PL=NP, PI=NP, NMC=12.5%, %#200=70.2		13.5	SS-6	24	21	29		50
		@13.5-ft: Light Red/Brownish Yellow, Munsell=10R 6/6 & 10YR 6/6								
265.1										
	18.5	**PARTIALLY WEATHERED ROCK (PWR)**		18.5	SS-7	50/4"				100+
260.1		SAMPLED AS: Hard, Moist, Very Pale Brown/Light Reddish Brown, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), with Sand, Munsell=10YR 7/3 & 5YR 6/4								
				23.5	SS-8	50/1.25"				100+
		@23.5-ft: Light Reddish Brown, Munsell=2.5YR 6/4								
255.1										
				28.5						

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Hard Drilling at 16.0-ft

Continued Next Page

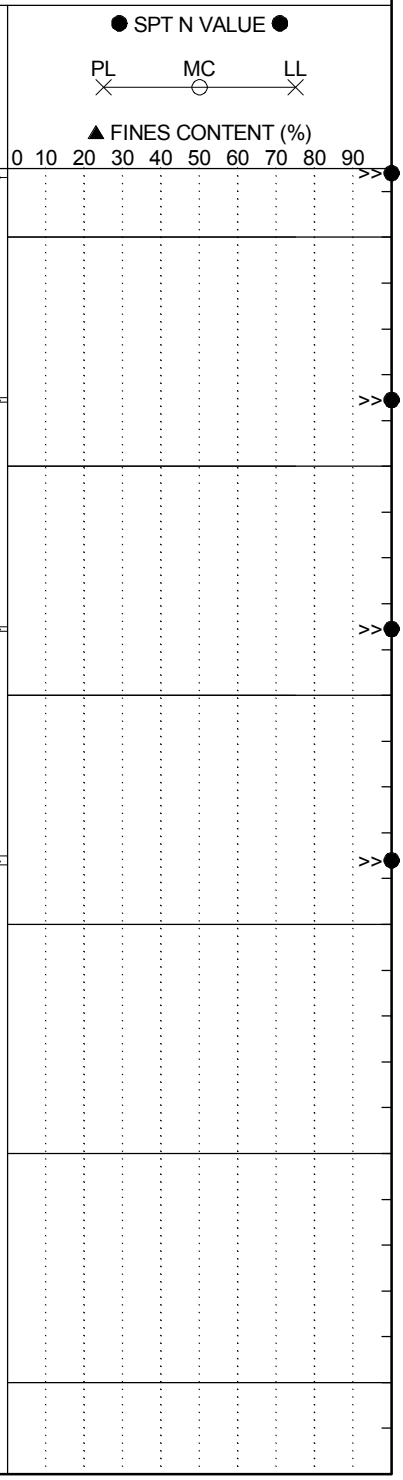
LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-28A
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RCA
Eng./Geo.:	C. Piercy	**Boring Location:**	5171+26	**Offset:**	22 L	**Alignment:**	Mainline
Elev.:	280.1 ft	**Latitude:**	34.036991	**Longitude:**	-81.107763	**Date Started:**	4/27/2018
Total Depth:	43.7 ft	**Soil Depth:**	43.7 ft	**Core Depth:**	0 ft	**Date Completed:**	4/27/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 5.8 ft	**24HR**	23.7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
250.1		@28.5-ft: Weak Red, Munsell=10R 5/4		SS-9	50/2.5"				100+
			33.5	SS-10	50/1.5"				100+
245.1		@33.5-ft: Light Reddish Brown, Munsell=2.5YR 6/4							
			38.5	SS-11	50/1.25"				100+
240.1		@38.5-ft: Yellow, Munsell=10YR 7/6							
	43.7		43.5	SS-12	50/2"				100+
235.1		@43.5-ft: Reddish Yellow, Munsell=7.5YR 7/6 Boring Terminated at 43.7 feet							
230.1									
225.1									



LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-29
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RCA
Eng./Geo.:	R. Wessinger	**Boring Location:**	5165+86	**Offset:**	38 L	**Alignment:**	Mainline
Elev.:	278.1 ft	**Latitude:**	34.035772	**Longitude:**	-81.108495	**Date Started:**	5/10/2018
Total Depth:	50 ft	**Soil Depth:**	50 ft	**Core Depth:**	0 ft	**Date Completed:**	5/10/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 23.0 ft	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.3	TOPSOIL (3")		0.0	SS-1	3	3	3	3	6
		FILL								
		Firm, Moist, Weak Red, Medium Plasticity, Sandy Lean CLAY (CL/A-6(6)), Munsell=10R 4/3		2.0	SS-2	2	2	4	4	6
	4.0	@SS-2: LL=33, PL=22, PI=11, NMC=20.7%, %#200=69.0		4.0	SS-3	5	8	9	10	17
273.1		**RESIDUUM**								
		Very Stiff, Moist, Red, Medium Plasticity, Gravelly SILT (ML/A-6(5)) with Sand, Munsell=10R 5/8		6.0	SS-4	5	11	12	13	23
		@SS-4: LL=40, PL=28, PI=12, NMC=16.2%, %#200=56.7		8.0	SS-5	9	11	16	23	27
268.1										
	13.5	Stiff, Moist, Red/Reddish Yellow, Low Plasticity, Elastic SILT (MH/A-5(11)), Munsell=2.5YR 5/8 & 7.5YR 8/6		13.5	SS-6	4	6	9		15
263.1										
		@18.5-ft: Moist to Wet		18.5	SS-7	2	4	6		10
		@SS-7: LL=51, PL=45, PI=6, NMC=35.7%, %#200=88.8								
258.1										
	23.5	▽		23.5	SS-8	4	6	9		15
		Stiff to Firm, Moist to Wet, Light Reddish Brown/White, Non-Plastic to Low Plasticity, SILT (ML/A-4), Munsell=2.5YR 6/4 & 2.5YR 8/1								
253.1				28.5						

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-29
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RCA
Eng./Geo.:	R. Wessinger	**Boring Location:**	5165+86	**Offset:**	38 L	**Alignment:**	Mainline
Elev.:	278.1 ft	**Latitude:**	34.035772	**Longitude:**	-81.108495	**Date Started:**	5/10/2018
Total Depth:	50 ft	**Soil Depth:**	50 ft	**Core Depth:**	0 ft	**Date Completed:**	5/10/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 23.0 ft	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		@28.5-ft: Very Pale Brown, Munsell=10YR 8/2			SS-9	2	4	6		10	
248.1											
				33.5							
		@33.5-ft: Very Pale Brown/Reddish Yellow, Munsell=10YR 8/2 & 7.5YR 7/8			SS-10	1	3	5		8	
243.1											
				38.5							
		@38.5-ft: Very Stiff to Hard			SS-11	3	6	10		16	
238.1											
				43.5							
		@43.5-ft: Red, Munsell=2.5YR 4/8			SS-12	8	13	21		34	
233.1											
				48.5							
					SS-13	10	13	22		35	
228.1	50.0	Boring Terminated at 50.0 feet									
223.1											

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/24/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-30
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I26RDB
Eng./Geo.:	C. Piercy	**Boring Location:**	6364+52	**Offset:**	15 R	**Alignment:**	Mainline
Elev.:	275.5 ft	**Latitude:**	34.035287	**Longitude:**	-81.107738	**Date Started:**	5/14/2018
Total Depth:	48.9 ft	**Soil Depth:**	48.9 ft	**Core Depth:**	0 ft	**Date Completed:**	5/14/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	33.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Cleared Woods								
	0.2	TOPSOIL (2")		0.0	SS-1	2	2	4	5	6
	0.5	Firm, Dry to Moist, Brown, Non-Plastic to Low Plasticity, SILT (ML/A-4) with Sand, Munsell=7.5YR 5/4		2.0	SS-2	5	6	9	12	15
		RESIDUUM								
270.5		Firm to Stiff, Dry to Moist, Weak Red/Red, Non-Plastic, SILT (ML/A-4(0)), Munsell=10R 4/3 & 2.5YR 4/6		4.0	SS-3	6	9	12	13	21
		@SS-1: LL=NP, PL=NP, PI=NP, NMC=29.1%		6.0	SS-4	7	9	10	14	19
		@2-ft: Moist, Reddish Brown, Munsell=2.5YR 5/3		8.0	SS-5	5	7	10	14	17
265.5		@4-ft: Very Stiff to Stiff								
		@6-ft: Reddish Brown/Weak Red, Munsell=2.5YR 5/3 & 5R 5/2								
		@8-ft: Reddish Brown/Reddish Yellow, Munsell=2.5YR 5/3 & 7.5YR 6/8		13.5	SS-6	3	6	8		14
		@13.5-ft: Grayish Olive/Strong Brown, Munsell=10Y 5/2 & 7.5YR 5/8								
260.5										
		@18.5-ft: Light Grayish Olive/Reddish Yellow, Medium Plasticity, A-7-5(16), Munsell=10Y 6/2 & 7.5YR 6/6		18.5	SS-7	5	8	13		21
255.5		@SS-7: LL=48, PL=37, PI=11, NMC=34.5%, %#200=97.0								
		@23.5-ft: Grayish Olive, Munsell=10Y 5/2		23.5	SS-8	6	12	17		29
250.5										
		@28.5-ft: Hard, Grayish Olive/Brownish Yellow, Munsell=10Y 5/2 & 10YR 6/8		28.5	SS-9	13	23	33		56
245.5										
				33.5						

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662	**County:**	Richland/Lexington	**Boring No.:**	RW-30		
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	I26RDB		
Eng./Geo.:	C. Piercy	**Boring Location:**	6364+52	**Offset:**	15 R	**Alignment:**	Mainline
Elev.:	275.5 ft	**Latitude:**	34.035287	**Longitude:**	-81.107738	**Date Started:**	5/14/2018
Total Depth:	48.9 ft	**Soil Depth:**	48.9 ft	**Core Depth:**	0 ft	**Date Completed:**	5/14/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	33.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
240.5		@33.5-ft: Pale Olive/Brownish Yellow, Munsell=10Y 6/4 & 10YR 6/6			SS-10	6	12	31		43
	38.5	**PARTIALLY WEATHERED ROCK (PWR)** SAMPLED AS: Hard, Moist, Light Grayish Olive, Non-Plastic to Low Plasticity, SILT (ML/A-4), Munsell=10Y 6/2		38.5	SS-11	50/5.5"				100+
235.5										
				43.5	SS-12	22	50/4"			100+
230.5										
	48.9	@48.5-ft: Grayish Olive, Munsell=10Y 5/2		48.5	SS-13	50/5"				100+
225.5		Boring Terminated at 48.9 feet								
220.5										
215.5										
210.5										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/25/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-31
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	Burning Tree
Eng./Geo.:	C. Piercy	**Boring Location:**	9357+06	**Offset:**	18 L	**Alignment:**	Mainline
Elev.:	296.2 ft	**Latitude:**	34.03544	**Longitude:**	-81.106928	**Date Started:**	5/10/2018
Total Depth:	60 ft	**Soil Depth:**	60 ft	**Core Depth:**	0 ft	**Date Completed:**	5/10/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	Dry

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Cleared Woods								
	0.3	TOPSOIL (3")		0.0	SS-1	1	7	8	8	15
		RESIDUUM								
		Stiff to Very Stiff, Dry to Moist, Red, Medium to High Plasticity, Fat CLAY (CH/A-7), Munsell=2.5YR 5/6		2.0						
	4.0				SS-2	6	10	10	10	20
		@3-ft: Red, Munsell=2.5YR 4/8		4.0						
291.2		Very Stiff to Stiff, Moist, Red/Weak Red, Medium Plasticity, Elastic SILT (MH/A-7-5(20)), Munsell=2.5YR 4/8 & 5R 5/2			SS-3	8	10	14	17	24
				6.0						
					SS-4	7	11	13	15	24
				8.0						
		@SS-3: LL=58, PL=43, PI=15, NMC=23.8%, %#200=96.1			SS-5	4	6	8	10	14
286.2		@6.5-ft: Reddish Yellow/Strong Brown, Munsell=7.5YR 2/6 & 7.5YR 4/6								
		@7-ft: Red/Brownish Yellow, Munsell=2.5YR 4/8 & 10YR 6/8								
		@8-ft: Brownish Yellow, Munsell=10YR 6/8		13.5						
		@13.5-ft: Brown, A-7-5(17), with Sand, Munsell=7.5YR 4/4			SS-6	4	6	8		14
281.2		@SS-6: LL=59, PL=45, PI=14, NMC=35.2%, %#200=83.0								
	18.5			18.5						
		Stiff, Moist, Weak Red/Yellow, Non-Plastic, SILT (ML/A-4(0)), Munsell=7.5R 5/3 & 10YR 7/6			SS-7	4	5	8		13
276.2		@SS-7: LL=NP, PL=NP, PI=NP, NMC=33.6%, %#200=96.5								
				23.5						
					SS-8	3	5	6		11
271.2										
				28.5						
		@28.5-ft: with Organics			SS-9	3	5	7		12
266.2										
				33.5						

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-31
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	Burning Tree
Eng./Geo.:	C. Piercy	**Boring Location:**	9357+06	**Offset:**	18 L	**Alignment:**	Mainline
Elev.:	296.2 ft	**Latitude:**	34.03544	**Longitude:**	-81.106928	**Date Started:**	5/10/2018
Total Depth:	60 ft	**Soil Depth:**	60 ft	**Core Depth:**	0 ft	**Date Completed:**	5/10/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	Dry

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
261.2		@33.5-ft: Weak Red/Yellow, Munsell=5R 5/4 & 10YR 7/8			SS-10	4	6	7		13
	38.5			38.5						
256.2		Firm, Moist, Pale Yellow/Light Yellowish Brown, Low Plasticity, Elastic SILT (MH/A-5(12)), Munsell=5Y 84 & 10YR 6/4			SS-11	2	2	5		7
		@SS-11: LL=53, PL=44, PI=9, NMC=41.6%, %#200=92.1								
	43.5			43.5						
251.2		Very Stiff to Stiff, Moist, Light Greenish Gray/Pale Yellow, Non-Plastic to Low Plasticity, SILT (ML/A-4), Munsell=10Y 7/1 & 5Y 8/4			SS-12	5	7	9		16
				48.5						
		@48.5-ft: Yellow/Pale Yellow, 2.5Y 7/6 & 5Y 7/4			SS-13	4	5	7		12
246.2										
				53.5						
		@53.5-ft: Gray, Munsell=5Y 6/1			SS-14	7	10	13		23
241.2										
				58.5						
		@59-ft: Brownish Yellow, Munsell=10YR 6/8			SS-15	6	9	13		22
236.2	60.0	Boring Terminated at 60.0 feet								
231.2										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 8/1/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-32
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	356+26	**Offset:**	78 R	**Alignment:**	Median CL
Elev.:	250.4 ft	**Latitude:**	34.033417	**Longitude:**	-81.107412	**Date Started:**	3/14/2018
Total Depth:	40 ft	**Soil Depth:**	40 ft	**Core Depth:**	0 ft	**Date Completed:**	3/14/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 13.0 ft	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.2	TOPSOIL (2")		0.0						
		RESIDUUM			SS-1	3	3	4	4	7
		Firm to Stiff, Moist, Weak Red, Medium Plasticity, Elastic SILT (MH/A-7-5(20)), Munsell=10R 4/3		2.0						
					SS-2	5	3	2	2	5
		@4-ft: Red, Munsell=10R 5/8		4.0						
245.4		@SS-3: LL=59, PL=44, PI=15, NMC=32.0%, %#200=97.3			SS-3	2	5	8	10	13
		@6-ft: Very Stiff to Stiff		6.0						
					SS-4	3	8	11	13	19
				8.0						
					SS-5	7	5	8	10	13
240.4										
	13.5			13.5						
		Firm to Soft, Red, Moist to Wet, Low Plasticity, SILT (ML/A-5), Munsell=10R 5/8			SS-6	2	1	5		6
235.4										
				18.5						
		@18.5-ft: Light Red, Munsell=10R 6/8			SS-7	1	1	2		3
230.4										
				23.5						

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

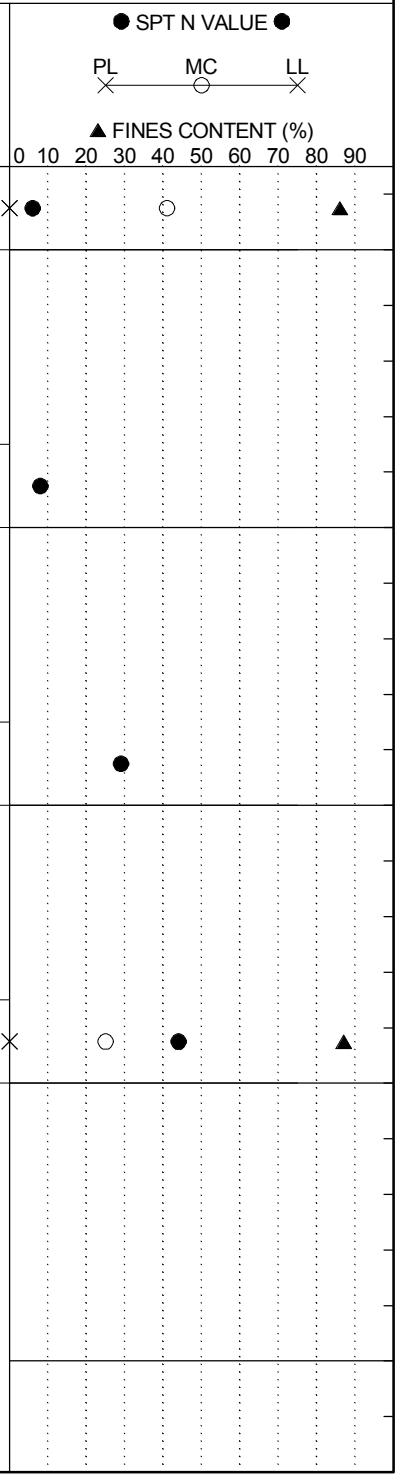
Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-32
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	356+26	**Offset:**	78 R	**Alignment:**	Median CL
Elev.:	250.4 ft	**Latitude:**	34.033417	**Longitude:**	-81.107412	**Date Started:**	3/14/2018
Total Depth:	40 ft	**Soil Depth:**	40 ft	**Core Depth:**	0 ft	**Date Completed:**	3/14/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 13.0 ft	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
225.4		@23.5-ft: Wet, Brownish Yellow, Non-Plastic, (A-4(0)), Munsell=10YR 6/6 @SS-8: LL=NP, PL=NP, PI=NP, NMC=41.2%, %#200=86.2, Organics=5.04%			SS-8	1	2	4		6
				28.5	SS-9	2	3	5		8
220.4										
				33.5	SS-10	8	10	19		29
215.4		@33.5-ft: Very Stiff to Hard, Light Yellowish Brown, Munsell=2.5Y 6/3								
				38.5	SS-11	9	16	28		44
210.4	40.0	@SS-11: LL=NP, PL=NP, PI=NP, NMC=25.2%, %#200=87.4								
		Boring Terminated at 40.0 feet								
205.4										



LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-33
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	126CDW1
Eng./Geo.:	C. Piercy	**Boring Location:**	7347+76	**Offset:**	7 L	**Alignment:**	Mainline
Elev.:	294.6 ft	**Latitude:**	34.038403	**Longitude:**	-81.106673	**Date Started:**	5/9/2018
Total Depth:	45 ft	**Soil Depth:**	45 ft	**Core Depth:**	0 ft	**Date Completed:**	5/9/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	34.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Wooded Area								
	0.2	ROOT MAT (1.5")		0.0	SS-1	1	3	6	7	9
		RESIDUUM								
		Stiff to Very STiff, Moist, Reddish Yellow, Low Plasticity, SILT (ML/A-4(6)), Munsell=7.5YR 6/6		2.0	SS-2	5	6	5	6	11
		@2-ft: Reddish Yellow/Red, Munsell=7.5YR 6/6 & 7.5YR 5/6		4.0	SS-3	4	7	12	14	19
289.6		@SS-2: LL=34, PL=28, PI=6, NMC=11.2%, %#200=90.4		6.0	SS-4	9	11	10	13	21
		@4-ft: Pale Red, Munsell=7.5YR 6/4 & 10R 7/2		8.0	SS-5	3	9	13	16	22
		@6-ft: Pale Red/Brownish Yellow, Non-Plastic, A-4(0), Munsell=10R 6/3 & 10YR 6/8								
284.6		@SS-4: LL=NP, PL=NP, PI=NP, NMC=23.0%, %#200=84.0								
		@8-ft: Pale Red, Munsell=10R 6/4		13.5	SS-6	18	22	13		35
		@13.5-ft: Hard to Very Stiff, Reddish Yellow, Munsell=7.5YR 6/6								
279.6				18.5	SS-7	6	11	15		26
		@18.5-ft: Red/Yellowish Red, Munsell=7.5R 5/6 & 5YR 5/8								
274.6				23.5	SS-8	5	8	11		19
		@23.5-ft: Weak Red/Red, Munsell=7.5R 5/4 & 10R 4/8								
269.6				28.5						

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

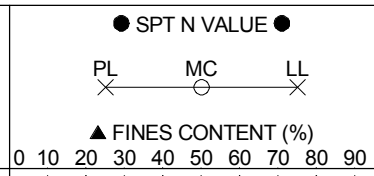
Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-33
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	126CDW1
Eng./Geo.:	C. Piercy	**Boring Location:**	7347+76	**Offset:**	7 L	**Alignment:**	Mainline
Elev.:	294.6 ft	**Latitude:**	34.038403	**Longitude:**	-81.106673	**Date Started:**	5/9/2018
Total Depth:	45 ft	**Soil Depth:**	45 ft	**Core Depth:**	0 ft	**Date Completed:**	5/9/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	34.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
264.6		@28.5-ft: Pale Brown/Pale Red, Munsell=2.5Y 7/4 & 5R 6/4 @SS-9: LL=NP, PL=NP, PI=NP, NMC=21.2%, %#200=80.8			SS-9	14	14	14		28
				33.5						
259.6		@33.5-ft: Pale Red/Light Gray, Munsell=7.5R 6/4 & 5YR 7/1			SS-10	8	14	15		29
				38.5						
254.6					SS-11	8	14	21		35
				43.5						
		@43.5-ft: Light Gray, Munsell=5YR 7/1			SS-12	16	32	48		80
249.6	45.0	Boring Terminated at 45.0 feet								
244.6										
239.6										



LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-34
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I26RBD
Eng./Geo.:	R. Wessinger	**Boring Location:**	4366+82	**Offset:**	44 R	**Alignment:**	Mainline
Elev.:	293.0 ft	**Latitude:**	34.037385	**Longitude:**	-81.106195	**Date Started:**	3/30/2018
Total Depth:	50 ft	**Soil Depth:**	50 ft	**Core Depth:**	0 ft	**Date Completed:**	3/30/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 28.0 ft	**24HR**	32 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Easement								
	0.1	TOPSOIL (1")		0.0	SS-1	3	6	4	5	10
		COASTAL PLAIN								
		Stiff to Very Stiff, Moist, Red, Medium Plasticity, Sandy Lean CLAY (CL/A-7-6(8)), Munsell=10R 4/8		2.0	SS-2	6	7	11	13	18
		@SS-2: LL=44, PL=26, PI=18, NMC=17.1%, %#200=54.6		4.0						
288.0		@4-ft: Hard			SS-3	12	15	17	22	32
	6.0			6.0						
		Hard, Moist, Red/Yellow, High Plasticity, Sandy Fat CLAY (CH/A-7-6(16)), Munsell=10R 4/8 & 7.5YR 8/6			SS-4	10	19	29	39	48
		@SS-4: LL=52, PL=23, PI=29, NMC=21.2%, %#200=62.8		8.0	SS-5	11	21	26	28	47
		@8-ft: Light Red, Munsell=2.5YR 6/8								
283.0										
				13.5						
	14.0				SS-6	10	16	12		28
		Medium Dense, Moist, Reddish Yellow, Medium Plasticity, Clayey GRAVEL (GC/A-2-7(1)) with Sand, Munsell=5YR 6/8								
278.0		@SS-6: LL=42, PL=25, PI=17, NMC=11.5%, %#200=29.4								
				18.5						
					SS-7	5	10	11		21
273.0										
	23.0			23.5						
		Medium Dense, Moist to Wet, Yellow, High Plasticity, Silty Fine to Coarse SAND (SM/A-2-7(3)), Munsell=10YR 8/8			SS-8	3	5	11		16
268.0		@SS-8: LL=66, PL=34, PI=32, NMC=21.5%, %#200=27.1								
	28.5 ▽			28.5						

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	RW-34
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I26RBD
Eng./Geo.:	R. Wessinger	**Boring Location:**	4366+82	**Offset:**	44 R	**Alignment:**	Mainline
Elev.:	293.0 ft	**Latitude:**	34.037385	**Longitude:**	-81.106195	**Date Started:**	3/30/2018
Total Depth:	50 ft	**Soil Depth:**	50 ft	**Core Depth:**	0 ft	**Date Completed:**	3/30/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 28.0 ft	**24HR**	32 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
263.0	0.0	Medium Dense, Moist to Wet, Yellow, Non-Plastic, Silty, Sandy GRAVEL (GM/A-1), Munsell=10YR 8/8		0.0	SS-9	3	10	9		19
	33.5	Medium Dense, Wet, Yellow, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2), with Gravel, Munsell=10YR 8/8		33.5	SS-10	9	4	14		18
258.0										
	38.5	@SS-11: No Recovery		38.5	SS-11	8	8	3		11
253.0										
	43.5	**COASTAL PLAIN** Medium Dense, Wet, Dark Grayish Brown, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2), with Gravel, Munsell=10YR 4/2		43.5	SS-12	9	7	10		17
248.0										
	48.5	**RESIDUUM** Hard, Moist to Wet, Light Gray, Non-Plastic to Low Plasticity, SILT (ML/A-4), Munsell=10YR 7/1		48.5	SS-13	13	20	28		48
243.0	50.0	Boring Terminated at 50.0 feet								
238.0										

SPT N VALUE ● — PL × — MC ○ — LL ×

▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90

Caving Caused By Gravel & Cobbles

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-1
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	C. Piercy	**Boring Location:**	31+13	**Offset:**	94 L	**Alignment:**	Median CL
Elev.:	314.6 ft	**Latitude:**	34.101444	**Longitude:**	-81.176987	**Date Started:**	4/12/2018
Total Depth:	30.7 ft	**Soil Depth:**	15.7 ft	**Core Depth:**	15 ft	**Date Completed:**	4/12/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 5.8 ft	**24HR**	5.3 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.3	TOPSOIL (4")		0.0						
	1.0	**FILL** Loose, Moist, Yellowish Red, Non-Plastic, SAND (SP-SM/A-2) with Silt, Munsell=5YR 5/6			SS-1	1	4	5	6	9
		RESIDUUM Stiff, Moist, Light Yellowish Brown, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), Munsell=10YR 6/4		2.0	SS-2	17	32	22	17	55
	4.0	@2-ft: Hard		4.0	SS-3	18	7	7	3	14
309.6		@SS-3: No Recovery								
	6.0	Firm, Moist to Dry, Light Brownish Gray/Light Yellowish Brown, Medium Plasticity, Sandy Lean CLAY (CL/A-6(5)), Munsell=2.5Y 6/2 & 2.5Y 6/4		6.0	SS-4	2	4	4	3	8
		@SS-4: LL=30, PL=18, PI=12, NMC=18.6%, %#200=62.4		8.0						
	9.0	@8-ft: Very Soft, Moist, Low Plasticity			SS-5	1/12"	1	1		2
		@SS-5: LL=22, PL=17, PI=5								
304.6		Very Loose, Moist, Light Yellowish Brown, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2), Munsell=2.5Y 6/4								
	13.5			13.5						
	14.0	Hard, Moist, Light Yellowish Brown, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4) with Gravel, Munsell=2.5Y 6/3			SS-6	6	50/5.5"			100+
299.6		**PARTIALLY WEATHERED ROCK (PWR)**								
	15.7	SAMPLED AS: Hard, Moist, Light Yellowish Brown, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), Munsell=2.5Y 6/3		15.7	SS-7	50/0"				100+
		PHYLLITE Metamorphic, Dark Gray, Fine Grained, Thinly Laminated to Laminated Foliation, Quartz/Feldspar/Sericite, Moderately to Slightly Weathered, Joints Dip from 20° to 80°, Numerous Joints, Moderately Wide to Very Narrow, No Infilling, Planar/Irregular, Very Close, Slightly Rough to Rough			NQ-1	%REC=89, %RQD=73, RMR=N/A, GSI=23-27				
294.6				20.7						

SPT N VALUE ● — PL × — MC ○ — LL × — ▲ FINES CONTENT (%) — 0 10 20 30 40 50 60 70 80 90

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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-1
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	C. Piercy	**Boring Location:**	31+13	**Offset:**	94 L	**Alignment:**	Median CL
Elev.:	314.6 ft	**Latitude:**	34.101444	**Longitude:**	-81.176987	**Date Started:**	4/12/2018
Total Depth:	30.7 ft	**Soil Depth:**	15.7 ft	**Core Depth:**	15 ft	**Date Completed:**	4/12/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 5.8 ft	**24HR**	5.3 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" 2nd 6" 3rd 6" 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		=> with Quartz Vein @NQ-2: Strong Rock, Joints Dip from 25° to 40°, Occasional Joints, Narrow to Very Narrow, Spotty (Calcite), Planar/Irregular, Very Close, Smooth to Rough			NQ-2			@21.7-ft: UC Strength=9,260 psi %REC=97, %RQD=79, RMR=37, GSI=23-27
289.6				25.7				
		=> with Quartz Vein @NQ-3: Fine to Coarse Grained, Highly to Slightly Weathered, Joints Dip from 30° to 80°, Numerous Joints, Moderately Wide to Very Narrow, Spotty (Calcite/Iron Oxide), Planar/Stepped/Irregular, Very Close, Slightly Rough to Rough			NQ-3			%REC=94, %RQD=60, RMR=N/A, GSI=16-20
284.6	30.7							
		Coring Terminated at 30.7 feet						
279.6								
274.6								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-2
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	40+35	**Offset:**	56 R	**Alignment:**	Median CL
Elev.:	329.3 ft	**Latitude:**	34.099295	**Longitude:**	-81.175308	**Date Started:**	2/26/2018
Total Depth:	24 ft	**Soil Depth:**	12.3 ft	**Core Depth:**	11.7 ft	**Date Completed:**	2/27/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 3.0 ft	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Asphalt Shoulder									
		ASPHALT (14")									
	1.2	**FILL**		1.2							
	2.0	Moist, Reddish Yellow, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-2), Munsell=7.5YR 6/8		2.0	SS-1	1	2				
	3.0				SS-2	4	6	33	50/3"	39	
	3.5	Dense, Moist to Dry, Bluish Gray/Light Gray, Non-Plastic, GRAVEL (GP/A-1) (Granite Screenings), Munsell=GLEY2 10B/6 & 2.5Y 7/2		4.0	SS-3	50/5"				100+	>>
324.3		**RESIDUUM**		6.0	SS-4	50/2"				100+	>>
		Hard, Moist to Dry, Light Gray, Non-Plastic to Low Plasticity, SILT (ML/A-4), Munsell=5Y 7/1		8.0	SS-5	50/1.5"				100+	>>
		PARTIALLY WEATHERED ROCK (PWR)									
319.3		SAMPLED AS: Hard, Moist to Dry, Olive Gray, Non-Plastic to Low Plasticity, SILT (ML/A-4), Munsell=5Y 5/2									
	12.3	**PHYLLITE**		12.3	SS-6	50/0"					
		Metamorphic, Dark Gray/White, Fine to Very Fine Grained, Laminated Foliation, Quartz/Feldspar/Sericite, Highly to Moderately Weathered, Joints Dip from 20° to 80°, Numerous Joints, Moderately Wide to Narrow, Surface Stain (Iron Oxide), Planar/Stepped, Very Close, Smooth to Slightly Rough			NQ-1						%REC=23, %RQD=0, RMR=N/A, GSI=10-15
314.3				16.0							
		@NQ-2: Joints Dip from 20° to 80°, Numerous Joints, Moderately Wide to Very Narrow, Surface Stain (Iron Oxide), Planar/Irregular, Very Close, Smooth to Slightly Rough			NQ-2						%REC=67, %RQD=12, RMR=N/A, GSI=13-18
309.3				21.0							
		@NQ-3: Highly to Slightly Weathered, Strong Rock, Joints Dip from 20° to 80°, Numerous Joints/Foliations, Very Narrow to Tight, Surface Stain (Iron Oxide), Wavy/Planar, Very Close, Smooth to Slightly Rough			NQ-3						@21.9-ft: UC Strength=9,650 psi %REC=94, %RQD=14, RMR=37, GSI=13-18
	24.0	Coring Terminated at 24.0 feet									

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-3
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	J. Ford	**Boring Location:**	43+71	**Offset:**	61 L	**Alignment:**	Median CL
Elev.:	330.1 ft	**Latitude:**	34.098831	**Longitude:**	-81.174273	**Date Started:**	4/3/2018
Total Depth:	21.3 ft	**Soil Depth:**	4.1 ft	**Core Depth:**	17.2 ft	**Date Completed:**	4/3/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 2.2 ft	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Asphalt Roadway									
	1.0	ASPHALT (12.5")		1.0							
		FILL									
		Moist to Dry, Reddish Yellow, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-2), Munsell=7.5YR 7/8		2.0	SS-1	4	8				
	3.0				SS-2	6	9	50/5.5"		59+	
		@2-ft: Reddish Yellow, Munsell=5YR 6/8		4.0	SS-3	50/1.25"				100+	>>
	4.1	**PARTIALLY WEATHERED ROCK (PWR)**		4.1							
325.1		SAMPLED AS: Very Dense, Moist to Dry, Dark Greenish Gray, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-2), with Rock Fragments, Munsell=GLEY1 4/10Y			NQ-1						%REC=84, %RQD=0, RMR=N/A, GSI=20-25
		PHYLLITE		6.3							
		Metamorphic, Dark Gray/Gray, Fine to Very Fine Grained, Thinly Laminated to Laminated Foliations, Quartz/Feldspar/Sericite, Moderately Weathered, Joints Dip from 15° to 60°, Numerous Joints, Moderately Wide to Very Narrow, Surface Stain (Iron Oxide), Planar/Stepped/Irregular, Very Close, Smooth to Slightly Rough			NQ-2						%REC=71, %RQD=0, RMR=N/A, GSI=20-25
320.1		@NQ-2: Joints Dip from 10° to 85°, Numerous Joints, Moderately Wide to Very Narrow, Surface Stain (Iron Oxide), Wavy, Very Close, Smooth to Rough		11.3							
		@NQ-3: Dark Gray, Moderately to Slightly Weathered, Joints Dip from 10° to 75°, Numerous Joints, Moderately Wide to Very Narrow, Surface Stain (Iron Oxide), Planar/Irregular, Very Close, Smooth to Rough			NQ-3						%REC=91, %RQD=34, RMR=N/A, GSI=22-27
315.1		@NQ-4: Joints Dip from 15° to 55°, Numerous Joints, Moderately Wide to Very Narrow, Surface Stain (Chlorite/Iron Oxide), Planar/Irregular, Very Close, Smooth to Rough		16.3							
					NQ-4						%REC=88, %RQD=60, RMR=N/A, GSI=24-29
310.1											
	21.3	Coring Terminated at 21.3 feet									

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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-4
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	80+48	**Offset:**	66 R	**Alignment:**	Median CL
Elev.:	297.3 ft	**Latitude:**	34.091152	**Longitude:**	-81.166366	**Date Started:**	2/27/2018
Total Depth:	43.6 ft	**Soil Depth:**	43.6 ft	**Core Depth:**	0 ft	**Date Completed:**	2/27/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 6.0 ft	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.3	TOPSOIL (3")		0.0						
		FILL			SS-1	3	3	3	5	6
		Firm to Stiff, Moist, Red, Low to Medium Plasticity, Sandy CLAY (CL/A-6), Munsell=2.5YR 5/8		2.0						
					SS-2	6	7	7	6	14
	4.0	@3.5-ft: with Organics		4.0						
		RESIDUUM								
292.3		Firm, Moist, Strong Brown/Brown, Low to Medium Plasticity, Sandy CLAY (CL/A-6),			SS-3	5	4	4	4	8
	6.0	Micaceous, Munsell=7.5YR 5/8 & 7.5YR 5/3		6.0						
		Firm to Soft, Wet, Light Olive Brown/Strong Brown, Low Plasticity, Sandy, Silty CLAY (CL-ML/A-4(1)), Munsell=2.5Y 5/3 & 7.5YR 5/8			SS-4	2	2	3	4	5
				8.0						
		@8-ft: Moist, Yellowish Red, Munsell=5YR 6/8			SS-5	1/12"		3	4	3
287.3		@SS-5: LL=26, PL=21, PI=5, NMC=23.8%, %#200=66.2								
	13.5			13.5						
		Stiff, Moist to Wet, Yellowish Red, Medium Plasticity, Sandy Lean CLAY (CL/A-7-6(9)), Munsell=5YR 6/8			SS-6	3	4	6		10
282.3		@SS-6: LL=42, PL=25, PI=17, NMC=26.7%, %#200=62.9								
	18.5			18.5						
		Stiff to Very Stiff, Moist to Wet, Grayish Brown, Non-Plastic, Sandy SILT (ML/A-4(0)), Munsell=2.5Y 5/2			SS-7	4	5	9		14
277.3										
				23.5						

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

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SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-4
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	80+48	**Offset:**	66 R	**Alignment:**	Median CL
Elev.:	297.3 ft	**Latitude:**	34.091152	**Longitude:**	-81.166366	**Date Started:**	2/27/2018
Total Depth:	43.6 ft	**Soil Depth:**	43.6 ft	**Core Depth:**	0 ft	**Date Completed:**	2/27/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 6.0 ft	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
		@SS-8: LL=NP, PL=NP, PI=NP, NMC=22.7%, %#200=57.5			SS-8	4	11	14		25
272.3				28.5						
		@28.5-ft: Hard, Dark Grayish Brown, Munsell=10YR 4/2			SS-9	10	23	27		50
267.3										
	33.5	**PARTIALLY WEATHERED ROCK (PWR)**		33.5	SS-10	50/5"				100+
		SAMPLED AS: Hard, Moist to Wet, Dark Grayish Brown, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), Munsell=2.5Y 4/2								
262.3										
		@38.5-ft: Dry, Bluish Gray, Micaceous, Munsell=GLEY2 5/10B		38.5	SS-11	50/1.5"				100+
257.3										
	43.6	@SS-12: No Recovery		43.5	SS-12	50/1"				100+
		Boring Terminated at 43.6 feet Due to Drilling Refusal at Top of Rock								
252.3										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-5
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	84+21	**Offset:**	67 L	**Alignment:**	Median CL
Elev.:	295.2 ft	**Latitude:**	34.090647	**Longitude:**	-81.165209	**Date Started:**	4/3/2018
Total Depth:	24.5 ft	**Soil Depth:**	9 ft	**Core Depth:**	15.5 ft	**Date Completed:**	4/3/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 4.2 ft	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Grassed Shoulder		0.0							
	0.5	TOPSOIL (6")									
	0.6	ASPHALT (1")									
		FILL Medium Dense, Moist to Dry, Gray, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-2), Munsell=2.5Y 6/1			SS-1	1	5	12	39	17	
	2.0			2.0	SS-2	50/6"				100+	>>
		RESIDUUM Very Dense, Dry, Olive Brown, Low Plasticity, Silty Fine SAND (SM/A-1-b) with Gravel, Munsell=2.5Y 5/6									
		@4-ft: Grayish Brown/Olive Yellow, Munsell=2.5Y 5/2 & 2.5Y 6/6		4.0							
290.2		@SS-3: LL=25, PL=22, PI=3, NMC=12.8%, %#200=22.5			SS-3	6	12	48	35	60	
				6.0	SS-4	23	31	50/1.5"		81+	
	7.0	**PARTIALLY WEATHERED ROCK (PWR)** SAMPLED AS: Very Dense, Moist, Olive/Olive Gray, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2), with Gravel, Munsell=5Y 4/3 & 5Y 4/2		8.0	SS-5	50/1.5"				100+	>>
	9.0			9.0	SS-6	50/0.5"				100+	>>
		LAPILLI TUFF Meta Igneous, Gray/White/Black, Coarse to Fine Grained, Laminated Foliations, Quartz/Feldspar/Biotite, Highly to Slightly Weathered, Strong Rock, Joints Dip from 45° to 60°, Few Joints/Foliations, Very Narrow to Tight, Filled (Clay/Calcite), Wavy/Irregular, Very Close, Rough									@9.8-ft: UC Strength=8,460 psi
285.2					NQ-1						%REC=87, %RQD=68, RMR=51, GSI=15-20
		@NQ-2: Dip from 45° to 60°, Occasional Joints/Veins/Bedding, Very Narrow to Tight, Surface Stain/Filled (Clay/Calcite), Wavy/Irregular, Very Close, Rough to Very Rough		11.7							
					NQ-2						%REC=98, %RQD=57, RMR=N/A, GSI=15-20
280.2				16.7							

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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-5
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	84+21	**Offset:**	67 L	**Alignment:**	Median CL
Elev.:	295.2 ft	**Latitude:**	34.090647	**Longitude:**	-81.165209	**Date Started:**	4/3/2018
Total Depth:	24.5 ft	**Soil Depth:**	9 ft	**Core Depth:**	15.5 ft	**Date Completed:**	4/3/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 4.2 ft	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		@NQ-3: Dip from 45° to 60°, Numerous Joints/Bedding, Very Narrow to Tight, Filled (Clay/Calcite), Wavy/Irregular, Very Close, Slightly Rough to Rough			NQ-3			%REC=93, %RQD=41, RMR=N/A, GSI=15-20
275.2				21.5				
		@NQ-4: Dip from 45° to 60°, Numerous Joints/Bedding, Very Narrow to Tight, Surface Stain/Filled (Clay/Calcite), Wavy/Irregular, Very Close, Slightly Rough to Rough			NQ-4			%REC=77, %RQD=72, RMR=N/A, GSI=15-20
	24.5							
270.2		Coring Terminated at 24.5 feet						
265.2								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/24/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-6
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	C. Piercy	**Boring Location:**	165+87	**Offset:**	87 R	**Alignment:**	Median CL
Elev.:	254.9 ft	**Latitude:**	34.073138	**Longitude:**	-81.148315	**Date Started:**	2/8/2018
Total Depth:	58.7 ft	**Soil Depth:**	58.7 ft	**Core Depth:**	0 ft	**Date Completed:**	2/8/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	6.7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.1	TOPSOIL (1")		0.0	SS-1	3	7	5	7	12
	0.8	**FILL** Stiff, Moist, Red, Non-Plastic to Low Plasticity, SILT (ML/A-4), Munsell=2.5YR 5/8		2.0	SS-2	6	7	8	12	15
		RESIDUUM		4.0						
249.9		Stifff to Very Stiff, Moist, Red/Greenish Gray, Medium Plasticity, SILT (ML/A-7-5(19)), Munsell=2.5YR 5/8 & 10Y 6/1			SS-3	10	10	12	12	22
		@2-ft: Greenish Gray/Brownish Yellow, Munsell=10Y 6/1 & 10YR 6/6		6.0	SS-4	4	10	12	14	22
		@SS-2: LL=49, PL=31, PI=18, NMC=22.7%, %#200=88.2		8.0	SS-5	5	8	14	19	22
244.9		@8-ft: Light Yellowish Brown/White, Non-Plastic, A-4(0), Munsell=10YR 6/4 & 10YR 8/1								
		@SS-5: LL=NP, PL=NP, PI=NP, NMC=27.2%, %#200=89.5		13.5	SS-6	15	21	24		45
239.9		@13.5-ft: Hard to Very Stiff, Light Yellowish Brown, Munsell=2.5Y 6/4								
				18.5	SS-7	11	16	19		35
234.9		@18.5-ft: Light Yellowish Brown/Greenish Gray, Munsell=2.5Y 6/4 & 5GY 6/1								
		@23.5-ft: Medium Plasticity, A-7-6(14)		23.5	SS-8	9	11	15		26
229.9		@SS-8: LL=42, PL=26, PI=14, NMC=21.7%, %#200=81.3								
				28.5	SS-9	15	30	49		79
224.9		@28.5-ft: Light Yellowish Brown/Light Greenish Gray, (Highly Weathered Phyllite), Munsell=2.5Y 6/4 & 10GY 7/1								
				33.5						

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

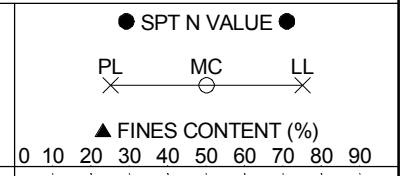
LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-6
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	C. Piercy	**Boring Location:**	165+87	**Offset:**	87 R	**Alignment:**	Median CL
Elev.:	254.9 ft	**Latitude:**	34.073138	**Longitude:**	-81.148315	**Date Started:**	2/8/2018
Total Depth:	58.7 ft	**Soil Depth:**	58.7 ft	**Core Depth:**	0 ft	**Date Completed:**	2/8/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	6.7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
219.9		@33.5-ft: A-6(15) @SS-10: LL=40, PL=26, PI=14, NMC=16.7%, %#200=94.4			SS-10	22	29	38		67
				38.5	SS-11	22	16	13		29
214.9										
	44.0			43.5	SS-12	41	50/2"			100+
209.9		**PARTIALLY WEATHERED ROCK (PWR)** SAMPLED AS: Hard, Moist, Light Yellowish Brown/Greenish Gray, Non-Plastic to Low Plasticity, SILT (ML/A-4) (Highly Weathered Phyllite)								
		@48.5-ft: Light Yellowish Brown/Very Dark Gray, Munsell=2.5Y 6/3 & 2.5Y 3/1		48.5	SS-13	44	40	50/3"		90+
204.9										
		@53.5-ft: Light Yellowish Brown/Very Dark Grayish Brown, Munsell=2.5Y 6/3 & 10YR 3/2		53.5	SS-14	50/3.5"				100+
199.9										
	58.7	Boring Terminated at 58.7 feet		58.5	SS-15	50/2"				100+
194.9										
189.9										



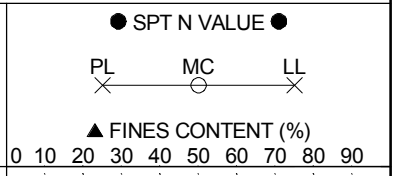
LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-7
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	C. Piercy	**Boring Location:**	177+11	**Offset:**	101 R	**Alignment:**	Median CL
Elev.:	245.9 ft	**Latitude:**	34.070732	**Longitude:**	-81.14598	**Date Started:**	2/20/2018
Total Depth:	40.6 ft	**Soil Depth:**	30.3 ft	**Core Depth:**	10.3 ft	**Date Completed:**	2/20/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 8.0 ft	**24HR**	19.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.3	TOPSOIL (3")		0.0						
		FILL			SS-1	1	4	7	6	11
		Stiff, Moist, Reddish Yellow/Light Yellowish Brown, Non-Plastic to Low Plasticity, SILT (ML/A-4), Munsell=7.5YR 6/6 & 2.5Y 6/4		2.0						
		@2-ft: Light Red/Light Brown, with Gravel, Munsell=2.5YR 6/6 & 7.5YR 6/4			SS-2	7	7	7	7	14
	4.0			4.0						
240.9		Stiff to Firm, Moist, Light Yellowish Brown, Medium Plasticity, CLAY (CL/A-6(9)), with Organics, Munsell=2.5Y 6/4			SS-3	5	8	6	6	14
		@4.5-ft: Light Olive Brown, Munsell=2.5Y 5/6		6.0						
		@SS-4: LL=31, PL=20, PI=11, NMC=28.5%, %#200=87.5, Organics=5.2%			SS-4	3	2	3	3	5
	8.0 ▽			8.0						
		RESIDUUM			SS-5	3	3	5	7	8
235.9		Firm, Moist, Brownish Yellow/Gray, Medium Plasticity, SILT (ML/A-7-6(15)), Munsell=10YR 6/6 & 5Y 5/1								
				13.5						
		@13.5-ft: Very Stiff to Hard, Greenish Gray/Brownish Yellow, Munsell=5GY 6/1 & 10YR 6/6			SS-6	5	10	14		24
230.9		@SS-6: LL=43, PL=29, PI=14, NMC=21.8%, %#200=89.6								
				18.5						
	19.5 ▼				SS-7	37	38	50/3.5"		88+
225.9		**PARTIALLY WEATHERED ROCK (PWR)**								
		SAMPLED AS: Hard, Moist to Dry, Greenish Gray/Light Yellowish Brown, Non-Plastic to Low Plasticity, SILT (ML/A-4), with Sand and Rock Fragments (Highly Weathered Phyllite), Munsell=10GY 6/1 & 2.5Y 6/4		23.5						



LEGEND

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SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-7
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	C. Piercy	**Boring Location:**	177+11	**Offset:**	101 R	**Alignment:**	Median CL
Elev.:	245.9 ft	**Latitude:**	34.070732	**Longitude:**	-81.14598	**Date Started:**	2/20/2018
Total Depth:	40.6 ft	**Soil Depth:**	30.3 ft	**Core Depth:**	10.3 ft	**Date Completed:**	2/20/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 8.0 ft	**24HR**	19.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		@23.5-ft: Light Greenish Gray, Munsell=10BG 7/1			SS-8	50/2.5"	100+	@24.0-ft.: Slow Drilling >>
220.9								
		@SS-9 & SS-10: No Recovery		28.5	SS-9	50/1"	100+	>>
215.9	30.3	**PHYLLITE**		30.3	SS-10	50/0.5"	100+	>>
		Metamorphic, Gray/Bluish Gray, Fine to Very Fine Grained, Laminated Foliations, Quartz/Feldspar/Sericite, Slightly Weathered, Joints Dip at 25°, Few Joints, Moderately Wide to Very Narrow, No Infilling, Planar, Very Close, Smooth			NQ-1			%REC=93, %RQD=93, RMR=N/A, GSI=22-27
				31.6				
		@NQ-2: Joints Dip from 10° to 30°, Occasional Joints, Moderately Wide to Very Narrow, Surface Stain/Partially Filled (Calcite/Iron Oxide), Planar/Irregular, Very Close, Smooth to Slightly Rough			NQ-2			%REC=92, %RQD=90, RMR=N/A, GSI=22-27
210.9								
		@NQ-3: Strong Rock, Joints Dip from 0° to 3°, Few Joints/Foliations, Tight, Filled (Healed/Quartz), Planar/Stepped, Very Close, Rough		36.6				@37.6-ft: UC Strength=8,730 psi
					NQ-3			%REC=96, %RQD=92, RMR=67, GSI=22-27
205.9	40.6	Coring Terminated at 40.6 feet						
200.9								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-8
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	180+57	**Offset:**	99 L	**Alignment:**	Median CL
Elev.:	247.0 ft	**Latitude:**	34.070351	**Longitude:**	-81.144744	**Date Started:**	5/17/2018
Total Depth:	41.2 ft	**Soil Depth:**	25.4 ft	**Core Depth:**	15.8 ft	**Date Completed:**	5/22/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 4.0 ft	**24HR**	10.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Asphalt Shoulder								
	0.8	ASPHALT (9")		0.8						
		FILL								
	2.0	Loose, Moist, Reddish Yellow, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-4), with Gravel, Munsell=5YR 7/6		2.0	SS-1	1	3	3		6
		Firm to Stiff, Moist, Reddish Yellow, Low Plasticity, SILT (ML/A-4(3)), Munsell=5YR 7/6		4.0	SS-2	3	3	4	4	7
242.0	5.5	@SS-2: LL=31, PL=26, PI=5, NMC=21.5%, %#200=70.3			SS-3	2	3	6	11	9
		RESIDUUM		6.0						
		Very Dense, Moist, Light Yellowish Brown/Black, Low Plasticity, Silty Coarse SAND (SM/A-4(0) with Gravel, Munsell=2.5Y 6/3 & 2.5Y 2.5/1			SS-4	20	31	29	31	60
		@SS-4: LL=29, PL=25, PI=4, NMC=17.9%, %#200=39.8		8.0						
237.0		@8-ft: Moist to Wet			SS-5	10	25	38	50/5.5"	63
	13.5	**PARTIALLY WEATHERED ROCK (PWR)**		13.5	SS-6	50/2"				100+
232.0		SAMPLED AS: Hard, Moist, Greenish Gray, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), with Gravel, Munsell=10Y 6/1								
		@18.5-ft: Bluish Gray, Munsell=10B 6/1		18.5	SS-7	50/1.5"				100+
227.0				23.5						

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-8
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	180+57	**Offset:**	99 L	**Alignment:**	Median CL
Elev.:	247.0 ft	**Latitude:**	34.070351	**Longitude:**	-81.144744	**Date Started:**	5/17/2018
Total Depth:	41.2 ft	**Soil Depth:**	25.4 ft	**Core Depth:**	15.8 ft	**Date Completed:**	5/22/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 4.0 ft	**24HR**	10.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
					SS-8	50/1.5"	100+	>>
222.0	25.4	**PHYLLITE** Metamorphic, Gray/White, Very Fine Grained, Laminated Foliations, Quartz/Feldspar/Sericite, Slightly Weathered, Joints Dip from 45° to 80°, Numerous Joints/Foliations/Veins, Very Narrow to Tight, Filled (Calcite), Wavy/Stepped, Very Close, Smooth to Slightly Rough		25.3	SS-9	50/<1"	100+	>>
				25.4	NQ-1			%REC=22, %RQD=0, RMR=N/A, GSI=15-25
				26.2	NQ-2			%REC=87, %RQD=18, RMR=N/A, GSI=15-25
217.0		@NQ-2: Joints Dip from 45° to 80°, Numerous Joints/Foliations/Veins, Very Narrow to Tight, Filled (Calcite), Wavy/Stepped, Very Close, Smooth to Slightly Rough						
		@NQ-3: Weak Rock, Joints Dip from 30° to 80°, Numerous Joints/Foliations/Veins, Very Narrow to Tight, Surface Stain/Filled (Calcite), Wavy/Stepped, Very Close, Smooth to Slightly Rough		31.2	NQ-3			@33.0-ft: UC Strength=1,980 psi %REC=95, %RQD=37 RMR=32, GSI=15-25
212.0								
		@NQ-4: Slightly Weathered to Fresh, Joints Dip from 20° to 70°, Occasional Joints/Foliations, Very Narrow to Tight, Filled (Calcite), Planar/Stepped, Very Close, Smooth to Slightly Rough		36.2	NQ-4			%REC=83, %RQD=62, RMR=N/A, GSI=N/A
207.0	41.2	Coring Terminated at 41.2 feet						
202.0								

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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-9
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	192+74	**Offset:**	57 R	**Alignment:**	Median CL
Elev.:	255.5 ft	**Latitude:**	34.067504	**Longitude:**	-81.142577	**Date Started:**	3/8/2018
Total Depth:	49.2 ft	**Soil Depth:**	38.6 ft	**Core Depth:**	10.6 ft	**Date Completed:**	3/8/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 3.0 ft	**24HR**	3.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.5	TOPSOIL (6")		0.0	SS-1	1	2	6	9	8
	2.0	**FILL** Loose, Moist to Wet, Yellowish Brown/Very Dark Gray, Non-Platic to Low Plasticity, Silty Fine to Medium SAND (A-2), with Gravel, Munsell=10YR 5/6 & 10YR 3/1		2.0	SS-2	3	3	3	3	6
				4.0						
250.5		**RESIDUUM** Firm to Stiff, Wet, Yellowish Brown/Yellowish Red, High Plasticity, Elastic SILT (MH/A-7-5(20)) with Gravel, Munsell=10YR 5/8 & 5YR 5/8			SS-3	3	4	5	6	9
	6.0			6.0	SS-4	3	9	10	14	19
	8.5	@SS-3: LL=57, PL=30, PI=27, NMC=24.8%, %#200=76.9		8.0	SS-5	27	50/5"			100+
245.5		Very Stiff to Hard, Moist to Wet, Yellowish Brown/Yellowish Red, High Plasticity, Lean CLAY (CL/A-7-6(20)), Munsell=10YR 5/8 & 5YR 5/8 @SS-4: LL=45, PL=19, PI=26, NMC=29.7%, %#200=91.4								
		PARTIALLY WEATHERED ROCK (PWR) SAMPLED AS: Hard, Moist, Light Yellowish Brown, Low Plasticity, SILT (ML/A-4(8)), Micaceous, Munsell=2.5Y 6/3		13.5	SS-6	50/2"				100+
240.5		@SS-5: LL=33, PL=24, PI=9, NMC=16.3%, %#200=85.6 @13.5-ft: Moist to Dry @17.5-ft: Soft Layer Encountered While Drilling (17.5-ft to 18.5-ft) @18.5-ft: A-4(7)		18.5	SS-7	4	23	37		60
235.5		@SS-7: LL=33, PL=27, PI=6, NMC=24.4%, %#200=94.9		23.5	SS-8	50/2.5"				100+
230.5				28.5						

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-9
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	192+74	**Offset:**	57 R	**Alignment:**	Median CL
Elev.:	255.5 ft	**Latitude:**	34.067504	**Longitude:**	-81.142577	**Date Started:**	3/8/2018
Total Depth:	49.2 ft	**Soil Depth:**	38.6 ft	**Core Depth:**	10.6 ft	**Date Completed:**	3/8/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW/RC	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	NQ	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 3.0 ft	**24HR**	3.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		@28.5-ft: Dry, Micaceous			SS-9	50/2"	100+	>>
225.5								
		@33.5-ft: Light Bluish Gray, GLEY2 7/5B		33.5	SS-10	50/1.25"	100+	>>
220.5								
	38.6			38.5	SS-11	50/0.75"	100+	>>
		PHYLLITE		38.6				
215.5		Metamorphic, Gray/Light Gray, Fine Grained, Thinly Laminated to Laminated Foliations, Quartz/Feldspar/Sericite, Slightly Weathered to Fresh, Joints Dip from 10° to 60°, Few Joints, Moderately Wide to Narrow, Filled (Calcite/Iron Oxide), Planar/Irregular, Very Close, Slightly Rough to Rough			NQ-1			REC=97%, RQD=97%, RMR=N/A, GSI=21-26
				41.2				
								@42.5-ft: UC Strength=5,450 psi
		@NQ-2: Highly Weathered to Fresh, Weak Rock, Joints Dip from 20° to 30°, Few Joints, Moderately Wide to Very Narrow, No Infilling, Planar/Irregular, Very Close, Smooth to Slightly Rough			NQ-2			REC=93%, RQD=80%, RMR=29, GSI=6-10
210.5								
								@Bottom NQ-2: Clay Seam
				46.2				
		@NQ-3: Highly to Slightly Weathered, Joints Dip from 10° to 40°, Numerous Joints, Moderately Wide to Very Narrow, No Infilling, Planar/Irregular, Very Close, Smooth to Slightly Rough			NQ-3			REC=89%, RQD=39%, RMR=N/A, GSI=5-9
	49.2							
		Coring Terminated at 49.2 feet						
205.5								
200.5								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/26/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-10
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	194+70	**Offset:**	58 L	**Alignment:**	Median CL
Elev.:	257.3 ft	**Latitude:**	34.067289	**Longitude:**	-81.141871	**Date Started:**	3/22/2018
Total Depth:	53.6 ft	**Soil Depth:**	53.6 ft	**Core Depth:**	0 ft	**Date Completed:**	3/22/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 4.0 ft	**24HR**	4.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.3	TOPSOIL (3")		0.0	SS-1	1	3	7	9	10
		FILL Stiff, Moist, Dark Reddish Gray, Low to Medium Plasticity, CLAY (CL/A-7), Munsell=5YR 4/2		2.0	SS-2	10	16	15	15	31
	4.0	@2-ft: Hard, Light Brownish Gray, Munsell=10YR 6/2		4.0	SS-3	15	15	34	48	49
252.3		**RESIDUUM** Hard, Moist to Wet, Light Brownish Gray, Low Plasticity, SILT (ML/A-4(7)), Micaceous, Munsell=10YR 6/2		6.0	SS-4	21	34	36	50	70
		@SS-3: LL=34, PL=25, PI=9, NMC=11.1%, %#200=81.5		8.0	SS-5	20	20	30	41	50
247.3		@6-ft: Light Yellowish Brown, Munsell=2.5Y 6/3								
		@8-ft: Moist, A-4(5)								
		@SS-5: LL=35, PL=31, PI=4, NMC=14.9%, %#200=87.1		13.5	SS-6	25	29	35		64
242.3										
	18.5	**PARTIALLY WEATHERED ROCK (PWR)** SAMPLED AS: Hard, Moist to Dry, Light Brownish Gray, Low Plasticity, SILT (ML/A-4(8)), Micaceous, Munsell=2.5Y 6/2		18.5	SS-7	50/4"				100+
237.3										
				23.5	SS-8	50/5"				100+
232.3										
				28.5						

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-10
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	194+70	**Offset:**	58 L	**Alignment:**	Median CL
Elev.:	257.3 ft	**Latitude:**	34.067289	**Longitude:**	-81.141871	**Date Started:**	3/22/2018
Total Depth:	53.6 ft	**Soil Depth:**	53.6 ft	**Core Depth:**	0 ft	**Date Completed:**	3/22/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 4.0 ft	**24HR**	4.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
227.3		@28.5-ft: Moist @SS-9: LL=33, PL=25, PI=8, NMC=12.9%, %#200=91.5			SS-9	35	45	50/3"		95+
				33.5	SS-10	18	36	50/4"		86+
222.3										
				38.5	SS-11	39	50/5.5"			100+
217.3										
		@43.5-ft: Olive Gray, with Sand, Munsell=5Y 5/2		43.5	SS-12	50/2"				100+
212.3										
		@48.5-ft: Dark Greenish Gray, Munsell=10GY 4/1		48.5	SS-13	50/1.5"				100+
207.3										
	53.6	@53-ft: Grayish Green, with Sand and Gravel, Munsell=5G 4/2		53.5	SS-14	50/1"				100+
202.3		Boring Terminated at 53.6 feet Due to Drilling Refusal at Top of Rock								

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-11
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	236+42	**Offset:**	108 R	**Alignment:**	Median CL
Elev.:	310.2 ft	**Latitude:**	34.058374	**Longitude:**	-81.133196	**Date Started:**	1/29/2018
Total Depth:	38.6 ft	**Soil Depth:**	38.6 ft	**Core Depth:**	0 ft	**Date Completed:**	1/29/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Asphalt Roadway								
	0.8	ASPHALT (9")		0.8						
		FILL			SS-1	12	11	7		18
	2.0	Medium Dense, Moist, Reddish Yellow, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-2), Munsell=5YR 6/8		2.0						
		RESIDUUM			SS-2	7	8	10	19	18
		Very Stiff to Hard, Moist to Dry, Brownish Yellow/White, Medium Plasticity, SILT (ML/A-7-6(11)) with Fine Sand, Micaceous, Munsell=10YR 4/8 & 10YR 8/1		4.0						
305.2	5.0				SS-3	23	39	50/5.5"		89+
		@SS-2: LL=42, PL=28, PI=14, NMC=16.9%, %#200=75.6		6.0						
		@4-ft: Dry, White/Very Pale Brown			SS-4	32	50/4.5"			100+
		PARTIALLY WEATHERED ROCK (PWR)		8.0						
		SAMPLED AS: Very Dense, Dry, White/Pale Brown, Non-Plastic, Sandy SILT (ML/A-4(0)), Micaceous, Munsell=10YR 8/1 & 10YR 8/2			SS-5	48	50/3"			100+
300.2		@6-ft: Moist, Light Bluish Gray, Munsell=GLEY2 8/1								
		@13.5-ft: Moist to Wet		13.5	SS-6	49	50/3"			100+
		@SS-6: LL=NP, PL=NP, PI=NP, NMC=18.4%, %#200=66.8								
295.2										
		@18.5-ft: Moist		18.5	SS-7	38	50/3.5"			100+
290.2										
				23.5						

SPT N VALUE ●

PL ⨯ MC ○ LL ⨯

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-11
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	236+42	**Offset:**	108 R	**Alignment:**	Median CL
Elev.:	310.2 ft	**Latitude:**	34.058374	**Longitude:**	-81.133196	**Date Started:**	1/29/2018
Total Depth:	38.6 ft	**Soil Depth:**	38.6 ft	**Core Depth:**	0 ft	**Date Completed:**	1/29/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
285.2					SS-8	50/5"	100+
				28.5	SS-9	50/4.5"	100+
280.2							
				33.5	SS-10	50/3.5"	100+
275.2		@33.5-ft: Light Bluish Gray/Dusky Red, Munsell=GLEY2 6/1 & 10R 3/4					
	38.6	@38.5-ft: Yellowish Brown/Gray, Munsell=10YR 5/8 & 10YR 6/1		38.5	SS-11	50/1.5"	100+
270.2		Boring Terminated at 38.6 feet Due to Drilling Refusal at Top of Rock					
265.2							

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/24/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-12
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	244+17	**Offset:**	108 R	**Alignment:**	Median CL
Elev.:	317.9 ft	**Latitude:**	34.056795	**Longitude:**	-81.131476	**Date Started:**	1/30/2018
Total Depth:	45 ft	**Soil Depth:**	45 ft	**Core Depth:**	0 ft	**Date Completed:**	1/30/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 25.0 ft	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Asphalt Roadway								
	0.3	ASPHALT (3.5")		0.3						
	1.0	**FILL** Medium Dense, Moist, Reddish Yellow, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-2), Munsell=5YR 7/8			SS-1	8	6	5		14
				2.0						
					SS-2	5	6	11	12	17
	4.0	**RESIDUUM** Stiff to Very Stiff, Moist, Yellowish Red, Medium Plasticity, Elastic SILT (MH/A-7-5(20)) with Fine Sand, Micaceous, Munsell=5YR 5/8		4.0						
312.9		@SS-2: LL=58, PL=38, PI=20, NMC=24.6%, %#200=84.4			SS-3	12	13	17	15	30
		Hard, Moist, Yellow/White/Dusky Red, Non-Plastic, Sandy SILT (ML/A-4(0)), Munsell=10YR 8/6, 10YR 8/1 & 7.5R 3/4		6.0						
					SS-4	12	29	31	39	60
		@SS-4: LL=NP, PL=NP, PI=NP, NMC=15.6%, %#200=66.7		8.0						
	9.5				SS-5	17	19	33	50/5.5"	52
307.9		**PARTIALLY WEATHERED ROCK (PWR)** SAMPLED AS: Hard, Moist, Yellow/White/Dusky Red, Non-Plastic to Low Plasticity, SILT (ML/A-4), Micaceous, Munsell=10YR 8/6, 10YR 8/1 & 7.5R 3/4								
	13.5			13.5	SS-6	50/5.5"				100+
		SAMPLED AS: Hard, Moist, Olive/Gray, Non-Plastic to Low Plasticity, SILT (ML/A-4) with Sand, Micaceous, Munsell=5Y 4/4 & 5Y								
302.9										
				18.5	SS-7	50/5.5"				100+
297.9										
	23.5			23.5						

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

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LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-12
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	244+17	**Offset:**	108 R	**Alignment:**	Median CL
Elev.:	317.9 ft	**Latitude:**	34.056795	**Longitude:**	-81.131476	**Date Started:**	1/30/2018
Total Depth:	45 ft	**Soil Depth:**	45 ft	**Core Depth:**	0 ft	**Date Completed:**	1/30/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 25.0 ft	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" 2nd 6" 3rd 6" 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
292.9		SAMPLED AS: Hard, Moist to Wet, Olive/Bluish Gray, Non-Plastic to Low Plasticity, SILT (ML/A-4), Micaceous, Munsell=5Y 4/4 & GLEY2_5PB 6/1			SS-8	50/4.5"	100+	>>
				28.5	SS-9	50/4.5"	100+	>>
287.9								
	33.5	**RESIDUUM**		33.5				
282.9		Hard, Moist, Bluish Gray/Olive Yellow, Non-Plastic, Sandy SILT (ML/A-4), Micaceous, Munsell=GLEY2 6/10B & 2.5Y 6/6			SS-10	13 22 48	70	
	38.5	**PARTIALLY WEATHERED ROCK (PWR)**		38.5	SS-11	29 50/4"	100+	>>
277.9		SAMPLED AS: Hard, Moist, Bluish Gray/Olive Yellow, Non-Plastic, Sandy SILT (ML/A-4), Micaceous, Munsell=GLEY2 6/10B & 2.5Y 6/6						
	43.5	**RESIDUUM**		43.5				
272.9	45.0	Hard, Moist to Wet, Bluish Gray/Bluish Black, Non-Plastic to Low Plasticity, SILT (ML/A-4) with Sand, Micaceous, Munsell=GLEY2 6/10B & GLEY2 2.5/10B			SS-12	35 47 31	78	
		Boring Terminated at 45.0 feet						

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-13
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	298+70	**Offset:**	86 R	**Alignment:**	Median CL
Elev.:	229.4 ft	**Latitude:**	34.045687	**Longitude:**	-81.119423	**Date Started:**	3/12/2018
Total Depth:	59.9 ft	**Soil Depth:**	59.9 ft	**Core Depth:**	0 ft	**Date Completed:**	3/13/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 3.0 ft	**24HR**	5.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Grassed Shoulder								
	0.2	TOPSOIL (2")		0.0	SS-1	1	2	3	3	5
		FILL								
	3.0	Firm to Soft, Moist, Olive Gray, Medium Plasticity, SILT (ML/A-6(9)) with Sand, Munsell=5Y 5/2		2.0						
		@SS-1: LL=38, PL=26, PI=12, NMC=18.9%, %#200=74.6			SS-2	2	2	2	1	4
224.4	5.0			4.0	SS-3	2	6	11	10	17
		Very Loose, Moist to Wet, Gray, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-2), Munsell=2.5Y 6/1		6.0	SS-4	7	6	7	9	13
		RESIDUUM		8.0	SS-5	2	5	5	7	10
219.4		Very Stiff to Stiff, Wet, Light Bluish Gray, Low Plasticity, Sandy Lean CLAY (CL/A-4(5)), Munsell=GLEY2 7/5PB								
		@8-ft: with Quartz Fragments								
		@SS-5: LL=32, PL=22, PI=10, NMC=21.7%, %#200=65.0								
	13.5			13.5	SS-6	10	13	16		29
214.4		Very Stiff, Moist, Yellowish Brown, Medium Plasticity, Elastic SILT (MH/A-7-5(20)), Micaceous, Munsell=2.5Y 6/3								
		@SS-6: LL=51, PL=32, PI=19, NMC=19.5%, %#200=95.0								
	18.5			18.5	SS-7	9	8	8		16
209.4		Very Stiff to Hard, Moist, Yellowish Brown, Low Plasticity, SILT (ML/A-4(4)), Micaceous, Munsell=5Y 6/2								
		@SS-7: LL=38, PL=36, PI=2, NMC=22.8%, %#200=86.5								
				23.5	SS-8	11	15	18		33
204.4		@23.5-ft: Light Olive Gray, Munsell=5Y 6/2								
				28.5	SS-9	25	38	42		80
199.4										
				33.5						

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-13
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	298+70	**Offset:**	86 R	**Alignment:**	Median CL
Elev.:	229.4 ft	**Latitude:**	34.045687	**Longitude:**	-81.119423	**Date Started:**	3/12/2018
Total Depth:	59.9 ft	**Soil Depth:**	59.9 ft	**Core Depth:**	0 ft	**Date Completed:**	3/13/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 3.0 ft	**24HR**	5.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
194.4		=> Medium Plasticity, A-7-5(20) @SS-10: LL=47, PL=30, PI=17, NMC=16.0%, %#200=97.0			SS-10	23	26	32		58
	38.5	**PARTIALLY WEATHERED ROCK (PWR)**		38.5	SS-11	50/5"				100+
189.4		SAMPLED AS: Hard, Moist, Gray, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), Micaceous, Munsell=5Y 6/1								
		@43.5-ft: Moist to Dry		43.5	SS-12	50/4"				100+
184.4										
				48.5	SS-13	50/2"				100+
179.4										
	53.5			53.5	SS-14	50/2.5"				100+
		SAMPLED AS: Hard, Dry, Greenish Gray/Pale Olive, Non-Plastic to Low Plasticity, SILT (ML/A-4), Micaceous, Munsell=GLEY1 6/10Y & 5Y 6/3								
174.4				58.5						
					SS-15	19	30	50/5"		80+
	59.9									
169.4		Boring Terminated at 59.9 feet								
164.4										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-14
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	S-36 (St Andrews Rd)
Eng./Geo.:	C. Piercy	**Boring Location:**	36+24	**Offset:**	212 L	**Alignment:**	Mainline
Elev.:	227.1 ft	**Latitude:**	34.045796	**Longitude:**	-81.116491	**Date Started:**	5/16/2018
Total Depth:	53.6 ft	**Soil Depth:**	53.6 ft	**Core Depth:**	0 ft	**Date Completed:**	5/16/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** 6.0 ft	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Asphalt Drive								
	0.4	ASPHALT (4.75")		0.0						
	0.7	GABC (4")			SS-1	1	5	2	2	7
		FILL		2.0						
		Firm to Soft, Moist, Very Pale Brown, Low Plasticity, Sandy SILT (ML/A-4(4)), Munsell=10YR 7/4			SS-2	2	3	1	1	4
		@1.1-ft: Red, Munsell=2.5YR 5/6		4.0						
222.1		@2-ft: Light Red/Reddish Yellow, Munsell=2.5YR 6/6 & 5YR 6/6			SS-3	4	2	3	3	5
	6.7			6.0						
		@4-ft: Reddish Yellow/Pale Red, Munsell=5YR 6/6 & 10R 6/4			SS-4	3	4	3	3	7
		@SS-3: LL=36, PL=30, PI=6, NMC=30.9%, %#200=68.0		8.0						
		@4.8-ft: Dark Gray, with Organics, Munsell=2.5Y 4/1			SS-5	1	2	2	1	4
217.1		@6-ft: Grayish Olive/Light Reddish Brown, Munsell=10Y 5/2 & 2.5YR 6/4								
		Firm to Soft, Moist, Grayish Olive, Low Plasticity, Sandy, Silty CLAY (CL-ML/A-4(2)), Munsell=10Y 5/2								
	13.5			13.5						
		@8-ft: Light Yellowish Brown, Munsell=2.5Y 6/3			SS-6	4	6	11		17
212.1		@SS-5: LL=26, PL=19, PI=7, NMC=19.5%, %#200=60.8, Organics=2.91%								
		RESIDUUM								
		Very Stiff to Hard, Moist, Weak Red/Yellow/Light Gray, Non-Plastic, SILT (ML/A-4(0)) with Sand, Munsell=7.5R 4/4, 2.5Y 7/6 & 2.5Y 7/1		18.5						
					SS-7	8	20	25		45
207.1		@SS-6: LL=NP, PL=NP, PI=NP, NMC=29.2%, %#200=82.8								
				23.5						
		@23.5-ft: Light Reddish Brown, Munsell=5YR 6/4			SS-8	6	20	19		39
202.1										
				28.5						

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-14
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	S-36 (St Andrews Rd)
Eng./Geo.:	C. Piercy	**Boring Location:**	36+24	**Offset:**	212 L	**Alignment:**	Mainline
Elev.:	227.1 ft	**Latitude:**	34.045796	**Longitude:**	-81.116491	**Date Started:**	5/16/2018
Total Depth:	53.6 ft	**Soil Depth:**	53.6 ft	**Core Depth:**	0 ft	**Date Completed:**	5/16/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** 6.0 ft	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
197.1		@28.5-ft: Red, Munsell=7.5R 4/6 @SS-9: LL=NP, PL=NP, PI=NP, NMC=30.0%, %#200=71.9			SS-9	9	13	16		29	
				33.5	SS-10	16	31	50/4.5"		81+	*Slow Drilling*
192.1		@34-ft: Pale Olive/Gray, Munsell=5Y 6/3 & 5Y 5/1									
				38.5	SS-11	34	36	50/3"		86+	
187.1											
	43.5	**PARTIALLY WEATHERED ROCK (PWR)** SAMPLED AS: Hard, Moist, Grayish Olive, Non-Plastic to Low Plasticity, SILT (ML/A-4) with Sand, Munsell=10Y 5/2		43.5	SS-12	50/3"				100+	>>
182.1											
				48.5	SS-13	50/3"				100+	>>
177.1											
	53.6	Boring Terminated at 53.6 feet Due to Drilling Refusal at Top of Rock		53.5	SS-14	50/1.5"				100+	>>
172.1											

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-15
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	314+37	**Offset:**	75 R	**Alignment:**	Median CL
Elev.:	214.3 ft	**Latitude:**	34.042325	**Longitude:**	-81.11619	**Date Started:**	3/13/2018
Total Depth:	43.6 ft	**Soil Depth:**	43.6 ft	**Core Depth:**	0 ft	**Date Completed:**	3/13/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 8.0 ft	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Grassed Shoulder									
		ASPHALT/GRAVEL (18")		0.0							
	1.5				SS-1	3	10	6	6	16	
		FILL		2.0							
		Medium Dense to Loose, Moist, Light Reddish Brown, Low Plasticity, Silty Fine to Medium SAND (SM/A-2-4), Munsell=5YR 6/4			SS-2	6	6	5	8	11	
		@SS-2: LL=16, PL=15, PI=1, NMC=9.0%, %#200=19.8		4.0							
209.3		@4-ft: Light Reddish Brown, Munsell=5YR 6/3			SS-3	8	8	7	6	15	
		@6-ft: Pink, with Wood Fragments, Munsell=7.5YR 7/4		6.0							
					SS-4	5	4	3	3	7	
		@8-ft: Very Loose, Brownish Yellow, Munsell=10YR 6/6		8.0							
	9.0				SS-5	1	2	1	2	3	
		RESIDUUM									
204.3		Soft, Moist to Wet, Brownish Yellow, Medium Plasticity, Sandy Lean CLAY (CL/A-6(7)), with Organics (Wood Fragments), Munsell=10YR 6/6									
		@SS-5: LL=35, PL=20, PI=15, NMC=23.3%, %#200=61.6									
	13.5			13.5							
		Firm, Moist to Wet, Brownish Yellow, Medium Plasticity, Elastic SILT (MH/A-7-5(20)) with Sand, Munsell=10YR 6/6			SS-6	1	3	4		7	
199.3		@SS-6: LL=72, PL=54, PI=18, NMC=38.7%, %#200=84.6									
	18.5			18.5							
		Hard, Moist to Wet, Brownish Yellow, Low Plasticity, SILT (ML/A-5(10)) with Sand, Micaceous, Munsell=10YR 6/6			SS-7	7	16	29		45	
194.3		@SS-7: LL=44, PL=34, PI=10, NMC=24.6%, %#200=79.6									
				23.5							

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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-15
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	314+37	**Offset:**	75 R	**Alignment:**	Median CL
Elev.:	214.3 ft	**Latitude:**	34.042325	**Longitude:**	-81.11619	**Date Started:**	3/13/2018
Total Depth:	43.6 ft	**Soil Depth:**	43.6 ft	**Core Depth:**	0 ft	**Date Completed:**	3/13/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 8.0 ft	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	24.0	**PARTIALLY WEATHERED ROCK (PWR)**		SS-8	29	50/4"			100+
189.3		SAMPLED AS: Hard, Moist to Dry, Olive Gray/Dusky Red, Non-Plastic to Low Plasticity, SILT (ML/A-4), Micaceous, Munsell=5Y 5/7 & 10R 3/4							
			28.5	SS-9	50/3.5"				100+
		@28.5-ft: Greenish Gray, Munsell=5GY 6/1							
184.3									
			33.5	SS-10	50/2"				100+
		@33.5-ft: Dry, Greenish Gray, Munsell=GLEY1 6/5GY							
179.3									
			38.5	SS-11	50/1.25"				100+
174.3									
		@42.5-ft: Greenish Gray, Munsell=10GY 5/1							
	43.6		43.5	SS-12	50/1.5"				100+
		Boring Terminated at 43.6 feet Due to Drilling Refusal at Top of Rock							
169.3									

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-16
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	C. Piercy	**Boring Location:**	320+94	**Offset:**	180 R	**Alignment:**	Median CL
Elev.:	215.3 ft	**Latitude:**	34.040728	**Longitude:**	-81.115119	**Date Started:**	5/3/2018
Total Depth:	68.9 ft	**Soil Depth:**	68.9 ft	**Core Depth:**	0 ft	**Date Completed:**	5/4/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 13.5 ft	**24HR**	2.3 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Asphalt								
	0.7	ASPHALT (8.25")		0.7						
	1.6	**FILL** Firm, Moist, Brown, Non-Plastic to Low Plasticity, SILT (ML/A-4), Munsell=7.5YR 5/4		2.0	SS-1	1	4	4		8
		RESIDUUM Very Stiff to Hard, Moist, Pinkish Gray, Non-Plastic, SILT (ML/A-4(0)), Munsell=5YR 6/2		4.0	SS-2	6	10	14	14	24
210.3		@2-ft: Brownish Yellow/Light Gray, Munsell=10YR 6/6 & 10YR 7/1 @SS-2: LL=NP, PL=NP, PI=NP, NMC=21.7%, %#200=80.0		6.0	SS-3	11	16	17	16	33
		@4-ft: Yellow/Light Reddish Brown, Munsell=10YR 7/8 & 5YR 6/3		8.0	SS-4	7	11	11	13	22
205.3		@6-ft: Yellow/Reddish Brown, Munsell=10YR 7/8 & 5YR 5/3			SS-5	5	10	12	13	22
		@13.5-ft: Reddish Brown/Yellow, Munsell=5YR 5/4 & 2.5Y 7/8		13.5	SS-6	12	15	19		34
200.3		@SS-6: LL=NP, PL=NP, PI=NP, NMC=25.8%, %#200=90.2		18.5	SS-7	6	19	22		41
195.3		@18.5-ft: Pale Red/Reddish Yellow, Munsell=10R 6/2 & 7.5YR 6/8		23.5	SS-8	16	31	39		70
190.3		@23.5-ft: Pale red/Yellowish Red, Munsell=10R 6/2 & 5YR 5/8		28.5						

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

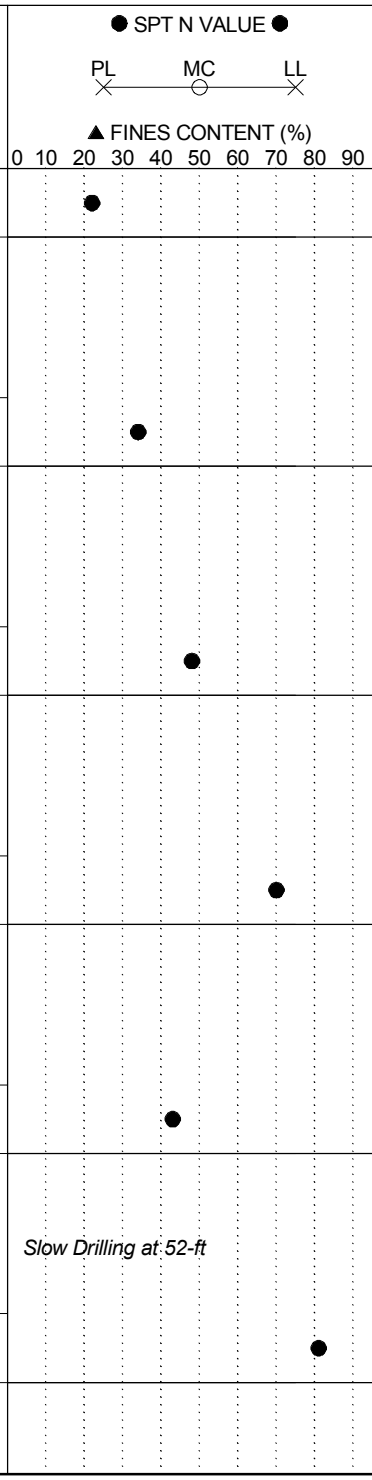
Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-16
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	C. Piercy	**Boring Location:**	320+94	**Offset:**	180 R	**Alignment:**	Median CL
Elev.:	215.3 ft	**Latitude:**	34.040728	**Longitude:**	-81.115119	**Date Started:**	5/3/2018
Total Depth:	68.9 ft	**Soil Depth:**	68.9 ft	**Core Depth:**	0 ft	**Date Completed:**	5/4/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 13.5 ft	**24HR**	2.3 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
		@28.5-ft: Moist to Wet, Weak Red/Brownish Yellow, Munsell=10R 5/3 & 10YR 6/6			SS-9	2	8	14		22
185.3				33.5						
		@33.5-ft: Weak Red/Brownish Yellow/Brown, Munsell=10R 5/3, 10YR 6/6 & 7.5YR 5/4			SS-10	7	13	21		34
180.3				38.5						
		@38.5-ft: Reddish Yellow/Weak Red, Munsell=7.5YR 6/6 & 5R 4/2			SS-11	7	17	31		48
175.3				43.5						
		@43.5-ft: Reddish Yellow/Weak Red, Munsell=7.5YR 6/8 & 10R 4/3			SS-12	17	32	38		70
170.3				48.5						
					SS-13	8	18	25		43
165.3				53.5						
		@53.5-ft: Weak Red/Red, Munsell=10R 4/3 & 2.5YR 5/8			SS-14	16	33	48		81
160.3										



LEGEND

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SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-16
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	C. Piercy	**Boring Location:**	320+94	**Offset:**	180 R	**Alignment:**	Median CL
Elev.:	215.3 ft	**Latitude:**	34.040728	**Longitude:**	-81.115119	**Date Started:**	5/3/2018
Total Depth:	68.9 ft	**Soil Depth:**	68.9 ft	**Core Depth:**	0 ft	**Date Completed:**	5/4/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 13.5 ft	**24HR**	2.3 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
				58.5						
		@58.5-ft: Light Grayish Olive/Reddish Yellow, Munsell=10Y 6/2 & 7.5YR 6/8			SS-15	25	38	50/4"		88+
155.3										
				63.5						
		@63.5-ft: Grayish Green, Munsell=5GY 5/2			SS-16	28	27	49		76
150.3										
	68.5			68.5						
	68.9	**PARTIALLY WEATHERED ROCK (PWR)**			SS-17	50/4.5"				100+
145.3		SAMPLED AS: Hard, Moist, Grayish Green, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-4) with Gravel, Munsell=5GY 5/2								
		Boring Terminated at 68.9 feet								
140.3										
135.3										
130.3										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

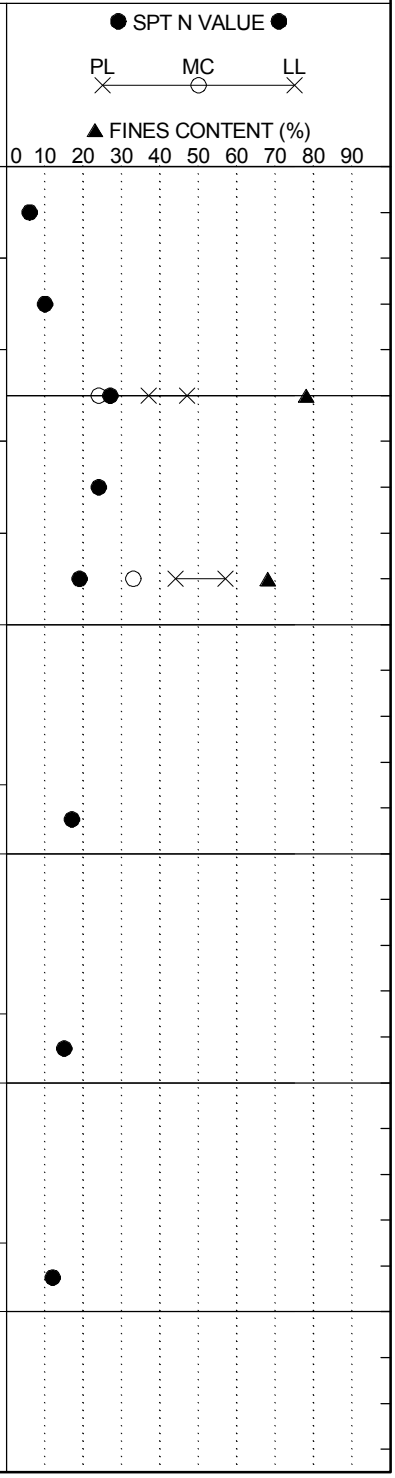
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/24/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-17
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	M. Miller	**Boring Location:**	330+80	**Offset:**	313 R	**Alignment:**	Median CL
Elev.:	248.6 ft	**Latitude:**	34.038376	**Longitude:**	-81.113448	**Date Started:**	4/12/2018
Total Depth:	79.9 ft	**Soil Depth:**	79.9 ft	**Core Depth:**	0 ft	**Date Completed:**	4/12/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	30.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Cleared Woods								
		RESIDUUM		0.0						
		Firm to Stiff, Moist, Red, Low Plasticity, SILT (ML/A-5(10)) with Sand, Munsell=2.5YR 4/8			SS-1	1	2	4	5	6
				2.0						
					SS-2	4	5	5	7	10
				4.0						
		@4-ft: Very Stiff								
243.6		@SS-3: LL=47, PL=37, PI=10, NMC=24.2%, %#200=77.7			SS-3	9	12	15	18	27
				6.0						
		@6-ft: Red/Brownish Yellow/White (Mottled), Munsell=2.5YR 4/8, 10YR 6/8 & 10YR 8/1			SS-4	8	12	12	12	24
	8.0			8.0						
		Very Stiff, Moist, Red/Brownish Yellow/White (Mottled), Medium Plasticity, Sandy Elastic SILT (MH/A-7-5(11)), Munsell=2.5YR 4/8, 10YR 6/8 & 10YR 8/1			SS-5	4	9	10	12	19
238.6		@SS-5: LL=57, PL=44, PI=12, NMC=33.0%, %#200=67.5								
				13.5						
					SS-6	5	8	9		17
233.6										
	18.5			18.5						
		Stiff to Very Stiff, Moist, Yellowish Red, Non-Plastic to Medium Plasticity, SILT (ML /A-4(0)), Munsell=5YR 5/8			SS-7	4	6	9		15
228.6										
				23.5						
		@23.5-ft: Red, Munsell=10R 4/8			SS-8	5	6	6		12
223.6										
				28.5						



LEGEND

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SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-17
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	M. Miller	**Boring Location:**	330+80	**Offset:**	313 R	**Alignment:**	Median CL
Elev.:	248.6 ft	**Latitude:**	34.038376	**Longitude:**	-81.113448	**Date Started:**	4/12/2018
Total Depth:	79.9 ft	**Soil Depth:**	79.9 ft	**Core Depth:**	0 ft	**Date Completed:**	4/12/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	30.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		@28.5-ft: Wet									
218.6		▼@SS-9: LL=NP, PL=NP, PI=NP, NMC=46.9%, %#200=88.9			SS-9	4	7	7		14	
				33.5							
					SS-10	5	10	11		21	
213.6											
				38.5							
					SS-11	8	12	17		29	
208.6											
				43.5							
					SS-12	5	9	12		21	
203.6											
				48.5							
		@48.5-ft: Red, Munsell=2.5YR 5/6			SS-13	7	12	13		25	
198.6											
				53.5							
		@SS-14: LL=NP, PL=NP, PI=NP, NMC=30.1%, %#200=88.9			SS-14	4	11	14		25	
193.6											

LEGEND

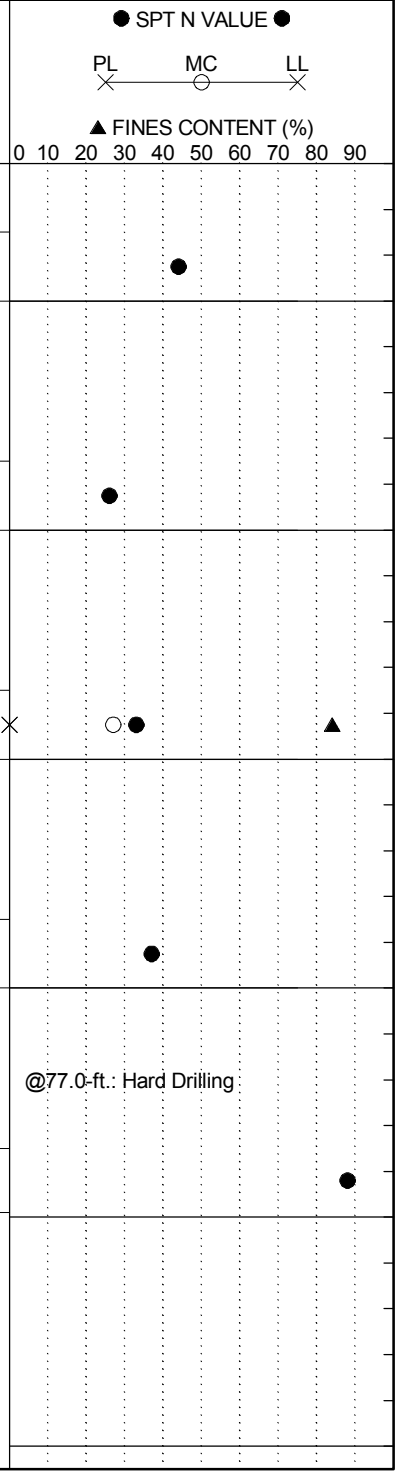
Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-17
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	M. Miller	**Boring Location:**	330+80	**Offset:**	313 R	**Alignment:**	Median CL
Elev.:	248.6 ft	**Latitude:**	34.038376	**Longitude:**	-81.113448	**Date Started:**	4/12/2018
Total Depth:	79.9 ft	**Soil Depth:**	79.9 ft	**Core Depth:**	0 ft	**Date Completed:**	4/12/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	30.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
				58.5						
		@58.5-ft: Hard to Very Stiff, Brownish Yellow, Munsell=10YR 6/6			SS-15	10	19	25		44
188.6										
				63.5						
		@63.5-ft: Brownish Yellow/Light Yellowish Brown, Munsell=10YR 6/6 & 10YR 6/4			SS-16	8	11	15		26
183.6										
				68.5						
		@SS-17: LL=NP, PL=NP, PI=NP, NMC=27.2%, %#200=84.0			SS-17	8	13	20		33
178.6										
				73.5						
					SS-18	6	15	22		37
173.6										
				78.5						
					SS-19	18	37	50/5"		87+
	79.9									
168.6		Boring Terminated at 79.9 feet								
163.6										



LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-20
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RC2
Eng./Geo.:	R. Wessinger	**Boring Location:**	5160+07	**Offset:**	6 R	**Alignment:**	Mainline
Elev.:	266.5 ft	**Latitude:**	34.034383	**Longitude:**	-81.110204	**Date Started:**	3/15/2018
Total Depth:	79.9 ft	**Soil Depth:**	79.9 ft	**Core Depth:**	0 ft	**Date Completed:**	3/16/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 25.0 ft	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Asphalt Drive								
	0.4	ASPHALT (4.25")		0.0	SS-1	1	2	2	2	4
		RESIDUUM								
		Soft, Moist, Red, Low Plasticity, Gravelly Lean CLAY (CL/A-6(4)), Munsell=2.5YR 4/8		2.0						
		@2-ft: Stiff			SS-2	3	4	5	5	9
	4.0	@SS-2: LL=36, PL=24, PI=12, NMC=16.5%, %#200=52.7		4.0						
261.5					SS-3	2	4	7	9	11
		Stiff, Moist, Red, Low Plasticity, Sandy Elastic SILT (MH/A-5(7)) with Gravel, Munsell=2.5YR 5/8		6.0						
		@SS-4: LL=52, PL=43, PI=9, NMC=27.0%, %#200=63.9			SS-4	4	5	9	12	14
	8.0			8.0						
		Stiff, Moist, Reddish Yellow, Medium Plasticity, Elastic SILT (MH/A-7-5(17)), Micaceous, Munsell=5YR 6/6			SS-5	5	3	6	8	9
256.5										
				13.5						
		@13.5-ft: Light Reddish Brown, Munsell=5YR 6/4			SS-6	3	7	8		15
251.5		@SS-6: LL=50, PL=37, PI=13, NMC=24.6%, %#200=92.5								
				18.5						
		@18.5-ft: Light Brown, Munsell=7.5YR 6/4			SS-7	4	6	8		14
246.5										
				23.5						
		@23.5-ft: Wet, A-7-5(17)			SS-8	3	4	6		10
		@SS-8: LL=57, PL=38, PI=19, NMC=36.2%, %#200=84.8								
241.5				28.5						

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-20
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RC2
Eng./Geo.:	R. Wessinger	**Boring Location:**	5160+07	**Offset:**	6 R	**Alignment:**	Mainline
Elev.:	266.5 ft	**Latitude:**	34.034383	**Longitude:**	-81.110204	**Date Started:**	3/15/2018
Total Depth:	79.9 ft	**Soil Depth:**	79.9 ft	**Core Depth:**	0 ft	**Date Completed:**	3/16/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 25.0 ft	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		@28.5-ft: Pinkish Gray, Munsell=7.5YR 6/2			SS-9	4	6	6		12	
236.5											
	33.5			33.5							
		@SS-10: No Recovery			SS-10	6	7	9		16	
231.5											
	38.5			38.5							
		RESIDUUM			SS-11	5	5	8		13	
		Stiff to Very Stiff, Wet, Light Yellowish Brown, Low Plasticity, SILT (ML/A-5(7)) with Sand, Micaceous, Munsell=10YR 6/4									
226.5		@SS-11: LL=42, PL=35, PI=7, NMC=31.3%, %#200=75.7									
				43.5							
					SS-12	4	7	13		20	
221.5											
				48.5							
		@48.5-ft: Light Olive Brown, Munsell=2.5Y 5/6			SS-13	5	8	11		19	
216.5											
				53.5							
		@53.5-ft: Light Olive Gray, Munsell=5Y 6/2			SS-14	3	4	6		10	
211.5											

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-20
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RC2
Eng./Geo.:	R. Wessinger	**Boring Location:**	5160+07	**Offset:**	6 R	**Alignment:**	Mainline
Elev.:	266.5 ft	**Latitude:**	34.034383	**Longitude:**	-81.110204	**Date Started:**	3/15/2018
Total Depth:	79.9 ft	**Soil Depth:**	79.9 ft	**Core Depth:**	0 ft	**Date Completed:**	3/16/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	90%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** 25.0 ft	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
		@58.5-ft: Non-Plastic, A-4(0)		58.5						
206.5		@SS-15: LL=NP, PL=NP, PI=NP, NMC=25.9%, %#200=80.8			SS-15	9	16	21		37
		@63.5-ft: Pale Brown, with Quartz Seam, Munsell=10YR 6/3		63.5						
201.5					SS-16	6	11	23		34
		@68.5-ft: Hard		68.5						
196.5					SS-17	25	27	35		62
		@73.5-ft: Grayish Brown, Munsell=2.5Y 5/2		73.5						
191.5					SS-18	19	33	46		79
		@78.5-ft: Olive Gray, Munsell=5Y 5/2		78.5						
186.5	79.9	Boring Terminated at 79.9 feet			SS-19	34	48	50/5"		98+
181.5										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-21
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	Burning Tree
Eng./Geo.:	C. Piercy	**Boring Location:**	9359+70	**Offset:**	50 R	**Alignment:**	Mainline
Elev.:	274.1 ft	**Latitude:**	34.034699	**Longitude:**	-81.107111	**Date Started:**	5/10/2018
Total Depth:	58.7 ft	**Soil Depth:**	58.7 ft	**Core Depth:**	0 ft	**Date Completed:**	5/14/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	Cave

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Cleared Woods								
	0.3	TOPSOIL (3")		0.0	SS-1	1	6	5	6	11
		RESIDUUM								
	2.0	Stiff, Dry to Moist, Brown, Non-Plastic to Low Plasticity, Sandy SILT (ML/A-4), Munsell=7.5YR 5/4		2.0	SS-2	5	6	6	9	12
	4.0	@SS-2: No Recovery		4.0	SS-3	6	9	9	13	18
269.1		Very Stiff to Stiff, Moist, Reddish Brown, Medium Plasticity, SILT (ML/A-7-5(17)), Munsell=2.5YR 5/4		6.0	SS-4	4	5	6	8	11
		@6-ft: Weak Red/Reddish Yellow, Munsell=10R 4/4 & 7.5YR 6/8		8.0	SS-5	3	5	8	10	13
		@SS-4: LL=49, PL=37, PI=12, NMC=31.6%, %#200=95.6								
264.1		@8-ft: Red/Light Yellowish Brown, Munsell=10R 4/6 & 2.5Y 6/4		13.5	SS-6	4	5	4		9
		@13.5-ft: Yellow/Yellowish Brown, Low Plasticity, A-4(5)Munsell=2.5Y 7/8 & 10YR 5/6								
259.1		@SS-6: LL=40, PL=36, PI=4, NMC=33.3%, %#200=79.4		18.5	SS-7	3	4	7		11
		@18.5-ft: Yellowish Brown/Pale Olive, Munsell=10YR 5/6 & 5Y 6/4								
254.1				23.5	SS-8	3	5	6		11
		@23.5-ft: Light Yellowish Brown/Light Grayish Olive, A-5(6), Munsell=2.5Y 6/4 & 10Y 6/2								
249.1		@SS-8: LL=42, PL=38, PI=4, NMC=37.1%, %#200=83.5		28.5	SS-9	9	13	22		35
		@28.5-ft: Hard, Grayish Olive/Bluish Gray, Munsell=10Y 5/2 & 5PB 5/1								
244.1				33.5						

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-21
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	Burning Tree
Eng./Geo.:	C. Piercy	**Boring Location:**	9359+70	**Offset:**	50 R	**Alignment:**	Mainline
Elev.:	274.1 ft	**Latitude:**	34.034699	**Longitude:**	-81.107111	**Date Started:**	5/10/2018
Total Depth:	58.7 ft	**Soil Depth:**	58.7 ft	**Core Depth:**	0 ft	**Date Completed:**	5/14/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	Cave

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
239.1		@33.5-ft: Stiff, Grayish Olive/Bluish Gray/Yellow, Munsell=10Y 5/2, 5PB 5/1 & 2.5Y 7/8		SS-10	4	4	8		12
			38.5	SS-11	8	30	50/3"		80+
	39.5								
234.1		**PARTIALLY WEATHERED ROCK (PWR)** SAMPLED AS: Hard, Moist, Light Grayish Olive/Yellow, Non-Plastic to Low Plasticity, SILT (ML/A-4) with Sand, Munsell=10Y 6/2 & 10YR 7/8							
		@43.5-ft: Light Grayish Olive, Munsell=10Y 6/2	43.5	SS-12	35	50/4"			100+
229.1									
		@48.5-ft: Light Grayish Olive/Grayish Green, Munsell=10Y 6/2 & 5GY 5/2	48.5	SS-13	15	50/3"			100+
224.1									
		@53.5-ft: Pale Olive, Munsell=5Y 6/3	53.5	SS-14	50/5.5"				100+
219.1									
	58.7	@58-ft: Grayish Olive/Light Olive, Munsell=10Y 5/2 & 10Y 5/4	58.5	SS-15	50/2.5"				100+
214.1		Boring Terminated at 58.7 feet							
209.1									

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Slow Drilling >>

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/25/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-26
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20CDW1
Eng./Geo.:	C. Piercy	**Boring Location:**	7175+80	**Offset:**	33 R	**Alignment:**	Mainline
Elev.:	282.0 ft	**Latitude:**	34.038351	**Longitude:**	-81.106044	**Date Started:**	5/9/2018
Total Depth:	58.7 ft	**Soil Depth:**	58.7 ft	**Core Depth:**	0 ft	**Date Completed:**	5/9/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	Cave

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	Cleared Woods								
	0.2	TOPSOIL (2")		0.0	SS-1	1	3	2	3	5
		COASTAL PLAIN		2.0	SS-2	2	1	2	3	3
		Firm to Soft, Moist, Dark Grayish Brown, Low Plasticity, Sandy SILT (ML/A-4(2)), with Organics, Munsell=10YR 4/2		4.0						
		@2-ft: Brownish Yellow, Munsell=10YR 6/8			SS-3	4	5	10	14	15
277.0	5.0	@SS-2: LL=33, PL=25, PI=8, NMC=19.4%, %#200=52.8		6.0						
	6.0	Medium Dense, Moist, Red/Brownish Yellow, Non-Plastic to Low Plasticity, Silty Fine to Coarse SAND (SM/A-2), with Gravel, Munsell=2.5YR 5/6 & 10YR 6/6			SS-4	9	6	6	11	12
	8.0			8.0	SS-5	5	7	13	20	20
272.0		**RESIDUUM**								
		Stiff, Moist, Weak Red/Light Gray, Non-Plastic to Low Plasticity, SILT (ML/A-4), Munsell=7.5R 5/4 & 5Y 7/1								
	13.5	@SS-5: No Recovery		13.5	SS-6	20	45	50/3"		95+
267.0		Hard, Moist, Weak Red/Pinkish Gray, Non-Plastic, SILT (ML/A-4(0)), Munsell=7.5R 5/3 & 7.5R 7/1								
				18.5	SS-7	16	34	50/3.5"		84+
		@SS-7: LL=NP, PL=NP, PI=NP, NMC=18.6%, %#200=91.1								
262.0										
				23.5	SS-8	20	22	22		44
		@23.5-ft: Brownish Yellow/Light Gray, Munsell=10YR 6/8 & 10YR 7/1								
257.0										
				28.5	SS-9	27	50/4"			100+
	29.0	**PARTIALLY WEATHERED ROCK (PWR)**								
252.0		SAMPLED AS: Very Dense, Moist, Brownish Yellow/Light Gray, Non-Plastic, Silty Coarse SAND (SM/A-4(0)), Munsell=10YR 6/8 & 10YR 7/1		33.5						

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	W-26
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20CDW1
Eng./Geo.:	C. Piercy	**Boring Location:**	7175+80	**Offset:**	33 R	**Alignment:**	Mainline
Elev.:	282.0 ft	**Latitude:**	34.038351	**Longitude:**	-81.106044	**Date Started:**	5/9/2018
Total Depth:	58.7 ft	**Soil Depth:**	58.7 ft	**Core Depth:**	0 ft	**Date Completed:**	5/9/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** Drilling Fluid	**24HR**	Cave

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
247.0		@SS-10: LL=NP, PL=NP, PI=NP, NMC=16.5%, %#200=48.1			SS-10	41	50/4.5"			100+
		@38.5-ft: Light Gray, Munsell=10YR 7/1		38.5	SS-11	50/5"				100+
242.0										
		@43.5-ft: Light Gray/Yellow, Munsell=10YR 7/1 & 10YR 7/8		43.5	SS-12	50/3.5"				100+
237.0										
		@48.5-ft: Light Gray, Munsell=5Y 7/1		48.5	SS-13	50/3"				100+
232.0										
		@53.5-ft: Greenish Gray, Munsell=10Y 6/1		53.5	SS-14	50/2"				100+
227.0										
	58.7			58.5	SS-15	50/2.5"				100+
		Boring Terminated at 58.7 feet								
222.0										
217.0										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/25/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	AP-1
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	80+48	**Offset:**	66 R	**Alignment:**	Median CL
Elev.:	297.3 ft	**Latitude:**	34.091152	**Longitude:**	-81.166366	**Date Started:**	5/23/2018
Total Depth:	8.3 ft	**Soil Depth:**	8.3 ft	**Core Depth:**	0 ft	**Date Completed:**	5/23/2018
Bore Hole Diameter (in):	6	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Not Recorded	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Grassed Shoulder						
		DRILL TO 6.0 FEET						
292.3								
	6.0			6.0				
		Moist, Reddish Brown, Medium Plasticity, Lean CLAY (CL/A-7-6(12)) with Sand						
		@UD-1: LL=41, PL=25, PI=16, %#200=73.9			UD-1			
	8.3							
		Boring Terminated at 8.3 feet						
287.3								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 8/2/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	AP-2
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	96+28	**Offset:**	47 L	**Alignment:**	Median CL
Elev.:	290.9 ft	**Latitude:**	34.088101	**Longitude:**	-81.162637	**Date Started:**	5/23/2018
Total Depth:	16.3 ft	**Soil Depth:**	16.3 ft	**Core Depth:**	0 ft	**Date Completed:**	5/23/2018
Bore Hole Diameter (in):	6	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Not Recorded	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Grassed Shoulder						
		DRILL TO 14.0 FEET						
285.9								
280.9								
	14.0			14.0				
275.9		Wet to Moist, Light Olive Brown/Light Brownish Gray, High Plasticity, Fat CLAY (CH/A-7-6(20)) with Sand, Munsell=2.5Y 5/6 & 2.5Y 6/2			UD-1			
		@UD-1: LL=56, PL=25, PI=31, %#200=74.5						
	16.3	Boring Terminated at 16.3 feet						

LEGEND

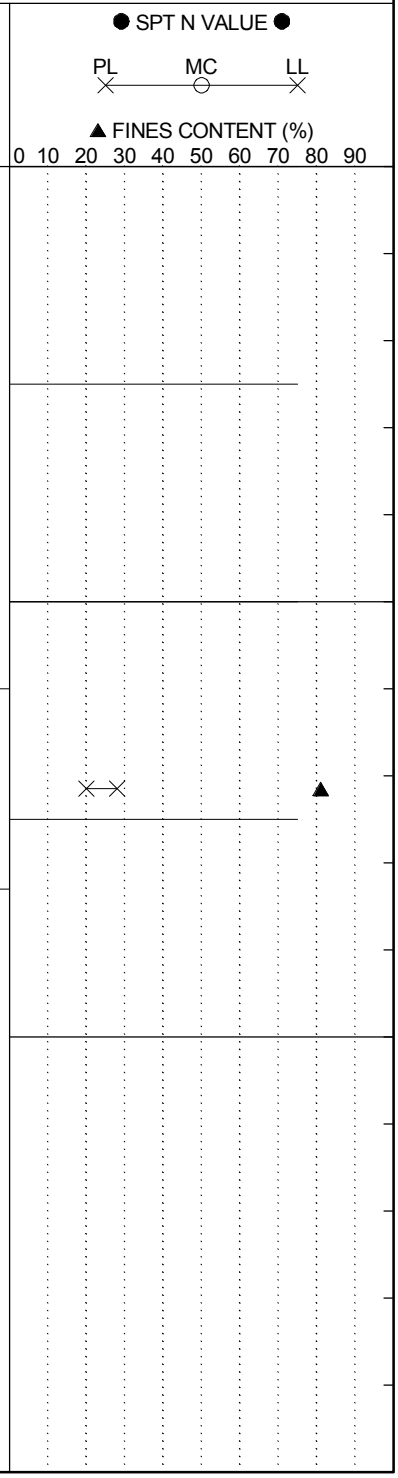
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/31/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	AP-3
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	116+31	**Offset:**	44 R	**Alignment:**	Median CL
Elev.:	278.7 ft	**Latitude:**	34.083703	**Longitude:**	-81.158647	**Date Started:**	5/23/2018
Total Depth:	8.3 ft	**Soil Depth:**	8.3 ft	**Core Depth:**	0 ft	**Date Completed:**	5/23/2018
Bore Hole Diameter (in):	6	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Not Recorded	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
	0.0	Grassed Shoulder					
		DRILL TO 6.0 FEET					
273.7							
	6.0	Moist, Yellowish Red/Light Yellowish Brown, Low Plasticity, Lean CLAY (CL/A-4(5)) with Sand, Munsell=5YR 5/6 & 10YR 6/4		6.0			
		@UD-1: LL=28, PL=20, PI=8, %#200=80.7			UD-1		
	8.3	Boring Terminated at 8.3 feet					
268.7							



LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	AP-4
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	276+32	**Offset:**	46 L	**Alignment:**	Median CL
Elev.:	238.7 ft	**Latitude:**	34.050536	**Longitude:**	-81.12397	**Date Started:**	5/23/2018
Total Depth:	10.5 ft	**Soil Depth:**	10.5 ft	**Core Depth:**	0 ft	**Date Completed:**	5/23/2018
Bore Hole Diameter (in):	6	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Not Recorded	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Grassed Shoulder						
		DRILL TO 8.0 FEET						
233.7								
	8.0			8.0				
		Moist, Red/Yellowish Brown, Low to Medium Plasticity, SILT (ML/A-4), Munsell=2.5YR 4/6 & 10YR 5/6			UD-1			
228.7								
	10.5	Boring Terminated at 10.5 feet						

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/31/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	AP-5
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	298+72	**Offset:**	86 R	**Alignment:**	Median CL
Elev.:	229.5 ft	**Latitude:**	34.045687	**Longitude:**	-81.119423	**Date Started:**	5/23/2018
Total Depth:	10.3 ft	**Soil Depth:**	10.3 ft	**Core Depth:**	0 ft	**Date Completed:**	5/23/2018
Bore Hole Diameter (in):	6	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Not Recorded	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
	0.0	Grassed Shoulder					
		DRILL TO 8.0 FEET					
224.5							
	8.0	Moist, Brownish Yellow/Light Gray, Medium Plasticity, Sandy Lean CLAY (CL/A-6(10)), Munsell=10YR 6/8 & 2.5Y 7/2		8.0			
		@UD-1: LL=40, PL=24, PI=16, %#200=70.4			UD-1		
219.5	10.3	Boring Terminated 10.3 feet					

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 8/1/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	AP-6
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	S-36 (St Andrews Rd)
Eng./Geo.:	C. Piercy	**Boring Location:**	30+75	**Offset:**	269 L	**Alignment:**	Mainline
Elev.:	212.2 ft	**Latitude:**	34.045368	**Longitude:**	-81.11803	**Date Started:**	5/18/2018
Total Depth:	10.5 ft	**Soil Depth:**	10.5 ft	**Core Depth:**	0 ft	**Date Completed:**	5/18/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** Not Recorded	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
	0.0	Grassed Shoulder					
		DRILL TO 8.0 FEET					
207.2							
	8.0	Moist, Strong Brown, Non-Plastic to Low Plasticity, SILT (ML/A-4), Munsell=7.5YR 5/6		8.0	UD-1		
202.2	10.5	Boring Terminated at 10.5 feet					

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/30/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	AP-7
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	S-36 (St Andrews Rd)
Eng./Geo.:	C. Piercy	**Boring Location:**	36+24	**Offset:**	212 L	**Alignment:**	Mainline
Elev.:	227.1 ft	**Latitude:**	34.045796	**Longitude:**	-81.116491	**Date Started:**	7/2/2018
Total Depth:	12.3 ft	**Soil Depth:**	12.3 ft	**Core Depth:**	0 ft	**Date Completed:**	7/2/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Not Recorded	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Asphalt Drive						
	0.3	ASPHALT (3.5")						
		DRILL TO 8.0 FEET						
222.1	8.0	Moist, Brown/Gray, Medium Plasticity, Sandy Lean CLAY (CL/A-6(7)), Munsell=10YR 5/3 & GLEY1 5/N		8.0				
		@UD-1: LL=32, PL=19, PI=13, %#200=67.6			UD-1			
217.1	10.0	Moist, Yellowish Brown, Medium Plasticity, Sandy Lean CLAY (CL/A-6), Munsell=10YR 5/8		10.0	UD-2			
	12.3	Boring Terminated at 12.3 feet						

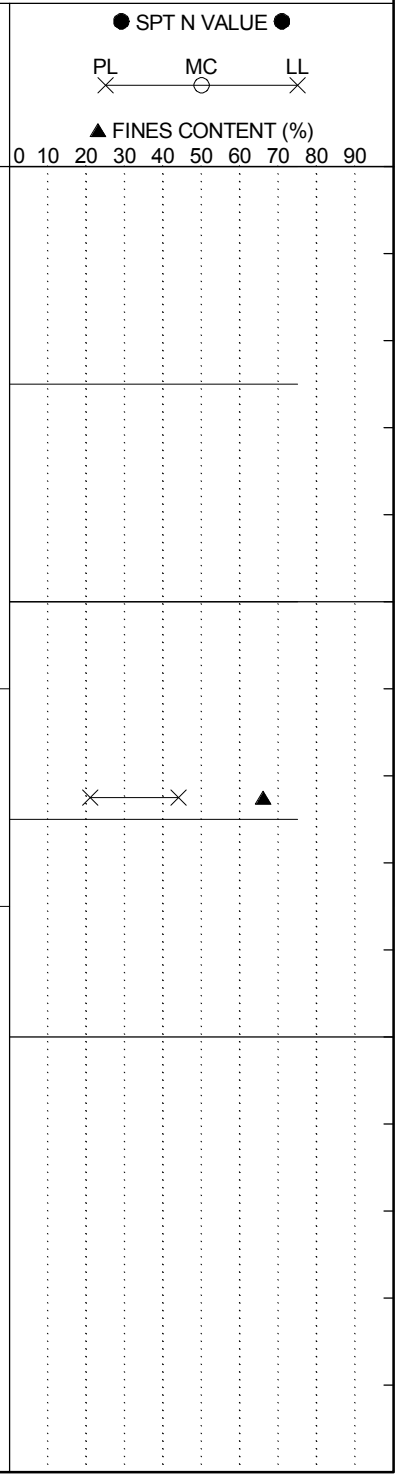
LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	AP-8
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	S-36 (St Andrews Rd)
Eng./Geo.:	C. Piercy	**Boring Location:**	29+98	**Offset:**	539 R	**Alignment:**	Mainline
Elev.:	207.3 ft	**Latitude:**	34.043214	**Longitude:**	-81.117335	**Date Started:**	5/23/2018
Total Depth:	8.5 ft	**Soil Depth:**	8.5 ft	**Core Depth:**	0 ft	**Date Completed:**	5/23/2018
Bore Hole Diameter (in):	6	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** Not Recorded	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
	0.0	Grassed Shoulder					
		DRILL TO 6.0 FEET					
202.3	6.0			6.0			
		Moist, Light Yellowish Brown, Medium Plasticity, Sandy Lean CLAY (CL/A-7-6(13)), Munsell=10YR 6/4			UD-1		
		@UD-1: LL=44, PL=21, PI=23, %#200=65.5					
	8.5						
		Boring Terminated at 8.5 feet					
197.3							



LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	AP-9
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	314+37	**Offset:**	88 R	**Alignment:**	Median CL
Elev.:	212.8 ft	**Latitude:**	34.042325	**Longitude:**	-81.11619	**Date Started:**	5/22/2018
Total Depth:	14.2 ft	**Soil Depth:**	14.2 ft	**Core Depth:**	0 ft	**Date Completed:**	5/22/2018
Bore Hole Diameter (in):	6	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Not Recorded	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Grassed Shoulder						
		DRILL TO 12.0 FEET						
207.8								
202.8								
	12.0	Moist, Strong Brown/Brownish Yellow/Light Gray, Medium to High Plasticity, Elastic SILT (MH/A-7), Munsell=7.5YR 5/8, 10YR 6/8 & 10YR 7/1		12.0	UD-1			
	14.2	Boring Terminated at 14.2 feet						

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/31/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	AP-10
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	314+41	**Offset:**	88 R	**Alignment:**	Median CL
Elev.:	212.8 ft	**Latitude:**	34.042325	**Longitude:**	-81.11619	**Date Started:**	5/22/2018
Total Depth:	13.2 ft	**Soil Depth:**	13.2 ft	**Core Depth:**	0 ft	**Date Completed:**	5/22/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Not Recorded	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
	0.0	Grassed Shoulder					
		DRILL TO 11.0 FEET					
207.8							
202.8							
	11.0			11.0			
		Moist, Strong Brown/Brownish Yellow/Light Gray, High Plasticity, Elastic SILT (MH/A-7-5(20)), Munsell=7.5YR 5/8, 10YR 6/8 & 10YR 7/1			UD-1		
	13.2	@UD-1: LL=65, PL=36, PI=29, %#200=97.0					
		Boring Terminated at 13.2 feet					
197.8							
192.8							
187.8							

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 9/25/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	AP-11
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	C. Piercy	**Boring Location:**	330+80	**Offset:**	313 R	**Alignment:**	Median CL
Elev.:	248.6 ft	**Latitude:**	34.038376	**Longitude:**	-81.113448	**Date Started:**	5/22/2018
Total Depth:	26.5 ft	**Soil Depth:**	26.5 ft	**Core Depth:**	0 ft	**Date Completed:**	5/22/2018
Bore Hole Diameter (in):	6	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** Not Recorded	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Cleared Woods						
		DRILL TO 24.0 FEET						
243.6								
238.6								
233.6								
228.6								
	24.0			24.0				
223.6		Moist, Reddish Brown, Medium Plasticity, SILT (ML/A-7-5(12)) with Sand			UD-1			
		@UD-1: LL=49, PL=37, PI=12, %#200=79.8						
	26.5	Boring Terminated at 26.5 feet						

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	AP-12
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	336+30	**Offset:**	61 L	**Alignment:**	Median CL
Elev.:	275.6 ft	**Latitude:**	34.037826	**Longitude:**	-81.111352	**Date Started:**	5/23/2018
Total Depth:	20.4 ft	**Soil Depth:**	20.4 ft	**Core Depth:**	0 ft	**Date Completed:**	5/23/2018
Bore Hole Diameter (in):	6	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Not Recorded	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Grassed Shoulder						
		DRILL TO 18.0 FEET						
270.6								
265.6								
260.6								
	18.0			18.0				
		Moist, Yellowish Red, Low to Medium Plasticity, Clayey SAND (SC/A-2-7), with Gravel			UD-1			
255.6	20.4							
		Boring Terminated at 20.4 feet						

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	AP-13
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RAC
Eng./Geo.:	C. Piercy	**Boring Location:**	3166+23	**Offset:**	9 L	**Alignment:**	Mainline
Elev.:	285.4 ft	**Latitude:**	34.038065	**Longitude:**	-81.109037	**Date Started:**	5/21/2018
Total Depth:	113.5 ft	**Soil Depth:**	113.5 ft	**Core Depth:**	0 ft	**Date Completed:**	5/22/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** Not Recorded	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Grassed Shoulder									
		DRILL TO REFUSAL									
280.4											
275.4											
270.4											
265.4											
260.4											
255.4											
250.4											
245.4											
240.4											
235.4											
230.4											

LEGEND

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SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662	**County:**	Richland/Lexington	**Boring No.:**	AP-13		
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	I20RAC		
Eng./Geo.:	C. Piercy	**Boring Location:**	3166+23	**Offset:**	9 L	**Alignment:**	Mainline
Elev.:	285.4 ft	**Latitude:**	34.038065	**Longitude:**	-81.109037	**Date Started:**	5/21/2018
Total Depth:	113.5 ft	**Soil Depth:**	113.5 ft	**Core Depth:**	0 ft	**Date Completed:**	5/22/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** Not Recorded	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
220.4										
215.4										
210.4										
205.4										
200.4	83.5	**PARTIALLY WEATHERED ROCK (PWR)**		83.5	SS-1	50/5"				100+
195.4										
190.4										
185.4										
180.4				103.5	SS-2	50/1"				100+
175.4										
170.4	113.5	Boring Terminated at 113.5 feet Due to Drilling Refusal at Top of Rock		113.5	SS-3	50/<1"				100+

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	AP-14
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RAC
Eng./Geo.:	C. Piercy	**Boring Location:**	3150+78	**Offset:**	17 L	**Alignment:**	Mainline
Elev.:	233.1 ft	**Latitude:**	34.036423	**Longitude:**	-81.112998	**Date Started:**	5/22/2018
Total Depth:	20.5 ft	**Soil Depth:**	20.5 ft	**Core Depth:**	0 ft	**Date Completed:**	5/22/2018
Bore Hole Diameter (in):	6	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** Not Recorded	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Grassed Shoulder						
		DRILL TO 18.0 FEET						
228.1								
223.1								
218.1								
	18.0	Moist, White/Gray/Dark Gray/Reddish Yellow, Non-Plastic, SILT (ML/A-4(0)), Munsell=GLEY1 8/N, GLEY1 6/N, GLEY1 4/N & 7.5YR 6/8		18.0	UD-1		×	▲
213.1	20.5	@UD-1: LL=NP, PL=NP, PI=NP, %#200=86.7						
		Boring Terminated at 20.5 feet						

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	AP-15
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	339+53	**Offset:**	84 R	**Alignment:**	Median CL
Elev.:	247.7 ft	**Latitude:**	34.036894	**Longitude:**	-81.111053	**Date Started:**	5/10/2018
Total Depth:	91.2 ft	**Soil Depth:**	91.2 ft	**Core Depth:**	0 ft	**Date Completed:**	5/14/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Not Recorded	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Grassed Shoulder									
		DRILL TO REFUSAL									
242.7											
237.7											
232.7											
227.7											
222.7											
217.7											
212.7											
207.7											
202.7											

LEGEND

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SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	AP-15
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	339+53	**Offset:**	84 R	**Alignment:**	Median CL
Elev.:	247.7 ft	**Latitude:**	34.036894	**Longitude:**	-81.111053	**Date Started:**	5/10/2018
Total Depth:	91.2 ft	**Soil Depth:**	91.2 ft	**Core Depth:**	0 ft	**Date Completed:**	5/14/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Not Recorded	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
192.7								
187.7								
182.7								
177.7								
172.7								
167.7								
162.7								
157.7	91.2	Boring Terminated at 91.2 feet Due to Drilling Refusal at Top of Rock		91.2	SS-1	50/0.75"	100+	>>
152.7								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 8/1/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	AP-16
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RCA
Eng./Geo.:	R. Wessinger	**Boring Location:**	5172+65	**Offset:**	23 L	**Alignment:**	Mainline
Elev.:	284.1 ft	**Latitude:**	34.038065	**Longitude:**	-81.109037	**Date Started:**	5/2/2018
Total Depth:	38.3 ft	**Soil Depth:**	38.3 ft	**Core Depth:**	0 ft	**Date Completed:**	5/2/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** Not Recorded	**24HR**	22.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Grassed Shoulder						
		DRILL TO 35.0 FEET						
279.1								
274.1								
269.1								
264.1		▼						
259.1								
254.1								
249.1	35.0			35.0				
	35.9	**PARTIALLY WEATHERED ROCK (PWR)**			UD-1			
	37.0	SAMPLED AS: Dry, Gray/Red/Strong Brown, Non-Plastic, SILT (ML/A-4), Munsell=2.5Y 6/1, 205YR 4/8 & 7.5YR 5/8		37.0				
	38.2				UD-2			
244.1		**PARTIALLY WEATHERED ROCK (PWR)** SAMPLED AS: Dry, Gray/Red/Strong Brown, Non-Plastic, SILT (ML/A-4), Munsell=2.5Y 6/1, 205YR 4/8 & 7.5YR 5/8						
		Boring Terminated at 38.3 feet						

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/27/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	AP-17
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RCA
Eng./Geo.:	R. Wessinger	**Boring Location:**	5168+49	**Offset:**	39 L	**Alignment:**	Mainline
Elev.:	281.3 ft	**Latitude:**	34.036302	**Longitude:**	-81.108	**Date Started:**	5/8/2018
Total Depth:	72.5 ft	**Soil Depth:**	72.5 ft	**Core Depth:**	0 ft	**Date Completed:**	5/9/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Not Recorded	**24HR**	19.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Grassed Shoulder						
		DRILL TO 70.0 FEET						
276.3								
271.3								
266.3								
		▼						
261.3								
256.3								
251.3								
246.3								
241.3								

LEGEND

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SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	AP-17
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RCA
Eng./Geo.:	R. Wessinger	**Boring Location:**	5168+49	**Offset:**	39 L	**Alignment:**	Mainline
Elev.:	281.3 ft	**Latitude:**	34.036302	**Longitude:**	-81.108	**Date Started:**	5/8/2018
Total Depth:	72.5 ft	**Soil Depth:**	72.5 ft	**Core Depth:**	0 ft	**Date Completed:**	5/9/2018
Bore Hole Diameter (in):	4	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Not Recorded	**24HR**	19.0 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
231.3								
226.3								
221.3								
216.3								
211.3	70.0			70.0				
	70.9	@UD-1: No Recovery		71.2	UD-1			
	71.2							
	71.7	Wet, Yellowish Brown, Non-Plastic to Low Plasticity, Silty Fine to Medium SAND (SM/A-4), Munsell=10YR 5/8			UD-2			
	72.5	**PARTIALLY WEATHERED ROCK (PWR)** SAMPLED AS: Dry, Strong Brown/Gray, Non-Plastic to Low Plasticity, SILT (ML/A-4), Munsell=7.5YR 5/8 & GLEY1 6/N						
206.3		Boring Terminated at 72.5 feet						
201.3								
196.3								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	AP-18
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RCA
Eng./Geo.:	C. Piercy	**Boring Location:**	5164+15	**Offset:**	36 L	**Alignment:**	Mainline
Elev.:	272.8 ft	**Latitude:**	34.03554	**Longitude:**	-81.108946	**Date Started:**	5/22/2018
Total Depth:	18.3 ft	**Soil Depth:**	18.3 ft	**Core Depth:**	0 ft	**Date Completed:**	5/22/2018
Bore Hole Diameter (in):	6	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** Not Recorded	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Grassed Shoulder						
		DRILL TO 16.0 FEET						
267.8								
262.8								
257.8								
	16.0	Moist, Yellow, Medium Plasticity, SILT (ML/A-7-5(14))		16.0				
		@UD-1: LL=47, PL=35, PI=12, %#200=86.5			UD-1			PL MC LL ▲
	18.3	Boring Terminated at 18.3 feet						

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	AP-19
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RC1
Eng./Geo.:	C. Piercy	**Boring Location:**	5161+53	**Offset:**	52 L	**Alignment:**	Mainline
Elev.:	271.0 ft	**Latitude:**	34.035422	**Longitude:**	-81.10975	**Date Started:**	5/22/2018
Total Depth:	8.5 ft	**Soil Depth:**	8.5 ft	**Core Depth:**	0 ft	**Date Completed:**	5/22/2018
Bore Hole Diameter (in):	6	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** Not Recorded	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Grassed Shoulder						
		DRILL TO 6.0 FEET						
266.0								
	6.0	Dry to Moist, Reddish Yellow/Very Pale Brown, Low Plasticity, SILT (ML/A-4(5)) with Sand, Munsell=5YR 6/6 & 10YR 8/2		6.0				
		@UD-1: LL=34, PL=27, PI=7, %#200=76.3			UD-1			✕ ▲
	8.5	Boring Terminated at 8.5 feet						
261.0								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	AP-20
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I20RC2
Eng./Geo.:	C. Piercy	**Boring Location:**	5161+62	**Offset:**	8 R	**Alignment:**	Mainline
Elev.:	273.6 ft	**Latitude:**	34.034325	**Longitude:**	-81.109706	**Date Started:**	5/22/2018
Total Depth:	40.5 ft	**Soil Depth:**	40.5 ft	**Core Depth:**	0 ft	**Date Completed:**	5/22/2018
Bore Hole Diameter (in):	6	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 550X	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	81%
Core Size:	N/A	**Driller:**	D. Harris	**Groundwater:**	**TOB** Not Recorded	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Grassed Shoulder						
		DRILL TO 38.0 FEET						
268.6								
263.6								
258.6								
253.6								
248.6								
243.6								
238.6								
	38.0			38.0				
		Moist, Reddish Yellow/Gray/Black, Medium Plasticity, Elastic SILT (MH/A-7-5(20)), Munsell=7.5YR 6/8, 7.5YR 6/1 & GLEY1 2.5/N			UD-1			▲
233.6	40.5	@UD-1: LL=62, PL=43, PI=19, %#200=94.2						
		Boring Terminated at 40.5 feet						

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	AP-21
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:	R. Wessinger	**Boring Location:**	356+26	**Offset:**	78 R	**Alignment:**	Median CL
Elev.:	250.4 ft	**Latitude:**	34.033417	**Longitude:**	-81.107412	**Date Started:**	5/23/2018
Total Depth:	20.5 ft	**Soil Depth:**	20.5 ft	**Core Depth:**	0 ft	**Date Completed:**	5/23/2018
Bore Hole Diameter (in):	6	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 45B	**Drill Method:**	HSA	**Hammer Type:**	Automatic	**Energy Ratio:**	84%
Core Size:	N/A	**Driller:**	L. Guempel	**Groundwater:**	**TOB** Not Recorded	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
	0.0	Grassed Shoulder					
		DRILL TO 18.0 FEET					
245.4							
240.4							
235.4							
	18.0			18.0			
		Moist, Red/Strong Brown/Black, Low Plasticity, SILT (ML/A-5(9)), Munsell=10R 4/8, 7.5YR 5/8 & 7.5YR 2.5/1			UD-1		
230.4		@UD-1: LL=48, PL=43, PI=5, %#200=88.1					
	20.5	Boring Terminated at 20.5 feet					

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	BS-1
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	I-26
Eng./Geo.:		**Boring Location:**	56+45	**Offset:**	99 L	**Alignment:**	Median CL
Elev.:	319.2 ft	**Latitude:**	34.096324	**Longitude:**	-81.171336	**Date Started:**	3/1/2018
Total Depth:	1 ft	**Soil Depth:**	ft	**Core Depth:**	ft	**Date Completed:**	3/1/2018
Bore Hole Diameter (in):		**Sampler Configuration**		**Liner Required:**	Y N	**Liner Used:**	Y N
Drill Machine:		**Drill Method:**		**Hammer Type:**		**Energy Ratio:**	
Core Size:		**Driller:**	L. Guempel	**Groundwater:**	**TOB** Dry	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
	0.0						
	1.0	Moist, Low Plasticity, Reddish Yellow, Sandy SILT (ML/A-4(3)), Munsell=5YR 6/8 @CU: LL=33, PL=28, PI=5, NMC=21.4%, %#200=69.6, Φ=15.2°, c=3.58 psi, Φ'=34.0°, c'=0.03 psi Bulk Sampling Terminated at 1.0 feet		0.0	CU		
314.2							
309.2							
304.2							
299.2							
294.2							

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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SCDOT Soil Test Log

Project ID:	P027662	**County:**	Richland/Lexington	**Boring No.:**	BS-2		
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	I-26		
Eng./Geo.:		**Boring Location:**	80+48	**Offset:**	66 R	**Alignment:**	Median CL
Elev.:	297.3 ft	**Latitude:**	34.091152	**Longitude:**	-81.166366	**Date Started:**	3/1/2018
Total Depth:	5 ft	**Soil Depth:**	ft	**Core Depth:**	ft	**Date Completed:**	3/1/2018
Bore Hole Diameter (in):		**Sampler Configuration**		**Liner Required:**	Y N	**Liner Used:**	Y N
Drill Machine:		**Drill Method:**		**Hammer Type:**		**Energy Ratio:**	
Core Size:		**Driller:**	R. Wessinger	**Groundwater:**	**TOB** Dry	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Moist, Brown/Strong Brown, Medium Plasticity, Sandy Lean CLAY (CL/A-6(6)), Munsell=7.5YR 5/4 & 7.5YR 4/6		0.0				
		@CU: LL=35, PL=24, PI=11, NMC=22.4%, %#200=68.7, Φ=12.2°, c=1.50 psi, Φ'=21.9°, c'=1.40 psi			CU			
292.3	5.0	Bulk Sampling Terminated at 5.0 feet						
287.3								
282.3								
277.3								
272.3								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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SCDOT Soil Test Log

Project ID:	P027662	**County:**	Richland/Lexington	**Boring No.:**	BS-3		
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	I-26		
Eng./Geo.:		**Boring Location:**	136+32	**Offset:**	93 L	**Alignment:**	Median CL
Elev.:	316.1 ft	**Latitude:**	34.079706	**Longitude:**	-81.154082	**Date Started:**	3/1/2018
Total Depth:	5 ft	**Soil Depth:**	ft	**Core Depth:**	ft	**Date Completed:**	3/1/2018
Bore Hole Diameter (in):		**Sampler Configuration**		**Liner Required:**	Y N	**Liner Used:**	Y N
Drill Machine:		**Drill Method:**		**Hammer Type:**		**Energy Ratio:**	
Core Size:		**Driller:**	L. Guempel	**Groundwater:**	**TOB** Dry	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Moist, Strong Brown/Reddish Yellow, Non-Plastic, SILT (ML/A-4(0)) with Sand, Munsell=7.5YR 5/8 & 7.5YR 6/8 @CU: LL=NP, PL=NP, PI=NP, NMC=26.0%, %#200=71.8, Φ=18.9°, c=3.51 psi, Φ'=30.4°, c'=1.19 psi		0.0	CU			
311.1	5.0	Bulk Sampling Terminated at 5.0 feet						
306.1								
301.1								
296.1								
291.1								

SC_DOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 8/1/18

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662	**County:**	Richland/Lexington	**Boring No.:**	BS-4		
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	I-26		
Eng./Geo.:		**Boring Location:**	168+46	**Offset:**	67 R	**Alignment:**	Median CL
Elev.:	247.2 ft	**Latitude:**	34.072625	**Longitude:**	-81.147717	**Date Started:**	3/1/2018
Total Depth:	3 ft	**Soil Depth:**	ft	**Core Depth:**	ft	**Date Completed:**	3/1/2018
Bore Hole Diameter (in):		**Sampler Configuration**		**Liner Required:**	Y N	**Liner Used:**	Y N
Drill Machine:		**Drill Method:**		**Hammer Type:**		**Energy Ratio:**	
Core Size:		**Driller:**	L. Guempel	**Groundwater:**	**TOB** Dry	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Moist, Red, Low Plasticity, Clayey Fine to Medium SAND (SC/A-4(1)), Munsell=2.5YR 5/8		0.0	CU			
		@CU: LL=31, PL=21, PI=10, NMC=21.8%, %#200=43.3, Φ=18.3°, c=0.80 psi, Φ'=26.3°, c'=0.00 psi						
	3.0	Bulk Sampling Terminated at 3.0 feet						
242.2								
237.2								
232.2								
227.2								
222.2								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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SCDOT Soil Test Log

Project ID:	P027662	**County:**	Richland/Lexington	**Boring No.:**	BS-5		
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	I-26		
Eng./Geo.:		**Boring Location:**	194+70	**Offset:**	58 L	**Alignment:**	Median CL
Elev.:	257.3 ft	**Latitude:**	34.067289	**Longitude:**	-81.141871	**Date Started:**	3/23/2018
Total Depth:	5 ft	**Soil Depth:**	ft	**Core Depth:**	ft	**Date Completed:**	3/23/2018
Bore Hole Diameter (in):		**Sampler Configuration**		**Liner Required:**	Y N	**Liner Used:**	Y N
Drill Machine:		**Drill Method:**		**Hammer Type:**		**Energy Ratio:**	
Core Size:		**Driller:**	R. Wessinger	**Groundwater:**	**TOB** Dry	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Moist, Light Olive Brown, Medium Plasticity, Lean CLAY (CL/A-7-6(14)) with Sand, Munsell=2.5Y 5/6		0.0				
		@CU: LL=41, PL=23, PI=18, NMC=16.0%, %#200=77.9, Φ=9.2°, c=3.82 psi, Φ'=26.1°, c'=0.15 psi			CU			
252.3	5.0	Bulk Sampling Terminated at 5.0 feet						
247.3								
242.3								
237.3								
232.3								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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SCDOT Soil Test Log

Project ID:	P027662	**County:**	Richland/Lexington	**Boring No.:**	BS-6		
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	I-26		
Eng./Geo.:		**Boring Location:**	244+56	**Offset:**	69 R	**Alignment:**	Median CL
Elev.:	313.9 ft	**Latitude:**	34.056787	**Longitude:**	-81.131297	**Date Started:**	3/1/2018
Total Depth:	4 ft	**Soil Depth:**	ft	**Core Depth:**	ft	**Date Completed:**	3/1/2018
Bore Hole Diameter (in):		**Sampler Configuration**		**Liner Required:**	Y N	**Liner Used:**	Y N
Drill Machine:		**Drill Method:**		**Hammer Type:**		**Energy Ratio:**	
Core Size:		**Driller:**	L. Guempel	**Groundwater:**	**TOB** Dry	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Moist, Strong Brown, Non-Plastic, SILT (ML/A-4(0)) with Sand, Munsell=7.5YR 5/8		0.0	CU			
		@CU: LL=NP, PL=NP, PI=NP, NMC=21.9%, %#200=73.3, Φ=19.2°, c=5.39 psi, Φ'=32.2°, c'=1.47 psi						
	4.0	Bulk Sampling Terminated at 4.0 feet						
308.9								
303.9								
298.9								
293.9								
288.9								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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SCDOT Soil Test Log

Project ID:	P027662	**County:**	Richland/Lexington	**Boring No.:**	BS-7		
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	I-26		
Eng./Geo.:		**Boring Location:**	282+30	**Offset:**	61 L	**Alignment:**	Median CL
Elev.:	248.0 ft	**Latitude:**	34.049344	**Longitude:**	-81.122606	**Date Started:**	3/23/2018
Total Depth:	5 ft	**Soil Depth:**	ft	**Core Depth:**	ft	**Date Completed:**	3/23/2018
Bore Hole Diameter (in):		**Sampler Configuration**		**Liner Required:**	Y N	**Liner Used:**	Y N
Drill Machine:		**Drill Method:**		**Hammer Type:**		**Energy Ratio:**	
Core Size:		**Driller:**	R. Wessinger	**Groundwater:**	**TOB** Dry	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Moist, Yellowish Red, Medium Plasticity, SILT (ML/A-7-6(17)), Munsell=5YR 5/6		0.0				
		@CU: LL=45, PL=29, PI=16, NMC=23.1%, %#200=91.7, Φ=9.3°, c=6.74 psi, Φ'=32.2°, c'=0.04 psi			CU			
243.0	5.0	Bulk Sampling Terminated at 5.0 feet						
238.0								
233.0								
228.0								
223.0								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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SCDOT Soil Test Log

Project ID:	P027662			**County:**	Richland/Lexington	**Boring No.:**	BS-8
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements					**Route:**	S-36 (St. Andrews)
Eng./Geo.:		**Boring Location:**	26+91	**Offset:**	134 L	**Alignment:**	Mainline
Elev.:	222.8 ft	**Latitude:**	34.044662	**Longitude:**	-81.119042	**Date Started:**	2/15/2018
Total Depth:	5 ft	**Soil Depth:**	ft	**Core Depth:**	ft	**Date Completed:**	2/15/2018
Bore Hole Diameter (in):		**Sampler Configuration**		**Liner Required:**	Y N	**Liner Used:**	Y N
Drill Machine:		**Drill Method:**		**Hammer Type:**		**Energy Ratio:**	
Core Size:		**Driller:**	C. Piercy	**Groundwater:**	**TOB** Dry	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Moist, Strong Brown, Medium Plasticity, Sandy Lean CLAY (CL/A-6(8)), Munsell=7.5YR 4/6 @CU: LL=40, PL=21, PI=19, NMC=18.5%, %#200=55.5, Φ=15.7°, c=2.70 psi, Φ'=27.0°, c'=2.00 psi		0.0	CU			
217.8	5.0	Bulk Sampling Terminated at 5.0 feet						
212.8								
207.8								
202.8								
197.8								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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SCDOT Soil Test Log

Project ID:	P027662	**County:**	Richland/Lexington	**Boring No.:**	BS-9		
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	I-26		
Eng./Geo.:		**Boring Location:**	314+37	**Offset:**	75 R	**Alignment:**	Median CL
Elev.:	214.3 ft	**Latitude:**	34.042325	**Longitude:**	-81.11619	**Date Started:**	3/13/2018
Total Depth:	5 ft	**Soil Depth:**	ft	**Core Depth:**	ft	**Date Completed:**	3/13/2018
Bore Hole Diameter (in):		**Sampler Configuration**		**Liner Required:**	Y N	**Liner Used:**	Y N
Drill Machine:		**Drill Method:**		**Hammer Type:**		**Energy Ratio:**	
Core Size:		**Driller:**	R. Wessinger	**Groundwater:**	**TOB** Dry	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Moist, Strong Brown, Low Plasticity, Silty Fine to Medium SAND (SM/A-2-4), Munsell=7.5YR 5/8 @CU: LL=15, PL=14, PI=1, %#200=22.9, Φ=45.0°, c=5.00 psi, Φ'=35.4°, c'=0.05 psi		0.0	CU			
209.3	5.0	Bulk Sampling Terminated at 5.0 feet						
204.3								
199.3								
194.3								
189.3								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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SCDOT Soil Test Log

Project ID:	P027662	**County:**	Richland/Lexington	**Boring No.:**	BS-10		
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	Burning Tree		
Eng./Geo.:		**Boring Location:**	9344+66	**Offset:**	7 L	**Alignment:**	Mainline
Elev.:	306.7 ft	**Latitude:**	34.038593	**Longitude:**	-81.107765	**Date Started:**	3/1/2018
Total Depth:	5 ft	**Soil Depth:**	ft	**Core Depth:**	ft	**Date Completed:**	3/1/2018
Bore Hole Diameter (in):		**Sampler Configuration**		**Liner Required:**	Y N	**Liner Used:**	Y N
Drill Machine:		**Drill Method:**		**Hammer Type:**		**Energy Ratio:**	
Core Size:		**Driller:**	L. Guempel	**Groundwater:**	**TOB** Dry	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Moist, Reddish Brown, Low Plasticity, Sandy Lean CLAY (CL/A-4(3)), Munsell=5YR 4/4		0.0				
		@CU: LL=29, PL=19, PI=10, NMC=17.3%, %#200=53.0, Φ=10.2°, c=4.88 psi, Φ'=31.6°, c'=0.80 psi			CU			
301.7	5.0	Bulk Sampling Terminated at 5.0 feet						
296.7								
291.7								
286.7								
281.7								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662	**County:**	Richland/Lexington	**Boring No.:**	BS-11		
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	I-20		
Eng./Geo.:		**Boring Location:**	168+67	**Offset:**	91 L	**Alignment:**	Median CL
Elev.:	285.7 ft	**Latitude:**	34.037774	**Longitude:**	-81.108164	**Date Started:**	4/2/2018
Total Depth:	5 ft	**Soil Depth:**	ft	**Core Depth:**	ft	**Date Completed:**	4/2/2018
Bore Hole Diameter (in):		**Sampler Configuration**		**Liner Required:**	Y N	**Liner Used:**	Y N
Drill Machine:		**Drill Method:**		**Hammer Type:**		**Energy Ratio:**	
Core Size:		**Driller:**	C. Piercy	**Groundwater:**	**TOB** Dry	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Dry, Weak Red, Non-Plastic, SILT (ML/A-4(0)), Munsell=10R 5/4		0.0				
		@CU: LL=NP, PL=NP, PI=NP, NMC=9.1%, %#200=92.7, Φ=25.7°, c=0.48 psi, Φ'=33.0°, c'=0.00 psi			CU			
280.7	5.0	Bulk Sampling Terminated at 5.0 feet						
275.7								
270.7								
265.7								
260.7								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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SCDOT Soil Test Log

Project ID:	P027662	**County:**	Richland/Lexington	**Boring No.:**	BS-12		
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	Burning Tree		
Eng./Geo.:		**Boring Location:**	9352+16	**Offset:**	5 R	**Alignment:**	Mainline
Elev.:	297.0 ft	**Latitude:**	34.036777	**Longitude:**	-81.106777	**Date Started:**	3/1/2018
Total Depth:	5 ft	**Soil Depth:**	ft	**Core Depth:**	ft	**Date Completed:**	3/1/2018
Bore Hole Diameter (in):		**Sampler Configuration**		**Liner Required:**	Y N	**Liner Used:**	Y N
Drill Machine:		**Drill Method:**		**Hammer Type:**		**Energy Ratio:**	
Core Size:		**Driller:**	L. Guempel	**Groundwater:**	**TOB** Dry	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Moist, Red, Low Plasticity, Sandy SILT (ML/A-4(4)), Munsell=2.5YR 5/6		0.0				
		@CU: LL=37, PL=28, PI=9, NMC=22.0%, %#200=58.9, Φ=18.3°, c=2.00 psi, Φ'=38.9°, c'=0.30 psi, Ignition Loss=0.1%			CU			
292.0	5.0	Bulk Sampling Terminated at 5.0 feet						
287.0								
282.0								
277.0								
272.0								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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SCDOT Soil Test Log

Project ID:	P027662	**County:**	Richland/Lexington	**Boring No.:**	BS-13		
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	I26RBD		
Eng./Geo.:		**Boring Location:**	4358+24	**Offset:**	21 L	**Alignment:**	Mainline
Elev.:	269.8 ft	**Latitude:**	34.035638	**Longitude:**	-81.108026	**Date Started:**	5/22/2018
Total Depth:	5 ft	**Soil Depth:**	ft	**Core Depth:**	ft	**Date Completed:**	5/22/2018
Bore Hole Diameter (in):		**Sampler Configuration**		**Liner Required:**	Y N	**Liner Used:**	Y N
Drill Machine:		**Drill Method:**		**Hammer Type:**		**Energy Ratio:**	
Core Size:		**Driller:**	C. Piercy	**Groundwater:**	**TOB** Dry	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	**DRILL TO 1.0 FEET**						
	1.0	Moist, Red/Pale Brown, Non-Plastic, SILT (ML/A-4(0)) with Sand, Munsell=10R 5/8 & 2.5Y 8/4		1.0				
264.8		@CU: LL=NP, PL=NP, PI=NP, NMC=29.5%, %#200=84.0, Φ=18.5°, c=1.32 psi, Φ'=27.3°, c'=0.91 psi			CU			
	8.0	Bulk Sampling Terminated at 8.0 feet						
259.8								
254.8								
249.8								
244.8								

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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662	**County:**	Richland/Lexington	**Boring No.:**	BS-14		
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	I26RBD		
Eng./Geo.:		**Boring Location:**	4353+87	**Offset:**	96 L	**Alignment:**	Mainline
Elev.:	269.6 ft	**Latitude:**	34.035105	**Longitude:**	-81.109222	**Date Started:**	3/14/2018
Total Depth:	5 ft	**Soil Depth:**	ft	**Core Depth:**	ft	**Date Completed:**	3/14/2018
Bore Hole Diameter (in):		**Sampler Configuration**		**Liner Required:**	Y N	**Liner Used:**	Y N
Drill Machine:		**Drill Method:**		**Hammer Type:**		**Energy Ratio:**	
Core Size:		**Driller:**	R. Wessinger	**Groundwater:**	**TOB** Dry	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Moist, Yellowish Red, Low Plasticity, Sandy SILT (ML/A-4(0)), Munsell=5YR 5/6		0.0				
		@CU: LL=37, PL=28, PI=9, %#200=69.4, Φ=21.3°, c=3.49 psi, Φ'=29.1°, c'=0.71 psi, Ignition Loss=0.1%			CU			
264.6	5.0	Bulk Sampling Terminated at 5.0 feet						
259.6								
254.6								
249.6								
244.6								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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SCDOT Soil Test Log

Project ID:	P027662	**County:**	Richland/Lexington	**Boring No.:**	BS-15		
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	I20RAC		
Eng./Geo.:		**Boring Location:**	3150+78	**Offset:**	17 L	**Alignment:**	Mainline
Elev.:	233.1 ft	**Latitude:**	34.036423	**Longitude:**	-81.112998	**Date Started:**	4/20/2018
Total Depth:	5 ft	**Soil Depth:**	ft	**Core Depth:**	ft	**Date Completed:**	4/20/2018
Bore Hole Diameter (in):		**Sampler Configuration**		**Liner Required:**	Y N	**Liner Used:**	Y N
Drill Machine:		**Drill Method:**		**Hammer Type:**		**Energy Ratio:**	
Core Size:		**Driller:**	M. Miller	**Groundwater:**	**TOB** Dry	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Moist, Light Brown, Low Plasticity, SILT (ML/A-4(6)) with Sand, Munsell=7.5YR 6/3		0.0				
		@CU: LL=34, PL=25, PI=9, NMC=17.6%, %#200=72.1, Φ=24.8°, c=0.06 psi, Φ'=30.5°, c'=0.53 psi			CU			
228.1	5.0	Bulk Sampling Terminated at 5.0 feet						
223.1								
218.1								
213.1								
208.1								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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SCDOT Soil Test Log

Project ID:	P027662	**County:**	Richland/Lexington	**Boring No.:**	BS-16		
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	Burning Tree		
Eng./Geo.:		**Boring Location:**	9318+00	**Offset:**	1 R	**Alignment:**	Median CL
Elev.:	223.1 ft	**Latitude:**	34.042253	**Longitude:**	-81.114948	**Date Started:**	5/24/2018
Total Depth:	5 ft	**Soil Depth:**	ft	**Core Depth:**	ft	**Date Completed:**	5/24/2018
Bore Hole Diameter (in):		**Sampler Configuration**		**Liner Required:**	Y N	**Liner Used:**	Y N
Drill Machine:		**Drill Method:**		**Hammer Type:**		**Energy Ratio:**	
Core Size:		**Driller:**	M. Touchberry	**Groundwater:**	**TOB** Dry	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Moist, Light Reddish Brown, Low Plasticity, Sandy Lean CLAY (CL/A-4(2)), Munsell=5YR 6/4 @CU: LL=27, PL=19, PI=8, NMC=12.2%, %#200=51.8, Φ=16.0°, c=0.00 psi, Φ'=25.0°, c'=0.31 psi		0.0	CU			
218.1	5.0	Bulk Sampling Terminated at 5.0 feet						
213.1								
208.1								
203.1								
198.1								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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SCDOT Soil Test Log

Project ID:	P027662	**County:**	Richland/Lexington	**Boring No.:**	BS-17		
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	Burning Tree		
Eng./Geo.:		**Boring Location:**	9329+00	**Offset:**	1 R	**Alignment:**	Mainline
Elev.:	271.7 ft	**Latitude:**	34.040013	**Longitude:**	-81.112541	**Date Started:**	5/24/2018
Total Depth:	3 ft	**Soil Depth:**	ft	**Core Depth:**	ft	**Date Completed:**	5/24/2018
Bore Hole Diameter (in):		**Sampler Configuration**		**Liner Required:**	Y N	**Liner Used:**	Y N
Drill Machine:		**Drill Method:**		**Hammer Type:**		**Energy Ratio:**	
Core Size:		**Driller:**	M. Touchberry	**Groundwater:**	**TOB** Dry	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Dry, Light Red, Medium Plasticity, Clayey Fine SAND (SC/A-6(2)) with Gravel, Munsell=2.5YR 6/6		0.0	CU			
	3.0	@CU: LL=28, PL=17, PI=11, NMC=8.2%, %#200=47.8, Φ=14.8°, c=0.58 psi, Φ'=41.0°, c'=0.00 psi						
		Bulk Sampling Terminated at 3.0 feet						
266.7								
261.7								
256.7								
251.7								
246.7								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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SCDOT Soil Test Log

Project ID:	P027662	**County:**	Richland/Lexington	**Boring No.:**	BS-18		
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	Burning Tree		
Eng./Geo.:		**Boring Location:**	9357+06	**Offset:**	18 L	**Alignment:**	Mainline
Elev.:	296.2 ft	**Latitude:**	34.03544	**Longitude:**	-81.106928	**Date Started:**	5/14/2018
Total Depth:	5 ft	**Soil Depth:**	ft	**Core Depth:**	ft	**Date Completed:**	5/14/2018
Bore Hole Diameter (in):		**Sampler Configuration**		**Liner Required:**	Y N	**Liner Used:**	Y N
Drill Machine:		**Drill Method:**		**Hammer Type:**		**Energy Ratio:**	
Core Size:		**Driller:**	C. Piercy	**Groundwater:**	**TOB** Dry	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Moist, Red, High Plasticity, Fat CLAY (CH/A-7-5(20)), Munsell=2.5YR 4/6		0.0				
		@CU: LL=64, PL=30, PI=34, NMC=22.5%, %#200=87.0, Φ=20.5°, c=0.13 psi, Φ'=33.9°, c'=0.22 psi, Ignition Loss=0.4%			CU			
291.2	5.0	Bulk Sampling Terminated at 5.0 feet						
286.2								
281.2								
276.2								
271.2								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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SCDOT Soil Test Log

Project ID:	P027662	**County:**	Richland/Lexington	**Boring No.:**	BS-19		
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	I26RBD		
Eng./Geo.:		**Boring Location:**	4333+02	**Offset:**	16 R	**Alignment:**	Mainline
Elev.:	283.9 ft	**Latitude:**	34.038159	**Longitude:**	-81.112633	**Date Started:**	5/24/2018
Total Depth:	3 ft	**Soil Depth:**	ft	**Core Depth:**	ft	**Date Completed:**	5/24/2018
Bore Hole Diameter (in):		**Sampler Configuration**		**Liner Required:**	Y N	**Liner Used:**	Y N
Drill Machine:		**Drill Method:**		**Hammer Type:**		**Energy Ratio:**	
Core Size:		**Driller:**	M. Touchberry	**Groundwater:**	**TOB** Dry	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Moist, Brownish Yellow/Yellowish Red, Medium Plasticity, Sandy Lean CLAY (CL/A-7-6(12)), Munsell=10YR 6/6 & 5YR 5/8		0.0	CU			
	3.0	@CU: LL=45, PL=25, PI=20, NMC=16.4%, %#200=66.5, Φ=8.0°, c=1.63 psi, Φ'=27.0°, c'=1.00 psi						
278.9		Bulk Sampling Terminated at 3.0 feet						
273.9								
268.9								
263.9								
258.9								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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SCDOT Soil Test Log

Project ID:	P027662	**County:**	Richland/Lexington	**Boring No.:**	BS-20		
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvements			**Route:**	I26CDE		
Eng./Geo.:		**Boring Location:**	8352+58	**Offset:**	49 R	**Alignment:**	Mainline
Elev.:	273.2 ft	**Latitude:**	34.033771	**Longitude:**	-81.108896	**Date Started:**	5/22/2018
Total Depth:	5 ft	**Soil Depth:**	ft	**Core Depth:**	ft	**Date Completed:**	5/22/2018
Bore Hole Diameter (in):		**Sampler Configuration**		**Liner Required:**	Y N	**Liner Used:**	Y N
Drill Machine:		**Drill Method:**		**Hammer Type:**		**Energy Ratio:**	
Core Size:		**Driller:**	C. Piercy	**Groundwater:**	**TOB** Dry	**24HR**	Backfilled

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	Moist, Red, Medium Plasticity, Elastic SILT (MH/A-7-5(19)), Munsell=2.5YR 4/8		0.0				
		@CU: LL=56, PL=39, PI=17, NMC=21.9%, %#200=86.3, Φ=15.6°, c=0.32 psi, Φ'=37.0°, c'=0.00 psi			CU			
268.2	5.0	Bulk Sampling Terminated at 5.0 feet						
263.2								
258.2								
253.2								
248.2								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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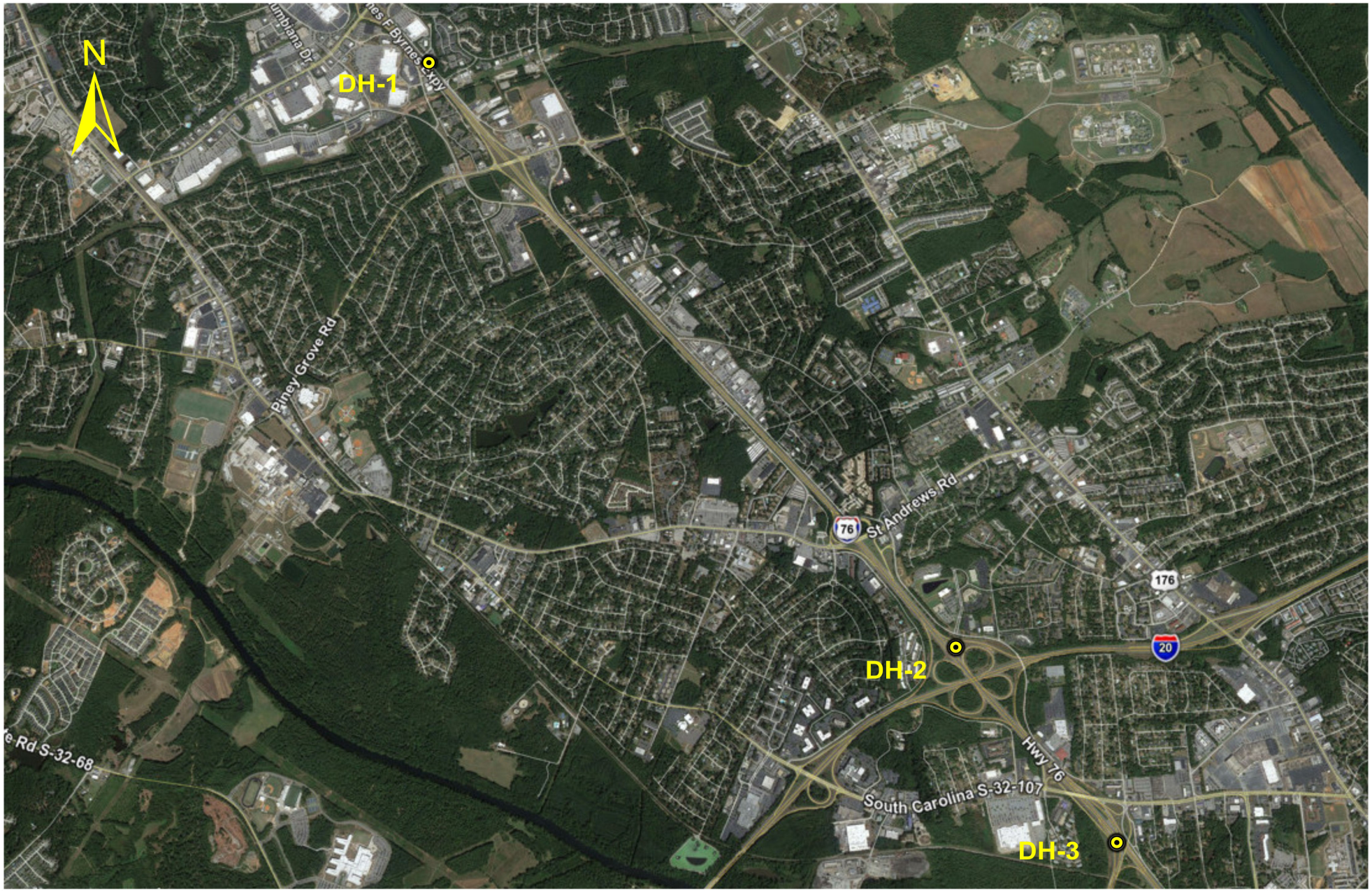
APPENDIX

SECTION 4 GEOPHYSICAL TEST RESULTS



GeoWave Solutions, Inc.
www.geowavesolutions.com

I-26 Corridor Improvements at I-20/I-126

F&ME Consultants

Columbia, South Carolina

Downhole Seismic
Shear-Wave Investigation

February 7, 2018

Project Manager: M. Ellers

GeoWave Solutions, Inc.
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I-26 Corridor Improvements at I-20/I-126

F&ME Consultants

Columbia, South Carolina

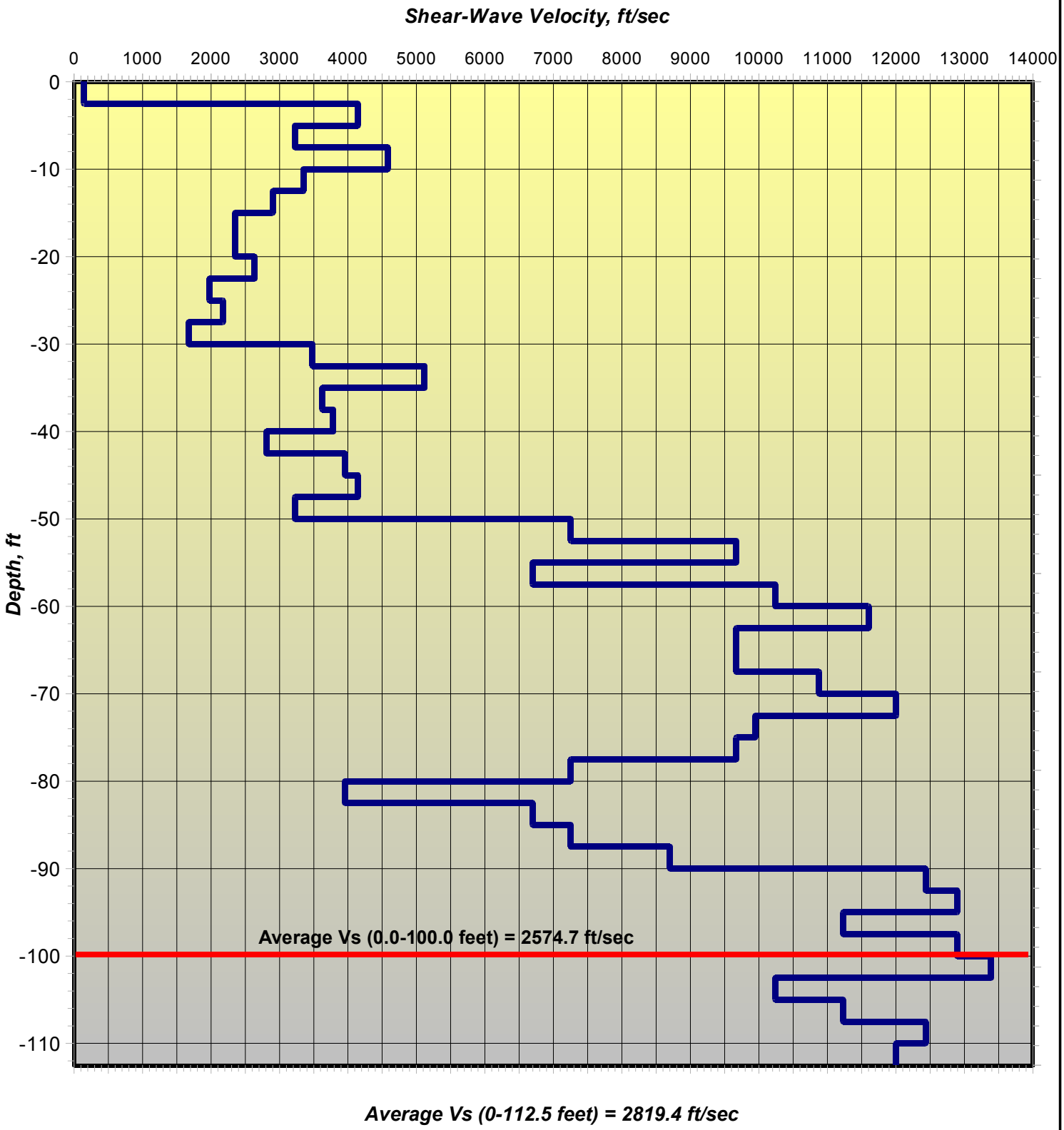
Downhole Seismic
Shear-Wave Investigation

February 7, 2018

Project Manager: M. Ellers

DH-1

34° 4.423'N 81° 8.890'W



Average Vs (0-112.5 feet) = 2819.4 ft/sec

GeoWave Solutions, Inc.
4575 Ansley Lane
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Tel: 770-886-3776
Fax: 770-886-7212
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I-26 Corridor Improvements at I-20/I-126

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Downhole Seismic Shear-Wave Investigation

Project Manager: M. Ellers

February 7, 2018

DH-1

34° 4.423'N 81° 8.890'W

Depth (ft)	Vs (ft/sec)
-2.5	145.6
-5.0	4144.8
-7.5	3223.7
-10.0	4581.0
-12.5	3347.7
-15.0	2901.3
-17.5	2352.4
-20.0	2352.4
-22.5	2637.6
-25.0	1978.2
-27.5	2176.0
-30.0	1673.8
-32.5	3481.6
-35.0	5120.0
-37.5	3626.7
-40.0	3784.4
-42.5	2807.7
-45.0	3956.4
-47.5	4144.7
-50.0	3223.7
-52.5	7253.4
-55.0	9671.1
-57.5	6695.4
-60.0	10240.0
-62.5	11605.5
-65.0	9671.1
-67.5	9671.1
-70.0	10880.0
-72.5	12005.4
-75.0	9947.5
-77.5	9671.1
-80.0	7253.4
-82.5	3956.4
-85.0	6695.4
-87.5	7253.3
-90.0	8704.0
-92.5	12434.2
-95.0	12894.9
-97.5	11231.0
-100.0	12894.6
-102.5	13391.0
-105.0	10240.0
-107.5	11230.9
-110.0	12434.5
-112.5	12005.4

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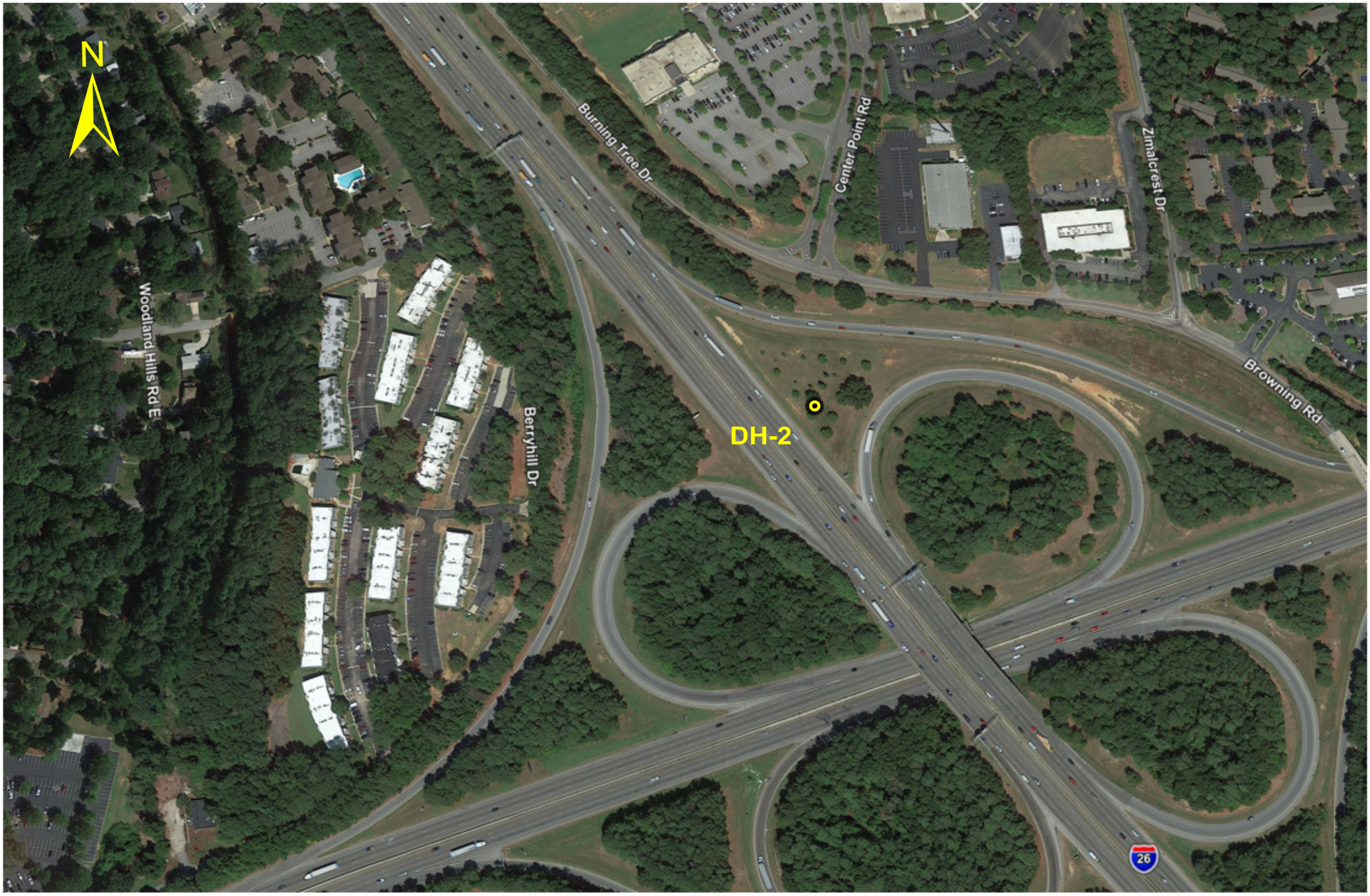

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I-26 Corridor Improvements at I-20/I-126

F&ME Consultants

Columbia, South Carolina

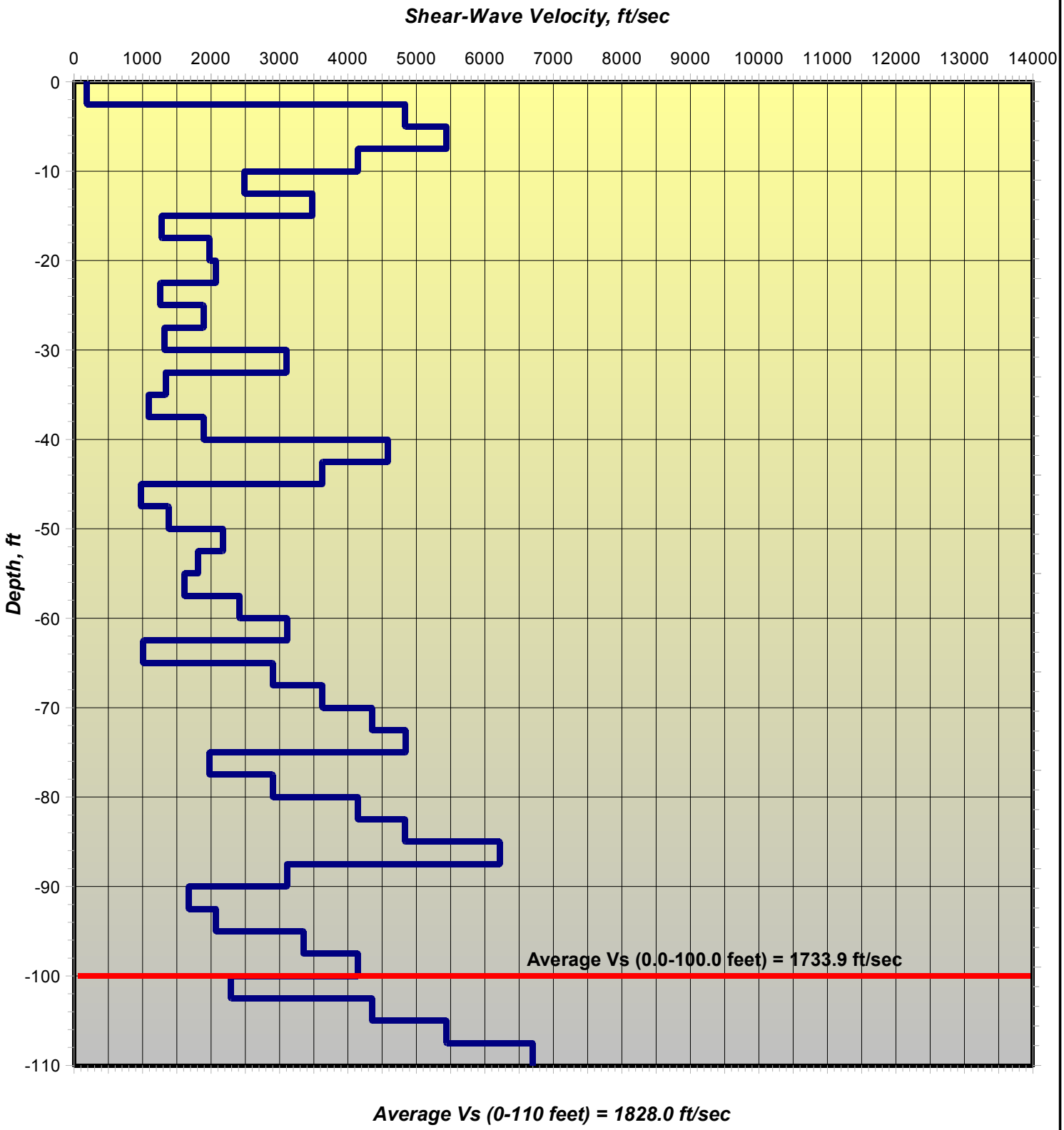
Downhole Seismic
Shear-Wave Investigation

February 7, 2018

Project Manager: M. Ellers

DH-2

34° 2.305'N 81° 6.693'W



Average Vs (0-110 feet) = 1828.0 ft/sec

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I-26 Corridor Improvements at I-20/I-126

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Downhole Seismic Shear-Wave Investigation

Project Manager: M. Ellers

February 7, 2018

DH-2

34° 2.305'N 81° 6.693'W

Depth (ft)	Vs (ft/sec)
-2.5	187.6
-5.0	4835.6
-7.5	5440.0
-10.0	4144.8
-12.5	2486.9
-15.0	3481.6
-17.5	1280.0
-20.0	1978.2
-22.5	2072.4
-25.0	1261.7
-27.5	1891.1
-30.0	1319.3
-32.5	3105.6
-35.0	1339.4
-37.5	1088.0
-40.0	1892.2
-42.5	4581.0
-45.0	3626.7
-47.5	978.0
-50.0	1381.9
-52.5	2175.8
-55.0	1812.9
-57.5	1611.9
-60.0	2417.6
-62.5	3109.5
-65.0	1012.1
-67.5	2900.2
-70.0	3628.4
-72.5	4347.8
-75.0	4837.8
-77.5	1978.2
-80.0	2901.3
-82.5	4144.8
-85.0	4835.6
-87.5	6217.1
-90.0	3108.6
-92.5	1673.8
-95.0	2072.4
-97.5	3347.7
-100.0	4144.7
-102.5	2290.5
-105.0	4352.0
-107.5	5440.0
-110.0	6695.4

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Project Manager: M. Ellers

February 7, 2018

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I-26 Corridor Improvements at I-20/I-126

F&ME Consultants

Columbia, South Carolina

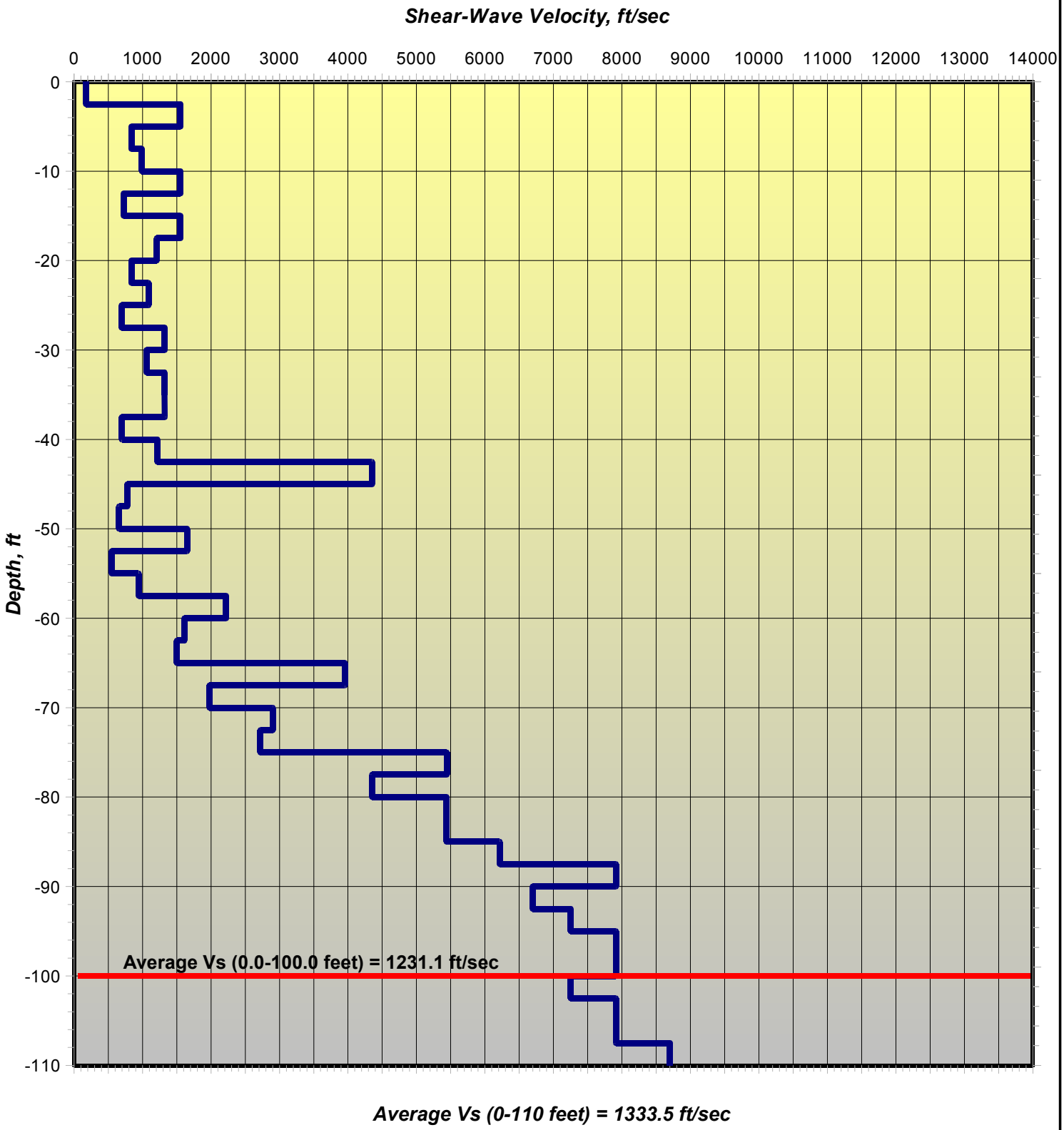
Downhole Seismic
Shear-Wave Investigation

February 7, 2018

Project Manager: M. Ellers

DH-3

34° 1.683'N 81° 6.111'W



Average Vs (0-110 feet) = 1333.5 ft/sec

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F&ME Consultants

Downhole Seismic Shear-Wave Investigation

Project Manager: M. Ellers

February 7, 2018

DH-3

34° 1.683'N 81° 6.111'W

Depth (ft)	Vs (ft/sec)
-2.5	172.7
-5.0	1553.8
-7.5	837.0
-10.0	989.3
-12.5	1553.8
-15.0	725.5
-17.5	1553.8
-20.0	1208.9
-22.5	837.0
-25.0	1087.9
-27.5	692.7
-30.0	1322.8
-32.5	1058.0
-35.0	1322.1
-37.5	1322.8
-40.0	696.0
-42.5	1216.1
-45.0	4352.0
-47.5	777.1
-50.0	659.1
-52.5	1652.3
-55.0	551.0
-57.5	944.8
-60.0	2222.2
-62.5	1611.4
-65.0	1500.7
-67.5	3956.4
-70.0	1978.2
-72.5	2900.4
-75.0	2720.4
-77.5	5442.0
-80.0	4352.0
-82.5	5440.0
-85.0	5440.0
-87.5	6217.1
-90.0	7912.8
-92.5	6695.4
-95.0	7253.3
-97.5	7912.8
-100.0	7912.7
-102.5	7253.3
-105.0	7912.8
-107.5	7912.7
-110.0	8704.1

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I-26 Corridor Improvements at I-20/I-126

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Downhole Seismic Shear-Wave Investigation

Project Manager: M. Ellers

February 7, 2018

APPENDIX

SECTION 5 ROCK CORE PHOTOS

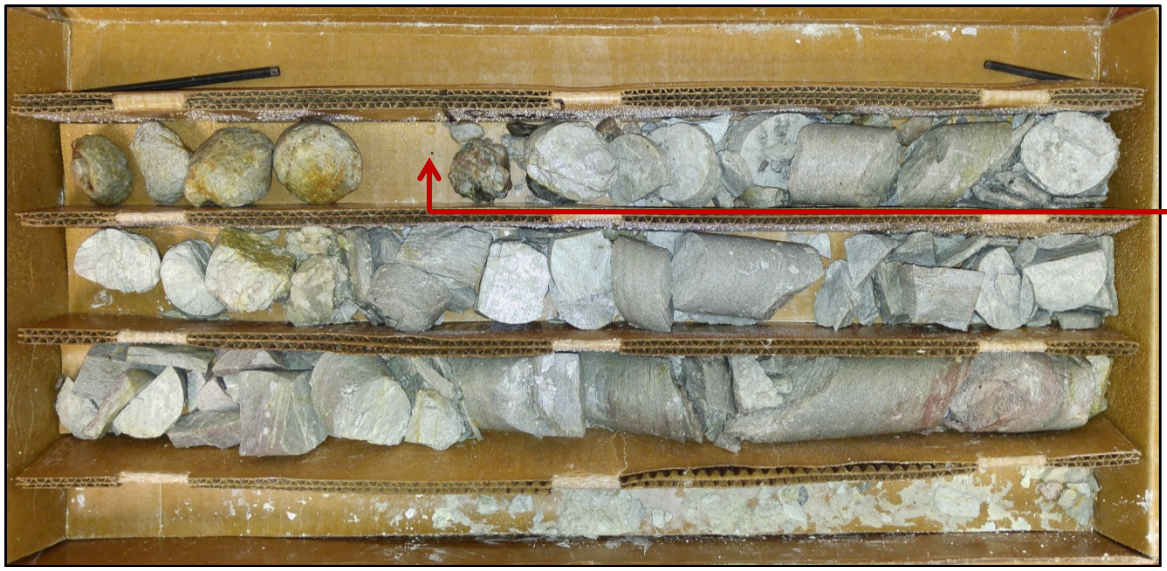
I-20/26/126 CORRIDOR IMPROVEMENTS

Boring B-1: S-757 Alignment – Station 40+96, Offset 27 ft - L

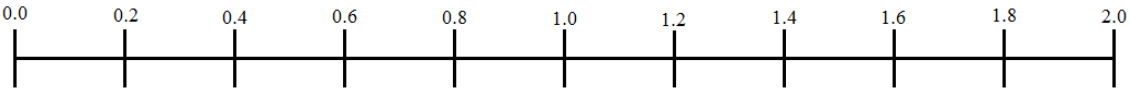
Begin Run 1
(23.8-26.0 ft)

Begin Run 2
(26.0-31.0 ft)

Begin Run 4
(36.0-41.0 ft)

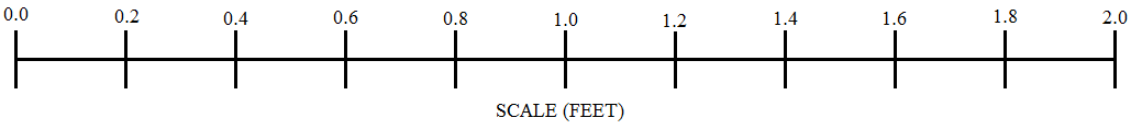


Begin Run 3
(31.0-36.0 ft)



Begin Run 5
(41.0-46.0 ft)

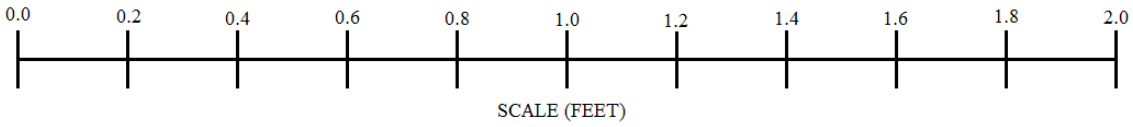
Begin Run 6
(46.0-51.0 ft)



I-20/26/126 CORRIDOR IMPROVEMENTS

Boring B-1: S-757 Alignment – Station 40+96, Offset 27 ft - L

Begin Run 7
(46.0-51.0 ft)



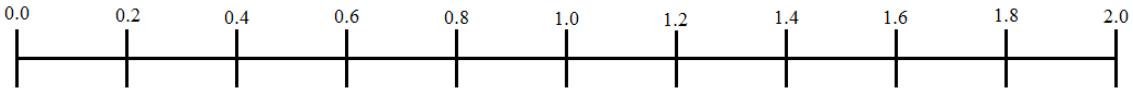
I-20/26/126 CORRIDOR IMPROVEMENTS

Boring B-6A: S-36 Alignment - Station 27+96, Offset 104 ft – R

Begin Run 1
(64.7-69.7 ft)

Begin Run 2
(69.7-74.7 ft)

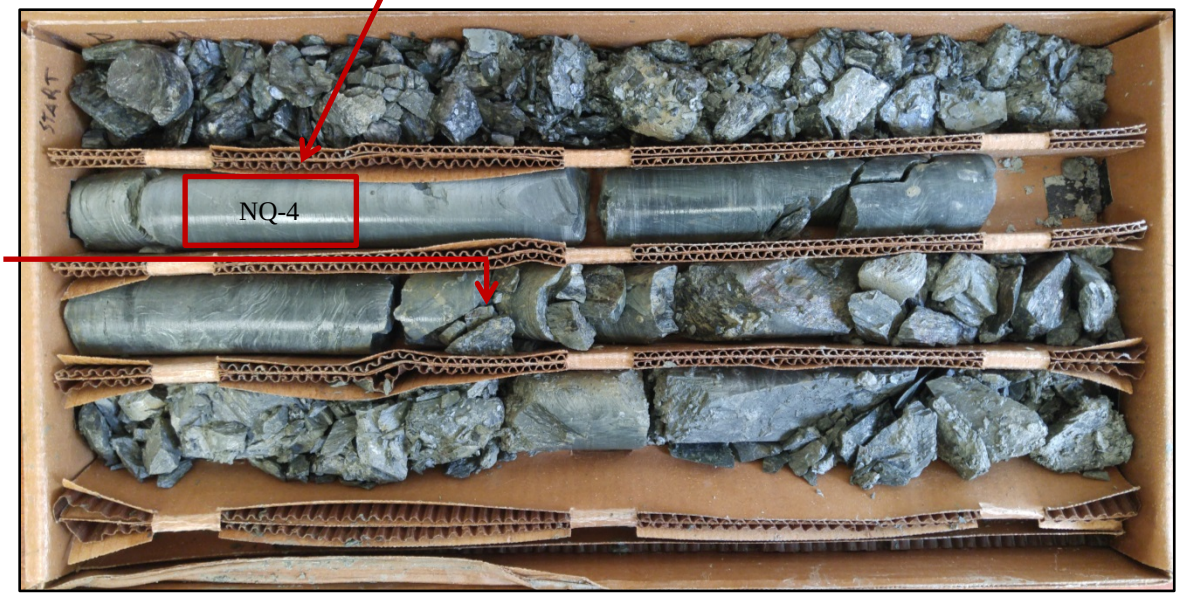
Begin Run 3
(74.7-79.7 ft)

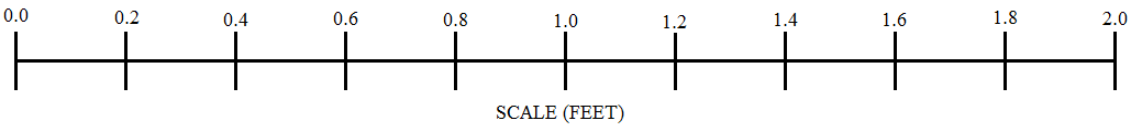


UC Strength
3,460 psi

Begin Run 4
(79.7-84.7 ft)

Begin Run 5
(84.7-89.7 ft)





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I-20/26/126 CORRIDOR IMPROVEMENTS

Boring B-7: S-36 Alignment - Station 31+21, Offset 161 ft – R

Begin Run 1
(43.6 – 45.9 ft)

Begin Run 2
(45.9 – 50.9 ft)

0.0 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8 2.0

SCALE (FEET)

Begin Run 3
(50.9 – 55.9 ft)

UC Strength
740 psi

0.0 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8 2.0

SCALE (FEET)

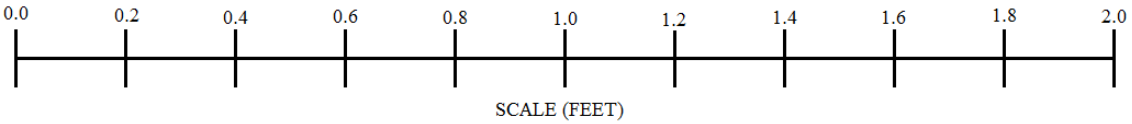
I-20/26/126 CORRIDOR IMPROVEMENTS

Boring B-7: S-36 Alignment - Station 31+21, Offset 161 ft – R

Begin Run 4
(55.9 – 60.9 ft)

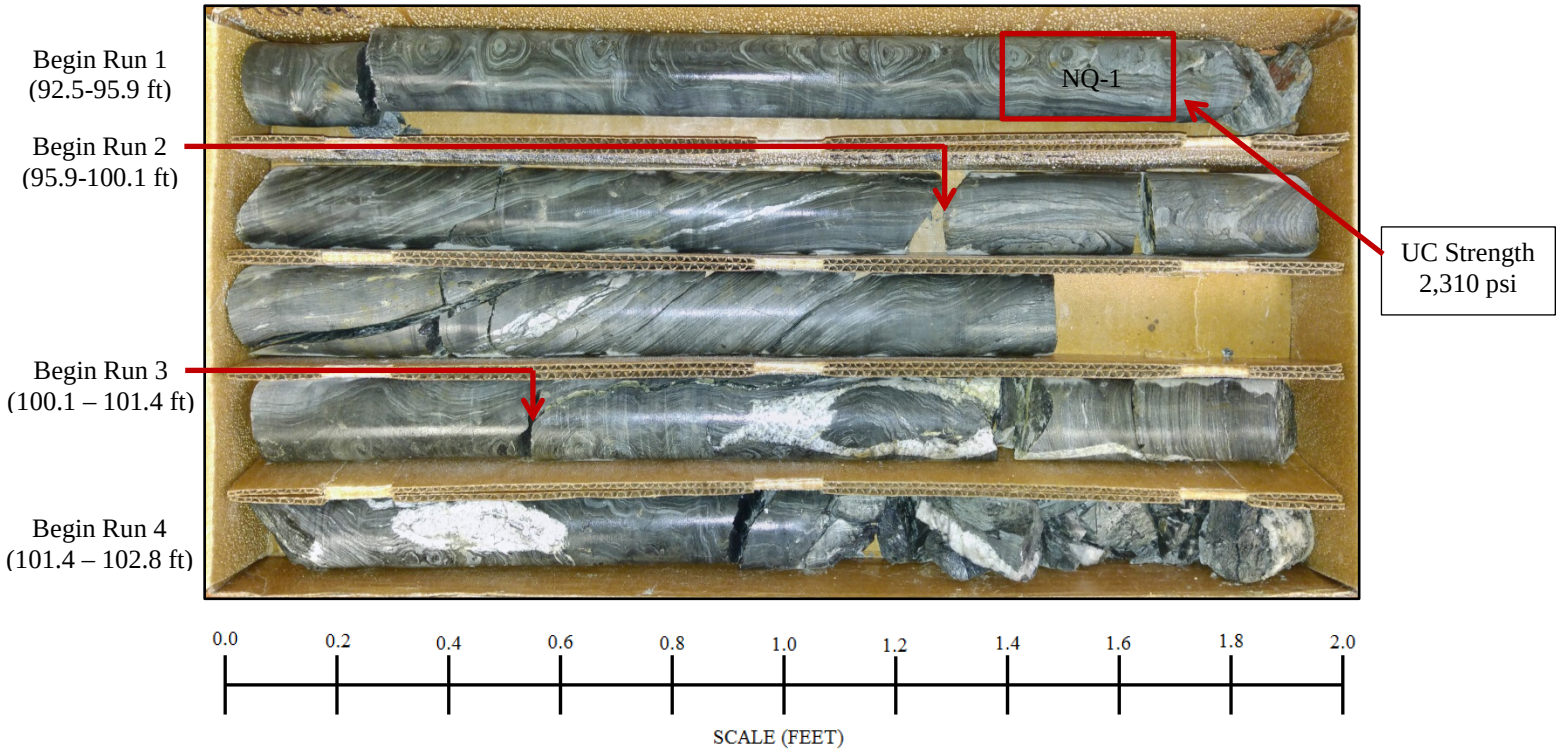
Begin Run 5
(60.9 – 63.6 ft)

UC Strength
1,360 psi



I-20/26/126 CORRIDOR IMPROVEMENTS

Boring B-8: 126CDW1 Alignment – Station 7332+07, Offset 17 ft – R



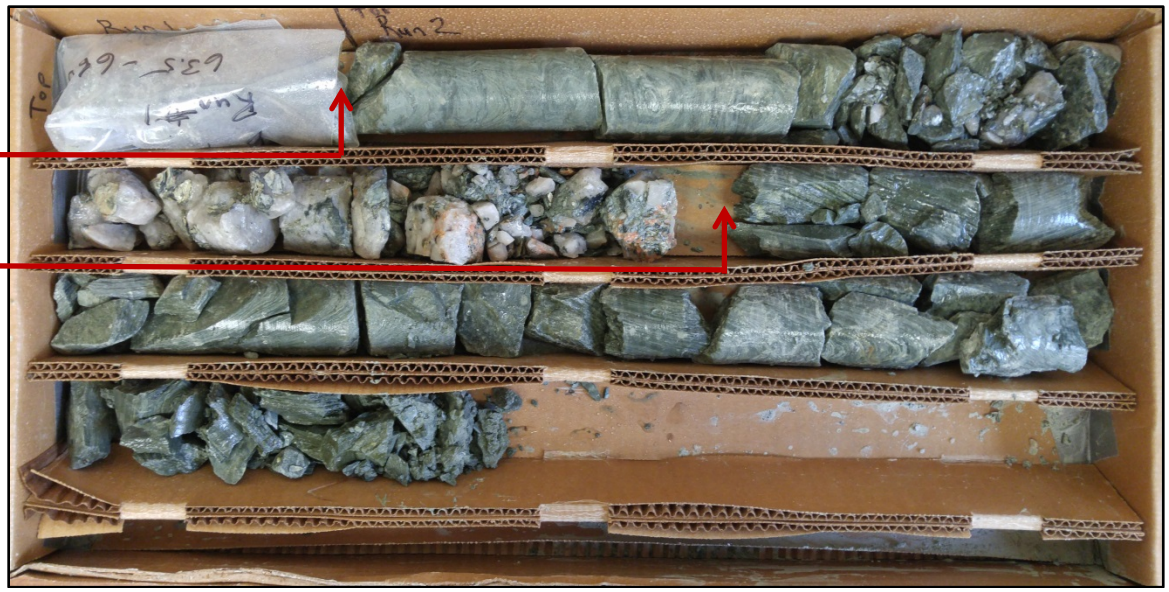
I-20/26/126 CORRIDOR IMPROVEMENTS

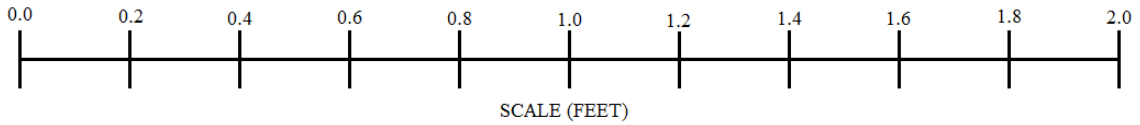
Boring B-9: I26RDB Alignment – Station 6389+63, Offset 155 ft – L

Begin Run 1
(63.6 – 66.0 ft)

Begin Run 2
(66.0 – 71.0 ft)

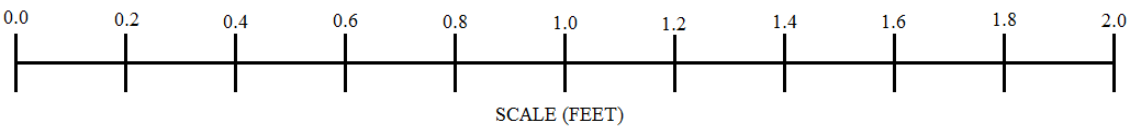
Begin Run 3
(71.0 – 76.0 ft)





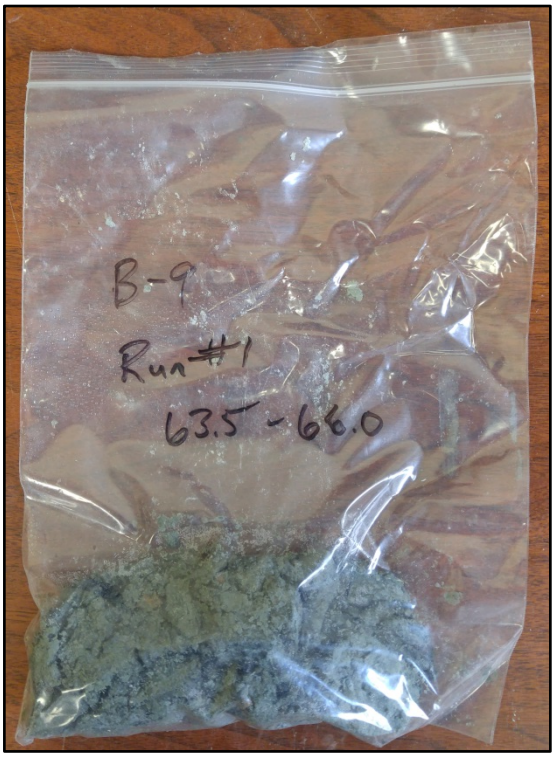
Begin Run 4
(76.0 – 81.0 ft)

Begin Run 5
(81.0 – 86.0 ft)



I-20/26/126 CORRIDOR IMPROVEMENTS

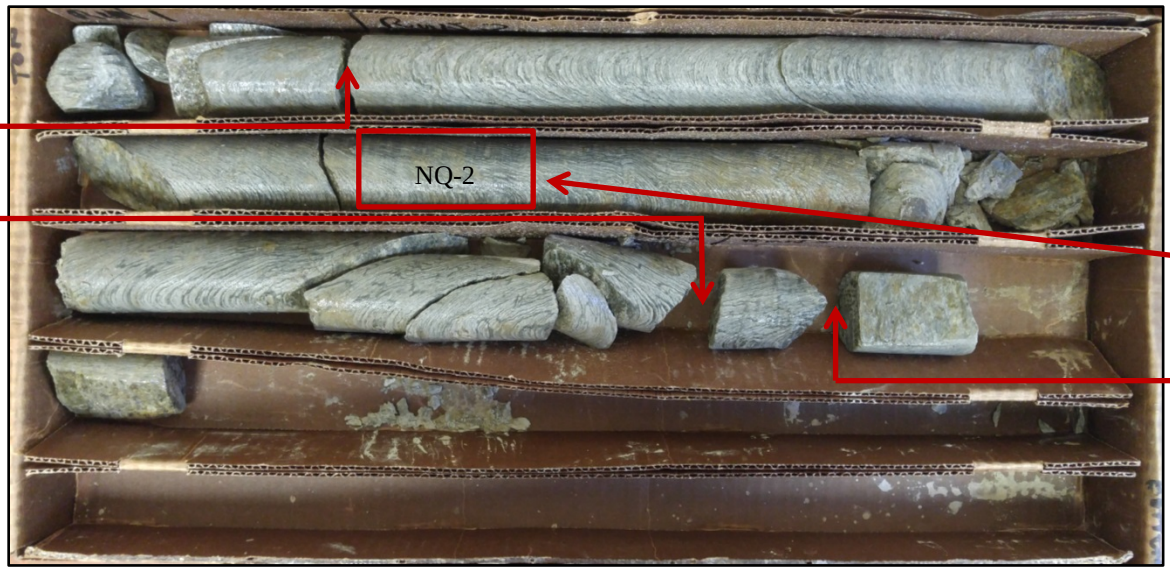
Boring B-9: I26RDB Alignment – Station 6389+63, Offset 155 ft – L

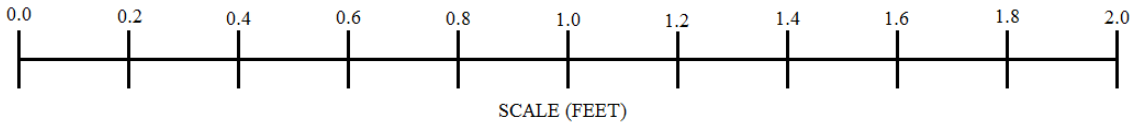


NQ-1

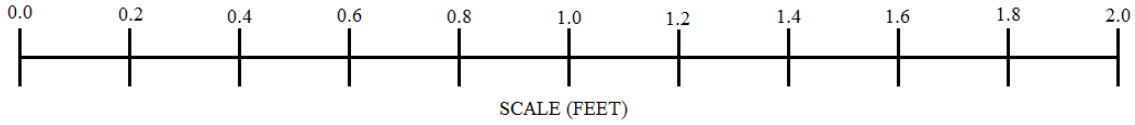
I-20/26/126 CORRIDOR IMPROVEMENTS

Boring B-11: I-26 Alignment – Station 341+66, Offset 78 ft – L



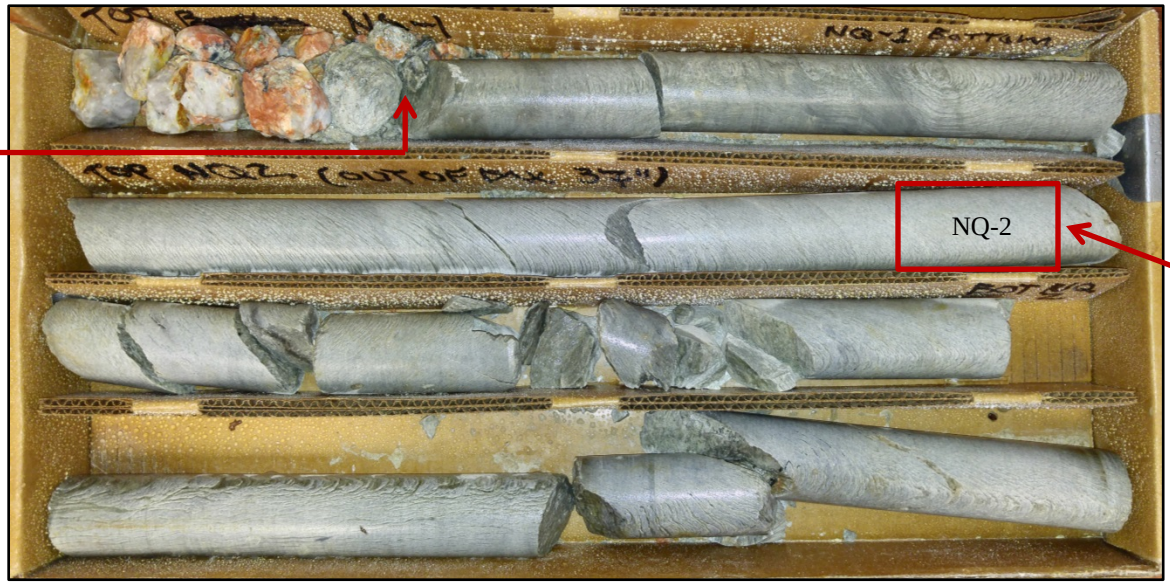


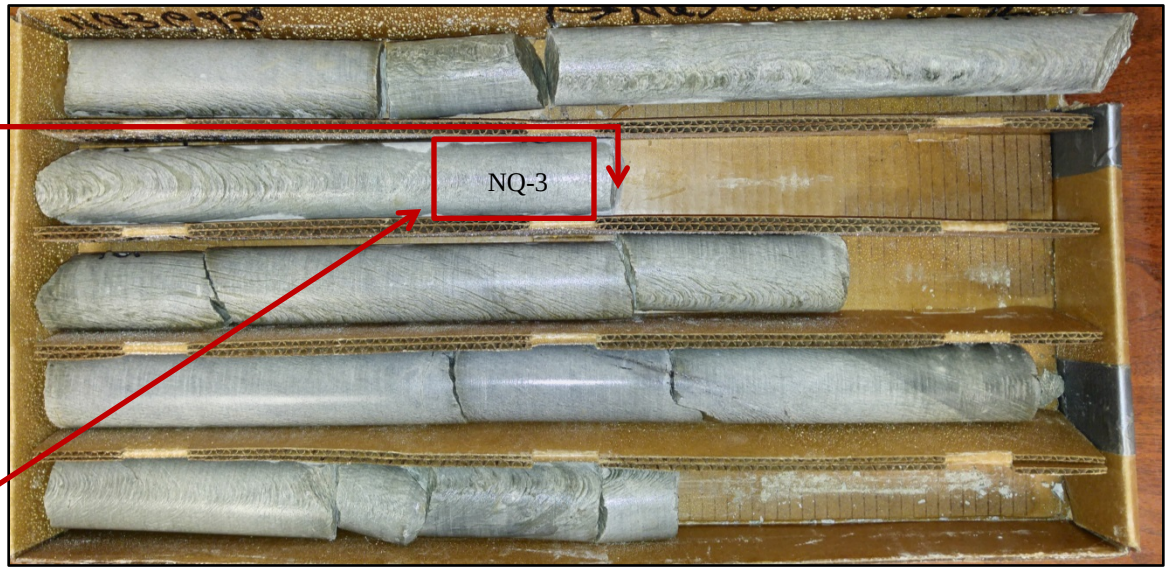
Approximately two (2) feet of rock was stuck and removed from the coring barrel during NQ-4 (89-4 – 94.4 ft)



I-20/26/126 CORRIDOR IMPROVEMENTS

Boring B-17: I20RAC Alignment – Station 3150+78, Offset 17 ft – L

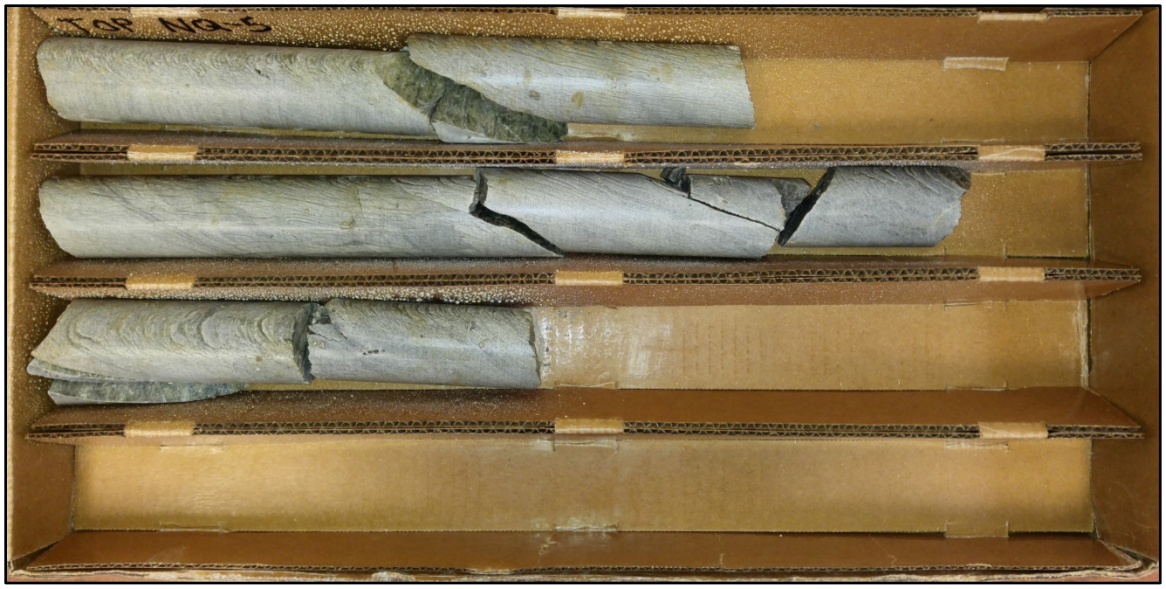


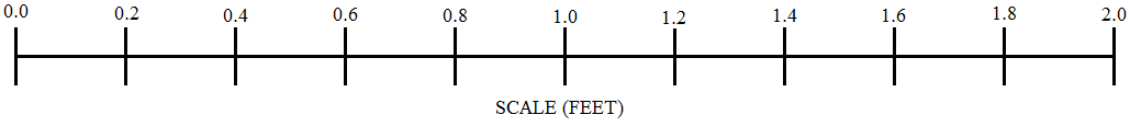


I-20/26/126 CORRIDOR IMPROVEMENTS

Boring B-17: I20RAC Alignment – Station 3150+78, Offset 17 ft – L

Begin Run 5
(101.0 – 104.5 ft)





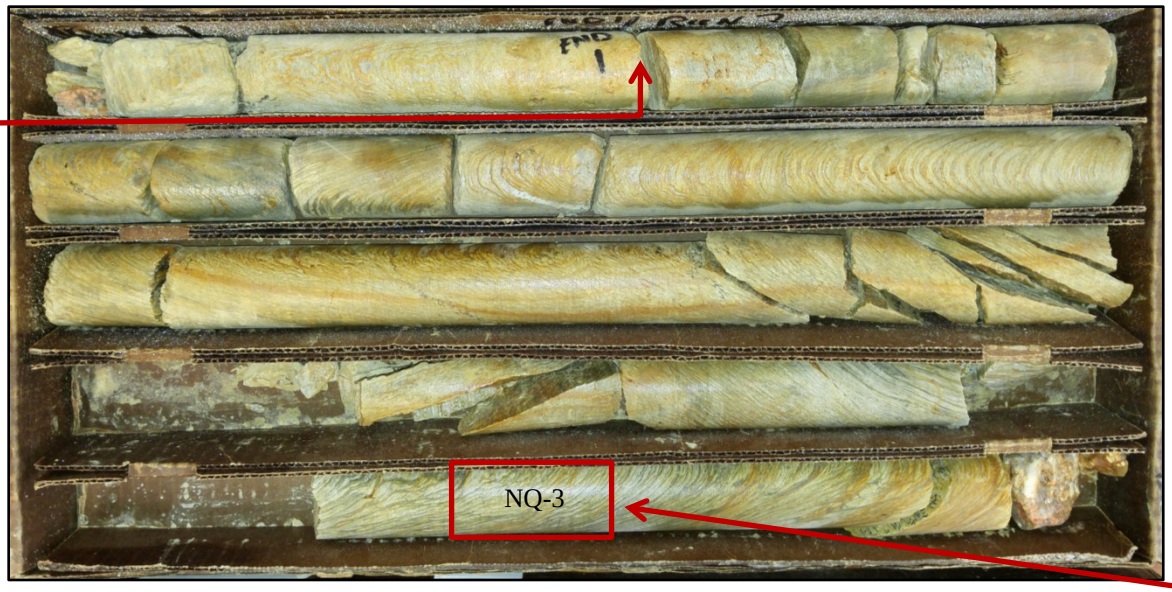
I-20/26/126 CORRIDOR IMPROVEMENTS

Boring B-18: I-20 Alignment – Station 154+03, Offset 100 ft – R

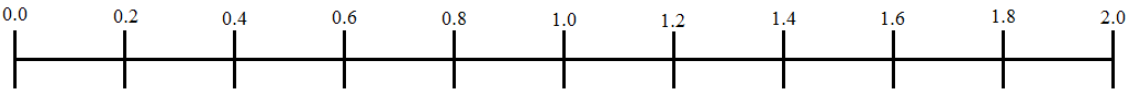
Begin Run 1
(73.6 – 75.1 ft)

Begin Run 2
(75.1 – 80.1 ft)

Begin Run 3
(80.1 – 85.1 ft)

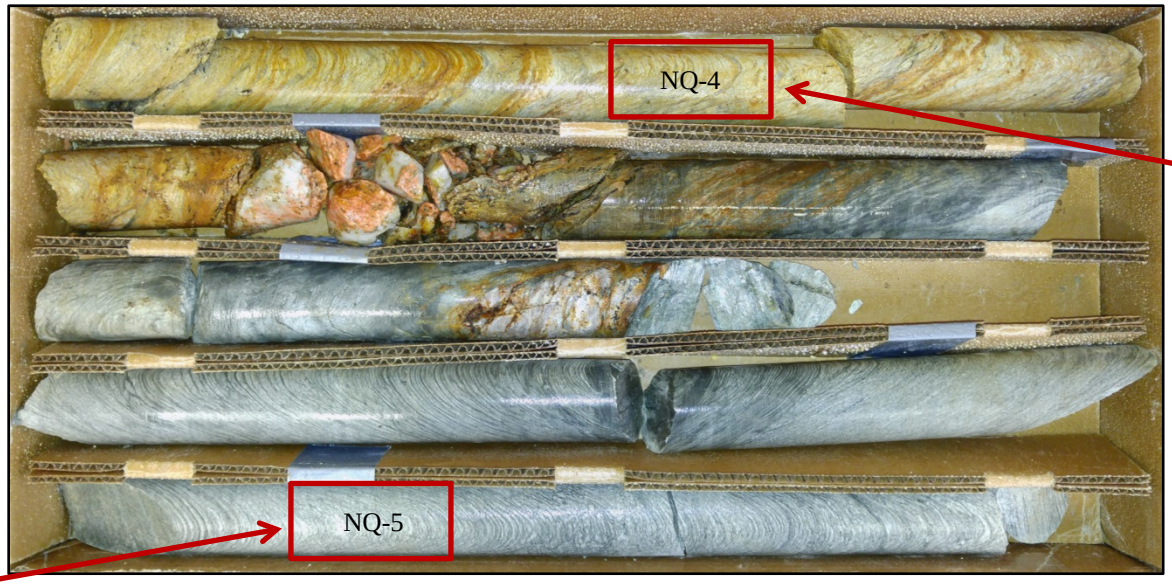


UC Strength
580 psi



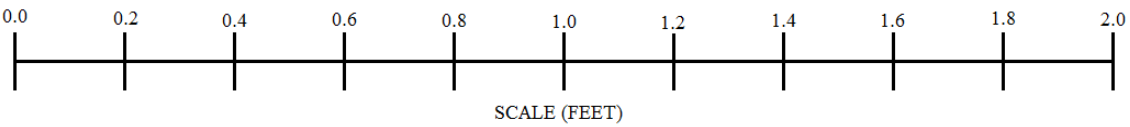
Begin Run 4
(85.1 – 90.1 ft)

Begin Run 5
(90.1 – 95.1 ft)



UC Strength
1,030 psi

UC Strength
1,590 psi

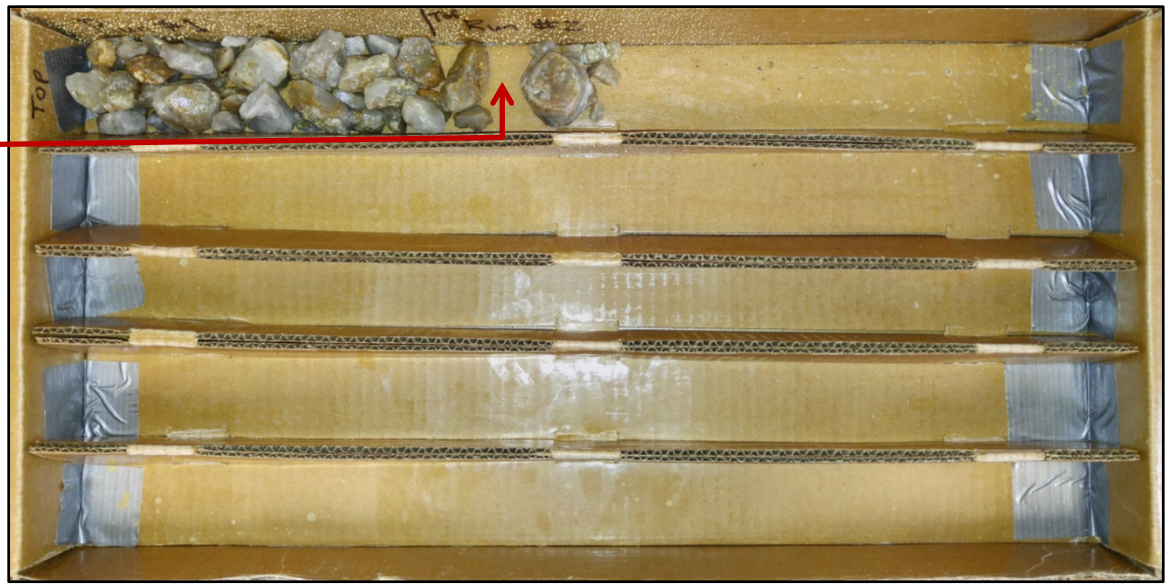


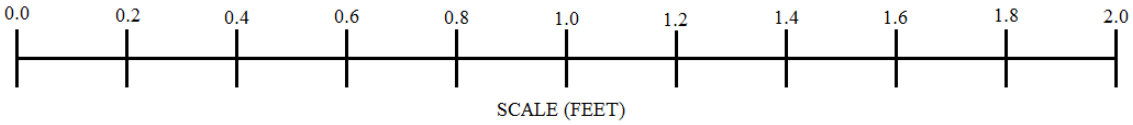
I-20/26/126 CORRIDOR IMPROVEMENTS

Boring B-19: I20RC1 Alignment – Station 5152+72, Offset 7 ft – R

Begin Run 1
(59.2 – 61.4 ft)

Begin Run 2
(61.4 – 66.4 ft)



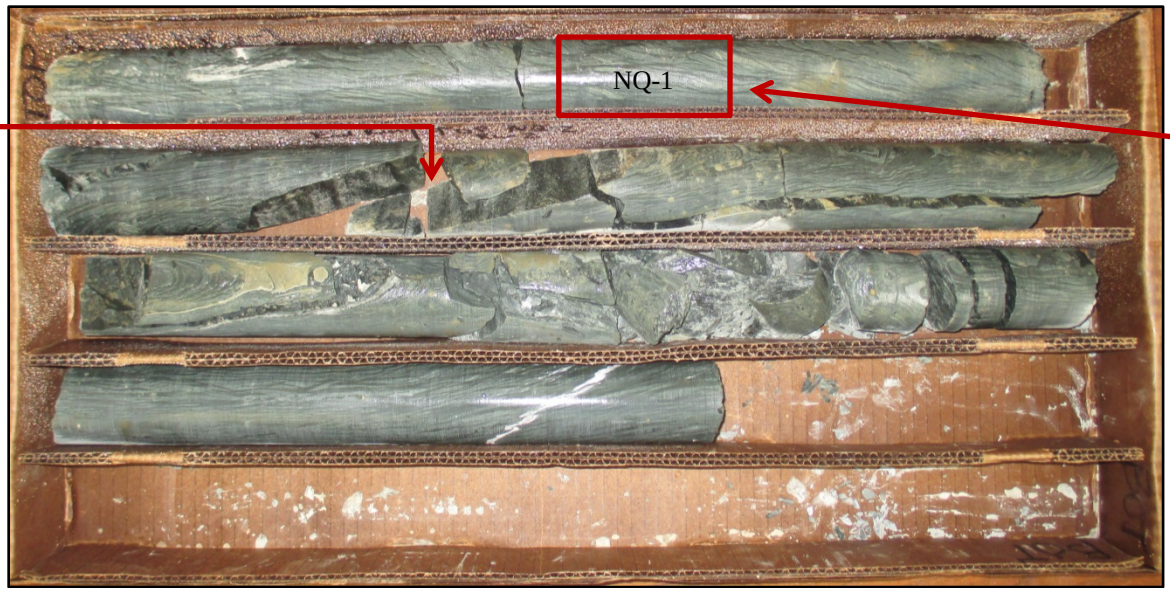


I-20/26/126 CORRIDOR IMPROVEMENTS

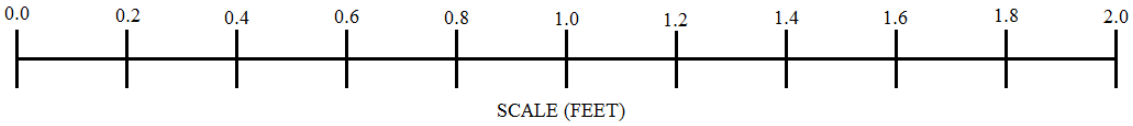
Boring B-63: S-36 Alignment – Station 30+38, Offset 99 ft – L

Begin Run 1
(43.0-45.4 ft)

Begin Run 2
(45.4-50.4 ft)

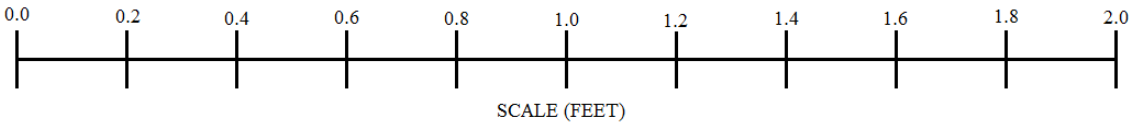


UC Strength
4,020 psi



Begin Run 3
(50.4-55.4 ft)

UC Strength
4,510 psi

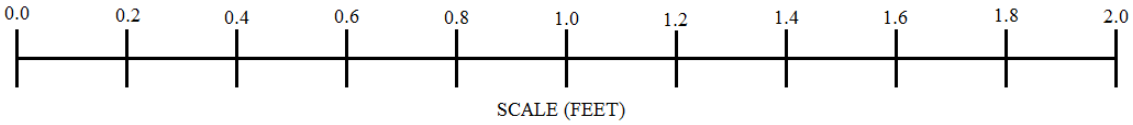


I-20/26/126 CORRIDOR IMPROVEMENTS

Boring B-63: S-36 Alignment – Station 30+38, Offset 99 ft – L

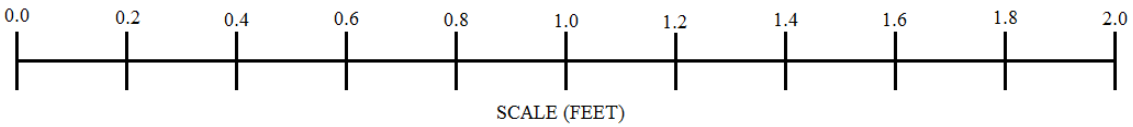
Begin Run 4
(55.4-60.4 ft)

UC Strength
7,270 psi



Begin Run 5
(60.4-65.4 ft)

UC Strength
4,110 psi

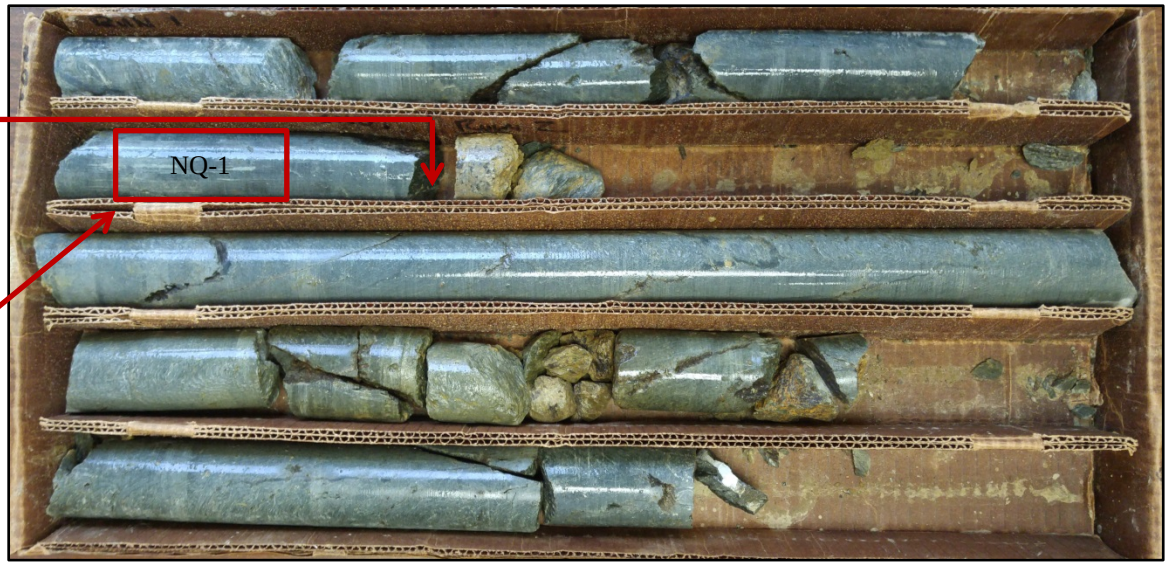


I-20/26/126 CORRIDOR IMPROVEMENTS

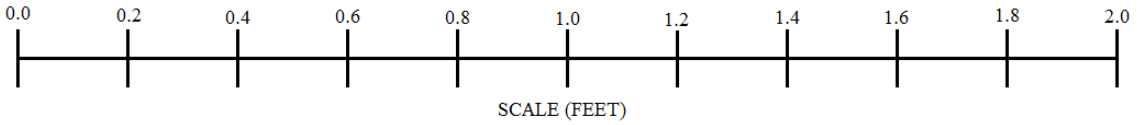
Boring DH-1: I-26 Alignment - Station 164+44, 85-ft LT

Begin Run 1
(38.6 – 41.3 ft)

Begin Run 2
(41.3 – 46.3 ft)



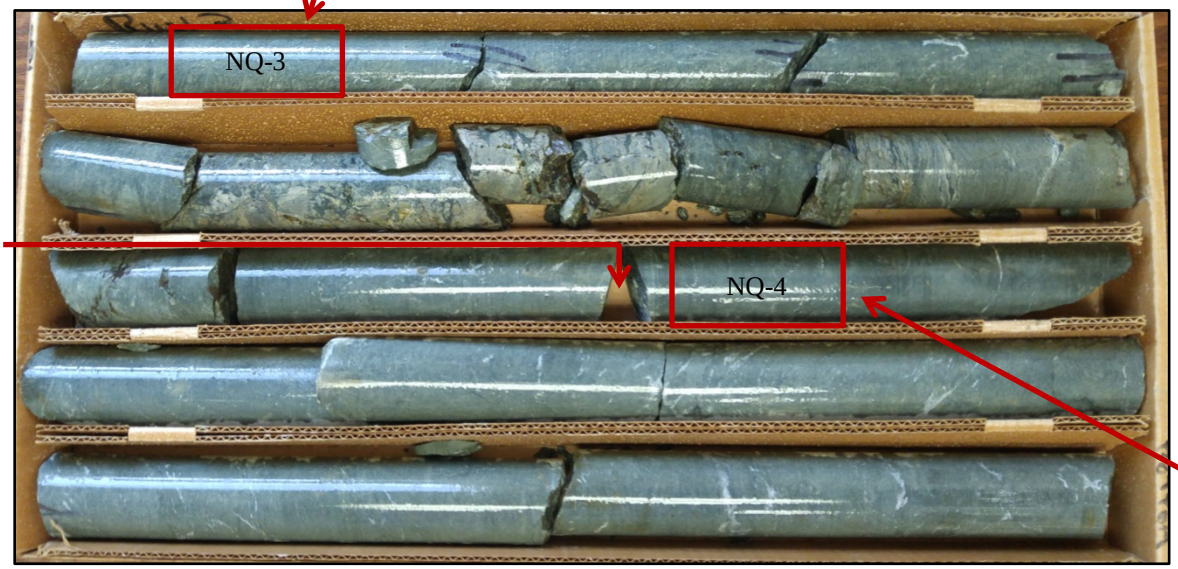
UC Strength
2,830 psi



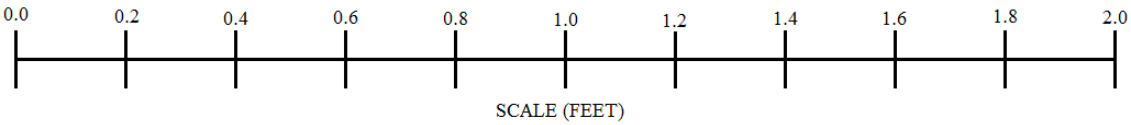
UC Strength
9,650 psi

Begin Run 3
(46.3-51.3 ft)

Begin Run 4
(51.3-56.3 ft)

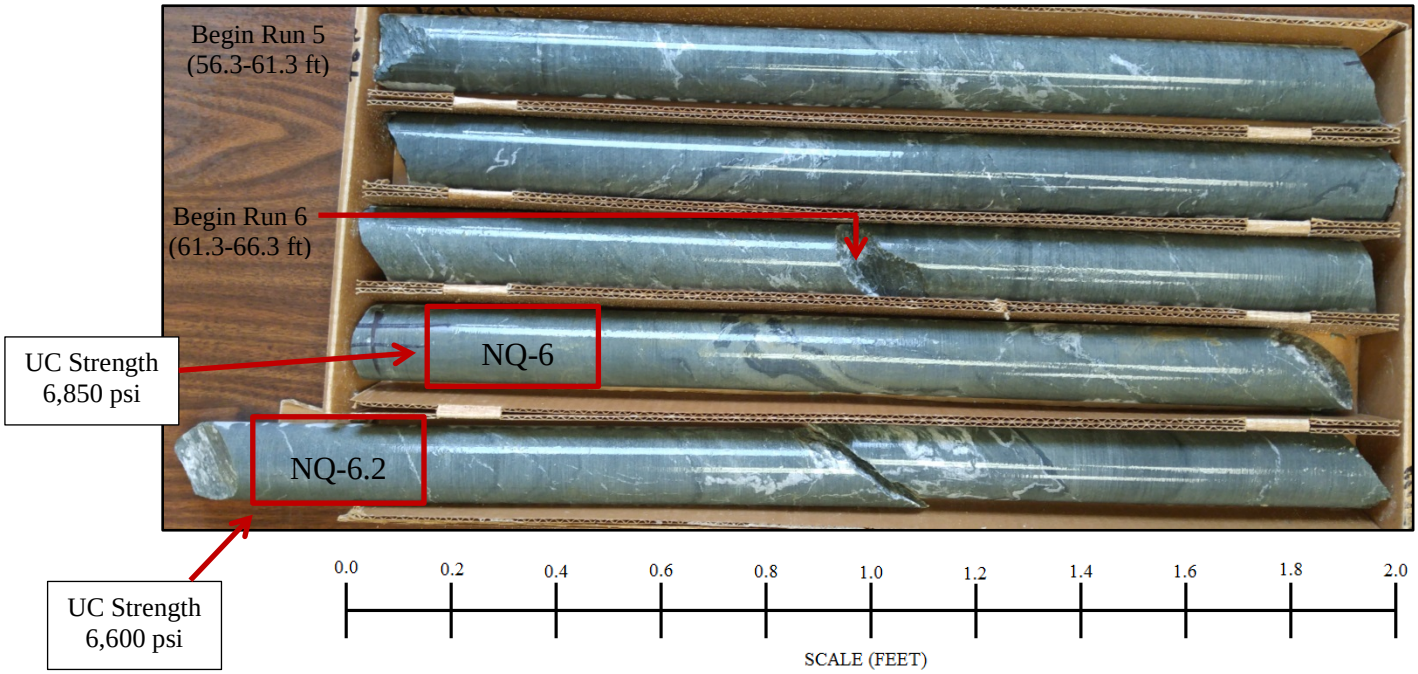


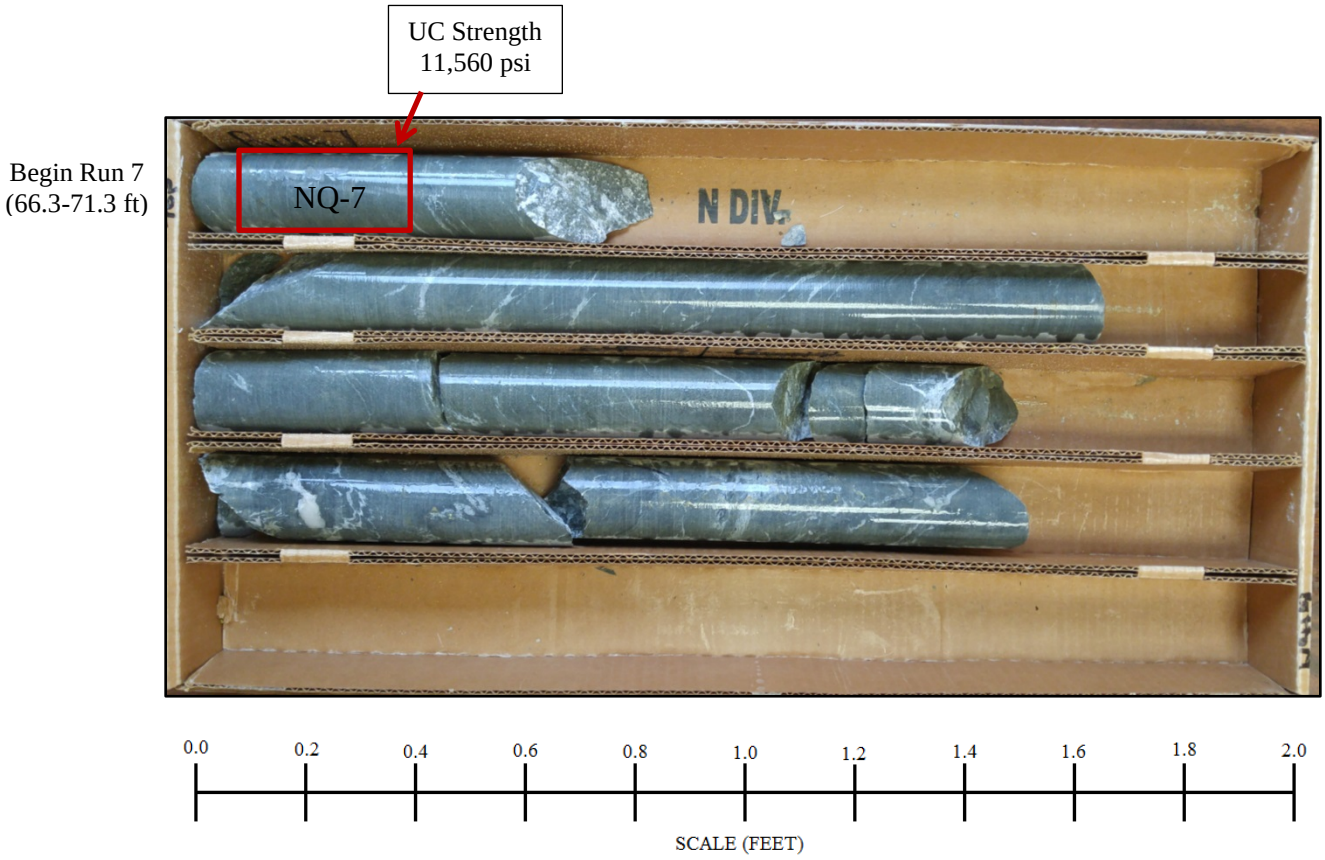
UC Strength
9,020 psi



I-20/26/126 CORRIDOR IMPROVEMENTS

Boring DH-1: I-26 Alignment - Station 164+44, 85-ft LT

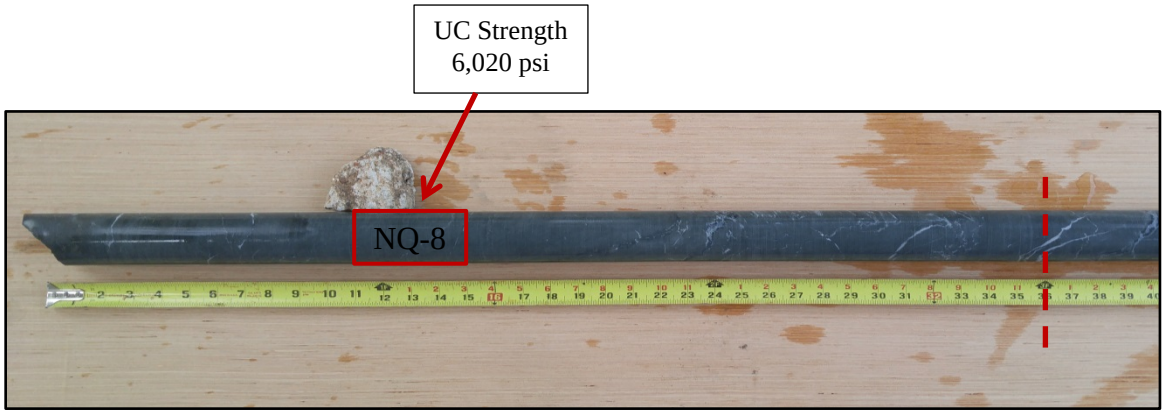




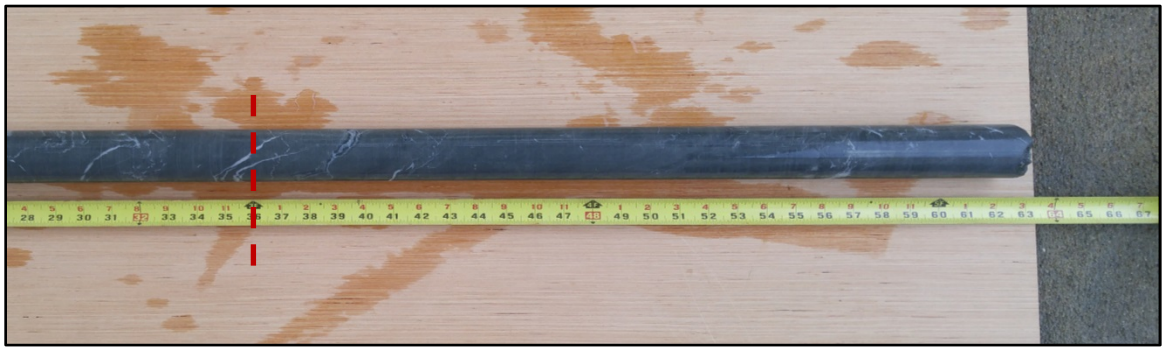
I-20/26/126 CORRIDOR IMPROVEMENTS

Boring DH-1: I-26 Alignment - Station 164+44, 85-ft LT

NQ-8 (71.3-76.3 ft)



NQ-8 (Top of Core)



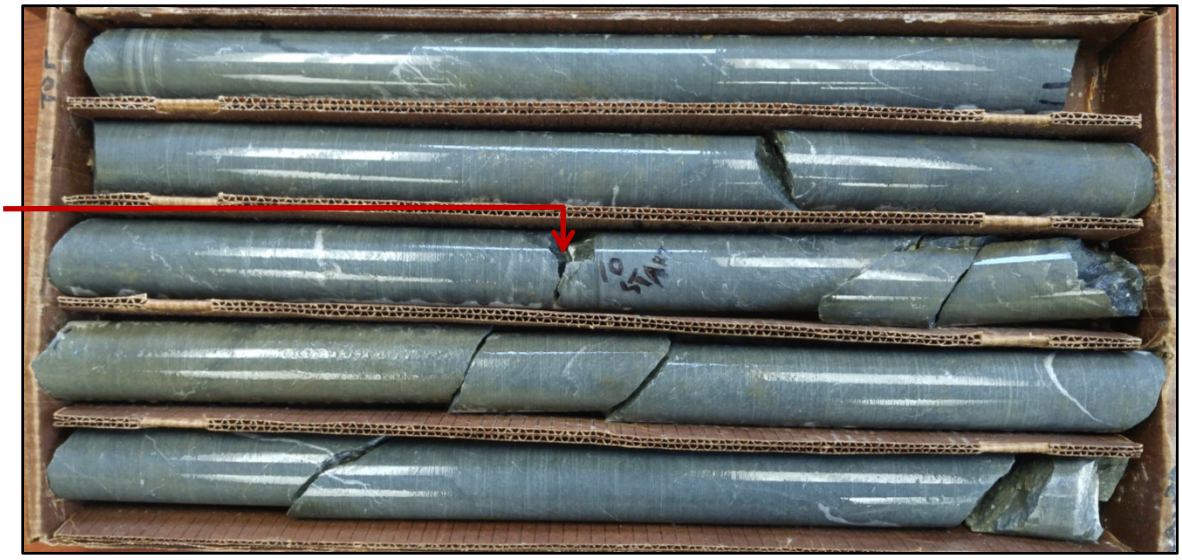
NQ-8 (Bottom of Core)

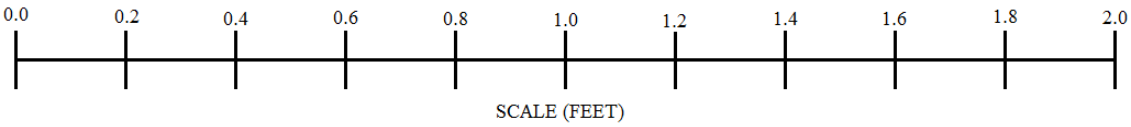
I-20/26/126 CORRIDOR IMPROVEMENTS

Boring DH-1: I-26 Alignment - Station 164+44, 85-ft LT

Begin Run 9
(76.3-81.3 ft)

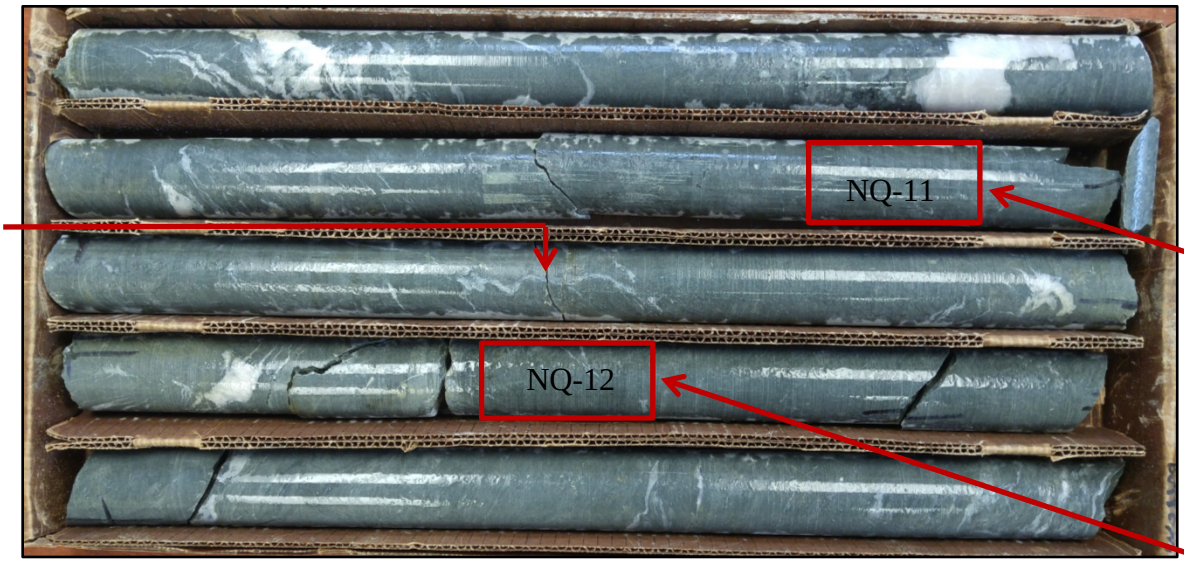
Begin Run 10
(76.3-81.3 ft)





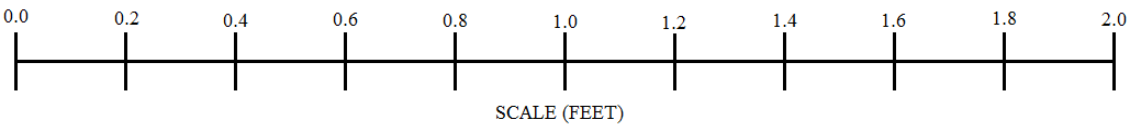
Begin Run 11
(86.3-91.3 ft)

Begin Run 12
(91.3-96.3 ft)



UC Strength
9,060 psi

UC Strength
6,460 psi

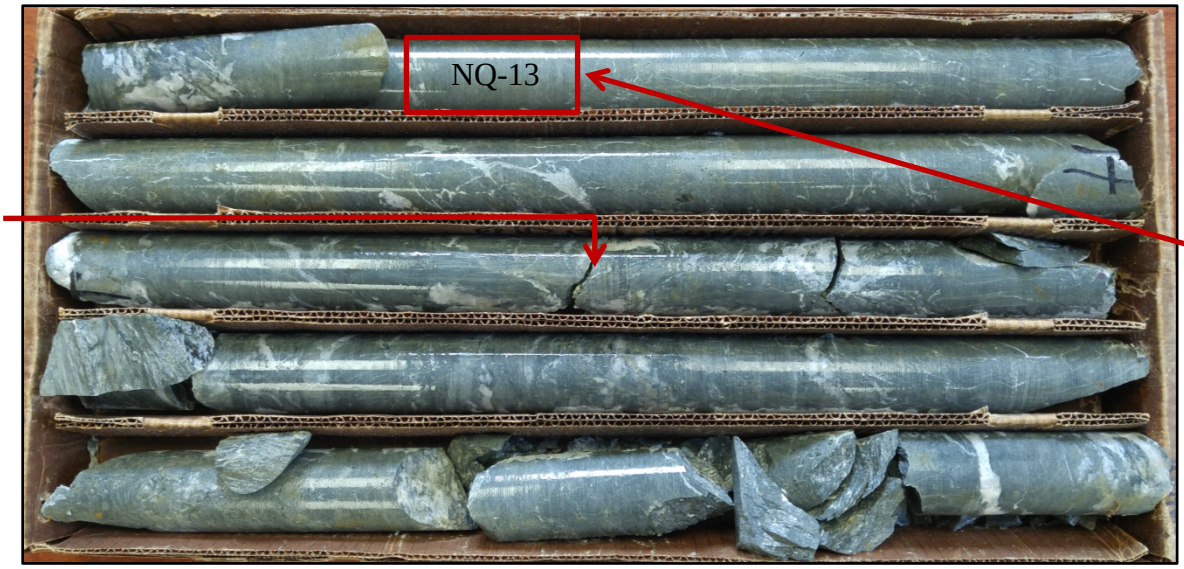


I-20/26/126 CORRIDOR IMPROVEMENTS

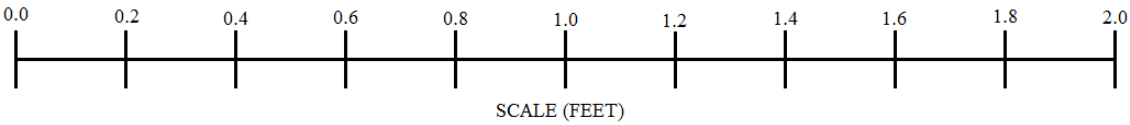
Boring DH-1: I-26 Alignment - Station 164+44, 85-ft LT

Begin Run 13
(96.3-101.3 ft)

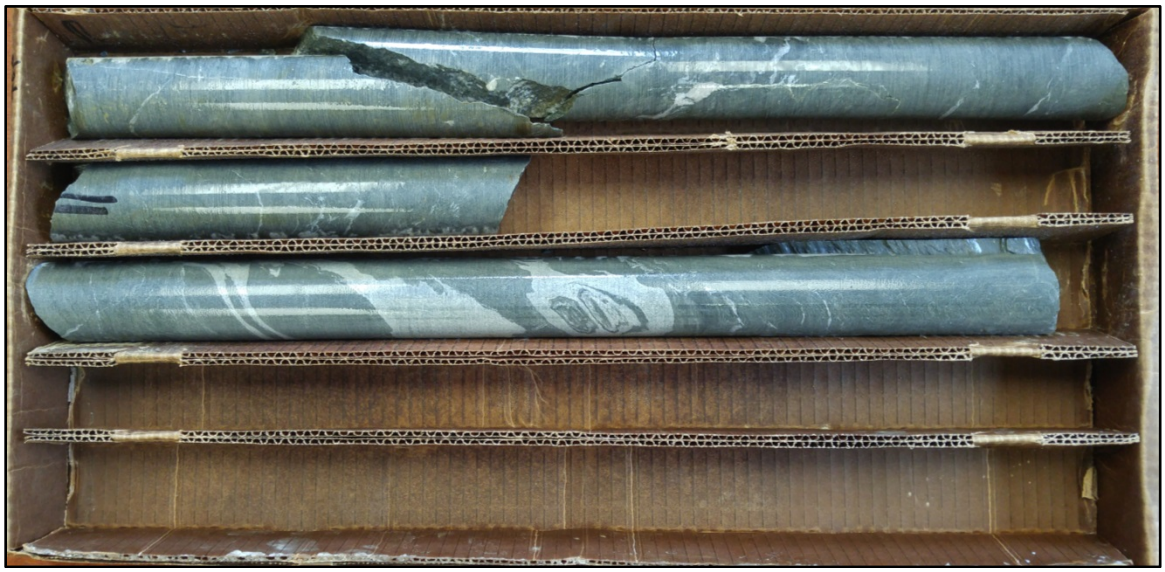
Begin Run 14
(101.3-106.3 ft)

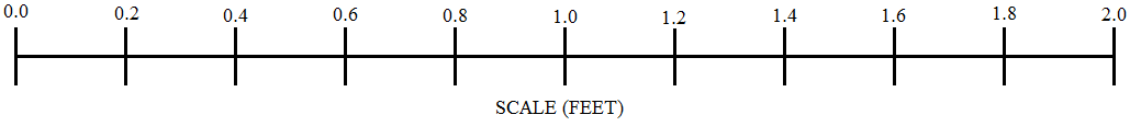


UC Strength
7,950 psi



Begin Run 15
(106.3-111.3 ft)

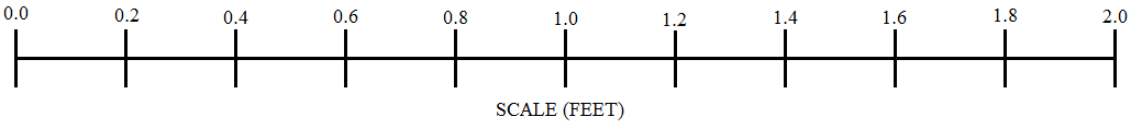


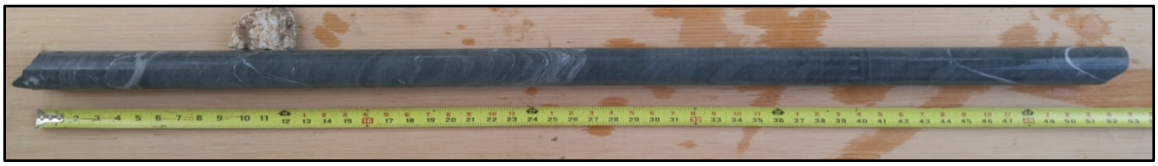


I-20/26/126 CORRIDOR IMPROVEMENTS

Boring DH-1: I-26 Alignment - Station 164+44, 85-ft LT

Begin Run 16
(111.3-116.3 ft)





NQ-17 (116-3-120.3 ft)

NQ-17 (Top of Core)

NQ-17 (Bottom of Core)

I-20/26/126 CORRIDOR IMPROVEMENTS

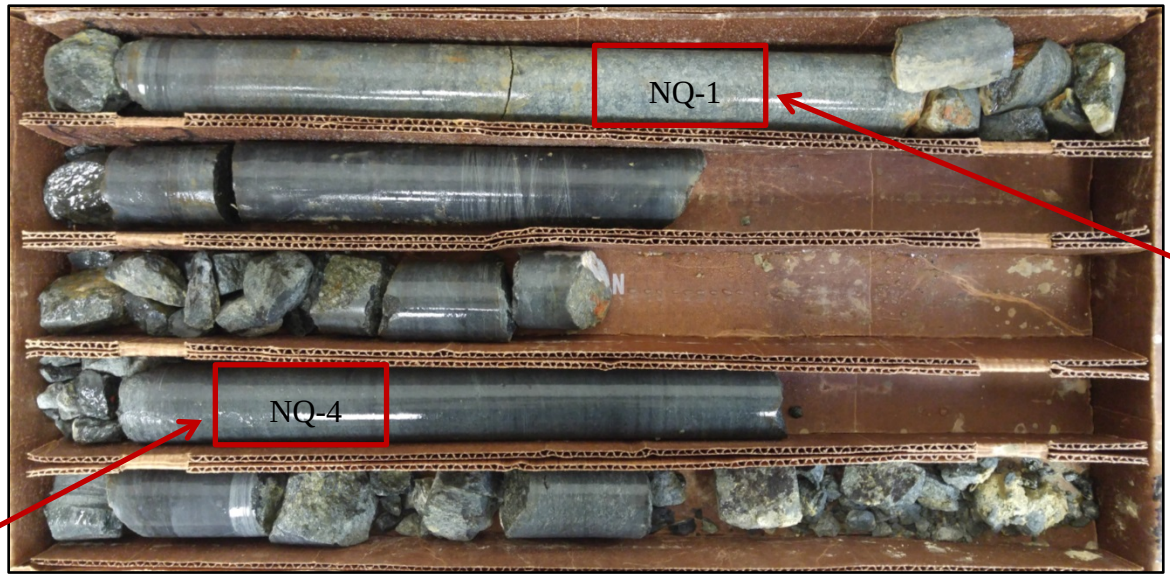
Boring DH-3A: I26RCA Alignment – Station 5383+53, 113 ft – R

Begin Run 1
(1.7-5.5 ft)

Begin Run 2
(13.9-15.8 ft)

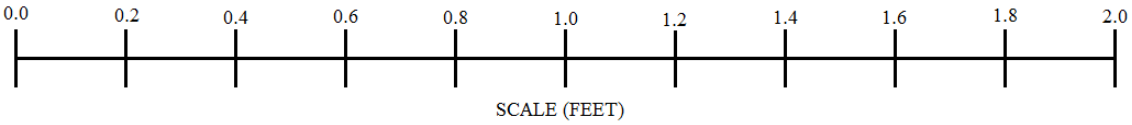
Begin Run 3
(15.8-20.8 ft)

Begin Run 4
(20.8-25.8 ft)



UC Strength
69510 psi

UC Strength
36670 psi



Soil (clay) was recovered in coring samples NQ-5 & NQ-6.

I-20/26/126 CORRIDOR IMPROVEMENTS

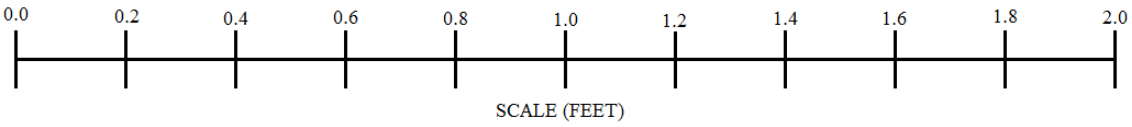
Boring DH-3A: I26RCA Alignment – Station 5383+53, 113 ft – R

Begin Run 7
(64.5-66.3 ft)

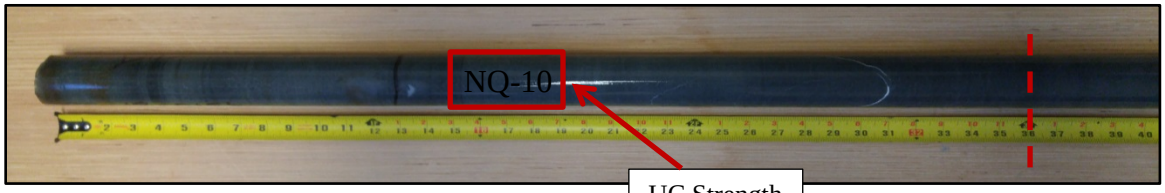
Begin Run 8
(66.3-71.3 ft)

Begin Run 9
(71.3-76.3 ft)

UC Strength
22610 psi

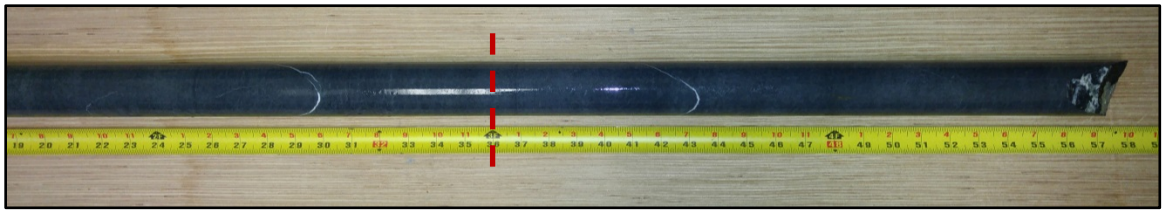


End Run 9 /
Begin Run 10
(76.3 ft)



NQ-9 & NQ-10 (Top of Core)

UC Strength
13710 psi



NQ-10 (Bottom of Core)

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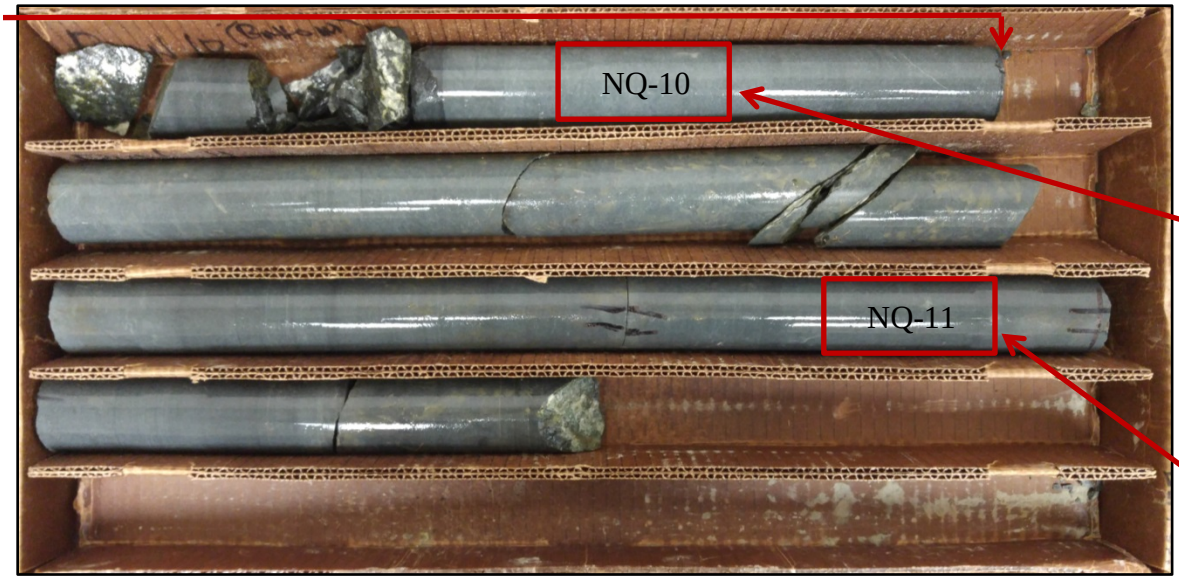
I-20/26/126 CORRIDOR IMPROVEMENTS

Boring DH-3A: I26RCA Alignment – Station 5383+53, 113 ft – R

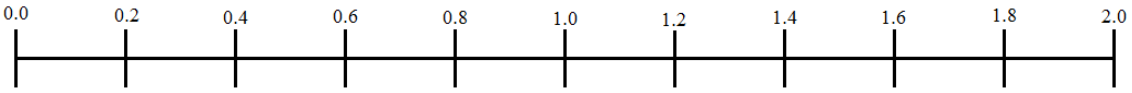
End Run 10
(81.3 ft)

Begin Run 11
(81.3-86.3 ft)



UC Strength
16760 psi

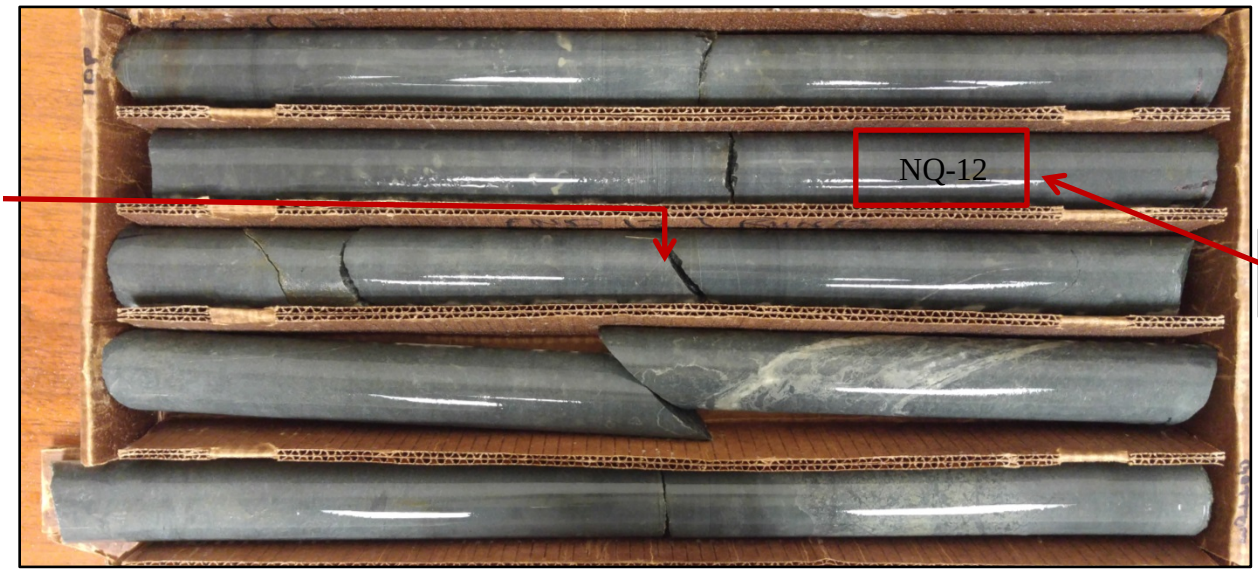
UC Strength
28600 psi



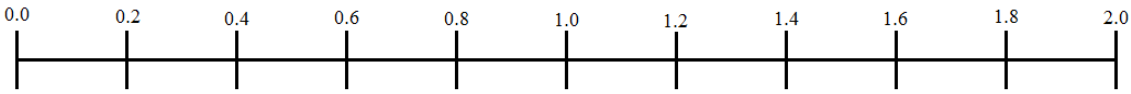
SCALE (FEET)

Begin Run 12
(86.3-91.3 ft)

Begin Run 13
(91.3-96.3 ft)



UC Strength
37260 psi

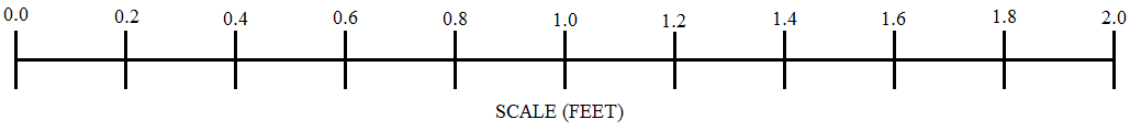


SCALE (FEET)

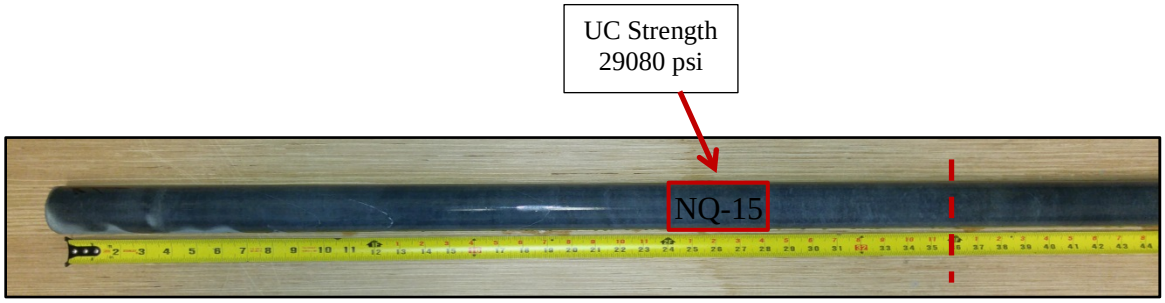
I-20/26/126 CORRIDOR IMPROVEMENTS

Boring DH-3A: I26RCA Alignment – Station 5383+53, 113 ft – R

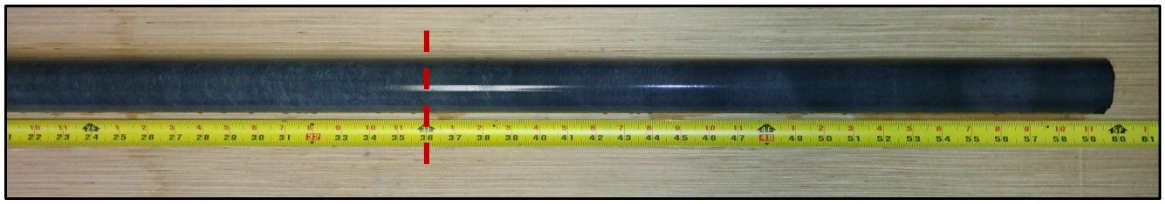
Begin Run 14
(96.3-101.3 ft)



NQ-15 (101.3-106.3 ft)



NQ-15 (Top of Core)



NQ-15 (Bottom of Core)

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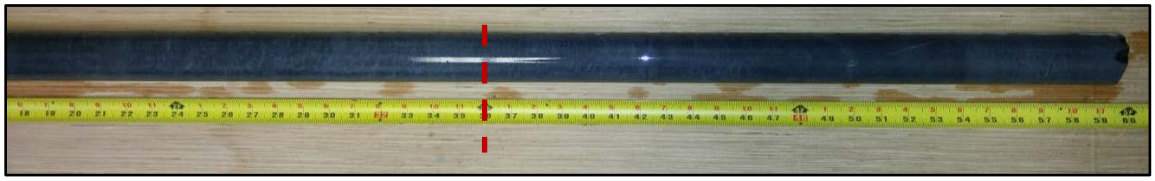
I-20/26/126 CORRIDOR IMPROVEMENTS

Boring DH-3A: I26RCA Alignment – Station 5383+53, 113 ft – R

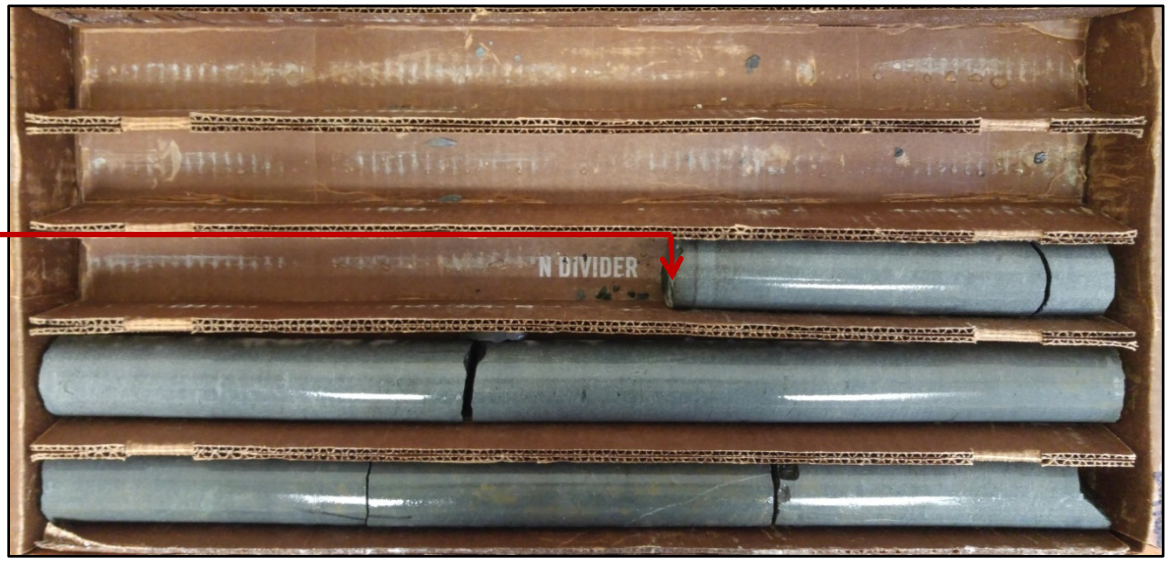
NQ-16 (106.3-111.3)

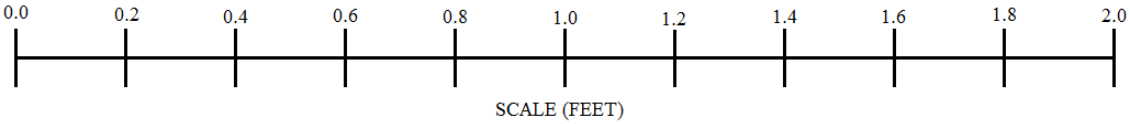
NQ-16 (Top of Core)



NQ-16 (Bottom of Core)

Begin Run 17
(111.3-116.3 ft)

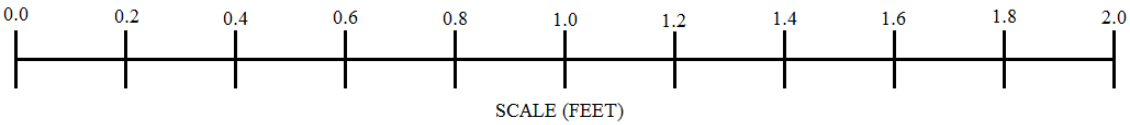




I-20/26/126 CORRIDOR IMPROVEMENTS

Boring DH-3A: I26RCA Alignment – Station 5383+53, 113 ft – R

Begin Run 18
(111.3-120.7 ft)

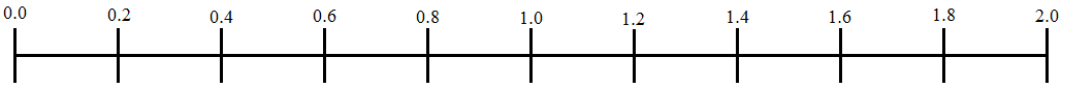


I-20/26/126 CORRIDOR IMPROVEMENTS

Boring W-1: I-26 Alignment – Station 31+13, Offset 94 ft – L

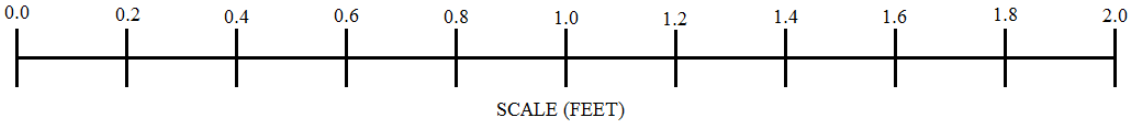
Begin Run 1
(15.7 – 20.7 ft)

Begin Run 2
(20.7 –25.7 ft)



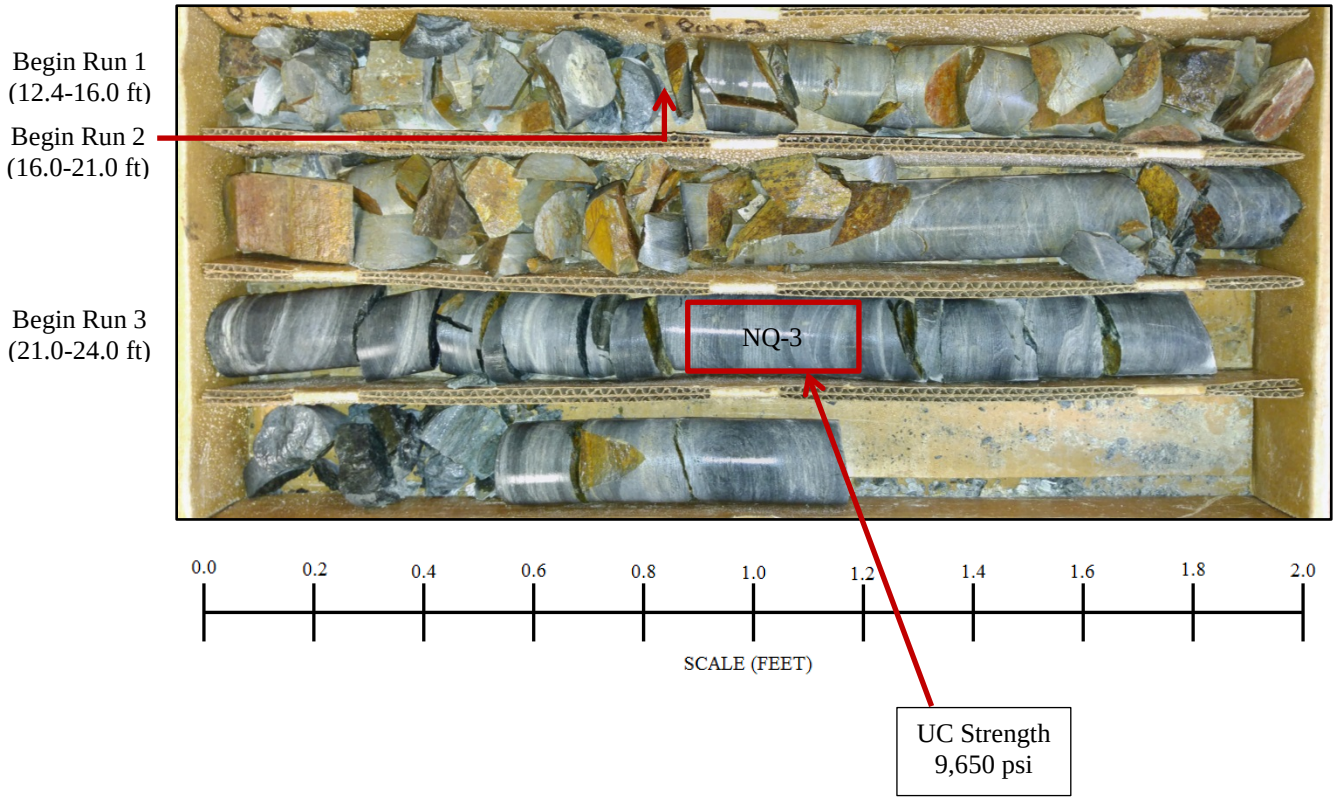
UC Strength
9,260 psi

Begin Run 3
(25.7 – 30.7 ft)



I-20/26/126 CORRIDOR IMPROVEMENTS

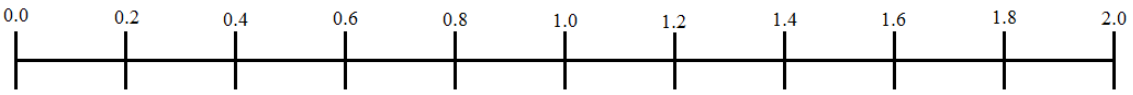
Boring W-2: I-26 Alignment – Station 40+35, Offset 56 ft – R



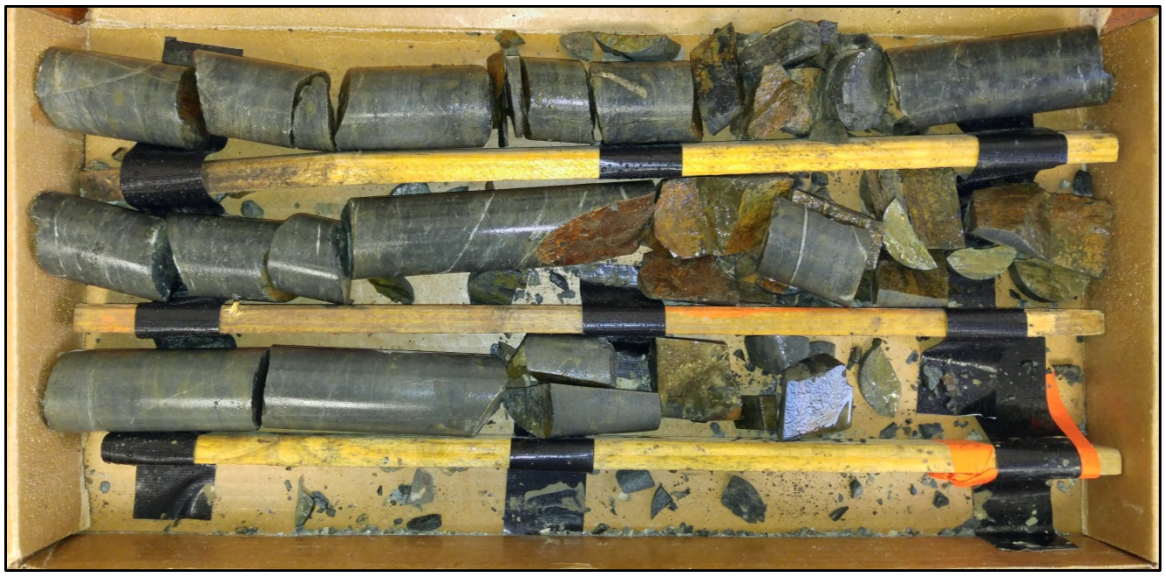
I-20/26/126 CORRIDOR IMPROVEMENTS

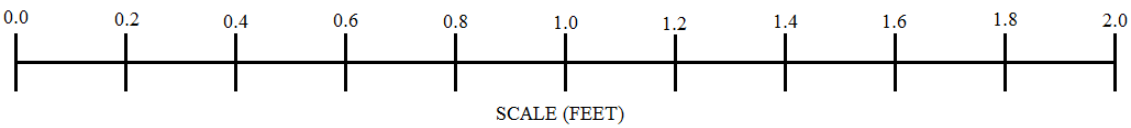
Boring W-3: I-26 Alignment – Station 43+71, Offset 61 ft – L

Begin Run 1
(4.1-6.3 ft)
Begin Run 2
(6.3-11.3 ft)



Begin Run 3
(11.3-16.3 ft)

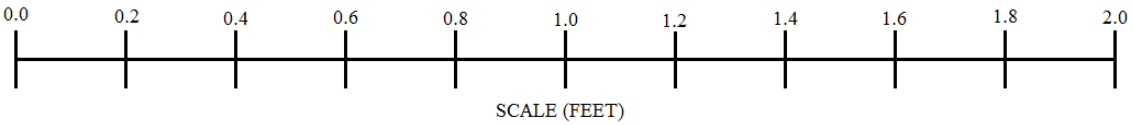




I-20/26/126 CORRIDOR IMPROVEMENTS

Boring W-3: I-26 Alignment – Station 43+71, Offset 61 ft – L

Begin Run 4
(16.3-21.3 ft)

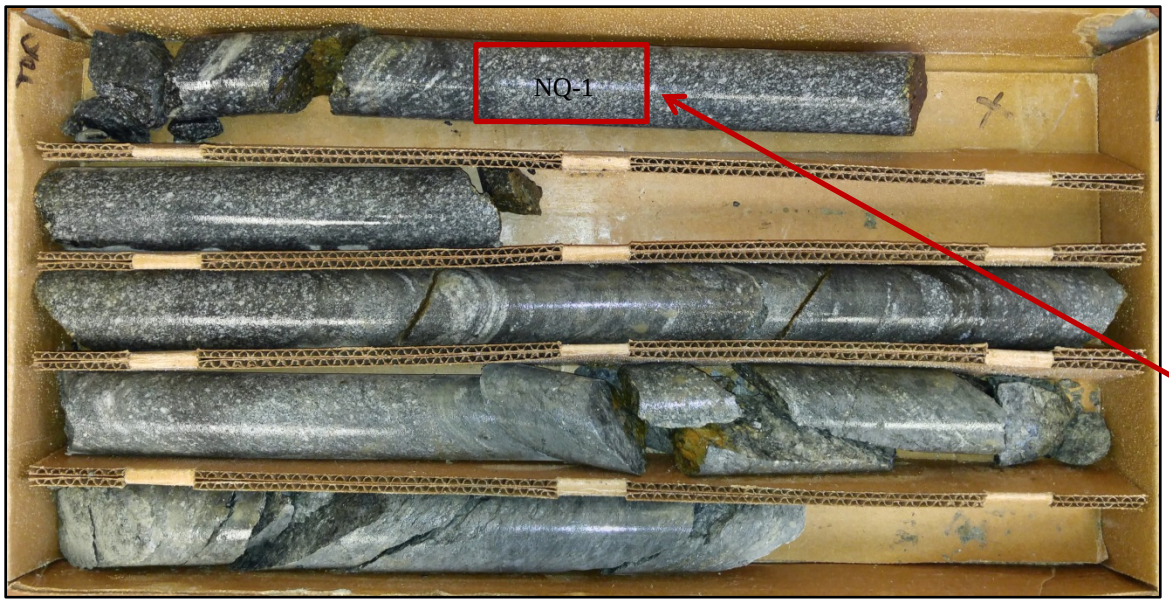


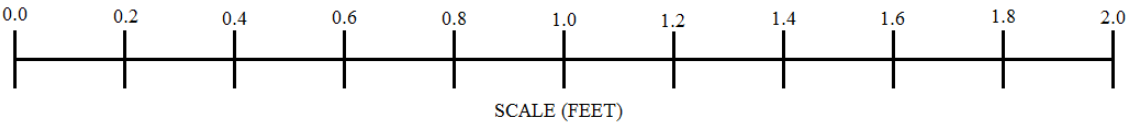
I-20/26/126 CORRIDOR IMPROVEMENTS

Boring W-5: I-26 Alignment – Station 84+21, Offset 67 ft – L

Begin Run 1
(9.0-11.7 ft)

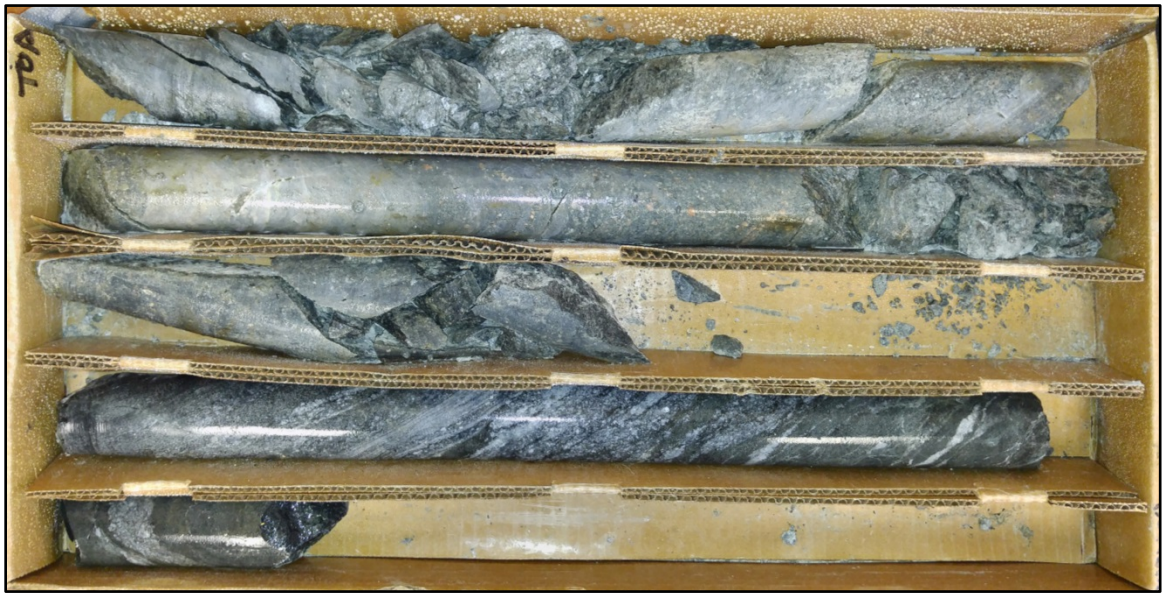
Begin Run 2
(11.7-16.7 ft)

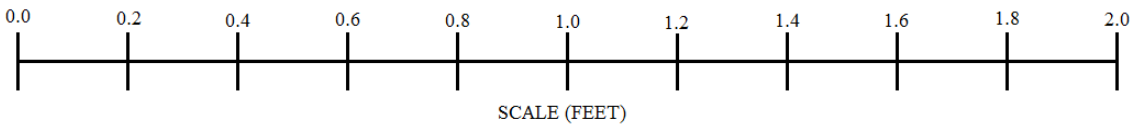




Begin Run 3
(16.7-21.5 ft)

Begin Run 4
(21.5-24.5 ft)

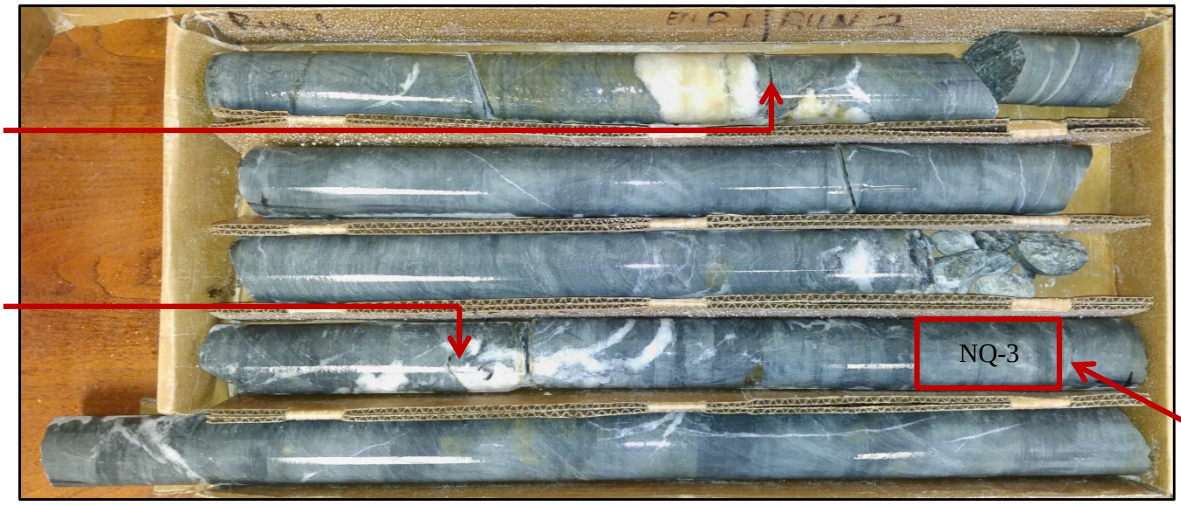




F&ME CONSULTANTS

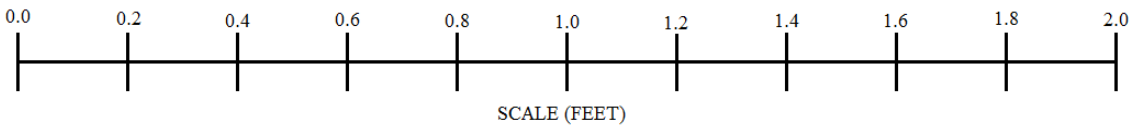
I-20/26/126 CORRIDOR IMPROVEMENTS

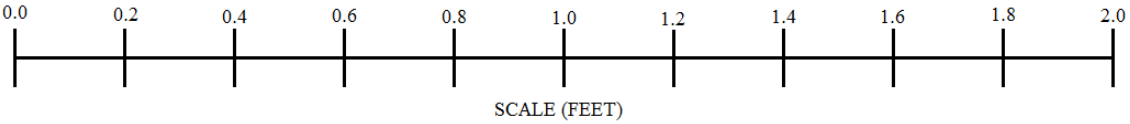
Boring W-7: I-26 Alignment - Station 177+11, Offset 101 ft – R



I-20/26/126 CORRIDOR IMPROVEMENTS

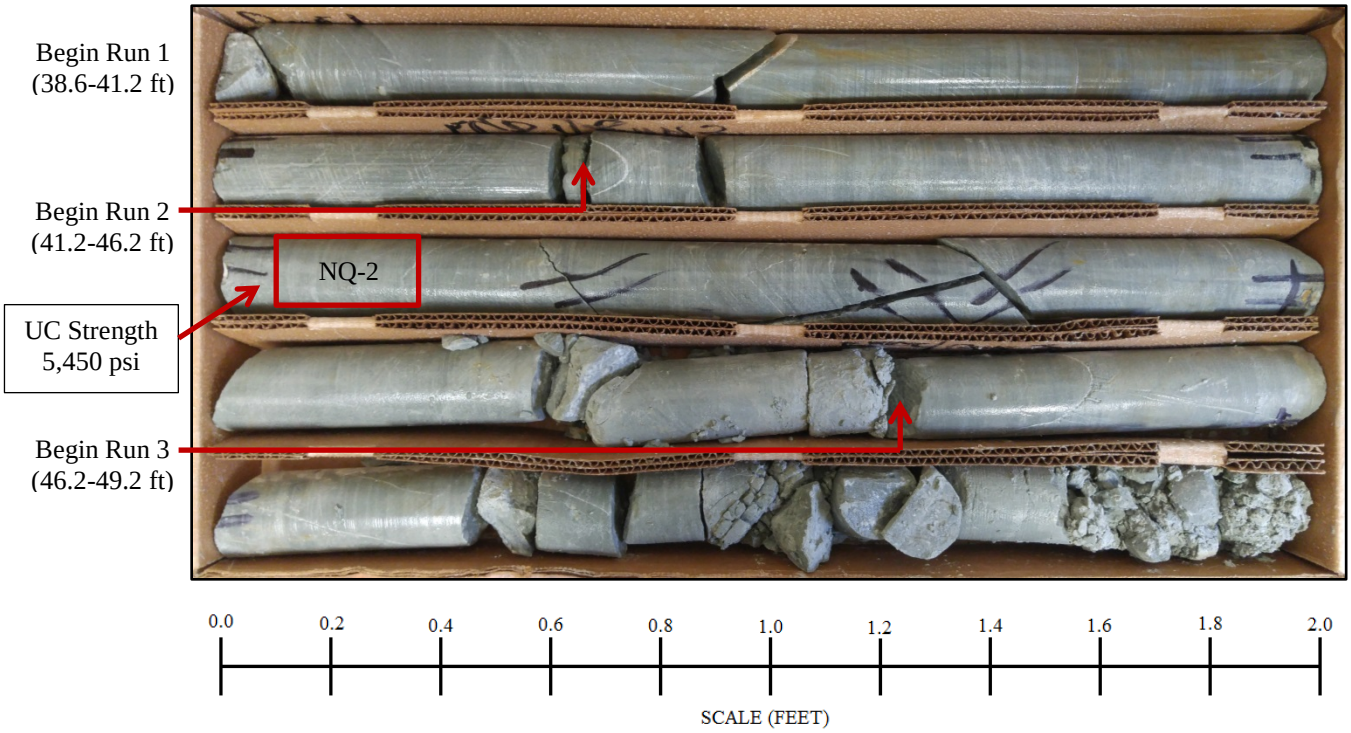
Boring W-8: I-26 Alignment – Station 180+57, Offset 99 ft – L





I-20/26/126 CORRIDOR IMPROVEMENTS

Boring W-9: I-26 Alignment - Station 192+74, Offset 57 ft – R

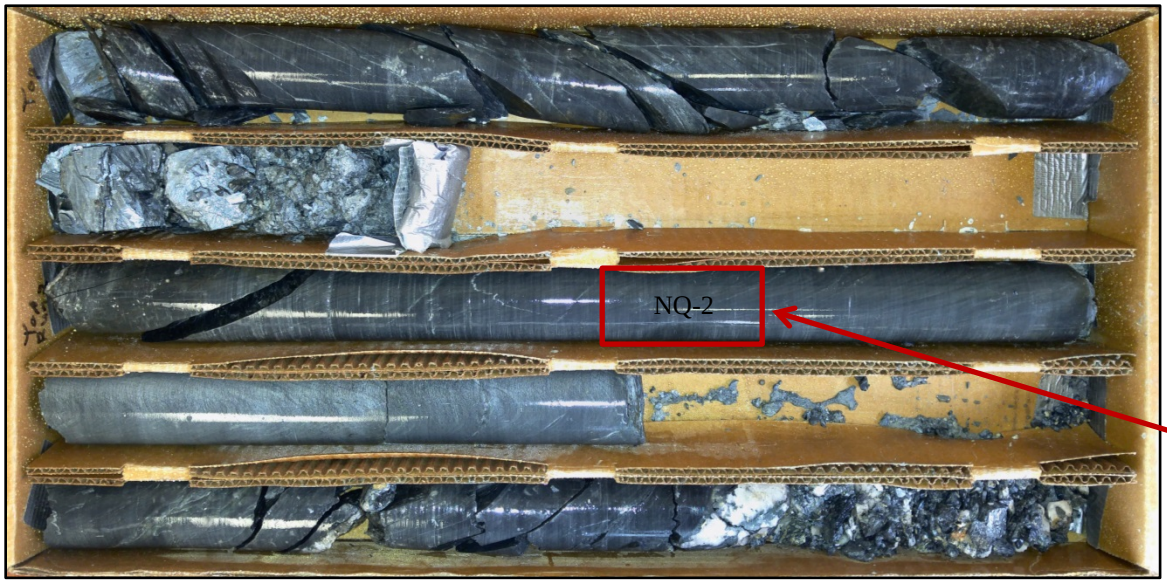


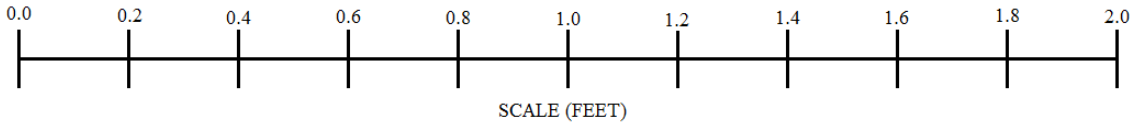
I-20/26/126 CORRIDOR IMPROVEMENTS

Boring RW-18: S-36 Alignment – Station 29+98, Offset 539 ft – R

Begin Run 1
(65.8-70.8 ft)

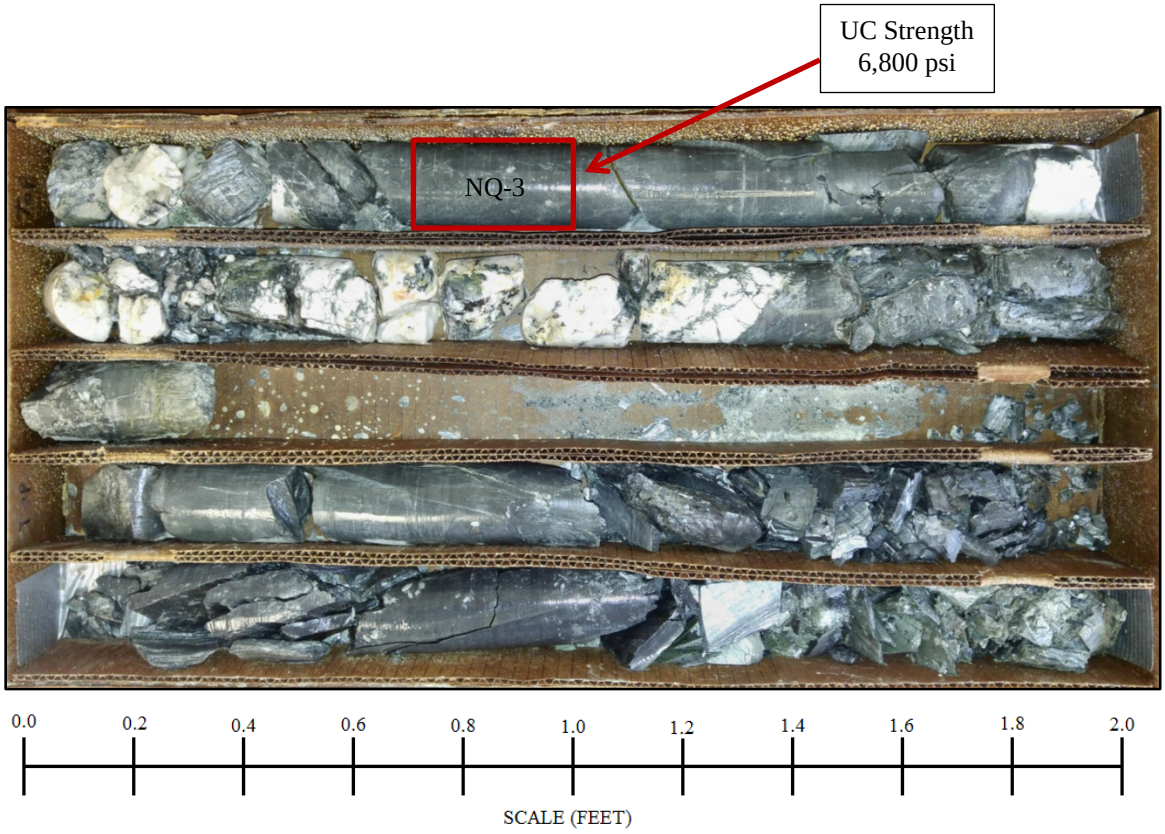
Begin Run 2
(70.8-75.8 ft)





Begin Run 3
(75.8-00.8 ft)

Begin Run 4
(80.8-85.8 ft)

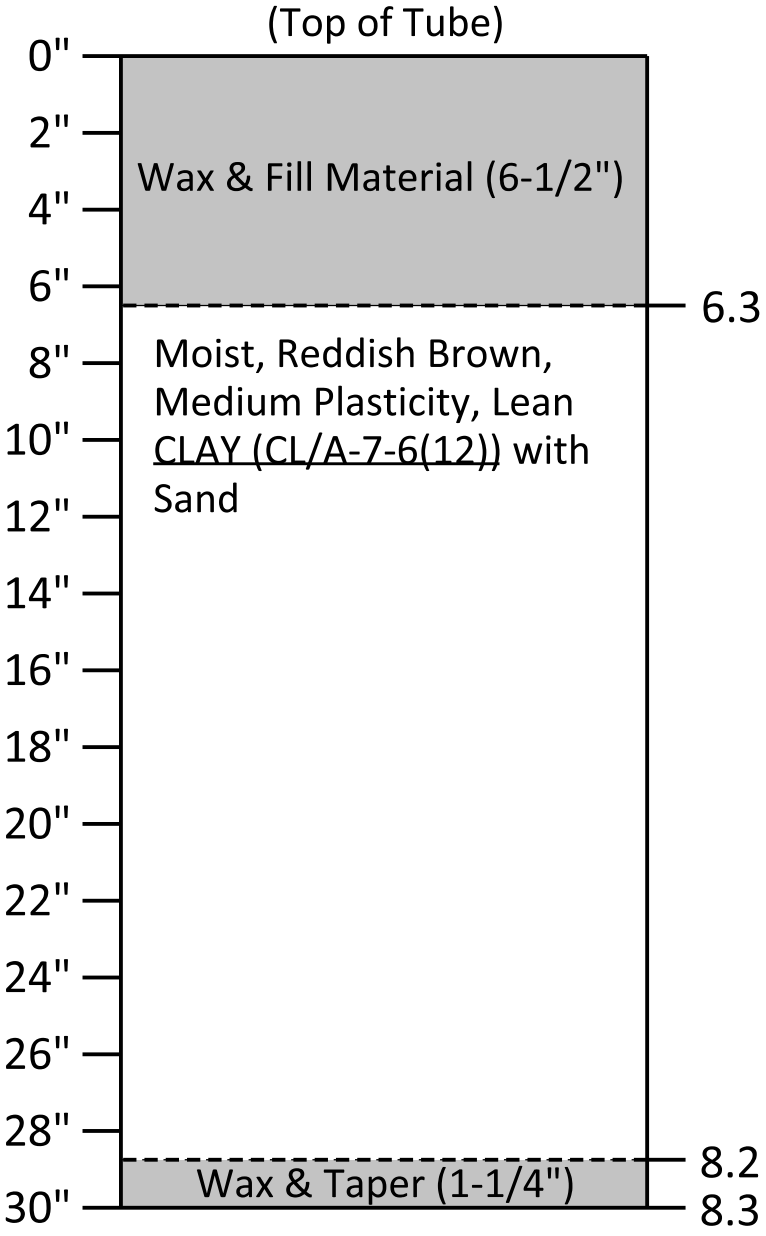


APPENDIX

SECTION 6 UD PREPARATION LOGS

UNDISTURBED SHELBY TUBE SAMPLE LOG

Shelby Tube UD-1



Prepared For: SCDOT

Project: Carolina Crossroads
I-20/26/126 Corridor Improvements

SCDOT Project ID: P027662

F&ME Project No.: G5662.01

Boring No.: AP-1

Sample Depth (feet): 6.0 - 8.3

Date Sampled: 5/23/2018

Date Pushed: 7/10/2018

Sample ID: 18-1029

Additional Comments:
The Shelby tube was advanced 28", and 23.5" of material was recovered. Sample was extruded by GeoTesting Express in Atlanta, GA. Grain size analysis, Atterberg limits and consolidated, undrained triaxial shear were performed on the sample.

LABORATORY TEST RESULTS							
Liquid Limit	Plastic Limit	Plasticity Index	%#200 Sieve	c (psi)	Φ	c' (psi)	Φ'
41	25	16	73.9	4.64	14.4	0.94	31.7

Client:	F&ME Consultants
Project Name:	I-20/26/126 Corridor Improvements
Project Location:	---
GTX #:	307802
Boring ID:	AP-1
Sample ID:	---
Depth, ft:	6-8.3

Top of Tube

Top of Sample

Moist, reddish brown clay

Bottom of Sample

Moist, reddish brown clay

Middle of Tube

Top of Sample

Moist, reddish brown clay

Bottom of Sample

Moist, reddish brown clay

Bottom of Tube

Top of Sample

Moist, reddish brown clay

Bottom of Sample

Moist, reddish brown clay

Client:	F&ME Consultants
Project Name:	I-20/26/126 Corridor Improvements
Project Location:	---
GTX #:	307802
Boring ID:	AP-1
Sample ID:	---
Depth, ft:	6-8.3

Top of Tube

Moist, reddish brown clay

Middle of Tube

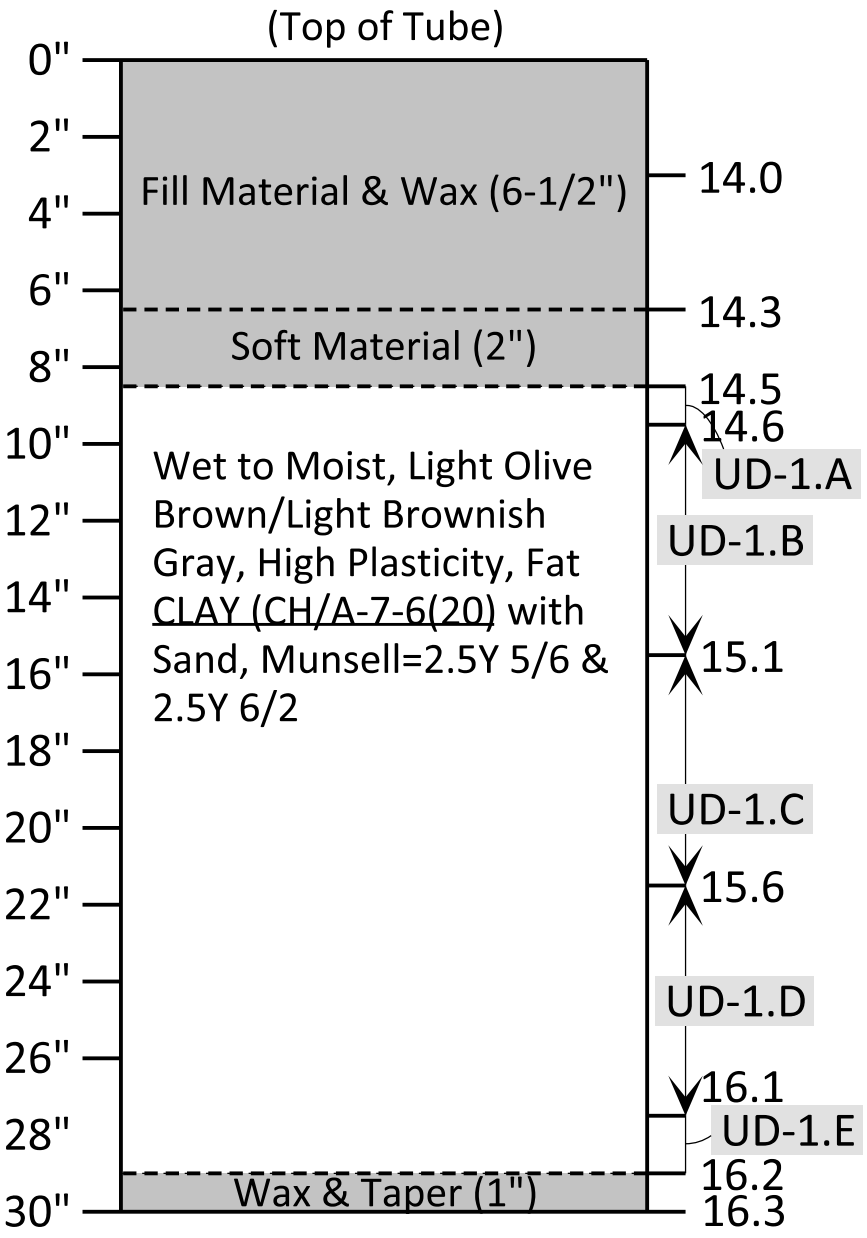
Moist, reddish brown clay

Bottom of Tube

Moist, reddish brown clay

UNDISTURBED SHELBY TUBE SAMPLE LOG

Shelby Tube UD-1



Prepared For: SCDOT

Project: Carolina Crossroads
I-20/26/126 Corridor Improvements

SCDOT Project ID: P027662

F&ME Project No.: G5662.01

Boring No.: AP-2

Sample Depth (feet): 14.0 - 16.3

Date Sampled: 5/23/2018

Date Pushed: 5/24/2018

Sample ID: 18-1034

Additional Comments:
Shelby tube was advanced 27", and 23-1/2" of material was recovered. The top 2" of sample were very soft and wet and were removed before extraction. Sample UD-1.A was also very soft and wet. Samples UD-1.B, UD-1.C, and UD-1.D were used for consolidated, undrained triaxial shear. Sample UD-2.E was used for grain size analysis and Atterberg limits.

LABORATORY TEST RESULTS							
Liquid Limit	Plastic Limit	Plasticity Index	%#200 Sieve	c (psi)	Φ	c' (psi)	Φ'
56	26	30	74.5	3.64	1.4	3.74	1.8

I-20/26/126 CORRIDOR IMPROVEMENTS

Boring AP-2: I-26 Alignment – Station 96+28, Offset 47 ft – L

UD-1.A (14.5 – 14.6 ft)

UD-1.B (14.6 – 15.1 ft)

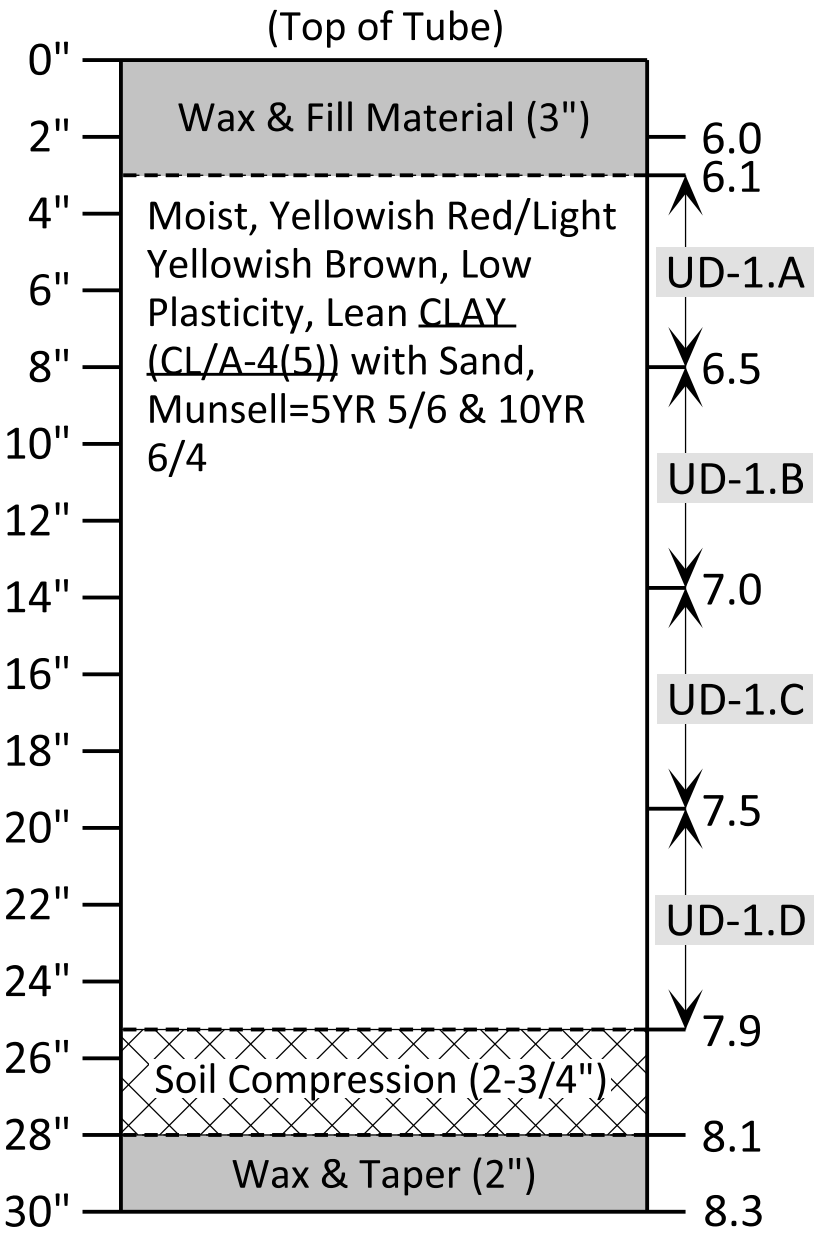
UD-1.C (15.1 – 15.6 ft)

UD-1.D (15.6 – 16.1 ft)

UD-1.E (16.1 – 16.2 ft)

UNDISTURBED SHELBY TUBE SAMPLE LOG

Shelby Tube UD-1



Prepared For: SCDOT

Project: Carolina Crossroads
I-20/26/126 Corridor Improvements

SCDOT Project ID: P027662

F&ME Project No.: G5662.01

Boring No.: AP-3

Sample Depth (feet): 6.0 - 8.3

Date Sampled: 5/23/2018

Date Pushed: 6/19/2018

Sample ID: 18-1037

Additional Comments:
Shelby tube was advanced 28", and 27" of material was recovered. Approximately 2-1/2" of soil compression occurred during extraction. Samples UD-1.B, UD-1.C & UD-1.D were used for consolidated, undrained triaxial shear. Sample UD-1.C was used for grain size analysis and Atterberg limits.

LABORATORY TEST RESULTS							
Liquid Limit	Plastic Limit	Plasticity Index	%#200 Sieve	c (psi)	Φ	c' (psi)	Φ'
28	20	8	80.7	0.00	28.5	0.00	41.0

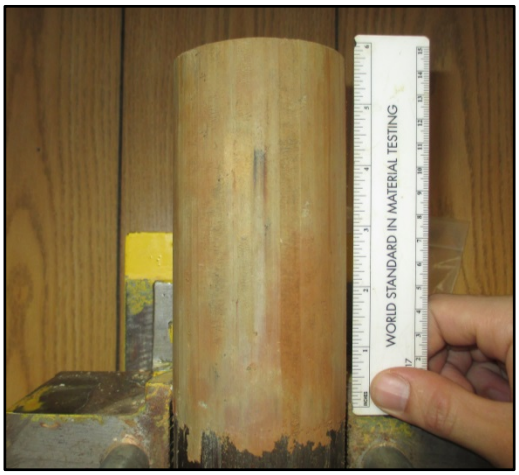
I-20/26/126 CORRIDOR IMPROVEMENTS

Boring AP-3: I-26 Alignment – Station 116+31, Offset 44 ft – R

UD-1.A (6.1 – 6.5 ft)

UD-1.B (6.5 – 7.0 ft)

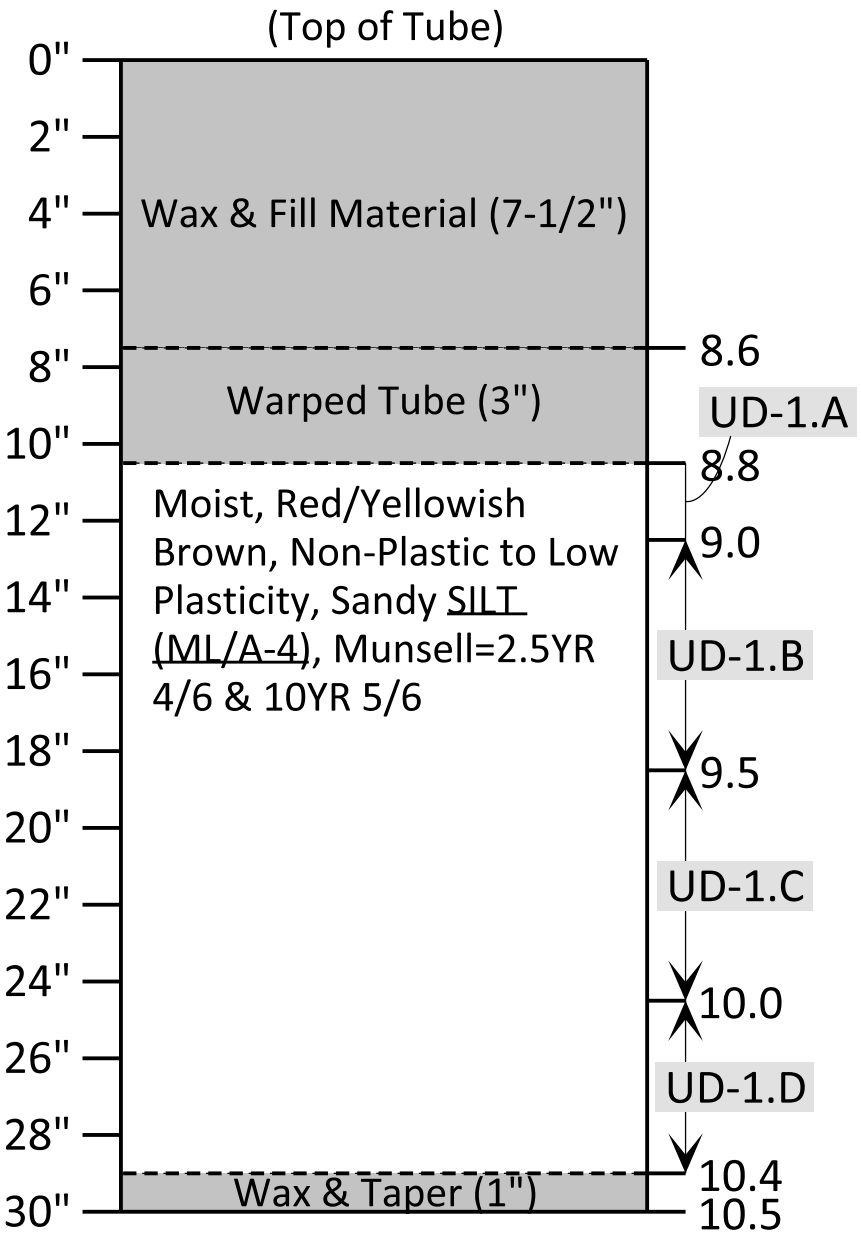
UD-1.C (7.0 – 7.5 ft)



UD-1.D (7.5 – 7.9 ft)

UNDISTURBED SHELBY TUBE SAMPLE LOG

Shelby Tube UD-1



Prepared For: SCDOT

Project: Carolina Crossroads
I-20/26/126 Corridor Improvements

SCDOT Project ID: P027662

F&ME Project No.: G5662.01

Boring No.: AP-4

Sample Depth (feet): 8.0 - 10.5

Date Sampled: 5/23/2018

Date Pushed: 6/13/2018

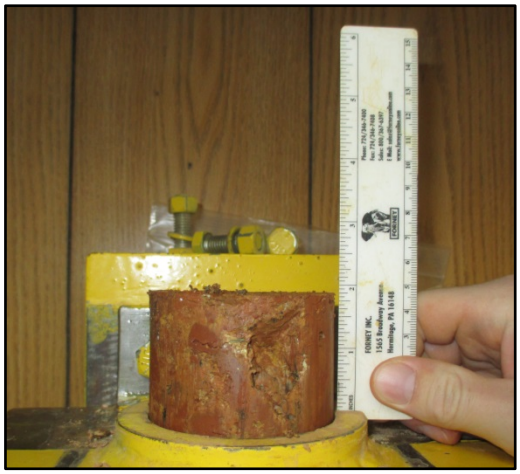
Sample ID: 18-1035

Additional Comments:
Shelby tube was advance 30", and 22-1/2" of material was recovered. The top 3" of the tube containing recovered material was damaged and had to be removed. Sample UD-1.A contained a large piece of quartz gravel and a sizeable void. Sample UD-1.B contained a large void. Triaxial shear, grain size, and Atterberg limits were not performed .

LABORATORY TEST RESULTS							
Liquid Limit	Plastic Limit	Plasticity Index	%#200 Sieve	c (psi)	Φ	c' (psi)	Φ'
--	--	--	--	--	--	--	--

I-20/26/126 CORRIDOR IMPROVEMENTS

Boring AP-4: I-26 Alignment – Station 276+32, Offset 46 ft – L

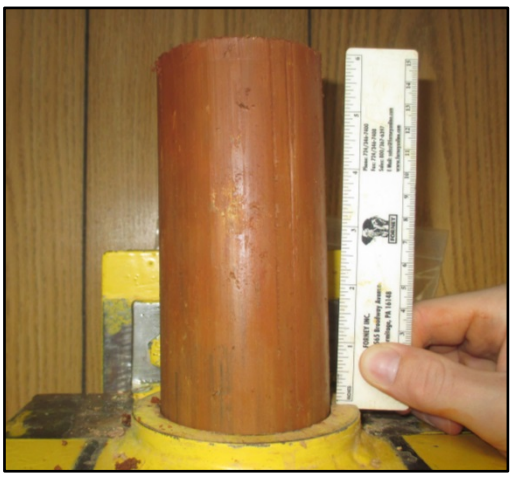


UD-1.A (8.8 - 9.0 ft)

UD-1.B (9.0 – 9.5 ft)

UD-1.B (Void)

UD-1.B (Void)

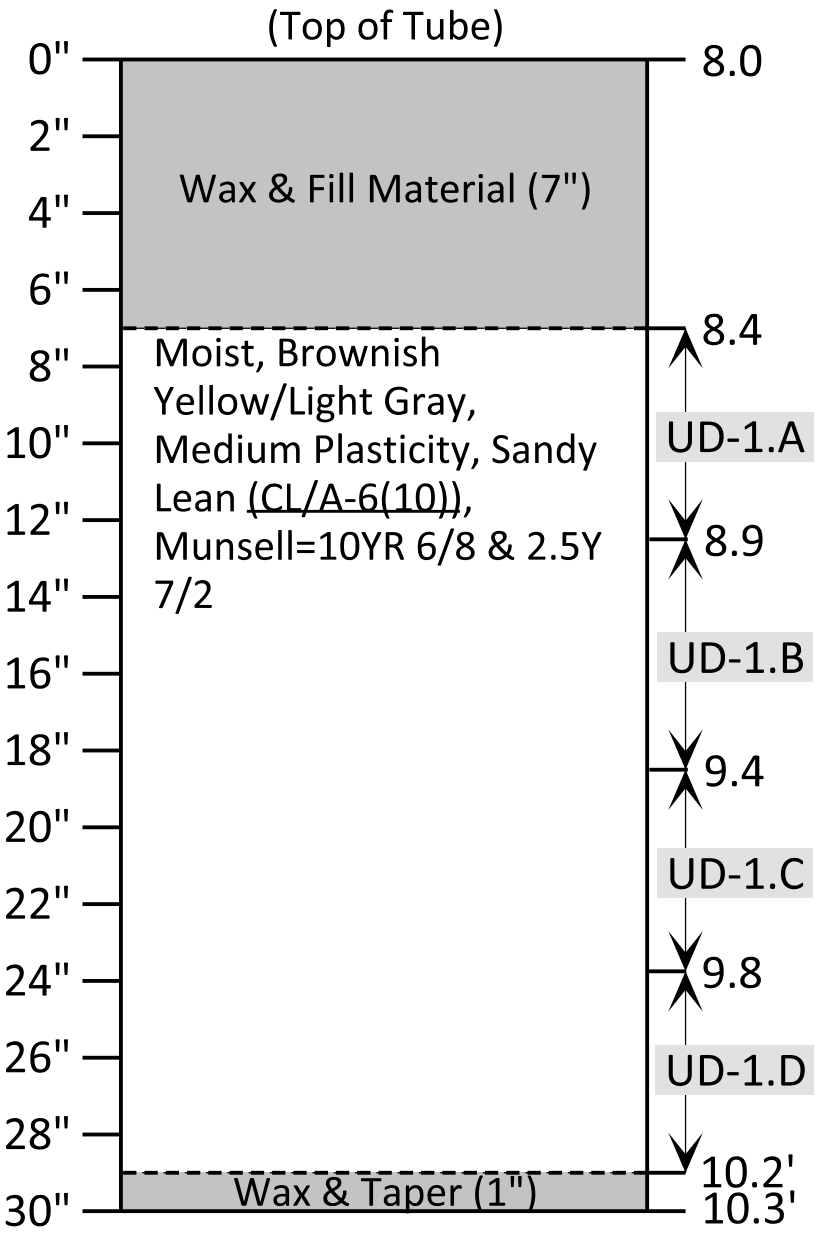


UD-1.C (9.5 – 10.0 ft)

UD-1.D (10.0 – 10.4 ft)

UNDISTURBED SHELBY TUBE SAMPLE LOG

Shelby Tube UD-1



Prepared For: SCDOT

Project: Carolina Crossroads
I-20/26/126 Corridor Improvements

SCDOT Project ID: P027662

F&ME Project No.: G5662.01

Boring No.: AP-5

Sample Depth (feet): 8.0 - 10.3

Date Sampled: 5/23/2018

Date Pushed: 6/12/2018

Sample ID: 18-1030

Additional Comments:
The Shelby tube was advanced 28", and 23" of material was recovered. Spamples UD-1.A contained several voids. Samples UD-1.B & UD-1.C contained large pieces of quartz gravel throughout the specimens. Sample UD-1.C was used for grain size analysis and Atterberg limits. Sample UD-1.D was used for consolidation.

LABORATORY TEST RESULTS							
Liquid Limit	Plastic Limit	Plasticity Index	%#200 Sieve	c (psi)	Φ	c' (psi)	Φ'
40	24	16	70.4	--	--	--	--

I-20/26/126 CORRIDOR IMPROVEMENTS

Boring AP-5: I-26 Alignment – Station 298+72, Offset 86 ft – R

UD-1.A (8.4 – 8.9 ft)

UD-1.A (Voids)

UD-1.A (Voids)

UD-1.B (8.9 – 9.4 ft)

UD-1.B (Quartz Gravel in Bottom)

UD-1.C (9.4 – 9.8 ft)

I-20/26/126 CORRIDOR IMPROVEMENTS

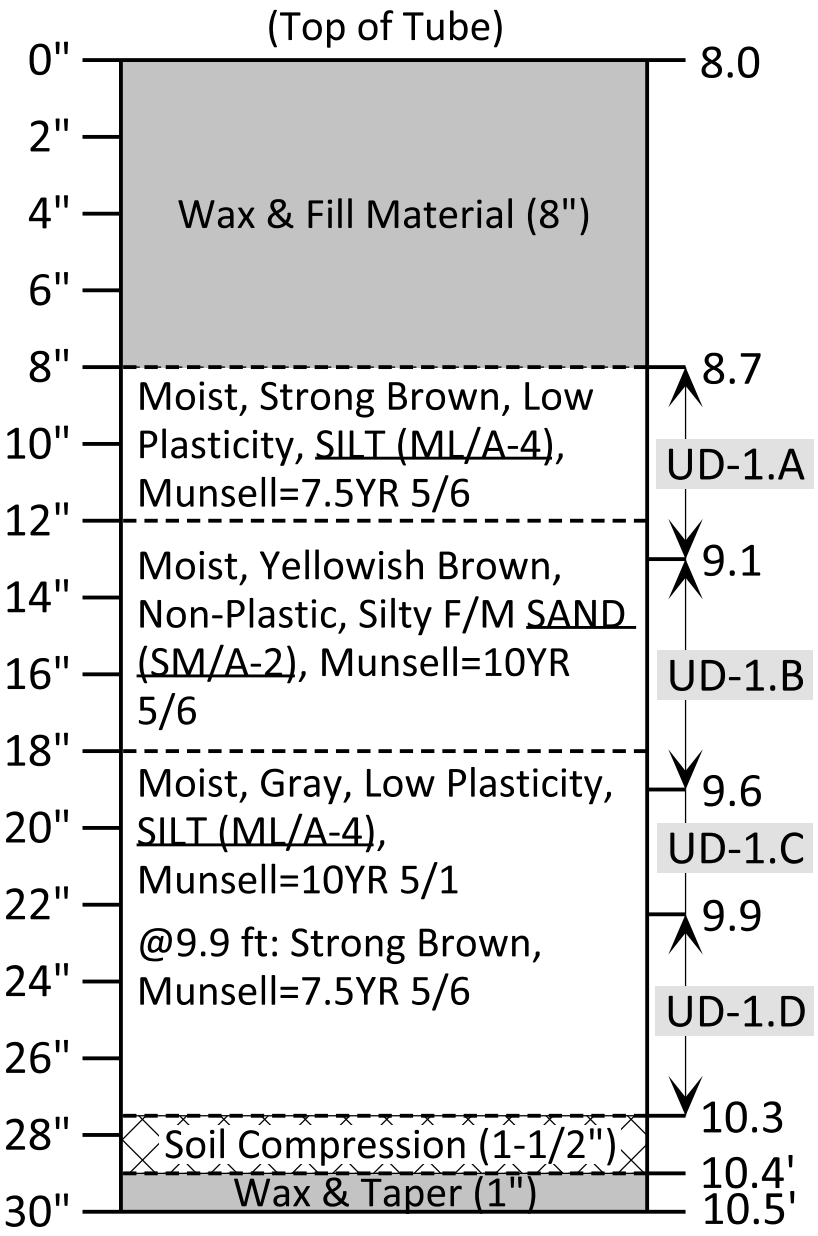
Boring AP-5: I-26 Alignment – Station 298+72, Offset 86 ft – R

UD-1.D (9.8 – 10.2 ft)

UD-1.D (Wax at Bottom of Tube)

UNDISTURBED SHELBY TUBE SAMPLE LOG

Shelby Tube UD-1



Prepared For: SCDOT

Project: Carolina Crossroads
I-20/26/126 Corridor Improvements

SCDOT Project ID: P027662

F&ME Project No.: G5662.01

Boring No.: AP-6

Sample Depth (feet): 8.0 - 10.5

Date Sampled: 5/18/2018

Date Pushed: 6/14/2018

Sample ID: 18-0984

Additional Comments:
The Shelby tube was advanced 30", and 22" of material was recovered. Sample UD-1.A contained several voids filled with wax & a large chunk of wood. Approximately 1-1/2" of soil compression occurred during extraction. Very soft, wet silt squeezed out from between the tube and the piston head at the bottom of the tube during extraction.

LABORATORY TEST RESULTS							
Liquid Limit	Plastic Limit	Plasticity Index	%#200 Sieve	c (psi)	Φ	c' (psi)	Φ'
--	--	--	--	--	--	--	--

I-20/26/126 CORRIDOR IMPROVEMENTS

Boring AP-6: S-36 (St. Andrews Rd) Alignment – Station 30+75, Offset 269 ft – L

UD-1.A (8.7 – 9.1 ft)

UD-1.A (Wood Fragments)

UD-1.B (9.1 – 9.6 ft)

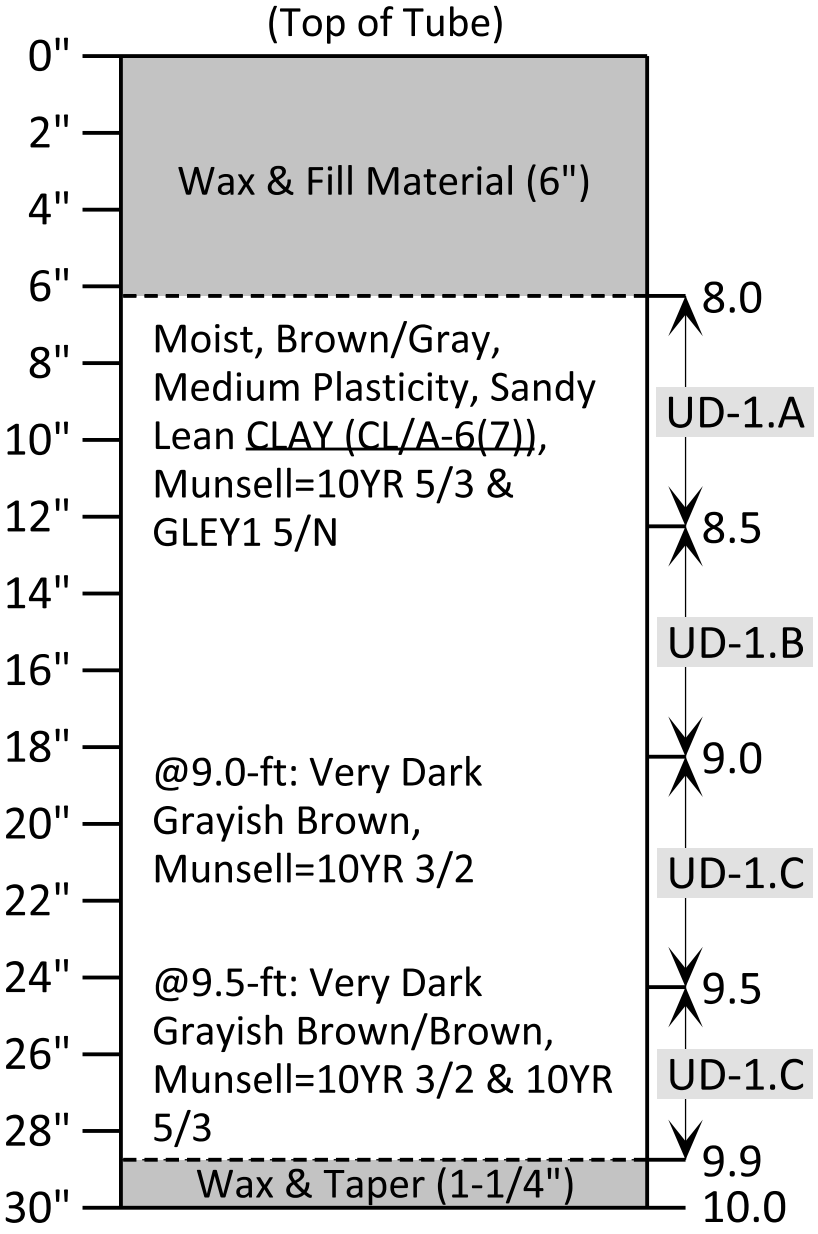
UD-1.C (9.6 – 9.9 ft)

UD-1.D (9.9 – 10.3 ft)

Bottom of Shelby Tube Press

UNDISTURBED SHELBY TUBE SAMPLE LOG

Shelby Tube UD-1



Prepared For: SCDOT

Project: Carolina Crossroads
I-20/26/126 Corridor Improvements

SCDOT Project ID: P027662

F&ME Project No.: G5662.01

Boring No.: AP-7

Sample Depth (feet): 8.0 - 10.0

Date Sampled: 7/2/2018

Date Pushed: 7/20/2018

Sample ID: 18-1335

Additional Comments:
The Shelby tube was advanced 24", and 24" of material was recovered. Samples UD-1.A & UD-1.B were used for consolidated, undrained triaxial shear. Sample UD-1.B was used for grain size analysis and Atterberg limits.

LABORATORY TEST RESULTS							
Liquid Limit	Plastic Limit	Plasticity Index	%#200 Sieve	c (psi)	Φ	c' (psi)	Φ'
32	19	13	67.6	0.00	28.0	0.00	41.0

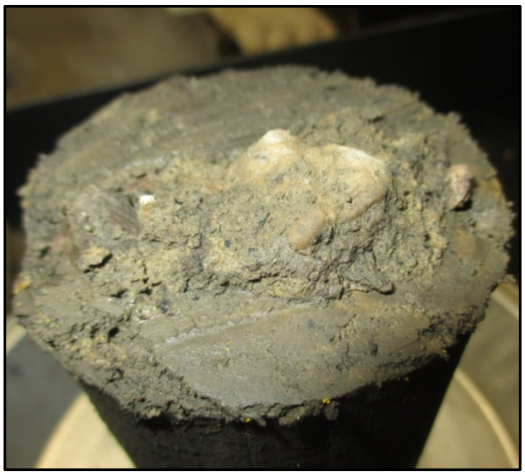
I-20/26/126 CORRIDOR IMPROVEMENTS

Boring AP-7: S-36 (St. Andrews Rd) Alignment – Station 36+24, Offset 212 ft – L

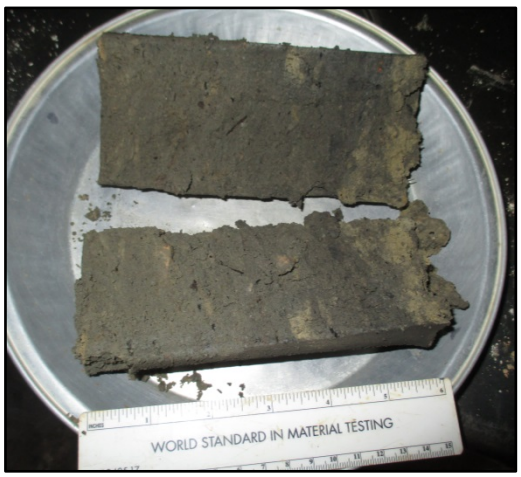
UD-1.A (8.0 – 8.5 ft)

UD-1.B (8.5 – 9.0 ft)

UD-1.C (9.0 – 9.5 ft)



UD-1.C (Rock in Bottom of Sample)

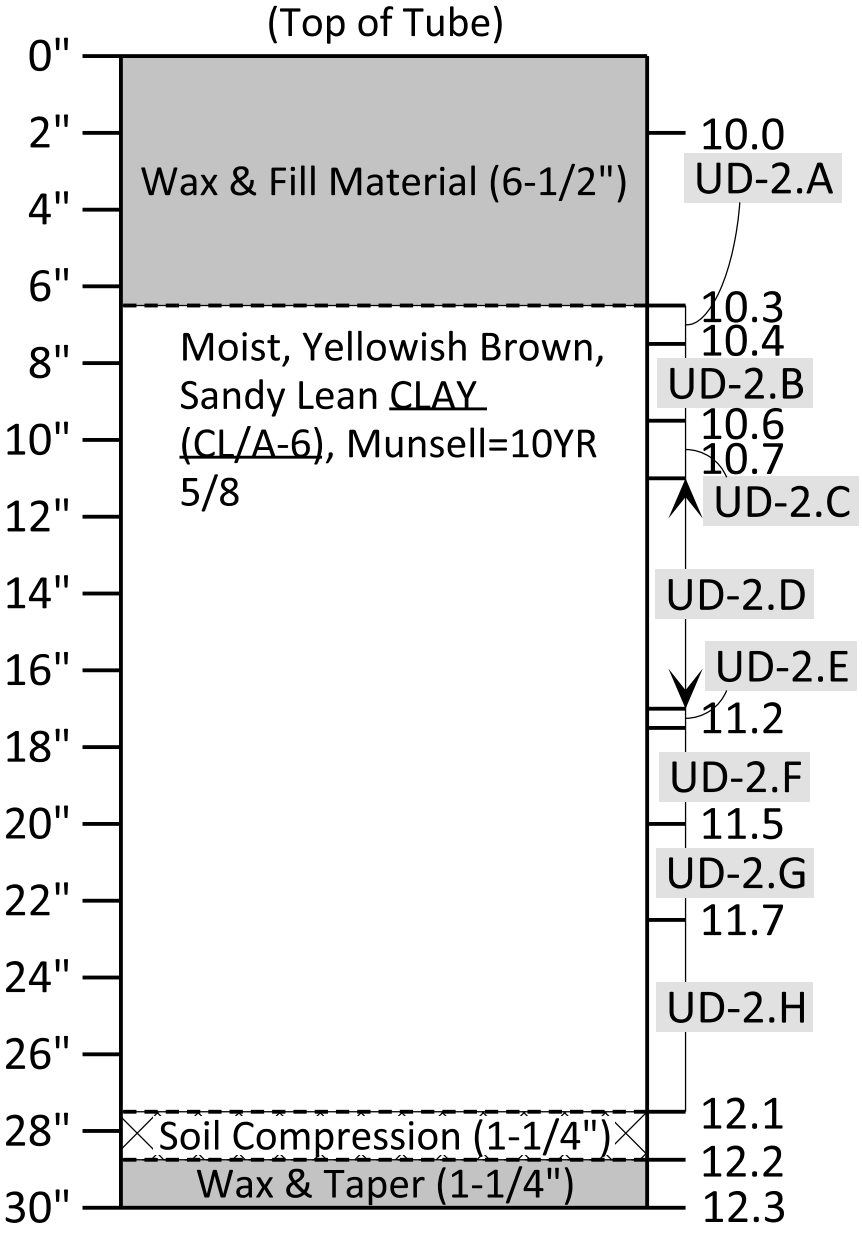


UD-1.C (Sample Split)

UD-1.D (9.5 – 9.9 ft)

UNDISTURBED SHELBY TUBE SAMPLE LOG

Shelby Tube UD-2



Prepared For: SCDOT

Project: Carolina Crossroads I-20/26/126 Corridor Improvements

SCDOT Project ID: P027662

F&ME Project No.: G5662.01

Boring No.: AP-7

Sample Depth (feet): 10.0 - 12.3

Date Sampled: 7/2/2018

Date Pushed: 7/23/2018

Sample ID: 18-1335

Additional Comments:
The Shelby tube was advanced 28", and 24-3/4" of material was recovered. Approximately 1-1/4" of soil compression occurred during extraction. Voids were encountered throughout the sample. Sample UD-2.H was used for consolidation.

LABORATORY TEST RESULTS							
Liquid Limit	Plastic Limit	Plasticity Index	%#200 Sieve	c (psi)	Φ	c' (psi)	Φ'
--	--	--	--	--	--	--	--

I-20/26/126 CORRIDOR IMPROVEMENTS

Boring AP-7: S-36 (St. Andrews Rd) Alignment – Station 36+24, Offset 212 ft – L

UD-2.A (10.3 – 10.4 ft)

UD-2.B (10.4 – 10.6 ft)

UD-2.C (10.6 – 10.7 ft)

UD-2.C (Void)

UD-2.D (10.7 – 11.2 ft)

UD-2.E (11.2 – 11.3 ft)

I-20/26/126 CORRIDOR IMPROVEMENTS

Boring AP-7: S-36 (St. Andrews Rd) Alignment – Station 36+24, Offset 212 ft – L

UD-2.F (11.3 – 11.5 ft)

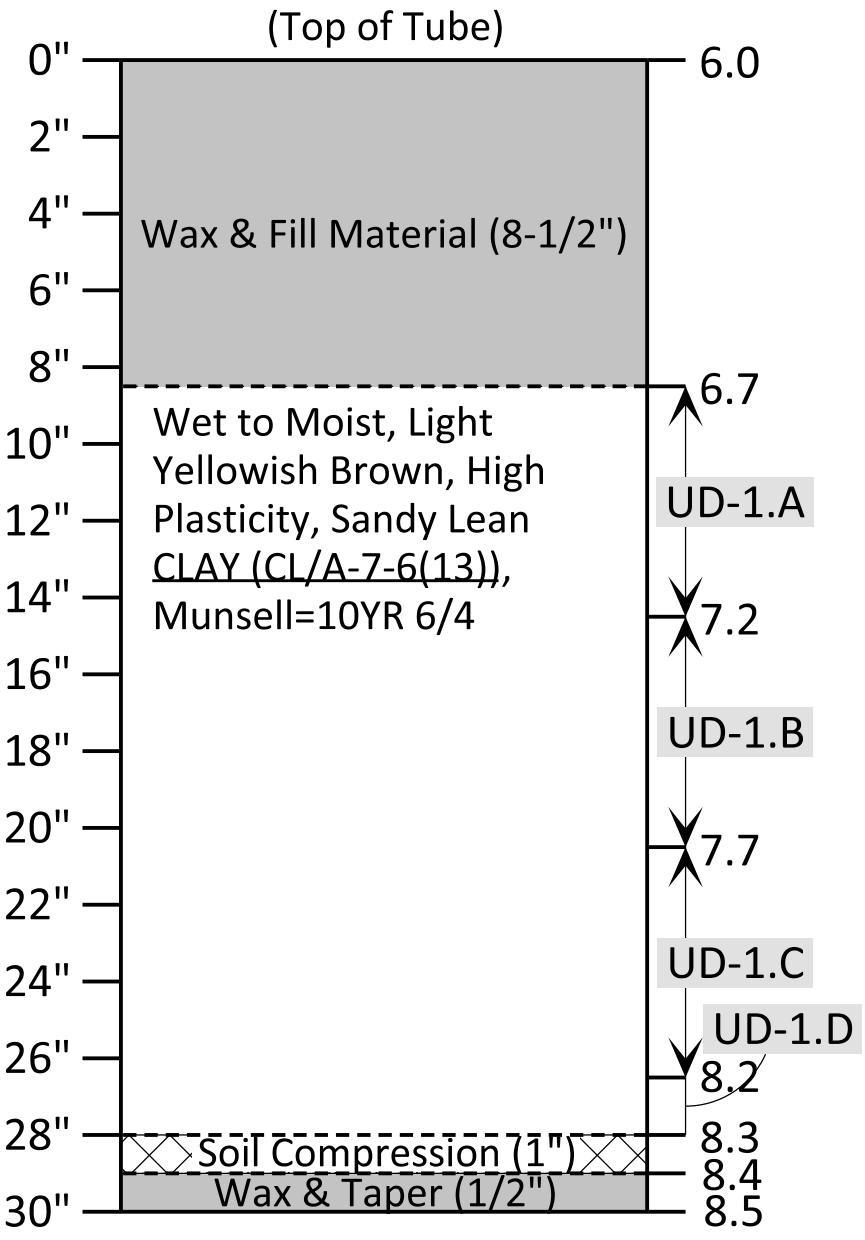
UD-2.G (11.5 – 11.7 ft)

UD-2.G (Split Sample)

UD-2.H (11.6 – 12.1 ft)

UNDISTURBED SHELBY TUBE SAMPLE LOG

Shelby Tube UD-1



Prepared For: SCDOT

Project: Carolina Crossroads
I-20/26/126 Corridor Improvements

SCDOT Project ID: P027662

F&ME Project No.: G5662.01

Boring No.: AP-8

Sample Depth (feet): 6.0 - 8.5

Date Sampled: 5/23/2018

Date Pushed: 7/3/2018

Sample ID: 18-1012

Additional Comments:
The Shelby tube was advanced 30", and 21.5" of material was recovered. Approximately 1" of soil compression occurred during extraction. Samples UD-1.A & UD-1.C were used for consolidated, undrained triaxial shear. UD-1.B was used for grain size analysis and Atterberg limits. Sample UD-1.D was used for consolidation.

LABORATORY TEST RESULTS							
Liquid Limit	Plastic Limit	Plasticity Index	%#200 Sieve	c (psi)	Φ	c' (psi)	Φ'
44	21	23	65.5	1.17	13.8	0.22	37.0

I-20/26/126 CORRIDOR IMPROVEMENTS

Boring AP-8: S-36 (St. Andrews Rd) Alignment – Station 29+98, Offset 539 ft – R

UD-1.A (6.7 – 7.2 ft)

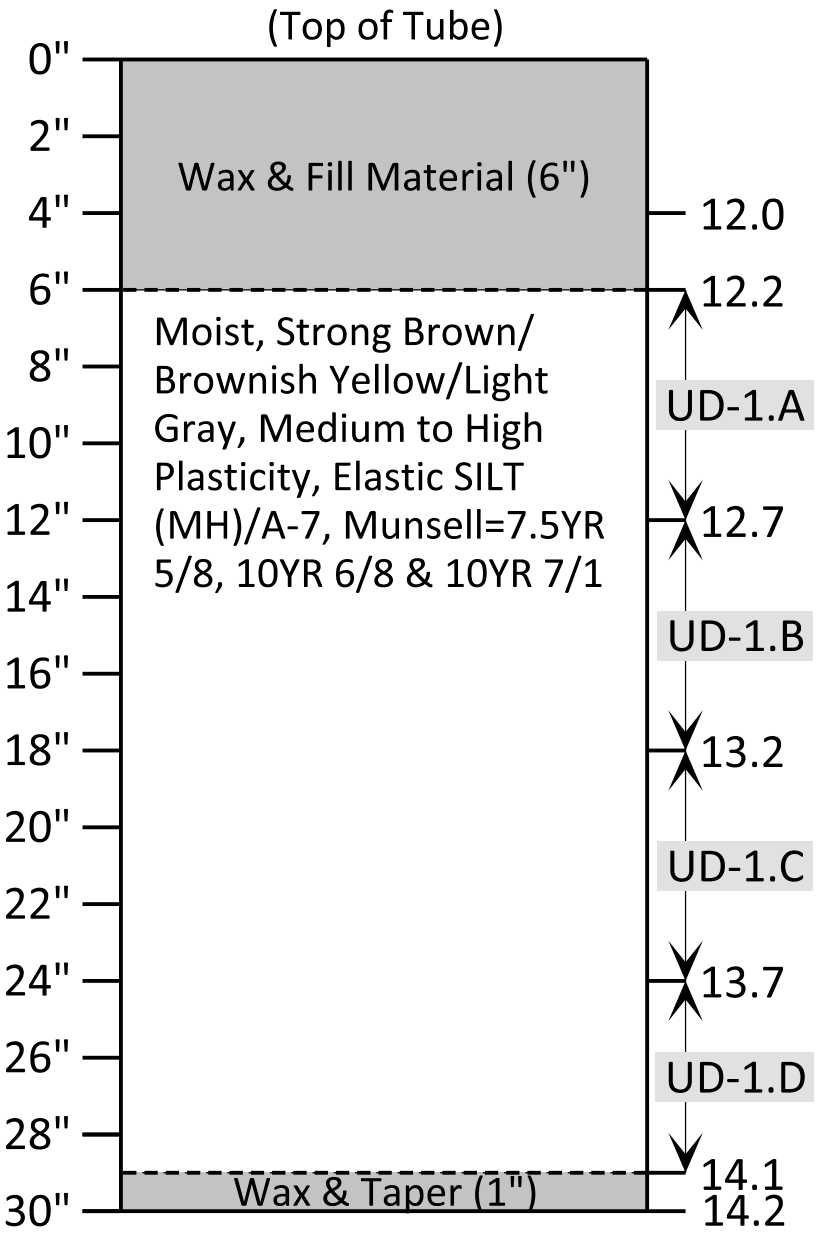
UD-1.B (7.2 – 7.7 ft)

UD-1.C (7.7 – 8.2)

UD-1.D (8.2 – 8.3 ft)

UNDISTURBED SHELBY TUBE SAMPLE LOG

Shelby Tube UD-1



Prepared For: SCDOT

Project: Carolina Crossroads
I-20/26/126 Corridor Improvements

SCDOT Project ID: P027662

F&ME Project No.: G5662.01

Boring No.: AP-9

Sample Depth (feet): 12.0 - 14.2

Date Sampled: 5/23/2018

Date Pushed: 7/31/2018

Sample ID: 18-1031

Additional Comments:
The Shelby tube was advanced 26", and 24" of material was recovered. Triaxial shear, grain size analysis and Atterberg limits were not performed on the sample.

LABORATORY TEST RESULTS							
Liquid Limit	Plastic Limit	Plasticity Index	%#200 Sieve	c (psi)	Φ	c' (psi)	Φ'
--	--	--	--	--	--	--	--

I-20/26/126 CORRIDOR IMPROVEMENTS

Boring AP-9: I-26 Alignment – Station 314+37, Offset 88 ft – R

UD-1.A (12.2 – 12.7 ft)

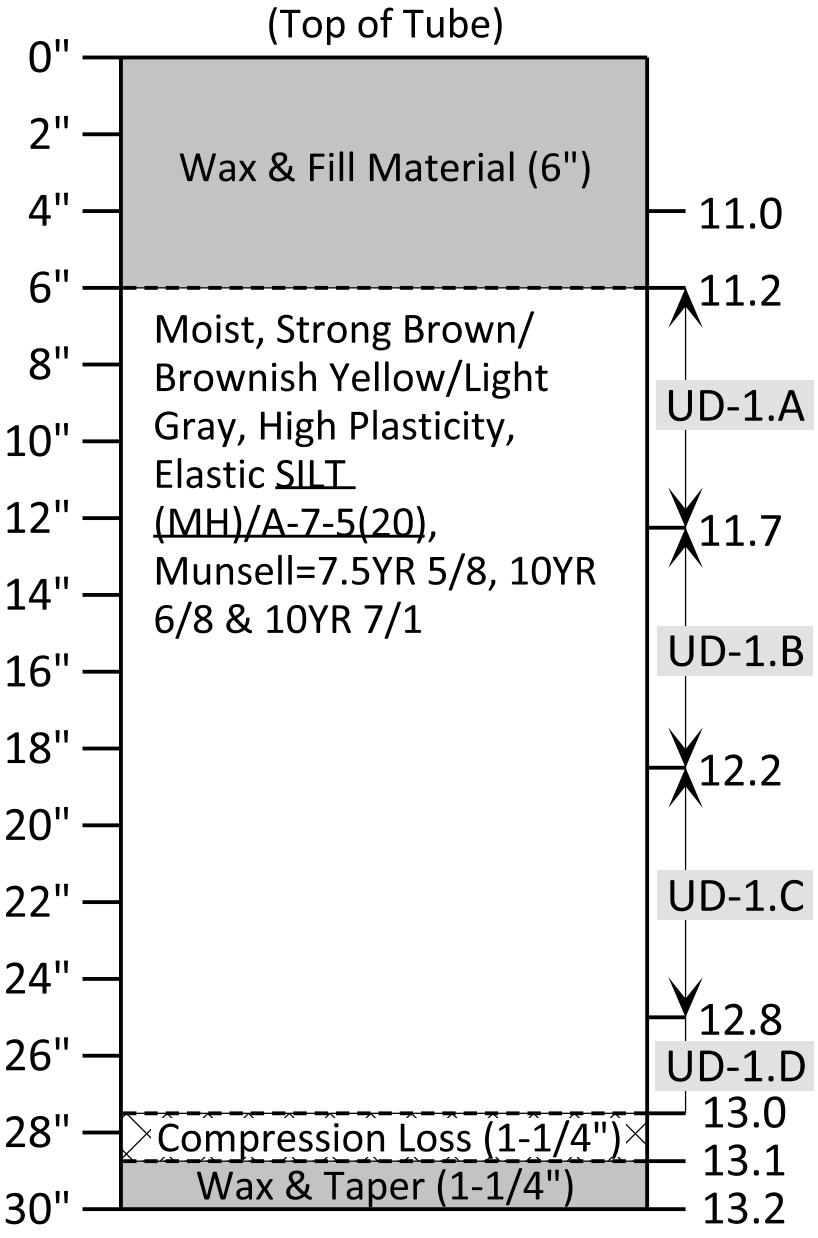
UD-1.B (12.7 – 13.2 ft)

UD-1.C (13.2 – 13.7 ft)

UD-1.D (13.7 – 14.1 ft)

UNDISTURBED SHELBY TUBE SAMPLE LOG

Shelby Tube UD-1



Prepared For: SCDOT

Project: Carolina Crossroads
I-20/26/126 Corridor Improvements

SCDOT Project ID: P027662

F&ME Project No.: G5662.01

Boring No.: AP-10

Sample Depth (feet): 11.0 - 13.2

Date Sampled: 5/23/2018

Date Pushed: 6/7/2018

Sample ID: 18-1032

Additional Comments:
The Shelby tube was advanced 26", and 24" of material was recovered. Approximately 1-1/4" of soil compression occurred during extraction. Samples UD-1.A, UD-1.B & UD-1.C were used for triaxial shear. Sample UD-1.A was used for grain size analysis and Atterberg limits.

LABORATORY TEST RESULTS							
Liquid Limit	Plastic Limit	Plasticity Index	%#200 Sieve	c (psi)	Φ	c' (psi)	Φ'
65	36	29	97.0	0.36	24.0	0.43	36.0

I-20/26/126 CORRIDOR IMPROVEMENTS

Boring AP-10: I-26 Alignment – Station 314+41, Offset 88 ft – R

UD-1.A (11.2 – 11.7 ft)

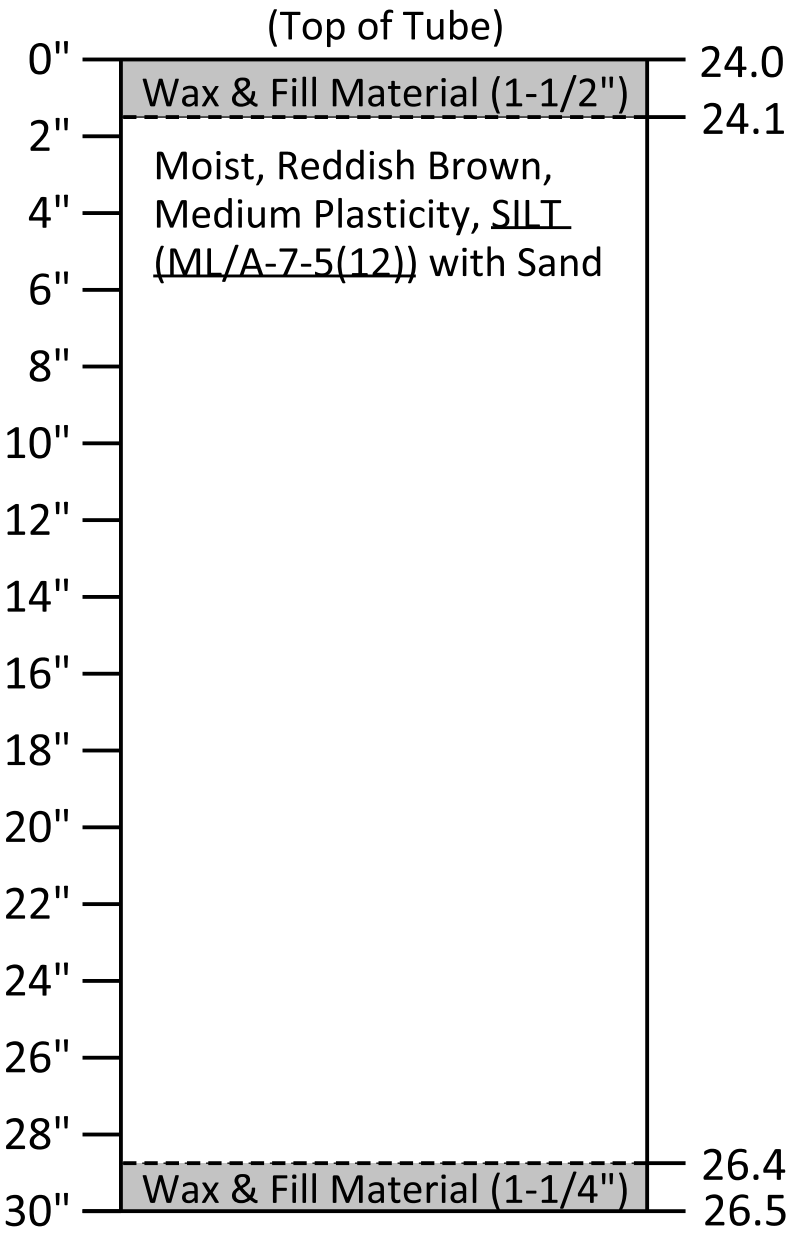
UD-1.B (11.7 – 12.2 ft)

UD-1.C (12.2 – 12.8 ft)

UD-1.D (12.8 – 13.0 ft)

UNDISTURBED SHELBY TUBE SAMPLE LOG

Shelby Tube UD-1



Prepared For: SCDOT

Project: Carolina Crossroads I-20/26/126 Corridor Improvements

SCDOT Project ID: P027662

F&ME Project No.: G5662.01

Boring No.: AP-11

Sample Depth (feet): 24.0 - 26.5

Date Sampled: 5/22/2018

Date Pushed: 7/13/2018

Sample ID: 18-1010

Additional Comments:
The Shelby tube was advanced 30", and 30" of material was recovered. Sample was extruded by GeoTesting Express in Atlanta, GA. Grain size analysis, Atterberg limits and consolidated, undrained triaxial shear were performed on the sample.

LABORATORY TEST RESULTS							
Liquid Limit	Plastic Limit	Plasticity Index	%#200 Sieve	c (psi)	Φ	c' (psi)	Φ'
49	37	12	79.8	0.00	28.1	0.00	38.0

Client:	F&ME Consultants
Project Name:	I-20/26/126 Corridor Improvements
Project Location:	---
GTX #:	307802
Boring ID:	AP-11
Sample ID:	---
Depth, ft:	24-26.5

Top of Tube

Top of Sample

Moist, reddish brown silt

Bottom of Sample

Moist, reddish brown silt

Middle of Tube

Top of Sample

Moist, reddish brown silt

Bottom of Sample

Moist, reddish brown silt

Bottom of Tube

Top of Sample

Moist, reddish brown silt

Bottom of Sample

Moist, reddish brown silt

Client:	F&ME Consultants
Project Name:	I-20/26/126 Corridor Improvements
Project Location:	---
GTX #:	307802
Boring ID:	AP-11
Sample ID:	---
Depth, ft:	24-26.5

Top of Tube

Moist, reddish brown silt

Middle of Tube

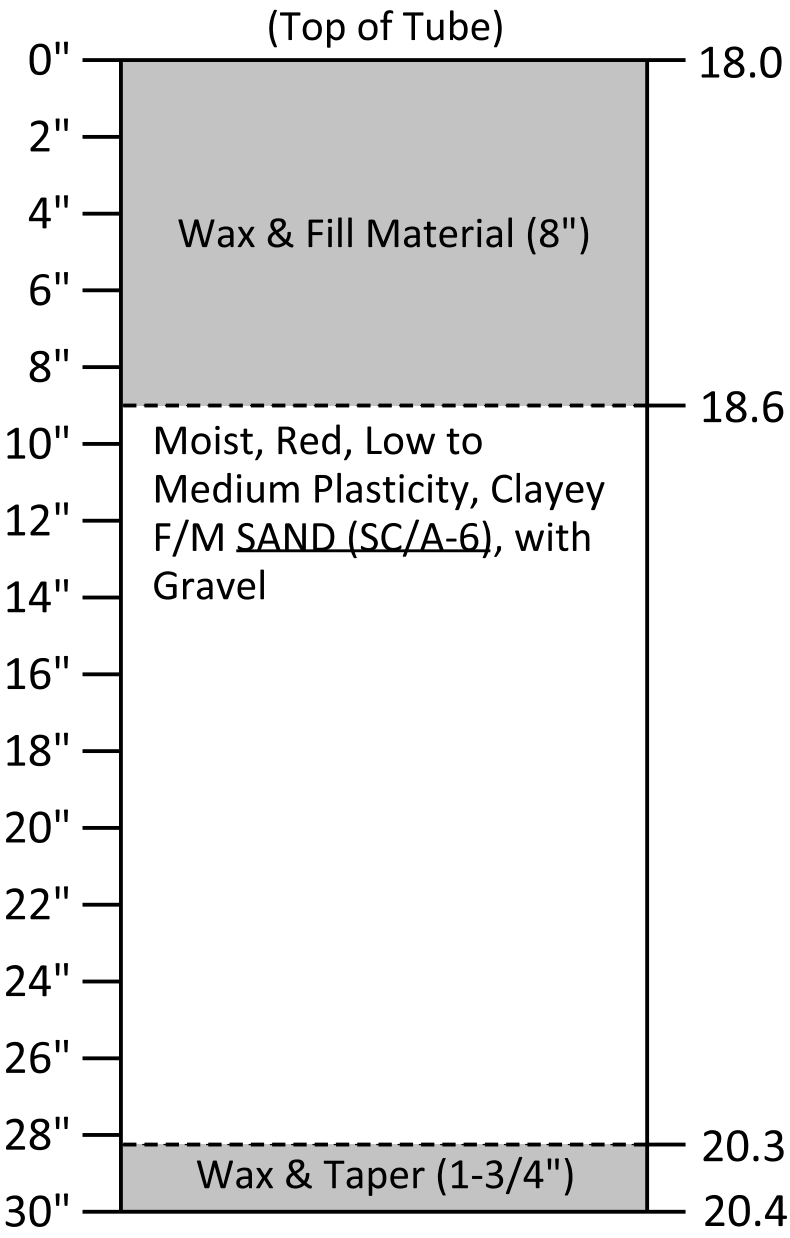
Moist, reddish brown silt

Bottom of Tube

Moist, reddish brown silt

UNDISTURBED SHELBY TUBE SAMPLE LOG

Shelby Tube UD-1



Prepared For: SCDOT

Project: Carolina Crossroads
I-20/26/126 Corridor Improvements

SCDOT Project ID: P027662

F&ME Project No.: G5662.01

Boring No.: AP-12

Sample Depth (feet): 18.0 - 20.4

Date Sampled: 5/23/2018

Date Pushed: 7/2/2018

Sample ID: 18-1033

Additional Comments:
The Shelby tube was advanced 29", and 22" of material was recovered. Sample was extruded by GeoTesting Express in Atlanta, GA. Consolidated, undrained triaxial shear was performed on the sample.

LABORATORY TEST RESULTS							
Liquid Limit	Plastic Limit	Plasticity Index	%#200 Sieve	c (psi)	Φ	c' (psi)	Φ'
--	--	--	--	0.00	25.0	0.00	37.0

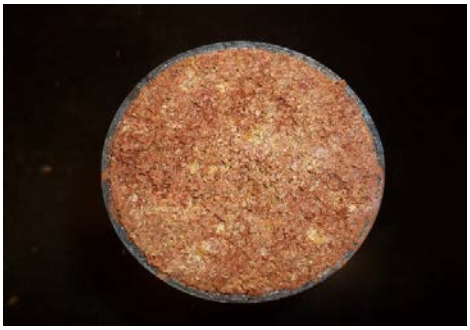
Client:	F&ME Consultants
Project Name:	I-20/26/126 Corridor Improvements
Project Location:	---
GTX #:	307802
Boring ID:	AP-12
Sample ID:	---
Depth, ft:	18-20.4

Top of Tube

Top of Sample

Moist, yellowish red clayey sand with gravel

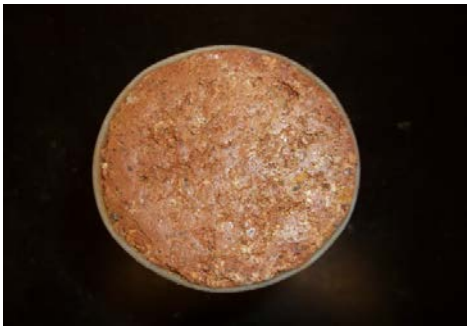
Bottom of Sample



Moist, yellowish red clayey sand with gravel

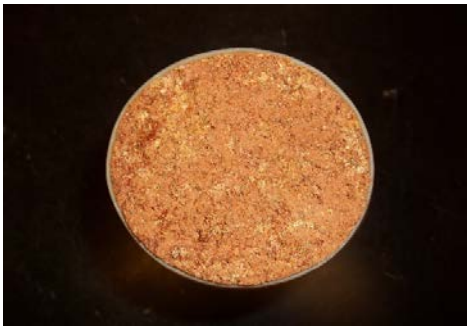
Middle of Tube

Top of Sample



Moist, yellowish red clayey sand with gravel

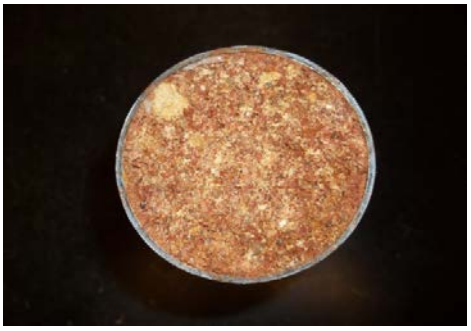
Bottom of Sample



Moist, yellowish red clayey sand with gravel

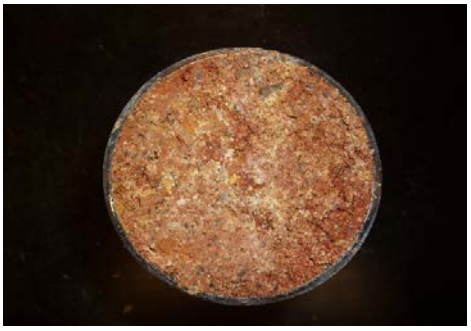
Bottom of Tube

Top of Sample



Moist, yellowish red clayey sand with gravel

Bottom of Sample



Moist, yellowish red clayey sand with gravel

Client:	F&ME Consultants
Project Name:	I-20/26/126 Corridor Improvements
Project Location:	---
GTX #:	307802
Boring ID:	AP-12
Sample ID:	---
Depth, ft:	18-20.4

Top of Tube

Moist, yellowish red clayey sand with gravel

Middle of Tube

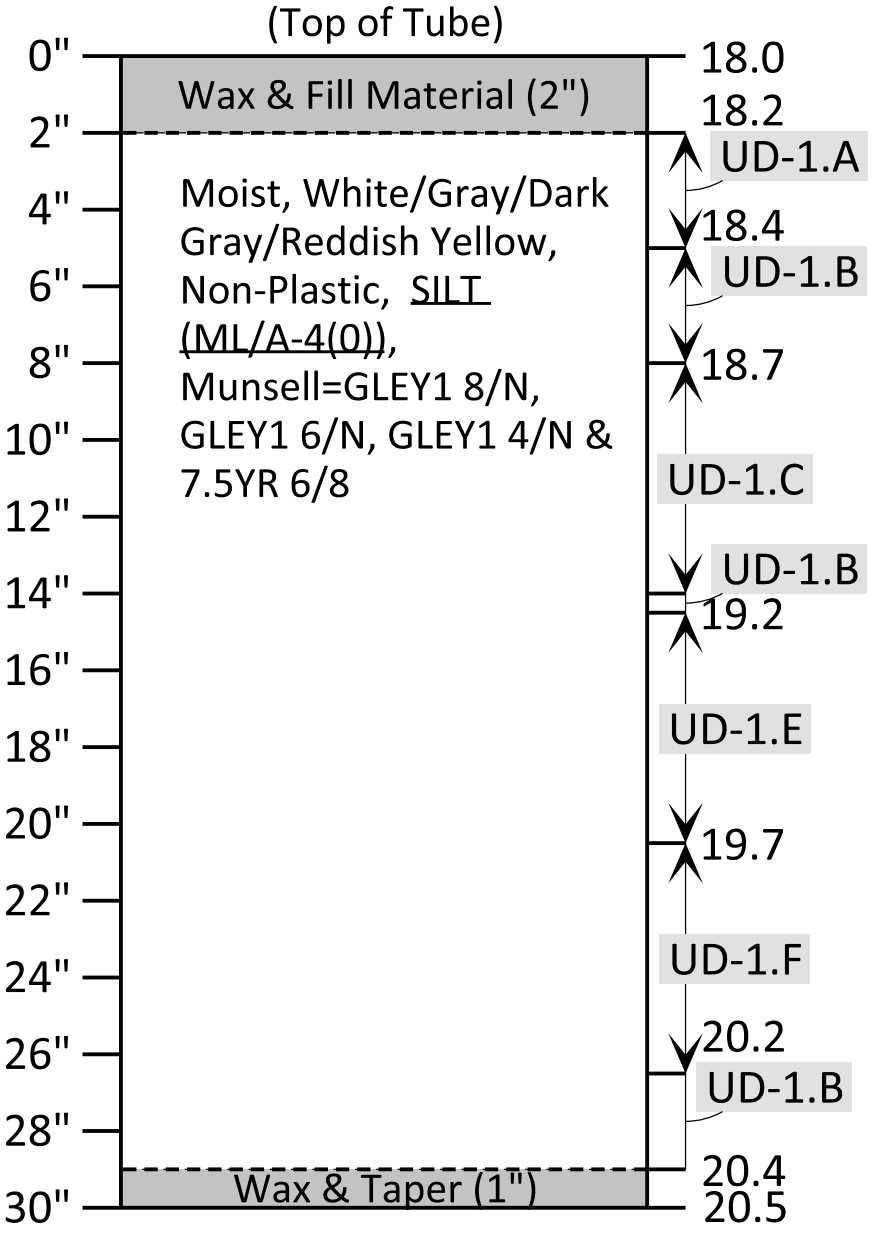
Moist, yellowish red clayey sand with gravel

Bottom of Tube

Moist, yellowish red clayey sand with gravel

UNDISTURBED SHELBY TUBE SAMPLE LOG

Shelby Tube UD-1



Prepared For: SCDOT

Project: Carolina Crossroads I-20/26/126 Corridor Improvements

SCDOT Project ID: P027662

F&ME Project No.: G5662.01

Boring No.: AP-14

Sample Depth (feet): 18.0 - 20.5

Date Sampled: 5/22/2018

Date Pushed: 7/16/2018

Sample ID: 18-1009

Additional Comments:
Shelby tube was advanced 30", and 28" of material was recovered. Material was very dry and brittle and was possibly a layer of PWR. Sample UD-1.F was used for unconsolidated, undrained triaxial shear, grain size analysis, and Atterberg limits.

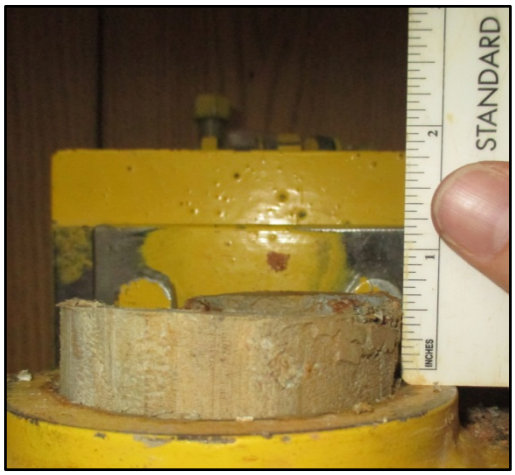
LABORATORY TEST RESULTS							
Liquid Limit	Plastic Limit	Plasticity Index	%#200 Sieve	c (psi)	Φ	c' (psi)	Φ'
NP	NP	NP	86.7	0.00	29.5	--	--

I-20/26/126 CORRIDOR IMPROVEMENTS

Boring AP-14: I20RAC Alignment – Station 3150+78, Offset 17 ft – L

UD-1.A (18.2 – 18.4 ft)

UD-1.C (18.7 – 19.2 ft)



UD-1.D (19.2 ft)

UD-1.E (19.2 – 19.7 ft)

UD-1.E (Top View of Sample)

UD-1.E (Split Sample)

I-20/26/126 CORRIDOR IMPROVEMENTS

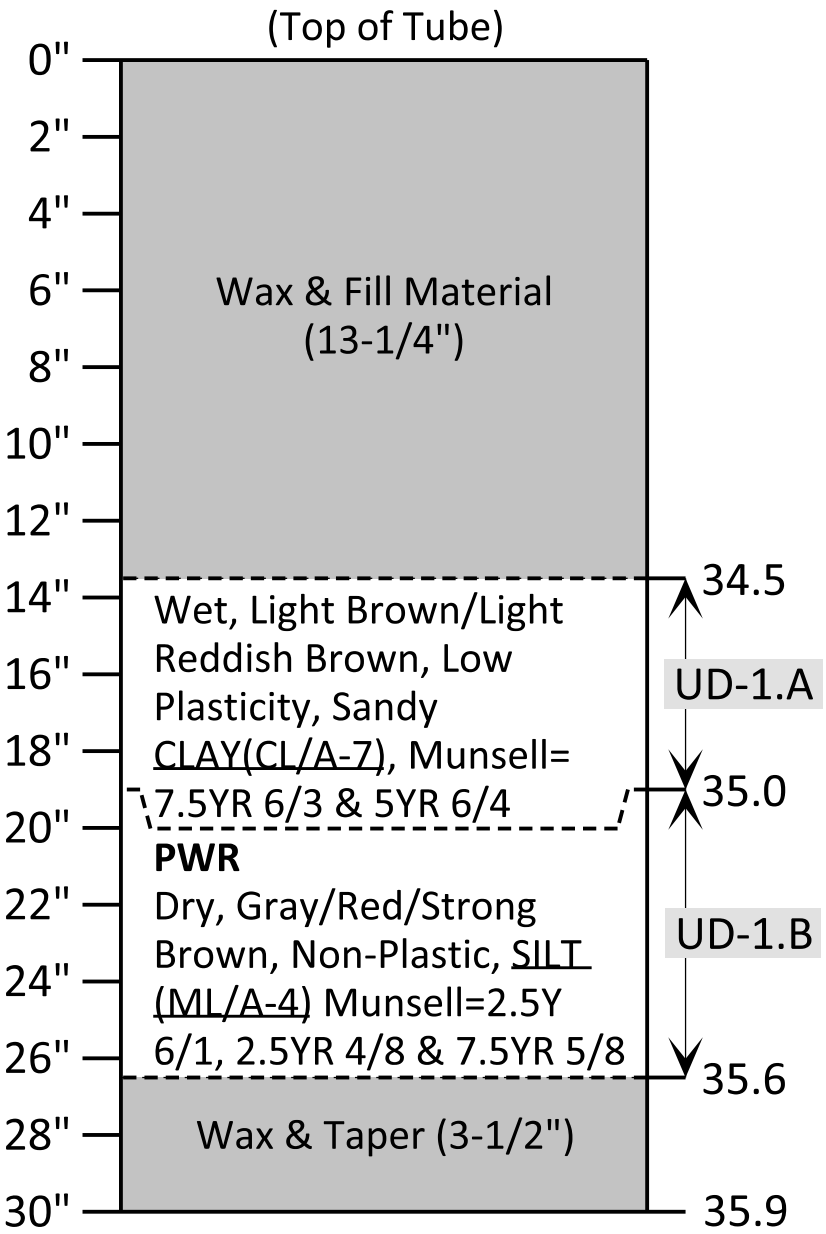
Boring AP-14: I20RAC Alignment – Station 3150+78, Offset 17 ft – L

UD-1.F

UD-1.G

UNDISTURBED SHELBY TUBE SAMPLE LOG

Shelby Tube UD-1



Prepared For: SCDOT

Project: Carolina Crossroads
I-20/26/126 Corridor Improvements

SCDOT Project ID: P027662

F&ME Project No.: G5662.01

Boring No.: AP-16

Sample Depth (feet): 35.0 - 35.9

Date Sampled: 5/4/2017

Date Pushed: 5/10/2018

Sample ID: 18-0854

Additional Comments:
Shelby Tube was advanced 11" but recovered 17" of material. Soft material within the top 5-1/2" of the tube, in sample UD-1.A, appears to be cave-in material. Specimen UD-1.B was very dry and fell apart during extraction. Vertical banding and layering of the PWR was evident. Unconfined compression, grain size analysis, and Atterberg limits were not performed.

LABORATORY TEST RESULTS							
Liquid Limit	Plastic Limit	Plasticity Index	%#200 Sieve	c (psi)	Φ	c' (psi)	Φ'
--	--	--	--	--	--	--	--

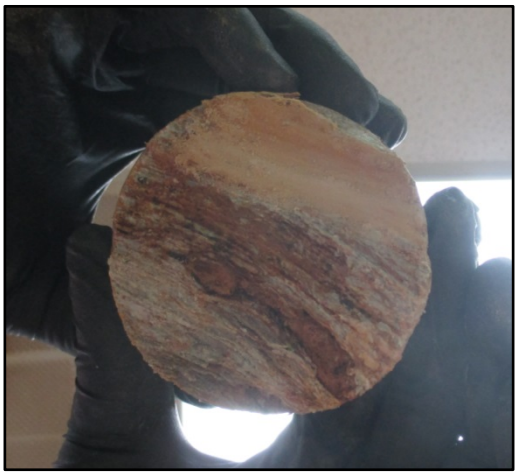
I-20/26/126 CORRIDOR IMPROVEMENTS

Boring AP-16: I20RCA Alignment – Station 5172+65, Offset 23 ft – L

UD-1.A (34.5 – 35.0 ft)

UD-1.B (35.0 – 35.6 ft)

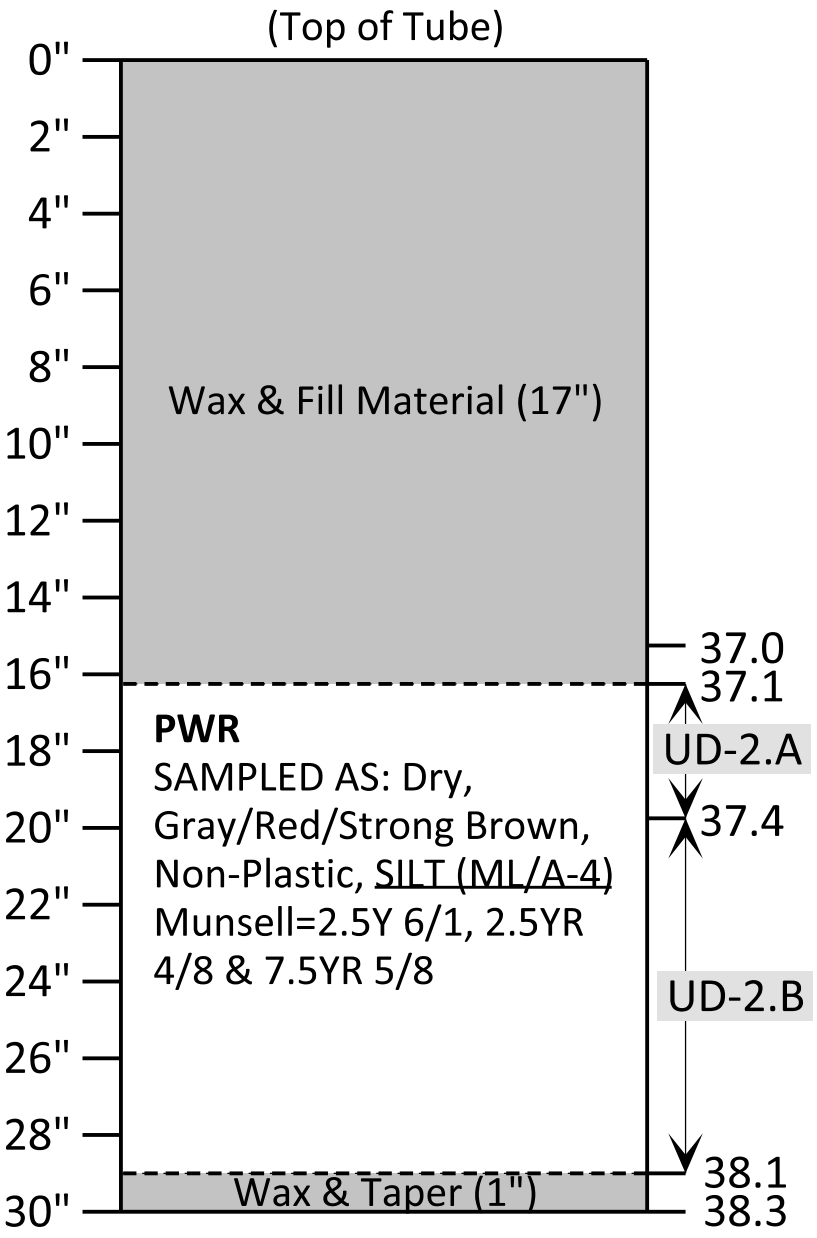
UD-1.B (Top View)



UD-1.B (Bottom View)

UNDISTURBED SHELBY TUBE SAMPLE LOG

Shelby Tube UD-2



Prepared For: SCDOT

Project: Carolina Crossroads
I-20/26/126 Corridor Improvements

SCDOT Project ID: P027662

F&ME Project No.: G5662.01

Boring No.: AP-16

Sample Depth (feet): 37.0 - 38.3

Date Sampled: 5/4/2018

Date Pushed: 5/30/2018

Sample ID: 18-0854

Additional Comments:
The Shelby tube was advanced 15", and 13 3/4" of material was recovered. Sample UD-2.A had several large pieces of quartz gravel. One 6" sample was cut from sample UD-2.B. The sample was soaked in water, and immediately began falling apart when put in contact with the water. After four minutes, the sample had completely broken apart.

LABORATORY TEST RESULTS							
Liquid Limit	Plastic Limit	Plasticity Index	%#200 Sieve	c (psi)	Φ	c' (psi)	Φ'
--	--	--	--	--	--	--	--

I-20/26/126 CORRIDOR IMPROVEMENTS

Boring AP-16: I20RCA Alignment – Station 5172+65, Offset 23 ft – L

UD-2.A (37.1 – 37.4 ft)

UD-2.B (37.4 – 38.1 ft)

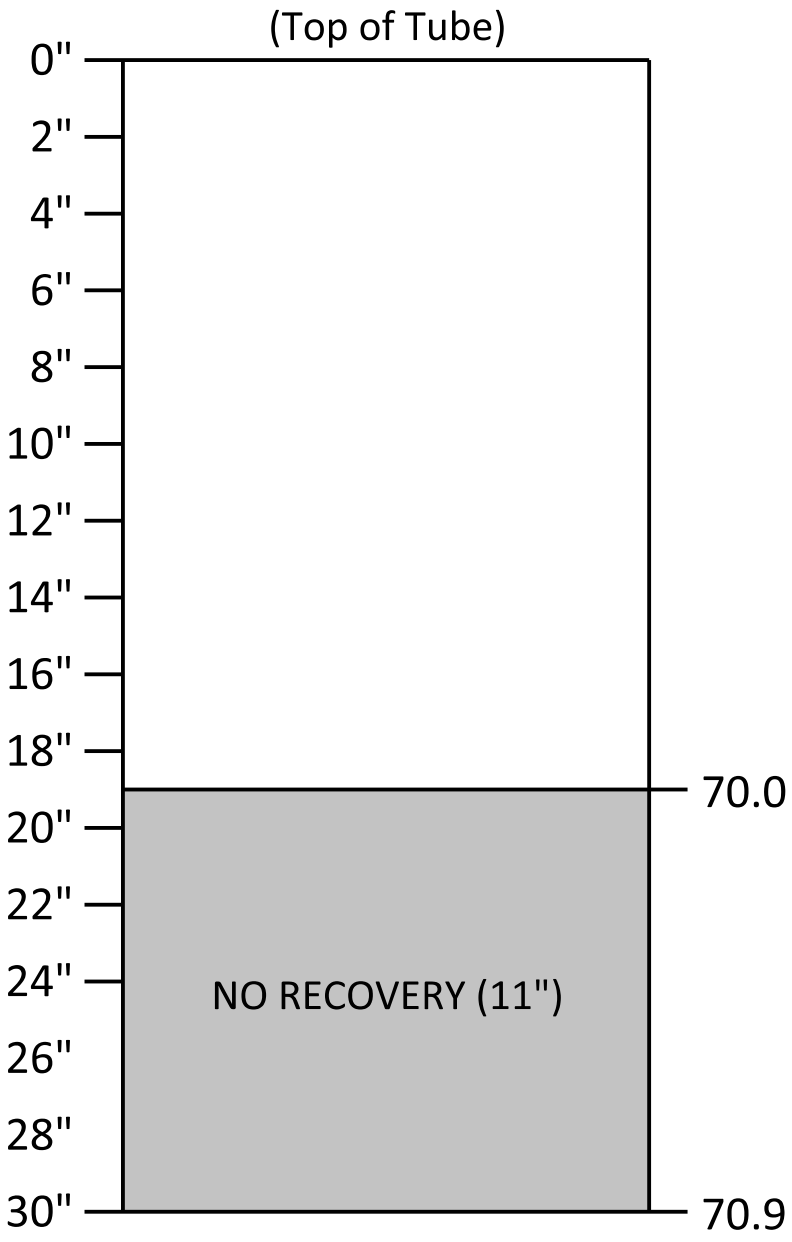
UD-2.B (Side View)

UD-2.B (Before Soaking)

UD-2.B (After 4-min Soaking)

UNDISTURBED SHELBY TUBE SAMPLE LOG

Shelby Tube UD-1



Prepared For: SCDOT

Project: Carolina Crossroads
I-20/26/126 Corridor Improvements

SCDOT Project ID: P027662

F&ME Project No.: G5662.01

Boring No.: AP-17

Sample Depth (feet): 70.0 - 70.9

Date Sampled: 5/9/2018

Date Pushed: N/A

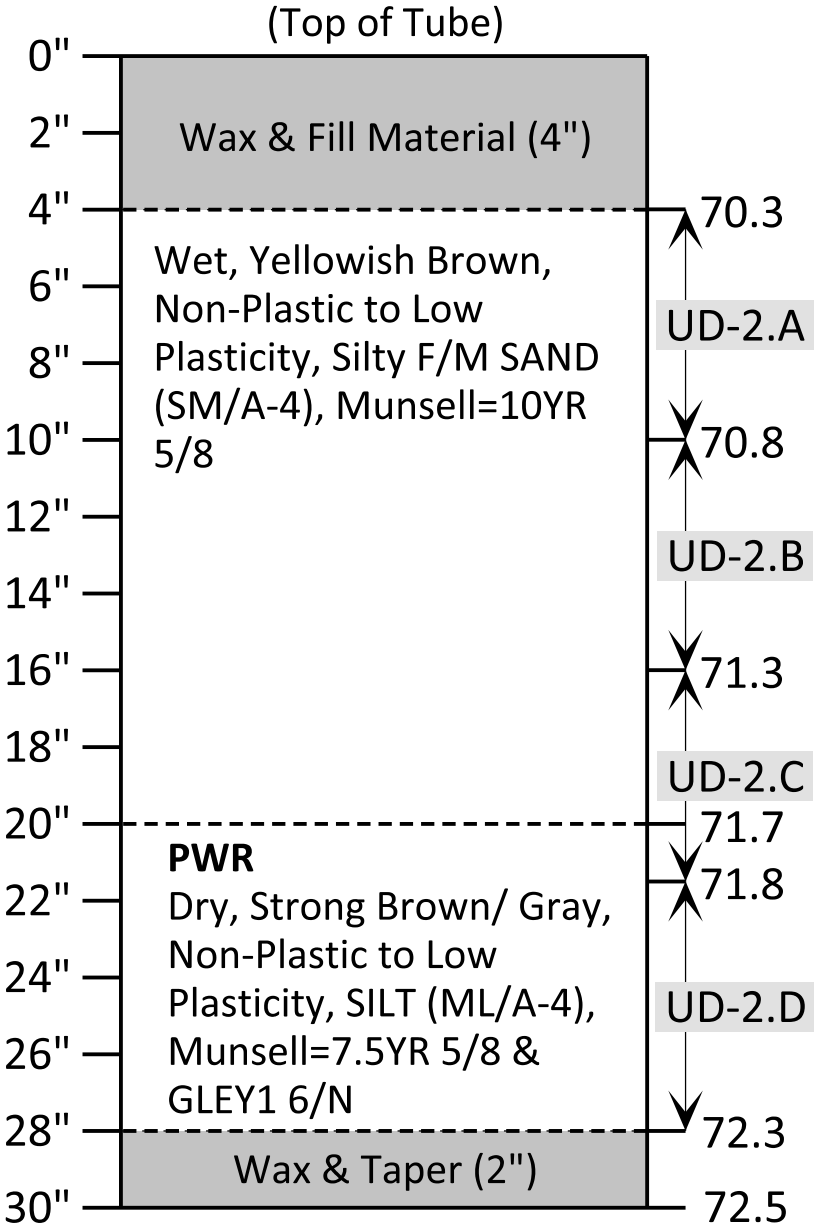
Sample ID: 18-0899

Additional Comments:
Shelby Tube was advanced 11", but no sample was recovered.

LABORATORY TEST RESULTS							
Liquid Limit	Plastic Limit	Plasticity Index	%#200 Sieve	c (psi)	Φ	c' (psi)	Φ'
--	--	--	--	--	--	--	--

UNDISTURBED SHELBY TUBE SAMPLE LOG

Shelby Tube UD-2



Prepared For: SCDOT

Project: Carolina Crossroads
I-20/26/126 Corridor Improvements

SCDOT Project ID: P027662

F&ME Project No.: G5662.01

Boring No.: AP-17

Sample Depth (feet): 71.2 - 72.5

Date Sampled: 5/9/2018

Date Pushed: 5/25/2018

Sample ID: 18-0899

Additional Comments:
Shelby Tube was advanced 15" but recovered 26" of material. Soft material within the top 16" of tube, labeled as UD-2.A , UD-2.B & a portion of UD-2.C, appears to be cave-in material or material that was not recovered after sample UD-1 was attempted. Unconfined compression, grain size analysis, and Atterberg limits were not performed.

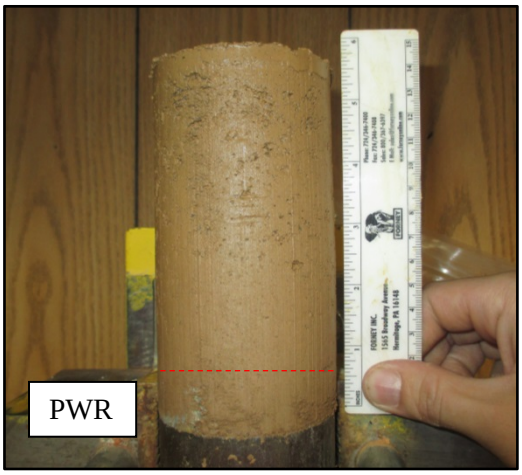
LABORATORY TEST RESULTS							
Liquid Limit	Plastic Limit	Plasticity Index	%#200 Sieve	c (psi)	Φ	c' (psi)	Φ'
--	--	--	--	--	--	--	--

I-20/26/126 CORRIDOR IMPROVEMENTS

Boring AP-17: I20RCA Alignment – Station 5168+49, Offset 39 ft – L

UD-2.A (70.3 – 70.8 ft)

UD-2.B (70.8 – 71.3 ft)

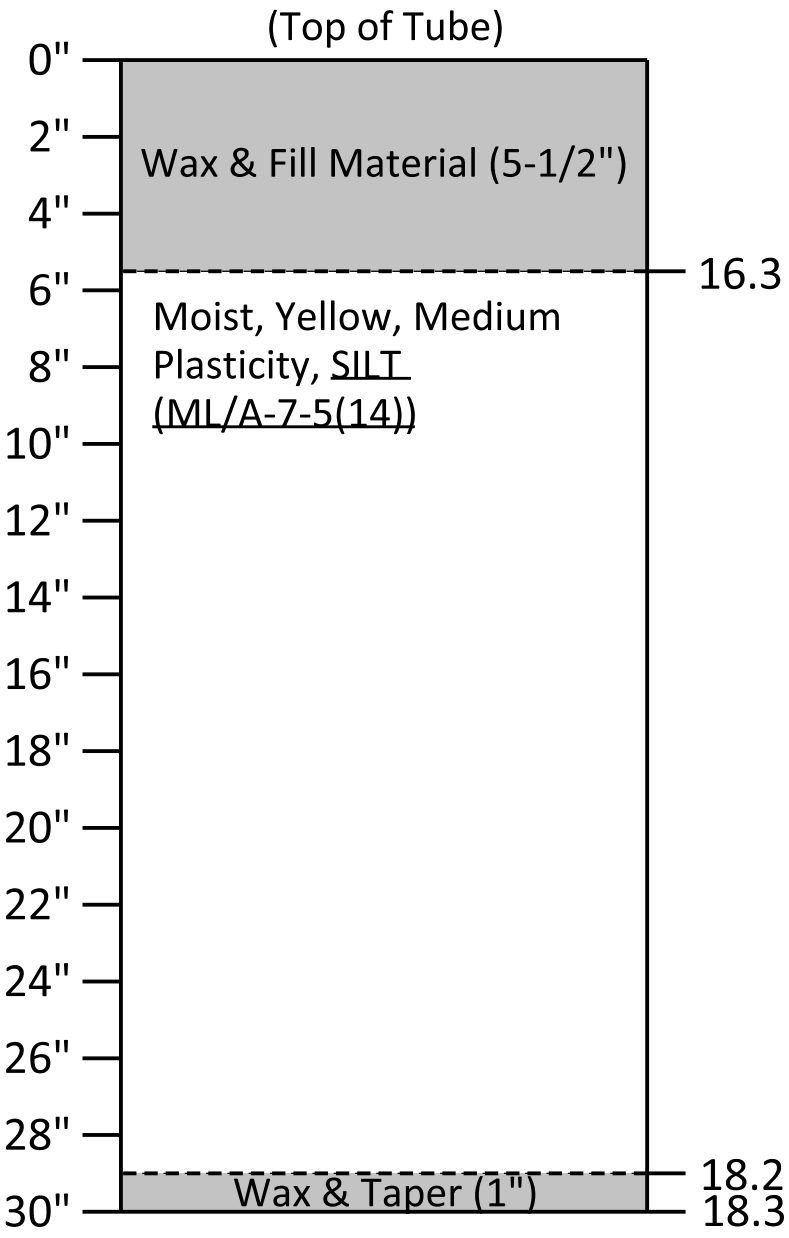


UD-2.C (71.3 – 71.8 ft)

UD-2.D (71.8 – 72.3 ft)

UNDISTURBED SHELBY TUBE SAMPLE LOG

Shelby Tube UD-1



Prepared For: SCDOT

Project: Carolina Crossroads
I-20/26/126 Corridor Improvements

SCDOT Project ID: P027662

F&ME Project No.: G5662.01

Boring No.: AP-18

Sample Depth (feet): 16.0 - 18.3

Date Sampled: 5/22/2018

Date Pushed: 7/18/2018

Sample ID: 18-1008

Additional Comments:
The Shelby tube was advanced 28", and 25.5" of material was recovered. Sample was extruded by GeoTesting Express in Atlanta, GA. Grain size analysis, Atterberg limits, and consolidated, undrained triaxial shear were performed on the sample.

LABORATORY TEST RESULTS							
Liquid Limit	Plastic Limit	Plasticity Index	%#200 Sieve	c (psi)	Φ	c' (psi)	Φ'
47	35	12	86.5	0.40	27.2	0.00	35.0

Client:	F&ME Consultants
Project Name:	I-20/26/126 Corridor Improvements
Project Location:	---
GTX #:	307802
Boring ID:	AP-18
Sample ID:	---
Depth, ft:	16-18.3

Top of Tube

Top of Sample

Moist, yellow silt with sand

Bottom of Sample

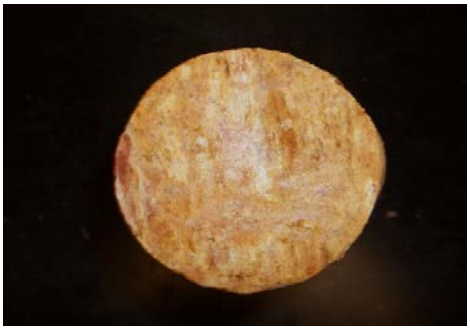
Moist, yellow silt with sand

Middle of Tube

Top of Sample

Moist, yellow silt with sand

Bottom of Sample



Moist, yellow silt with sand

Bottom of Tube

Top of Sample

Moist, yellow silt with sand

Bottom of Sample

Moist, yellow silt with sand

Client:	F&ME Consultants
Project Name:	I-20/26/126 Corridor Improvements
Project Location:	---
GTX #:	307802
Boring ID:	AP-18
Sample ID:	---
Depth, ft:	16-18.3

Top of Tube

Moist, yellow silt with sand

Middle of Tube

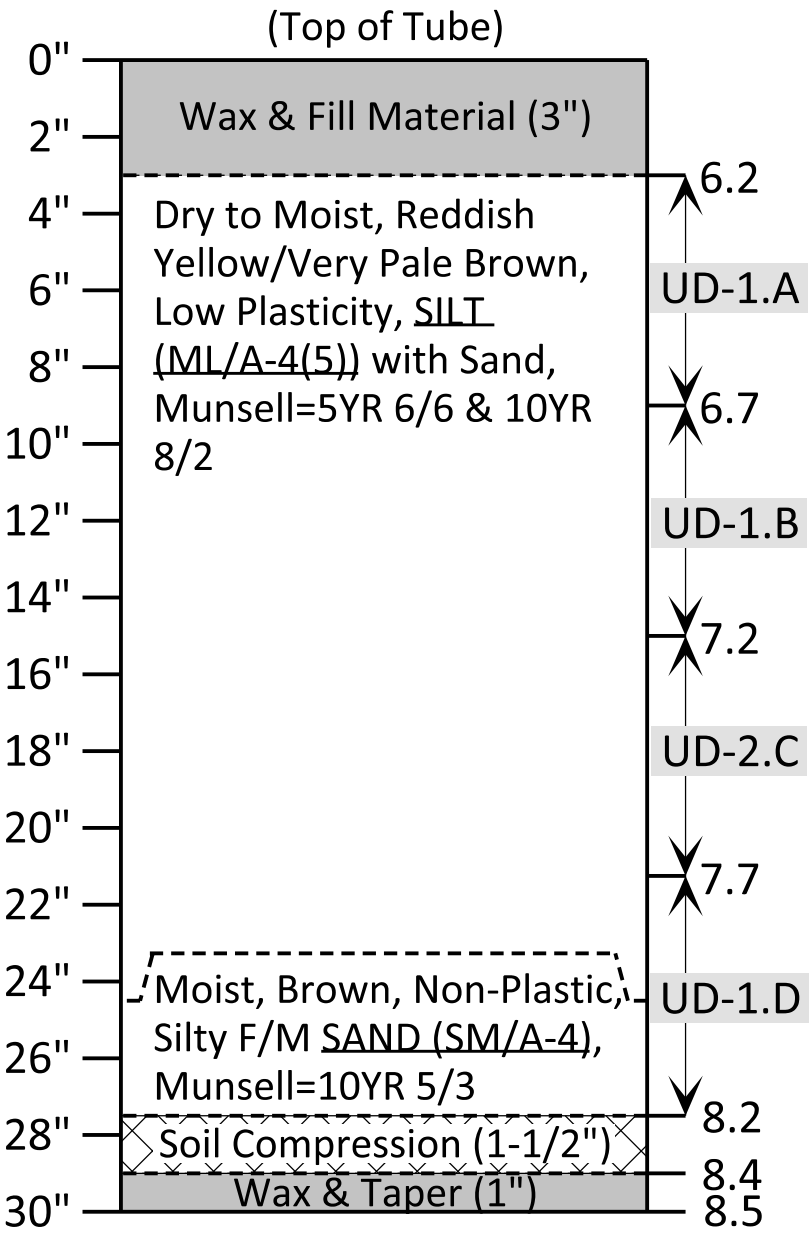
Moist, yellow silt with sand

Bottom of Tube

Moist, yellow silt with sand

UNDISTURBED SHELBY TUBE SAMPLE LOG

Shelby Tube UD-1



Prepared For: SCDOT

Project: Carolina Crossroads
I-20/26/126 Corridor Improvements

SCDOT Project ID: P027662

F&ME Project No.: G5662.01

Boring No.: AP-19

Sample Depth (feet): 6.0 - 8.5

Date Sampled: 5/22/2018

Date Pushed: 6/4/2018

Sample ID: 18-1007

Additional Comments:
The Shelby tube was advanced 30", and 27" of material was recovered. Approximately 1-1/2" of soil compression occured during extraction. Sample UD-1.B had a sizeable void when extracted from the tube. Samples UD-1.A & UD-1.C were used for triaxial shear. Sample UD-1.B was used for grain size analysis and Atterberg limits.

LABORATORY TEST RESULTS							
Liquid Limit	Plastic Limit	Plasticity Index	%#200 Sieve	c (psi)	Φ	c' (psi)	Φ'
34	27	7	76.3	0.00	25.3	0.00	36.0

I-20/26/126 CORRIDOR IMPROVEMENTS

Boring AP-19: I20RC1 Alignment – Station 5161+53, Offset 52 ft – L

UD-1.A (6.2 – 6.7 ft)

UD-1.B (6.7 – 7.2 ft)

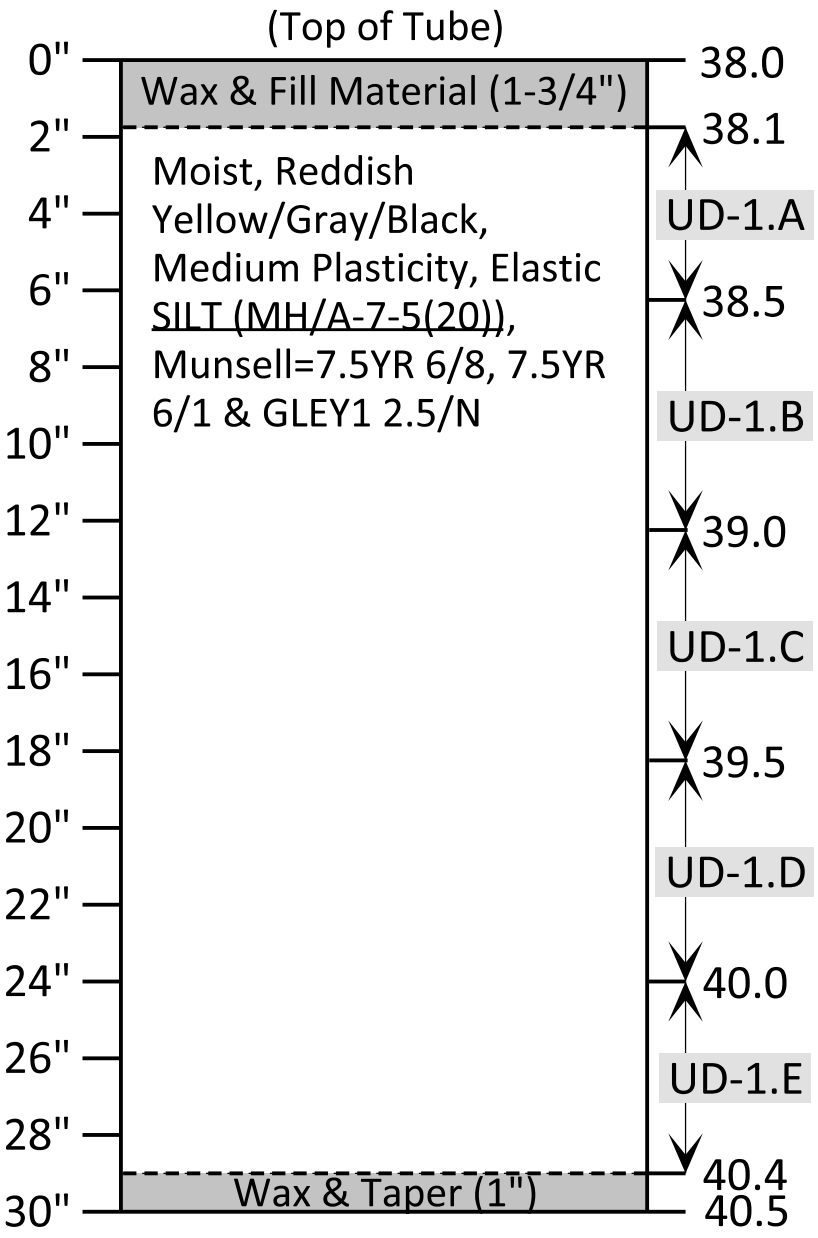
UD-1.B (Void – Side View)

UD-1.C (7.2 – 7.7 ft)

UD-1.D (7.7 – 8.2 ft)

UNDISTURBED SHELBY TUBE SAMPLE LOG

Shelby Tube UD-1



Prepared For: SCDOT

Project: Carolina Crossroads I-20/26/126 Corridor Improvements

SCDOT Project ID: P027662

F&ME Project No.: G5662.01

Boring No.: AP-20

Sample Depth (feet): 38.0 - 40.5

Date Sampled: 5/22/2018

Date Pushed: 7/17/2018

Sample ID: 18-1011

Additional Comments:
The Shelby tube was advanced 30", and 29" of material was recovered. Samples UD-1.B, UD-1.C & UD-1.D were used for consolidated, undrained triaxial shear testing. Specimen UD-1.C was used for grain size analysis and Atterberg limits.

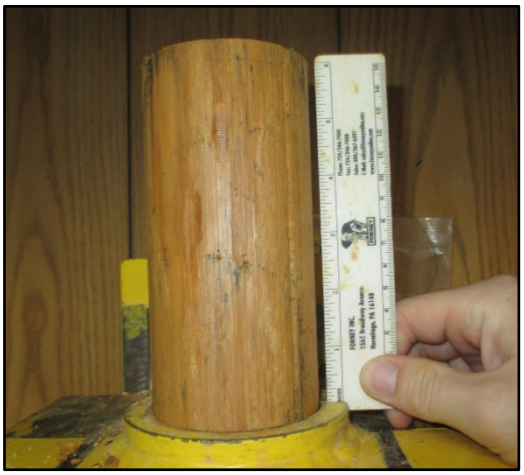
LABORATORY TEST RESULTS							
Liquid Limit	Plastic Limit	Plasticity Index	%#200 Sieve	c (psi)	Φ	c' (psi)	Φ'
62	43	19	94.2	0.00	22.6	3.79	28.0

I-20/26/126 CORRIDOR IMPROVEMENTS

Boring AP-20: I20RC2 Alignment – Station 5161+62, Offset 8 ft – R

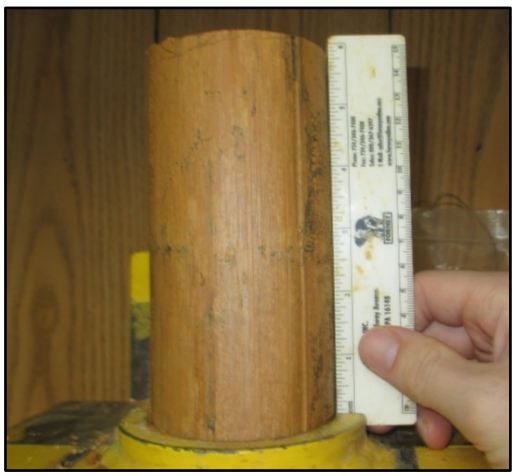
UD-1.A (38.1 – 38.5 ft)

UD-1.B (38.5 – 39.0 ft)



UD-1.C (39.0 – 39.5 ft)

UD-1.C (Top of Sample)

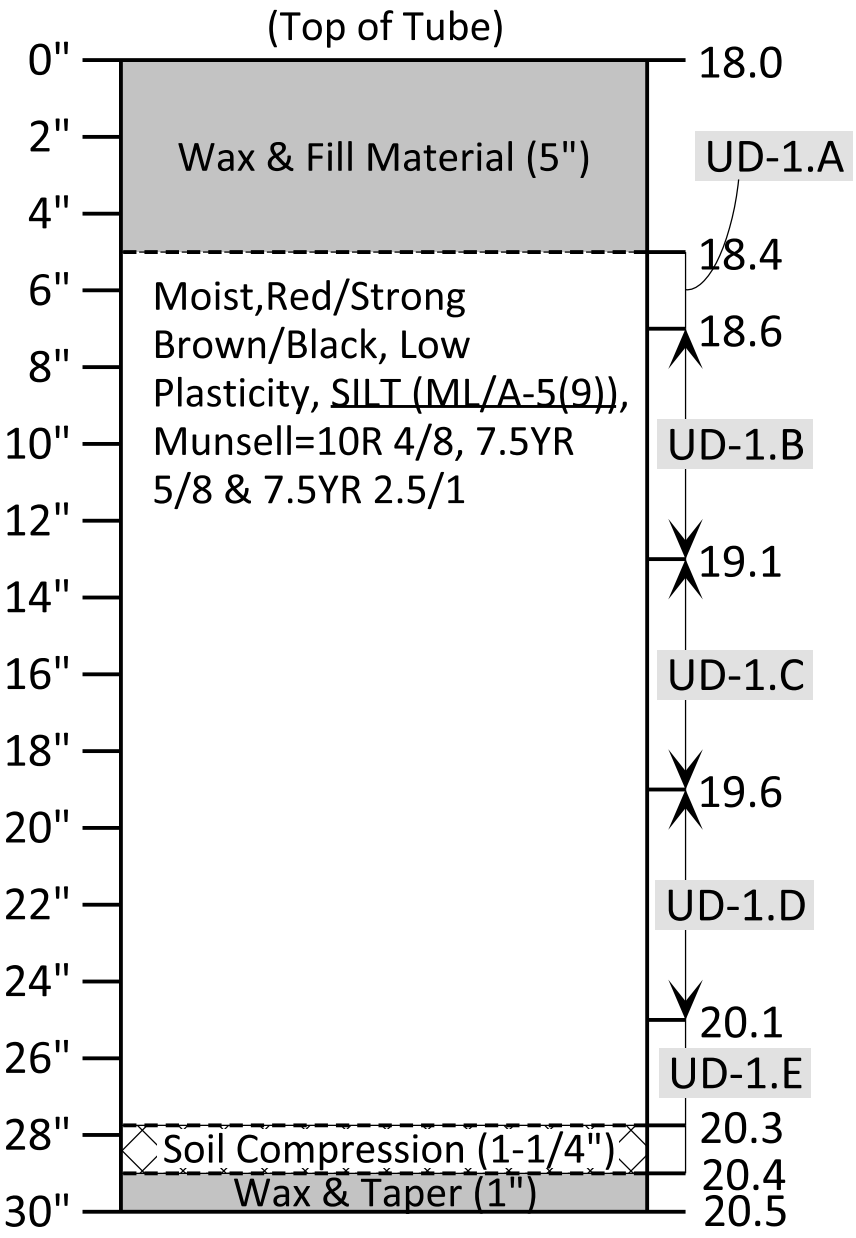


UD-1.D (39.5 – 40.0 ft)

UD-1.E (40.0 – 40.4 ft)

UNDISTURBED SHELBY TUBE SAMPLE LOG

Shelby Tube UD-1



Prepared For: SCDOT

Project: I-20/26/126 Corridor Improvements

SCDOT Project ID: P027662

F&ME Project No.: G5662.01

Boring No.: AP-21

Sample Depth: 18.0' - 20.5'

Date Sampled: 5/23/2018

Date Pushed: 6/28/2018

Sample ID: 18-1036

Additional Comments:
The Shelby tube was advanced 30", and 27" of material was recovered. Approximately 1-1/4" of soil compression occurred during extraction. Specimens UD-1.B, UD-1.C & UD-1.D were used for triaxial shear. Specimen UD-1.C was used for grain size analysis and Atterberg limits.

LABORATORY TEST RESULTS							
Liquid Limit	Plastic Limit	Plasticity Index	%#200 Sieve	c (psi)	Φ	c' (psi)	Φ'
48	43	5	88.1	0.00	25.7	0.00	38.5

I-20/26/126 CORRIDOR IMPROVEMENTS

Boring AP-21: I-26 Alignment – Station 356+26, Offset 78 ft – R

UD-1.A (18.4 – 18.6 ft)

UD-1.B (18.6 – 19.1 ft)

UD-1.C (19.1 – 19.6 ft)

UD-1.D (19.6 – 20.1 ft)

UD-1.E (20.1 – 20.3 ft)

APPENDIX

SECTION 7 LABORATORY TEST RESULTS

CAROLINA CROSSROADS I-20/26/126 CORRIDOR IMPROVEMENTS
LEXINGTON/RICHLAND COUNTIES, SOUTH CAROLINA
F&ME PROJECT NO.: G5662.01; SCDOT PROJECT NO.: P027662

SPLIT SPOON SAMPLE LABORATORY RESULTS SUMMARY

Boring Number	Sample Number	Sample Depth (ft)	Index									Organics (%)	Ignition Loss (%)	Electro-Chemical			
			% Gravel	% Sand	% Fines (Silt/Clay)	LL	PL	PI	Moisture Content	USCS	AASHTO Class			pH	Resistivity (Ohms-cm)	Sulfate (mg/kg)	Chloride (mg/kg)
B-2	SS-2	2.0-4.0	0.8	41.1	58.1	33	25	8	14.4	ML	A-4(3)	--	--	--	--	--	--
B-2	SS-4	6.0-8.0	--	--	--	--	--	--	--	--	--	--	--	3.4	1,733	ND	280
B-2	SS-6	13.5-15.0	1.0	49.2	49.8	NP	NP	NP	20.5	SM	A-4(0)	--	--	--	--	--	--
B-2	SS-7	18.5-20.0	0.4	45.1	54.5	NP	NP	NP	23.7	ML	A-4(0)	--	--	--	--	--	--
B-2	SS-9	28.5-30.0	2.7	70.1	27.2	29	22	7	15.8	SC-SM	A-2-4	--	--	--	--	--	--
B-2	SS-12	43.5-45.0	0.3	68.9	30.8	NP	NP	NP	17.4	SM	A-2-4	--	--	--	--	--	--
B-3	SS-3	4.0-6.0	--	--	--	--	--	--	--	--	--	--	--	4.9	83,588	ND	ND
B-3	SS-4	6.0-8.0	2.9	19.9	77.2	61	30	31	25.8	CH	A-7-5(20)	--	--	--	--	--	--
B-3	SS-6	13.5-15.0	8.1	49.4	42.5	NP	NP	NP	16.5	SM	A-4(0)	--	--	--	--	--	--
B-3	SS-11	38.5-40.0	1.8	57.6	40.6	NP	NP	NP	19.6	SM	A-4(0)	--	--	--	--	--	--
B-4	SS-2	2.0-4.0	1.3	19.7	79.0	51	26	25	27.4	CH	A-7-6(20)	--	--	--	--	--	--
B-4	SS-3	4.0-6.0	--	--	--	--	--	--	--	--	--	--	--	4.5	60,142	ND	ND
B-4	SS-6/SS-7	13.5-20.0	0.0	23.4	76.6	27	23	4	18.5	ML	A-4(2)	--	--	--	--	--	--
B-5	SS-2	2.0-4.0	0.0	1.8	98.2	52	34	18	33.8	MH	A-7-5(20)	--	--	--	--	--	--
B-5	SS-4	6.0-8.0	--	--	--	--	--	--	--	--	--	--	--	5.3	13,252	ND	17
B-5	SS-5	8.0-10.0	0.5	14.2	85.3	52	35	17	19.2	MH	A-7-5(18)	--	--	--	--	--	--
B-5	SS-6	13.5-15.0	1.9	20.4	77.7	31	22	9	15.3	CL	A-4(6)	--	--	--	--	--	--
B-5	SS-9	28.5-30.0	8.9	12.4	78.7	44	15	29	14.4	ML	A-7-6(13)	--	--	--	--	--	--
B-5	SS-12	43.5-45.0	7.1	22.0	70.9	38	24	14	16.0	CL	A-6(9)	--	--	--	--	--	--
B-6	SS-3	4.0-6.0	0.2	80.8	19.0	20	18	2	9.8	SM	A-2-4	--	--	--	--	--	--
B-6	SS-4	6.0-8.0	--	--	--	--	--	--	--	--	--	--	--	4.8	101,936	ND	ND
B-6	SS-6	13.5-15.0	0.8	80.7	18.5	NP	NP	NP	10.4	SM	A-2-4	--	--	--	--	--	--
B-6	SS-7	18.5-20.0	1.5	5.8	92.7	62	34	28	29.0	MH	A-7-5(20)	--	--	--	--	--	--
B-6	SS-9	28.5-30.0	0.0	4.4	95.6	50	34	16	18.4	MH	A-7-5(20)	--	--	--	--	--	--
B-7	SS-1	0.0-2.0	8.9	25.9	65.2	37	25	12	19.4	ML	A-6(7)	--	--	--	--	--	--
B-7	SS-3	4.0-6.0	--	--	--	--	--	--	--	--	--	--	--	4.8	3,874	ND	13

CAROLINA CROSSROADS I-20/26/126 CORRIDOR IMPROVEMENTS
LEXINGTON/RICHLAND COUNTIES, SOUTH CAROLINA
F&ME PROJECT NO.: G5662.01; SCDOT PROJECT NO.: P027662

SPLIT SPOON SAMPLE LABORATORY RESULTS SUMMARY

Boring Number	Sample Number	Sample Depth (ft)	Index									Organics (%)	Ignition Loss (%)	Electro-Chemical			
			% Gravel	% Sand	% Fines (Silt/Clay)	LL	PL	PI	Moisture Content	USCS	AASHTO Class			pH	Resistivity (Ohms-cm)	Sulfate (mg/kg)	Chloride (mg/kg)
B-7	SS-4	6.0-8.0	0.4	6.1	93.5	31	23	8	27.5	ML	A-4(8)	4.01	--	--	--	--	--
B-7	SS-6	13.5-15.0	26.4	55.2	18.4	NP	NP	NP	10.4	SM	A-1-b	--	--	--	--	--	--
B-8	SS-2	2.0-4.0	1.6	72.4	26.0	50	29	21	10.6	SM	A-2-7(1)	--	--	--	--	--	--
B-8	SS-4	6.0-8.0	0.0	2.3	97.7	NP	NP	NP	27.2	ML	A-4(0)	--	--	--	--	--	--
B-8	SS-6	13.5-15.0	--	--	--	--	--	--	--	--	--	--	--	4	90,723	ND	ND
B-8	SS-7	18.5-20.0	11.7	18.8	69.5	NP	NP	NP	20.8	ML	A-4(0)	--	--	--	--	--	--
B-8	SS-10	33.5-35.0	2.0	21.0	77.0	32	25	7	25.5	ML	A-4(5)	--	--	--	--	--	--
B-8	SS-12	43.5-45.0	1.1	9.4	89.5	NP	NP	NP	24.8	ML	A-4(0)	--	--	--	--	--	--
B-8	SS-16	63.5-65.0	0.0	29.5	70.5	NP	NP	NP	24.4	ML	A-4(0)	--	--	--	--	--	--
B-8	SS-19	78.5-80.0	0.8	23.5	75.7	NP	NP	NP	24.0	ML	A-4(0)	--	--	--	--	--	--
B-9	SS-3	4.0-6.0	--	--	--	--	--	--	--	--	--	--	--	4.4	68,297	ND	25
B-9	SS-4	6.0-8.0	17.6	50.3	32.1	NP	NP	NP	12.9	SM	A-2-4	--	--	--	--	--	--
B-9	SS-7	18.5-20.0	4.1	11.5	84.4	41	31	10	26.5	ML	A-5(10)	--	--	--	--	--	--
B-9	SS-9	28.5-30.0	15.3	6.4	78.3	NP	NP	NP	31.3	ML	A-4(0)	--	--	--	--	--	--
B-9	SS-14	53.5-55.0	2.0	22.8	75.2	41	36	5	23.4	ML	A-5(5)	--	--	--	--	--	--
B-10	SS-3	4.0-6.0	3.7	29.4	66.9	30	28	2	19.5	ML	A-4(1)	--	--	--	--	--	--
B-10	SS-4	6.0-8.0	--	--	--	--	--	--	--	--	--	--	--	4.5	11,213	ND	26
B-10	SS-7	18.5-20.0	0.0	14.9	85.1	NP	NP	NP	22.9	ML	A-4(0)	--	--	--	--	--	--
B-10	SS-15	58.5-60.0	1.1	22.6	76.3	NP	NP	NP	23.5	ML	A-4(0)	--	--	--	--	--	--
B-11	SS-4	6.0-8.0	0.2	11.0	88.8	34	33	1	22.1	ML	A-4(3)	--	--	--	--	--	--
B-11	SS-5	8.0-10.0	--	--	--	--	--	--	--	--	--	--	--	4	25,484	ND	ND
B-11	SS-9	28.5-30.0	0.0	12.9	87.1	34	29	5	27.3	ML	A-4(5)	--	--	--	--	--	--
B-11	SS-11	38.5-40.0	0.0	21.8	78.2	NP	NP	NP	23.2	ML	A-4(0)	--	--	--	--	--	--
B-11	SS-13	48.5-50.0	0.9	27.1	72.0	NP	NP	NP	22.2	ML	A-4(0)	--	--	--	--	--	--
B-11	SS-21	104.4-105.8	1.1	34.3	64.6	30	26	4	13.7	ML	A-4(2)	--	--	--	--	--	--
B-12	SS-1	0.0-2.0	3.8	19.0	77.2	29	23	6	17.3	ML	A-4(4)	--	--	--	--	--	--

CAROLINA CROSSROADS I-20/26/126 CORRIDOR IMPROVEMENTS
LEXINGTON/RICHLAND COUNTIES, SOUTH CAROLINA
F&ME PROJECT NO.: G5662.01; SCDOT PROJECT NO.: P027662

SPLIT SPOON SAMPLE LABORATORY RESULTS SUMMARY

Boring Number	Sample Number	Sample Depth (ft)	Index									Organics (%)	Ignition Loss (%)	Electro-Chemical			
			% Gravel	% Sand	% Fines (Silt/Clay)	LL	PL	PI	Moisture Content	USCS	AASHTO Class			pH	Resistivity (Ohms-cm)	Sulfate (mg/kg)	Chloride (mg/kg)
B-12	SS-4	6.0-8.0	1.7	34.4	63.9	27	23	4	20.6	ML	A-4(1)	--	--	--	--	--	--
B-12	SS-5	8.0-10.0	2.1	49.6	48.3	30	25	5	20.2	SM	A-4(0)	--	--	--	--	--	--
B-12	SS-8	23.5-25.0	11.1	30.0	58.9	NP	NP	NP	18.2	ML	A-4(0)	--	--	--	--	--	--
B-12	SS-9	28.5-30.0	--	--	--	--	--	--	--	--	--	--	--	4.9	21,407	ND	21
B-12	SS-13	48.5-50.0	0.3	13.5	86.2	41	31	10	22.8	ML	A-5(10)	--	--	--	--	--	--
B-13	SS-2	2.0-4.0	7.9	11.5	80.6	45	33	12	26.4	ML	A-7-5(12)	--	--	--	--	--	--
B-13	SS-5	8.0-10.0	--	--	--	--	--	--	--	--	--	--	--	4.1	39,755	ND	15
B-13	SS-6	13.5-15.0	0.2	15.2	84.6	NP	NP	NP	29.1	ML	A-4(0)	--	--	--	--	--	--
B-13	SS-8	23.5-25.0	0.3	18.7	81.0	NP	NP	NP	32.8	ML	A-4(0)	--	--	--	--	--	--
B-13	SS-11	38.5-40.0	0.0	18.4	81.6	42	34	8	43.2	ML	A-5(9)	--	--	--	--	--	--
B-13	SS-13	48.5-50.0	0.0	27.4	72.6	32	27	5	25.8	ML	A-4(3)	--	--	--	--	--	--
B-13	SS-17	68.5-70.0	0.0	31.6	68.4	NP	NP	NP	18.6	ML	A-4(0)	--	--	--	--	--	--
B-14	SS-4	6.0-8.0	2.3	9.2	88.5	43	32	11	30.5	ML	A-7-5(12)	--	--	--	--	--	--
B-14	SS-5	8.0-10.0	--	--	--	--	--	--	--	--	--	--	--	3.8	8,868	ND	32
B-14	SS-6	13.5-15.0	0.1	17.3	82.6	52	26	26	23.2	CH	A-7-6(20)	--	--	--	--	--	--
B-14	SS-7	18.5-20.0	0.0	12.7	87.3	39	30	9	26.3	ML	A-4(8)	--	--	--	--	--	--
B-14	SS-8	23.5-25.0	0.0	3.5	96.5	NP	NP	NP	21.7	ML	A-4(0)	--	--	--	--	--	--
B-14	SS-11	38-5-40.0	0.0	6.0	94.0	38	31	7	28.5	ML	A-4(8)	--	--	--	--	--	--
B-15	SS-4	6.0-8.0	0.0	3.5	96.5	67	47	20	31.2	MH	A-7-5(20)	--	--	--	--	--	--
B-15	SS-6	13.5-15.0	0.4	6.5	93.1	51	42	9	31.8	MH	A-5(12)	--	--	--	--	--	--
B-15	SS-8	23.5-25.0	--	--	--	--	--	--	--	--	--	--	--	4.8	56,065	ND	ND
B-15	SS-9	28.5-30.0	19.1	31.2	49.7	42	35	7	18.2	SM	A-5(2)	--	--	--	--	--	--
B-15	SS-13	48.5-50.0	1.7	5.8	92.5	33	28	5	28.1	ML	A-4(6)	--	--	--	--	--	--
B-16	SS-2	2.0-4.0	9.3	24.7	66.0	NP	NP	NP	7.3	ML	A-4(0)	--	--	--	--	--	--
B-16	SS-6	13.5-15.0	16.0	22.7	61.3	NP	NP	NP	17.0	ML	A-4(0)	--	--	--	--	--	--
B-16	SS-7	18.5-20.0	15.4	34.1	50.5	17	15	2	12.8	ML	A-4(0)	--	--	--	--	--	--

CAROLINA CROSSROADS I-20/26/126 CORRIDOR IMPROVEMENTS
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F&ME PROJECT NO.: G5662.01; SCDOT PROJECT NO.: P027662

SPLIT SPOON SAMPLE LABORATORY RESULTS SUMMARY

Boring Number	Sample Number	Sample Depth (ft)	Index									Organics (%)	Ignition Loss (%)	Electro-Chemical			
			% Gravel	% Sand	% Fines (Silt/Clay)	LL	PL	PI	Moisture Content	USCS	AASHTO Class			pH	Resistivity (Ohms-cm)	Sulfate (mg/kg)	Chloride (mg/kg)
B-16	SS-8	23.5-25.0	0.0	25.8	74.2	NP	NP	NP	27.1	ML	A-4(0)	--	--	--	--	--	--
B-16	SS-9	28.5-30.0	--	--	--	--	--	--	--	--	--	--	--	4.6	34,658	ND	ND
B-16	SS-10	33.5-35.0	0.0	20.2	79.7	41	39	2	46.9	ML	A-5(4)	--	--	--	--	--	--
B-16	SS-13	48.5-50.0	0.0	18.5	81.5	NP	NP	NP	28.7	ML	A-4(0)	--	--	--	--	--	--
B-16	SS-19	78.5-80.0	0.8	18.8	80.4	NP	NP	NP	24.6	ML	A-4(0)	--	--	--	--	--	--
B-17	SS-2	2.0-4.0	8.6	20.6	70.8	32	27	5	14.2	ML	A-4(3)	--	--	--	--	--	--
B-17	SS-5	8.0-10.0	9.5	14.0	76.5	53	35	18	22.9	MH	A-7-5(16)	--	--	--	--	--	--
B-17	SS-7	18.5-20.0	1.5	11.1	87.4	38	37	1	30.0	ML	A-4(3)	--	--	--	--	--	--
B-17	SS-8	23.5-25.0	--	--	--	--	--	--	--	--	--	--	--	4.3	44,852	ND	13
B-17	SS-11	38.5-40.0	23.0	18.6	58.4	37	27	10	20.4	ML	A-4(4)	--	--	--	--	--	--
B-17	SS-14	53.5-55.0	15.3	39.3	45.4	28	26	2	18.5	SM	A-4(0)	--	--	--	--	--	--
B-17	SS-16	63.5-65.0	1.7	34.5	63.8	24	19	5	21.1	CL-ML	A-4(1)	--	--	--	--	--	--
B-18	SS-1	0.0-2.0	0.2	33.1	66.9	35	27	8	11.3	ML	A-4(5)	--	--	--	--	--	--
B-18	SS-5	8.0-10.0	--	--	--	--	--	--	--	--	--	--	--	5.4	55,046	ND	ND
B-18	SS-6	13.5-15.0	4.2	26.1	69.7	NP	NP	NP	23.4	ML	A-4(0)	--	--	--	--	--	--
B-18	SS-10	33.5-35.0	28.2	32.9	38.9	33	23	10	16.6	SC	A-4(1)	--	--	--	--	--	--
B-19	SS-4	6.0-8.0	1.3	30.1	68.6	22	17	5	19.2	CL-ML	A-4(1)	2.05	--	--	--	--	--
B-19	SS-5	8.0-10.0	--	--	--	--	--	--	--	--	--	--	--	5.2	94,801	ND	ND
B-19	SS-6	13.5-15.0	2.3	24.0	73.7	33	26	7	22.2	ML	A-4(5)	--	--	--	--	--	--
B-19	SS-8	23.5-25.0	2.7	21.1	76.2	34	31	3	14.8	ML	A-4(3)	--	--	--	--	--	--
B-20	SS-4	6.0-8.0	12.3	19.1	68.6	NP	NP	NP	19.6	ML	A-4(0)	--	--	--	--	--	--
B-20	SS-8	23.5-25.0	--	--	--	--	--	--	--	--	--	--	--	4.4	93,781	ND	ND
B-20	SS-9	28.5-30.0	0.9	19.1	80.0	33	29	4	22.3	ML	A-4(4)	--	--	--	--	--	--
B-20	SS-12/SS-13	43.5-50.0	0.2	21.6	78.2	29	25	4	19.9	ML	A-4(2)	--	--	--	--	--	--
B-21	SS-2	2.0-4.0	0.9	9.2	89.9	28	27	1	7.9	ML	A-4(1)	--	--	--	--	--	--
B-21	SS-5	8.0-10.0	0.7	5.5	93.8	NP	NP	NP	18.4	ML	A-4(0)	--	--	--	--	--	--

CAROLINA CROSSROADS I-20/26/126 CORRIDOR IMPROVEMENTS
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			% Gravel	% Sand	% Fines (Silt/Clay)	LL	PL	PI	Moisture Content	USCS	AASHTO Class			pH	Resistivity (Ohms-cm)	Sulfate (mg/kg)	Chloride (mg/kg)
B-21	SS-6	13.5-15.0	--	--	--	--	--	--	--	--	--	--	--	4.1	66,259	ND	ND
B-21	SS-8	23.5-25.0	0.0	13.8	86.2	NP	NP	NP	25.7	ML	A-4(0)	--	--	--	--	--	--
B-21	SS-10	33.5-35.0	0.0	23.9	76.1	NP	NP	NP	21.0	ML	A-4(0)	--	--	--	--	--	--
B-21	SS-13	48.5-50.0	0.0	11.5	88.5	NP	NP	NP	29.8	ML	A-4(0)	--	--	--	--	--	--
B-21	SS-16	63.5-65.0	0.0	22.1	77.9	NP	NP	NP	20.4	ML	A-4(0)	--	--	--	--	--	--
B-22	SS-1	0.0-2.0	2.9	18.9	78.2	30	29	1	16.8	ML	A-4(1)	--	--	--	--	--	--
B-22	SS-6	13.5-15.0	--	--	--	--	--	--	--	--	--	--	--	3.9	53,007	ND	16
B-22	SS-7	18.5-20.0	4.9	12.4	82.7	NP	NP	NP	23.4	ML	A-4(0)	--	--	--	--	--	--
B-22	SS-9	28.5-30.0	0.0	16.9	83.1	29	28	1	24.1	ML	A-4(1)	--	--	--	--	--	--
B-22	SS-11	38.5-40.0	13.7	32.6	53.7	NP	NP	NP	17.9	ML	A-4(0)	--	--	--	--	--	--
B-22	SS-13	48.5-50.0	1.0	24.7	74.3	NP	NP	NP	22.1	ML	A-4(0)	--	--	--	--	--	--
B-22	SS-15	58.5-60.0	7.4	25.1	67.5	NP	NP	NP	21.9	ML	A-4(0)	--	--	--	--	--	--
B-22	SS-17	68.5-70.0	0.1	17.8	82.1	NP	NP	NP	25.3	ML	A-4(0)	--	--	--	--	--	--
B-23	SS-2	2.0-4.0	1.2	43.6	55.2	42	24	18	19.1	CL	A-7-6(8)	--	--	--	--	--	--
B-23	SS-7	18.5-20.0	0.0	47.0	53.0	40	23	17	22.3	CL	A-6(6)	--	--	--	--	--	--
B-23	SS-9	28.5-30.0	0.0	8.2	91.8	NP	NP	NP	21.8	ML	A-4(0)	--	--	--	--	--	--
B-23	SS-10	33.5-35.0	--	--	--	--	--	--	--	--	--	--	--	4.4	65,239	ND	ND
B-23	SS-15	58.5-60.0	0.0	13.8	86.2	NP	NP	NP	25.9	ML	A-4(0)	--	--	--	--	--	--
B-24	SS-2	2.0-4.0	10.1	14.6	75.3	NP	NP	NP	1.0	ML	A-4(0)	--	--	--	--	--	--
B-24	SS-5	8.0-10.0	0.6	15.9	83.5	33	26	7	13.1	ML	A-4(6)	--	--	--	--	--	--
B-24	SS-6	13.5-15.0	--	--	--	--	--	--	--	--	--	--	--	4.8	21,407	ND	12
B-24	SS-7	18.5-20.0	0.0	12.4	87.6	NP	NP	NP	10.8	ML	A-4(0)	--	--	--	--	--	--
B-25	SS-1	0.0-2.0	6.9	43.4	49.7	29	26	3	7.7	SM	A-4(0)	--	--	--	--	--	--
B-25	SS-3	4.0-6.0	3.8	47.5	48.7	29	21	8	13.7	SC	A-4(1)	--	--	--	--	--	--
B-25	SS-4	6.0-8.0	5.0	14.6	76.8	NP	NP	NP	8.0	ML	A-4(0)	--	--	--	--	--	--
B-25	SS-6	13.5-15.0	1.2	13.6	85.3	32	26	6	11.9	ML	A-4(5)	--	--	--	--	--	--

CAROLINA CROSSROADS I-20/26/126 CORRIDOR IMPROVEMENTS
LEXINGTON/RICHLAND COUNTIES, SOUTH CAROLINA
F&ME PROJECT NO.: G5662.01; SCDOT PROJECT NO.: P027662

SPLIT SPOON SAMPLE LABORATORY RESULTS SUMMARY

Boring Number	Sample Number	Sample Depth (ft)	Index									Organics (%)	Ignition Loss (%)	Electro-Chemical			
			% Gravel	% Sand	% Fines (Silt/Clay)	LL	PL	PI	Moisture Content	USCS	AASHTO Class			pH	Resistivity (Ohms-cm)	Sulfate (mg/kg)	Chloride (mg/kg)
B-25	SS-7	18.5-20.0	--	--	--	--	--	--	--	--	--	--	--	4.8	31,600	ND	18
B-26	SS-2	2.0-4.0	0.1	8.0	91.9	59	45	14	28.8	MH	A-7-5(20)	--	--	--	--	--	--
B-26	SS-7	18.5-20.0	--	--	--	--	--	--	--	--	--	--	--	4.8	12,232	ND	ND
B-26	SS-8	23.5-25.0	5.1	4.3	90.6	57	37	20	41.3	MH	A-7-5(20)	--	--	--	--	--	--
B-26	SS-10	33.5-35.0	0.0	3.7	96.3	NP	NP	NP	30.8	ML	A-4(0)	--	--	--	--	--	--
B-26	SS-12	43.5-45.0	0.0	15.9	84.1	44	33	11	25.1	ML	A-7-5(11)	--	--	--	--	--	--
B-27	SS-4	6.0-8.0	1.8	15.1	83.1	NP	NP	NP	20.0	ML	A-4(0)	--	--	--	--	--	--
B-27	SS-6	13.5-15.0	0.4	5.4	94.2	NP	NP	NP	29.3	ML	A-4(0)	--	--	--	--	--	--
B-27	SS-8	23.5-25.0	--	--	--	--	--	--	--	--	--	--	--	4.2	45,871	ND	15
B-27	SS-12	43.5-45.0	1.6	23.5	74.9	NP	NP	NP	30.0	ML	A-4(0)	--	--	--	--	--	--
B-28	SS-2	2.0-4.0	0.3	40.6	59.2	46	26	20	20.2	CL	A-7-6(10)	--	--	--	--	--	--
B-28	SS-3	4.0-6.0	0.0	31.5	68.5	52	25	27	21.0	CH	A-7-6(18)	--	--	--	--	--	--
B-28	SS-4	6.0-8.0	--	--	--	--	--	--	--	--	--	--	--	3.7	51,988	ND	ND
B-28	SS-5	8.0-10.0	1.4	60.4	38.2	NP	NP	NP	19.2	SM	A-4(0)	--	--	--	--	--	--
B-28	SS-8	23.5-25.0	1.3	16.4	82.3	NP	NP	NP	16.4	ML	A-4(0)	--	--	--	--	--	--
B-28	SS-10	33.5-35.0	1.0	23.4	75.6	NP	NP	NP	18.1	ML	A-4(0)	--	--	--	--	--	--
B-28	SS-12	43.5-45.0	7.4	19.5	73.1	40	26	14	18.2	ML	A-6(10)	--	--	--	--	--	--
B-63	SS-1	0.0-2.0	2.2	16.3	81.5	44	25	19	18.2	CL	A-7-6(16)	--	--	--	--	--	--
B-63	SS-2	2.0-4.0	--	--	--	--	--	--	--	--	--	--	--	4.5	35,678	ND	15
B-63	SS-4	6.0-8.0	13.0	19.3	67.7	58	33	25	25.4	MH	A-7-5(18)	--	--	--	--	--	--
B-63	SS-5	8.0-10.0	1.2	13.0	85.8	62	35	27	34.5	MH	A-7-5(20)	--	--	--	--	--	--
DH-1	SS-4	6.0-8.0	0.0	4.8	95.2	40	27	13	23.8	ML	A-6(14)	--	--	--	--	--	--
DH-1	SS-7	18.5-20.0	0.0	3.0	97.0	42	27	15	19.0	ML	A-7-6(17)	--	--	--	--	--	--
DH-2	SS-3	4.0-6.0	0.7	44.8	54.5	51	22	29	16.3	CH	A-7-6(12)	--	--	--	--	--	--
DH-2	SS-7	18.5-20.0	10.2	50.3	39.5	39	22	17	21.8	SC	A-6(3)	--	--	--	--	--	--
DH-2	SS-11	38.5-40.0	1.4	5.3	93.3	NP	NP	NP	32.5	ML	A-4(0)	--	--	--	--	--	--

CAROLINA CROSSROADS I-20/26/126 CORRIDOR IMPROVEMENTS
LEXINGTON/RICHLAND COUNTIES, SOUTH CAROLINA
F&ME PROJECT NO.: G5662.01; SCDOT PROJECT NO.: P027662

SPLIT SPOON SAMPLE LABORATORY RESULTS SUMMARY

Boring Number	Sample Number	Sample Depth (ft)	Index									Organics (%)	Ignition Loss (%)	Electro-Chemical			
			% Gravel	% Sand	% Fines (Silt/Clay)	LL	PL	PI	Moisture Content	USCS	AASHTO Class			pH	Resistivity (Ohms-cm)	Sulfate (mg/kg)	Chloride (mg/kg)
DH-2	SS-16	63.5-65.0	0.0	34.9	65.1	NP	NP	NP	19.5	ML	A-4(0)	--	--	--	--	--	--
DH-3	SS-1	0.0-2.0	4.9	19.6	75.5	45	31	14	27.8	ML	A-7-5(12)	--	--	--	--	--	--
DH-3	SS-4	6.0-8.0	8.9	27.2	63.9	32	26	6	26.4	ML	A-4(3)	--	--	--	--	--	--
DH-3A	SS-6	43.5-45.0	0.2	31.3	68.5	42	31	11	28.2	ML	A-7-5(8)	--	--	--	--	--	--
DH-3A	SS-8	53.5-55.0	0.5	17.2	82.3	53	36	17	47.2	MH	A-7-5(17)	--	--	--	--	--	--
RW-2	SS-5	8.0-10.0	0.5	7.2	92.3	39	29	10	26.9	ML	A-4(8)	--	--	--	--	--	--
RW-2	SS-7	18.5-20.0	0.0	12.2	87.8	32	24	8	22.1	ML	A-4(7)	--	--	--	--	--	--
RW-2	SS-9	28.5-30.0	0.4	13.1	86.5	38	26	12	22.4	ML	A-6(11)	--	--	--	--	--	--
RW-3	SS-4	6.0-8.0	9.7	35.3	55.0	28	21	7	9.5	CL-ML	A-4(2)	--	--	--	--	--	--
RW-3	SS-6	13.5-15.0	3.4	30.6	66.0	33	26	7	16.5	ML	A-4(4)	--	--	--	--	--	--
RW-4	SS-2	2.0-4.0	13.6	36.0	50.4	39	28	11	17.4	ML	A-6(3)	--	--	--	--	--	--
RW-5	SS-2	2.0-4.0	25.3	28.9	30.2	NP	NP	NP	12.4	SM	A-2-4	--	--	--	--	--	--
RW-5	SS-4	8.0-10.0	7.9	38.5	53.6	35	20	15	21.5	CL	A-6(5)	--	--	--	--	--	--
RW-6	SS-2	2.0-4.0	16.1	42.9	41.0	NP	NP	NP	14.9	SM	A-4(0)	--	--	--	--	--	--
RW-7	SS-3	4.0-6.0	1.7	23.9	74.4	35	22	13	20.5	CL	A-6(9)	--	--	--	--	--	--
RW-7	SS-6	13.5-15.0	0.4	37.8	61.8	36	24	12	24.1	CL	A-6(6)	--	--	--	--	--	--
RW-8	SS-2	2.0-4.0	3.6	20.7	75.6	27	18	9	13.4	CL	A-4(5)	--	--	--	--	--	--
RW-8	SS-3	4.0-6.0	15.0	25.0	50.1	43	20	23	9.1	CL	A-7-6(8)	--	--	--	--	--	--
RW-8	SS-5	8.0-10.0	--	--	--	--	--	--	12.7	--	--	--	--	--	--	--	--
RW-10	SS-2	2.0-4.0	0.0	10.7	89.3	52	29	23	17.8	MH	A-7-6(20)	--	--	--	--	--	--
RW-10	SS-5	8.0-10.0	0.0	14.9	85.1	NP	NP	NP	15.9	ML	A-4(0)	--	--	--	--	--	--
RW-10	SS-7	18.5-20.0	0.0	22.1	77.9	34	29	5	22.8	ML	A-4(4)	--	--	--	--	--	--
RW-11	SS-2	2.0-4.0	0.0	12.2	87.8	28	23	5	20.9	ML	A-4(4)	--	--	--	--	--	--
RW-12	SS-1	0.0-2.0	0.9	14.7	84.3	45	33	12	19.7	ML	A-7-5(12)	--	--	--	--	--	--
RW-12	SS-2	2.0-4.0	0.0	3.2	96.8	56	23	33	32.0	CH	A-7-6(20)	--	--	--	--	--	--
RW-12	SS-3	4.0-6.0	0.0	3.2	96.8	42	25	17	20.6	CL	A-7-6(19)	--	--	--	--	--	--

CAROLINA CROSSROADS I-20/26/126 CORRIDOR IMPROVEMENTS
LEXINGTON/RICHLAND COUNTIES, SOUTH CAROLINA
F&ME PROJECT NO.: G5662.01; SCDOT PROJECT NO.: P027662

SPLIT SPOON SAMPLE LABORATORY RESULTS SUMMARY

Boring Number	Sample Number	Sample Depth (ft)	Index									Organics (%)	Ignition Loss (%)	Electro-Chemical			
			% Gravel	% Sand	% Fines (Silt/Clay)	LL	PL	PI	Moisture Content	USCS	AASHTO Class			pH	Resistivity (Ohms-cm)	Sulfate (mg/kg)	Chloride (mg/kg)
RW-12	SS-5	8.0-10.0	0.0	6.8	93.2	41	27	14	29.7	ML	A-7-6(15)	--	--	--	--	--	--
RW-13	SS-2	2.0-4.0	0.0	34.4	65.6	NP	NP	NP	11.1	ML	A-4(0)	--	--	--	--	--	--
RW-14	SS-4	6.0-8.0	1.0	40.9	58.1	41	26	15	22.9	ML	A-7-6(7)	--	--	--	--	--	--
RW-14	SS-5	8.0-10.0	11.9	51.7	36.4	34	23	11	16.6	SC	A-6(1)	--	--	--	--	--	--
RW-14	SS-7	18.5-20.0	0.8	8.9	90.3	51	39	12	34.0	MH	A-7-5(16)	--	--	--	--	--	--
RW-14	SS-10	33.5-35.0	0.1	1.3	98.6	NP	NP	NP	30.6	ML	A-4(0)	--	--	--	--	--	--
RW-15	SS-5	8.0-10.0	2.3	6.9	90.8	46	29	17	27.5	ML	A-7-6(18)	--	--	--	--	--	--
RW-15	SS-7	18.5-20.0	8.9	25.8	65.3	NP	NP	NP	19.2	ML	A-4(0)	--	--	--	--	--	--
RW-15	SS-10	33.5-35.0	0.0	7.6	92.4	NP	NP	NP	17.1	ML	A-4(0)	--	--	--	--	--	--
RW-16	SS-3	4.0-6.0	0.0	1.7	98.3	81	18	63	20.1	CH	A-7-6(20)	--	--	--	--	--	--
RW-16	SS-6	13.5-15.0	0.0	6.6	93.4	42	24	18	17.3	CL	A-7-6(218)	--	--	--	--	--	--
RW-16	SS-9	28.5-30.0	0.0	42.6	57.4	35	25	10	14.2	ML	A-6(10)	--	--	--	--	--	--
RW-17	SS-3	4.0-6.0	7.8	17.9	74.3	48	34	14	24.5	ML	A-7-5(12)	--	--	--	--	--	--
RW-17	SS-5	8.0-10.0	0.8	46.5	52.7	33	24	9	26.9	ML	A-4(3)	--	--	--	--	--	--
RW-18	SS-3	4.0-6.0	8.4	35.0	56.7	NP	NP	NP	8.7	ML	A-4(0)	--	--	--	--	--	--
RW-18	SS-4	6.0-8.0	4.3	31.2	64.5	40	23	17	13.6	CL	A-6(9)	--	--	--	--	--	--
RW-18	SS-5	8.0-10.0	--	--	--	26	19	7	--	--	--	--	--	--	--	--	--
RW-19	SS-4	6.0-8.0	30.1	13.5	56.4	37	27	10	17.0	ML	A-4(4)	--	--	--	--	--	--
RW-19	SS-5	8.0-10.0	--	--	--	--	--	--	--	--	--	--	0.6	--	--	--	--
RW-19	SS-6	13.5-15.0	14.6	29.0	56.4	37	21	16	18.3	CL	A-6(6)	--	--	--	--	--	--
RW-20	SS-1	0.0-2.0	1.4	6.6	92.0	43	35	8	17.8	ML	A-5(11)	--	--	--	--	--	--
RW-20	SS-8	23.5-25.0	1.9	10.4	87.7	NP	NP	NP	25.6	ML	A-4(0)	--	--	--	--	--	--
RW-21	SS-2	2.0-4.0	2.8	20.8	76.4	63	35	28	23.6	MH	A-7-5(20)	--	--	--	--	--	--
RW-21	SS-6	13.5-15.0	2.5	5.0	92.5	NP	NP	NP	27.1	ML	A-4(0)	--	--	--	--	--	--
RW-21	SS-10	33.5-35.0	0.0	9.4	90.6	NP	NP	NP	35.8	ML	A-4(0)	--	--	--	--	--	--
RW-22	SS-2	2.0-4.0	0.0	13.7	86.3	33	29	4	8.2	ML	A-4(4)	--	--	--	--	--	--

CAROLINA CROSSROADS I-20/26/126 CORRIDOR IMPROVEMENTS
LEXINGTON/RICHLAND COUNTIES, SOUTH CAROLINA
F&ME PROJECT NO.: G5662.01; SCDOT PROJECT NO.: P027662

SPLIT SPOON SAMPLE LABORATORY RESULTS SUMMARY

Boring Number	Sample Number	Sample Depth (ft)	Index									Organics (%)	Ignition Loss (%)	Electro-Chemical			
			% Gravel	% Sand	% Fines (Silt/Clay)	LL	PL	PI	Moisture Content	USCS	AASHTO Class			pH	Resistivity (Ohms-cm)	Sulfate (mg/kg)	Chloride (mg/kg)
RW-22	SS-5	8.0-10.0	0.5	17.2	82.3	35	27	8	23.0	ML	A-4(7)	--	--	--	--	--	--
RW-23	SS-2	2.0-4.0	0.0	2.1	97.9	57	38	19	25.8	MH	A-7-5(20)	--	--	--	--	--	--
RW-23	SS-6	13.5-15.0	0.0	2.7	97.3	58	47	11	29.7	MH	A-7-5(19)	--	--	--	--	--	--
RW-23	SS-9	28.5-30.0	0.0	6.6	93.4	50	41	9	33.8	MH	A-5(12)	--	--	--	--	--	--
RW-23	SS-11	38.5-40.0	0.1	11.2	88.7	48	34	14	27.6	ML	A-7-5(16)	--	--	--	--	--	--
RW-23	SS-12	43.5-45.0	0.0	4.2	95.8	45	34	11	26.0	ML	A-7-5(15)	--	--	--	--	--	--
RW-24	SS-5	8.0-10.0	3.9	54.4	41.7	58	30	28	21.6	SC	A-7-5(7)	--	--	--	--	--	--
RW-24	SS-6	13.5-15.0	0.2	62.9	36.9	NP	NP	NP	20.2	SM	A-4(0)	--	--	--	--	--	--
RW-24	SS-7	18.5-20.0	12.6	62.5	19.4	51	25	26	14.3	SC	A-2-7(1)	--	--	--	--	--	--
RW-24	SS-8	23.5-25.0	0.0	27.6	72.4	32	22	10	27.7	CL	A-4(6)	--	--	--	--	--	--
RW-24	SS-9	28.5-30.0	9.4	38.5	52.1	35	27	8	21.4	ML	A-4(2)	--	--	--	--	--	--
RW-25	SS-3	4.0-6.0	1.4	59.6	39.0	61	42	19	14.9	SM	A-7-5(3)	--	--	--	--	--	--
RW-25	SS-5	8.0-10.0	1.0	73.7	25.3	54	36	18	16.6	SM	A-2-7(1)	--	--	--	--	--	--
RW-25	SS-7	18.5-20.0	2.3	6.5	91.2	NP	NP	NP	28.8	ML	A-4(0)	--	--	--	--	--	--
RW-25	SS-10	33.5-35.0	0.7	19.4	79.9	NP	NP	NP	23.3	ML	A-4(0)	--	--	--	--	--	--
RW-26	SS-2	2.0-4.0	0.4	66.2	33.4	64	28	36	14.4	SC	A-2-7(4)	--	--	--	--	--	--
RW-26	SS-4	6.0-8.0	0.0	62.5	37.5	48	29	19	19.1	SM	A-7-6(2)	--	--	--	--	--	--
RW-26	SS-7	18.5-20.0	0.6	7.0	92.4	NP	NP	NP	28.9	ML	A-4(0)	--	--	--	--	--	--
RW-26	SS-10	33.5-35.0	1.3	9.9	88.8	NP	NP	NP	27.6	ML	A-4(0)	--	--	--	--	--	--
RW-27	SS-2	2.0-4.0	2.6	14.1	83.3	32	28	4	10.7	ML	A-4(0)	--	--	--	--	--	--
RW-27	SS-4	6.0-8.0	0.3	7.8	91.9	38	32	6	23.9	ML	A-4(8)	--	--	--	--	--	--
RW-27	SS-6	13.5-15.0	0.5	11.7	87.8	NP	NP	NP	25.6	ML	A-4(0)	--	--	--	--	--	--
RW-27	SS-7	18.5-20.0	0.0	19.7	80.3	NP	NP	NP	21.2	ML	A-4(0)	--	--	--	--	--	--
RW-27	SS-10	33.5-35.0	0.0	18.0	82.0	NP	NP	NP	21.4	ML	A-4(0)	--	--	--	--	--	--
RW-28A	SS-1	0.0-2.0	10.7	39.4	49.9	33	26	7	11.8	SM	A-4(1)	--	--	--	--	--	--
RW-28A	SS-5	8.0-10.0	0.0	29.8	70.2	NP	NP	NP	12.5	ML	A-4(0)	--	--	--	--	--	--

CAROLINA CROSSROADS I-20/26/126 CORRIDOR IMPROVEMENTS
LEXINGTON/RICHLAND COUNTIES, SOUTH CAROLINA
F&ME PROJECT NO.: G5662.01; SCDOT PROJECT NO.: P027662

SPLIT SPOON SAMPLE LABORATORY RESULTS SUMMARY

Boring Number	Sample Number	Sample Depth (ft)	Index									Organics (%)	Ignition Loss (%)	Electro-Chemical			
			% Gravel	% Sand	% Fines (Silt/Clay)	LL	PL	PI	Moisture Content	USCS	AASHTO Class			pH	Resistivity (Ohms-cm)	Sulfate (mg/kg)	Chloride (mg/kg)
RW-29	SS-2	2.0-4.0	0.1	30.9	69.0	33	22	11	20.7	CL	A-6(6)	--	--	--	--	--	--
RW-29	SS-4	6.0-8.0	22.1	21.2	56.7	40	28	12	16.2	ML	A-6(5)	--	--	--	--	--	--
RW-29	SS-7	18.5-20.0	0.0	11.2	88.8	51	45	6	35.7	MH	A-5(11)	--	--	--	--	--	--
RW-30	SS-1	0.0-2.0	0.3	4.1	95.6	NP	NP	NP	29.1	ML	A-4(0)	--	--	--	--	--	--
RW-30	SS-7	18.5-20.0	0.0	3.0	97.0	48	37	11	34.5	ML	A-7-5(16)	--	--	--	--	--	--
RW-31	SS-3	4.0-6.0	0.0	3.9	96.1	58	43	15	23.8	MH	A-7-5(20)	--	--	--	--	--	--
RW-31	SS-6	13.5-15.0	0.2	16.7	83.0	59	45	14	35.2	MH	A-7-5(17)	--	--	--	--	--	--
RW-31	SS-7	18.5-20.0	0.3	3.1	96.5	NP	NP	NP	33.6	ML	A-4(0)	--	--	--	--	--	--
RW-31	SS-11	38.5-40.0	0.3	7.6	92.1	53	44	9	41.6	MH	A-5(12)	--	--	--	--	--	--
RW-32	SS-3	4.0-6.0	0.0	2.7	97.3	59	44	15	32.0	MH	A-7-5(20)	--	--	--	--	--	--
RW-32	SS-8	23.5-25.0	0.0	13.8	86.2	NP	NP	NP	41.2	ML	A-4(0)	5.04	--	--	--	--	--
RW-32	SS-11	38.5-40.0	0.0	12.6	87.4	NP	NP	NP	25.2	ML	A-4(0)	--	--	--	--	--	--
RW-33	SS-2	2.0-4.0	0.1	9.5	90.4	34	28	6	11.2	ML	A-4(6)	--	--	--	--	--	--
RW-33	SS-4	6.0-8.0	1.6	14.4	84.0	NP	NP	NP	23.0	ML	A-4(0)	--	--	--	--	--	--
RW-33	SS-9	28.5-30.0	0.4	18.8	80.8	NP	NP	NP	21.2	ML	A-4(0)	--	--	--	--	--	--
RW-34	SS-2	2.0-4.0	0.0	45.4	54.6	44	26	18	17.1	CL	A-7-6(8)	--	--	--	--	--	--
RW-34	SS-4	6.0-8.0	0.1	371.0	62.8	52	23	29	21.2	CH	A-7-6(16)	--	--	--	--	--	--
RW-34	SS-6	13.5-18.5	36.4	34.2	29.4	42	25	17	11.5	GC	A-2-7(1)	--	--	--	--	--	--
RW-34	SS-8	23.5-25.0	1.3	71.6	27.1	66	34	32	21.5	SM	A-2-7(3)	--	--	--	--	--	--
W-1	SS-4	6.0-8.0	12.7	24.9	62.4	30	18	12	18.6	CL	A-6(5)	--	--	--	--	--	--
W-1	SS-5	8.0-8.5	--	--	--	22	17	5	--	--	--	--	--	--	--	--	--
W-4	SS-5	8.0-10.0	5.7	28.1	66.2	26	21	5	23.8	CL-ML	A-4(1)	--	--	--	--	--	--
W-4	SS-6	13.5-15.0	7.6	29.5	62.9	42	25	17	26.7	CL	A-7-6(9)	--	--	--	--	--	--
W-4	SS-8	23.5-25.0	0.1	42.4	57.5	NP	NP	NP	22.7	ML	A-4(0)	--	--	--	--	--	--
W-5	SS-3	4.0-6.0	37.6	39.9	22.5	25	22	3	12.8	SM	A-1-b	--	--	--	--	--	--
W-6	SS-2	2.0-4.0	0.0	11.8	88.2	49	31	18	22.7	ML	A-7-5(19)	--	--	--	--	--	--

CAROLINA CROSSROADS I-20/26/126 CORRIDOR IMPROVEMENTS
LEXINGTON/RICHLAND COUNTIES, SOUTH CAROLINA
F&ME PROJECT NO.: G5662.01; SCDOT PROJECT NO.: P027662

SPLIT SPOON SAMPLE LABORATORY RESULTS SUMMARY

Boring Number	Sample Number	Sample Depth (ft)	Index									Organics (%)	Ignition Loss (%)	Electro-Chemical			
			% Gravel	% Sand	% Fines (Silt/Clay)	LL	PL	PI	Moisture Content	USCS	AASHTO Class			pH	Resistivity (Ohms-cm)	Sulfate (mg/kg)	Chloride (mg/kg)
W-6	SS-5	8.0-10.0	2.5	8.0	89.5	NP	NP	NP	27.2	ML	A-4(0)	--	--	--	--	--	--
W-6	SS-8	23.5-25.0	1.4	17.3	18.3	42	26	16	21.7	ML	A-7-6(14)	--	--	--	--	--	--
W-6	SS-10	33.5-35.0	0.0	5.6	94.4	40	26	14	16.7	ML	A-6(15)	--	--	--	--	--	--
W-7	SS-4	6.0-8.0	0.9	11.6	87.5	31	20	11	28.5	CL	A-6(9)	5.23	--	--	--	--	--
W-7	SS-6	13.5-15.0	0.0	10.4	89.6	43	29	14	21.8	ML	A-7-6(15)	--	--	--	--	--	--
W-8	SS-2	2.0-4.0	3.4	26.3	70.3	31	26	5	21.5	ML	A-4(3)	--	--	--	--	--	--
W-8	SS-4	6.0-8.0	17.2	37.9	39.8	29	25	4	17.9	SM	A-4(0)	--	--	--	--	--	--
W-9	SS-3	4.0-6.0	14.6	8.5	76.9	57	30	27	24.8	MH	A-7-5(20)	--	--	--	--	--	--
W-9	SS-4	6.0-8.0	2.4	6.2	91.4	45	19	26	29.7	CL	A-7-6(20)	--	--	--	--	--	--
W-9	SS-5	8.0-10.0	4.7	9.7	85.6	33	24	9	16.3	ML	A-4(8)	--	--	--	--	--	--
W-9	SS-7	18.5-20.0	0.2	4.9	94.9	33	27	6	24.4	ML	A-4(7)	--	--	--	--	--	--
W-10	SS-3	4.0-6.0	1.7	16.8	81.5	34	25	9	11.1	ML	A-4(7)	--	--	--	--	--	--
W-10	SS-5	8.0-10.0	0.0	12.9	87.1	35	31	4	14.9	ML	A-4(5)	--	--	--	--	--	--
W-10	SS-9	28.5-30.0	0.0	8.5	91.5	33	25	8	12.9	ML	A-4(8)	--	--	--	--	--	--
W-11	SS-2	2.0-4.0	0.0	24.4	75.6	42	28	14	16.9	ML	A-7-6(11)	--	--	--	--	--	--
W-11	SS-6	13.5-15.0	0.0	33.2	66.8	NP	NP	NP	18.4	ML	A-4(0)	--	--	--	--	--	--
W-12	SS-2	2.0-4.0	1.1	14.5	84.4	58	38	20	24.6	MH	A-7-5(20)	--	--	--	--	--	--
W-12	SS-4	6.0-8.0	0.3	33.0	66.7	NP	NP	NP	15.6	ML	A-4(0)	--	--	--	--	--	--
W-13	SS-1	0.0-2.0	1.9	23.5	74.6	38	26	12	18.9	ML	A-6(9)	--	--	--	--	--	--
W-13	SS-5	8.0-10.0	10.6	24.4	65.0	32	22	10	21.7	CL	A-4(5)	--	--	--	--	--	--
W-13	SS-6	13.5-15.0	0.3	4.7	95.0	51	32	19	19.5	MH	A-7-5(20)	--	--	--	--	--	--
W-13	SS-7	18.5-20.0	1.2	12.3	86.5	38	36	2	22.8	ML	A-4(4)	--	--	--	--	--	--
W-13	SS-10	33.5-35.0	0.0	3.0	97.0	47	30	17	16.0	ML	A-7-5(20)	--	--	--	--	--	--
W-14	SS-3	4.0-6.0	3.7	28.4	68.0	36	30	6	30.9	ML	A-4(4)	--	--	--	--	--	--
W-14	SS-5	8.0-10.0	4.3	34.8	60.8	26	19	7	19.5	CL-ML	A-4(2)	2.91	--	--	--	--	--
W-14	SS-6	13.5-15.0	1.5	15.8	82.8	NP	NP	NP	29.2	ML	A-4(0)	--	--	--	--	--	--

CAROLINA CROSSROADS I-20/26/126 CORRIDOR IMPROVEMENTS
LEXINGTON/RICHLAND COUNTIES, SOUTH CAROLINA
F&ME PROJECT NO.: G5662.01; SCDOT PROJECT NO.: P027662

SPLIT SPOON SAMPLE LABORATORY RESULTS SUMMARY

Boring Number	Sample Number	Sample Depth (ft)	Index									Organics (%)	Ignition Loss (%)	Electro-Chemical			
			% Gravel	% Sand	% Fines (Silt/Clay)	LL	PL	PI	Moisture Content	USCS	AASHTO Class			pH	Resistivity (Ohms-cm)	Sulfate (mg/kg)	Chloride (mg/kg)
W-14	SS-9	28.5-30.0	3.0	25.1	71.9	NP	NP	NP	30.0	ML	A-4(0)	--	--	--	--	--	--
W-15	SS-2	2.0-4.0	0.0	80.2	19.8	16	15	1	9.0	SM	A-2-4	--	--	--	--	--	--
W-15	SS-5	8.0-10.0	3.8	34.6	61.6	35	20	15	23.3	CL	A-6(7)	--	--	--	--	--	--
W-15	SS-6	13.5-15.0	1.4	14.0	84.6	72	54	18	38.7	MH	A-7-5(20)	--	--	--	--	--	--
W-15	SS-7	18.5-20.0	7.5	12.9	79.6	44	34	10	24.6	ML	A-5(10)	--	--	--	--	--	--
W-16	SS-2	2.0-4.0	4.8	15.2	80.0	NP	NP	NP	21.7	ML	A-4(0)	--	--	--	--	--	--
W-16	SS-6	13.5-15.0	0.0	9.8	90.2	NP	NP	NP	25.8	ML	A-4(0)	--	--	--	--	--	--
W-17	SS-3	4.0-6.0	1.1	21.2	77.7	47	37	10	24.2	ML	A-5(10)	--	--	--	--	--	--
W-17	SS-5	8.0-10.0	12.9	19.6	67.5	57	44	13	33.0	MH	A-7-5(11)	--	--	--	--	--	--
W-17	SS-9	28.5-30.0	2.3	8.8	88.9	NP	NP	NP	46.9	ML	A-4(0)	--	--	--	--	--	--
W-17	SS-14	53.5-55.0	0.0	11.1	88.9	NP	NP	NP	30.1	ML	A-4(0)	--	--	--	--	--	--
W-17	SS-17	68.5-70.0	0.2	15.8	84.0	NP	NP	NP	27.2	ML	A-4(0)	--	--	--	--	--	--
W-20	SS-2	2.0-4.0	24.8	22.5	52.7	36	24	12	16.5	CL	A-6(4)	--	--	--	--	--	--
W-20	SS-4	6.0-8.0	17.7	18.4	63.9	52	43	9	27.0	MH	A-5(7)	--	--	--	--	--	--
W-20	SS-6	13.5-15.0	0.0	7.5	92.5	50	37	13	24.6	MH	A-7-5(17)	--	--	--	--	--	--
W-20	SS-8	23.5-25.0	4.5	10.7	84.8	57	38	19	36.2	MH	A-7-5(20)	--	--	--	--	--	--
W-20	SS-11	38.5-40.0	8.7	15.6	75.7	42	35	7	31.3	ML	A-5(7)	--	--	--	--	--	--
W-20	SS-15	58.5-60.0	0.2	19.0	80.8	NP	NP	NP	25.9	ML	A-4(0)	--	--	--	--	--	--
W-21	SS-4	6.0-8.0	0.2	4.1	95.6	49	37	12	31.6	ML	A-7-5(17)	--	--	--	--	--	--
W-21	SS-6	13.5-15.0	1.8	11.9	79.4	40	36	4	33.3	ML	A-4(5)	--	--	--	--	--	--
W-21	SS-8	23.5-25.0	0.0	16.5	83.5	42	38	4	37.1	ML	A-5(6)	--	--	--	--	--	--
W-26	SS-2	2.0-4.0	0.7	46.5	52.8	33	25	8	19.4	ML	A-4(2)	--	--	--	--	--	--
W-26	SS-7	18.5-20.0	0.0	8.9	91.1	NP	NP	NP	18.6	ML	A-4(0)	--	--	--	--	--	--
W-26	SS-10	33.5-35.0	8.0	43.9	48.1	NP	NP	NP	16.5	SM	A-4(0)	--	--	--	--	--	--

CAROLINA CROSSROADS I-20/26/126 CORRIDOR IMPROVEMENTS
LEXINGTON/RICHLAND COUNTIES, SOUTH CAROLINA
F&ME PROJECT NO.: G5662.01; SCDOT PROJECT NO.: P027662

BULK & UD SAMPLE LABORATORY RESULTS SUMMARY

Boring Number	Sample Depth (ft)	Index									Ignition Loss (%)	Standard Proctor		CU Triaxial Shear				Consolidation
		% Gravel	% Sand	% Fines (Silt/Clay)	LL	PL	PI	Moisture Content	USCS	AASHTO Class		Optimum Moisture Content (%)	Maximum Dry Density (pcf)	φ (degrees)	C (psi)	φ' (degrees)	C' (psi)	
AP-1	6.0-8.3	0.0	26.1	73.9	41	25	16	--	CL	A-7-6(12)	--	--	--	14.4	4.64	31.7	0.94	--
AP-2	14.0-16.3	6.8	18.7	74.5	56	25	31	--	CH	A-7-6(20)	--	--	--	1.4	3.64	1.8	3.74	--
AP-3	6.0-8.3	0.6	18.6	80.7	28	20	8	--	CL	A-4(5)	--	--	--	28.5	0.00	41.0	0.00	--
AP-5	8.0-10.3	9.0	20.6	70.4	40	24	16	--	CL	A-6(10)	--	--	--	--	--	--	--	SEE RESULTS
AP-7	8.0-12.3	1.5	30.9	67.6	32	19	13	--	CL	A-6(7)	--	--	--	28.0	0.00	41.0	0.00	SEE RESULTS
AP-8	6.0-8.5	2.0	32.5	65.5	44	21	23	--	CL	A-7-6(13)	--	--	--	13.8	1.17	37.0	0.22	SEE RESULTS
AP-9	12.0-14.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	SEE RESULTS
AP-10	11.0-13.2	0.0	3.0	97.0	65	36	29	--	MH	A-7-5(20)	--	--	--	24.0	0.36	36.0	0.43	--
AP-11	24.0-26.5	1.5	18.7	79.8	49	37	12	--	ML	A-7-5(12)	--	--	--	28.1	0.00	38.0	0.00	--
AP-12	18.0-20.4	--	--	--	--	--	--	--	--	--	--	--	--	25.0	0.00	37.0	0.00	--
AP-14	18.0-20.5	2.6	10.7	86.7	NP	NP	NP	--	ML	A-4(0)	--	--	--	29.5	0.00	--	--	--
AP-18	16.0-18.3	0.0	13.5	86.5	47	35	12	--	ML	A-7-5(12)	--	--	--	27.2	0.40	35.0	0.00	--
AP-19	6.0-8.5	2.4	21.2	76.3	34	27	7	--	ML	A-4(5)	--	--	--	25.3	0.00	36.0	0.00	--
AP-20	38.0-40.5	0.2	5.6	94.2	62	43	19	--	MH	A-7-5(20)	--	--	--	22.6	0.00	28.0	3.79	--
AP-21	18.0-20.5	0.0	11.9	88.1	48	43	5	--	ML	A-5(9)	--	--	--	25.7	0.00	38.5	0.00	--
BS-1	0.0-1.0	6.0	24.4	69.6	33	28	5	21.4	ML	A-4(3)	--	14	107.1	15.2	3.58	34.0	0.03	--
BS-2	0.0-5.0	1.6	29.7	68.7	35	24	11	22.4	CL	A-6(6)	--	19.9	104.5	12.2	1.50	21.9	1.40	--
BS-3	0.0-5.0	3.4	24.8	71.8	NP	NP	NP	26.0	ML	A-4(0)	--	24	95.9	18.9	3.51	30.4	1.19	--
BS-4	0.0-3.0	3.5	53.2	43.3	31	21	10	21.8	SC	A-4(1)	--	14.1	116.1	18.3	0.80	26.3	0.00	--
BS-5	0.0-5.0	4.3	17.8	77.9	41	23	18	16.0	CL	A-7-6(14)	--	15.3	108.1	9.2	3.82	26.1	0.15	--
BS-6	0.0-4.0	6.5	20.2	73.3	NP	NP	NP	21.9	ML	A-4(0)	--	19.5	105.9	19.2	5.39	32.2	1.47	--

CAROLINA CROSSROADS I-20/26/126 CORRIDOR IMPROVEMENTS
LEXINGTON/RICHLAND COUNTIES, SOUTH CAROLINA
F&ME PROJECT NO.: G5662.01; SCDOT PROJECT NO.: P027662

BULK & UD SAMPLE LABORATORY RESULTS SUMMARY

Boring Number	Sample Depth (ft)	Index									Ignition Loss (%)	Standard Proctor		CU Triaxial Shear				Consolidation
		% Gravel	% Sand	% Fines (Silt/Clay)	LL	PL	PI	Moisture Content	USCS	AASHTO Class		Optimum Moisture Content (%)	Maximum Dry Density (pcf)	φ (degrees)	C (psi)	φ' (degrees)	C' (psi)	
BS-7	0.0-5.0	0.5	7.8	91.7	45	29	16	23.1	ML	A-7-6(17)	--	20.3	102.8	9.3	6.74	32.2	0.04	--
BS-8	0.0-5.0	5.0	39.5	55.5	40	21	19	18.5	CL	A-6(8)	--	14.5	114.8	15.7	2.70	27.0	2.00	--
BS-9	0.0-5.0	0.1	77.0	22.9	15	14	1	--	SM	A-2-4	--	9.1	128.1	45.0	5.00	35.4	0.05	--
BS-10	0.0-5.0	5.3	41.7	53.0	29	19	10	17.3	CL	A-4(3)	--	16	111.7	10.2	4.88	31.6	0.80	--
BS-11	0.0-5.0	0.0	7.3	92.7	NP	NP	NP	9.1	ML	A-4(0)	--	19.1	101.2	25.7	0.48	33.0	0.00	--
BS-12	0.0-5.0	1.0	40.1	58.9	37	28	9	22.0	ML	A-4(4)	0.1	16.6	111.7	18.3	2.00	38.9	0.30	--
BS-13	1.0-8.0	3.9	12.0	84.0	NP	NP	NP	29.5	ML	A-4(0)	--	26.9	93.7	18.5	1.32	27.3	0.91	--
BS-14	0.0-5.0	3.1	27.5	69.4	37	28	9	--	ML	A-4(6)	0.1	15.1	113.1	21.3	3.49	29.1	0.71	--
BS-15	0.0-5.0	8.5	19.4	72.1	34	25	9	17.6	ML	A-4(6)	--	16.5	108.6	24.8	0.06	30.5	0.53	--
BS-16	0.0-5.0	5.4	42.8	51.8	27	19	8	12.2	CL	A-4(2)	--	13.3	118.7	16.0	0.00	25.0	0.31	--
BS-17	0.0-3.0	17.5	34.7	47.8	28	17	11	8.2	SC	A-6(2)	--	16.7	107.4	14.8	0.58	41.0	0.00	--
BS-18	0.0-5.0	4.4	8.6	87.0	64	30	34	22.5	CH	A-7-6(20)	0.4	23.6	95.7	20.5	0.13	33.9	0.22	--
BS-19	0.0-3.0	5.2	28.4	66.5	45	25	20	16.4	CL	A-7-6(12)	--	22.6	99.3	8.0	1.63	27.0	1.00	--
BS-20	0.0-5.0	2.8	11.0	86.3	56	39	17	21.9	MH	A-7-5(19)	--	23.3	97.2	15.6	0.32	37.0	0.00	--

CAROLINA CROSSROADS I-20/26/126 CORRIDOR IMPROVEMENTS
LEXINGTON/RICHLAND COUNTIES, SOUTH CAROLINA
F&ME PROJECT NO.: G5662.01; SCDOT PROJECT NO.: P027662

ROCK CORE LABORATORY RESULTS SUMMARY

Boring Number	Sample Number	Sample Depth (ft)	Rock Type	Unit Weight (lb / ft^3)	UC Strength (psi)
B-6A	NQ-4	81.9-82.2	Phyllite	170.3	3460
B-7	NQ-3	52.7-53.0	Phyllite	152.5	740
B-7	NQ-4	59.2-59.5	Phyllite	165.3	1360
B-8	NQ-1	93.8-94.1	Phyllite	167.2	2310
B-11	NQ-2	81.2-81.5	Phyllite	165.5	860
B-17	NQ-2	88.8-89.1	Phyllite	161.5	730
B-17	NQ-3	95.6-95.9	Phyllite	164.8	3300
B-18	NQ-3	81.6-81.9	Phyllite	156.6	580
B-18	NQ-4	86.2-86.5	Phyllite	155.5	1030
B-18	NQ-5	93.8-94.1	Phyllite	158.7	1590
B-63	NQ-1	44.0-44.3	Phyllite	167.0	4020
B-63	NQ-3	50.5-50.8	Phyllite	169.8	4510
B-63	NQ-4	57.4-57.7	Phyllite	170.2	7270
B-63	NQ-5	61.4-61.7	Phyllite	170.2	4110
DH-1	NQ-1	40.6-40.9	Phyllite	168.2	2830
DH-1	NQ-3	46.6-46.9	Phyllite	171.8	9650
DH-1	NQ-4	51.4-51.7	Phyllite	173.7	9020
DH-1	NQ-6	62.6-62.9	Phyllite	172.7	6850
DH-1	NQ-6	64.6-64.9	Phyllite	172.9	6600
DH-1	NQ-7	66.4-66.7	Phyllite	173.8	11560
DH-1	NQ-8	72.2-72.5	Phyllite	173.1	6020
DH-1	NQ-11	89.7-90.0	Phyllite	171.8	9060
DH-1	NQ-12	93.0-93.3	Phyllite	171.3	6460
DH-1	NQ-13	97.0-97.3	Phyllite	171.3	7950
DH-3A	NQ-1	2.9-3.2	Hornfels	194.7	69510
DH-3A	NQ-4	21.1-21.4	Hornfels	184.1	36670
DH-3A	NQ-9	72.3-72.6	Hornfels	183.2	22610
DH-3A	NQ-10	76.5-76.8	Hornfels	193.0	13710
DH-3A	NQ-10	80.6-80.9	Hornfels	184.0	16760
DH-3A	NQ-11	84.6-84.9	Hornfels	184.7	28600
DH-3A	NQ-12	89.6-89.9	Hornfels	183.5	37260
DH-3A	NQ-15	103.3-103.6	Hornfels	183.0	29080
RW-18	NQ-2	71.8-72.1	Phyllite	171.0	2240
RW-18	NQ-3	76.5-76.8	Phyllite	169.6	6800
W-1	NQ-2	21.7-30.0	Phyllite	173.3	9260
W-2	NQ-3	21.9-22.2	Phyllite	169.7	9650
W-5	NQ-1	9.8-10.0	Lapilli Tuff	168.3	8460
W-7	NQ-3	37.6-37.9	Phyllite	173.8	8730
W-8	NQ-3	33.0-33.3	Phyllite	150.3	1980
W-9	NQ-2	42.5-42.8	Phyllite	167.7	5450

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3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0574	**DATE SAMPLE RECEIVED:**	3/27/2018
DESCRIPTION OF SOIL:	Various		
TESTED BY:	MB	**DATE OF TESTING:**	3/30/2018
		DATE OF WEIGHING:	4/2/2018

BORING NO.	B-2	B-2	B-2	B-2	B-2
SAMPLE NO.	18-0574C SS-2	18-0574F SS-6	18-0574I SS-7	18-0574L SS-9	18-0574O SS-12
SAMPLE DEPTH	2.0-4.0'	13.5-15.0'	18.5-20.0'	28.5-30.0'	43.5-45.0'
WATER CONTENT, W%	14.4	20.5	23.7	15.8	17.4

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

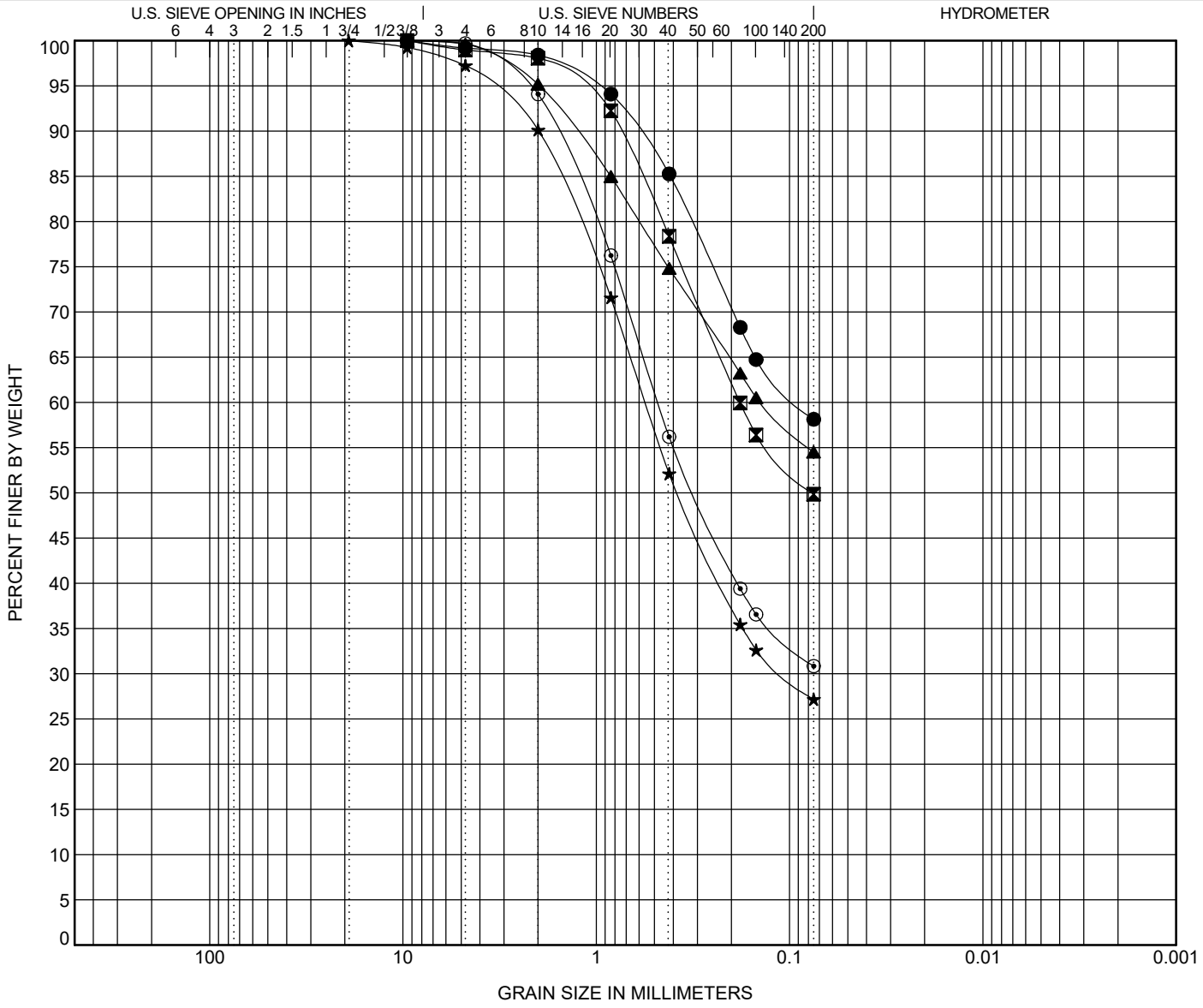
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	B-2	4.0	Sandy SILT (ML) A-4(3)	33	25	8		
⊠	B-2	15.0	Silty F/M SAND (SM) A-4(0)	NP	NP	NP		
▲	B-2	20.0	Sandy SILT (ML) A-4(0)	NP	NP	NP		
★	B-2	30.0	Silty, Clayey F/C SAND (SC-SM) A-2-4	29	22	7		
⊙	B-2	45.0	Silty F/C SAND (SM) A-2-4	NP	NP	NP		

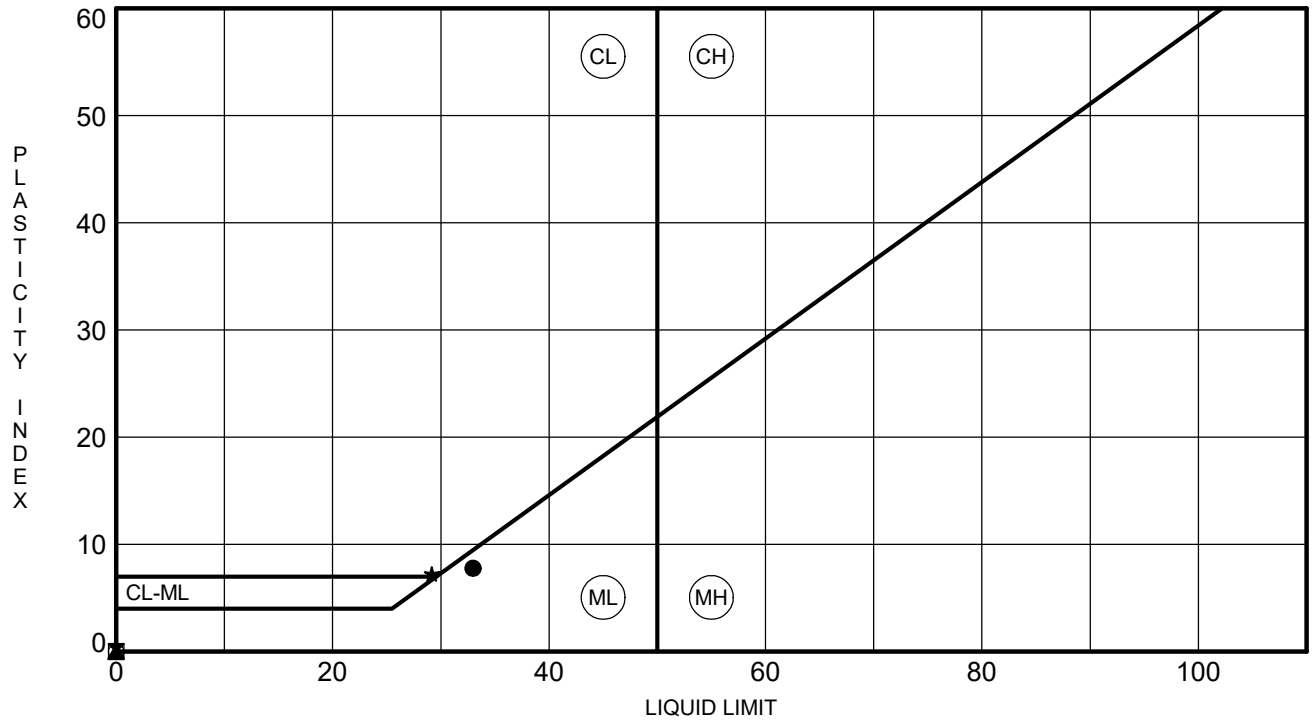
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	B-2	4.0	9.52	1.008			0.8	41.1	58.1	
⊠	B-2	15.0	9.52	1.268	0.076		1.0	49.2	49.8	
▲	B-2	20.0	9.52	1.971			0.4	45.1	54.5	
★	B-2	30.0	19.1	3.619	0.377		2.7	70.1	27.2	
⊙	B-2	45.0	9.52	2.302	0.307		0.3	68.9	30.8	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/13/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**B-2**	**4.0**	**33**	**25**	**8**	**58**	**Sandy SILT (ML) A-4(3)**
⊠	**B-2**	**15.0**	**NP**	**NP**	**NP**	**50**	**Silty F/M SAND (SM) A-4(0)**
▲	**B-2**	**20.0**	**NP**	**NP**	**NP**	**55**	**Sandy SILT (ML) A-4(0)**
★	**B-2**	**30.0**	**29**	**22**	**7**	**27**	**Silty, Clayey F/C SAND (SC-SM) A-2-4**
⊙	**B-2**	**45.0**	**NP**	**NP**	**NP**	**31**	**Silty F/C SAND (SM) A-2-4**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/13/18

Client:	F&ME Consultants				
Project:	I-20/26/126 Corridor Improvements				
Location:	---			Project No:	GTX-307802
Boring ID:	---	Sample Type:	---	Tested By:	twh
Sample ID:	---	Test Date:	05/11/18	Checked By:	n/a
Depth :	---	Test Id:	293112		

pH of Soil by ASTM D4972

Boring ID	Sample ID	Depth	Visual Description	pH of Soil in Distilled Water	pH of Soil in Calcium Chloride
B-2	---	6-8 ft	Moist, light red clay with sand	3.4	2.8

Notes: Sample Preparation: screened through #10 sieve

Method A, pH meter used

Client:	F&ME Consultants
Project:	I-20/26/126 Corridor Improvement
Location:	---
GTX#:	307802
Test Date:	05/09/18
Tested By:	twh
Checked By:	jm

Laboratory Measurement of Soil Resistivity Using the Wenner Four-Electrode Method by ASTM G57 (Laboratory Measurement)

Boring ID	Sample ID	Depth, ft.	Sample Description	Electrical Resistivity, ohm-cm	Electrical Conductivity, $(ohm\text{-}cm)^{-1}$
B-2	---	6-8 ft	Moist, light red clay with sand	1,733	5.77E-04

Notes: Test Equipment: Nilsson Model 400 Soil Resistance Meter, MC Miller Soil Box
Water added to sample to create a thick slurry prior to testing (saturated condition).
Electrical Conductivity is calculated as inverse of Electrical Resistivity (per ASTM G57)
Test conducted in standard laboratory atmosphere: 68-73 F

Project Name: I-20/26/126 CORRIDOR IMPROVEME
Project Number: 307802
Lab Number: L1814569
Report Date: 05/01/18

SAMPLE RESULTS

Lab ID: L1814569-01
Client ID: B-2, 6-8 FT
Sample Location: Not Specified
Sample Depth:
Matrix: Soil

Date Collected: 04/18/18 14:02
Date Received: 04/25/18
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	85.6		%	0.100	NA	1	-	04/27/18 09:39	121,2540G	RI
Chloride	280		mg/kg	12	--	1	-	04/30/18 22:49	1,9251	TL
Sulfate	ND		mg/kg	120	--	1	-	04/30/18 17:05	1,9038	BR

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3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0206	**DATE SAMPLE RECEIVED:**	2/5/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	2/5/2018
		DATE OF WEIGHING:	2/6/2018

BORING NO.	B-3	B-3	B-3		
SAMPLE NO.	18-0206C SS-4	18-0206F SS-6	18-0206I SS-11		
SAMPLE DEPTH	6.0-8.0'	13.5-15.0'	38.5-40.0'		
WATER CONTENT, W%	25.8	16.5	19.6		

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

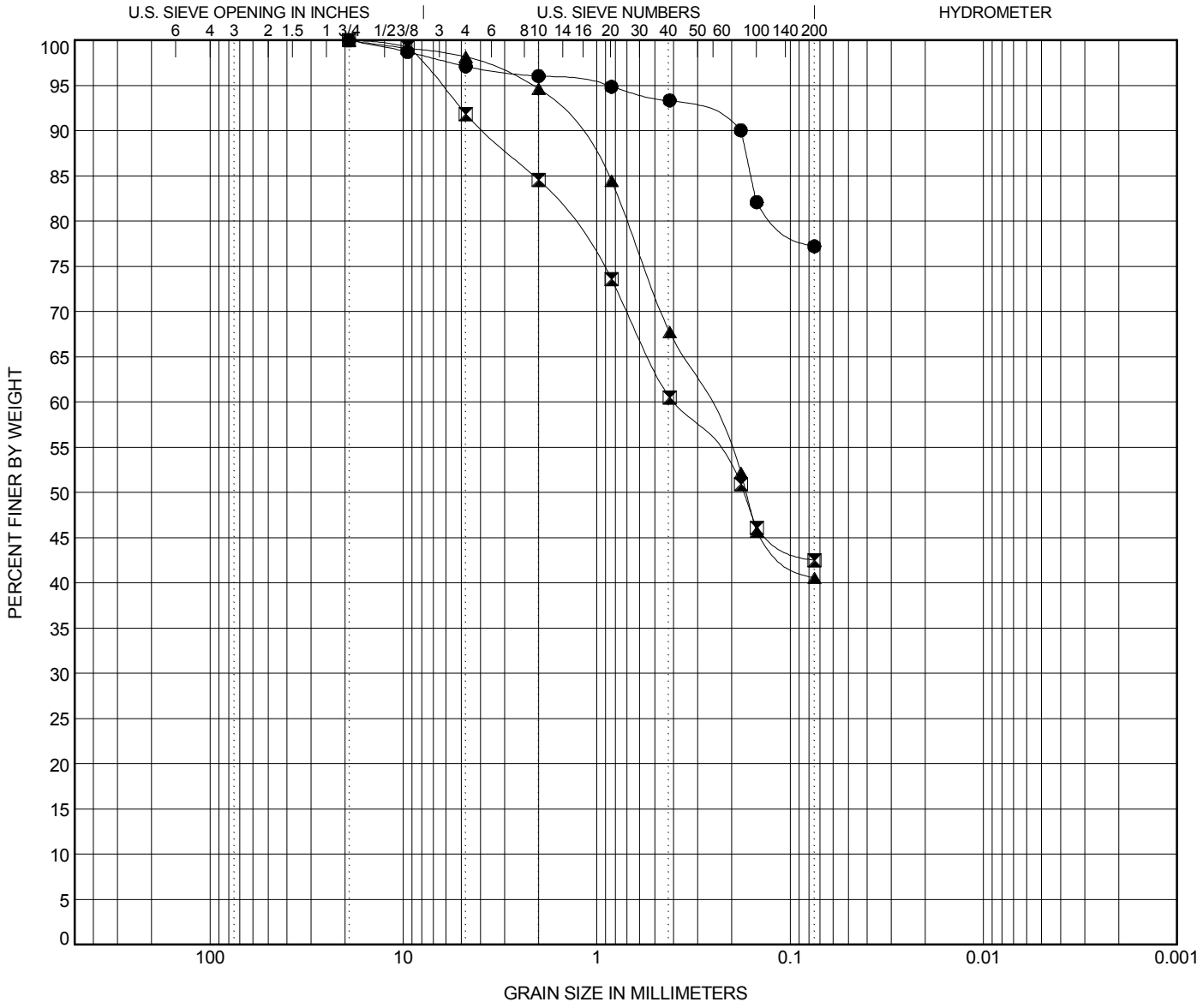
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**B-3**	**8.0**	**Fat CLAY (CH) with Fine Sand A-7-5(20)**	**61**	**30**	**31**		
⧓	**B-3**	**15.0**	**Silty F/M SAND (SM) A-4(0)**	**NP**	**NP**	**NP**		
▲	**B-3**	**40.0**	**Silty F/M SAND (SM) A-4(0)**	**NP**	**NP**	**NP**		

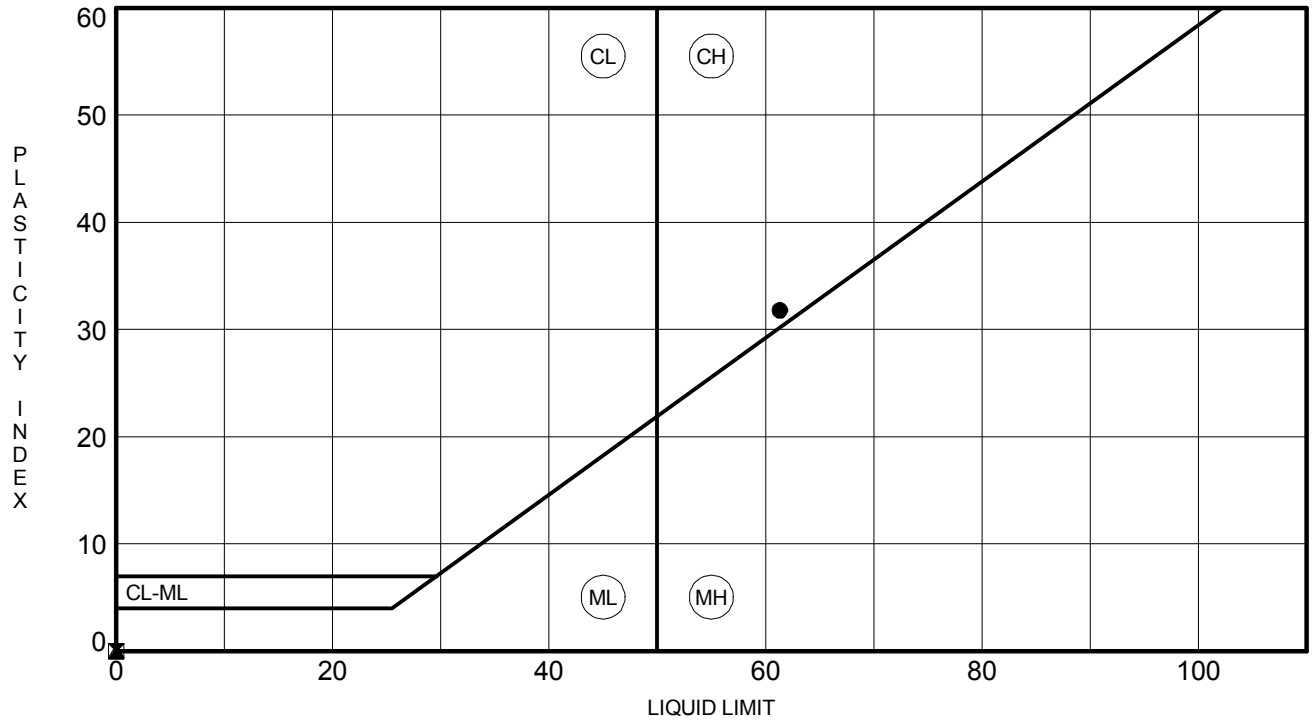
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-3**	**8.0**	**19.1**	**0.919**			**2.9**	**19.9**	**77.2**	
⧓	**B-3**	**15.0**	**19.1**	**6.394**	**0.174**		**8.1**	**49.3**	**42.5**	
▲	**B-3**	**40.0**	**19.1**	**2.17**	**0.169**		**1.8**	**57.6**	**40.6**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 2/13/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**B-3**	**8.0**	**61**	**30**	**31**	**77**	**Fat CLAY (CH) with Fine Sand A-7-5(20)**
⧓	**B-3**	**15.0**	**NP**	**NP**	**NP**	**43**	**Silty F/M SAND (SM) A-4(0)**
▲	**B-3**	**40.0**	**NP**	**NP**	**NP**	**41**	**Silty F/M SAND (SM) A-4(0)**

Client:	F&ME Consultants				
Project:	I-20/26/126 Corridor Improvements				
Location:	---			Project No:	GTX-307802
Boring ID:	---	Sample Type:	---	Tested By:	twh
Sample ID:	---	Test Date:	03/14/18	Checked By:	jm
Depth :	---	Test Id:	292933		

pH of Soil by ASTM D4972

Boring ID	Sample ID	Depth	Visual Description	pH of Soil in Distilled Water	pH of Soil in Calcium Chloride
B-3	---	4-6 ft	Moist, brownish yellow sandy clay with gravel	4.9	4.0

Notes: Sample Preparation: screened through #10 sieve

Method A, pH meter used

Client:	F&ME Consultants
Project:	I-20/26/126 Corridor Improvement
Location:	---
GTX#:	307802
Test Date:	03/23/18
Tested By:	twh
Checked By:	jm

Laboratory Measurement of Soil Resistivity Using the Wenner Four-Electrode Method by ASTM G57 (Laboratory Measurement)

Boring ID	Sample ID	Depth, ft.	Sample Description	Electrical Resistivity, ohm-cm	Electrical Conductivity, $(ohm\text{-}cm)^{-1}$
B-3	---	4-6 ft	Moist, brownish yellow sandy clay with gravel	83,588	1.20E-05

Notes: Test Equipment: Nilsson Model 400 Soil Resistance Meter, MC Miller Soil Box
Water added to sample to create a thick slurry prior to testing (saturated condition).
Electrical Conductivity is calculated as inverse of Electrical Resistivity (per ASTM G57)
Test conducted in standard laboratory atmosphere: 68-73 F

Project Name: I-20/26/126 CORRIDOR IMPROV.
Project Number: 307802

Lab Number: L1808774
Report Date: 03/21/18

SAMPLE RESULTS

Lab ID: L1808774-01
Client ID: B-3, 4-6 FT
Sample Location: Not Specified

Date Collected: 03/13/18 14:25
Date Received: 03/15/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	87.8		%	0.100	NA	1	-	03/17/18 04:52	121,2540G	FN
Chloride	ND		mg/kg	11	--	1	-	03/21/18 02:02	1,9251	ML
Sulfate	ND		mg/kg	110	--	1	-	03/18/18 23:30	1,9038	JR

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0748	**DATE SAMPLE RECEIVED:**	4/30/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	4/30/2018
		DATE OF WEIGHING:	5/1/2018

BORING NO.	B-4	B-4			
SAMPLE NO.	18-0748C SS-2	18-0748F SS-6/SS-7			
SAMPLE DEPTH	2.0-4.0'	13.5-20.0'			
WATER CONTENT, W%	27.4	18.5			

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

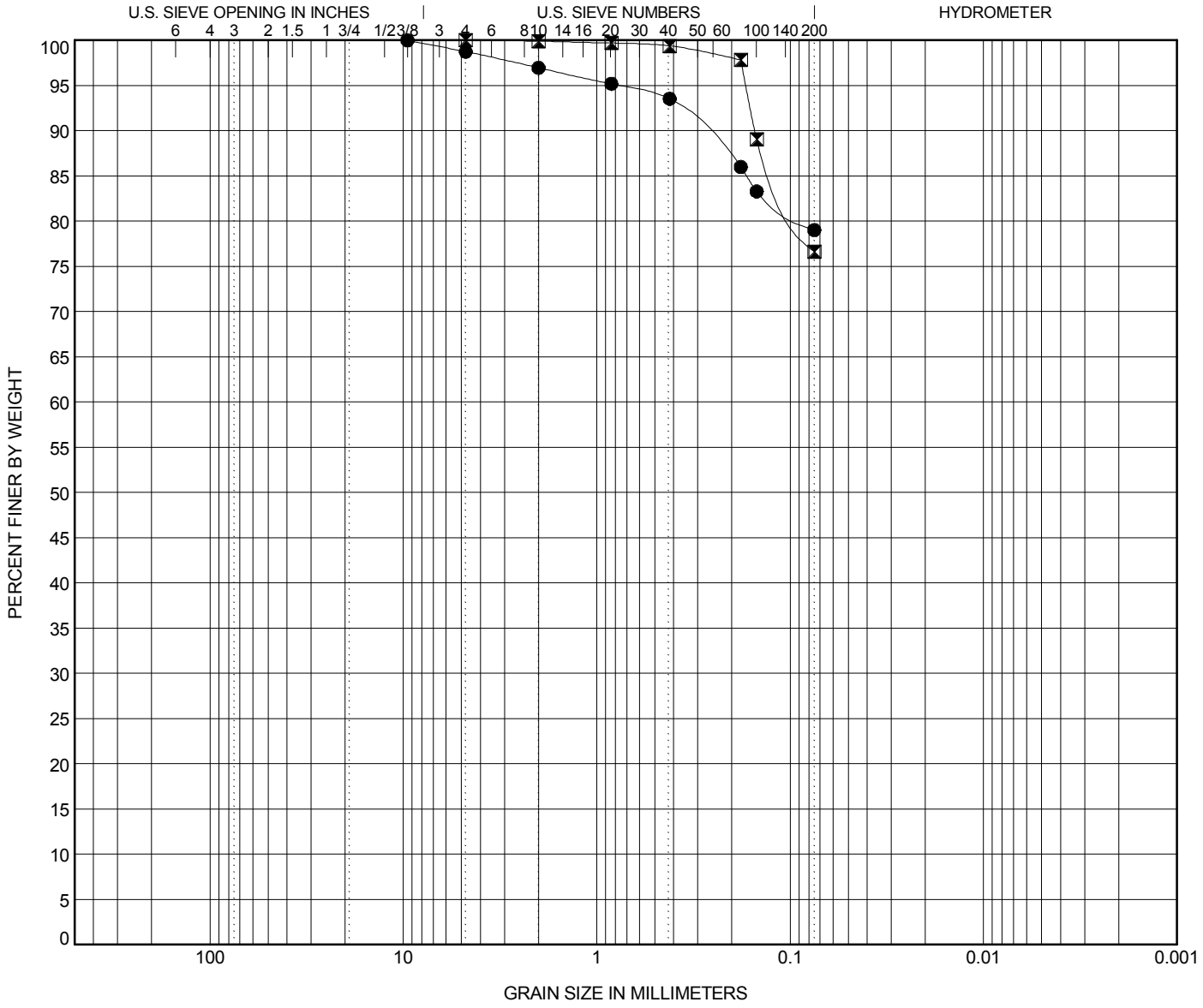
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**B-4**	**4.0**	**Fat CLAY (CH) with Sand A-7-6(20)**	**51**	**26**	**25**		
⧓	**B-4**	**20.0**	**SILT (ML) with Sand A-4(2)**	**27**	**23**	**4**		

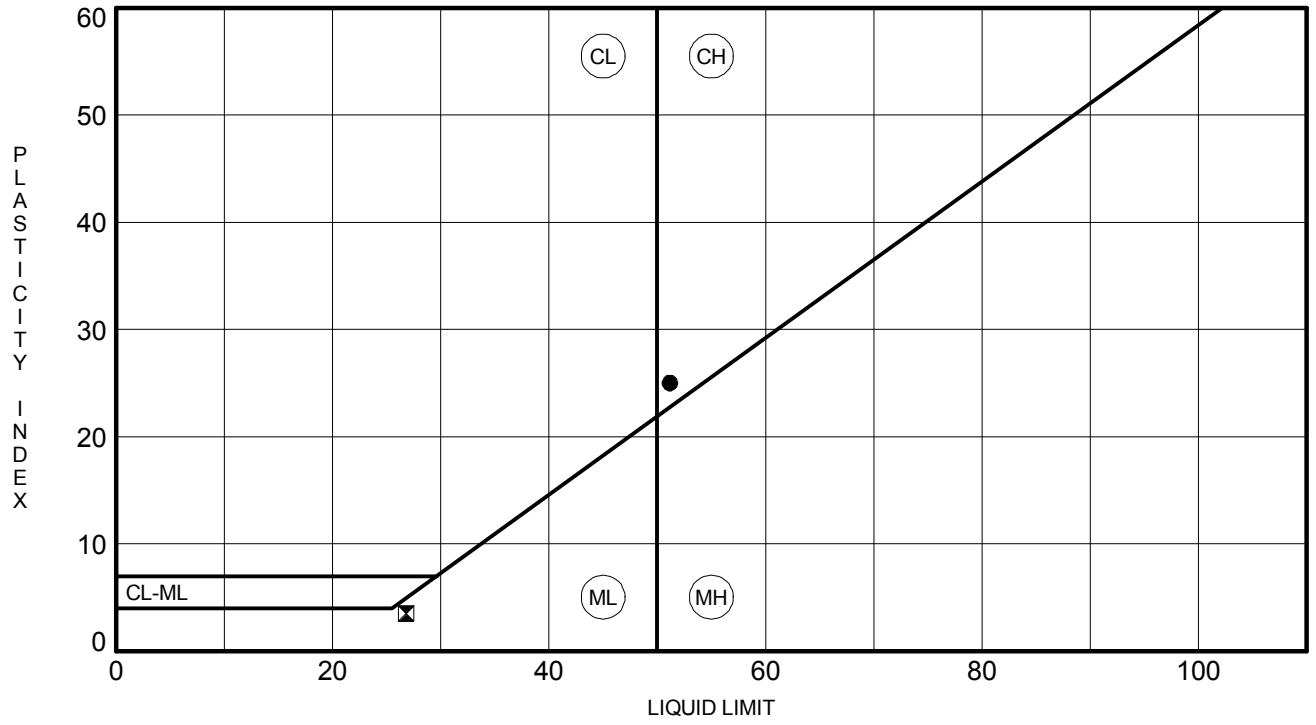
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-4**	**4.0**	**9.52**	**0.772**			**1.3**	**19.7**	**79.0**	
⧓	**B-4**	**20.0**	**4.76**	**0.169**			**0.0**	**23.4**	**76.6**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 5/14/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**B-4**	**4.0**	**51**	**26**	**25**	**79**	**Fat CLAY (CH) with Sand A-7-6(20)**
⊠	**B-4**	**20.0**	**27**	**23**	**4**	**77**	**SILT (ML) with Sand A-4(2)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 5/14/18

Client:	F&ME Consultants				
Project:	I-20/26/126 Corridor Improvements				
Location:	---			Project No:	GTX-307802
Boring ID:	---	Sample Type:	---	Tested By:	twh
Sample ID:	---	Test Date:	06/08/18	Checked By:	MCM
Depth :	---	Test Id:	295616		

pH of Soil by ASTM D4972

Boring ID	Sample ID	Depth	Visual Description	pH of Soil in Distilled Water	pH of Soil in Calcium Chloride
B-4	---	4-6 ft	Moist, reddish yellow sandy silt	4.5	3.6

Notes: Sample Preparation: screened through #10 sieve

Method A, pH meter used

Client:	F&ME Consultants
Project:	I-20/26/126 Corridor Improvement
Location:	---
GTX#:	307802
Test Date:	06/11/18
Tested By:	twh
Checked By:	emm

Laboratory Measurement of Soil Resistivity Using the Wenner Four-Electrode Method by ASTM G57 (Laboratory Measurement)

Boring ID	Sample ID	Depth, ft.	Sample Description	Electrical Resistivity, ohm-cm	Electrical Conductivity, $(ohm\text{-}cm)^{-1}$
B-4	---	4-6 ft	Moist, reddish yellow sandy silt	60,142	1.66E-05

Notes: Test Equipment: Nilsson Model 400 Soil Resistance Meter, MC Miller Soil Box
Water added to sample to create a thick slurry prior to testing (saturated condition).
Electrical Conductivity is calculated as inverse of Electrical Resistivity (per ASTM G57)
Test conducted in standard laboratory atmosphere: 68-73 F

Project Name: I-20/26/126 CORRIDOR IMPROVE
Project Number: 307802
Lab Number: L1824882
Report Date: 07/10/18

SAMPLE RESULTS

Lab ID: L1824882-01
Client ID: B-4, 4-6 FT
Sample Location: Not Specified
Sample Depth:
Matrix: Soil

Date Collected: 06/28/18 14:02
Date Received: 06/29/18
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	87.6		%	0.100	NA	1	-	07/03/18 13:04	121,2540G	RI
Chloride	ND		mg/kg	10	--	1	-	07/03/18 22:14	1,9251	TL
Sulfate	ND		mg/kg	110	--	1	-	07/03/18 01:55	1,9038	JR

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3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0282	**DATE SAMPLE RECEIVED:**	2/13/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	2/15/2018
		DATE OF WEIGHING:	2/16/2018

BORING NO.	B-5	B-5	B-5	B-5	B-5
SAMPLE NO.	18-0282C SS-2	18-0282F SS-5	18-0282I SS-6	18-0282L SS-9	18-0282O SS-12
SAMPLE DEPTH	2.0-4.0'	8.0-10.0'	13.5-15.0'	28.5-30.0'	43.5-45.0'
WATER CONTENT, W%	33.8	19.2	15.3	14.4	16.0

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

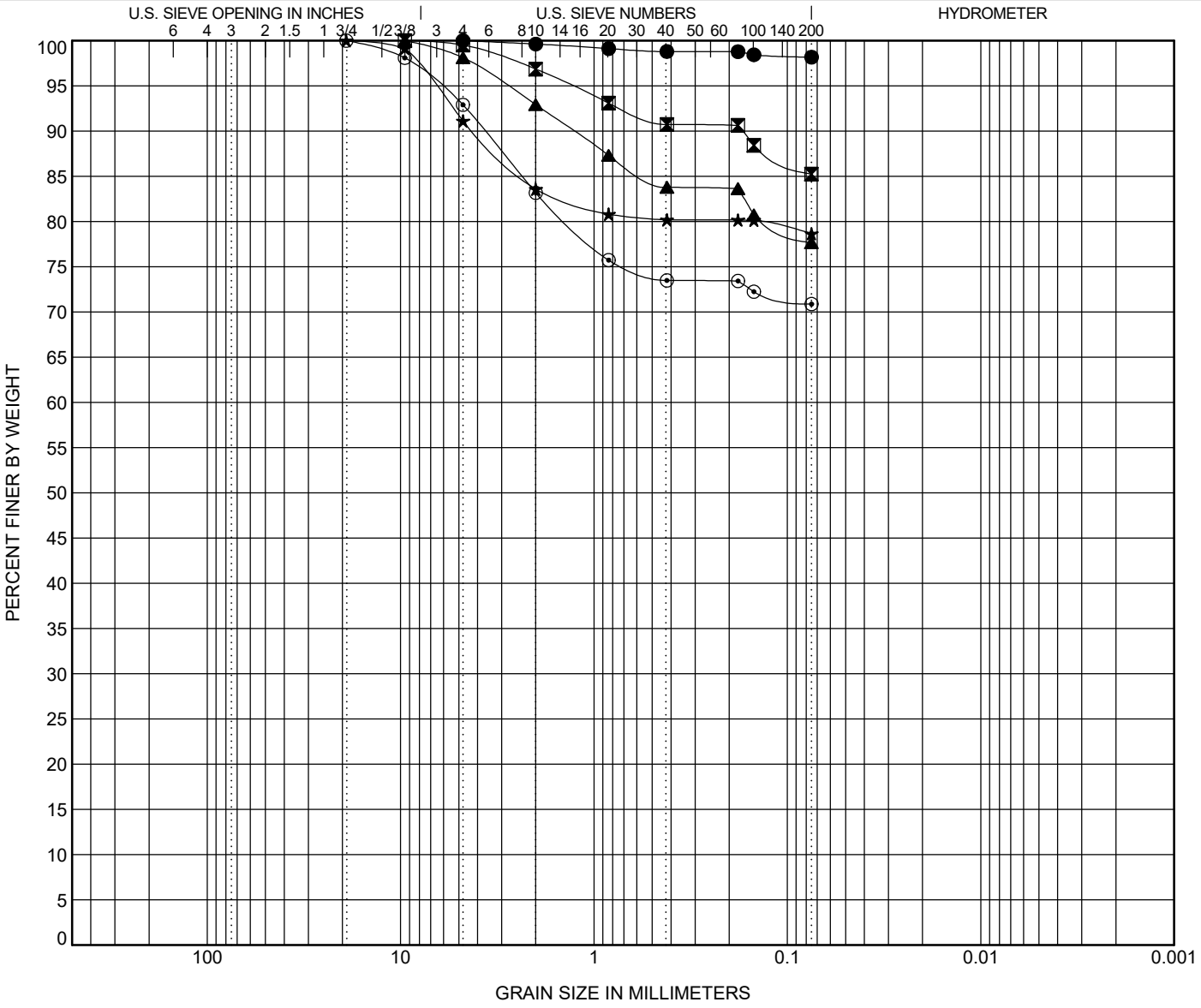
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**B-5**	**4.0**	**Elastic SILT (MH) A-7-5(20)**	**52**	**34**	**18**		
⊠	**B-5**	**10.0**	**Elastic SILT (MH) A-7-5(18)**	**52**	**35**	**17**		
▲	**B-5**	**15.0**	**Lean CLAY (CL) with F/M Sand A-4(6)**	**31**	**22**	**9**		
★	**B-5**	**30.0**	**SILT (ML) with F/C Sand A-7-6(13)**	**44**	**29**	**15**		
⊙	**B-5**	**45.0**	**Lean CLAY (CL) with F/C Sand A-6(9)**	**38**	**24**	**14**		

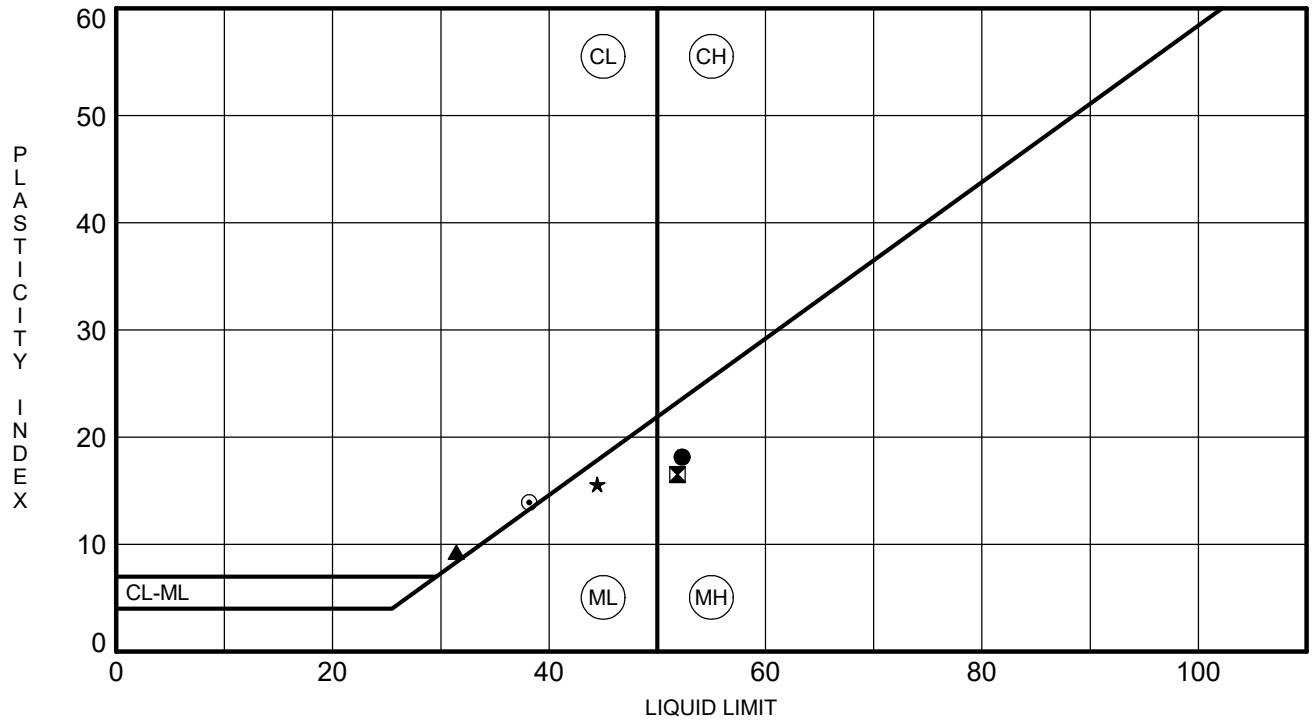
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-5**	**4.0**	**4.76**				**0.0**	**1.8**	**98.2**	
⊠	**B-5**	**10.0**	**9.52**	**1.304**			**0.5**	**14.2**	**85.3**	
▲	**B-5**	**15.0**	**9.52**	**2.829**			**1.9**	**20.4**	**77.7**	
★	**B-5**	**30.0**	**19.1**	**6.657**			**8.9**	**12.4**	**78.7**	
⊙	**B-5**	**45.0**	**19.1**	**6.298**			**7.1**	**22.0**	**70.9**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 3/2/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**B-5**	**4.0**	**52**	**34**	**18**	**98**	**Elastic SILT (MH) A-7-5(20)**
⊠	**B-5**	**10.0**	**52**	**35**	**17**	**85**	**Elastic SILT (MH) A-7-5(18)**
▲	**B-5**	**15.0**	**31**	**22**	**9**	**78**	**Lean CLAY (CL) with F/M Sand A-4(6)**
★	**B-5**	**30.0**	**44**	**29**	**15**	**79**	**SILT (ML) with F/C Sand A-7-6(13)**
⊙	**B-5**	**45.0**	**38**	**24**	**14**	**71**	**Lean CLAY (CL) with F/C Sand A-6(9)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 3/2/18

Client:	F&ME Consultants				
Project:	I-20/26/126 Corridor Improvements				
Location:	---			Project No:	GTX-307802
Boring ID:	---	Sample Type:	---	Tested By:	twh
Sample ID:	---	Test Date:	03/14/18	Checked By:	jm
Depth :	---	Test Id:	292933		

pH of Soil by ASTM D4972

Boring ID	Sample ID	Depth	Visual Description	pH of Soil in Distilled Water	pH of Soil in Calcium Chloride
B-5	---	6-8 ft	Moist, olive clay with sand	5.3	3.9

Notes: Sample Preparation: screened through #10 sieve

Method A, pH meter used

Client:	F&ME Consultants
Project:	I-20/26/126 Corridor Improvement
Location:	---
GTX#:	307802
Test Date:	03/23/18
Tested By:	twh
Checked By:	jm

Laboratory Measurement of Soil Resistivity Using the Wenner Four-Electrode Method by ASTM G57 (Laboratory Measurement)

Boring ID	Sample ID	Depth, ft.	Sample Description	Electrical Resistivity, ohm-cm	Electrical Conductivity, $(ohm\text{-}cm)^{-1}$
B-5	---	6-8 ft	Moist, olive clay with sand	13,252	7.55E-05

Notes: Test Equipment: Nilsson Model 400 Soil Resistance Meter, MC Miller Soil Box
Water added to sample to create a thick slurry prior to testing (saturated condition).
Electrical Conductivity is calculated as inverse of Electrical Resistivity (per ASTM G57)
Test conducted in standard laboratory atmosphere: 68-73 F

Project Name: I-20/26/126 CORRIDOR IMPROV.
Project Number: 307802

Lab Number: L1808774
Report Date: 03/21/18

SAMPLE RESULTS

Lab ID: L1808774-02
Client ID: B-5, 6-8 FT
Sample Location: Not Specified

Date Collected: 03/13/18 14:31
Date Received: 03/15/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	82.0		%	0.100	NA	1	-	03/17/18 04:52	121,2540G	FN
Chloride	17		mg/kg	12	--	1	-	03/20/18 22:40	1,9251	ML
Sulfate	ND		mg/kg	120	--	1	-	03/18/18 23:30	1,9038	JR

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0294	**DATE SAMPLE RECEIVED:**	2/16/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	2/16/2018
		DATE OF WEIGHING:	2/19/2018

BORING NO.	B-6	B-6	B-6	B-6	
SAMPLE NO.	18-0294C SS-3	18-0294F SS-6	18-0294I SS-7	18-0294L SS-9	
SAMPLE DEPTH	4.0-6.0'	13.5-15.0'	18.5-20.0'	28.5-30.0'	
WATER CONTENT, W%	9.8	10.4	29.0	18.4	

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

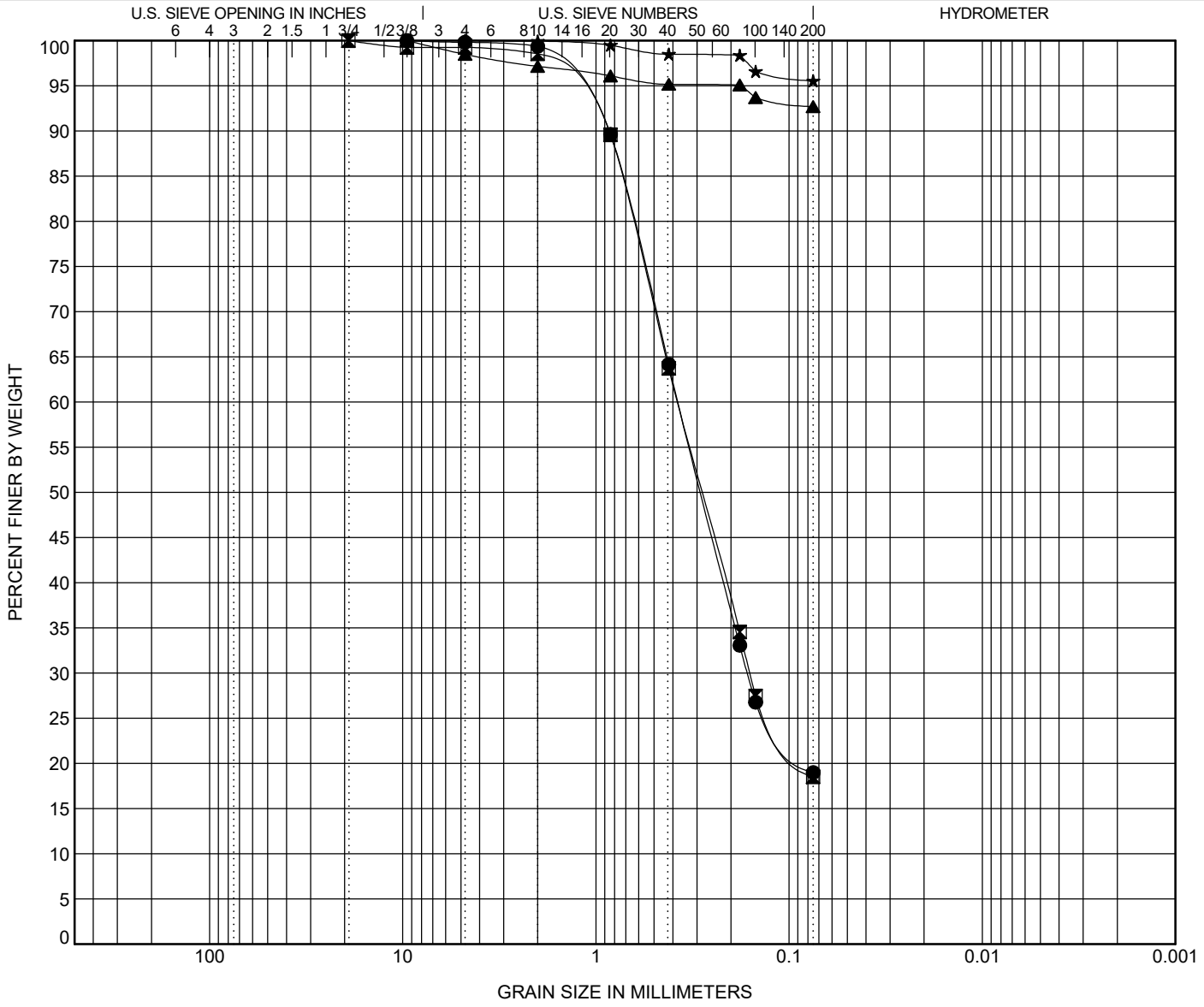
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**B-6**	**6.0**	**Silty F/M SAND (SM) A-2-4**	**20**	**18**	**2**		
⊠	**B-6**	**15.0**	**Silty F/M SAND (SM) A-2-4**	**NP**	**NP**	**NP**		
▲	**B-6**	**20.0**	**Elastic SILT (MH) A-7-5(20)**	**62**	**34**	**28**		
★	**B-6**	**30.0**	**Elastic SILT (MH) A-7-5(20)**	**50**	**34**	**16**		

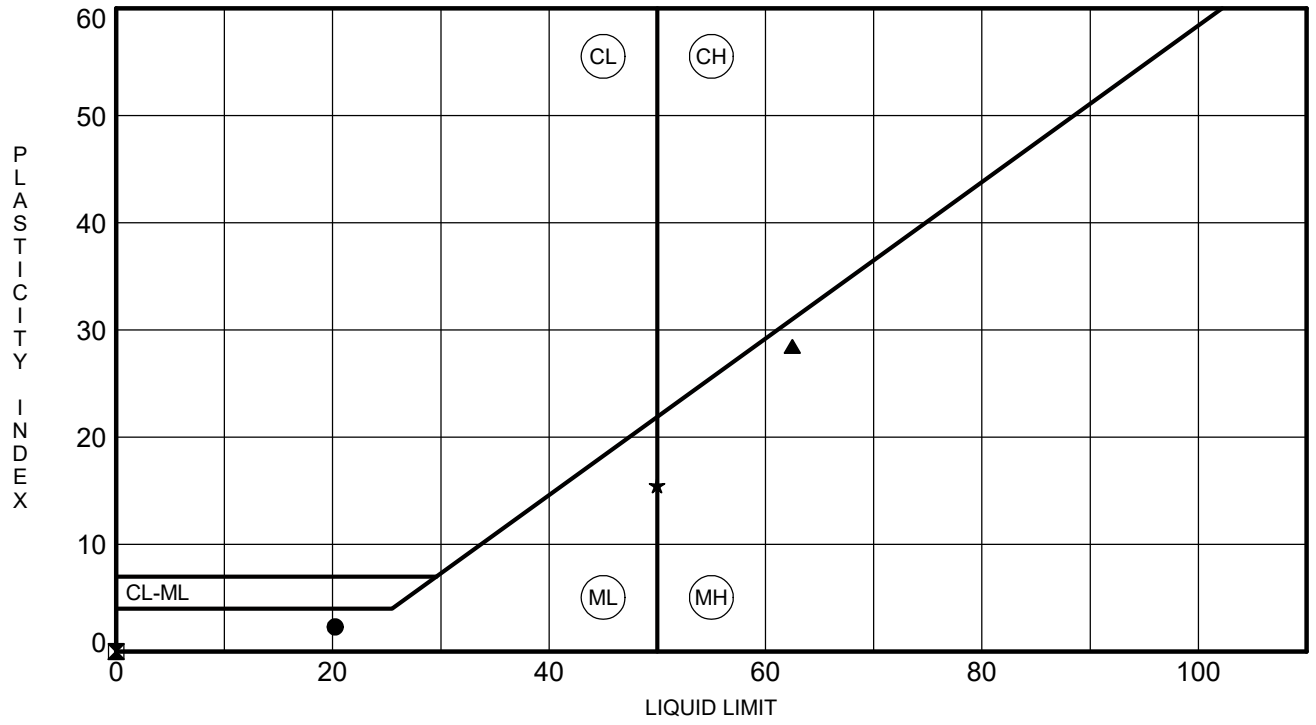
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-6**	**6.0**	**9.52**	**1.355**	**0.286**		**0.2**	**80.8**	**19.0**	
⊠	**B-6**	**15.0**	**19.1**	**1.42**	**0.282**		**0.8**	**80.7**	**18.5**	
▲	**B-6**	**20.0**	**9.52**	**0.178**			**1.5**	**5.8**	**92.7**	
★	**B-6**	**30.0**	**4.76**				**0.0**	**4.4**	**95.6**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 3/2/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**B-6**	**6.0**	**20**	**18**	**2**	**19**	**Silty F/M SAND (SM) A-2-4**
⧓	**B-6**	**15.0**	**NP**	**NP**	**NP**	**19**	**Silty F/M SAND (SM) A-2-4**
▲	**B-6**	**20.0**	**62**	**34**	**28**	**93**	**Elastic SILT (MH) A-7-5(20)**
★	**B-6**	**30.0**	**50**	**34**	**16**	**96**	**Elastic SILT (MH) A-7-5(20)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 3/2/18

Client:	F&ME Consultants				
Project:	I-20/26/126 Corridor Improvements				
Location:	---			Project No:	GTX-307802
Boring ID:	---	Sample Type:	---	Tested By:	twh
Sample ID:	---	Test Date:	03/14/18	Checked By:	jm
Depth :	---	Test Id:	292933		

pH of Soil by ASTM D4972

Boring ID	Sample ID	Depth	Visual Description	pH of Soil in Distilled Water	pH of Soil in Calcium Chloride
B-6	---	6-8 ft	Moist, reddish yellow silty sand	4.8	4.0

Notes: Sample Preparation: screened through #10 sieve

Method A, pH meter used

Client:	F&ME Consultants
Project:	I-20/26/126 Corridor Improvement
Location:	---
GTX#:	307802
Test Date:	03/23/18
Tested By:	twh
Checked By:	jm

Laboratory Measurement of Soil Resistivity Using the Wenner Four-Electrode Method by ASTM G57 (Laboratory Measurement)

Boring ID	Sample ID	Depth, ft.	Sample Description	Electrical Resistivity, ohm-cm	Electrical Conductivity, $(ohm\text{-}cm)^{-1}$
B-6	---	6-8 ft	Moist, reddish yellow silty sand	101,936	9.81E-06

Notes: Test Equipment: Nilsson Model 400 Soil Resistance Meter, MC Miller Soil Box
Water added to sample to create a thick slurry prior to testing (saturated condition).
Electrical Conductivity is calculated as inverse of Electrical Resistivity (per ASTM G57)
Test conducted in standard laboratory atmosphere: 68-73 F

Project Name: I-20/26/126 CORRIDOR IMPROV.
Project Number: 307802
Lab Number: L1808774
Report Date: 03/21/18

SAMPLE RESULTS

Lab ID: L1808774-03
Client ID: B-6, 6-8 FT
Sample Location: Not Specified
Sample Depth:
Matrix: Soil

Date Collected: 03/13/18 14:39
Date Received: 03/15/18
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	91.7		%	0.100	NA	1	-	03/17/18 04:52	121,2540G	FN
Chloride	ND		mg/kg	10	--	1	-	03/20/18 22:41	1,9251	ML
Sulfate	ND		mg/kg	110	--	1	-	03/18/18 23:30	1,9038	JR

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

ROCK CORE COMPRESSION TEST

PROJECT: I-20/26/126 Corridor Improvements **PROJECT NO:** G5662.01

SAMPLED BY: RW **DATE SAMPLED:** 2/15/2018

TESTED BY: BF **DATE TESTED:** 2/16/2018

Lab No.	18-0292A				
Boring No.	B-6A				
Sample No.	NQ-4				
Depth	81.9-82.2				
Length (in)	3.91				
Diameter (in)	1.87				
Mass (g)	477.13				
Cross Sectional Area (in^2)	2.73				
Load (lb)	9450				
Compressive Strength (psi)	3460				
Corrected Compressive Strength (psi)					
Unit Weight (lb/ft^3)	170.26				

Signature: _____

Remarks: _____

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0168	**DATE SAMPLE RECEIVED:**	1/26/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	1/29/2018
		DATE OF WEIGHING:	1/30/2018

BORING NO.	B-7	B-7	B-7		
SAMPLE NO.	18-0168C SS-1	18-0168F SS-4	18-0168J SS-6		
SAMPLE DEPTH	0.0-2.0'	6.0-8.0'	13.5-15.0'		
WATER CONTENT, W%	19.4	27.5	10.4		

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

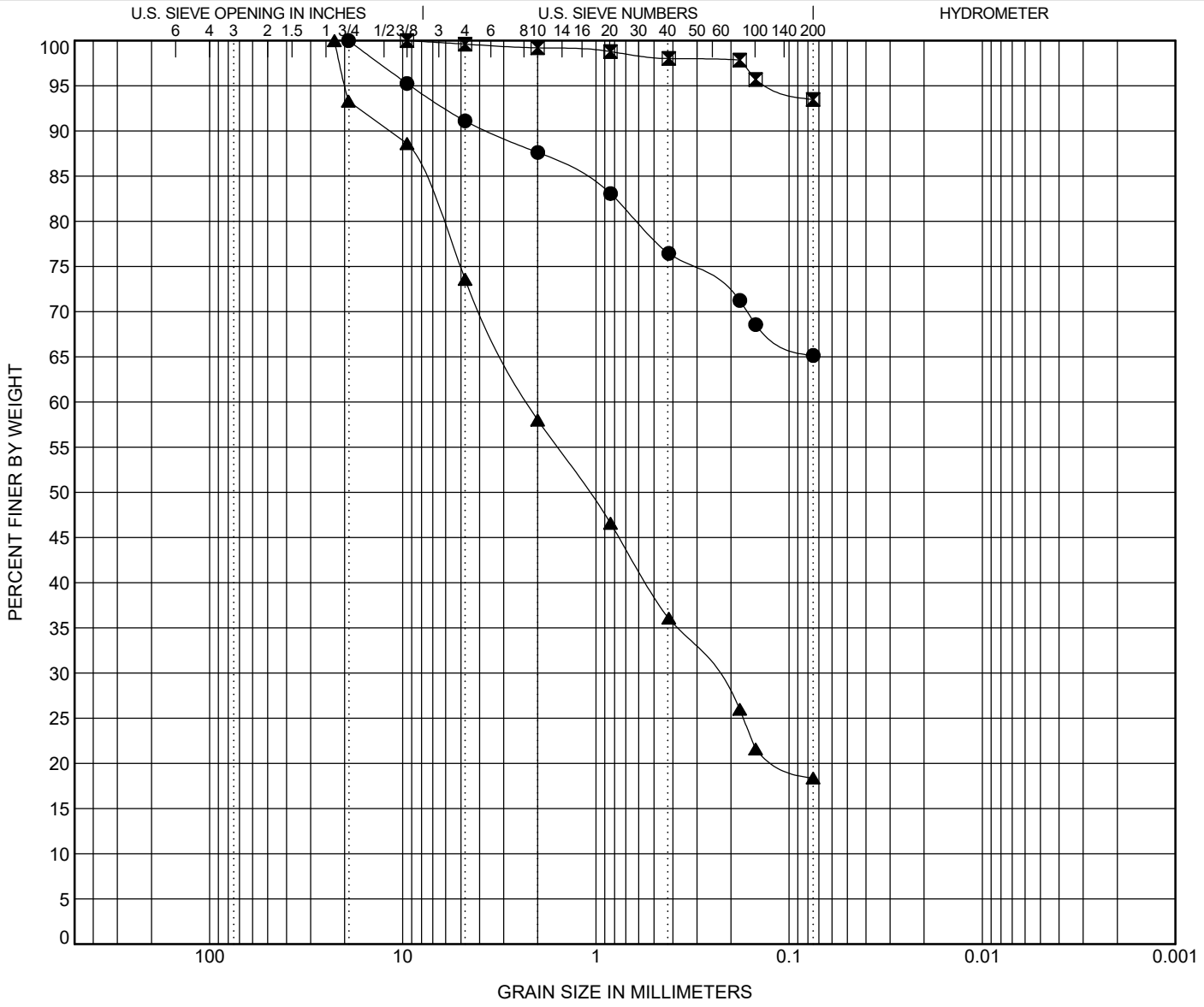
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**B-7**	**2.0**	**Sandy SILT (ML) A-6(7)**	**37**	**25**	**12**		
⊠	**B-7**	**8.0**	**SILT (ML) A-4(8)**	**31**	**23**	**8**		
▲	**B-7**	**15.0**	**Silty F/C SAND (SM) with Gravel A-1-b**	**NP**	**NP**	**NP**		

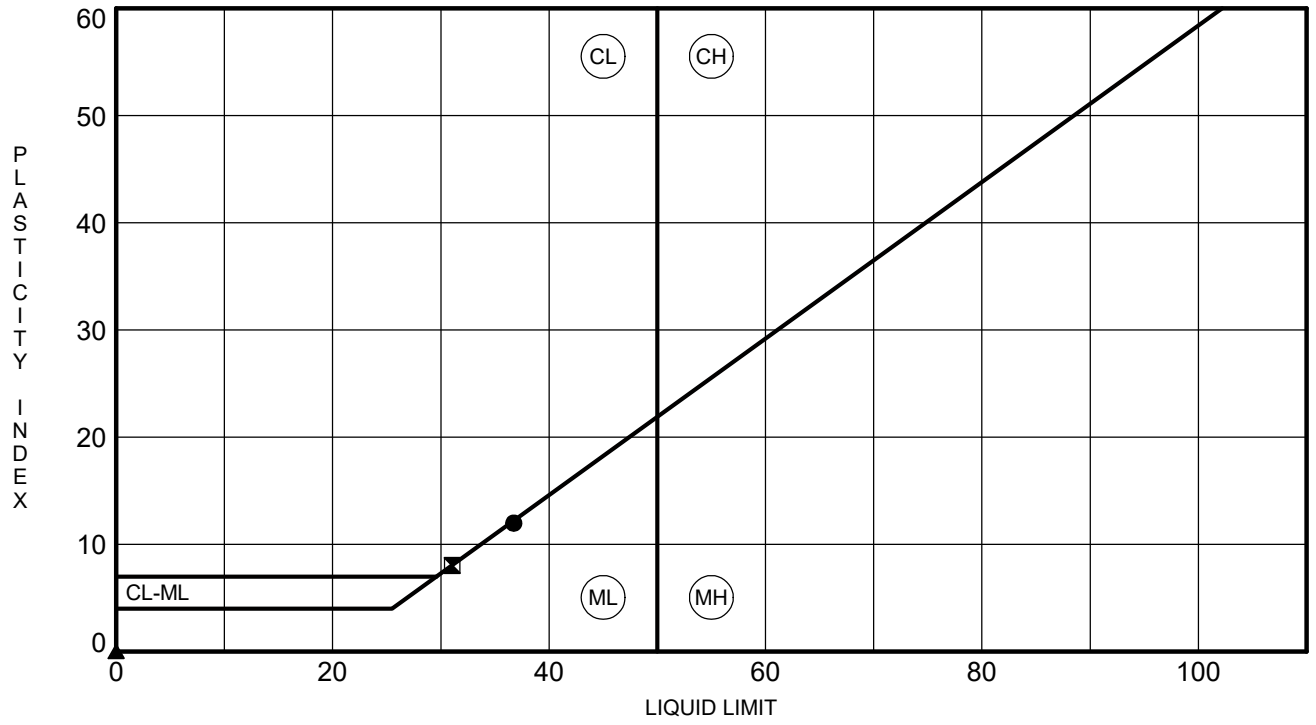
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-7**	**2.0**	**19.1**	**9.121**			**8.9**	**25.9**	**65.2**	
⊠	**B-7**	**8.0**	**9.52**	**0.12**			**0.4**	**6.1**	**93.5**	
▲	**B-7**	**15.0**	**22.6**	**19.933**	**1.089**		**26.4**	**55.2**	**18.4**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 2/12/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**B-7**	**2.0**	**37**	**25**	**12**	**65**	**Sandy SILT (ML) A-6(7)**
⧓	**B-7**	**8.0**	**31**	**23**	**8**	**93**	**SILT (ML) A-4(8)**
▲	**B-7**	**15.0**	**NP**	**NP**	**NP**	**18**	**Silty F/C SAND (SM) with Gravel A-1-b**

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

ORGANIC IMPURITIES DETERMINATION
(AASHTO T267)

PROJECT:	Carolina Crossroads	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0168G	**DATE SAMPLE RECEIVED:**	1/26/2018
DESCRIPTION OF SOIL:	SILT (ML) A-4(8)		
TESTED BY:	MB	**DATE OF TESTING:**	1/29/2018
		DATE OF WEIGHING:	1/29/2018

BORING NO.	B-7				
SAMPLE NO.	18-0168G SS-4				
SAMPLE DEPTH	6.0-8.0'				
WT. OF CRUCIBLE + DRY SOIL (BEFORE IGNITION) (GRAMS)	156.92				
WT. OF CRUCIBLE + DRY SOIL (AFTER IGNITION) (GRAMS)	155.07				
WT. OF CRUCIBLE (GRAMS)	110.78				
WT. OF DRY SOIL (BEFORE IGNITION) (GRAMS)	46.14				
WT. OF DRY SOIL (AFTER IGNITION) (GRAMS)	44.29				
IGNITION LOSS (GRAMS)	1.85				
ORGANIC IMPURITIES %	4.01				

Client:	F&ME Consultants				
Project:	I-20/26/126 Corridor Improvements				
Location:	---			Project No:	GTX-307802
Boring ID:	---	Sample Type:	---	Tested By:	twh
Sample ID:	---	Test Date:	03/14/18	Checked By:	jm
Depth :	---	Test Id:	292933		

pH of Soil by ASTM D4972

Boring ID	Sample ID	Depth	Visual Description	pH of Soil in Distilled Water	pH of Soil in Calcium Chloride
B-7	---	4-6 ft	Moist, reddish yellow sandy clay	4.8	4.4

Notes: Sample Preparation: screened through #10 sieve

Method A, pH meter used

Client:	F&ME Consultants
Project:	I-20/26/126 Corridor Improvement
Location:	---
GTX#:	307802
Test Date:	03/23/18
Tested By:	twh
Checked By:	jm

Laboratory Measurement of Soil Resistivity Using the Wenner Four-Electrode Method by ASTM G57 (Laboratory Measurement)

Boring ID	Sample ID	Depth, ft.	Sample Description	Electrical Resistivity, ohm-cm	Electrical Conductivity, $(ohm\text{-}cm)^{-1}$
B-7	---	4-6 ft	Moist, reddish yellow sandy clay	3,874	2.58E-04

Notes: Test Equipment: Nilsson Model 400 Soil Resistance Meter, MC Miller Soil Box
Water added to sample to create a thick slurry prior to testing (saturated condition).
Electrical Conductivity is calculated as inverse of Electrical Resistivity (per ASTM G57)
Test conducted in standard laboratory atmosphere: 68-73 F

Project Name: I-20/26/126 CORRIDOR IMPROV.
Project Number: 307802
Lab Number: L1808774
Report Date: 03/21/18

SAMPLE RESULTS

Lab ID: L1808774-04
Client ID: B-7, 4-6 FT
Sample Location: Not Specified
Sample Depth:
Matrix: Soil

Date Collected: 03/13/18 14:44
Date Received: 03/15/18
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	81.4		%	0.100	NA	1	-	03/17/18 04:52	121,2540G	FN
Chloride	13		mg/kg	11	--	1	-	03/20/18 22:42	1,9251	ML
Sulfate	ND		mg/kg	120	--	1	-	03/18/18 23:30	1,9038	JR

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

ROCK CORE COMPRESSION TEST

PROJECT: I-20/26/126 Corridor Improvements **PROJECT NO:** G5662.01

SAMPLED BY: RW **DATE SAMPLED:** 1/24/2018

TESTED BY: BF **DATE TESTED:** 1/30/2018

Lab No.	18-0169A	18-0169B			
Boring No.	B-7	B-7			
Sample No.	NQ-3	NQ-4			
Depth	52.7-53.0	59.2-59.5			
Length (in)	3.74	3.93			
Diameter (in)	1.86	1.86			
Mass (g)	406.77	463.46			
Cross Sectional Area (in^2)	2.72	2.72			
Load (lb)	2020	3700			
Compressive Strength (psi)	740	1360			
Corrected Compressive Strength (psi)					
Unit Weight (lb/ft^3)	152.49	165.34			

Signature: _____

Remarks: _____

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0640	**DATE SAMPLE RECEIVED:**	4/6/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	JH	**DATE OF TESTING:**	4/6/2018
		DATE OF WEIGHING:	4/9/2018

BORING NO.	B-8	B-8	B-8	B-8	B-8
SAMPLE NO.	18-0640C SS-2	18-0640F SS-4	18-0640I SS-7	18-0640L SS-10	18-0640O SS-12
SAMPLE DEPTH	2.0-4.0'	6.0-8.0'	18.5-20.0'	33.5-35.0'	43.5-45.0'
WATER CONTENT, W%	10.6	27.2	20.8	25.5	24.8

BORING NO.	B-8	B-8			
SAMPLE NO.	18-0640R SS-16	18-0640U SS-19			
SAMPLE DEPTH	63.5-65.0'	78.5-80.0'			
WATER CONTENT, W%	24.4	24.0			

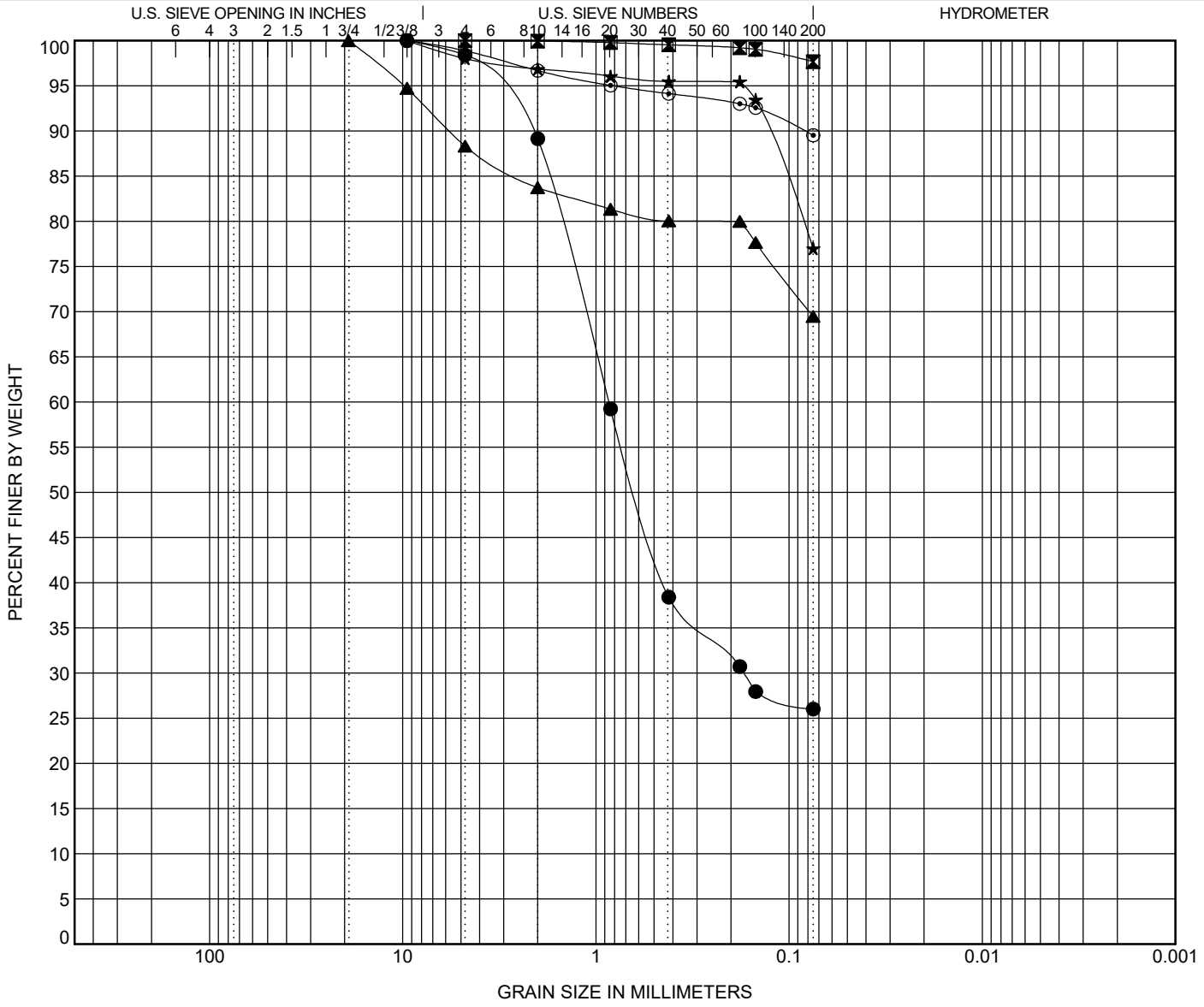
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**B-8**	**4.0**	**Silty F/C SAND (SM) A-2-7(1)**	**50**	**29**	**21**		
⊠	**B-8**	**8.0**	**SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		
▲	**B-8**	**20.0**	**Sandy SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		
★	**B-8**	**35.0**	**SILT (ML) with Fine Sand A-4(5)**	**32**	**25**	**7**		
⊙	**B-8**	**45.0**	**SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		

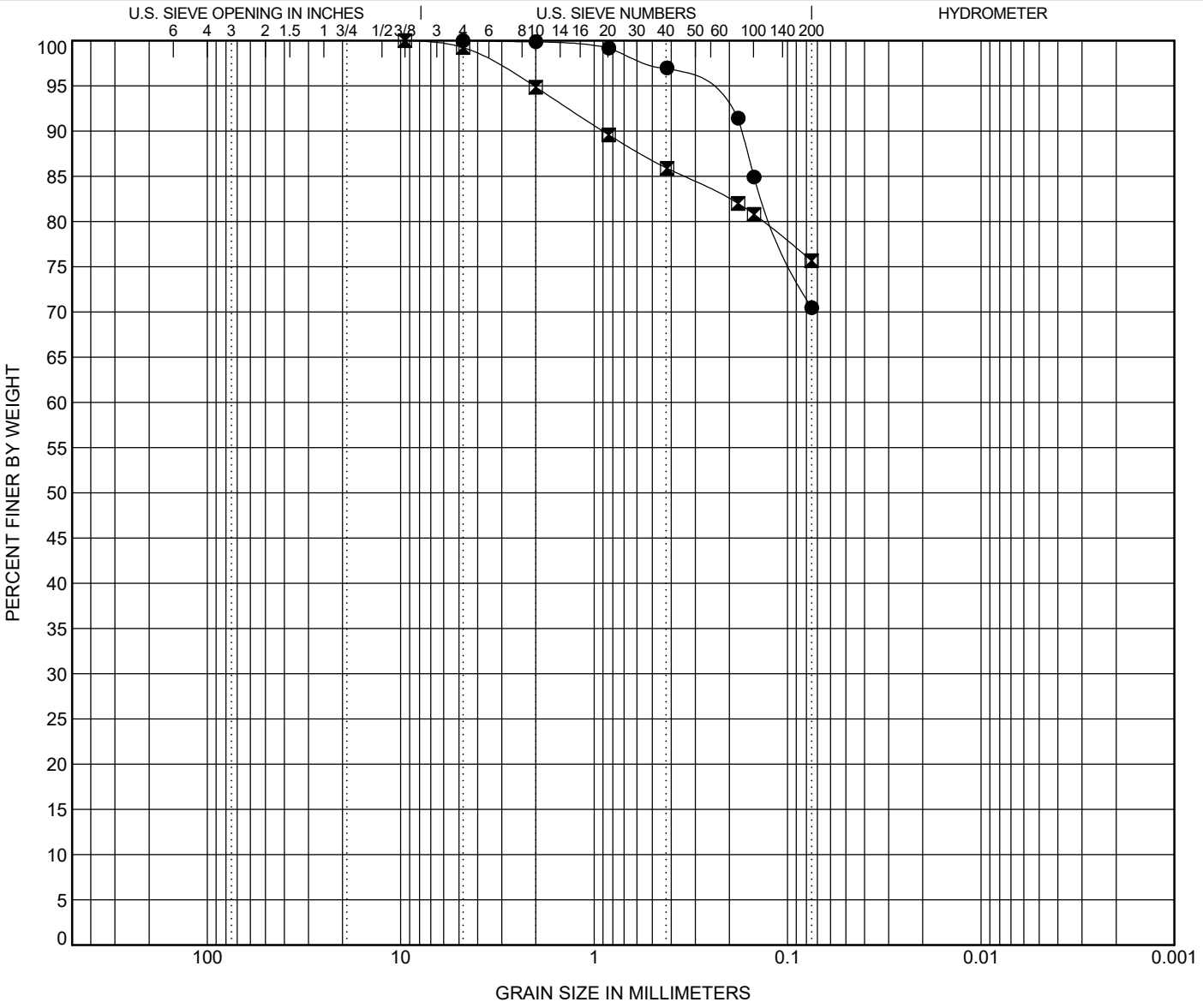
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-8**	**4.0**	**9.52**	**3.458**	**0.618**		**1.6**	**72.4**	**26.0**	
⊠	**B-8**	**8.0**	**4.76**				**0.0**	**2.3**	**97.7**	
▲	**B-8**	**20.0**	**19.1**	**9.873**			**11.7**	**18.8**	**69.5**	
★	**B-8**	**35.0**	**9.52**	**0.172**			**2.0**	**21.0**	**77.0**	
⊙	**B-8**	**45.0**	**9.52**	**0.813**			**1.1**	**9.4**	**89.5**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/26/18

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**B-8**	**65.0**	**SILT (ML) with Fine Sand A-4(0)**	**NP**	**NP**	**NP**		
⊠	**B-8**	**80.0**	**SILT (ML) with F/M Sand A-4(0)**	**NP**	**NP**	**NP**		

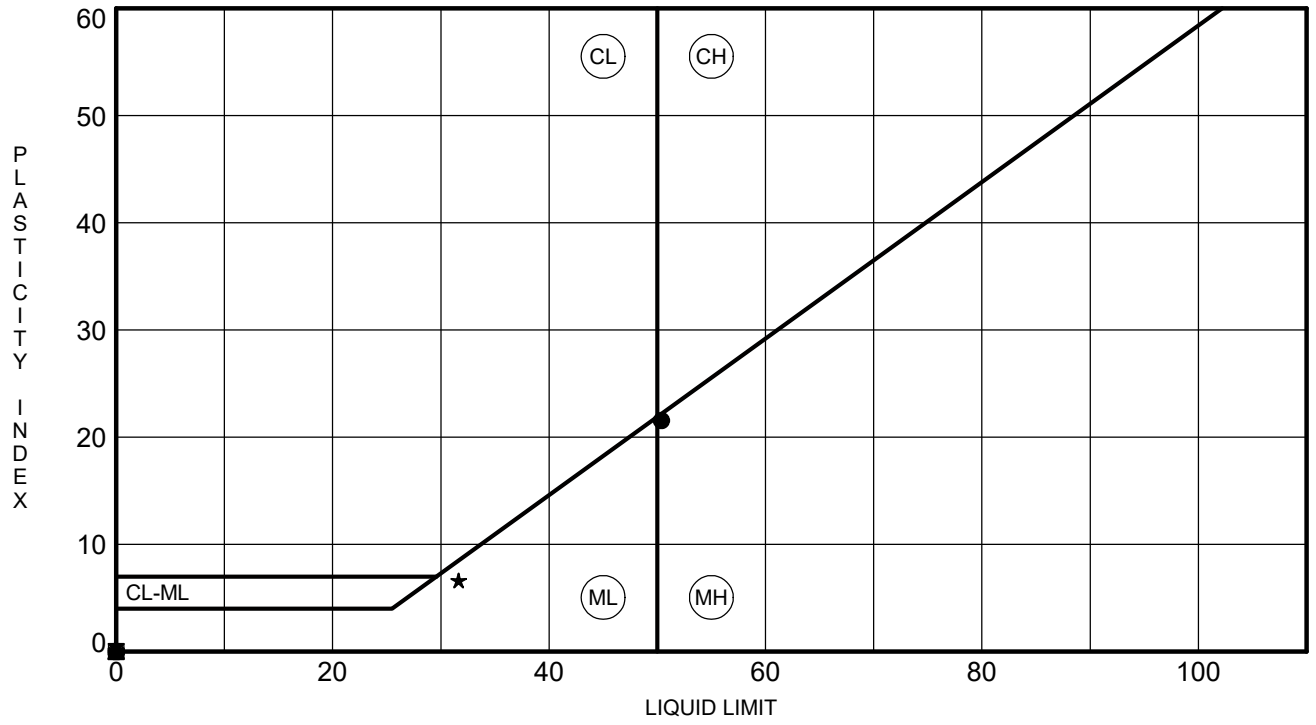
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-8**	**65.0**	**4.76**	**0.31**			**0.0**	**29.5**	**70.5**	
⊠	**B-8**	**80.0**	**9.52**	**2.055**			**0.8**	**23.5**	**75.7**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/26/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**B-8**	**4.0**	**50**	**29**	**21**	**26**	**Silty F/C SAND (SM) A-2-7(1)**
⊠	**B-8**	**8.0**	**NP**	**NP**	**NP**	**98**	**SILT (ML) A-4(0)**
▲	**B-8**	**20.0**	**NP**	**NP**	**NP**	**69**	**Sandy SILT (ML) A-4(0)**
★	**B-8**	**35.0**	**32**	**25**	**7**	**77**	**SILT (ML) with Fine Sand A-4(5)**
⊙	**B-8**	**45.0**	**NP**	**NP**	**NP**	**90**	**SILT (ML) A-4(0)**
✿	**B-8**	**65.0**	**NP**	**NP**	**NP**	**70**	**SILT (ML) with Fine Sand A-4(0)**
○	**B-8**	**80.0**	**NP**	**NP**	**NP**	**76**	**SILT (ML) with F/M Sand A-4(0)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/26/18

Client:	F&ME Consultants				
Project:	I-20/26/126 Corridor Improvements				
Location:	---			Project No:	GTX-307802
Boring ID:	---	Sample Type:	---	Tested By:	twh
Sample ID:	---	Test Date:	05/11/18	Checked By:	n/a
Depth :	---	Test Id:	293112		

pH of Soil by ASTM D4972

Boring ID	Sample ID	Depth	Visual Description	pH of Soil in Distilled Water	pH of Soil in Calcium Chloride
B-8	---	13.5-15 ft	Moist, red clay	4.0	3.0

Notes: Sample Preparation: screened through #10 sieve

Method A, pH meter used

Client:	F&ME Consultants
Project:	I-20/26/126 Corridor Improvement
Location:	---
GTX#:	307802
Test Date:	05/09/18
Tested By:	twh
Checked By:	jm

Laboratory Measurement of Soil Resistivity Using the Wenner Four-Electrode Method by ASTM G57 (Laboratory Measurement)

Boring ID	Sample ID	Depth, ft.	Sample Description	Electrical Resistivity, ohm-cm	Electrical Conductivity, $(ohm\text{-}cm)^{-1}$
B-8	---	13.5-15 ft	Moist, red clay	90,723	1.10E-05

Notes: Test Equipment: Nilsson Model 400 Soil Resistance Meter, MC Miller Soil Box
Water added to sample to create a thick slurry prior to testing (saturated condition).
Electrical Conductivity is calculated as inverse of Electrical Resistivity (per ASTM G57)
Test conducted in standard laboratory atmosphere: 68-73 F

Project Name: I-20/26/126 CORRIDOR IMPROVEME
Project Number: 307802
Lab Number: L1814569
Report Date: 05/01/18

SAMPLE RESULTS

Lab ID: L1814569-02
Client ID: B-8, 13.5-15 FT
Sample Location: Not Specified
Sample Depth:
Matrix: Soil

Date Collected: 04/18/18 14:05
Date Received: 04/25/18
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	76.2		%	0.100	NA	1	-	04/27/18 09:39	121,2540G	RI
Chloride	ND		mg/kg	13	--	1	-	04/30/18 23:31	1,9251	TL
Sulfate	ND		mg/kg	130	--	1	-	04/30/18 17:05	1,9038	BR

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

ROCK CORE COMPRESSION TEST

PROJECT: I-20/26/126 Corridor Improvements **PROJECT NO:** G5662.01

SAMPLED BY: RW **DATE SAMPLED:** 4/3/2018

TESTED BY: BF **DATE TESTED:** 4/6/2018

Lab No.	18-0658A				
Boring No.	B-8				
Sample No.	NQ-1				
Depth	93.8-94.1				
Length (in)	3.87				
Diameter (in)	1.87				
Mass (g)	467.08				
Cross Sectional Area (in^2)	2.75				
Load (lb)	6365				
Compressive Strength (psi)	2310				
Corrected Compressive Strength (psi)					
Unit Weight (lb/ft^3)	167.22				

Signature: _____

Remarks: _____

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0700	**DATE SAMPLE RECEIVED:**	4/16/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	4/17/2018
		DATE OF WEIGHING:	4/18/2018

BORING NO.	B-9	B-9	B-9	B-9	
SAMPLE NO.	18-0700C SS-4	18-0700F SS-7	18-0700I SS-9	18-0700L SS-14	
SAMPLE DEPTH	6.0-8.0'	18.5-20.0'	28.5-30.0'	53.5-55.0'	
WATER CONTENT, W%	12.9	26.5	31.3	23.4	

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

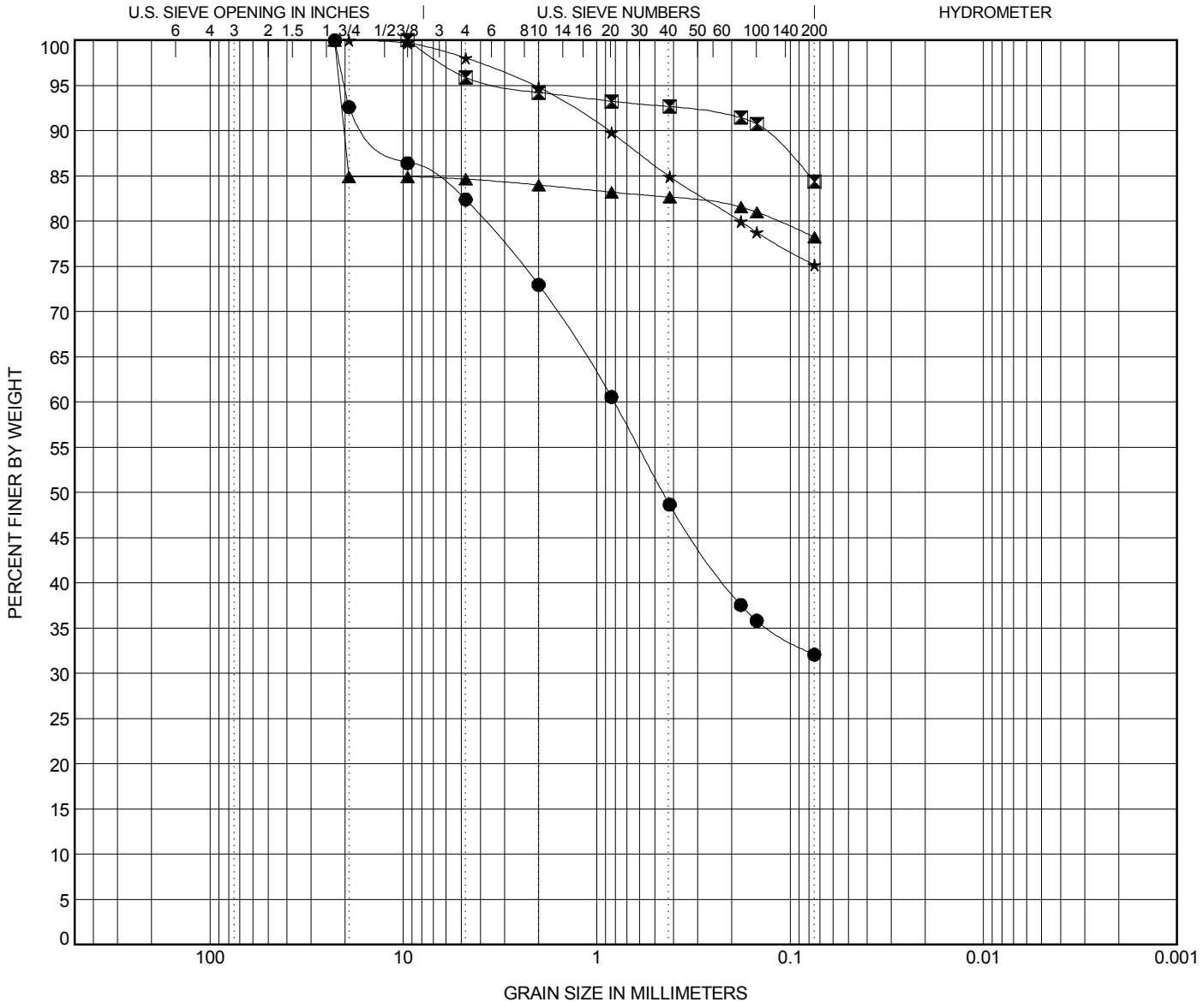
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**B-9**	**8.0**	**Silty F/C SAND (SM) with Gravel A-2-4**	**NP**	**NP**	**NP**		
⊠	**B-9**	**20.0**	**SILT (ML) with Fine Sand A-5(10)**	**41**	**31**	**10**		
▲	**B-9**	**30.0**	**SILT (ML) with Gravel A-4(0)**	**NP**	**NP**	**NP**		
★	**B-9**	**55.0**	**SILT (ML) with F/M Sand A-5(5)**	**41**	**36**	**5**		

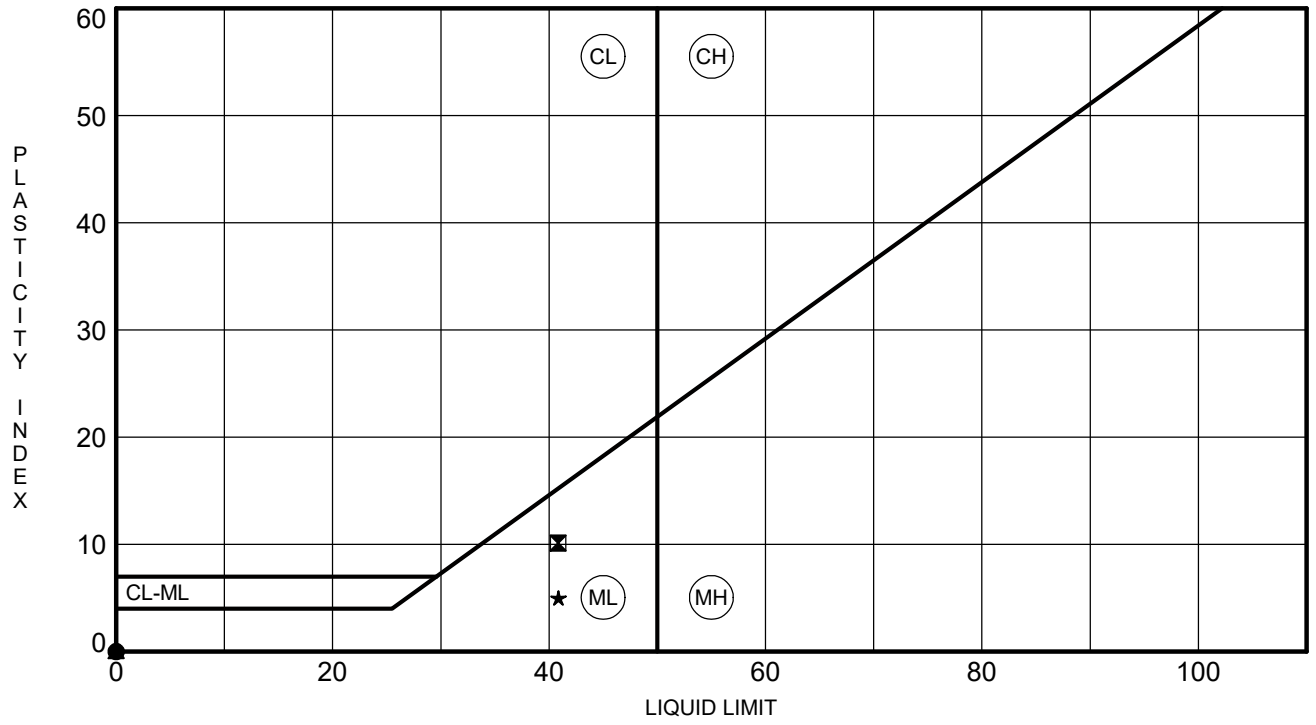
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-9**	**8.0**	**22.6**	**20.162**	**0.454**		**17.6**	**50.3**	**32.1**	
⊠	**B-9**	**20.0**	**9.52**	**2.975**			**4.1**	**11.5**	**84.4**	
▲	**B-9**	**30.0**	**22.6**	**21.373**			**15.3**	**6.4**	**78.3**	
★	**B-9**	**55.0**	**19.1**	**2.1**			**2.0**	**22.8**	**75.2**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 5/2/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**B-9**	**8.0**	**NP**	**NP**	**NP**	**32**	**Silty F/C SAND (SM) with Gravel A-2-4**
⊠	**B-9**	**20.0**	**41**	**31**	**10**	**84**	**SILT (ML) with Fine Sand A-5(10)**
▲	**B-9**	**30.0**	**NP**	**NP**	**NP**	**78**	**SILT (ML) with Gravel A-4(0)**
★	**B-9**	**55.0**	**41**	**36**	**5**	**75**	**SILT (ML) with F/M Sand A-5(5)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 5/1/18

Client:	F&ME Consultants				
Project:	I-20/26/126 Corridor Improvements				
Location:	---			Project No:	GTX-307802
Boring ID:	---	Sample Type:	---	Tested By:	twh
Sample ID:	---	Test Date:	05/11/18	Checked By:	n/a
Depth :	---	Test Id:	293112		

pH of Soil by ASTM D4972

Boring ID	Sample ID	Depth	Visual Description	pH of Soil in Distilled Water	pH of Soil in Calcium Chloride
B-9	---	4-6 ft	Moist, red clay with sand	4.4	3.0

Notes: Sample Preparation: screened through #10 sieve

Method A, pH meter used

Client:	F&ME Consultants
Project:	I-20/26/126 Corridor Improvement
Location:	---
GTX#:	307802
Test Date:	05/09/18
Tested By:	twh
Checked By:	jm

Laboratory Measurement of Soil Resistivity Using the Wenner Four-Electrode Method by ASTM G57 (Laboratory Measurement)

Boring ID	Sample ID	Depth, ft.	Sample Description	Electrical Resistivity, ohm-cm	Electrical Conductivity, $(ohm\text{-}cm)^{-1}$
B-9	---	4-6 ft	Moist, red clay with sand	68,297	1.46E-05

Notes: Test Equipment: Nilsson Model 400 Soil Resistance Meter, MC Miller Soil Box
Water added to sample to create a thick slurry prior to testing (saturated condition).
Electrical Conductivity is calculated as inverse of Electrical Resistivity (per ASTM G57)
Test conducted in standard laboratory atmosphere: 68-73 F

Project Name: I-20/26/126 CORRIDOR IMPROVEME
Project Number: 307802
Lab Number: L1814569
Report Date: 05/01/18

SAMPLE RESULTS

Lab ID: L1814569-03
Client ID: B-9, 4-6 FT
Sample Location: Not Specified
Sample Depth:
Matrix: Soil

Date Collected: 04/18/18 14:09
Date Received: 04/25/18
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	75.4		%	0.100	NA	1	-	04/27/18 09:39	121,2540G	RI
Chloride	25		mg/kg	13	--	1	-	04/30/18 22:55	1,9251	TL
Sulfate	ND		mg/kg	130	--	1	-	04/30/18 17:05	1,9038	BR

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0699	**DATE SAMPLE RECEIVED:**	4/16/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	4/17/2018
		DATE OF WEIGHING:	4/18/2018

BORING NO.	B-10	B-10	B-10		
SAMPLE NO.	18-0699C SS-3	18-0699F SS-7	18-0699I SS-15		
SAMPLE DEPTH	4.0-6.0'	18.5-20.0'	58.5-60.0'		
WATER CONTENT, W%	19.5	22.9	23.5		

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

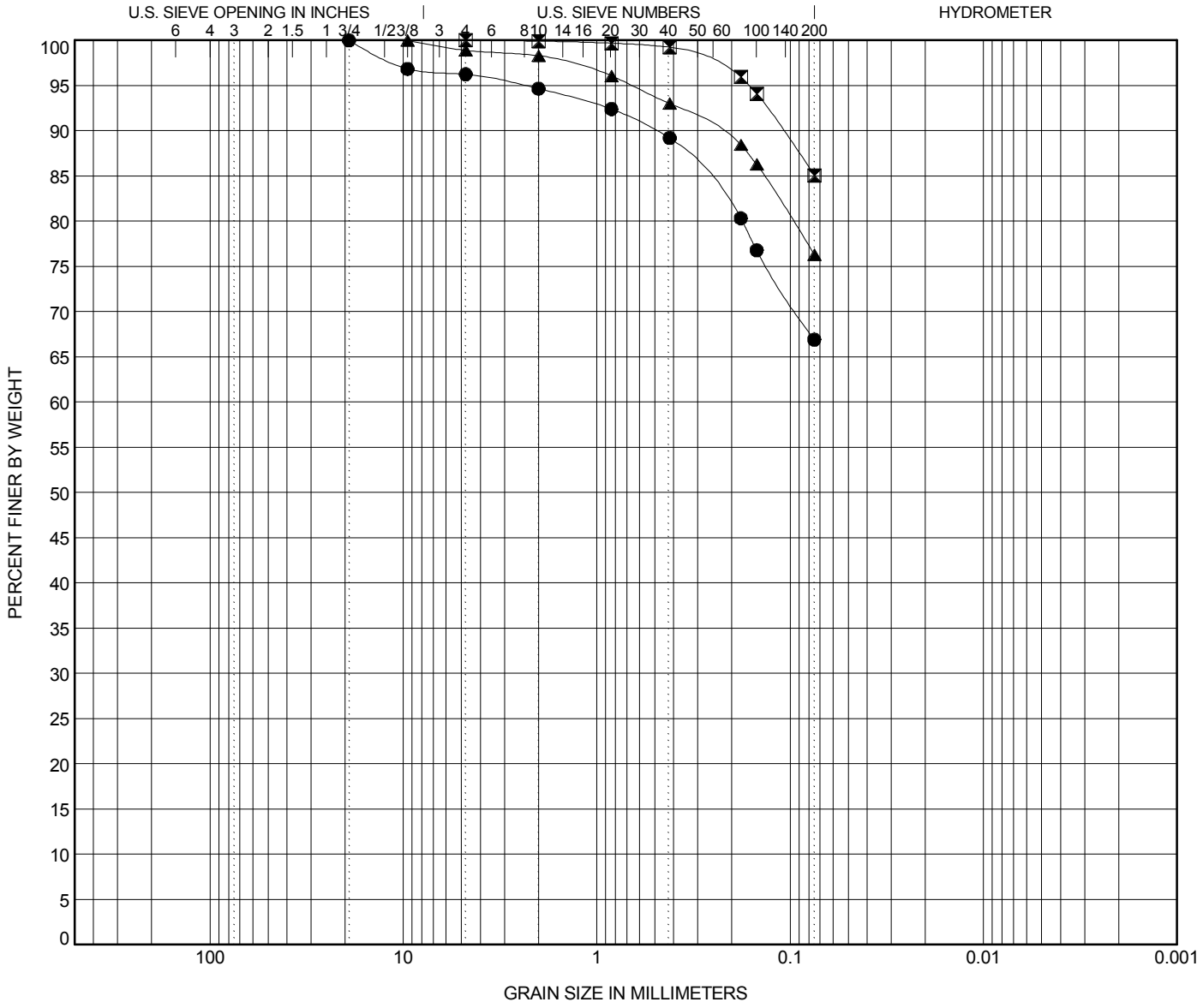
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**B-10**	**6.0**	**Sandy SILT (ML) A-4(1)**	**30**	**28**	**2**		
⧓	**B-10**	**20.0**	**SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		
▲	**B-10**	**60.0**	**SILT (ML) with F/M Sand A-4(0)**	**NP**	**NP**	**NP**		

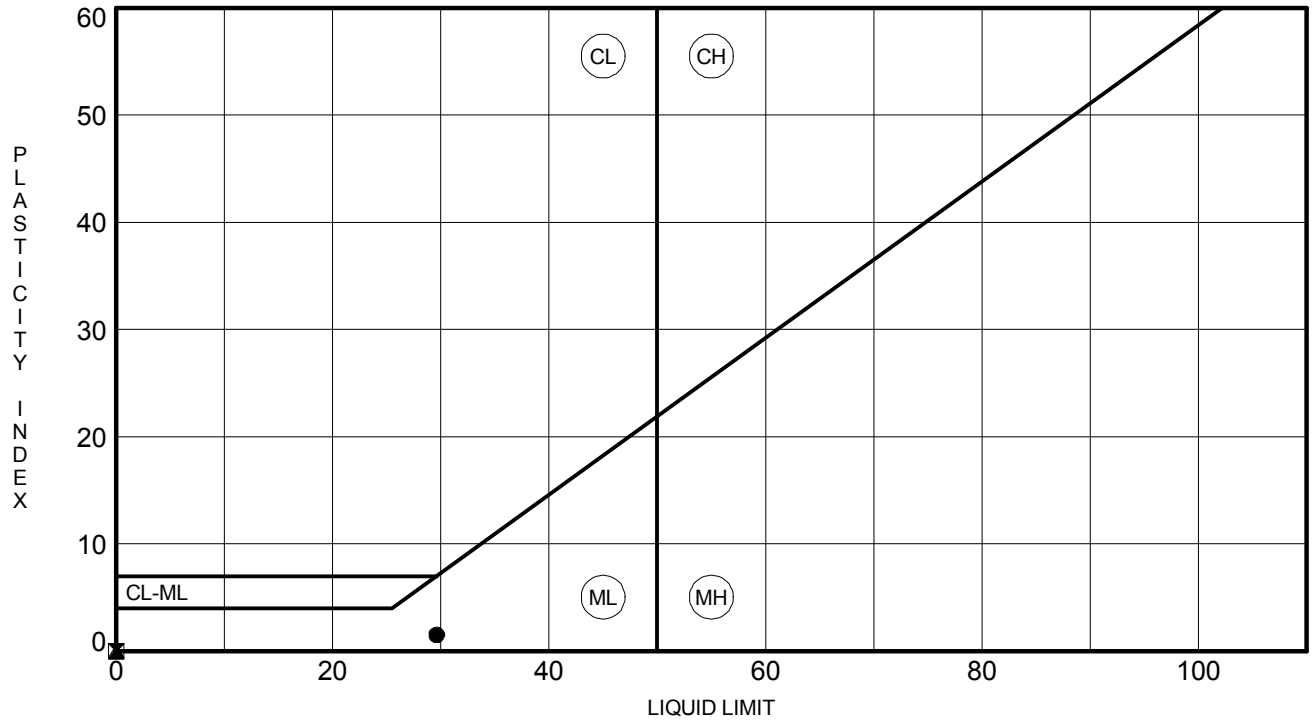
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-10**	**6.0**	**19.1**	**2.407**			**3.7**	**29.3**	**66.9**	
⧓	**B-10**	**20.0**	**4.76**	**0.164**			**0.0**	**14.9**	**85.1**	
▲	**B-10**	**60.0**	**9.52**	**0.658**			**1.1**	**22.6**	**76.3**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/5/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**B-10**	**6.0**	**30**	**28**	**2**	**67**	**Sandy SILT (ML) A-4(1)**
⊠	**B-10**	**20.0**	**NP**	**NP**	**NP**	**85**	**SILT (ML) A-4(0)**
▲	**B-10**	**60.0**	**NP**	**NP**	**NP**	**76**	**SILT (ML) with F/M Sand A-4(0)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/5/18

Client:	F&ME Consultants				
Project:	I-20/26/126 Corridor Improvements				
Location:	---			Project No:	GTX-307802
Boring ID:	---	Sample Type:	---	Tested By:	twh
Sample ID:	---	Test Date:	05/11/18	Checked By:	n/a
Depth :	---	Test Id:	293112		

pH of Soil by ASTM D4972

Boring ID	Sample ID	Depth	Visual Description	pH of Soil in Distilled Water	pH of Soil in Calcium Chloride
B-10	---	6-8 ft	Moist, yellow clay	4.5	3.9

Notes: Sample Preparation: screened through #10 sieve

Method A, pH meter used

Client:	F&ME Consultants
Project:	I-20/26/126 Corridor Improvement
Location:	---
GTX#:	307802
Test Date:	05/09/18
Tested By:	twh
Checked By:	jm

Laboratory Measurement of Soil Resistivity Using the Wenner Four-Electrode Method by ASTM G57 (Laboratory Measurement)

Boring ID	Sample ID	Depth, ft.	Sample Description	Electrical Resistivity, ohm-cm	Electrical Conductivity, $(ohm\text{-}cm)^{-1}$
B-10	---	6-8 ft	Moist, yellow clay	11,213	8.92E-05

Notes: Test Equipment: Nilsson Model 400 Soil Resistance Meter, MC Miller Soil Box
Water added to sample to create a thick slurry prior to testing (saturated condition).
Electrical Conductivity is calculated as inverse of Electrical Resistivity (per ASTM G57)
Test conducted in standard laboratory atmosphere: 68-73 F

Project Name: I-20/26/126 CORRIDOR IMPROVEME
Project Number: 307802
Lab Number: L1814569
Report Date: 05/01/18

SAMPLE RESULTS

Lab ID: L1814569-04
Client ID: B-10, 6-8 FT
Sample Location: Not Specified
Sample Depth:
Matrix: Soil

Date Collected: 04/18/18 14:14
Date Received: 04/25/18
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	79.6		%	0.100	NA	1	-	04/27/18 09:39	121,2540G	RI
Chloride	26		mg/kg	12	--	1	-	04/30/18 22:56	1,9251	TL
Sulfate	ND		mg/kg	120	--	1	-	04/30/18 17:05	1,9038	BR

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0702	**DATE SAMPLE RECEIVED:**	4/16/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	4/17/2018
		DATE OF WEIGHING:	4/18/2018

BORING NO.	B-11	B-11	B-11	B-11	B-11
SAMPLE NO.	18-0702C SS-4	18-0702F SS-9	18-0702I SS-11	18-0702L SS-13	18-0702O SS-21
SAMPLE DEPTH	6.0-8.0'	28.5-30.0'	38.5-40.0'	48.5-50.0'	104.4-105.8'
WATER CONTENT, W%	22.1	27.3	23.2	22.2	13.7

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

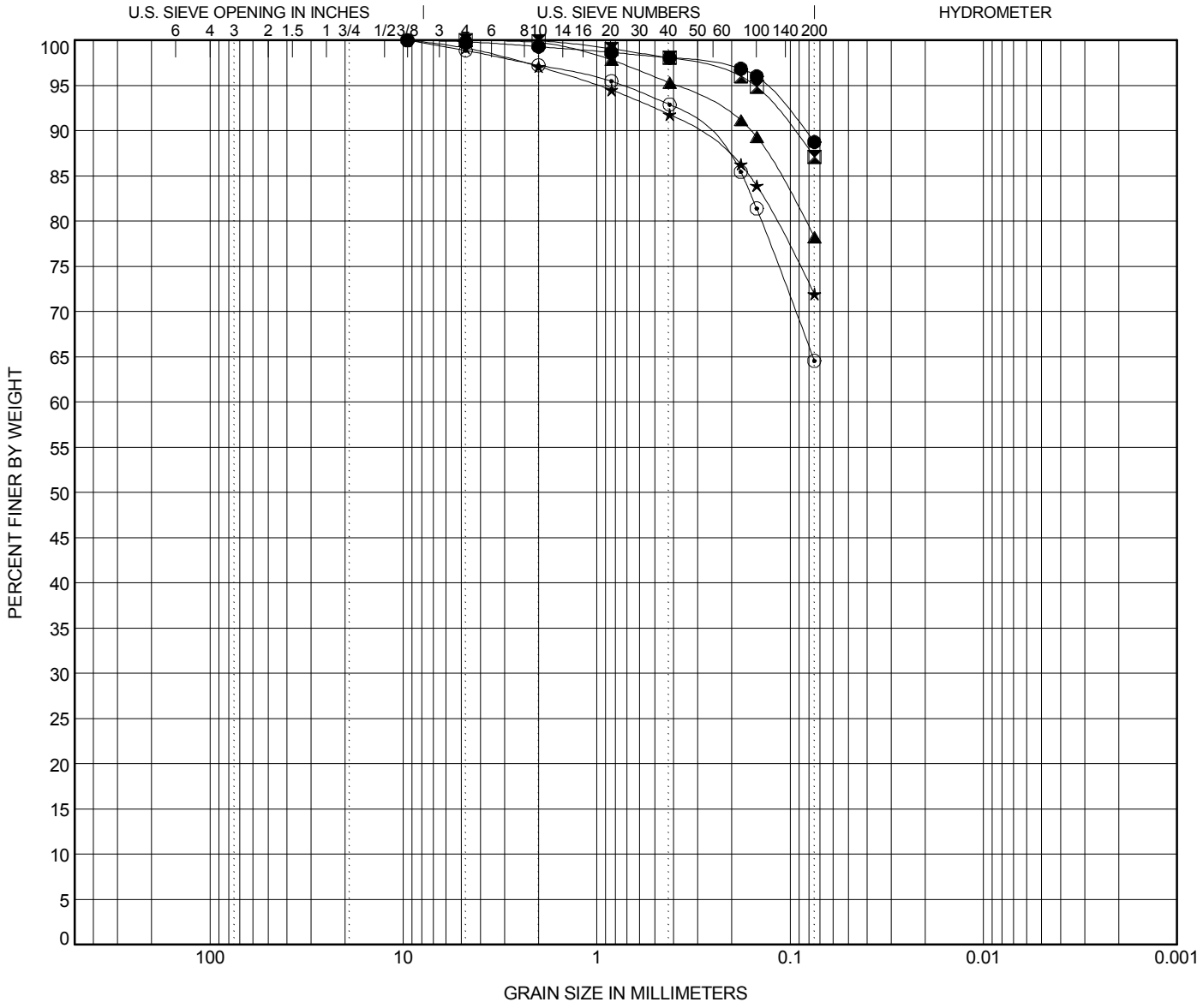
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**B-11**	**8.0**	**SILT (ML) A-4(3)**	**34**	**33**	**1**		
⧓	**B-11**	**30.0**	**SILT (ML) A-4(5)**	**34**	**29**	**5**		
▲	**B-11**	**40.0**	**SILT (ML) with F/M Sand A-4(0)**	**NP**	**NP**	**NP**		
★	**B-11**	**50.0**	**SILT (ML) with F/M Sand A-4(0)**	**NP**	**NP**	**NP**		
⊙	**B-11**	**105.8**	**Sandy SILT (ML) A-4(2)**	**30**	**26**	**4**		

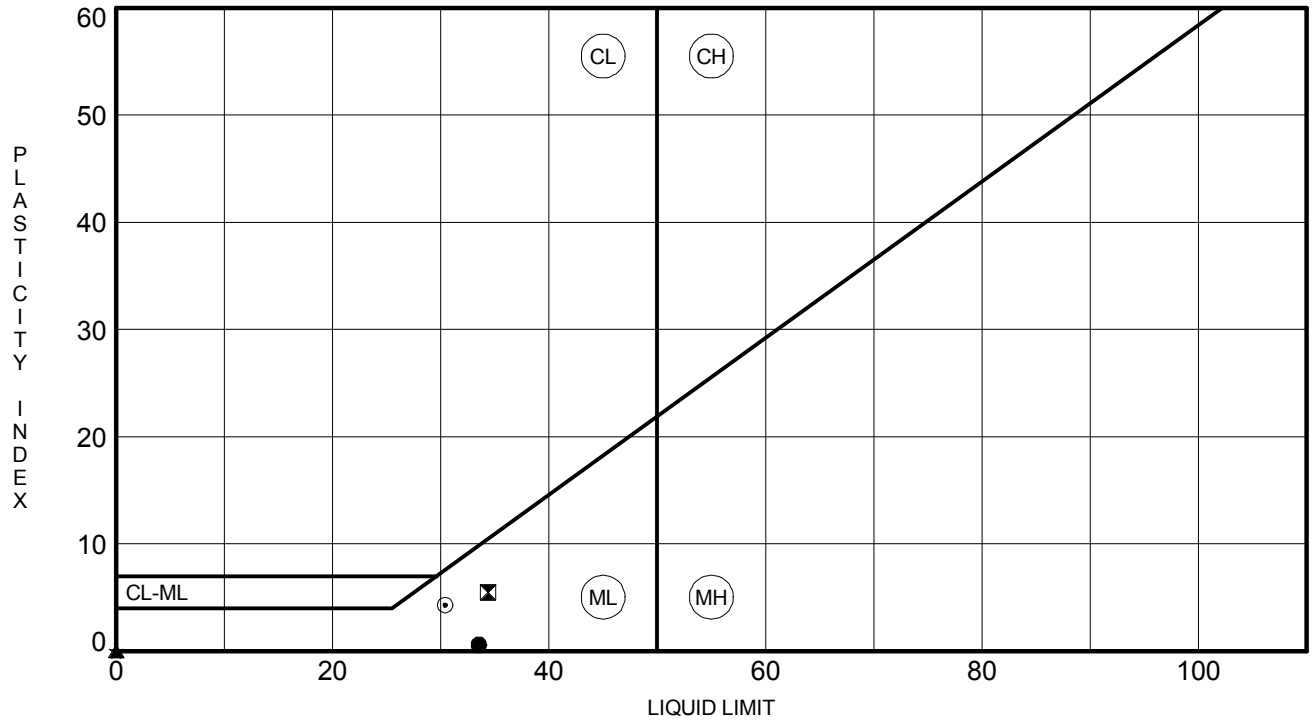
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-11**	**8.0**	**9.52**	**0.135**			**0.2**	**11.1**	**88.8**	
⧓	**B-11**	**30.0**	**4.76**	**0.152**			**0.0**	**12.9**	**87.1**	
▲	**B-11**	**40.0**	**4.76**	**0.393**			**0.0**	**21.8**	**78.2**	
★	**B-11**	**50.0**	**9.52**	**0.99**			**0.9**	**27.2**	**72.0**	
⊙	**B-11**	**105.8**	**9.52**	**0.736**			**1.1**	**34.3**	**64.6**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/5/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**B-11**	**8.0**	**34**	**33**	**1**	**89**	**SILT (ML) A-4(3)**
⊠	**B-11**	**30.0**	**34**	**29**	**5**	**87**	**SILT (ML) A-4(5)**
▲	**B-11**	**40.0**	**NP**	**NP**	**NP**	**78**	**SILT (ML) with F/M Sand A-4(0)**
★	**B-11**	**50.0**	**NP**	**NP**	**NP**	**72**	**SILT (ML) with F/M Sand A-4(0)**
⊙	**B-11**	**105.8**	**30**	**26**	**4**	**65**	**Sandy SILT (ML) A-4(2)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/5/18

Client:	F&ME Consultants				
Project:	I-20/26/126 Corridor Improvements				
Location:	---			Project No:	GTX-307802
Boring ID:	---	Sample Type:	---	Tested By:	twh
Sample ID:	---	Test Date:	05/11/18	Checked By:	n/a
Depth :	---	Test Id:	293112		

pH of Soil by ASTM D4972

Boring ID	Sample ID	Depth	Visual Description	pH of Soil in Distilled Water	pH of Soil in Calcium Chloride
B-11	---	8-10 ft	Moist, light red clay with sand	4.0	3.5

Notes: Sample Preparation: screened through #10 sieve

Method A, pH meter used

Client:	F&ME Consultants
Project:	I-20/26/126 Corridor Improvement
Location:	---
GTX#:	307802
Test Date:	05/09/18
Tested By:	twh
Checked By:	jm

Laboratory Measurement of Soil Resistivity Using the Wenner Four-Electrode Method by ASTM G57 (Laboratory Measurement)

Boring ID	Sample ID	Depth, ft.	Sample Description	Electrical Resistivity, ohm-cm	Electrical Conductivity, $(ohm\text{-}cm)^{-1}$
B-11	---	8-10 ft	Moist, light red clay with sand	25,484	3.92E-05

Notes: Test Equipment: Nilsson Model 400 Soil Resistance Meter, MC Miller Soil Box
Water added to sample to create a thick slurry prior to testing (saturated condition).
Electrical Conductivity is calculated as inverse of Electrical Resistivity (per ASTM G57)
Test conducted in standard laboratory atmosphere: 68-73 F

Project Name: I-20/26/126 CORRIDOR IMPROVEME
Project Number: 307802
Lab Number: L1814569
Report Date: 05/01/18

SAMPLE RESULTS

Lab ID: L1814569-05
Client ID: B-11, 8-10 FT
Sample Location: Not Specified
Sample Depth:
Matrix: Soil

Date Collected: 04/18/18 14:19
Date Received: 04/25/18
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	82.0		%	0.100	NA	1	-	04/27/18 09:39	121,2540G	RI
Chloride	ND		mg/kg	12	--	1	-	04/30/18 22:57	1,9251	TL
Sulfate	ND		mg/kg	120	--	1	-	04/30/18 17:05	1,9038	BR

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

ROCK CORE COMPRESSION TEST

PROJECT: I-20/26/126 Corridor Improvements **PROJECT NO:** G5662.01

SAMPLED BY: RW **DATE SAMPLED:** 4/10/2018

TESTED BY: BF **DATE TESTED:** 4/17/2018

Lab No.	18-0703A				
Boring No.	B-11				
Sample No.	NQ-2				
Depth	81.2-81.5				
Length (in)	3.95				
Diameter (in)	1.87				
Mass (g)	469.78				
Cross Sectional Area (in^2)	2.73				
Load (lb)	2340				
Compressive Strength (psi)	860				
Corrected Compressive Strength (psi)					
Unit Weight (lb/ft^3)	165.51				

Signature: _____

Remarks: _____

F&ME CONSULTANTS
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Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0768	**DATE SAMPLE RECEIVED:**	4/30/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	4/30/2018
		DATE OF WEIGHING:	5/1/2018

BORING NO.	B-12	B-12	B-12	B-12	B-12
SAMPLE NO.	18-0768C SS-1	18-0768F SS-4	18-0768O SS-5	18-0768I SS-8	18-0768L SS-13
SAMPLE DEPTH	0.0-2.0'	6.0-8.0'	8.0-10.0'	23.5-25.0'	48.5-50.0'
WATER CONTENT, W%	17.3	20.6	20.2	18.2	22.8

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

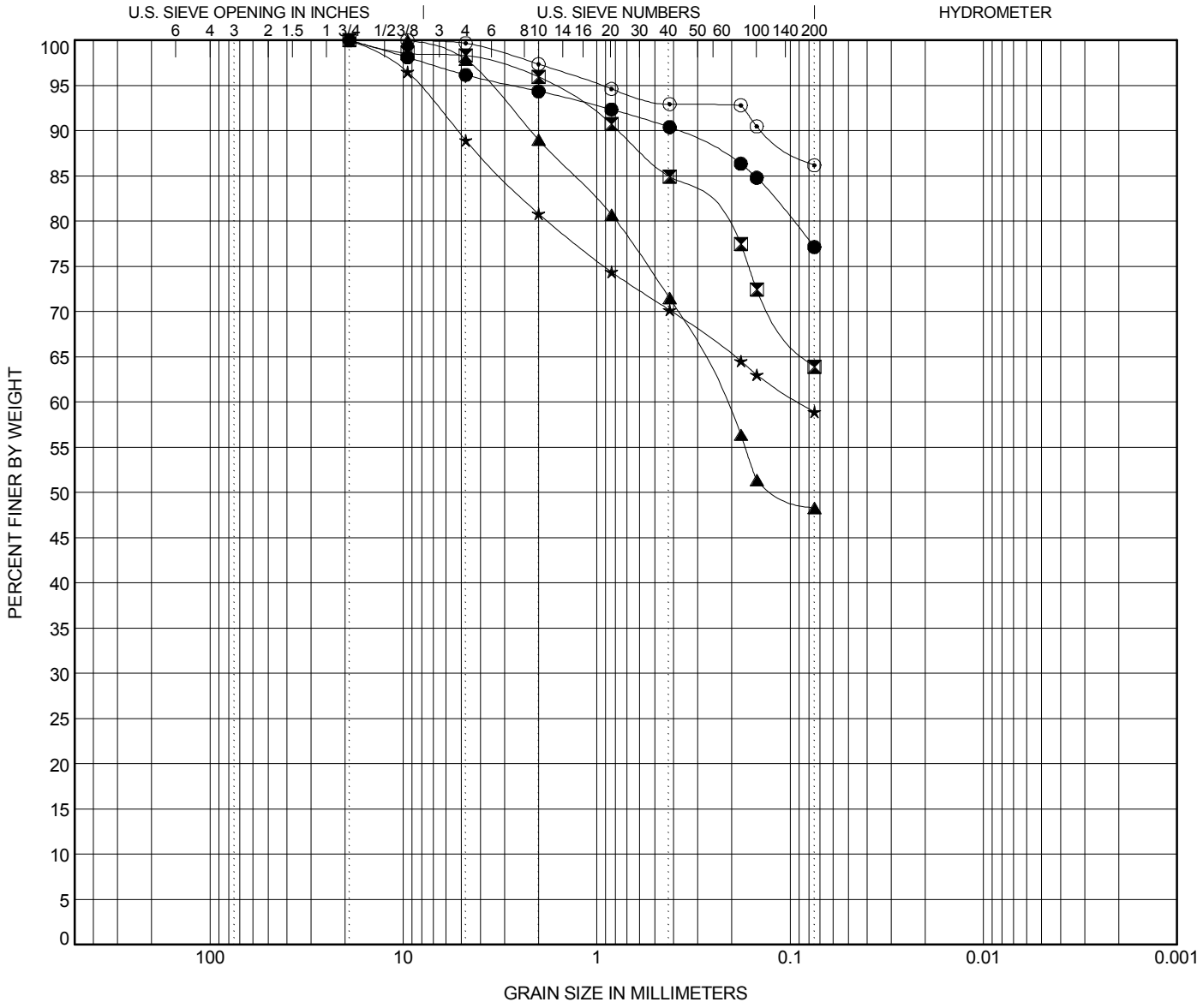
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**B-12**	**2.0**	**SILT (ML) with Sand A-4(4)**	**29**	**23**	**6**		
⊠	**B-12**	**8.0**	**Sandy SILT (ML) A-4(1)**	**27**	**23**	**4**		
▲	**B-12**	**10.0**	**Silty Fine SAND (SM) A-4(0)**	**30**	**25**	**5**		
★	**B-12**	**25.0**	**Sandy SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		
⊙	**B-12**	**50.0**	**SILT (ML) A-5(10)**	**41**	**31**	**10**		

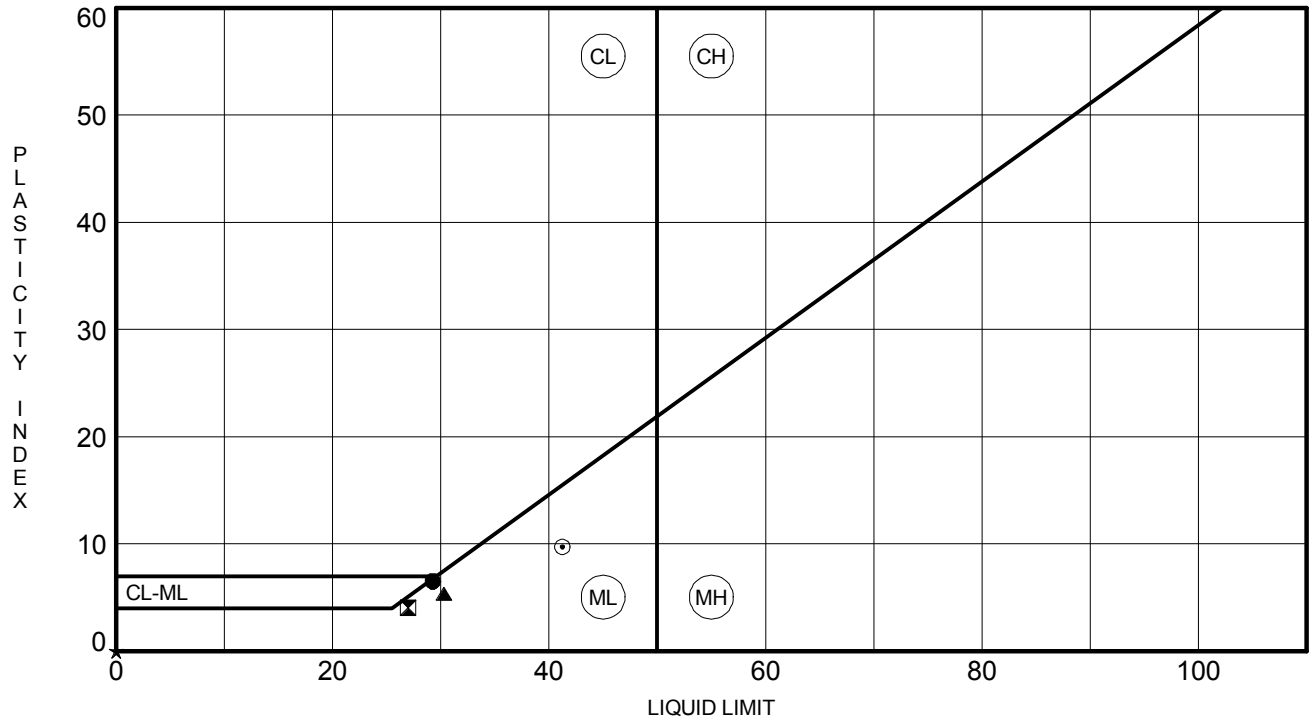
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-12**	**2.0**	**19**	**2.703**			**3.8**	**19.0**	**77.2**	
⊠	**B-12**	**8.0**	**19**	**1.707**			**1.7**	**34.4**	**63.9**	
▲	**B-12**	**10.0**	**9.52**	**3.589**	**0.109**		**2.1**	**49.6**	**48.3**	
★	**B-12**	**25.0**	**19**	**8.288**			**11.1**	**30.0**	**58.9**	
⊙	**B-12**	**50.0**	**9.52**	**0.945**			**0.3**	**13.5**	**86.2**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/29/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**B-12**	**2.0**	**29**	**23**	**6**	**77**	**SILT (ML) with Sand A-4(4)**
⊠	**B-12**	**8.0**	**27**	**23**	**4**	**64**	**Sandy SILT (ML) A-4(1)**
▲	**B-12**	**10.0**	**30**	**25**	**5**	**48**	**Silty Fine SAND (SM) A-4(0)**
★	**B-12**	**25.0**	**NP**	**NP**	**NP**	**59**	**Sandy SILT (ML) A-4(0)**
⊙	**B-12**	**50.0**	**41**	**31**	**10**	**86**	**SILT (ML) A-5(10)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/29/18

Client:	F&ME Consultants				
Project:	I-20/26/126 Corridor Improvements				
Location:	---			Project No:	GTX-307802
Boring ID:	---	Sample Type:	---	Tested By:	twh
Sample ID:	---	Test Date:	06/08/18	Checked By:	MCM
Depth :	---	Test Id:	295616		

pH of Soil by ASTM D4972

Boring ID	Sample ID	Depth	Visual Description	pH of Soil in Distilled Water	pH of Soil in Calcium Chloride
B-12	---	28.5-30 ft	Moist, yellow sandy silt	4.9	3.8

Notes: Sample Preparation: screened through #10 sieve

Method A, pH meter used

Client:	F&ME Consultants
Project:	I-20/26/126 Corridor Improvement
Location:	---
GTX#:	307802
Test Date:	06/11/18
Tested By:	twh
Checked By:	emm

Laboratory Measurement of Soil Resistivity Using the Wenner Four-Electrode Method by ASTM G57 (Laboratory Measurement)

Boring ID	Sample ID	Depth, ft.	Sample Description	Electrical Resistivity, ohm-cm	Electrical Conductivity, $(ohm\text{-}cm)^{-1}$
B-12	---	28.5-30 ft	Moist, yellow sandy silt	21,407	4.67E-05

Notes: Test Equipment: Nilsson Model 400 Soil Resistance Meter, MC Miller Soil Box
Water added to sample to create a thick slurry prior to testing (saturated condition).
Electrical Conductivity is calculated as inverse of Electrical Resistivity (per ASTM G57)
Test conducted in standard laboratory atmosphere: 68-73 F

Project Name: I-20/26/126 CORRIDOR IMPROVE
Project Number: 307802
Lab Number: L1824882
Report Date: 07/10/18

SAMPLE RESULTS

Lab ID: L1824882-02
Client ID: B-12, 28.5-30 FT
Sample Location: Not Specified
Sample Depth:
Matrix: Soil

Date Collected: 06/28/18 14:09
Date Received: 06/29/18
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	82.4		%	0.100	NA	1	-	07/03/18 13:04	121,2540G	RI
Chloride	21		mg/kg	11	--	1	-	07/03/18 22:18	1,9251	TL
Sulfate	ND		mg/kg	120	--	1	-	07/03/18 01:55	1,9038	JR

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0536	**DATE SAMPLE RECEIVED:**	3/27/2018
DESCRIPTION OF SOIL:	Various		
TESTED BY:	MB	**DATE OF TESTING:**	3/30/2018
		DATE OF WEIGHING:	4/2/2018

BORING NO.	B-13	B-13	B-13	B-13	B-13
SAMPLE NO.	18-0536C SS-2	18-0536F SS-6	18-0536I SS-8	18-0536L SS-11	18-0536O SS-13
SAMPLE DEPTH	2.0-4.0'	13.5-15.0'	23.5-25.0'	38.5-40.0'	48.5-50.0'
WATER CONTENT, W%	26.4	29.1	32.8	43.2	25.8

BORING NO.	B-13				
SAMPLE NO.	18-0536R SS-17				
SAMPLE DEPTH	68.5-70.0'				
WATER CONTENT, W%	18.6				

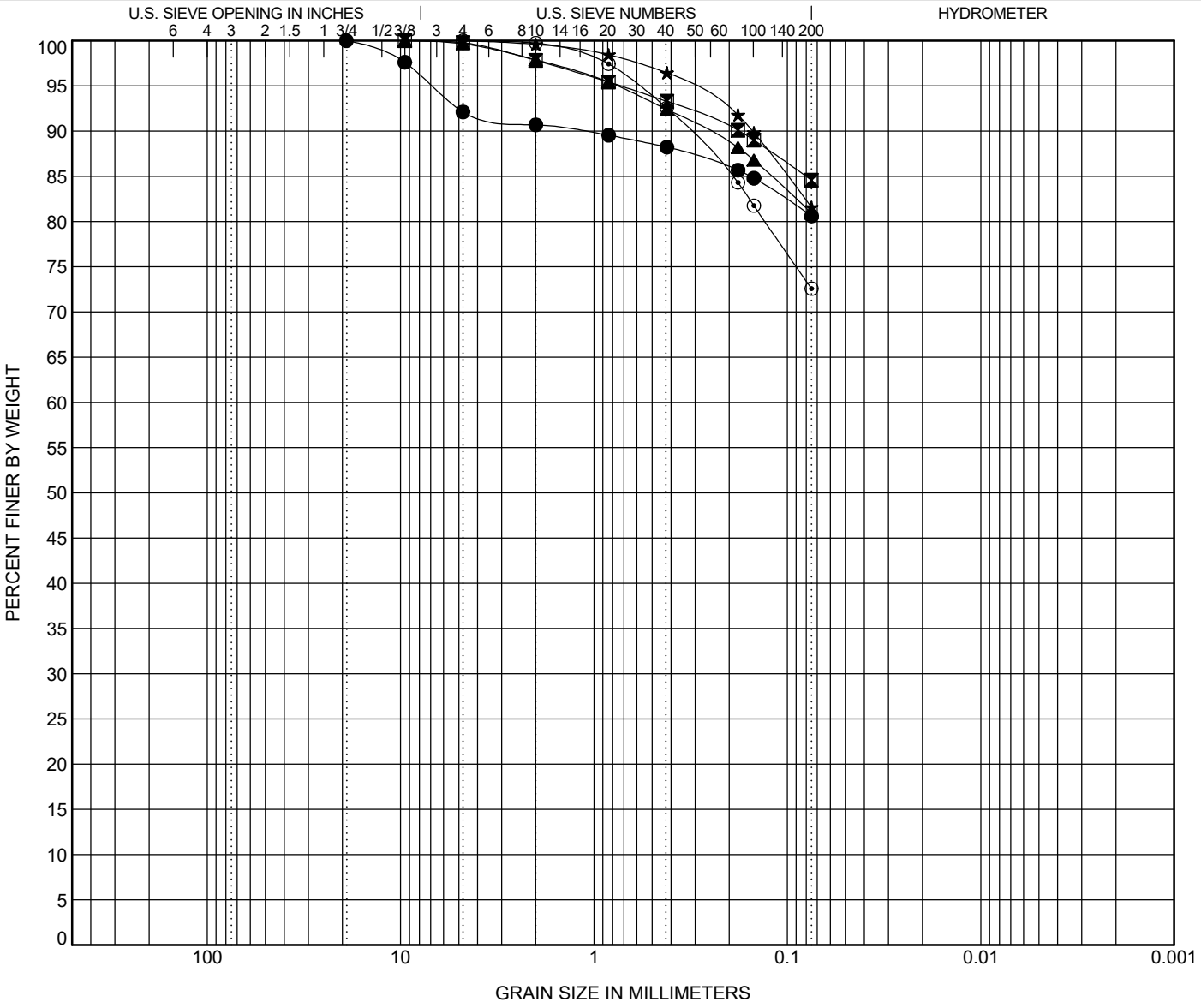
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**B-13**	**4.0**	**SILT (ML) with F/M Sand A-7-5(12)**	**45**	**33**	**12**		
⊠	**B-13**	**15.0**	**SILT (ML) with F/M Sand A-4(0)**	**NP**	**NP**	**NP**		
▲	**B-13**	**25.0**	**SILT (ML) with F/M Sand A-4(0)**	**NP**	**NP**	**NP**		
★	**B-13**	**40.0**	**SILT (ML) with Fine Sand A-5(9)**	**42**	**34**	**8**		
⊙	**B-13**	**50.0**	**SILT (ML) with F/M Sand A-4(3)**	**32**	**27**	**5**		

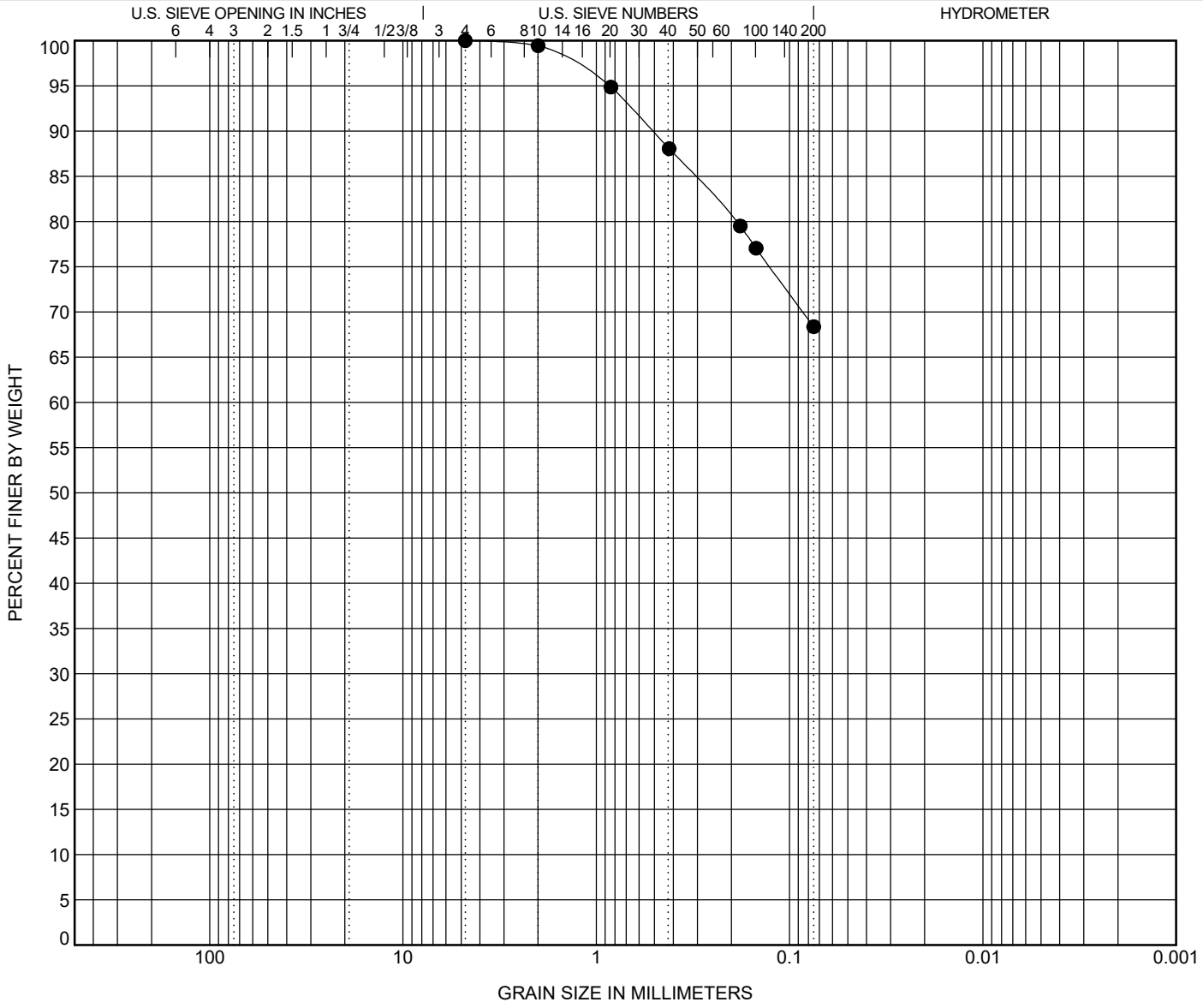
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-13**	**4.0**	**19.1**	**6.849**			**7.9**	**11.5**	**80.6**	
⊠	**B-13**	**15.0**	**9.52**	**0.73**			**0.2**	**15.2**	**84.6**	
▲	**B-13**	**25.0**	**9.52**	**0.761**			**0.3**	**18.7**	**81.0**	
★	**B-13**	**40.0**	**4.76**	**0.323**			**0.0**	**18.4**	**81.6**	
⊙	**B-13**	**50.0**	**4.76**	**0.595**			**0.0**	**27.4**	**72.6**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/13/18

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**B-13**	**70.0**	**Sandy SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		

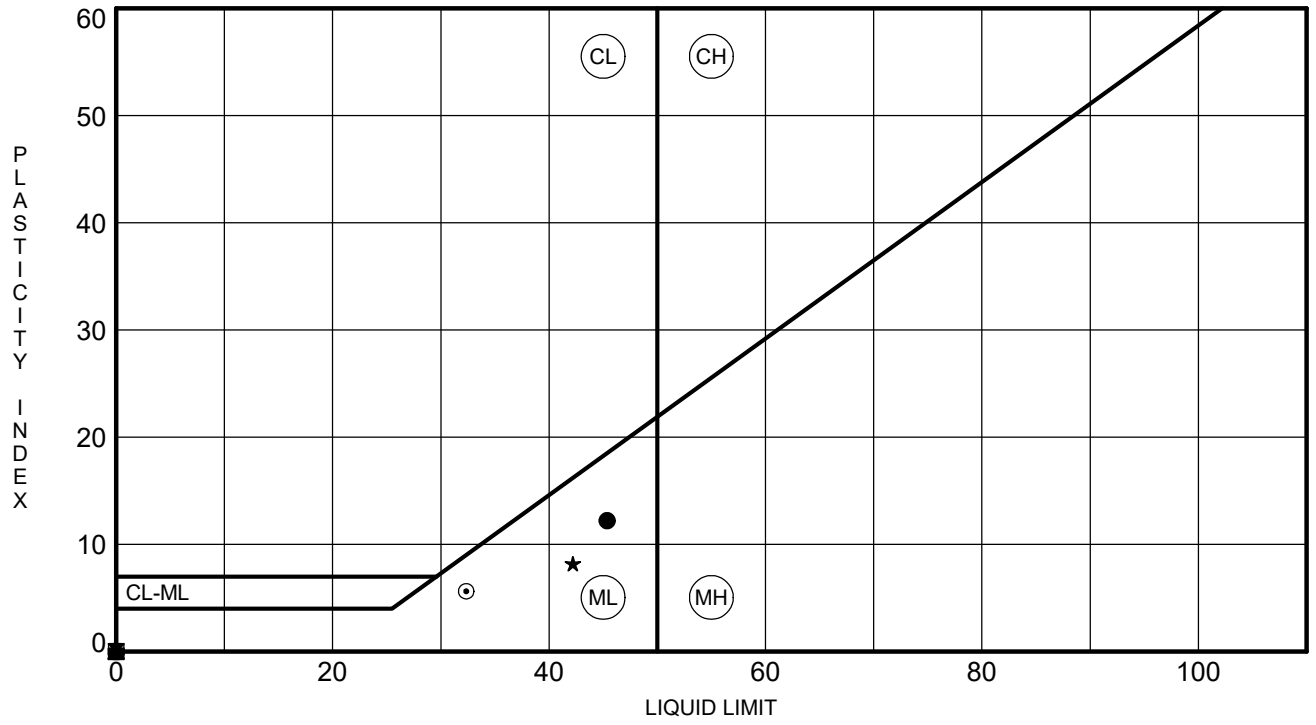
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-13**	**70.0**	**4.76**	**0.862**			**0.0**	**31.6**	**68.4**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/13/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**B-13**	**4.0**	**45**	**33**	**12**	**81**	**SILT (ML) with F/M Sand A-7-5(12)**
⊠	**B-13**	**15.0**	**NP**	**NP**	**NP**	**85**	**SILT (ML) with F/M Sand A-4(0)**
▲	**B-13**	**25.0**	**NP**	**NP**	**NP**	**81**	**SILT (ML) with F/M Sand A-4(0)**
★	**B-13**	**40.0**	**42**	**34**	**8**	**82**	**SILT (ML) with Fine Sand A-5(9)**
⊙	**B-13**	**50.0**	**32**	**27**	**5**	**73**	**SILT (ML) with F/M Sand A-4(3)**
✿	**B-13**	**70.0**	**NP**	**NP**	**NP**	**68**	**Sandy SILT (ML) A-4(0)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/13/18

Client:	F&ME Consultants				
Project:	I-20/26/126 Corridor Improvements				
Location:	---			Project No:	GTX-307802
Boring ID:	---	Sample Type:	---	Tested By:	twh
Sample ID:	---	Test Date:	05/11/18	Checked By:	n/a
Depth :	---	Test Id:	293112		

pH of Soil by ASTM D4972

Boring ID	Sample ID	Depth	Visual Description	pH of Soil in Distilled Water	pH of Soil in Calcium Chloride
B-13	---	8-10 ft	Moist, red clay	4.1	3.1

Notes: Sample Preparation: screened through #10 sieve

Method A, pH meter used

Client:	F&ME Consultants
Project:	I-20/26/126 Corridor Improvement
Location:	---
GTX#:	307802
Test Date:	05/09/18
Tested By:	twh
Checked By:	jm

Laboratory Measurement of Soil Resistivity Using the Wenner Four-Electrode Method by ASTM G57 (Laboratory Measurement)

Boring ID	Sample ID	Depth, ft.	Sample Description	Electrical Resistivity, ohm-cm	Electrical Conductivity, $(ohm\text{-}cm)^{-1}$
B-13	---	8-10 ft	Moist, red clay	39,755	2.52E-05

Notes: Test Equipment: Nilsson Model 400 Soil Resistance Meter, MC Miller Soil Box
Water added to sample to create a thick slurry prior to testing (saturated condition).
Electrical Conductivity is calculated as inverse of Electrical Resistivity (per ASTM G57)
Test conducted in standard laboratory atmosphere: 68-73 F

Project Name: I-20/26/126 CORRIDOR IMPROVEME
Project Number: 307802
Lab Number: L1814569
Report Date: 05/01/18

SAMPLE RESULTS

Lab ID: L1814569-06
Client ID: B-13, 8-10 FT
Sample Location: Not Specified
Sample Depth:
Matrix: Soil
Date Collected: 04/18/18 14:21
Date Received: 04/25/18
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	77.8		%	0.100	NA	1	-	04/27/18 09:39	121,2540G	RI
Chloride	15		mg/kg	13	--	1	-	04/30/18 22:57	1,9251	TL
Sulfate	ND		mg/kg	130	--	1	-	04/30/18 17:05	1,9038	BR

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0487	**DATE SAMPLE RECEIVED:**	3/20/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	3/20/2018
		DATE OF WEIGHING:	3/21/2018

BORING NO.	B-14	B-14	B-14	B-14	B-14
SAMPLE NO.	18-0487C SS-4	18-0487F SS-6	18-0487I SS-7	18-0487L SS-8	18-0487O SS-11
SAMPLE DEPTH	6.0-8.0'	13.5-15.0'	18.5-20.0'	23.5-25.0'	38.5-40.0'
WATER CONTENT, W%	30.5	23.2	26.3	21.7	28.5

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

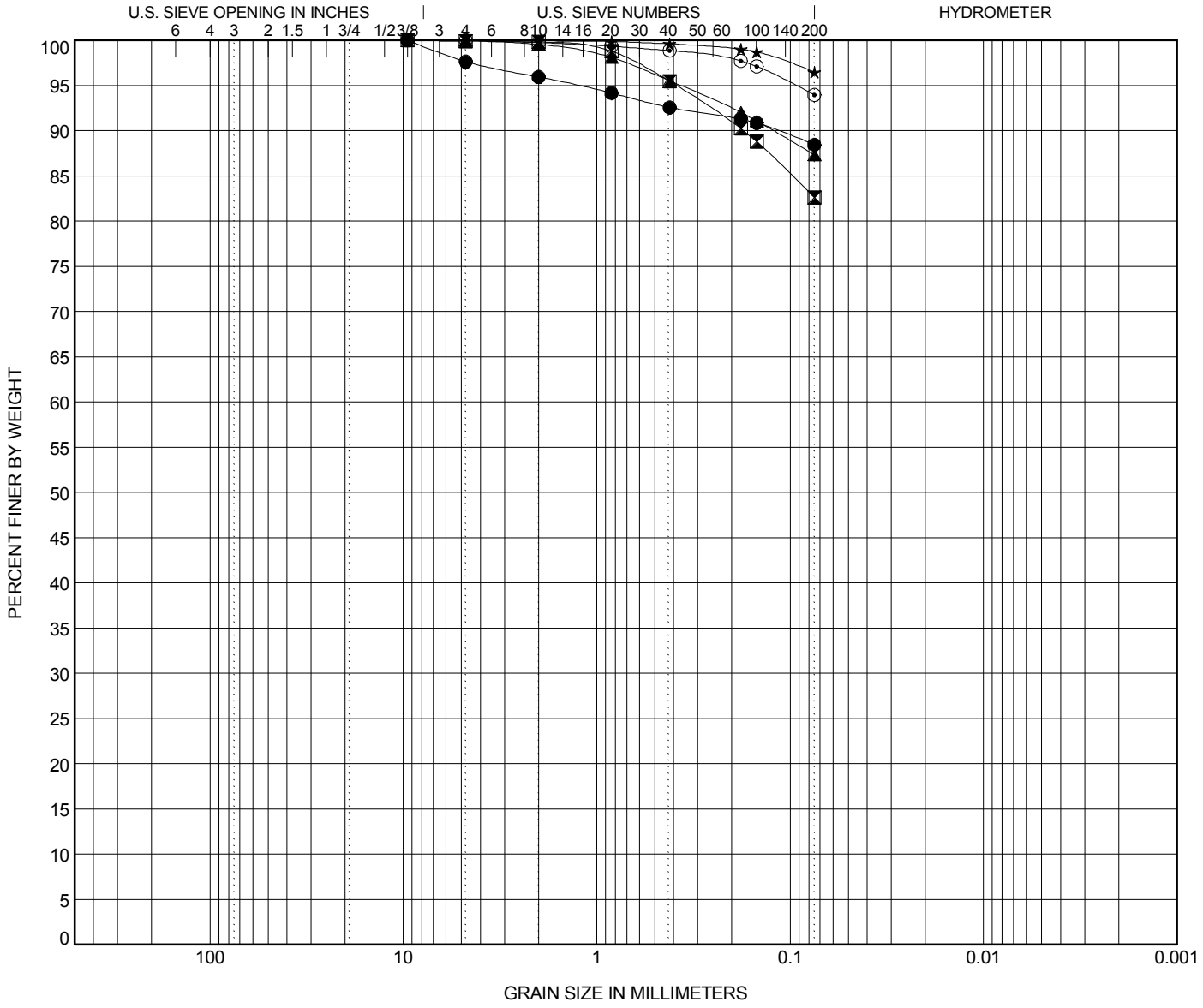
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**B-14**	**8.0**	**SILT (ML) A-7-5(12)**	**43**	**32**	**11**		
⊠	**B-14**	**15.0**	**Fat CLAY (CH) with Fine Sand A-7-6(20)**	**52**	**26**	**26**		
▲	**B-14**	**20.0**	**SILT (ML) A-4(8)**	**39**	**30**	**9**		
★	**B-14**	**25.0**	**SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		
⊙	**B-14**	**40.0**	**SILT (ML) A-4(8)**	**38**	**31**	**7**		

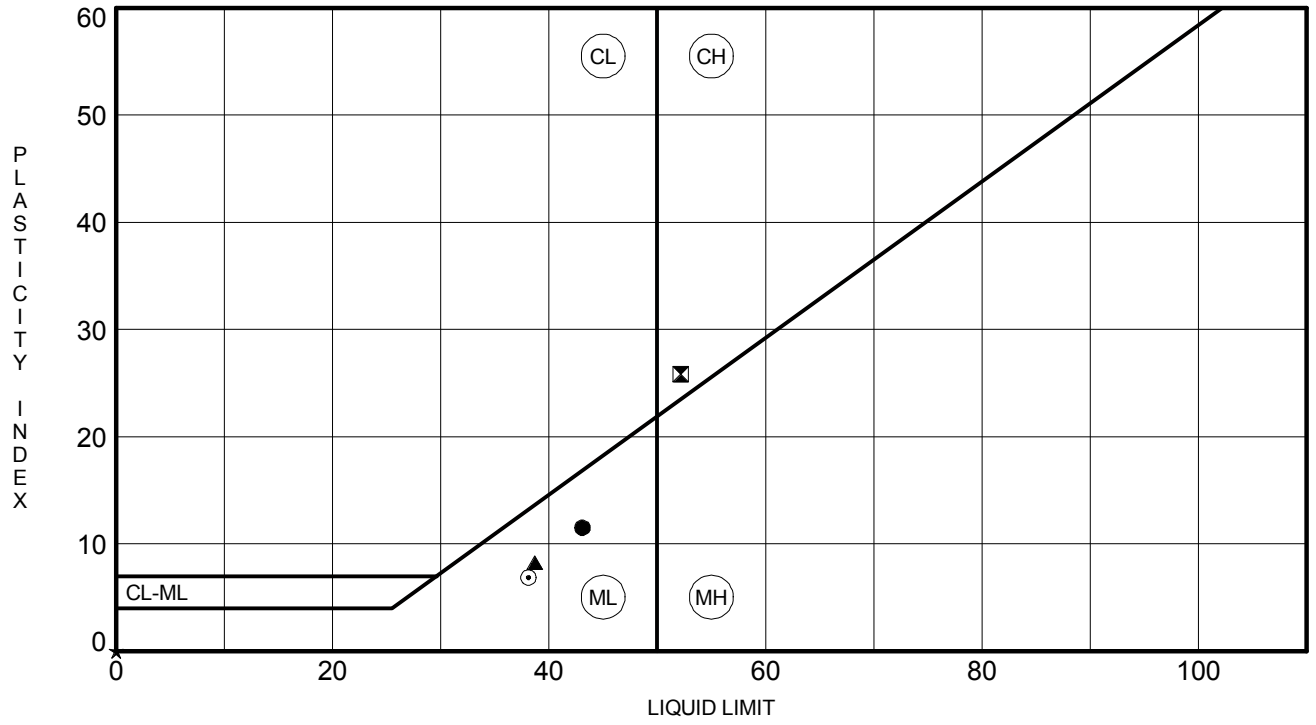
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-14**	**8.0**	**9.52**	**1.256**			**2.4**	**9.2**	**88.5**	
⊠	**B-14**	**15.0**	**9.52**	**0.388**			**0.1**	**17.3**	**82.6**	
▲	**B-14**	**20.0**	**4.76**	**0.368**			**0.0**	**12.7**	**87.3**	
★	**B-14**	**25.0**	**4.76**				**0.0**	**3.5**	**96.5**	
⊙	**B-14**	**40.0**	**4.76**	**0.094**			**0.0**	**6.0**	**94.0**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/5/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**B-14**	**8.0**	**43**	**32**	**11**	**88**	**SILT (ML) A-7-5(12)**
⊠	**B-14**	**15.0**	**52**	**26**	**26**	**83**	**Fat CLAY (CH) with Fine Sand A-7-6(20)**
▲	**B-14**	**20.0**	**39**	**30**	**9**	**87**	**SILT (ML) A-4(8)**
★	**B-14**	**25.0**	**NP**	**NP**	**NP**	**96**	**SILT (ML) A-4(0)**
⊙	**B-14**	**40.0**	**38**	**31**	**7**	**94**	**SILT (ML) A-4(8)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/5/18

Client:	F&ME Consultants				
Project:	I-20/26/126 Corridor Improvements				
Location:	---			Project No:	GTX-307802
Boring ID:	---	Sample Type:	---	Tested By:	twh
Sample ID:	---	Test Date:	05/11/18	Checked By:	n/a
Depth :	---	Test Id:	293112		

pH of Soil by ASTM D4972

Boring ID	Sample ID	Depth	Visual Description	pH of Soil in Distilled Water	pH of Soil in Calcium Chloride
B-14	---	8-10 ft	Moist, dark grayish brown sandy silt	3.8	3.1

Notes: Sample Preparation: screened through #10 sieve

Method A, pH meter used

Client:	F&ME Consultants
Project:	I-20/26/126 Corridor Improvement
Location:	---
GTX#:	307802
Test Date:	05/09/18
Tested By:	twh
Checked By:	jm

Laboratory Measurement of Soil Resistivity Using the Wenner Four-Electrode Method by ASTM G57 (Laboratory Measurement)

Boring ID	Sample ID	Depth, ft.	Sample Description	Electrical Resistivity, ohm-cm	Electrical Conductivity, $(ohm\text{-}cm)^{-1}$
B-14	---	8-10 ft	Moist, dark grayish brown sandy silt	8,868	1.13E-04

Notes: Test Equipment: Nilsson Model 400 Soil Resistance Meter, MC Miller Soil Box
Water added to sample to create a thick slurry prior to testing (saturated condition).
Electrical Conductivity is calculated as inverse of Electrical Resistivity (per ASTM G57)
Test conducted in standard laboratory atmosphere: 68-73 F

Project Name: I-20/26/126 CORRIDOR IMPROVEME
Project Number: 307802
Lab Number: L1814569
Report Date: 05/01/18

SAMPLE RESULTS

Lab ID: L1814569-07
Client ID: B-14, 8-10 FT
Sample Location: Not Specified
Sample Depth:
Matrix: Soil

Date Collected: 04/18/18 14:29
Date Received: 04/25/18
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	88.0		%	0.100	NA	1	-	04/27/18 09:39	121,2540G	RI
Chloride	32		mg/kg	11	--	1	-	04/30/18 23:29	1,9251	TL
Sulfate	ND		mg/kg	110	--	1	-	04/30/18 17:05	1,9038	BR

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0772	**DATE SAMPLE RECEIVED:**	4/30/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	4/30/2018
		DATE OF WEIGHING:	5/1/2018

BORING NO.	B-15	B-15	B-15	B-15	
SAMPLE NO.	18-0772C SS-4	18-0772F SS-6	18-0772I SS-9	18-0772L SS-13	
SAMPLE DEPTH	6.0-8.0'	13.5-15.0'	28.5-30.0'	48.5-50.0'	
WATER CONTENT, W%	31.2	31.8	18.2	28.1	

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

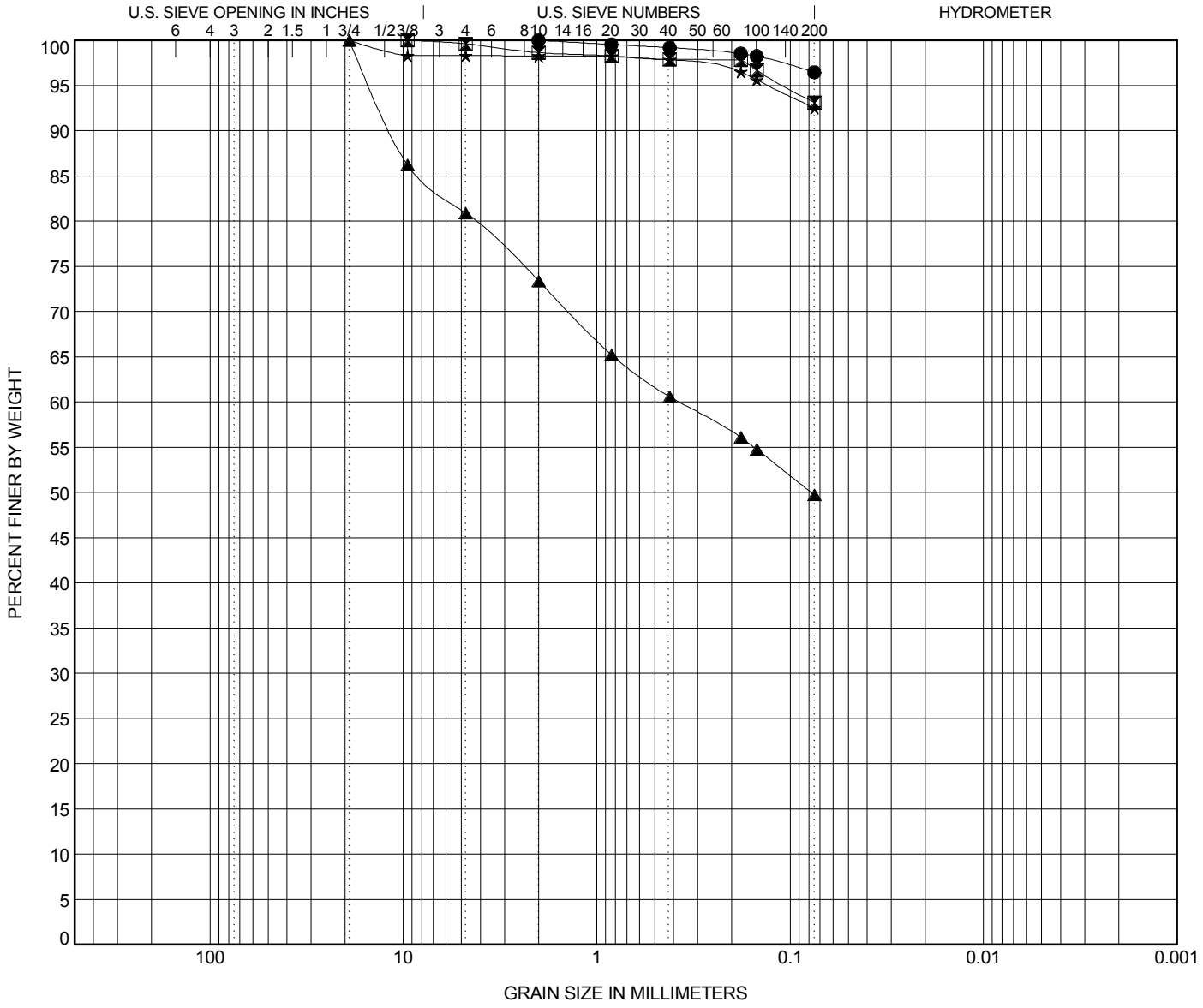
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**B-15**	**8.0**	**Elastic SILT (MH) A-7-5(20)**	**67**	**47**	**20**		
⊠	**B-15**	**15.0**	**Elastic SILT (MH) A-5(12)**	**51**	**42**	**9**		
▲	**B-15**	**30.0**	**Silty Coarse SAND (SM) with Gravel A-5(2)**	**42**	**35**	**7**		
★	**B-15**	**50.0**	**SILT (ML) A-4(6)**	**33**	**28**	**5**		

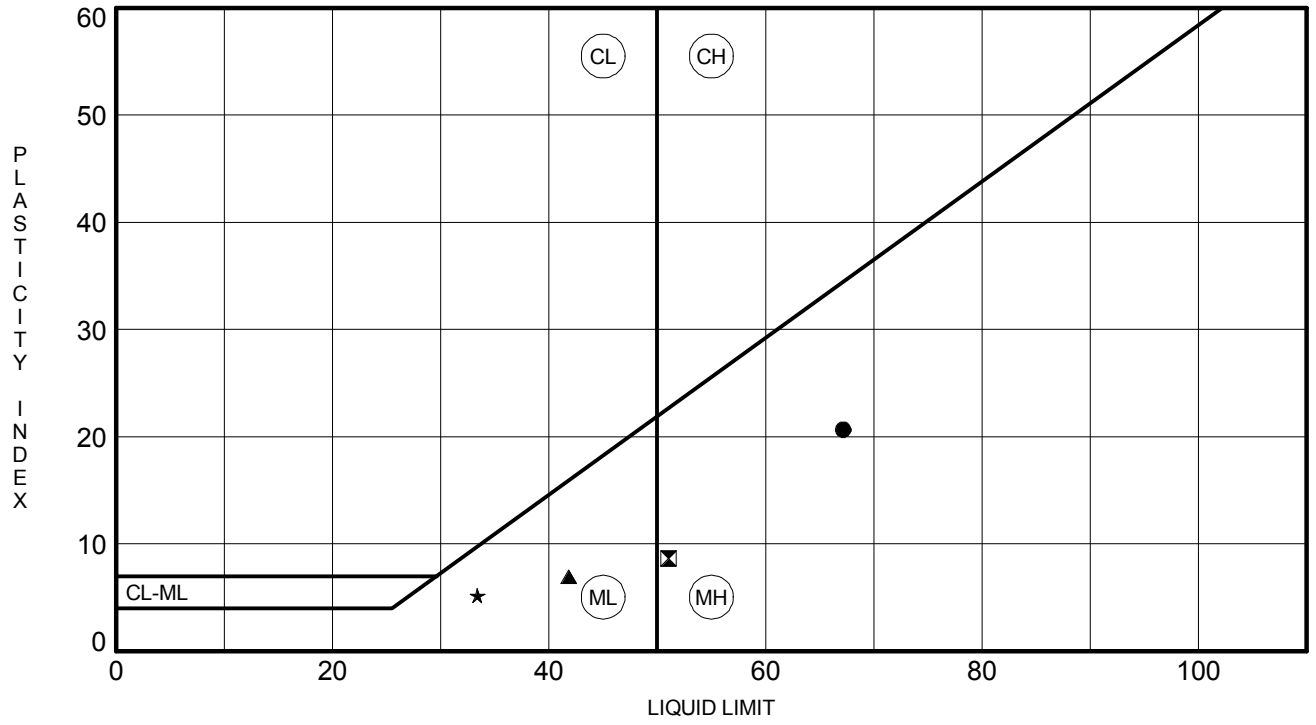
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-15**	**8.0**	**2**				**0.0**	**3.5**	**96.5**	
⊠	**B-15**	**15.0**	**9.52**	**0.107**			**0.4**	**6.5**	**93.1**	
▲	**B-15**	**30.0**	**19**	**14.783**	**0.078**		**19.1**	**31.2**	**49.7**	
★	**B-15**	**50.0**	**19**	**0.13**			**1.7**	**5.8**	**92.5**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 5/14/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**B-15**	**8.0**	**67**	**47**	**20**	**96**	**Elastic SILT (MH) A-7-5(20)**
⧓	**B-15**	**15.0**	**51**	**42**	**9**	**93**	**Elastic SILT (MH) A-5(12)**
▲	**B-15**	**30.0**	**42**	**35**	**7**	**50**	**Silty Coarse SAND (SM) with Gravel A-5(2)**
★	**B-15**	**50.0**	**33**	**28**	**5**	**93**	**SILT (ML) A-4(6)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 5/14/18

Client:	F&ME Consultants				
Project:	I-20/26/126 Corridor Improvements				
Location:	---			Project No:	GTX-307802
Boring ID:	---	Sample Type:	---	Tested By:	twh
Sample ID:	---	Test Date:	06/08/18	Checked By:	MCM
Depth :	---	Test Id:	295616		

pH of Soil by ASTM D4972

Boring ID	Sample ID	Depth	Visual Description	pH of Soil in Distilled Water	pH of Soil in Calcium Chloride
B-15	---	23.5-25 ft	Moist, olive brown sandy clay	4.8	3.8

Notes: Sample Preparation: screened through #10 sieve

Method A, pH meter used

Client:	F&ME Consultants
Project:	I-20/26/126 Corridor Improvement
Location:	---
GTX#:	307802
Test Date:	06/11/18
Tested By:	twh
Checked By:	emm

Laboratory Measurement of Soil Resistivity Using the Wenner Four-Electrode Method by ASTM G57 (Laboratory Measurement)

Boring ID	Sample ID	Depth, ft.	Sample Description	Electrical Resistivity, ohm-cm	Electrical Conductivity, $(ohm\text{-}cm)^{-1}$
B-15	---	23.5-25 ft	Moist, olive brown sandy clay	56,065	1.78E-05

Notes: Test Equipment: Nilsson Model 400 Soil Resistance Meter, MC Miller Soil Box
Water added to sample to create a thick slurry prior to testing (saturated condition).
Electrical Conductivity is calculated as inverse of Electrical Resistivity (per ASTM G57)
Test conducted in standard laboratory atmosphere: 68-73 F

Project Name: I-20/26/126 CORRIDOR IMPROVE
Project Number: 307802
Lab Number: L1824882
Report Date: 07/10/18

SAMPLE RESULTS

Lab ID: L1824882-03
Client ID: B-15, 23.5-25 FT
Sample Location: Not Specified
Sample Depth:
Matrix: Soil

Date Collected: 06/28/18 14:13
Date Received: 06/29/18
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	78.3		%	0.100	NA	1	-	07/03/18 13:04	121,2540G	RI
Chloride	ND		mg/kg	11	--	1	-	07/03/18 22:19	1,9251	TL
Sulfate	ND		mg/kg	130	--	1	-	07/03/18 01:55	1,9038	JR

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0968	**DATE SAMPLE RECEIVED:**	5/31/2018
DESCRIPTION OF SOIL:	Various		
TESTED BY:	MB	**DATE OF TESTING:**	6/4/2018
		DATE OF WEIGHING:	6/5/2018

BORING NO.	B-16	B-16	B-16	B-16	B-16
SAMPLE NO.	18-0968C SS-2	18-0968U SS-6	18-0968F SS-7	18-0968I SS-8	18-0968L SS-10
SAMPLE DEPTH	2.0-4.0'	13.5-15.0'	18.5-20.0'	23.5-25.0'	33.5-35.0'
WATER CONTENT, W%	7.3	17.0	12.8	27.13	46.92

BORING NO.	B-16	B-16			
SAMPLE NO.	18-0968O SS-13	18-0968R SS-19			
SAMPLE DEPTH	48.5-50.0'	78.5-80.0'			
WATER CONTENT, W%	28.7	24.58			

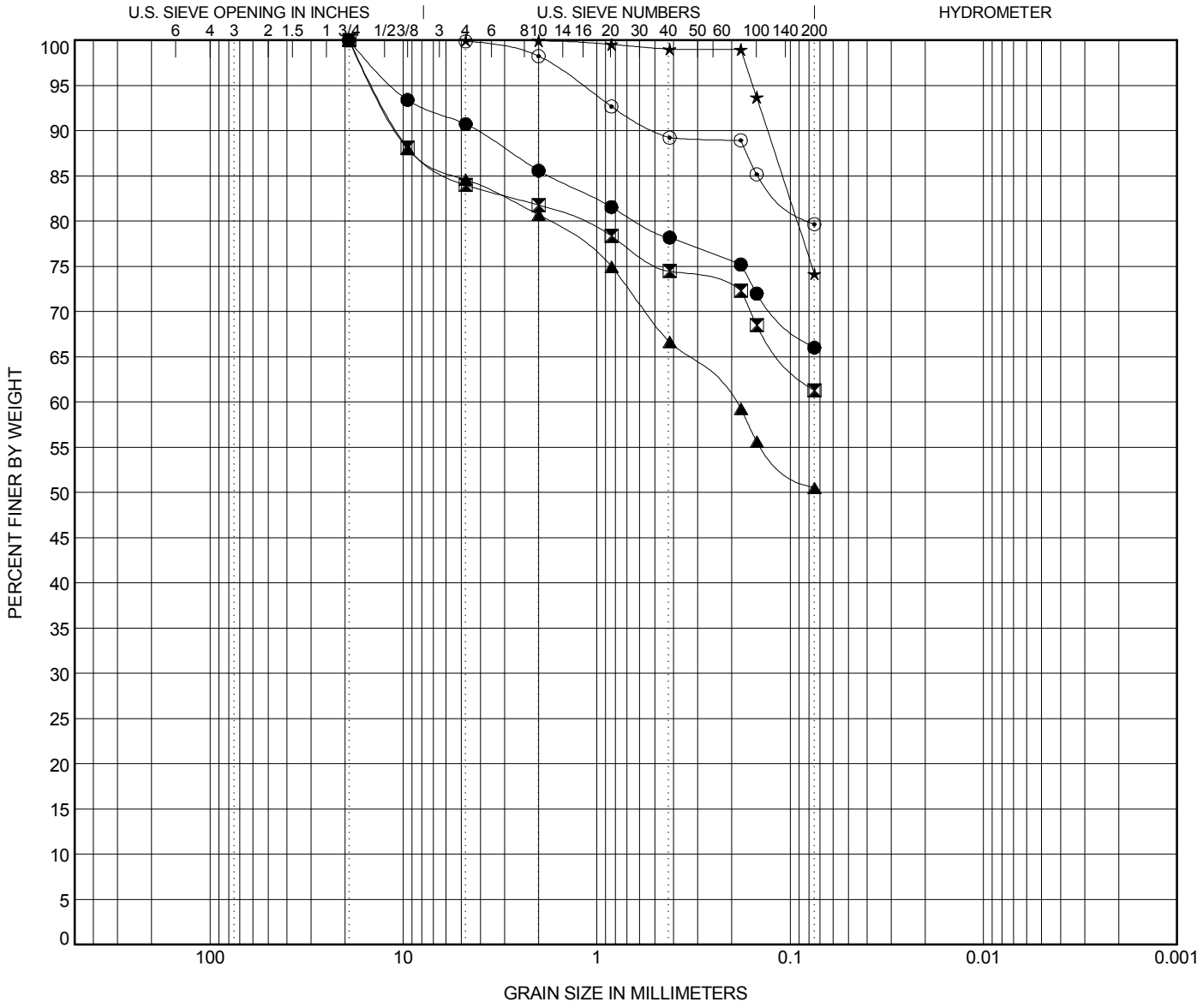
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**B-16**	**4.0**	**Sandy SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		
⧓	**B-16**	**15.0**	**Sandy SILT (ML) with Gravel A-4(0)**	**NP**	**NP**	**NP**		
▲	**B-16**	**20.0**	**Sandy SILT (ML) with Gravel A-4(0)**	**17**	**15**	**2**		
★	**B-16**	**25.0**	**SILT (ML) with Sand A-4(0)**	**NP**	**NP**	**NP**		
⊙	**B-16**	**35.0**	**SILT (ML) with Sand A-5(4)**	**41**	**39**	**2**		

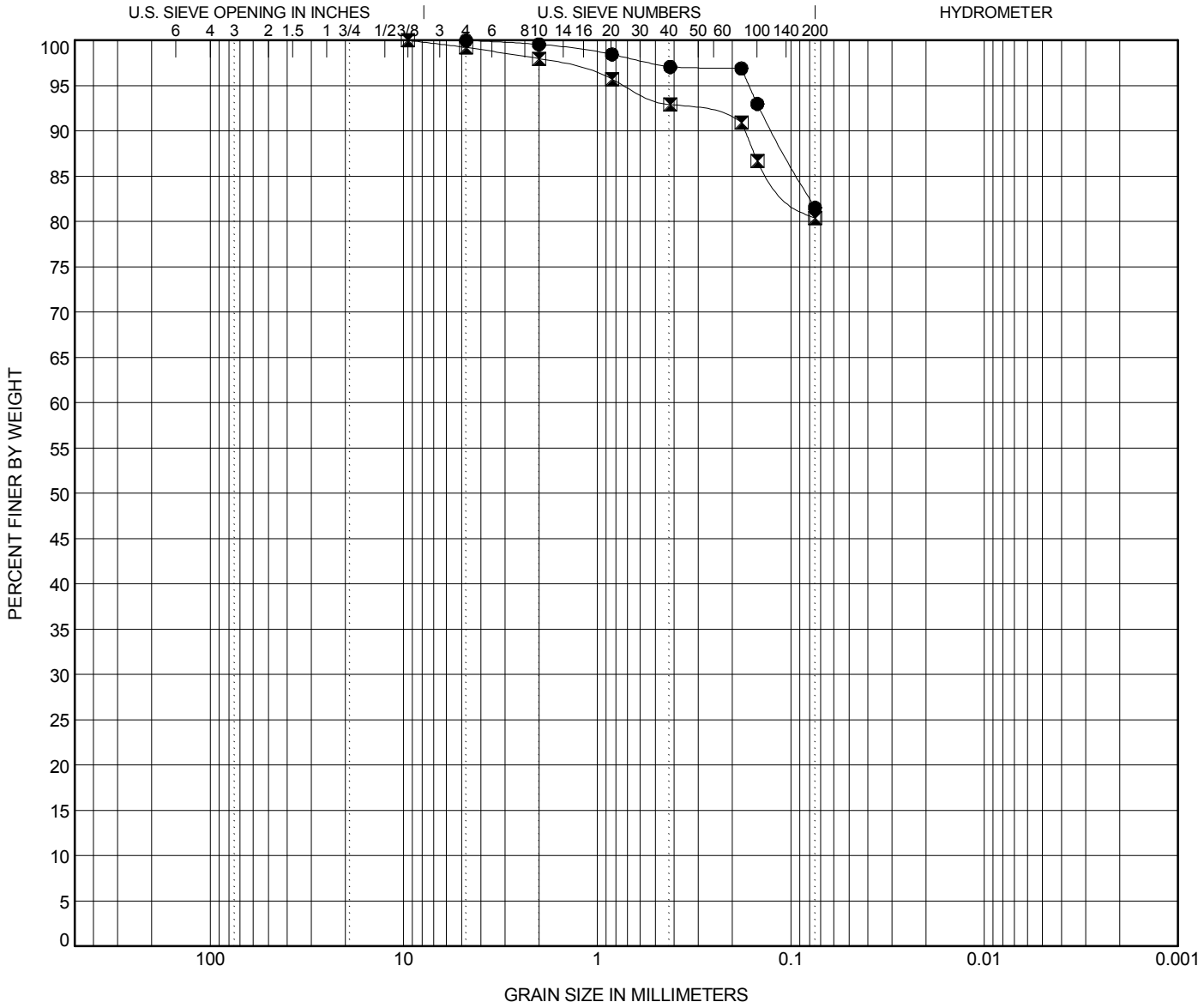
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-16**	**4.0**	**19.1**	**11.255**			**9.3**	**24.7**	**66.0**	
⧓	**B-16**	**15.0**	**19.05**	**14.213**			**16.0**	**22.7**	**61.3**	
▲	**B-16**	**20.0**	**19.1**	**14.291**			**15.4**	**34.1**	**50.5**	
★	**B-16**	**25.0**	**4.76**	**0.156**			**0.0**	**25.8**	**74.2**	
⊙	**B-16**	**35.0**	**4.76**	**1.204**			**0.0**	**20.2**	**79.7**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/29/18

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**B-16**	**50.0**	**SILT (ML) with Sand A-4(0)**	**NP**	**NP**	**NP**		
⧓	**B-16**	**80.0**	**SILT (ML) with Sand A-4(0)**	**NP**	**NP**	**NP**		

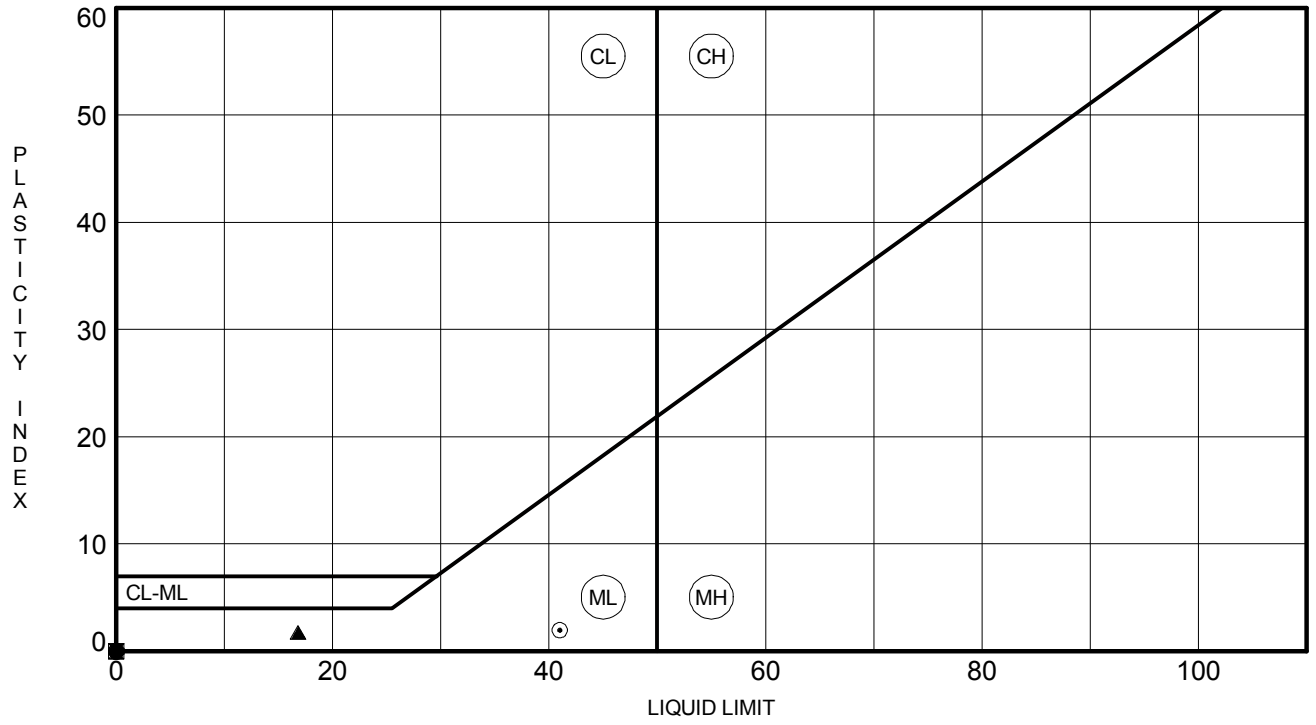
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-16**	**50.0**	**4.76**	**0.164**			**0.0**	**18.5**	**81.5**	
⧓	**B-16**	**80.0**	**9.52**	**0.699**			**0.8**	**18.8**	**80.4**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/29/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**B-16**	**4.0**	**NP**	**NP**	**NP**	**66**	**Sandy SILT (ML) A-4(0)**
⊠	**B-16**	**15.0**	**NP**	**NP**	**NP**	**61**	**Sandy SILT (ML) with Gravel A-4(0)**
▲	**B-16**	**20.0**	**17**	**15**	**2**	**51**	**Sandy SILT (ML) with Gravel A-4(0)**
★	**B-16**	**25.0**	**NP**	**NP**	**NP**	**74**	**SILT (ML) with Sand A-4(0)**
⊙	**B-16**	**35.0**	**41**	**39**	**2**	**80**	**SILT (ML) with Sand A-5(4)**
✿	**B-16**	**50.0**	**NP**	**NP**	**NP**	**82**	**SILT (ML) with Sand A-4(0)**
○	**B-16**	**80.0**	**NP**	**NP**	**NP**	**80**	**SILT (ML) with Sand A-4(0)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/29/18

Client:	F&ME Consultants				
Project:	I-20/26/126 Corridor Improvements				
Location:	---			Project No:	GTX-307802
Boring ID:	---	Sample Type:	---	Tested By:	twh
Sample ID:	---	Test Date:	06/08/18	Checked By:	MCM
Depth :	---	Test Id:	295616		

pH of Soil by ASTM D4972

Boring ID	Sample ID	Depth	Visual Description	pH of Soil in Distilled Water	pH of Soil in Calcium Chloride
B-16	---	28.5-30 ft	Moist, dark yellowish brown sandy silt	4.6	3.6

Notes: Sample Preparation: screened through #10 sieve

Method A, pH meter used

Client:	F&ME Consultants
Project:	I-20/26/126 Corridor Improvement
Location:	---
GTX#:	307802
Test Date:	06/11/18
Tested By:	twh
Checked By:	emm

Laboratory Measurement of Soil Resistivity Using the Wenner Four-Electrode Method by ASTM G57 (Laboratory Measurement)

Boring ID	Sample ID	Depth, ft.	Sample Description	Electrical Resistivity, ohm-cm	Electrical Conductivity, $(ohm\text{-}cm)^{-1}$
B-16	---	28.5-30 ft	Moist, dark yellowish brown sandy silt	34,658	2.89E-05

Notes: Test Equipment: Nilsson Model 400 Soil Resistance Meter, MC Miller Soil Box
Water added to sample to create a thick slurry prior to testing (saturated condition).
Electrical Conductivity is calculated as inverse of Electrical Resistivity (per ASTM G57)
Test conducted in standard laboratory atmosphere: 68-73 F

Project Name: I-20/26/126 CORRIDOR IMPROVE
Project Number: 307802
Lab Number: L1824882
Report Date: 07/10/18

SAMPLE RESULTS

Lab ID: L1824882-04
Client ID: B-16, 28.5-30 FT
Sample Location: Not Specified
Sample Depth:
Matrix: Soil

Date Collected: 06/28/18 14:18
Date Received: 06/29/18
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	65.4		%	0.100	NA	1	-	07/03/18 13:04	121,2540G	RI
Chloride	ND		mg/kg	14	--	1	-	07/03/18 22:20	1,9251	TL
Sulfate	ND		mg/kg	150	--	1	-	07/03/18 01:55	1,9038	JR

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0752	**DATE SAMPLE RECEIVED:**	4/30/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	4/30/2018
		DATE OF WEIGHING:	5/1/2018

BORING NO.	B-17	B-17	B-17	B-17	B-17
SAMPLE NO.	18-0752C SS-2	18-0752F SS-5	18-0752I SS-7	18-0752L SS-11	18-0752O SS-14
SAMPLE DEPTH	2.0-4.0'	8.0-10.0'	18.5-20.0'	38.5-40.0'	53.5-55.0'
WATER CONTENT, W%	14.2	22.9	30.0	20.4	18.5

BORING NO.	B-17				
SAMPLE NO.	18-0752R SS-16				
SAMPLE DEPTH	63.5-65.0'				
WATER CONTENT, W%	21.1				

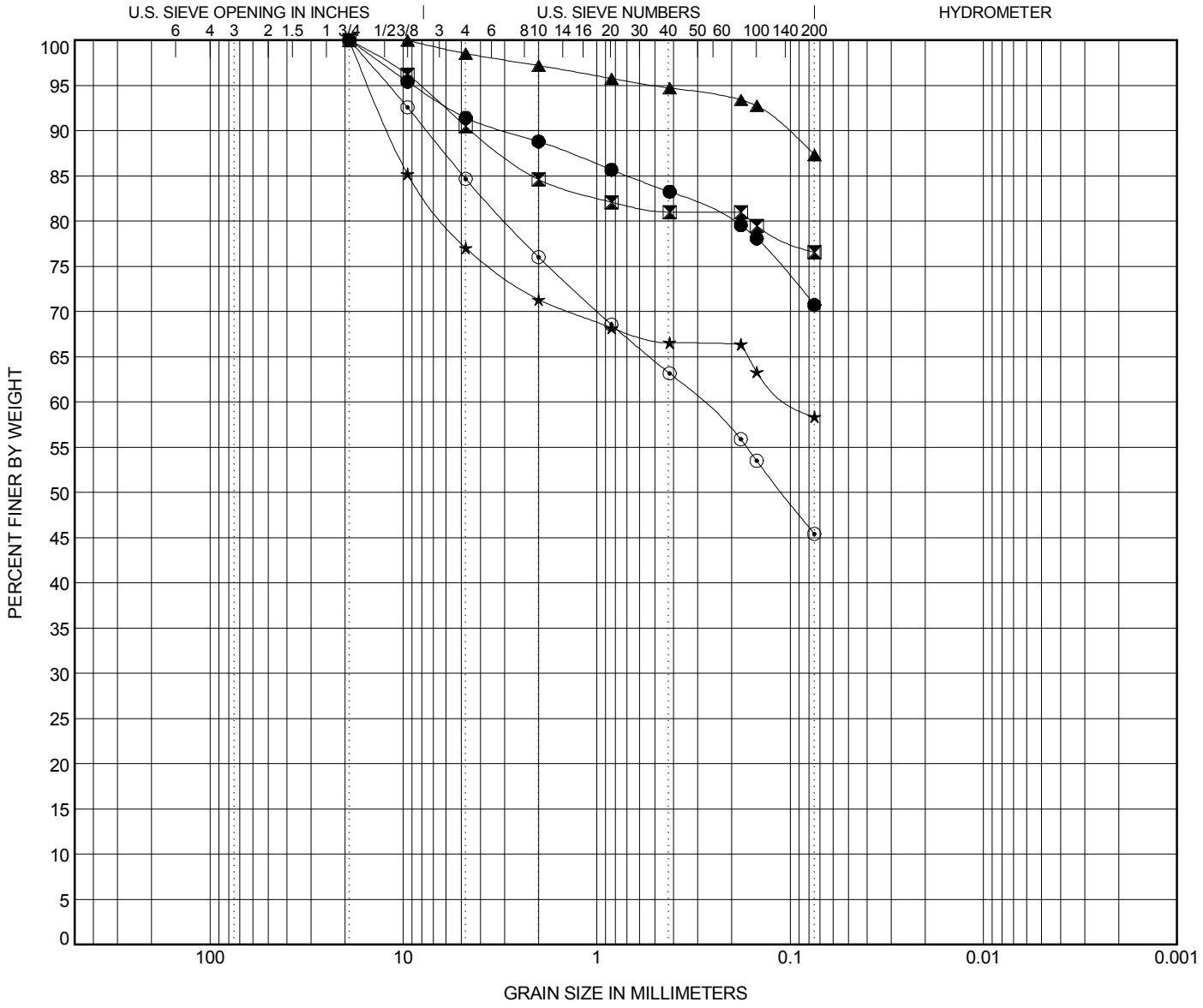
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**B-17**	**4.0**	**SILT (ML) with Sand A-4(3)**	**32**	**27**	**5**		
⊠	**B-17**	**10.0**	**Elastic SILT (MH) with Sand A-7-5(16)**	**53**	**35**	**18**		
▲	**B-17**	**20.0**	**SILT (ML) A-4(3)**	**38**	**37**	**1**		
★	**B-17**	**40.0**	**Gravelly SILT (ML) with Sand A-4(4)**	**37**	**27**	**10**		
⊙	**B-17**	**55.0**	**Silty SAND (SM) with Gravel A-4(0)**	**28**	**26**	**2**		

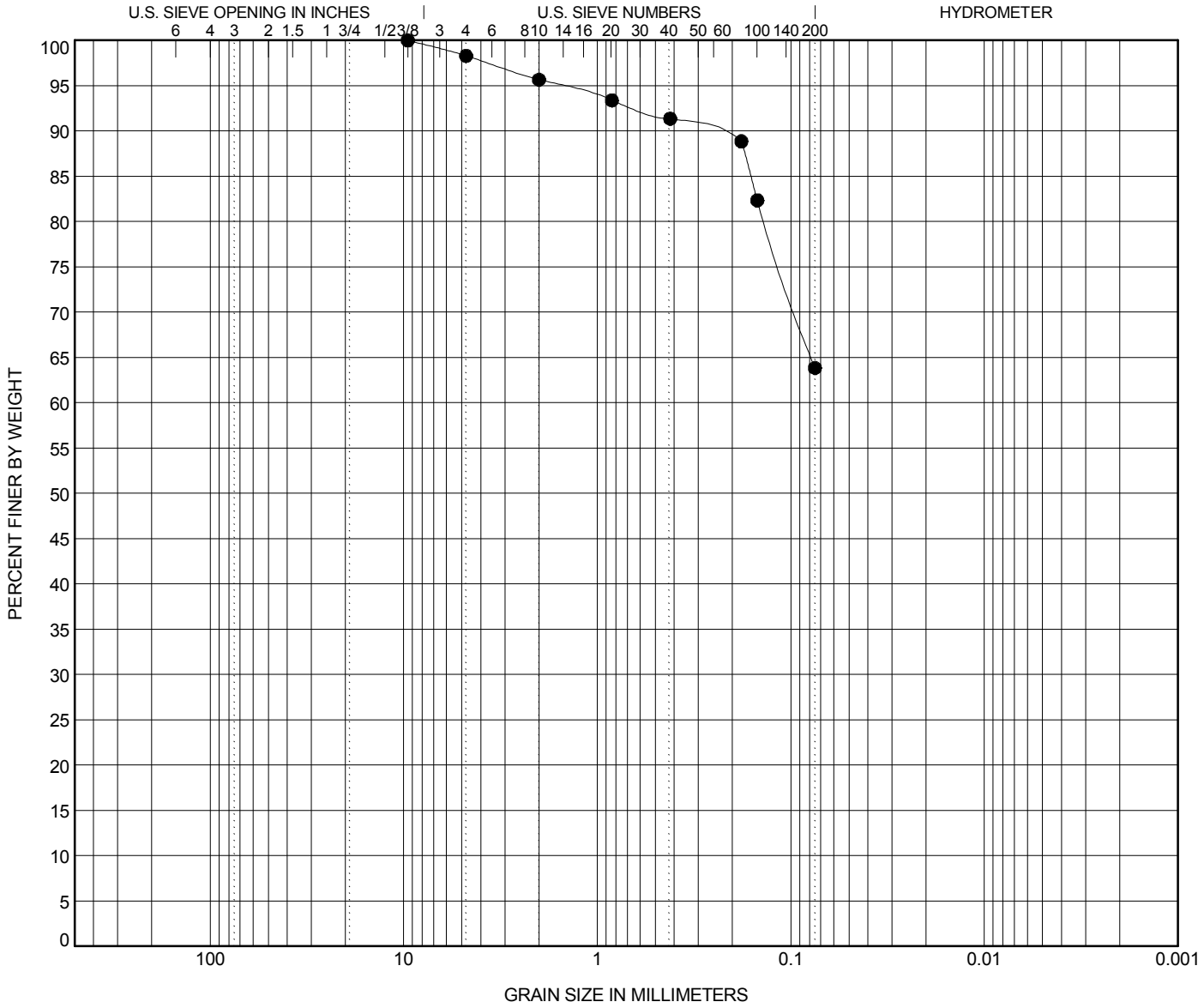
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-17**	**4.0**	**19**	**8.814**			**8.6**	**20.6**	**70.8**	
⊠	**B-17**	**10.0**	**19**	**8.224**			**9.5**	**14.0**	**76.5**	
▲	**B-17**	**20.0**	**9.52**	**0.501**			**1.5**	**11.1**	**87.4**	
★	**B-17**	**40.0**	**19**	**15.037**			**23.0**	**18.6**	**58.4**	
⊙	**B-17**	**55.0**	**19**	**11.912**	**0.111**		**15.3**	**39.3**	**45.4**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 5/14/18

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**B-17**	**65.0**	**Sandy, Silty CLAY (CL-ML) A-4(1)**	**24**	**19**	**5**		

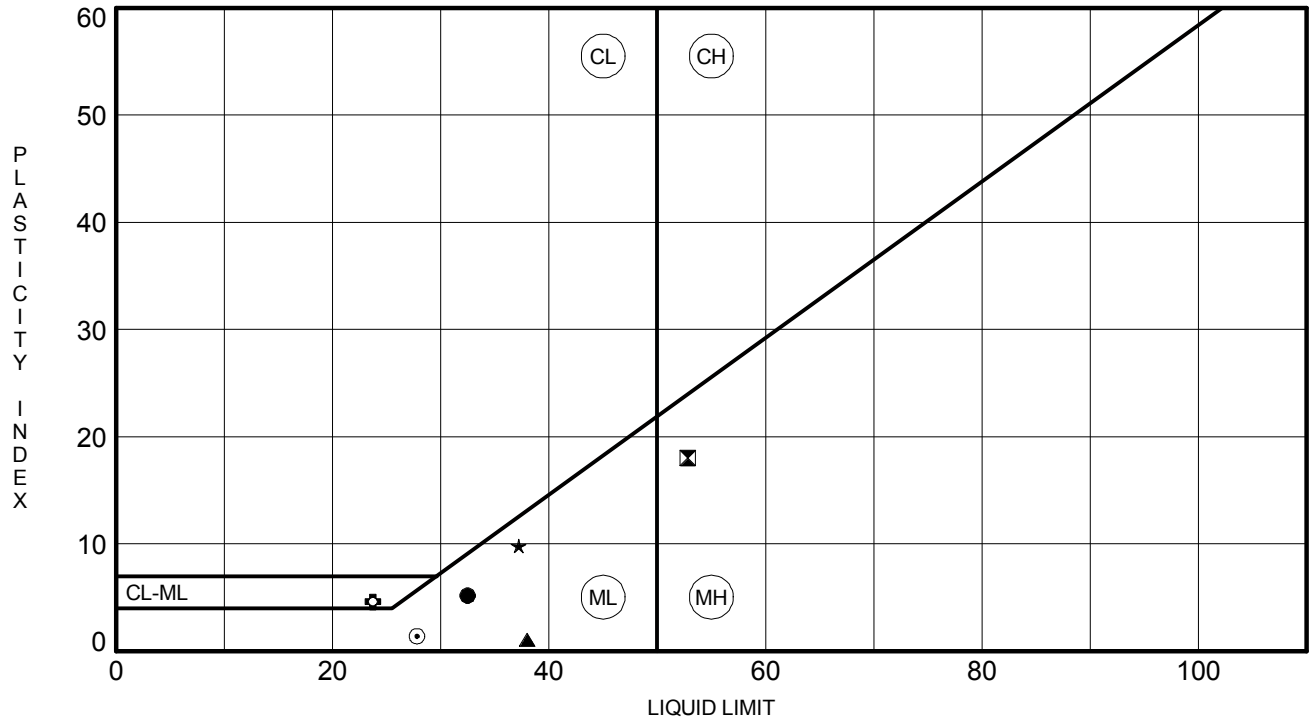
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-17**	**65.0**	**9.52**	**1.55**			**1.7**	**34.5**	**63.8**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 5/14/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**B-17**	**4.0**	**32**	**27**	**5**	**71**	**SILT (ML) with Sand A-4(3)**
⊠	**B-17**	**10.0**	**53**	**35**	**18**	**77**	**Elastic SILT (MH) with Sand A-7-5(16)**
▲	**B-17**	**20.0**	**38**	**37**	**1**	**87**	**SILT (ML) A-4(3)**
★	**B-17**	**40.0**	**37**	**27**	**10**	**58**	**Gravelly SILT (ML) with Sand A-4(4)**
⊙	**B-17**	**55.0**	**28**	**26**	**2**	**45**	**Silty SAND (SM) with Gravel A-4(0)**
✿	**B-17**	**65.0**	**24**	**19**	**5**	**64**	**Sandy, Silty CLAY (CL-ML) A-4(1)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 5/14/18

Client:	F&ME Consultants				
Project:	I-20/26/126 Corridor Improvements				
Location:	---			Project No:	GTX-307802
Boring ID:	---	Sample Type:	---	Tested By:	twh
Sample ID:	---	Test Date:	06/08/18	Checked By:	MCM
Depth :	---	Test Id:	295616		

pH of Soil by ASTM D4972

Boring ID	Sample ID	Depth	Visual Description	pH of Soil in Distilled Water	pH of Soil in Calcium Chloride
B-17	---	23.5-25 ft	Moist, light olive brown sandy clay	4.3	3.3

Notes: Sample Preparation: screened through #10 sieve

Method A, pH meter used

Client:	F&ME Consultants
Project:	I-20/26/126 Corridor Improvement
Location:	---
GTX#:	307802
Test Date:	06/11/18
Tested By:	twh
Checked By:	emm

Laboratory Measurement of Soil Resistivity Using the Wenner Four-Electrode Method by ASTM G57 (Laboratory Measurement)

Boring ID	Sample ID	Depth, ft.	Sample Description	Electrical Resistivity, ohm-cm	Electrical Conductivity, $(ohm\text{-}cm)^{-1}$
B-17	---	23.5-25 ft	Moist, light olive brown sandy clay	44,852	2.23E-05

Notes: Test Equipment: Nilsson Model 400 Soil Resistance Meter, MC Miller Soil Box
Water added to sample to create a thick slurry prior to testing (saturated condition).
Electrical Conductivity is calculated as inverse of Electrical Resistivity (per ASTM G57)
Test conducted in standard laboratory atmosphere: 68-73 F

Project Name: I-20/26/126 CORRIDOR IMPROVE
Project Number: 307802
Lab Number: L1824882
Report Date: 07/10/18

SAMPLE RESULTS

Lab ID: L1824882-05
Client ID: B-17, 23.5-25 FT
Sample Location: Not Specified
Sample Depth:
Matrix: Soil
Date Collected: 06/28/18 14:23
Date Received: 06/29/18
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	77.5		%	0.100	NA	1	-	07/03/18 13:04	121,2540G	RI
Chloride	13		mg/kg	12	--	1	-	07/03/18 21:20	1,9251	TL
Sulfate	ND		mg/kg	130	--	1	-	07/03/18 01:55	1,9038	JR

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

ROCK CORE COMPRESSION TEST

PROJECT: I-20/26/126 Corridor Improvements **PROJECT NO:** G5662.01

SAMPLED BY: MM **DATE SAMPLED:** 4/19/2018

TESTED BY: BF **DATE TESTED:** 4/25/2018

Lab No.	18-0767A	18-0767B			
Boring No.	B-17	B-17			
Sample No.	NQ-2	NQ-3			
Depth	88.8-89.1	95.6-95.9			
Length (in)	3.88	3.84			
Diameter (in)	1.85	1.85			
Mass (g)	442.70	443.71			
Cross Sectional Area (in^2)	2.69	2.67			
Load (lb)	1950	8830			
Compressive Strength (psi)	730	3300			
Corrected Compressive Strength (psi)					
Unit Weight (lb/ft^3)	161.54	164.78			

Signature: _____

Remarks: _____

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0807	**DATE SAMPLE RECEIVED:**	4/30/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	4/30/2018
		DATE OF WEIGHING:	5/1/2018

BORING NO.	B-18	B-18	B-18		
SAMPLE NO.	18-0807C SS-1	18-0807F SS-6	18-0807I SS-10		
SAMPLE DEPTH	0.0-2.0'	13.5-15.0'	33.5-35.0'		
WATER CONTENT, W%	11.3	23.4	16.6		

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

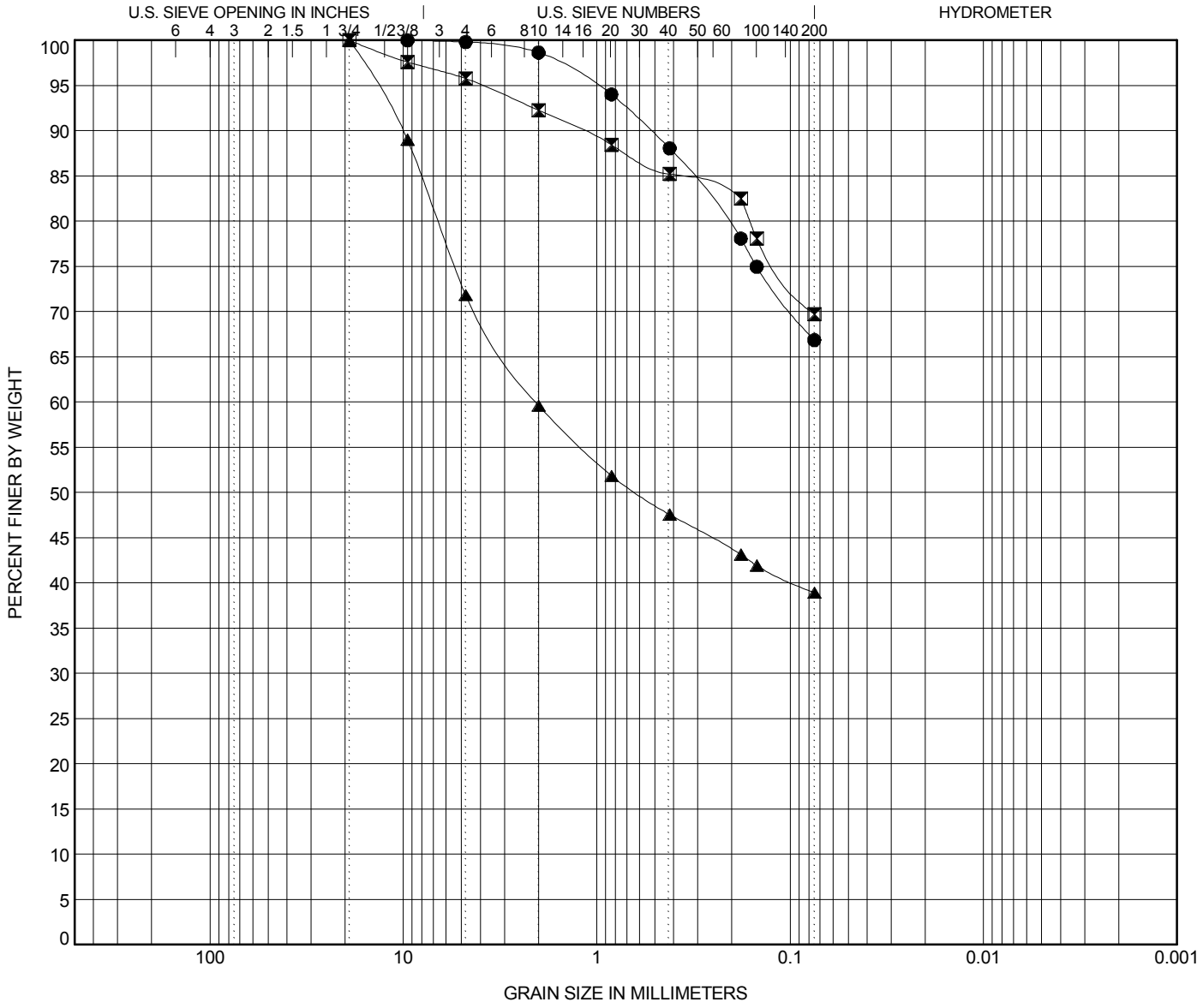
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**B-18**	**2.0**	**Sandy SILT (ML) A-4(5)**	**35**	**27**	**8**		
⧓	**B-18**	**15.0**	**Sandy SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		
▲	**B-18**	**35.0**	**Clayey Coarse SAND (SC) with Gravel A-4(1)**	**33**	**23**	**10**		

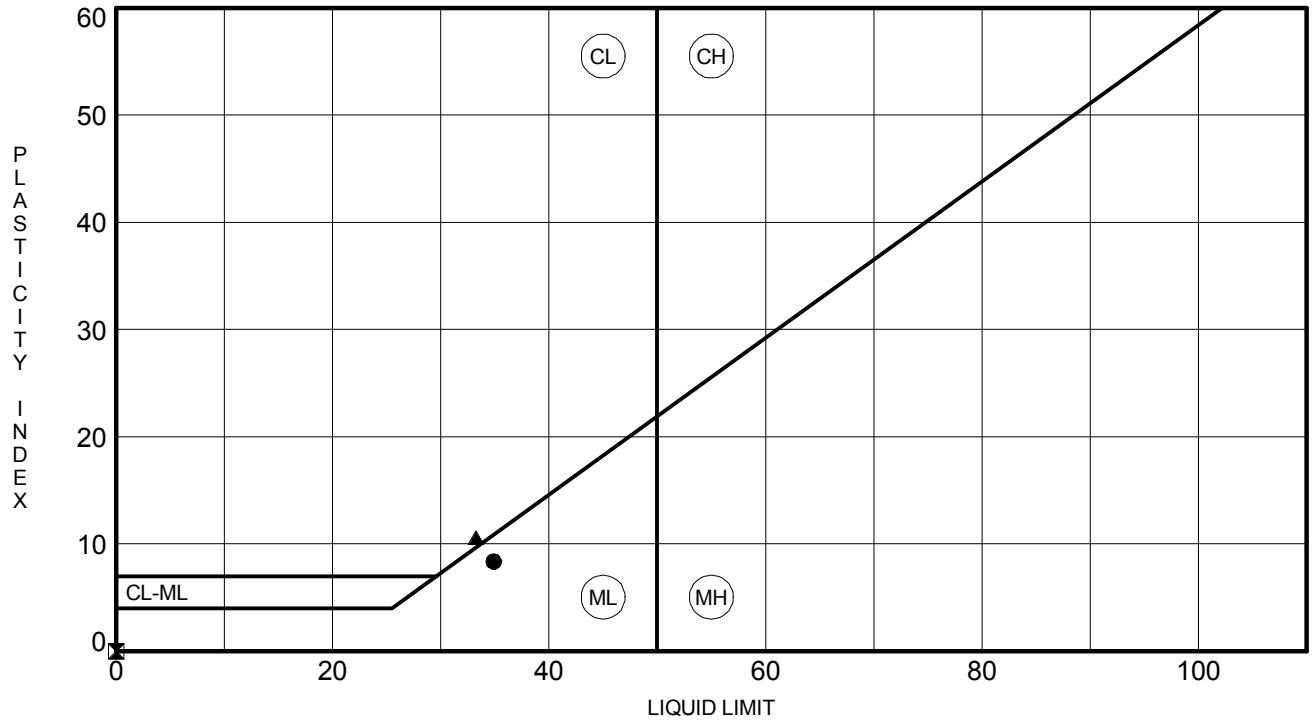
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-18**	**2.0**	**9.52**	**1.007**			**0.2**	**33.1**	**66.9**	
⧓	**B-18**	**15.0**	**19**	**3.926**			**4.2**	**26.1**	**69.7**	
▲	**B-18**	**35.0**	**19**	**13.868**	**0.623**		**28.2**	**32.9**	**38.9**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 5/14/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**B-18**	**2.0**	**35**	**27**	**8**	**67**	**Sandy SILT (ML) A-4(5)**
⧓	**B-18**	**15.0**	**NP**	**NP**	**NP**	**70**	**Sandy SILT (ML) A-4(0)**
▲	**B-18**	**35.0**	**33**	**23**	**10**	**39**	**Clayey Coarse SAND (SC) with Gravel A-4(1)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 5/14/18

Client:	F&ME Consultants				
Project:	I-20/26/126 Corridor Improvements				
Location:	---			Project No:	GTX-307802
Boring ID:	---	Sample Type:	---	Tested By:	twh
Sample ID:	---	Test Date:	06/08/18	Checked By:	MCM
Depth :	---	Test Id:	295616		

pH of Soil by ASTM D4972

Boring ID	Sample ID	Depth	Visual Description	pH of Soil in Distilled Water	pH of Soil in Calcium Chloride
B-18	---	8-10 ft	Moist, olive yellow sandy silt	5.4	4.0

Notes: Sample Preparation: screened through #10 sieve

Method A, pH meter used

Client:	F&ME Consultants
Project:	I-20/26/126 Corridor Improvement
Location:	---
GTX#:	307802
Test Date:	06/11/18
Tested By:	twh
Checked By:	emm

Laboratory Measurement of Soil Resistivity Using the Wenner Four-Electrode Method by ASTM G57 (Laboratory Measurement)

Boring ID	Sample ID	Depth, ft.	Sample Description	Electrical Resistivity, ohm-cm	Electrical Conductivity, $(ohm\text{-}cm)^{-1}$
B-18	---	8-10 ft	Moist, olive yellow sandy silt	55,046	1.82E-05

Notes: Test Equipment: Nilsson Model 400 Soil Resistance Meter, MC Miller Soil Box
Water added to sample to create a thick slurry prior to testing (saturated condition).
Electrical Conductivity is calculated as inverse of Electrical Resistivity (per ASTM G57)
Test conducted in standard laboratory atmosphere: 68-73 F

Project Name: I-20/26/126 CORRIDOR IMPROVE
Project Number: 307802
Lab Number: L1824882
Report Date: 07/10/18

SAMPLE RESULTS

Lab ID: L1824882-06
Client ID: B-18, 8-10 FT
Sample Location: Not Specified
Sample Depth:
Matrix: Soil

Date Collected: 06/28/18 14:28
Date Received: 06/29/18
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	84.6		%	0.100	NA	1	-	07/03/18 13:04	121,2540G	RI
Chloride	ND		mg/kg	10	--	1	-	07/03/18 21:21	1,9251	TL
Sulfate	ND		mg/kg	120	--	1	-	07/03/18 01:55	1,9038	JR

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

ROCK CORE COMPRESSION TEST

PROJECT: I-20/26/126 Corridor Improvements **PROJECT NO:** G5662.01

SAMPLED BY: RW **DATE SAMPLED:** 4/25/2018

TESTED BY: BF **DATE TESTED:** 5/2/2018

Lab No.	18-0808A	18-0808B	18-0808C		
Boring No.	B-18	B-18	B-18		
Sample No.	NQ-3	NQ-4	NQ-5		
Depth	81.6-81.9	86.2-86.5	93.8-94.1		
Length (in)	3.84	3.77	4.01		
Diameter (in)	1.85	1.85	1.85		
Mass (g)	425.53	415.40	448.17		
Cross Sectional Area (in^2)	2.69	2.70	2.69		
Load (lb)	1550	2770	4260		
Compressive Strength (psi)	580	1030	1590		
Corrected Compressive Strength (psi)					
Unit Weight (lb/ft^3)	156.63	155.53	158.68		

Signature: _____

Remarks: _____

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0804	**DATE SAMPLE RECEIVED:**	4/30/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	4/30/2018
		DATE OF WEIGHING:	5/1/2018

BORING NO.	B-19	B-19	B-19		
SAMPLE NO.	18-0804C SS-4	18-0804F SS-6	18-0804I SS-8		
SAMPLE DEPTH	6.0-8.0'	13.5-15.0'	23.5-25.0'		
WATER CONTENT, W%	19.2	22.2	14.8		

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

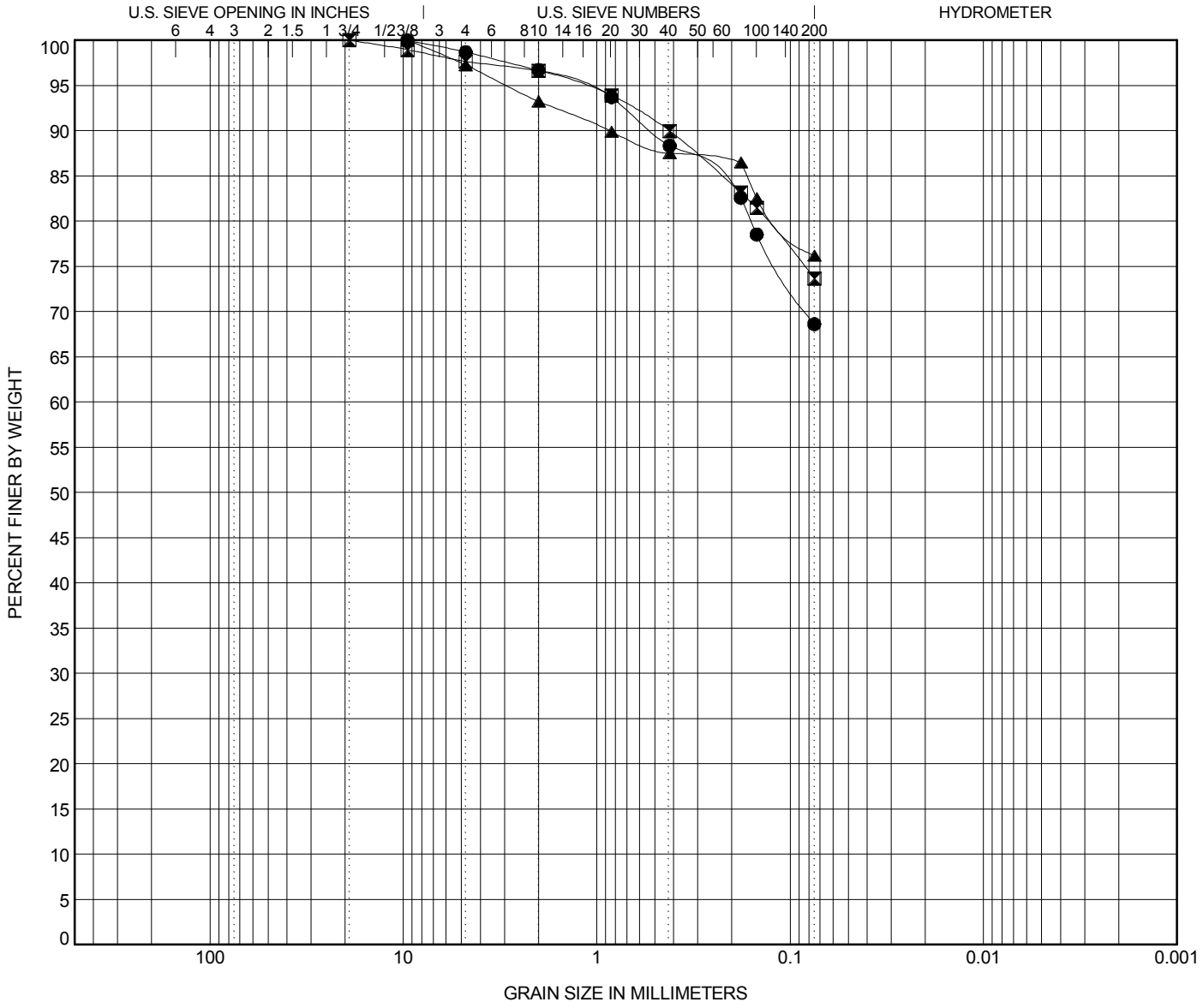
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**B-19**	**8.0**	**Sandy, Silty CLAY (CL-ML) A-4(1)**	**22**	**17**	**5**		
⧓	**B-19**	**15.0**	**SILT (ML) with Sand A-4(5)**	**33**	**26**	**7**		
▲	**B-19**	**25.0**	**SILT (ML) with Sand A-4(3)**	**34**	**31**	**3**		

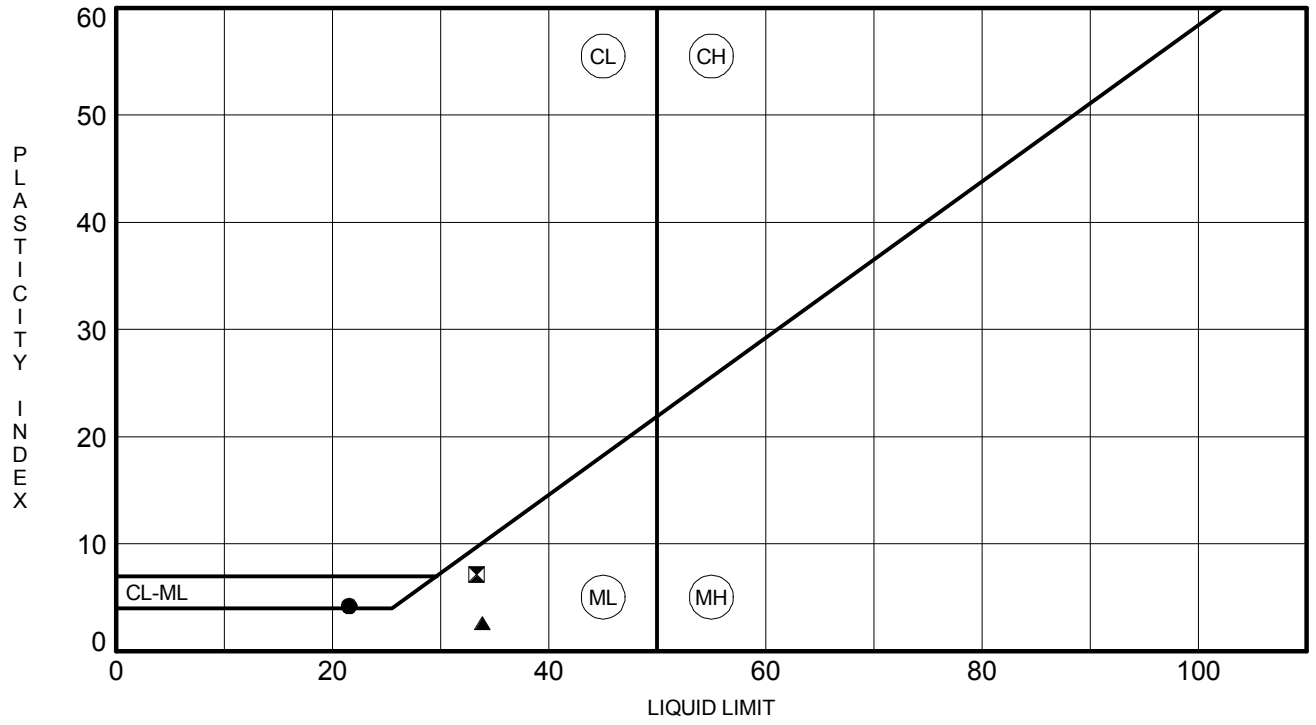
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-19**	**8.0**	**9.52**	**1.213**			**1.3**	**30.1**	**68.6**	
⧓	**B-19**	**15.0**	**19**	**1.19**			**2.3**	**24.0**	**73.7**	
▲	**B-19**	**25.0**	**9.52**	**2.913**			**2.7**	**21.1**	**76.2**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 5/14/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**B-19**	**8.0**	**22**	**17**	**5**	**69**	**Sandy, Silty CLAY (CL-ML) A-4(1)**
⊠	**B-19**	**15.0**	**33**	**26**	**7**	**74**	**SILT (ML) with Sand A-4(5)**
▲	**B-19**	**25.0**	**34**	**31**	**3**	**76**	**SILT (ML) with Sand A-4(3)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 5/14/18

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

ORGANIC IMPURITIES DETERMINATION
(AASHTO T267)

PROJECT:	Carolina Crossroads	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0804	**DATE SAMPLE RECEIVED:**	4/30/2018
DESCRIPTION OF SOIL:	Sandy, Silty CLAY (CL-ML) A-4(1)		
TESTED BY:	MB	**DATE OF TESTING:**	5/1/2018
		DATE OF WEIGHING:	5/1/2018

BORING NO.	B-19				
SAMPLE NO.	18-0804D SS-4				
SAMPLE DEPTH	6.0-8.0'				
WT. OF CRUCIBLE + DRY SOIL (BEFORE IGNITION) (GRAMS)	191.15				
WT. OF CRUCIBLE + DRY SOIL (AFTER IGNITION) (GRAMS)	189.94				
WT. OF CRUCIBLE (GRAMS)	132.08				
WT. OF DRY SOIL (BEFORE IGNITION) (GRAMS)	59.07				
WT. OF DRY SOIL (AFTER IGNITION) (GRAMS)	57.86				
IGNITION LOSS (GRAMS)	1.21				
ORGANIC IMPURITIES %	2.05				

Client:	F&ME Consultants				
Project:	I-20/26/126 Corridor Improvements				
Location:	---			Project No:	GTX-307802
Boring ID:	---	Sample Type:	---	Tested By:	twh
Sample ID:	---	Test Date:	06/08/18	Checked By:	MCM
Depth :	---	Test Id:	295616		

pH of Soil by ASTM D4972

Boring ID	Sample ID	Depth	Visual Description	pH of Soil in Distilled Water	pH of Soil in Calcium Chloride
B-19	---	8-10 ft	Moist, reddish yellow sandy silt	5.2	3.9

Notes: Sample Preparation: screened through #10 sieve

Method A, pH meter used

Client:	F&ME Consultants
Project:	I-20/26/126 Corridor Improvement
Location:	---
GTX#:	307802
Test Date:	06/11/18
Tested By:	twh
Checked By:	emm

Laboratory Measurement of Soil Resistivity Using the Wenner Four-Electrode Method by ASTM G57 (Laboratory Measurement)

Boring ID	Sample ID	Depth, ft.	Sample Description	Electrical Resistivity, ohm-cm	Electrical Conductivity, $(ohm\text{-}cm)^{-1}$
B-19	---	8-10 ft	Moist, reddish yellow sandy silt	94,801	1.05E-05

Notes: Test Equipment: Nilsson Model 400 Soil Resistance Meter, MC Miller Soil Box
Water added to sample to create a thick slurry prior to testing (saturated condition).
Electrical Conductivity is calculated as inverse of Electrical Resistivity (per ASTM G57)
Test conducted in standard laboratory atmosphere: 68-73 F

Project Name: I-20/26/126 CORRIDOR IMPROVE
Project Number: 307802
Lab Number: L1824882
Report Date: 07/10/18

SAMPLE RESULTS

Lab ID: L1824882-07
Client ID: B-19, 8-10 FT
Sample Location: Not Specified
Sample Depth:
Matrix: Soil

Date Collected: 06/28/18 14:33
Date Received: 06/29/18
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	84.8		%	0.100	NA	1	-	07/03/18 13:04	121,2540G	RI
Chloride	ND		mg/kg	10	--	1	-	07/03/18 21:22	1,9251	TL
Sulfate	ND		mg/kg	120	--	1	-	07/03/18 01:55	1,9038	JR

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0769	**DATE SAMPLE RECEIVED:**	4/30/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	4/30/2018
		DATE OF WEIGHING:	5/1/2018

BORING NO.	B-20	B-20	B-20		
SAMPLE NO.	18-0769C SS-4	18-0769F SS-9	18-0769I SS-12/SS-13		
SAMPLE DEPTH	6.0-8.0'	28.5-30.0'	43.5-50.0'		
WATER CONTENT, W%	19.6	22.3	19.9		

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

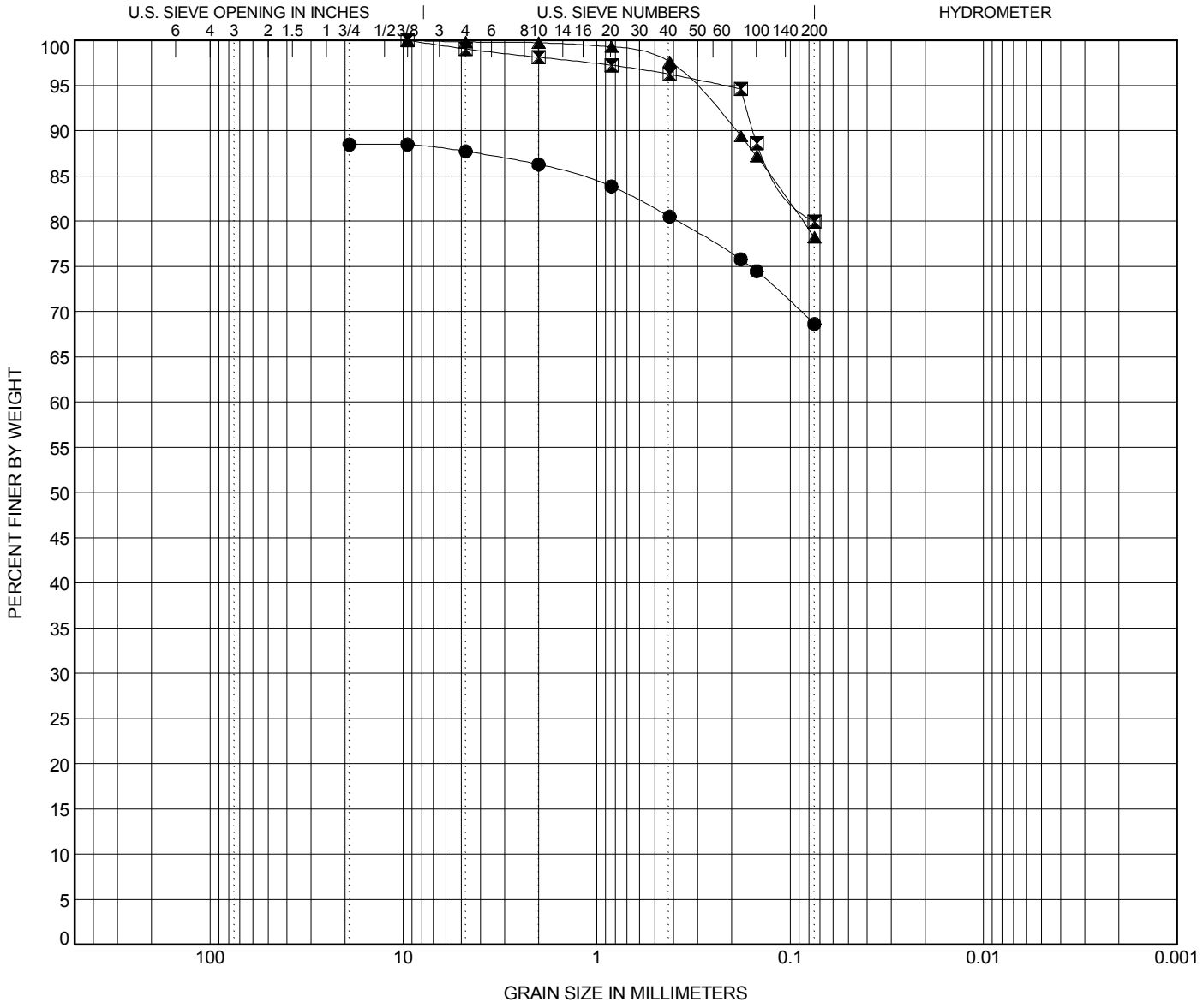
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**B-20**	**8.0**	**Sandy SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		
⧓	**B-20**	**30.0**	**SILT (ML) with Sand A-4(4)**	**33**	**29**	**4**		
▲	**B-20**	**50.0**	**SILT (ML) with Sand A-4(2)**	**29**	**25**	**4**		

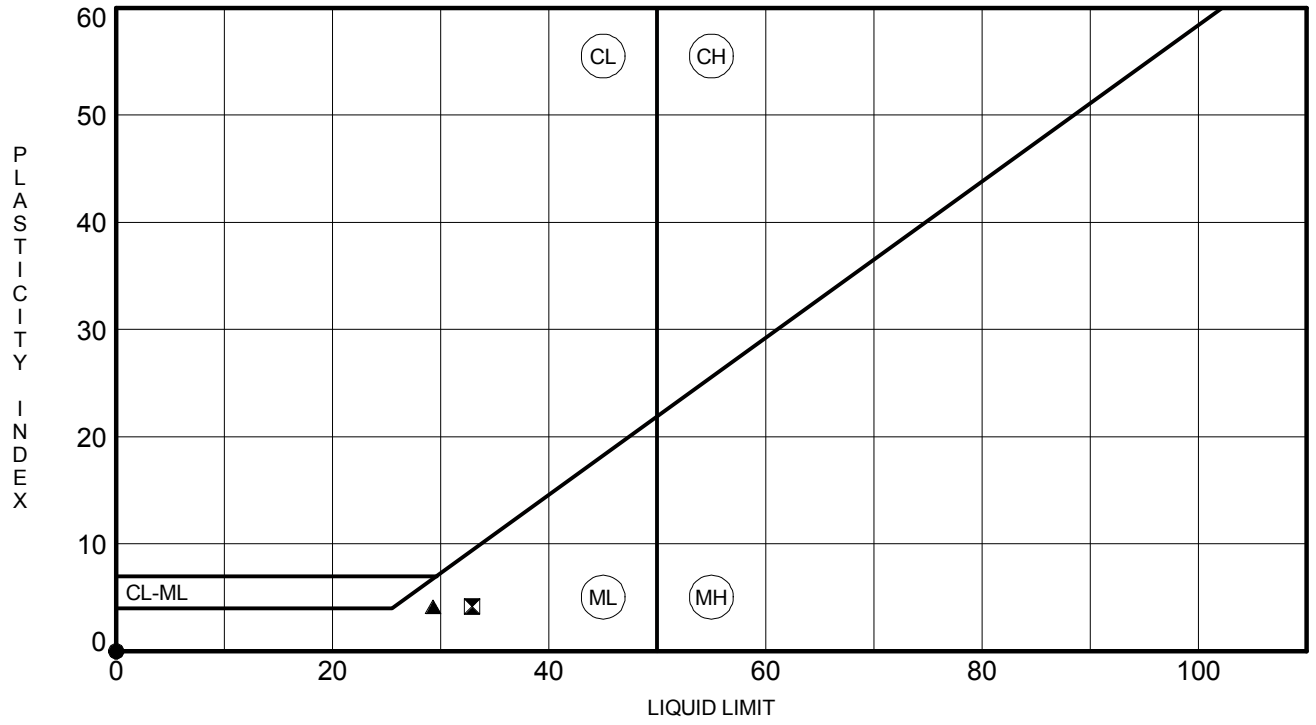
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-20**	**8.0**	**19**				**12.3**	**19.1**	**68.6**	
⧓	**B-20**	**30.0**	**9.52**	**0.22**			**0.9**	**19.1**	**80.0**	
▲	**B-20**	**50.0**	**9.52**	**0.319**			**0.2**	**21.6**	**78.2**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 5/14/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**B-20**	**8.0**	**NP**	**NP**	**NP**	**69**	**Sandy SILT (ML) A-4(0)**
⊠	**B-20**	**30.0**	**33**	**29**	**4**	**80**	**SILT (ML) with Sand A-4(4)**
▲	**B-20**	**50.0**	**29**	**25**	**4**	**78**	**SILT (ML) with Sand A-4(2)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 5/14/18

Client:	F&ME Consultants				
Project:	I-20/26/126 Corridor Improvements				
Location:	---			Project No:	GTX-307802
Boring ID:	---	Sample Type:	---	Tested By:	twh
Sample ID:	---	Test Date:	06/08/18	Checked By:	MCM
Depth :	---	Test Id:	295616		

pH of Soil by ASTM D4972

Boring ID	Sample ID	Depth	Visual Description	pH of Soil in Distilled Water	pH of Soil in Calcium Chloride
B-20	---	23.5-25 ft	Moist, light reddish brown sandy silt	4.4	3.3

Notes: Sample Preparation: screened through #10 sieve

Method A, pH meter used

Client:	F&ME Consultants
Project:	I-20/26/126 Corridor Improvement
Location:	---
GTX#:	307802
Test Date:	06/11/18
Tested By:	twh
Checked By:	emm

Laboratory Measurement of Soil Resistivity Using the Wenner Four-Electrode Method by ASTM G57 (Laboratory Measurement)

Boring ID	Sample ID	Depth, ft.	Sample Description	Electrical Resistivity, ohm-cm	Electrical Conductivity, $(ohm\text{-}cm)^{-1}$
B-20	---	23.5-25 ft	Moist, light reddish brown sandy silt	93,781	1.07E-05

Notes: Test Equipment: Nilsson Model 400 Soil Resistance Meter, MC Miller Soil Box
Water added to sample to create a thick slurry prior to testing (saturated condition).
Electrical Conductivity is calculated as inverse of Electrical Resistivity (per ASTM G57)
Test conducted in standard laboratory atmosphere: 68-73 F

Project Name: I-20/26/126 CORRIDOR IMPROVE
Project Number: 307802
Lab Number: L1824882
Report Date: 07/10/18

SAMPLE RESULTS

Lab ID: L1824882-08
Client ID: B-20, 23.5-25 FT
Sample Location: Not Specified
Sample Depth:
Matrix: Soil

Date Collected: 06/28/18 14:38
Date Received: 06/29/18
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	84.6		%	0.100	NA	1	-	07/03/18 13:04	121,2540G	RI
Chloride	ND		mg/kg	11	--	1	-	07/03/18 21:23	1,9251	TL
Sulfate	ND		mg/kg	120	--	1	-	07/03/18 01:55	1,9038	JR

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0605	**DATE SAMPLE RECEIVED:**	4/3/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	4/3/2018
		DATE OF WEIGHING:	4/4/2018

BORING NO.	B-21	B-21	B-21	B-21	B-21
SAMPLE NO.	18-0605C SS-2	18-0605F SS-5	18-0605I SS-8	18-0605L SS-10	18-0605O SS-13
SAMPLE DEPTH	2.0-4.0'	8.0-10.0'	23.5-25.0'	33.5-35.0'	48.5-50.0'
WATER CONTENT, W%	7.9	18.4	25.7	21.0	29.8

BORING NO.	B-21				
SAMPLE NO.	18-0605R SS-16				
SAMPLE DEPTH	63.5-65.0'				
WATER CONTENT, W%	20.4				

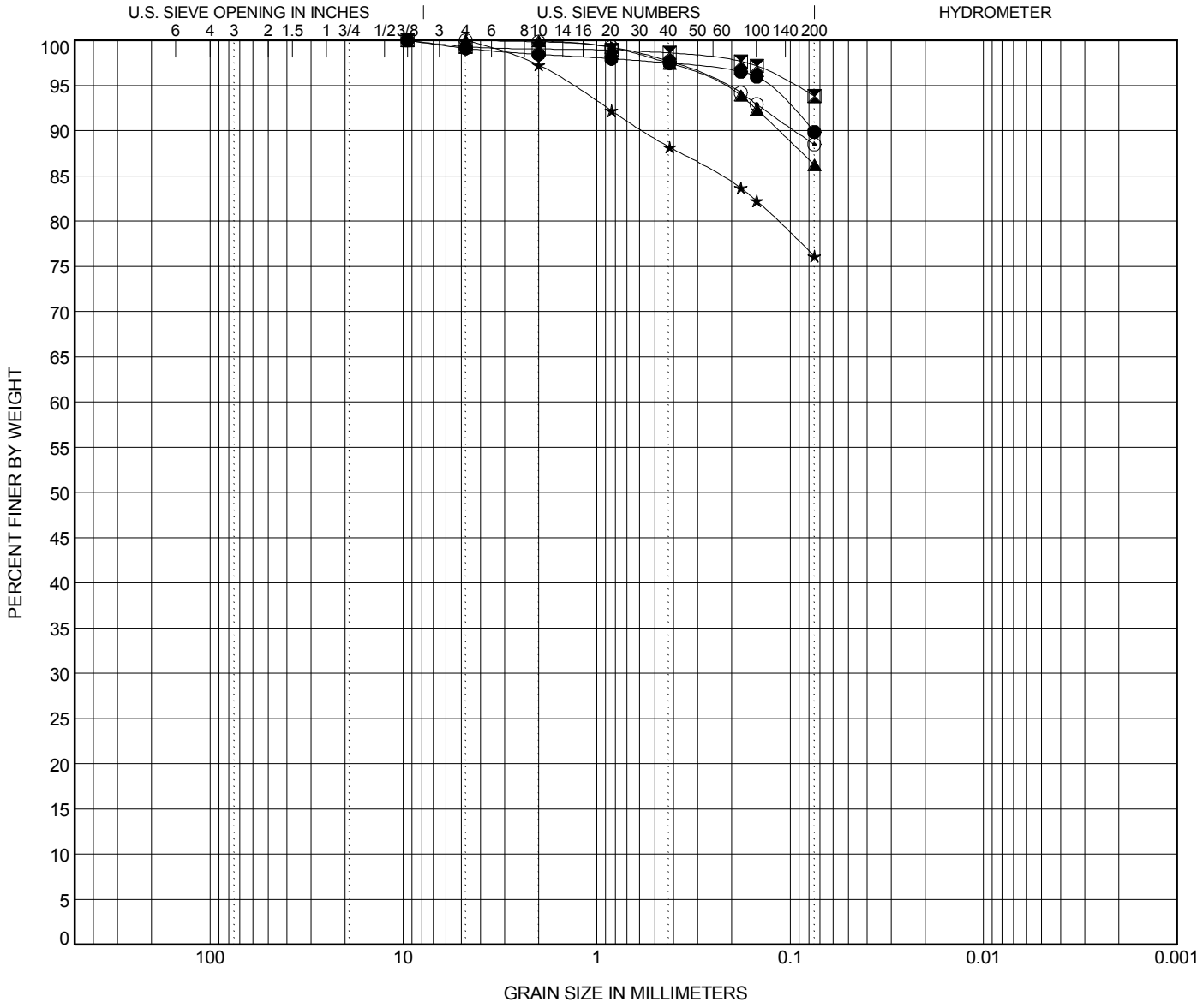
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**B-21**	**4.0**	**SILT (ML) A-4(1)**	**28**	**27**	**1**		
⧓	**B-21**	**10.0**	**SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		
▲	**B-21**	**25.0**	**SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		
★	**B-21**	**35.0**	**SILT (ML) with F/M Sand A-4(0)**	**NP**	**NP**	**NP**		
⊙	**B-21**	**50.0**	**SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		

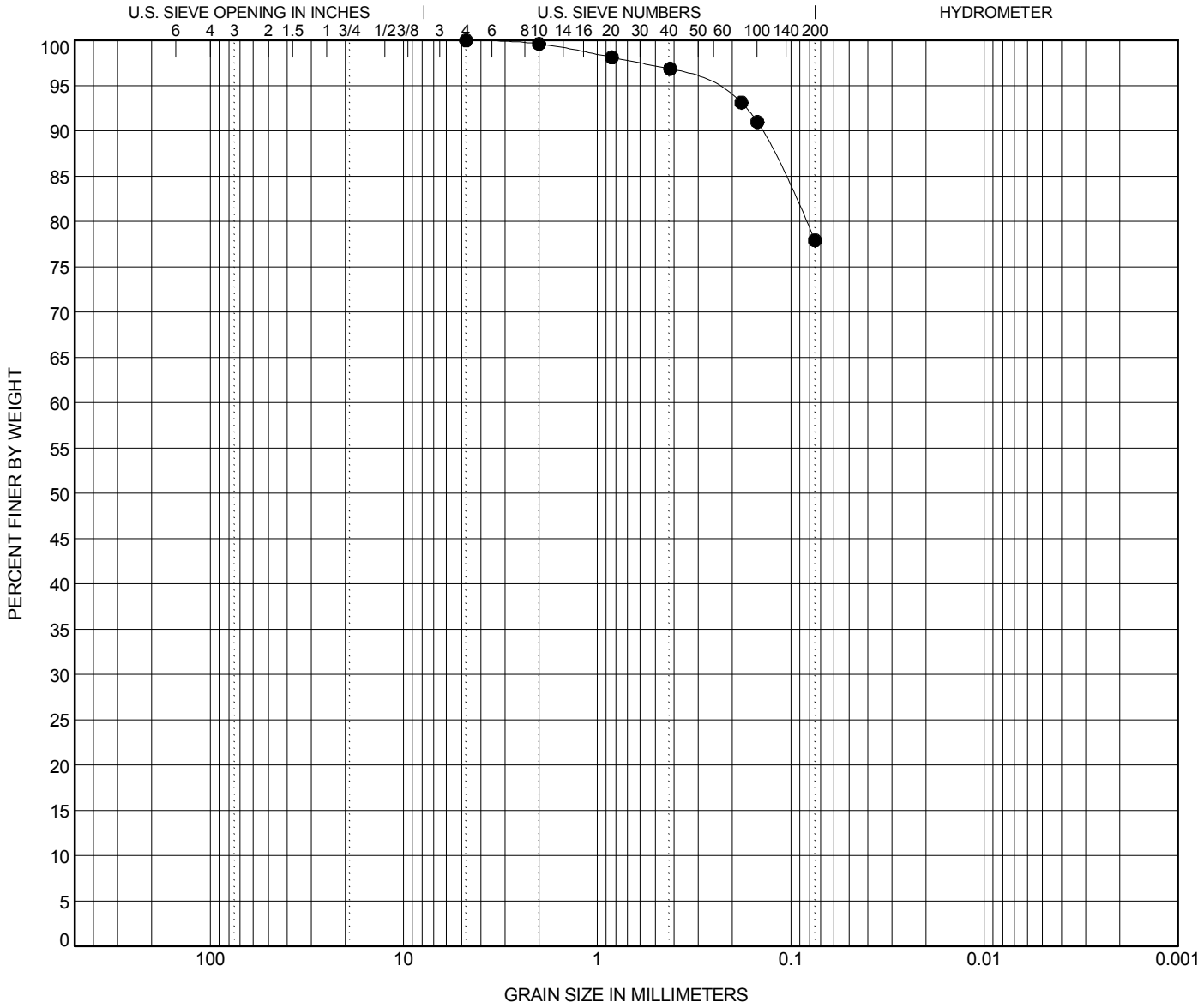
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-21**	**4.0**	**9.52**	**0.133**			**0.9**	**9.2**	**89.9**	
⧓	**B-21**	**10.0**	**9.52**	**0.095**			**0.7**	**5.5**	**93.8**	
▲	**B-21**	**25.0**	**4.76**	**0.234**			**0.0**	**13.8**	**86.2**	
★	**B-21**	**35.0**	**4.76**	**1.352**			**0.0**	**23.9**	**76.1**	
⊙	**B-21**	**50.0**	**4.76**	**0.218**			**0.0**	**11.5**	**88.5**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/5/18

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
● **B-21**	**65.0**	**SILT (ML) with Fine Sand A-4(0)**	**NP**	**NP**	**NP**		

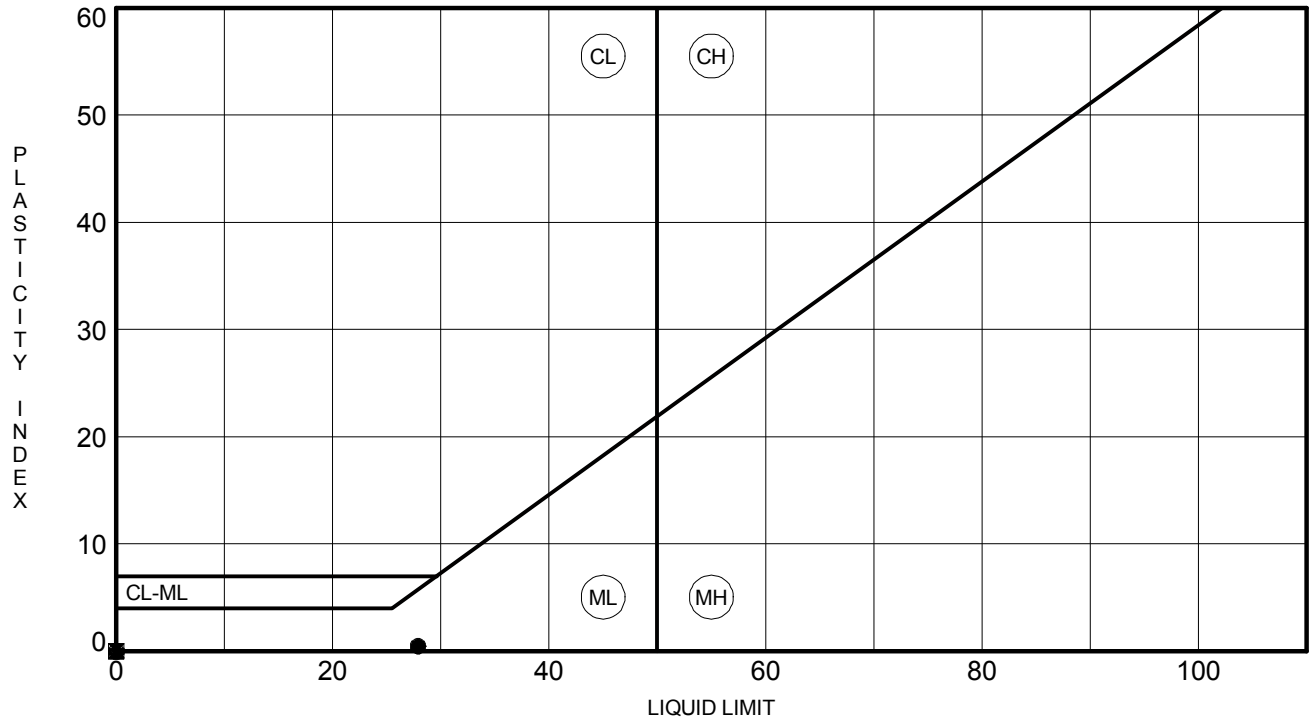
BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
● **B-21**	**65.0**	**4.76**	**0.274**			**0.0**	**22.1**	**77.9**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/5/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**B-21**	**4.0**	**28**	**27**	**1**	**90**	**SILT (ML) A-4(1)**
⊠	**B-21**	**10.0**	**NP**	**NP**	**NP**	**94**	**SILT (ML) A-4(0)**
▲	**B-21**	**25.0**	**NP**	**NP**	**NP**	**86**	**SILT (ML) A-4(0)**
★	**B-21**	**35.0**	**NP**	**NP**	**NP**	**76**	**SILT (ML) with F/M Sand A-4(0)**
⊙	**B-21**	**50.0**	**NP**	**NP**	**NP**	**88**	**SILT (ML) A-4(0)**
✿	**B-21**	**65.0**	**NP**	**NP**	**NP**	**78**	**SILT (ML) with Fine Sand A-4(0)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/5/18

Client:	F&ME Consultants				
Project:	I-20/26/126 Corridor Improvements				
Location:	---			Project No:	GTX-307802
Boring ID:	---	Sample Type:	---	Tested By:	twh
Sample ID:	---	Test Date:	05/11/18	Checked By:	n/a
Depth :	---	Test Id:	293112		

pH of Soil by ASTM D4972

Boring ID	Sample ID	Depth	Visual Description	pH of Soil in Distilled Water	pH of Soil in Calcium Chloride
B-21	---	13.5-15 ft	Moist, yellow clay	4.1	3.5

Notes: Sample Preparation: screened through #10 sieve

Method A, pH meter used

Client:	F&ME Consultants
Project:	I-20/26/126 Corridor Improvement
Location:	---
GTX#:	307802
Test Date:	05/09/18
Tested By:	twh
Checked By:	jm

Laboratory Measurement of Soil Resistivity Using the Wenner Four-Electrode Method by ASTM G57 (Laboratory Measurement)

Boring ID	Sample ID	Depth, ft.	Sample Description	Electrical Resistivity, ohm-cm	Electrical Conductivity, $(ohm\text{-}cm)^{-1}$
B-21	---	13.5-15 ft	Moist, yellow clay	66,259	1.51E-05

Notes: Test Equipment: Nilsson Model 400 Soil Resistance Meter, MC Miller Soil Box
Water added to sample to create a thick slurry prior to testing (saturated condition).
Electrical Conductivity is calculated as inverse of Electrical Resistivity (per ASTM G57)
Test conducted in standard laboratory atmosphere: 68-73 F

Project Name: I-20/26/126 CORRIDOR IMPROVEME
Project Number: 307802
Lab Number: L1814569
Report Date: 05/01/18

SAMPLE RESULTS

Lab ID: L1814569-08
Client ID: B-21, 13.5-15 FT
Sample Location: Not Specified
Sample Depth:
Matrix: Soil

Date Collected: 04/18/18 14:33
Date Received: 04/25/18
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	82.6		%	0.100	NA	1	-	04/27/18 09:39	121,2540G	RI
Chloride	ND		mg/kg	12	--	1	-	04/30/18 22:59	1,9251	TL
Sulfate	ND		mg/kg	120	--	1	-	04/30/18 17:05	1,9038	BR

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0622	**DATE SAMPLE RECEIVED:**	4/3/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	4/3/2018
		DATE OF WEIGHING:	4/4/2018

BORING NO.	B-22	B-22	B-22	B-22	B-22
SAMPLE NO.	18-0622C SS-1	18-0622F SS-7	18-0622I SS-9	18-0622L SS-11	18-0622O SS-13
SAMPLE DEPTH	0.0-2.0'	18.5-20.0'	28.5-30.0'	38.5-40.0'	48.5-50.0'
WATER CONTENT, W%	16.8	23.4	24.1	17.9	22.1

BORING NO.	B-22	B-22			
SAMPLE NO.	18-0622R SS-15	18-0622U SS-17			
SAMPLE DEPTH	58.5-60.0'	68.5-70.0'			
WATER CONTENT, W%	21.9	25.3			

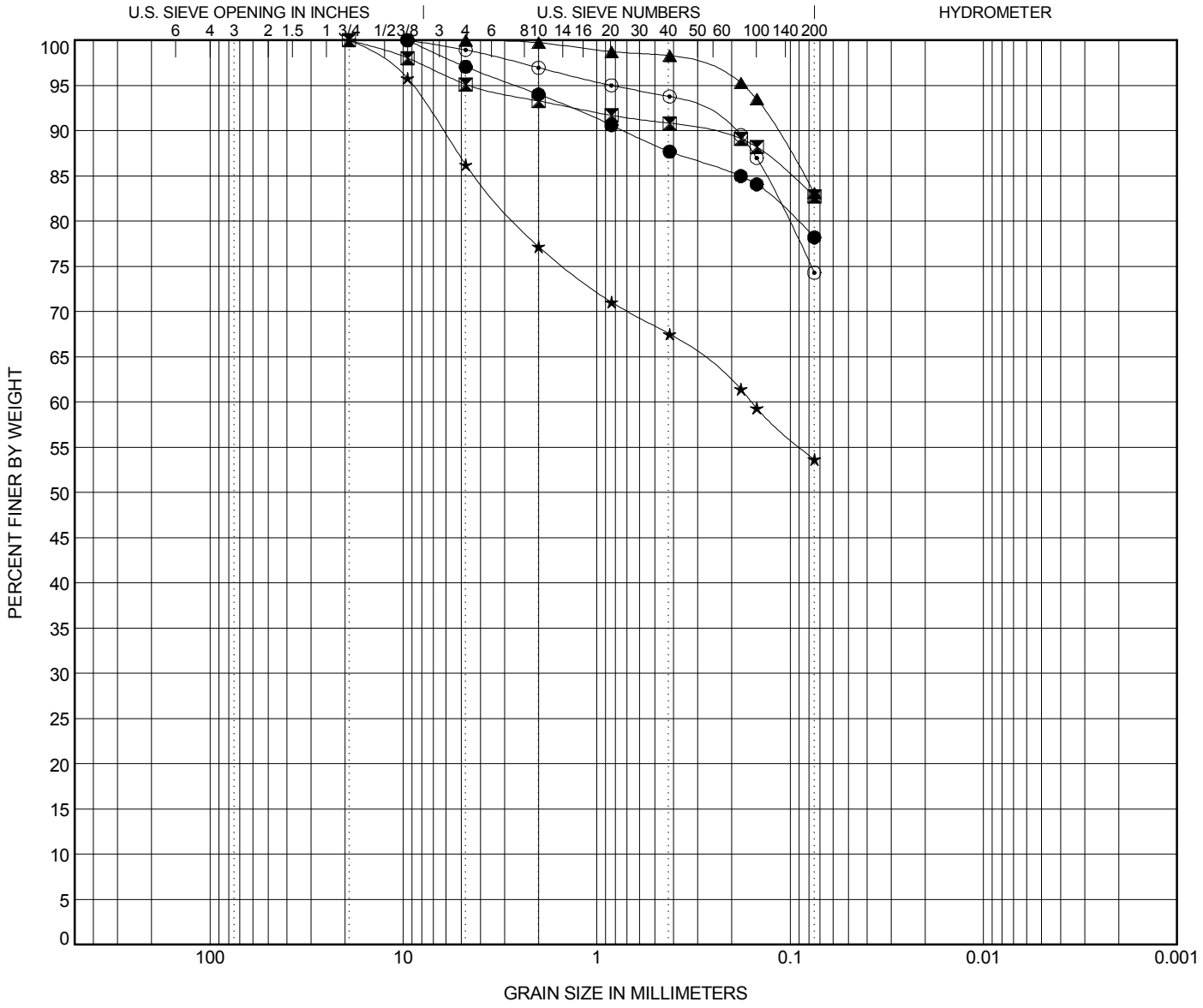
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**B-22**	**2.0**	**SILT (ML) with F/M Sand A-4(1)**	**30**	**29**	**1**		
⊠	**B-22**	**20.0**	**SILT (ML) with Fine Sand A-4(0)**	**NP**	**NP**	**NP**		
▲	**B-22**	**30.0**	**SILT (ML) with Fine Sand A-4(1)**	**29**	**28**	**1**		
★	**B-22**	**40.0**	**Sandy SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		
⊙	**B-22**	**50.0**	**SILT (ML) with Fine Sand A-4(0)**	**NP**	**NP**	**NP**		

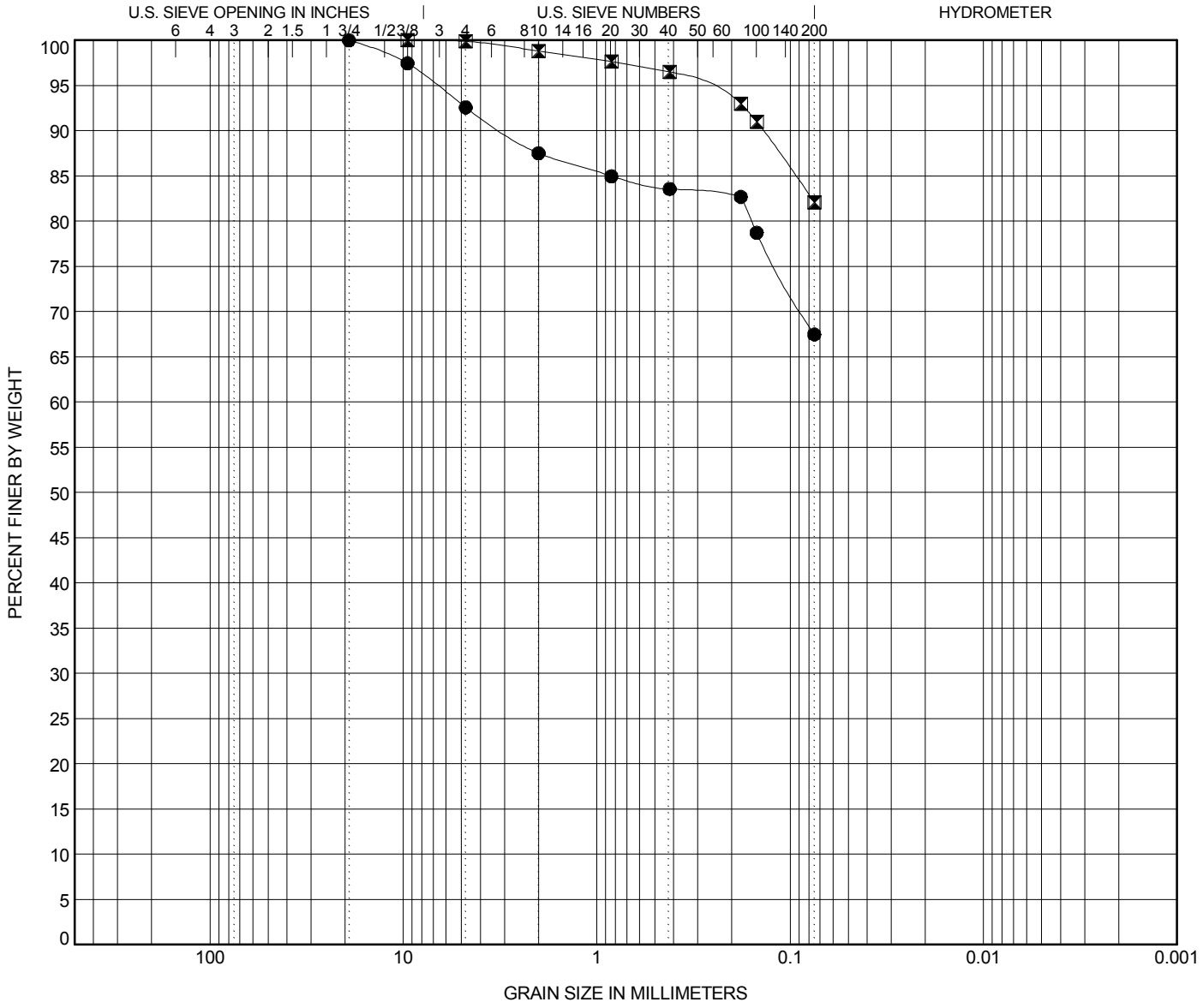
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-22**	**2.0**	**9.52**	**2.632**			**2.9**	**18.9**	**78.2**	
⊠	**B-22**	**20.0**	**19.1**	**4.456**			**4.9**	**12.4**	**82.7**	
▲	**B-22**	**30.0**	**4.76**	**0.174**			**0.0**	**16.9**	**83.1**	
★	**B-22**	**40.0**	**19.1**	**8.974**			**13.8**	**32.6**	**53.7**	
⊙	**B-22**	**50.0**	**9.52**	**0.829**			**1.0**	**24.6**	**74.3**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/5/18

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**B-22**	**60.0**	**Sandy SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		
⧓	**B-22**	**70.0**	**SILT (ML) with Fine Sand A-4(0)**	**NP**	**NP**	**NP**		

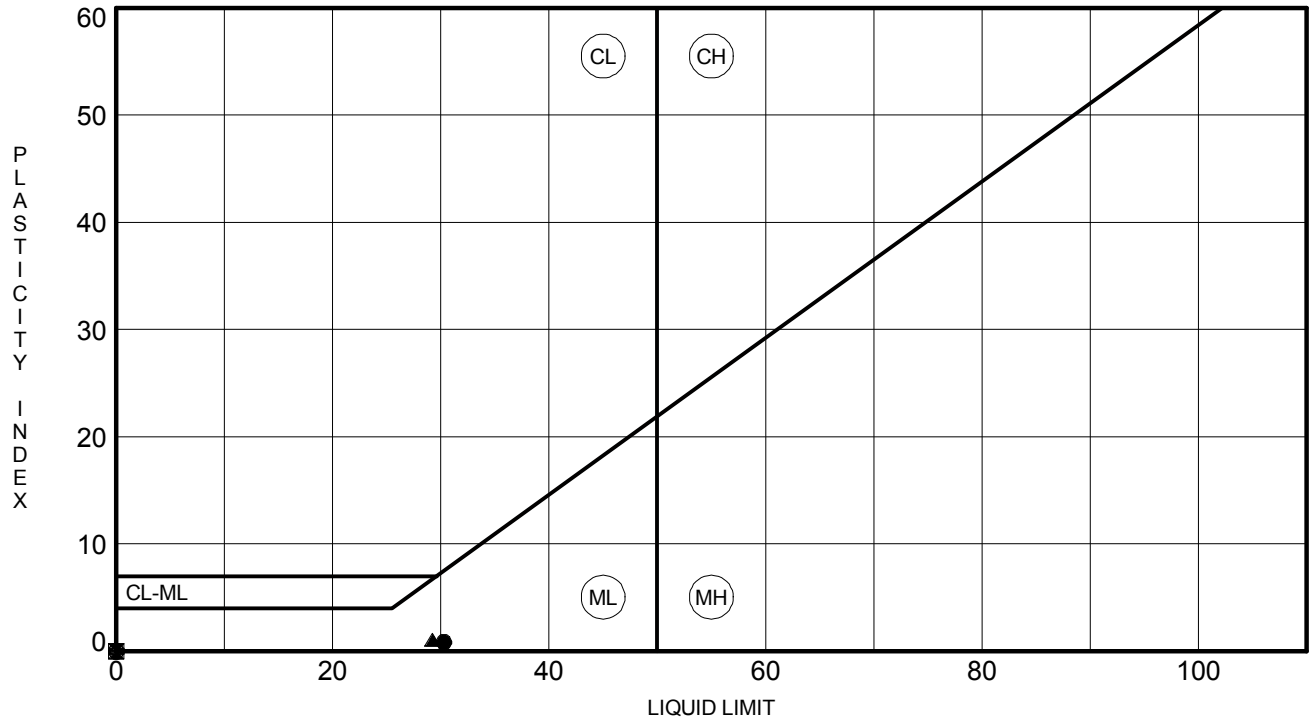
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-22**	**60.0**	**19.1**	**6.703**			**7.4**	**25.1**	**67.5**	
⧓	**B-22**	**70.0**	**9.52**	**0.291**			**0.1**	**17.8**	**82.1**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/5/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**B-22**	**2.0**	**30**	**29**	**1**	**78**	**SILT (ML) with F/M Sand A-4(1)**
⊠	**B-22**	**20.0**	**NP**	**NP**	**NP**	**83**	**SILT (ML) with Fine Sand A-4(0)**
▲	**B-22**	**30.0**	**29**	**28**	**1**	**83**	**SILT (ML) with Fine Sand A-4(1)**
★	**B-22**	**40.0**	**NP**	**NP**	**NP**	**54**	**Sandy SILT (ML) A-4(0)**
⊙	**B-22**	**50.0**	**NP**	**NP**	**NP**	**74**	**SILT (ML) with Fine Sand A-4(0)**
✿	**B-22**	**60.0**	**NP**	**NP**	**NP**	**67**	**Sandy SILT (ML) A-4(0)**
○	**B-22**	**70.0**	**NP**	**NP**	**NP**	**82**	**SILT (ML) with Fine Sand A-4(0)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/5/18

Client:	F&ME Consultants				
Project:	I-20/26/126 Corridor Improvements				
Location:	---			Project No:	GTX-307802
Boring ID:	---	Sample Type:	---	Tested By:	twh
Sample ID:	---	Test Date:	05/11/18	Checked By:	n/a
Depth :	---	Test Id:	293112		

pH of Soil by ASTM D4972

Boring ID	Sample ID	Depth	Visual Description	pH of Soil in Distilled Water	pH of Soil in Calcium Chloride
B-22	---	13.5-15 ft	Moist, yellow clay with sand	3.9	3.1

Notes: Sample Preparation: screened through #10 sieve

Method A, pH meter used

Client:	F&ME Consultants
Project:	I-20/26/126 Corridor Improvement
Location:	---
GTX#:	307802
Test Date:	05/09/18
Tested By:	twh
Checked By:	jm

Laboratory Measurement of Soil Resistivity Using the Wenner Four-Electrode Method by ASTM G57 (Laboratory Measurement)

Boring ID	Sample ID	Depth, ft.	Sample Description	Electrical Resistivity, ohm-cm	Electrical Conductivity, $(ohm\text{-}cm)^{-1}$
B-22	---	13.5-15 ft	Moist, yellow clay with sand	53,007	1.89E-05

Notes: Test Equipment: Nilsson Model 400 Soil Resistance Meter, MC Miller Soil Box
Water added to sample to create a thick slurry prior to testing (saturated condition).
Electrical Conductivity is calculated as inverse of Electrical Resistivity (per ASTM G57)
Test conducted in standard laboratory atmosphere: 68-73 F

Project Name: I-20/26/126 CORRIDOR IMPROVEME
Project Number: 307802
Lab Number: L1814569
Report Date: 05/01/18

SAMPLE RESULTS

Lab ID: L1814569-09
Client ID: B-22, 13.5-15 FT
Sample Location: Not Specified
Sample Depth:
Matrix: Soil
Date Collected: 04/18/18 14:35
Date Received: 04/25/18
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	73.1		%	0.100	NA	1	-	04/27/18 09:39	121,2540G	RI
Chloride	16		mg/kg	14	--	1	-	04/30/18 23:00	1,9251	TL
Sulfate	ND		mg/kg	140	--	1	-	04/30/18 17:05	1,9038	BR

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0872	**DATE SAMPLE RECEIVED:**	5/15/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	5/22/2018
		DATE OF WEIGHING:	5/23/2018

BORING NO.	B-23	B-23	B-23	B-23	
SAMPLE NO.	18-0872C SS-2	18-0872F SS-7	18-0872I SS-9	18-0872L SS-15	
SAMPLE DEPTH	2.0-4.0'	18.5-20.0'	28.5-30.0'	58.5-60.0'	
WATER CONTENT, W%	19.1	22.3	21.8	25.9	

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

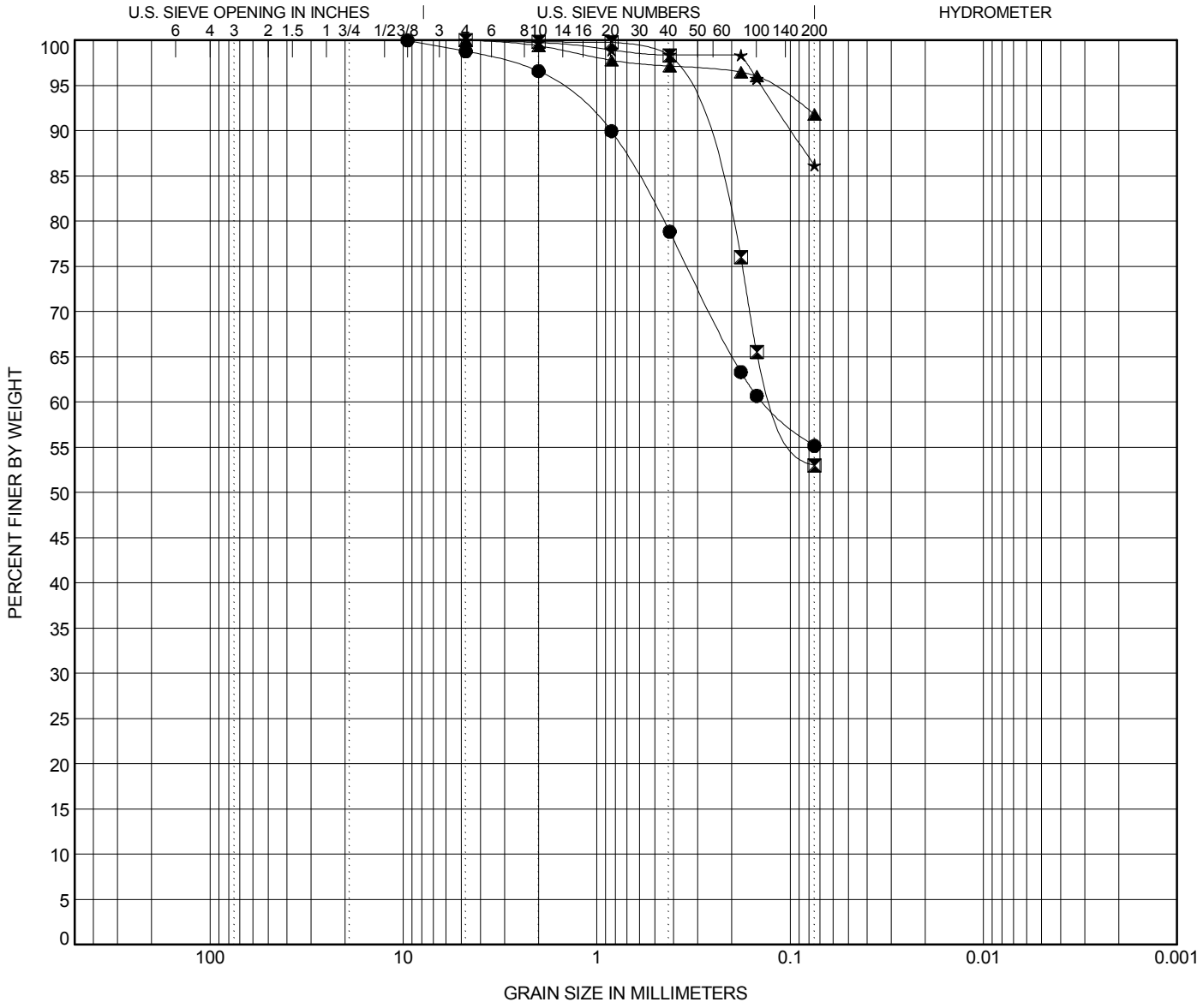
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**B-23**	**4.0**	**Sandy Lean CLAY (CL) A-7-6(8)**	**42**	**24**	**18**		
⧓	**B-23**	**20.0**	**Sandy Lean CLAY (CL) A-6(6)**	**40**	**23**	**17**		
▲	**B-23**	**30.0**	**SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		
★	**B-23**	**60.0**	**SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		

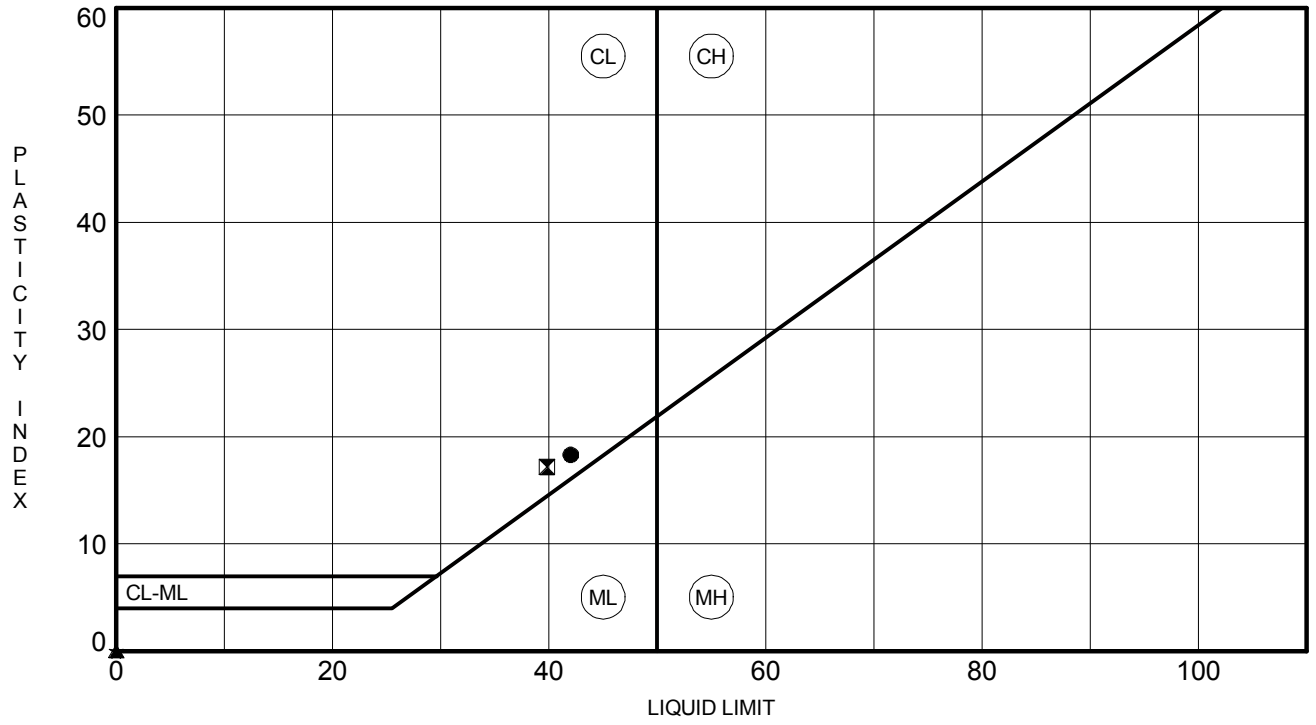
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-23**	**4.0**	**9.52**	**1.623**			**1.2**	**43.6**	**55.2**	
⧓	**B-23**	**20.0**	**4.76**	**0.37**			**0.0**	**47.0**	**53.0**	
▲	**B-23**	**30.0**	**4.76**	**0.126**			**0.0**	**8.2**	**91.8**	
★	**B-23**	**60.0**	**4.76**	**0.141**			**0.0**	**13.8**	**86.2**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/7/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**B-23**	**4.0**	**42**	**24**	**18**	**55**	**Sandy Lean CLAY (CL) A-7-6(8)**
⊠	**B-23**	**20.0**	**40**	**23**	**17**	**53**	**Sandy Lean CLAY (CL) A-6(6)**
▲	**B-23**	**30.0**	**NP**	**NP**	**NP**	**92**	**SILT (ML) A-4(0)**
★	**B-23**	**60.0**	**NP**	**NP**	**NP**	**86**	**SILT (ML) A-4(0)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/7/18

Client:	F&ME Consultants				
Project:	I-20/26/126 Corridor Improvements				
Location:	---			Project No:	GTX-307802
Boring ID:	---	Sample Type:	---	Tested By:	twh
Sample ID:	---	Test Date:	06/08/18	Checked By:	MCM
Depth :	---	Test Id:	295616		

pH of Soil by ASTM D4972

Boring ID	Sample ID	Depth	Visual Description	pH of Soil in Distilled Water	pH of Soil in Calcium Chloride
B-23	---	33.5-35 ft	Moist, light reddish brown sandy silt	4.4	3.5

Notes: Sample Preparation: screened through #10 sieve

Method A, pH meter used

Client:	F&ME Consultants
Project:	I-20/26/126 Corridor Improvement
Location:	---
GTX#:	307802
Test Date:	06/11/18
Tested By:	twh
Checked By:	emm

Laboratory Measurement of Soil Resistivity Using the Wenner Four-Electrode Method by ASTM G57 (Laboratory Measurement)

Boring ID	Sample ID	Depth, ft.	Sample Description	Electrical Resistivity, ohm-cm	Electrical Conductivity, $(ohm\text{-}cm)^{-1}$
B-23	---	33.5-35 ft	Moist, light reddish brown sandy silt	65,239	1.53E-05

Notes: Test Equipment: Nilsson Model 400 Soil Resistance Meter, MC Miller Soil Box
Water added to sample to create a thick slurry prior to testing (saturated condition).
Electrical Conductivity is calculated as inverse of Electrical Resistivity (per ASTM G57)
Test conducted in standard laboratory atmosphere: 68-73 F

Project Name: I-20/26/126 CORRIDOR IMPROVE
Project Number: 307802
Lab Number: L1824882
Report Date: 07/10/18

SAMPLE RESULTS

Lab ID: L1824882-09
Client ID: B-23, 33.5-35 FT
Sample Location: Not Specified
Sample Depth:
Matrix: Soil

Date Collected: 06/28/18 14:42
Date Received: 06/29/18
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	82.5		%	0.100	NA	1	-	07/03/18 13:04	121,2540G	RI
Chloride	ND		mg/kg	12	--	1	-	07/03/18 21:23	1,9251	TL
Sulfate	ND		mg/kg	120	--	1	-	07/03/18 01:55	1,9038	JR

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0833	**DATE SAMPLE RECEIVED:**	5/8/2018
DESCRIPTION OF SOIL:	Various		
TESTED BY:	BF	**DATE OF TESTING:**	5/8/2018
		DATE OF WEIGHING:	5/12/2018

BORING NO.	B-24	B-24	B-24		
SAMPLE NO.	18-0833C SS-2	18-0833F SS-5	18-0833I SS-7		
SAMPLE DEPTH	2.0-4.0'	8.0-10.0'	18.5-20.0'		
WATER CONTENT, W%	1.0	13.1	10.8		

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

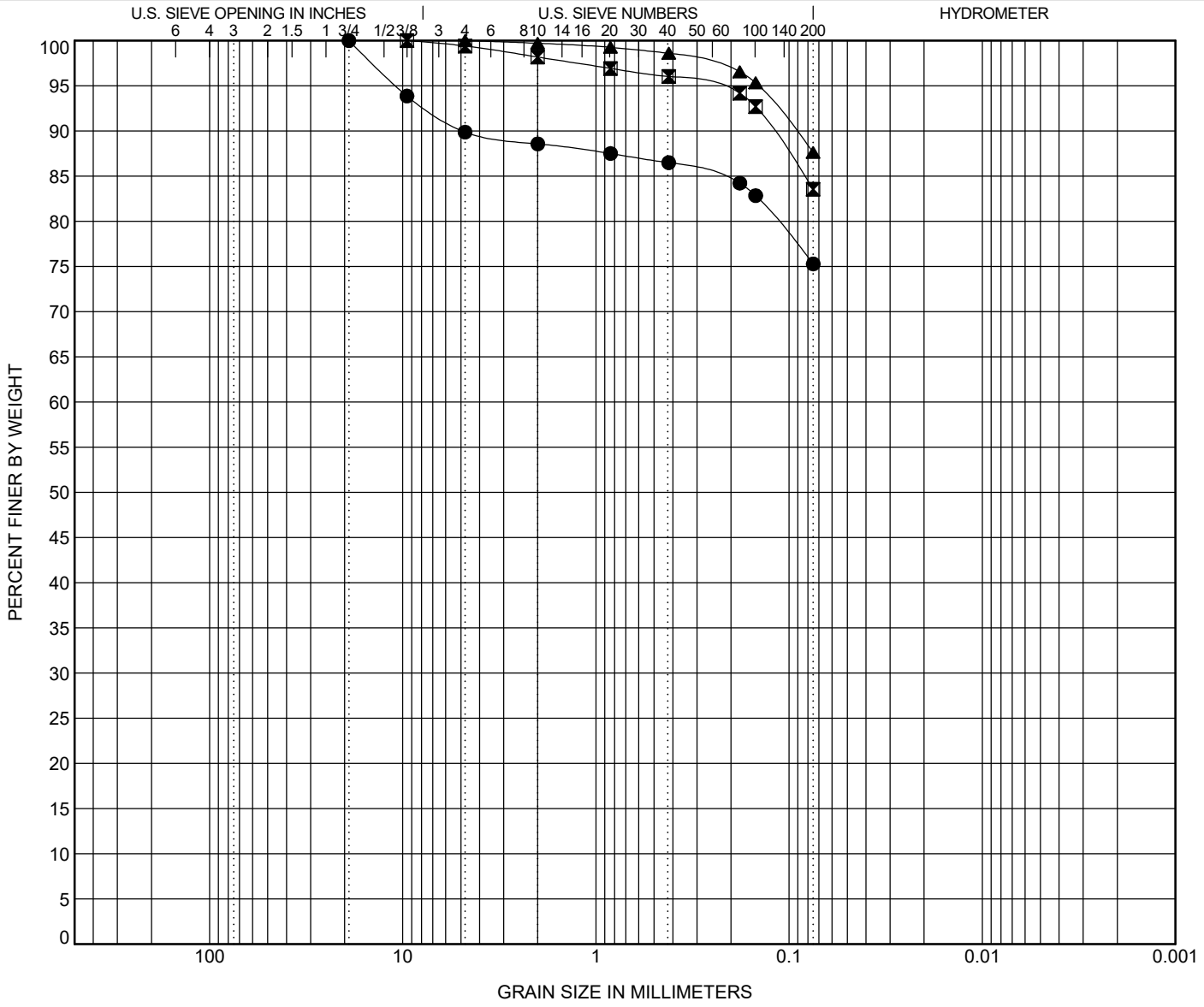
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

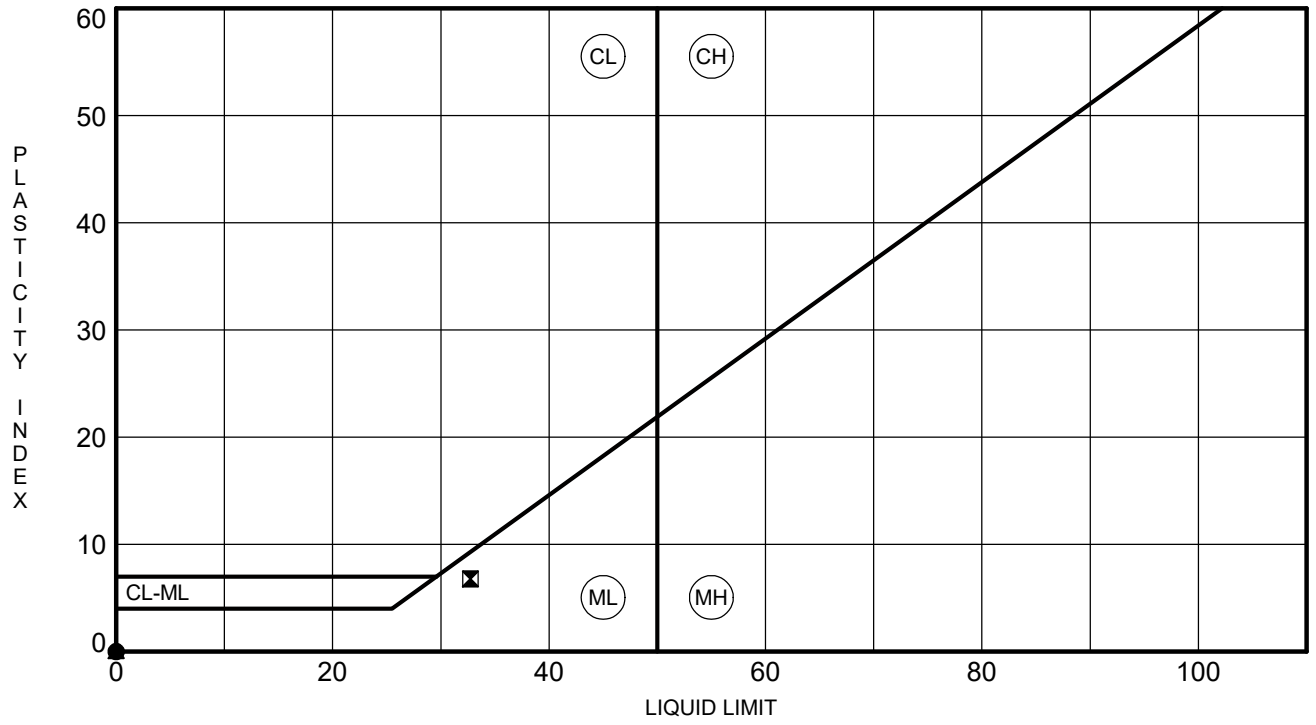
	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**B-24**	**4.0**	**SILT (ML) with Fine Sand A-4(0)**	**NP**	**NP**	**NP**		
⊠	**B-24**	**10.0**	**SILT (ML) with Fine Sand A-4(6)**	**33**	**26**	**7**		
▲	**B-24**	**20.0**	**SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		

	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-24**	**4.0**	**19**	**10.819**			**10.1**	**14.6**	**75.3**	
⊠	**B-24**	**10.0**	**9.52**	**0.261**			**0.6**	**15.9**	**83.5**	
▲	**B-24**	**20.0**	**4.76**	**0.145**			**0.0**	**12.4**	**87.6**	

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**B-24**	**4.0**	**NP**	**NP**	**NP**	**75**	**SILT (ML) with Fine Sand A-4(0)**
⊠	**B-24**	**10.0**	**33**	**26**	**7**	**84**	**SILT (ML) with Fine Sand A-4(6)**
▲	**B-24**	**20.0**	**NP**	**NP**	**NP**	**88**	**SILT (ML) A-4(0)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 5/22/18

Client:	F&ME Consultants				
Project:	I-20/26/126 Corridor Improvements				
Location:	---			Project No:	GTX-307802
Boring ID:	---	Sample Type:	---	Tested By:	twh
Sample ID:	---	Test Date:	06/08/18	Checked By:	MCM
Depth :	---	Test Id:	295616		

pH of Soil by ASTM D4972

Boring ID	Sample ID	Depth	Visual Description	pH of Soil in Distilled Water	pH of Soil in Calcium Chloride
B-24	---	13.5-15 ft	Moist, reddish yellow sandy silt	4.8	3.9

Notes: Sample Preparation: screened through #10 sieve

Method A, pH meter used

Client:	F&ME Consultants
Project:	I-20/26/126 Corridor Improvement
Location:	---
GTX#:	307802
Test Date:	06/11/18
Tested By:	twh
Checked By:	emm

Laboratory Measurement of Soil Resistivity Using the Wenner Four-Electrode Method by ASTM G57 (Laboratory Measurement)

Boring ID	Sample ID	Depth, ft.	Sample Description	Electrical Resistivity, ohm-cm	Electrical Conductivity, $(ohm\text{-}cm)^{-1}$
B-24	---	13.5-15 ft	Moist, reddish yellow sandy silt	21,407	2.09E-05

Notes: Test Equipment: Nilsson Model 400 Soil Resistance Meter, MC Miller Soil Box
Water added to sample to create a thick slurry prior to testing (saturated condition).
Electrical Conductivity is calculated as inverse of Electrical Resistivity (per ASTM G57)
Test conducted in standard laboratory atmosphere: 68-73 F

Project Name: I-20/26/126 CORRIDOR IMPROVE
Project Number: 307802
Lab Number: L1824882
Report Date: 07/10/18

SAMPLE RESULTS

Lab ID: L1824882-10
Client ID: B-24, 13.5-15 FT
Sample Location: Not Specified
Sample Depth:
Matrix: Soil

Date Collected: 06/28/18 14:49
Date Received: 06/29/18
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	84.4		%	0.100	NA	1	-	07/03/18 13:04	121,2540G	RI
Chloride	12		mg/kg	10	--	1	-	07/03/18 21:24	1,9251	TL
Sulfate	ND		mg/kg	120	--	1	-	07/03/18 01:55	1,9038	JR

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0834	**DATE SAMPLE RECEIVED:**	5/8/2018
DESCRIPTION OF SOIL:	Various		
TESTED BY:	BF	**DATE OF TESTING:**	5/8/2018
		DATE OF WEIGHING:	5/12/2018

BORING NO.	B-25	B-25	B-25	B-25	
SAMPLE NO.	18-0834C SS-1	18-0834L SS-3	18-0834F SS-4	18-0834I SS-6	
SAMPLE DEPTH	0.0-2.0'	4.0-6.0'	6.0-8.0'	13.5-15.0'	
WATER CONTENT, W%	7.7	13.7	8.0	11.91	

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

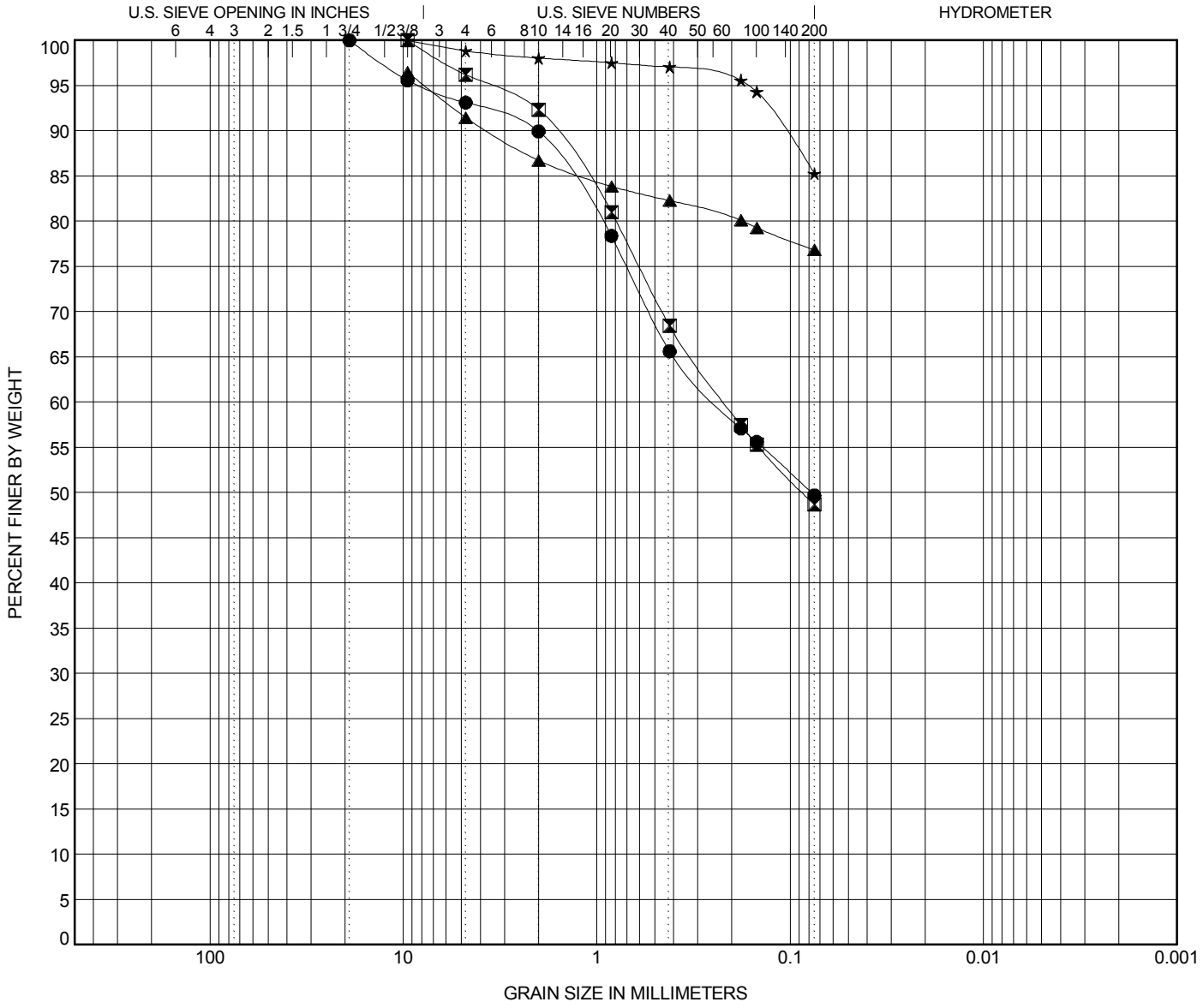
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**B-25**	**2.0**	**Silty F/M SAND (SM) A-4(0)**	**29**	**26**	**3**		
⧓	**B-25**	**6.0**	**Clayey Fine SAND (SC) A-4(1)**	**29**	**21**	**8**		
▲	**B-25**	**8.0**	**SILT (ML) with F/C Sand A-4(0)**	**NP**	**NP**	**NP**		
★	**B-25**	**15.0**	**SILT (ML) A-4(5)**	**32**	**26**	**6**		

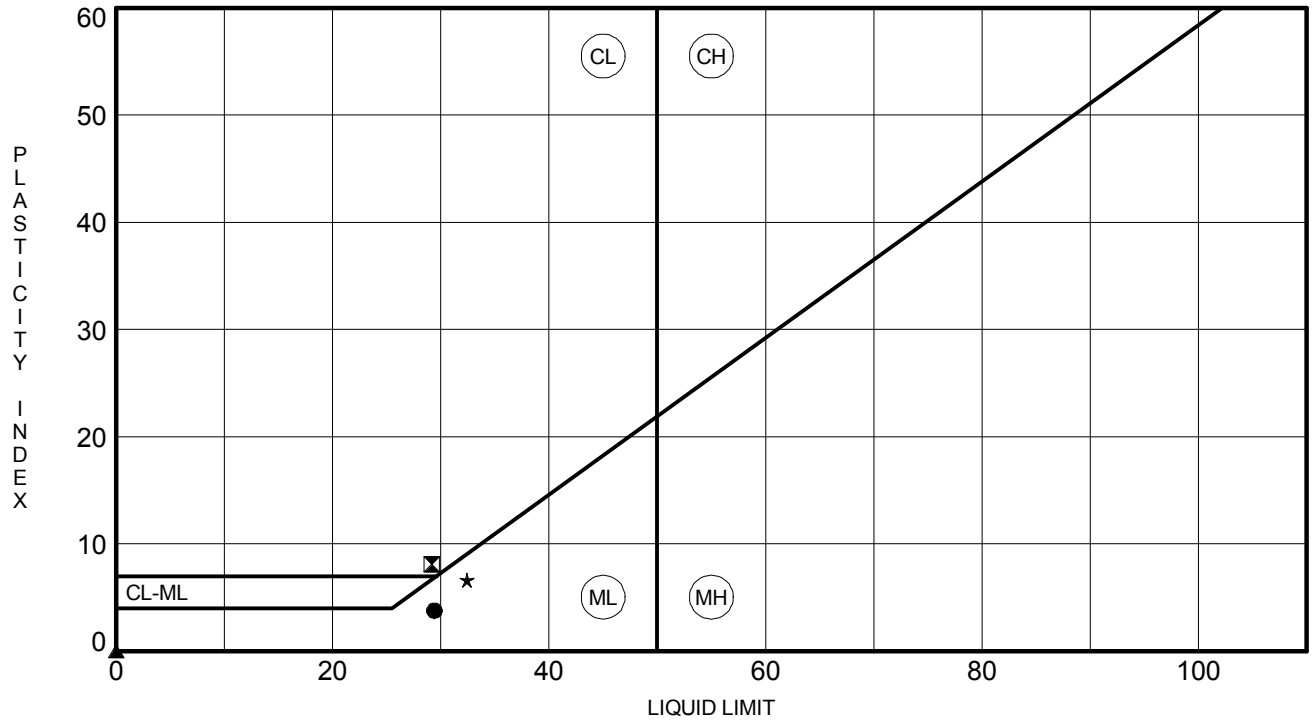
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-25**	**2.0**	**19**	**8.074**	**0.078**		**6.9**	**43.4**	**49.7**	
⧓	**B-25**	**6.0**	**9.52**	**3.628**	**0.086**		**3.8**	**47.5**	**48.7**	
▲	**B-25**	**8.0**	**9.52**	**7.754**			**5.0**	**14.6**	**76.8**	
★	**B-25**	**15.0**	**9.52**	**0.165**			**1.2**	**13.6**	**85.3**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/29/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**B-25**	**2.0**	**29**	**26**	**3**	**50**	**Silty F/M SAND (SM) A-4(0)**
⊠	**B-25**	**6.0**	**29**	**21**	**8**	**49**	**Clayey Fine SAND (SC) A-4(1)**
▲	**B-25**	**8.0**	**NP**	**NP**	**NP**	**77**	**SILT (ML) with F/C Sand A-4(0)**
★	**B-25**	**15.0**	**32**	**26**	**6**	**85**	**SILT (ML) A-4(5)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/29/18

Client:	F&ME Consultants				
Project:	I-20/26/126 Corridor Improvements				
Location:	---			Project No:	GTX-307802
Boring ID:	---	Sample Type:	---	Tested By:	twh
Sample ID:	---	Test Date:	06/08/18	Checked By:	MCM
Depth :	---	Test Id:	295616		

pH of Soil by ASTM D4972

Boring ID	Sample ID	Depth	Visual Description	pH of Soil in Distilled Water	pH of Soil in Calcium Chloride
B-25	---	18.5-20 ft	Moist, light reddish brown sandy silt	4.8	3.8

Notes: Sample Preparation: screened through #10 sieve

Method A, pH meter used

Client:	F&ME Consultants
Project:	I-20/26/126 Corridor Improvement
Location:	---
GTX#:	307802
Test Date:	06/11/18
Tested By:	twh
Checked By:	emm

Laboratory Measurement of Soil Resistivity Using the Wenner Four-Electrode Method by ASTM G57 (Laboratory Measurement)

Boring ID	Sample ID	Depth, ft.	Sample Description	Electrical Resistivity, ohm-cm	Electrical Conductivity, $(ohm\text{-}cm)^{-1}$
B-25	---	18.5-20 ft	Moist, light reddish brown sandy silt	31,600	3.16E-05

Notes: Test Equipment: Nilsson Model 400 Soil Resistance Meter, MC Miller Soil Box
Water added to sample to create a thick slurry prior to testing (saturated condition).
Electrical Conductivity is calculated as inverse of Electrical Resistivity (per ASTM G57)
Test conducted in standard laboratory atmosphere: 68-73 F

Project Name: I-20/26/126 CORRIDOR IMPROVE
Project Number: 307802
Lab Number: L1824882
Report Date: 07/10/18

SAMPLE RESULTS

Lab ID: L1824882-11
Client ID: B-25, 18.5-20 FT
Sample Location: Not Specified
Sample Depth:
Matrix: Soil

Date Collected: 06/28/18 14:52
Date Received: 06/29/18
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	81.8		%	0.100	NA	1	-	07/03/18 13:04	121,2540G	RI
Chloride	18		mg/kg	12	--	1	-	07/03/18 21:25	1,9251	TL
Sulfate	ND		mg/kg	120	--	1	-	07/03/18 02:15	1,9038	JR

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0853	**DATE SAMPLE RECEIVED:**	5/15/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	5/22/2018
		DATE OF WEIGHING:	5/23/2018

BORING NO.	B-26	B-26	B-26	B-26	
SAMPLE NO.	18-0853C SS-2	18-0853F SS-8	18-0853I SS-10	18-0853L SS-12	
SAMPLE DEPTH	2.0-4.0'	23.5-25.0'	33.5-35.0'	43.5-45.0'	
WATER CONTENT, W%	28.8	41.3	30.8	25.1	

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

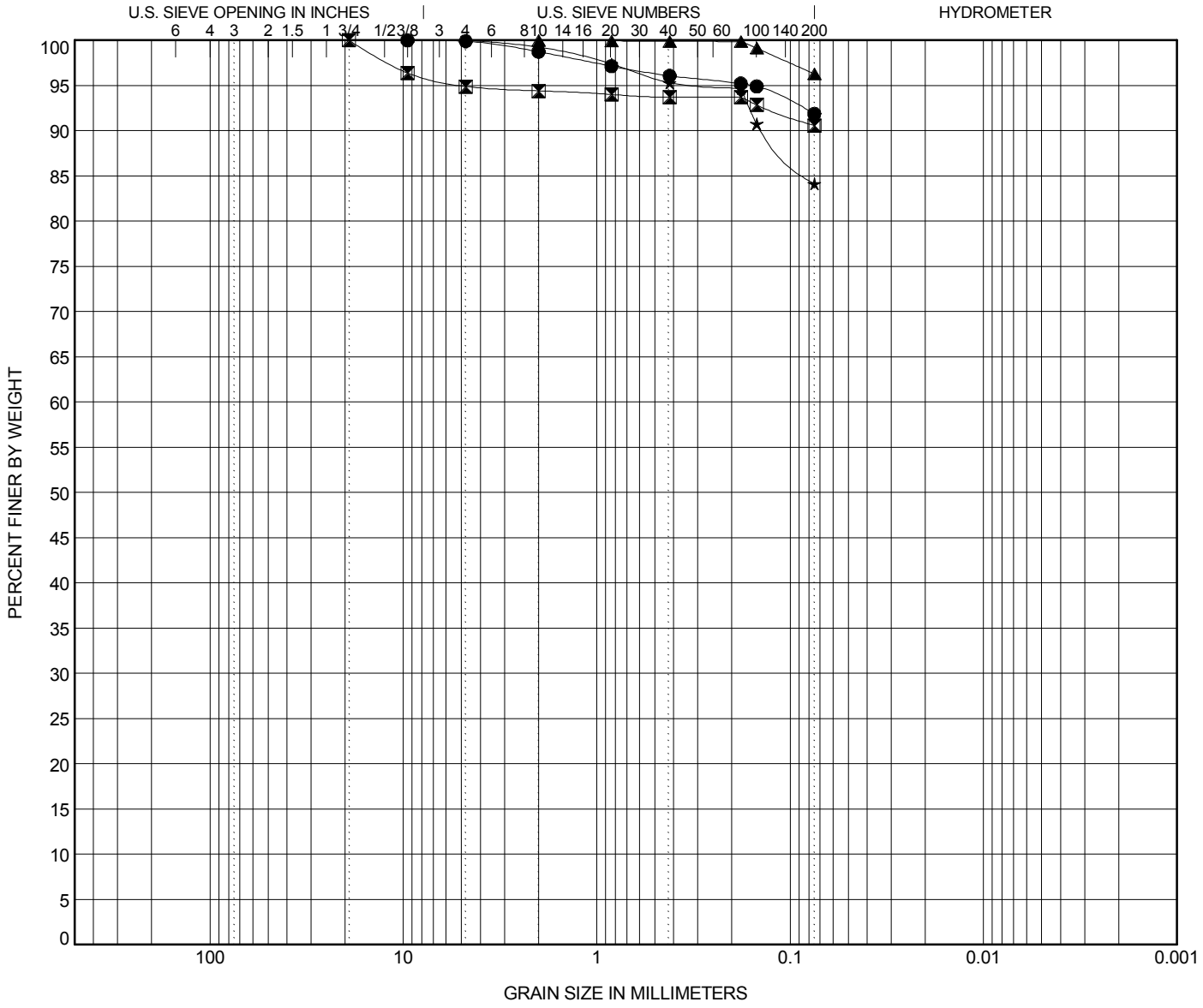
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**B-26**	**4.0**	**Elastic SILT (MH) A-7-5(20)**	**59**	**45**	**14**		
⧓	**B-26**	**25.0**	**Elastic SILT (MH) A-7-5(20)**	**57**	**37**	**20**		
▲	**B-26**	**35.0**	**SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		
★	**B-26**	**45.0**	**SILT (ML) with Sand A-7-5(11)**	**44**	**33**	**11**		

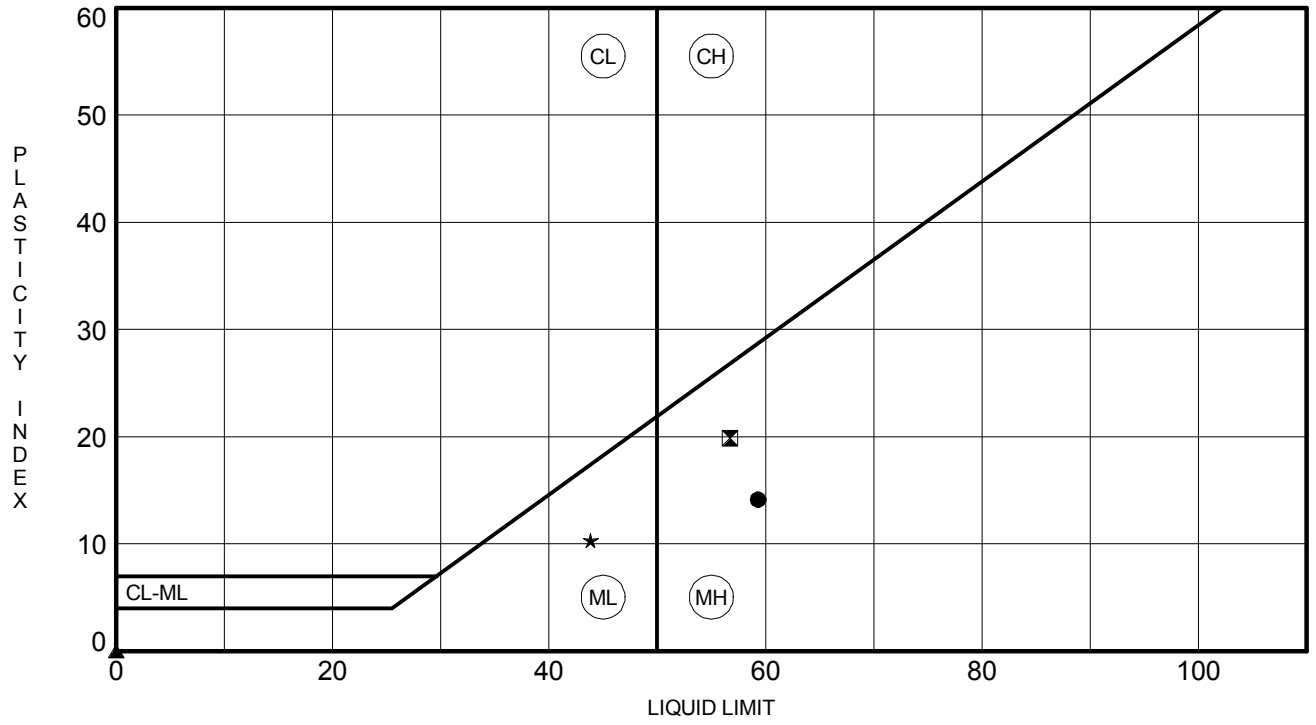
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-26**	**4.0**	**9.52**	**0.157**			**0.1**	**8.0**	**91.9**	
⧓	**B-26**	**25.0**	**19.1**	**4.989**			**5.1**	**4.3**	**90.6**	
▲	**B-26**	**35.0**	**2**				**0.0**	**3.7**	**96.3**	
★	**B-26**	**45.0**	**4.76**	**0.275**			**0.0**	**15.9**	**84.1**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/5/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**B-26**	**4.0**	**59**	**45**	**14**	**92**	**Elastic SILT (MH) A-7-5(20)**
⊠	**B-26**	**25.0**	**57**	**37**	**20**	**91**	**Elastic SILT (MH) A-7-5(20)**
▲	**B-26**	**35.0**	**NP**	**NP**	**NP**	**96**	**SILT (ML) A-4(0)**
★	**B-26**	**45.0**	**44**	**33**	**11**	**84**	**SILT (ML) with Sand A-7-5(11)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/5/18

Client:	F&ME Consultants				
Project:	I-20/26/126 Corridor Improvements				
Location:	---			Project No:	GTX-307802
Boring ID:	---	Sample Type:	---	Tested By:	twh
Sample ID:	---	Test Date:	06/08/18	Checked By:	MCM
Depth :	---	Test Id:	295616		

pH of Soil by ASTM D4972

Boring ID	Sample ID	Depth	Visual Description	pH of Soil in Distilled Water	pH of Soil in Calcium Chloride
B-26	---	18.5-20 ft	Moist, olive gray sandy clay	4.8	3.7

Notes: Sample Preparation: screened through #10 sieve

Method A, pH meter used

Client:	F&ME Consultants
Project:	I-20/26/126 Corridor Improvement
Location:	---
GTX#:	307802
Test Date:	06/11/18
Tested By:	twh
Checked By:	emm

Laboratory Measurement of Soil Resistivity Using the Wenner Four-Electrode Method by ASTM G57 (Laboratory Measurement)

Boring ID	Sample ID	Depth, ft.	Sample Description	Electrical Resistivity, ohm-cm	Electrical Conductivity, $(ohm\text{-}cm)^{-1}$
B-26	---	18.5-20 ft	Moist, olive gray sandy clay	12,232	8.18E-05

Notes: Test Equipment: Nilsson Model 400 Soil Resistance Meter, MC Miller Soil Box
Water added to sample to create a thick slurry prior to testing (saturated condition).
Electrical Conductivity is calculated as inverse of Electrical Resistivity (per ASTM G57)
Test conducted in standard laboratory atmosphere: 68-73 F

Project Name: I-20/26/126 CORRIDOR IMPROVE
Project Number: 307802
Lab Number: L1824882
Report Date: 07/10/18

SAMPLE RESULTS

Lab ID: L1824882-12
Client ID: B-26, 18.5-20 FT
Sample Location: Not Specified
Sample Depth:
Matrix: Soil

Date Collected: 06/28/18 14:56
Date Received: 06/29/18
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	73.5		%	0.100	NA	1	-	07/03/18 13:04	121,2540G	RI
Chloride	ND		mg/kg	13	--	1	-	07/03/18 21:27	1,9251	TL
Sulfate	ND		mg/kg	140	--	1	-	07/03/18 02:15	1,9038	JR

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0897	**DATE SAMPLE RECEIVED:**	5/15/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	5/22/2018
		DATE OF WEIGHING:	5/23/2018

BORING NO.	B-27	B-27	B-27		
SAMPLE NO.	18-0897C SS-4	18-0897F SS-6	18-0897I SS-12		
SAMPLE DEPTH	6.0-8.0'	13.5-15.0'	43.5-45.0'		
WATER CONTENT, W%	20.0	29.3	30.0		

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

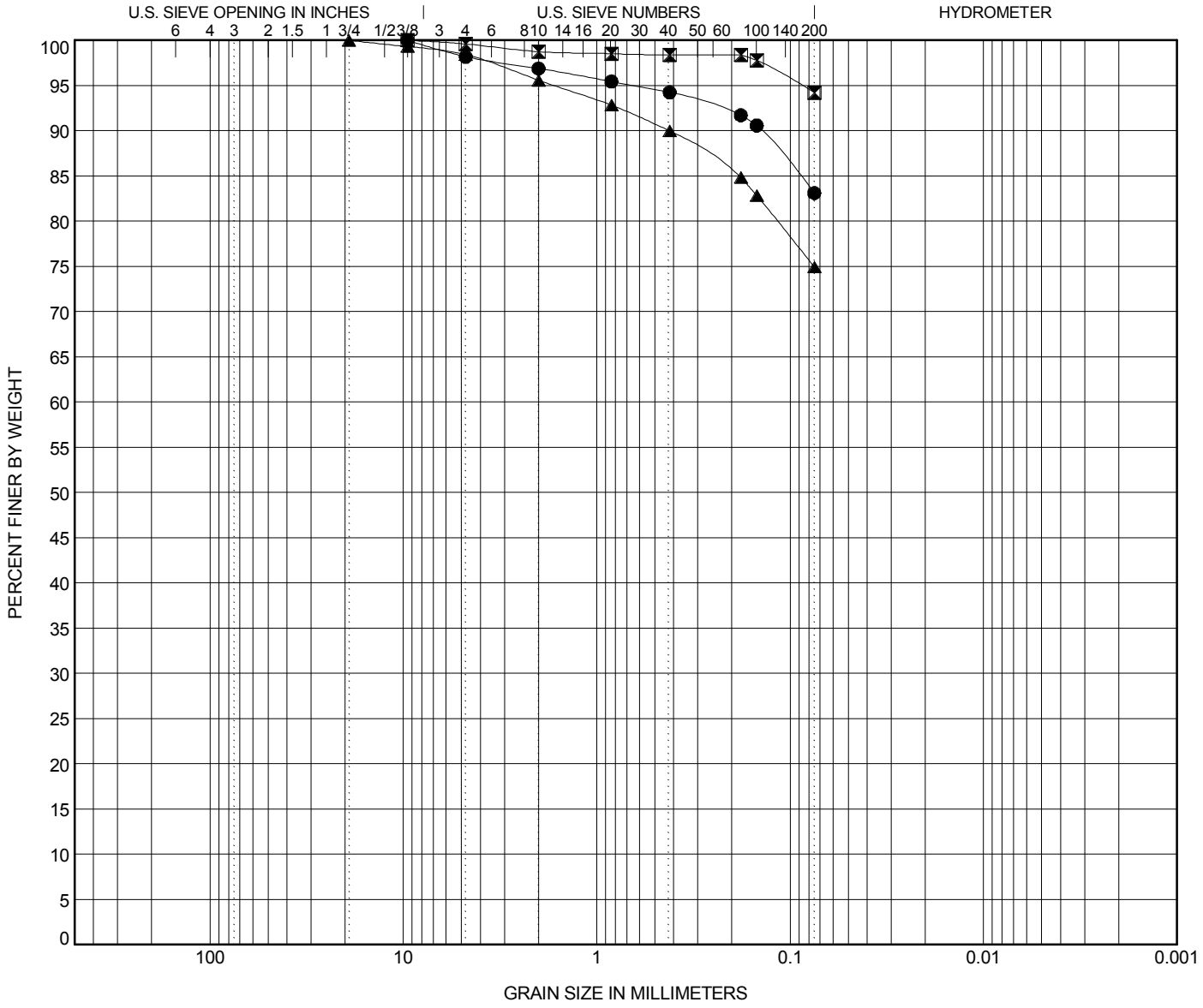
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**B-27**	**8.0**	**SILT (ML) with Sand A-4(0)**	**NP**	**NP**	**NP**		
⧓	**B-27**	**15.0**	**SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		
▲	**B-27**	**45.0**	**SILT (ML) with Sand A-4(0)**	**NP**	**NP**	**NP**		

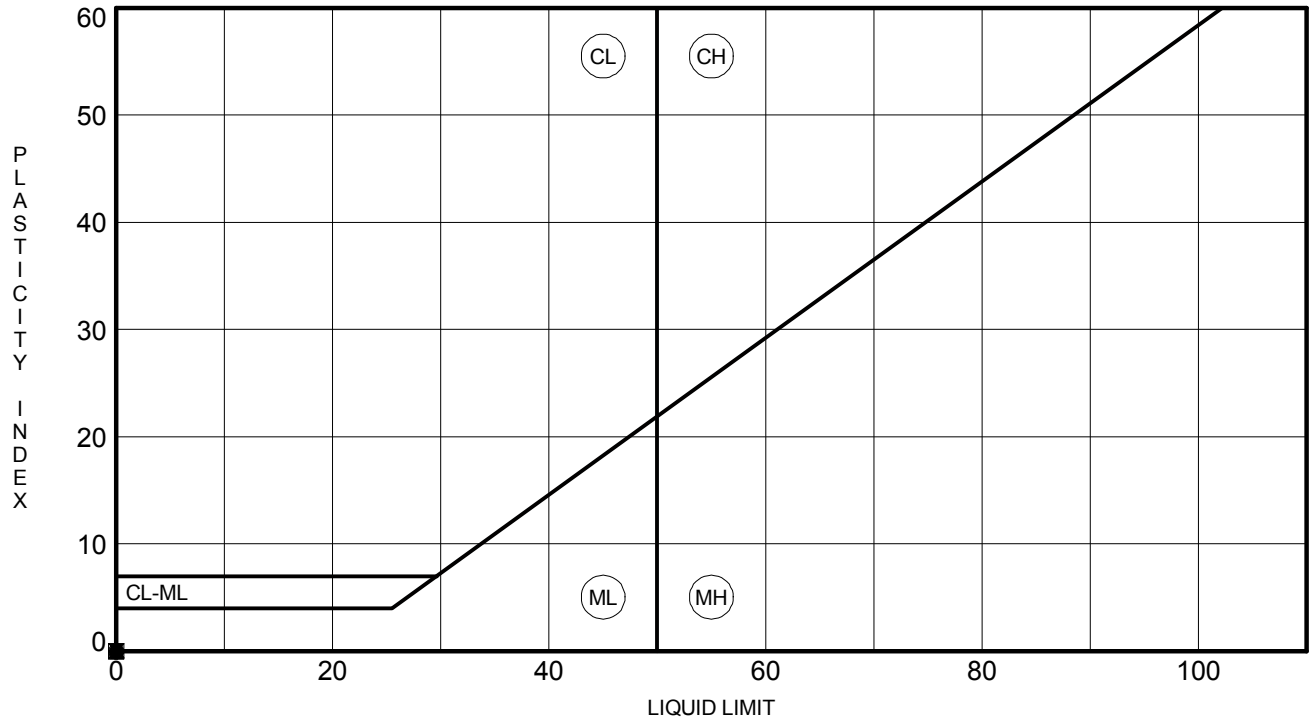
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-27**	**8.0**	**9.52**	**0.645**			**1.8**	**15.1**	**83.1**	
⧓	**B-27**	**15.0**	**9.52**	**0.087**			**0.4**	**5.4**	**94.2**	
▲	**B-27**	**45.0**	**19.1**	**1.663**			**1.6**	**23.5**	**74.9**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/7/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**B-27**	**8.0**	**NP**	**NP**	**NP**	**83**	**SILT (ML) with Sand A-4(0)**
⊠	**B-27**	**15.0**	**NP**	**NP**	**NP**	**94**	**SILT (ML) A-4(0)**
▲	**B-27**	**45.0**	**NP**	**NP**	**NP**	**75**	**SILT (ML) with Sand A-4(0)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/7/18

Client:	F&ME Consultants				
Project:	I-20/26/126 Corridor Improvements				
Location:	---			Project No:	GTX-307802
Boring ID:	---	Sample Type:	---	Tested By:	twh
Sample ID:	---	Test Date:	06/08/18	Checked By:	MCM
Depth :	---	Test Id:	295616		

pH of Soil by ASTM D4972

Boring ID	Sample ID	Depth	Visual Description	pH of Soil in Distilled Water	pH of Soil in Calcium Chloride
B-27	---	23.5-25 ft	Moist, yellowish red sandy silt	4.2	3.3

Notes: Sample Preparation: screened through #10 sieve

Method A, pH meter used

Client:	F&ME Consultants
Project:	I-20/26/126 Corridor Improvement
Location:	---
GTX#:	307802
Test Date:	06/11/18
Tested By:	twh
Checked By:	emm

Laboratory Measurement of Soil Resistivity Using the Wenner Four-Electrode Method by ASTM G57 (Laboratory Measurement)

Boring ID	Sample ID	Depth, ft.	Sample Description	Electrical Resistivity, ohm-cm	Electrical Conductivity, $(ohm\text{-}cm)^{-1}$
B-27	---	23.5-25 ft	Moist, yellowish red sandy silt	45,871	2.18E-05

Notes: Test Equipment: Nilsson Model 400 Soil Resistance Meter, MC Miller Soil Box
Water added to sample to create a thick slurry prior to testing (saturated condition).
Electrical Conductivity is calculated as inverse of Electrical Resistivity (per ASTM G57)
Test conducted in standard laboratory atmosphere: 68-73 F

Project Name: I-20/26/126 CORRIDOR IMPROVE
Project Number: 307802
Lab Number: L1824882
Report Date: 07/10/18

SAMPLE RESULTS

Lab ID: L1824882-13
Client ID: B-27, 23.5-25 FT
Sample Location: Not Specified
Sample Depth:
Matrix: Soil

Date Collected: 06/28/18 15:02
Date Received: 06/29/18
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	80.1		%	0.100	NA	1	-	07/03/18 13:04	121,2540G	RI
Chloride	15		mg/kg	12	--	1	-	07/03/18 21:30	1,9251	TL
Sulfate	ND		mg/kg	120	--	1	-	07/03/18 02:15	1,9038	JR

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0512	**DATE SAMPLE RECEIVED:**	3/20/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	3/20/2018
		DATE OF WEIGHING:	3/21/2018

BORING NO.	B-28	B-28	B-28	B-28	B-28
SAMPLE NO.	18-0512C SS-2	18-0512R SS-3	18-0512F SS-5	18-0512I SS-8	18-0512L SS-10
SAMPLE DEPTH	2.0-4.0'	4.0-6.0'	8.0-10.0'	23.5-25.0'	33.5-35.0'
WATER CONTENT, W%	20.2	21.0	19.2	16.4	18.1

BORING NO.	B-28				
SAMPLE NO.	18-0512O SS-12				
SAMPLE DEPTH	43.5-45.0'				
WATER CONTENT, W%	18.2				

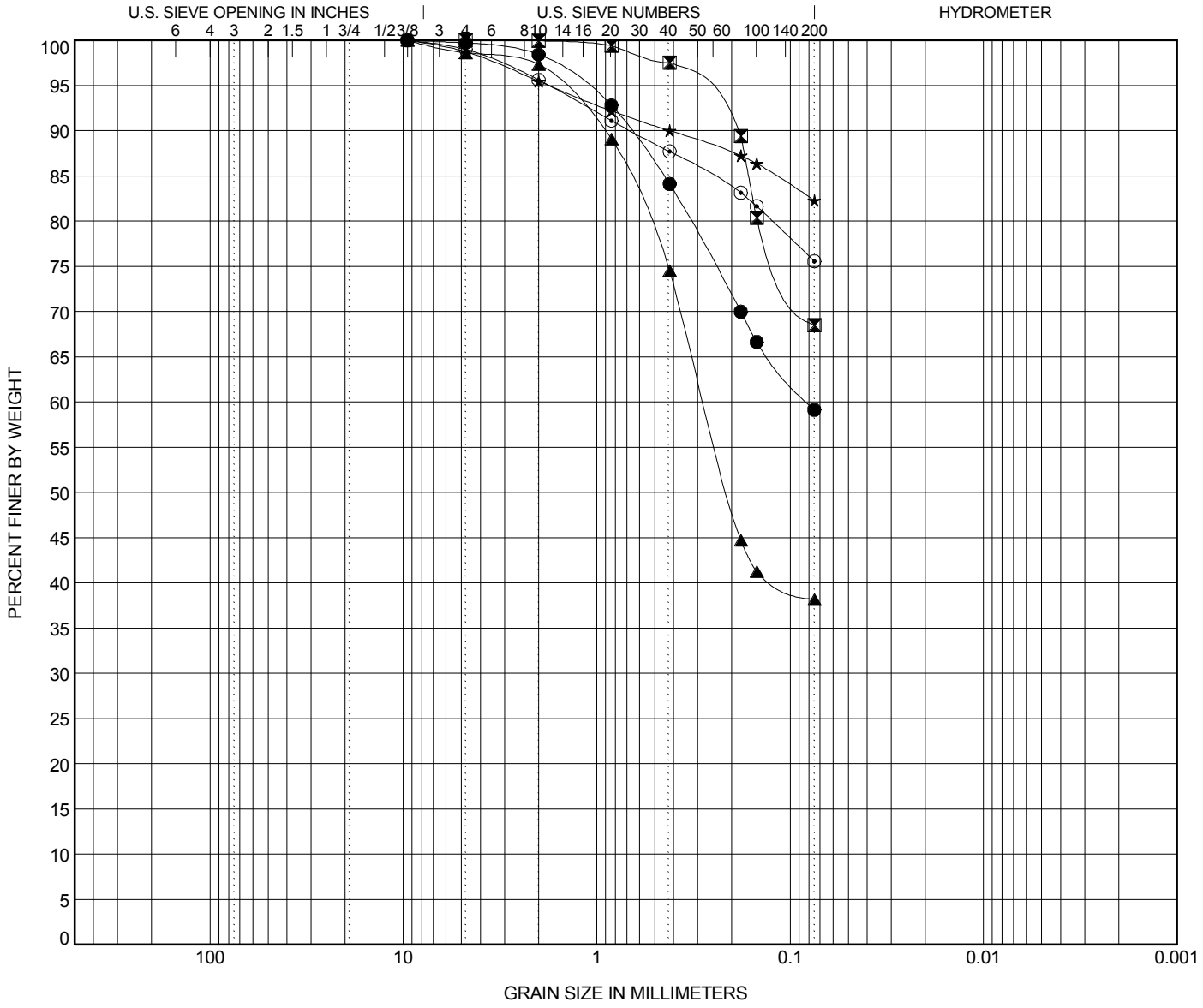
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**B-28**	**4.0**	**Sandy Lean CLAY (CL) A-7-6(10)**	**46**	**26**	**20**		
⊠	**B-28**	**6.0**	**Sandy Fat CLAY (CH) A-7-6(18)**	**52**	**25**	**27**		
▲	**B-28**	**10.0**	**Silty F/M SAND (SM) A-4(0)**	**NP**	**NP**	**NP**		
★	**B-28**	**25.0**	**SILT (ML) with F/M Sand A-4(0)**	**NP**	**NP**	**NP**		
⊙	**B-28**	**35.0**	**SILT (ML) with F/M Sand A-4(0)**	**NP**	**NP**	**NP**		

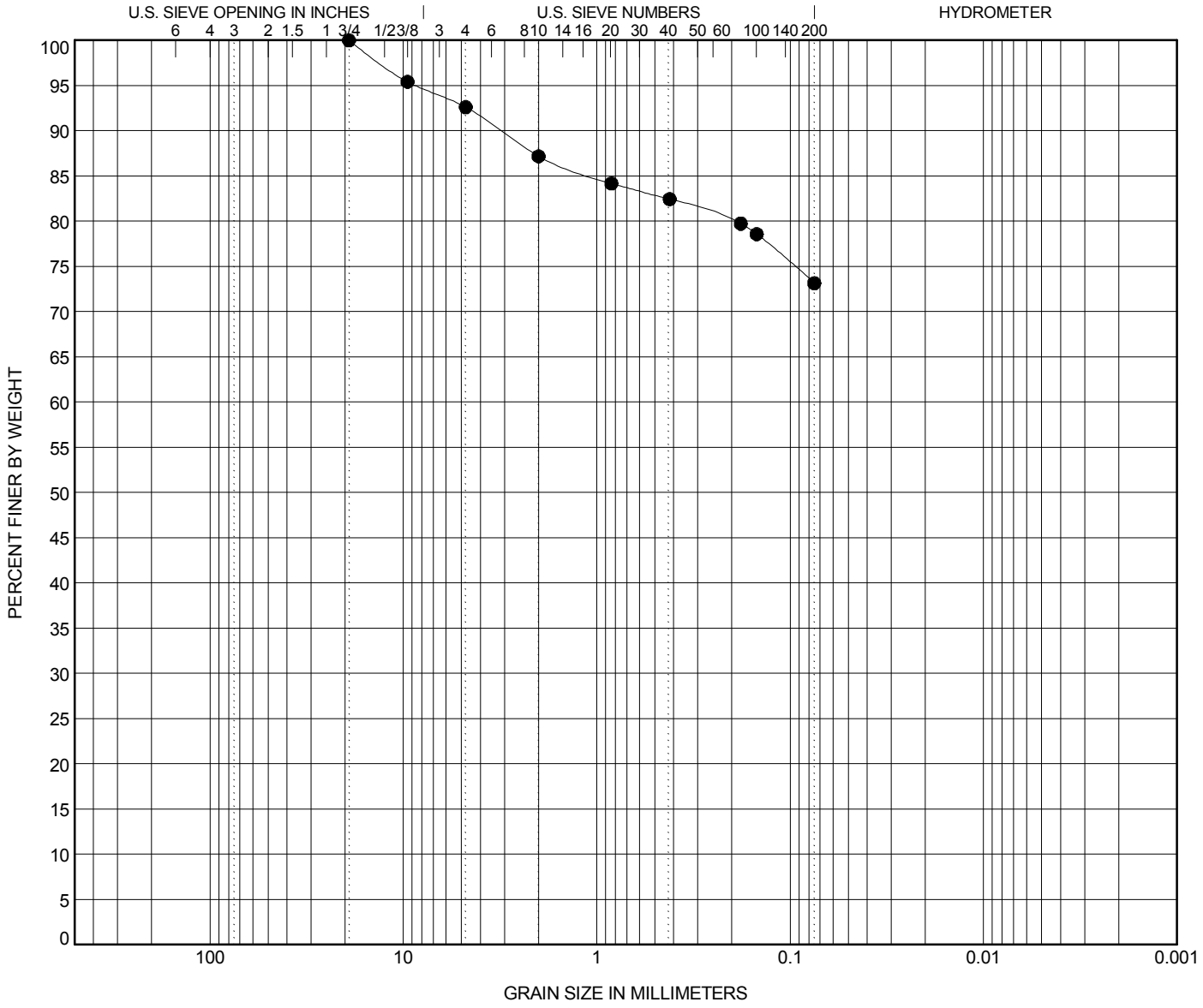
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-28**	**4.0**	**9.52**	**1.176**			**0.3**	**40.6**	**59.2**	
⊠	**B-28**	**6.0**	**4.76**	**0.322**			**0.0**	**31.5**	**68.5**	
▲	**B-28**	**10.0**	**9.52**	**1.563**	**0.209**		**1.4**	**60.5**	**38.2**	
★	**B-28**	**25.0**	**9.52**	**1.766**			**1.3**	**16.4**	**82.3**	
⊙	**B-28**	**35.0**	**9.52**	**1.77**			**1.0**	**23.4**	**75.6**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/29/18

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**B-28**	**45.0**	**SILT (ML) with F/C Sand A-6(10)**	**40**	**26**	**14**		

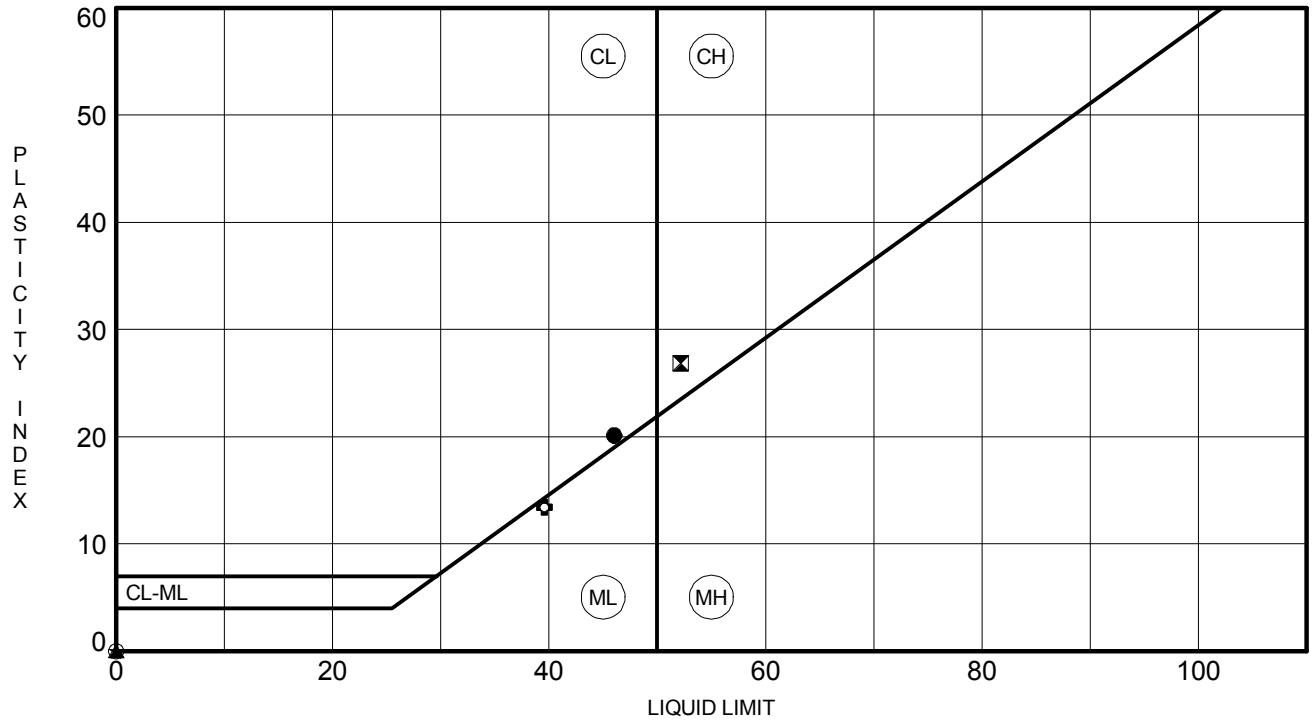
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-28**	**45.0**	**19.1**	**8.573**			**7.4**	**19.5**	**73.2**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/29/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**B-28**	**4.0**	**46**	**26**	**20**	**59**	**Sandy Lean CLAY (CL) A-7-6(10)**
⧓	**B-28**	**6.0**	**52**	**25**	**27**	**68**	**Sandy Fat CLAY (CH) A-7-6(18)**
▲	**B-28**	**10.0**	**NP**	**NP**	**NP**	**38**	**Silty F/M SAND (SM) A-4(0)**
★	**B-28**	**25.0**	**NP**	**NP**	**NP**	**82**	**SILT (ML) with F/M Sand A-4(0)**
⊙	**B-28**	**35.0**	**NP**	**NP**	**NP**	**76**	**SILT (ML) with F/M Sand A-4(0)**
✿	**B-28**	**45.0**	**40**	**26**	**14**	**73**	**SILT (ML) with F/C Sand A-6(10)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/29/18

Client:	F&ME Consultants				
Project:	I-20/26/126 Corridor Improvements				
Location:	---			Project No:	GTX-307802
Boring ID:	---	Sample Type:	---	Tested By:	twh
Sample ID:	---	Test Date:	05/11/18	Checked By:	n/a
Depth :	---	Test Id:	293112		

pH of Soil by ASTM D4972

Boring ID	Sample ID	Depth	Visual Description	pH of Soil in Distilled Water	pH of Soil in Calcium Chloride
B-28	---	6-8 ft	Moist, light red clay	3.7	2.7

Notes: Sample Preparation: screened through #10 sieve

Method A, pH meter used

Client:	F&ME Consultants
Project:	I-20/26/126 Corridor Improvement
Location:	---
GTX#:	307802
Test Date:	05/09/18
Tested By:	twh
Checked By:	jm

Laboratory Measurement of Soil Resistivity Using the Wenner Four-Electrode Method by ASTM G57 (Laboratory Measurement)

Boring ID	Sample ID	Depth, ft.	Sample Description	Electrical Resistivity, ohm-cm	Electrical Conductivity, $(ohm\text{-}cm)^{-1}$
B-28	---	6-8 ft	Moist, light red clay	51,988	1.92E-05

Notes: Test Equipment: Nilsson Model 400 Soil Resistance Meter, MC Miller Soil Box
Water added to sample to create a thick slurry prior to testing (saturated condition).
Electrical Conductivity is calculated as inverse of Electrical Resistivity (per ASTM G57)
Test conducted in standard laboratory atmosphere: 68-73 F

Project Name: I-20/26/126 CORRIDOR IMPROVEME
Project Number: 307802
Lab Number: L1814569
Report Date: 05/01/18

SAMPLE RESULTS

Lab ID: L1814569-10
Client ID: B-28, 6-8 FT
Sample Location: Not Specified
Sample Depth:
Matrix: Soil

Date Collected: 04/18/18 14:39
Date Received: 04/25/18
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	80.2		%	0.100	NA	1	-	04/27/18 09:39	121,2540G	RI
Chloride	ND		mg/kg	12	--	1	-	04/30/18 23:01	1,9251	TL
Sulfate	ND		mg/kg	120	--	1	-	04/30/18 17:05	1,9038	BR

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0971	**DATE SAMPLE RECEIVED:**	5/31/2018
DESCRIPTION OF SOIL:	Various		
TESTED BY:	MB	**DATE OF TESTING:**	6/4/2018
		DATE OF WEIGHING:	6/5/2018

BORING NO.	B-63	B-63	B-63		
SAMPLE NO.	18-0971C SS-1	18-0971F SS-4	18-0971I SS-5		
SAMPLE DEPTH	0.0-2.0'	6.0-8.0'	8.0-10.0'		
WATER CONTENT, W%	18.2	25.4	34.5		

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

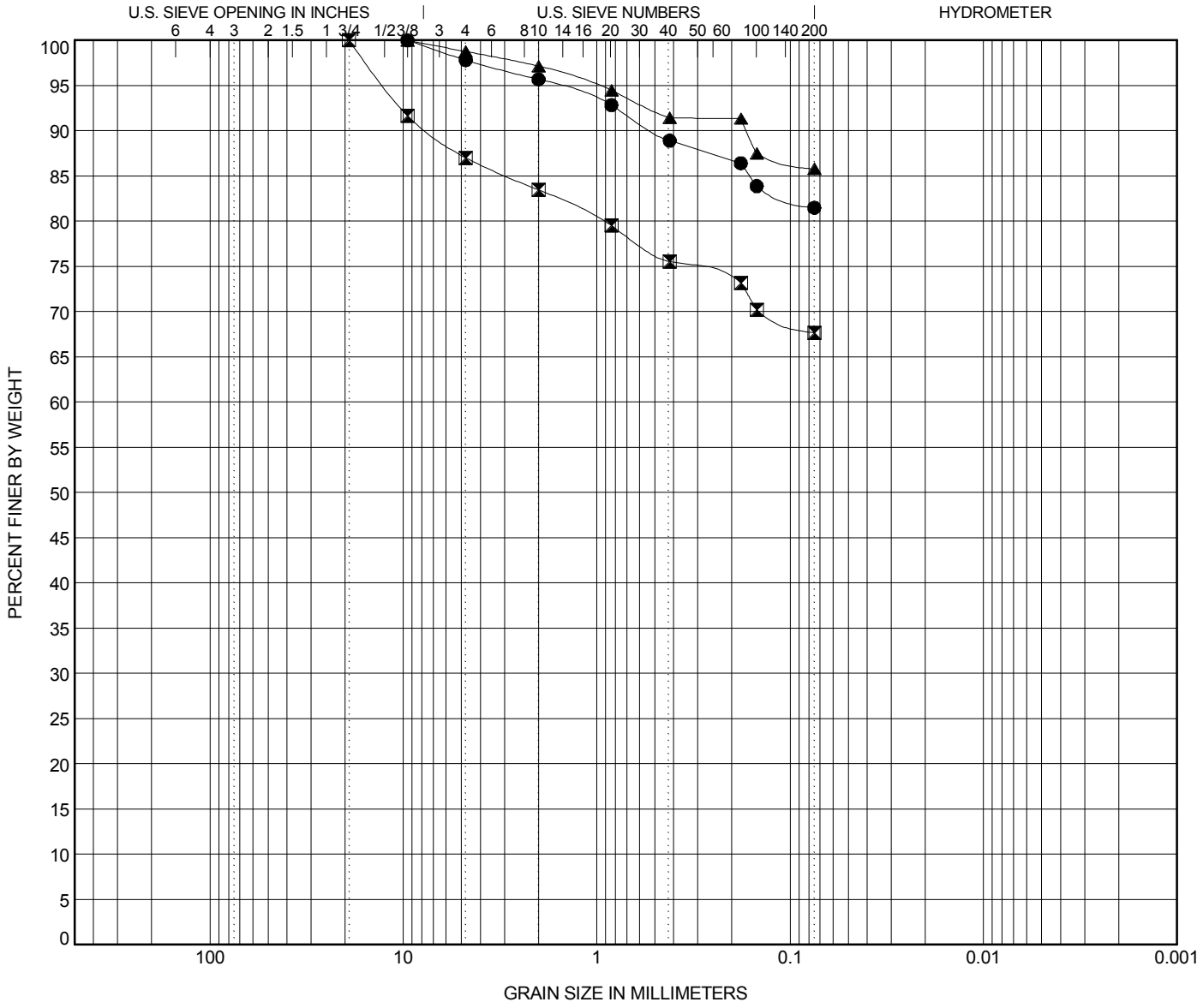
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
● B-63	2.0	**Lean CLAY (CL) with Sand A-7-6(16)**	44	25	19		
⧓ B-63	8.0	**Sandy Elastic SILT (MH) A-7-5(18)**	58	33	25		
▲ B-63	10.0	**Elastic SILT (MH) A-7-5(20)**	62	35	27		

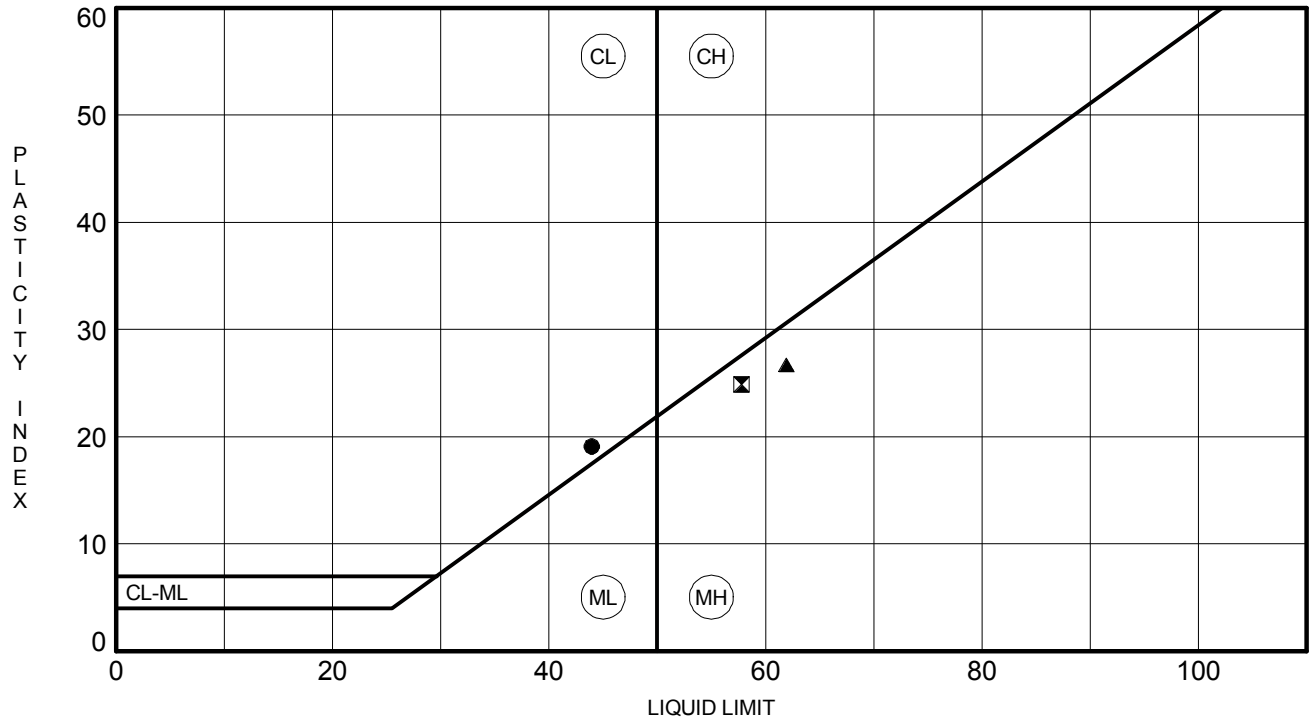
BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
● B-63	2.0	9.52	1.619			2.2	16.3	81.5	
⧓ B-63	8.0	19.1	12.583			13.0	19.3	67.7	
▲ B-63	10.0	9.52	0.996			1.2	13.0	85.8	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 8/2/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**B-63**	**2.0**	**44**	**25**	**19**	**81**	**Lean CLAY (CL) with Sand A-7-6(16)**
⊠	**B-63**	**8.0**	**58**	**33**	**25**	**68**	**Sandy Elastic SILT (MH) A-7-5(18)**
▲	**B-63**	**10.0**	**62**	**35**	**27**	**86**	**Elastic SILT (MH) A-7-5(20)**

Client:	F&ME Consultants				
Project:	I-20/26/126 Corridor Improvements				
Location:	---			Project No:	GTX-307802
Boring ID:	---	Sample Type:	---	Tested By:	twh
Sample ID:	---	Test Date:	06/08/18	Checked By:	MCM
Depth :	---	Test Id:	295616		

pH of Soil by ASTM D4972

Boring ID	Sample ID	Depth	Visual Description	pH of Soil in Distilled Water	pH of Soil in Calcium Chloride
B-63	---	2-4 ft	Moist, yellowish red sandy silt	4.5	3.4

Notes: Sample Preparation: screened through #10 sieve

Method A, pH meter used

Client:	F&ME Consultants
Project:	I-20/26/126 Corridor Improvement
Location:	---
GTX#:	307802
Test Date:	06/11/18
Tested By:	twh
Checked By:	emm

Laboratory Measurement of Soil Resistivity Using the Wenner Four-Electrode Method by ASTM G57 (Laboratory Measurement)

Boring ID	Sample ID	Depth, ft.	Sample Description	Electrical Resistivity, ohm-cm	Electrical Conductivity, $(ohm\text{-}cm)^{-1}$
B-63	---	2-4 ft	Moist, yellowish red sandy silt	35,678	2.80E-05

Notes: Test Equipment: Nilsson Model 400 Soil Resistance Meter, MC Miller Soil Box
Water added to sample to create a thick slurry prior to testing (saturated condition).
Electrical Conductivity is calculated as inverse of Electrical Resistivity (per ASTM G57)
Test conducted in standard laboratory atmosphere: 68-73 F

Project Name: I-20/26/126 CORRIDOR IMPROVE
Project Number: 307802
Lab Number: L1824882
Report Date: 07/10/18

SAMPLE RESULTS

Lab ID: L1824882-14
Client ID: B-63, 2-4 FT
Sample Location: Not Specified
Sample Depth:
Matrix: Soil
Date Collected: 06/28/18 15:08
Date Received: 06/29/18
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	79.9		%	0.100	NA	1	-	07/03/18 13:04	121,2540G	RI
Chloride	15		mg/kg	12	--	1	-	07/03/18 21:31	1,9251	TL
Sulfate	ND		mg/kg	120	--	1	-	07/03/18 02:15	1,9038	JR

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

ROCK CORE COMPRESSION TEST

PROJECT: I-20/26/126 Corridor Improvements **PROJECT NO:** G5662.01

SAMPLED BY: CP **DATE SAMPLED:** 5/18/2018

TESTED BY: BF **DATE TESTED:** 5/23/2018

Lab No.	18-0985A	18-0985B	18-0985C	18-0985D	
Boring No.	B-63	B-63	B-63	B-63	
Sample No.	NQ-1	NQ-3	NQ-4	NQ-5	
Depth	44.0-44.3	50.5-50.8	57.4-57.7	61.4-61.7	
Length (in)	3.92	3.97	4.00	3.99	
Diameter (in)	1.86	1.86	1.85	1.85	
Mass (g)	464.48	477.97	481.36	480.89	
Cross Sectional Area (in^2)	2.70	2.70	2.70	2.70	
Load (lb)	10865	12180	19605	11075	
Compressive Strength (psi)	4020	4510	7270	4110	
Corrected Compressive Strength (psi)					
Unit Weight (lb/ft^3)	167.02	169.84	170.21	170.17	

Signature: _____

Remarks: _____

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0018	**DATE SAMPLE RECEIVED:**	1/12/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	1/12/2018
		DATE OF WEIGHING:	1/15/2018

BORING NO.	DH-1	DH-1			
SAMPLE NO.	18-0018C SS-4	18-0018F SS-7			
SAMPLE DEPTH	6.0 - 8.0'	18.5 - 20.0'			
WATER CONTENT, W%	23.8	19.0			

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

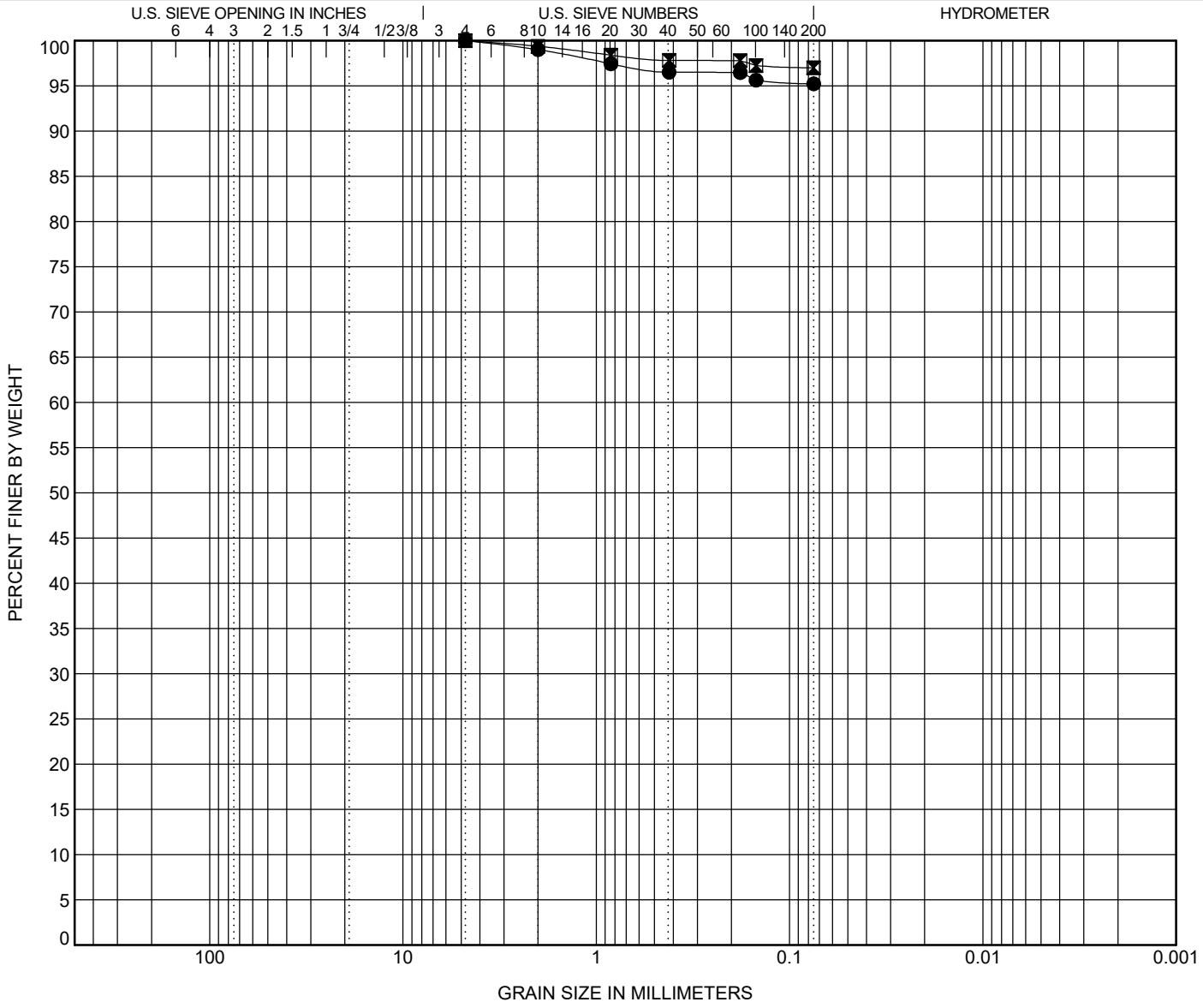
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**DH-1**	**8.0**	**SILT (ML) A-6(14)**	**40**	**27**	**13**		
⊠	**DH-1**	**20.0**	**SILT (ML) A-7-6(17)**	**42**	**27**	**15**		

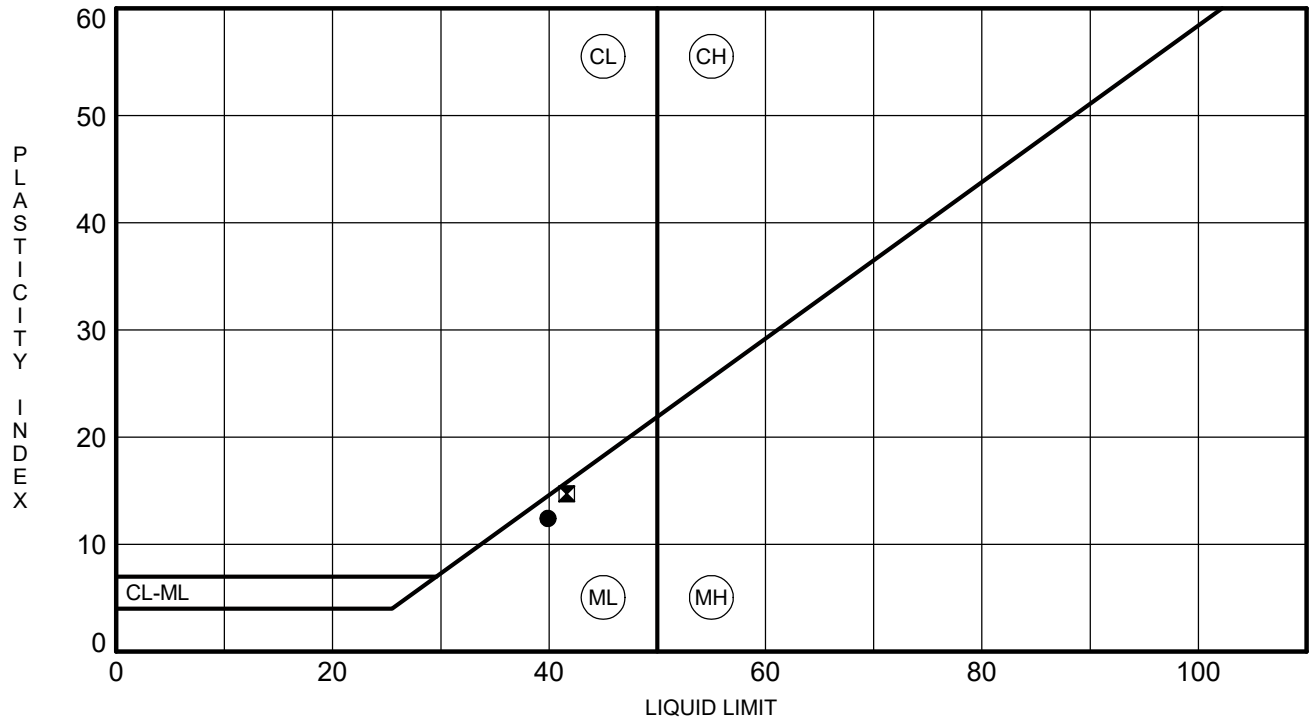
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**DH-1**	**8.0**	**4.76**				**0.0**	**4.8**	**95.2**	
⊠	**DH-1**	**20.0**	**4.76**				**0.0**	**3.0**	**97.0**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 1/24/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**DH-1**	**8.0**	**40**	**27**	**13**	**95**	**SILT (ML) A-6(14)**
⊠	**DH-1**	**20.0**	**42**	**27**	**15**	**97**	**SILT (ML) A-7-6(17)**

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

ROCK CORE COMPRESSION TEST

PROJECT: I-20/26/126 Corridor Improvements **PROJECT NO:** G5662.01

SAMPLED BY: RW **DATE SAMPLED:** 1/4/2018

TESTED BY: BF **DATE TESTED:** 1/25/2018

Lab No.	18-0019A	18-0019B	18-0019C	18-0019D	18-0019E
Boring No.	DH-1	DH-1	DH-1	DH-1	DH-1
Sample No.	NQ-1	NQ-3	NQ-4	NQ-6	NQ-7
Depth	40.6-40.9	46.6-46.9	51.4-51.7	62.6-62.9	66.4-66.7
Length (in)	3.91	3.69	4.09	4.06	3.98
Diameter (in)	1.86	1.86	1.86	1.86	1.86
Mass (g)	468.97	452.06	506.82	500.03	493.26
Cross Sectional Area (in^2)	2.72	2.72	2.72	2.72	2.72
Load (lb)	7680	26225	24505	18605	31400
Compressive Strength (psi)	2830	9650	9020	6850	11560
Corrected Compressive Strength (psi)					
Unit Weight (lb/ft^3)	168.16	171.76	173.73	172.67	173.76

Signature: _____

Remarks: _____

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

ROCK CORE COMPRESSION TEST

PROJECT: I-20/26/126 Corridor Improvements **PROJECT NO:** G5662.01

SAMPLED BY: RW **DATE SAMPLED:** 1/4/2018

TESTED BY: BF **DATE TESTED:** 2/2/2018

Lab No.	18-0019A	18-0019B	18-0019C		
Boring No.	DH-1	DH-1	DH-1		
Sample No.	NQ-6	NQ-8	NQ-11		
Depth	64.6-64.9	72.2-72.5	89.7-90.0		
Length (in)	3.96	3.96	3.89		
Diameter (in)	1.86	1.86	1.86		
Mass (g)	488.32	490.28	475.61		
Cross Sectional Area (in^2)	2.72	2.72	2.71		
Load (lb)	17940	16385	24570		
Compressive Strength (psi)	6600	6020	9060		
Corrected Compressive Strength (psi)					
Unit Weight (lb/ft^3)	172.89	173.08	171.83		

Signature: _____

Remarks: _____

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

ROCK CORE COMPRESSION TEST

PROJECT: I-20/26/126 Corridor Improvements **PROJECT NO:** G5662.01

SAMPLED BY: RW **DATE SAMPLED:** 1/4/2018

TESTED BY: BF **DATE TESTED:** 4/4/2018

Lab No.	18-0019I	18-0019J			
Boring No.	DH-1	DH-1			
Sample No.	NQ-12	NQ-13			
Depth	93.0-93.3	97.0-97.3			
Length (in)	3.97	3.95			
Diameter (in)	1.86	1.86			
Mass (g)	487.00	484.50			
Cross Sectional Area (in^2)	2.73	2.73			
Load (lb)	17640	21675			
Compressive Strength (psi)	6460	7950			
Corrected Compressive Strength (psi)					
Unit Weight (lb/ft^3)	171.29	171.33			

Signature: _____

Remarks: _____

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0052	**DATE SAMPLE RECEIVED:**	1/12/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	1/12/2018
		DATE OF WEIGHING:	1/15/2018

BORING NO.	DH-2	DH-2	DH-2	DH-2	
SAMPLE NO.	18-0052C SS-3	18-0052F SS-7	18-0052I SS-11	18-0052L SS-16	
SAMPLE DEPTH	4.0 - 6.0'	18.5 - 20.0'	38.5 - 40.0'	63.5 - 65.0'	
WATER CONTENT, W%	16.3	21.8	32.5	19.5	

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

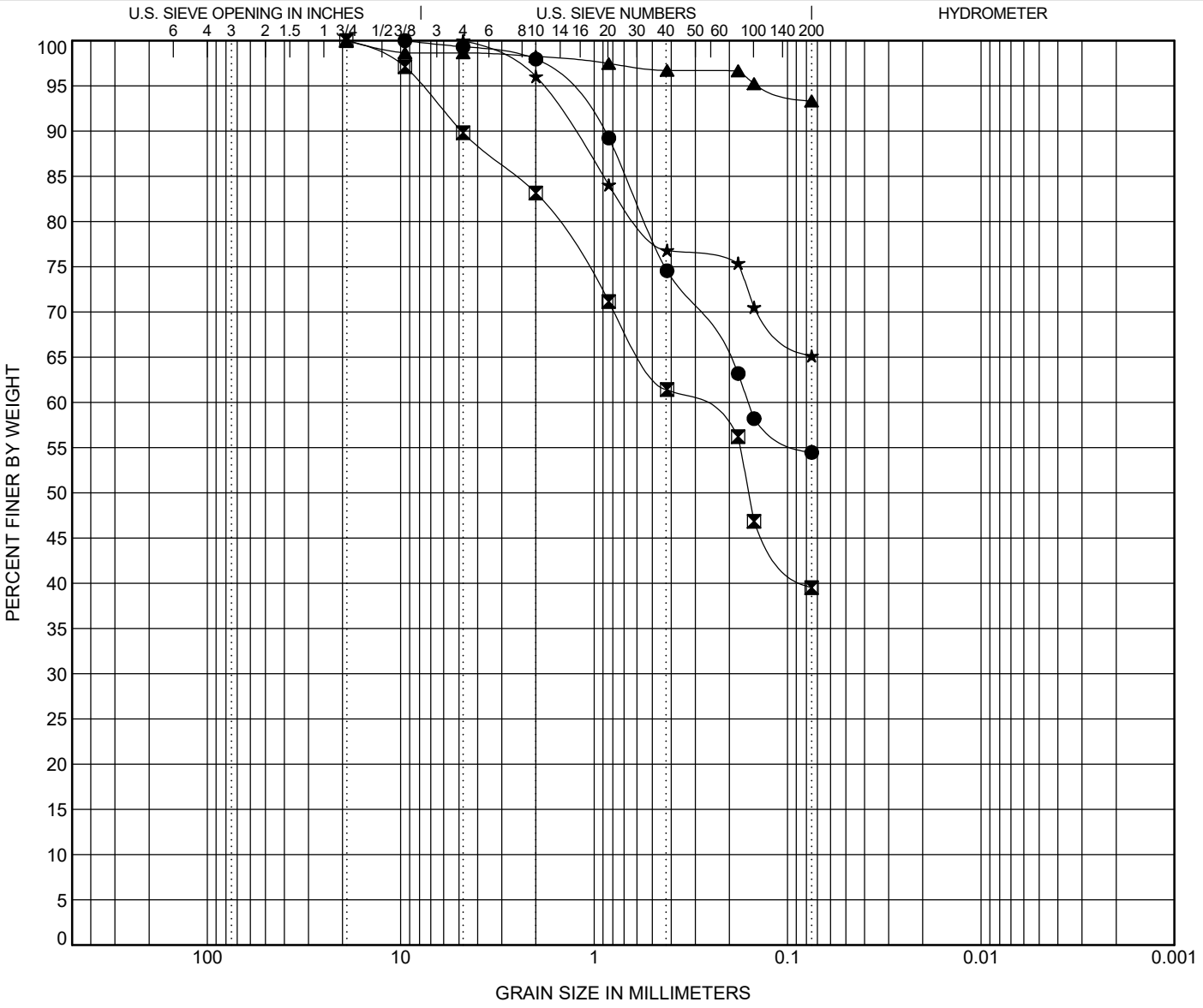
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**DH-2**	**6.0**	**Sandy Fat CLAY (CH) A-7-6(12)**	**51**	**22**	**29**		
⊠	**DH-2**	**20.0**	**Clayey F/C SAND (SC) A-6(3)**	**39**	**22**	**17**		
▲	**DH-2**	**40.0**	**SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		
★	**DH-2**	**65.0**	**Sandy SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		

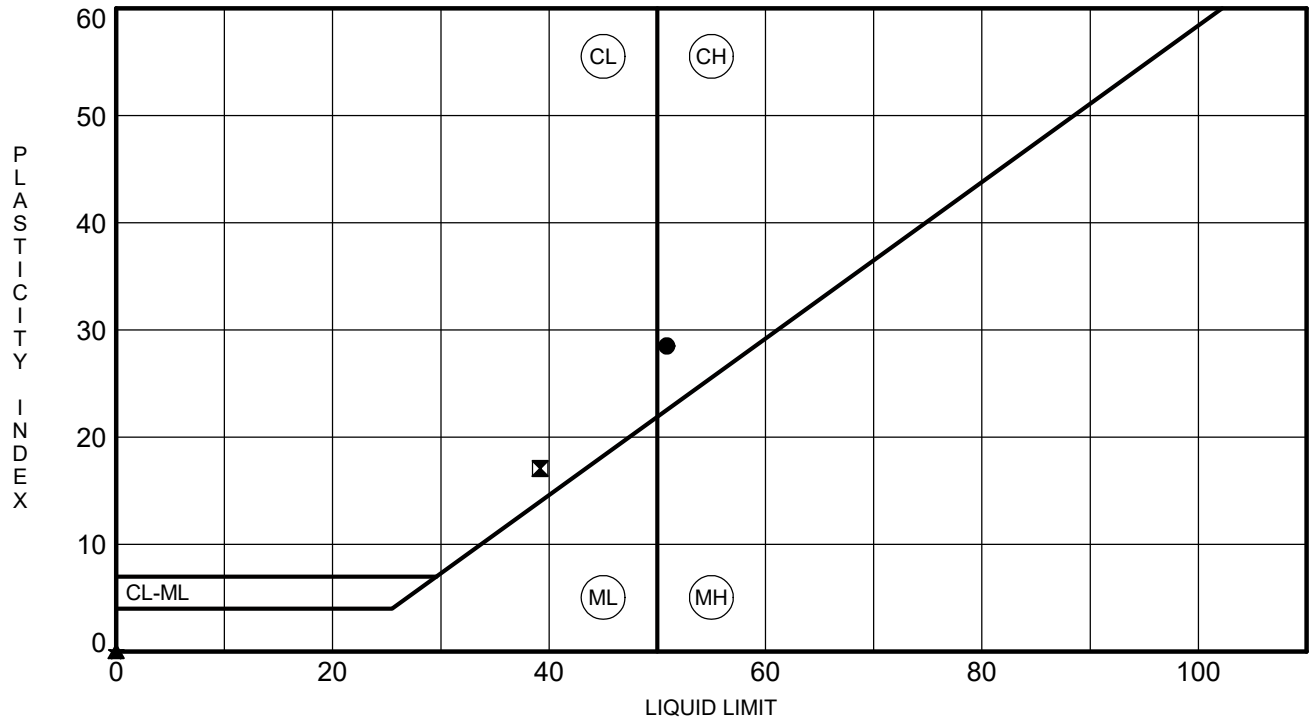
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**DH-2**	**6.0**	**9.52**	**1.49**			**0.7**	**44.8**	**54.5**	
⊠	**DH-2**	**20.0**	**19.1**	**7.791**	**0.159**		**10.2**	**50.3**	**39.5**	
▲	**DH-2**	**40.0**	**19.1**	**0.137**			**1.4**	**5.3**	**93.3**	
★	**DH-2**	**65.0**	**4.76**	**1.856**			**0.0**	**34.9**	**65.1**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 1/24/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**DH-2**	**6.0**	**51**	**22**	**29**	**54**	**Sandy Fat CLAY (CH) A-7-6(12)**
⊠	**DH-2**	**20.0**	**39**	**22**	**17**	**40**	**Clayey F/C SAND (SC) A-6(3)**
▲	**DH-2**	**40.0**	**NP**	**NP**	**NP**	**93**	**SILT (ML) A-4(0)**
★	**DH-2**	**65.0**	**NP**	**NP**	**NP**	**65**	**Sandy SILT (ML) A-4(0)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 1/24/18

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0155	**DATE SAMPLE RECEIVED:**	1/26/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	1/29/2018
		DATE OF WEIGHING:	1/30/2018

BORING NO.	DH-3	DH-3			
SAMPLE NO.	18-0155C SS-1	18-0155F SS-4			
SAMPLE DEPTH	0.0-2.0'	6.0-8.0'			
WATER CONTENT, W%	27.8	26.4			

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

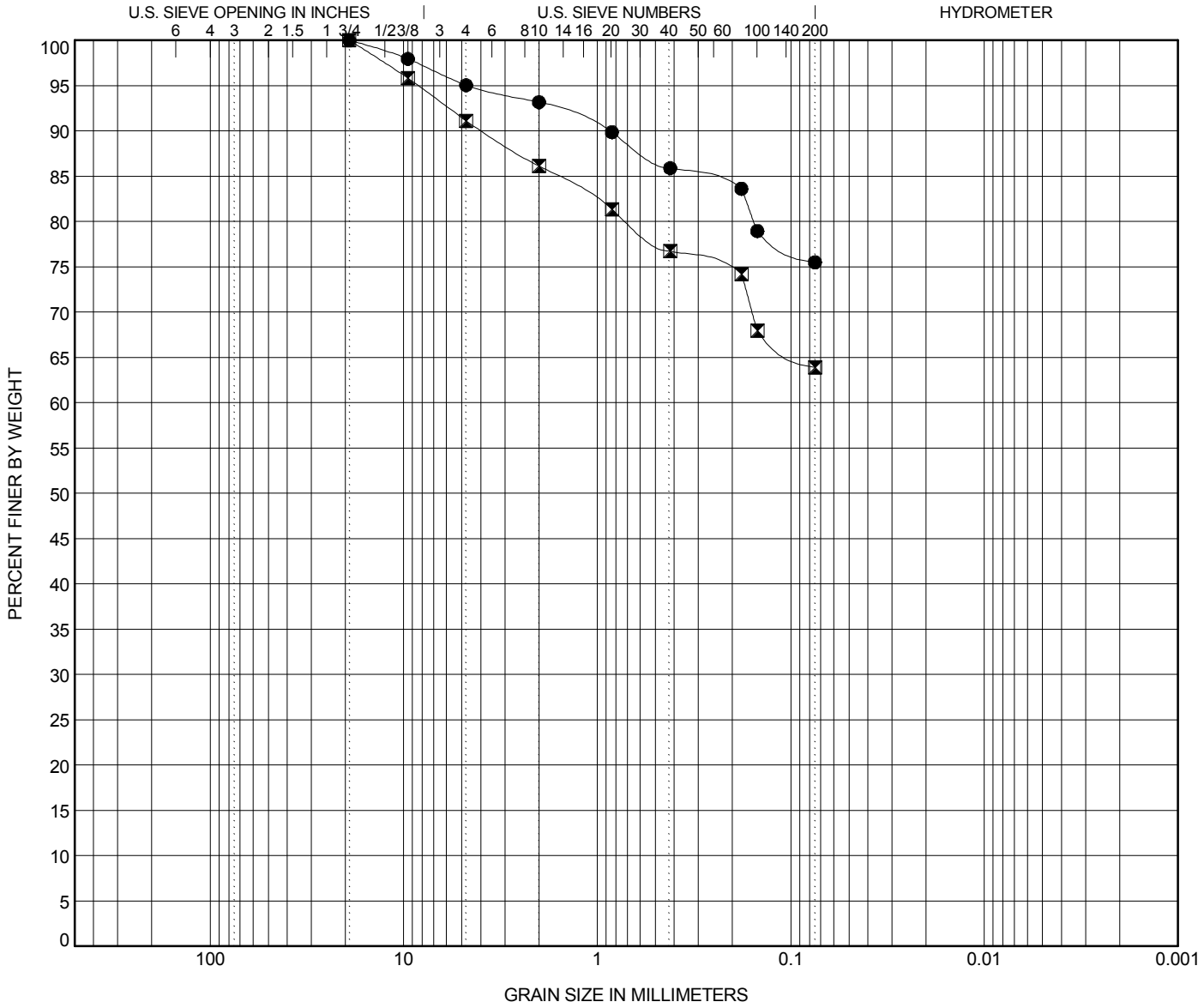
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**DH-3**	**2.0**	**SILT (ML) with F/M Sand A-7-5(12)**	**45**	**31**	**14**		
⧓	**DH-3**	**8.0**	**Sandy SILT (ML) A-4(3)**	**32**	**26**	**6**		

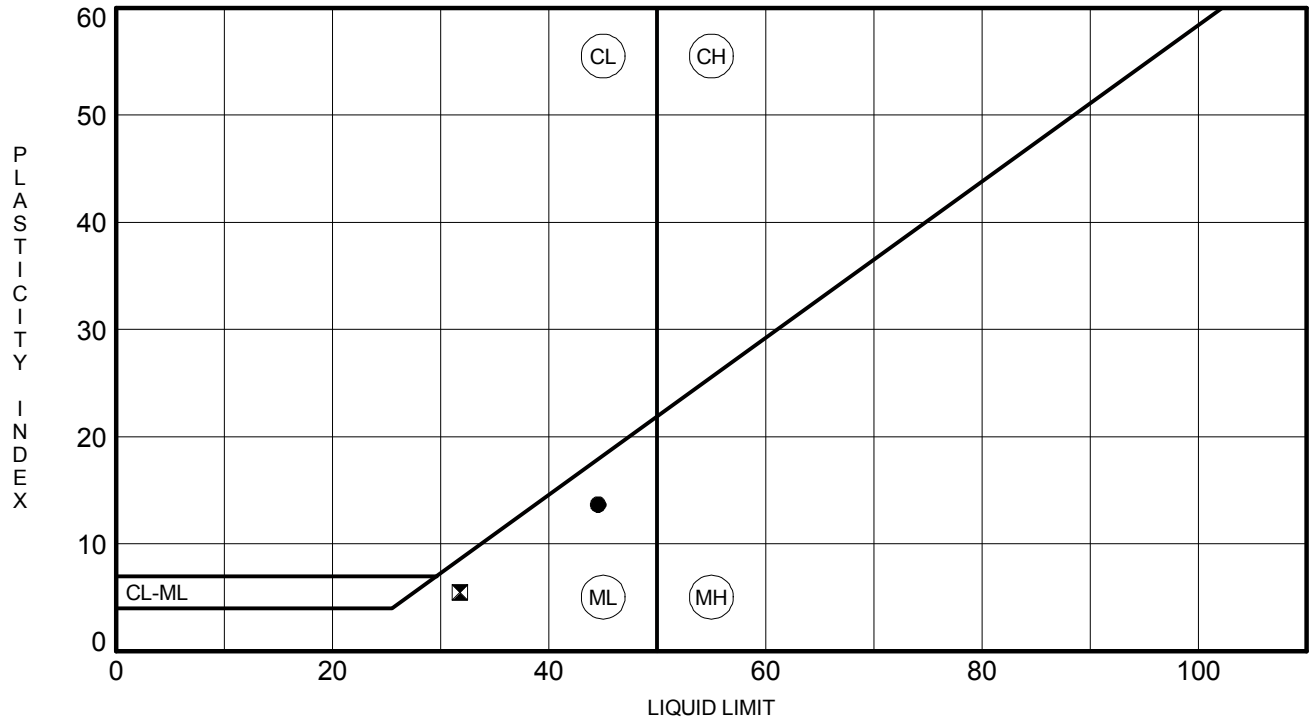
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**DH-3**	**2.0**	**19.1**	**4.617**			**4.9**	**19.5**	**75.5**	
⧓	**DH-3**	**8.0**	**19.1**	**8.407**			**8.9**	**27.2**	**63.9**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 2/13/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**DH-3**	**2.0**	**45**	**31**	**14**	**76**	**SILT (ML) with F/M Sand A-7-5(12)**
⊠	**DH-3**	**8.0**	**32**	**26**	**6**	**64**	**Sandy SILT (ML) A-4(3)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 2/13/18

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0155	**DATE SAMPLE RECEIVED:**	1/26/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	1/29/2018
		DATE OF WEIGHING:	1/30/2018

BORING NO.	DH-3A	DH-3A			
SAMPLE NO.	18-0155I SS-6	18-0155L SS-8			
SAMPLE DEPTH	43.5-45.0'	53.5-55.0'			
WATER CONTENT, W%	28.2	47.2			

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

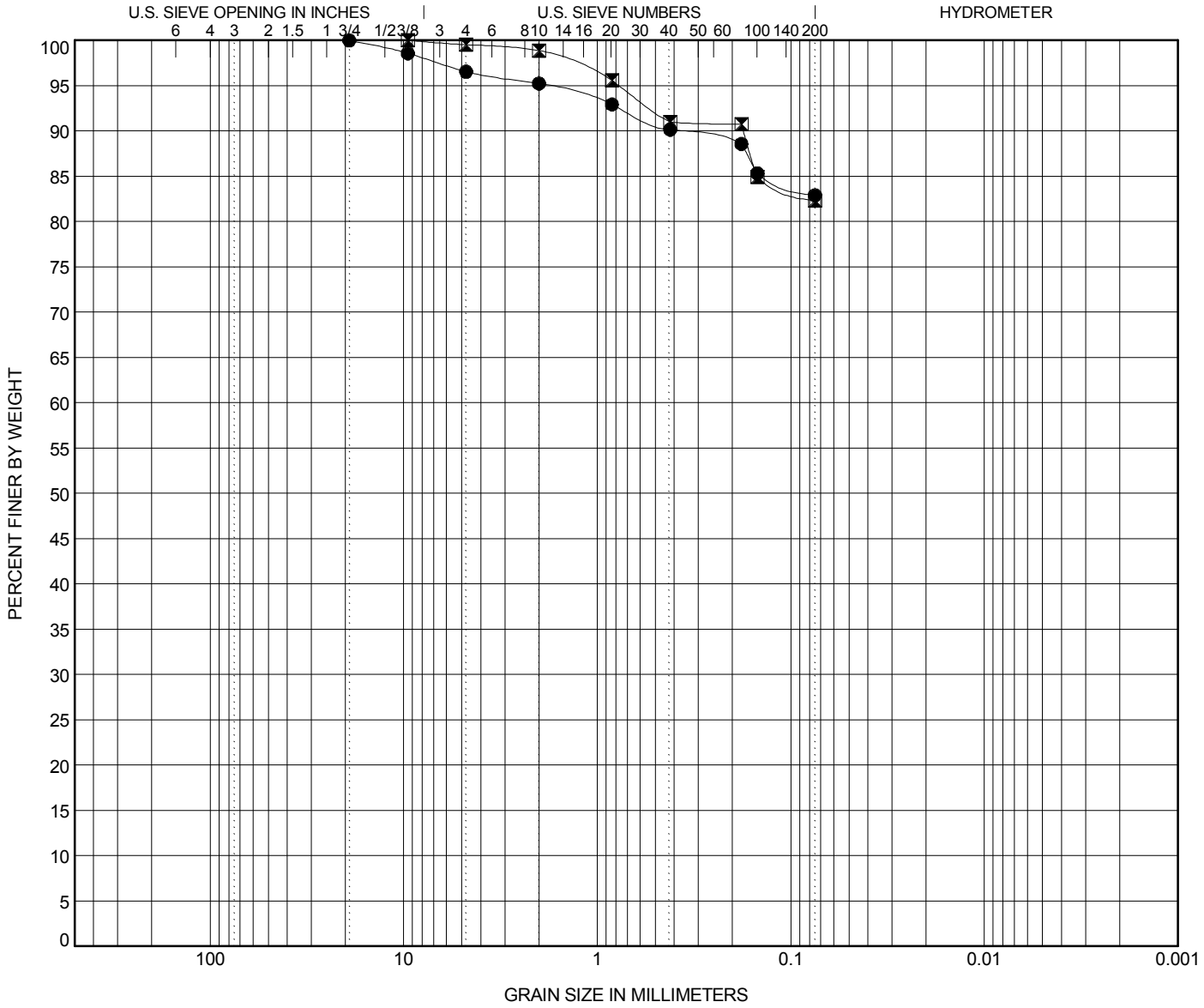
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**DH-3A**	**45.0**	**Sandy SILT (ML) A-7-5(8)**	**42**	**31**	**11**		
⧓	**DH-3A**	**55.0**	**Elastic SILT (MH) with F/M Sand A-7-5(17)**	**53**	**36**	**17**		

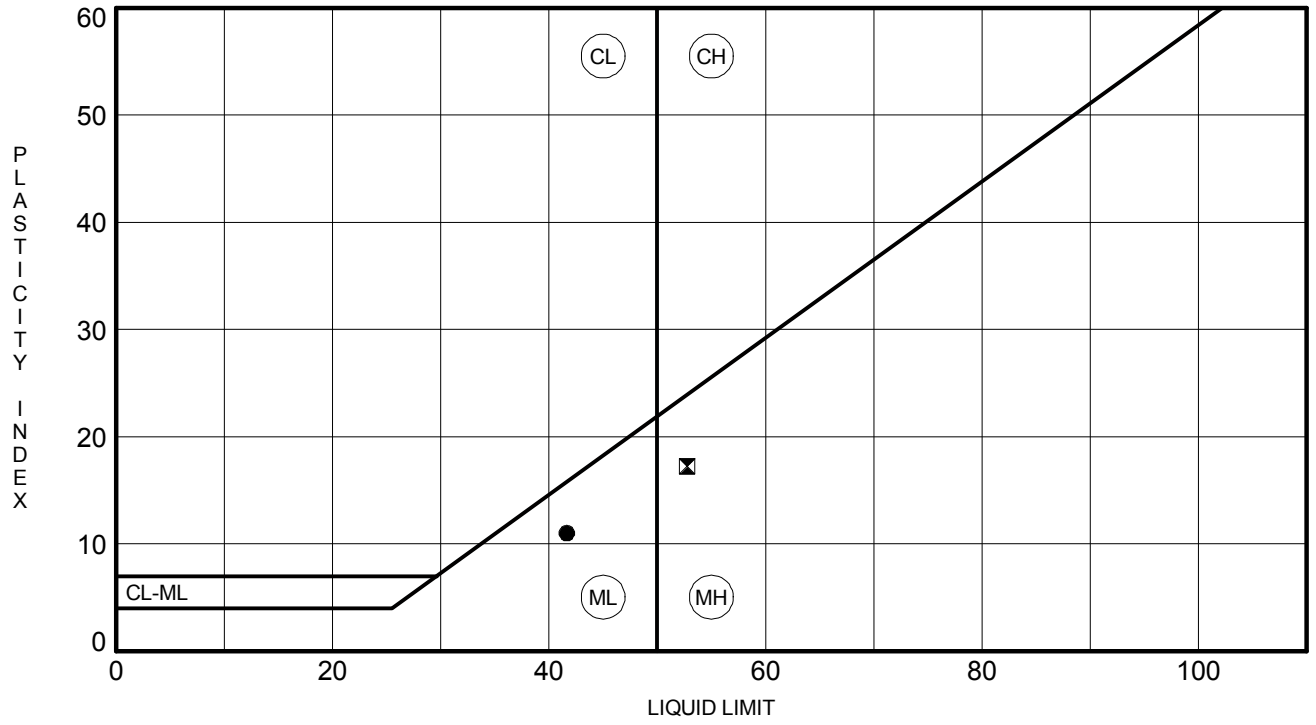
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**DH-3A**	**45.0**	**19.1**	**1.82**			**3.4**	**13.6**	**82.9**	
⧓	**DH-3A**	**55.0**	**9.52**	**0.77**			**0.5**	**17.2**	**82.3**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/30/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**DH-3A**	**45.0**	**42**	**31**	**11**	**83**	**Sandy SILT (ML) A-7-5(8)**
⊠	**DH-3A**	**55.0**	**53**	**36**	**17**	**82**	**Elastic SILT (MH) with F/M Sand A-7-5(17)**

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

ROCK CORE COMPRESSION TEST

PROJECT: I-20/26/126 Corridor Improvements **PROJECT NO:** G5662.01

SAMPLED BY: RW **DATE SAMPLED:** 1/22/2018

TESTED BY: BF **DATE TESTED:** 2/2/2018

Lab No.	18-0156A	18-0156B	18-0156C	18-0156D	18-0156E
Boring No.	DH-3A	DH-3A	DH-3A	DH-3A	DH-3A
Sample No.	NQ-1	NQ-4	NQ-9	NQ-10	NQ-10
Depth	2.9-3.2	21.1-21.4	72.3-72.6	76.5-76.8	80.6-80.9
Length (in)	4.08	3.86	3.94	4.02	3.97
Diameter (in)	1.86	1.85	1.85	1.85	1.86
Mass (g)	566.99	498.97	510.35	549.26	519.50
Cross Sectional Area (in^2)	2.72	2.68	2.70	2.70	2.71
Load (lb)	189270	98135	60965	37020	45430
Compressive Strength (psi)	69510	36670	22610	13710	16760
Corrected Compressive Strength (psi)					
Unit Weight (lb/ft^3)	194.66	184.14	183.17	192.95	183.95

Signature: _____

Remarks: _____

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

ROCK CORE COMPRESSION TEST

PROJECT: I-20/26/126 Corridor Improvements **PROJECT NO:** G5662.01

SAMPLED BY: RW **DATE SAMPLED:** 1/22/2018

TESTED BY: BF **DATE TESTED:** 2/2/2018

Lab No.	18-0156F	18-0156G	18-0156H		
Boring No.	DH-3A	DH-3A	DH-3A		
Sample No.	NQ-11	NQ-12	NQ-15		
Depth	84.6-84.9	89.6-89.9	103.3-103.6		
Length (in)	3.99	4.00	3.97		
Diameter (in)	1.86	1.86	1.86		
Mass (g)	524.43	522.69	518.34		
Cross Sectional Area (in^2)	2.71	2.71	2.72		
Load (lb)	77635	101135	79100		
Compressive Strength (psi)	28600	37260	29080		
Corrected Compressive Strength (psi)					
Unit Weight (lb/ft^3)	184.71	183.45	182.95		

Signature: _____

Remarks: _____

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0321	**DATE SAMPLE RECEIVED:**	2/23/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	2/23/2018
		DATE OF WEIGHING:	2/26/2018

BORING NO.	RW-2	RW-2	RW-2		
SAMPLE NO.	18-0321C SS-5	18-0321F SS-7	18-0321I SS-9		
SAMPLE DEPTH	8.0-10.0'	18.5-20.0'	28.5-30.0'		
WATER CONTENT, W%	26.9	22.1	22.4		

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

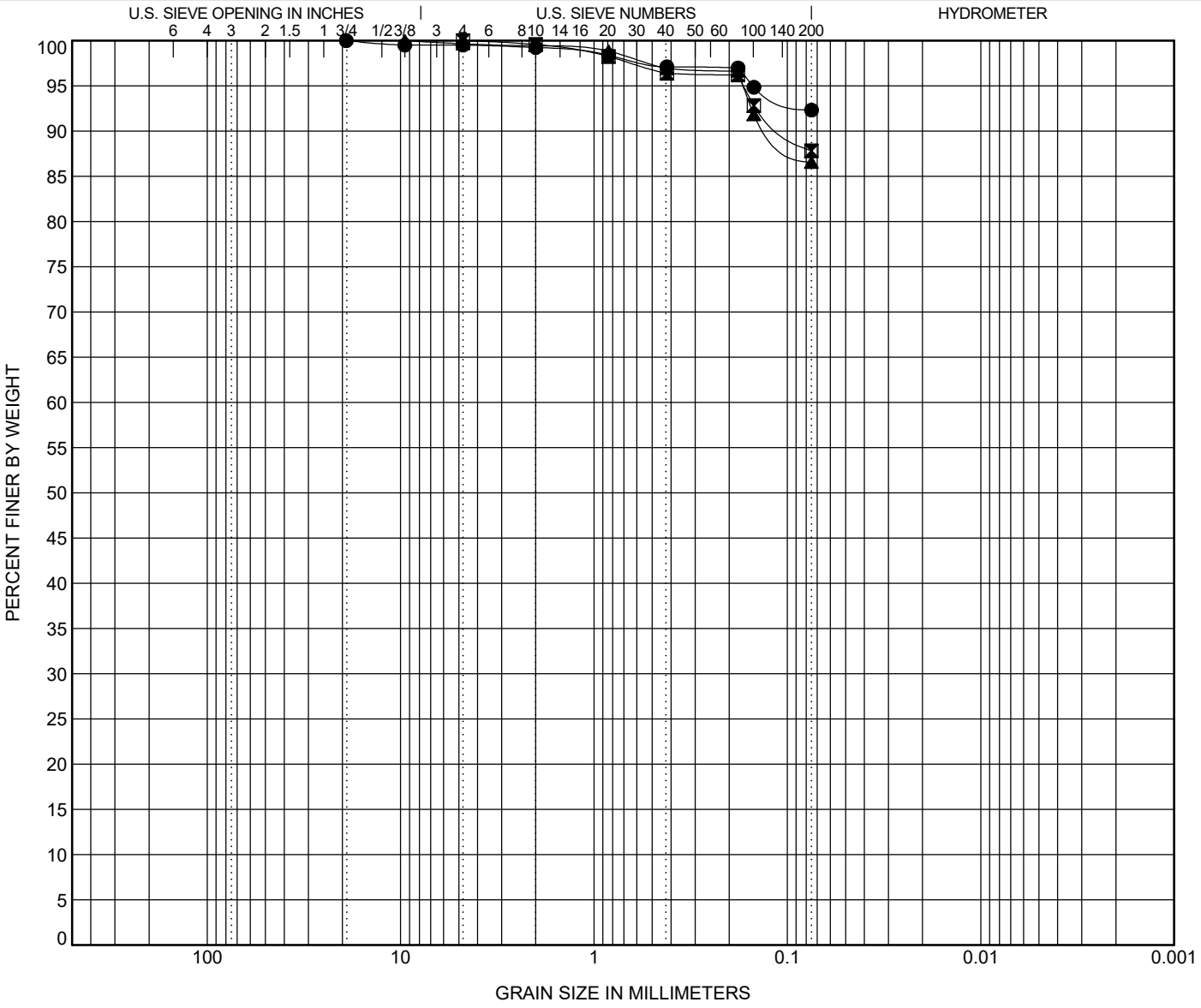
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**RW-2**	**10.0**	**SILT (ML) A-4(8)**	**39**	**29**	**10**		
⊠	**RW-2**	**20.0**	**SILT (ML) A-4(7)**	**32**	**24**	**8**		
▲	**RW-2**	**30.0**	**SILT (ML) A-6(11)**	**38**	**26**	**12**		

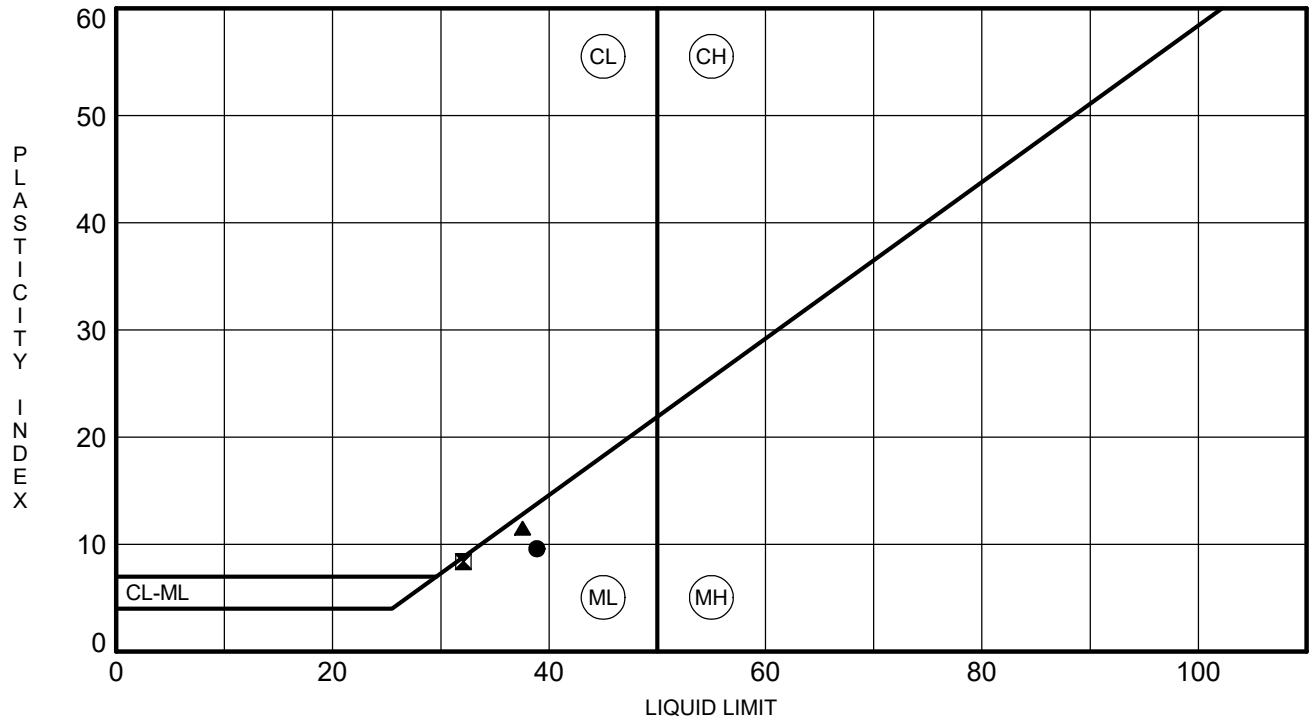
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**RW-2**	**10.0**	**19.1**	**0.151**			**0.5**	**7.2**	**92.3**	
⊠	**RW-2**	**20.0**	**4.76**	**0.168**			**0.0**	**12.2**	**87.8**	
▲	**RW-2**	**30.0**	**9.52**	**0.169**			**0.4**	**13.1**	**86.5**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/9/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**RW-2**	**10.0**	**39**	**29**	**10**	**92**	**SILT (ML) A-4(8)**
⊠	**RW-2**	**20.0**	**32**	**24**	**8**	**88**	**SILT (ML) A-4(7)**
▲	**RW-2**	**30.0**	**38**	**26**	**12**	**87**	**SILT (ML) A-6(11)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/9/18

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0325	**DATE SAMPLE RECEIVED:**	2/23/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	2/23/2018
		DATE OF WEIGHING:	2/26/2018

BORING NO.	RW-3	RW-3			
SAMPLE NO.	18-0325C SS-4	18-0325F SS-6			
SAMPLE DEPTH	6.0-8.0'	13.5-15.0'			
WATER CONTENT, W%	9.5	16.5			

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

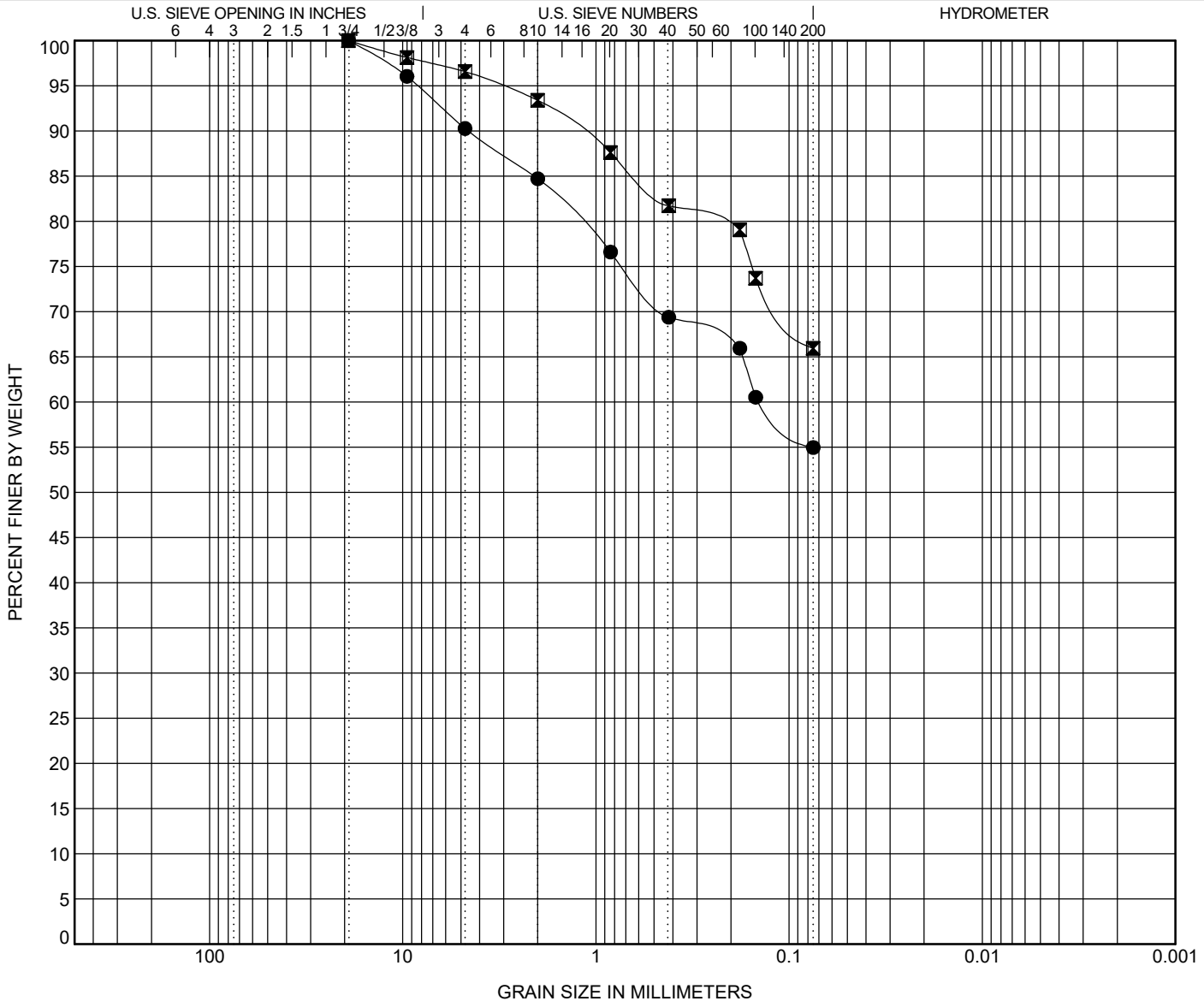
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**RW-3**	**8.0**	**Sandy Silty CLAY (CL-ML) A-4(2)**	**28**	**21**	**7**		
⊠	**RW-3**	**15.0**	**Sandy SILT (ML) A-4(4)**	**33**	**26**	**7**		

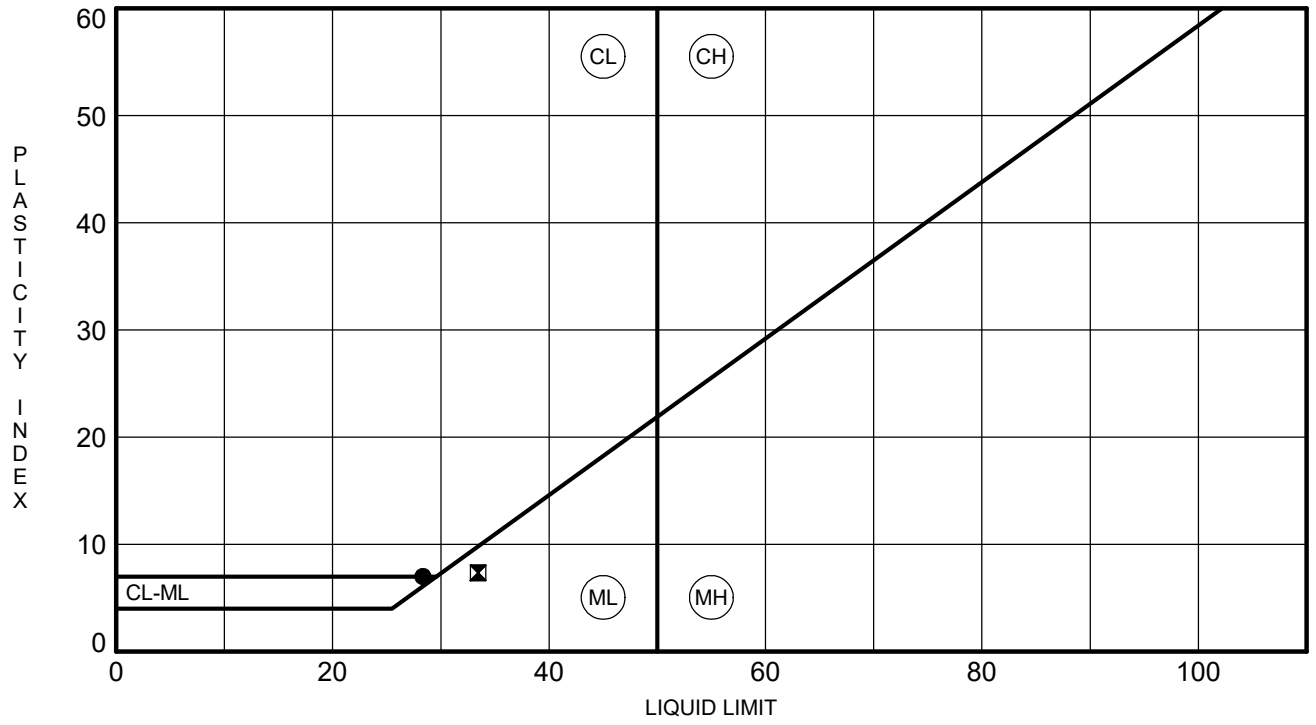
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**RW-3**	**8.0**	**19.1**	**8.399**			**9.7**	**35.3**	**55.0**	
⊠	**RW-3**	**15.0**	**19.1**	**3.109**			**3.4**	**30.6**	**66.0**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/9/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**RW-3**	**8.0**	**28**	**21**	**7**	**55**	**Sandy Silty CLAY (CL-ML) A-4(2)**
⊠	**RW-3**	**15.0**	**33**	**26**	**7**	**66**	**Sandy SILT (ML) A-4(4)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/9/18

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0326	**DATE SAMPLE RECEIVED:**	2/23/2018
DESCRIPTION OF SOIL:	Sandy SILT (ML) A-6(3)		
TESTED BY:	MB	**DATE OF TESTING:**	2/23/2018
		DATE OF WEIGHING:	2/26/2018

BORING NO.	RW-4				
SAMPLE NO.	18-0326C SS-2				
SAMPLE DEPTH	0.0-2.0'				
WATER CONTENT, W%	17.4				

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

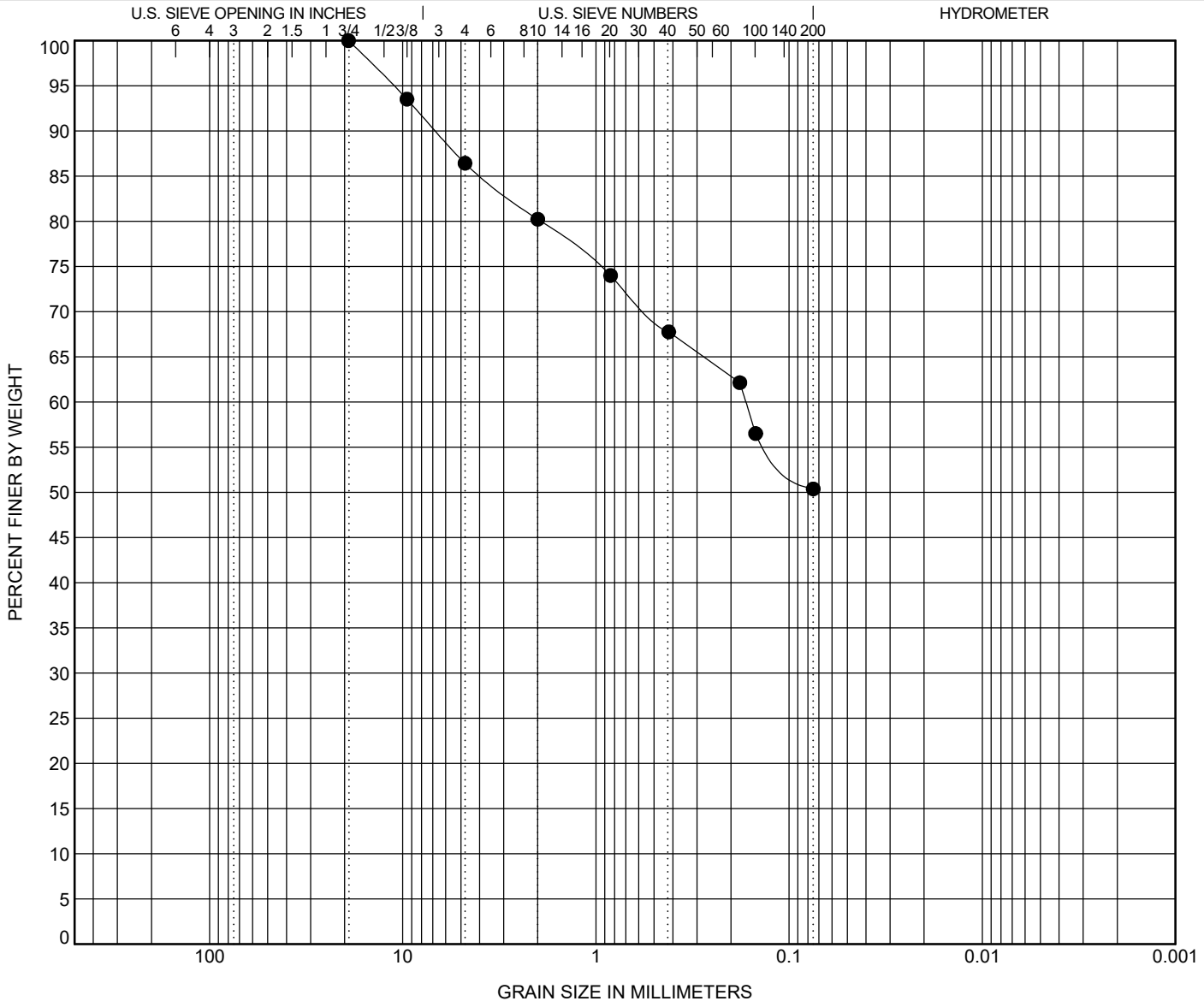
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**RW-4**	**4.0**	**Sandy SILT (ML) A-6(3)**	**39**	**28**	**11**		

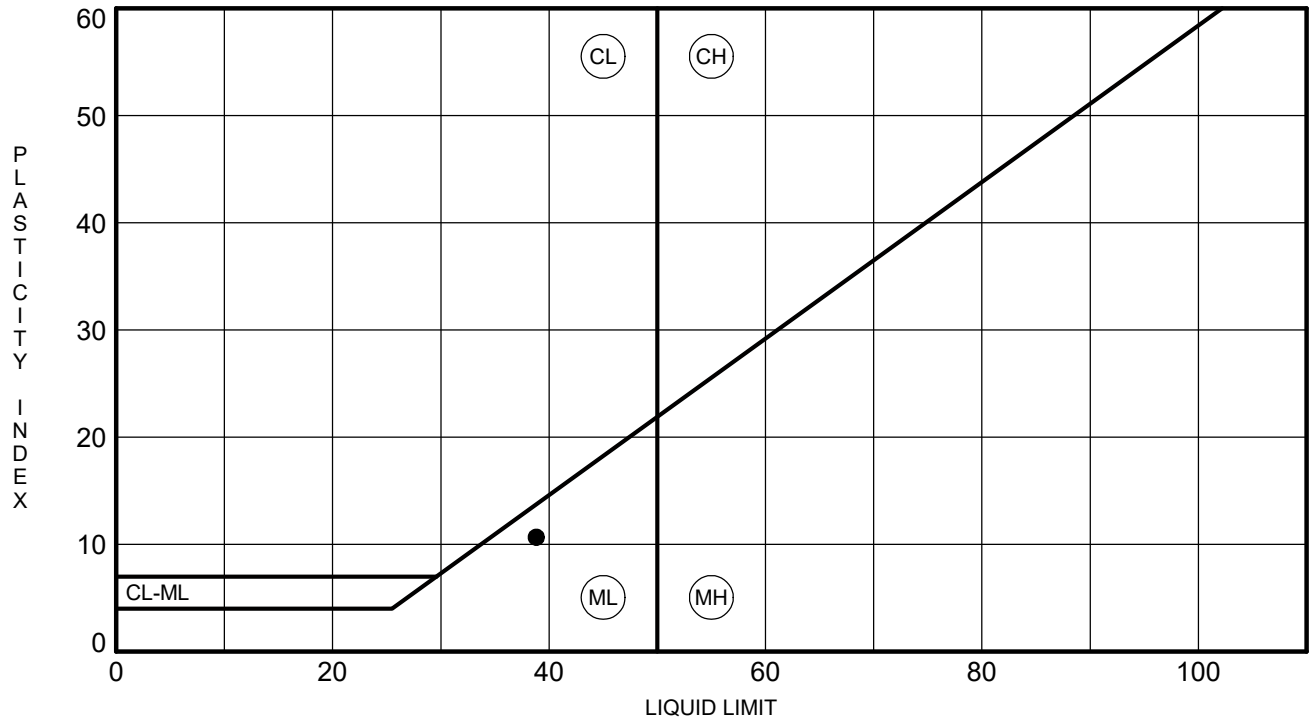
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**RW-4**	**4.0**	**19.1**	**11.162**			**13.6**	**36.0**	**50.4**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/9/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**RW-4**	**4.0**	**39**	**28**	**11**	**50**	**Sandy SILT (ML) A-6(3)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/9/18

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0651	**DATE SAMPLE RECEIVED:**	4/6/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	4/6/2018
		DATE OF WEIGHING:	4/9/2018

BORING NO.	RW-5	RW-5			
SAMPLE NO.	18-0651I SS-2	18-0651C SS-5			
SAMPLE DEPTH	2.0-4.0'	8.0-10.0'			
WATER CONTENT, W%	12.4	21.5			

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

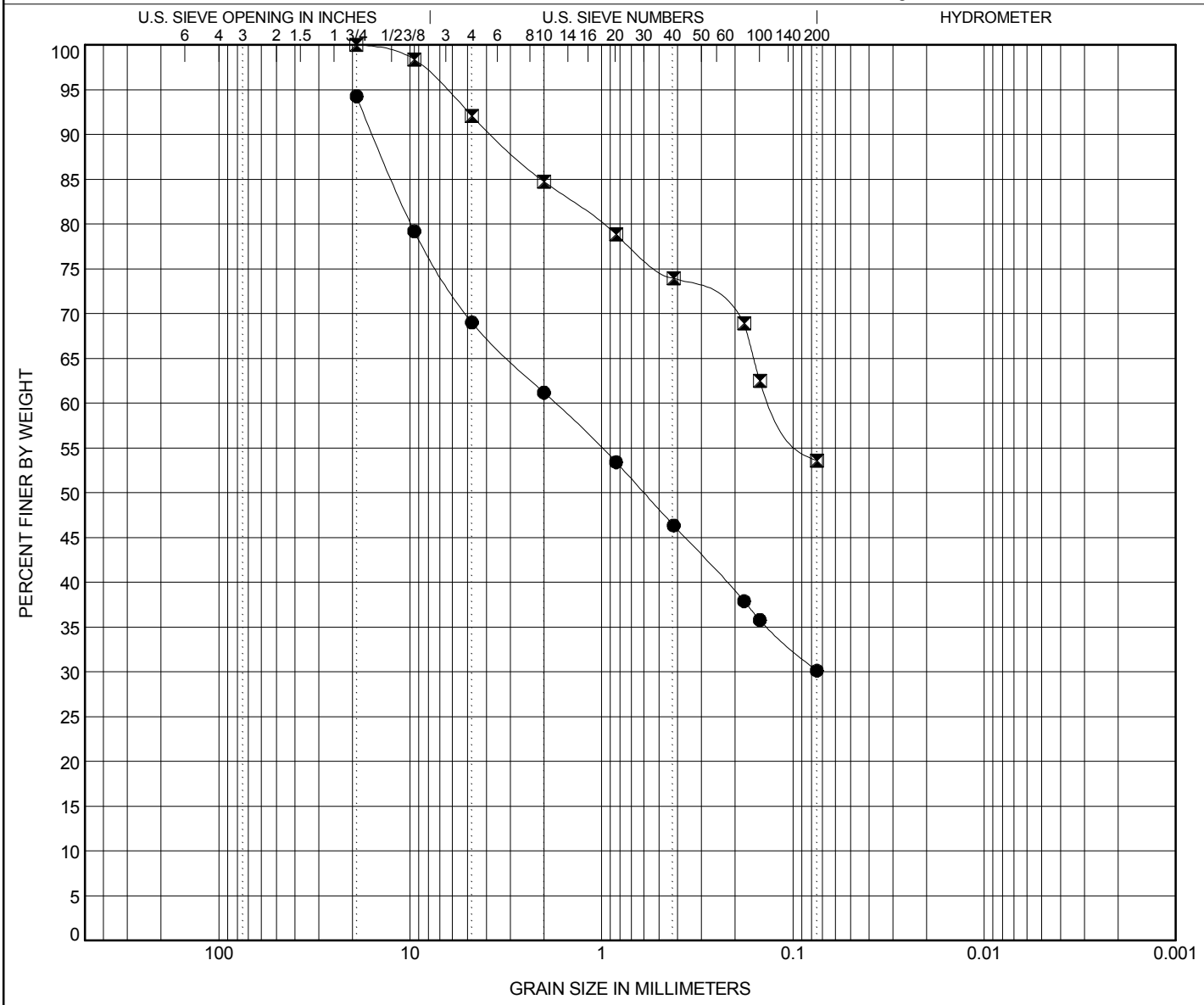
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**RW-5**	**4.0**	**Silty Fine SAND (SM) with Gravel A-2-4**	**NP**	**NP**	**NP**		
⧓	**RW-5**	**10.0**	**Sandy Lean CLAY (CL) A-6(5)**	**35**	**20**	**15**		

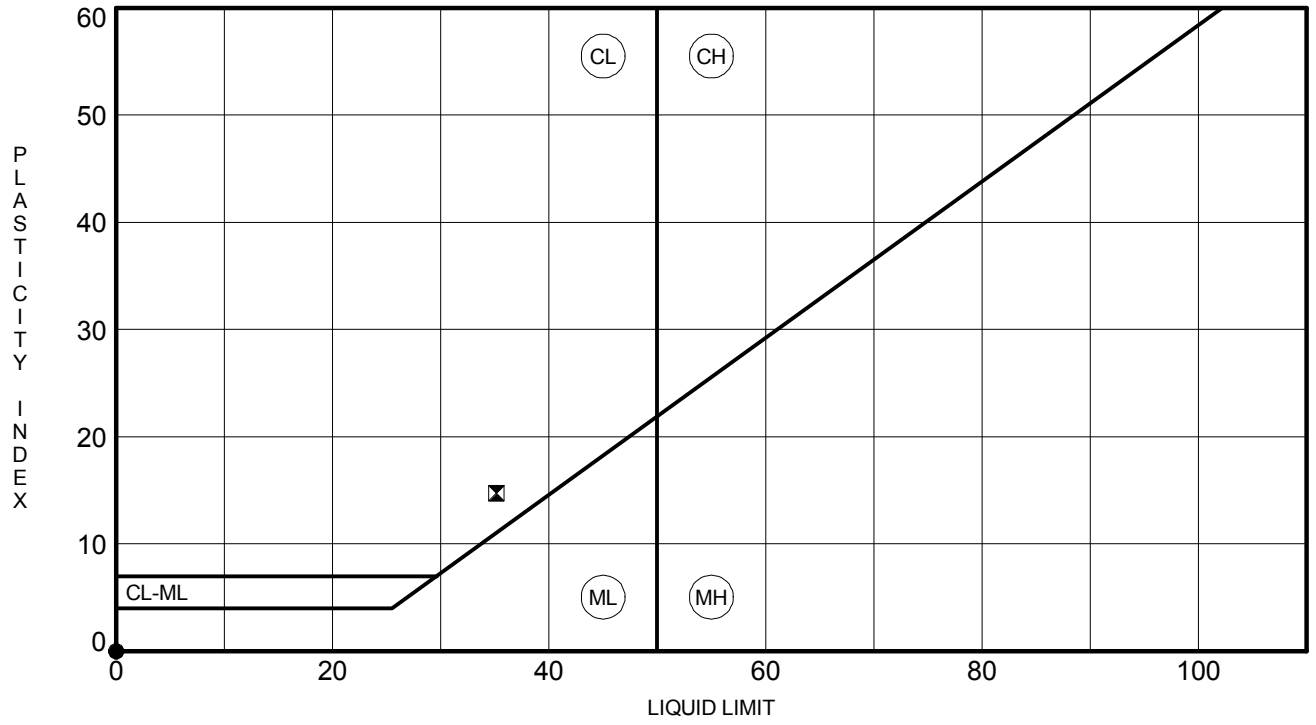
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**RW-5**	**4.0**	**19.05**		**0.6**		**25.3**	**38.9**	**30.2**	
⧓	**RW-5**	**10.0**	**19.1**	**6.546**			**7.9**	**38.5**	**53.6**	

GRAIN SIZE G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 8/1/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**RW-5**	**4.0**	**NP**	**NP**	**NP**	**30**	**Silty Fine SAND (SM) with Gravel A-2-4**
⊠	**RW-5**	**10.0**	**35**	**20**	**15**	**54**	**Sandy Lean CLAY (CL) A-6(5)**

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3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0389	**DATE SAMPLE RECEIVED:**	3/1/2018
DESCRIPTION OF SOIL:	Silty F/C SAND (SM) with Gravel A-4(0)		
TESTED BY:	MB	**DATE OF TESTING:**	3/2/2018
		DATE OF WEIGHING:	3/5/2018

BORING NO.	RW-6				
SAMPLE NO.	18-0389C SS-2				
SAMPLE DEPTH	2.0-4.0'				
WATER CONTENT, W%	14.9				

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

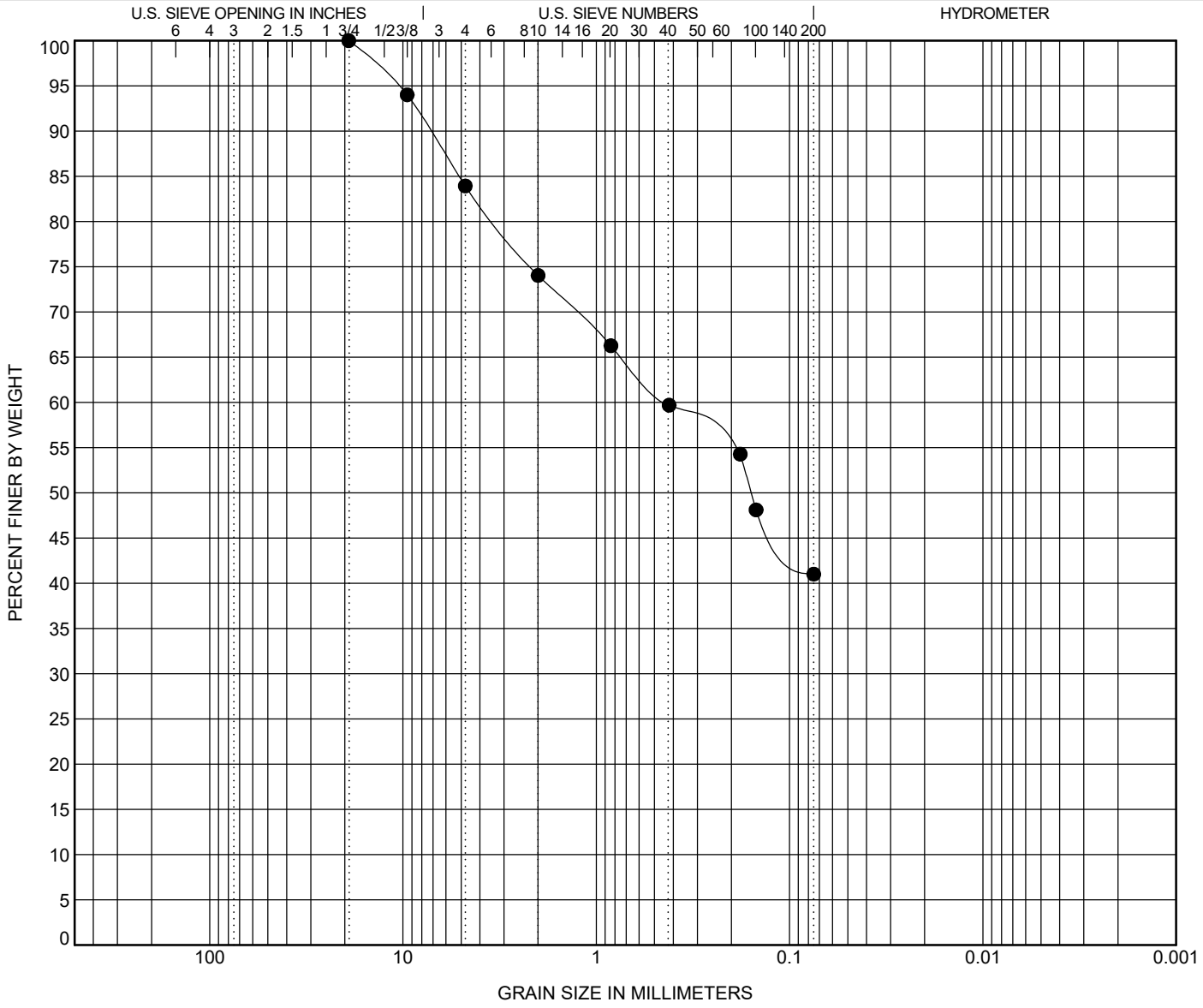
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**RW-6**	**4.0**	**Silty F/C SAND (SM) with Gravel A-4(0)**	**NP**	**NP**	**NP**		

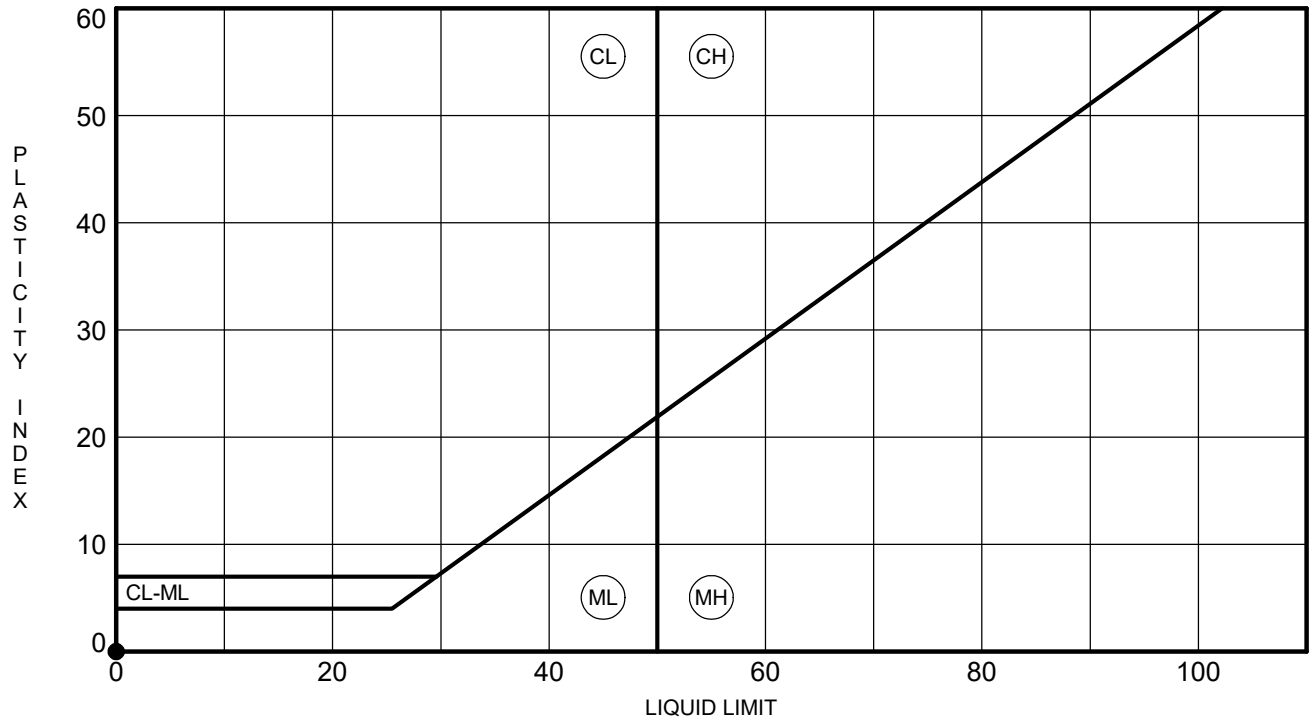
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**RW-6**	**4.0**	**19.1**	**10.679**	**0.158**		**16.1**	**42.9**	**41.0**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/9/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**RW-6**	**4.0**	**NP**	**NP**	**NP**	**41**	**Silty F/C SAND (SM) with Gravel A-4(0)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/9/18

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0327	**DATE SAMPLE RECEIVED:**	2/23/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	2/23/2018
		DATE OF WEIGHING:	2/26/2018

BORING NO.	RW-7	RW-7			
SAMPLE NO.	18-0327C SS-3	18-0327F SS-6			
SAMPLE DEPTH	4.0-6.0'	13.5-15.0'			
WATER CONTENT, W%	20.5	24.1			

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

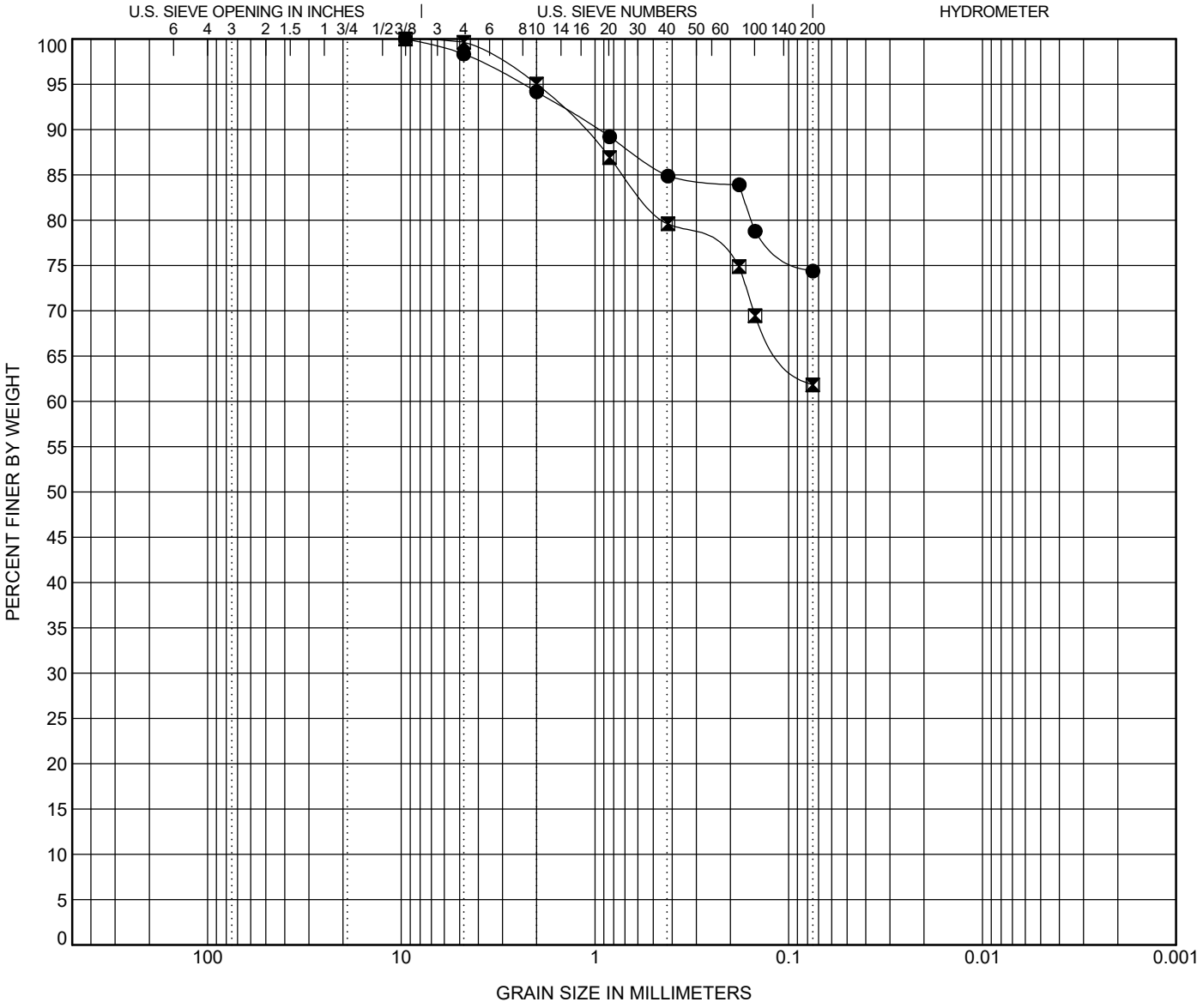
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**RW-7**	**6.0**	**Lean CLAY (CL) with F/M Sand A-6(9)**	**35**	**22**	**13**		
⊠	**RW-7**	**15.0**	**Sandy Lean CLAY (CL) A-6(6)**	**36**	**24**	**12**		

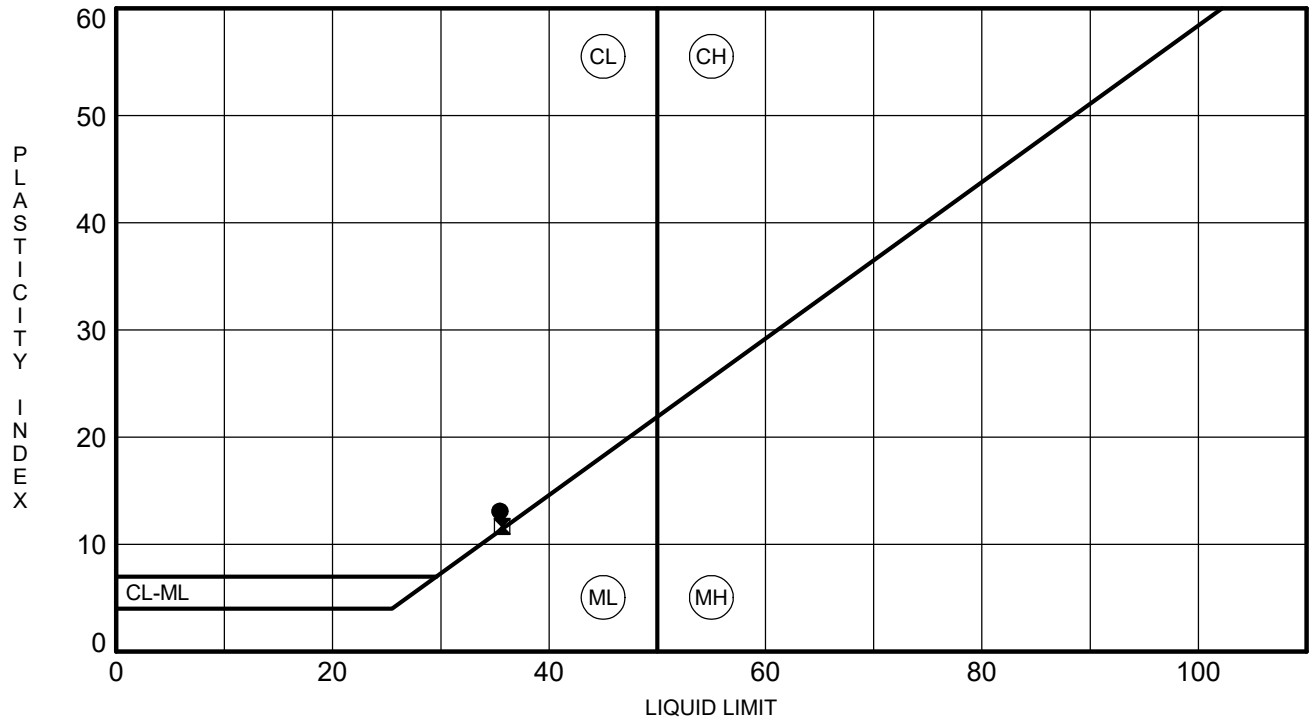
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**RW-7**	**6.0**	**9.52**	**2.378**			**1.7**	**23.9**	**74.4**	
⊠	**RW-7**	**15.0**	**9.52**	**1.994**			**0.4**	**37.8**	**61.8**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/9/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**RW-7**	**6.0**	**35**	**22**	**13**	**74**	**Lean CLAY (CL) with F/M Sand A-6(9)**
⧓	**RW-7**	**15.0**	**36**	**24**	**12**	**62**	**Sandy Lean CLAY (CL) A-6(6)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/9/18

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0937	**DATE SAMPLE RECEIVED:**	5/31/2018
DESCRIPTION OF SOIL:	Various		
TESTED BY:	MB	**DATE OF TESTING:**	6/4/2018
		DATE OF WEIGHING:	6/5/2018

BORING NO.	RW-8	RW-8	RW-8		
SAMPLE NO.	18-0937C SS-2	18-0937F SS-3	18-0937I SS-5		
SAMPLE DEPTH	2.0-4.0'	4.0-6.0'	8.0-10.0'		
WATER CONTENT, W%	13.4	9.1	12.7		

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

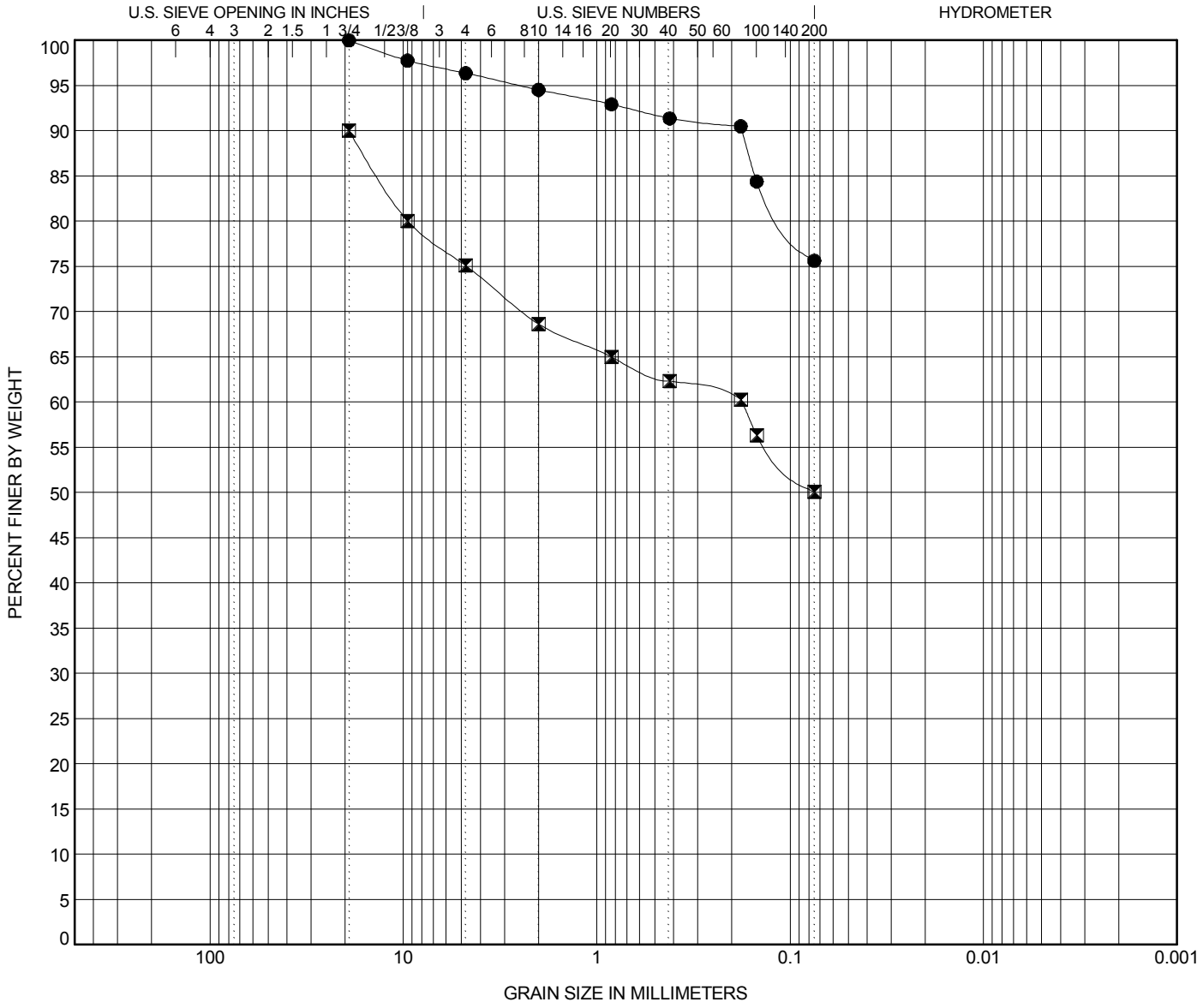
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**RW-8**	**4.0**	**Lean CLAY (CL) with Sand A-4(5)**	**27**	**18**	**9**		
⧓	**RW-8**	**6.0**	**Sandy Lean CLAY (CL) with Gravel A-7-6(8)**	**43**	**20**	**23**		

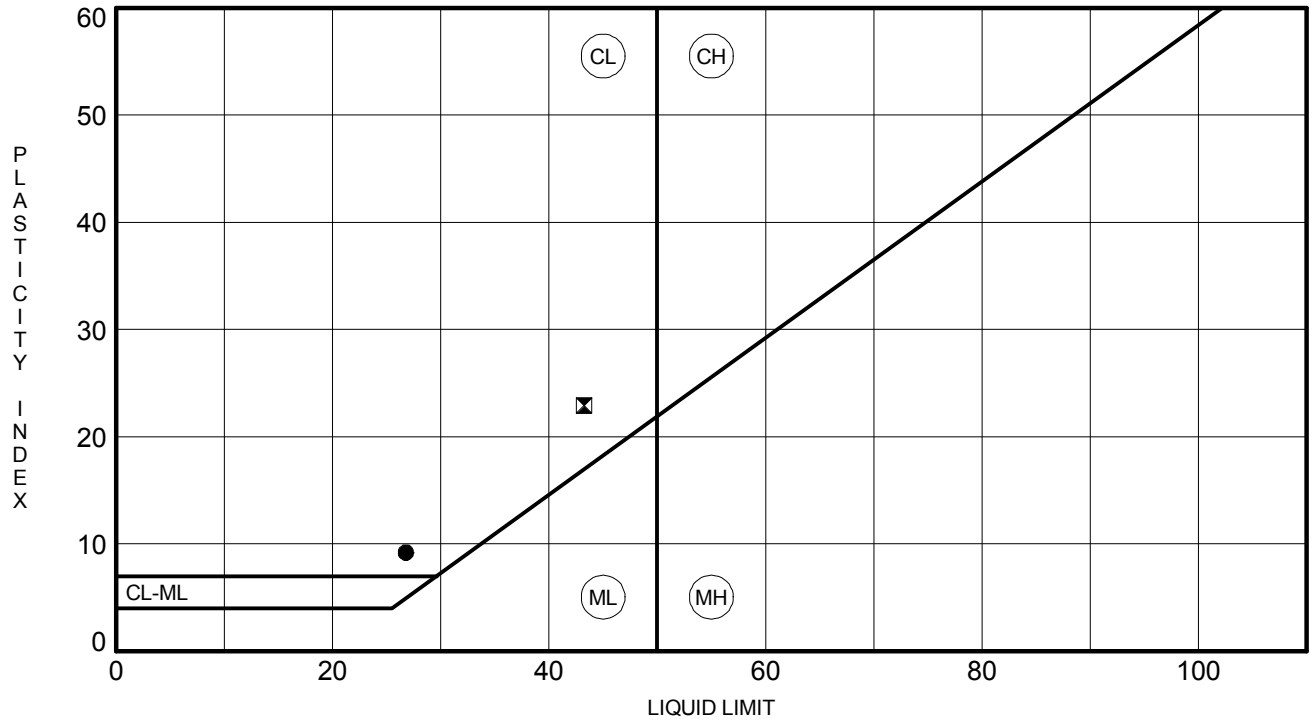
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**RW-8**	**4.0**	**19.1**	**2.494**			**3.6**	**20.7**	**75.6**	
⧓	**RW-8**	**6.0**	**19.1**				**15.0**	**25.0**	**50.1**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/12/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**RW-8**	**4.0**	**27**	**18**	**9**	**76**	**Lean CLAY (CL) with Sand A-4(5)**
⧓	**RW-8**	**6.0**	**43**	**20**	**23**	**50**	**Sandy Lean CLAY (CL) with Gravel A-7-6(8)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/12/18

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0938	**DATE SAMPLE RECEIVED:**	5/31/2018
DESCRIPTION OF SOIL:	Various		
TESTED BY:	MB	**DATE OF TESTING:**	6/4/2018
		DATE OF WEIGHING:	6/5/2018

BORING NO.	RW-10	RW-10	RW-10		
SAMPLE NO.	18-0938C SS-2	18-0938F SS-5	18-0938I SS-7		
SAMPLE DEPTH	2.0-4.0'	8.0-10.0'	18.5-20.0'		
WATER CONTENT, W%	17.8	15.9	22.8		

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

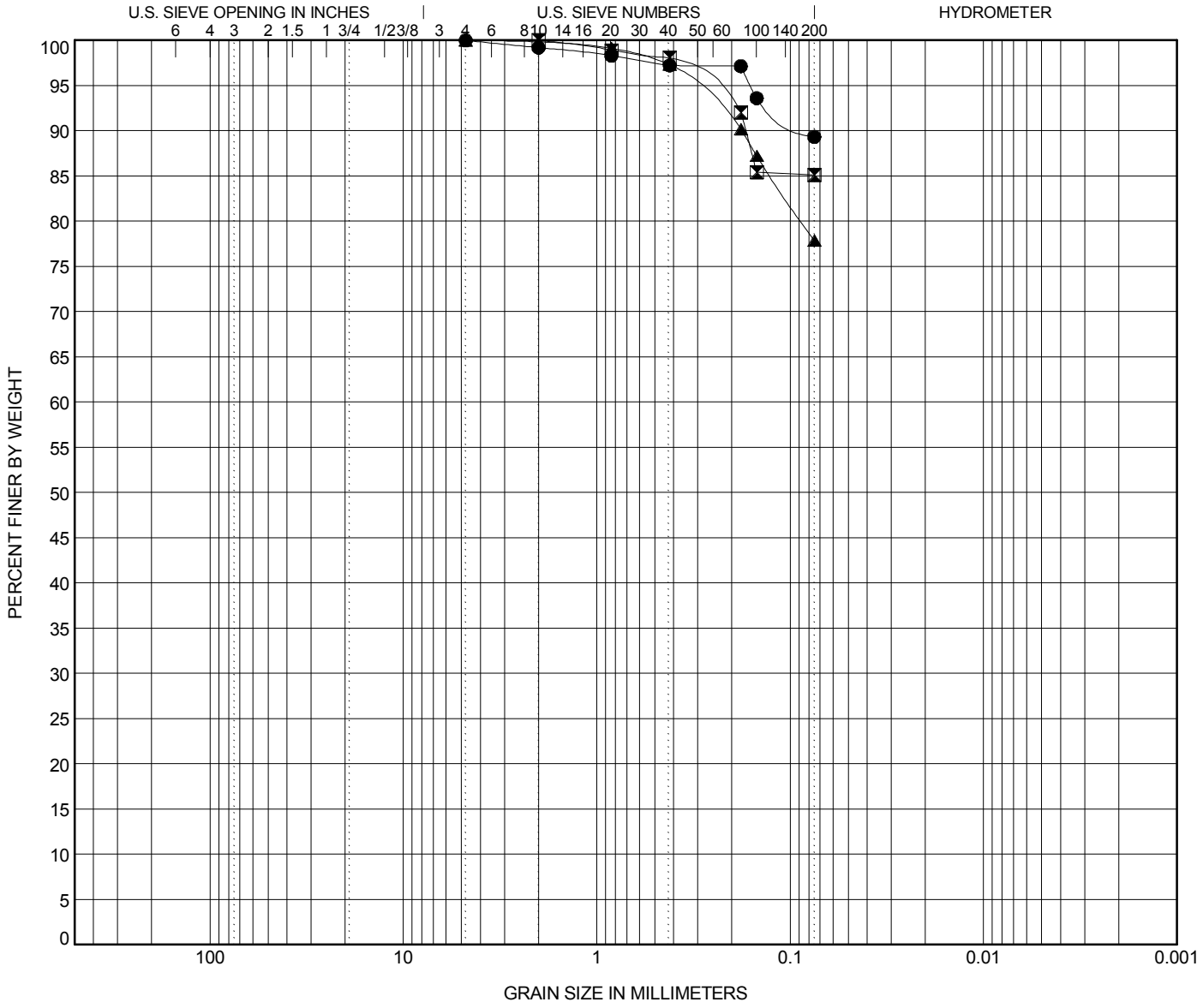
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**RW-10**	**4.0**	**Elastic SILT (MH) A-7-6(20)**	**52**	**29**	**23**		
⧓	**RW-10**	**10.0**	**SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		
▲	**RW-10**	**20.0**	**SILT (ML) with Sand A-4(4)**	**34**	**29**	**5**		

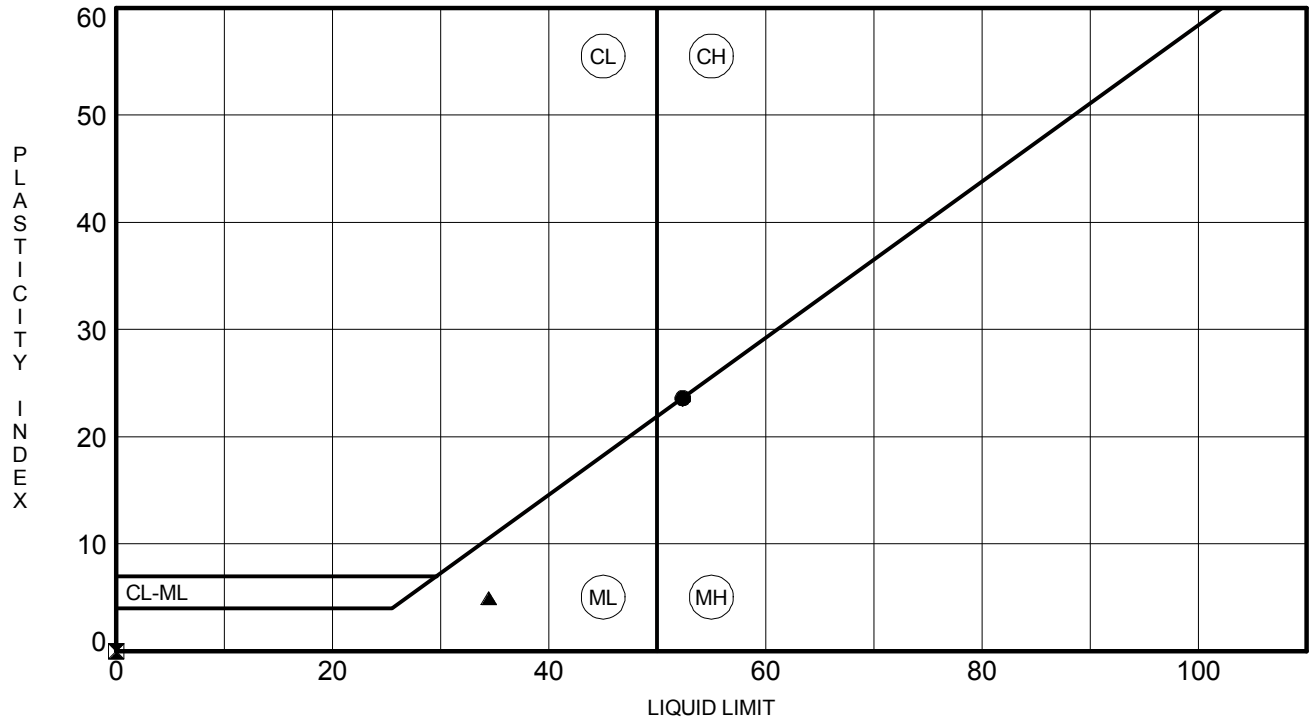
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**RW-10**	**4.0**	**4.76**	**0.16**			**0.0**	**10.7**	**89.3**	
⧓	**RW-10**	**10.0**	**2**	**0.273**			**0.0**	**14.9**	**85.1**	
▲	**RW-10**	**20.0**	**4.76**	**0.319**			**0.0**	**22.1**	**77.9**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/29/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**RW-10**	**4.0**	**52**	**29**	**23**	**89**	**Elastic SILT (MH) A-7-6(20)**
⧓	**RW-10**	**10.0**	**NP**	**NP**	**NP**	**85**	**SILT (ML) A-4(0)**
▲	**RW-10**	**20.0**	**34**	**29**	**5**	**78**	**SILT (ML) with Sand A-4(4)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/29/18

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0450	**DATE SAMPLE RECEIVED:**	3/20/2018
DESCRIPTION OF SOIL:	SILT (ML) A-4(4)		
TESTED BY:	MB	**DATE OF TESTING:**	3/20/2018
		DATE OF WEIGHING:	3/21/2018

BORING NO.	RW-11				
SAMPLE NO.	18-0450C SS-2				
SAMPLE DEPTH	2.0-4.0'				
WATER CONTENT, W%	20.9				

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

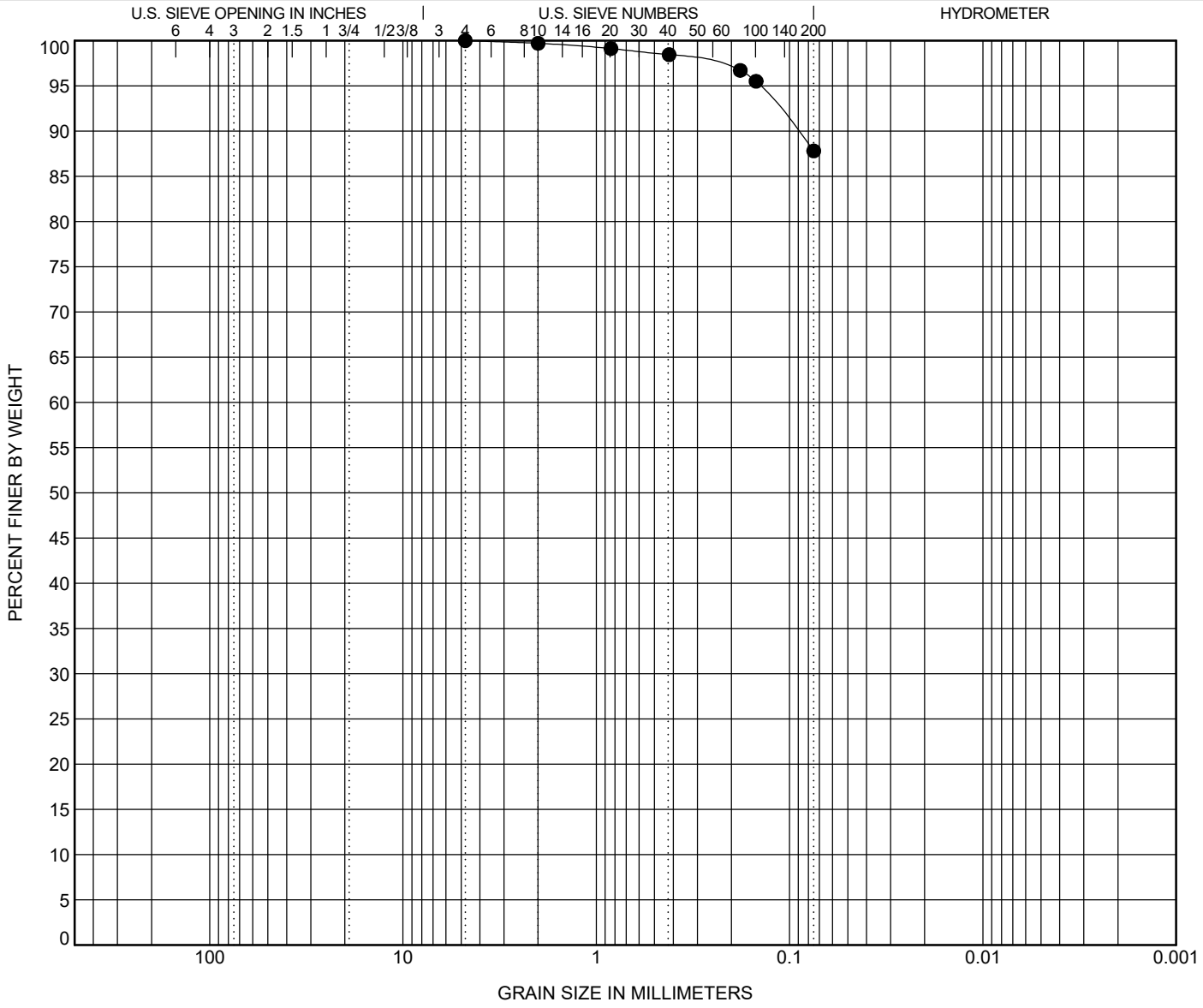
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

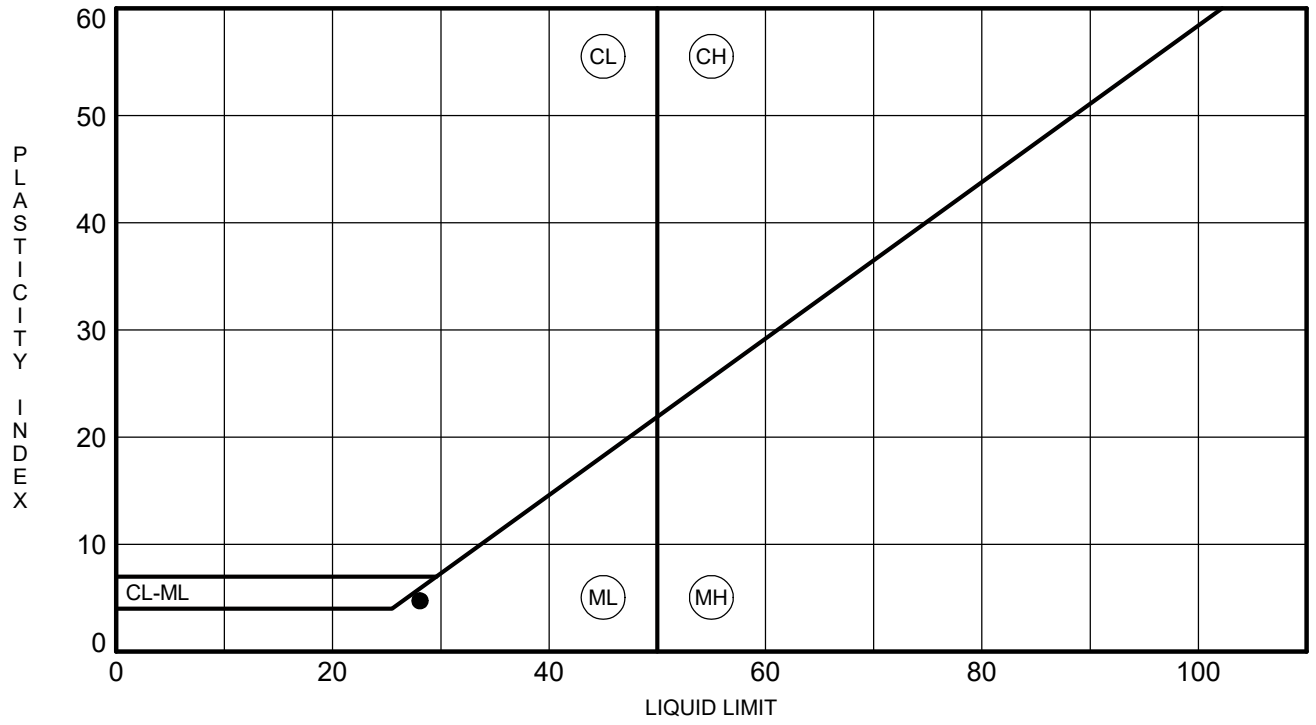
	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**RW-11**	**4.0**	**SILT (ML) A-4(4)**	**28**	**23**	**5**		

	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**RW-11**	**4.0**	**4.76**	**0.142**			**0.0**	**12.2**	**87.8**	

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**RW-11**	**4.0**	**28**	**23**	**5**	**88**	**SILT (ML) A-4(4)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/11/18

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0835	**DATE SAMPLE RECEIVED:**	5/8/2018
DESCRIPTION OF SOIL:	Various		
TESTED BY:	BF	**DATE OF TESTING:**	5/8/2018
		DATE OF WEIGHING:	5/12/2018

BORING NO.	RW-12	RW-12	RW-12	RW-12	
SAMPLE NO.	18-0835C SS-1	18-0835L SS-2	18-0835F SS-3	18-0835I SS-5	
SAMPLE DEPTH	0.0-2.0'	2.0-4.0'	4.0-6.0'	8.0-10.0'	
WATER CONTENT, W%	19.7	32.0	20.6	29.74	

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

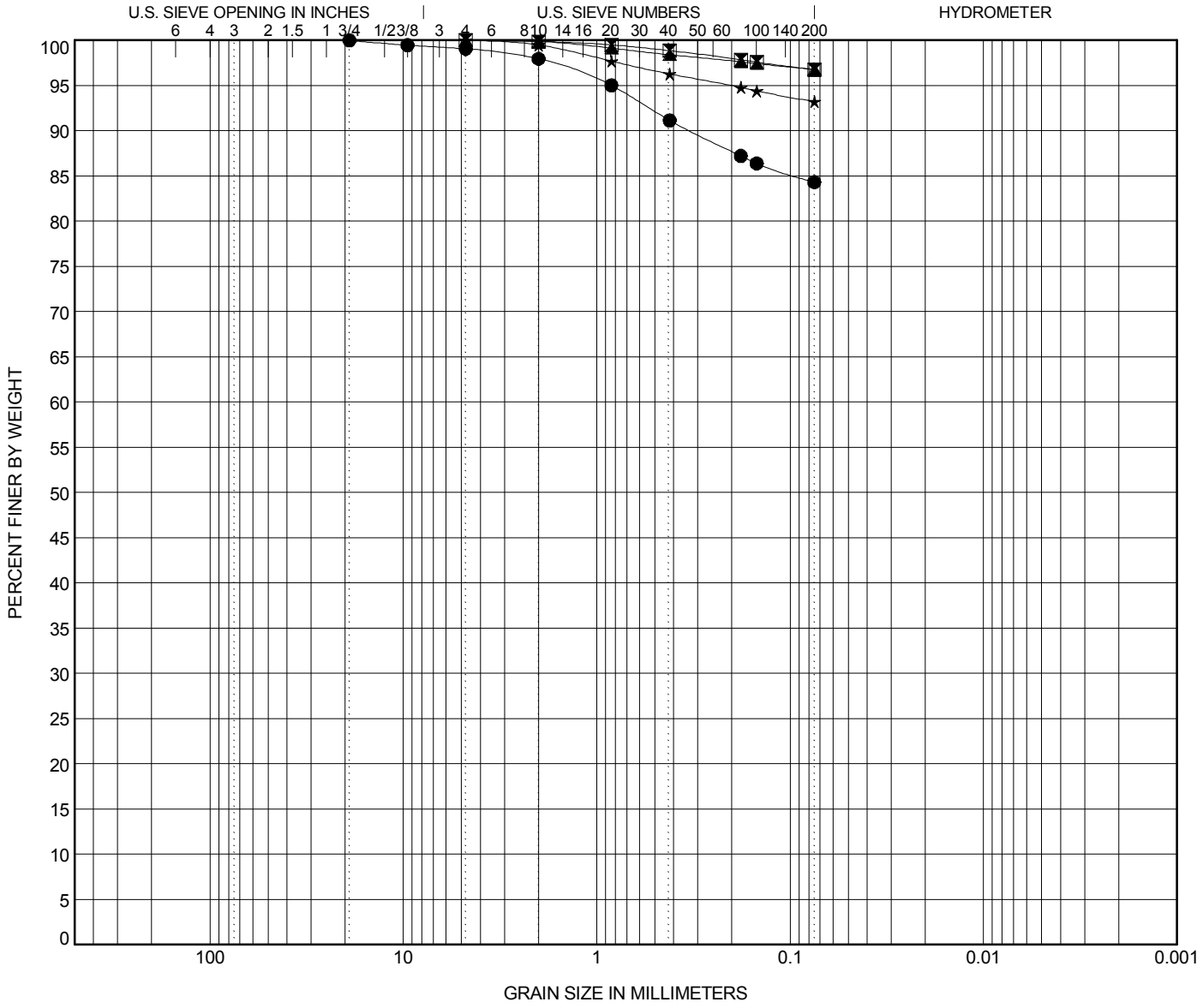
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**RW-12**	**2.0**	**SILT (ML) with F/M Sand A-7-5(12)**	**45**	**33**	**12**		
⧓	**RW-12**	**4.0**	**Fat CLAY (CH) A-7-6(20)**	**56**	**23**	**33**		
▲	**RW-12**	**6.0**	**Lean CLAY (CL) A-7-6(19)**	**42**	**25**	**17**		
★	**RW-12**	**10.0**	**SILT (ML) A-7-6(15)**	**41**	**27**	**14**		

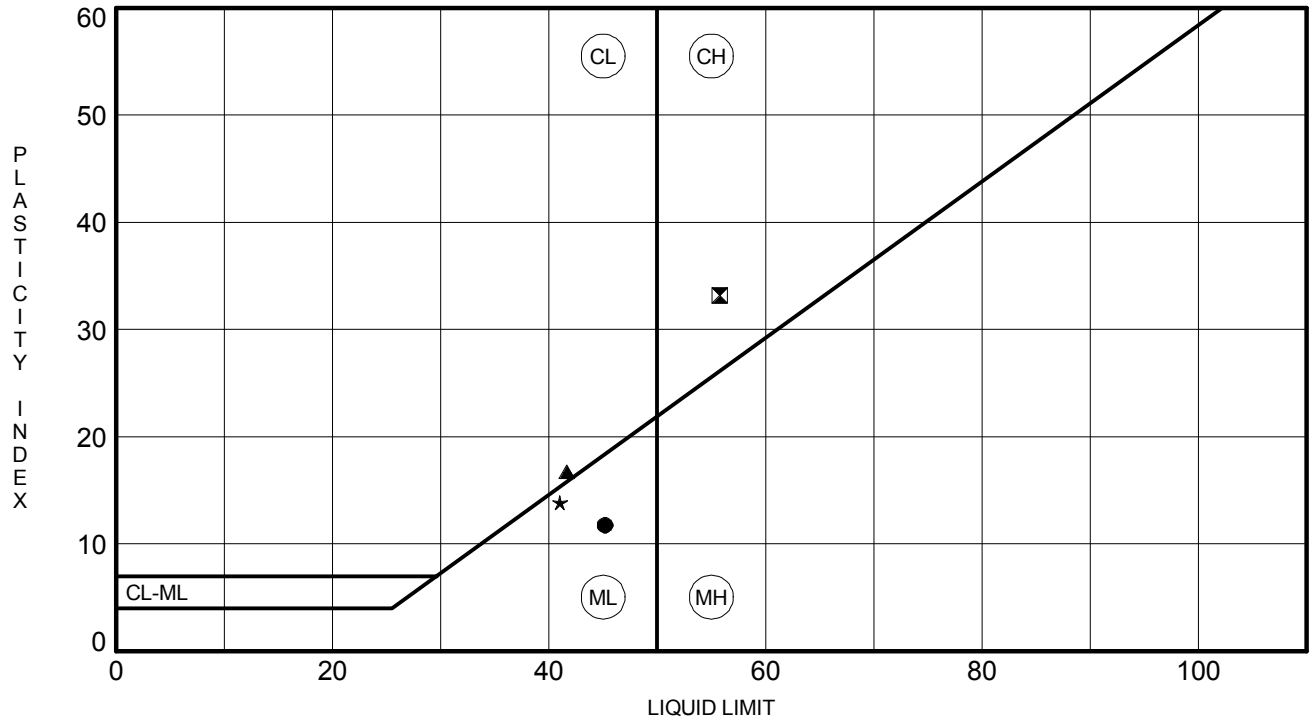
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**RW-12**	**2.0**	**19**	**0.835**			**0.9**	**14.7**	**84.3**	
⧓	**RW-12**	**4.0**	**4.76**				**0.0**	**3.2**	**96.8**	
▲	**RW-12**	**6.0**	**4.76**				**0.0**	**3.2**	**96.8**	
★	**RW-12**	**10.0**	**4.76**	**0.202**			**0.0**	**6.8**	**93.2**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/29/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**RW-12**	**2.0**	**45**	**33**	**12**	**84**	**SILT (ML) with F/M Sand A-7-5(12)**
⧓	**RW-12**	**4.0**	**56**	**23**	**33**	**97**	**Fat CLAY (CH) A-7-6(20)**
▲	**RW-12**	**6.0**	**42**	**25**	**17**	**97**	**Lean CLAY (CL) A-7-6(19)**
★	**RW-12**	**10.0**	**41**	**27**	**14**	**93**	**SILT (ML) A-7-6(15)**

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0570	**DATE SAMPLE RECEIVED:**	3/27/2018
DESCRIPTION OF SOIL:	Sandy SILT (ML) A-4(0)		
TESTED BY:	MB	**DATE OF TESTING:**	3/30/2018
		DATE OF WEIGHING:	4/2/2018

BORING NO.	RW-13				
SAMPLE NO.	18-0570C SS-2				
SAMPLE DEPTH	2.0-4.0'				
WATER CONTENT, W%	11.1				

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

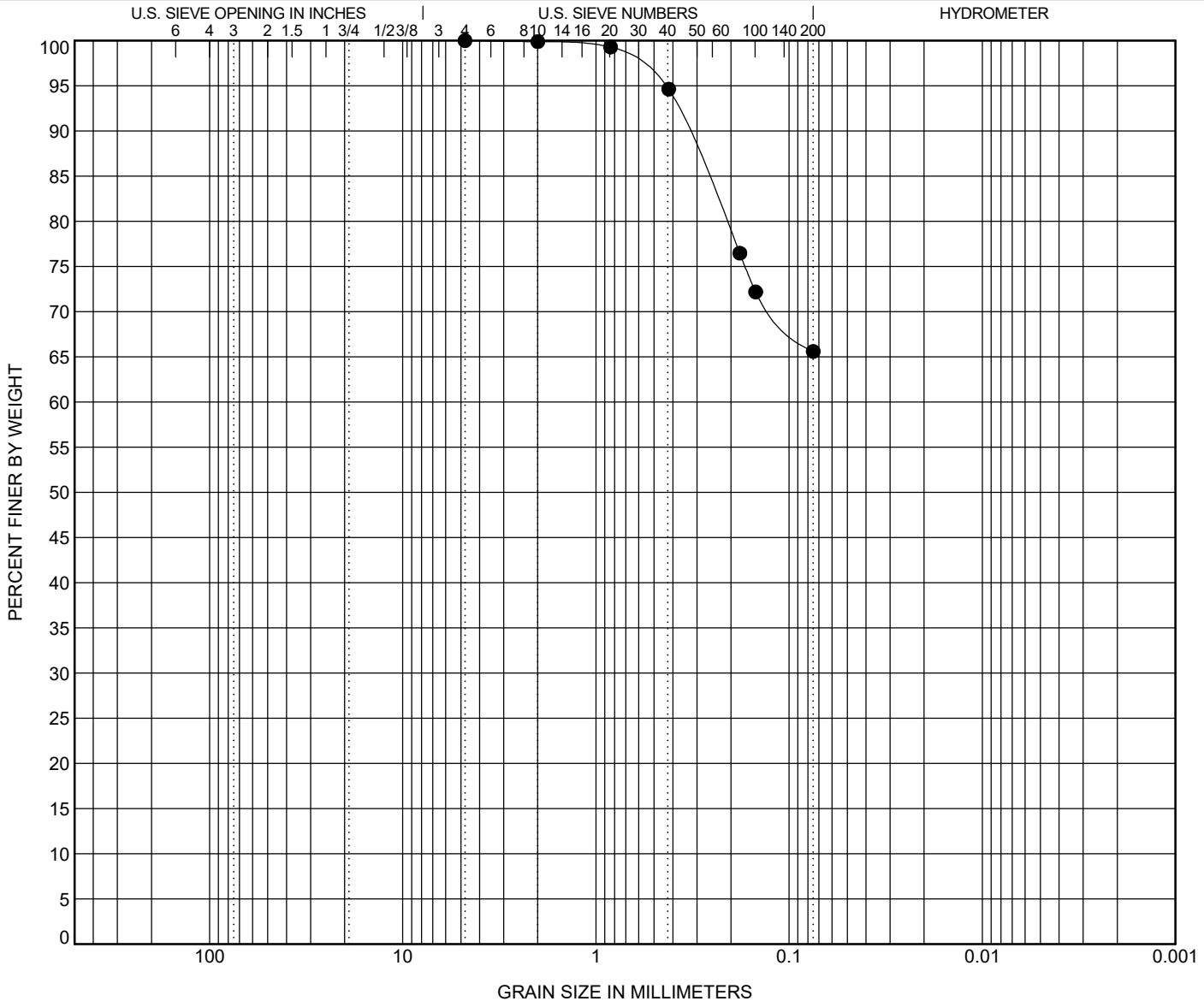
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

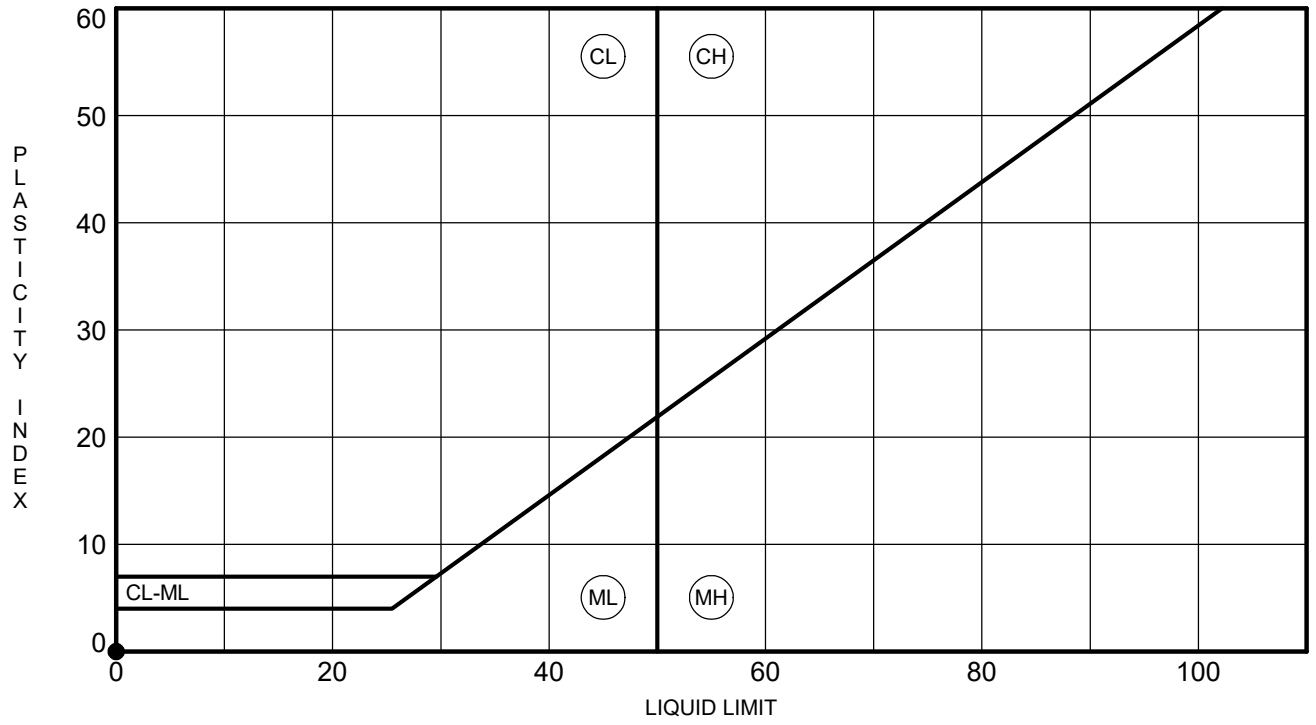
	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**RW-13**	**4.0**	**Sandy SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		

	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**RW-13**	**4.0**	**4.76**	**0.444**			**0.0**	**34.4**	**65.6**	

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**RW-13**	**4.0**	**NP**	**NP**	**NP**	**66**	**Sandy SILT (ML) A-4(0)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/13/18

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0451	**DATE SAMPLE RECEIVED:**	3/20/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	3/20/2018
		DATE OF WEIGHING:	3/21/2018

BORING NO.	RW-14	RW-14	RW-14	RW-14	
SAMPLE NO.	18-0451C SS-4	18-0451F SS-5	18-0451I SS-7	18-0451L SS-10	
SAMPLE DEPTH	6.0-8.0'	8.0-10.0'	18.5-20.0'	33.5-35.0'	
WATER CONTENT, W%	22.9	16.6	34.0	30.6	

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

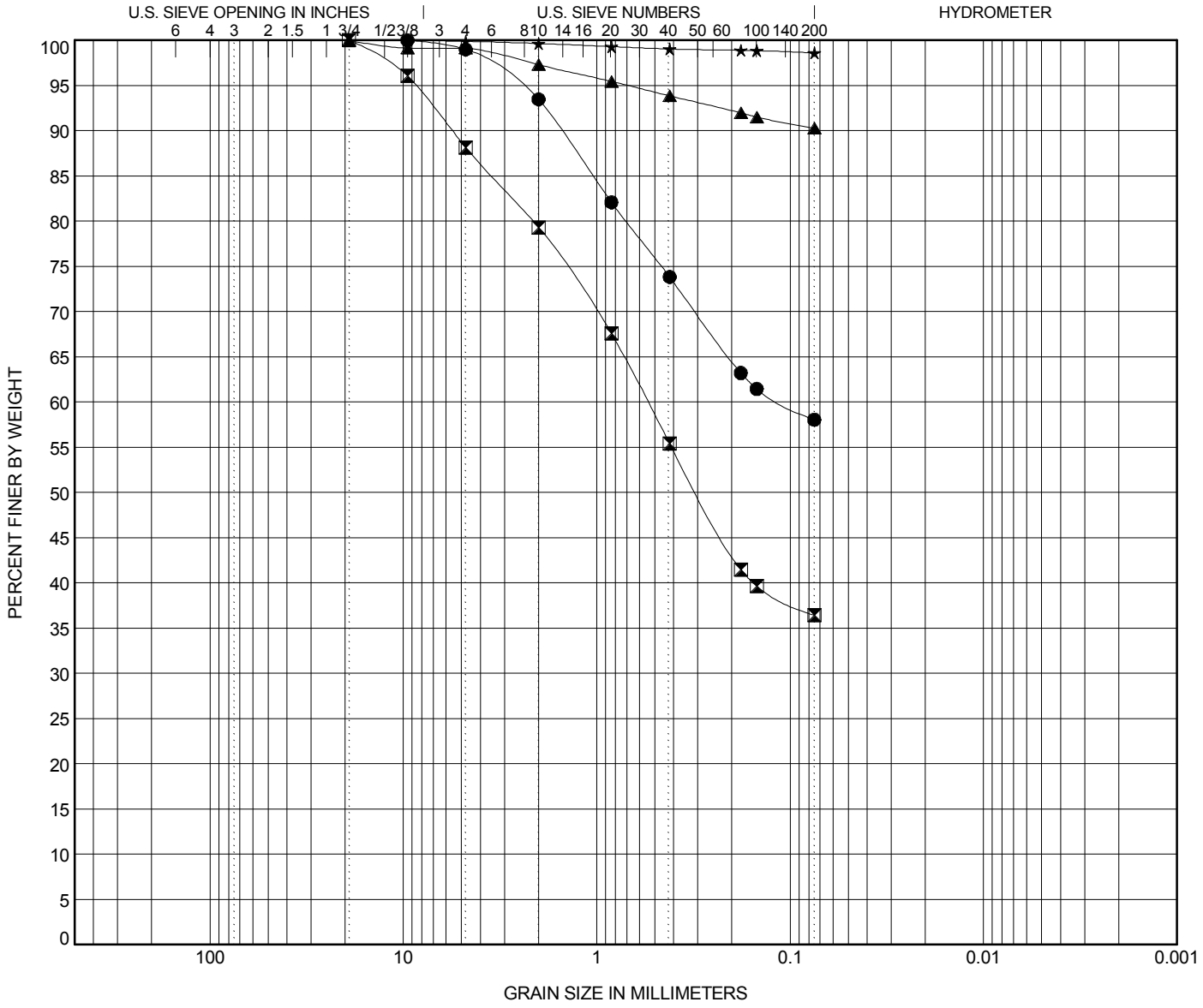
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**RW-14**	**8.0**	**Sandy SILT (ML) A-7-6(7))**	**41**	**26**	**15**		
⧓	**RW-14**	**10.0**	**Clayey Fine SAND (SC) A-6(1)**	**34**	**23**	**11**		
▲	**RW-14**	**20.0**	**Elastic SILT (MH) A-7-5(16)**	**51**	**39**	**12**		
★	**RW-14**	**35.0**	**SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		

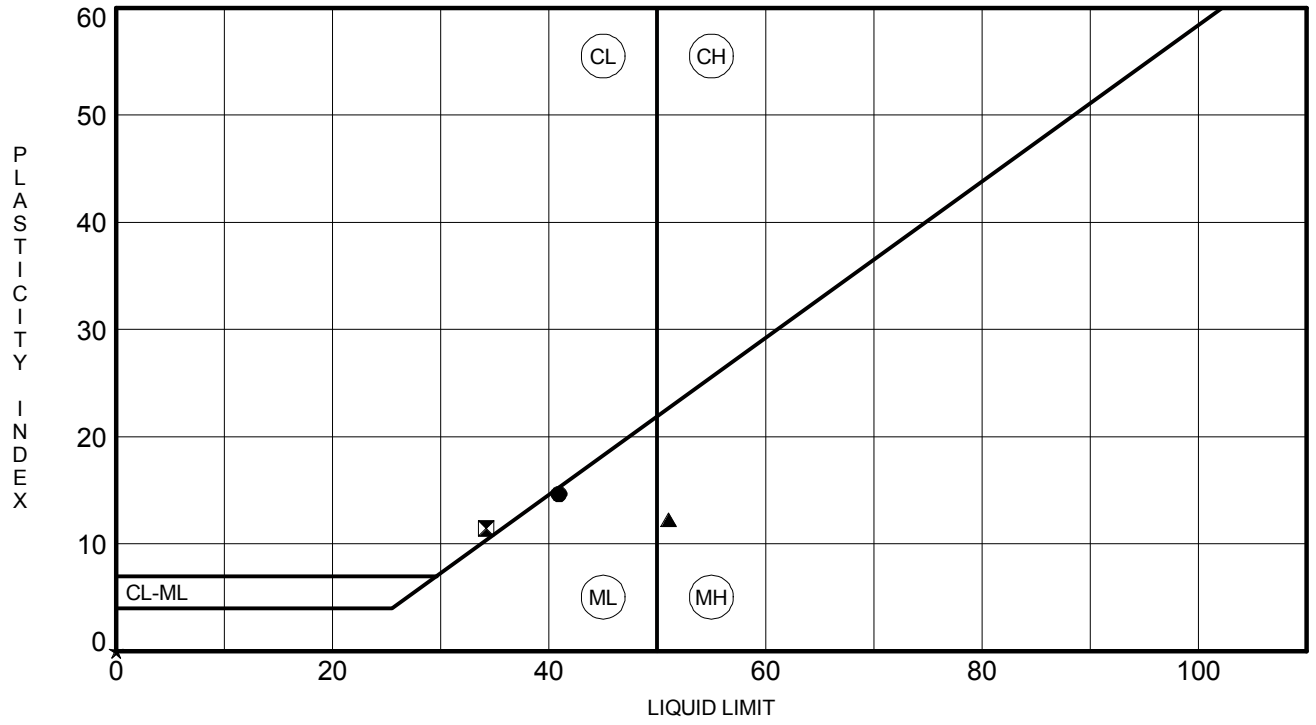
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**RW-14**	**8.0**	**9.52**	**2.537**			**1.0**	**40.9**	**58.1**	
⧓	**RW-14**	**10.0**	**19.1**	**8.671**	**0.302**		**11.9**	**51.7**	**36.4**	
▲	**RW-14**	**20.0**	**19.1**	**0.687**			**0.9**	**8.9**	**90.3**	
★	**RW-14**	**35.0**	**9.52**				**0.1**	**1.3**	**98.6**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/5/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**RW-14**	**8.0**	**41**	**26**	**15**	**58**	**Sandy SILT (ML) A-7-6(7))**
⊠	**RW-14**	**10.0**	**34**	**23**	**11**	**36**	**Clayey Fine SAND (SC) A-6(1)**
▲	**RW-14**	**20.0**	**51**	**39**	**12**	**90**	**Elastic SILT (MH) A-7-5(16)**
★	**RW-14**	**35.0**	**NP**	**NP**	**NP**	**99**	**SILT (ML) A-4(0)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/5/18

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0571	**DATE SAMPLE RECEIVED:**	3/27/2018
DESCRIPTION OF SOIL:	Various		
TESTED BY:	MB	**DATE OF TESTING:**	3/30/2018
		DATE OF WEIGHING:	4/2/2018

BORING NO.	RW-15	RW-15	RW-15		
SAMPLE NO.	18-0571C SS-5	18-0571F SS-7	18-0571I SS-10		
SAMPLE DEPTH	8.0-10.0'	18.5-20.0'	33.5-35.0'		
WATER CONTENT, W%	27.5	19.2	17.1		

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

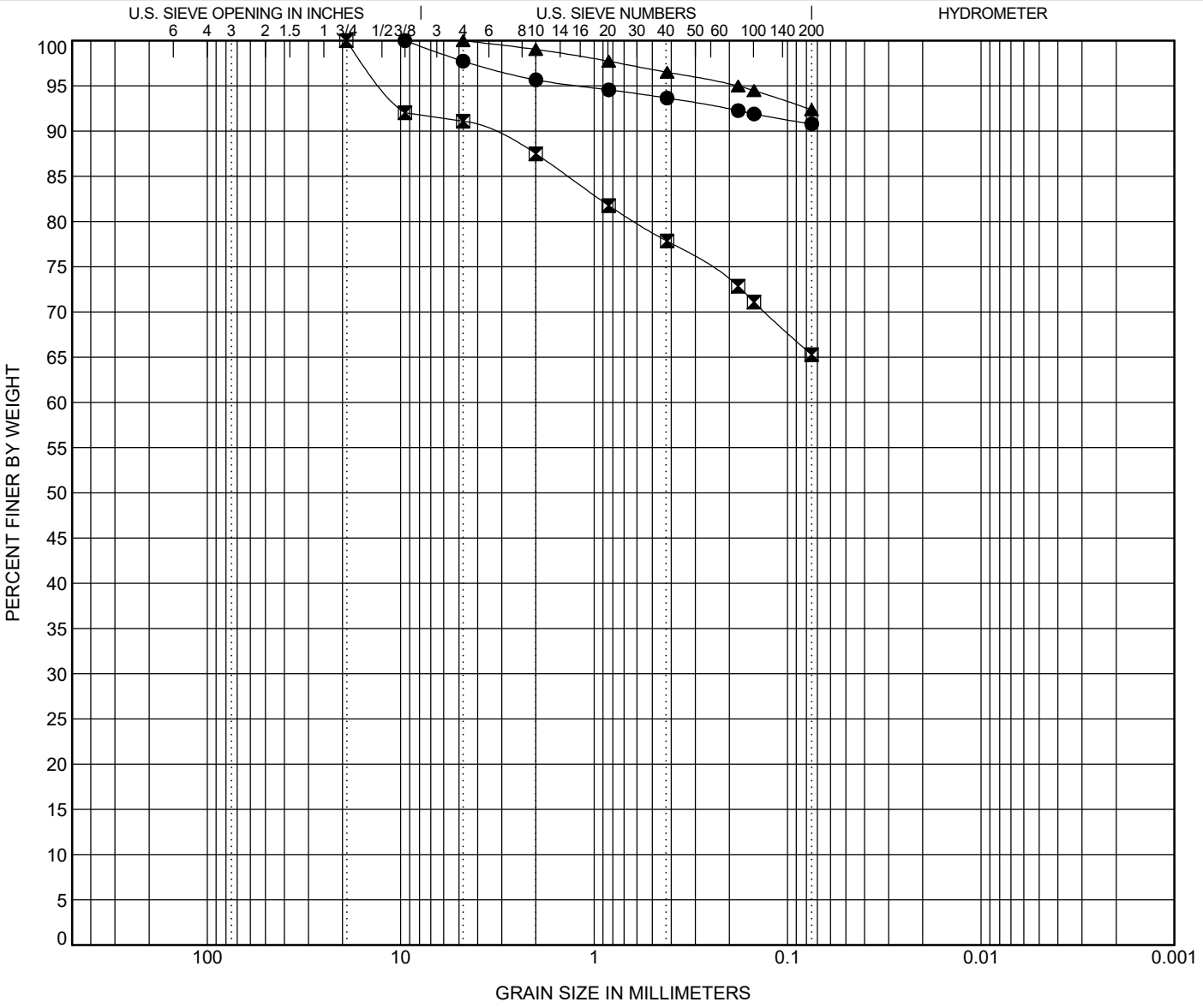
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**RW-15**	**10.0**	**SILT (ML) A-7-6(18)**	**46**	**29**	**17**		
⊠	**RW-15**	**20.0**	**Sandy SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		
▲	**RW-15**	**35.0**	**SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		

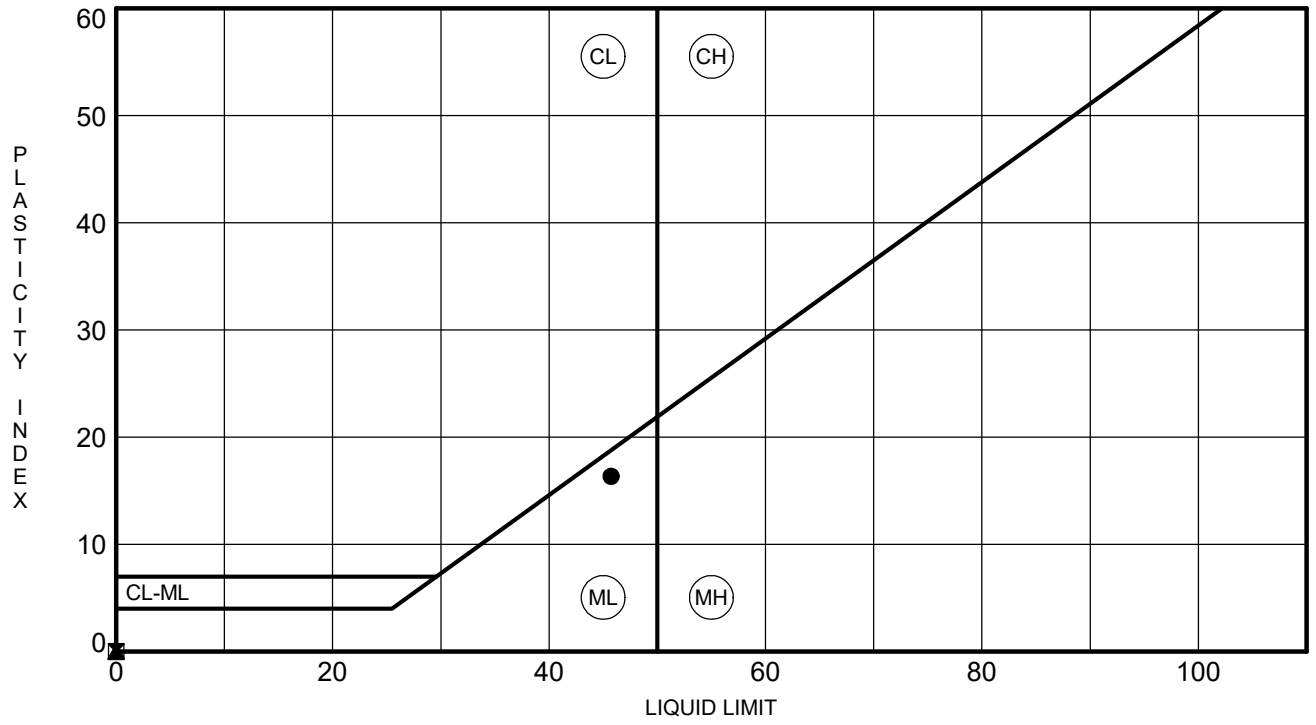
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**RW-15**	**10.0**	**9.52**	**1.188**			**2.3**	**6.9**	**90.8**	
⊠	**RW-15**	**20.0**	**19.1**	**12.341**			**8.9**	**25.8**	**65.3**	
▲	**RW-15**	**35.0**	**4.76**	**0.182**			**0.0**	**7.6**	**92.4**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/13/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**RW-15**	**10.0**	**46**	**29**	**17**	**91**	**SILT (ML) A-7-6(18)**
⧓	**RW-15**	**20.0**	**NP**	**NP**	**NP**	**65**	**Sandy SILT (ML) A-4(0)**
▲	**RW-15**	**35.0**	**NP**	**NP**	**NP**	**92**	**SILT (ML) A-4(0)**

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0281	**DATE SAMPLE RECEIVED:**	2/13/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	2/15/2018
		DATE OF WEIGHING:	2/16/2018

BORING NO.	RW-16	RW-16	RW-16		
SAMPLE NO.	18-0281C SS-3	18-0281F SS-6	18-0281I SS-9		
SAMPLE DEPTH	4.0-6.0'	13.5-15.0'	28.5-30.0'		
WATER CONTENT, W%	20.1	17.3	14.2		

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

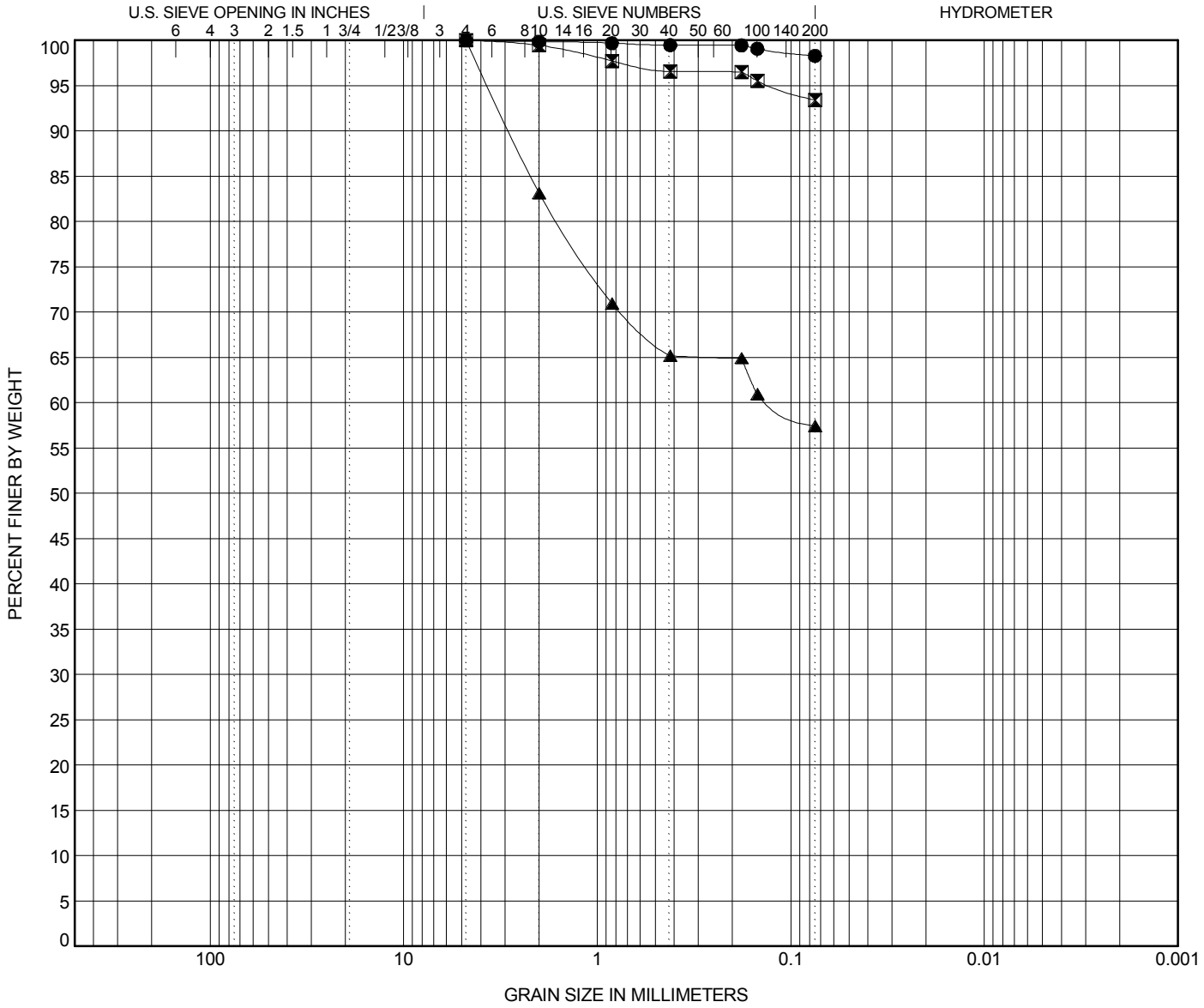
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**RW-16**	**6.0**	**Fat CLAY (CH) A-7-6(20)**	**81**	**18**	**63**		
⧓	**RW-16**	**15.0**	**Lean CLAY (CL) A-7-6(18)**	**42**	**24**	**18**		
▲	**RW-16**	**30.0**	**Sandy SILT (ML) A-6(10)**	**35**	**25**	**10**		

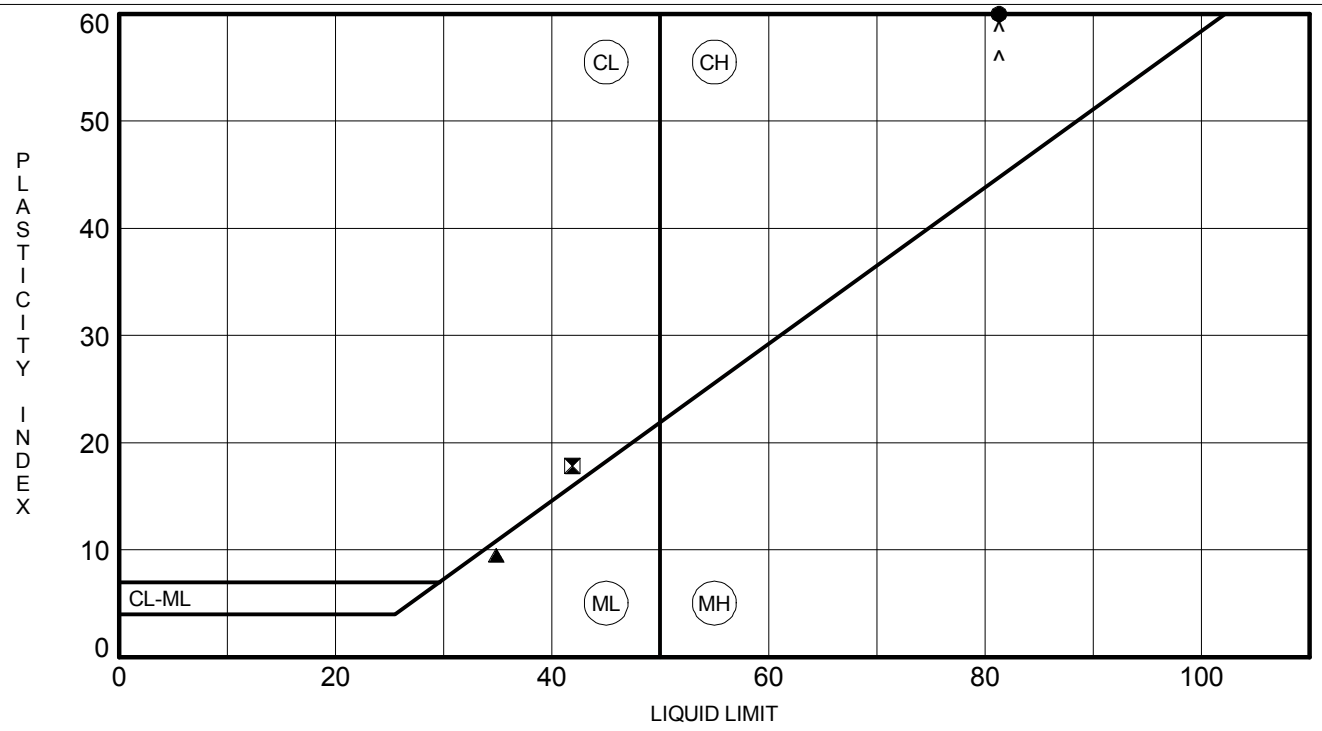
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**RW-16**	**6.0**	**4.76**				**0.0**	**1.7**	**98.3**	
⧓	**RW-16**	**15.0**	**4.76**	**0.125**			**0.0**	**6.6**	**93.4**	
▲	**RW-16**	**30.0**	**4.76**	**3.679**			**0.0**	**42.6**	**57.4**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 3/2/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**RW-16**	**6.0**	**81**	**18**	**63**	**98**	**Fat CLAY (CH) A-7-6(20)**
⊠	**RW-16**	**15.0**	**42**	**24**	**18**	**93**	**Lean CLAY (CL) A-7-6(18)**
▲	**RW-16**	**30.0**	**35**	**25**	**10**	**57**	**Sandy SILT (ML) A-6(10)**

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0166	**DATE SAMPLE RECEIVED:**	1/26/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	1/29/2018
		DATE OF WEIGHING:	1/30/2018

BORING NO.	RW-17	RW-17			
SAMPLE NO.	18-0166C SS-3	18-0166F SS-5			
SAMPLE DEPTH	4.0-6.0'	8.0-10.0'			
WATER CONTENT, W%	24.5	26.9			

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

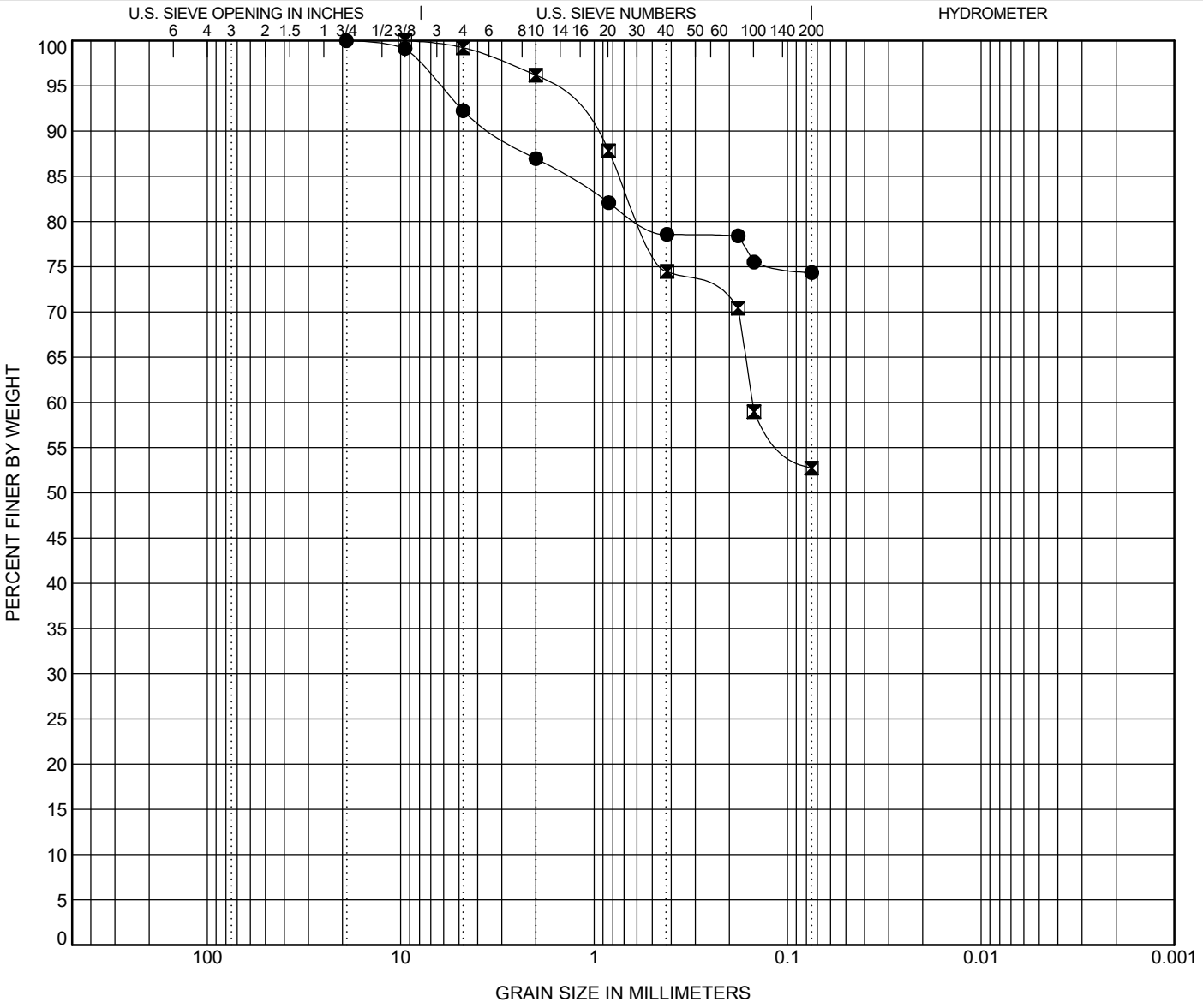
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**RW-17**	**6.0**	**SILT (ML) with F/C Sand A-7-5(12)**	**48**	**34**	**14**		
⊠	**RW-17**	**10.0**	**Sandy SILT (ML) A-4(3)**	**33**	**24**	**9**		

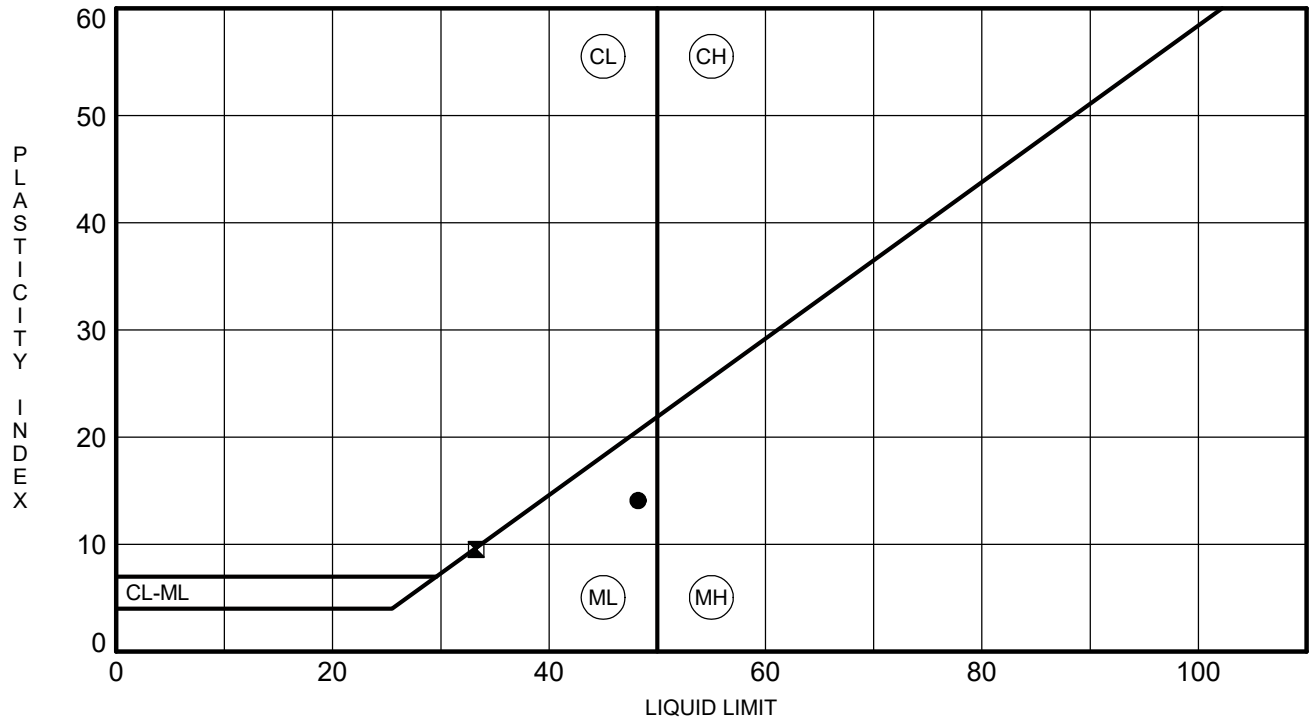
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**RW-17**	**6.0**	**19.1**	**6.281**			**7.8**	**17.9**	**74.3**	
⊠	**RW-17**	**10.0**	**9.52**	**1.771**			**0.8**	**46.5**	**52.7**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 2/12/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**RW-17**	**6.0**	**48**	**34**	**14**	**74**	**SILT (ML) with F/C Sand A-7-5(12)**
⊠	**RW-17**	**10.0**	**33**	**24**	**9**	**53**	**Sandy SILT (ML) A-4(3)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 2/12/18

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0846	**DATE SAMPLE RECEIVED:**	5/8/2018
DESCRIPTION OF SOIL:	Various		
TESTED BY:	BF	**DATE OF TESTING:**	5/8/2018
		DATE OF WEIGHING:	5/12/2018

BORING NO.	RW-18	RW-18			
SAMPLE NO.	18-0846C SS-3	18-0846F SS-4			
SAMPLE DEPTH	4.0-6.0'	6.0-8.0'			
WATER CONTENT, W%	8.7	13.6			

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

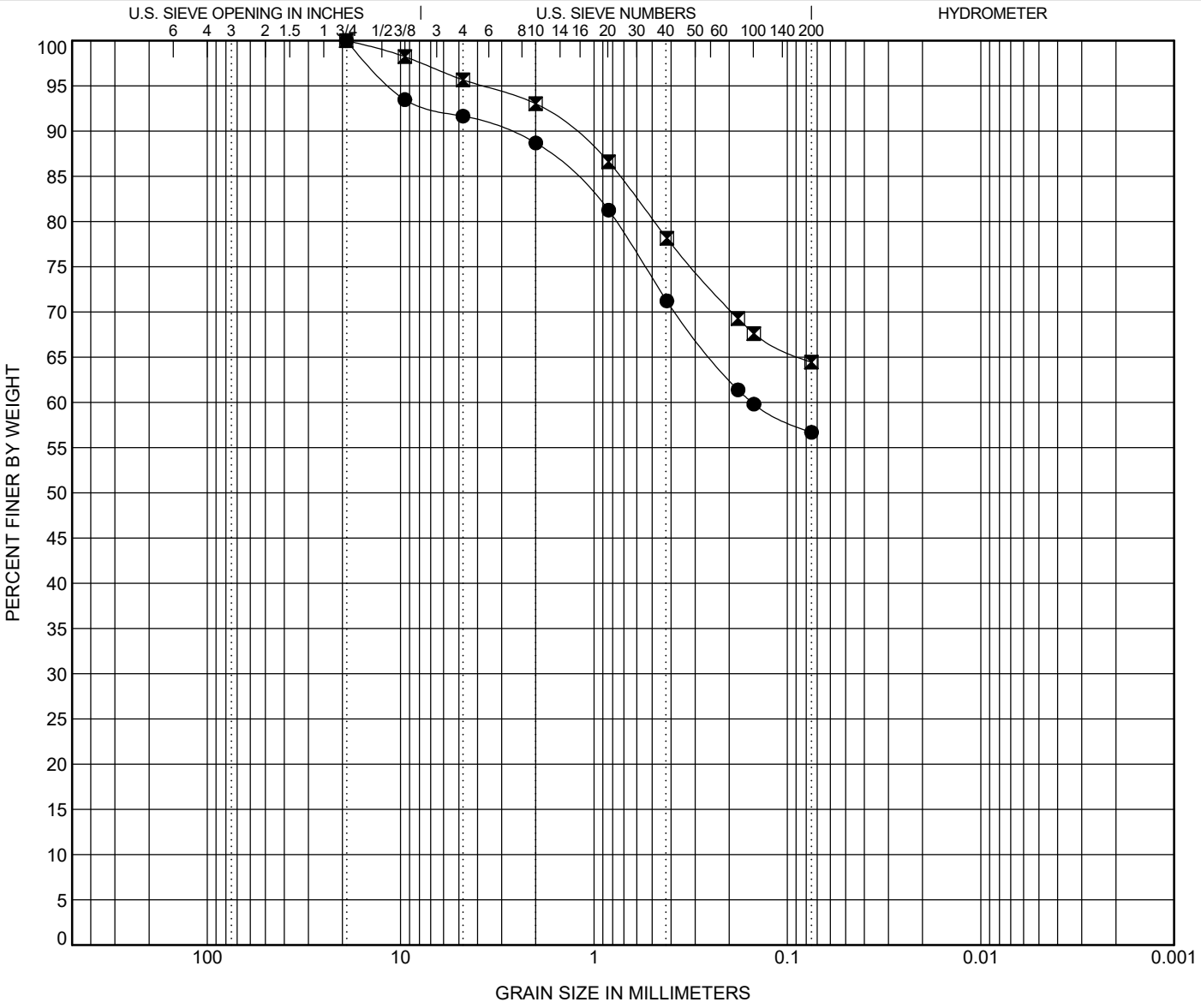
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**RW-18**	**6.0**	**Sandy SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		
⊠	**RW-18**	**8.0**	**Sandy Lean CLAY (CL) A-6(9)**	**40**	**23**	**17**		

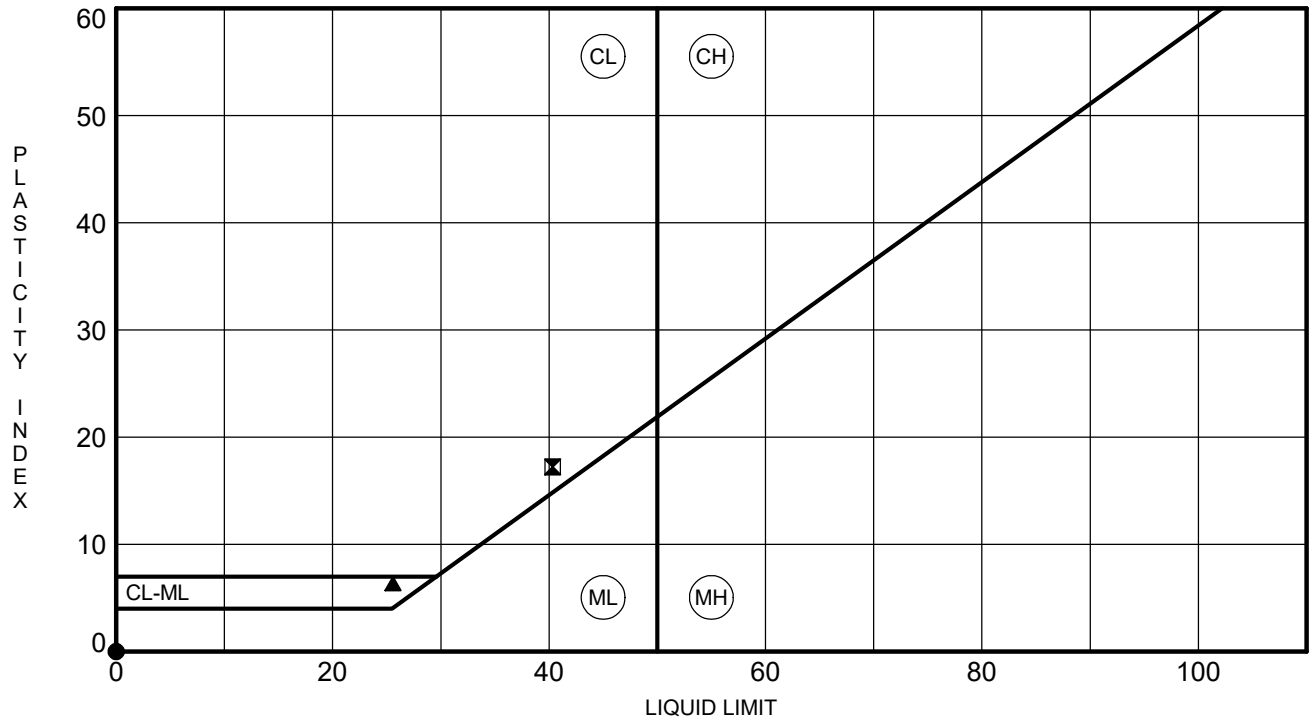
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**RW-18**	**6.0**	**19.1**	**11.196**			**8.4**	**35.0**	**56.7**	
⊠	**RW-18**	**8.0**	**19.1**	**3.817**			**4.3**	**31.2**	**64.5**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 5/22/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**RW-18**	**6.0**	**NP**	**NP**	**NP**	**57**	**Sandy SILT (ML) A-4(0)**
⊠	**RW-18**	**8.0**	**40**	**23**	**17**	**64**	**Sandy Lean CLAY (CL) A-6(9)**
▲	**RW-18**	**18.0**	**26**	**19**	**7**		

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 5/22/18

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

ROCK CORE COMPRESSION TEST

PROJECT: I-20/26/126 Corridor Improvements **PROJECT NO:** G5662.01

SAMPLED BY: CP **DATE SAMPLED:** 5/3/2018

TESTED BY: BF **DATE TESTED:** 5/16/2018

Lab No.	18-0847A	18-0847B			
Boring No.	RW-18	RW-18			
Sample No.	NQ-2	NQ-3			
Depth	71.8-72.1	76.5-76.8			
Length (in)	4.04	3.83			
Diameter (in)	1.85	1.84			
Mass (g)	487.24	452.73			
Cross Sectional Area (in^2)	2.69	2.66			
Load (lb)	6010	18050			
Compressive Strength (psi)	2240	6800			
Corrected Compressive Strength (psi)					
Unit Weight (lb/ft^3)	171.01	169.62			

Signature: _____

Remarks: _____

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Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0167	**DATE SAMPLE RECEIVED:**	1/26/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	1/29/2018
		DATE OF WEIGHING:	1/30/2018

BORING NO.	RW-19	RW-19			
SAMPLE NO.	18-0167C SS-4	18-0167F SS-6			
SAMPLE DEPTH	6.0-8.0'	13.5-15.0'			
WATER CONTENT, W%	17.0	18.3			

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

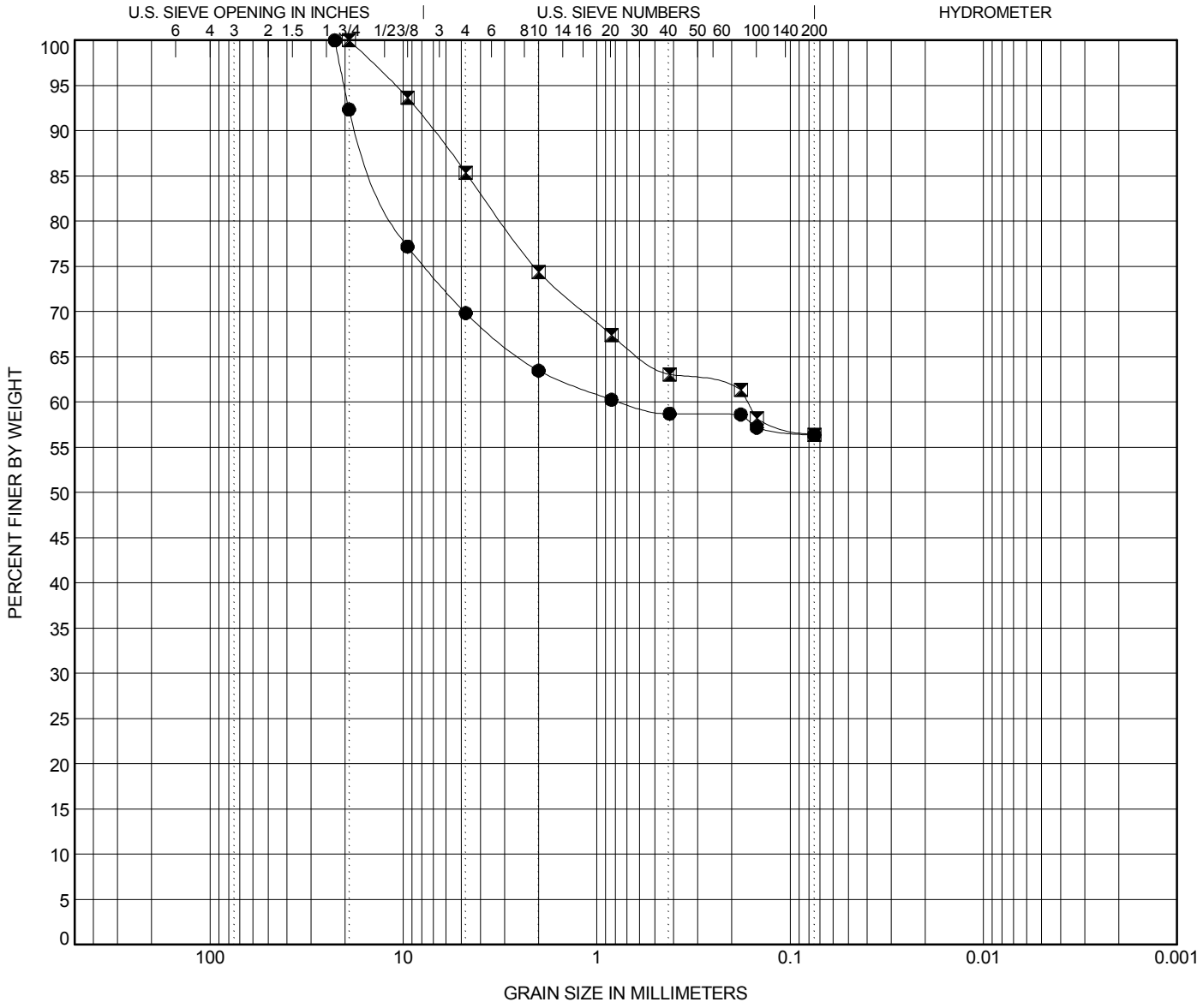
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**RW-19**	**8.0**	**Gravelly SILT (ML) with Sand A-4(4)**	**37**	**27**	**10**		
⧓	**RW-19**	**15.0**	**Sandy Lean CLAY (CL) A-6(6)**	**37**	**21**	**16**		

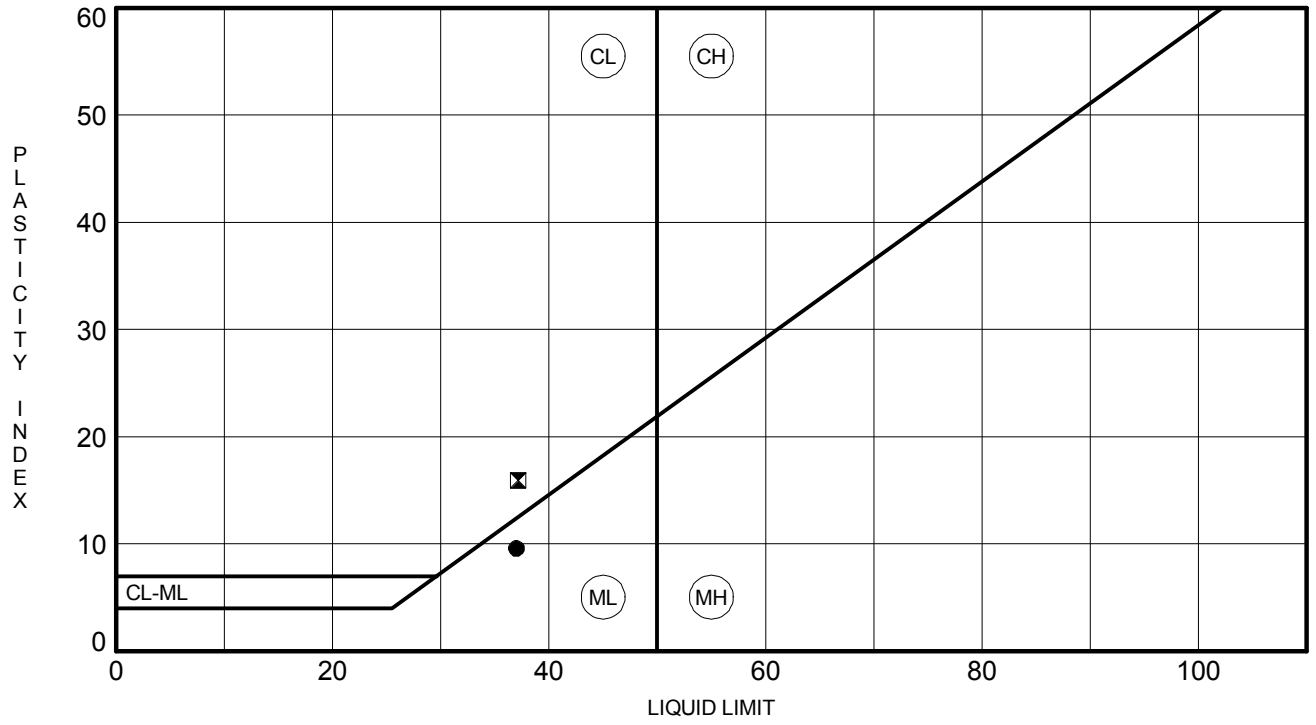
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**RW-19**	**8.0**	**22.6**	**20.241**			**30.2**	**13.5**	**56.4**	
⧓	**RW-19**	**15.0**	**19.1**	**11.047**			**14.6**	**28.9**	**56.4**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 2/12/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**RW-19**	**8.0**	**37**	**27**	**10**	**56**	**Gravelly SILT (ML) with Sand A-4(4)**
⊠	**RW-19**	**15.0**	**37**	**21**	**16**	**56**	**Sandy Lean CLAY (CL) A-6(6)**

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INORGANIC IMPURITIES DETERMINATION
(SC-T-36)

PROJECT: Carolina Crossroads **PROJECT NO.:** G5662.01

SAMPLE NUMBER: 18-0167G **DATE SAMPLE RECEIVED:** 1/30/2018

DESCRIPTION OF SOIL:

TESTED BY: JH **DATE OF TESTING:** 2/2/2018

DATE OF WEIGHING: 2/2/2018

BORING NO.	RW-19				
SAMPLE NO.	18-0167G				
SAMPLE DEPTH	8-10				
200 WASH PAN NUMBER	3088				
WEIGHT OF PAN	8.03				
WEIGHT OF SAMPLE & PAN (BEFORE WASH)	108.03				
WEIGHT OF SAMPLE (BEFORE WASH)	100.00				
WEIGHT OF SAMPLE PASSING #10 & PAN (AFTER WASH)	19.34				
WEIGHT OF SAMPLE PASSING #10 (AFTER WASH)	11.31				
MATERIAL >#10 PAN NUMBER	3010				
MATERIAL >#10 PAN WEIGHT	8.13				
WEIGHT OF SAMPLE RETAINED #10 & PAN (AFTER WASH)	23.45				
WEIGHT OF SAMPLE RETAINED #10 (AFTER WASH)	15.32				
PERCENT PASSING #10 & RETAINED ON #200 (% SANDS)	13.4%				
ORGANIC PAN NUMBER	A				
WT. OF CRUCIBLE + DRY SOIL (BEFORE IGNITION) (GRAMS)	72.34				
WT. OF CRUCIBLE + DRY SOIL (AFTER IGNITION) (GRAMS)	71.83				
WT. OF CRUCIBLE (GRAMS)	61.06				
WT. OF DRY SOIL (BEFORE IGNITION) (GRAMS)	11.28				
WT. OF DRY SOIL (AFTER IGNITION) (GRAMS)	10.77				
IGNITION LOSS (GRAMS)	0.51				
INORGANIC IMPURITIES %	0.6%				

F&ME CONSULTANTS
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Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0723	**DATE SAMPLE RECEIVED:**	4/16/2018
DESCRIPTION OF SOIL:	Various		
TESTED BY:	MB	**DATE OF TESTING:**	4/17/2018
		DATE OF WEIGHING:	4/18/2018

BORING NO.	RW-20	RW-20			
SAMPLE NO.	18-0723C SS-1	18-0723F SS-8			
SAMPLE DEPTH	0.0-2.0'	23.5-25.0'			
WATER CONTENT, W%	17.8	25.6			

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

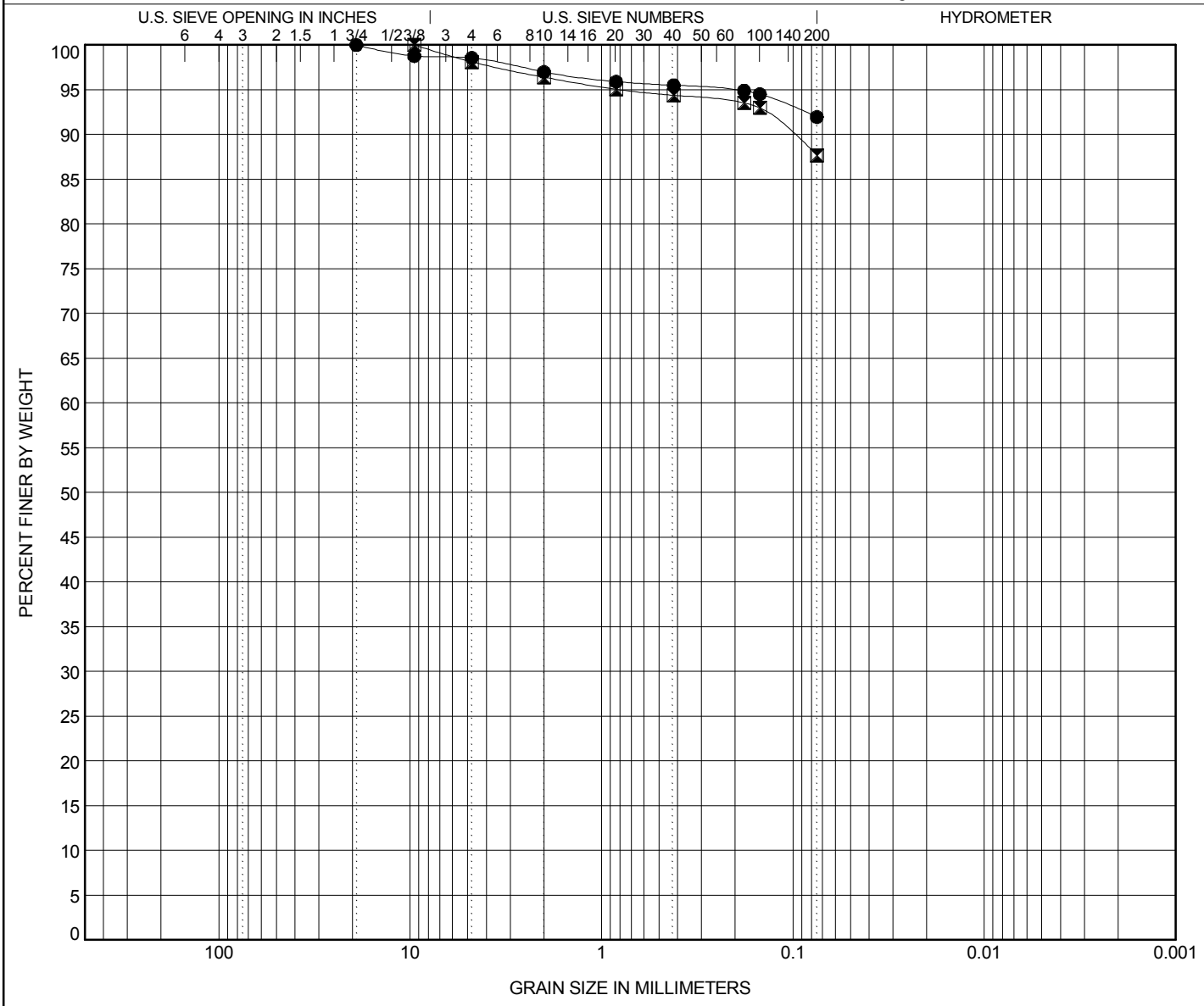
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**RW-20**	**2.0**	**SILT (ML) A-5(11)**	**43**	**35**	**8**		
⧓	**RW-20**	**25.0**	**SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		

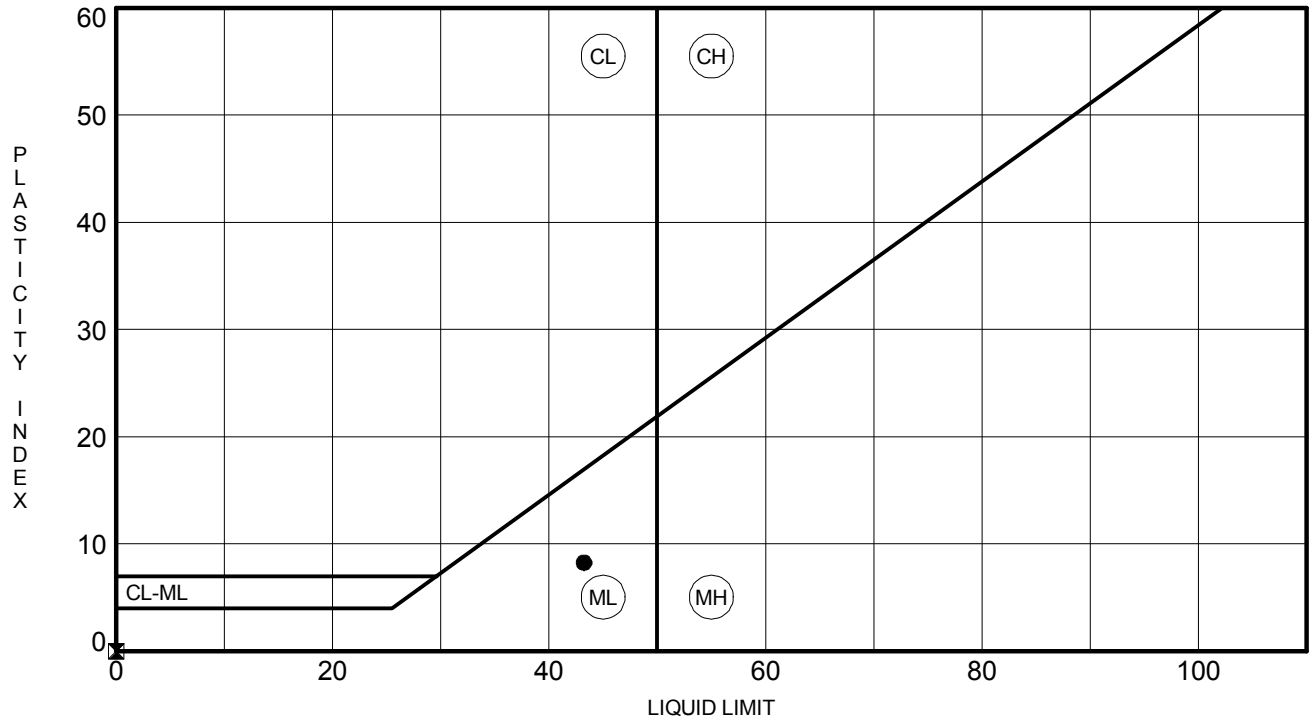
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**RW-20**	**2.0**	**19.1**	**0.209**			**1.4**	**6.6**	**92.0**	
⧓	**RW-20**	**25.0**	**9.52**	**0.792**			**1.9**	**10.4**	**87.7**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/5/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**RW-20**	**2.0**	**43**	**35**	**8**	**92**	**SILT (ML) A-5(11)**
⧓	**RW-20**	**25.0**	**NP**	**NP**	**NP**	**88**	**SILT (ML) A-4(0)**

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Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0694	**DATE SAMPLE RECEIVED:**	4/16/2018
DESCRIPTION OF SOIL:	Various		
TESTED BY:	MB	**DATE OF TESTING:**	4/17/2018
		DATE OF WEIGHING:	4/18/2018

BORING NO.	RW-21	RW-21	RW-21		
SAMPLE NO.	18-0694C SS-2	18-0694F SS-6	18-0694I SS-10		
SAMPLE DEPTH	2.0-4.0'	13.5-15.0'	33.5-35.0'		
WATER CONTENT, W%	23.6	27.1	35.8		

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

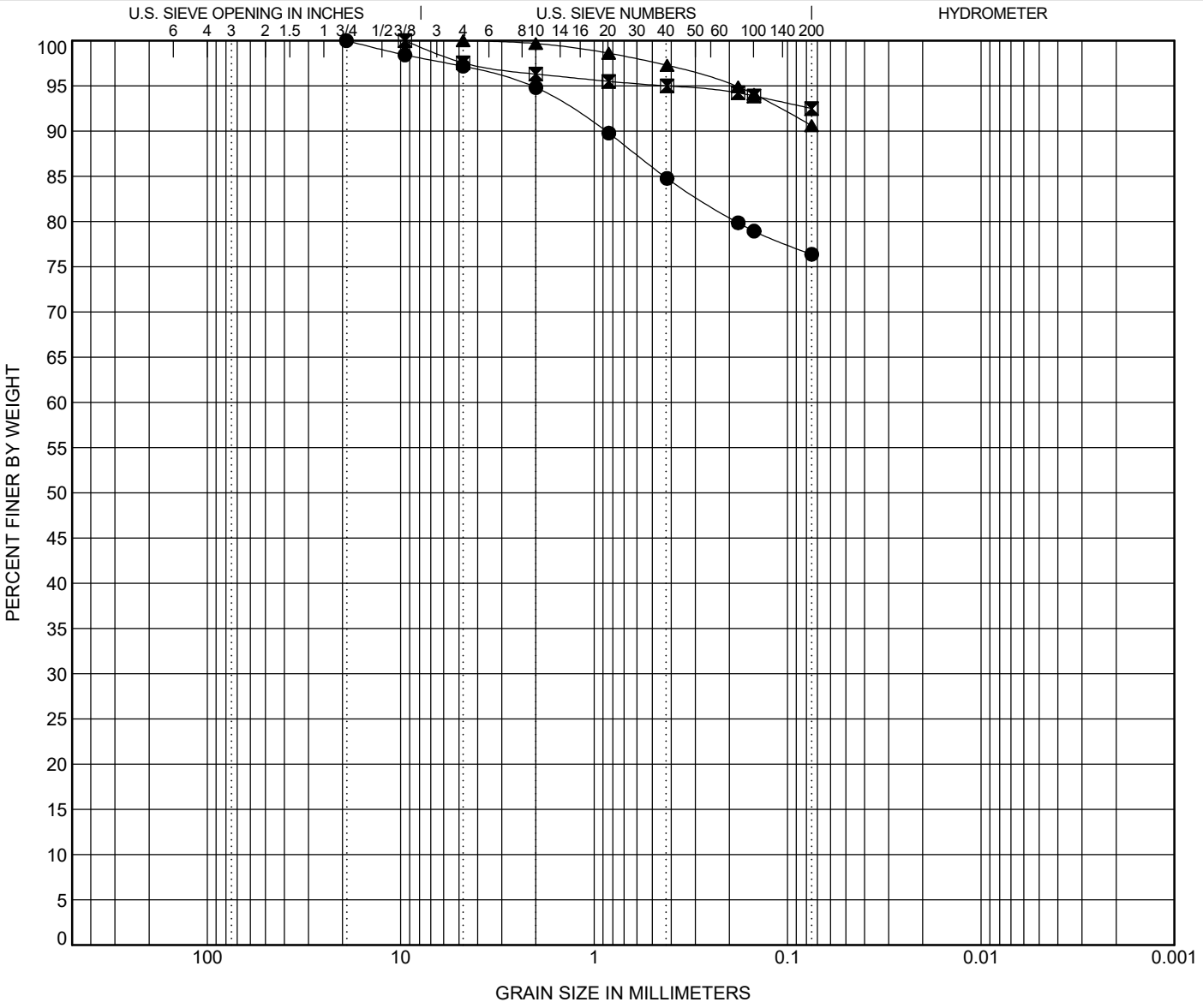
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**RW-21**	**4.0**	**Elastic SILT (MH) with F/M Sand A-7-5(20)**	**63**	**35**	**28**		
⊠	**RW-21**	**15.0**	**SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		
▲	**RW-21**	**35.0**	**SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		

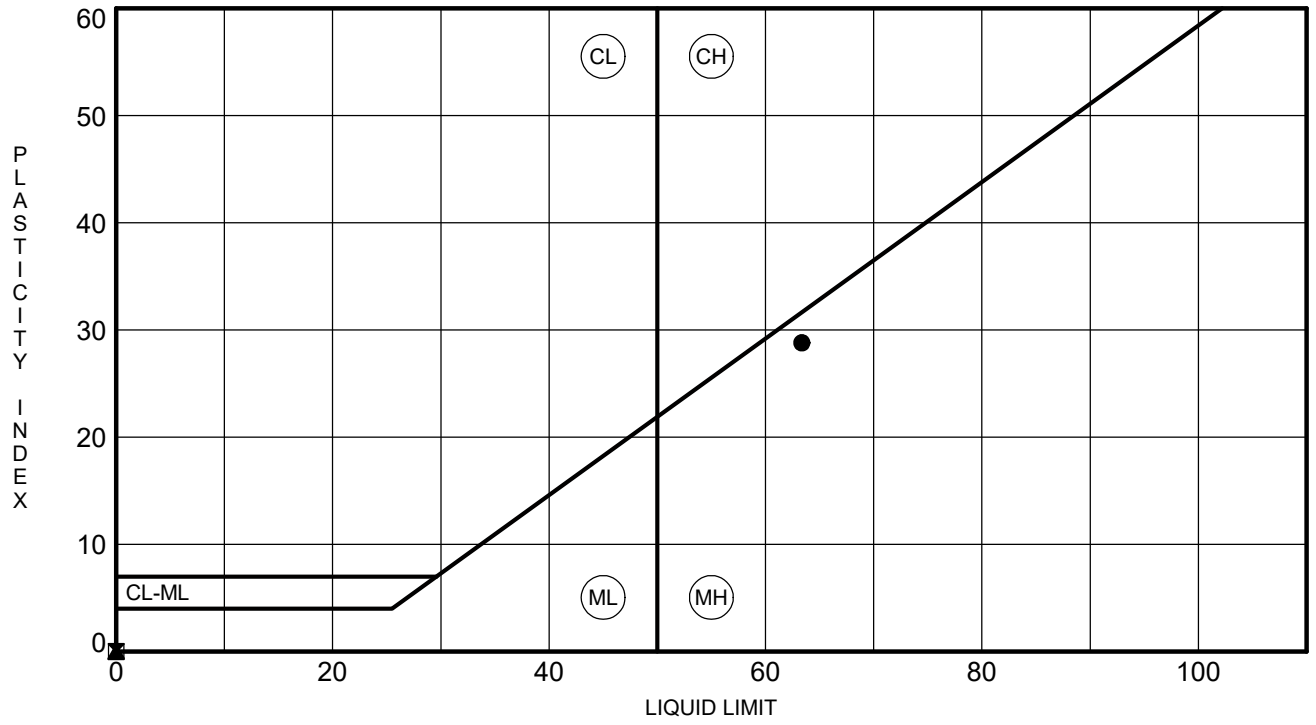
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**RW-21**	**4.0**	**19.1**	**2.143**			**2.8**	**20.8**	**76.4**	
⊠	**RW-21**	**15.0**	**9.52**	**0.423**			**2.5**	**5.0**	**92.5**	
▲	**RW-21**	**35.0**	**4.76**	**0.187**			**0.0**	**9.4**	**90.6**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 5/1/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**RW-21**	**4.0**	**63**	**35**	**28**	**76**	**Elastic SILT (MH) with F/M Sand A-7-5(20)**
⧓	**RW-21**	**15.0**	**NP**	**NP**	**NP**	**92**	**SILT (ML) A-4(0)**
▲	**RW-21**	**35.0**	**NP**	**NP**	**NP**	**91**	**SILT (ML) A-4(0)**

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Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0770	**DATE SAMPLE RECEIVED:**	4/30/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	4/30/2018
		DATE OF WEIGHING:	5/1/2018

BORING NO.	RW-22	RW-22			
SAMPLE NO.	18-0770C SS-2	18-0770F SS-5			
SAMPLE DEPTH	2.0-4.0'	8.0-10.0'			
WATER CONTENT, W%	8.2	23.0			

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

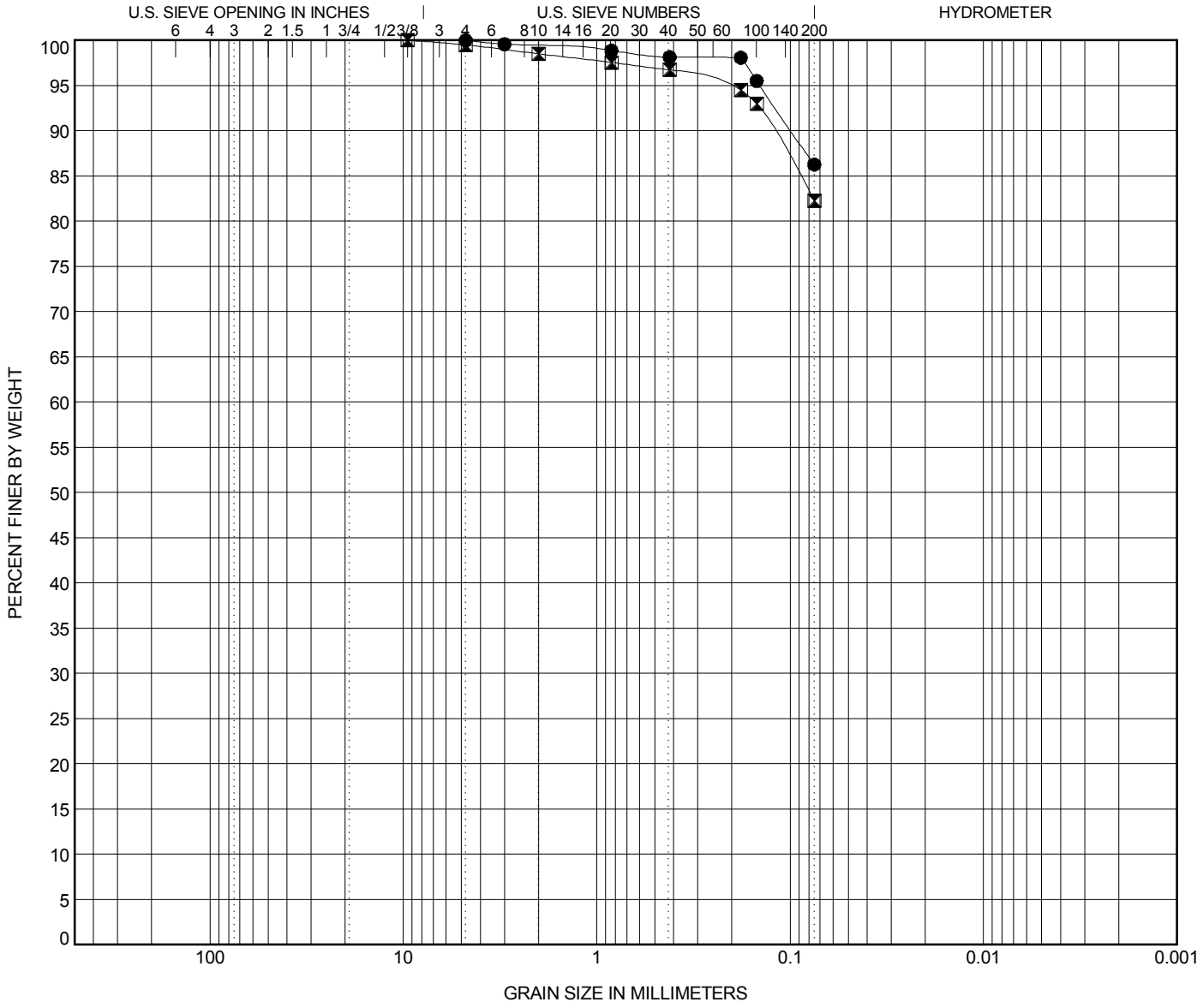
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**RW-22**	**4.0**	**SILT (ML) A-4(4)**	**33**	**29**	**4**		
⧓	**RW-22**	**10.0**	**SILT (ML) with Sand A-4(7)**	**35**	**27**	**8**		

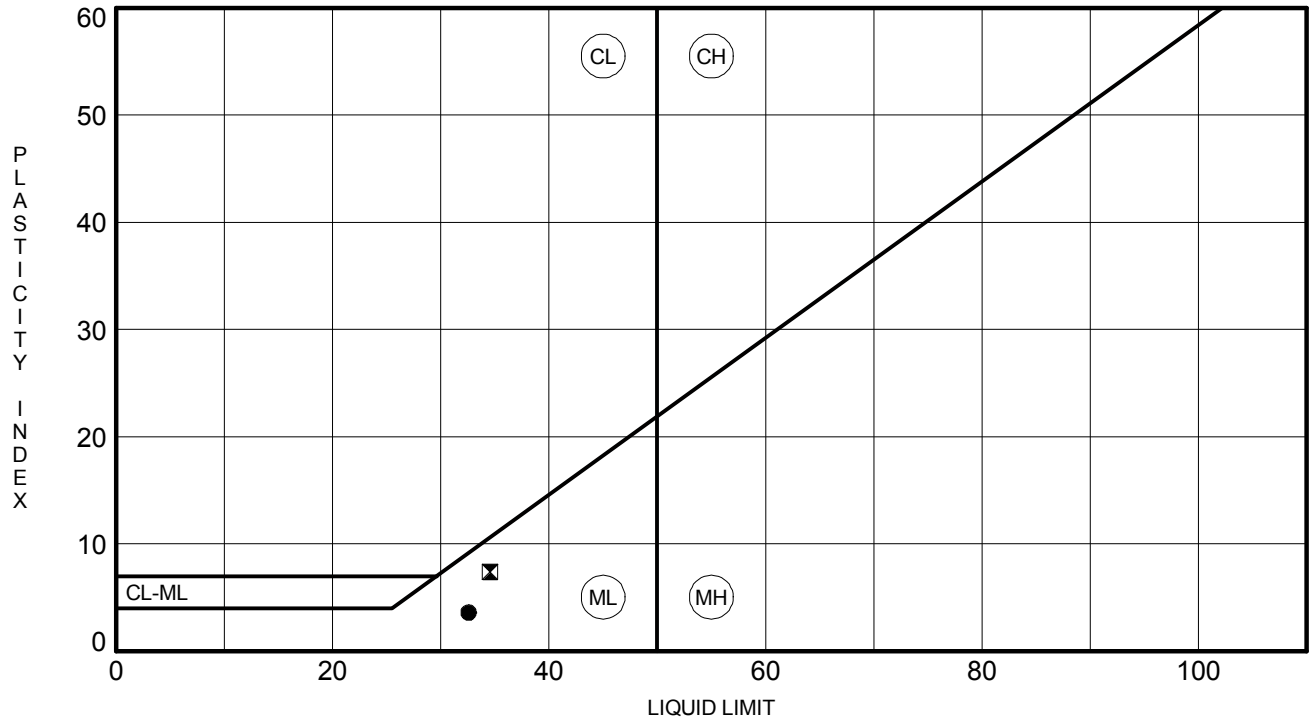
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**RW-22**	**4.0**	**4.76**	**0.143**			**0.0**	**13.7**	**86.3**	
⧓	**RW-22**	**10.0**	**9.52**	**0.217**			**0.5**	**17.2**	**82.3**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 5/14/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**RW-22**	**4.0**	**33**	**29**	**4**	**86**	**SILT (ML) A-4(4)**
⊠	**RW-22**	**10.0**	**35**	**27**	**8**	**82**	**SILT (ML) with Sand A-4(7)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 5/14/18

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0831	**DATE SAMPLE RECEIVED:**	5/8/2018
DESCRIPTION OF SOIL:	Various		
TESTED BY:	BF	**DATE OF TESTING:**	5/8/2018
		DATE OF WEIGHING:	5/12/2018

BORING NO.	RW-23	RW-23	RW-23	RW-23	RW-23
SAMPLE NO.	18-0831C SS-2	18-0831F SS-6	18-0831I SS-9	18-0831L SS-11	18-0831O SS-12
SAMPLE DEPTH	2.0-4.0'	13.5-15.0'	28.5-30.0'	38.5-40.0'	43.5-45.0'
WATER CONTENT, W%	25.8	29.7	33.8	27.6	26.0

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

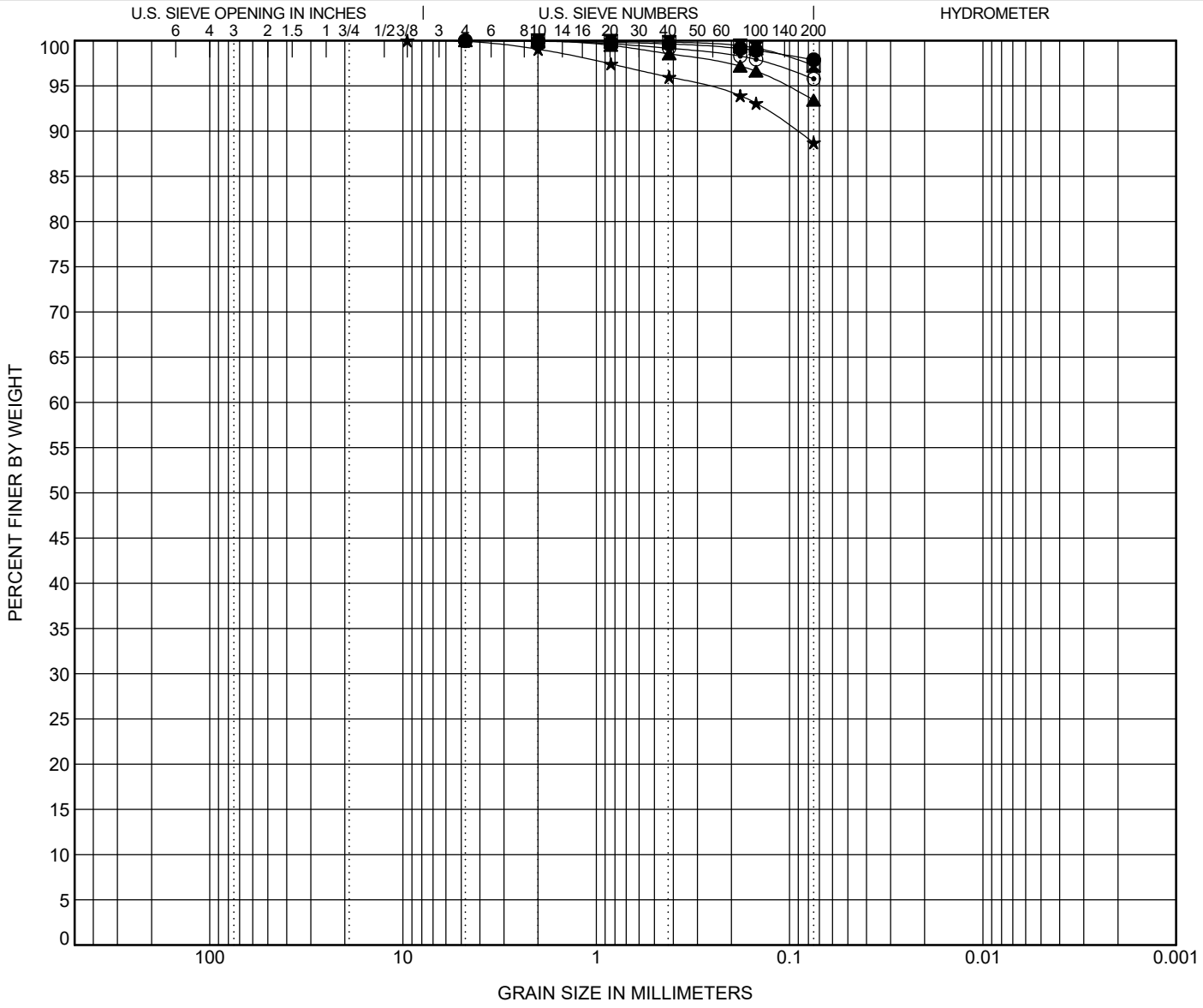
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**RW-23**	**4.0**	**Elastic SILT (MH) A-7-5(20)**	**57**	**38**	**19**		
⊠	**RW-23**	**15.0**	**Elastic SILT (MH) A-7-5(19)**	**58**	**47**	**11**		
▲	**RW-23**	**30.0**	**Elastic SILT (MH) A-5(12)**	**50**	**41**	**9**		
★	**RW-23**	**40.0**	**SILT (ML) A-7-5(16)**	**48**	**34**	**14**		
⊙	**RW-23**	**45.0**	**SILT (ML) A-7-5(15)**	**45**	**34**	**11**		

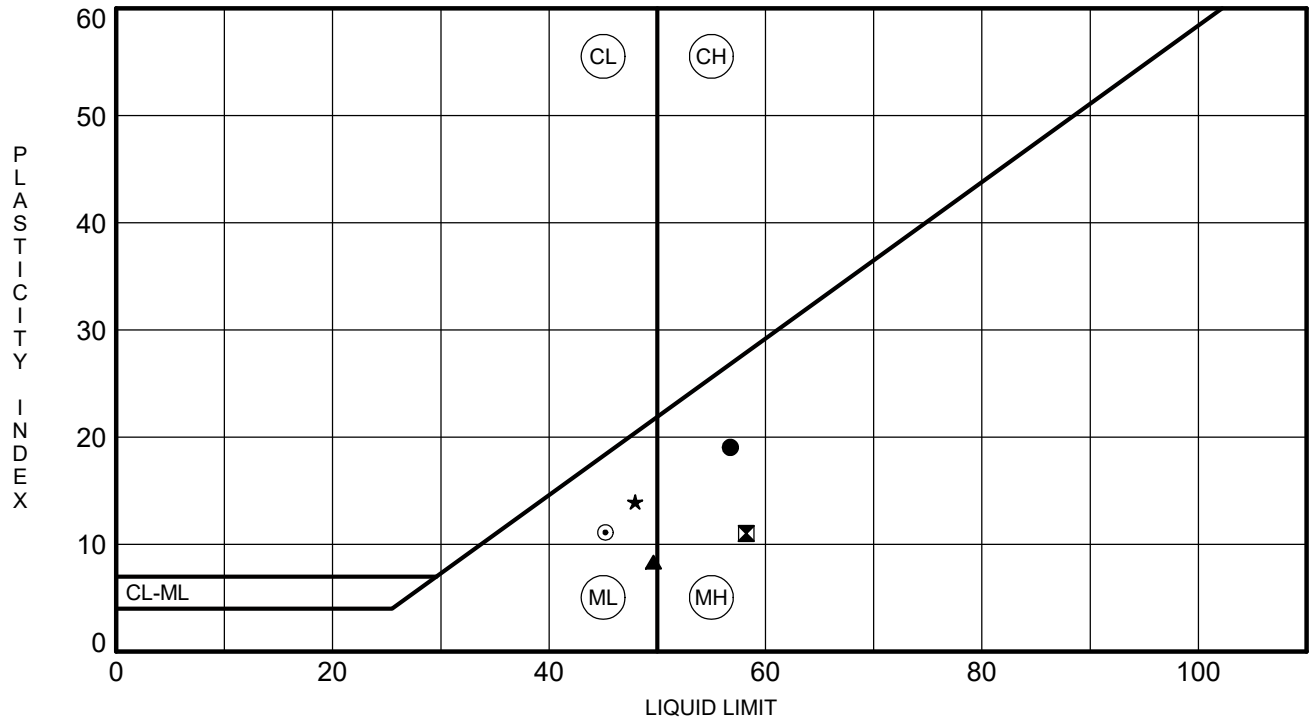
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**RW-23**	**4.0**	**4.76**				**0.0**	**2.1**	**97.9**	
⊠	**RW-23**	**15.0**	**2**				**0.0**	**2.7**	**97.3**	
▲	**RW-23**	**30.0**	**4.76**	**0.105**			**0.0**	**6.6**	**93.4**	
★	**RW-23**	**40.0**	**9.52**	**0.281**			**0.1**	**11.2**	**88.7**	
⊙	**RW-23**	**45.0**	**4.76**				**0.0**	**4.2**	**95.8**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 5/22/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**RW-23**	**4.0**	**57**	**38**	**19**	**98**	**Elastic SILT (MH) A-7-5(20)**
⧓	**RW-23**	**15.0**	**58**	**47**	**11**	**97**	**Elastic SILT (MH) A-7-5(19)**
▲	**RW-23**	**30.0**	**50**	**41**	**9**	**93**	**Elastic SILT (MH) A-5(12)**
★	**RW-23**	**40.0**	**48**	**34**	**14**	**89**	**SILT (ML) A-7-5(16)**
⊙	**RW-23**	**45.0**	**45**	**34**	**11**	**96**	**SILT (ML) A-7-5(15)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 5/22/18

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0572	**DATE SAMPLE RECEIVED:**	3/27/2018
DESCRIPTION OF SOIL:	Various		
TESTED BY:	MB	**DATE OF TESTING:**	3/30/2018
		DATE OF WEIGHING:	4/2/2018

BORING NO.	RW-24	RW-24	RW-24	RW-24	RW-24
SAMPLE NO.	18-0572C SS-5	18-0572F SS-6	18-0572L SS-7	18-0572O SS-8	18-0572I SS-9
SAMPLE DEPTH	8.0-10.0'	13.5-15.0'	18.5-20.0	23.5-25.0	28.5-30.0'
WATER CONTENT, W%	21.6	20.2	14.3	27.7	21.4

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

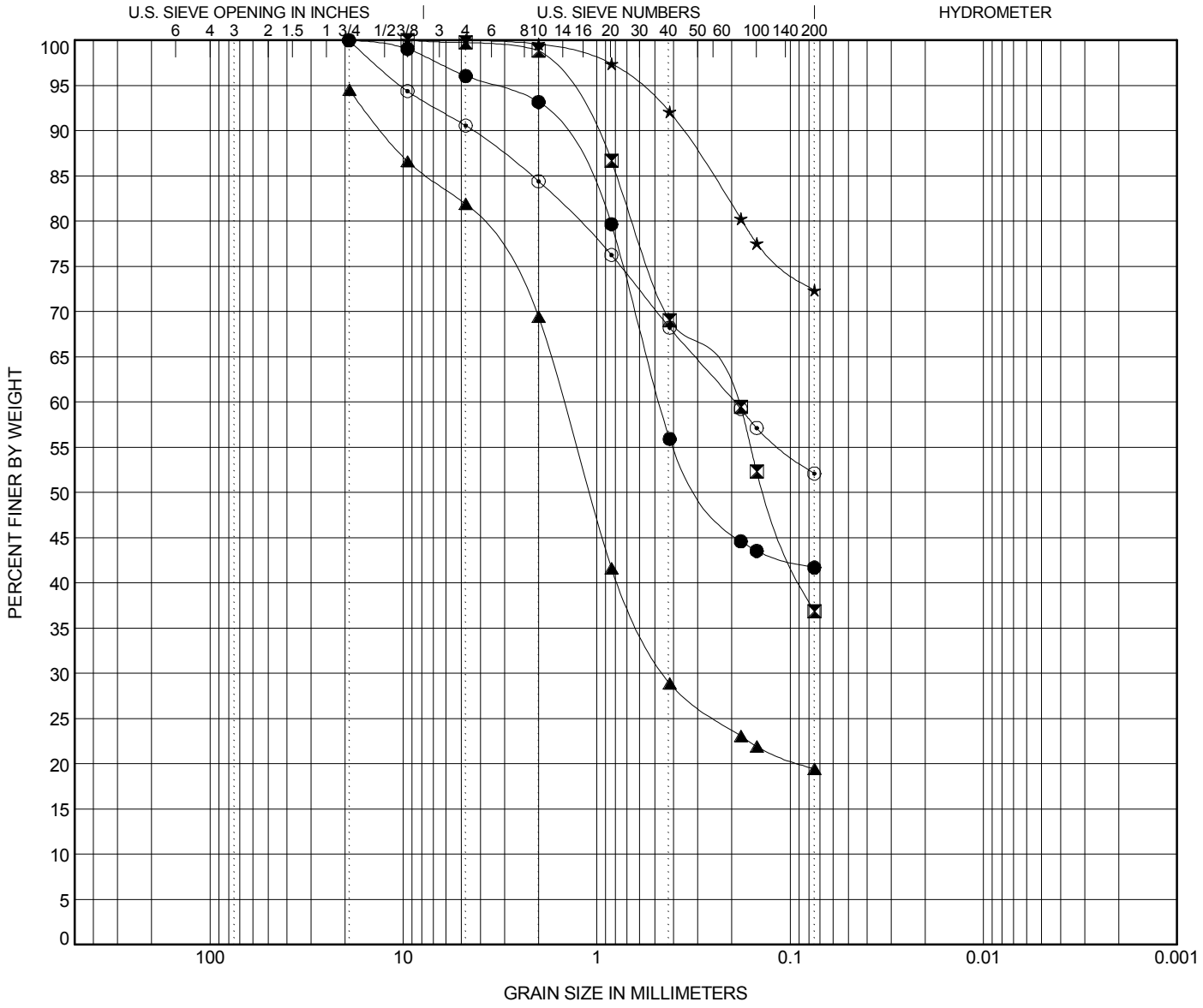
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**RW-24**	**10.0**	**Clayey F/M SAND (SC) A-7-5(7)**	**58**	**30**	**28**		
⊠	**RW-24**	**15.0**	**Silty F/M SAND (SM) A-4(0)**	**NP**	**NP**	**NP**		
▲	**RW-24**	**20.0**	**Clayey F/M SAND (SC) with Gravel A-2-7(1)**	**51**	**25**	**26**		
★	**RW-24**	**25.0**	**Lean CLAY (CL) with Sand A-4(6)**	**32**	**22**	**10**		
⊙	**RW-24**	**30.0**	**Sandy SILT (ML) A-4(2)**	**35**	**27**	**8**		

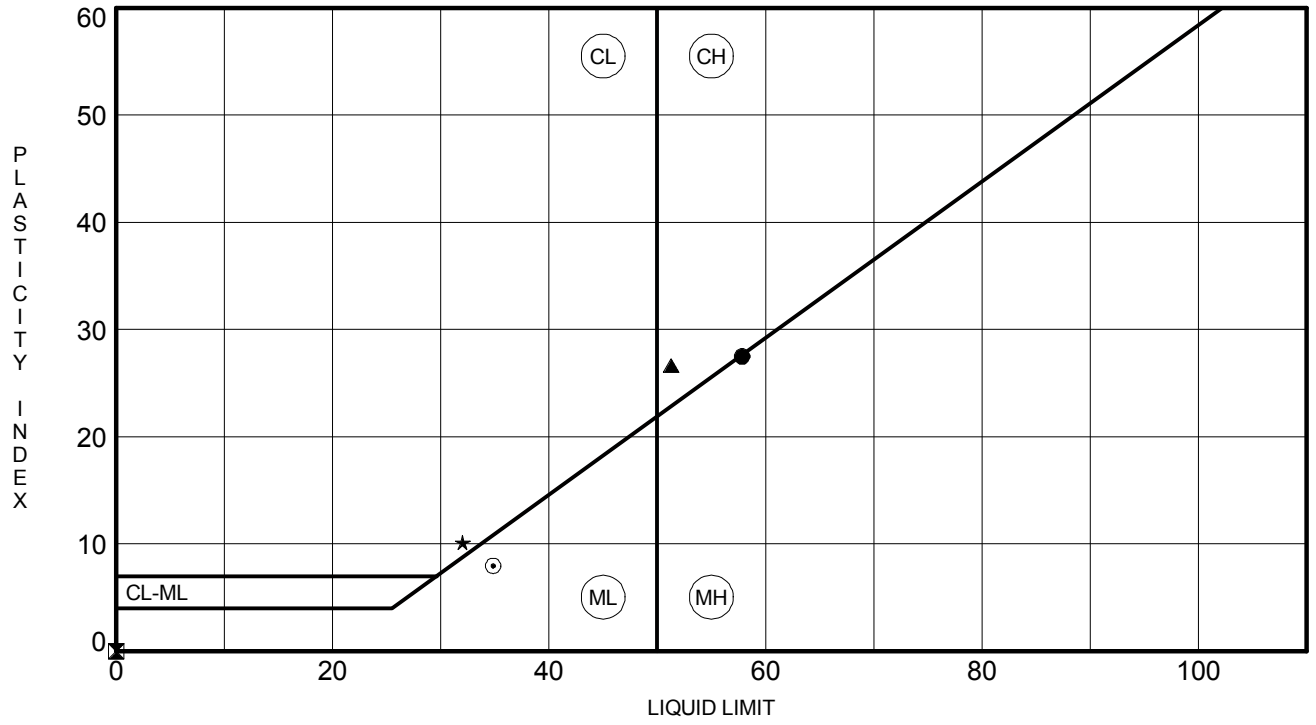
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**RW-24**	**10.0**	**19.1**	**3.452**	**0.269**		**3.9**	**54.3**	**41.7**	
⊠	**RW-24**	**15.0**	**9.52**	**1.518**	**0.134**		**0.2**	**62.9**	**36.9**	
▲	**RW-24**	**20.0**	**19.05**		**1.09**		**12.6**	**62.5**	**19.4**	
★	**RW-24**	**25.0**	**9.52**	**0.613**			**0.0**	**27.6**	**72.4**	
⊙	**RW-24**	**30.0**	**19.1**	**10.265**			**9.4**	**38.5**	**52.1**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/2/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**RW-24**	**10.0**	**58**	**30**	**28**	**42**	**Clayey F/M SAND (SC) A-7-5(7)**
⊠	**RW-24**	**15.0**	**NP**	**NP**	**NP**	**37**	**Silty F/M SAND (SM) A-4(0)**
▲	**RW-24**	**20.0**	**51**	**25**	**26**	**19**	**Clayey F/M SAND (SC) with Gravel A-2-7(1)**
★	**RW-24**	**25.0**	**32**	**22**	**10**	**72**	**Lean CLAY (CL) with Sand A-4(6)**
⊙	**RW-24**	**30.0**	**35**	**27**	**8**	**52**	**Sandy SILT (ML) A-4(2)**

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Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0724	**DATE SAMPLE RECEIVED:**	4/16/2018
DESCRIPTION OF SOIL:	Various		
TESTED BY:	MB	**DATE OF TESTING:**	4/17/2018
		DATE OF WEIGHING:	4/18/2018

BORING NO.	RW-25	RW-25	RW-25	RW-25	
SAMPLE NO.	18-0724L SS-3	18-0724C SS-5	18-0724F SS-7	18-0724I SS-10	
SAMPLE DEPTH	4.0-6.0'	8.0-10.0'	18.5-20.0'	33.5-35.0'	
WATER CONTENT, W%	14.9	16.6	28.8	23.3	

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

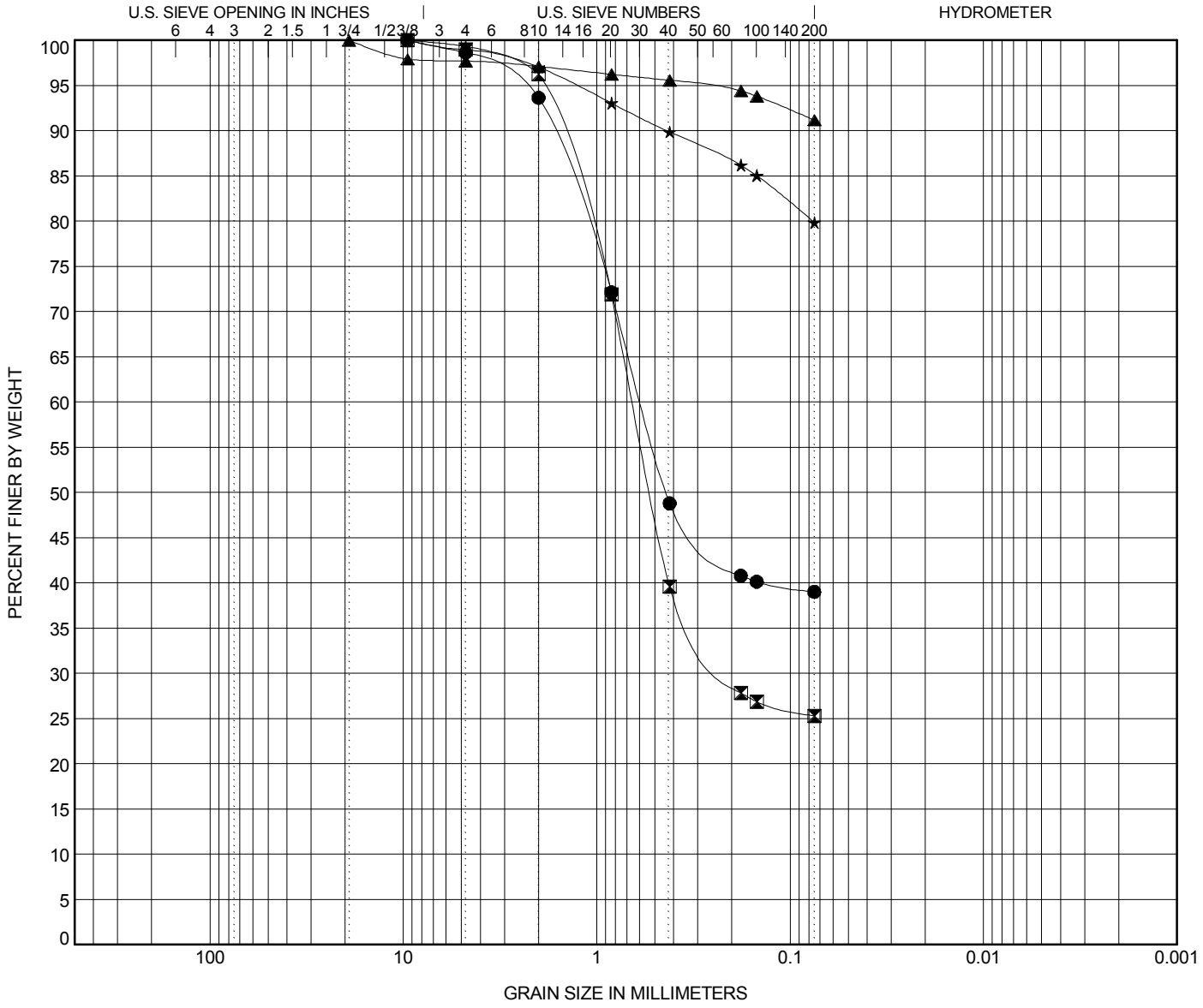
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**RW-25**	**6.0**	**Silty F/M SAND (SM) A-7-5(3)**	**61**	**42**	**19**		
⧓	**RW-25**	**10.0**	**Silty F/M SAND (SM) A-2-7(1)**	**54**	**36**	**18**		
▲	**RW-25**	**20.0**	**SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		
★	**RW-25**	**35.0**	**SILT (ML) with F/M Sand A-4(0)**	**NP**	**NP**	**NP**		

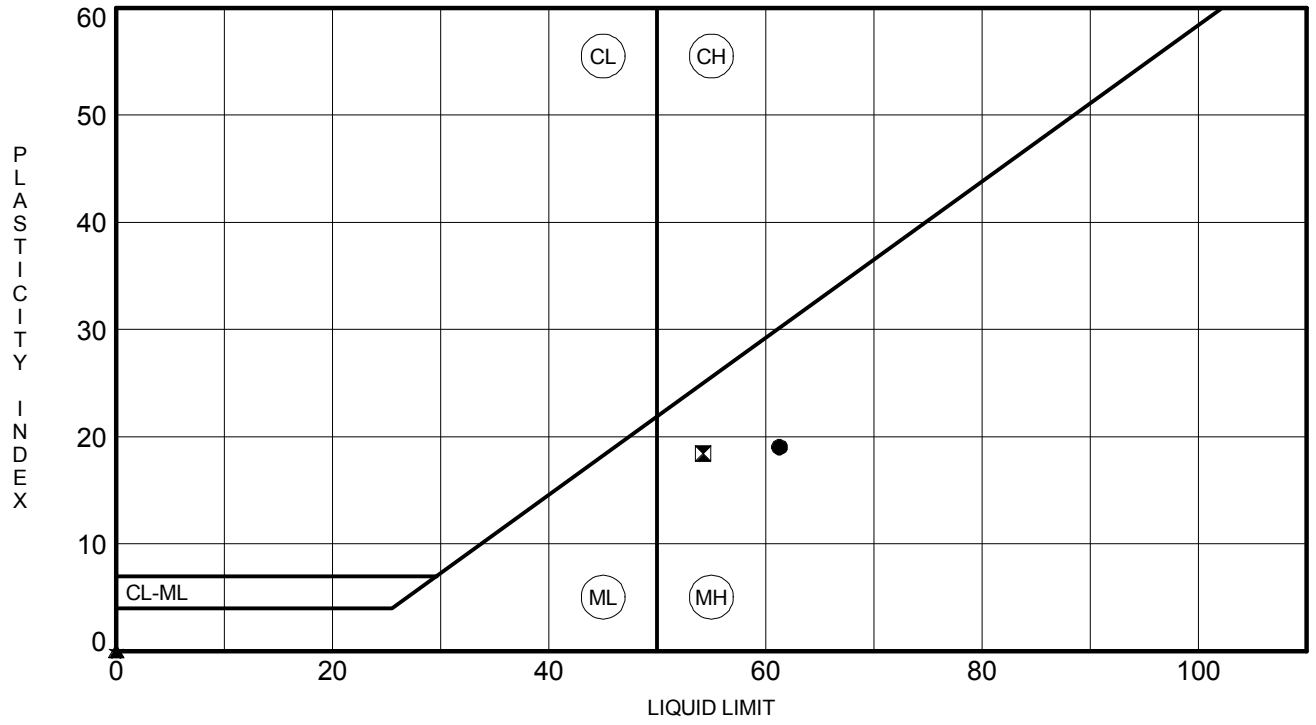
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**RW-25**	**6.0**	**9.52**	**2.525**	**0.435**		**1.4**	**59.6**	**39.0**	
⧓	**RW-25**	**10.0**	**9.52**	**1.912**	**0.525**		**1.0**	**73.7**	**25.3**	
▲	**RW-25**	**20.0**	**19.1**	**0.273**			**2.3**	**6.5**	**91.2**	
★	**RW-25**	**35.0**	**9.52**	**1.281**			**0.7**	**19.5**	**79.9**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/29/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**RW-25**	**6.0**	**61**	**42**	**19**	**39**	**Silty F/M SAND (SM) A-7-5(3)**
⧓	**RW-25**	**10.0**	**54**	**36**	**18**	**25**	**Silty F/M SAND (SM) A-2-7(1)**
▲	**RW-25**	**20.0**	**NP**	**NP**	**NP**	**91**	**SILT (ML) A-4(0)**
★	**RW-25**	**35.0**	**NP**	**NP**	**NP**	**80**	**SILT (ML) with F/M Sand A-4(0)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/29/18

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0632	**DATE SAMPLE RECEIVED:**	4/6/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	JH	**DATE OF TESTING:**	4/6/2018
		DATE OF WEIGHING:	4/9/2018

BORING NO.	RW-26	RW-26	RW-26	RW-26	
SAMPLE NO.	18-0632C SS-2	18-0632F SS-4	18-0632I SS-7	18-0632L SS-10	
SAMPLE DEPTH	2.0-4.0'	6.0-8.0'	18.5-20.0'	33.5-35.0'	
WATER CONTENT, W%	14.4	19.1	28.9	27.6	

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

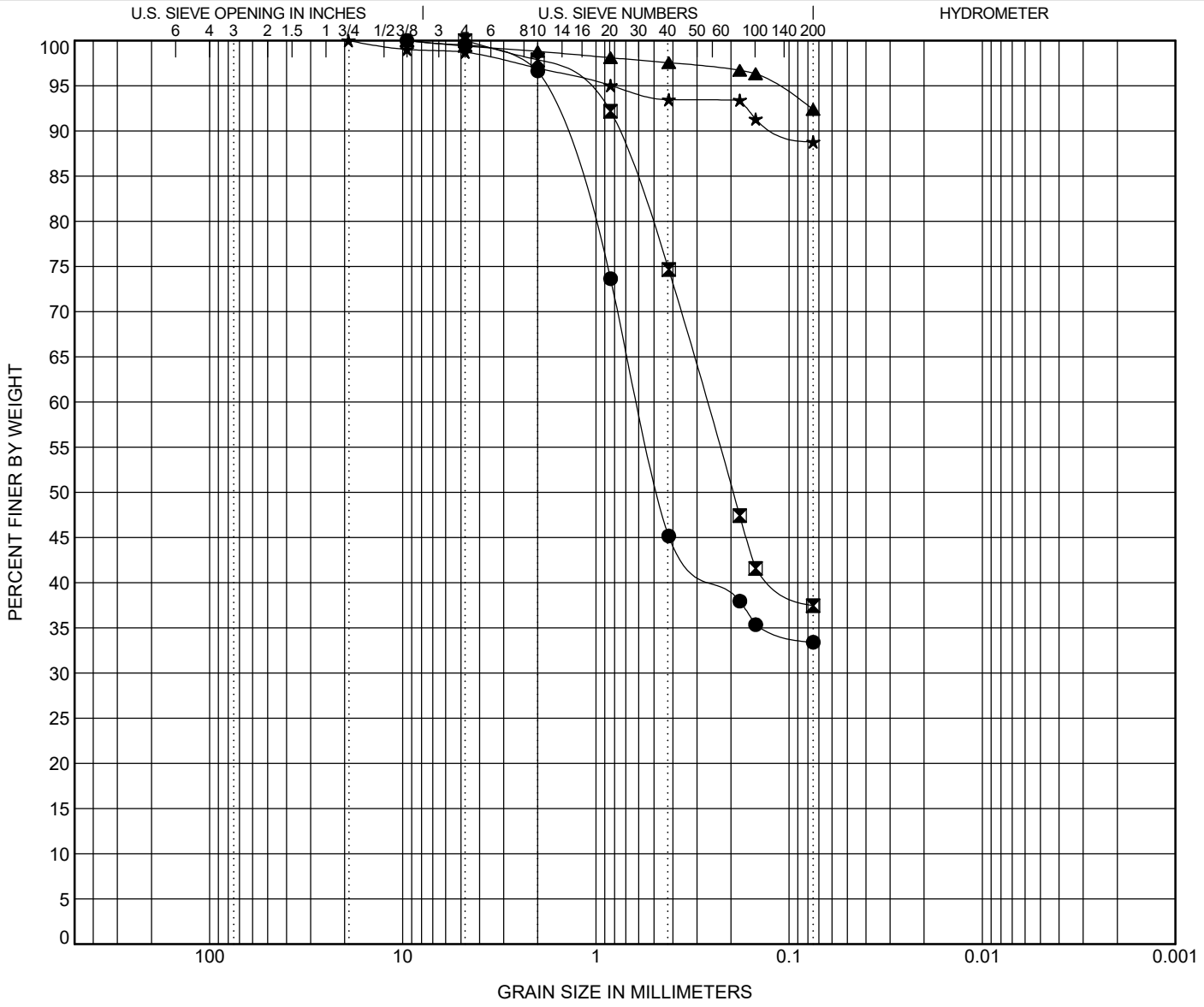
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**RW-26**	**4.0**	**Clayey F/M SAND (SC) A-2-7(4)**	**64**	**28**	**36**		
⊠	**RW-26**	**8.0**	**Silty F/M SAND (SM) A-7-6(2)**	**48**	**29**	**19**		
▲	**RW-26**	**20.0**	**SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		
★	**RW-26**	**35.0**	**SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		

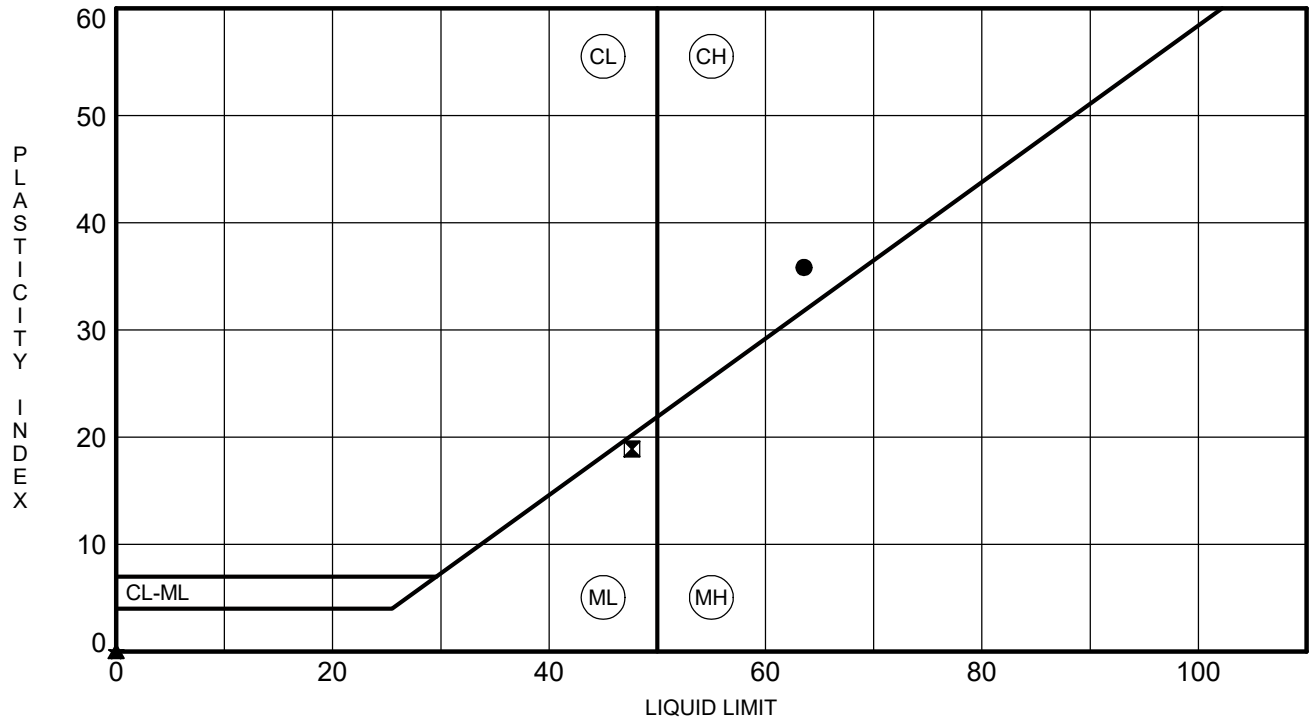
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**RW-26**	**4.0**	**9.52**	**1.88**	**0.472**		**0.4**	**66.2**	**33.4**	
⊠	**RW-26**	**8.0**	**4.76**	**1.291**	**0.195**		**0.0**	**62.5**	**37.5**	
▲	**RW-26**	**20.0**	**9.52**	**0.118**			**0.6**	**7.0**	**92.4**	
★	**RW-26**	**35.0**	**19.1**	**0.828**			**1.3**	**9.9**	**88.8**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/26/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**RW-26**	**4.0**	**64**	**28**	**36**	**33**	**Clayey F/M SAND (SC) A-2-7(4)**
⊠	**RW-26**	**8.0**	**48**	**29**	**19**	**37**	**Silty F/M SAND (SM) A-7-6(2)**
▲	**RW-26**	**20.0**	**NP**	**NP**	**NP**	**92**	**SILT (ML) A-4(0)**
★	**RW-26**	**35.0**	**NP**	**NP**	**NP**	**89**	**SILT (ML) A-4(0)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/26/18

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0633	**DATE SAMPLE RECEIVED:**	4/6/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	JH	**DATE OF TESTING:**	4/6/2018
		DATE OF WEIGHING:	4/9/2018

BORING NO.	RW-27	RW-27	RW-27	RW-27	RW-27
SAMPLE NO.	18-0633C SS-2	18-0633F SS-4	18-0633I SS-6	18-0633L SS-7	18-0633O SS-10
SAMPLE DEPTH	2.0-4.0'	6.0-8.0'	13.5-15.0'	18.5-20.0'	33.5-35.0'
WATER CONTENT, W%	10.7	23.9	25.6	21.2	21.4

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

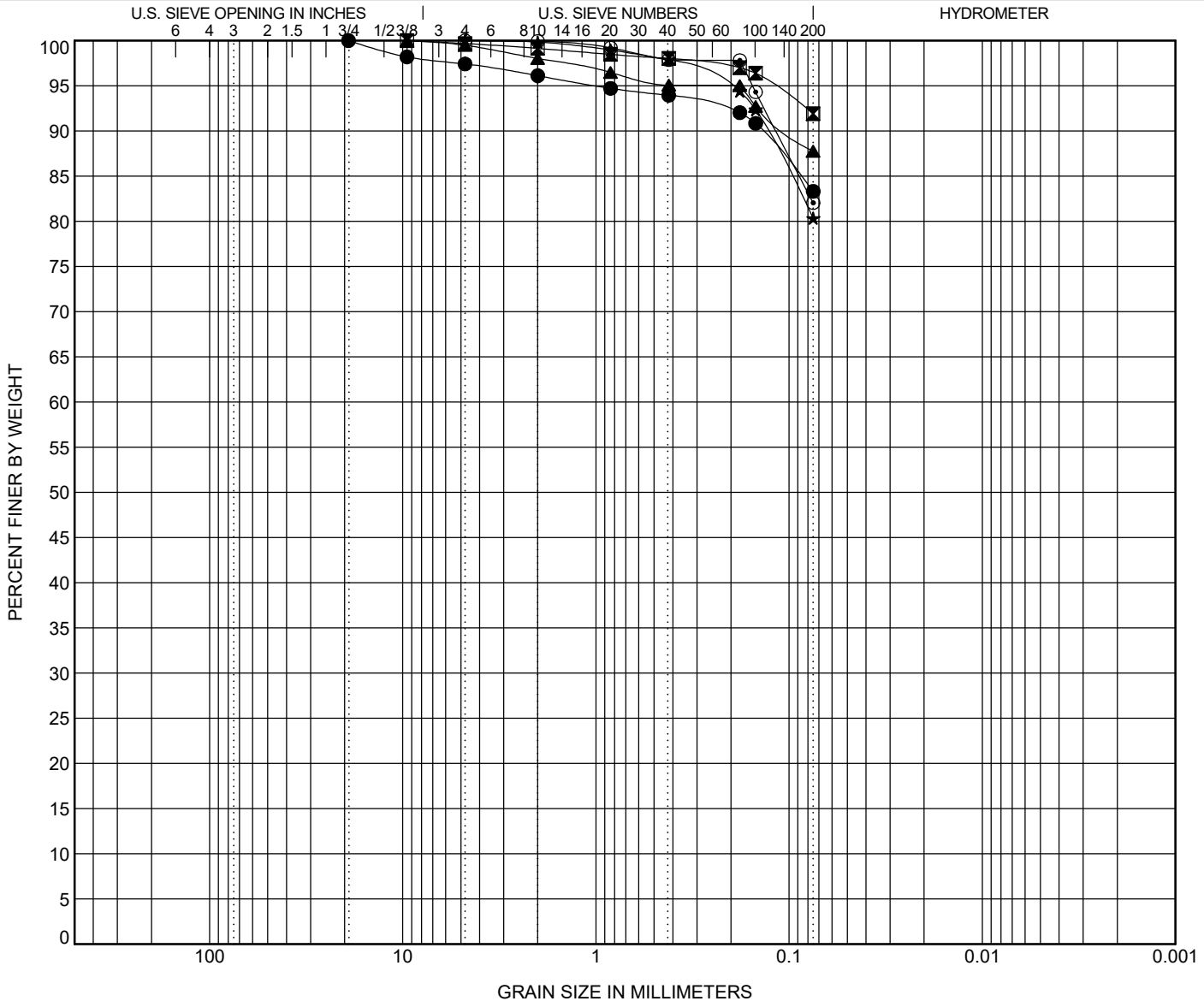
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**RW-27**	**4.0**	**SILT (ML) with Fine Sand A-4(0)**	**32**	**28**	**4**		
⊠	**RW-27**	**8.0**	**SILT (ML) A-4(8)**	**38**	**32**	**6**		
▲	**RW-27**	**15.0**	**SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		
★	**RW-27**	**20.0**	**SILT (ML) with Fine Sand A-4(0)**	**NP**	**NP**	**NP**		
⊙	**RW-27**	**35.0**	**SILT (ML) with Fine Sand A-4(0)**	**NP**	**NP**	**NP**		

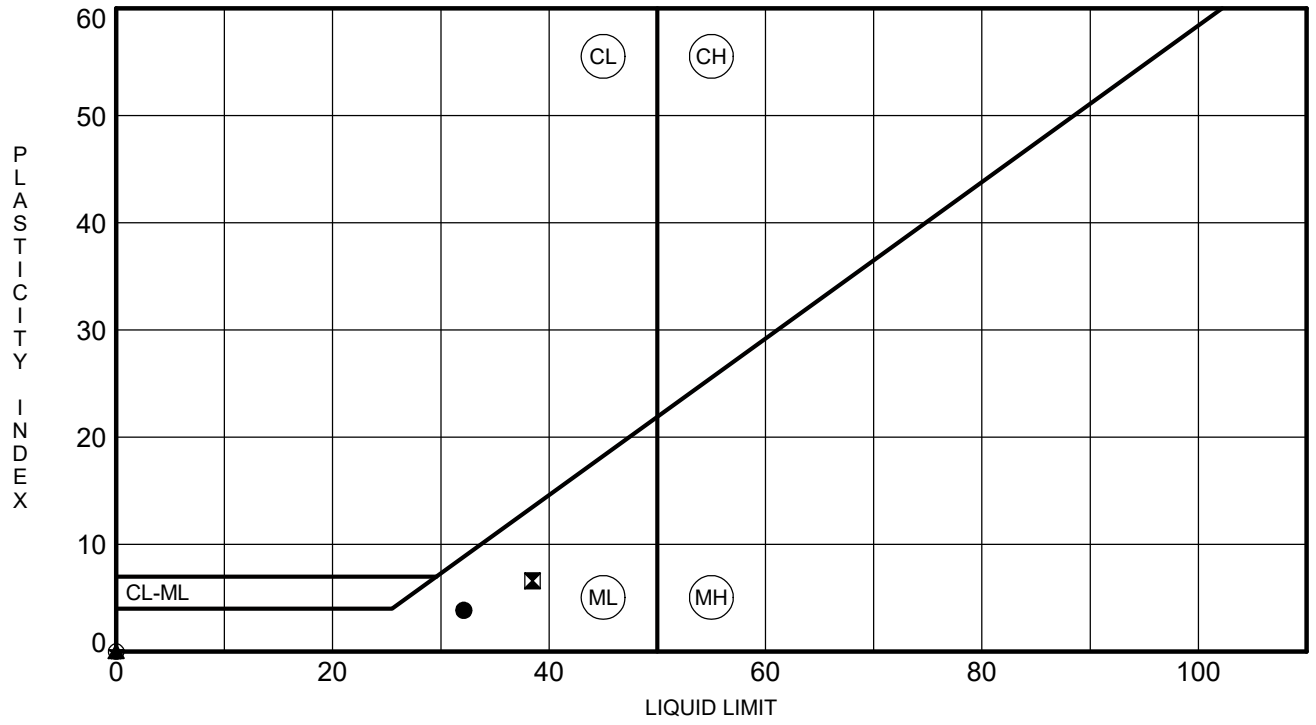
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**RW-27**	**4.0**	**19.1**	**1.005**			**2.6**	**14.1**	**83.3**	
⊠	**RW-27**	**8.0**	**9.52**	**0.12**			**0.3**	**7.8**	**91.9**	
▲	**RW-27**	**15.0**	**9.52**	**0.18**			**0.5**	**11.7**	**87.8**	
★	**RW-27**	**20.0**	**4.76**	**0.207**			**0.0**	**19.7**	**80.3**	
⊙	**RW-27**	**35.0**	**4.76**	**0.155**			**0.0**	**18.0**	**82.0**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/26/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**RW-27**	**4.0**	**32**	**28**	**4**	**83**	**SILT (ML) with Fine Sand A-4(0)**
⊠	**RW-27**	**8.0**	**38**	**32**	**6**	**92**	**SILT (ML) A-4(8)**
▲	**RW-27**	**15.0**	**NP**	**NP**	**NP**	**88**	**SILT (ML) A-4(0)**
★	**RW-27**	**20.0**	**NP**	**NP**	**NP**	**80**	**SILT (ML) with Fine Sand A-4(0)**
⊙	**RW-27**	**35.0**	**NP**	**NP**	**NP**	**82**	**SILT (ML) with Fine Sand A-4(0)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/26/18

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0817	**DATE SAMPLE RECEIVED:**	5/8/2018
DESCRIPTION OF SOIL:	Various		
TESTED BY:	BF	**DATE OF TESTING:**	5/8/2018
		DATE OF WEIGHING:	5/12/2018

BORING NO.	RW-28A	RW-28A			
SAMPLE NO.	18-0817C SS-1	18-0817F SS-5			
SAMPLE DEPTH	0.0-2.0'	8.0-10.0'			
WATER CONTENT, W%	11.8	12.5			

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

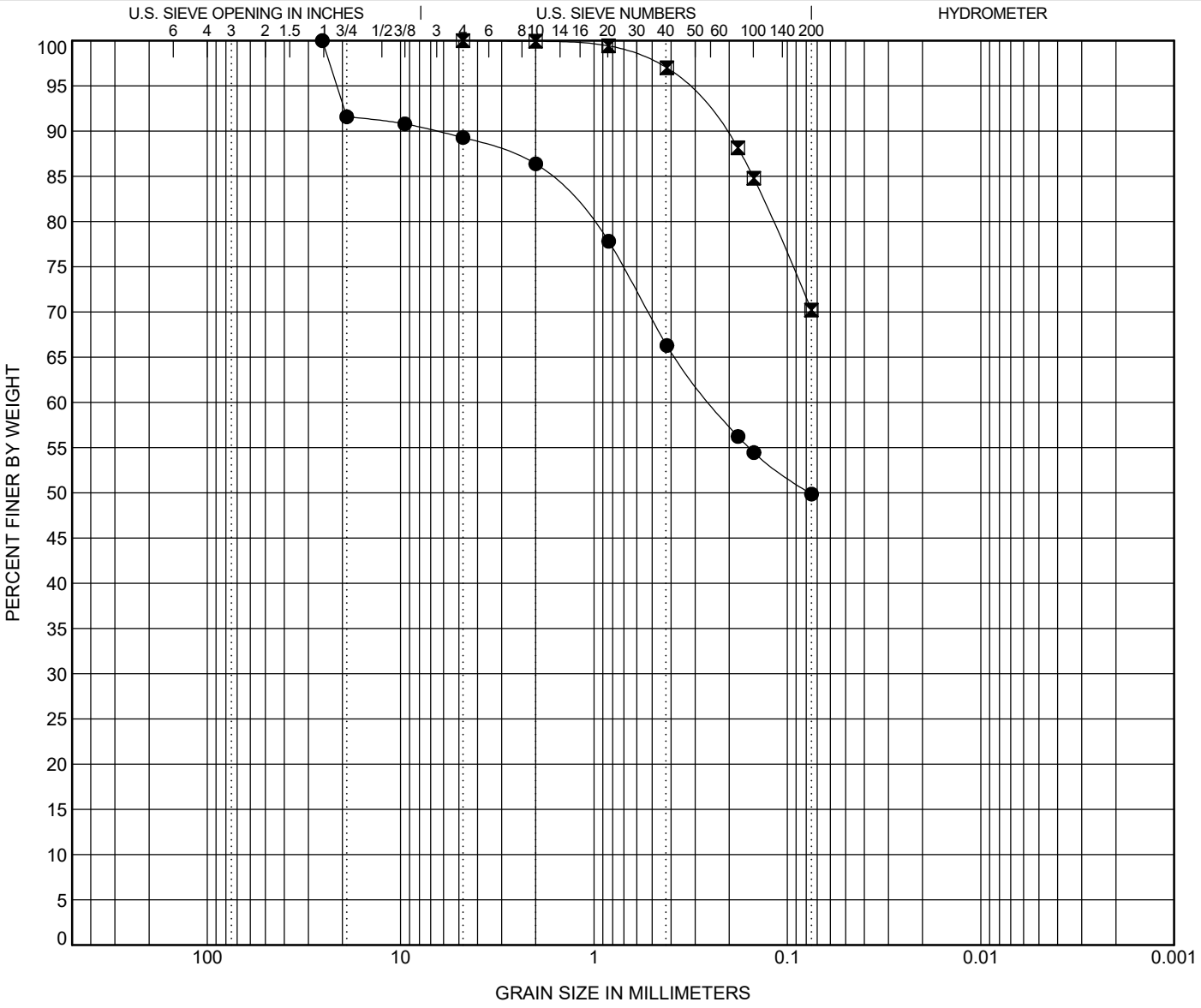
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**RW-28A**	**2.0**	**Silty F/M SAND (SM) A-4(1)**	**33**	**26**	**7**		
⊠	**RW-28A**	**10.0**	**SILT (ML) with Fine Sand A-4(0)**	**NP**	**NP**	**NP**		

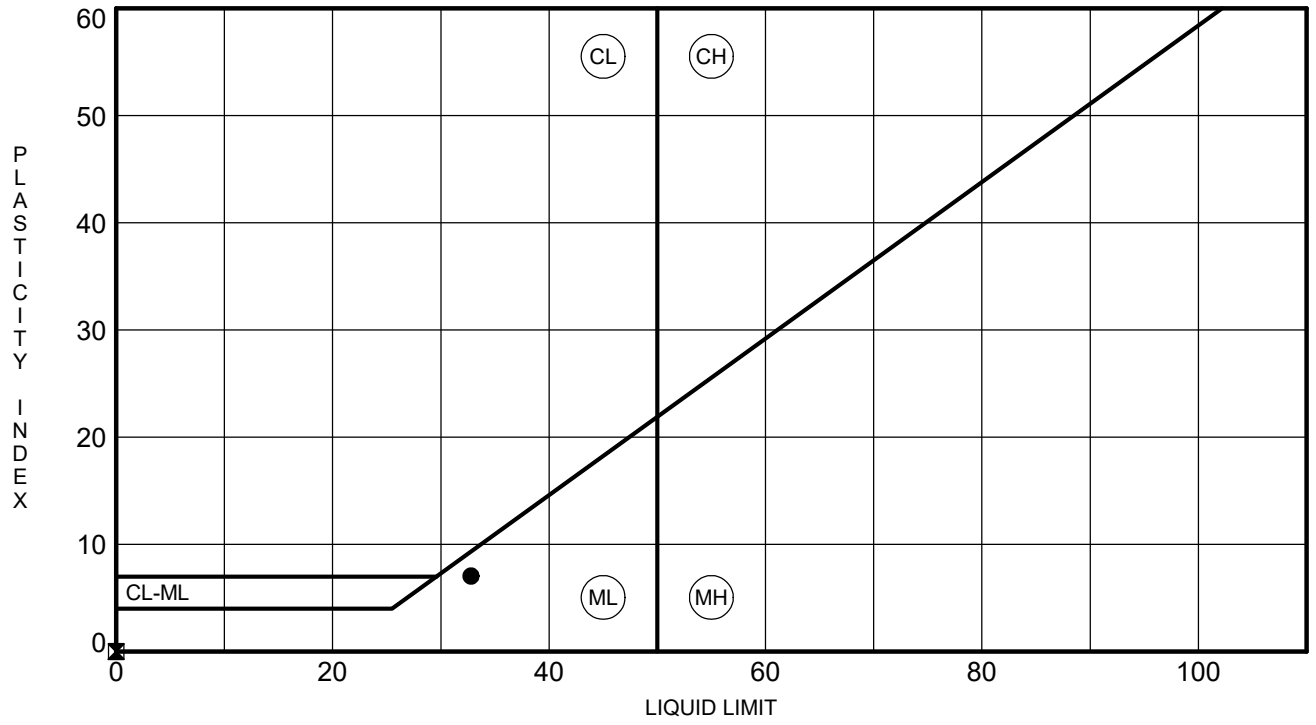
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**RW-28A**	**2.0**	**25.4**	**21.379**	**0.077**		**10.7**	**39.4**	**49.9**	
⊠	**RW-28A**	**10.0**	**4.76**	**0.347**			**0.0**	**29.8**	**70.2**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 5/22/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**RW-28A**	**2.0**	**33**	**26**	**7**	**50**	**Silty F/M SAND (SM) A-4(1)**
⧓	**RW-28A**	**10.0**	**NP**	**NP**	**NP**	**70**	**SILT (ML) with Fine Sand A-4(0)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 5/22/18

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0898	**DATE SAMPLE RECEIVED:**	5/15/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	5/22/2018
		DATE OF WEIGHING:	5/23/2018

BORING NO.	RW-29	RW-29	RW-29		
SAMPLE NO.	18-0898C SS-2	18-0898F SS-4	18-0898I SS-7		
SAMPLE DEPTH	2.0-4.0'	6.0-8.0'	18.5-20.0'		
WATER CONTENT, W%	20.7	16.2	35.7		

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

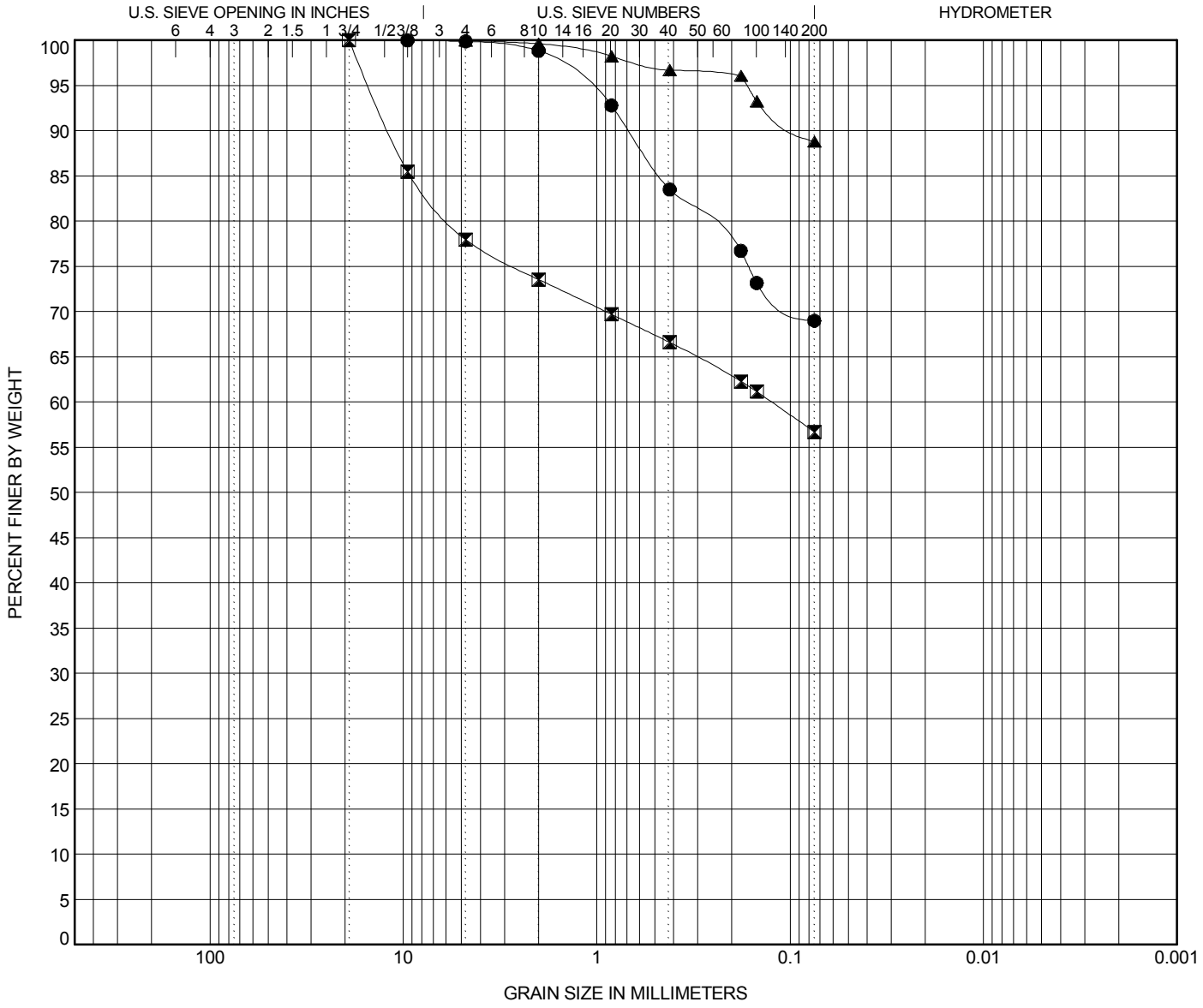
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**RW-29**	**4.0**	**Sandy Lean CLAY (CL) A-6(6)**	**33**	**22**	**11**		
⧓	**RW-29**	**8.0**	**Gravelly SILT (ML) with Sand A-6(5)**	**40**	**28**	**12**		
▲	**RW-29**	**20.0**	**Elastic SILT (MH) A-5(11)**	**51**	**45**	**6**		

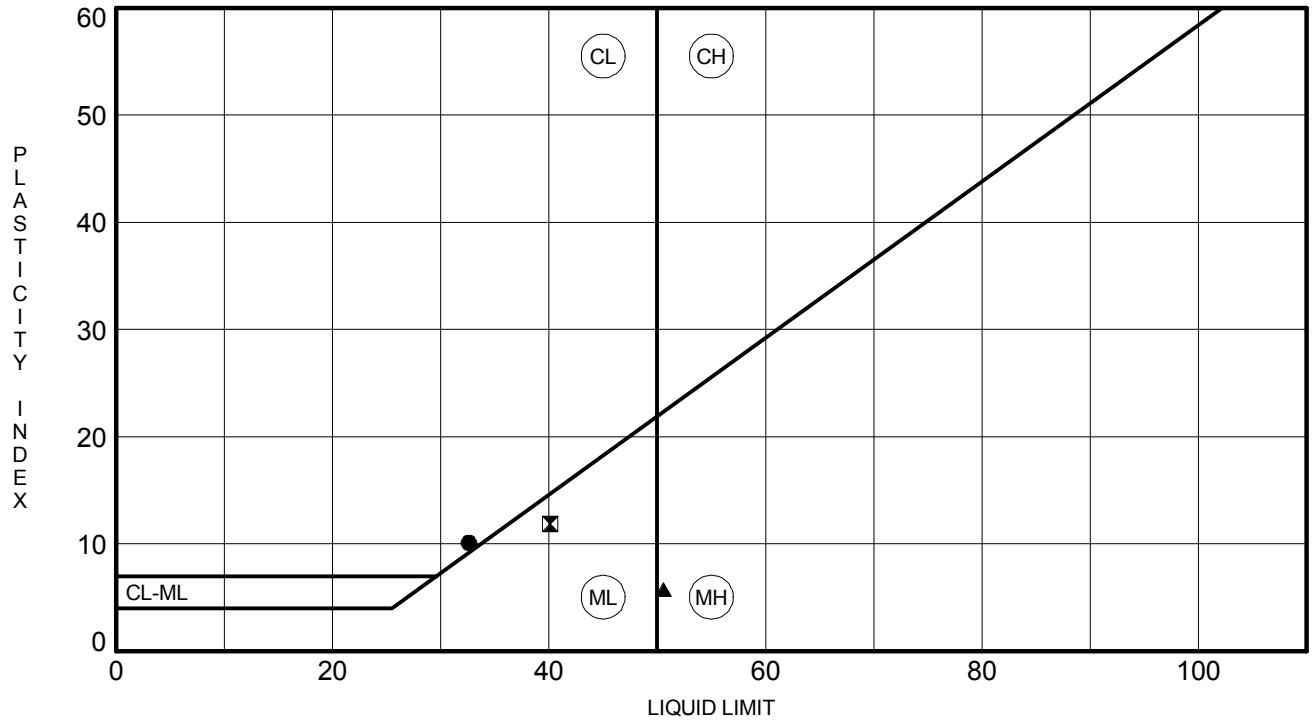
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**RW-29**	**4.0**	**9.52**	**1.151**			**0.1**	**30.9**	**69.0**	
⧓	**RW-29**	**8.0**	**19.1**	**15.027**			**22.1**	**21.2**	**56.7**	
▲	**RW-29**	**20.0**	**4.76**	**0.167**			**0.0**	**11.2**	**88.8**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/7/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**RW-29**	**4.0**	**33**	**22**	**11**	**69**	**Sandy Lean CLAY (CL) A-6(6)**
⧓	**RW-29**	**8.0**	**40**	**28**	**12**	**57**	**Gravelly SILT (ML) with Sand A-6(5)**
▲	**RW-29**	**20.0**	**51**	**45**	**6**	**89**	**Elastic SILT (MH) A-5(11)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/7/18

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0934	**DATE SAMPLE RECEIVED:**	5/15/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	5/22/2018
		DATE OF WEIGHING:	5/23/2018

BORING NO.	RW-30	RW-30			
SAMPLE NO.	18-0934C SS-1	18-0934F SS-7			
SAMPLE DEPTH	0.0-2.0'	18.5-20.0'			
WATER CONTENT, W%	29.1	34.5			

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

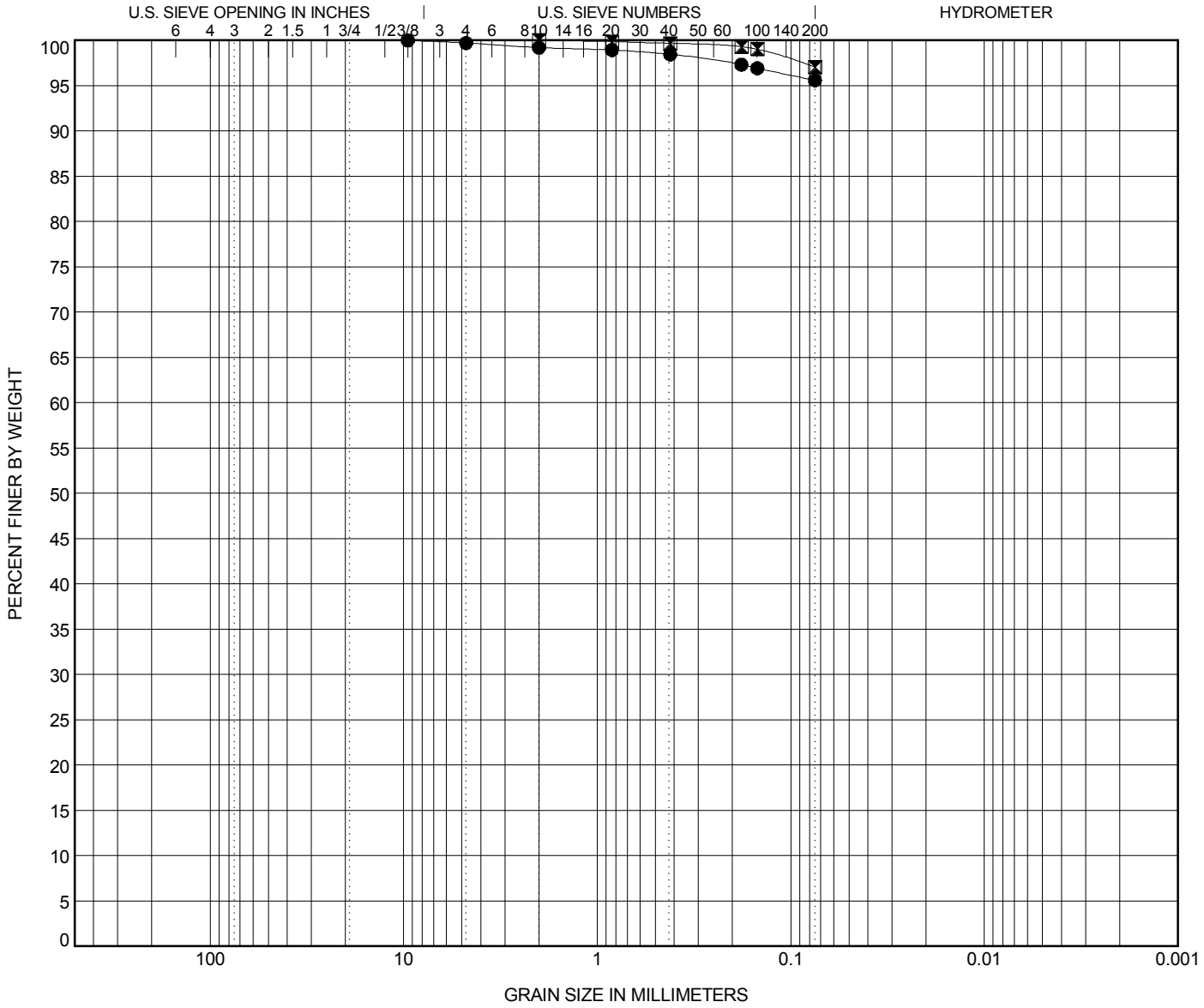
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**RW-30**	**2.0**	**SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		
⧓	**RW-30**	**20.0**	**SILT (ML) A-7-5(16)**	**48**	**37**	**11**		

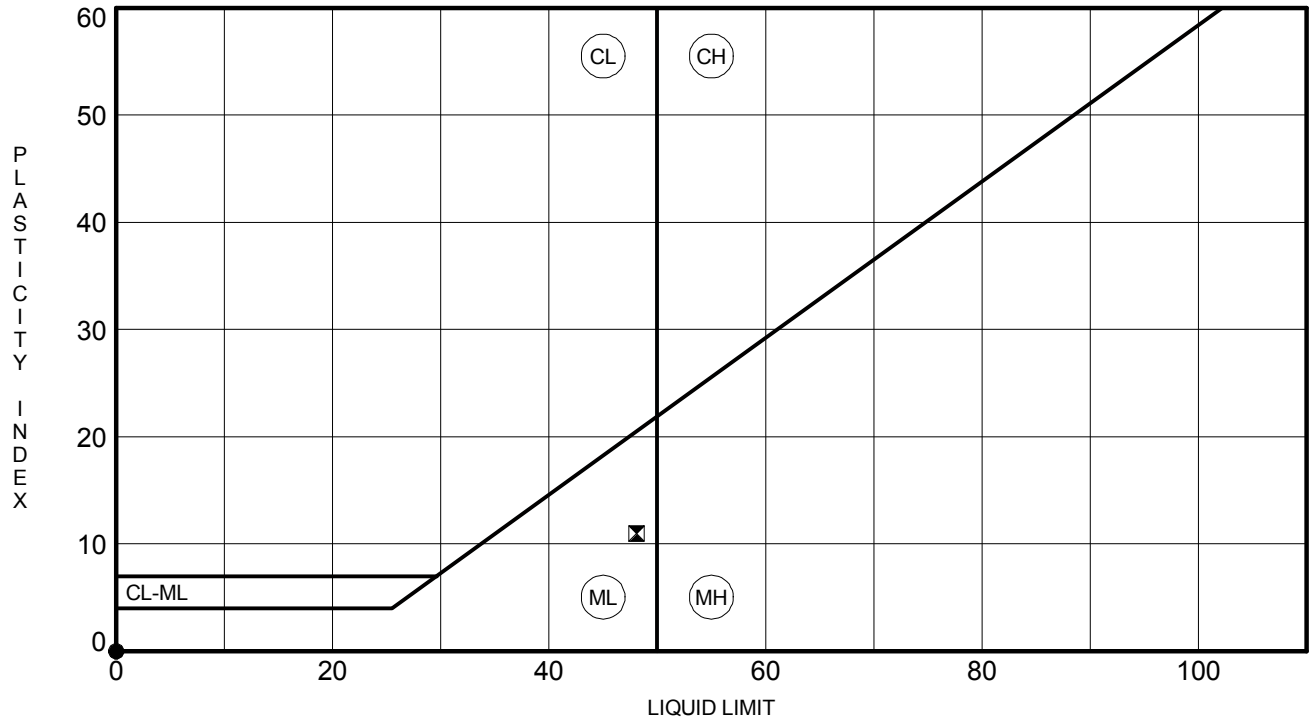
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**RW-30**	**2.0**	**9.52**				**0.3**	**4.1**	**95.6**	
⧓	**RW-30**	**20.0**	**2**				**0.0**	**3.0**	**97.0**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/7/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**RW-30**	**2.0**	**NP**	**NP**	**NP**	**96**	**SILT (ML) A-4(0)**
⧓	**RW-30**	**20.0**	**48**	**37**	**11**	**97**	**SILT (ML) A-7-5(16)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/7/18

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0896	**DATE SAMPLE RECEIVED:**	5/15/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	5/22/2018
		DATE OF WEIGHING:	5/23/2018

BORING NO.	RW-31	RW-31	RW-31	RW-31	
SAMPLE NO.	18-0896C SS-3	18-0896L SS-6	18-0896F SS-7	18-0896I SS-11	
SAMPLE DEPTH	4.0-6.0'	13.5-15.0'	18.5-20.0'	38.5-40.0'	
WATER CONTENT, W%	23.8	35.2	33.6	41.6	

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

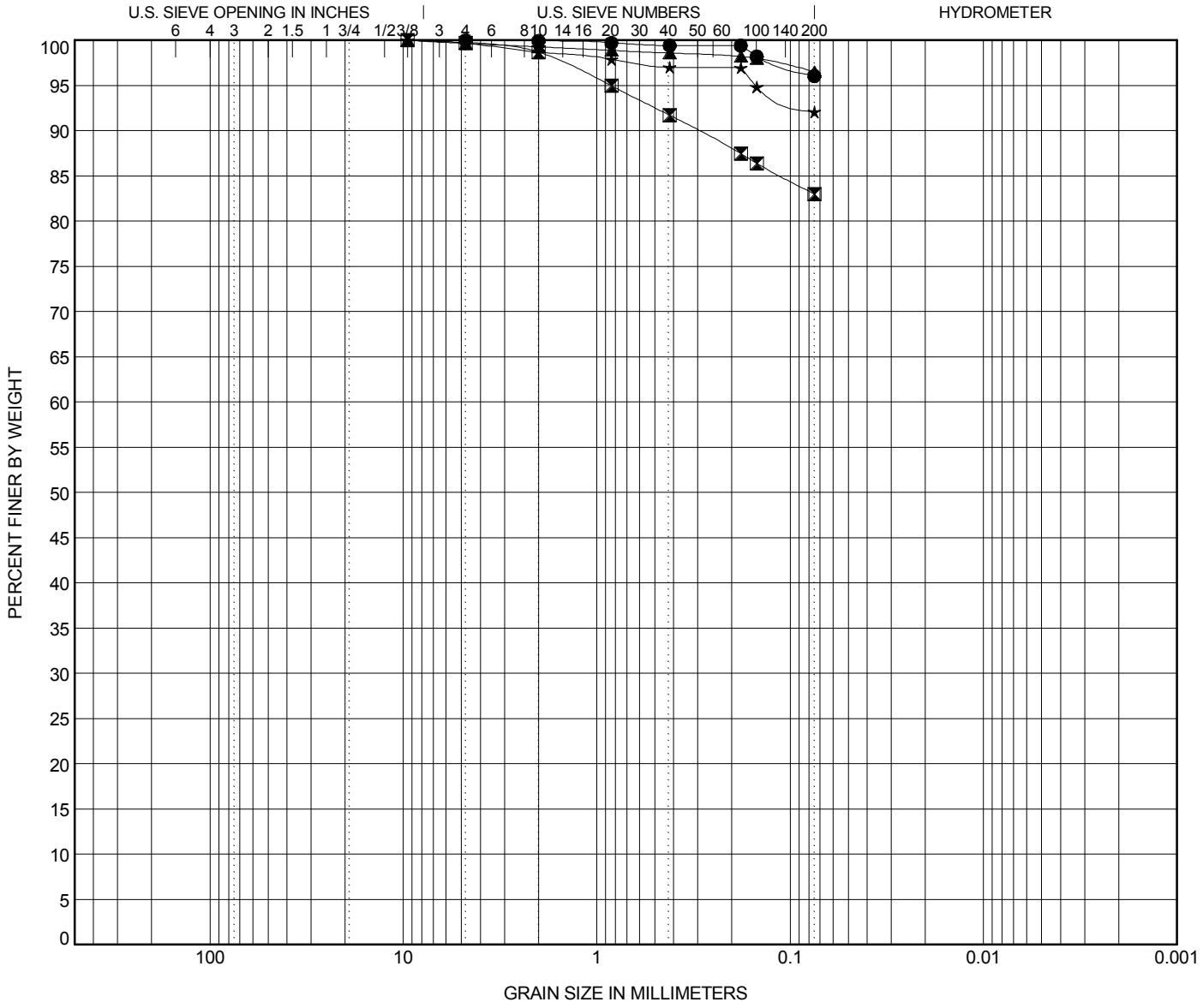
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**RW-31**	**6.0**	**Elastic SILT (MH) A-7-5(20)**	**58**	**43**	**15**		
⧓	**RW-31**	**15.0**	**Elastic SILT (MH) with Sand A-7-5(17)**	**59**	**45**	**14**		
▲	**RW-31**	**20.0**	**SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		
★	**RW-31**	**40.0**	**Elastic SILT (MH) A-5(12)**	**53**	**44**	**9**		

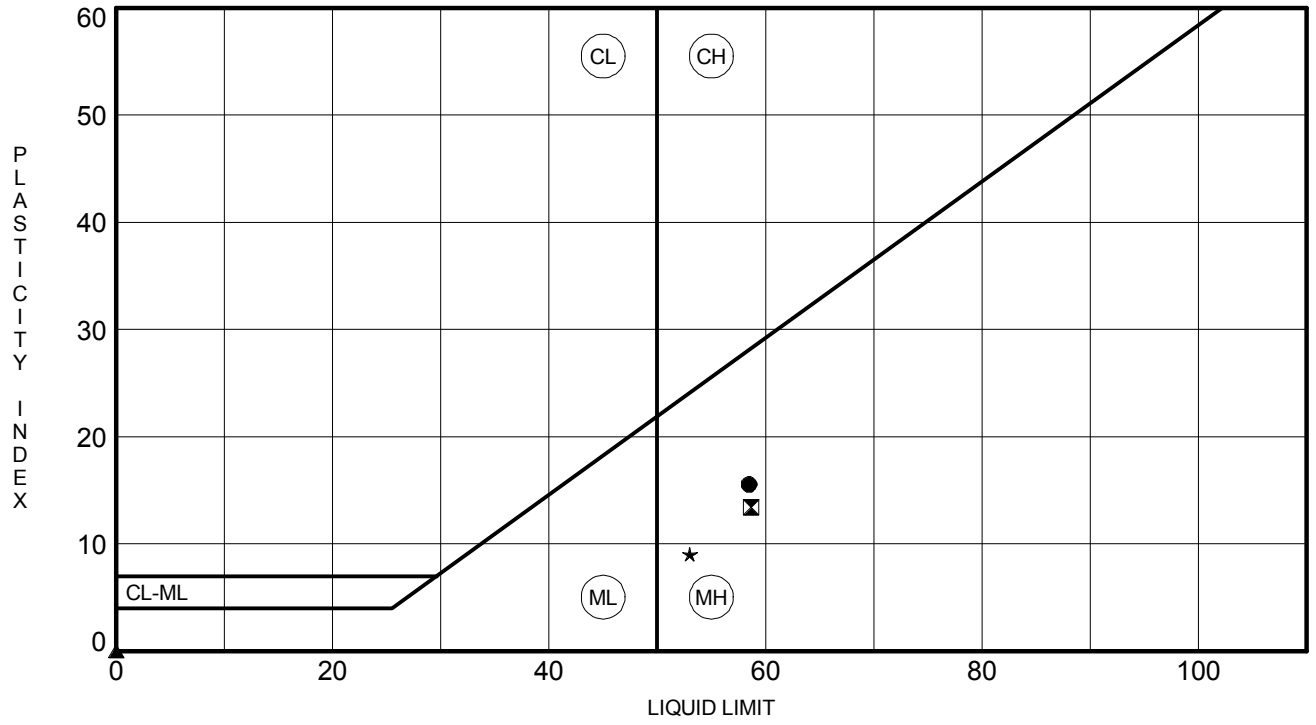
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**RW-31**	**6.0**	**4.76**				**0.0**	**3.9**	**96.1**	
⧓	**RW-31**	**15.0**	**9.52**	**0.846**			**0.2**	**16.7**	**83.0**	
▲	**RW-31**	**20.0**	**9.52**				**0.3**	**3.1**	**96.5**	
★	**RW-31**	**40.0**	**9.52**	**0.151**			**0.3**	**7.6**	**92.1**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/29/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**RW-31**	**6.0**	**58**	**43**	**15**	**96**	**Elastic SILT (MH) A-7-5(20)**
⊠	**RW-31**	**15.0**	**59**	**45**	**14**	**83**	**Elastic SILT (MH) with Sand A-7-5(17)**
▲	**RW-31**	**20.0**	**NP**	**NP**	**NP**	**97**	**SILT (ML) A-4(0)**
★	**RW-31**	**40.0**	**53**	**44**	**9**	**92**	**Elastic SILT (MH) A-5(12)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/29/18

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0513	**DATE SAMPLE RECEIVED:**	3/20/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	3/20/2018
		DATE OF WEIGHING:	3/21/2018

BORING NO.	RW-32	RW-32	RW-32		
SAMPLE NO.	18-0513C SS-3	18-0513F SS-8	18-0513I SS-11		
SAMPLE DEPTH	4.0-6.0'	23.5-25.0'	38.5-40.0'		
WATER CONTENT, W%	32.0	41.2	25.2		

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

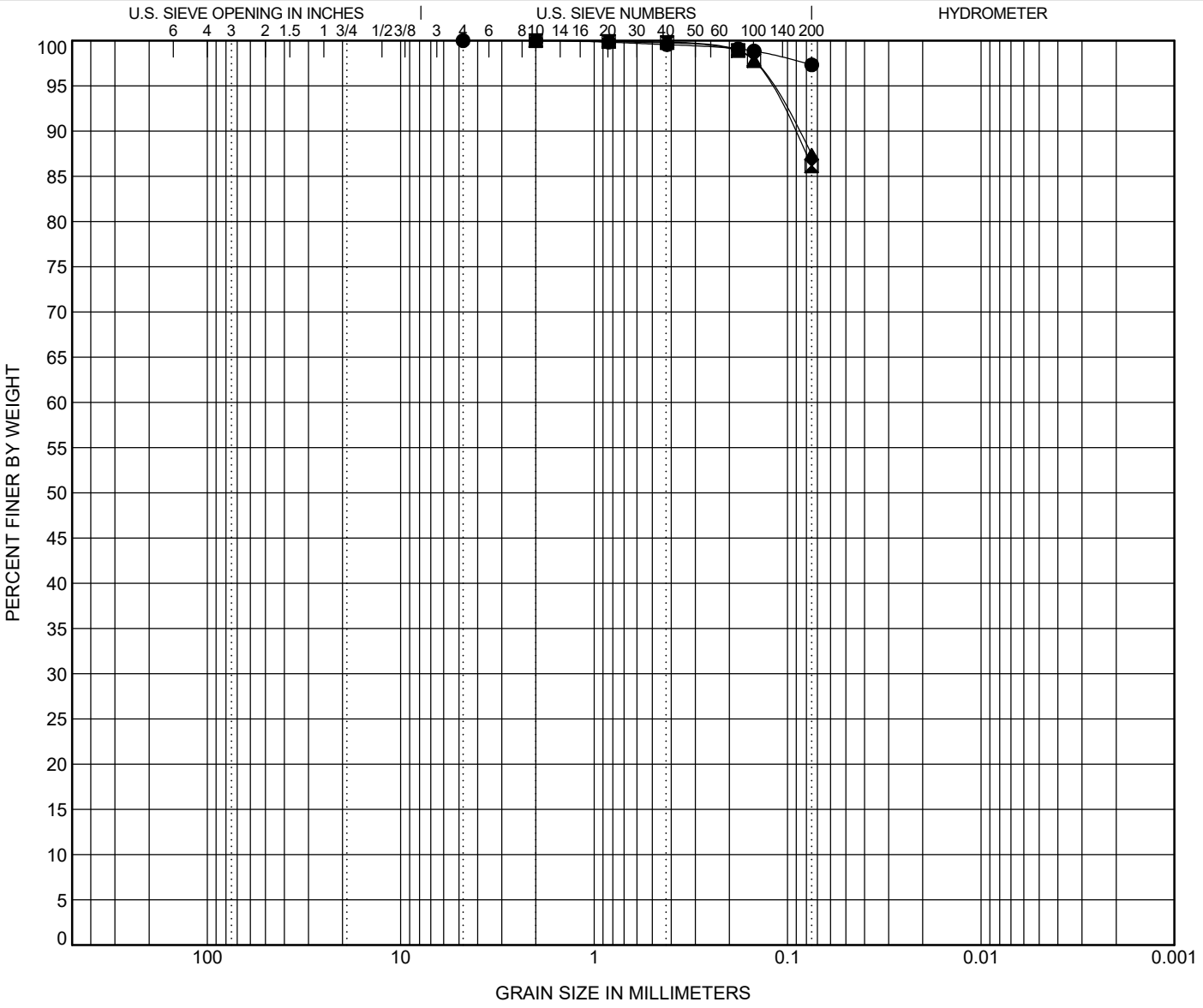
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**RW-32**	**6.0**	**Elastic SILT (MH) A-7-5(20)**	**59**	**44**	**15**		
⊠	**RW-32**	**25.0**	**SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		
▲	**RW-32**	**40.0**	**SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		

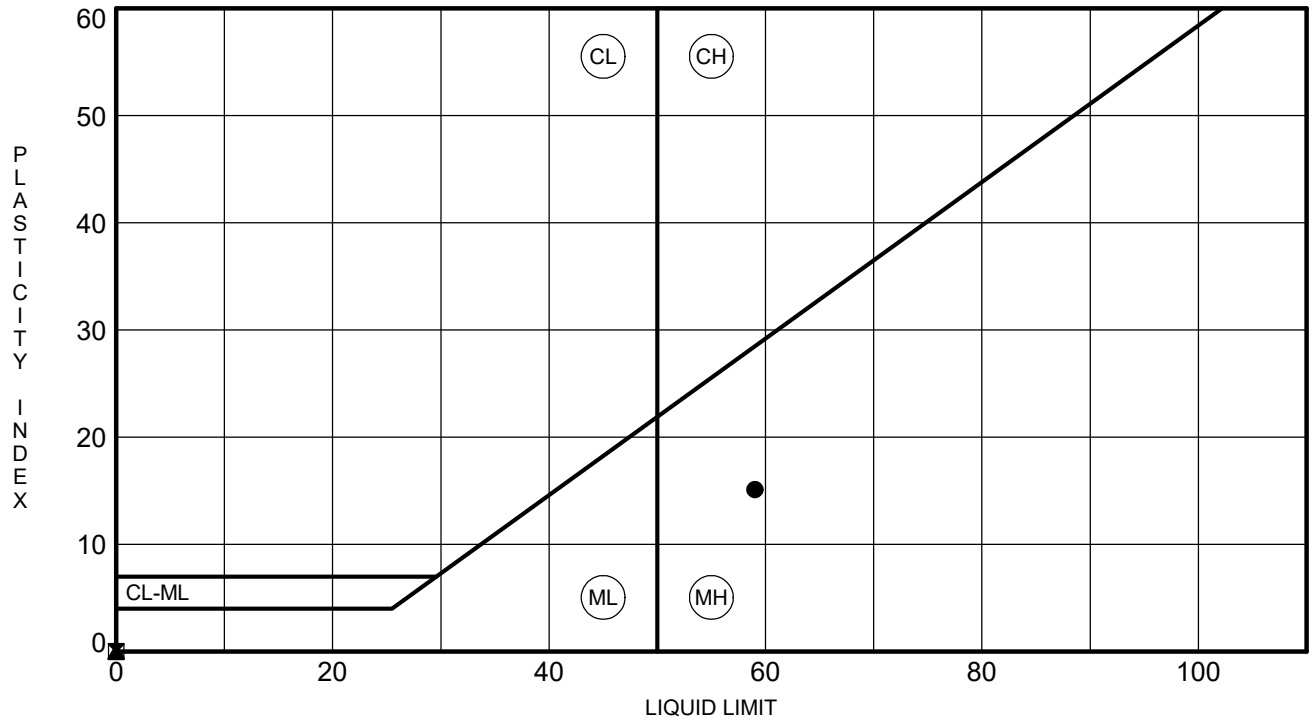
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**RW-32**	**6.0**	**4.76**				**0.0**	**2.7**	**97.3**	
⊠	**RW-32**	**25.0**	**2**	**0.126**			**0.0**	**13.8**	**86.2**	
▲	**RW-32**	**40.0**	**2**	**0.124**			**0.0**	**12.6**	**87.4**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/11/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**RW-32**	**6.0**	**59**	**44**	**15**	**97**	**Elastic SILT (MH) A-7-5(20)**
⧓	**RW-32**	**25.0**	**NP**	**NP**	**NP**	**86**	**SILT (ML) A-4(0)**
▲	**RW-32**	**40.0**	**NP**	**NP**	**NP**	**87**	**SILT (ML) A-4(0)**

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

ORGANIC IMPURITIES DETERMINATION
(AASHTO T267)

PROJECT:	Carolina Crossroads	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0513	**DATE SAMPLE RECEIVED:**	3/20/2018
DESCRIPTION OF SOIL:	SILT (ML) A-4(0)		
TESTED BY:	MB	**DATE OF TESTING:**	3/26/2018
		DATE OF WEIGHING:	3/26/2018

BORING NO.	RW-32				
SAMPLE NO.	18-0513G SS-8				
SAMPLE DEPTH	23.5-25.0'				
WT. OF CRUCIBLE + DRY SOIL (BEFORE IGNITION) (GRAMS)	159.58				
WT. OF CRUCIBLE + DRY SOIL (AFTER IGNITION) (GRAMS)	157.31				
WT. OF CRUCIBLE (GRAMS)	114.58				
WT. OF DRY SOIL (BEFORE IGNITION) (GRAMS)	45.00				
WT. OF DRY SOIL (AFTER IGNITION) (GRAMS)	42.73				
IGNITION LOSS (GRAMS)	2.27				
ORGANIC IMPURITIES %	5.04				

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0893	**DATE SAMPLE RECEIVED:**	5/15/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	5/22/2018
		DATE OF WEIGHING:	5/23/2018

BORING NO.	RW-33	RW-33	RW-33		
SAMPLE NO.	18-0893C SS-2	18-0893F SS-4	18-0893I SS-9		
SAMPLE DEPTH	2.0-4.0'	6.0-8.0'	28.5-30.0'		
WATER CONTENT, W%	11.2	23.0	21.2		

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

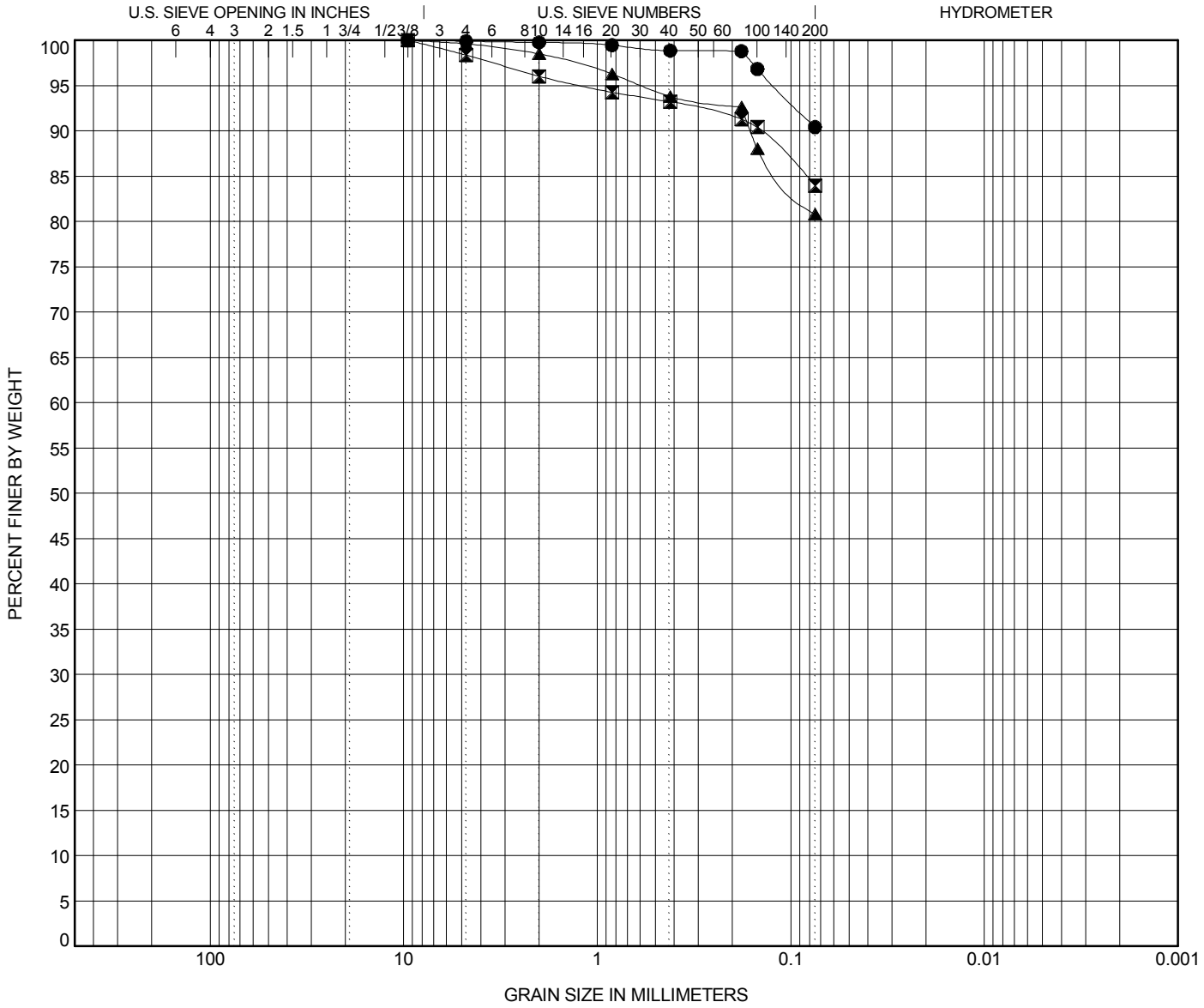
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**RW-33**	**4.0**	**SILT (ML) A-4(6)**	**34**	**28**	**6**		
⧓	**RW-33**	**8.0**	**SILT (ML) with Sand A-4(0)**	**NP**	**NP**	**NP**		
▲	**RW-33**	**30.0**	**SILT (ML) with Sand A-4(0)**	**NP**	**NP**	**NP**		

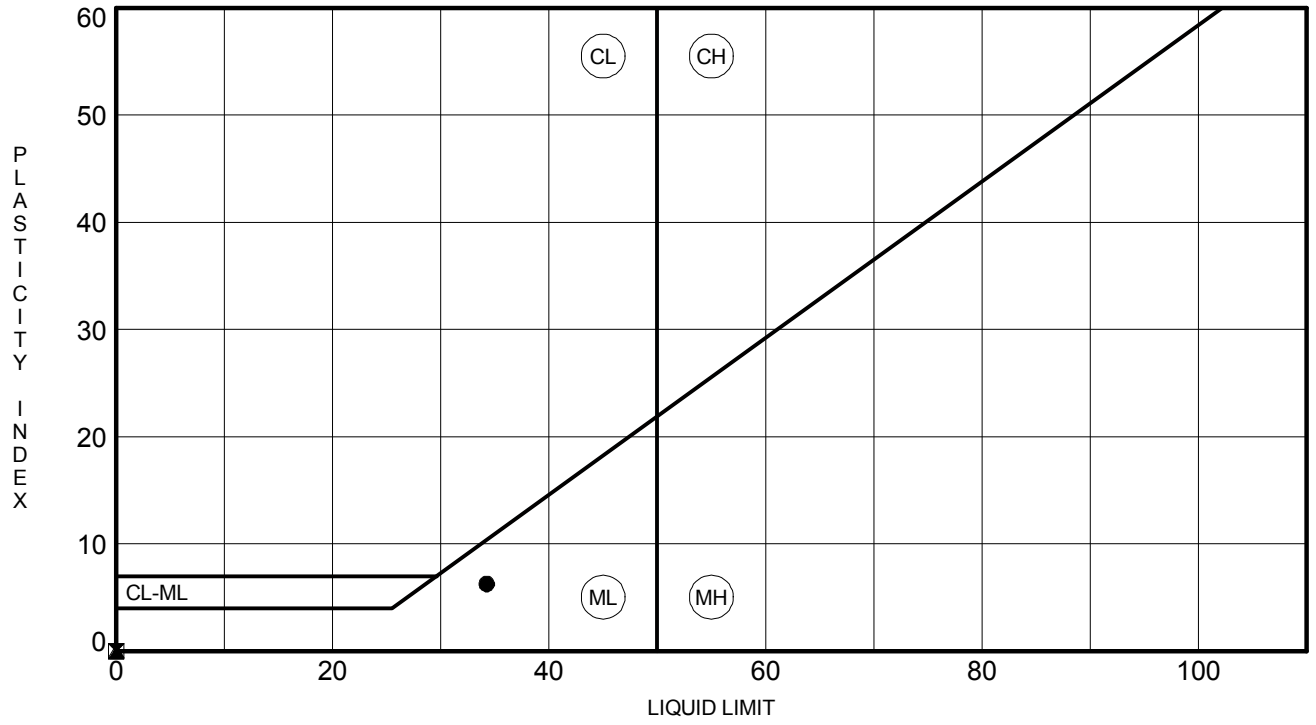
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**RW-33**	**4.0**	**9.52**	**0.122**			**0.1**	**9.5**	**90.4**	
⧓	**RW-33**	**8.0**	**9.52**	**1.193**			**1.6**	**14.4**	**84.0**	
▲	**RW-33**	**30.0**	**9.52**	**0.585**			**0.4**	**18.8**	**80.8**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/7/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**RW-33**	**4.0**	**34**	**28**	**6**	**90**	**SILT (ML) A-4(6)**
⧓	**RW-33**	**8.0**	**NP**	**NP**	**NP**	**84**	**SILT (ML) with Sand A-4(0)**
▲	**RW-33**	**30.0**	**NP**	**NP**	**NP**	**81**	**SILT (ML) with Sand A-4(0)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/7/18

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0623	**DATE SAMPLE RECEIVED:**	4/3/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	4/3/2018
		DATE OF WEIGHING:	4/4/2018

BORING NO.	RW-34	RW-34	RW-34	RW-34	
SAMPLE NO.	18-0623C SS-2	18-0623F SS-4	18-0623I SS-6	18-0623L SS-8	
SAMPLE DEPTH	2.0-4.0'	6.0-8.0'	13.5-15.0'	23.5-25.0'	
WATER CONTENT, W%	17.1	21.2	11.5	21.5	

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

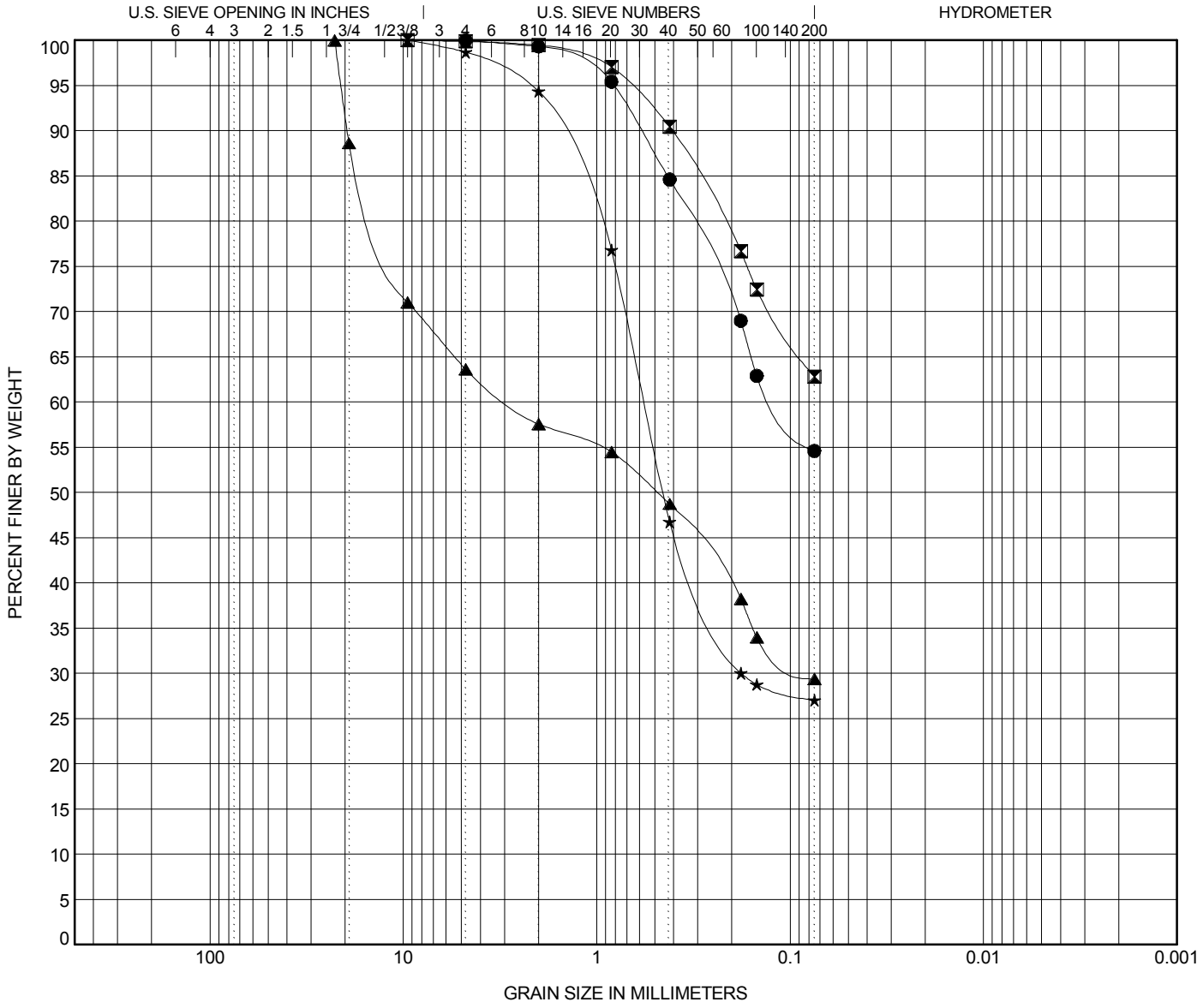
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**RW-34**	**4.0**	**Sandy Lean CLAY (CL) A-7-6(8)**	**44**	**26**	**18**		
⊠	**RW-34**	**8.0**	**Sandy Fat CLAY (CH) A-7-6(16)**	**52**	**23**	**29**		
▲	**RW-34**	**15.0**	**Clayey GRAVEL (GC) with F/C Sand A-2-7(1)**	**42**	**25**	**17**		
★	**RW-34**	**25.0**	**Silty F/C SAND (SM) A-2-7(3)**	**66**	**34**	**32**		

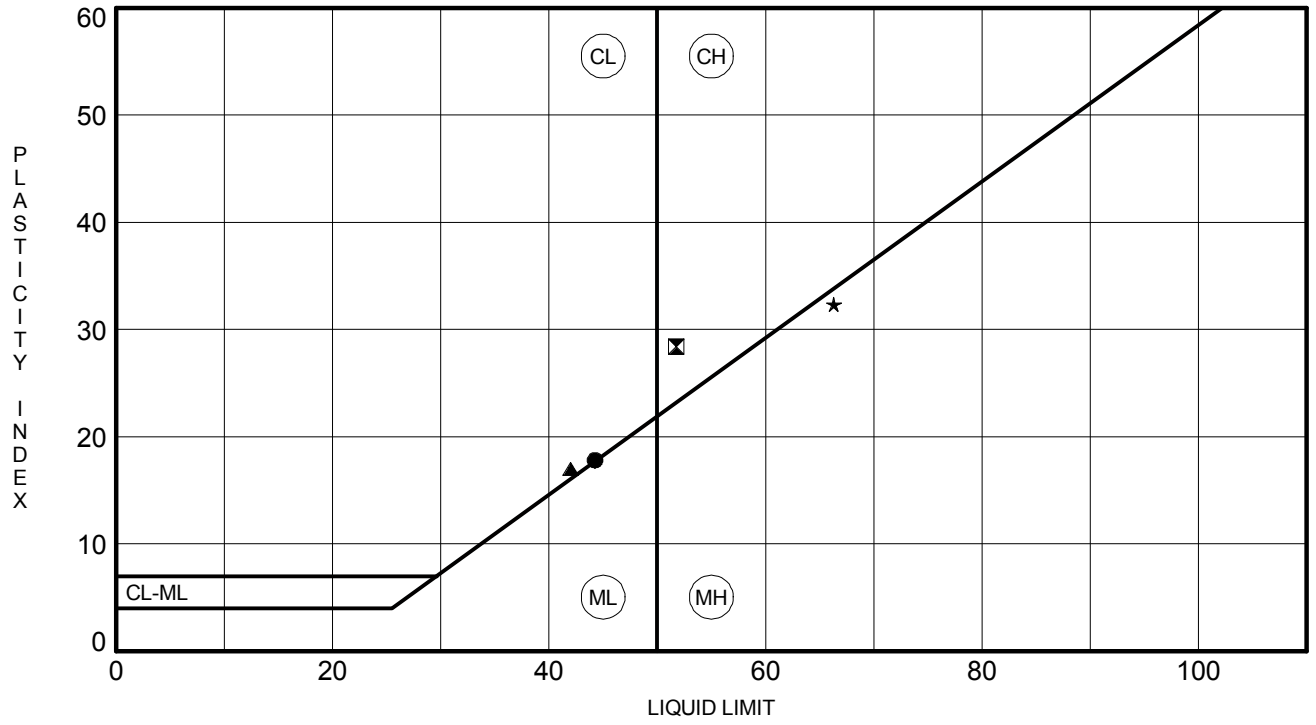
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**RW-34**	**4.0**	**4.76**	**0.817**			**0.0**	**45.4**	**54.6**	
⊠	**RW-34**	**8.0**	**9.52**	**0.676**			**0.1**	**37.1**	**62.8**	
▲	**RW-34**	**15.0**	**22.6**	**20.987**	**0.488**		**36.4**	**34.2**	**29.4**	
★	**RW-34**	**25.0**	**9.52**	**2.264**	**0.453**		**1.3**	**71.6**	**27.1**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/5/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**RW-34**	**4.0**	**44**	**26**	**18**	**55**	**Sandy Lean CLAY (CL) A-7-6(8)**
⧓	**RW-34**	**8.0**	**52**	**23**	**29**	**63**	**Sandy Fat CLAY (CH) A-7-6(16)**
▲	**RW-34**	**15.0**	**42**	**25**	**17**	**29**	**Clayey GRAVEL (GC) with F/C Sand A-2-7(1)**
★	**RW-34**	**25.0**	**66**	**34**	**32**	**27**	**Silty F/C SAND (SM) A-2-7(3)**

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0710	**DATE SAMPLE RECEIVED:**	6/15/2018
DESCRIPTION OF SOIL:	Sandy Lean CLAY (CL) A-6(5)		
TESTED BY:	MB	**DATE OF TESTING:**	6/15/2018
		DATE OF WEIGHING:	6/18/2018

BORING NO.	W-1				
SAMPLE NO.	18-0710E SS-4				
SAMPLE DEPTH	6.0-8.0'				
WATER CONTENT, W%	18.6				

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

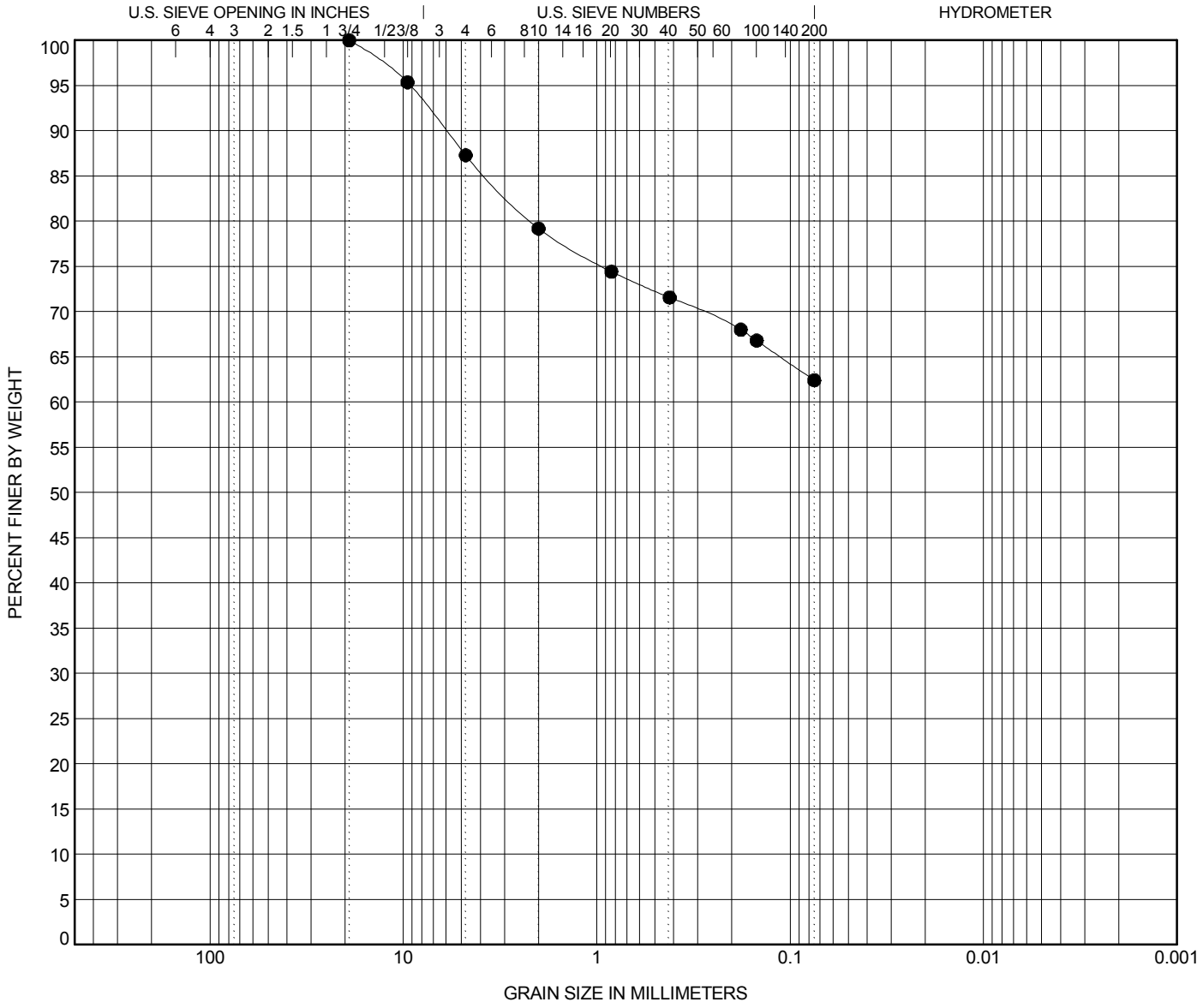
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**W-1**	**8.0**	**Sandy Lean CLAY (CL) A-6(5)**	**30**	**18**	**12**		

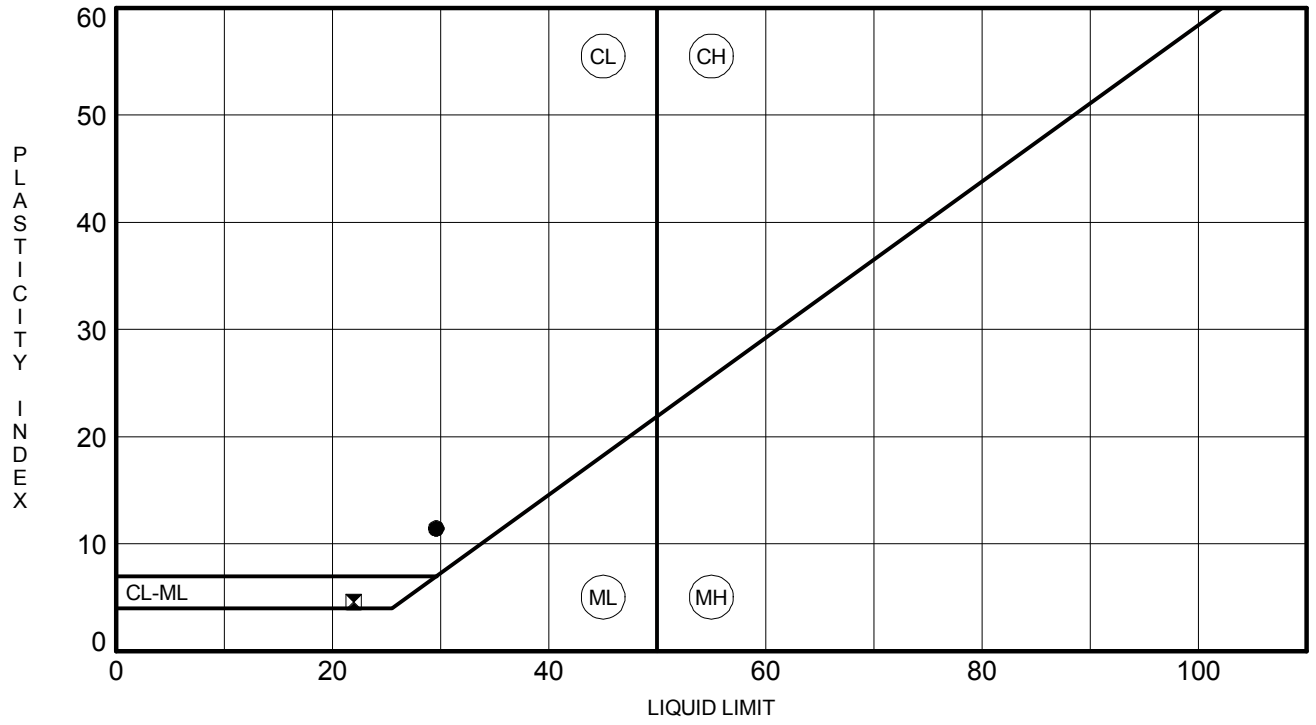
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**W-1**	**8.0**	**19.05**	**9.219**			**12.7**	**24.9**	**62.4**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/29/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**W-1**	**8.0**	**30**	**18**	**12**	**62**	**Sandy Lean CLAY (CL) A-6(5)**
⊠	**W-1**	**8.5**	**22**	**17**	**5**		

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

ROCK CORE COMPRESSION TEST

PROJECT: I-20/26/126 Corridor Improvements **PROJECT NO:** G5662.01

SAMPLED BY: CP **DATE SAMPLED:** 4/12/2018

TESTED BY: BF **DATE TESTED:** 4/17/2018

Lab No.	18-0711A				
Boring No.	W-1				
Sample No.	NQ-2				
Depth	21.7-30.0				
Length (in)	3.94				
Diameter (in)	1.86				
Mass (g)	486.34				
Cross Sectional Area (in^2)	2.72				
Load (lb)	25150				
Compressive Strength (psi)	9260				
Corrected Compressive Strength (psi)					
Unit Weight (lb/ft^3)	173.28				

Signature: _____

Remarks: _____

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

ROCK CORE COMPRESSION TEST

PROJECT: I-20/26/126 Corridor Improvements **PROJECT NO:** G5662.01

SAMPLED BY: RW **DATE SAMPLED:** 2/27/2018

TESTED BY: BF **DATE TESTED:** 3/7/2018

Lab No.	18-0393A				
Boring No.	W-2				
Sample No.	NQ-3				
Depth	21.9-22.2				
Length (in)	3.98				
Diameter (in)	1.86				
Mass (g)	483.67				
Cross Sectional Area (in^2)	2.73				
Load (lb)	26320				
Compressive Strength (psi)	9650				
Corrected Compressive Strength (psi)					
Unit Weight (lb/ft^3)	169.74				

Signature: _____

Remarks: _____

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0391	**DATE SAMPLE RECEIVED:**	3/1/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	3/2/2018
		DATE OF WEIGHING:	3/5/2018

BORING NO.	W-4	W-4	W-4		
SAMPLE NO.	18-0391C SS-5	18-0391F SS-6	18-0391I SS-8		
SAMPLE DEPTH	8.0-10.0'	13.5-15.0'	23.5-25.0'		
WATER CONTENT, W%	23.8	26.7	22.7		

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

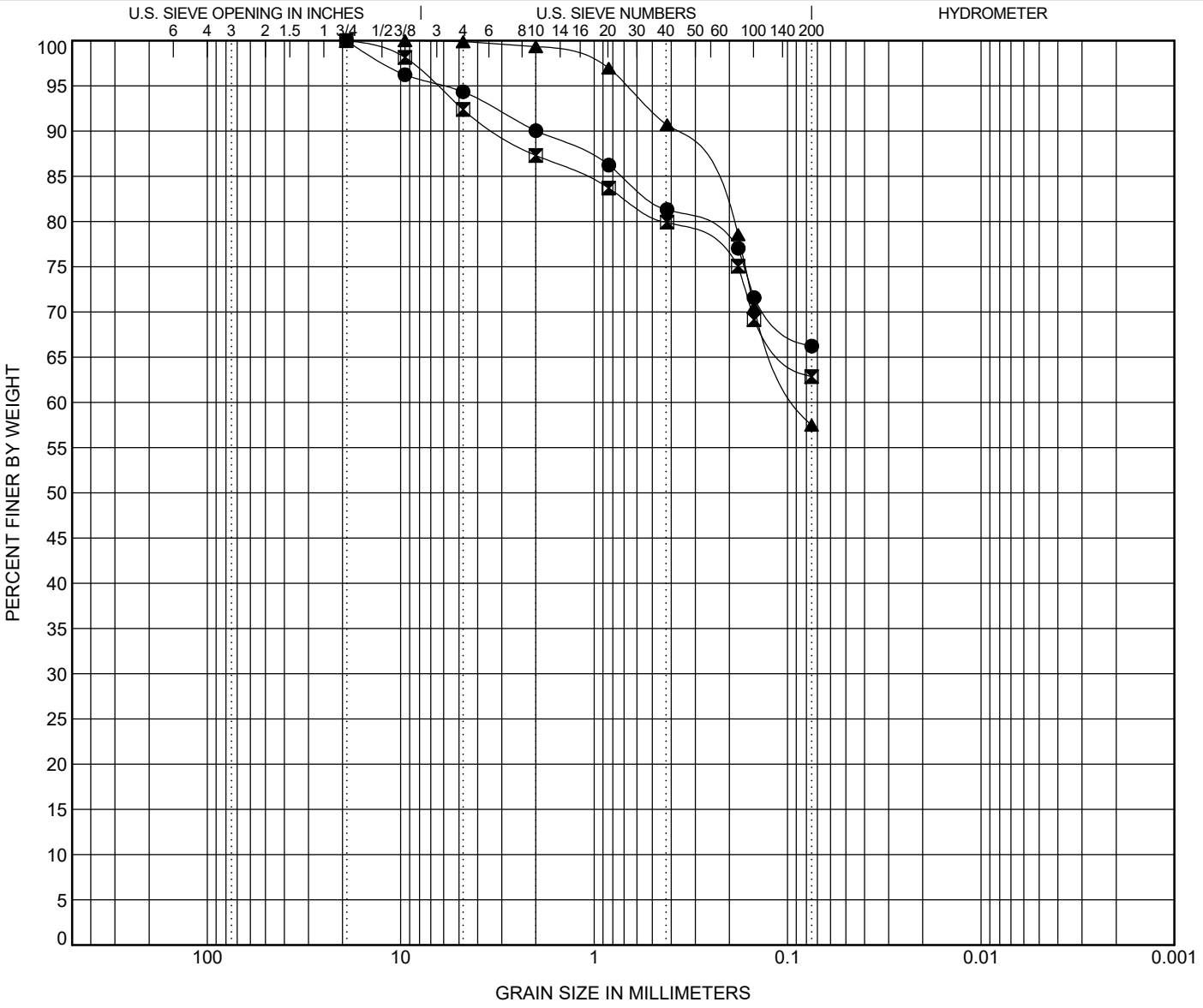
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**W-4**	**10.0**	**Sandy Silty CLAY (CL-ML) A-4(1)**	**26**	**21**	**5**		
⊠	**W-4**	**15.0**	**Sandy Lean CLAY (CL) A-7-6(9)**	**42**	**25**	**17**		
▲	**W-4**	**25.0**	**Sandy SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		

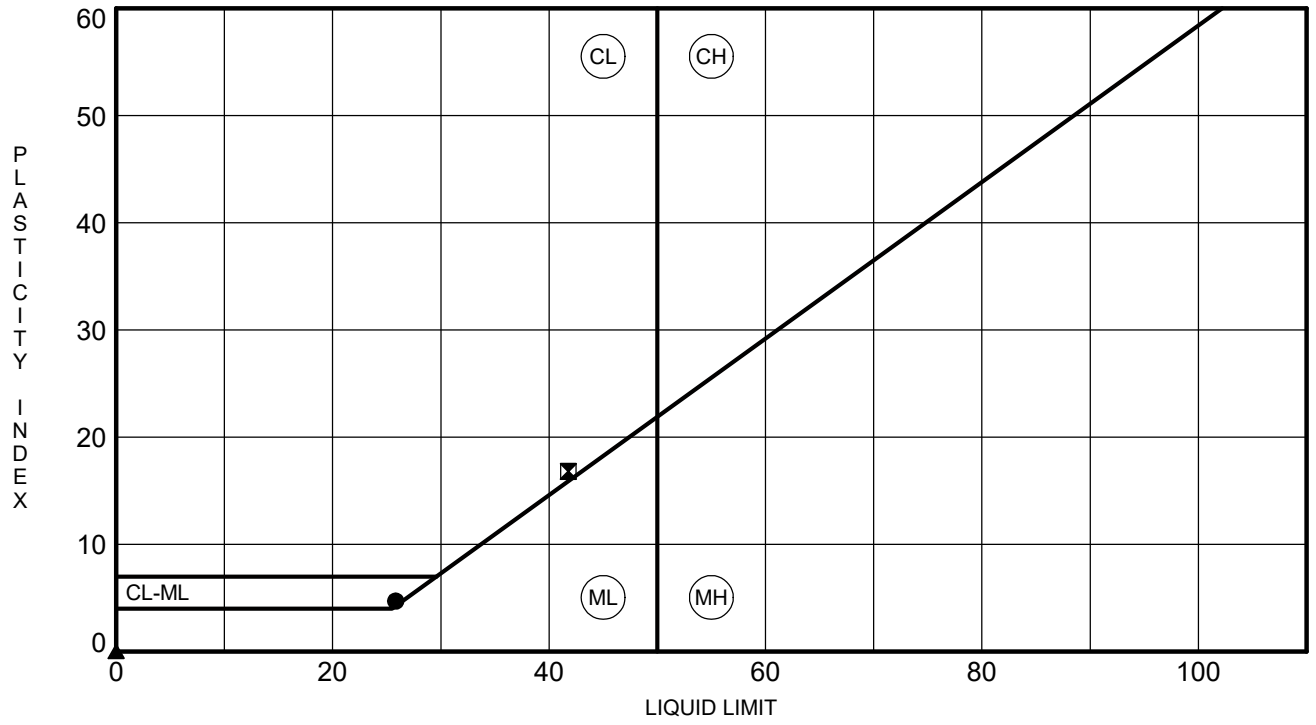
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**W-4**	**10.0**	**19.1**	**6.052**			**5.7**	**28.1**	**66.2**	
⊠	**W-4**	**15.0**	**19.1**	**6.518**			**7.6**	**29.5**	**62.9**	
▲	**W-4**	**25.0**	**9.52**	**0.676**			**0.1**	**42.4**	**57.5**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/9/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**W-4**	**10.0**	**26**	**21**	**5**	**66**	**Sandy Silty CLAY (CL-ML) A-4(1)**
⊠	**W-4**	**15.0**	**42**	**25**	**17**	**63**	**Sandy Lean CLAY (CL) A-7-6 (9)**
▲	**W-4**	**25.0**	**NP**	**NP**	**NP**	**57**	**Sandy SILT (ML) A-4(0)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/9/18

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0653	**DATE SAMPLE RECEIVED:**	4/30/2018
DESCRIPTION OF SOIL:	Silty Fine SAND (SM) with Gravel A-1-b		
TESTED BY:	MB	**DATE OF TESTING:**	4/30/2018
		DATE OF WEIGHING:	5/1/2018

BORING NO.	W-5				
SAMPLE NO.	18-0653C SS-3				
SAMPLE DEPTH	4.0-6.0'				
WATER CONTENT, W%	12.8				

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

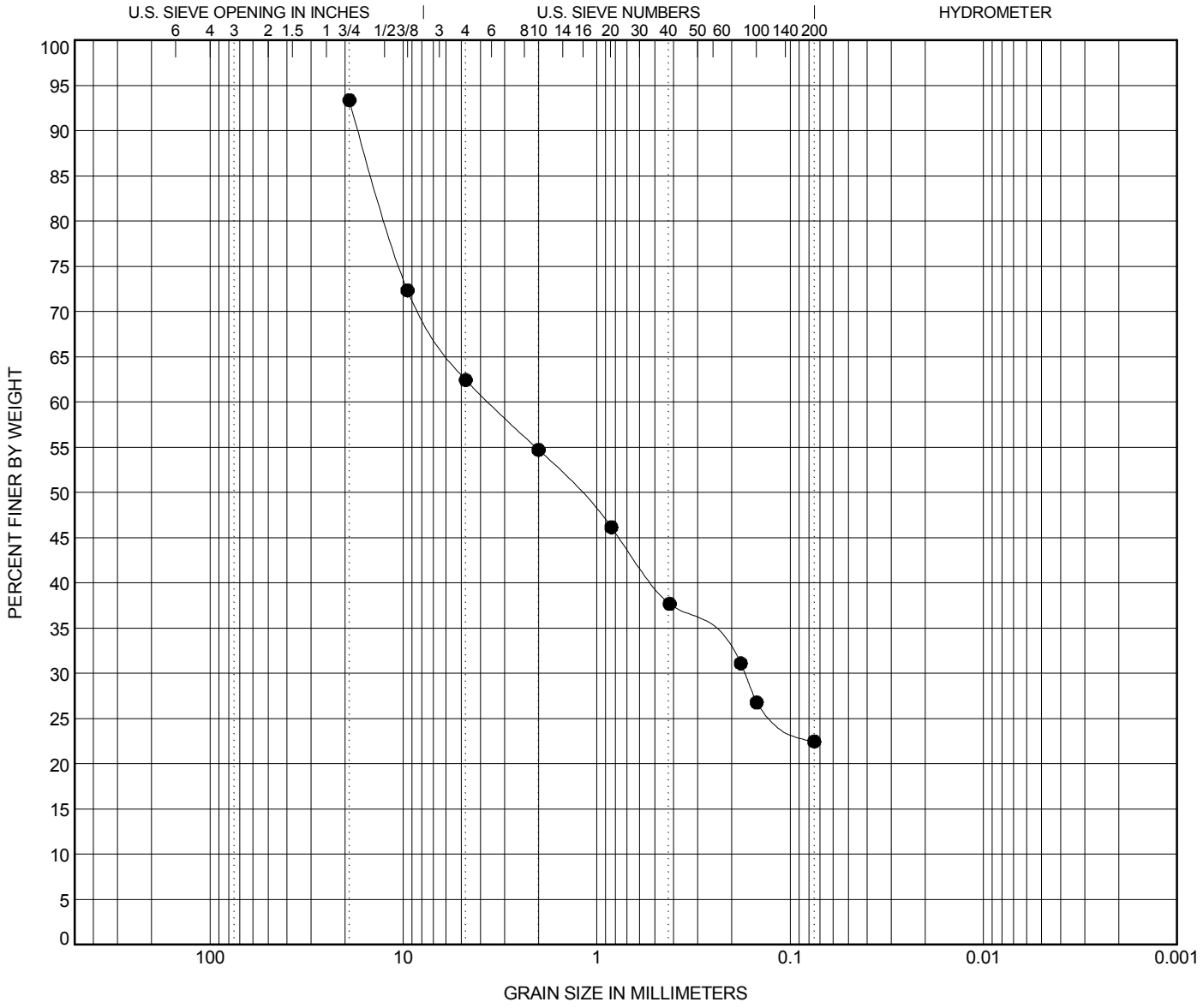
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**W-5**	**6.0**	**Silty Fine SAND (SM) with Gravel A-1-b**	**25**	**22**	**3**		

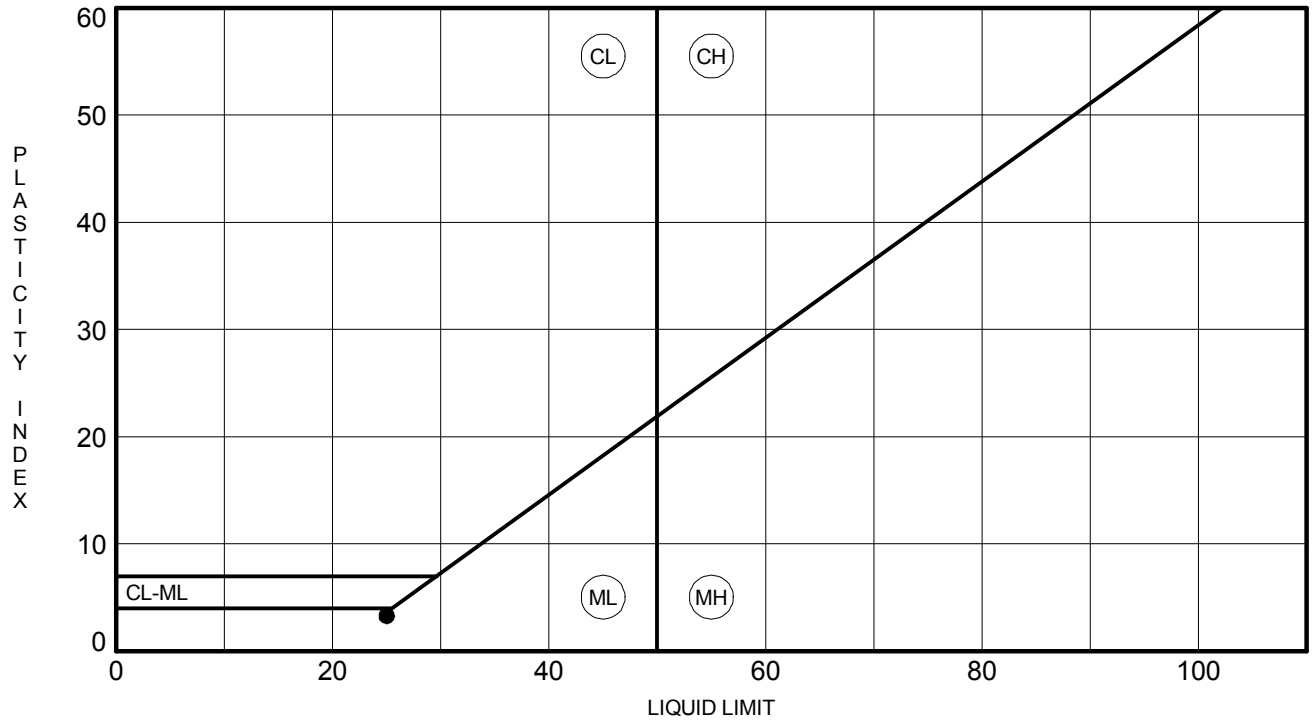
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**W-5**	**6.0**	**19**		**1.239**		**37.6**	**39.9**	**22.5**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 5/14/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**W-5**	**6.0**	**25**	**22**	**3**	**22**	**Silty Fine SAND (SM) with Gravel A-1-b**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 5/14/18

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

ROCK CORE COMPRESSION TEST

PROJECT: I-20/26/126 Corridor Improvements **PROJECT NO:** G5662.01

SAMPLED BY: RW **DATE SAMPLED:** 4/3/2018

TESTED BY: BF **DATE TESTED:** 4/6/2018

Lab No.	18-0655A				
Boring No.	W-5				
Sample No.	NQ-1				
Depth	9.8-10.1				
Length (in)	4.02				
Diameter (in)	1.87				
Mass (g)	489.33				
Cross Sectional Area (in^2)	2.76				
Load (lb)	23345				
Compressive Strength (psi)	8460				
Corrected Compressive Strength (psi)					
Unit Weight (lb/ft^3)	168.33				

Signature: _____

Remarks: _____

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0262	**DATE SAMPLE RECEIVED:**	2/13/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	2/15/2018
		DATE OF WEIGHING:	2/16/2018

BORING NO.	W-6	W-6	W-6	W-6	
SAMPLE NO.	18-0262C SS-2	18-0262F SS-5	18-0262I SS-8	18-0262L SS-10	
SAMPLE DEPTH	2.0-4.0'	8.0-10.0'	23.5-25.0'	33.5-35.0'	
WATER CONTENT, W%	22.7	27.2	21.7	16.7	

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

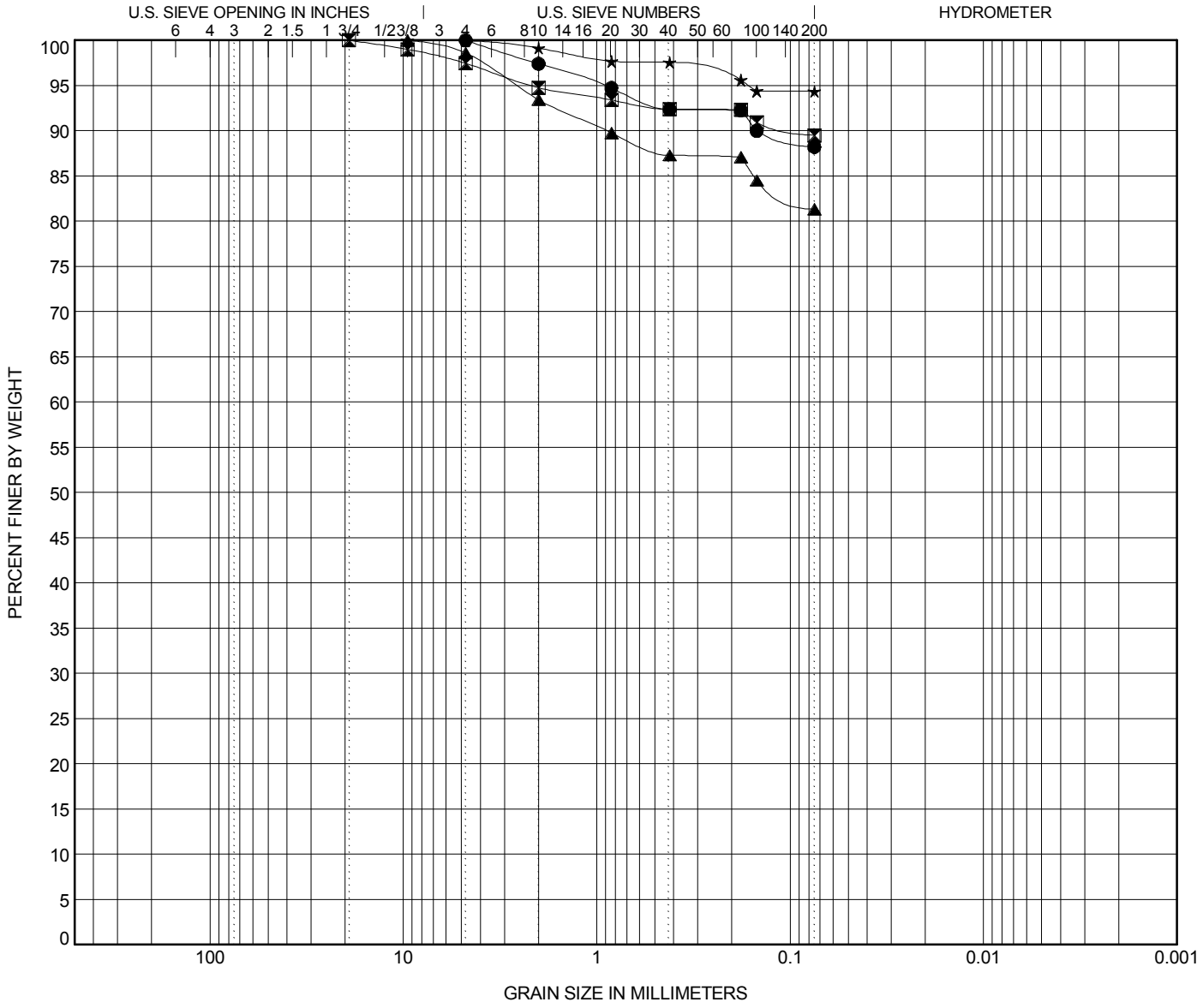
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**W-6**	**4.0**	**SILT (ML) A-7-5(19)**	**49**	**31**	**18**		
⧓	**W-6**	**10.0**	**SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		
▲	**W-6**	**25.0**	**SILT (ML) with F/M Sand A-7-6(14)**	**42**	**26**	**16**		
★	**W-6**	**35.0**	**SILT (ML) A-6(15)**	**40**	**26**	**14**		

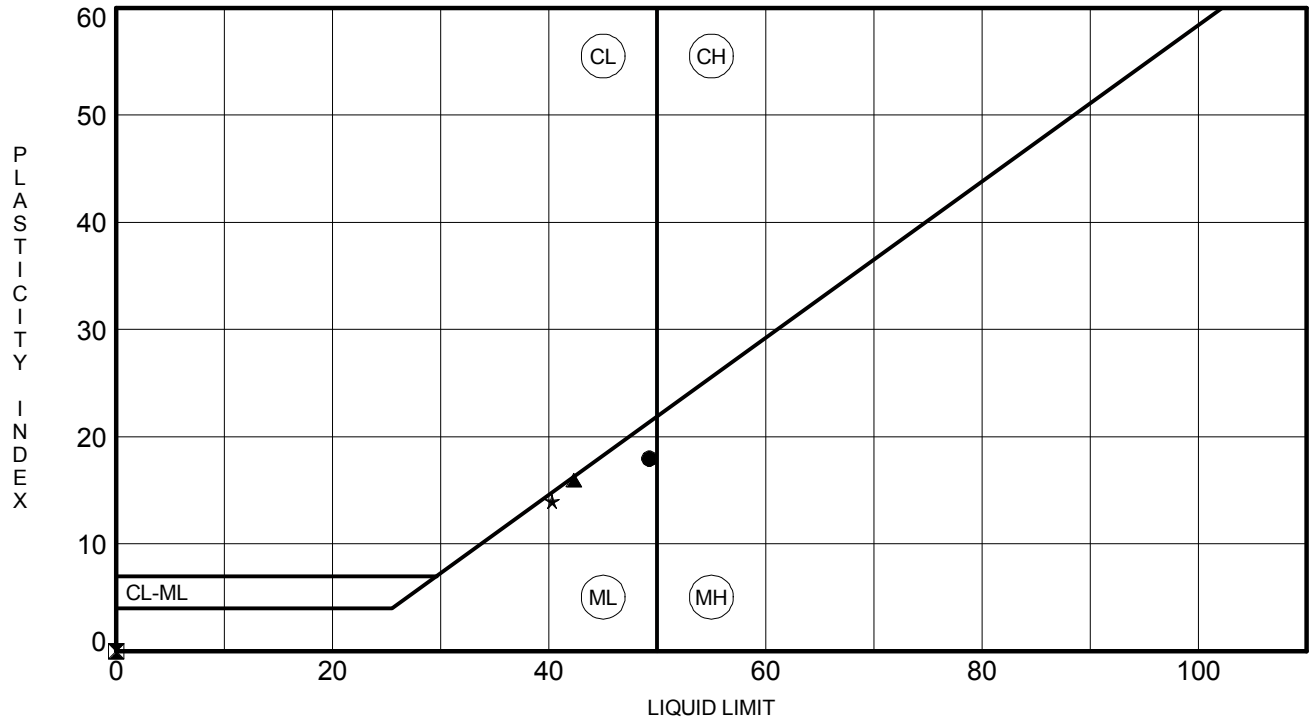
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**W-6**	**4.0**	**4.76**	**0.913**			**0.0**	**11.8**	**88.2**	
⧓	**W-6**	**10.0**	**19.1**	**2.161**			**2.5**	**8.0**	**89.5**	
▲	**W-6**	**25.0**	**9.52**	**2.598**			**1.4**	**17.3**	**81.3**	
★	**W-6**	**35.0**	**9.52**	**0.164**			**0.0**	**5.6**	**94.4**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 3/2/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**W-6**	**4.0**	**49**	**31**	**18**	**88**	**SILT (ML) A-7-5(19)**
⊠	**W-6**	**10.0**	**NP**	**NP**	**NP**	**89**	**SILT (ML) A-4(0)**
▲	**W-6**	**25.0**	**42**	**26**	**16**	**81**	**SILT (ML) with F/M Sand A-7-6(14)**
★	**W-6**	**35.0**	**40**	**26**	**14**	**94**	**SILT (ML) A-6(15)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 3/2/18

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0320	**DATE SAMPLE RECEIVED:**	2/23/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	2/23/2018
		DATE OF WEIGHING:	2/26/2018

BORING NO.	W-7	W-7			
SAMPLE NO.	18-0320C SS-4	18-0320F SS-6			
SAMPLE DEPTH	6.0-8.0'	13.5-15.0'			
WATER CONTENT, W%	28.5	21.8			

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

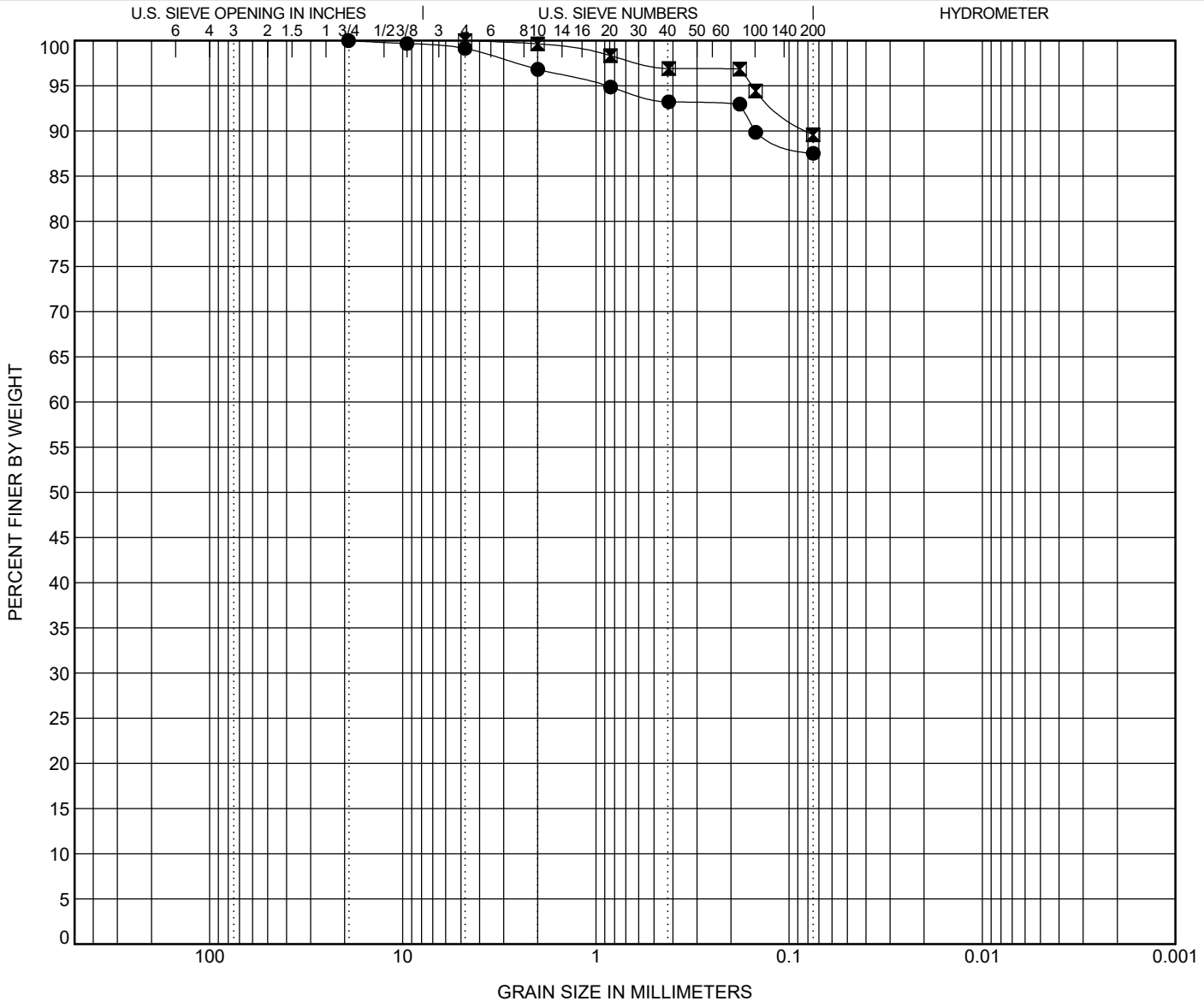
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**W-7**	**8.0**	**Lean CLAY (CL) A-6(9)**	**31**	**20**	**11**		
⊠	**W-7**	**15.0**	**SILT (ML) A-7-6(15)**	**43**	**29**	**14**		

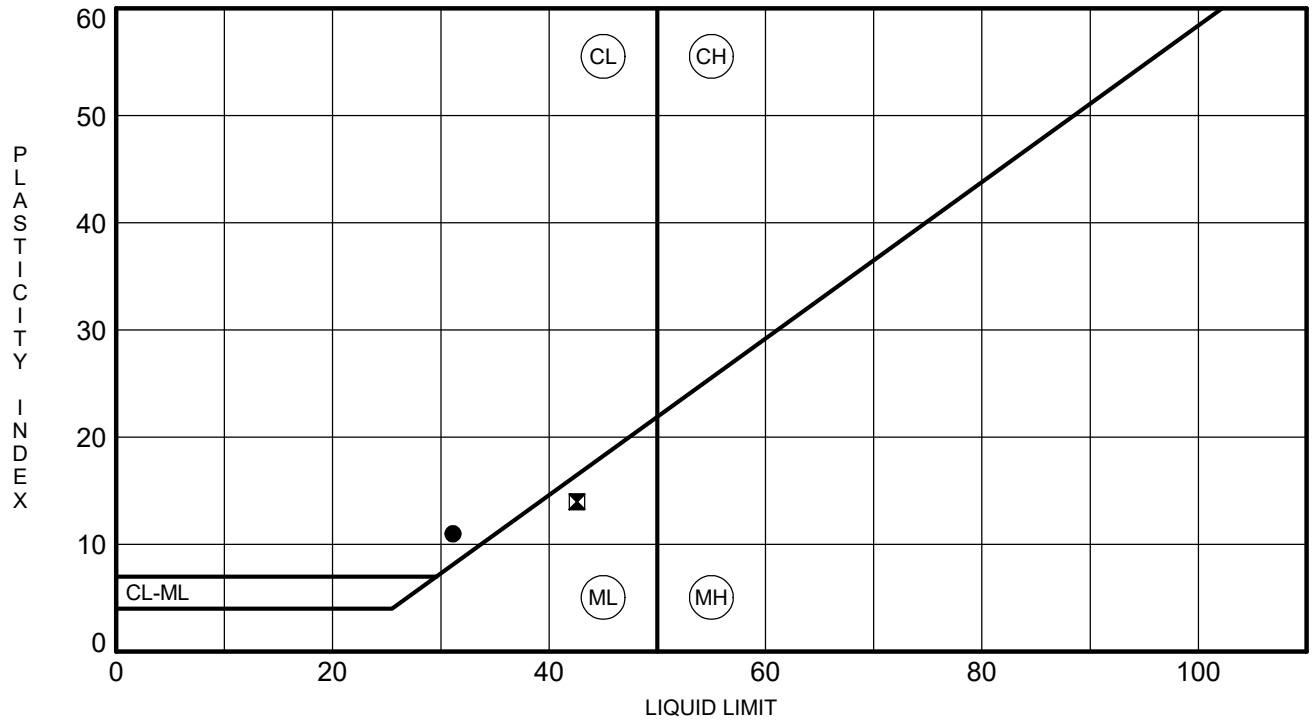
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**W-7**	**8.0**	**19.1**	**0.893**			**0.9**	**11.6**	**87.5**	
⊠	**W-7**	**15.0**	**4.76**	**0.156**			**0.0**	**10.4**	**89.6**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/9/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**W-7**	**8.0**	**31**	**20**	**11**	**88**	**Lean CLAY (CL) A-6(9)**
⊠	**W-7**	**15.0**	**43**	**29**	**14**	**90**	**SILT (ML) A-7-6(15)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/9/18

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

ORGANIC IMPURITIES DETERMINATION
(AASHTO T267)

PROJECT:	Carolina Crossroads	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0320D	**DATE SAMPLE RECEIVED:**	2/23/2018
DESCRIPTION OF SOIL:	Lean CLAY (CL) A-6(9)		
TESTED BY:	MB	**DATE OF TESTING:**	1/29/2018
		DATE OF WEIGHING:	1/29/2018

BORING NO.	W-7				
SAMPLE NO.	18-0320D SS-4				
SAMPLE DEPTH	6.0-8.0'				
WT. OF CRUCIBLE + DRY SOIL (BEFORE IGNITION) (GRAMS)	193.74				
WT. OF CRUCIBLE + DRY SOIL (AFTER IGNITION) (GRAMS)	190.78				
WT. OF CRUCIBLE (GRAMS)	137.12				
WT. OF DRY SOIL (BEFORE IGNITION) (GRAMS)	56.62				
WT. OF DRY SOIL (AFTER IGNITION) (GRAMS)	53.66				
IGNITION LOSS (GRAMS)	2.96				
ORGANIC IMPURITIES %	5.23				

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

ROCK CORE COMPRESSION TEST

PROJECT: I-20/26/126 Corridor Improvements **PROJECT NO:** G5662.01

SAMPLED BY: RW **DATE SAMPLED:** 2/15/2018

TESTED BY: BF **DATE TESTED:** 2/16/2018

Lab No.	18-0336A				
Boring No.	W-7				
Sample No.	NQ-3				
Depth	37.6-37.9				
Length (in)	3.92				
Diameter (in)	1.87				
Mass (g)	489.87				
Cross Sectional Area (in^2)	2.74				
Load (lb)	23895				
Compressive Strength (psi)	8730				
Corrected Compressive Strength (psi)					
Unit Weight (lb/ft^3)	173.76				

Signature: _____

Remarks: _____

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0969	**DATE SAMPLE RECEIVED:**	5/31/2018
DESCRIPTION OF SOIL:	Various		
TESTED BY:	MB	**DATE OF TESTING:**	6/4/2018
		DATE OF WEIGHING:	6/5/2018

BORING NO.	W-8	W-8			
SAMPLE NO.	18-0969C SS-2	18-0969F SS-4			
SAMPLE DEPTH	2.0-4.0'	6.0-8.0'			
WATER CONTENT, W%	21.5	17.9			

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

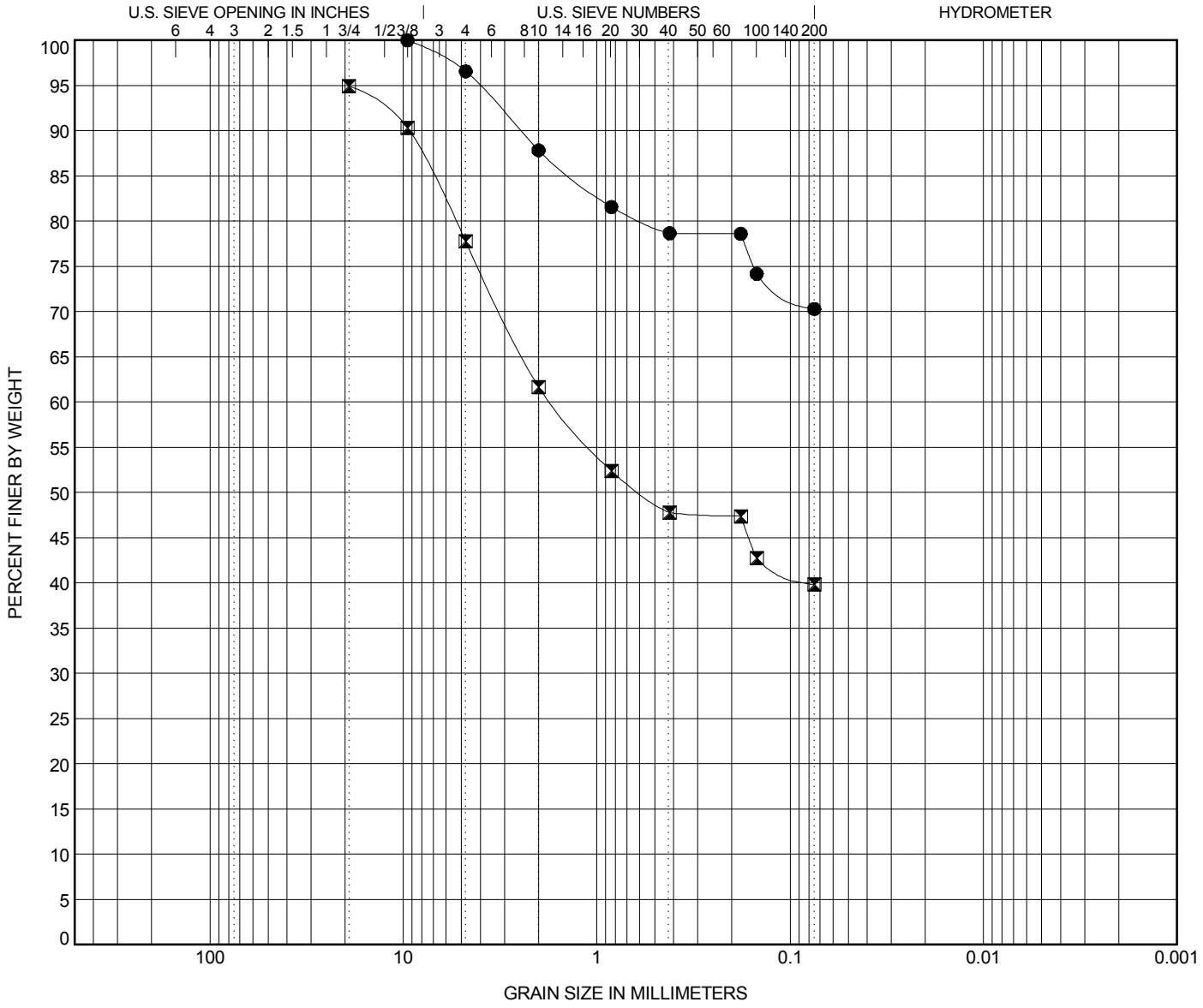
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**W-8**	**4.0**	**SILT (ML) with Sand A-4(3)**	**31**	**26**	**5**		
⧓	**W-8**	**8.0**	**Silty Coarse SAND (SM) with Gravel A-4(0)**	**29**	**25**	**4**		

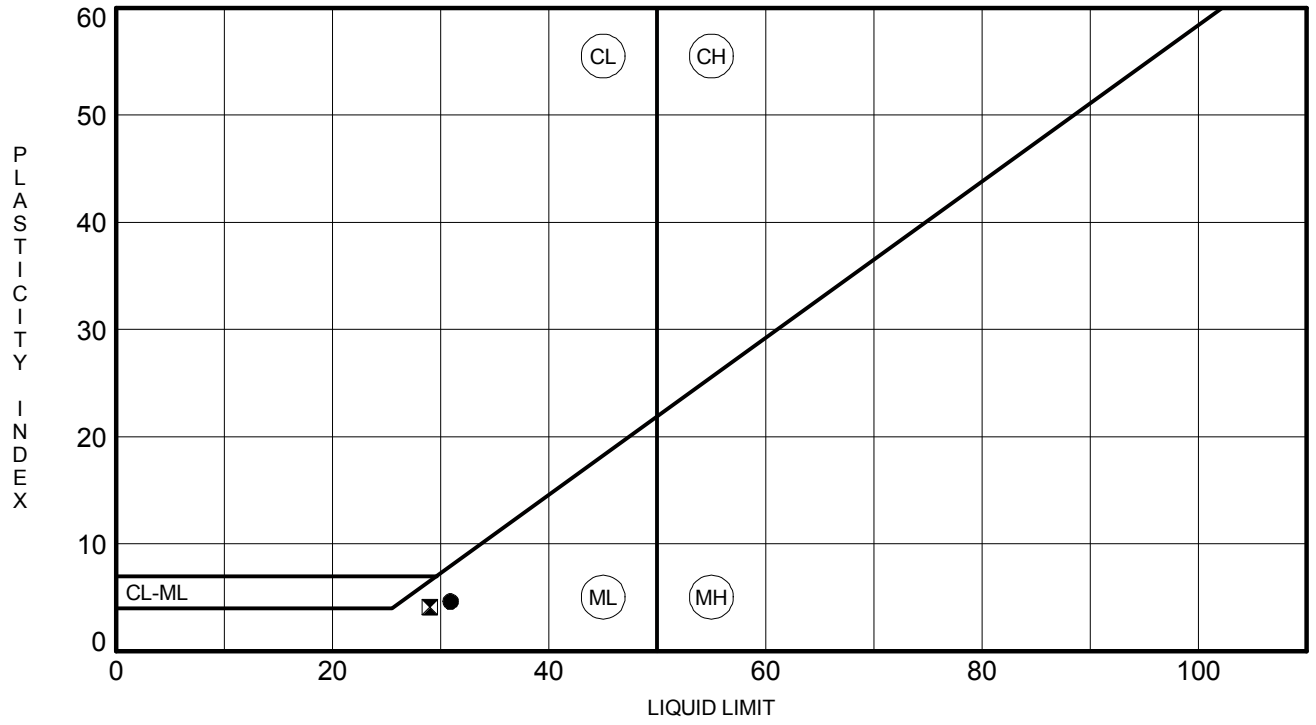
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**W-8**	**4.0**	**9.52**	**4.068**			**3.4**	**26.3**	**70.3**	
⧓	**W-8**	**8.0**	**19.1**		**0.586**		**17.2**	**37.9**	**39.8**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/12/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**W-8**	**4.0**	**31**	**26**	**5**	**70**	**SILT (ML) with Sand A-4(3)**
⊠	**W-8**	**8.0**	**29**	**25**	**4**	**40**	**Silty Coarse SAND (SM) with Gravel A-4(0)**

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

ROCK CORE COMPRESSION TEST

PROJECT: I-20/26/126 Corridor Improvements **PROJECT NO:** G5662.01

SAMPLED BY: RW **DATE SAMPLED:** 5/23/2018

TESTED BY: BF **DATE TESTED:** 5/30/2018

Lab No.	18-1028A				
Boring No.	W-8				
Sample No.	NQ-3				
Depth	33.0-33.0				
Length (in)	3.98				
Diameter (in)	1.85				
Mass (g)	421.34				
Cross Sectional Area (in^2)	2.68				
Load (lb)	5315				
Compressive Strength (psi)	1980				
Corrected Compressive Strength (psi)					
Unit Weight (lb/ft^3)	150.32				

Signature: _____

Remarks: _____

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0452	**DATE SAMPLE RECEIVED:**	3/20/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	3/20/2018
		DATE OF WEIGHING:	3/21/2018

BORING NO.	W-9	W-9	W-9	W-9	
SAMPLE NO.	18-0452C SS-3	18-0452L SS-4	18-0452F SS-5	18-0452I SS-7	
SAMPLE DEPTH	4.0-6.0'	6.0-8.0'	8.0-10.0'	18.5-20.0'	
WATER CONTENT, W%	24.8	29.7	16.3	24.4	

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

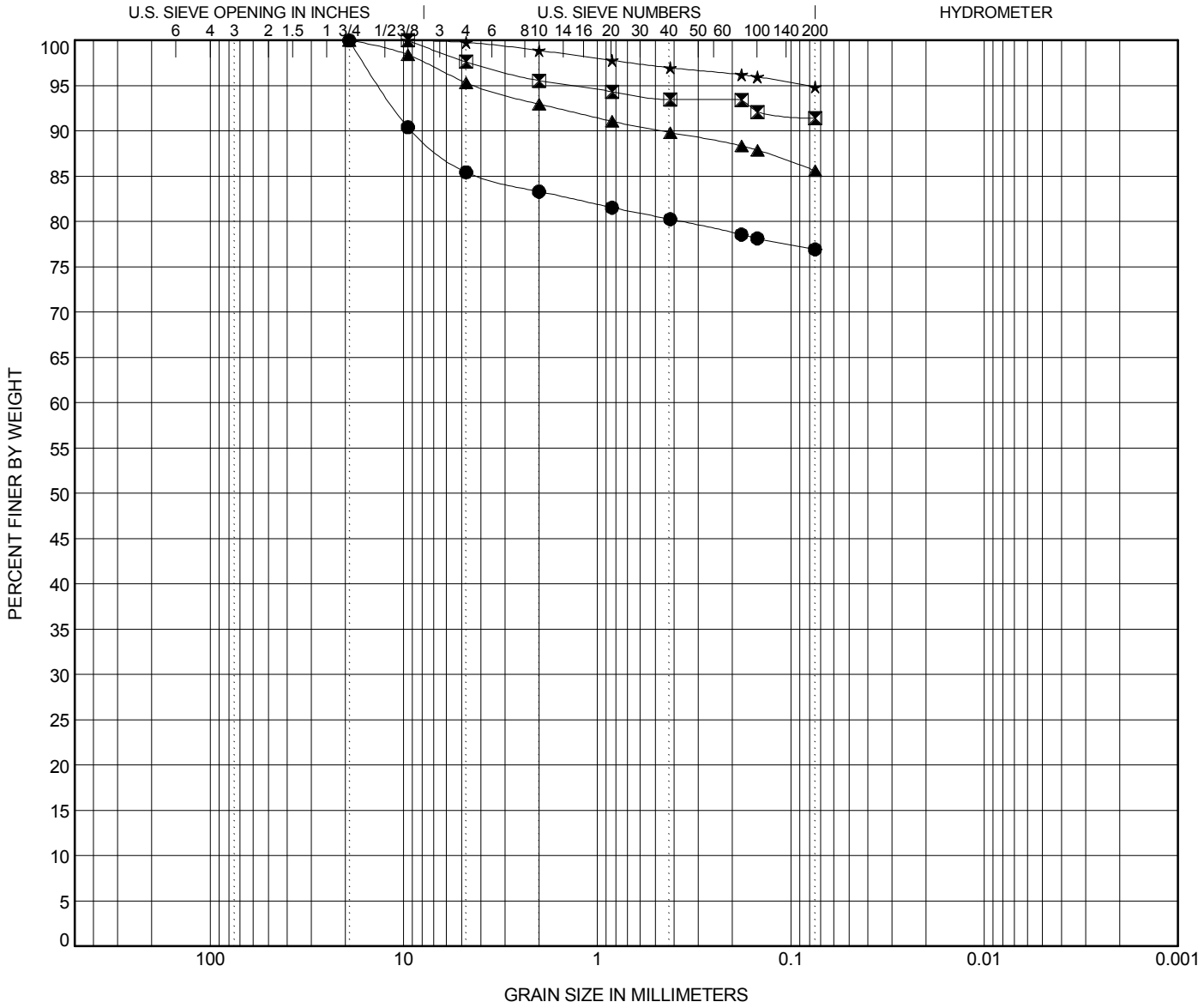
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**W-9**	**6.0**	**Elastic SILT (MH) with Gravel A-7-5(20)**	**57**	**30**	**27**		
⊠	**W-9**	**8.0**	**Lean CLAY (CL) A-7-6(20)**	**45**	**19**	**26**		
▲	**W-9**	**10.0**	**SILT (ML) A-4(8)**	**33**	**24**	**9**		
★	**W-9**	**20.0**	**SILT (ML) A-4(7)**	**33**	**27**	**6**		

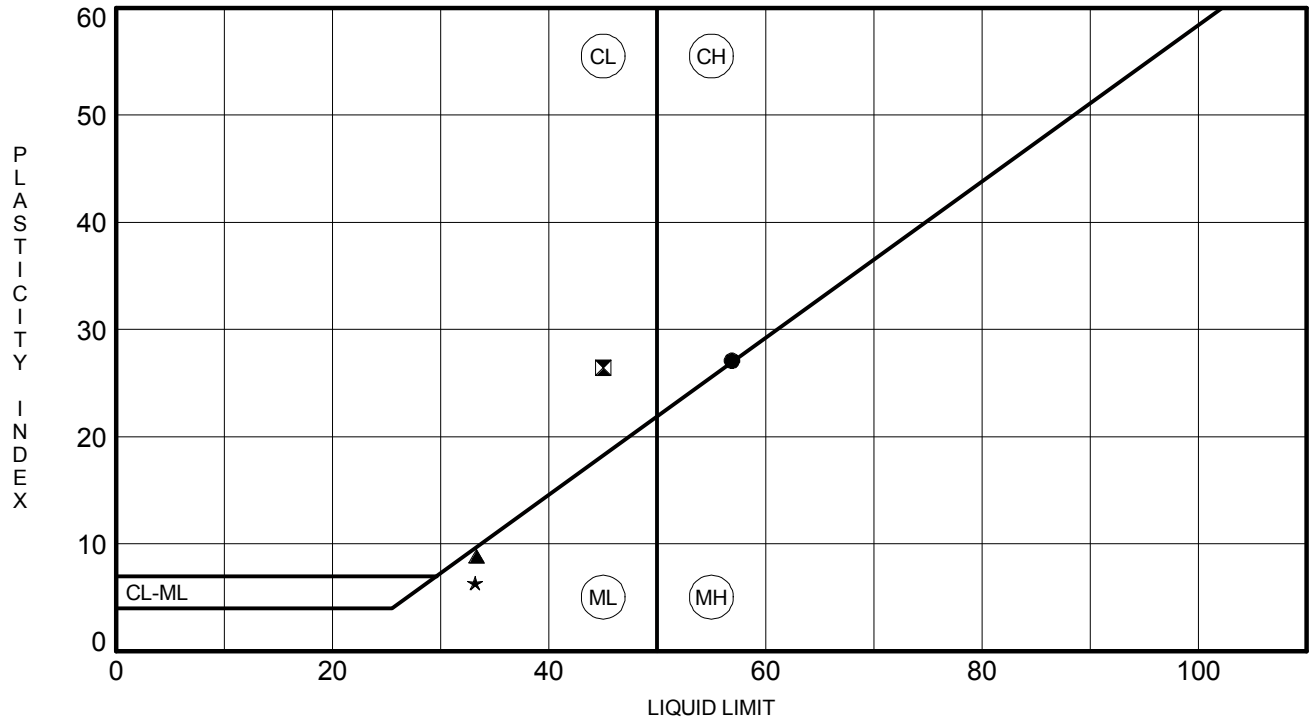
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**W-9**	**6.0**	**19.1**	**13.277**			**14.6**	**8.5**	**76.9**	
⊠	**W-9**	**8.0**	**9.52**	**1.344**			**2.4**	**6.2**	**91.4**	
▲	**W-9**	**10.0**	**19.1**	**4.22**			**4.7**	**9.7**	**85.6**	
★	**W-9**	**20.0**	**9.52**	**0.082**			**0.2**	**4.9**	**94.9**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/29/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**W-9**	**6.0**	**57**	**30**	**27**	**77**	**Elastic SILT (MH) with Gravel A-7-5(20)**
⊠	**W-9**	**8.0**	**45**	**19**	**26**	**91**	**Lean CLAY (CL) A-7-6(20)**
▲	**W-9**	**10.0**	**33**	**24**	**9**	**86**	**SILT (ML) A-4(8)**
★	**W-9**	**20.0**	**33**	**27**	**6**	**95**	**SILT (ML) A-4(7)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/29/18

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

ROCK CORE COMPRESSION TEST

PROJECT: I-20/26/126 Corridor Improvements **PROJECT NO:** G5662.01

SAMPLED BY: RW **DATE SAMPLED:** 3/8/2018

TESTED BY: BF **DATE TESTED:** 3/20/2018

Lab No.	18-0453A				
Boring No.	W-9				
Sample No.	NQ-2				
Depth	42.5-42.8				
Length (in)	3.94				
Diameter (in)	1.87				
Mass (g)	475.53				
Cross Sectional Area (in^2)	2.74				
Load (lb)	14930				
Compressive Strength (psi)	5450				
Corrected Compressive Strength (psi)					
Unit Weight (lb/ft^3)	167.73				

Signature: _____

Remarks: _____

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0573	**DATE SAMPLE RECEIVED:**	3/27/2018
DESCRIPTION OF SOIL:	Various		
TESTED BY:	MB	**DATE OF TESTING:**	3/30/2018
		DATE OF WEIGHING:	4/2/2018

BORING NO.	W-10	W-10	W-10		
SAMPLE NO.	18-0573C SS-3	18-0573F SS-5	18-0573I SS-9		
SAMPLE DEPTH	4.0-6.0'	8.0-10.0'	28.5-30.0'		
WATER CONTENT, W%	11.1	14.9	12.9		

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

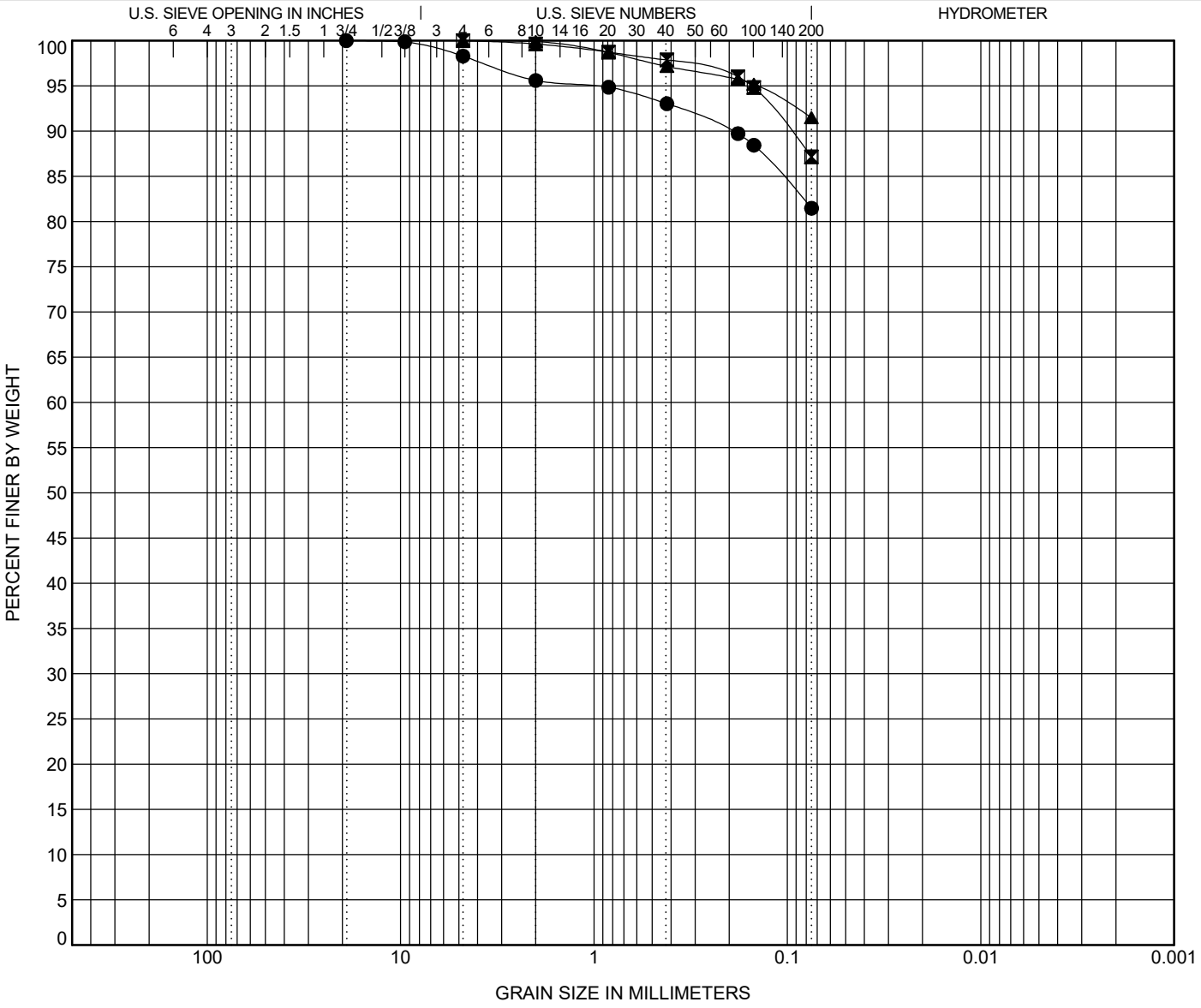
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**W-10**	**6.0**	**SILT (ML) with Fine Sand A-4(7)**	**34**	**25**	**9**		
⊠	**W-10**	**10.0**	**SILT (ML) A-4(5)**	**35**	**31**	**4**		
▲	**W-10**	**30.0**	**SILT (ML) A-4(8)**	**33**	**25**	**8**		

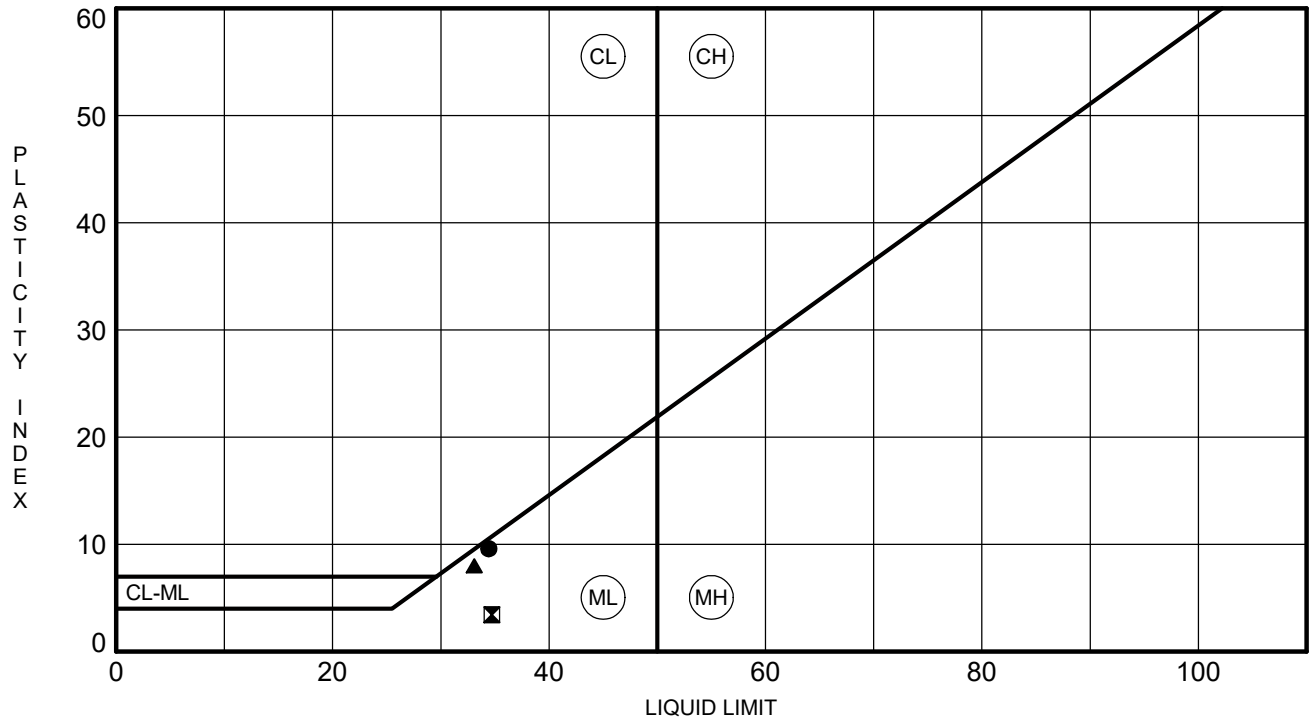
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**W-10**	**6.0**	**19.1**	**1.003**			**1.7**	**16.8**	**81.5**	
⊠	**W-10**	**10.0**	**4.76**	**0.153**			**0.0**	**12.9**	**87.1**	
▲	**W-10**	**30.0**	**4.76**	**0.144**			**0.0**	**8.5**	**91.5**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/13/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**W-10**	**6.0**	**34**	**25**	**9**	**81**	**SILT (ML) with Fine Sand A-4(7)**
⊠	**W-10**	**10.0**	**35**	**31**	**4**	**87**	**SILT (ML) A-4(5)**
▲	**W-10**	**30.0**	**33**	**25**	**8**	**91**	**SILT (ML) A-4(8)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/13/18

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0192	**DATE SAMPLE RECEIVED:**	2/5/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	2/5/2018
		DATE OF WEIGHING:	2/6/2018

BORING NO.	W-11	W-11			
SAMPLE NO.	18-0192C SS-2	18-0192F SS-6			
SAMPLE DEPTH	2.0-4.0'	13.5-15.0'			
WATER CONTENT, W%	16.9	18.4			

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

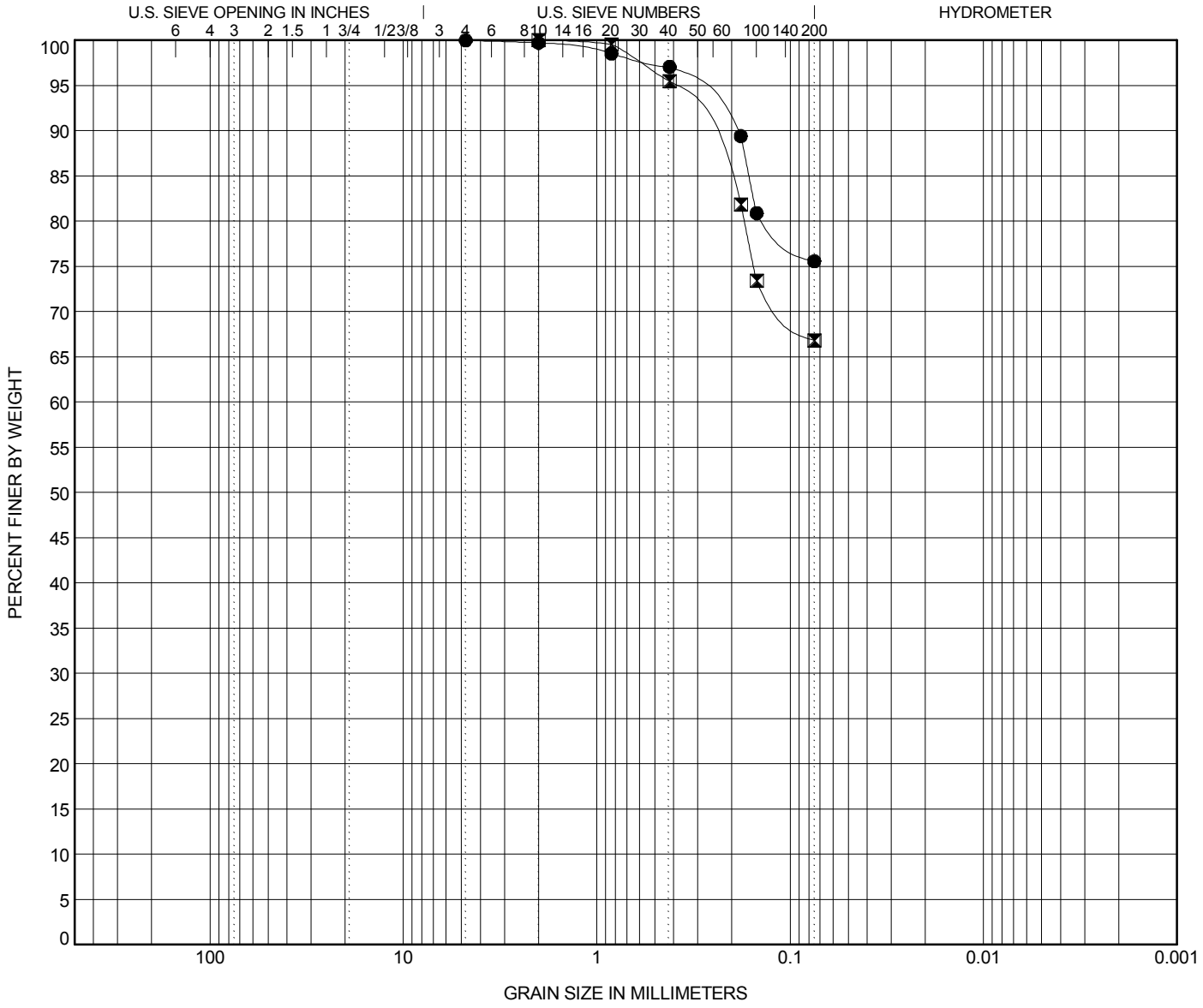
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**W-11**	**4.0**	**SILT (ML) with Fine Sand A-7-6(11)**	**42**	**28**	**14**		
⊠	**W-11**	**15.0**	**Sandy SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		

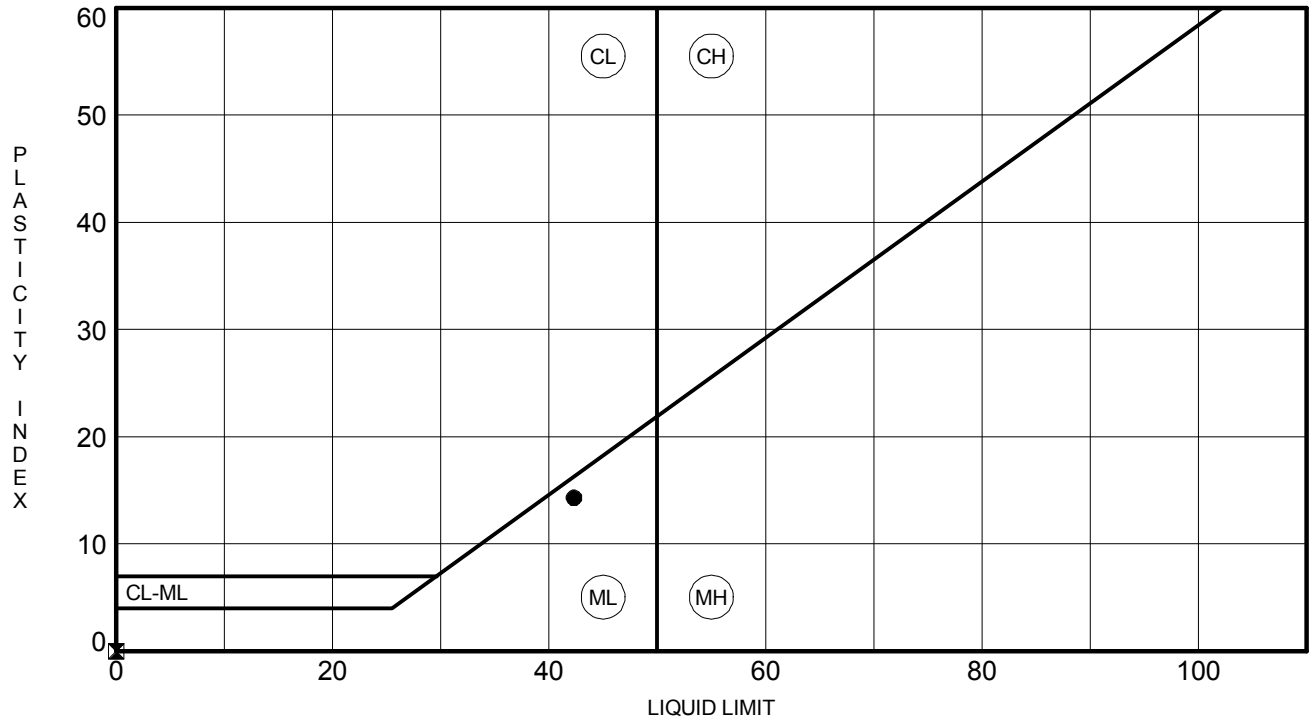
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**W-11**	**4.0**	**4.76**	**0.334**			**0.0**	**24.4**	**75.6**	
⊠	**W-11**	**15.0**	**2**	**0.408**			**0.0**	**33.2**	**66.8**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 2/13/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**W-11**	**4.0**	**42**	**28**	**14**	**76**	**SILT (ML) with Fine Sand A-7-6(11)**
⧓	**W-11**	**15.0**	**NP**	**NP**	**NP**	**67**	**Sandy SILT (ML) A-4(0)**

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0193	**DATE SAMPLE RECEIVED:**	2/5/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	2/5/2018
		DATE OF WEIGHING:	2/6/2018

BORING NO.	W-12	W-12			
SAMPLE NO.	18-0193C SS-2	18-0193F SS-4			
SAMPLE DEPTH	2.0-4.0'	6.0-8.0'			
WATER CONTENT, W%	24.6	15.6			

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

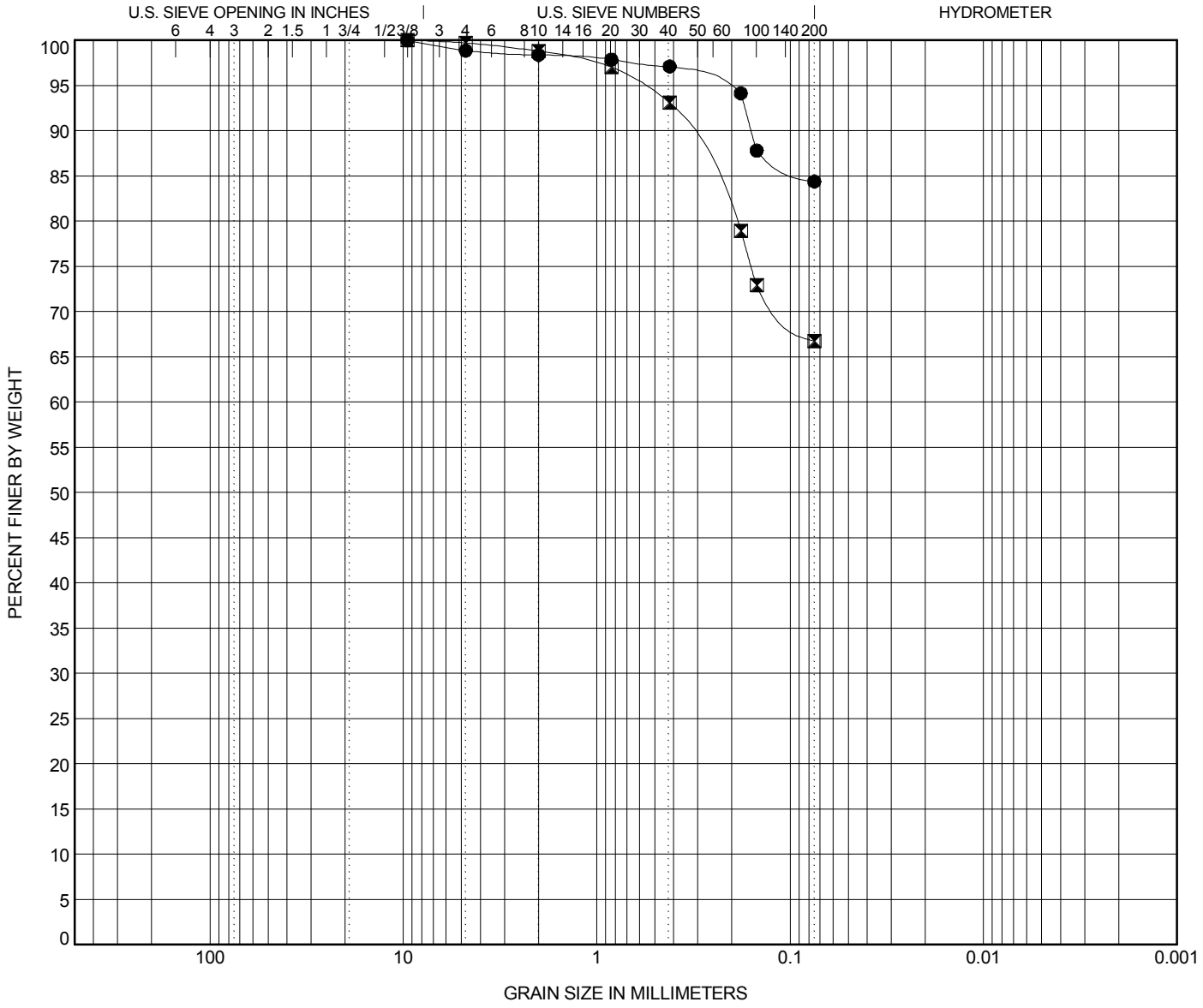
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**W-12**	**4.0**	**Elastic SILT (MH) with Fine Sand A-7-5(20)**	**58**	**38**	**20**		
⧓	**W-12**	**8.0**	**Sandy SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		

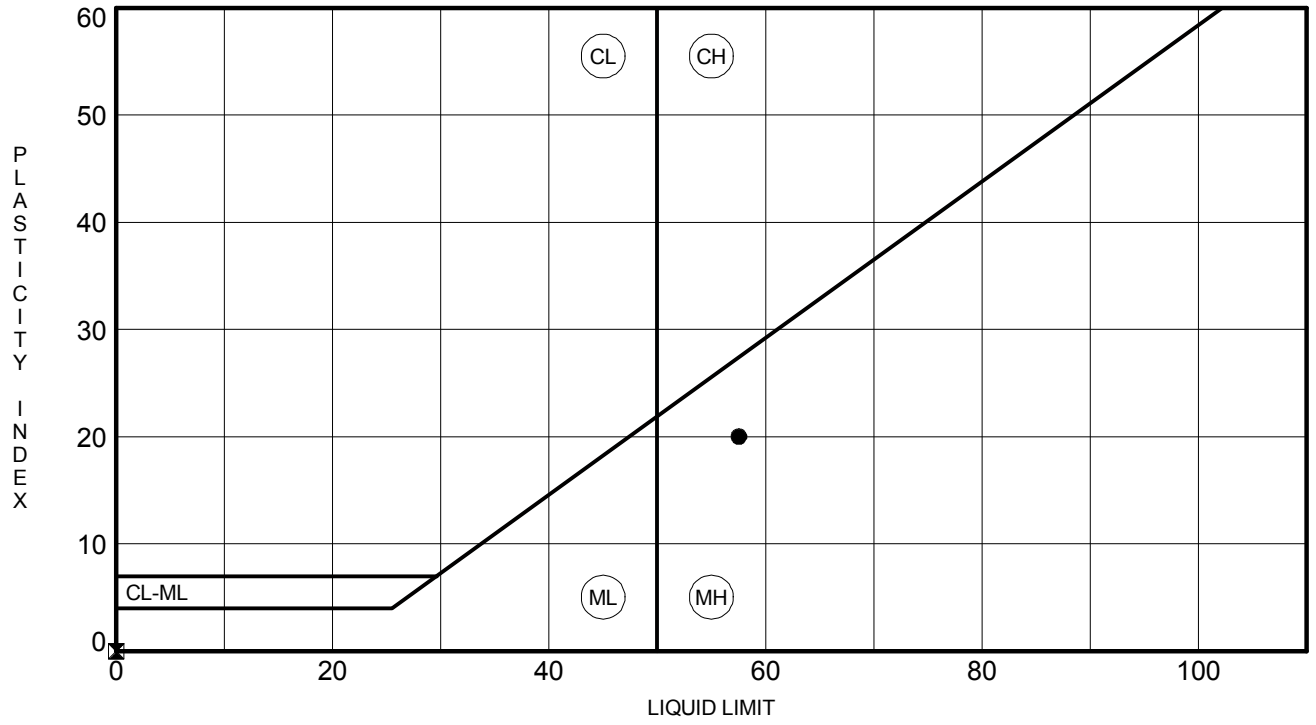
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**W-12**	**4.0**	**9.52**	**0.229**			**1.1**	**14.5**	**84.4**	
⧓	**W-12**	**8.0**	**9.52**	**0.586**			**0.3**	**33.0**	**66.7**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 2/13/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**W-12**	**4.0**	**58**	**38**	**20**	**84**	**Elastic SILT (MH) with Fine Sand A-7-5(20)**
⧓	**W-12**	**8.0**	**NP**	**NP**	**NP**	**67**	**Sandy SILT (ML) A-4(0)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 2/13/18

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0467	**DATE SAMPLE RECEIVED:**	3/20/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	3/20/2018
		DATE OF WEIGHING:	3/21/2018

BORING NO.	W-13	W-13	W-13	W-13	W-13
SAMPLE NO.	18-0467C SS-1	18-0467F SS-5	18-0467I SS-6	18-0467O SS-7	18-0467L SS-10
SAMPLE DEPTH	0.0-2.0'	8.0-10.0'	13.5-15.0'	18.5-20.0'	33.5-35.0'
WATER CONTENT, W%	18.9	21.7	19.5	22.8	16.0

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

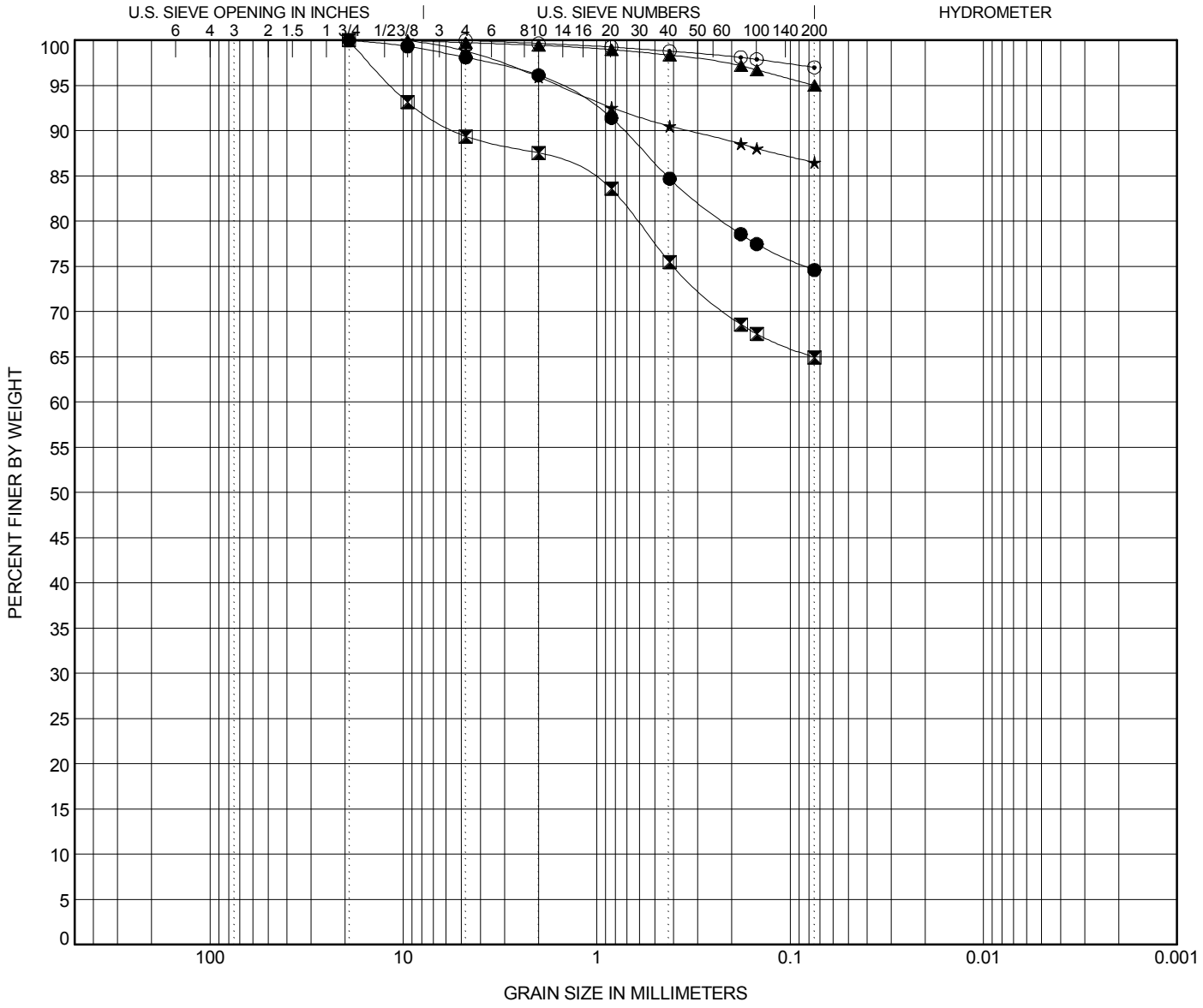
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**W-13**	**2.0**	**SILT (ML) with F/M Sand A-6(9)**	**38**	**26**	**12**		
⊠	**W-13**	**10.0**	**Sandy Lean CLAY (CL) A-4(5)**	**32**	**22**	**10**		
▲	**W-13**	**15.0**	**Elastic SILT (MH) A-7-5(20)**	**51**	**32**	**19**		
★	**W-13**	**20.0**	**SILT (ML) A-4(4)**	**38**	**36**	**2**		
⊙	**W-13**	**35.0**	**SILT (ML) A-7-5(20)**	**47**	**30**	**17**		

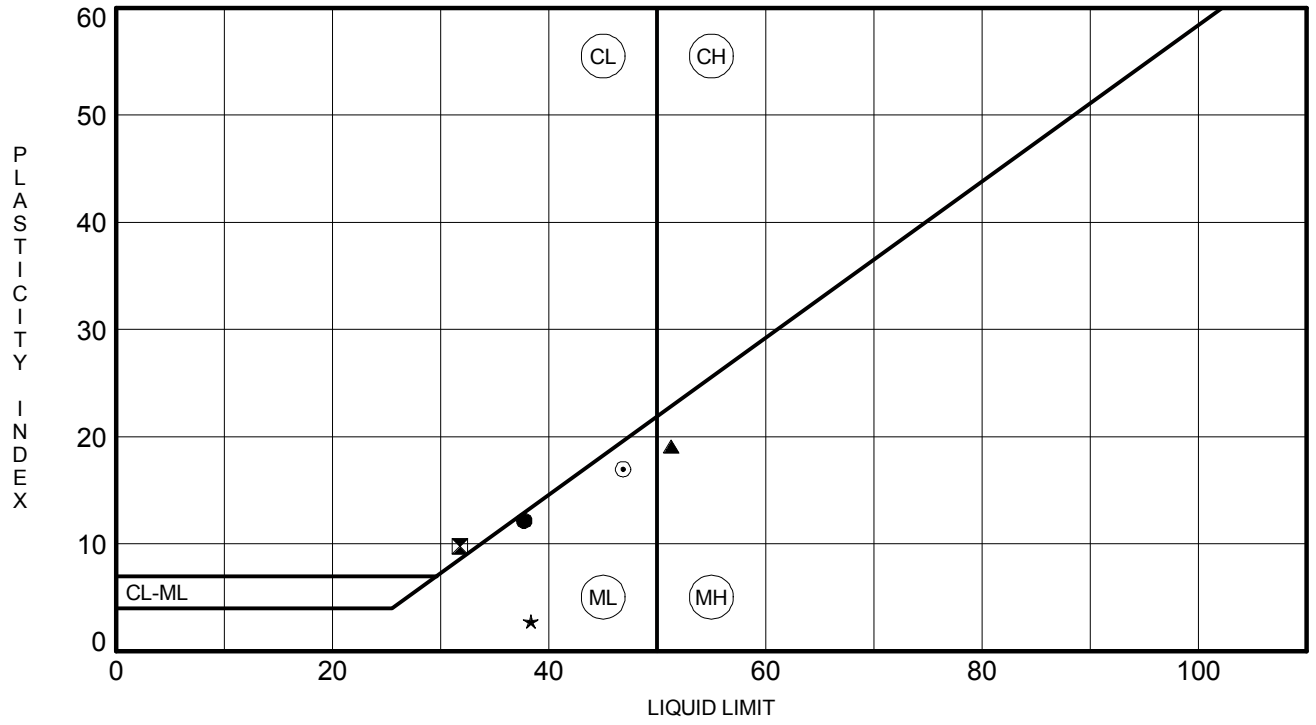
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**W-13**	**2.0**	**19.1**	**1.617**			**1.9**	**23.5**	**74.6**	
⊠	**W-13**	**10.0**	**19.1**	**11.479**			**10.6**	**24.4**	**64.9**	
▲	**W-13**	**15.0**	**9.52**				**0.3**	**4.7**	**95.0**	
★	**W-13**	**20.0**	**9.52**	**1.569**			**1.2**	**12.3**	**86.5**	
⊙	**W-13**	**35.0**	**4.76**				**0.0**	**3.0**	**97.0**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/5/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**W-13**	**2.0**	**38**	**26**	**12**	**75**	**SILT (ML) with F/M Sand A-6(9)**
⊠	**W-13**	**10.0**	**32**	**22**	**10**	**65**	**Sandy Lean CLAY (CL) A-4(5)**
▲	**W-13**	**15.0**	**51**	**32**	**19**	**95**	**Elastic SILT (MH) A-7-5(20)**
★	**W-13**	**20.0**	**38**	**36**	**2**	**87**	**SILT (ML) A-4(4)**
⊙	**W-13**	**35.0**	**47**	**30**	**17**	**97**	**SILT (ML) A-7-5(20)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/5/18

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0947	**DATE SAMPLE RECEIVED:**	5/31/2018
DESCRIPTION OF SOIL:	Various		
TESTED BY:	MB	**DATE OF TESTING:**	6/4/2018
		DATE OF WEIGHING:	6/5/2018

BORING NO.	W-14	W-14	W-14	W-14	
SAMPLE NO.	18-0947C SS-3	18-0947F SS-5	18-0947I SS-6	18-0947L SS-9	
SAMPLE DEPTH	4.0-6.0'	8.0-10.0'	13.5-15.0'	28.5-30.0'	
WATER CONTENT, W%	30.9	19.5	29.2	30.0	

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

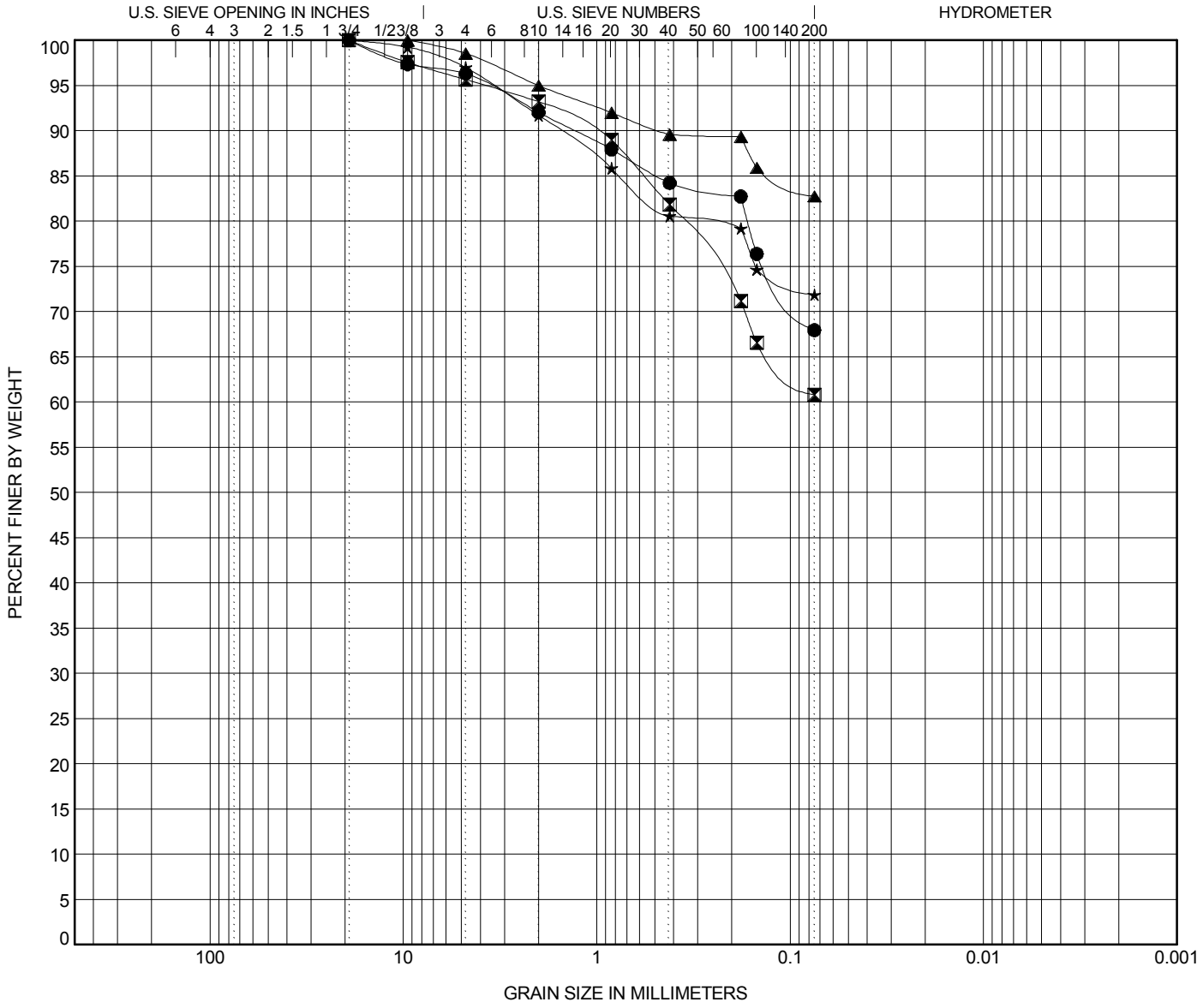
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**W-14**	**6.0**	**Sandy SILT (ML) A-4(4)**	**36**	**30**	**6**		
⊠	**W-14**	**10.0**	**Sandy, Silty CLAY (CL-ML) A-4(2)**	**26**	**19**	**7**		
▲	**W-14**	**15.0**	**SILT (ML) with Sand A-4(0)**	**NP**	**NP**	**NP**		
★	**W-14**	**30.0**	**SILT (ML) with Sand A-4(0)**	**NP**	**NP**	**NP**		

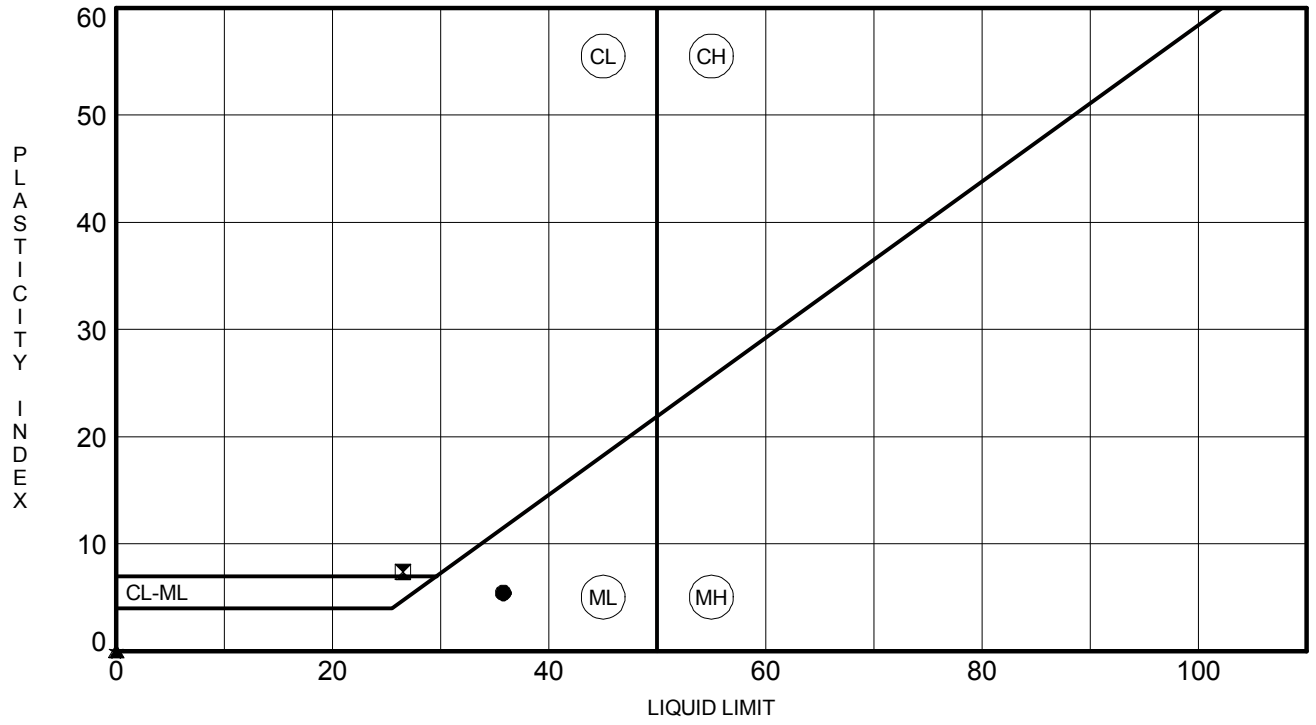
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**W-14**	**6.0**	**19.1**	**3.631**			**3.7**	**28.4**	**68.0**	
⊠	**W-14**	**10.0**	**19.1**	**3.757**			**4.3**	**34.8**	**60.8**	
▲	**W-14**	**15.0**	**9.52**	**1.996**			**1.5**	**15.8**	**82.8**	
★	**W-14**	**30.0**	**19.1**	**3.429**			**3.0**	**25.1**	**71.9**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/5/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**W-14**	**6.0**	**36**	**30**	**6**	**68**	**Sandy SILT (ML) A-4(4)**
⊠	**W-14**	**10.0**	**26**	**19**	**7**	**61**	**Sandy, Silty CLAY (CL-ML) A-4(2)**
▲	**W-14**	**15.0**	**NP**	**NP**	**NP**	**83**	**SILT (ML) with Sand A-4(0)**
★	**W-14**	**30.0**	**NP**	**NP**	**NP**	**72**	**SILT (ML) with Sand A-4(0)**

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

ORGANIC IMPURITIES DETERMINATION
(AASHTO T267)

PROJECT:	Carolina Crossroads	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0947G	**DATE SAMPLE RECEIVED:**	5/31/2018
DESCRIPTION OF SOIL:	Sandy, Silty CLAY (CL-ML) A-4(2)		
TESTED BY:	MB	**DATE OF TESTING:**	6/11/2018
		DATE OF WEIGHING:	6/11/2018

BORING NO.	W-14				
SAMPLE NO.	18-0947G SS-5				
SAMPLE DEPTH	8.0-10.0'				
WT. OF CRUCIBLE + DRY SOIL (BEFORE IGNITION) (GRAMS)	200.00				
WT. OF CRUCIBLE + DRY SOIL (AFTER IGNITION) (GRAMS)	198.18				
WT. OF CRUCIBLE (GRAMS)	137.48				
WT. OF DRY SOIL (BEFORE IGNITION) (GRAMS)	62.52				
WT. OF DRY SOIL (AFTER IGNITION) (GRAMS)	60.70				
IGNITION LOSS (GRAMS)	1.82				
ORGANIC IMPURITIES %	2.91				

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Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0486	**DATE SAMPLE RECEIVED:**	3/20/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	3/20/2018
		DATE OF WEIGHING:	3/21/2018

BORING NO.	W-15	W-15	W-15	W-15	
SAMPLE NO.	18-0486C SS-2	18-0486L SS-5	18-0486F SS-6	18-0486I SS-7	
SAMPLE DEPTH	2.0-4.0'	8.0-10.0'	13.5-15.0'	18.5-20.0'	
WATER CONTENT, W%	9.0	23.3	38.7	24.6	

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

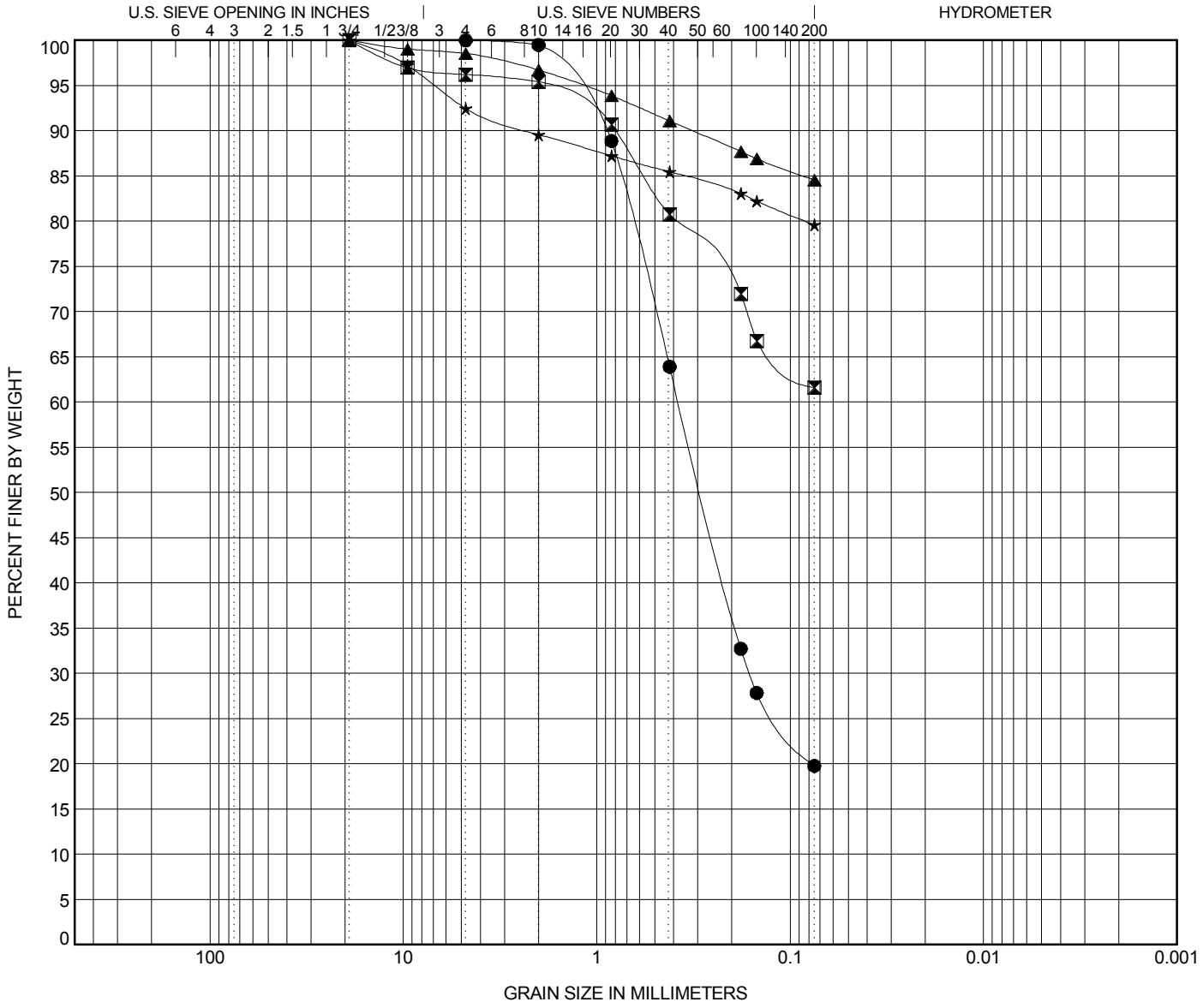
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**W-15**	**4.0**	**Silty F/M SAND (SM) A-2-4**	**16**	**15**	**1**		
⊠	**W-15**	**10.0**	**Sandy Lean CLAY (CL) A-6(7)**	**35**	**20**	**15**		
▲	**W-15**	**15.0**	**Elastic SILT (MH) with F/M Sand A-7-5(20)**	**72**	**54**	**18**		
★	**W-15**	**20.0**	**SILT (ML) with F/M Sand A-5(10)**	**44**	**34**	**10**		

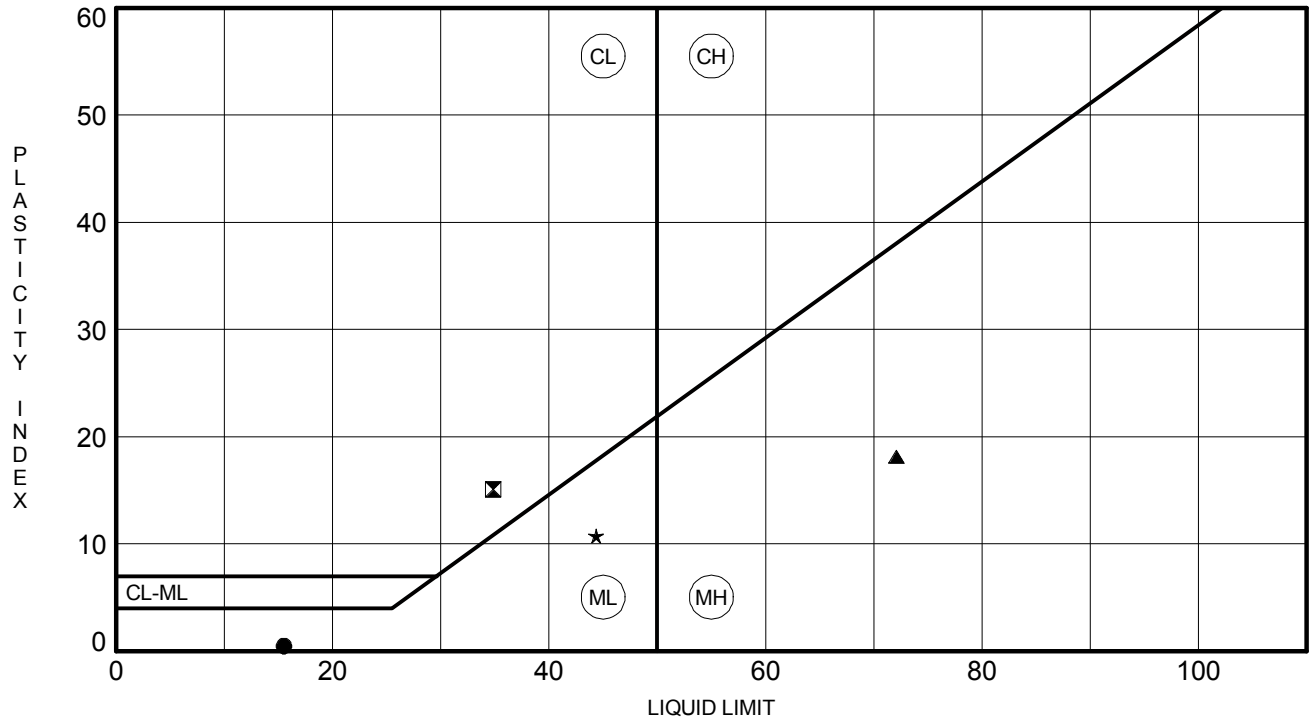
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**W-15**	**4.0**	**4.76**	**1.386**	**0.288**		**0.0**	**80.2**	**19.8**	
⊠	**W-15**	**10.0**	**19.05**	**1.855**			**3.8**	**34.6**	**61.6**	
▲	**W-15**	**15.0**	**19.1**	**1.18**			**1.4**	**14.0**	**84.6**	
★	**W-15**	**20.0**	**19.1**	**6.878**			**7.5**	**12.8**	**79.6**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/29/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**W-15**	**4.0**	**16**	**15**	**1**	**20**	**Silty F/M SAND (SM) A-2-4**
⊠	**W-15**	**10.0**	**35**	**20**	**15**	**62**	**Sandy Lean CLAY (CL) A-6(7)**
▲	**W-15**	**15.0**	**72**	**54**	**18**	**85**	**Elastic SILT (MH) with F/M Sand A-7-5(20)**
★	**W-15**	**20.0**	**44**	**34**	**10**	**80**	**SILT (ML) with F/M Sand A-5(10)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/29/18

F&ME CONSULTANTS
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Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0857	**DATE SAMPLE RECEIVED:**	5/15/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	5/22/2018
		DATE OF WEIGHING:	5/23/2018

BORING NO.	W-16	W-16			
SAMPLE NO.	18-0857C SS-2	18-0857F SS-6			
SAMPLE DEPTH	2.0-4.0'	13.5-15.0'			
WATER CONTENT, W%	21.7	25.8			

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

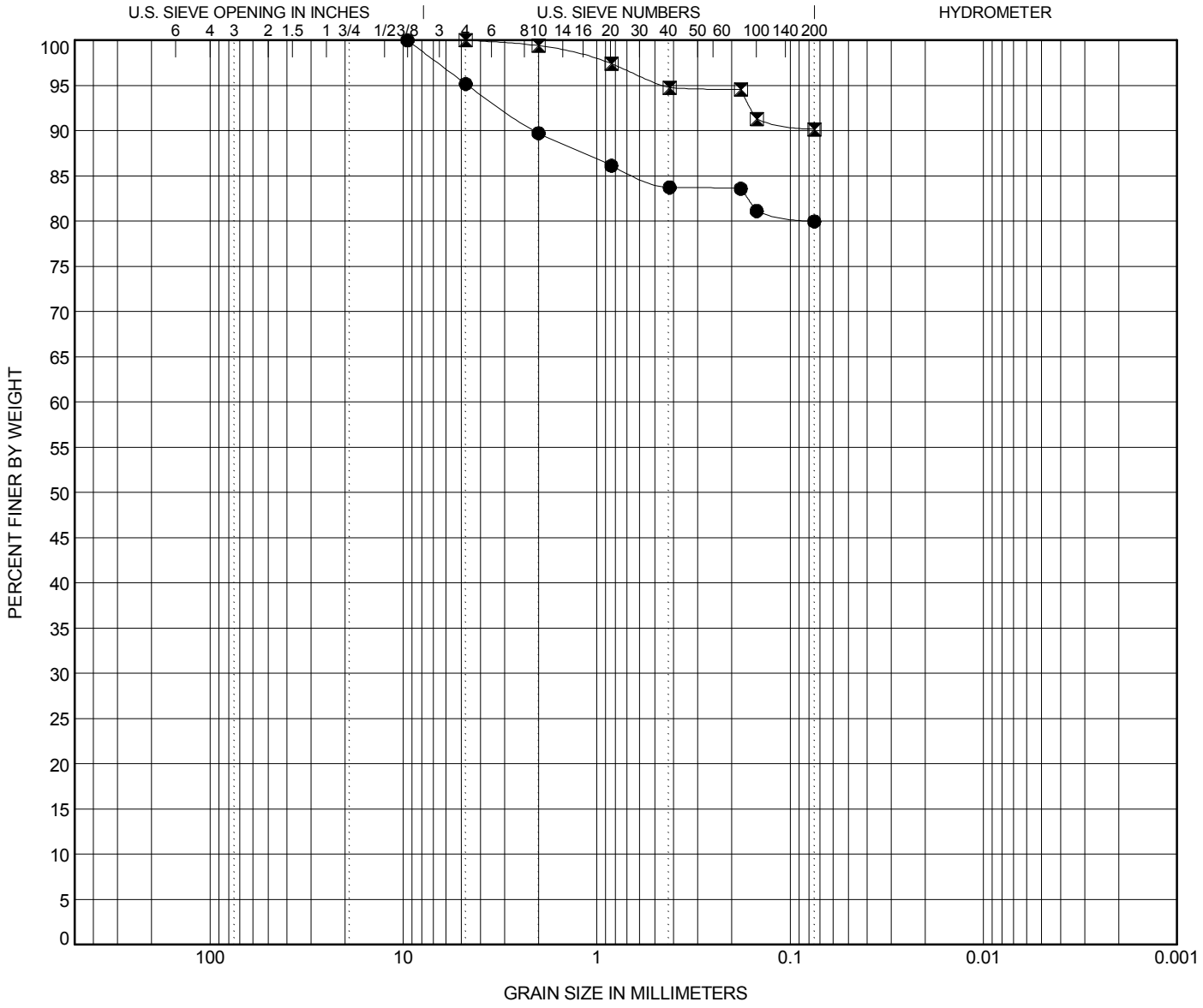
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**W-16**	**4.0**	**SILT (ML) with Sand A-4(0)**	**NP**	**NP**	**NP**		
⧓	**W-16**	**15.0**	**SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		

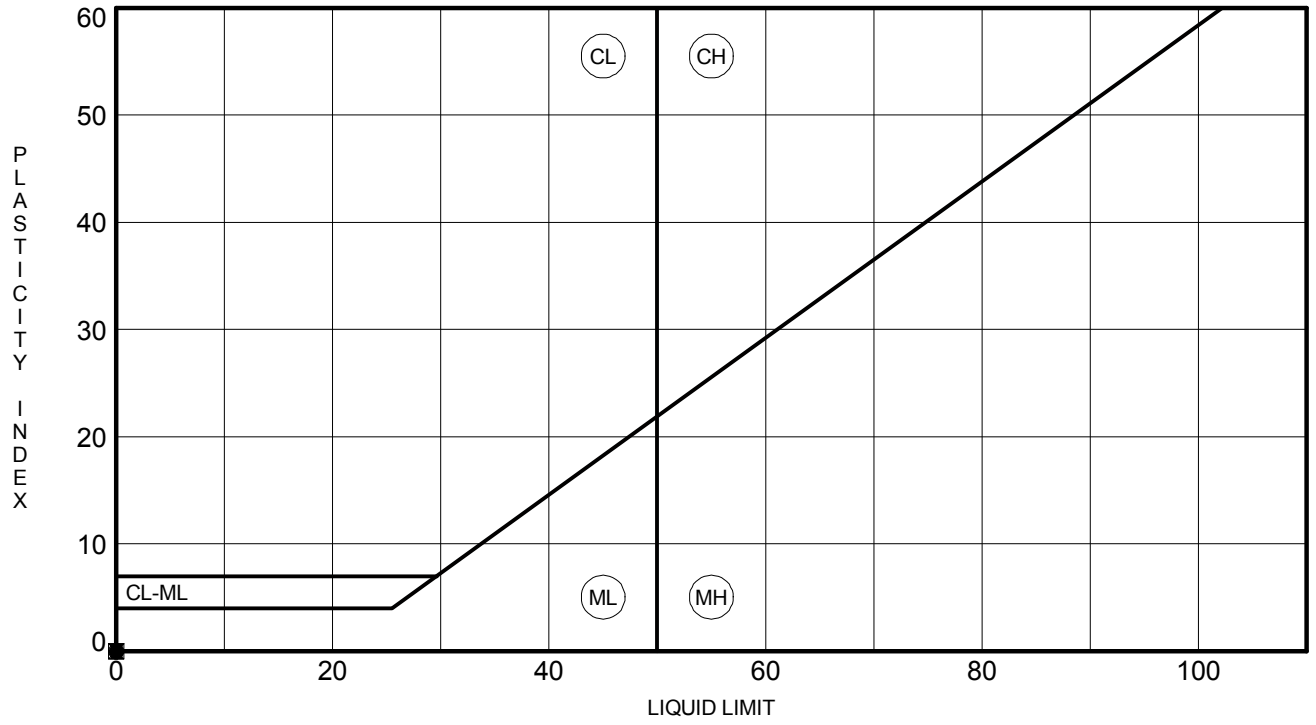
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**W-16**	**4.0**	**9.52**	**4.621**			**4.8**	**15.2**	**80.0**	
⧓	**W-16**	**15.0**	**4.76**	**0.447**			**0.0**	**9.8**	**90.2**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/7/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**W-16**	**4.0**	**NP**	**NP**	**NP**	**80**	**SILT (ML) with Sand A-4(0)**
⊠	**W-16**	**15.0**	**NP**	**NP**	**NP**	**90**	**SILT (ML) A-4(0)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/7/18

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Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0722	**DATE SAMPLE RECEIVED:**	4/16/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	4/17/2018
		DATE OF WEIGHING:	4/18/2018

BORING NO.	W-17	W-17	W-17	W-17	W-17
SAMPLE NO.	18-0722C SS-3	18-0722F SS-5	18-0722I SS-9	18-0722L SS-14	18-0722O SS-17
SAMPLE DEPTH	4.0-6.0'	8.0-10.0'	28.5-30.0'	53.5-55.0'	68.5-70.0'
WATER CONTENT, W%	24.2	33.0	46.9	30.1	27.2

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

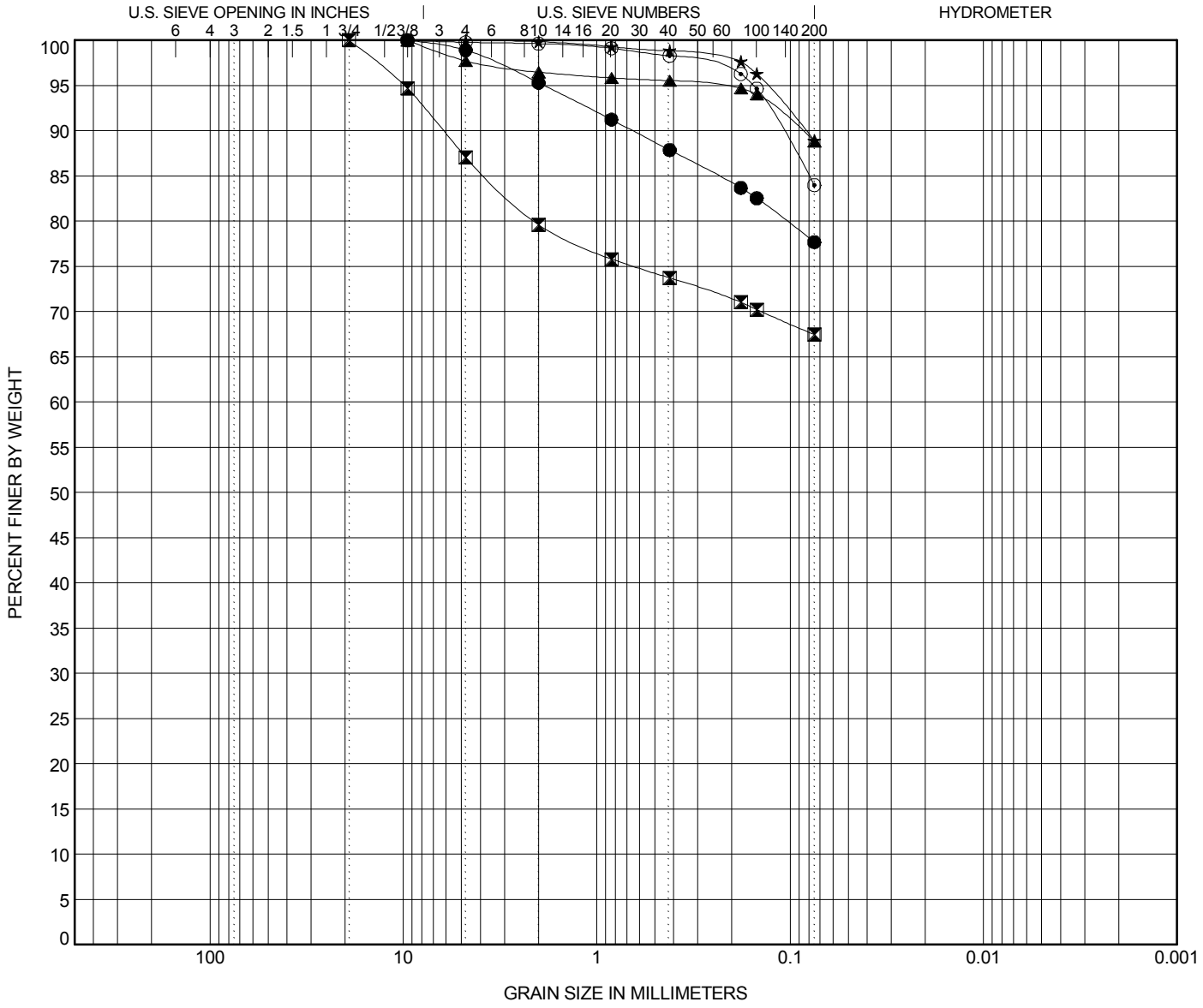
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**W-17**	**6.0**	**SILT (ML) with Sand A-5(10)**	**47**	**37**	**10**		
⊠	**W-17**	**10.0**	**Sandy Elastic SILT (MH) A-7-5(11)**	**57**	**44**	**13**		
▲	**W-17**	**30.0**	**SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		
★	**W-17**	**55.0**	**SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		
⊙	**W-17**	**70.0**	**SILT (ML) with Fine Sand A-4(0)**	**NP**	**NP**	**NP**		

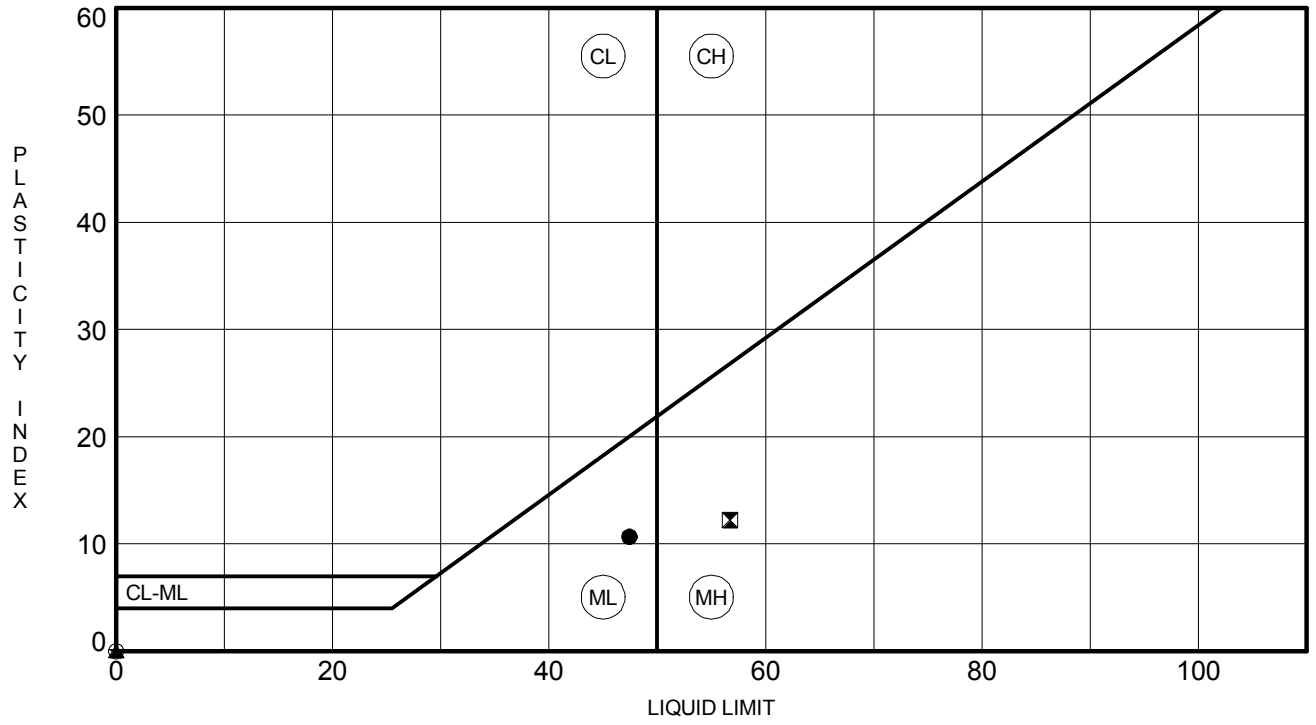
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**W-17**	**6.0**	**9.52**	**1.868**			**1.1**	**21.2**	**77.7**	
⊠	**W-17**	**10.0**	**19.1**	**9.934**			**12.9**	**19.6**	**67.5**	
▲	**W-17**	**30.0**	**9.52**	**0.244**			**2.3**	**8.9**	**88.9**	
★	**W-17**	**55.0**	**4.76**	**0.132**			**0.0**	**11.1**	**88.9**	
⊙	**W-17**	**70.0**	**9.52**	**0.155**			**0.2**	**15.8**	**84.0**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 7/5/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**W-17**	**6.0**	**47**	**37**	**10**	**78**	**SILT (ML) with Sand A-5(10)**
⊠	**W-17**	**10.0**	**57**	**44**	**13**	**67**	**Sandy Elastic SILT (MH) A-7-5(11)**
▲	**W-17**	**30.0**	**NP**	**NP**	**NP**	**89**	**SILT (ML) A-4(0)**
★	**W-17**	**55.0**	**NP**	**NP**	**NP**	**89**	**SILT (ML) A-4(0)**
⊙	**W-17**	**70.0**	**NP**	**NP**	**NP**	**84**	**SILT (ML) with Fine Sand A-4(0)**

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Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0514	**DATE SAMPLE RECEIVED:**	3/20/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	3/20/2018
		DATE OF WEIGHING:	3/21/2018

BORING NO.	W-20	W-20	W-20	W-20	W-20
SAMPLE NO.	18-0514O SS-2	18-0514C SS-4	18-0514R SS-6	18-0514F SS-8	18-0514I SS-11
SAMPLE DEPTH	2.0-4.0'	6.0-8.0'	13.5-15.0'	23.5-25.0'	38.5-40.0'
WATER CONTENT, W%	16.5	27.0	24.6	36.2	31.3

BORING NO.	W-20				
SAMPLE NO.	18-0514L SS-15				
SAMPLE DEPTH	58.5-60.0'				
WATER CONTENT, W%	25.9				

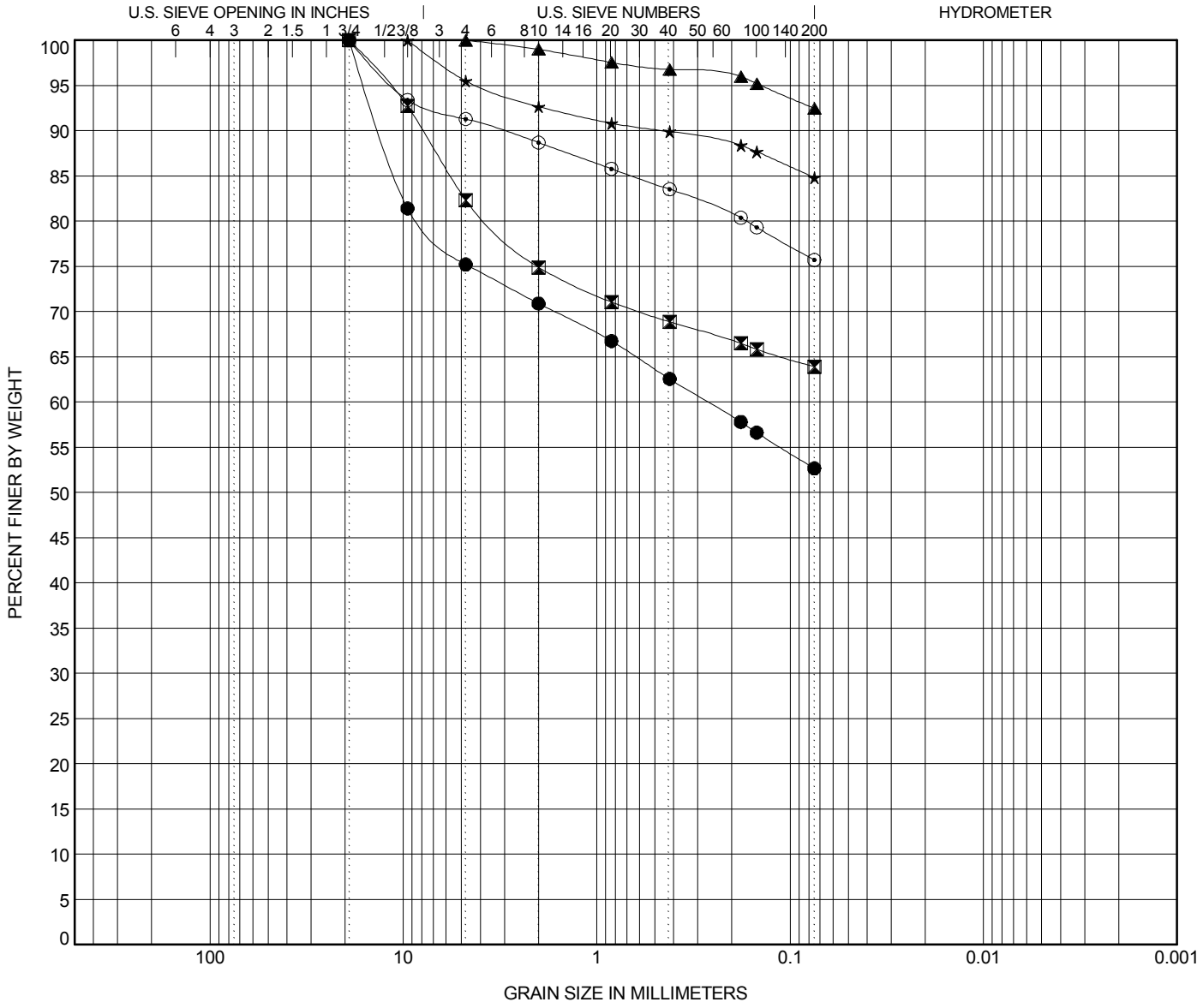
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**W-20**	**4.0**	**Gravelly Lean CLAY (CL) with Sand A-6(4)**	**36**	**24**	**12**		
⧓	**W-20**	**8.0**	**Sandy Elastic SILT (MH) with Gravel A-5(7)**	**52**	**43**	**9**		
▲	**W-20**	**15.0**	**Elastic SILT (MH) A-7-5(17)**	**50**	**37**	**13**		
★	**W-20**	**25.0**	**Elastic SILT (MH) with F/M Sand A-7-5(20)**	**57**	**38**	**19**		
⊙	**W-20**	**40.0**	**SILT (ML) with F/M Sand A-5(7)**	**42**	**35**	**7**		

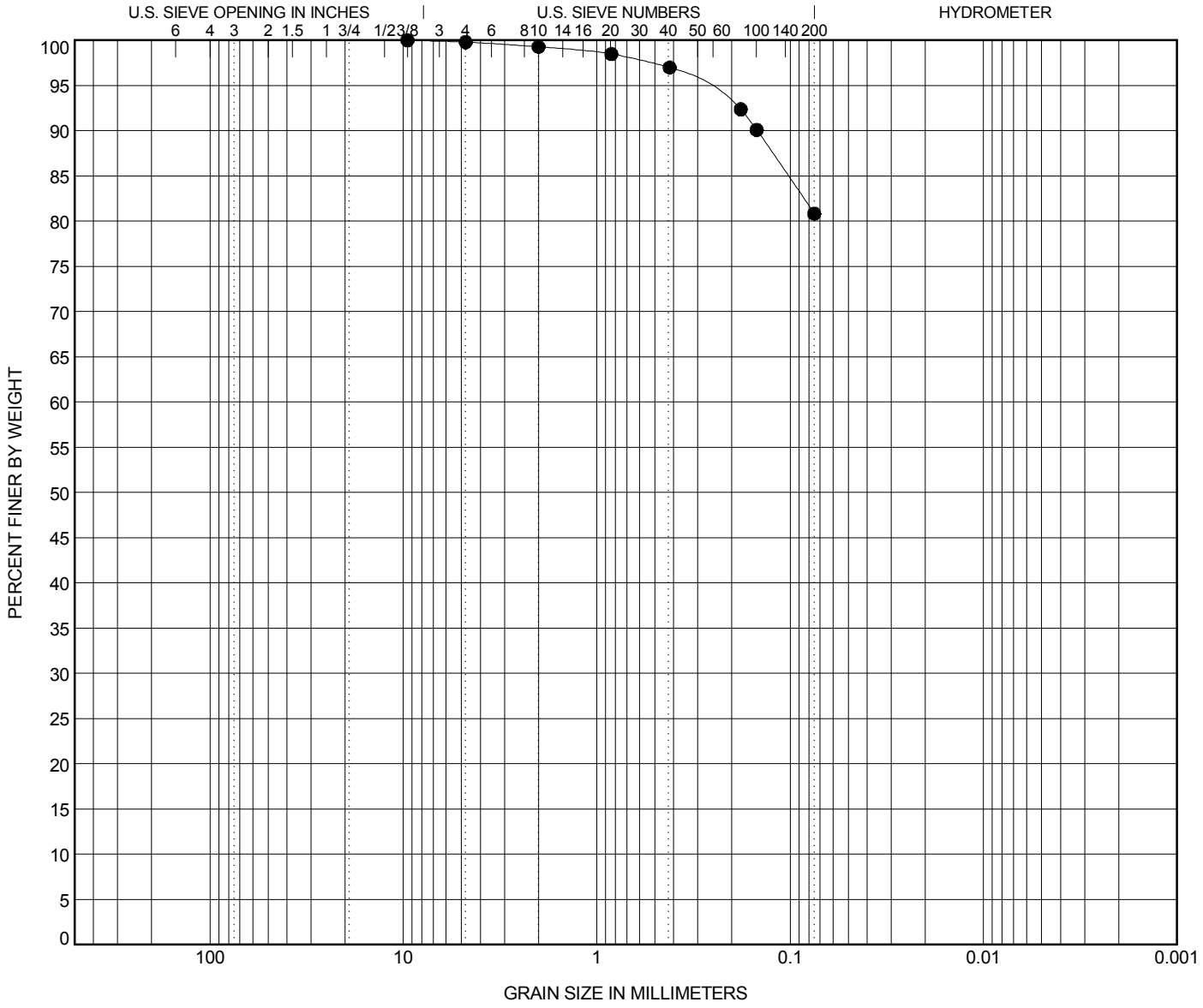
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**W-20**	**4.0**	**19.05**	**15.805**			**24.8**	**22.5**	**52.7**	
⧓	**W-20**	**8.0**	**19.1**	**11.826**			**17.7**	**18.4**	**63.9**	
▲	**W-20**	**15.0**	**4.76**	**0.141**			**0.0**	**7.5**	**92.5**	
★	**W-20**	**25.0**	**9.52**	**4.063**			**4.5**	**10.7**	**84.8**	
⊙	**W-20**	**40.0**	**19.1**	**11.267**			**8.7**	**15.6**	**75.7**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/29/18

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
● **W-20**	**60.0**	**SILT (ML) with Fine Sand A-4(0)**	**NP**	**NP**	**NP**		

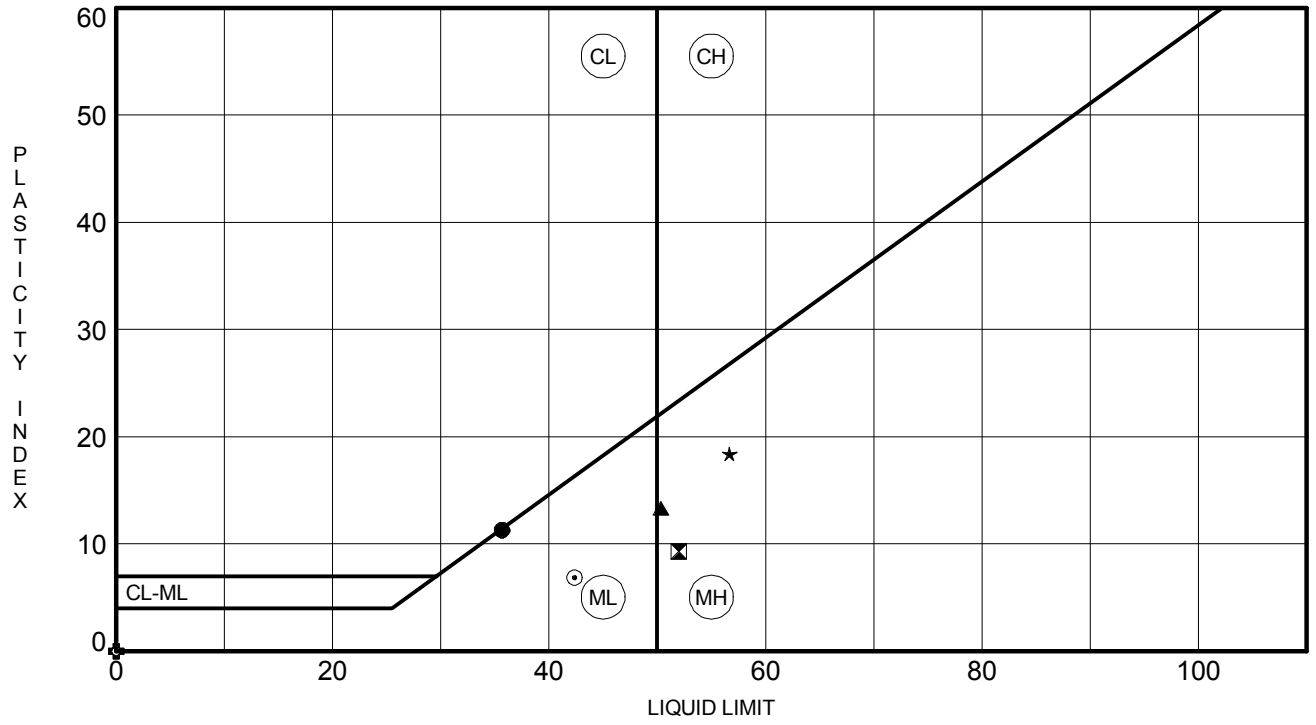
BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
● **W-20**	**60.0**	**9.52**	**0.291**			**0.2**	**19.0**	**80.8**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/29/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**W-20**	**4.0**	**36**	**24**	**12**	**53**	**Gravelly Lean CLAY (CL) with Sand A-6(4)**
⊠	**W-20**	**8.0**	**52**	**43**	**9**	**64**	**Sandy Elastic SILT (MH) with Gravel A-5(7)**
▲	**W-20**	**15.0**	**50**	**37**	**13**	**92**	**Elastic SILT (MH) A-7-5(17)**
★	**W-20**	**25.0**	**57**	**38**	**19**	**85**	**Elastic SILT (MH) with F/M Sand A-7-5(20)**
⊙	**W-20**	**40.0**	**42**	**35**	**7**	**76**	**SILT (ML) with F/M Sand A-5(7)**
✿	**W-20**	**60.0**	**NP**	**NP**	**NP**	**81**	**SILT (ML) with Fine Sand A-4(0)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/29/18

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0933	**DATE SAMPLE RECEIVED:**	5/15/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	5/22/2018
		DATE OF WEIGHING:	5/23/2018

BORING NO.	W-21	W-21	W-21		
SAMPLE NO.	18-0933C SS-4	18-0933F SS-6	18-0933I SS-8		
SAMPLE DEPTH	6.0-8.0'	13.5-15.0'	23.5-25.0'		
WATER CONTENT, W%	31.6	33.3	37.1		

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

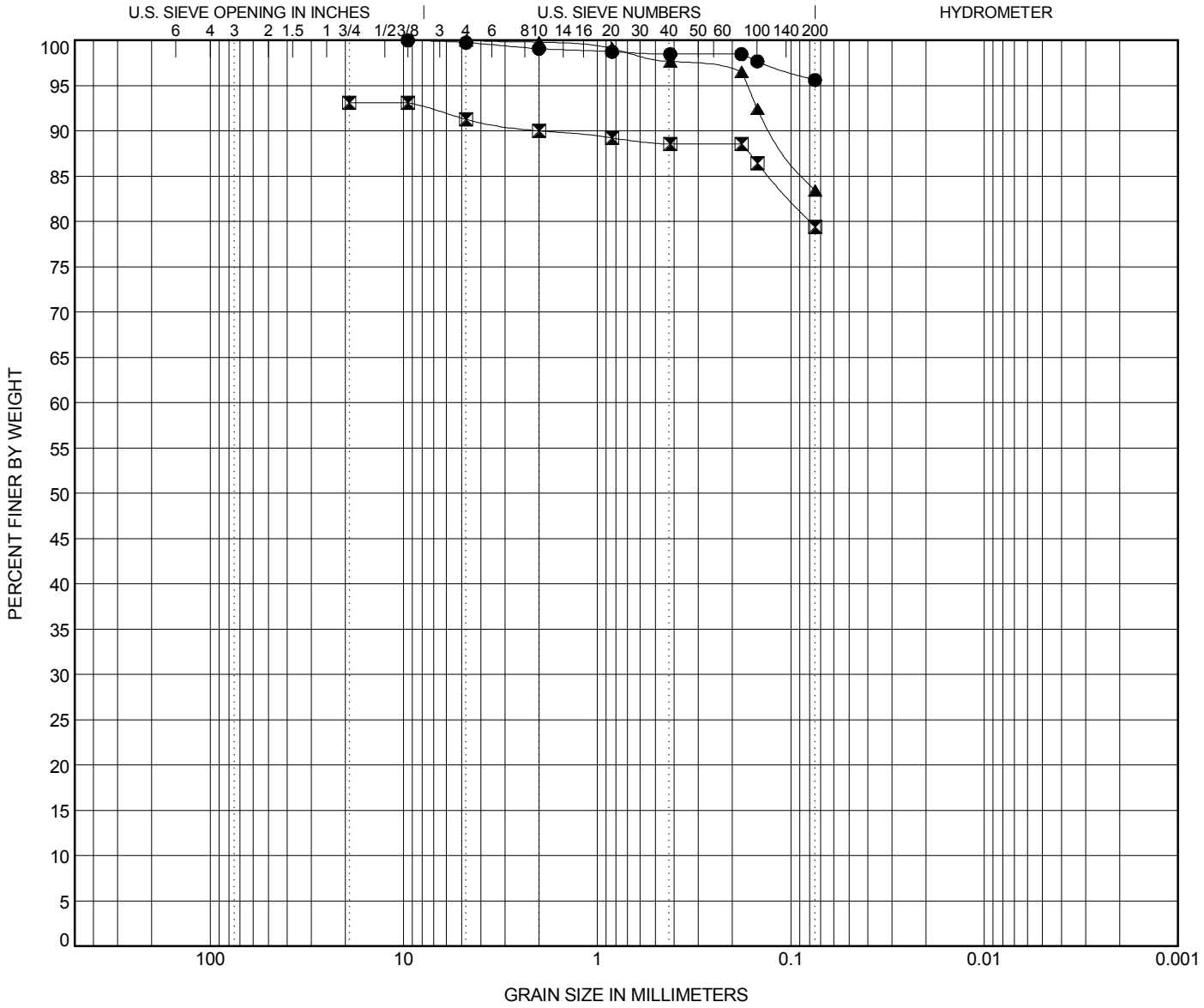
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**W-21**	**8.0**	**SILT (ML) A-7-5(17)**	**49**	**37**	**12**		
⧓	**W-21**	**15.0**	**SILT (ML) with Sand A-4(5)**	**40**	**36**	**4**		
▲	**W-21**	**25.0**	**SILT (ML) with Sand A-5(6)**	**42**	**38**	**4**		

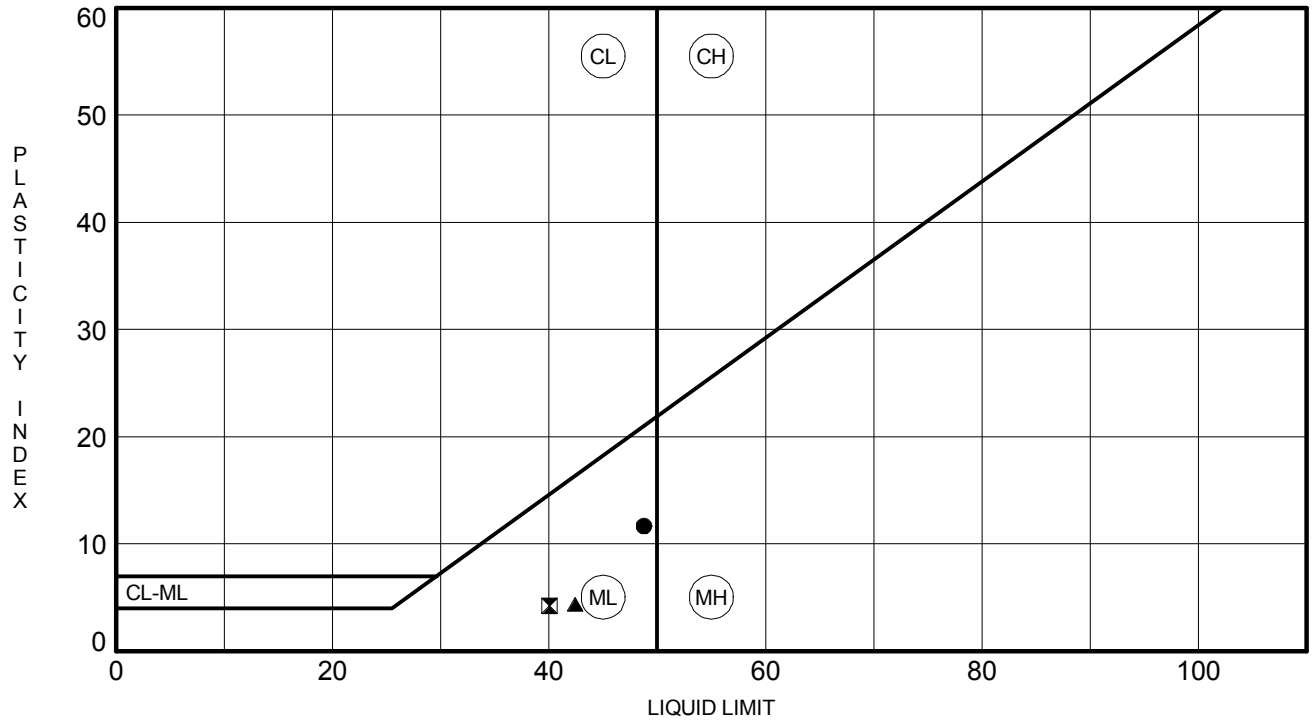
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**W-21**	**8.0**	**9.52**				**0.2**	**4.1**	**95.6**	
⧓	**W-21**	**15.0**	**19.1**				**1.8**	**11.9**	**79.4**	
▲	**W-21**	**25.0**	**4.76**	**0.168**			**0.0**	**16.5**	**83.5**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/7/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**W-21**	**8.0**	**49**	**37**	**12**	**96**	**SILT (ML) A-7-5(17)**
⊠	**W-21**	**15.0**	**40**	**36**	**4**	**79**	**SILT (ML) with Sand A-4(5)**
▲	**W-21**	**25.0**	**42**	**38**	**4**	**83**	**SILT (ML) with Sand A-5(6)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/7/18

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0892	**DATE SAMPLE RECEIVED:**	5/15/2018
DESCRIPTION OF SOIL:	VARIOUS		
TESTED BY:	MB	**DATE OF TESTING:**	5/22/2018
		DATE OF WEIGHING:	5/23/2018

BORING NO.	W-26	W-26	W-26		
SAMPLE NO.	18-0892C SS-2	18-0892F SS-7	18-0892I SS-10		
SAMPLE DEPTH	2.0-4.0'	18.5-20.0'	33.5-35.0'		
WATER CONTENT, W%	19.4	18.6	16.5		

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

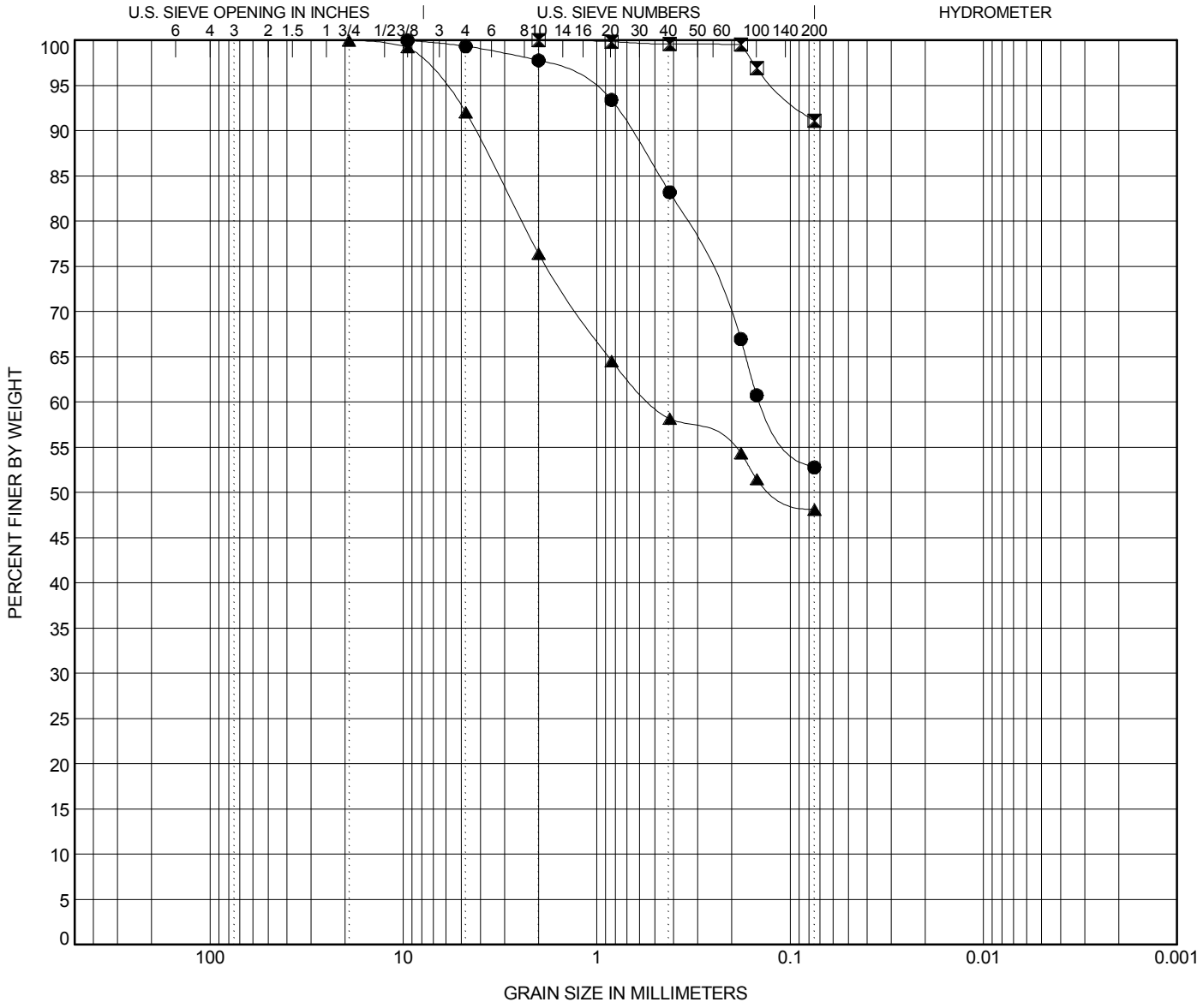
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**W-26**	**4.0**	**Sandy SILT (ML) A-4(2)**	**33**	**25**	**8**		
⧓	**W-26**	**20.0**	**SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		
▲	**W-26**	**35.0**	**Silty Coarse SAND (SM) A-4(0)**	**NP**	**NP**	**NP**		

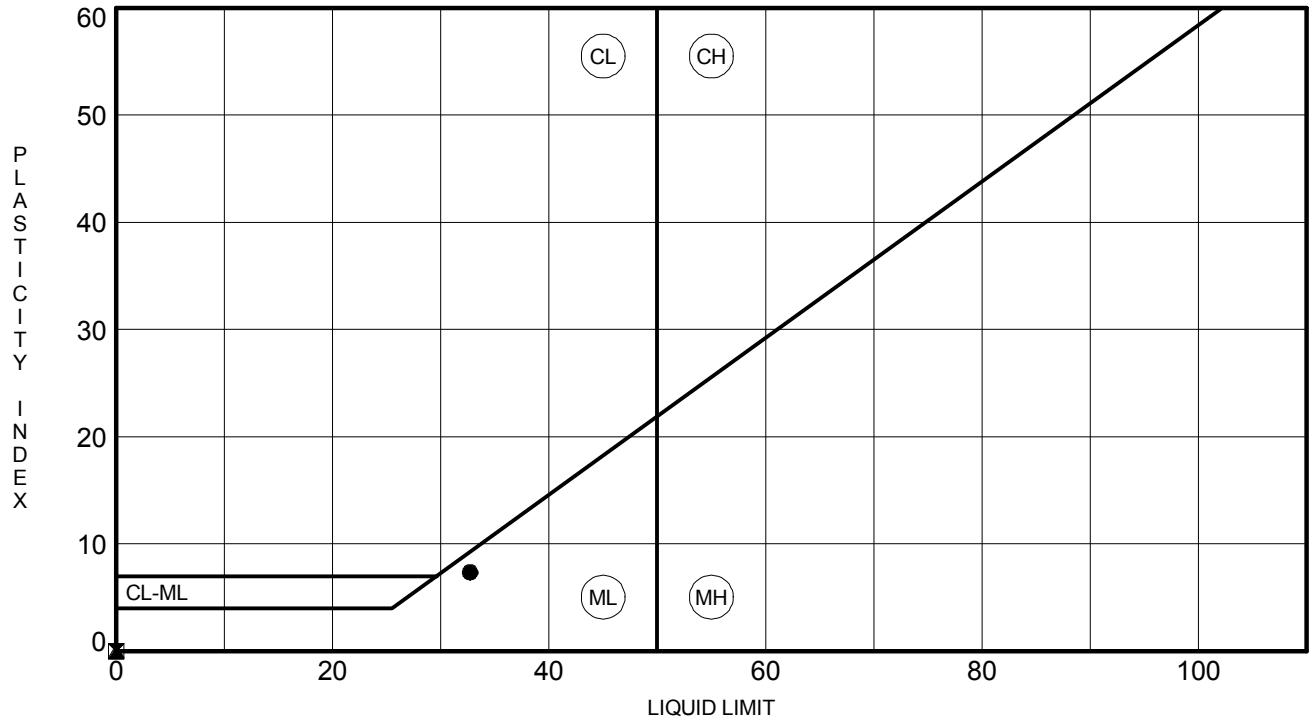
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**W-26**	**4.0**	**9.52**	**1.15**			**0.7**	**46.5**	**52.8**	
⧓	**W-26**	**20.0**	**2**	**0.119**			**0.0**	**8.9**	**91.1**	
▲	**W-26**	**35.0**	**19.1**	**6.317**	**0.11**		**8.0**	**43.9**	**48.1**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/7/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington

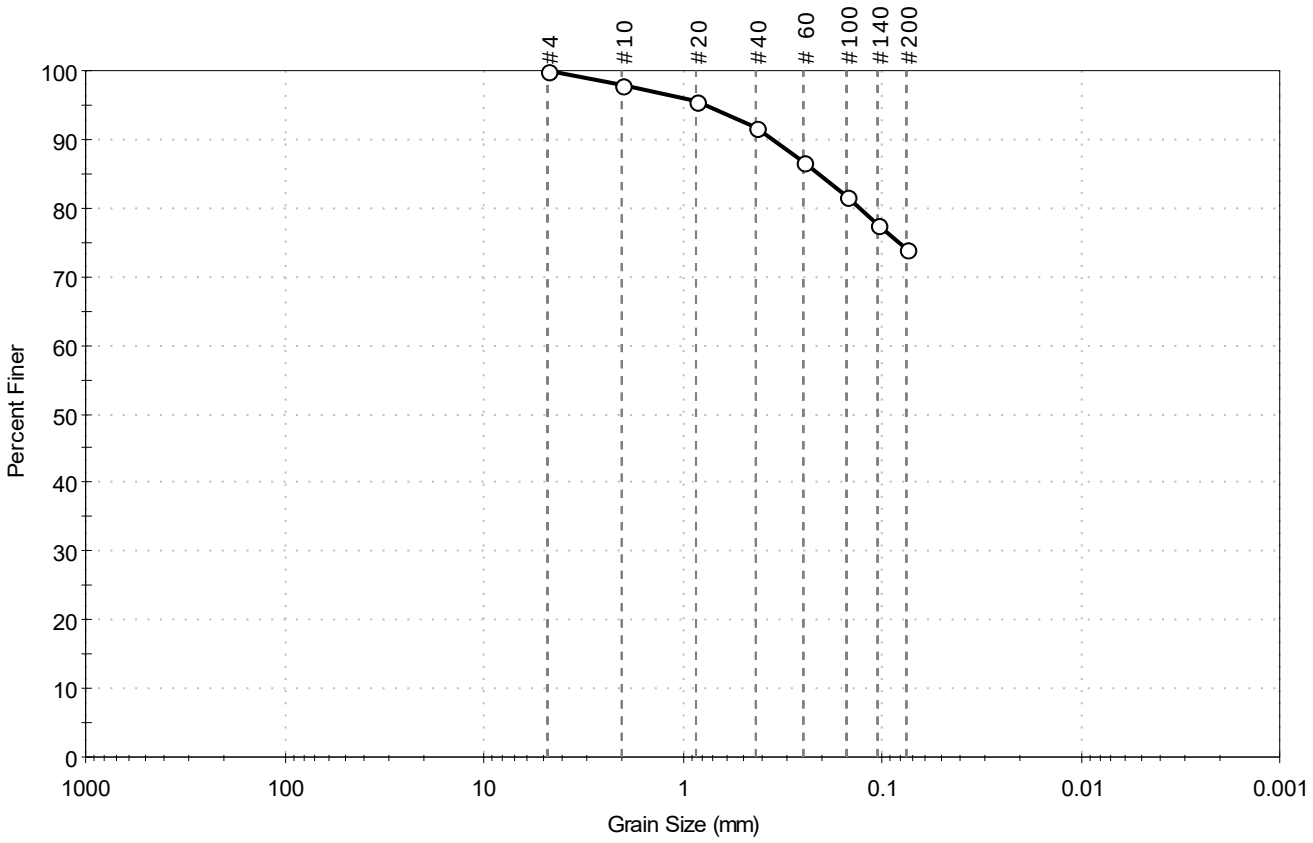


	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**W-26**	**4.0**	**33**	**25**	**8**	**53**	**Sandy SILT (ML) A-4(2)**
⊠	**W-26**	**20.0**	**NP**	**NP**	**NP**	**91**	**SILT (ML) A-4(0)**
▲	**W-26**	**35.0**	**NP**	**NP**	**NP**	**48**	**Silty Coarse SAND (SM) A-4(0)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/7/18

Client:	F&ME Consultants				
Project:	I-20/26/126 Corridor Improvements				
Location:	---			Project No:	GTX-307802
Boring ID:	---	Sample Type:	tube	Tested By:	twh
Sample ID:	AP-1	Test Date:	08/02/18	Checked By:	jm
Depth :	6-8.3 ft	Test Id:	299283		
Test Comment:	---				
Visual Description:	Moist, reddish brown clay with sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	26.1	73.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	98		
#20	0.85	96		
#40	0.42	92		
# 60	0.25	87		
#100	0.15	82		
#140	0.11	78		
#200	0.075	74		

Coefficients

D_{85} = 0.2093 mm	D_{30} = N/A
D_{60} = N/A	D_{15} = N/A
D_{50} = N/A	D_{10} = N/A
C_u = N/A	C_c = N/A

Classification

ASTM Lean CLAY with Sand (CL)

AASHTO Clayey Soils (A-7-6 (12))

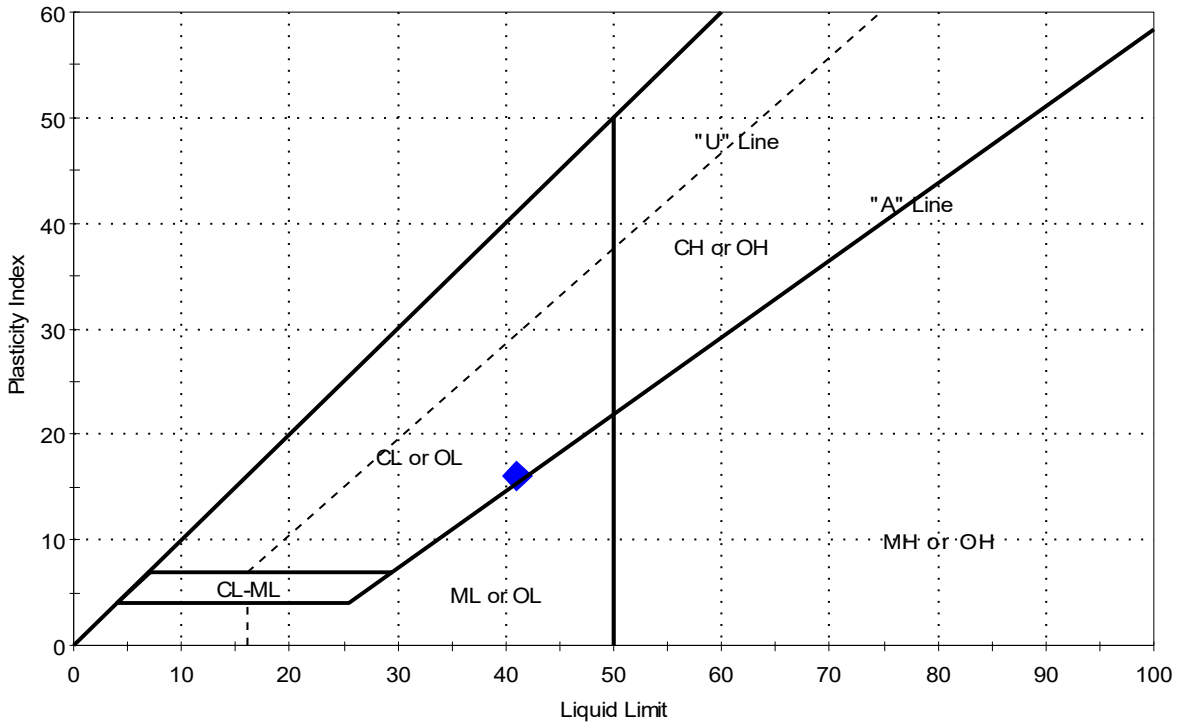
Sample / Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

Client:	F&ME Consultants				
Project:	I-20/26/126 Corridor Improvements				
Location:	---			Project No:	GTX-307802
Boring ID:	---	Sample Type:	tube	Tested By:	twh
Sample ID:	AP-1	Test Date:	08/02/18	Checked By:	jm
Depth :	6-8.3 ft	Test Id:	299286		
Test Comment:	---				
Visual Description:	Moist, reddish brown clay with sand				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	AP-1	---	6-8.3 ft	27	41	25	16	0.1	Lean CLAY with Sand (CL)

Sample Prepared using the WET method

8% Retained on #40 Sieve

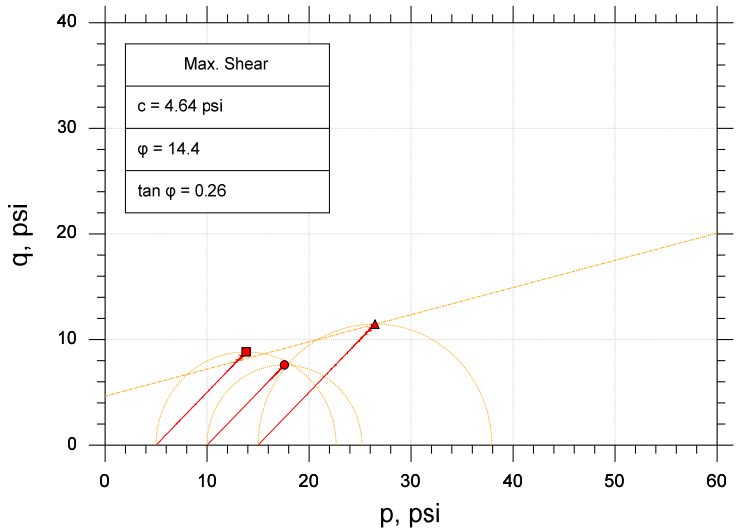
Dry Strength: HIGH

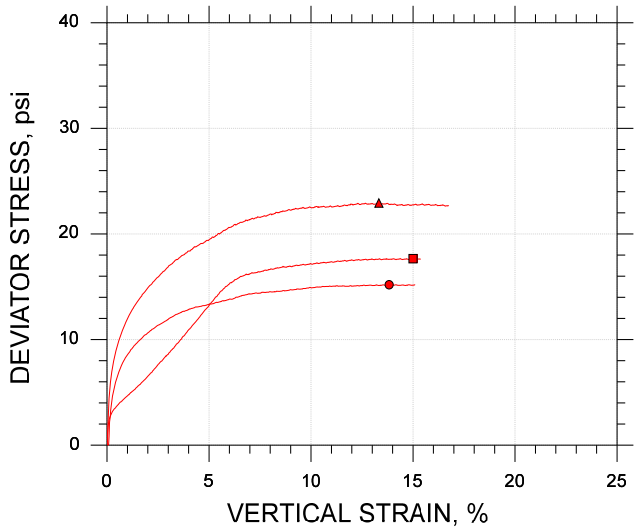
Dilatancy: NONE

Toughness: MEDIUM

Client: F&ME Consultants	
Project Name: I-20/26/126 Corridor Improv.	
Project Location: ---	
Project Number: GTX-307802	
Tested By: jm	Checked By: mcm
Boring ID: ---	
Preparation: intact	
Description: Moist, reddish brown clay	
Classification: ---	
Group Symbol: ---	
Liquid Limit: ---	Plastic Limit: ---
Plasticity Index: ---	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





		■	●	▲	
Symbol					
Sample ID		AP-1	AP-1	AP-1	
Depth, ft		6-8.3 ft	6-8.3 ft	6-8.3 ft	
Test Number		CU-15-1	CU-15-2	CU-15-3	
Initial	Height, in	6.120	5.941	6.130	
	Diameter, in	2.870	2.880	2.870	
	Moisture Content (from Cuttings), %	27.4	26.7	24.3	
	Dry Density, pcf	96.8	94.8	99.0	
	Saturation (Wet Method), %	99.7	92.5	93.3	
	Void Ratio	0.741	0.779	0.702	
Before Shear	Moisture Content, %	27.1	27.0	24.2	
	Dry Density, pcf	97.3	97.4	102.	
	Cross-sectional Area (Method A), in²	6.450	6.376	6.330	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.733	0.730	0.652	
	Back Pressure, psi	55.00	41.00	43.01	
Vertical Effective Consolidation Stress, psi		5.024	9.997	15.01	
Horizontal Effective Consolidation Stress, psi		5.007	10.00	15.02	
Vertical Strain after Consolidation, %		0.2011	0.4673	0.7296	
Volumetric Strain after Consolidation, %		0.4627	2.259	2.705	
Time to 50% Consolidation, min		19.36	25.00	36.00	
Shear Strength, psi		8.831	7.595	11.46	
Strain at Failure, %		15.0	13.8	13.3	
Strain Rate, %/min		0.01600	0.01600	0.01600	
Deviator Stress at Failure, psi		17.66	15.19	22.93	
Effective Minor Principal Stress at Failure, psi		9.359	7.245	10.85	
Effective Major Principal Stress at Failure, psi		27.02	22.43	33.78	
B-Value		0.96	0.95	0.96	

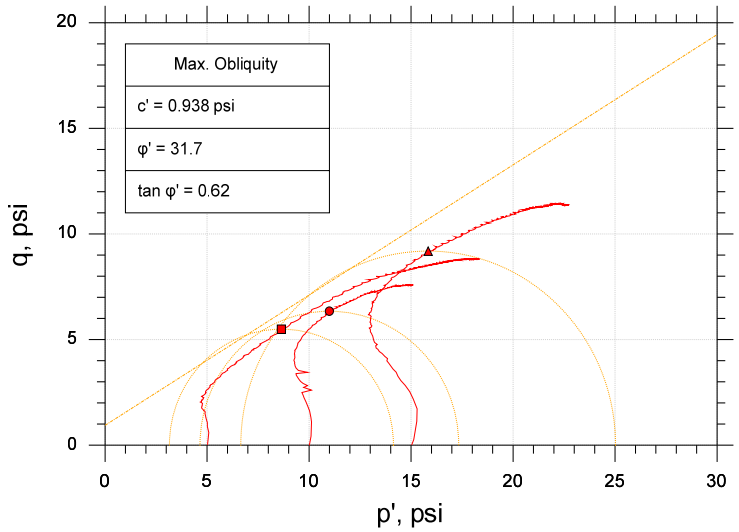
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

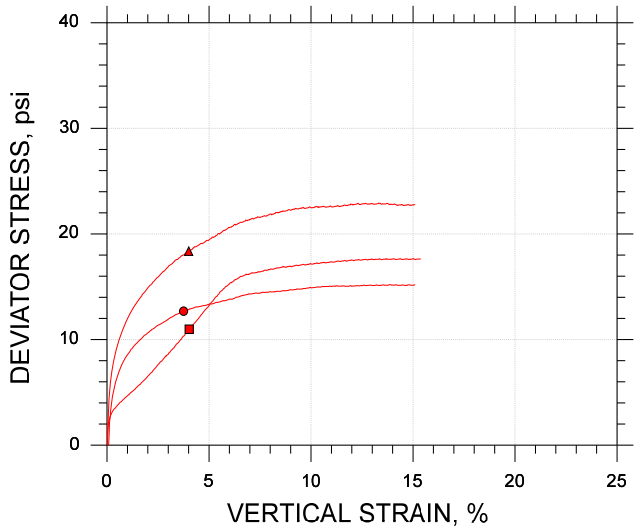
Remarks:

System 1057

Client: F&ME Consultants	
Project Name: I-20/26/126 Corridor Improv.	
Project Location: ---	
Project Number: GTX-307802	
Tested By: jm	Checked By: mcm
Boring ID: ---	
Preparation: intact	
Description: Moist, reddish brown clay	
Classification: ---	
Group Symbol: ---	
Liquid Limit: ---	Plastic Limit: ---
Plasticity Index: ---	Estimated Specific Gravity: 2.7

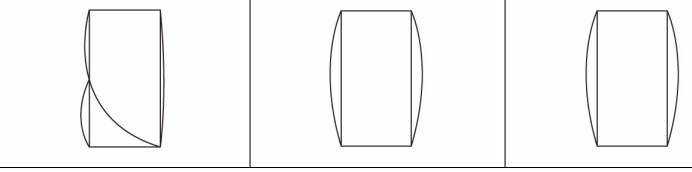
CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		■	●	▲	
Sample ID		AP-1	AP-1	AP-1	
Depth, ft		6-8.3 ft	6-8.3 ft	6-8.3 ft	
Test Number		CU-15-1	CU-15-2	CU-15-3	
Initial	Height, in	6.120	5.941	6.130	
	Diameter, in	2.870	2.880	2.870	
	Moisture Content (from Cuttings), %	27.4	26.7	24.3	
	Dry Density, pcf	96.8	94.8	99.0	
	Saturation (Wet Method), %	99.7	92.5	93.3	
	Void Ratio	0.741	0.779	0.702	
Before Shear	Moisture Content, %	27.1	27.0	24.2	
	Dry Density, pcf	97.3	97.4	102.	
	Cross-sectional Area (Method A), in²	6.450	6.376	6.330	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.733	0.730	0.652	
	Back Pressure, psi	55.00	41.00	43.01	
Vertical Effective Consolidation Stress, psi		5.024	9.997	15.01	
Horizontal Effective Consolidation Stress, psi		5.007	10.00	15.02	
Vertical Strain after Consolidation, %		0.2011	0.4673	0.7296	
Volumetric Strain after Consolidation, %		0.4627	2.259	2.705	
Time to 50% Consolidation, min		19.36	25.00	36.00	
Shear Strength, psi		5.489	6.342	9.187	
Strain at Failure, %		4.03	3.75	4.00	
Strain Rate, %/min		0.01600	0.01600	0.01600	
Deviator Stress at Failure, psi		10.98	12.68	18.37	
Effective Minor Principal Stress at Failure, psi		3.154	4.652	6.651	
Effective Major Principal Stress at Failure, psi		14.13	17.34	25.03	
B-Value		0.96	0.95	0.96	

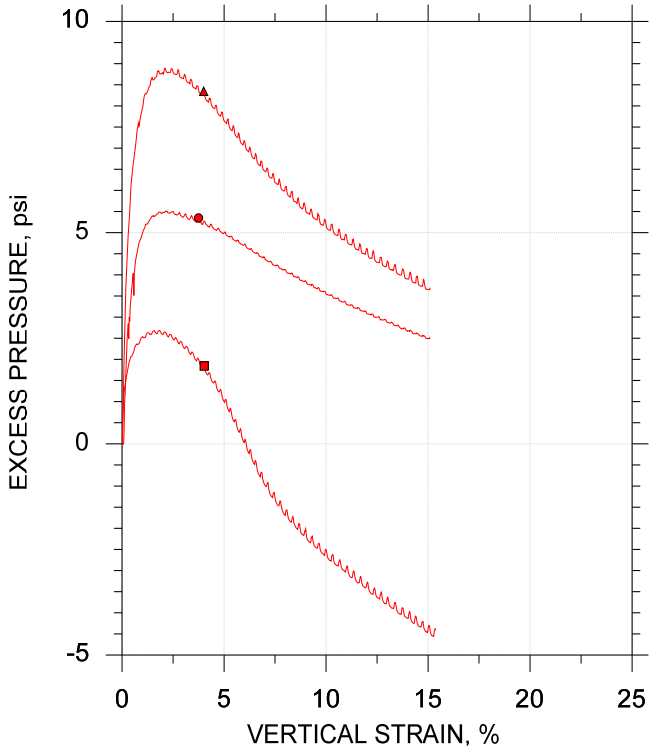
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

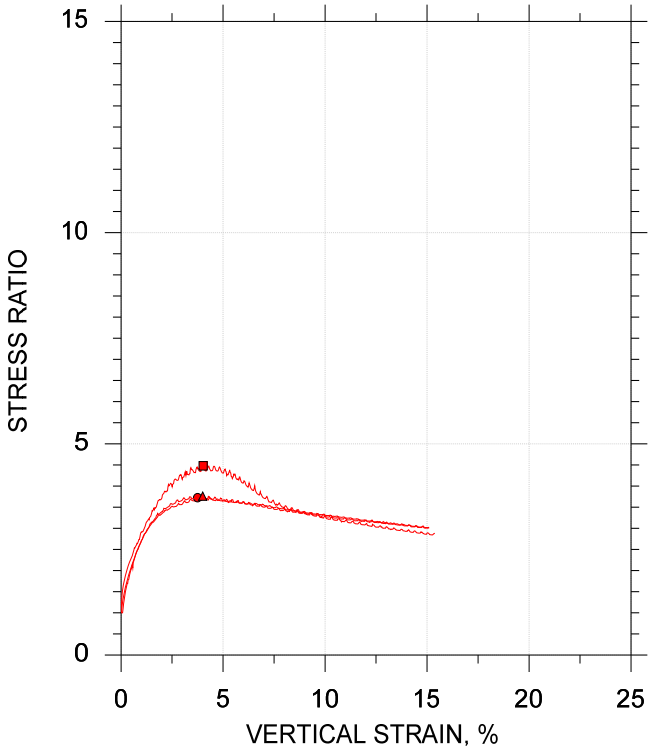


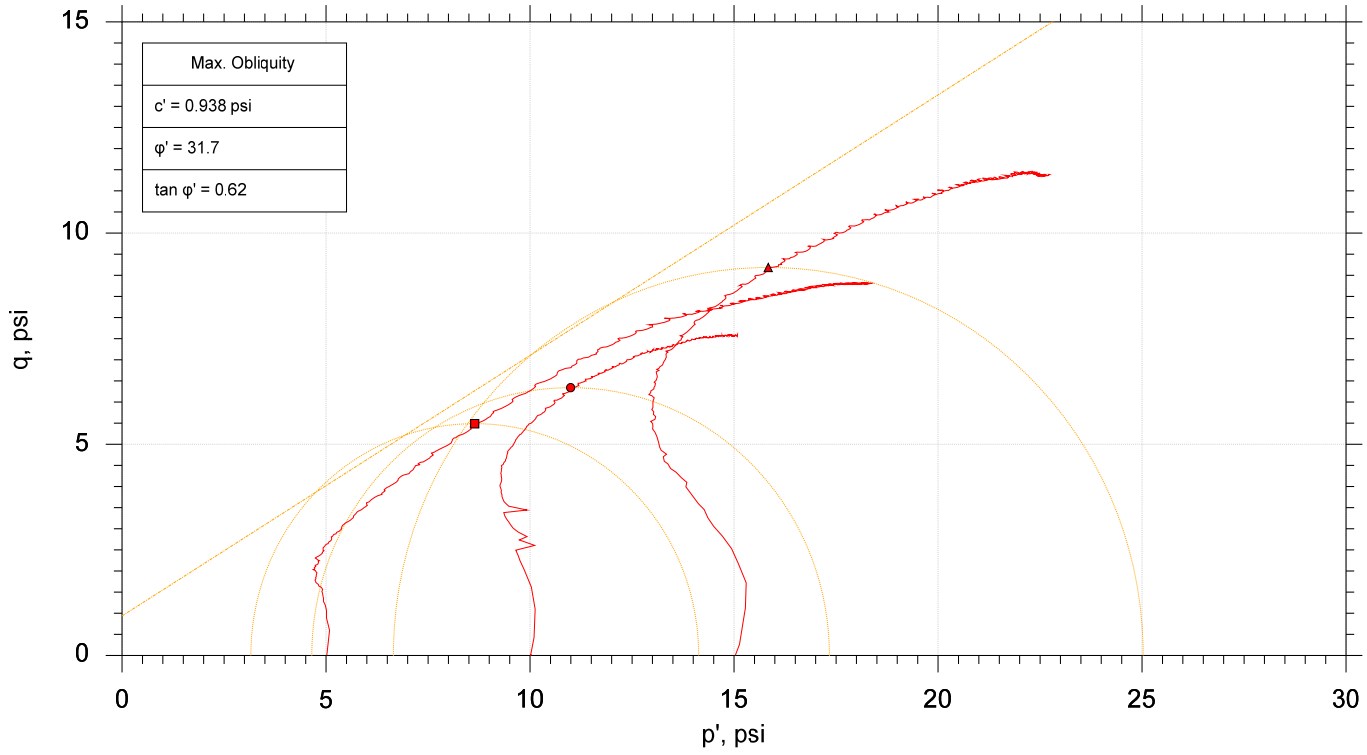
Remarks:

System 1057

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	AP-1	CU-15-1	6-8.3 ft	jm	7/8/18	mcm	7/16/18	307802-CU-15-1m.dat
●	AP-1	CU-15-2	6-8.3 ft	jm	7/6/18	mcm	7/16/18	307802-CU-15-2m.dat
▲	AP-1	CU-15-3	6-8.3 ft	jm	7/5/18	mcm	7/16/18	307802-CU-15-3m.dat

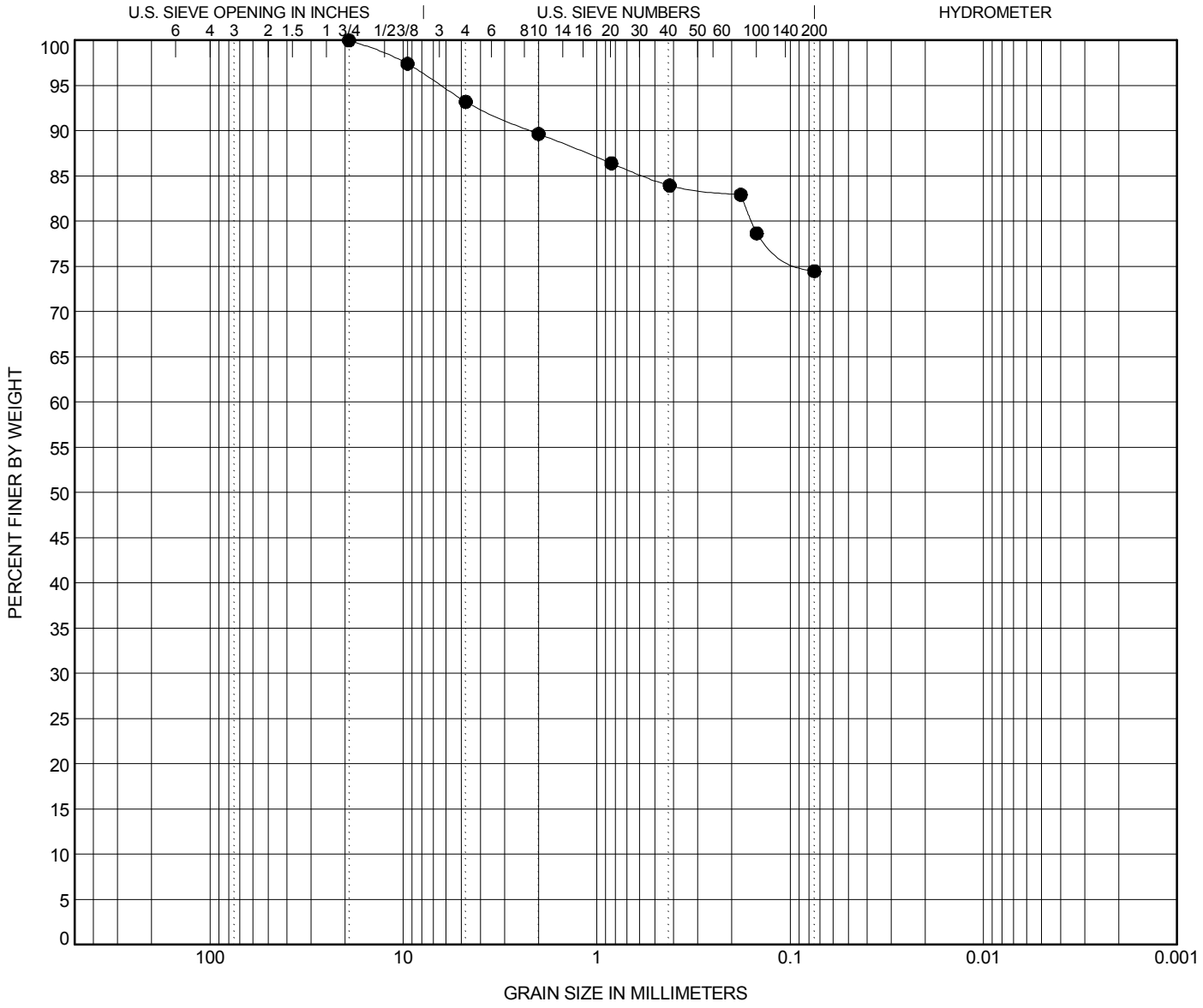
GeoTesting EXPRESS

Project: I-20/26/126 Corridor Improv.	Location: ---	Project No.: GTX-307802
Boring No.: ---	Sample Type: intact	
Description: Moist, reddish brown clay		
Remarks: System 1057		

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**AP-2**	**16.3**	**Fat CLAY (CH) with Sand A-7-6(20)**	**56**	**25**	**31**		

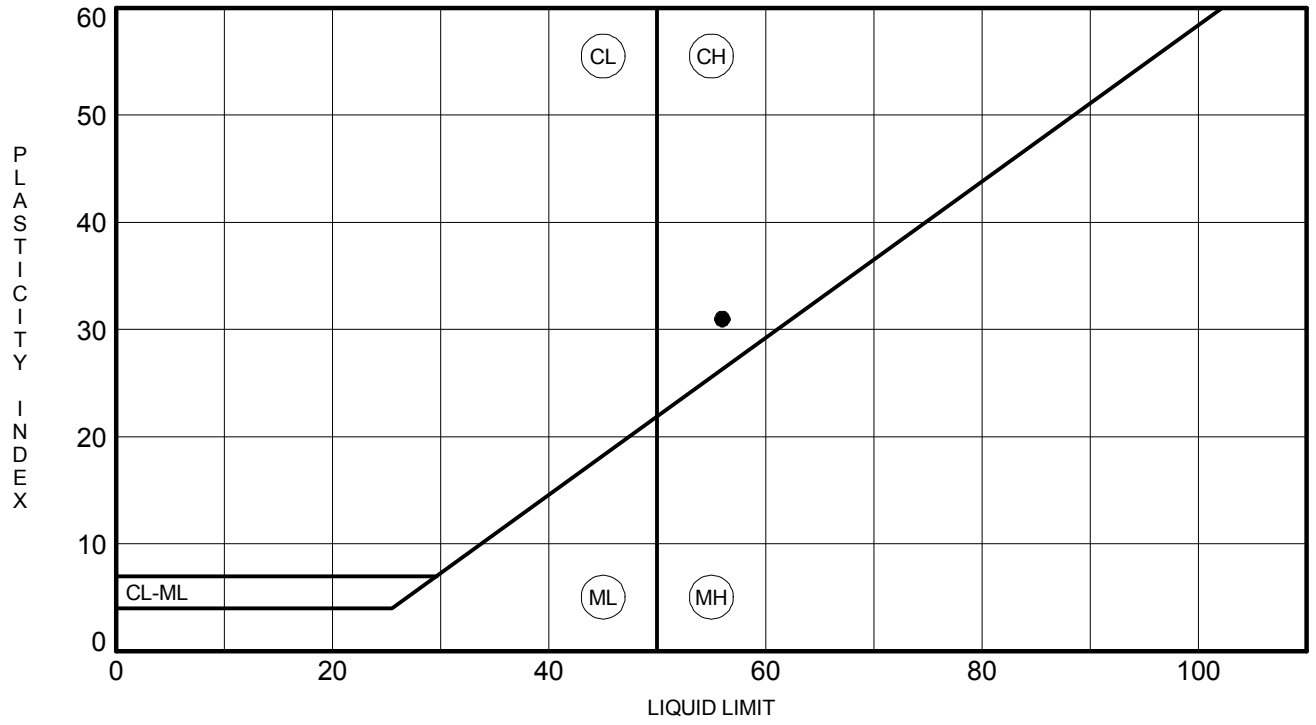
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**AP-2**	**16.3**	**19.1**	**6.387**			**6.8**	**18.7**	**74.5**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 8/2/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

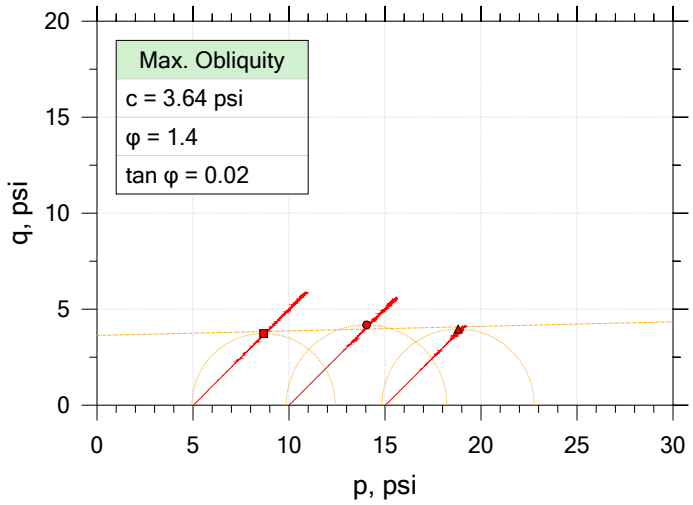
PROJECT COUNTY Richland/Lexington

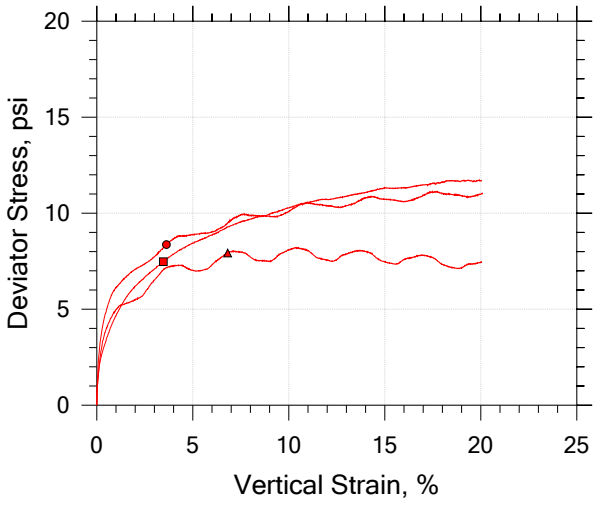


	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**AP-2**	**16.3**	**56**	**25**	**31**	**74**	**Fat CLAY (CH) with Sand A-7-6(20)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 8/2/18

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297





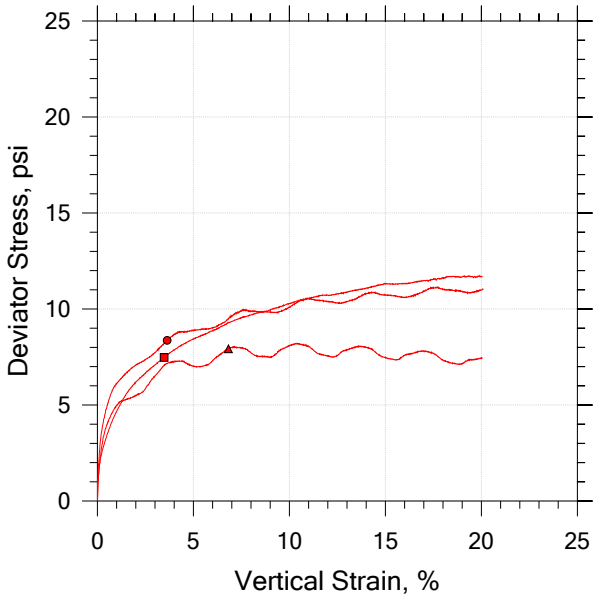
		■	●	▲
Symbol				
Sample ID		18-1034	18-1034	18-1034
Depth, ft		14' - 16'	14' - 16'	14' - 16'
Test Number		A	B	C
Initial	Height, in	6.007	5.932	6.042
	Diameter, in	2.855	2.855	2.875
	Moisture Content (from Cuttings), %	15.6	25.2	22.8
	Dry Density, pcf	116.	103.	102.
	Saturation (Wet Method), %	94.7	108.8	96.6
	Void Ratio	0.442	0.622	0.633
Final	Moisture Content, %	15.8	22.1	23.1
	Dry Density, pcf	118.	105.	103.
	Cross-Sectional Area (Method A), in²	6.340	6.316	6.458
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.423	0.591	0.619
	Back Pressure, %	52.99	101.0	101.0
Vertical Effective Consolidation Stress, psi		4.985	9.985	15.00
Horizontal Effective Consolidation Stress, psi		5.012	9.999	15.02
Vertical Strain after Consolidation, %		0.3001	0.2896	0.3303
Volumetric Strain after Consolidation, %		1.306	1.119	0.9414
Time to 50% Consolidation, min		0.0000	0.0000	0.0000
Shear Strength, psi		3.738	4.183	3.965
Strain at Failure, %		3.47	3.63	6.82
Strain Rate, %/min		0.07500	0.07500	0.07500
Deviator Stress at Failure, psi		7.476	8.366	7.929
Effective Minor Principal Stress at Failure, psi		1.559	2.191	5.175
Effective Major Principal Stress at Failure, psi		9.036	10.56	13.10
B-Value		0.95	0.90	0.91

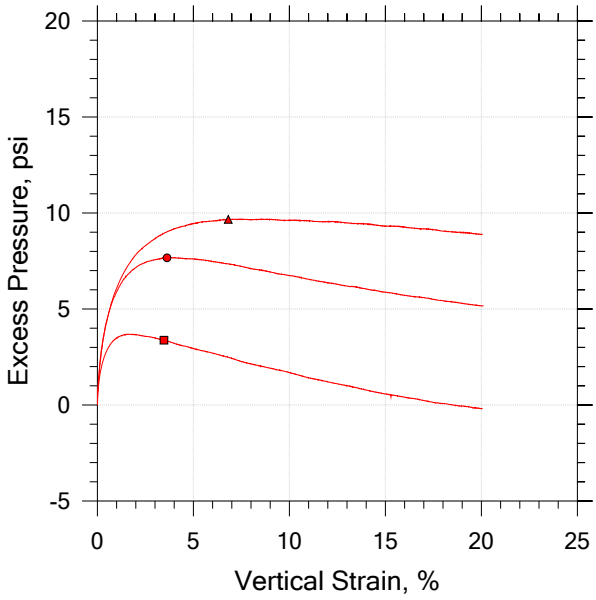
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

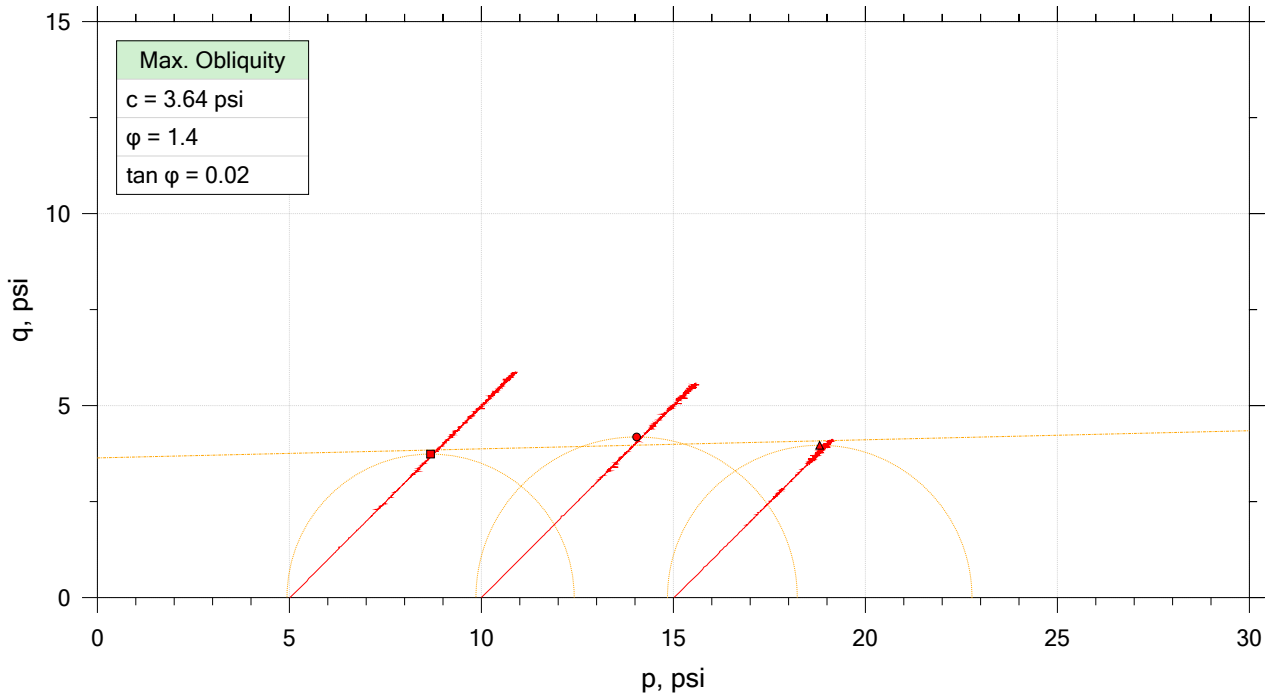
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-2	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1034	Test Date: 5/24/2018 - 5/30/2018	Depth: 14' - 16'
Test No.: ABC	Sample Type: Undisturbed	Elevation: --
Description: Fat CLAY (CH/A-7-6(20)) with Sand LL: 56 PL: 26 PI: 30 %#200 Finer: 74.5		
Remarks:		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297





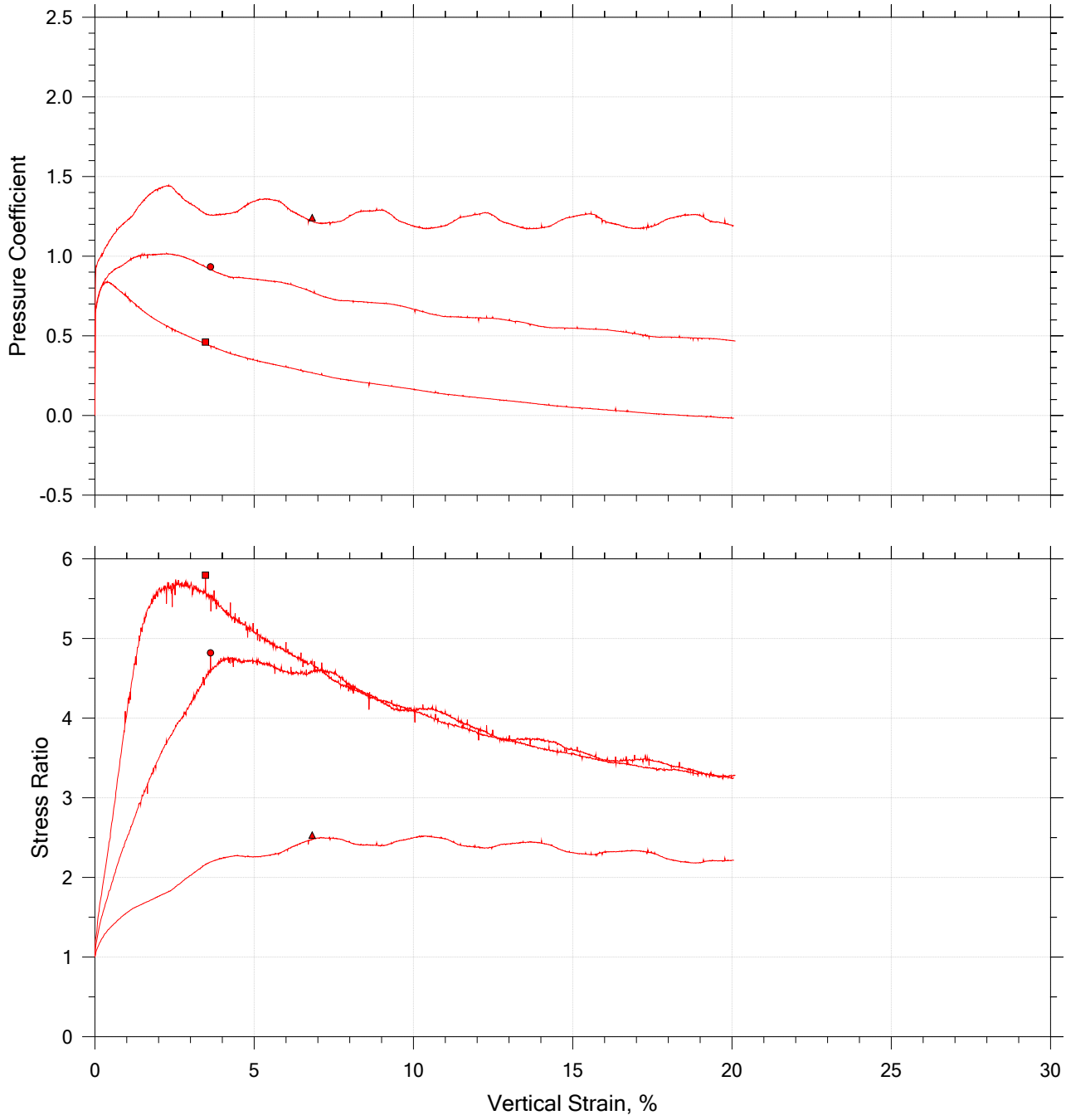


	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-1034	A	14' - 16'	WAP	5/24/2018	JFH/RS		18-1034_AP-17_test A.dat
●	18-1034	B	14' - 16'	WAP	5/25/2018	JFH/RS		18-1034_AP-17_test B.dat
▲	18-1034	C	14' - 16'	WAP	5/28/2018	JFH/RS		18-1034_AP-17_test C.dat

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-2	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1034	Test Date: 5/24/2018 - 5/30/2018	Depth: 14' - 16'
Test No.: ABC	Sample Type: Undisturbed	Elevation: --
Description: Fat CLAY (CH/A-7-6(20)) with Sand LL: 56 PL: 26 PI: 30 %#200 Finer: 74.5		
Remarks:		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297

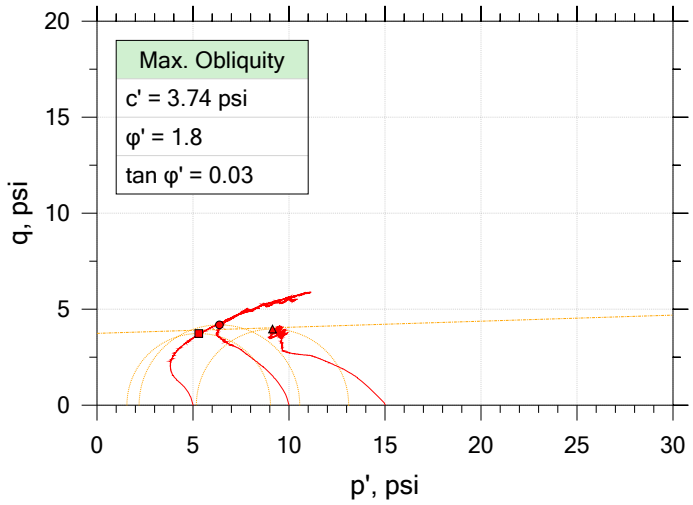


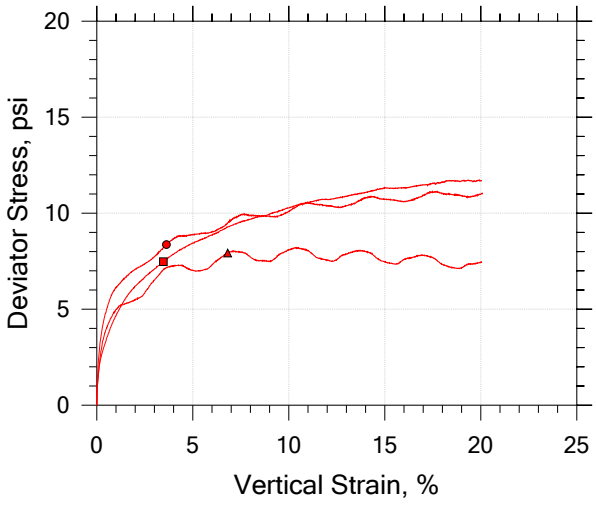
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-1034	A	14' - 16'	WAP	5/24/2018	JFH/RS		18-1034_AP-17_test A.dat
●	18-1034	B	14' - 16'	WAP	5/25/2018	JFH/RS		18-1034_AP-17_test B.dat
▲	18-1034	C	14' - 16'	WAP	5/28/2018	JFH/RS		18-1034_AP-17_test C.dat

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-2	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1034	Test Date: 5/24/2018 - 5/30/2018	Depth: 14' - 16'
Test No.: ABC	Sample Type: Undisturbed	Elevation: --
Description: Fat CLAY (CH/A-7-6(20)) with Sand LL: 56 PL: 26 PI: 30 %#200 Finer: 74.5		
Remarks:		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297





Symbol		■	●	▲	
Sample ID		18-1034	18-1034	18-1034	
Depth, ft		14' - 16'	14' - 16'	14' - 16'	
Test Number		A	B	C	
Initial	Height, in	6.007	5.932	6.042	
	Diameter, in	2.855	2.855	2.875	
	Moisture Content (from Cuttings), %	15.6	25.2	22.8	
	Dry Density, pcf	116.	103.	102.	
	Saturation (Wet Method), %	94.7	108.8	96.6	
	Void Ratio	0.442	0.622	0.633	
Final	Moisture Content, %	15.8	22.1	23.1	
	Dry Density, pcf	118.	105.	103.	
	Cross-Sectional Area (Method A), in²	6.340	6.316	6.458	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.423	0.591	0.619	
	Back Pressure, %	52.99	101.0	101.0	
Vertical Effective Consolidation Stress, psi		4.985	9.985	15.00	
Horizontal Effective Consolidation Stress, psi		5.012	9.999	15.02	
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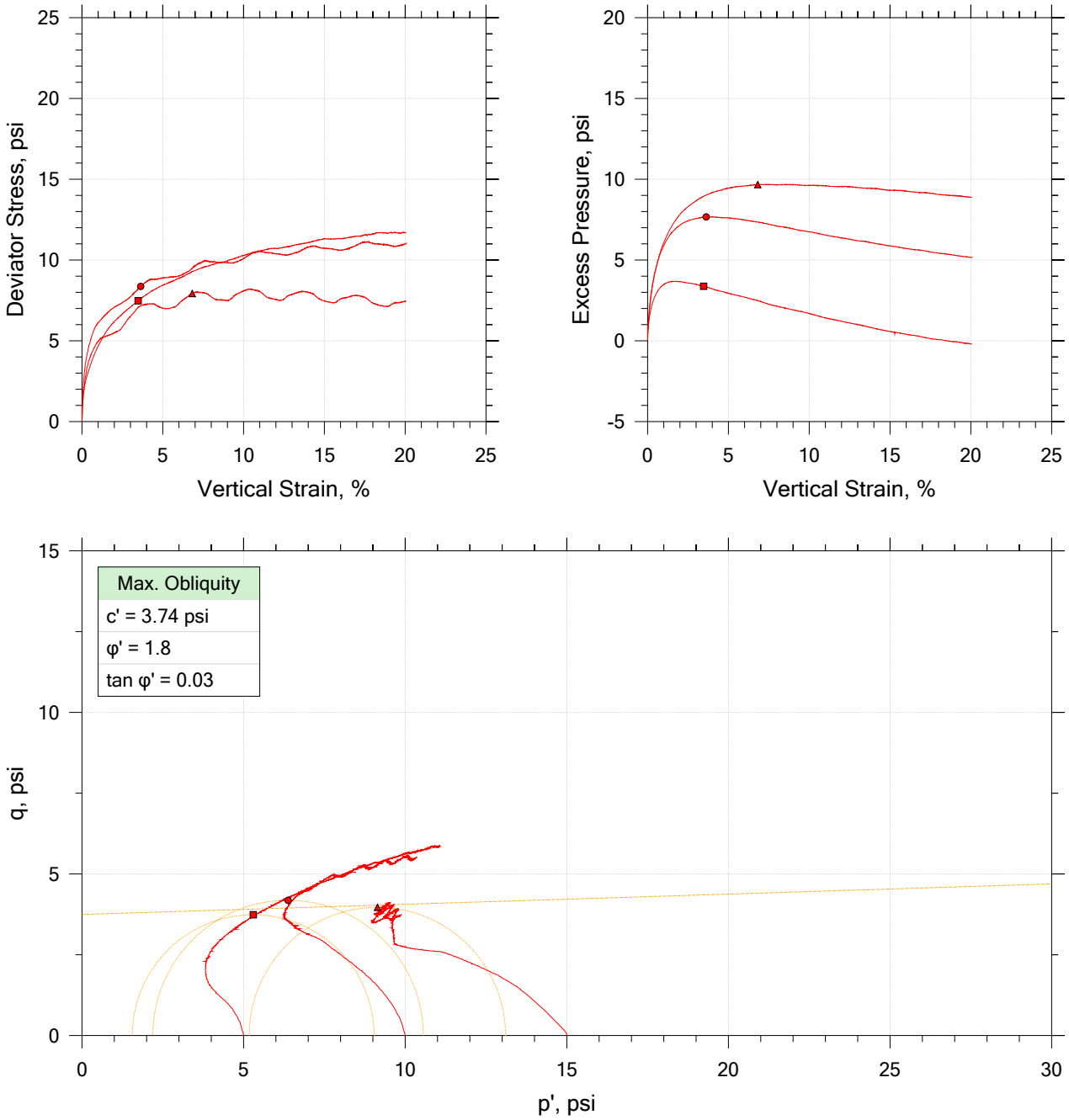
Volumetric Strain after Consolidation, %		1.306	1.119	0.9414	
Time to 50% Consolidation, min		0.0000	0.0000	0.0000	
Shear Strength, psi		3.738	4.183	3.965	
Strain at Failure, %		3.47	3.63	6.82	
Strain Rate, %/min		0.07500	0.07500	0.07500	
Deviator Stress at Failure, psi		7.476	8.366	7.929	
Effective Minor Principal Stress at Failure, psi		1.559	2.191	5.175	
Effective Major Principal Stress at Failure, psi		9.036	10.56	13.10	
B-Value		0.95	0.90	0.91	

Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-2	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1034	Test Date: 5/24/2018 - 5/30/2018	Depth: 14' - 16'
Test No.: ABC	Sample Type: Undisturbed	Elevation: --
Description: Fat CLAY (CH/A-7-6(20)) with Sand LL: 56 PL: 26 PI: 30 %#200 Finer: 74.5		
Remarks:		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297

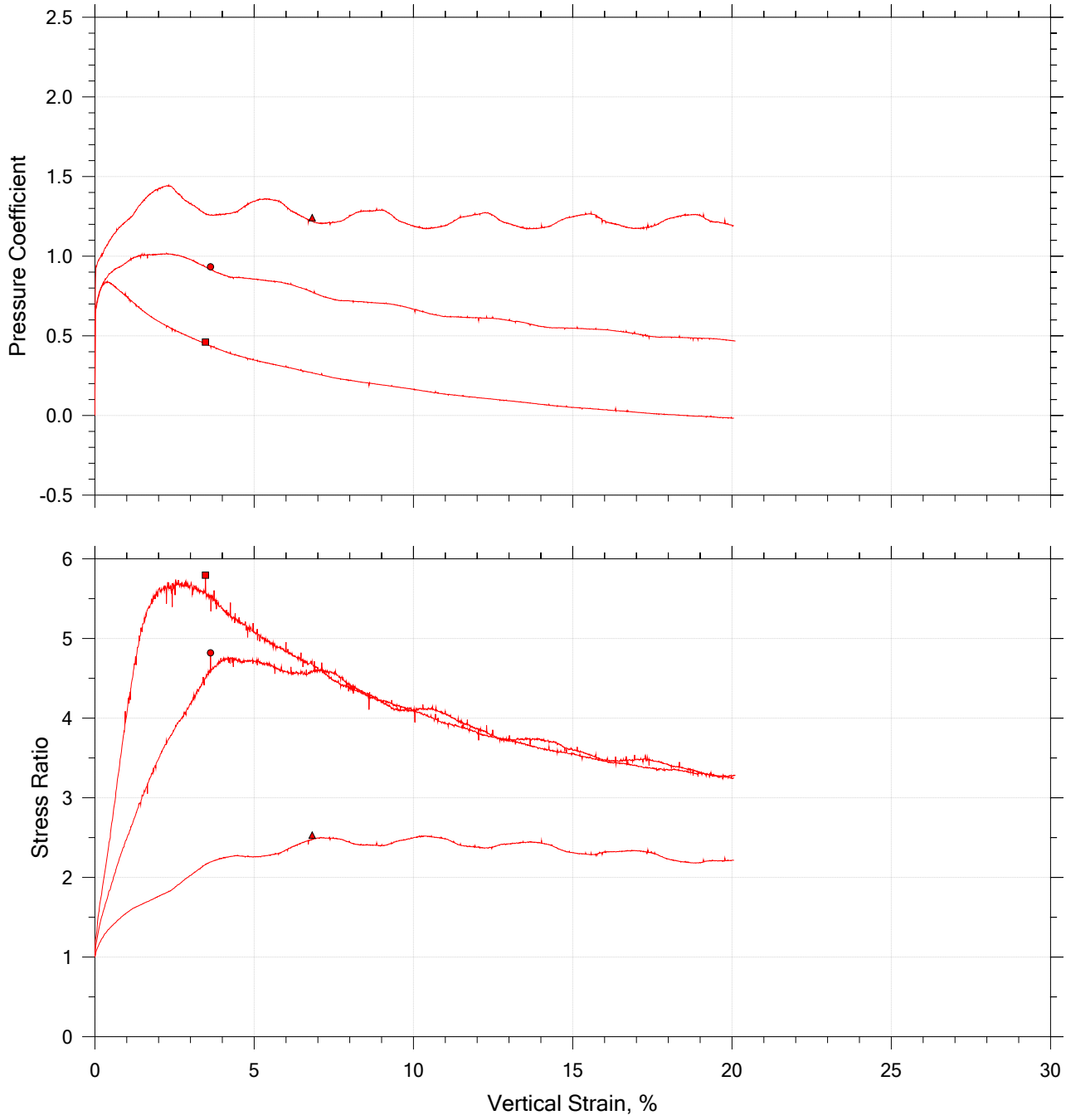


	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-1034	A	14' - 16'	WAP	5/24/2018	JFH/RS		18-1034_AP-17_test A.dat
●	18-1034	B	14' - 16'	WAP	5/25/2018	JFH/RS		18-1034_AP-17_test B.dat
▲	18-1034	C	14' - 16'	WAP	5/28/2018	JFH/RS		18-1034_AP-17_test C.dat

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-2	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1034	Test Date: 5/24/2018 - 5/30/2018	Depth: 14' - 16'
Test No.: ABC	Sample Type: Undisturbed	Elevation: --
Description: Fat CLAY (CH/A-7-6(20)) with Sand LL: 56 PL: 26 PI: 30 %#200 Finer: 74.5		
Remarks:		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297



	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-1034	A	14' - 16'	WAP	5/24/2018	JFH/RS		18-1034_AP-17_test A.dat
●	18-1034	B	14' - 16'	WAP	5/25/2018	JFH/RS		18-1034_AP-17_test B.dat
▲	18-1034	C	14' - 16'	WAP	5/28/2018	JFH/RS		18-1034_AP-17_test C.dat

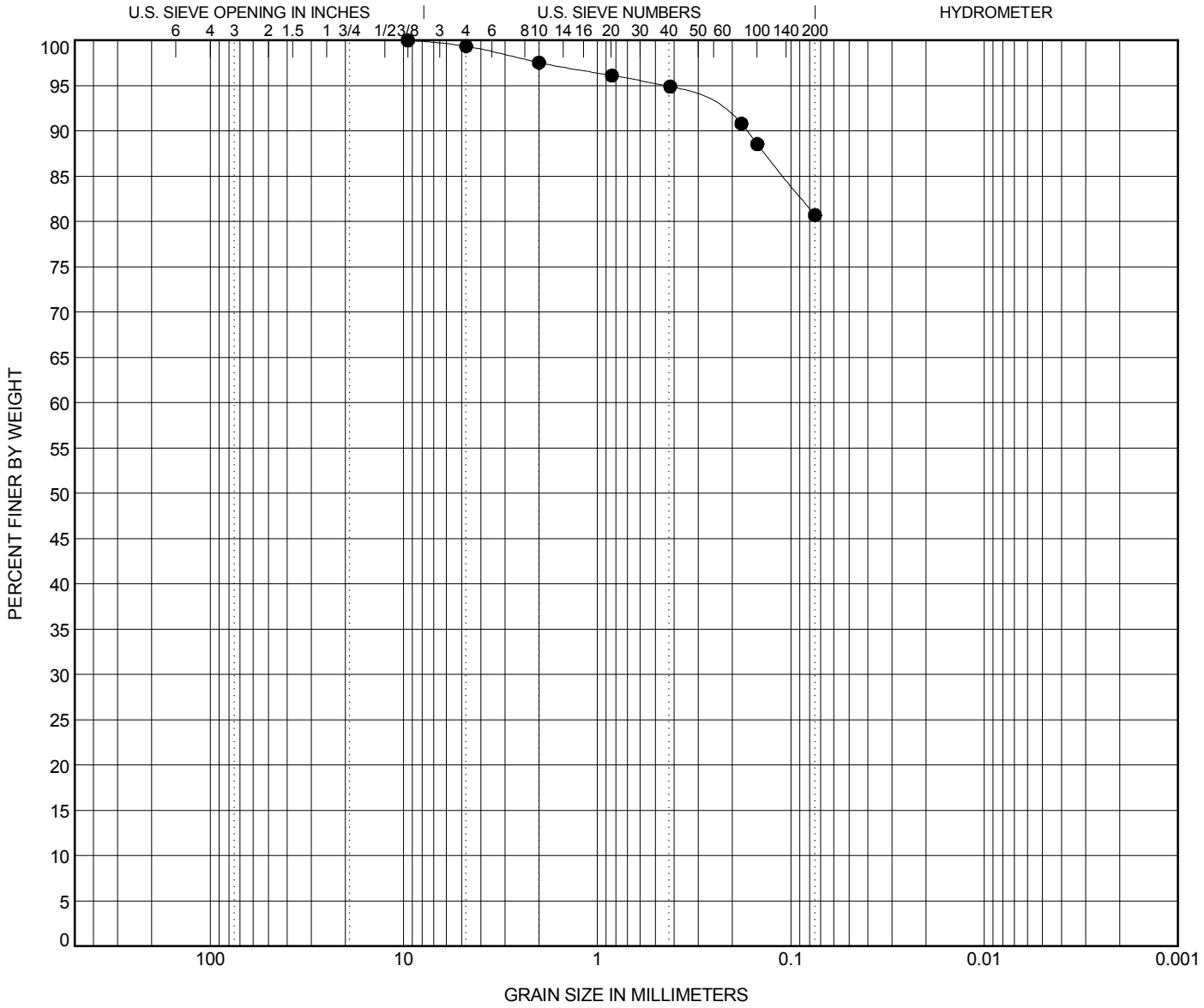
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-2	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1034	Test Date: 5/24/2018 - 5/30/2018	Depth: 14' - 16'
Test No.: ABC	Sample Type: Undisturbed	Elevation: --
Description: Fat CLAY (CH/A-7-6(20)) with Sand LL: 56 PL: 26 PI: 30 %#200 Finer: 74.5		
Remarks:		

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

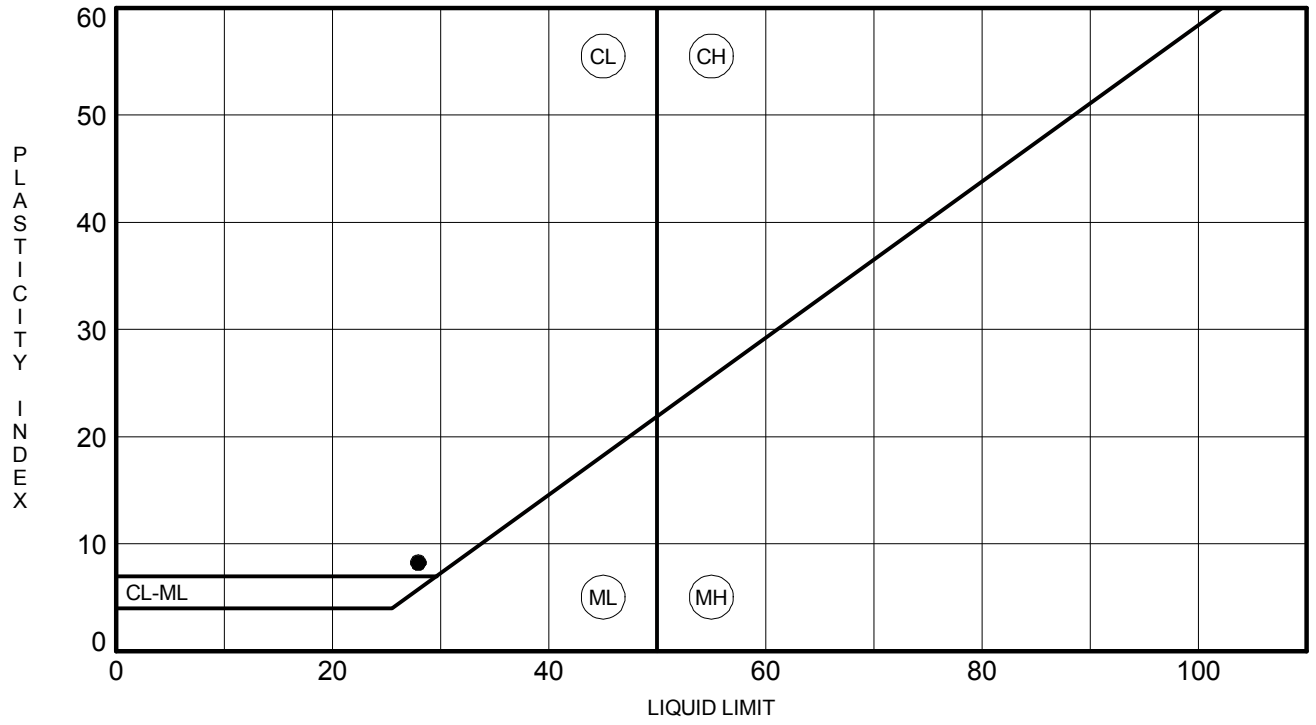
	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**AP-3**	**8.0**	**Lean CLAY (CL) with Sand A-4(5)**	**28**	**20**	**8**		

	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**AP-3**	**8.0**	**9.52**	**0.44**			**0.6**	**18.6**	**80.7**	

ATTERBERG LIMITS' RESULTS

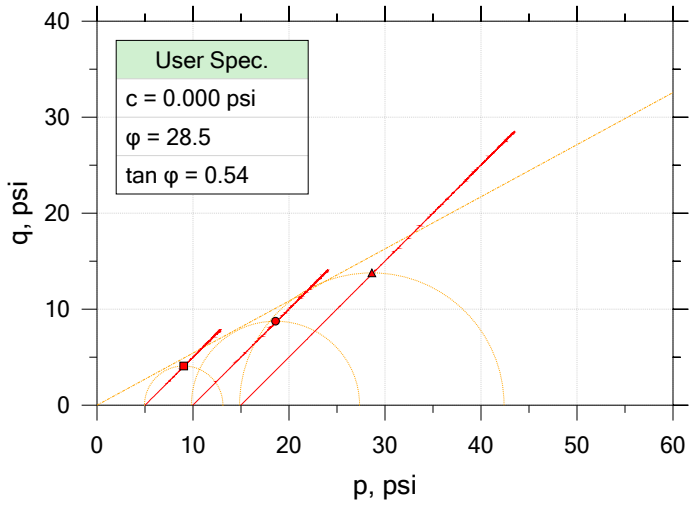
PROJECT ID P027662 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

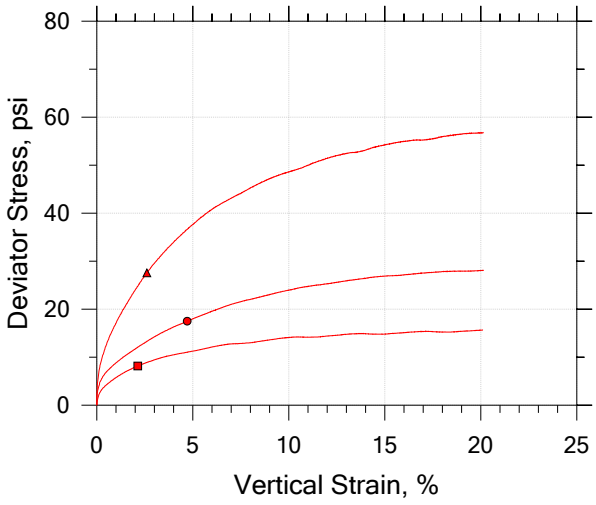
PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**AP-3**	**8.0**	**28**	**20**	**8**	**81**	**Lean CLAY (CL) with Sand A-4(5)**

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297





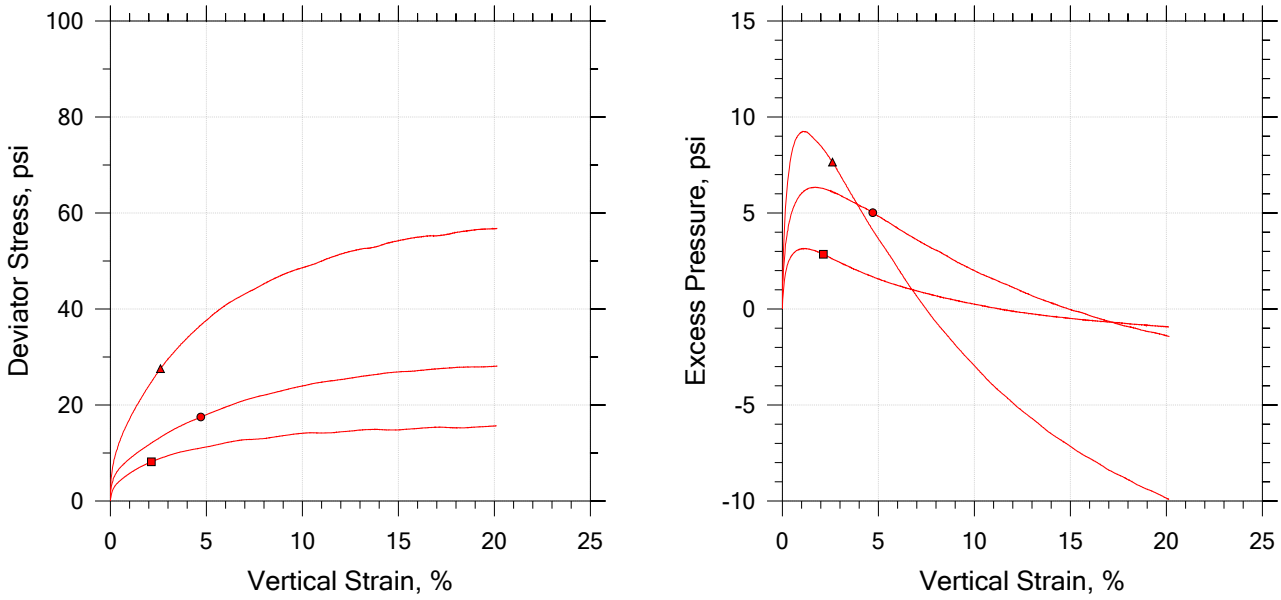
		■	●	▲	
Symbol					
Sample ID		18-1037	18-1037	18-1037	
Depth, ft		8' - 10'	8' - 10'	8' - 10'	
Test Number		A	B	C	
Initial	Height, in	5.780	5.462	5.696	
	Diameter, in	2.837	2.849	2.849	
	Moisture Content (from Cuttings), %	29.5	19.3	19.3	
	Dry Density, pcf	94.3	111.	112.	
	Saturation (Wet Method), %	102.0	102.7	106.3	
	Void Ratio	0.774	0.504	0.487	
Final	Moisture Content, %	27.9	17.7	17.0	
	Dry Density, pcf	95.7	114.	115.	
	Cross-Sectional Area (Method A), in²	6.260	6.293	6.288	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.748	0.473	0.457	
	Back Pressure, %	94.99	68.01	101.0	
Vertical Effective Consolidation Stress, psi		4.972	9.937	14.94	
Horizontal Effective Consolidation Stress, psi		5.002	9.975	14.98	
Vertical Strain after Consolidation, %		0.3942	0.6483	0.5546	
Volumetric Strain after Consolidation, %		0.9974	1.661	1.549	
Time to 50% Consolidation, min		0.0000	0.0000	0.0000	
Shear Strength, psi		4.086	8.759	13.78	
Strain at Failure, %		2.13	4.71	2.61	
Strain Rate, %/min		0.07500	0.07500	0.07500	
Deviator Stress at Failure, psi		8.172	17.52	27.56	
Effective Minor Principal Stress at Failure, psi		2.090	4.820	7.192	
Effective Major Principal Stress at Failure, psi		10.26	22.34	34.75	
B-Value		0.95	0.95	0.95	

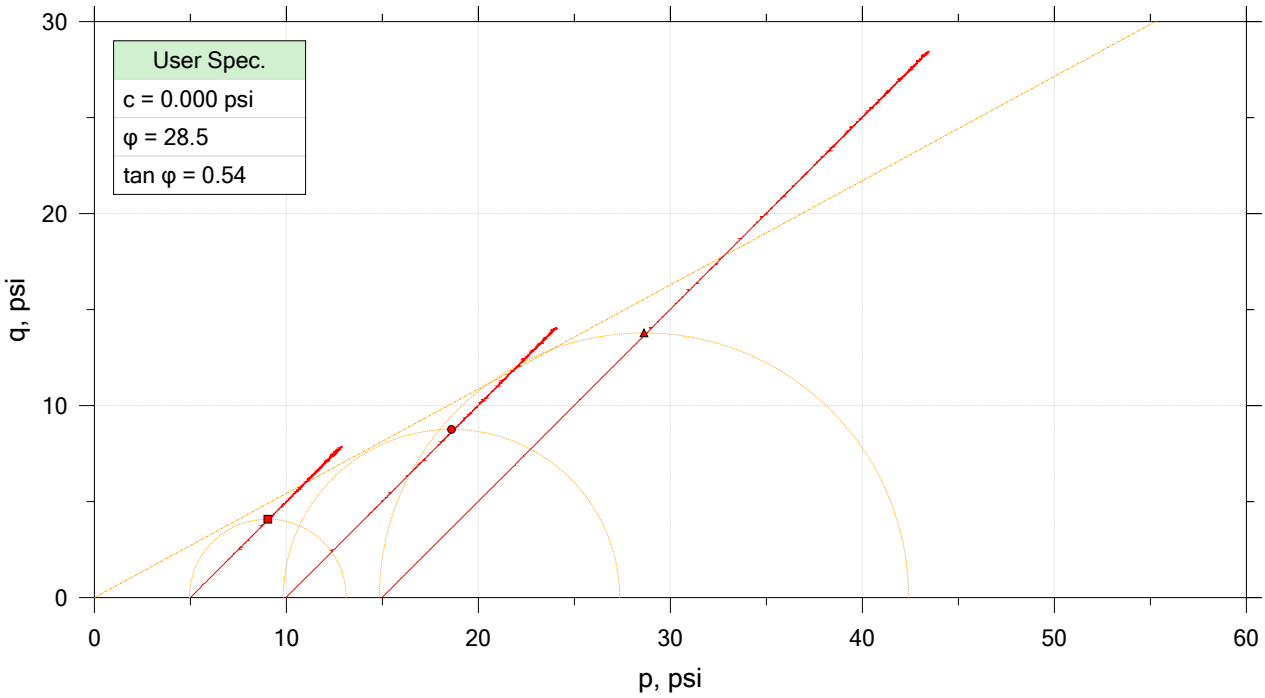
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-3	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1037	Test Date: 6/19/2018 - 6/21/2018	Depth: 8' - 10'
Test No.: ABC	Sample Type: Undisturbed	Elevation: --
Description: Lean CLAY (CL/A-4(5)) with Sand LL: 28 PL: 20 PI: 8 %#200 Finer: 80.7		
Remarks:		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297





	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-1037	A	8' - 10'	WAP	6/19/2018	JFH/RS		18-1037_AP-18_test A.dat
●	18-1037	B	8' - 10'	WAP	6/20/2018	JFH/RS		18-1037_AP-18_test B.dat
▲	18-1037	C	8' - 10'	WAP	6/21/2018	JFH/RS		18-1037_AP-18_test C.dat

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-3	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1037	Test Date: 6/19/2018 - 6/21/2018	Depth: 8' - 10'
Test No.: ABC	Sample Type: Undisturbed	Elevation: --
Description: Lean CLAY (CL/A-4(5)) with Sand LL: 28 PL: 20 PI: 8 %#200 Finer: 80.7		
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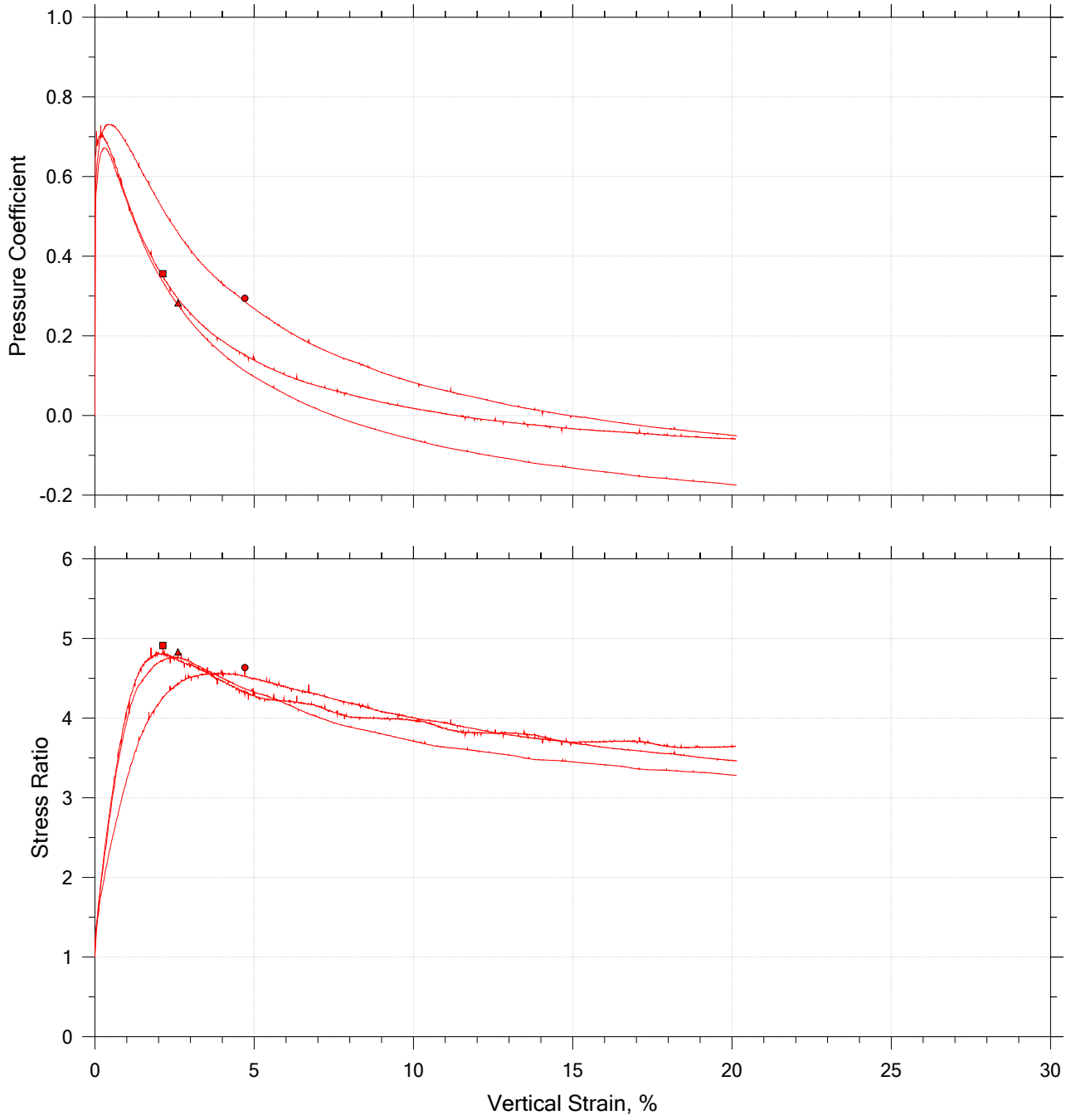

	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-1037	A	8' - 10'	WAP	6/19/2018	JFH/RS		18-1037_AP-18_test A.dat
●	18-1037	B	8' - 10'	WAP	6/20/2018	JFH/RS		18-1037_AP-18_test B.dat
▲	18-1037	C	8' - 10'	WAP	6/21/2018	JFH/RS		18-1037_AP-18_test C.dat

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-3	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1037	Test Date: 6/19/2018 - 6/21/2018	Depth: 8' - 10'
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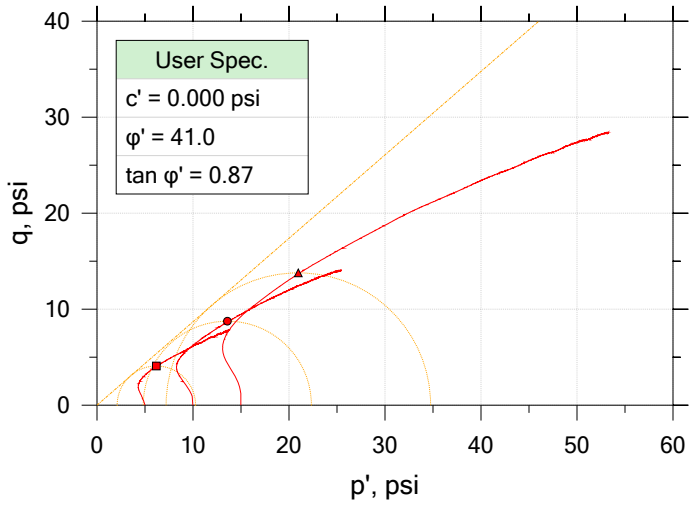

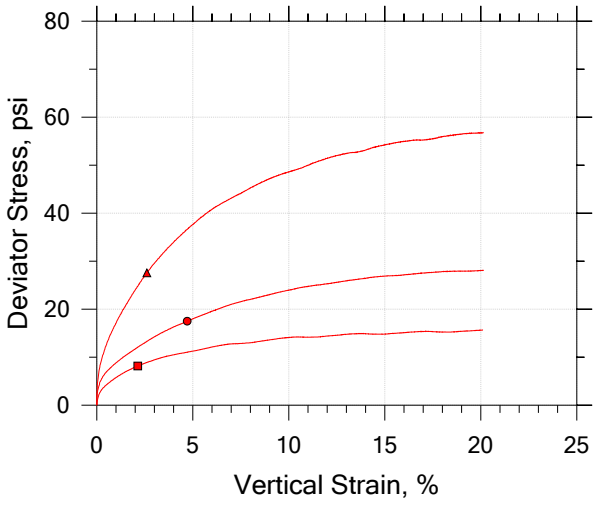

		■	●	▲	
Symbol					
Sample ID		18-1037	18-1037	18-1037	
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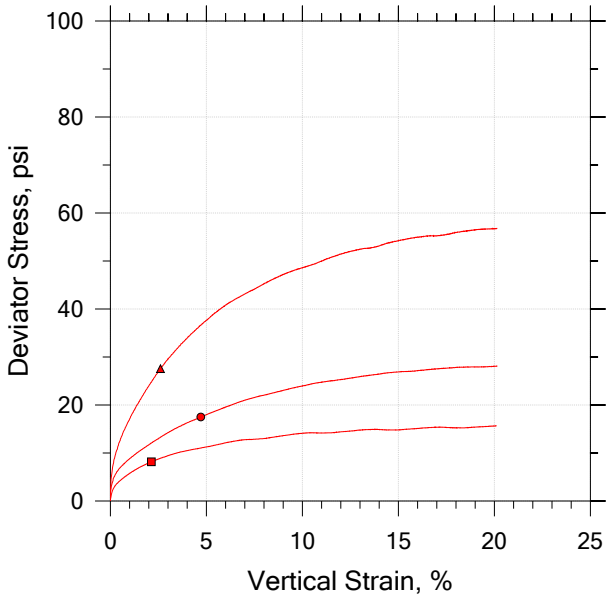
	Diameter, in	2.837	2.849	2.849	
	Moisture Content (from Cuttings), %	29.5	19.3	19.3	
	Dry Density, pcf	94.3	111.	112.	
	Saturation (Wet Method), %	102.0	102.7	106.3	
	Void Ratio	0.774	0.504	0.487	
Final	Moisture Content, %	27.9	17.7	17.0	
	Dry Density, pcf	95.7	114.	115.	
	Cross-Sectional Area (Method A), in²	6.260	6.293	6.288	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.748	0.473	0.457	
	Back Pressure, %	94.99	68.01	101.0	
Vertical Effective Consolidation Stress, psi		4.972	9.937	14.94	
Horizontal Effective Consolidation Stress, psi		5.002	9.975	14.98	
Vertical Strain after Consolidation, %		0.3942	0.6483	0.5546	
Volumetric Strain after Consolidation, %		0.9974	1.661	1.549	
Time to 50% Consolidation, min		0.0000	0.0000	0.0000	
Shear Strength, psi		4.086	8.759	13.78	
Strain at Failure, %		2.13	4.71	2.61	
Strain Rate, %/min		0.07500	0.07500	0.07500	
Deviator Stress at Failure, psi		8.172	17.52	27.56	
Effective Minor Principal Stress at Failure, psi		2.090	4.820	7.192	
Effective Major Principal Stress at Failure, psi		10.26	22.34	34.75	
B-Value		0.95	0.95	0.95	

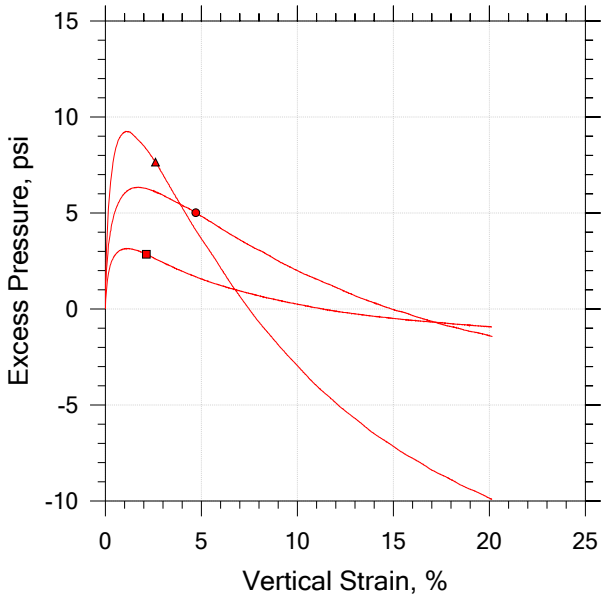
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

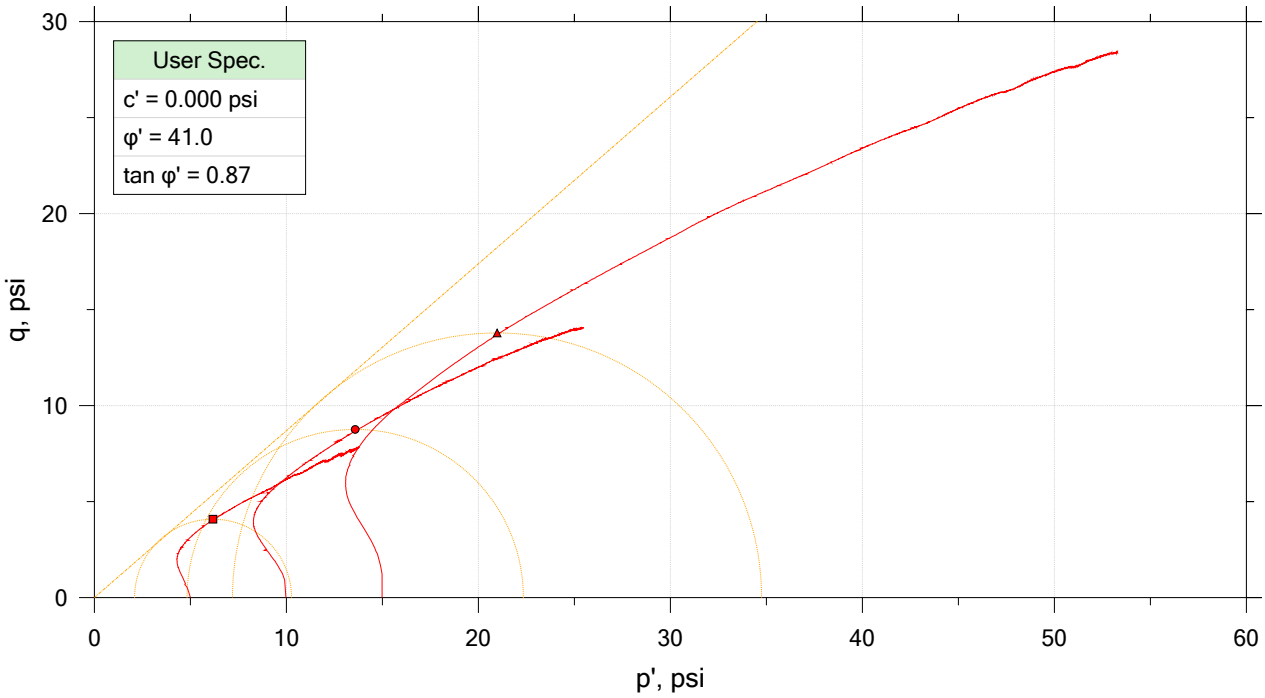
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-3	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1037	Test Date: 6/19/2018 - 6/21/2018	Depth: 8' - 10'
Test No.: ABC	Sample Type: Undisturbed	Elevation: --
Description: Lean CLAY (CL/A-4(5)) with Sand LL: 28 PL: 20 PI: 8 %#200 Finer: 80.7		
Remarks:		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297





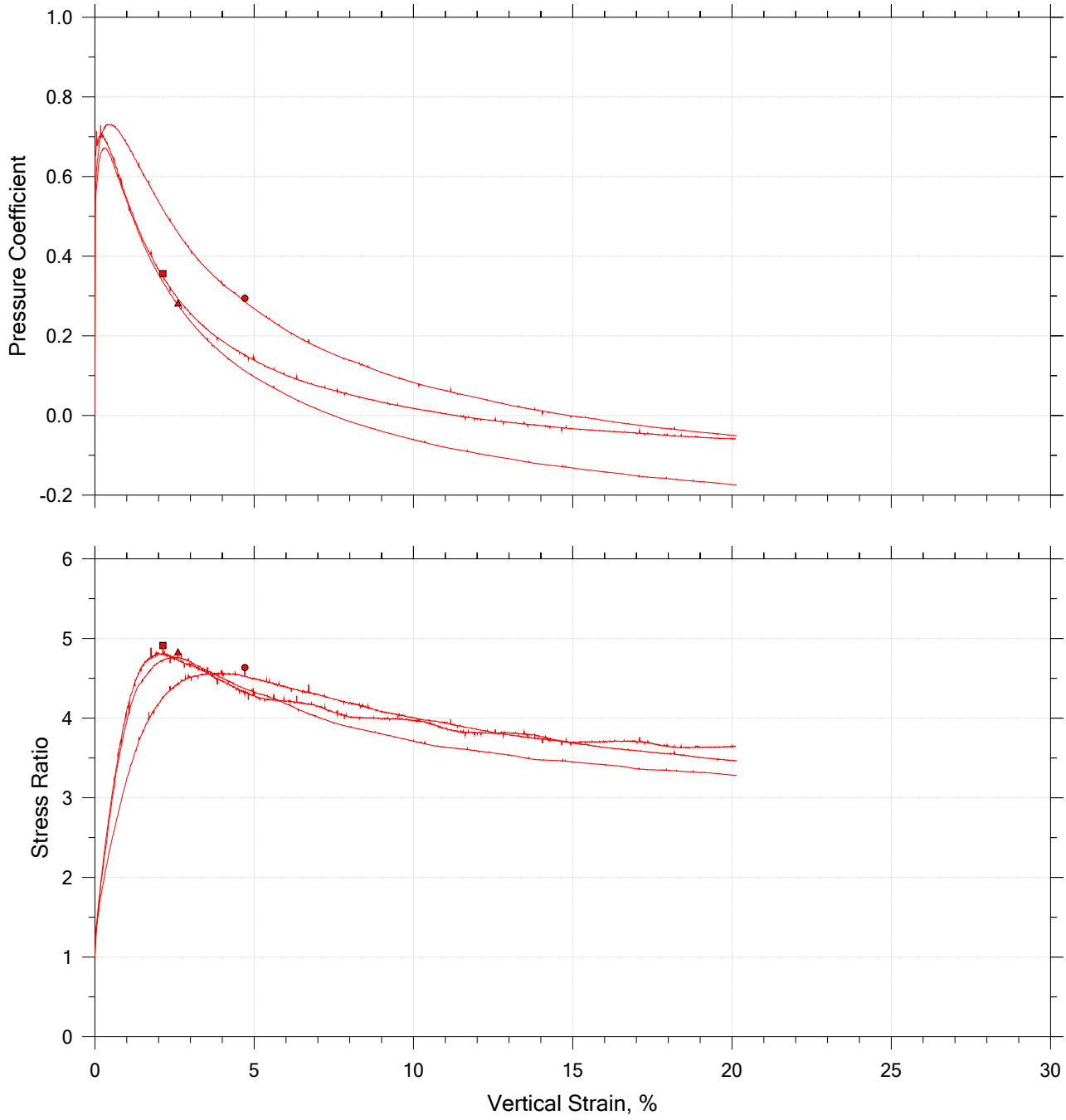


	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-1037	A	8' - 10'	WAP	6/19/2018	JFH/RS		18-1037_AP-18_test A.dat
●	18-1037	B	8' - 10'	WAP	6/20/2018	JFH/RS		18-1037_AP-18_test B.dat
▲	18-1037	C	8' - 10'	WAP	6/21/2018	JFH/RS		18-1037_AP-18_test C.dat

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-3	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1037	Test Date: 6/19/2018 - 6/21/2018	Depth: 8' - 10'
Test No.: ABC	Sample Type: Undisturbed	Elevation: --
Description: Lean CLAY (CL/A-4(5)) with Sand LL: 28 PL: 20 PI: 8 %#200 Finer: 80.7		
Remarks:		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297



	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-1037	A	8' - 10'	WAP	6/19/2018	JFH/RS		18-1037_AP-18_test A.dat
●	18-1037	B	8' - 10'	WAP	6/20/2018	JFH/RS		18-1037_AP-18_test B.dat
▲	18-1037	C	8' - 10'	WAP	6/21/2018	JFH/RS		18-1037_AP-18_test C.dat

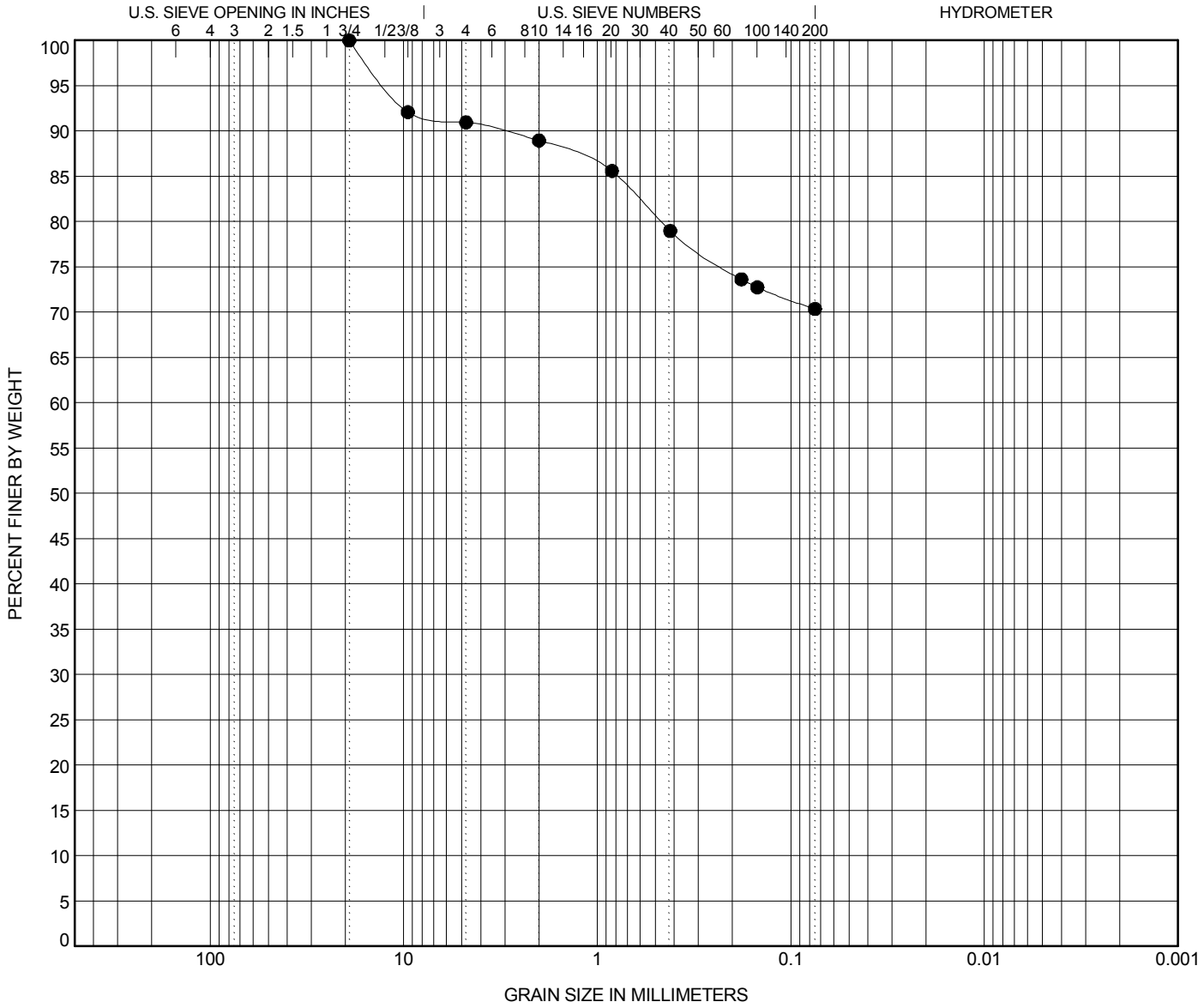
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-3	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1037	Test Date: 6/19/2018 - 6/21/2018	Depth: 8' - 10'
Test No.: ABC	Sample Type: Undisturbed	Elevation: --
Description: Lean CLAY (CL/A-4(5)) with Sand LL: 28 PL: 20 PI: 8 %#200 Finer: 80.7		
Remarks:		

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**AP-5**	**10.3**	**Sandy Lean CLAY (CL) A-6(10)**	**40**	**24**	**16**		

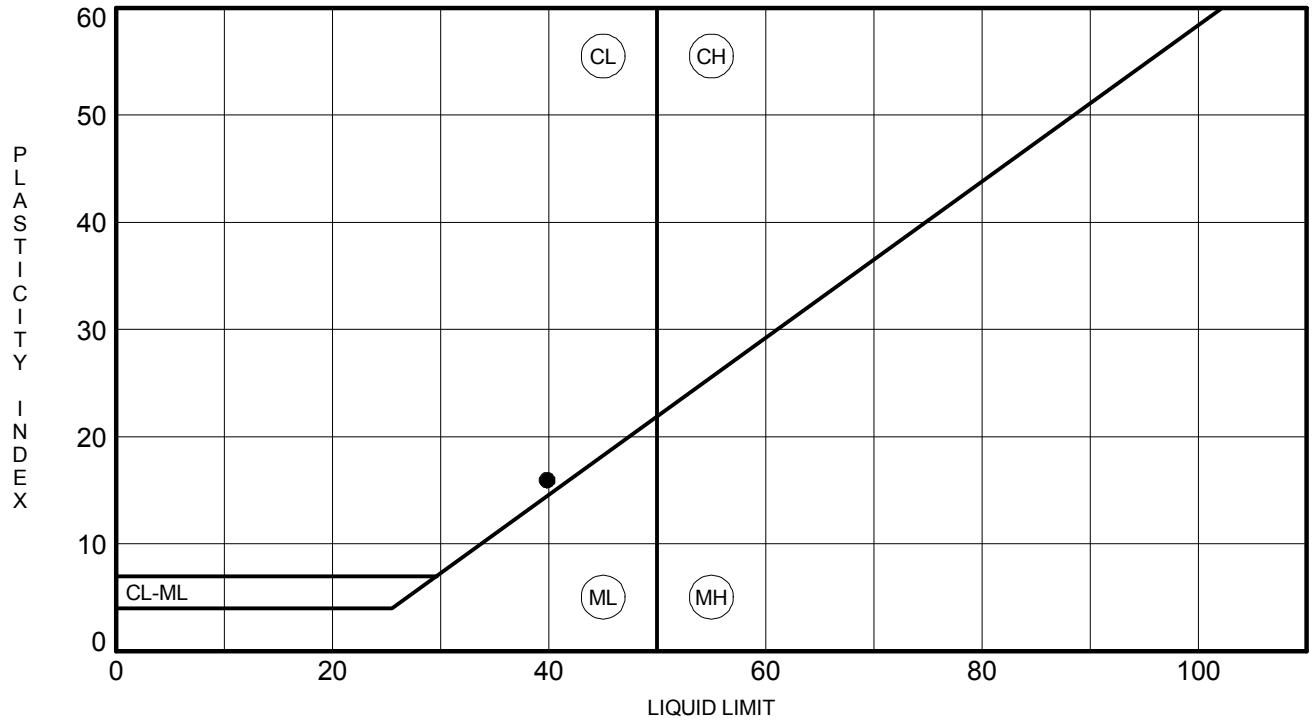
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**AP-5**	**10.3**	**19.1**	**12.301**			**9.0**	**20.6**	**70.4**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 8/2/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**AP-5**	**10.3**	**40**	**24**	**16**	**70**	**Sandy Lean CLAY (CL) A-6(10)**

F&ME CONSULTANTS

3112 Devine Street
Columbia, South Carolina 29205

SPECIFIC GRAVITY OF SOILS
(ASTM D854 / AASHTO T100)

Project Name:	I-20/26/126 Corridor Improvements	**Project No.:**	G5662.01
Sample Location:	AP-5	**Sample/Boring No.:**	18-1030
Description of Soil (Group Name & Symbol):	Sandy Lean CLAY (CL/A-6(10))	**Elevation/Depth of Sample:**	8.0' - 10.3'
% of Soils Passing #4 Sieve:		**Date Received:**	7/30/2018
Material Excluded:	**Yes**	X	**No**
Description of Excluded Material:			
Method:	**A**	X	**B**
Tested By:	William Pitts	**Date Tested:**	7/31/2018

Test No.	1			
Volume of Flask at 20° C	500ml			
Method of Air Removal	Boil			
Mass Flask + Water + Soil (Wb)	811.4			
Test Temperature ° C (Tx)	25			
Mass Flask + Water (Wa)	685.1			
Container No.	C			
Mass of Container + Oven Dry Soil	388.51			
Mass of Container	188.5			
Mass of Oven Dry Soil (Wo)	200.01			
Specific Gravity @ Test Temperature **Wo/[Wo+(Wa-Wb)]**	2.712			
Specific Gravity (SG) **K x Specific Gravity @ Test Temperature**	2.709			

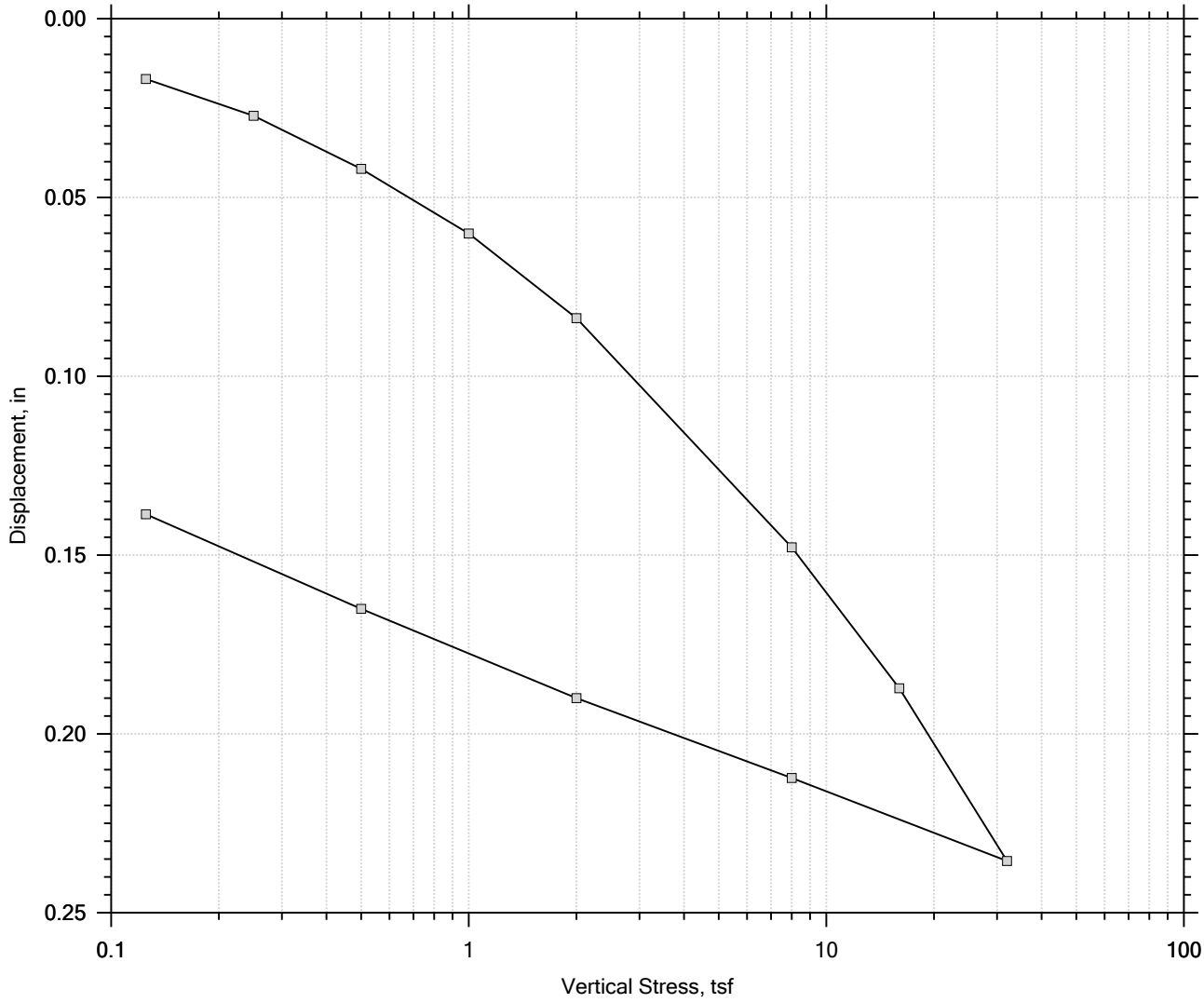
$$K = \frac{\text{Related Density of Water @ Test Temperature}}{\text{Relative Density of Water @ 20° C}}$$

Average Specific Gravity of Soils = _____

Remarks: _____

One-Dimensional Consolidation by ASTM D2435 - Method B

Summary Report

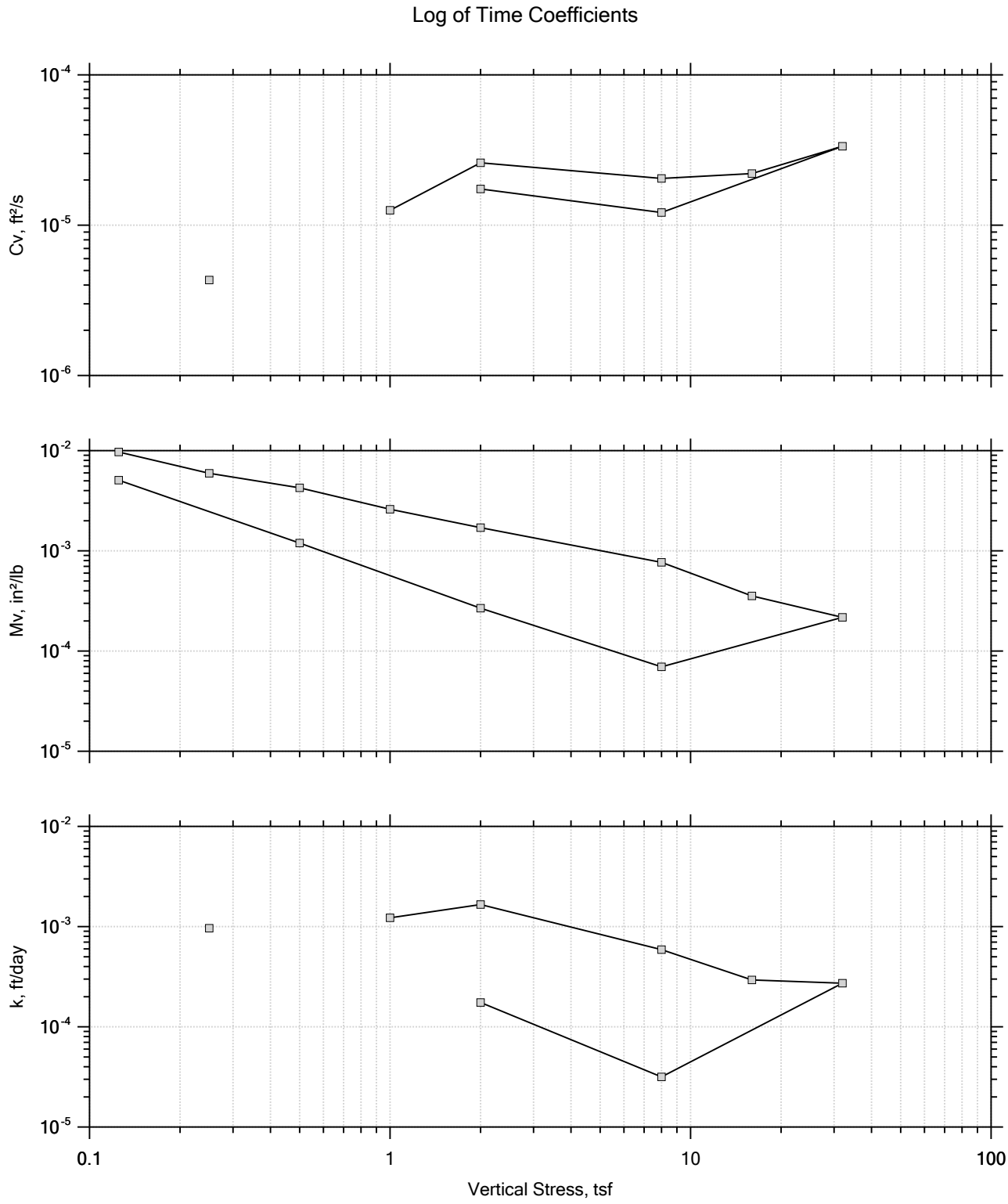


					Before Test	After Test
Current Vertical Effective Stress: 0 tsf				Water Content, %	27.42	23.99
Preconsolidation Stress: 0 tsf				Dry Unit Weight, pcf	96.477	102.91
Compression Ratio: 0				Saturation, %	98.66	101.03
Diameter: 2.5 in		Height: 1 in		Void Ratio	0.75	0.64
LL: 40	PL: 24	PI: 16	GS: 2.71			

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-5	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1030	Test Date: 07/27/2018	Depth: 8.0' - 10.3'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-6(10)) LL: 40 PL: 24 PI: 16 %#200 Finer: 70.4		
Remarks:		
Displacement at End of Increment		

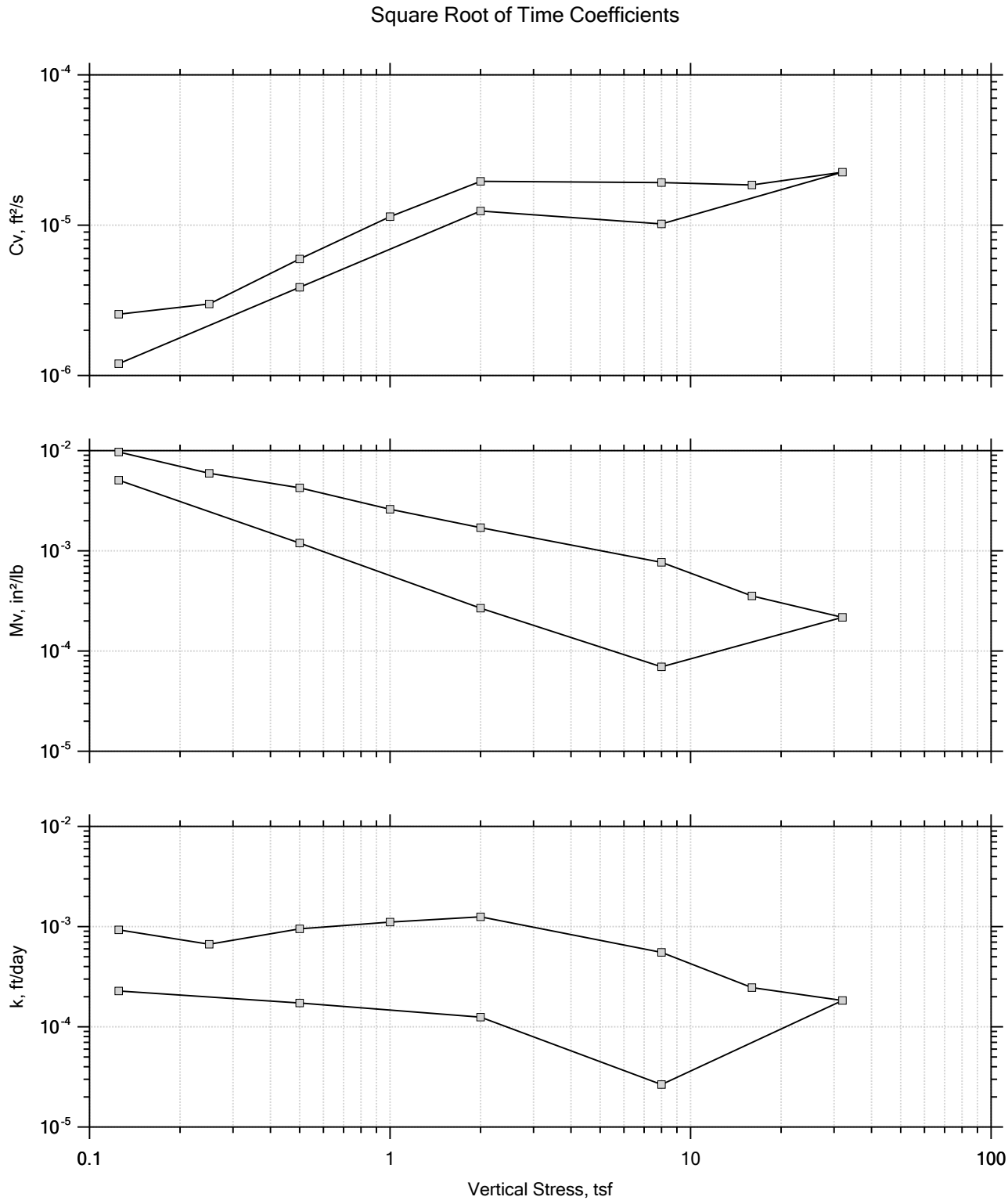
One-Dimensional Consolidation by ASTM D2435 - Method B



F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-5	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1030	Test Date: 07/27/2018	Depth: 8.0' - 10.3'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-6(10)) LL: 40 PL: 24 PI: 16 %#200 Finer: 70.4		
Remarks:		

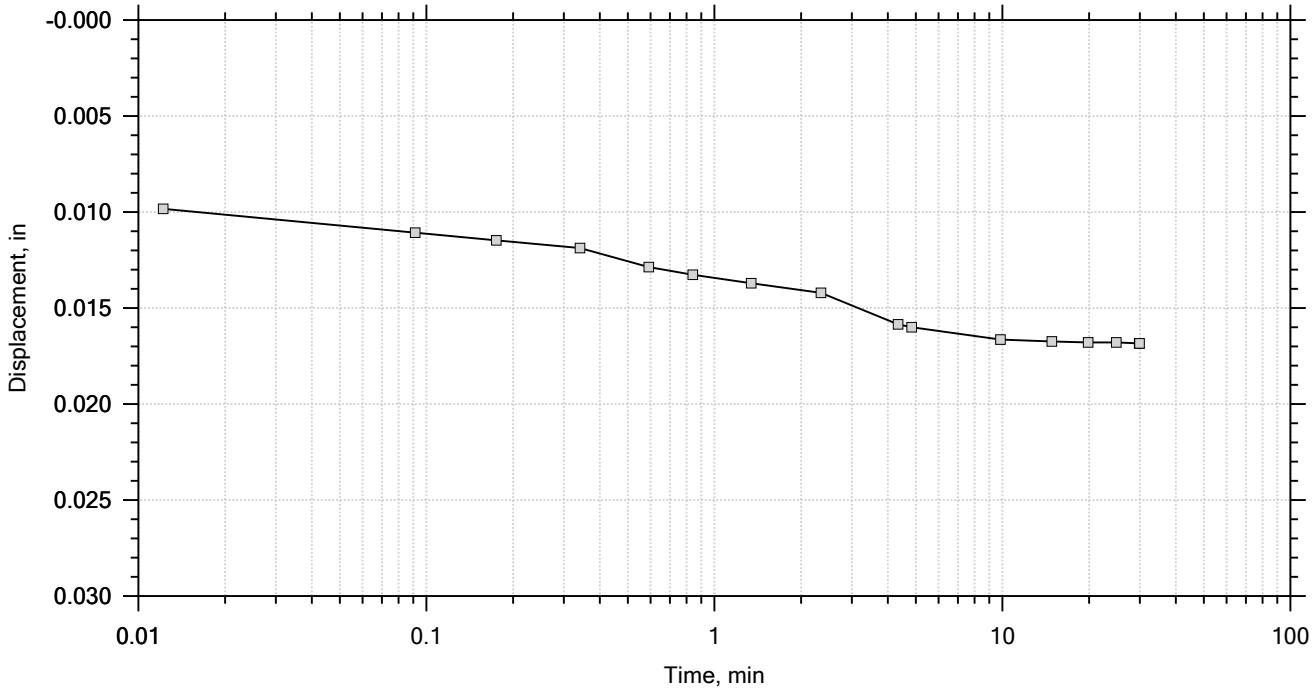
One-Dimensional Consolidation by ASTM D2435 - Method B

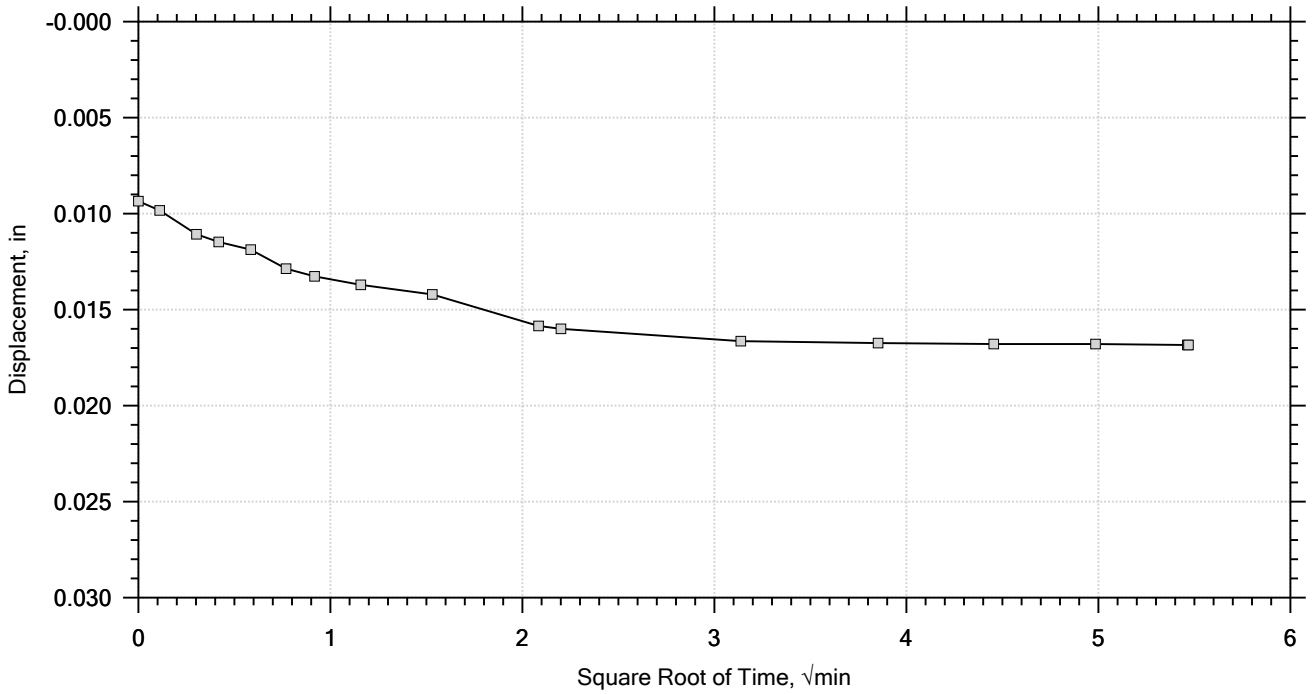


F&ME CONSULTANTS	Project: CCR	Location: Columbia, SC	Project No.: G5662.01
	Boring No.: AP-5	Tested By: WAP	Checked By: RS/JFH
	Sample No.: 18-1030	Test Date: 07/27/2018	Depth: 8.0' - 10.3'
	Test No.: A	Sample Type: Undisturbed	Elevation: --
	Description: Sandy Lean CLAY (CL/A-6(10)) LL: 40 PL: 24 PI: 16 %#200 Finer: 70.4		
	Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 12
Constant Load Step
Stress: 0.125 tsf



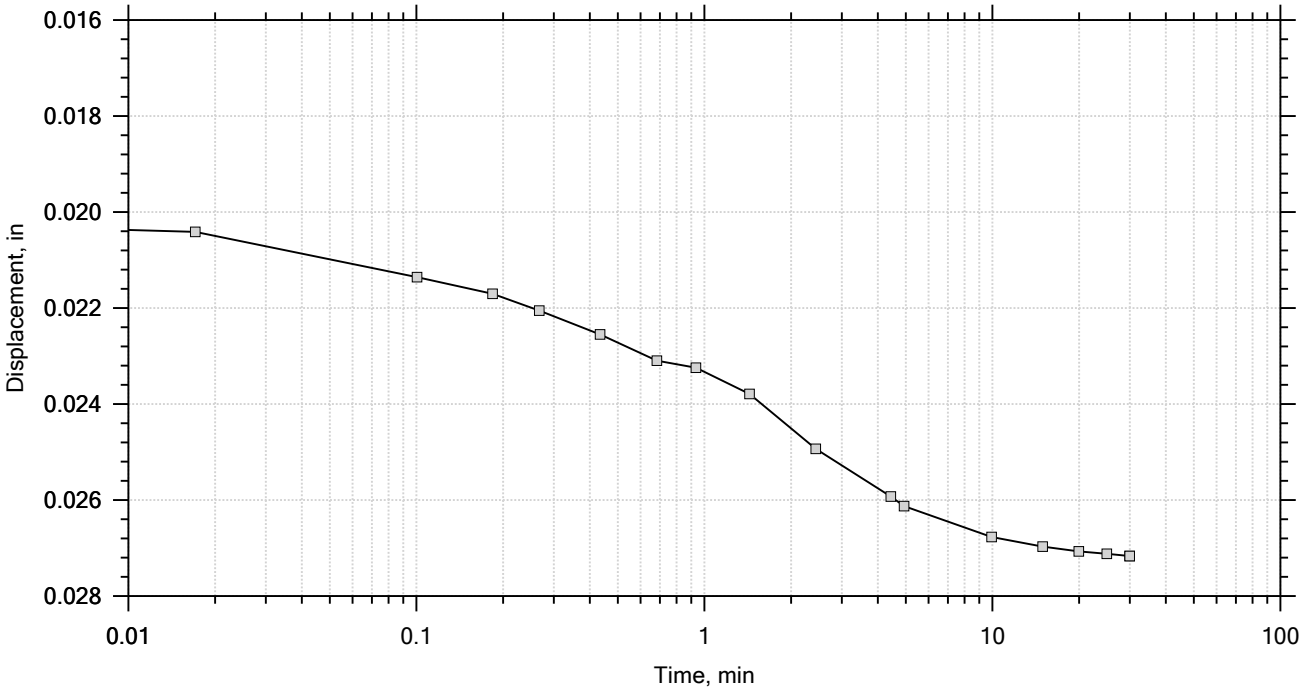


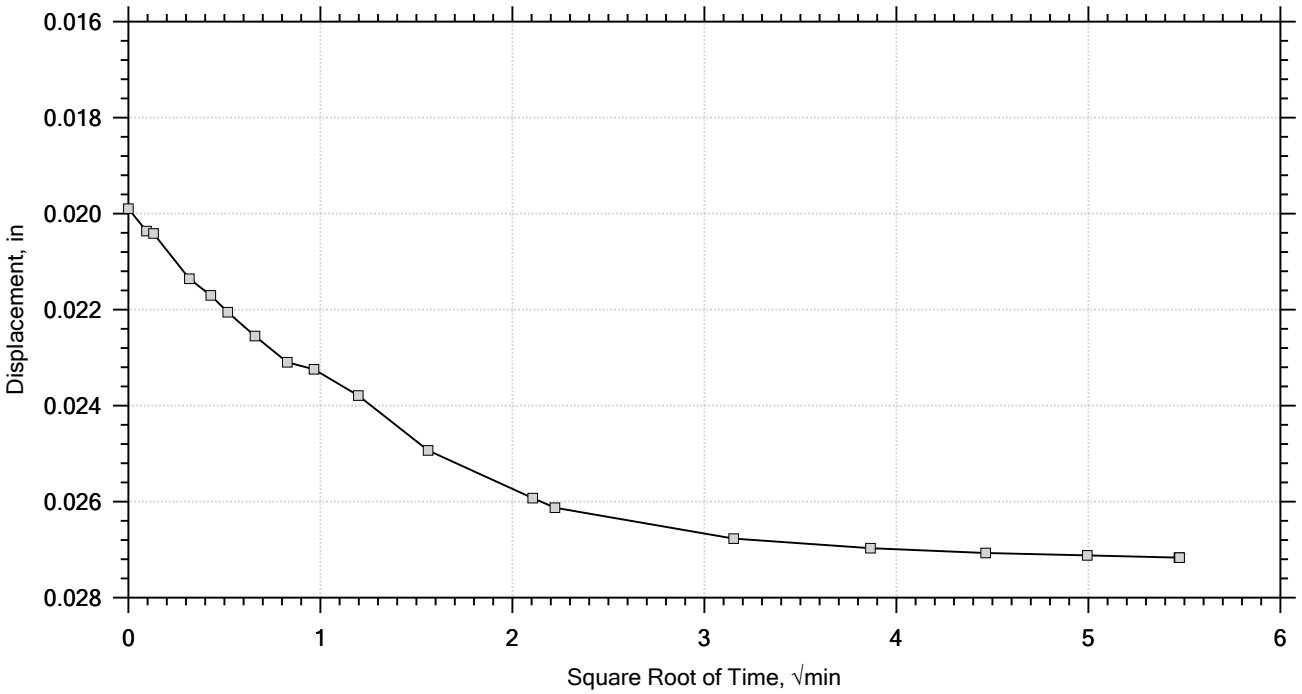
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-5	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1030	Test Date: 07/27/2018	Depth: 8.0' - 10.3'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-6(10)) LL: 40 PL: 24 PI: 16 %#200 Finer: 70.4		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 12
Constant Load Step
Stress: 0.25 tsf



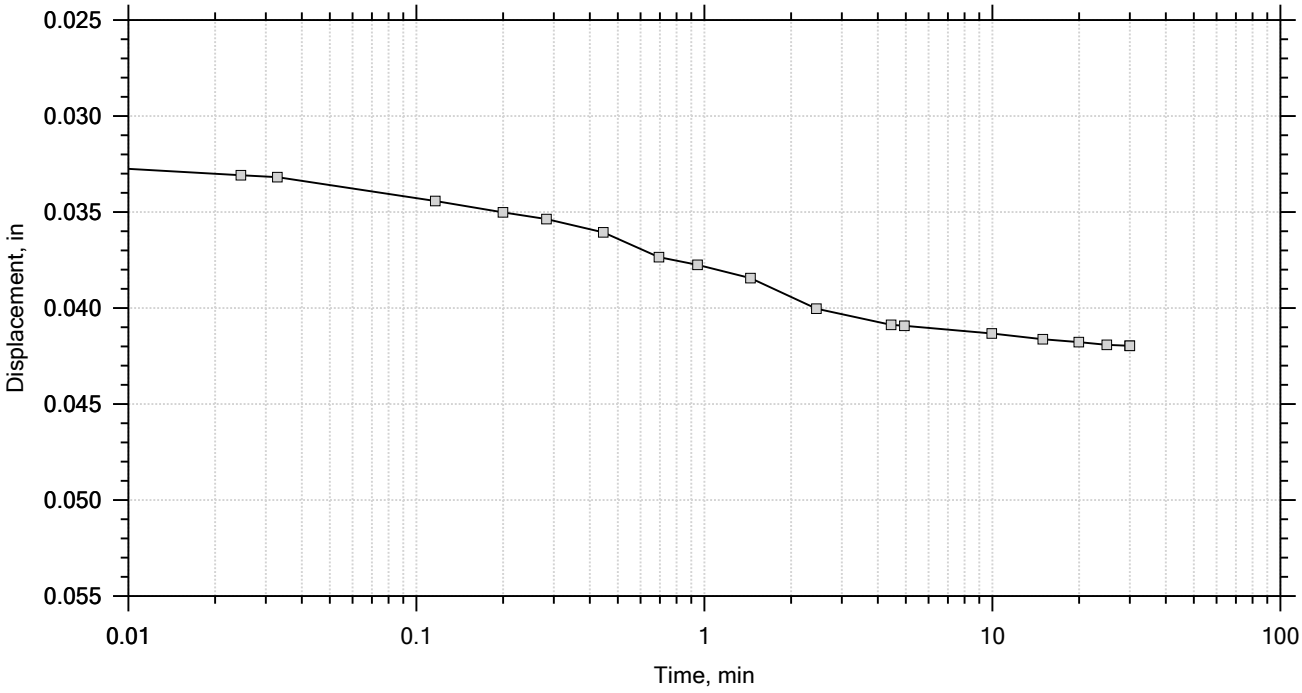


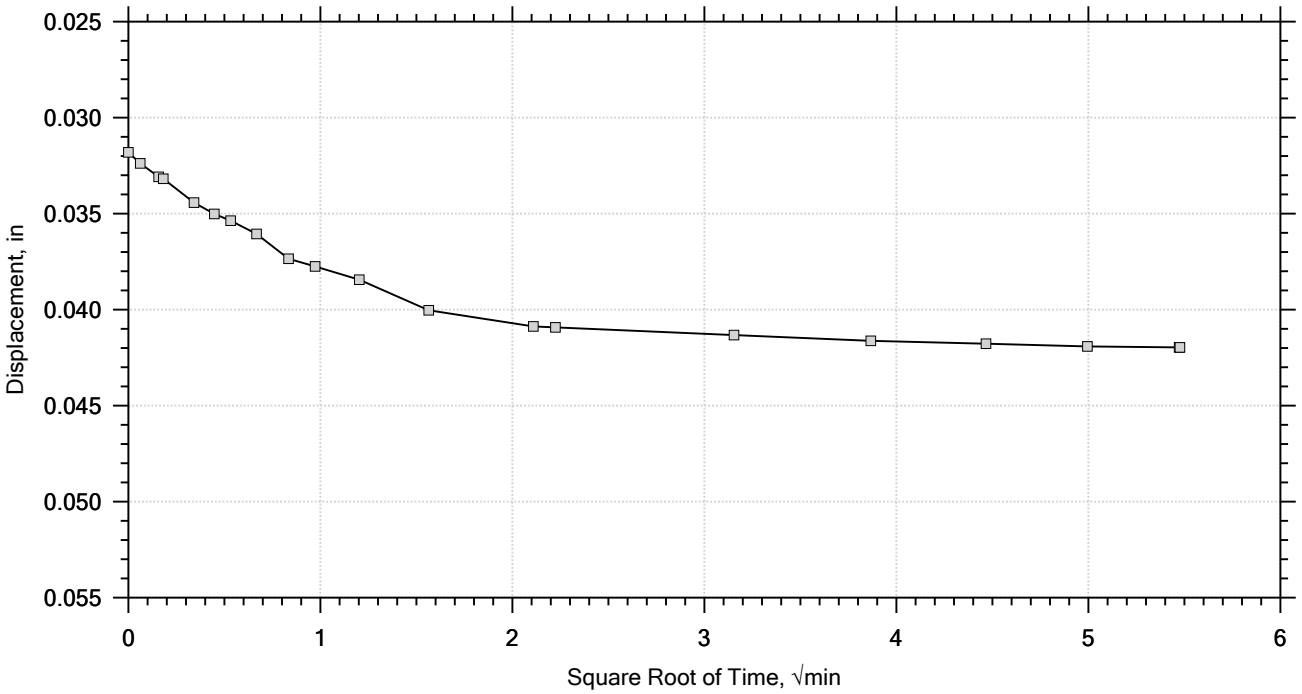
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-5	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1030	Test Date: 07/27/2018	Depth: 8.0' - 10.3'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-6(10)) LL: 40 PL: 24 PI: 16 %#200 Finer: 70.4		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 12
Constant Load Step
Stress: 0.5 tsf



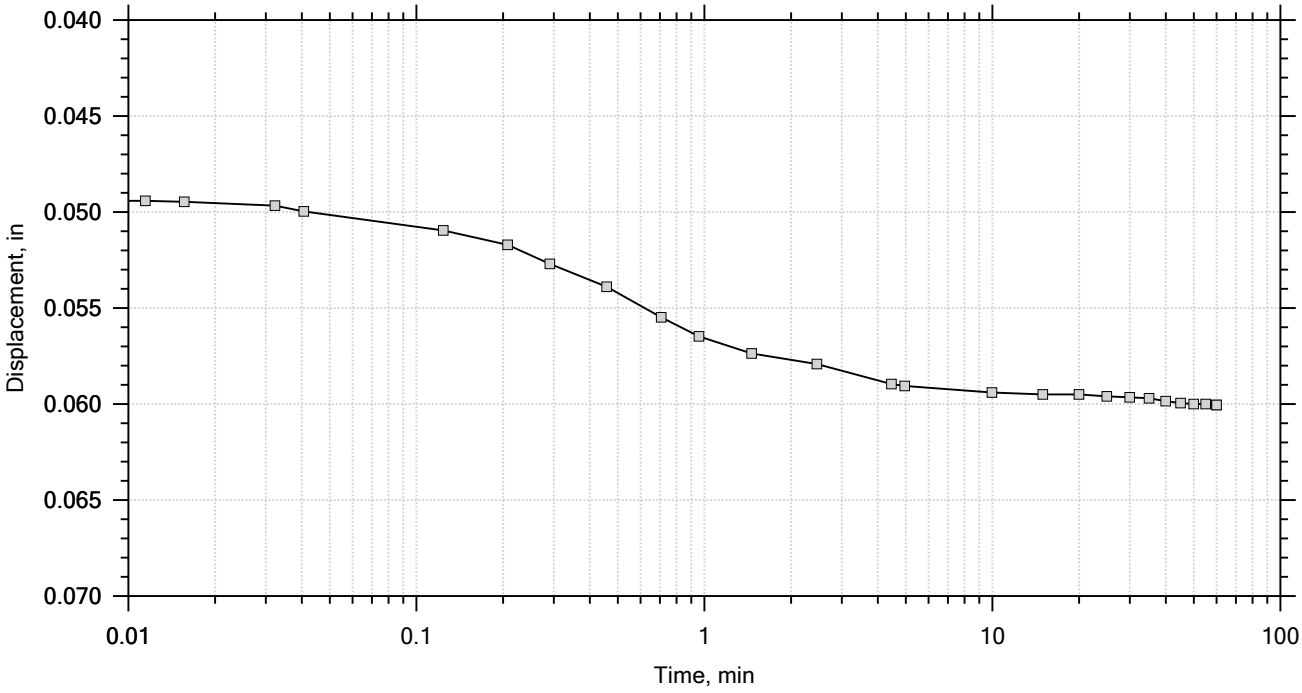


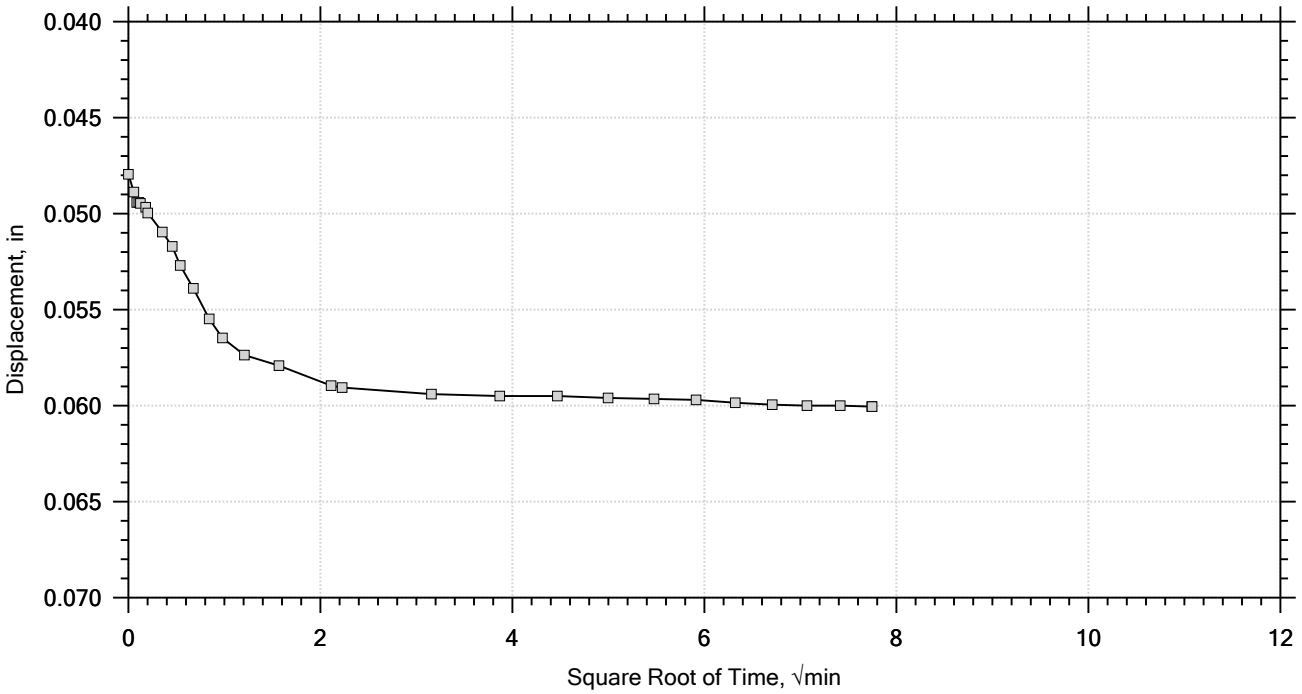
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-5	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1030	Test Date: 07/27/2018	Depth: 8.0' - 10.3'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-6(10)) LL: 40 PL: 24 PI: 16 %#200 Finer: 70.4		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 12
Constant Load Step
Stress: 1 tsf



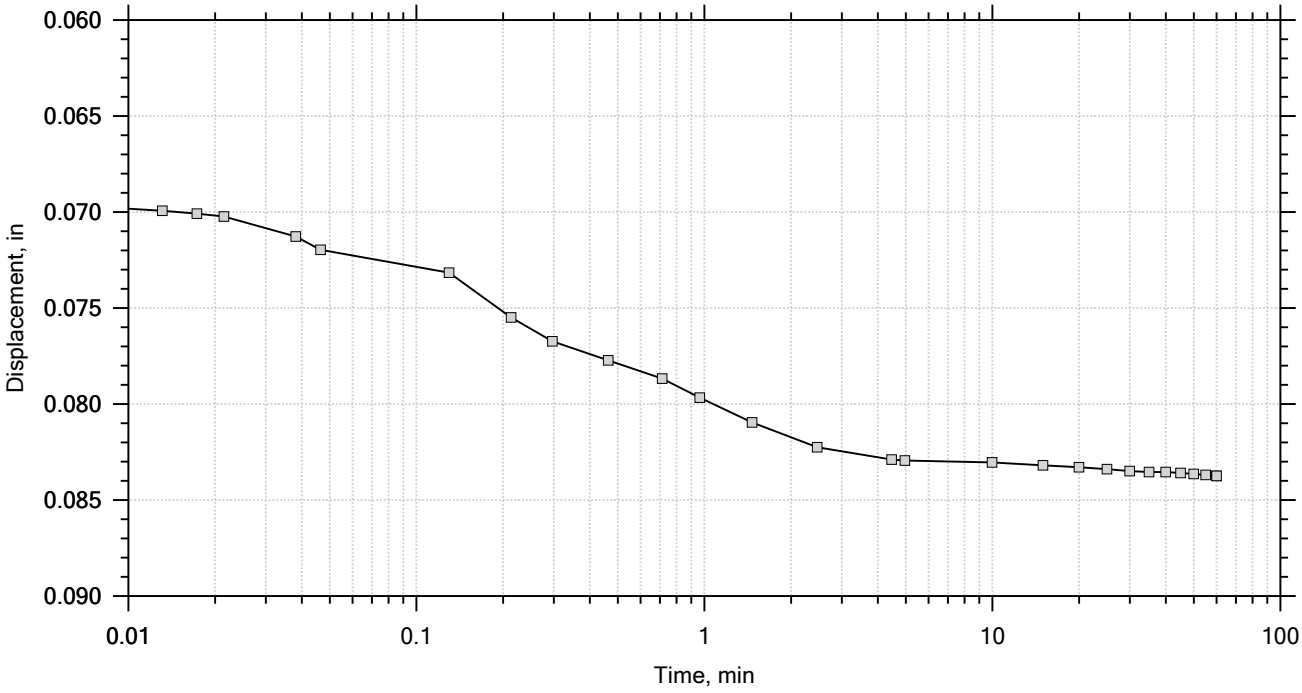


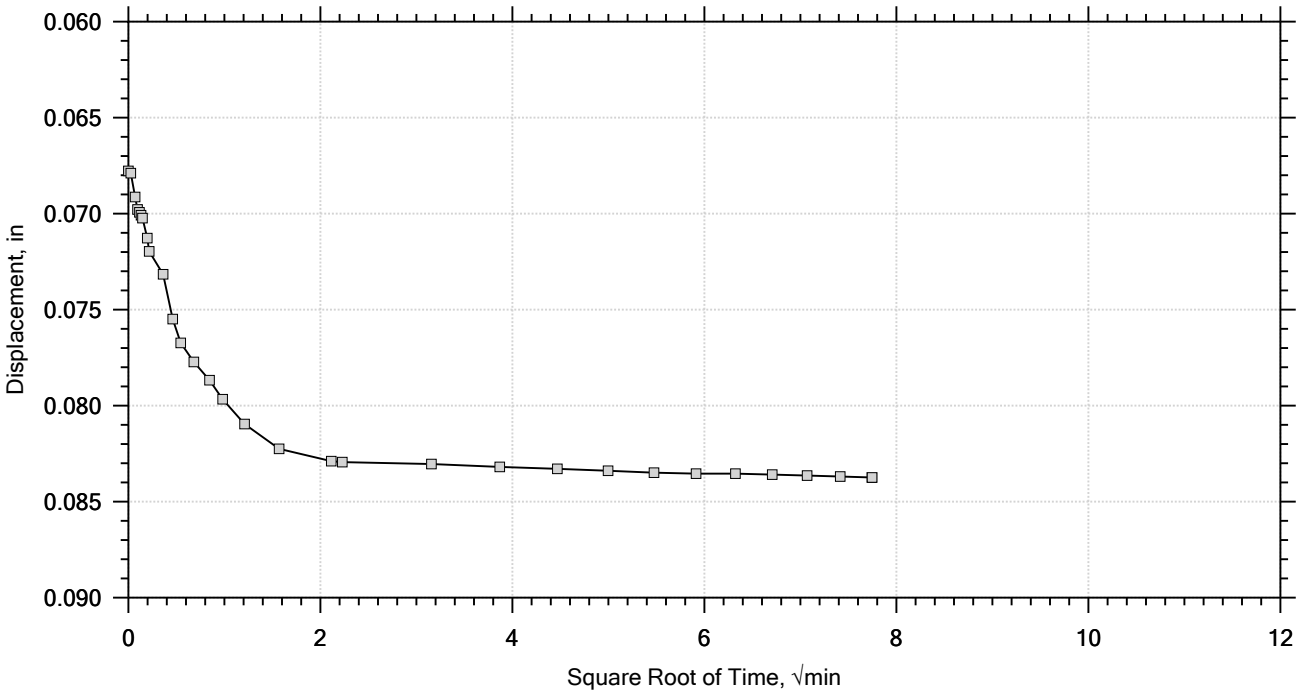
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-5	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1030	Test Date: 07/27/2018	Depth: 8.0' - 10.3'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-6(10)) LL: 40 PL: 24 PI: 16 %#200 Finer: 70.4		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 12
Constant Load Step
Stress: 2 tsf



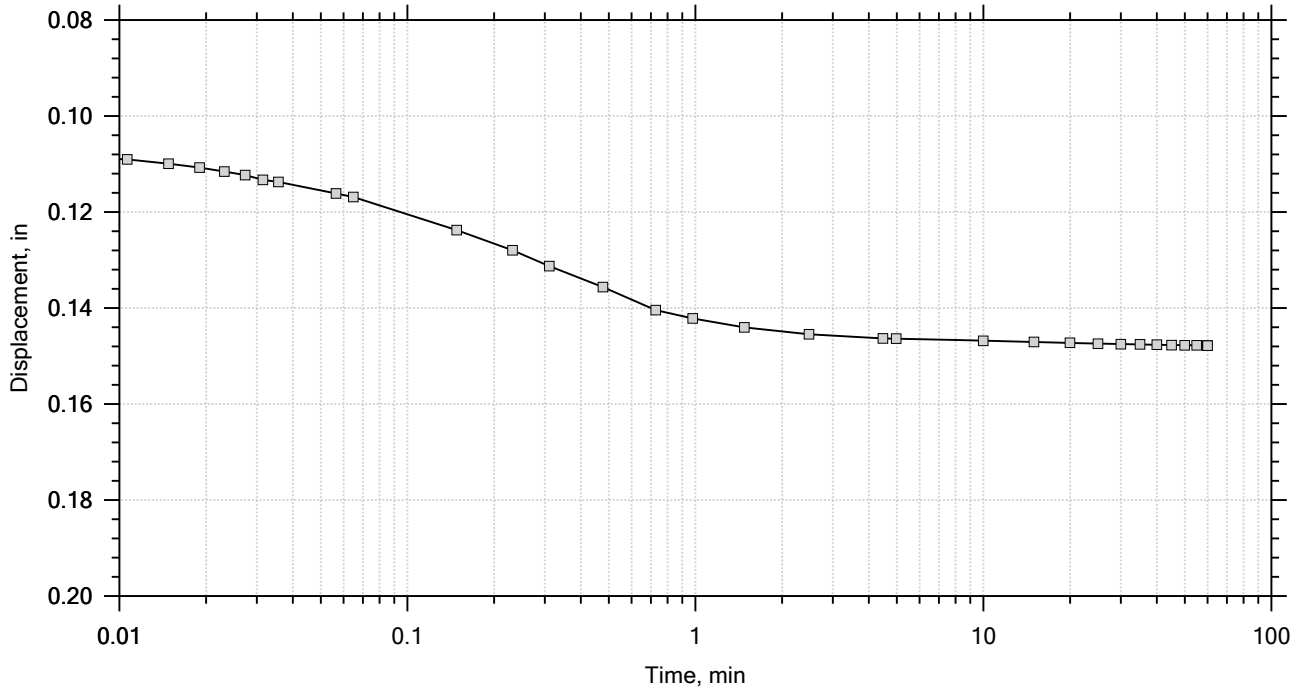


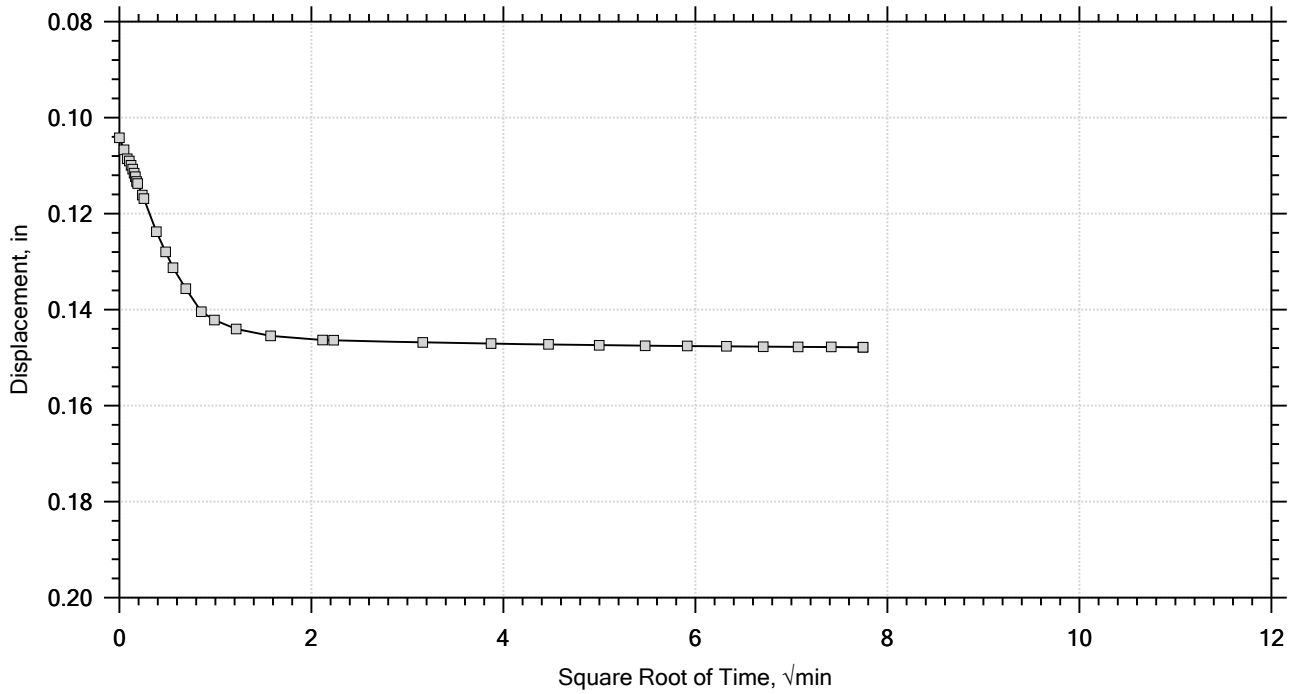
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-5	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1030	Test Date: 07/27/2018	Depth: 8.0' - 10.3'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-6(10)) LL: 40 PL: 24 PI: 16 %#200 Finer: 70.4		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 12
Constant Load Step
Stress: 8 tsf



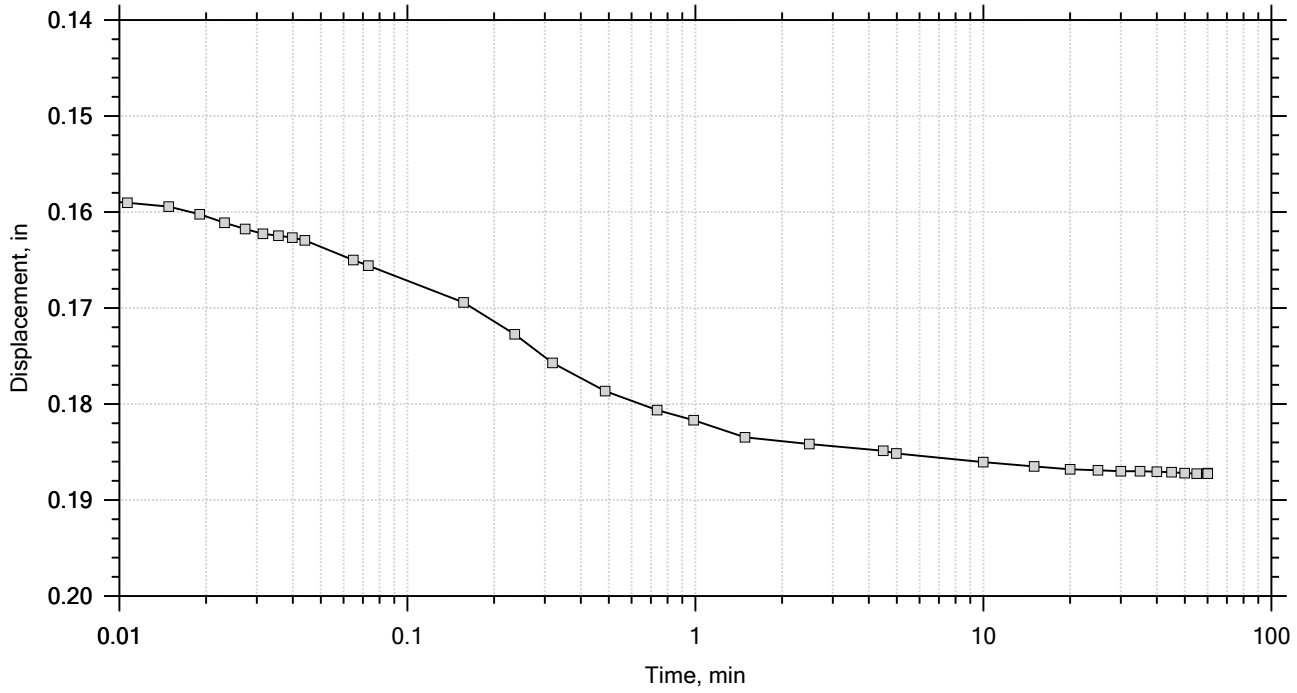


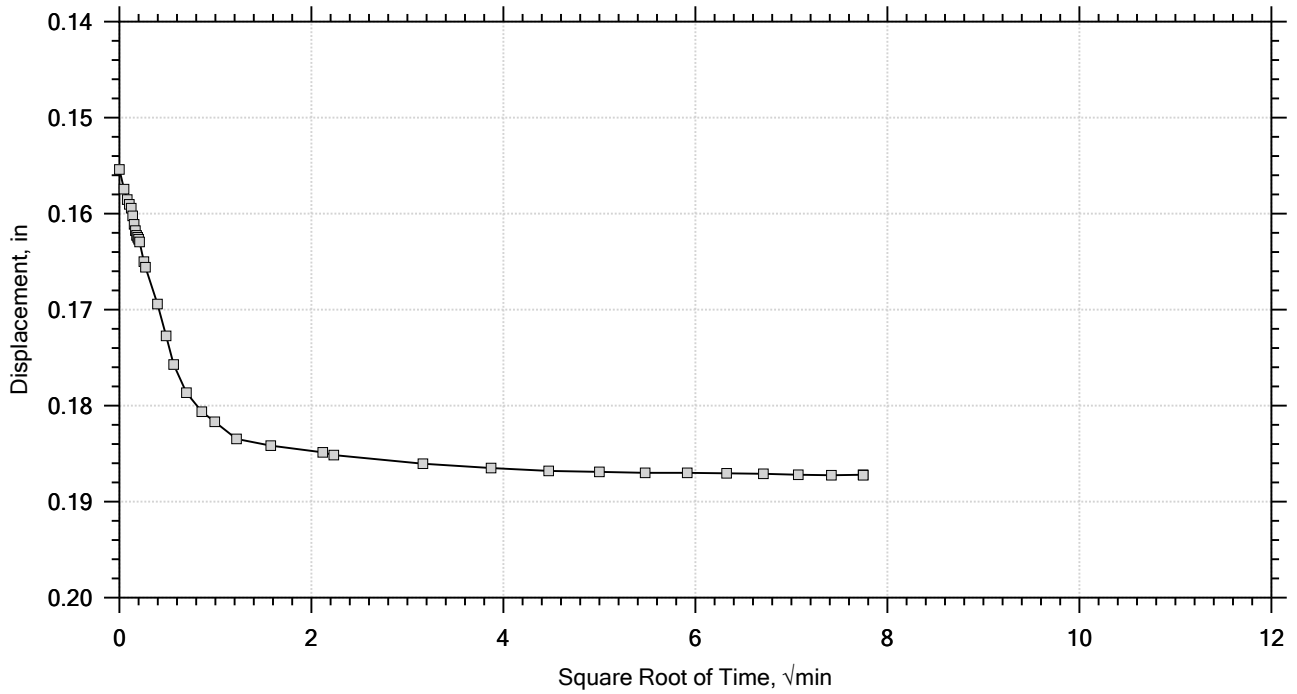
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-5	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1030	Test Date: 07/27/2018	Depth: 8.0' - 10.3'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-6(10)) LL: 40 PL: 24 PI: 16 %#200 Finer: 70.4		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 12
Constant Load Step
Stress: 16 tsf



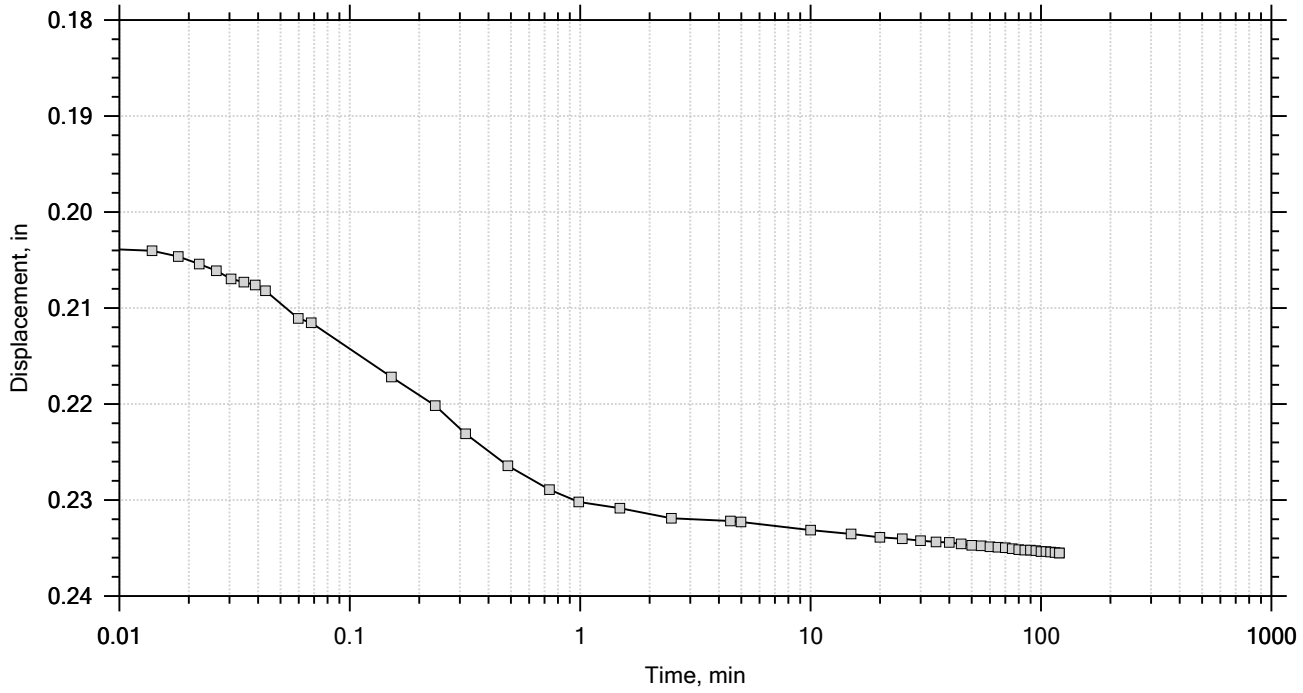


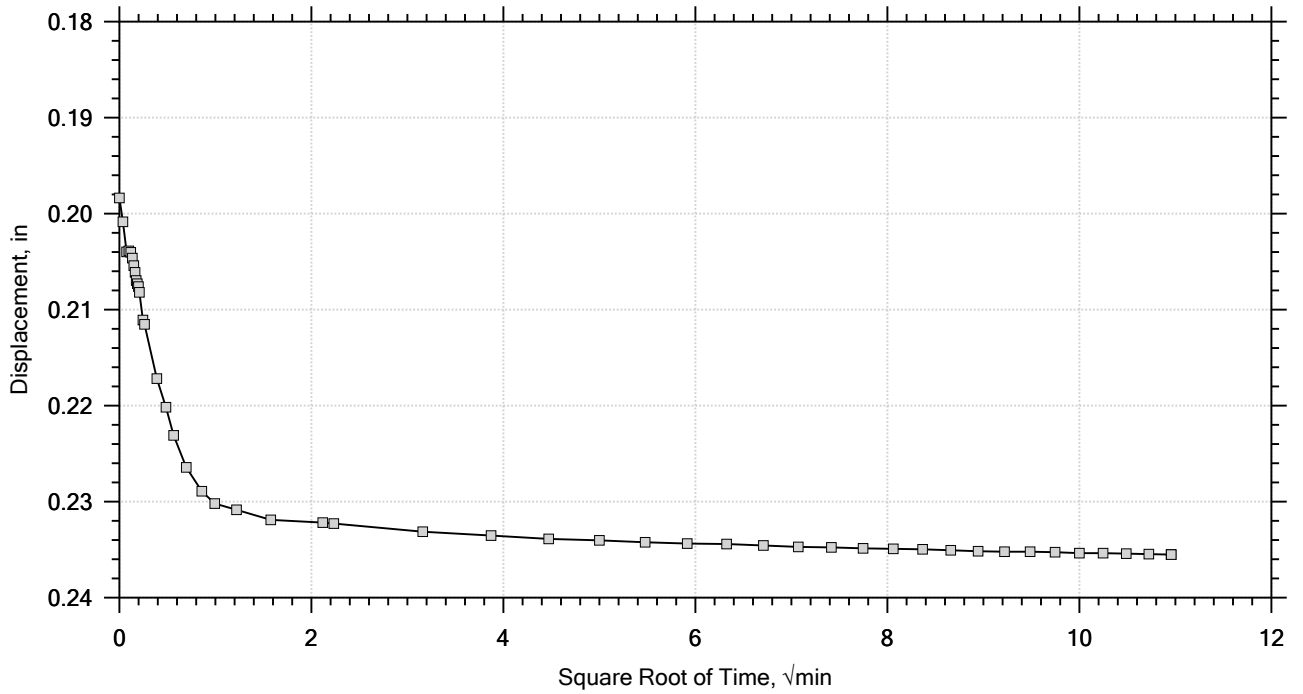
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-5	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1030	Test Date: 07/27/2018	Depth: 8.0' - 10.3'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-6(10)) LL: 40 PL: 24 PI: 16 %#200 Finer: 70.4		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 12
Constant Load Step
Stress: 32 tsf



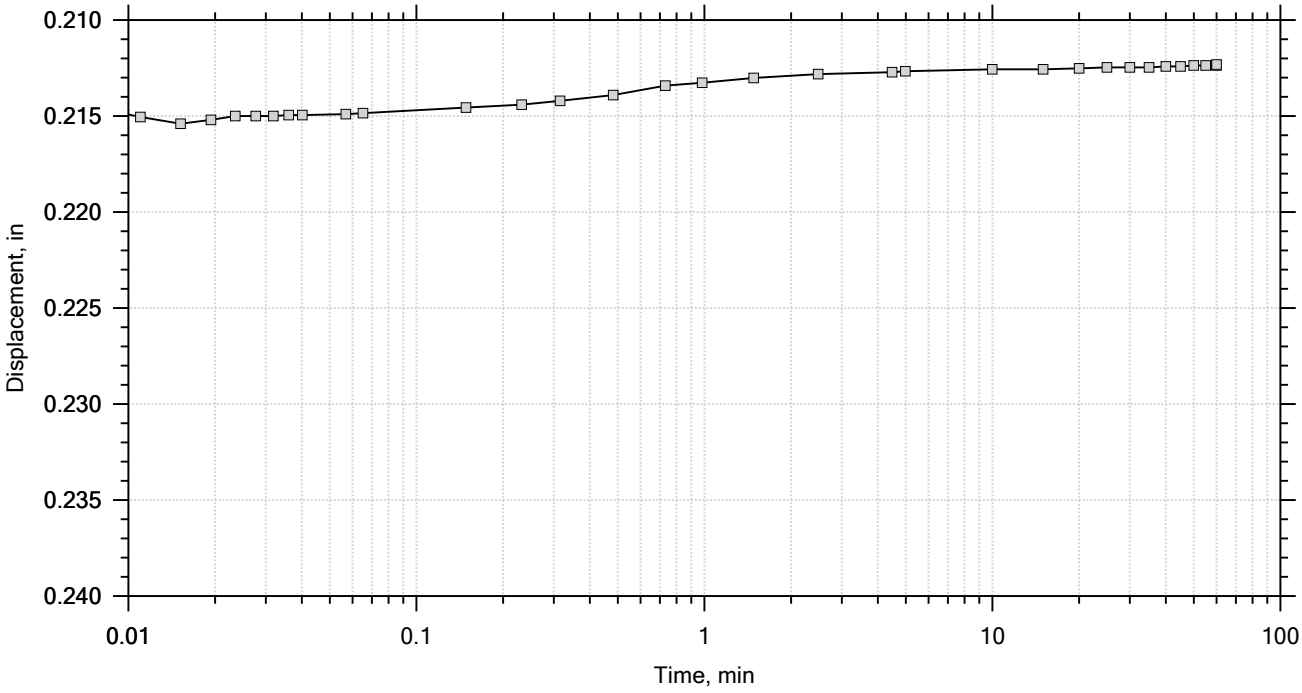


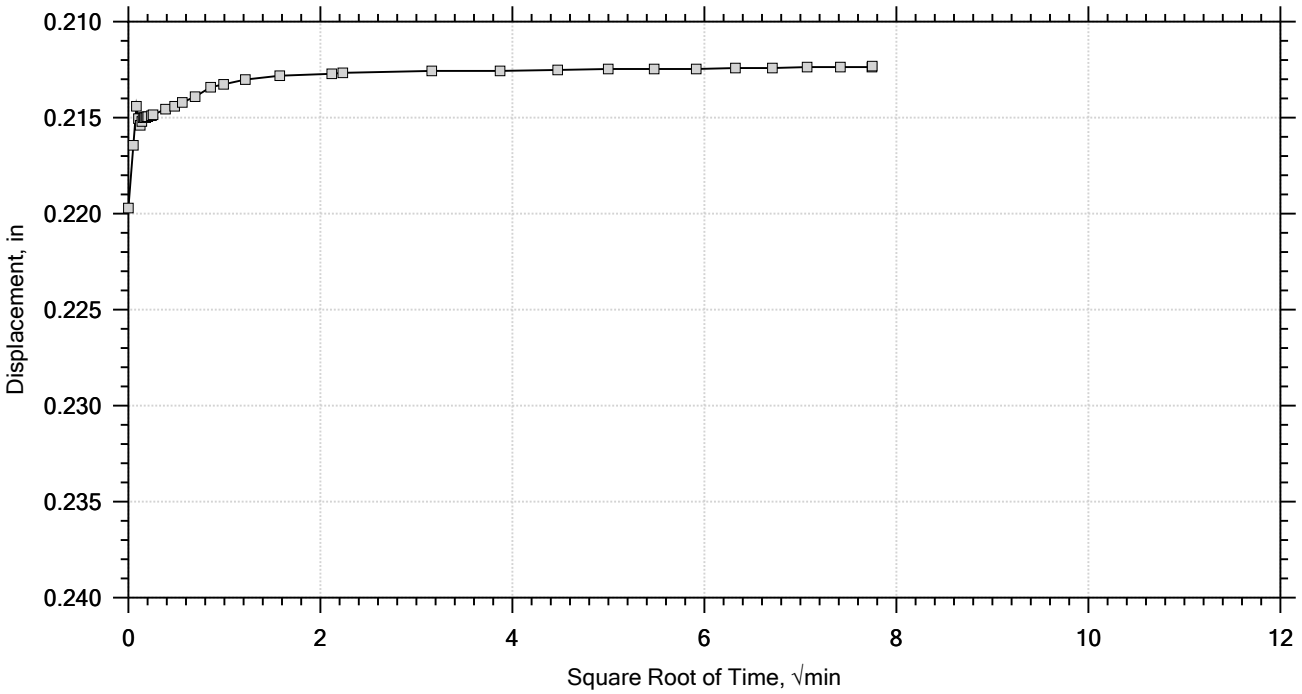
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-5	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1030	Test Date: 07/27/2018	Depth: 8.0' - 10.3'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-6(10)) LL: 40 PL: 24 PI: 16 %#200 Finer: 70.4		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 12
Constant Load Step
Stress: 8 tsf



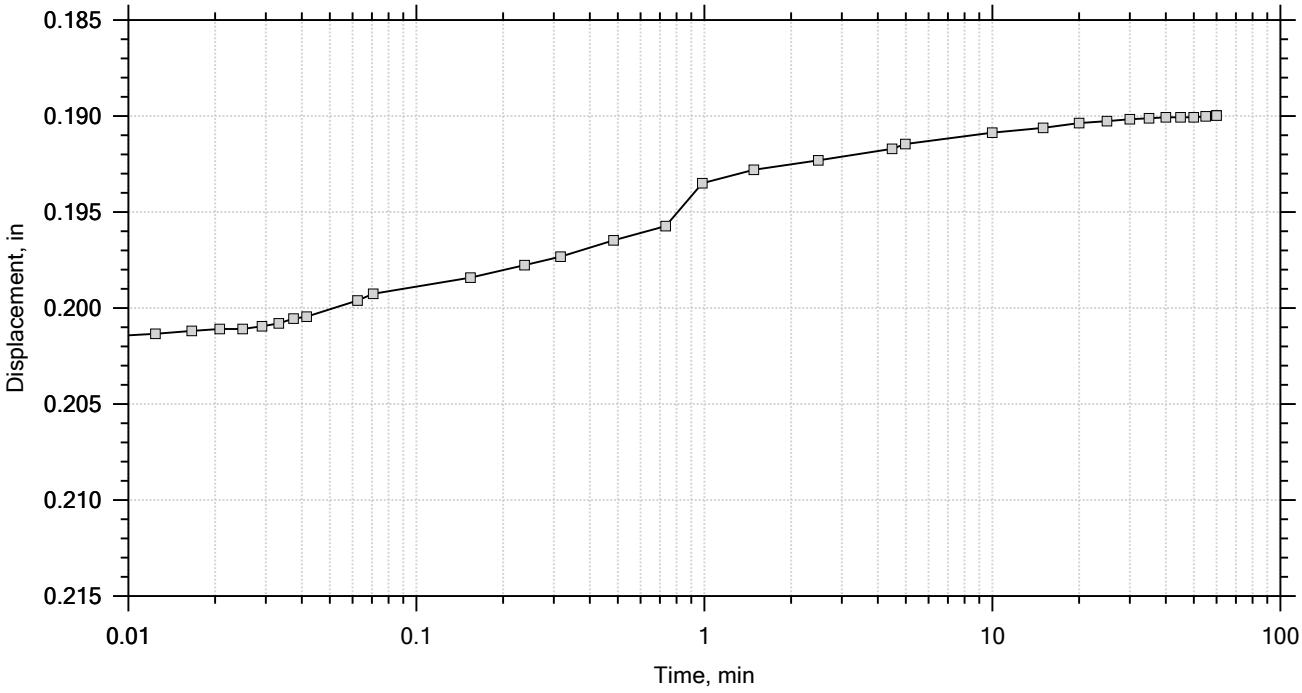


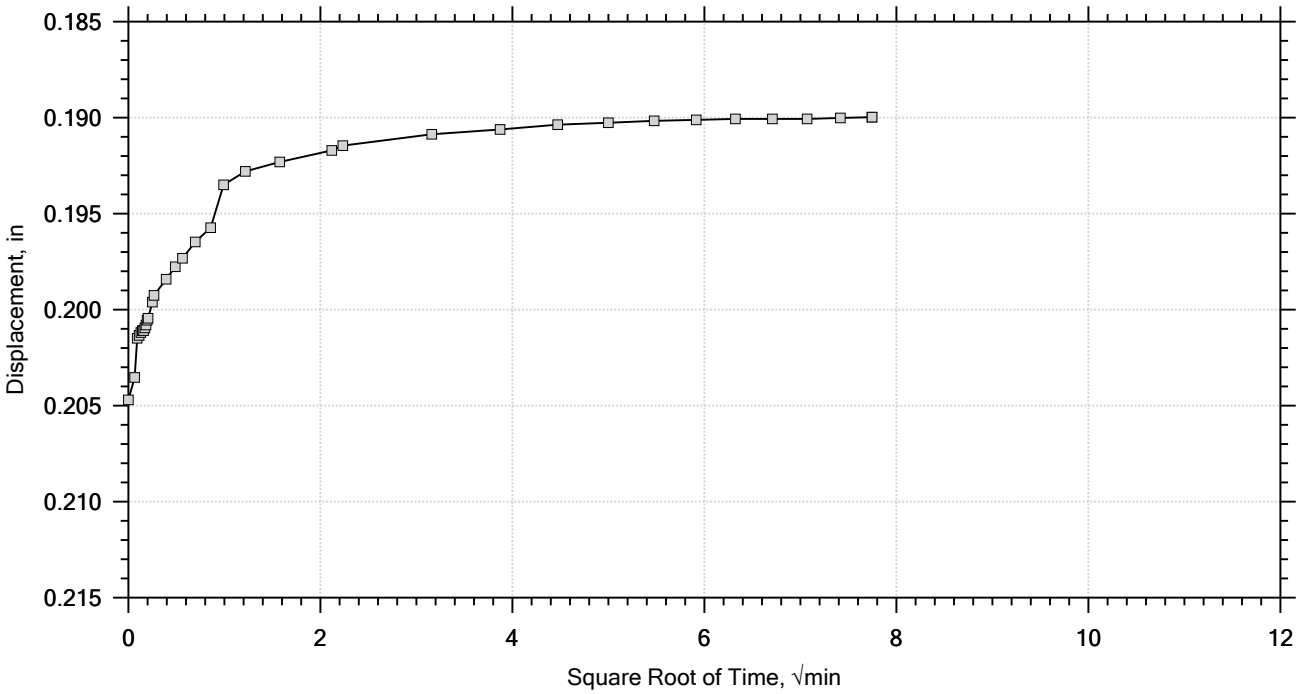
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-5	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1030	Test Date: 07/27/2018	Depth: 8.0' - 10.3'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-6(10)) LL: 40 PL: 24 PI: 16 %#200 Finer: 70.4		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 12
Constant Load Step
Stress: 2 tsf



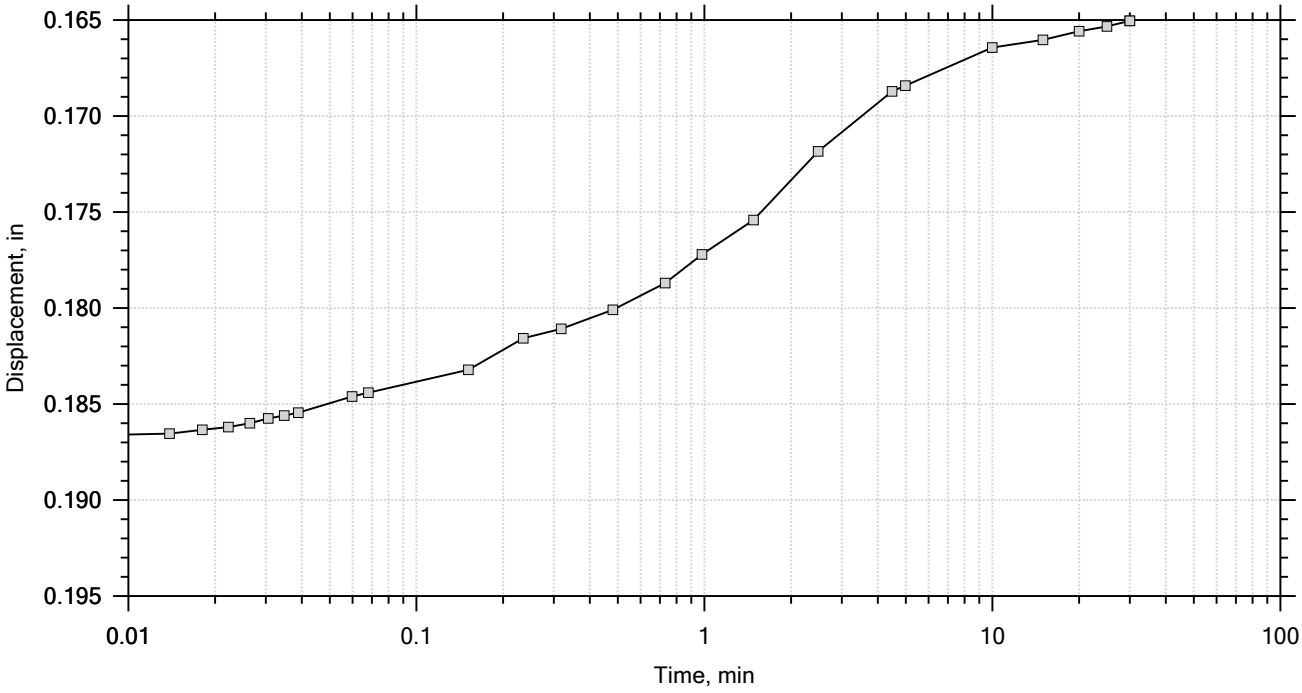


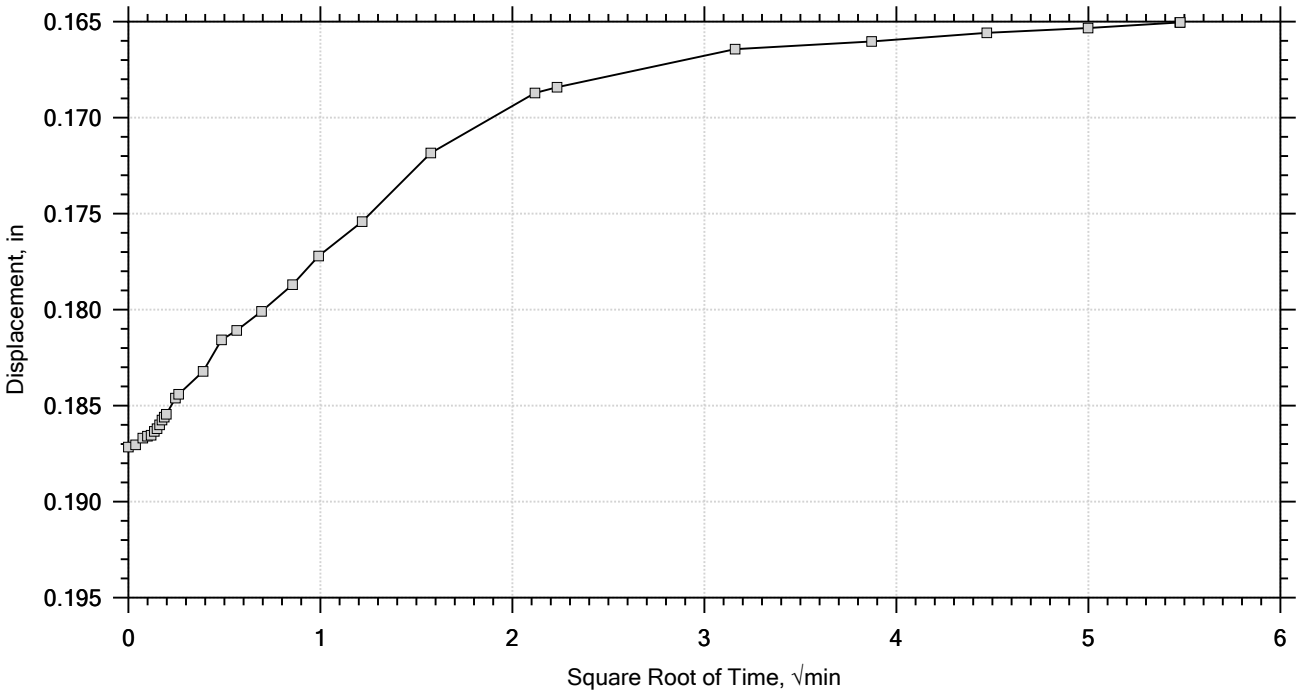
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-5	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1030	Test Date: 07/27/2018	Depth: 8.0' - 10.3'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-6(10)) LL: 40 PL: 24 PI: 16 %#200 Finer: 70.4		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 12
Constant Load Step
Stress: 0.5 tsf



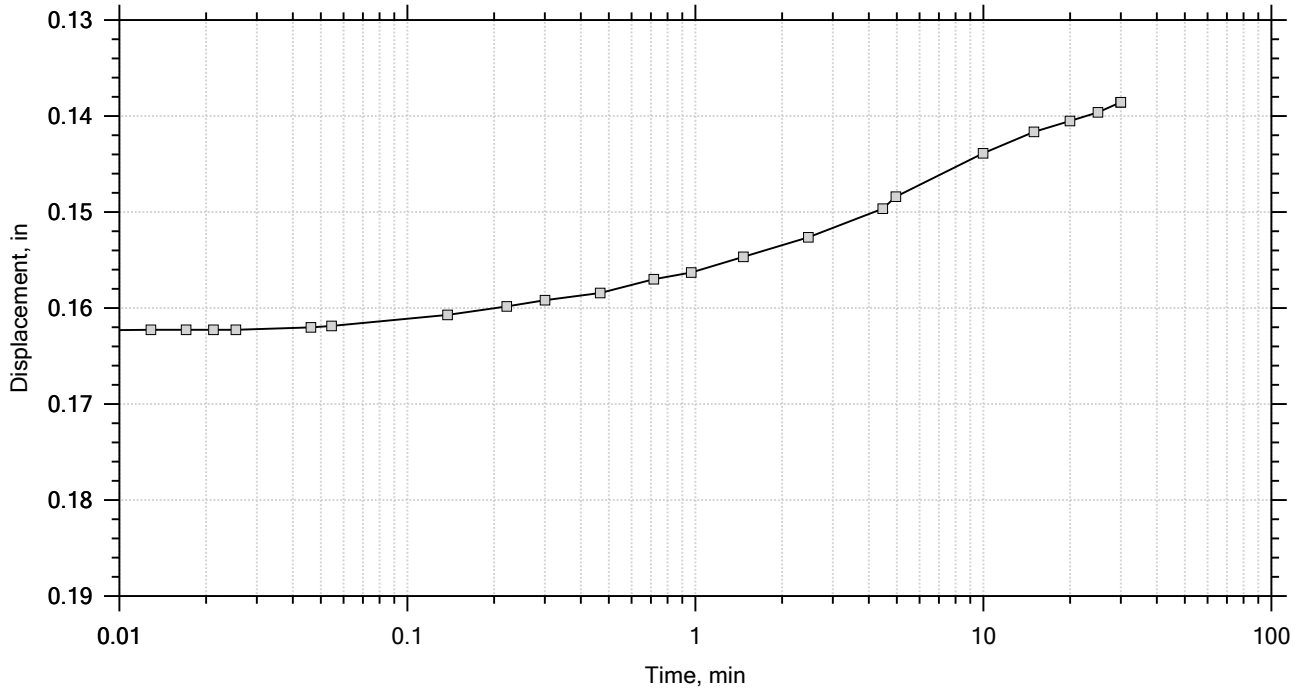


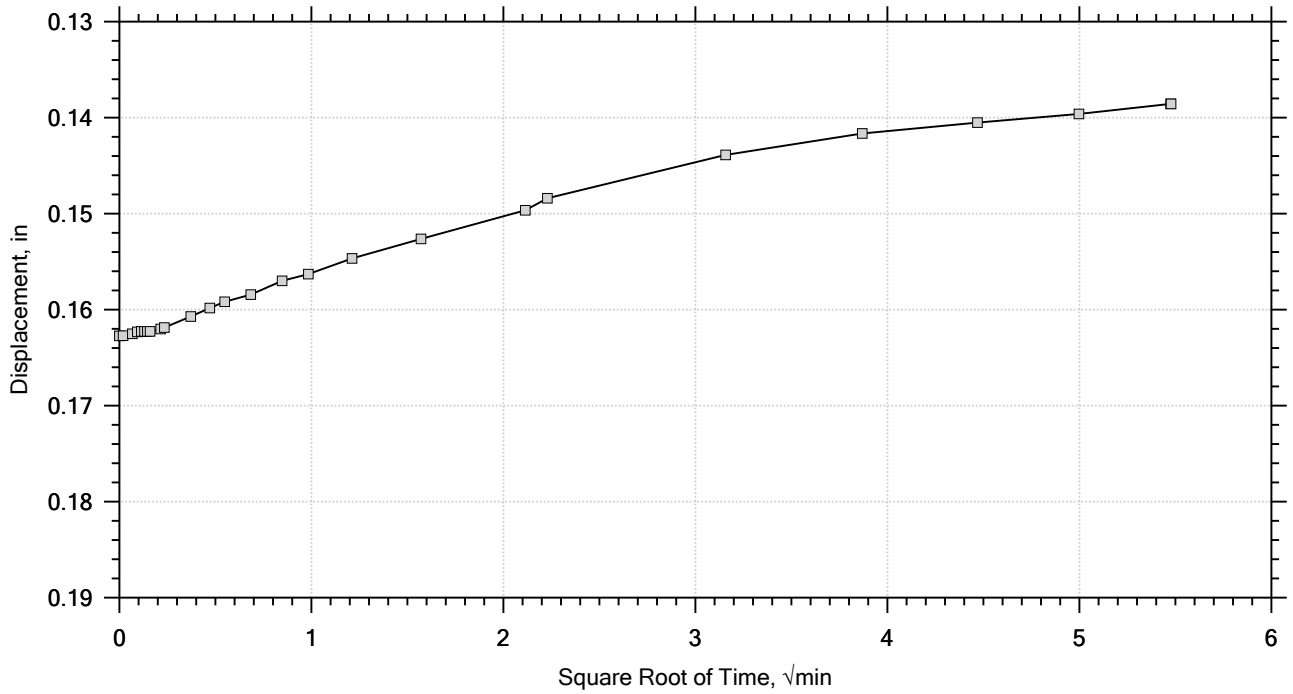
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-5	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1030	Test Date: 07/27/2018	Depth: 8.0' - 10.3'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-6(10)) LL: 40 PL: 24 PI: 16 %#200 Finer: 70.4		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 12
Constant Load Step
Stress: 0.125 tsf





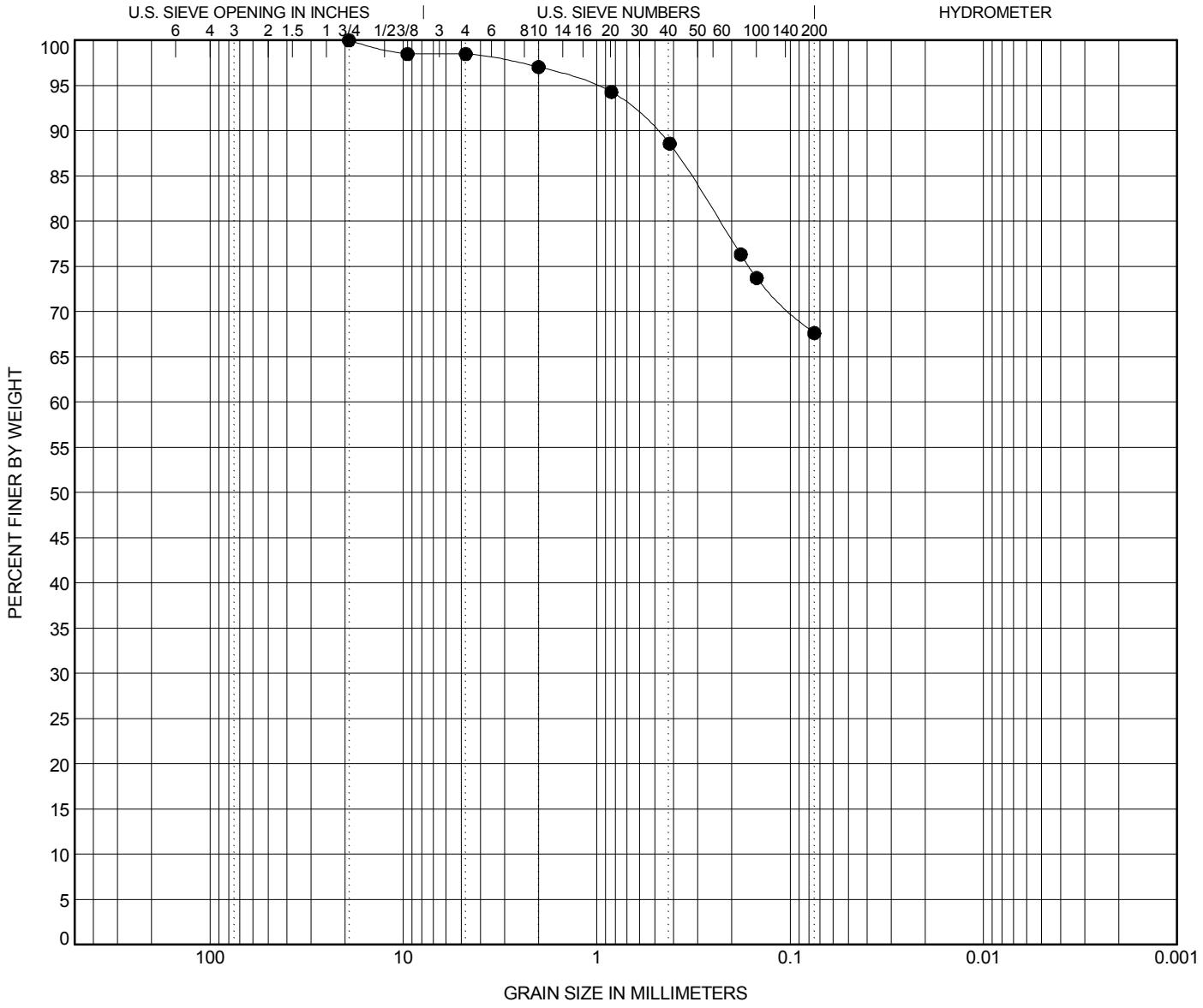
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-5	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1030	Test Date: 07/27/2018	Depth: 8.0' - 10.3'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-6(10)) LL: 40 PL: 24 PI: 16 %#200 Finer: 70.4		
Remarks:		

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
● **AP-7**	**12.3**	**Sandy Lean CLAY (CL) A-6(7)**	**32**	**19**	**13**		

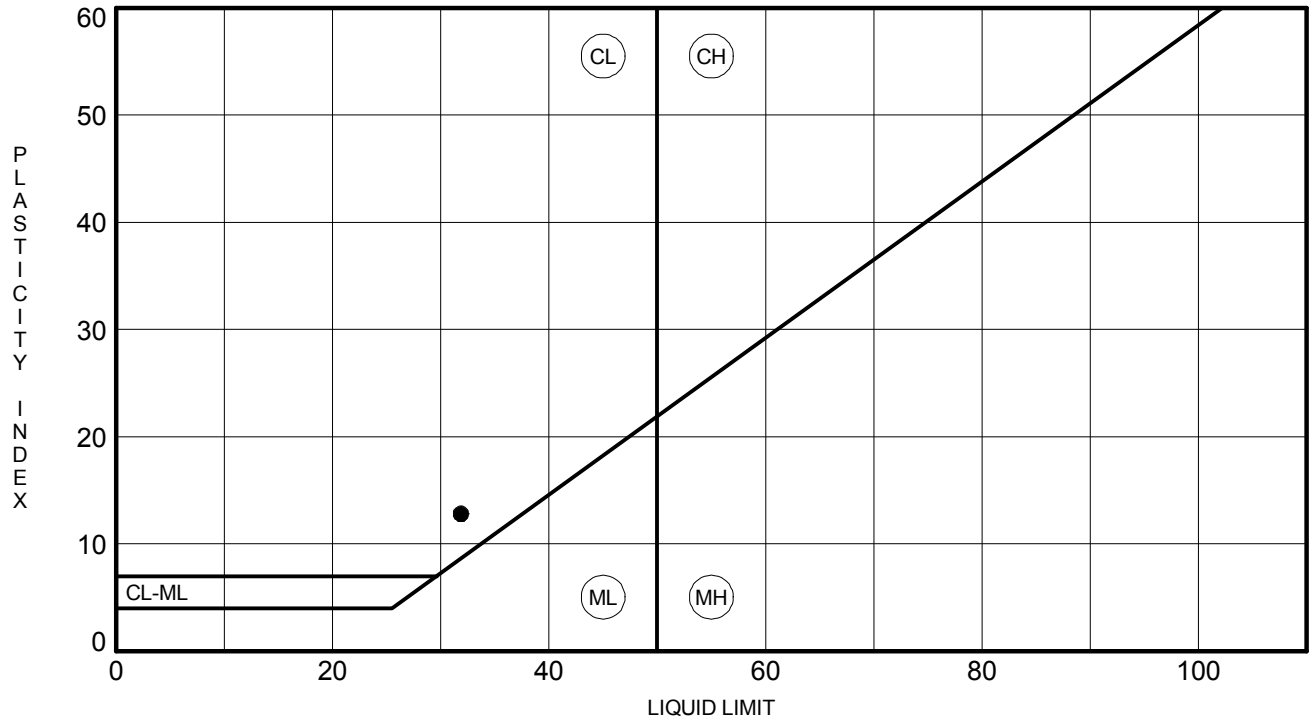
BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
● **AP-7**	**12.3**	**19.1**	**1.049**			**1.5**	**30.9**	**67.6**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 8/2/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**AP-7**	**12.3**	**32**	**19**	**13**	**68**	**Sandy Lean CLAY (CL) A-6(7)**

F&ME CONSULTANTS

3112 Devine Street
Columbia, South Carolina 29205

SPECIFIC GRAVITY OF SOILS
(ASTM D854 / AASHTO T100)

Project Name:	I-20/26/126 Corridor Improvements	**Project No.:**	G5662.01
Sample Location:	AP-7	**Sample/Boring No.:**	18-1335
Description of Soil (Group Name & Symbol):	Sandy Lean CLAY (CL/A-6(7))	**Elevation/Depth of Sample:**	10.0' - 12.5'
% of Soils Passing #4 Sieve:		**Date Received:**	7/25/2018
Material Excluded:	**Yes**	X	**No**
Description of Excluded Material:			
Method:	**A**	X	**B**
Tested By:	William Pitts	**Date Tested:**	7/26/2018

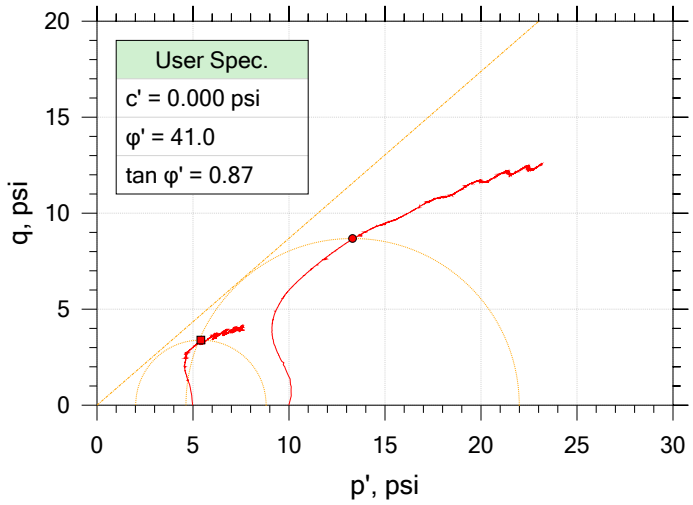
Test No.	1			
Volume of Flask at 20° C	500ml			
Method of Air Removal	Boil			
Mass Flask + Water + Soil (Wb)	813.0			
Test Temperature ° C (Tx)	25			
Mass Flask + Water (Wa)	685.1			
Container No.	C			
Mass of Container + Oven Dry Soil	388.6			
Mass of Container	188.5			
Mass of Oven Dry Soil (Wo)	200.1			
Specific Gravity @ Test Temperature **Wo/[Wo+(Wa-Wb)]**	2.771			
Specific Gravity (SG) **K x Specific Gravity @ Test Temperature**	2.768			

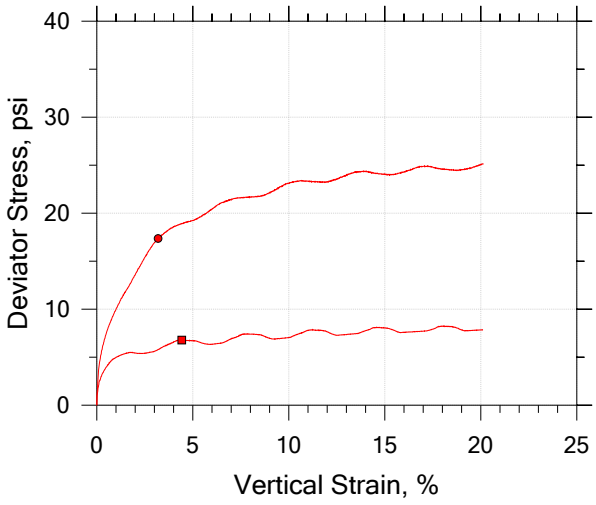
$$K = \frac{\text{Related Density of Water @ Test Temperature}}{\text{Relative Density of Water @ 20° C}}$$

Average Specific Gravity of Soils = _____

Remarks: _____

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297





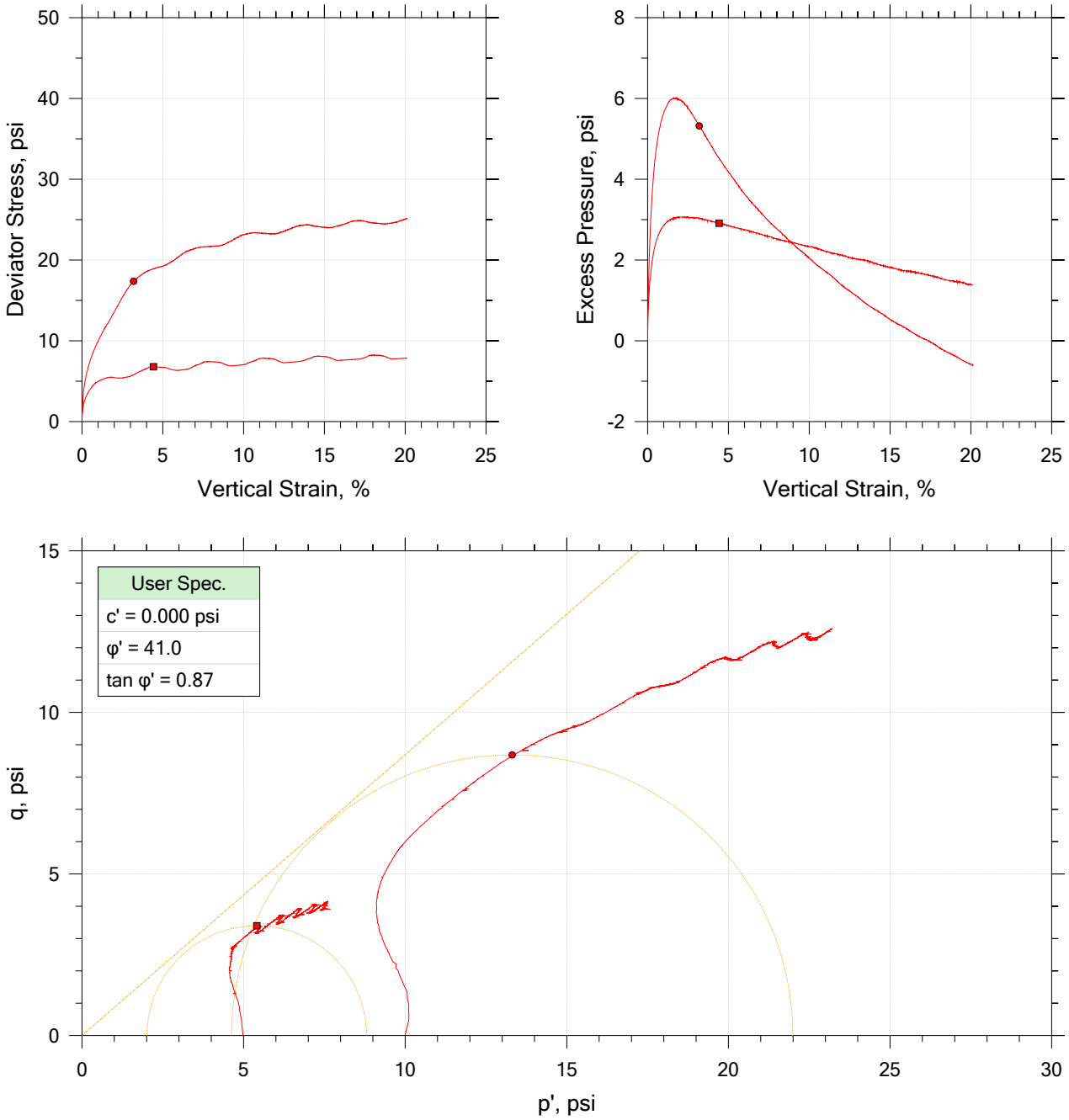
Symbol		■	●		
Sample ID		18-1335	18-1335		
Depth, ft		6' - 8.5'	6' - 8.5'		
Test Number		A	B		
Initial	Height, in	5.903	5.931		
	Diameter, in	2.849	2.857		
	Moisture Content (from Cuttings), %	13.5	13.5		
	Dry Density, pcf	112.	116.		
	Saturation (Wet Method), %	72.3	80.7		
	Void Ratio	0.500	0.448		
Final	Moisture Content, %	17.5	15.2		
	Dry Density, pcf	114.	119.		
	Cross-Sectional Area (Method A), in²	6.279	6.281		
	Saturation, %	100.0	100.0		
	Void Ratio	0.469	0.408		
	Back Pressure, %	101.0	67.99		
Vertical Effective Consolidation Stress, psi		4.966	9.960		
Horizontal Effective Consolidation Stress, psi		4.990	9.991		
Vertical Strain after Consolidation, %		0.2111	0.5319		
Volumetric Strain after Consolidation, %		0.9729	2.177		
Time to 50% Consolidation, min		0.0000	0.0000		
Shear Strength, psi		3.395	8.682		
Strain at Failure, %		4.43	3.19		
Strain Rate, %/min		0.07500	0.07500		
Deviator Stress at Failure, psi		6.790	17.36		
Effective Minor Principal Stress at Failure, psi		2.013	4.628		
Effective Major Principal Stress at Failure, psi		8.803	21.99		
B-Value		0.95	0.95		

Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-7	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1335	Test Date: 7/20/2018 - 7/21/2018	Depth: 6' - 8.5'
Test No.: AB	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-6(7))	LL: 32 PL: 19 PI: 13	%#200 Finer: 67.6
Remarks:		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297

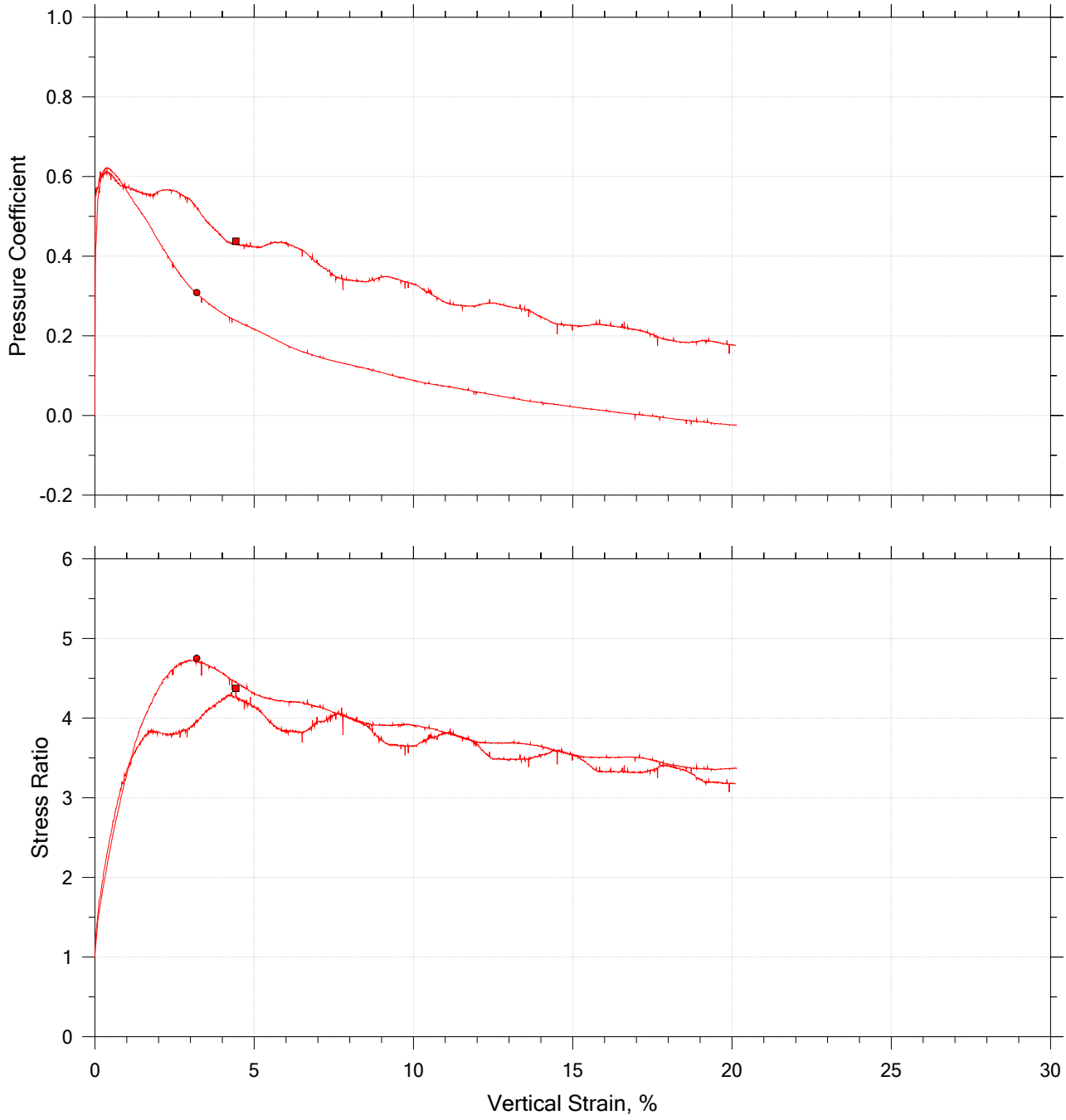


	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-1335	A	6' - 8.5'	WAP	7/20/2018	JFH/RS		18-1335_AP-26_test A.dat
●	18-1335	B	6' - 8.5'	WAP	7/21/2018	JFH/RS		18-1335_AP-26_test B.dat

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-7	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1335	Test Date: 7/20/2018 - 7/21/2018	Depth: 6' - 8.5'
Test No.: AB	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-6(7)) LL: 32 PL: 19 PI: 13 %#200 Finer: 67.6		
Remarks:		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297



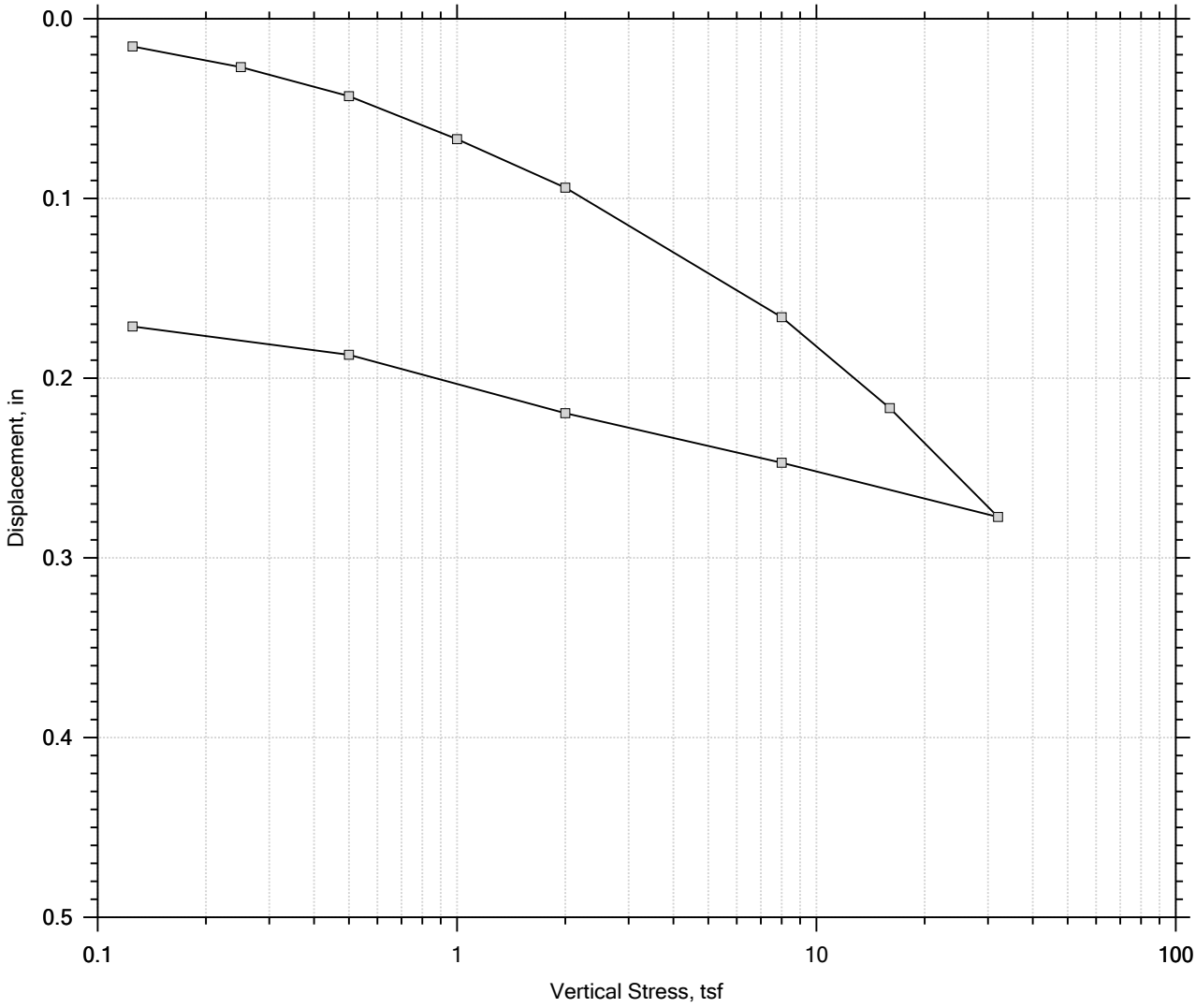
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-1335	A	6' - 8.5'	WAP	7/20/2018	JFH/RS		18-1335_AP-26_test A.dat
●	18-1335	B	6' - 8.5'	WAP	7/21/2018	JFH/RS		18-1335_AP-26_test B.dat

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-7	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1335	Test Date: 7/20/2018 - 7/21/2018	Depth: 6' - 8.5'
Test No.: AB	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-6(7)) LL: 32 PL: 19 PI: 13 %#200 Finer: 67.6		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Summary Report

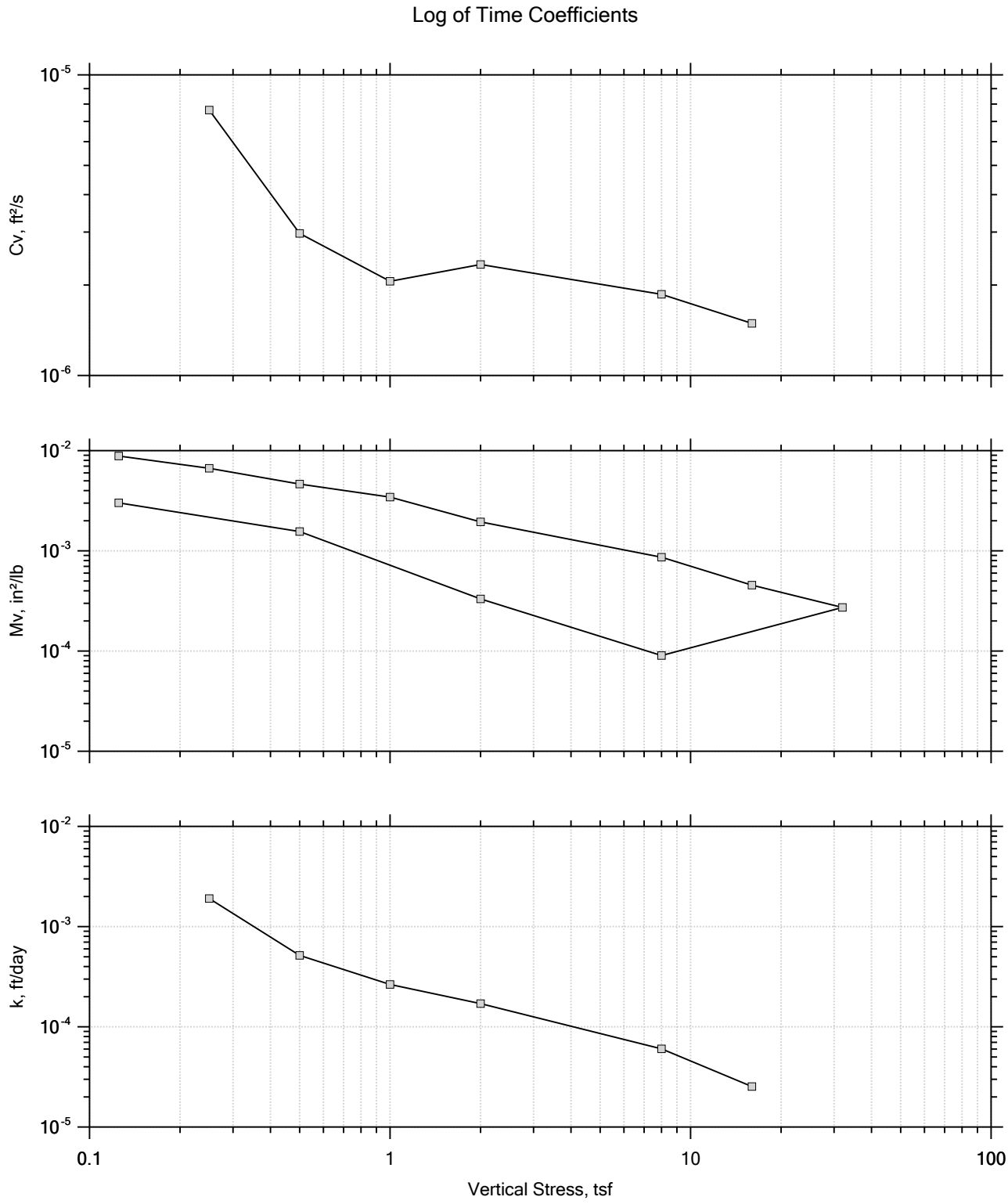


					Before Test	After Test
Current Vertical Effective Stress: 0 tsf				Water Content, %	36.25	29.55
Preconsolidation Stress: 0 tsf				Dry Unit Weight, pcf	85.956	98.236
Compression Ratio: 0				Saturation, %	99.32	107.74
Diameter: 2.5 in		Height: 1 in		Void Ratio	1.01	0.76
LL: 32	PL: 19	PI: 13	GS: 2.77			

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-7	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1335	Test Date: 07/26/2018	Depth: 10' - 12.5
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-6(7)) LL: 32 PL: 19 PI: 13 %#200 Finer: 67.6		
Remarks:		
Displacement at End of Increment		

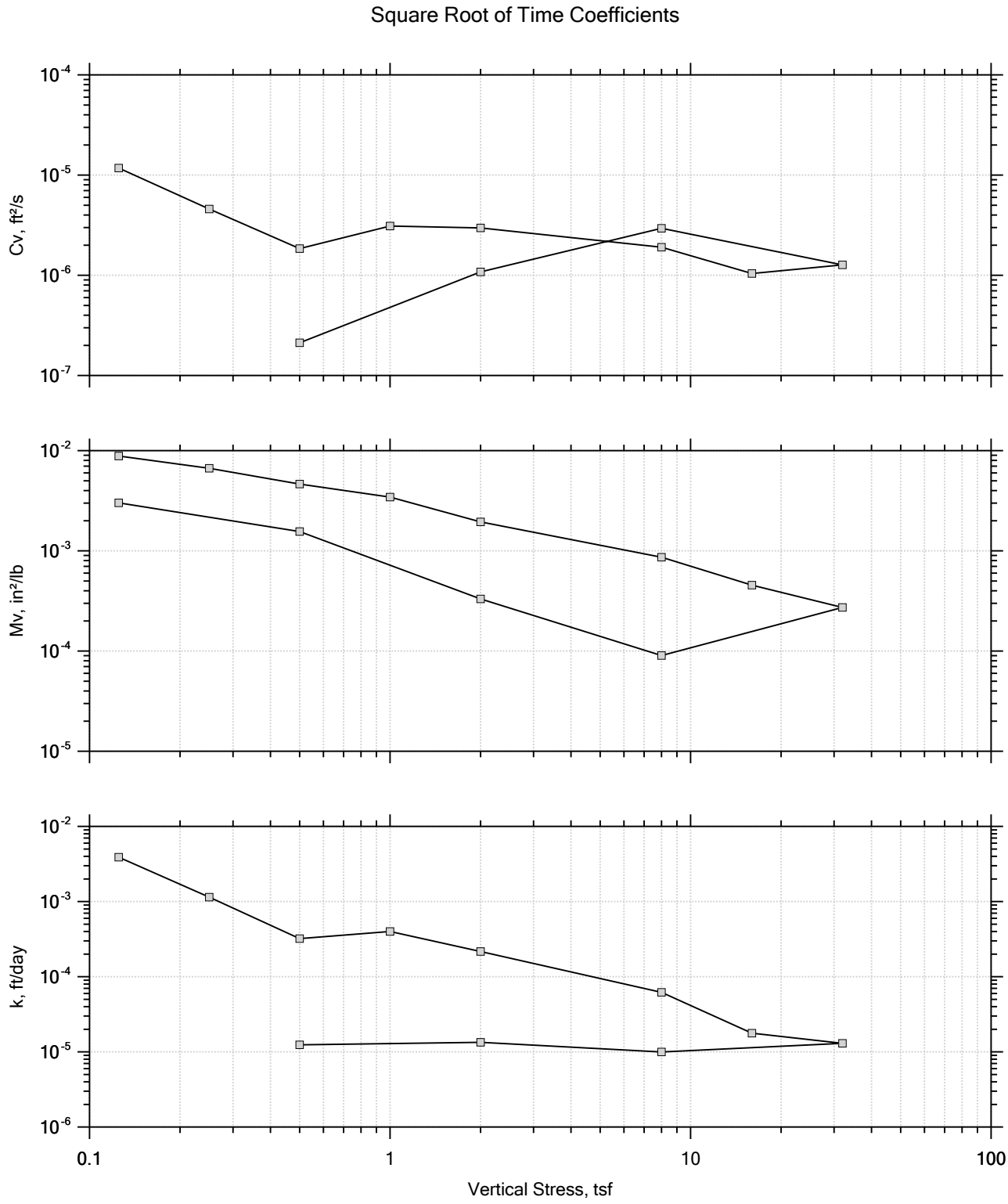
One-Dimensional Consolidation by ASTM D2435 - Method B



F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-7	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1335	Test Date: 07/26/2018	Depth: 10' - 12.5
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-6(7)) LL: 32 PL: 19 PI: 13 %#200 Finer: 67.6		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

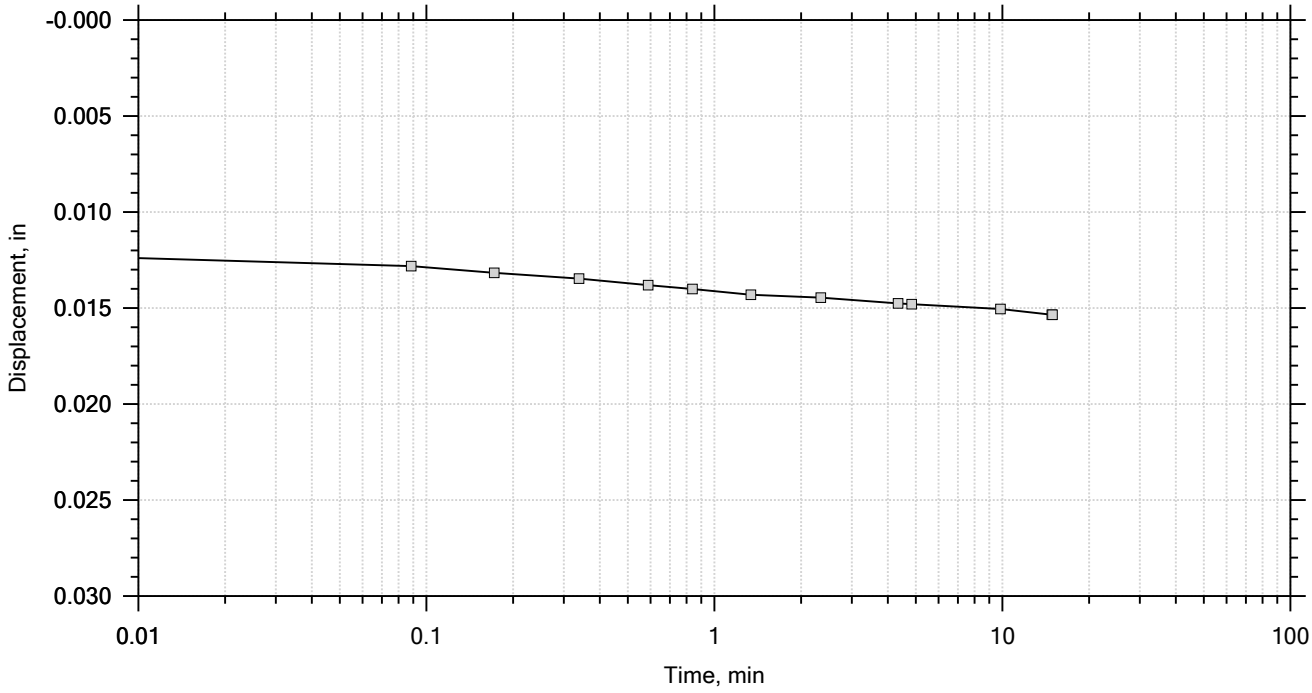


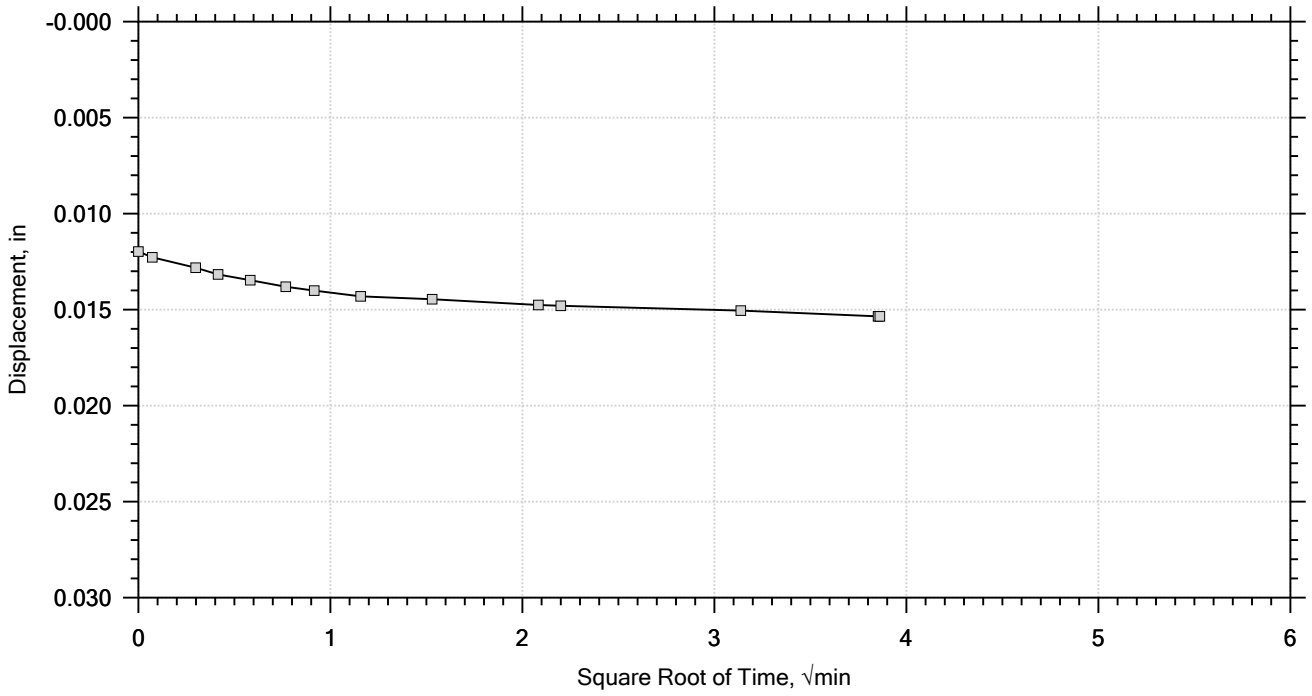
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-7	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1335	Test Date: 07/26/2018	Depth: 10' - 12.5
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-6(7)) LL: 32 PL: 19 PI: 13 %#200 Finer: 67.6		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 12
Constant Load Step
Stress: 0.125 tsf



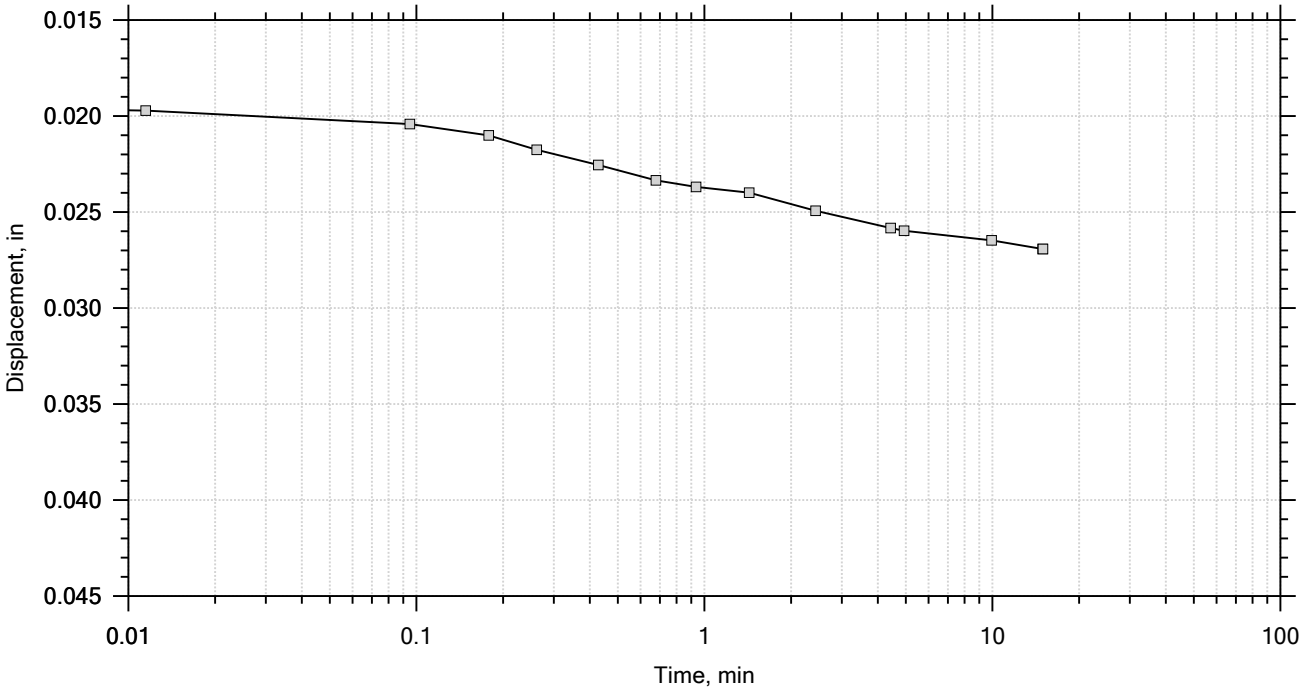


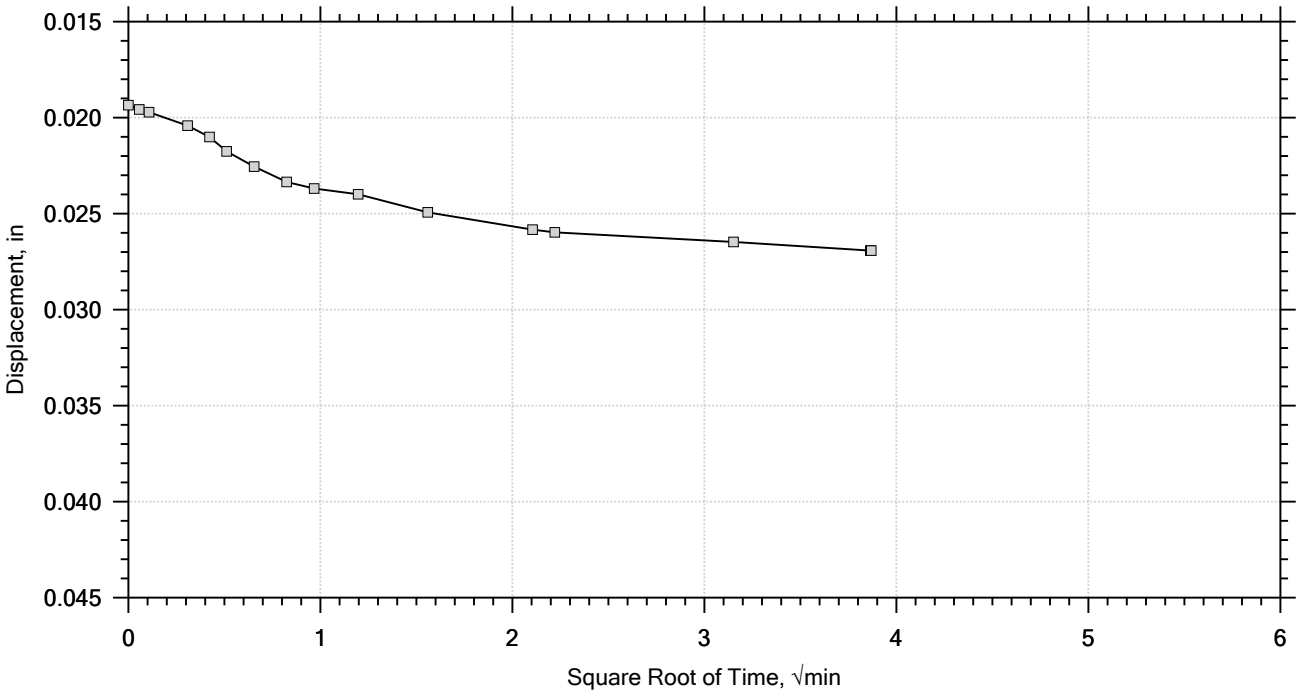
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-7	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1335	Test Date: 07/26/2018	Depth: 10' - 12.5
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-6(7)) LL: 32 PL: 19 PI: 13 %#200 Finer: 67.6		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 12
Constant Load Step
Stress: 0.25 tsf



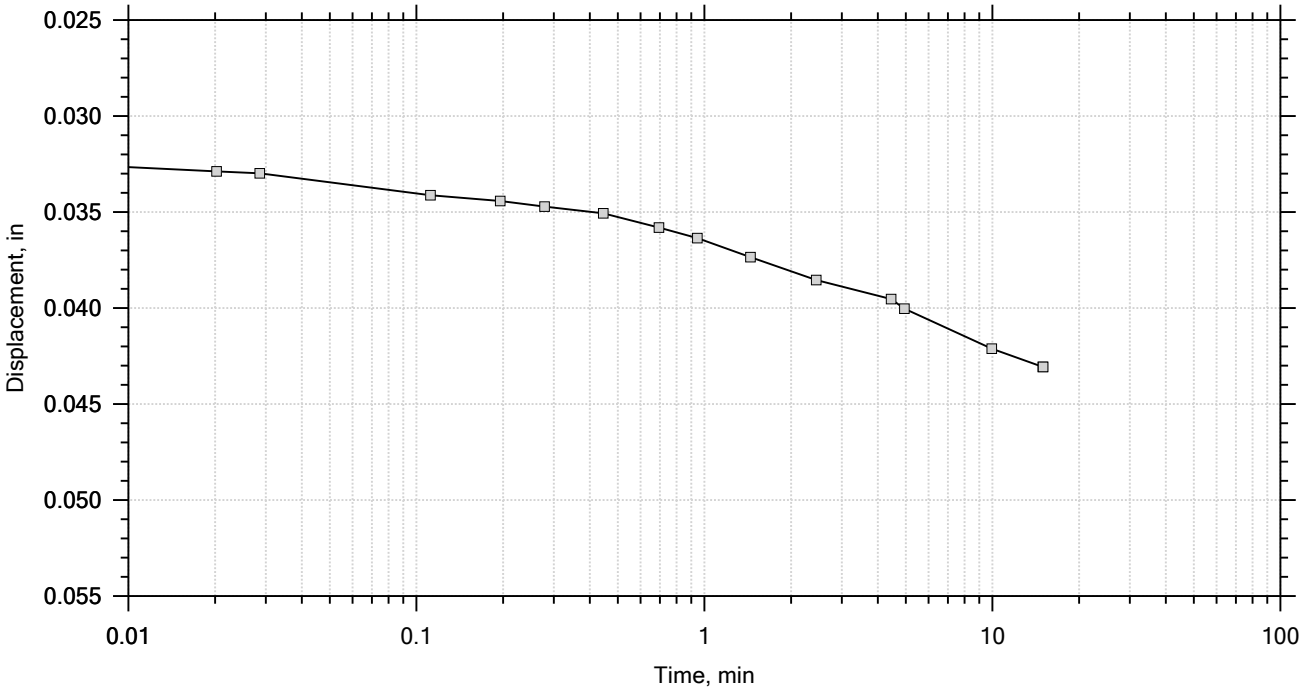


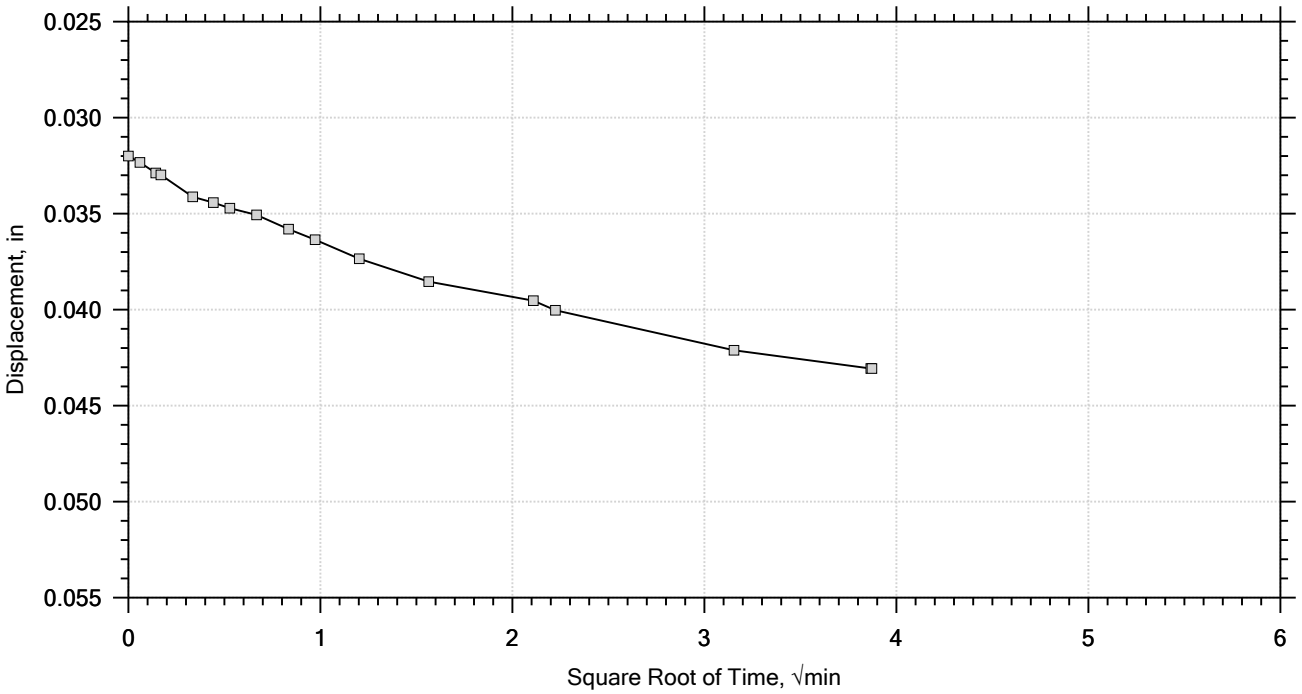
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-7	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1335	Test Date: 07/26/2018	Depth: 10' - 12.5
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-6(7)) LL: 32 PL: 19 PI: 13 %#200 Finer: 67.6		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 12
Constant Load Step
Stress: 0.5 tsf



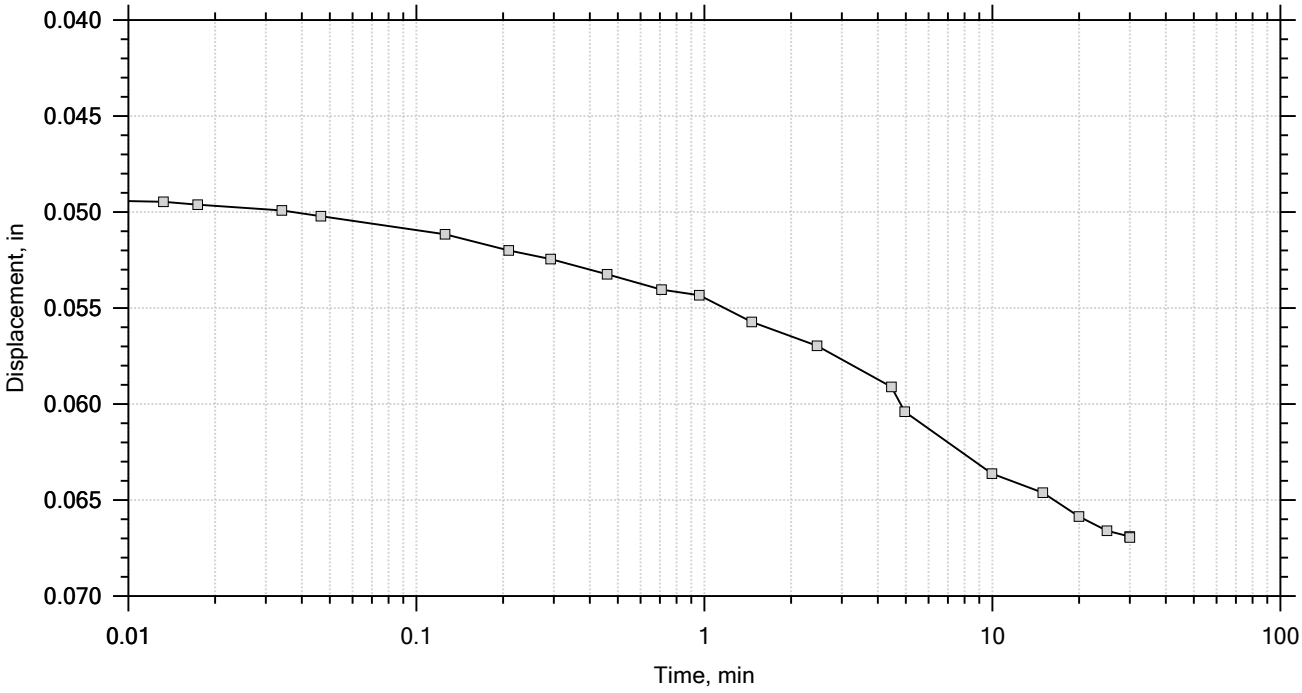


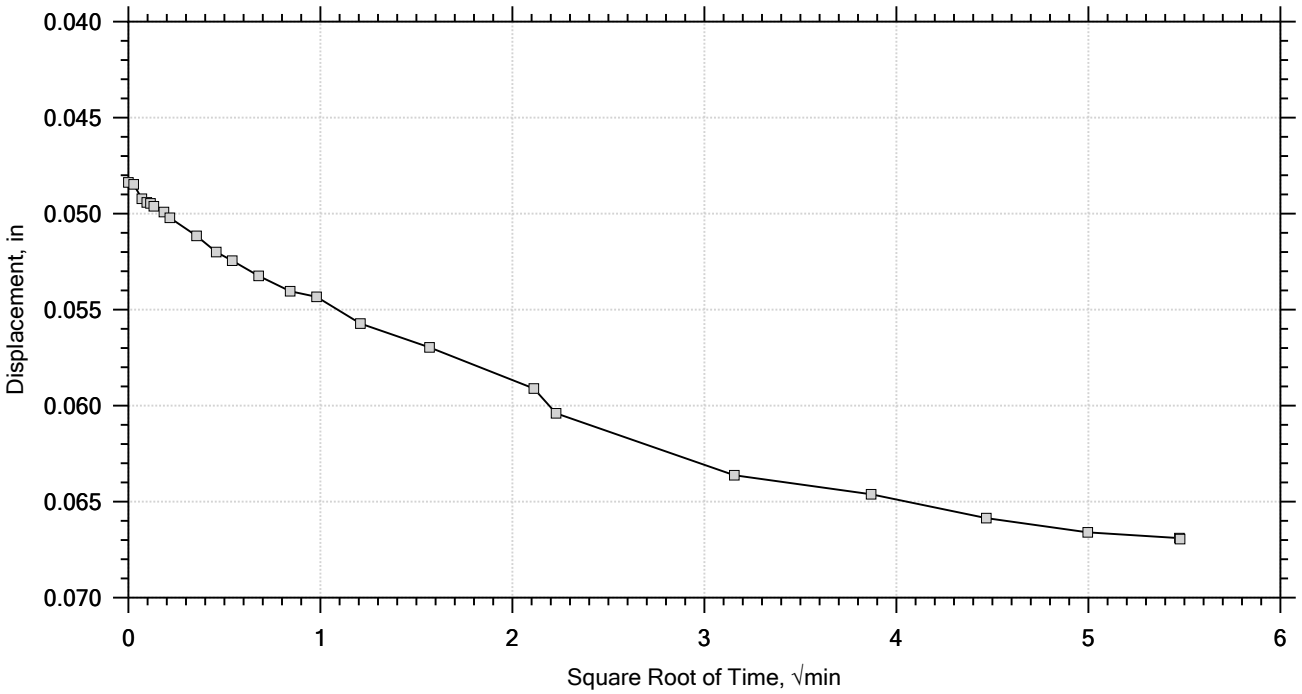
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-7	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1335	Test Date: 07/26/2018	Depth: 10' - 12.5
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-6(7)) LL: 32 PL: 19 PI: 13 %#200 Finer: 67.6		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 12
Constant Load Step
Stress: 1 tsf



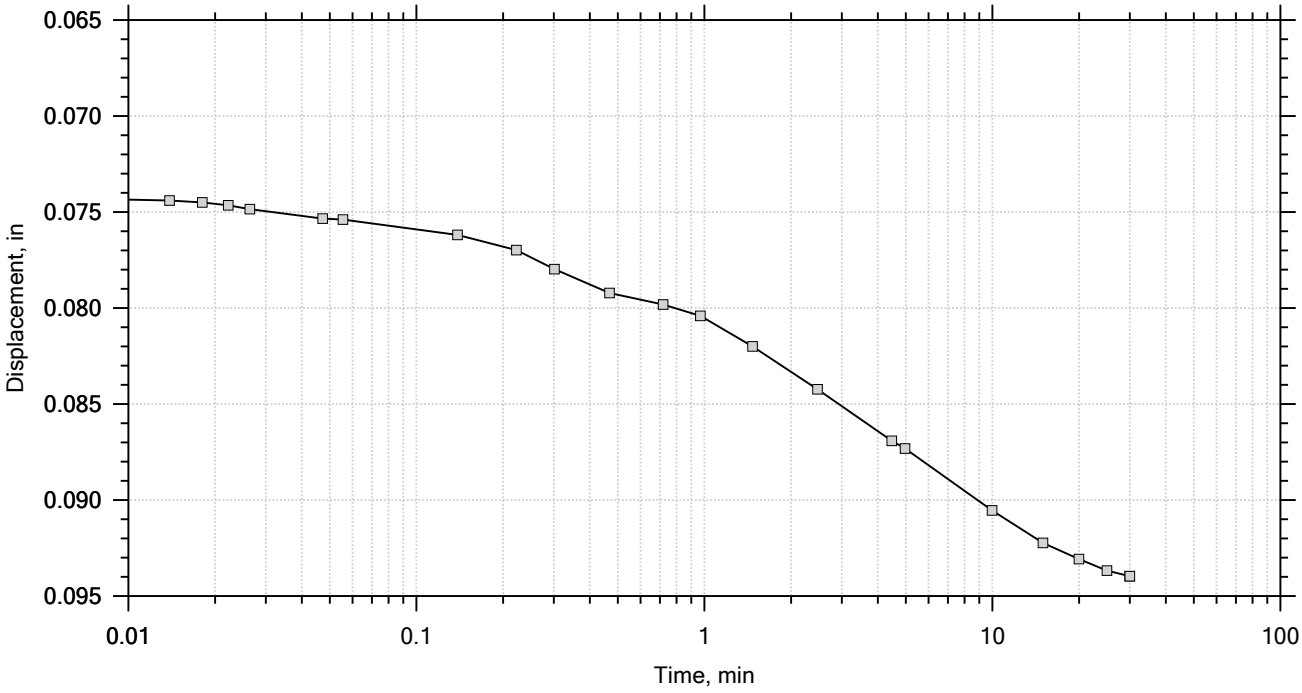


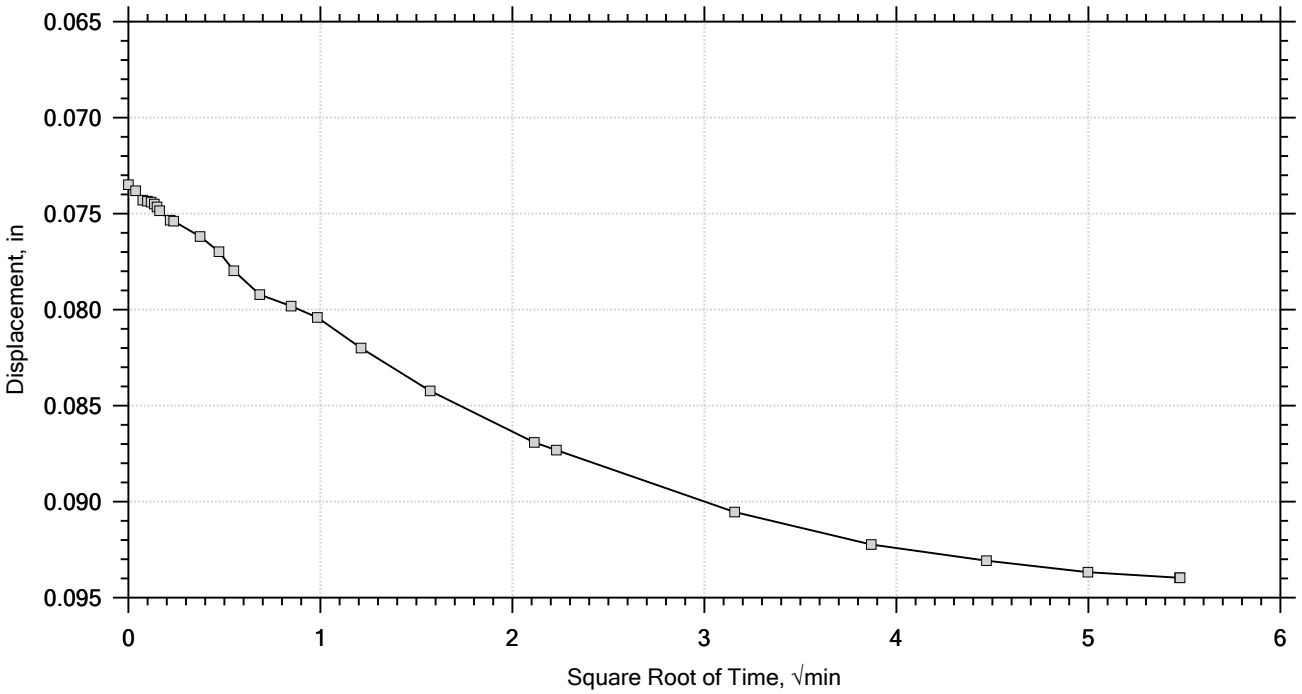
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-7	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1335	Test Date: 07/26/2018	Depth: 10' - 12.5
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-6(7)) LL: 32 PL: 19 PI: 13 %#200 Finer: 67.6		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 12
Constant Load Step
Stress: 2 tsf



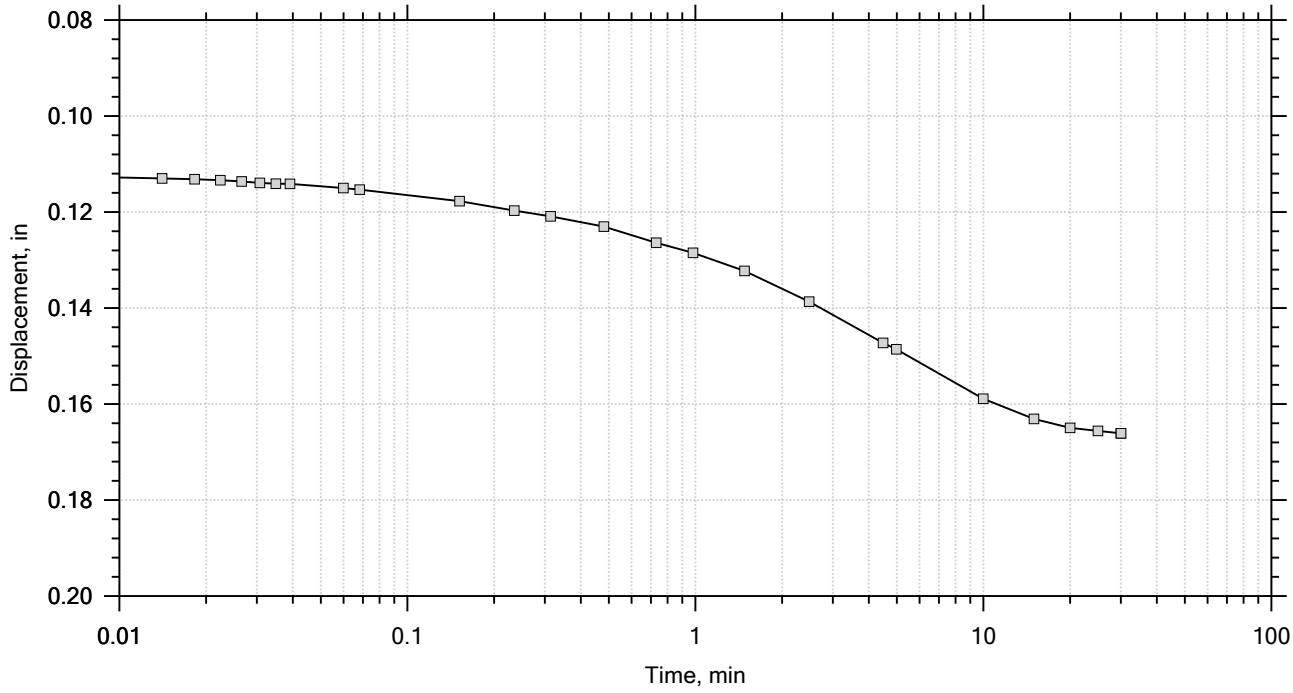


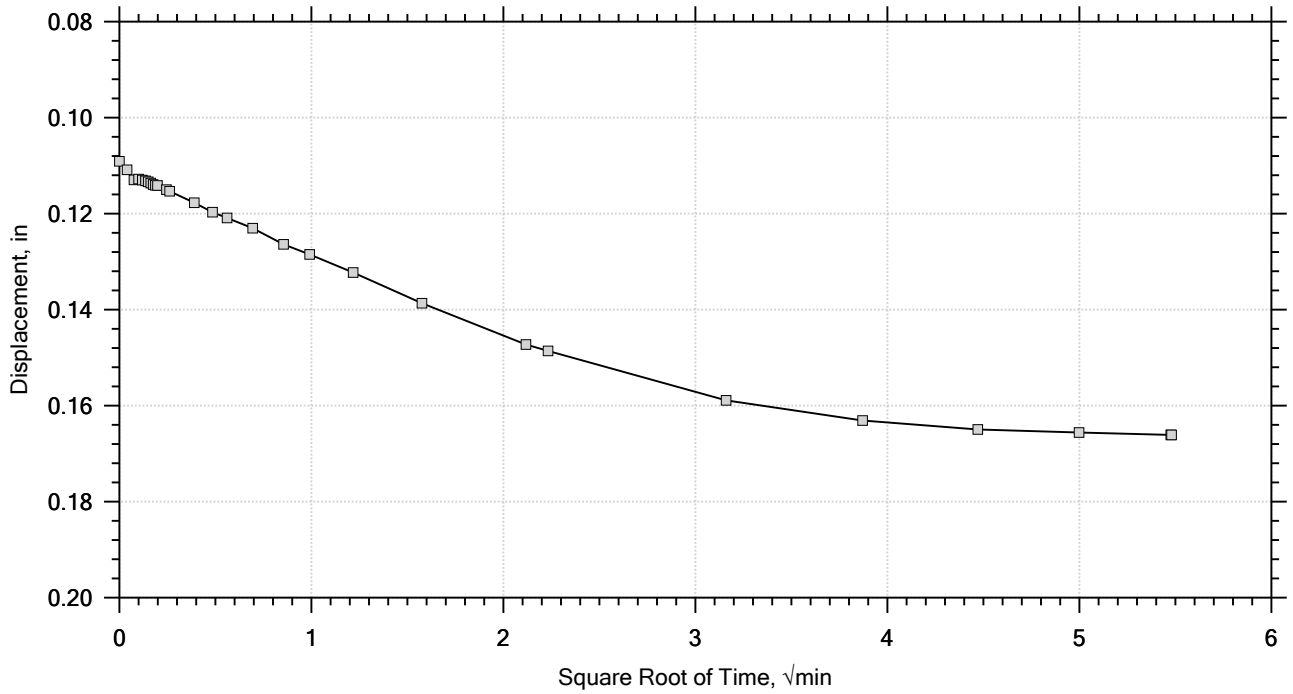
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-7	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1335	Test Date: 07/26/2018	Depth: 10' - 12.5
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-6(7)) LL: 32 PL: 19 PI: 13 %#200 Finer: 67.6		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 12
Constant Load Step
Stress: 8 tsf



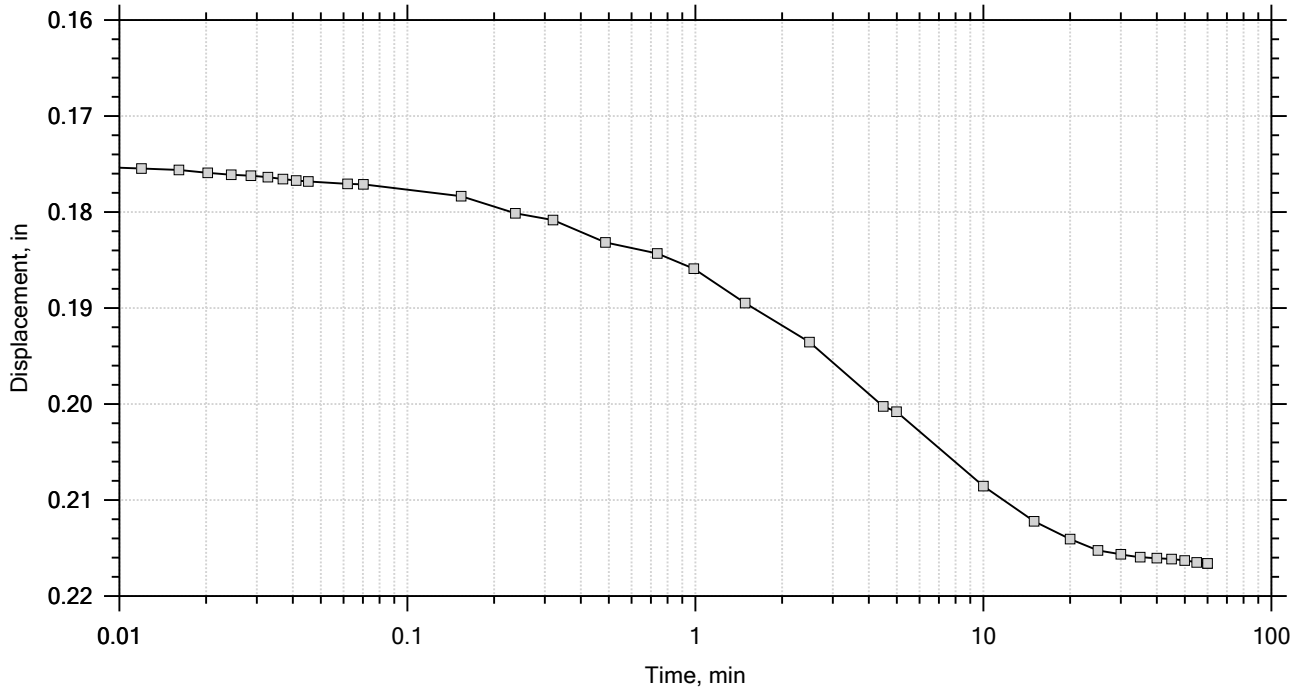


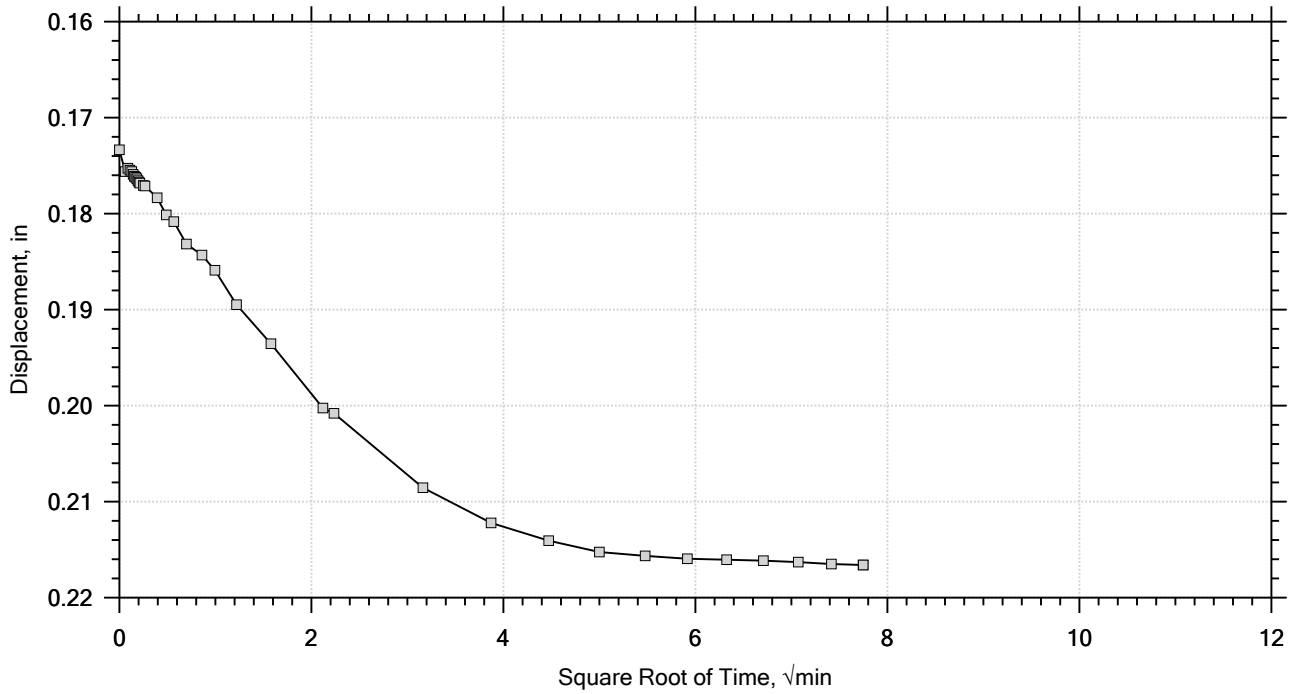
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-7	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1335	Test Date: 07/26/2018	Depth: 10' - 12.5
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-6(7)) LL: 32 PL: 19 PI: 13 %#200 Finer: 67.6		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 12
Constant Load Step
Stress: 16 tsf



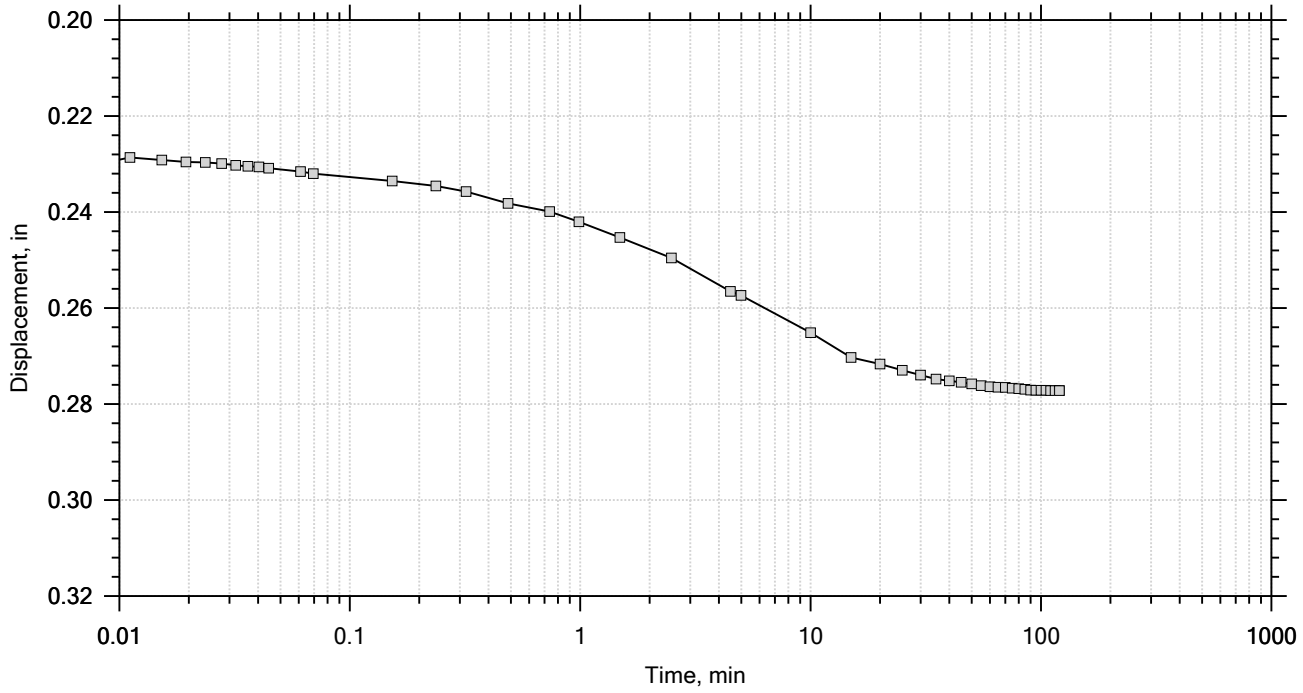


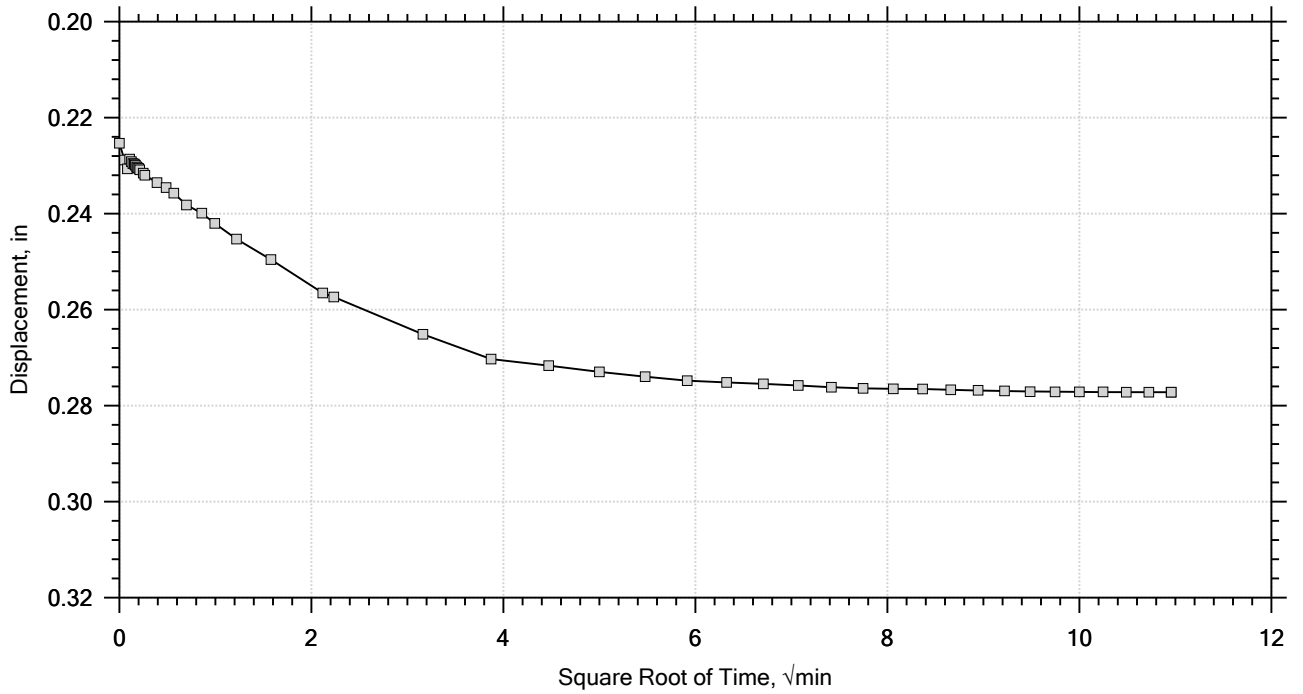
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-7	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1335	Test Date: 07/26/2018	Depth: 10' - 12.5
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-6(7)) LL: 32 PL: 19 PI: 13 %#200 Finer: 67.6		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 12
Constant Load Step
Stress: 32 tsf



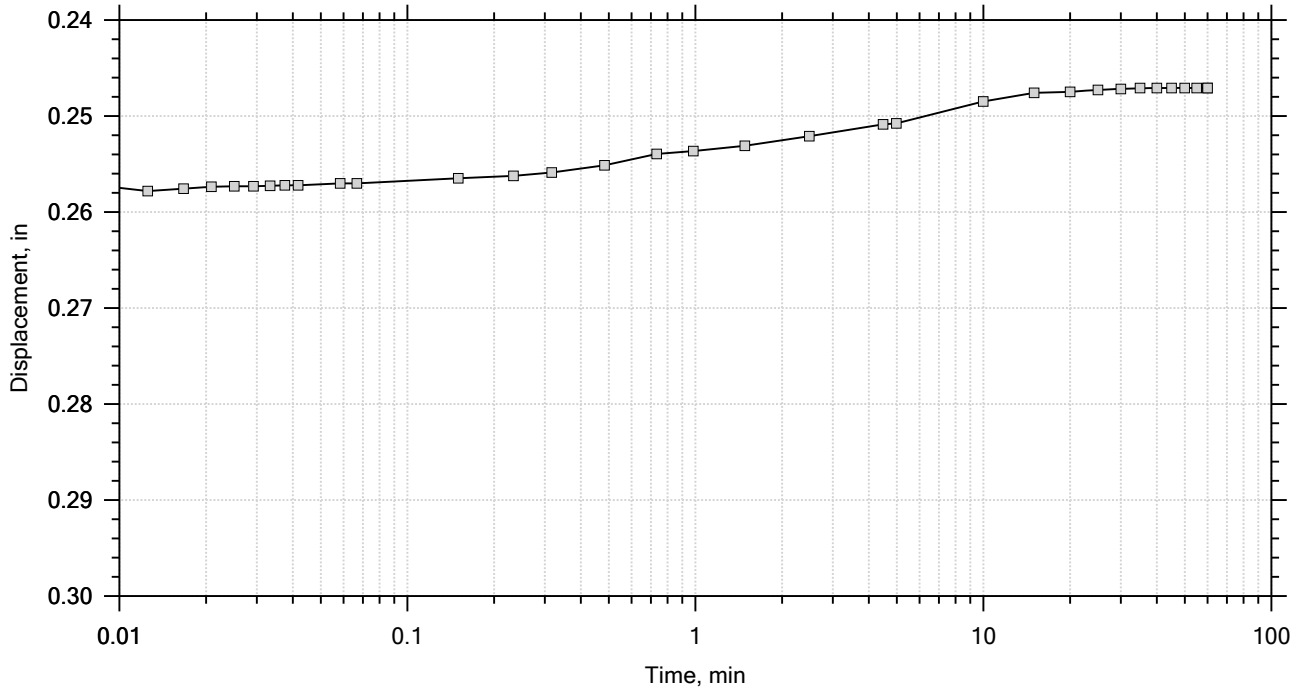


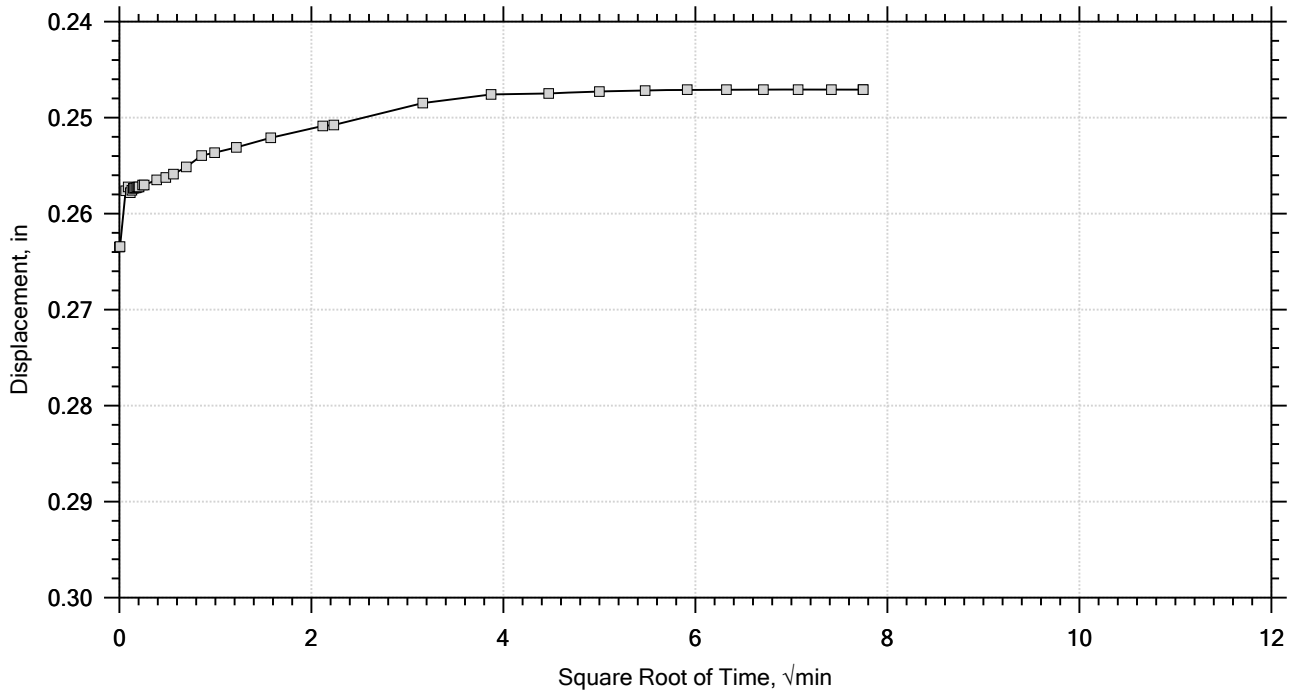
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-7	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1335	Test Date: 07/26/2018	Depth: 10' - 12.5
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-6(7)) LL: 32 PL: 19 PI: 13 %#200 Finer: 67.6		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 12
Constant Load Step
Stress: 8 tsf



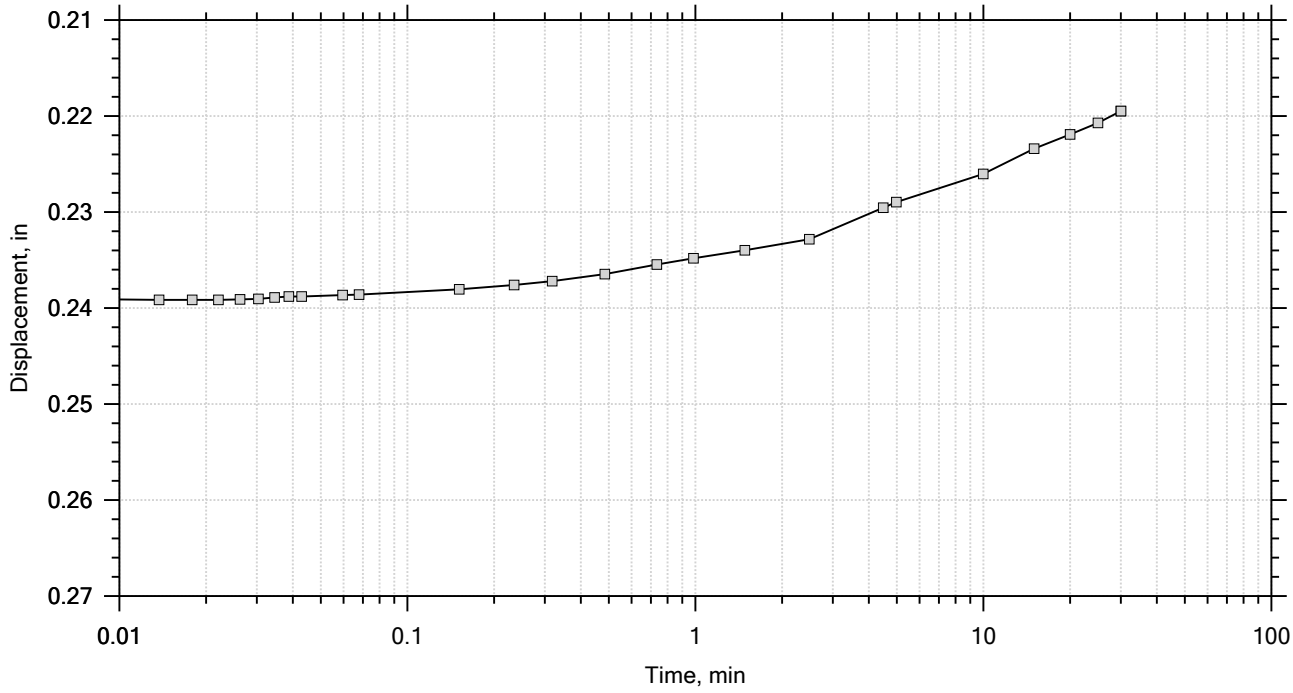


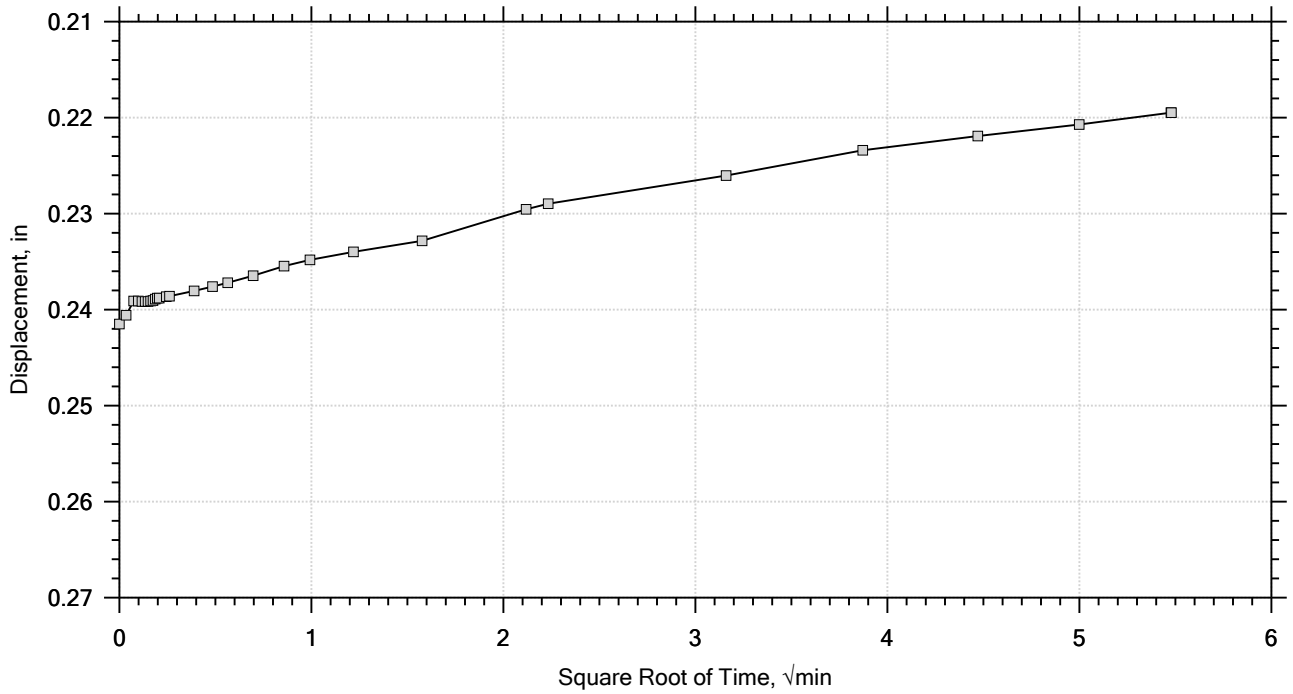
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-7	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1335	Test Date: 07/26/2018	Depth: 10' - 12.5
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-6(7)) LL: 32 PL: 19 PI: 13 %#200 Finer: 67.6		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 12
Constant Load Step
Stress: 2 tsf



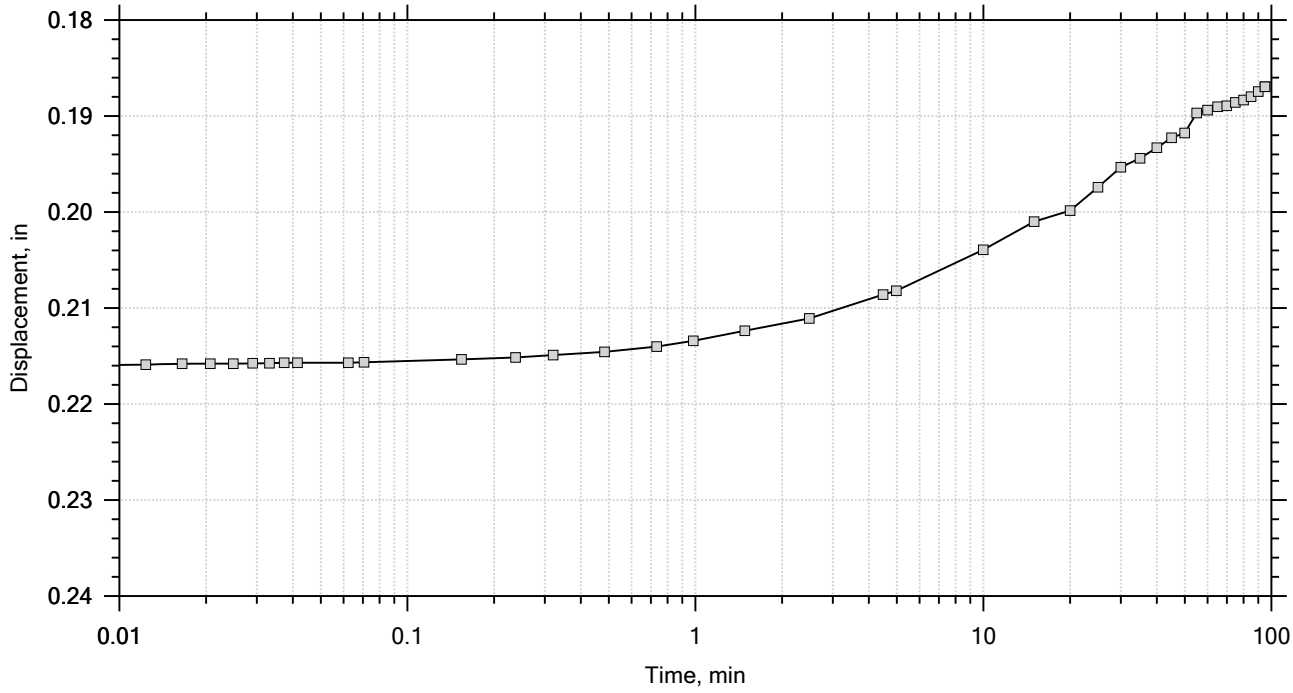


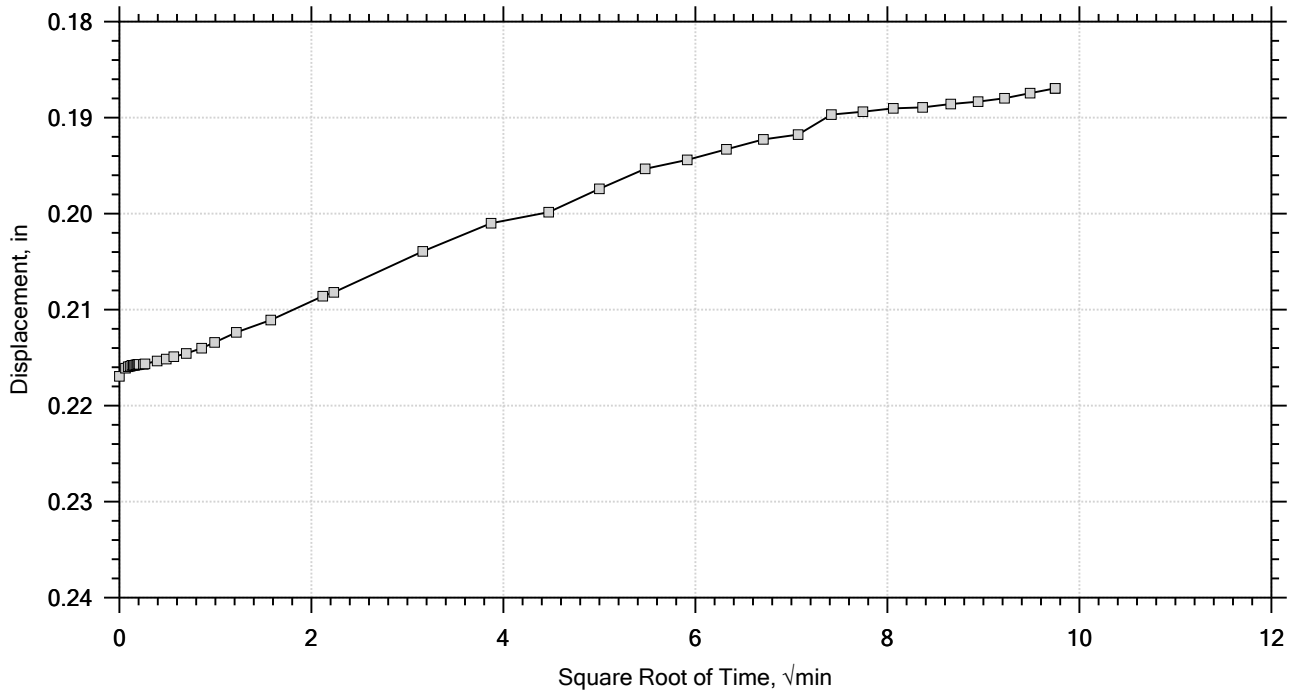
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-7	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1335	Test Date: 07/26/2018	Depth: 10' - 12.5
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-6(7)) LL: 32 PL: 19 PI: 13 %#200 Finer: 67.6		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 12
Constant Load Step
Stress: 0.5 tsf



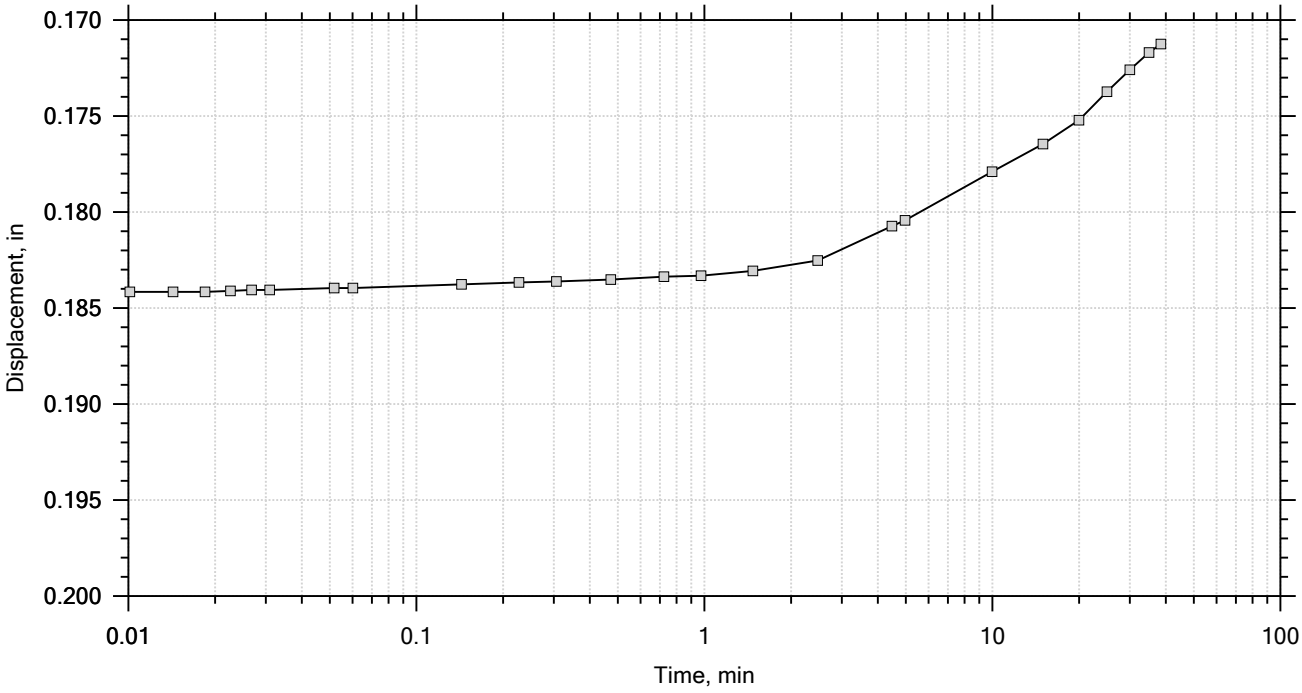


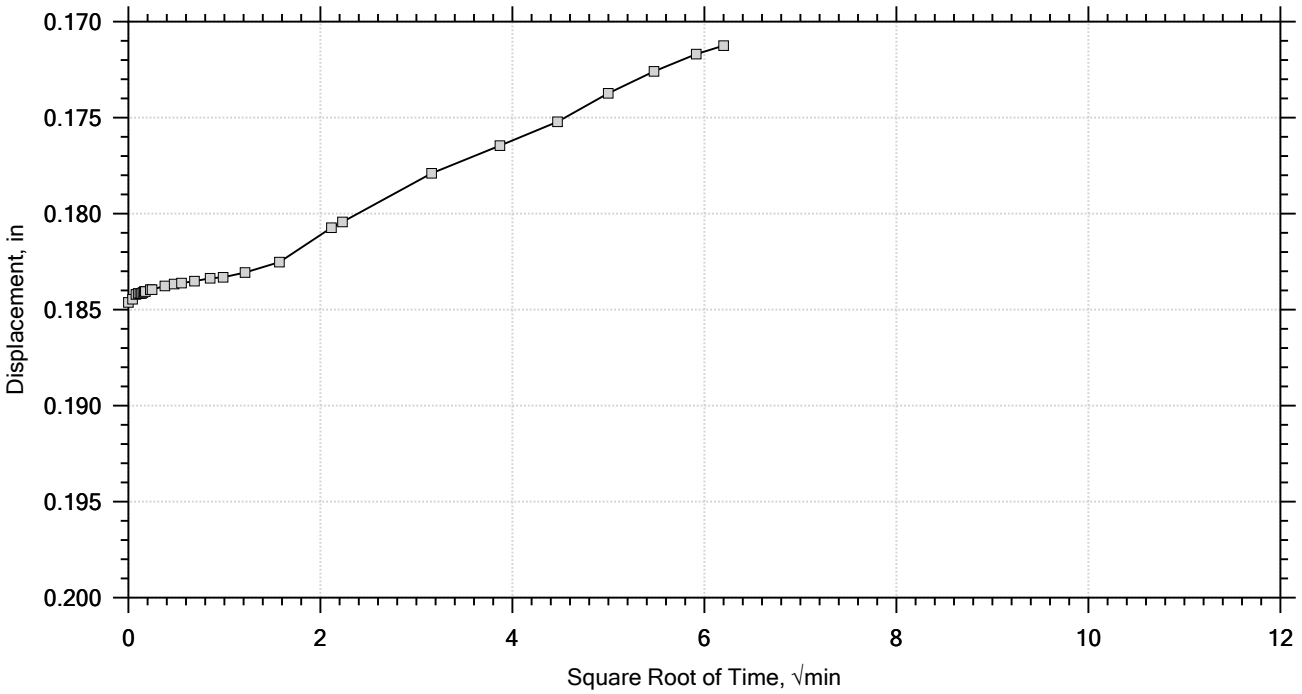
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-7	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1335	Test Date: 07/26/2018	Depth: 10' - 12.5
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-6(7)) LL: 32 PL: 19 PI: 13 %#200 Finer: 67.6		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 12
Constant Load Step
Stress: 0.125 tsf





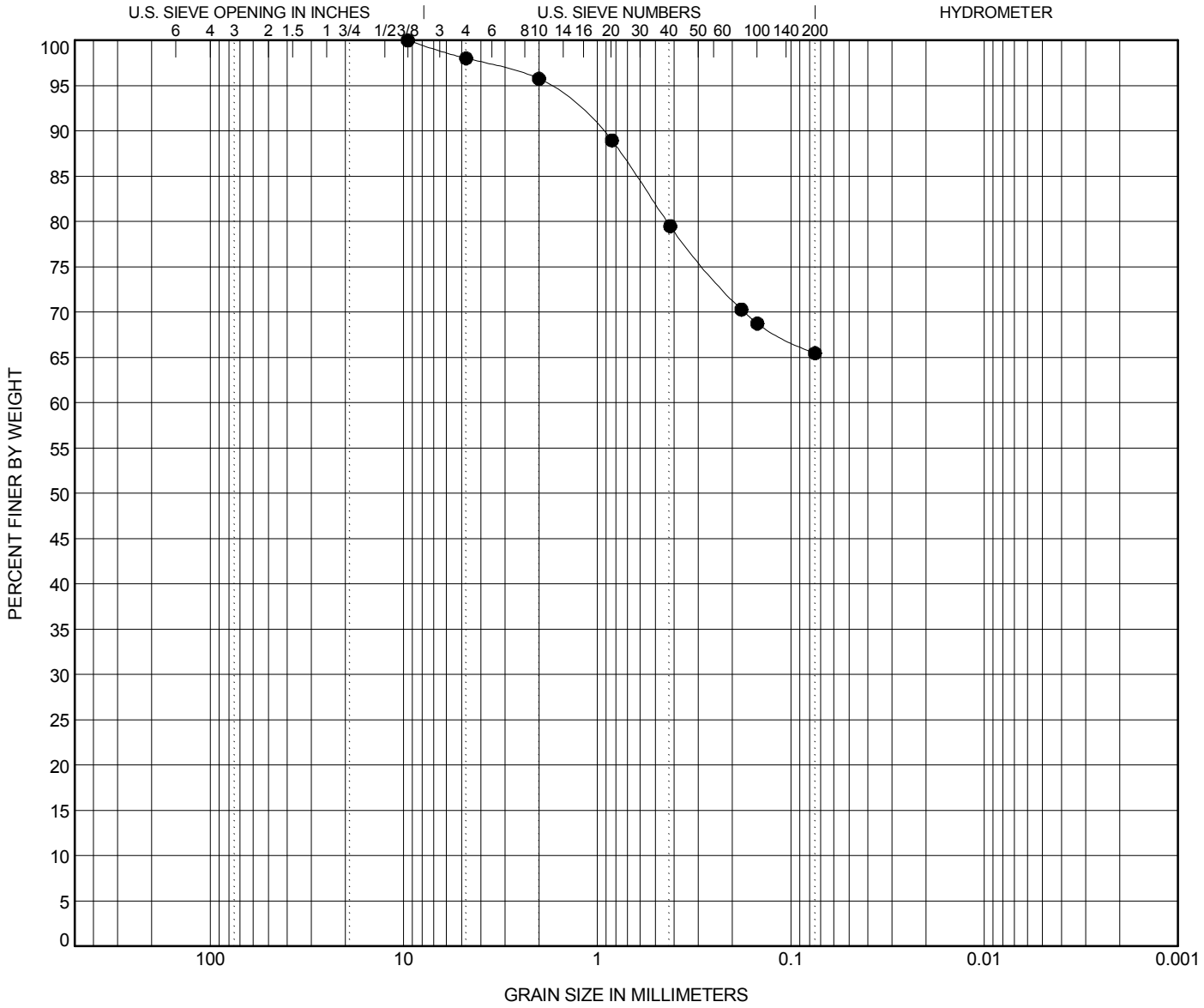
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-7	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1335	Test Date: 07/26/2018	Depth: 10' - 12.5
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-6(7)) LL: 32 PL: 19 PI: 13 %#200 Finer: 67.6		
Remarks:		

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**AP-8**	**8.5**	**Sandy Lean CLAY (CL) A-7-6(13)**	**44**	**21**	**23**		

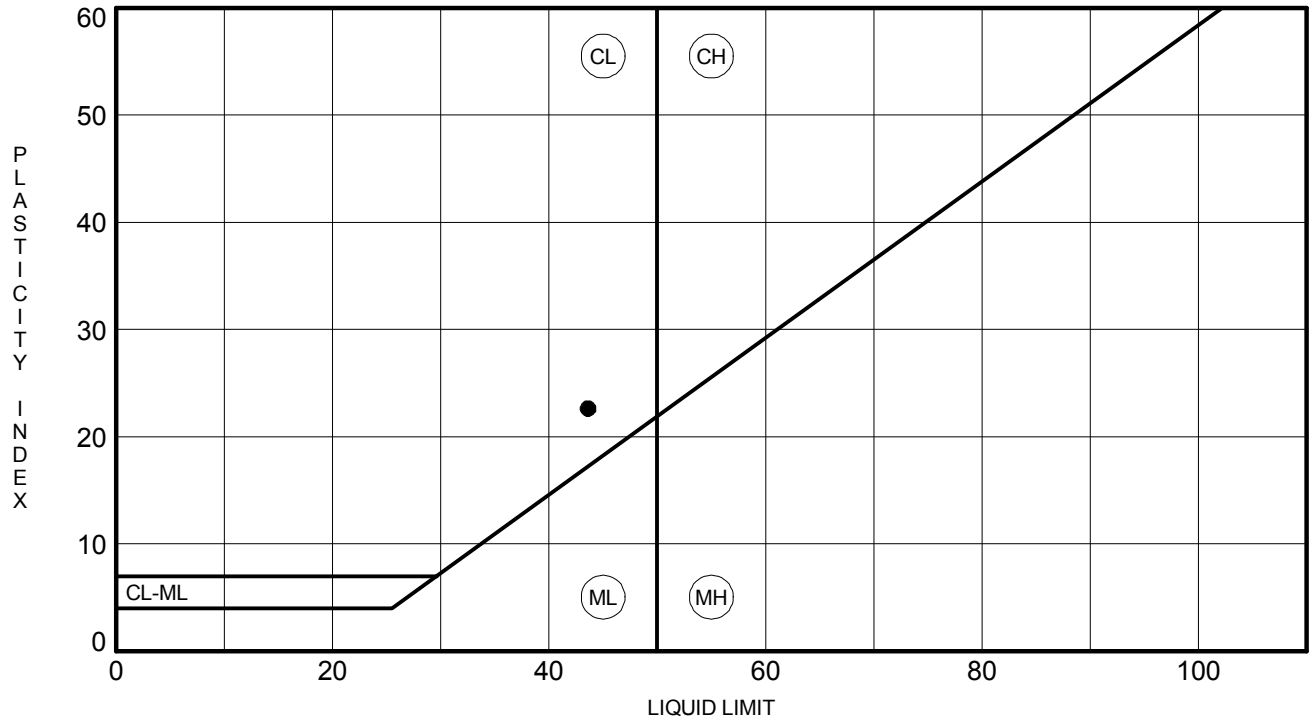
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**AP-8**	**8.5**	**9.52**	**1.812**			**2.0**	**32.5**	**65.5**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 8/2/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**AP-8**	**8.5**	**44**	**21**	**23**	**65**	**Sandy Lean CLAY (CL) A-7-6(13)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 8/2/18

F&ME CONSULTANTS

3112 Devine Street
Columbia, South Carolina 29205

SPECIFIC GRAVITY OF SOILS
(ASTM D854 / AASHTO T100)

Project Name:	I-20/26/126 Corridor Improvements	**Project No.:**	G5662.01
Sample Location:	AP-8	**Sample/Boring No.:**	18-1012
Description of Soil (Group Name & Symbol):	Sandy Lean CLAY (CL/A-7-6(13))	**Elevation/Depth of Sample:**	6' - 8.5'
% of Soils Passing #4 Sieve:		**Date Received:**	7/31/2018
Material Excluded:	**Yes**	X	**No**
Description of Excluded Material:			
Method:	**A**	X	**B**
Tested By:	William Pitts	**Date Tested:**	8/1/2018

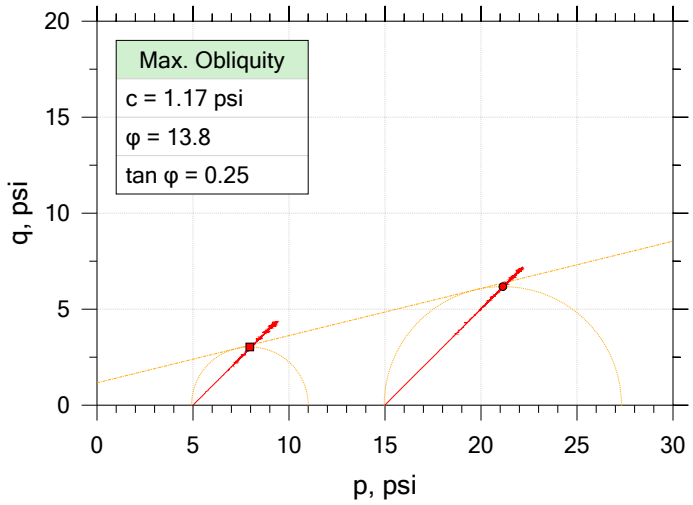
Test No.	1			
Volume of Flask at 20° C	500ml			
Method of Air Removal	Boil			
Mass Flask + Water + Soil (Wb)	811.3			
Test Temperature ° C (Tx)	25			
Mass Flask + Water (Wa)	686.5			
Container No.	E			
Mass of Container + Oven Dry Soil	389.52			
Mass of Container	189.5			
Mass of Oven Dry Soil (Wo)	200.02			
Specific Gravity @ Test Temperature **Wo/[Wo+(Wa-Wb)]**	2.657			
Specific Gravity (SG) **K x Specific Gravity @ Test Temperature**	2.654			

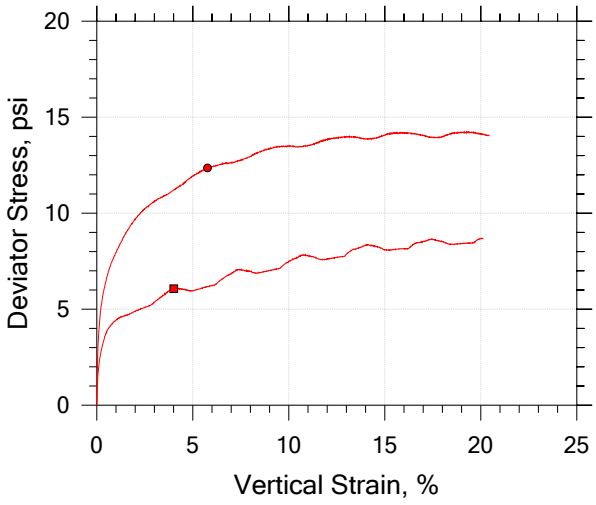
$$K = \frac{\text{Related Density of Water @ Test Temperature}}{\text{Relative Density of Water @ 20° C}}$$

Average Specific Gravity of Soils = _____

Remarks: _____

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297





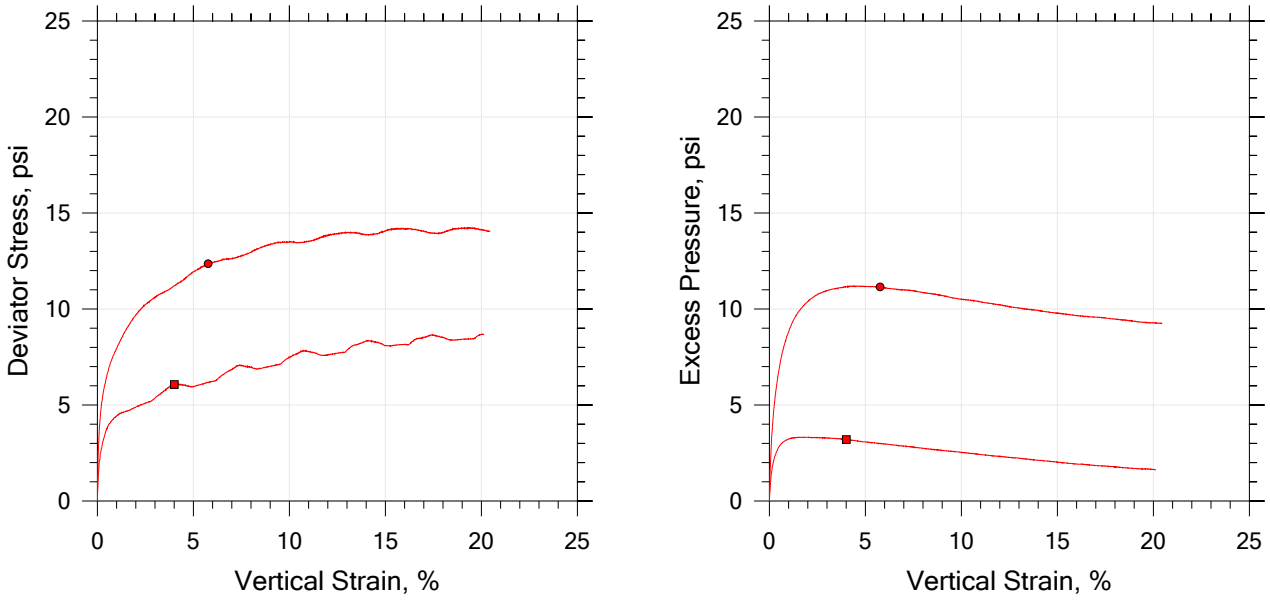
Symbol		■	●		
Sample ID		18-1012	18-1012		
Depth, ft		6' - 8.5'	6' - 8.5'		
Test Number		A	C		
Initial	Height, in	5.937	5.909		
	Diameter, in	2.847	2.844		
	Moisture Content (from Cuttings), %	29.9	30.9		
	Dry Density, pcf	95.9	93.3		
	Saturation (Wet Method), %	107.5	104.4		
	Void Ratio	0.745	0.793		
Final	Moisture Content, %	26.5	25.8		
	Dry Density, pcf	97.9	98.9		
	Cross-Sectional Area (Method A), in²	6.277	6.126		
	Saturation, %	100.0	100.0		
	Void Ratio	0.710	0.691		
	Back Pressure, %	79.99	101.0		
Vertical Effective Consolidation Stress, psi		4.978	14.88		
Horizontal Effective Consolidation Stress, psi		4.999	14.98		
Vertical Strain after Consolidation, %		0.3582	1.658		
Volumetric Strain after Consolidation, %		1.199	4.165		
Time to 50% Consolidation, min		0.0000	0.0000		
Shear Strength, psi		3.035	6.179		
Strain at Failure, %		4.01	5.77		
Strain Rate, %/min		0.07500	0.07500		
Deviator Stress at Failure, psi		6.070	12.36		
Effective Minor Principal Stress at Failure, psi		1.724	3.806		
Effective Major Principal Stress at Failure, psi		7.793	16.16		
B-Value		0.96	0.96		

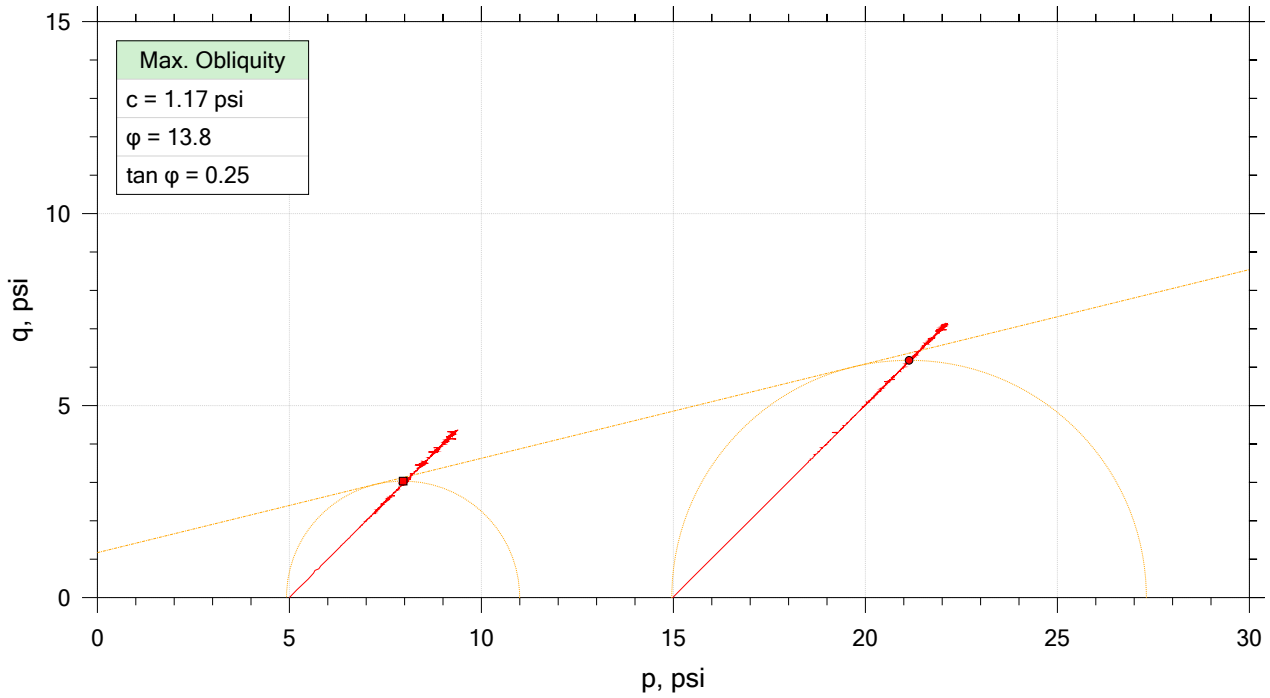
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-8	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1012	Test Date: 7/3/2018 - 7/6/2018	Depth: 6' - 8.5'
Test No.: AC	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-7-6(13)) LL: 44 PL: 21 PI: 23 %#200 Finer: 65.5		
Remarks:		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297



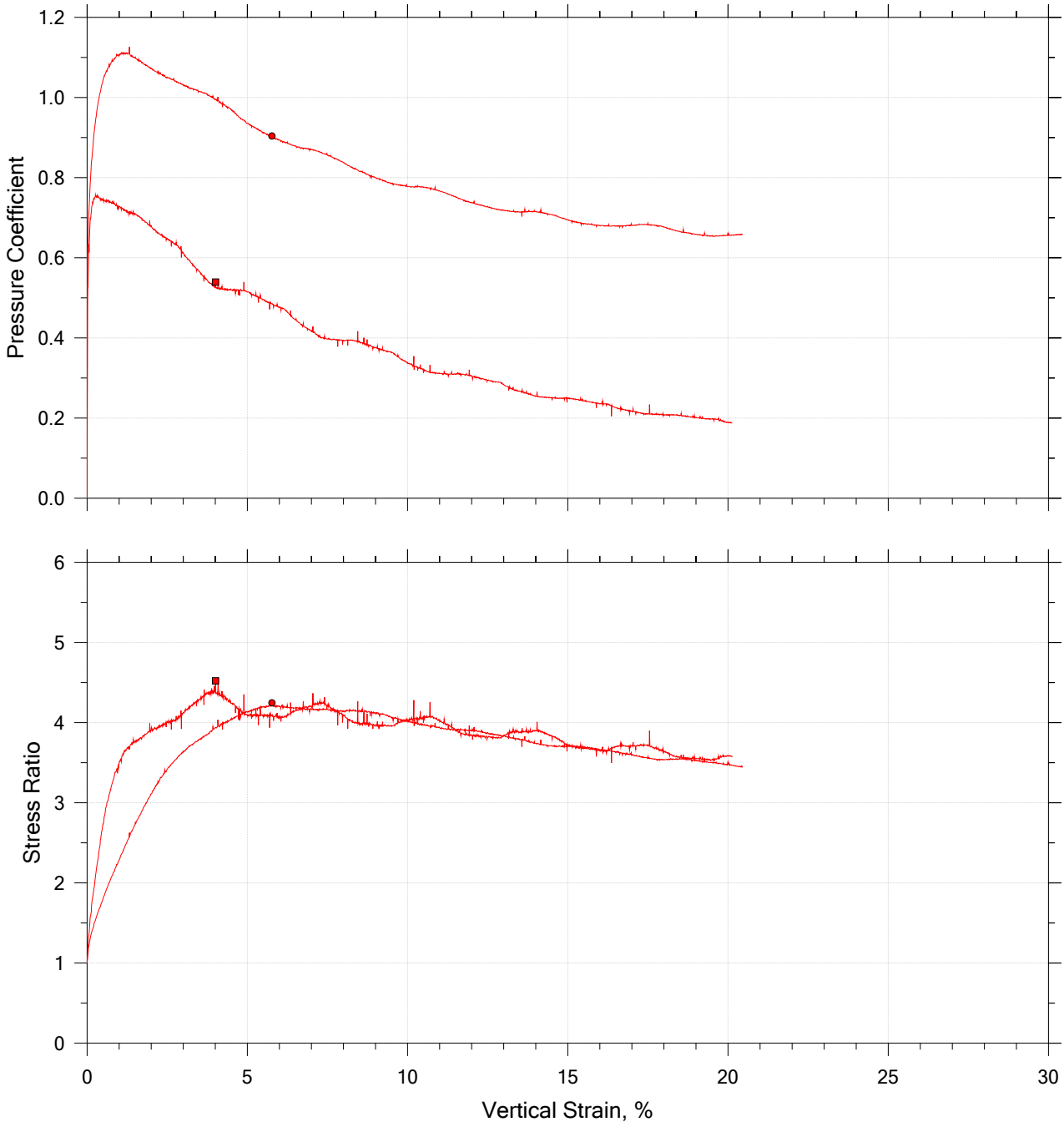


	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-1012	A	6' - 8.5'	WAP	7/3/2018	JFH/RS		18-1012_AP-8_test A.dat
●	18-1012	C	6' - 8.5'	WAP	7/6/2018	JFH/RS		18-1012_AP-8_test C.dat

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-8	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1012	Test Date: 7/3/2018 - 7/6/2018	Depth: 6' - 8.5'
Test No.: AC	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-7-6(13)) LL: 44 PL: 21 PI: 23 %#200 Finer: 65.5		
Remarks:		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297

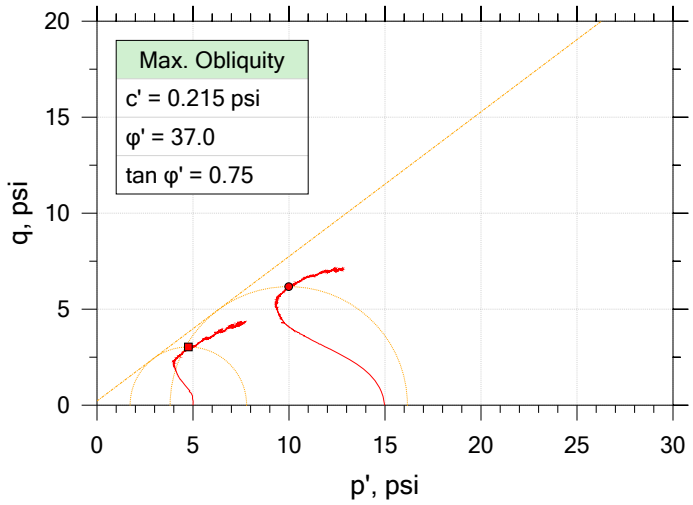


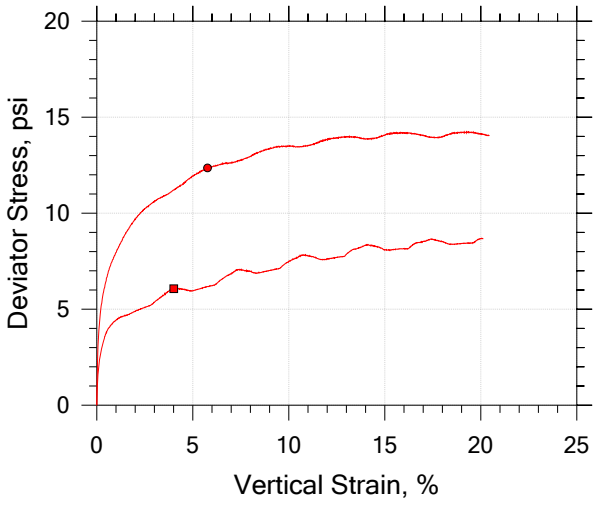
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-1012	A	6' - 8.5'	WAP	7/3/2018	JFH/RS		18-1012_AP-8_test A.dat
●	18-1012	C	6' - 8.5'	WAP	7/6/2018	JFH/RS		18-1012_AP-8_test C.dat

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-8	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1012	Test Date: 7/3/2018 - 7/6/2018	Depth: 6' - 8.5'
Test No.: AC	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-7-6(13)) LL: 44 PL: 21 PI: 23 %#200 Finer: 65.5		
Remarks:		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297





Symbol		■	●		
Sample ID		18-1012	18-1012		
Depth, ft		6' - 8.5'	6' - 8.5'		
Test Number		A	C		
Initial	Height, in	5.937	5.909		
	Diameter, in	2.847	2.844		
	Moisture Content (from Cuttings), %	29.9	30.9		
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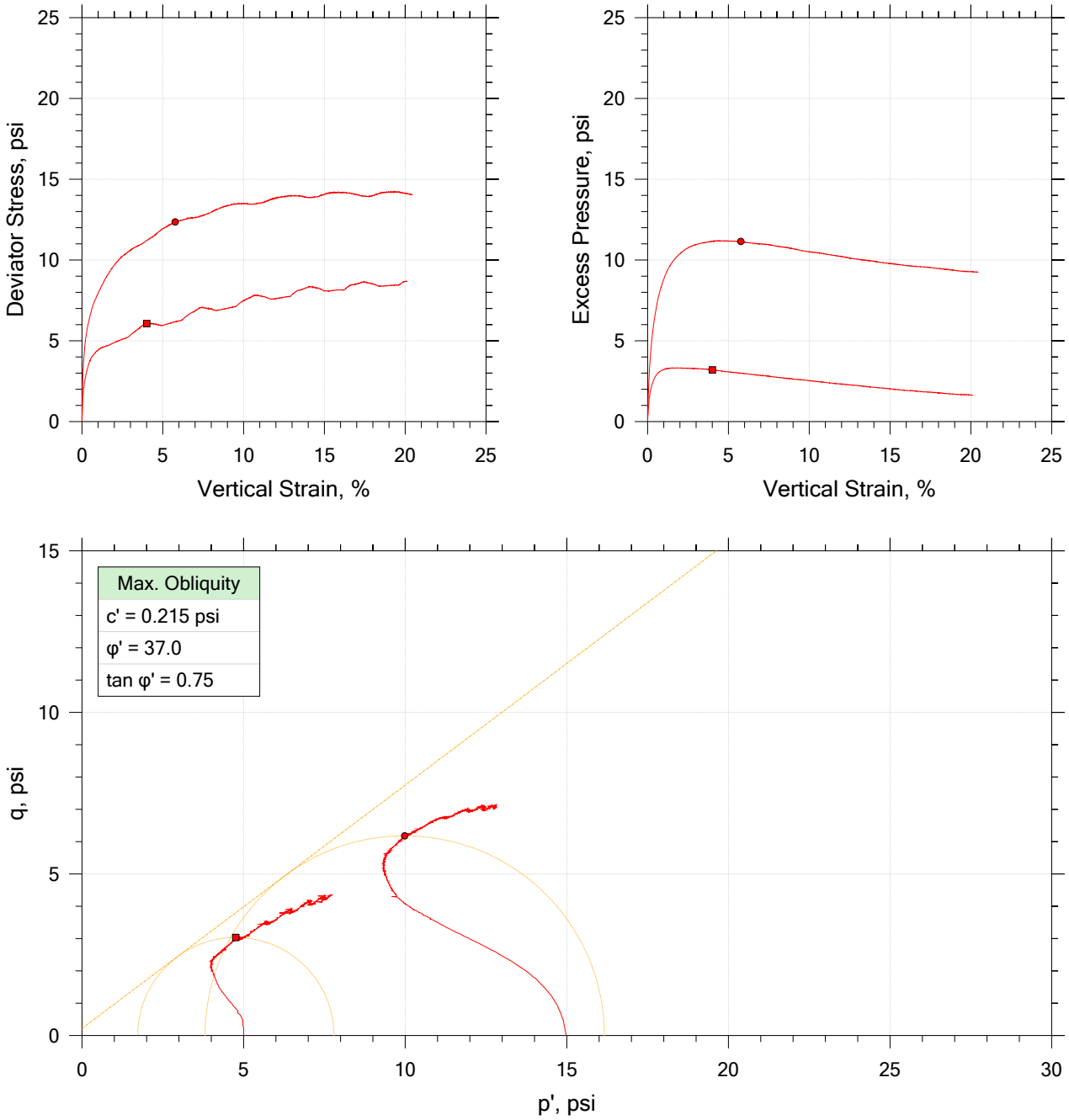
	Saturation (Wet Method), %	107.5	104.4		
	Void Ratio	0.745	0.793		
Final	Moisture Content, %	26.5	25.8		
	Dry Density, pcf	97.9	98.9		
	Cross-Sectional Area (Method A), in²	6.277	6.126		
	Saturation, %	100.0	100.0		
	Void Ratio	0.710	0.691		
	Back Pressure, %	79.99	101.0		
Vertical Effective Consolidation Stress, psi		4.978	14.88		
Horizontal Effective Consolidation Stress, psi		4.999	14.98		
Vertical Strain after Consolidation, %		0.3582	1.658		
Volumetric Strain after Consolidation, %		1.199	4.165		
Time to 50% Consolidation, min		0.0000	0.0000		
Shear Strength, psi		3.035	6.179		
Strain at Failure, %		4.01	5.77		
Strain Rate, %/min		0.07500	0.07500		
Deviator Stress at Failure, psi		6.070	12.36		
Effective Minor Principal Stress at Failure, psi		1.724	3.806		
Effective Major Principal Stress at Failure, psi		7.793	16.16		
B-Value		0.96	0.96		

Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-8	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1012	Test Date: 7/3/2018 - 7/6/2018	Depth: 6' - 8.5'
Test No.: AC	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-7-6(13)) LL: 44 PL: 21 PI: 23 %#200 Finer: 65.5		
Remarks:		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297

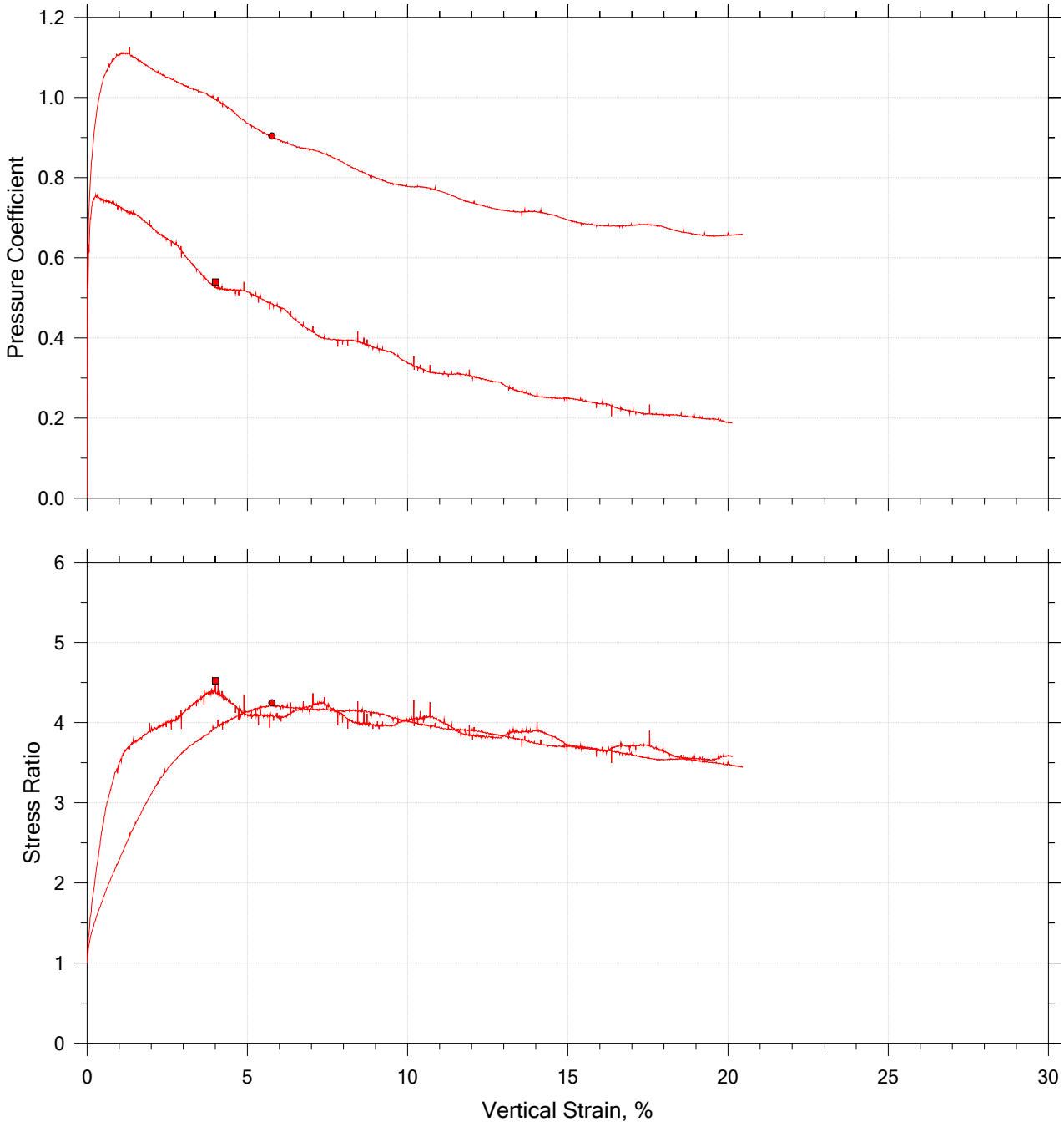


	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-1012	A	6' - 8.5'	WAP	7/3/2018	JFH/RS		18-1012_AP-8_test A.dat
●	18-1012	C	6' - 8.5'	WAP	7/6/2018	JFH/RS		18-1012_AP-8_test C.dat

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-8	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1012	Test Date: 7/3/2018 - 7/6/2018	Depth: 6' - 8.5'
Test No.: AC	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-7-6(13)) LL: 44 PL: 21 PI: 23 %#200 Finer: 65.5		
Remarks:		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297



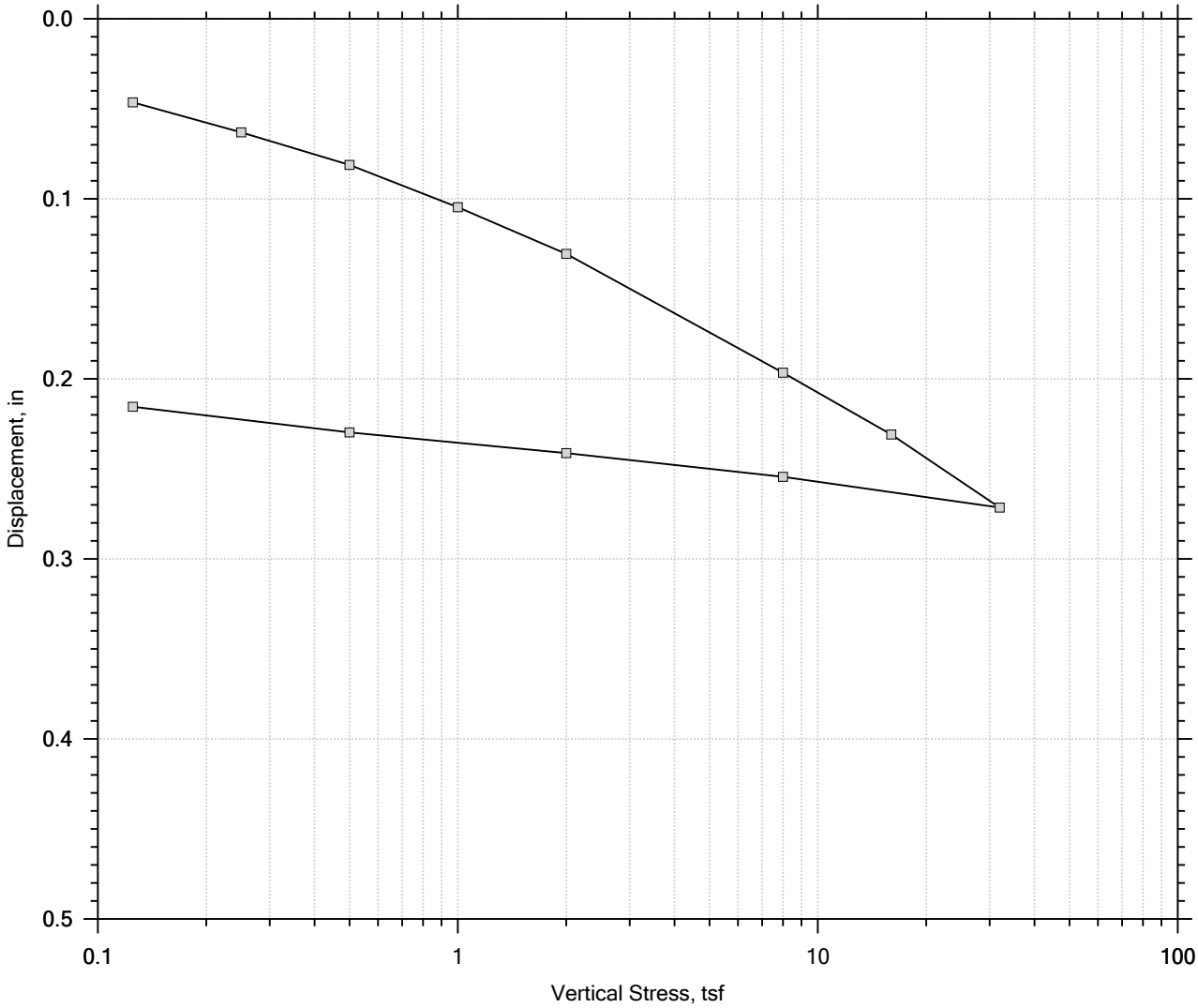
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-1012	A	6' - 8.5'	WAP	7/3/2018	JFH/RS		18-1012_AP-8_test A.dat
●	18-1012	C	6' - 8.5'	WAP	7/6/2018	JFH/RS		18-1012_AP-8_test C.dat

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-8	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1012	Test Date: 7/3/2018 - 7/6/2018	Depth: 6' - 8.5'
Test No.: AC	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-7-6(13)) LL: 44 PL: 21 PI: 23 %#200 Finer: 65.5		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Summary Report

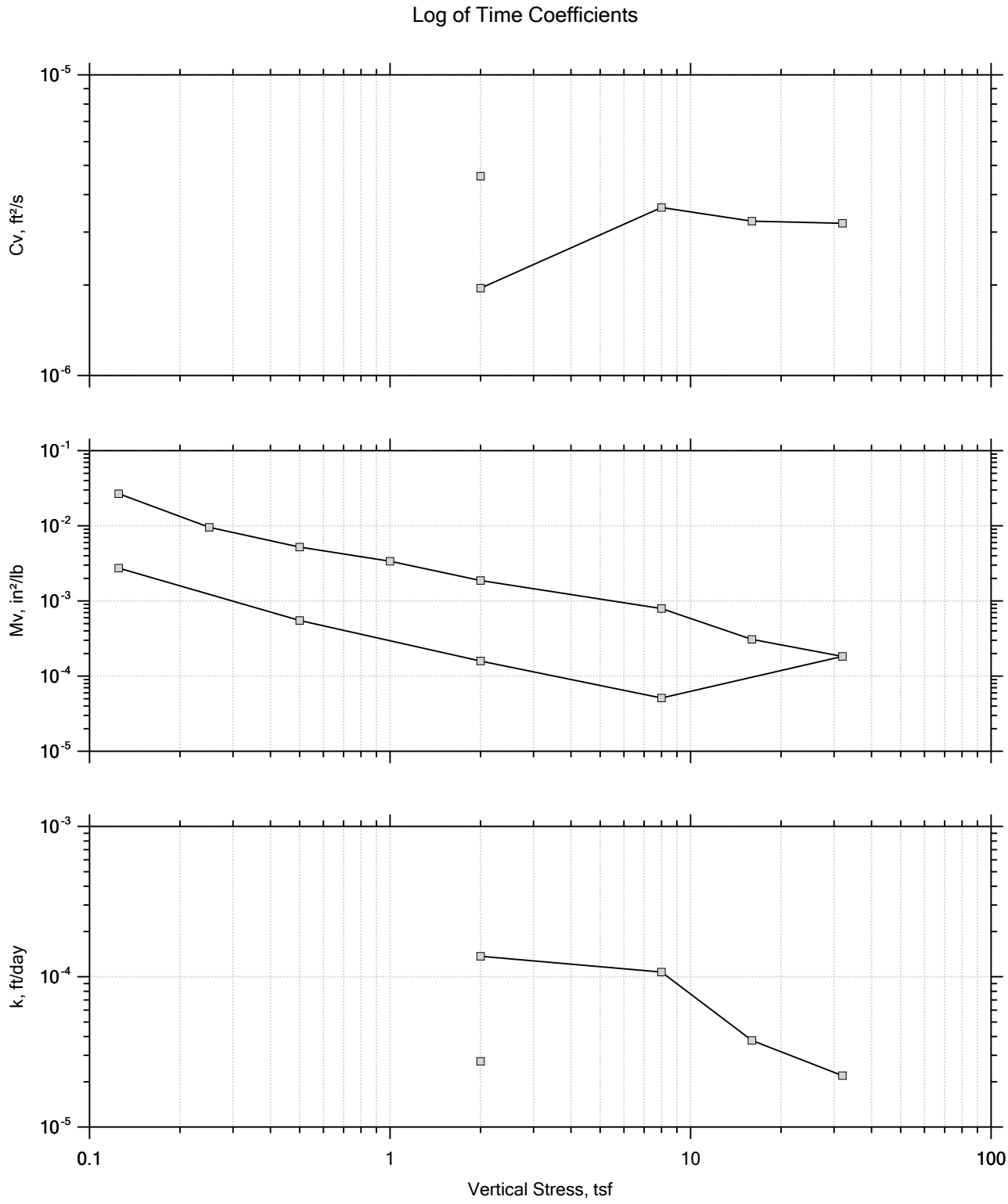


					Before Test	After Test
Current Vertical Effective Stress: 0 tsf				Water Content, %	24.73	17.29
Preconsolidation Stress: 0 tsf				Dry Unit Weight, pcf	90.771	113.78
Compression Ratio: 0				Saturation, %	79.51	100.57
Diameter: 2.5 in		Height: 1 in		Void Ratio	0.83	0.46
LL: 44	PL: 21	PI: 23	GS: 2.65			

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-8	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1012	Test Date: 07/30/2018	Depth: 6.0' - 8.5'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-7-6(13)) LL: 44 PL: 21 PI: 23 %#200 Finer: 65.5		
Remarks:		
Displacement at End of Increment		

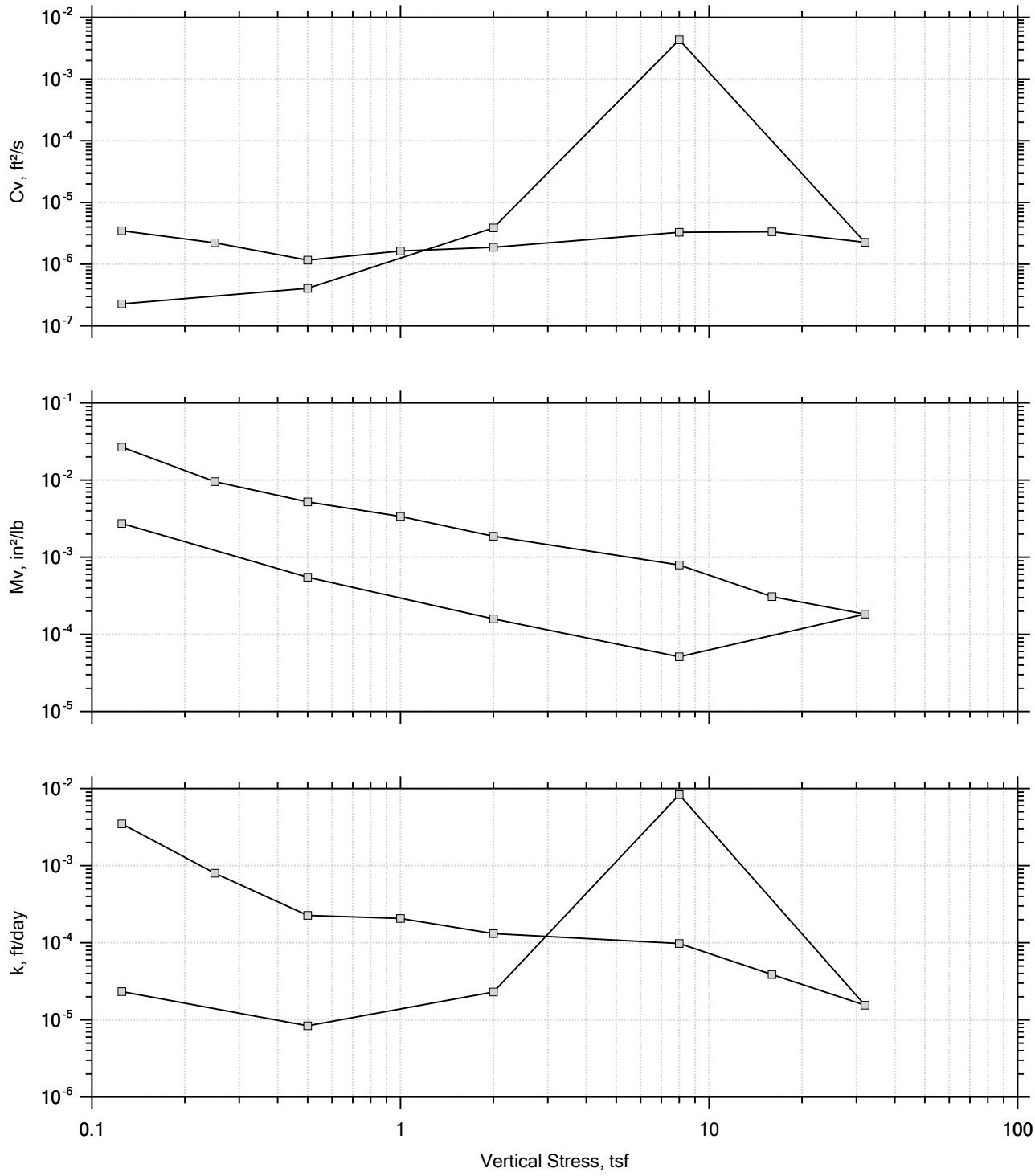
One-Dimensional Consolidation by ASTM D2435 - Method B



F&ME CONSULTANTS	Project: CCR	Location: Columbia, SC	Project No.: G5662.01
	Boring No.: AP-8	Tested By: WAP	Checked By: RS/JFH
	Sample No.: 18-1012	Test Date: 07/30/2018	Depth: 6.0' - 8.5'
	Test No.: A	Sample Type: Undisturbed	Elevation: --
	Description: Sandy Lean CLAY (CL/A-7-6(13)) LL: 44 PL: 21 PI: 23 %#200 Finer: 65.5		
	Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Square Root of Time Coefficients

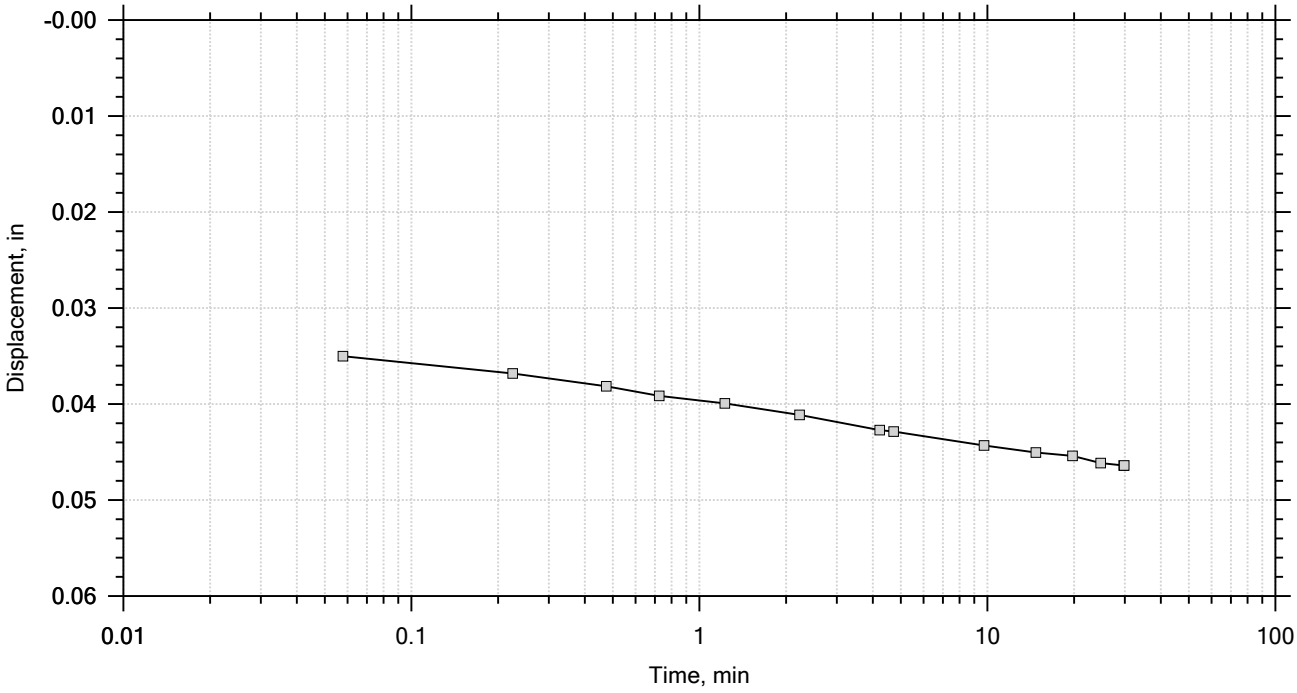


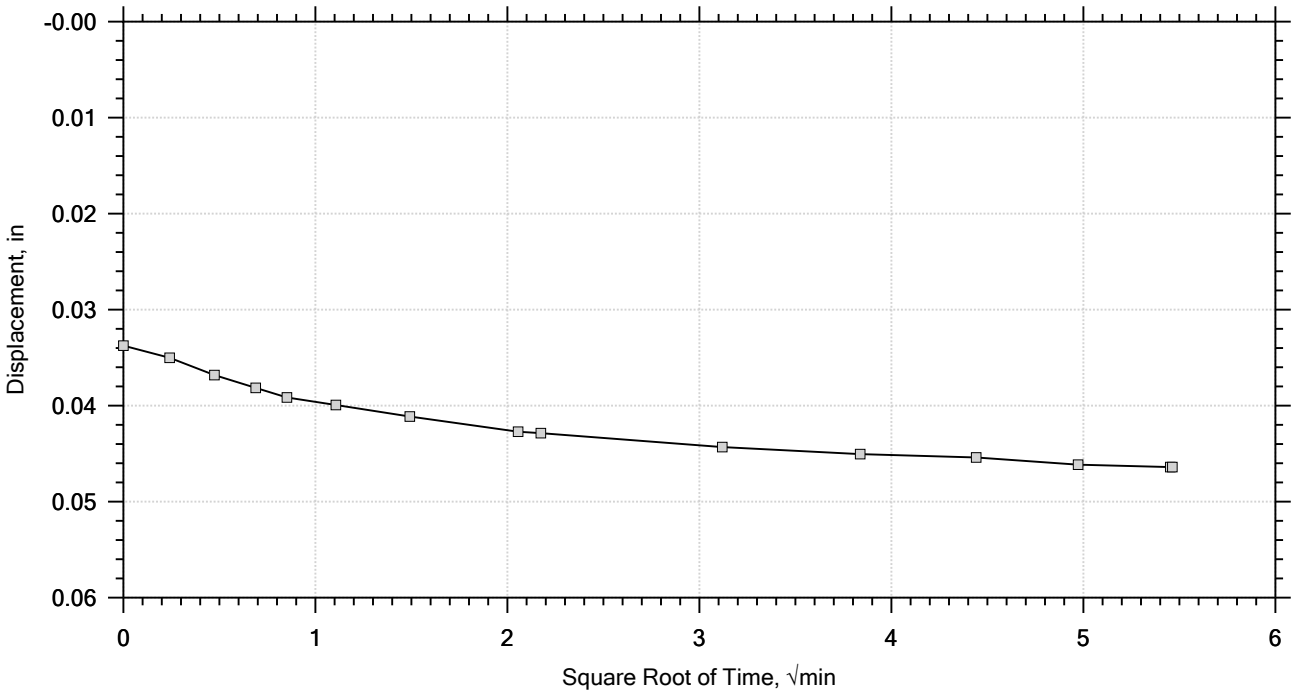
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-8	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1012	Test Date: 07/30/2018	Depth: 6.0' - 8.5'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-7-6(13)) LL: 44 PL: 21 PI: 23 %#200 Finer: 65.5		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 12
Constant Load Step
Stress: 0.125 tsf



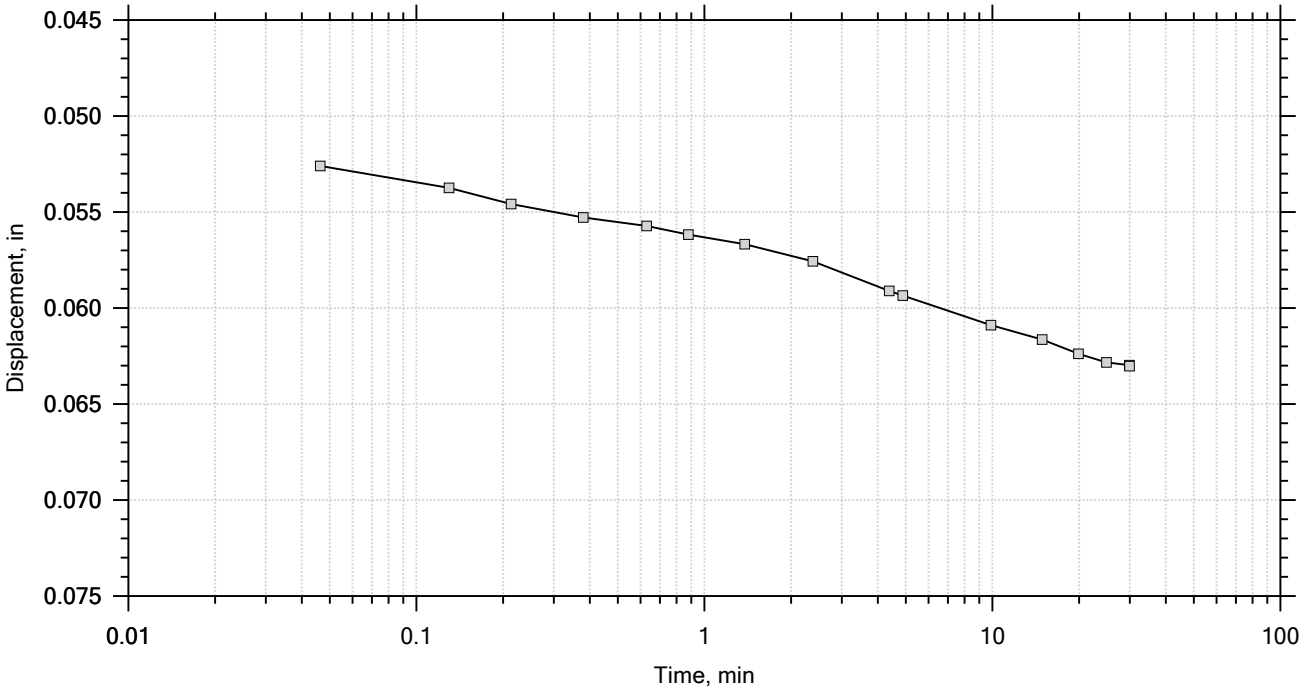


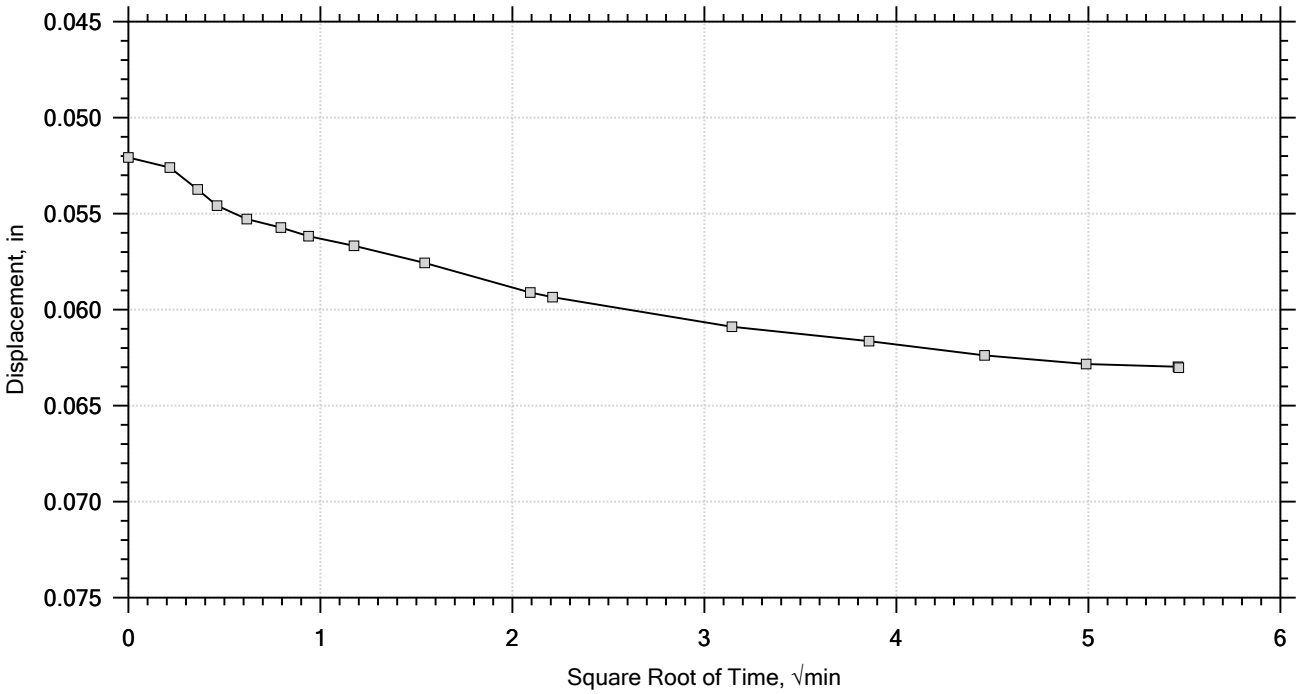
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-8	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1012	Test Date: 07/30/2018	Depth: 6.0' - 8.5'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-7-6(13)) LL: 44 PL: 21 PI: 23 %#200 Finer: 65.5		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 12
Constant Load Step
Stress: 0.25 tsf



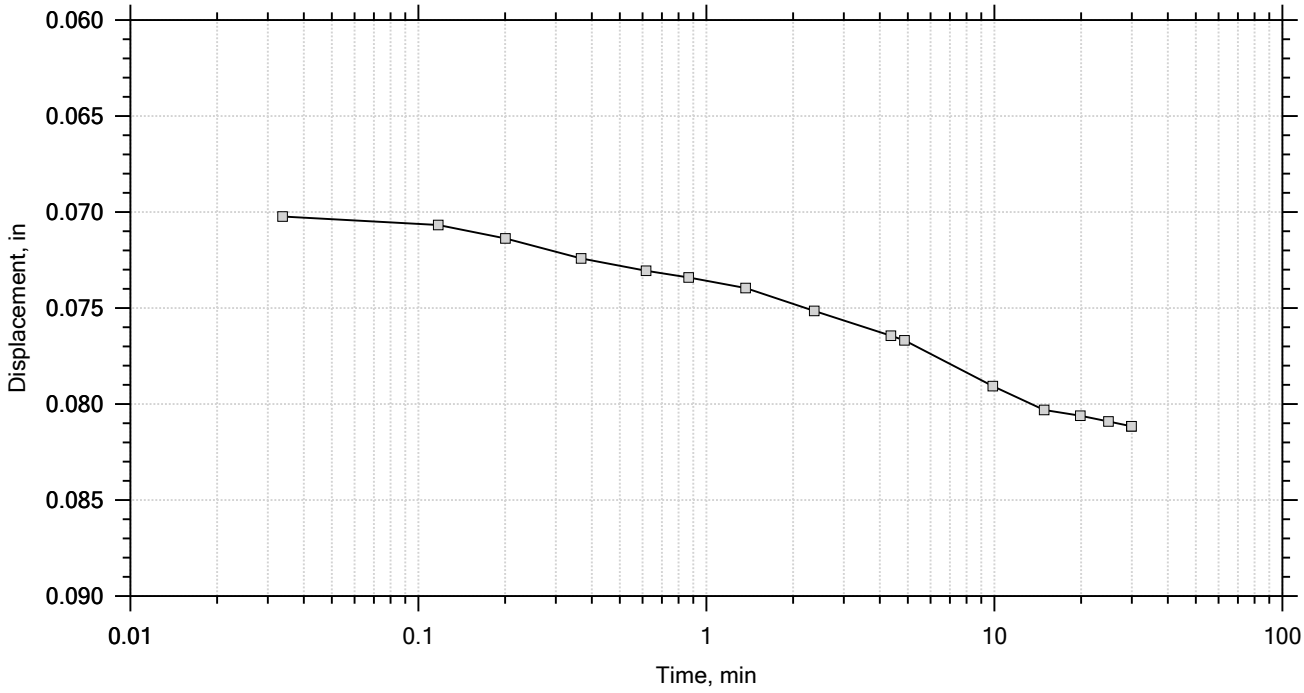


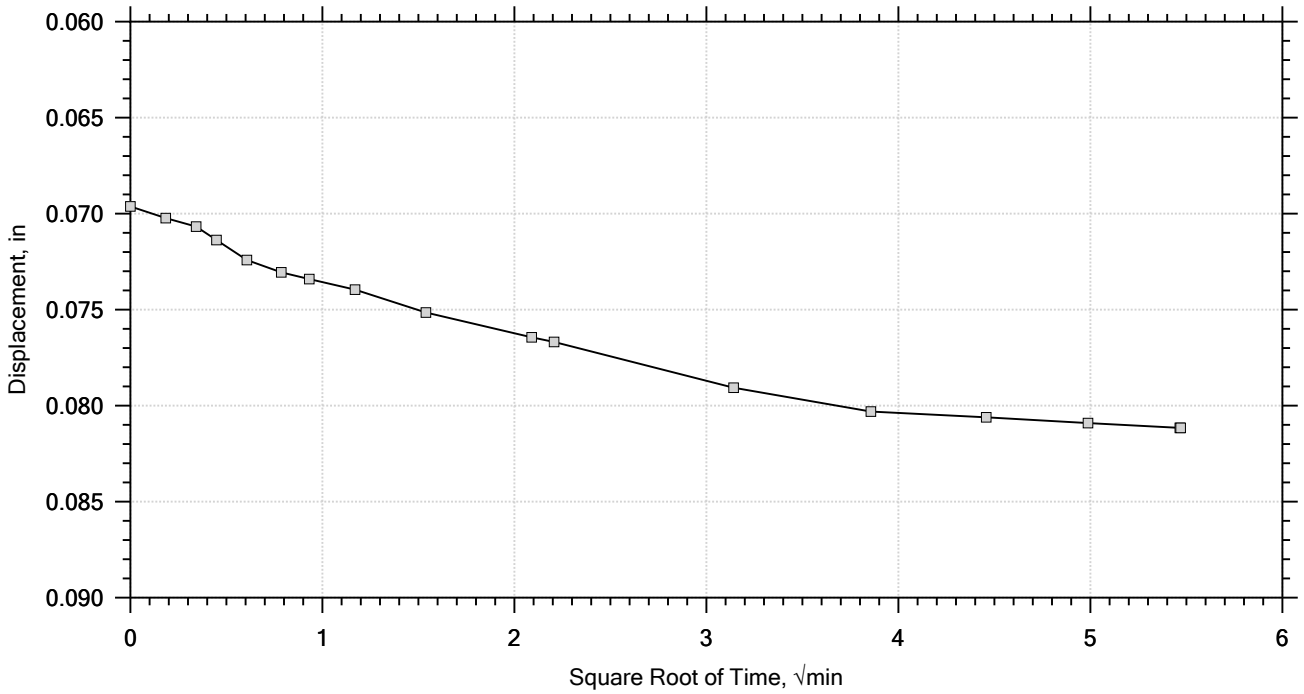
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-8	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1012	Test Date: 07/30/2018	Depth: 6.0' - 8.5'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-7-6(13)) LL: 44 PL: 21 PI: 23 %#200 Finer: 65.5		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 12
Constant Load Step
Stress: 0.5 tsf



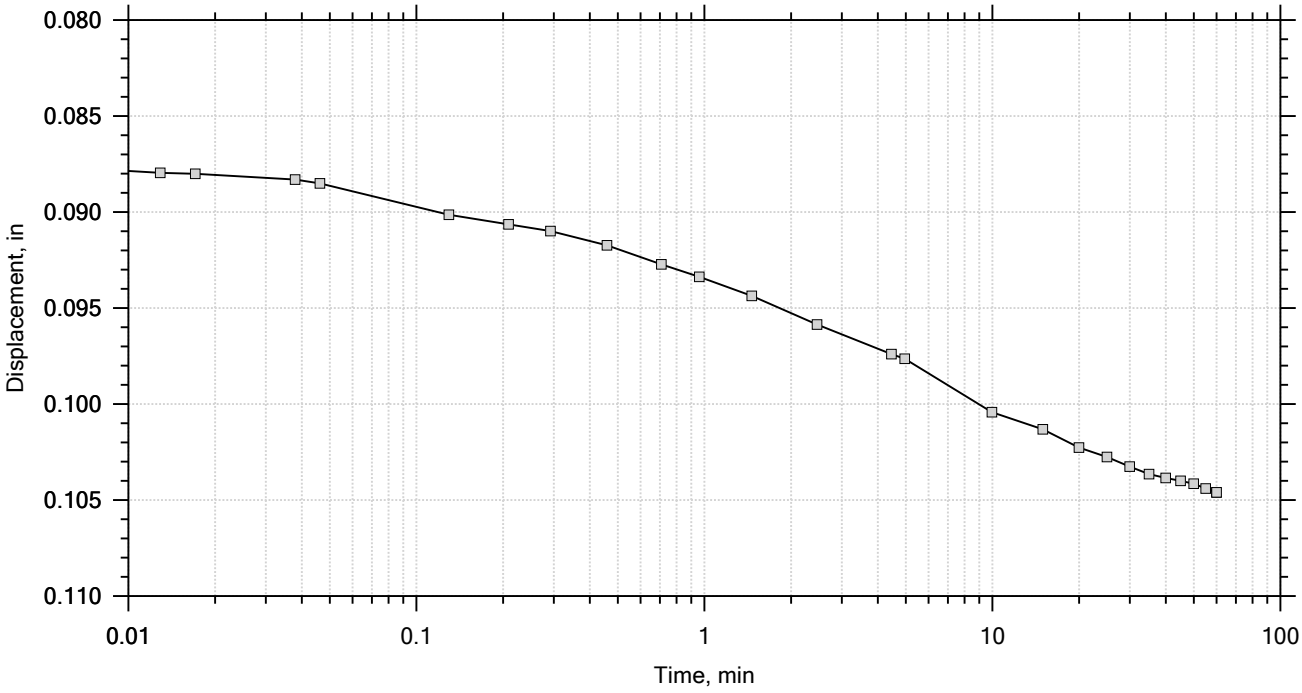


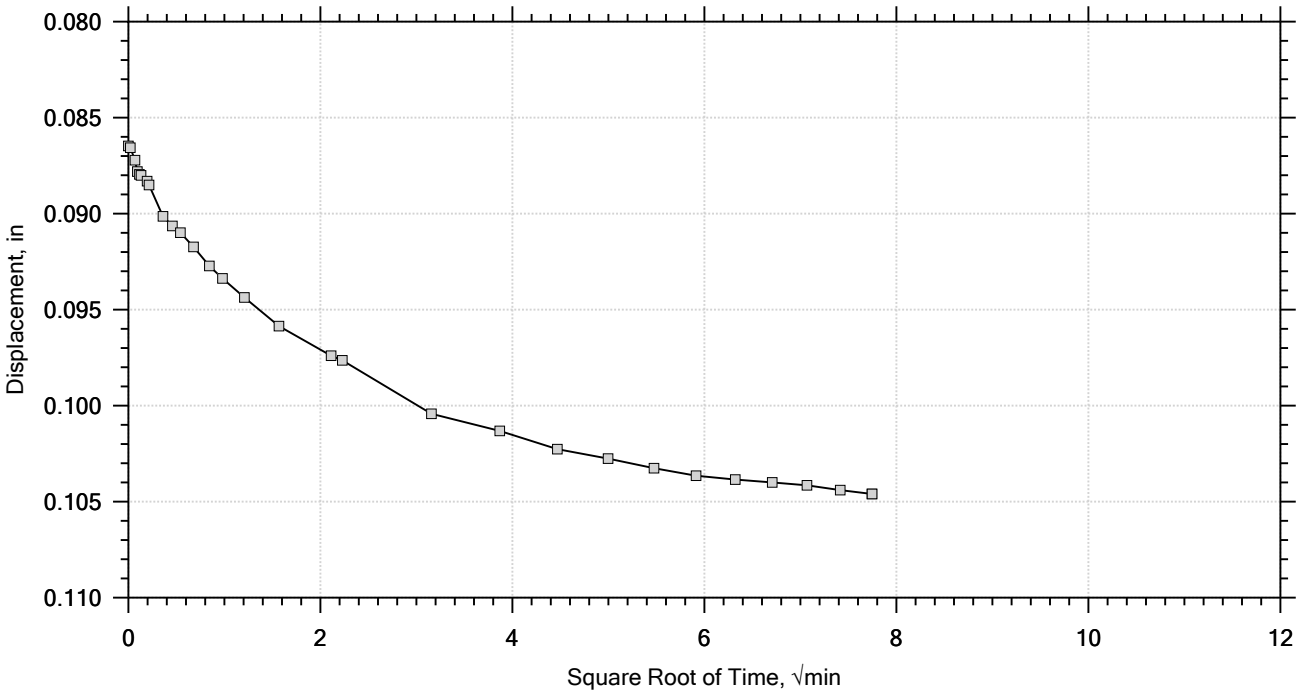
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-8	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1012	Test Date: 07/30/2018	Depth: 6.0' - 8.5'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-7-6(13)) LL: 44 PL: 21 PI: 23 %#200 Finer: 65.5		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 12
Constant Load Step
Stress: 1 tsf



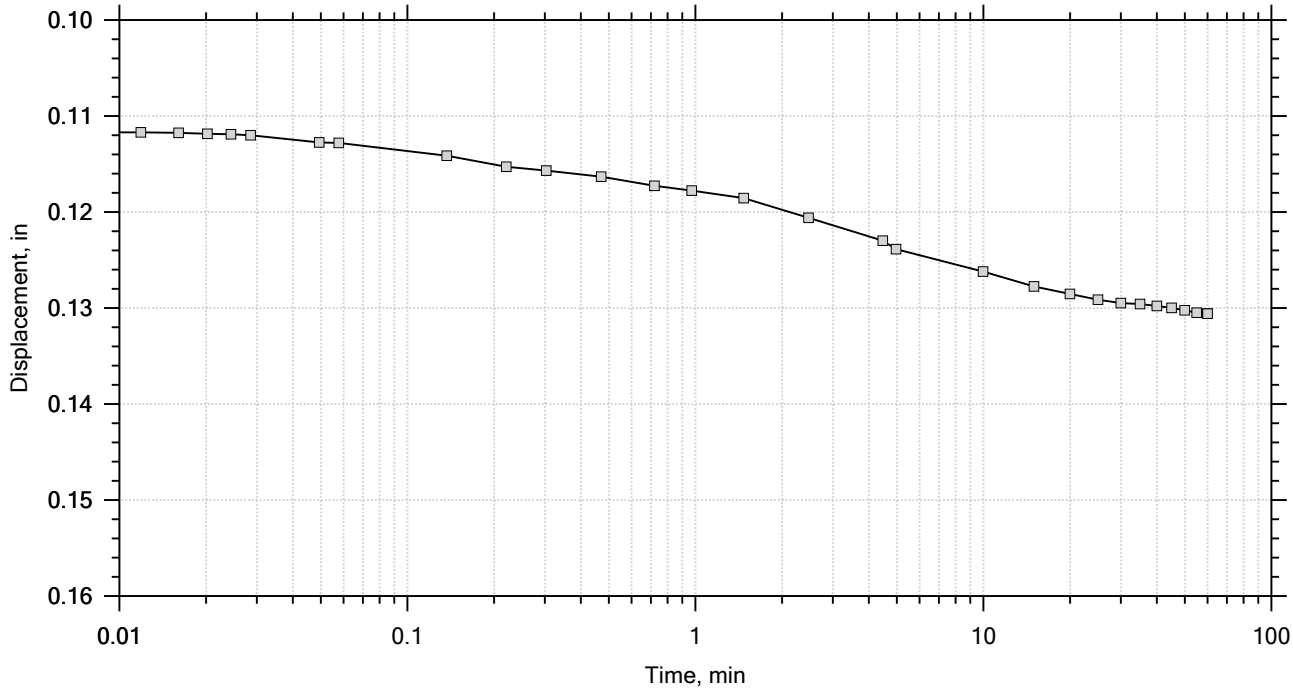


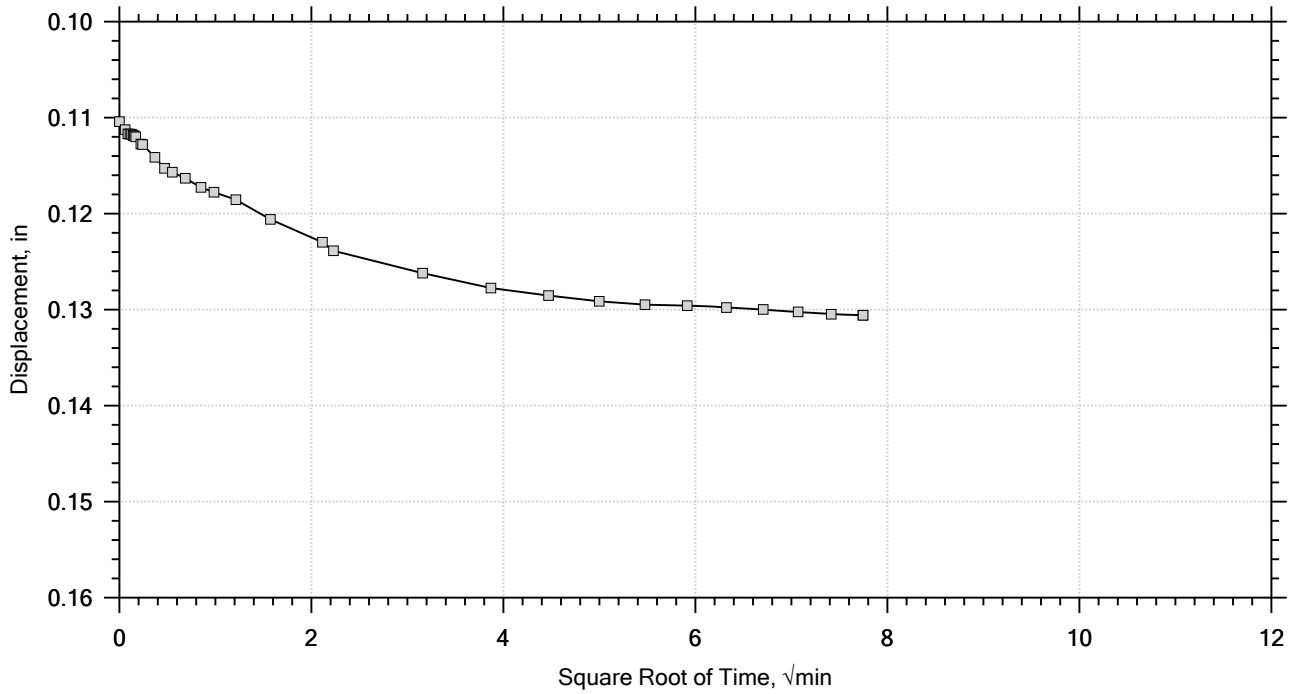
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-8	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1012	Test Date: 07/30/2018	Depth: 6.0' - 8.5'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-7-6(13)) LL: 44 PL: 21 PI: 23 %#200 Finer: 65.5		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 12
Constant Load Step
Stress: 2 tsf



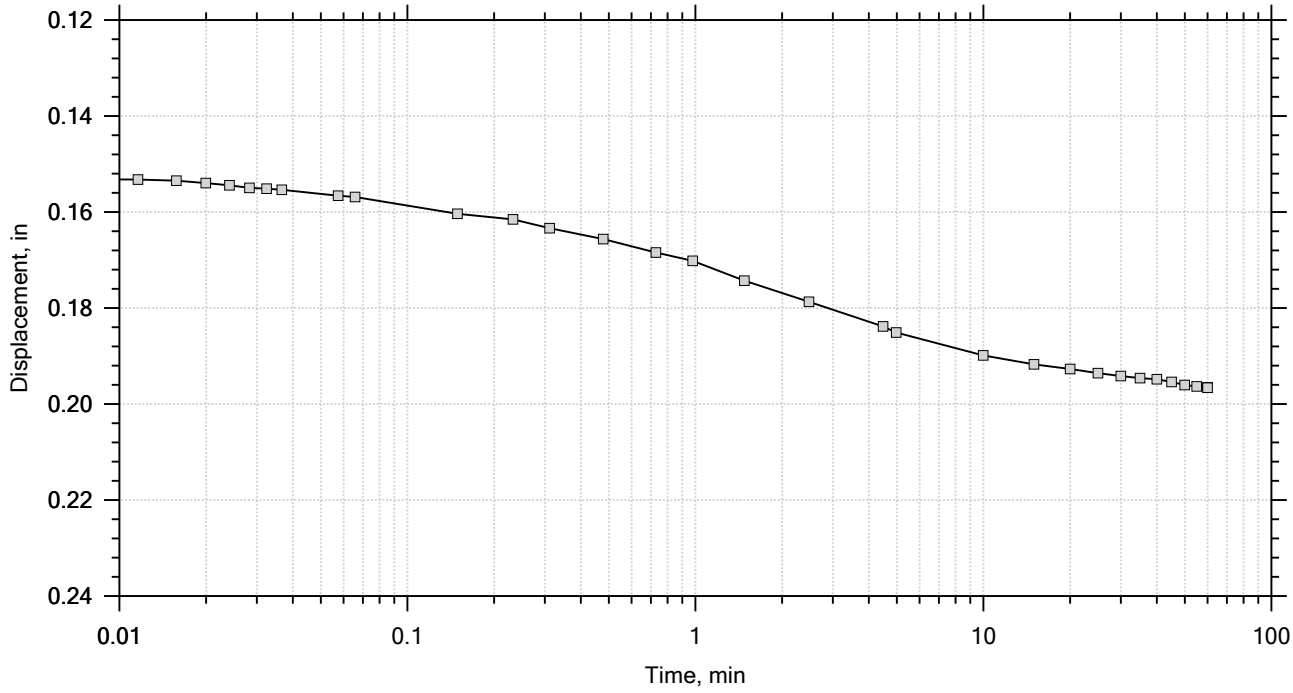


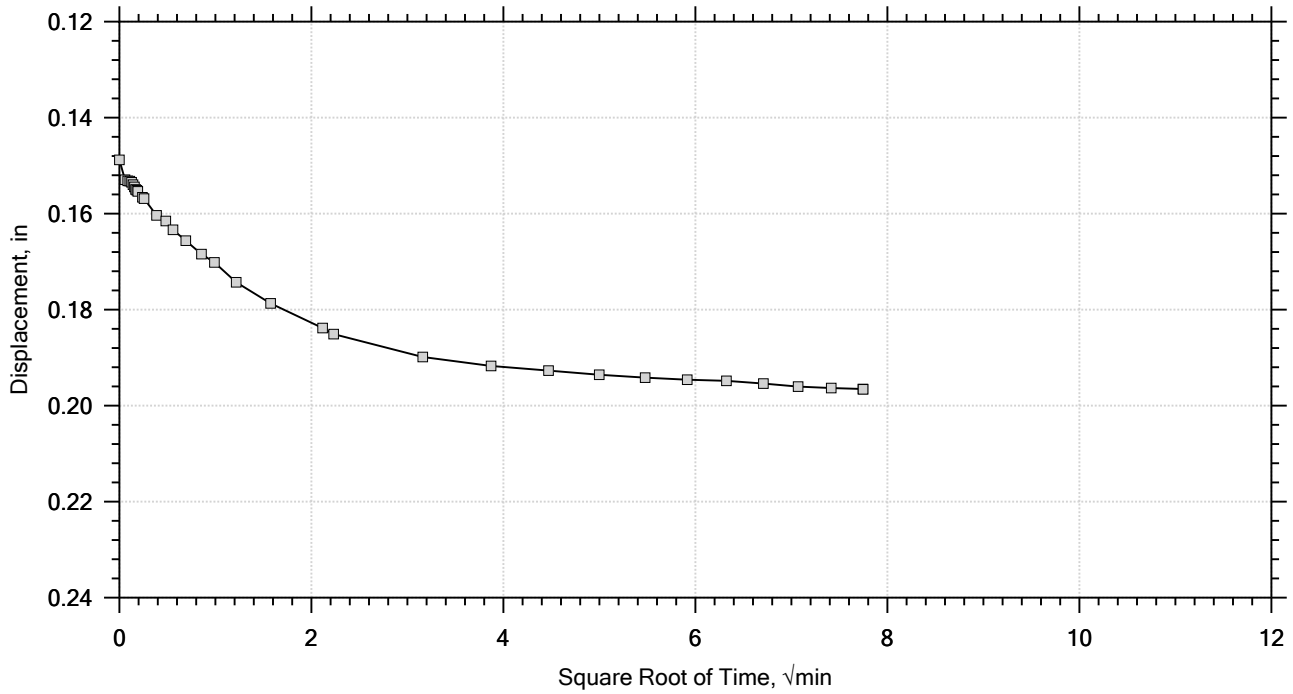
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-8	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1012	Test Date: 07/30/2018	Depth: 6.0' - 8.5'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-7-6(13)) LL: 44 PL: 21 PI: 23 %#200 Finer: 65.5		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 12
Constant Load Step
Stress: 8 tsf



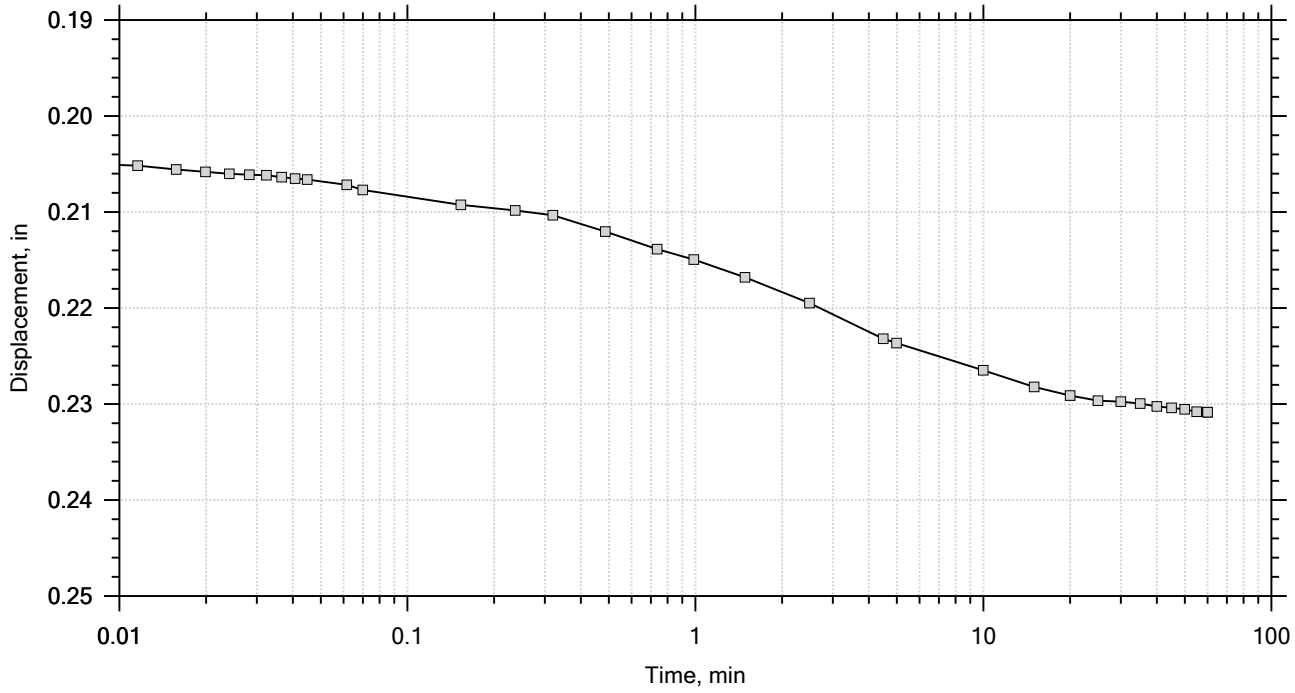


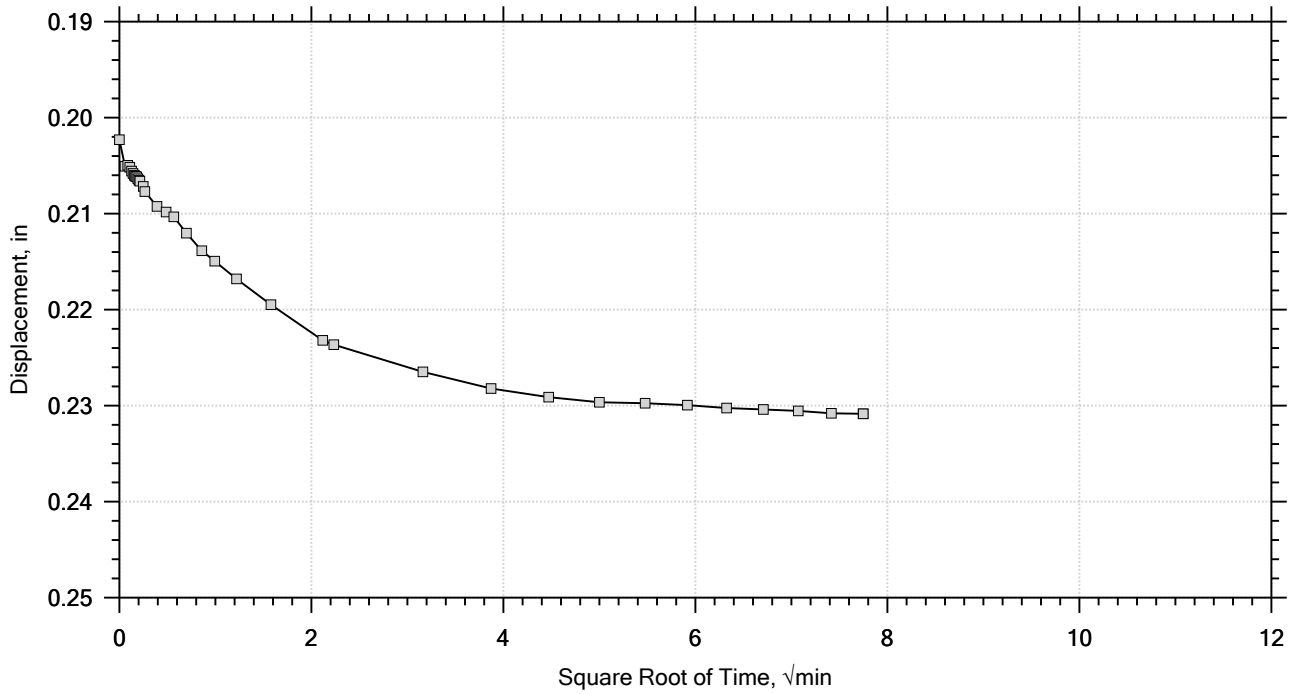
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-8	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1012	Test Date: 07/30/2018	Depth: 6.0' - 8.5'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-7-6(13)) LL: 44 PL: 21 PI: 23 %#200 Finer: 65.5		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 12
Constant Load Step
Stress: 16 tsf



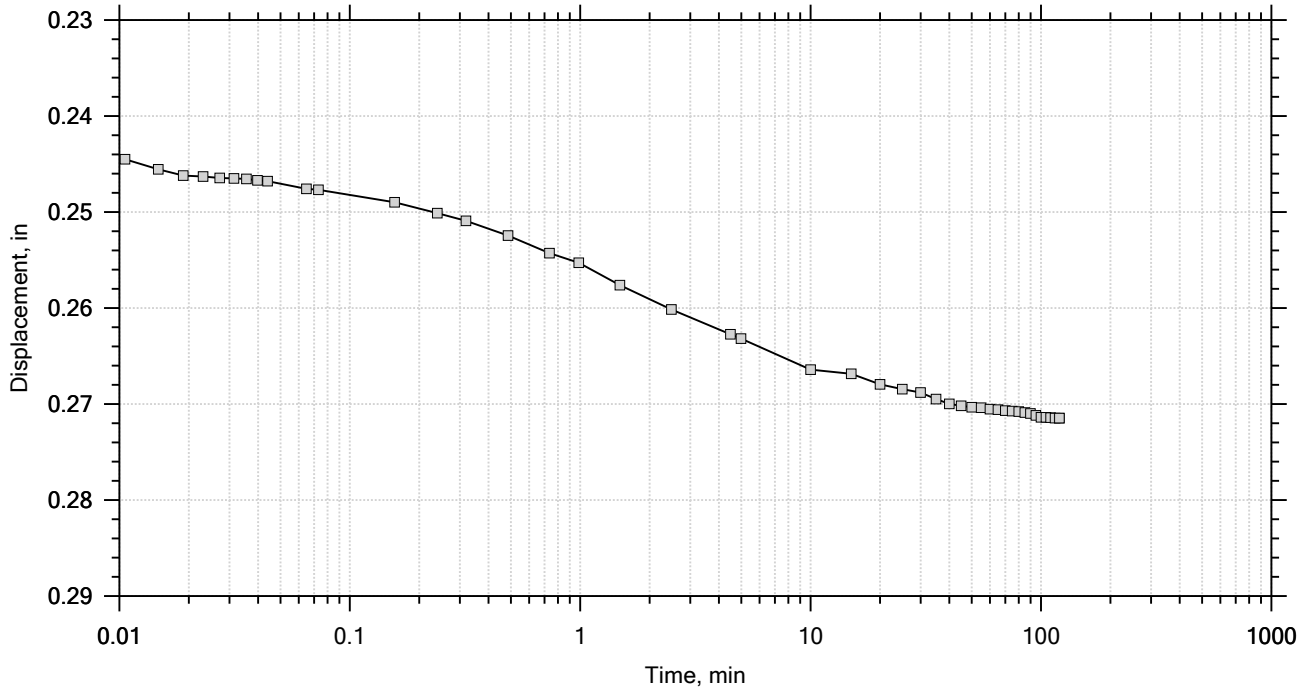


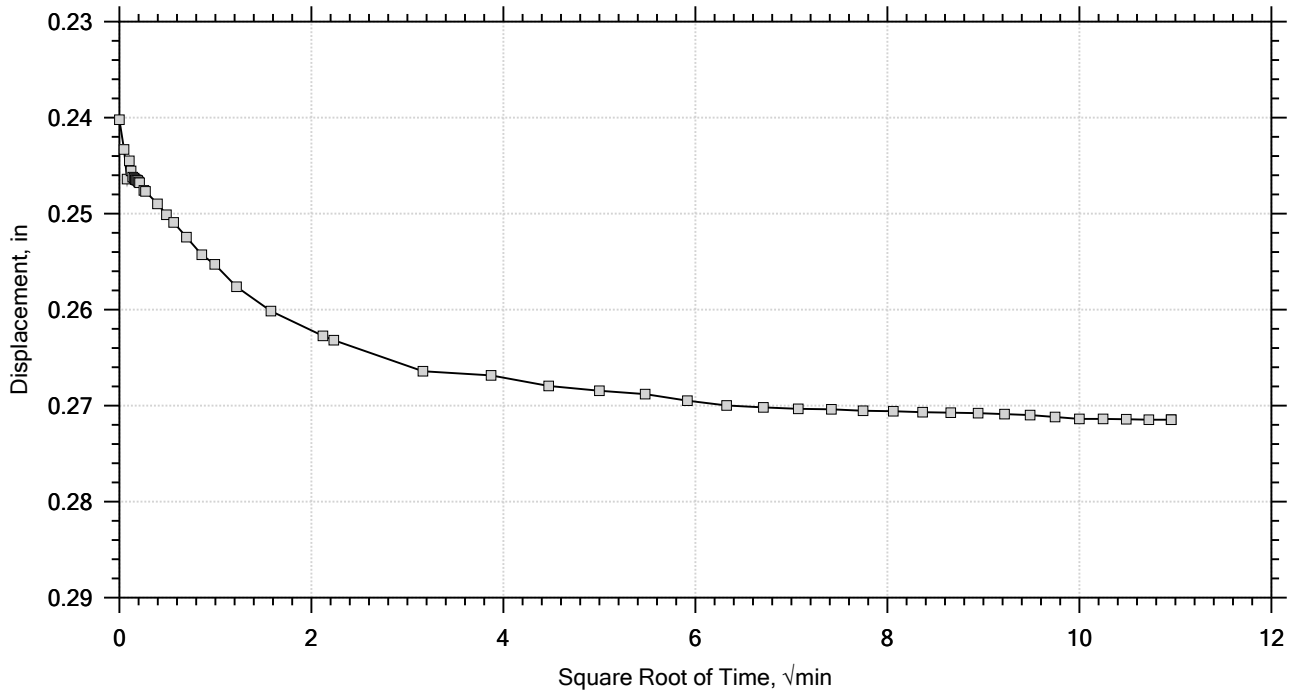
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-8	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1012	Test Date: 07/30/2018	Depth: 6.0' - 8.5'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-7-6(13)) LL: 44 PL: 21 PI: 23 %#200 Finer: 65.5		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 12
Constant Load Step
Stress: 32 tsf



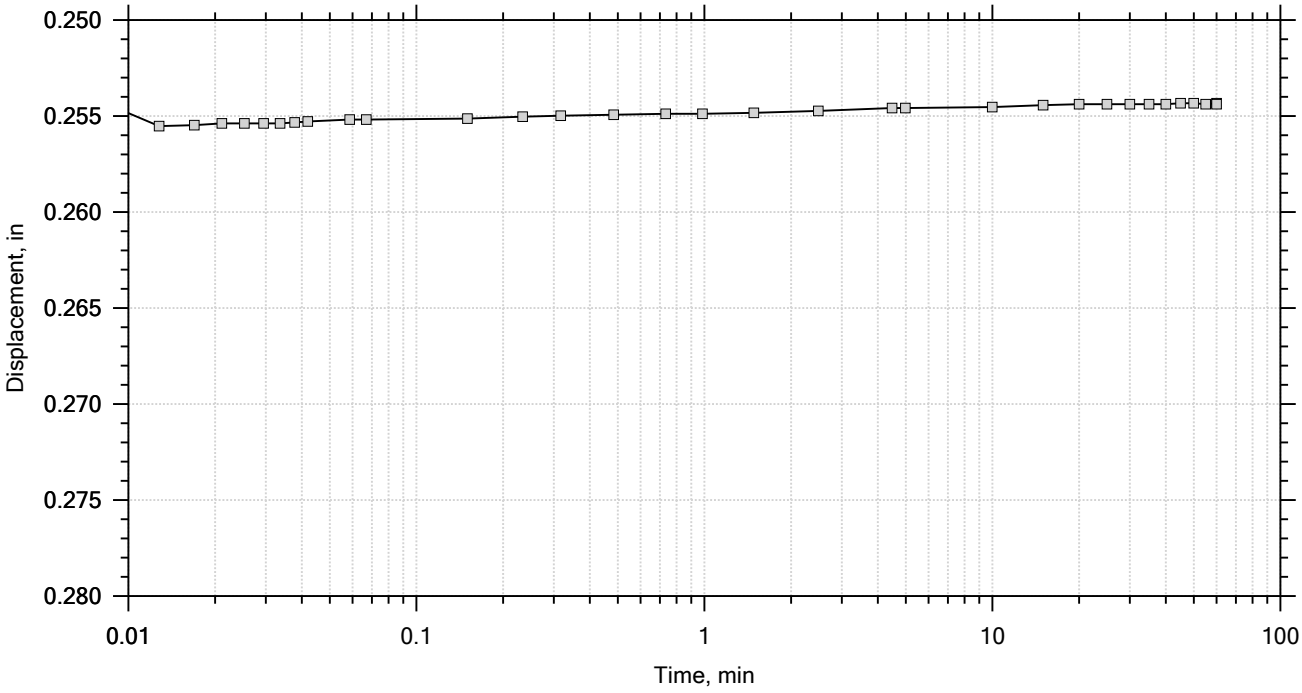


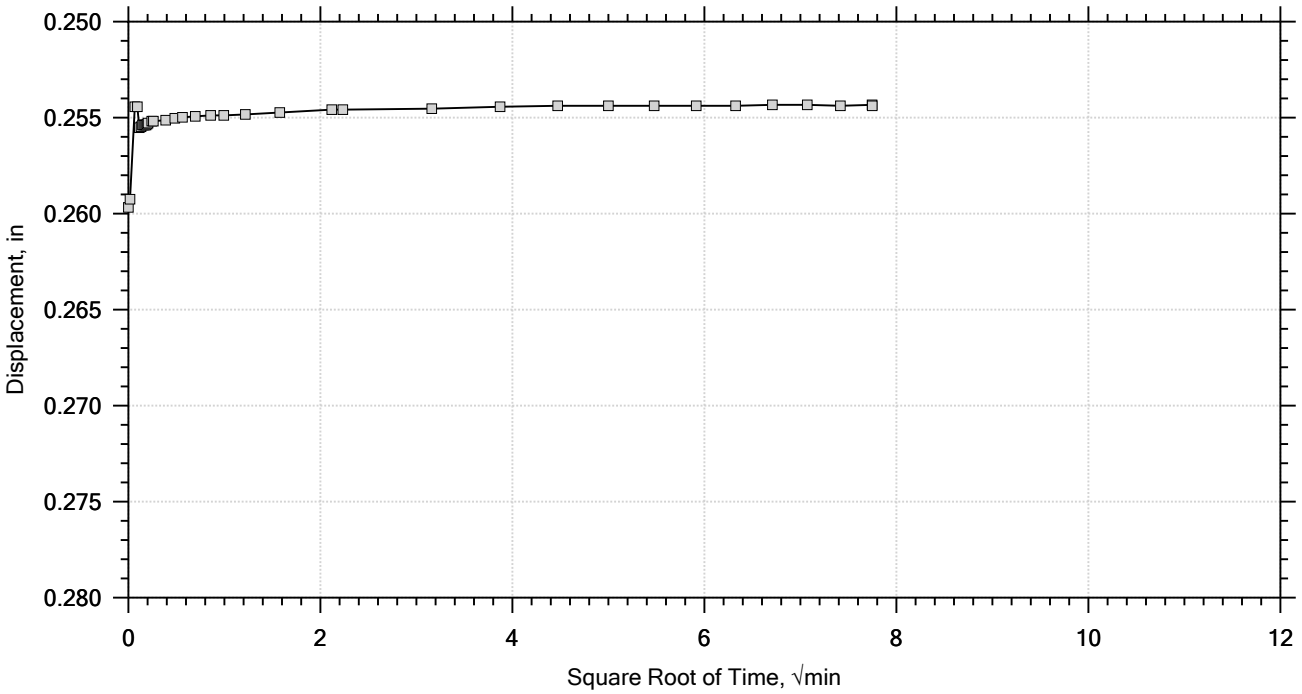
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-8	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1012	Test Date: 07/30/2018	Depth: 6.0' - 8.5'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-7-6(13)) LL: 44 PL: 21 PI: 23 %#200 Finer: 65.5		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 12
Constant Load Step
Stress: 8 tsf



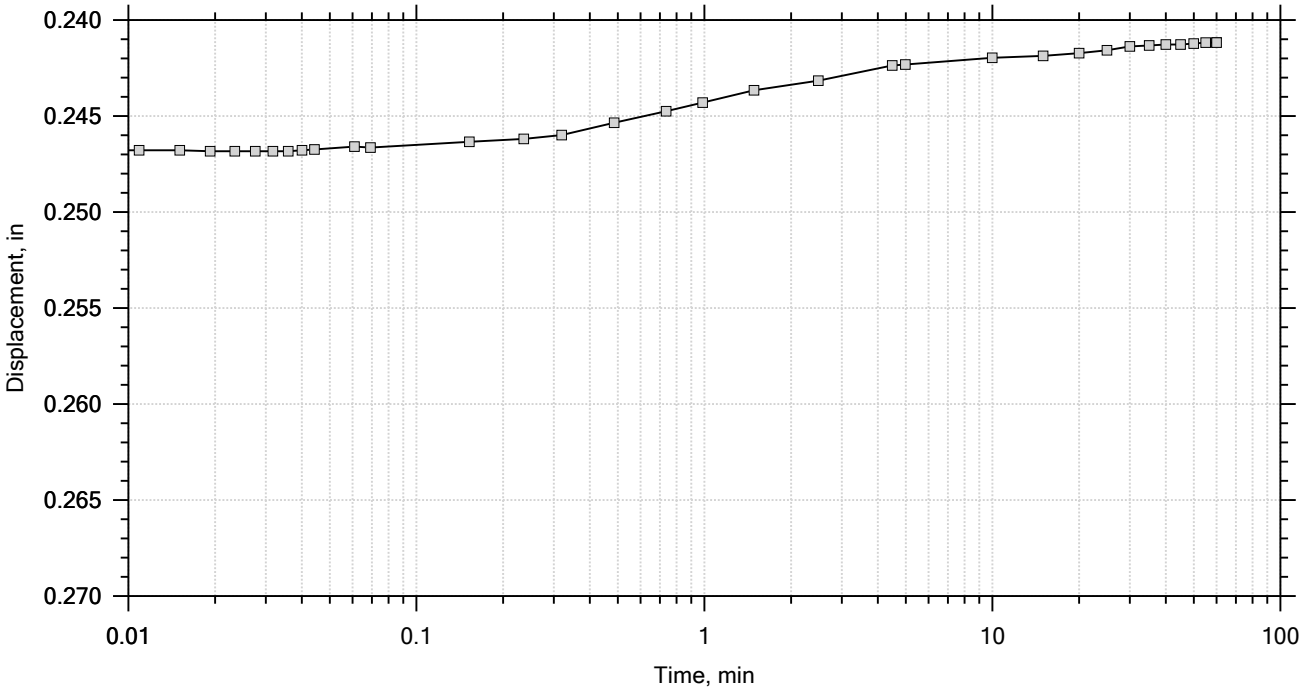


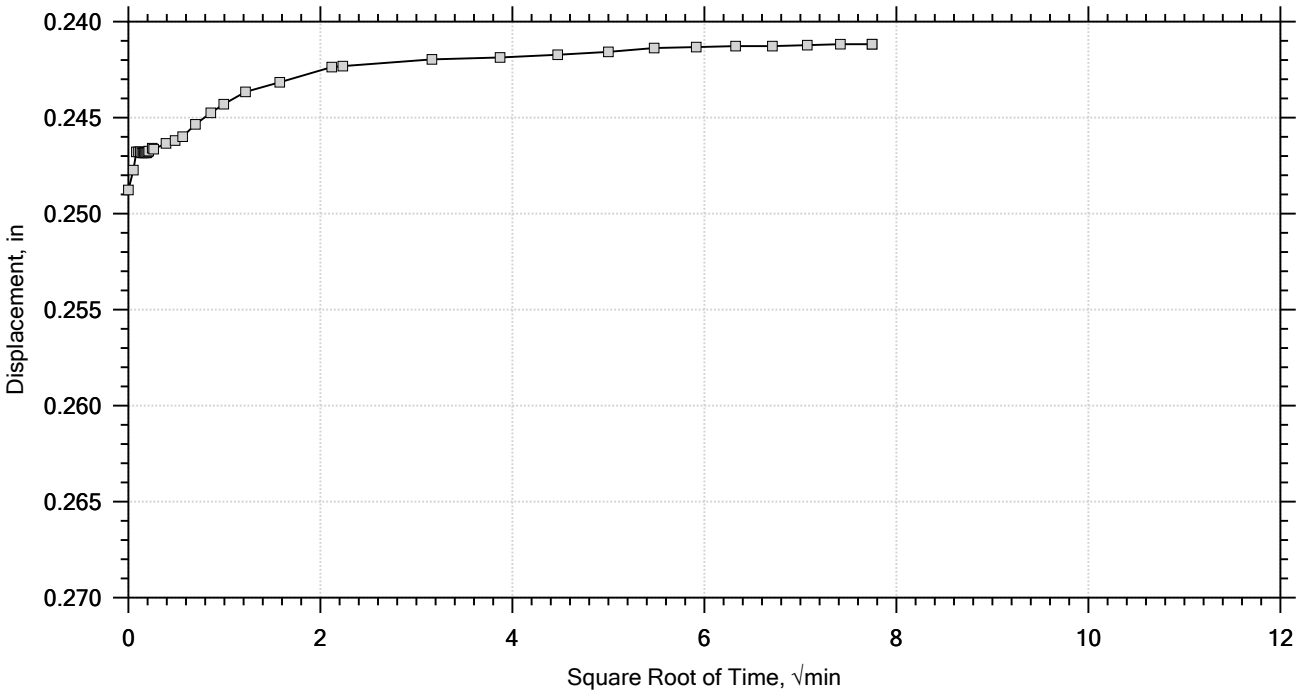
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-8	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1012	Test Date: 07/30/2018	Depth: 6.0' - 8.5'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-7-6(13)) LL: 44 PL: 21 PI: 23 %#200 Finer: 65.5		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 12
Constant Load Step
Stress: 2 tsf



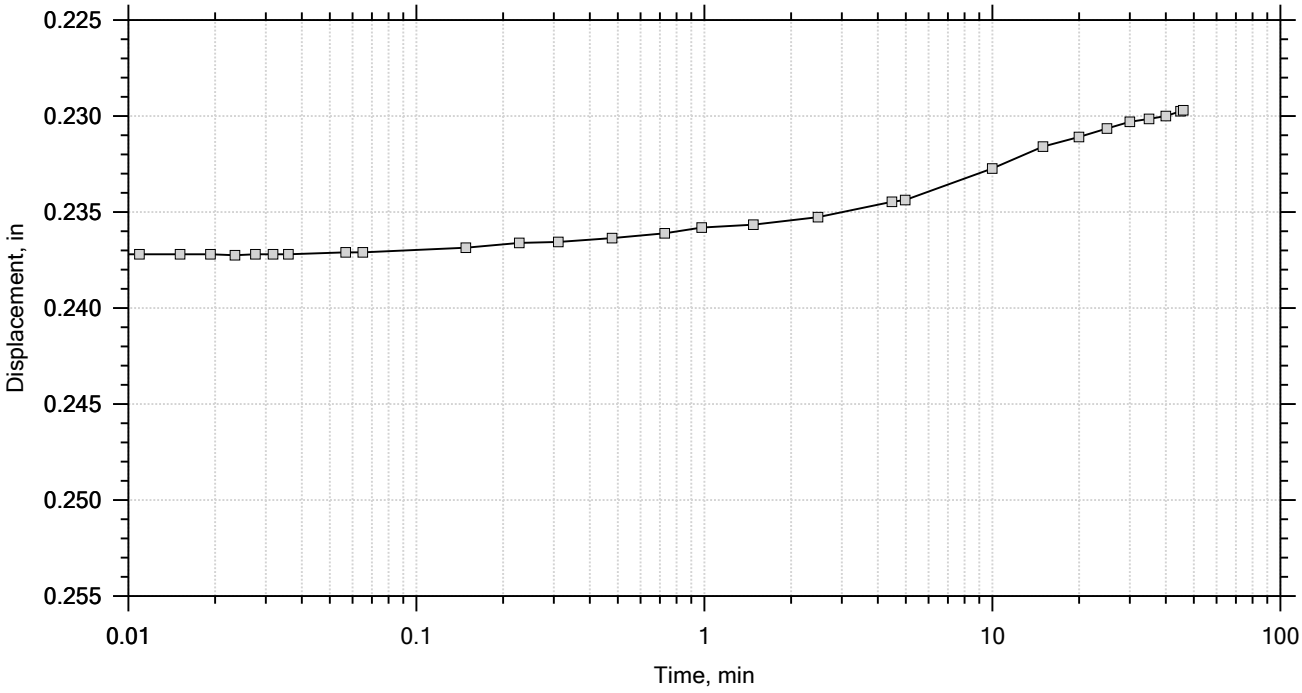


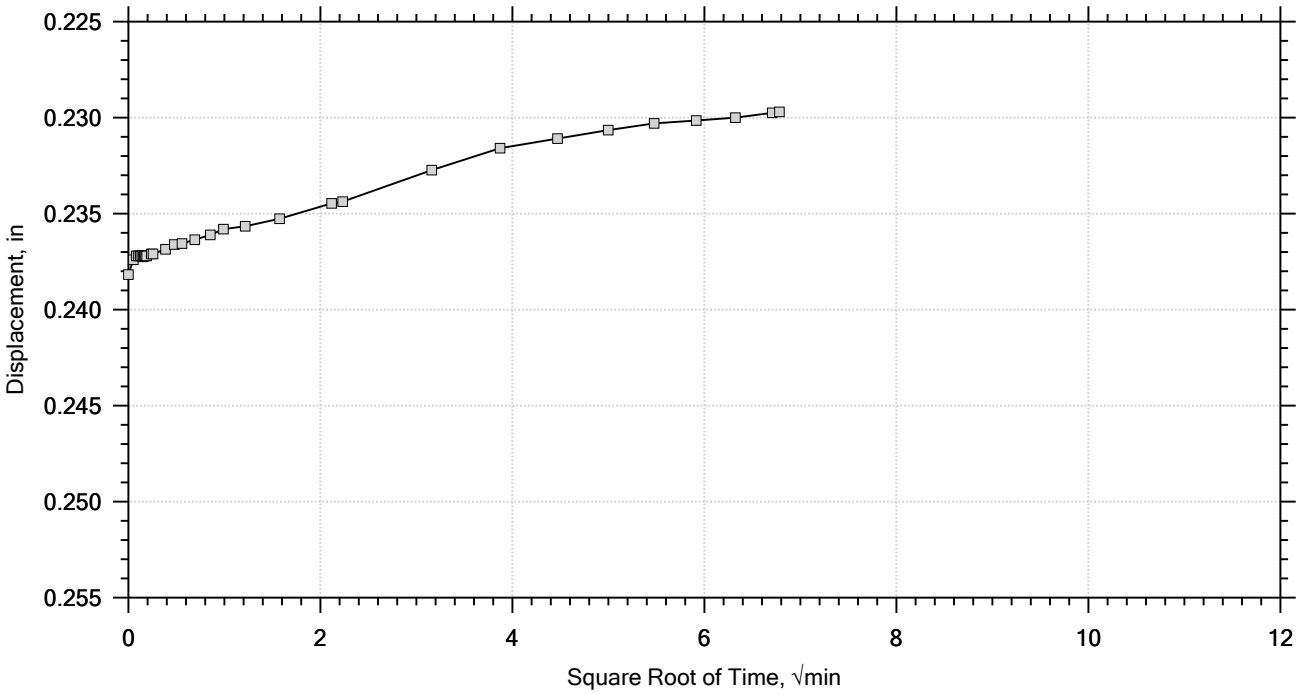
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-8	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1012	Test Date: 07/30/2018	Depth: 6.0' - 8.5'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-7-6(13)) LL: 44 PL: 21 PI: 23 %#200 Finer: 65.5		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 12
Constant Load Step
Stress: 0.5 tsf



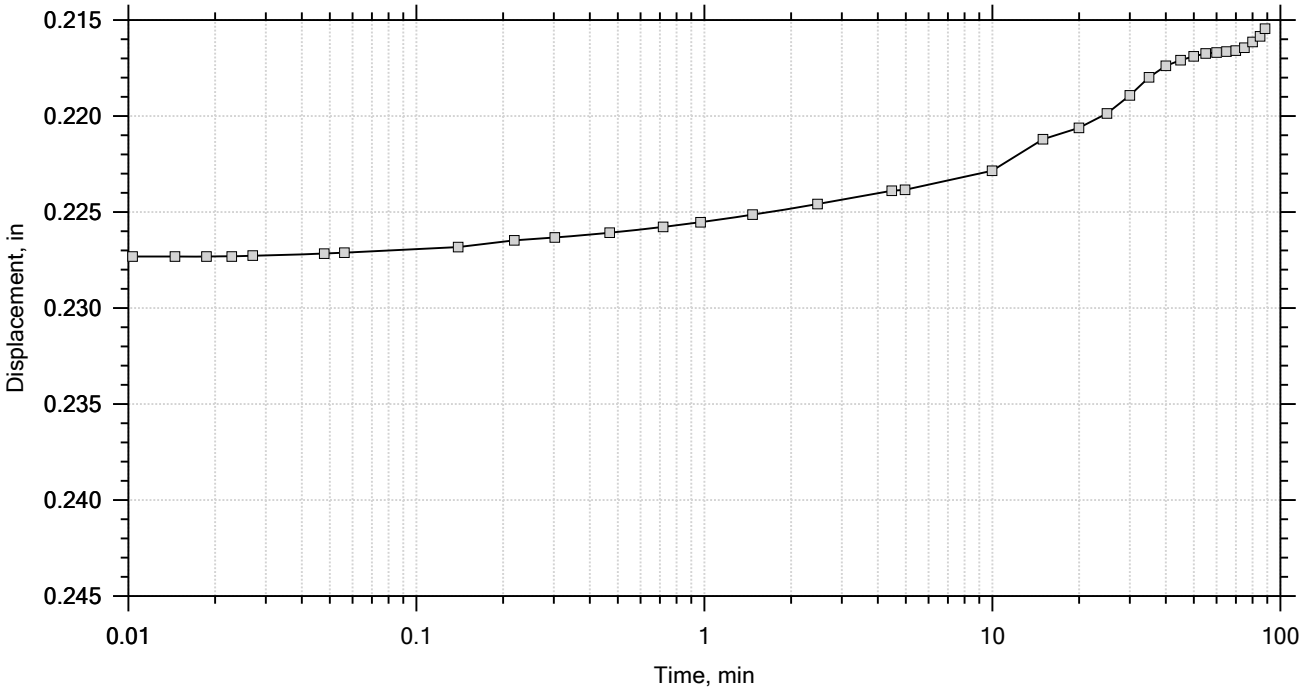


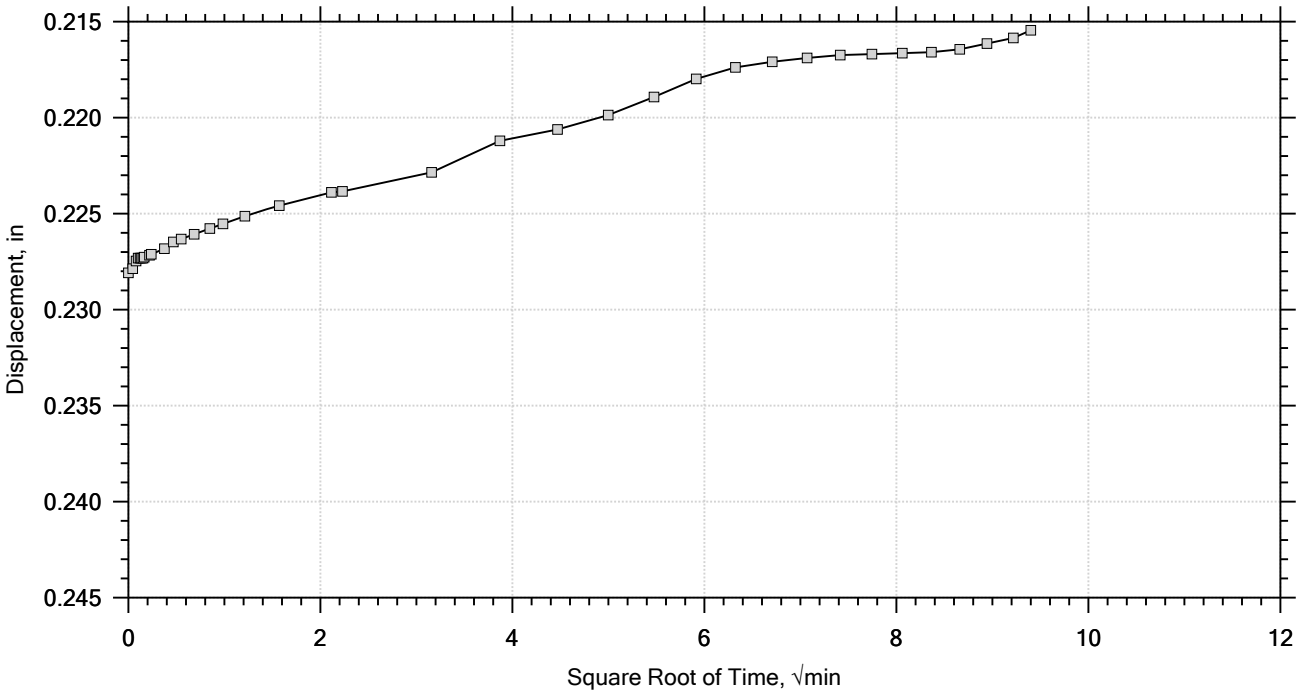
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-8	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1012	Test Date: 07/30/2018	Depth: 6.0' - 8.5'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-7-6(13)) LL: 44 PL: 21 PI: 23 %#200 Finer: 65.5		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 12
Constant Load Step
Stress: 0.125 tsf





F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-8	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1012	Test Date: 07/30/2018	Depth: 6.0' - 8.5'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Sandy Lean CLAY (CL/A-7-6(13)) LL: 44 PL: 21 PI: 23 %#200 Finer: 65.5		
Remarks:		

F&ME CONSULTANTS

3112 Devine Street
Columbia, South Carolina 29205

SPECIFIC GRAVITY OF SOILS
(ASTM D854 / AASHTO T100)

Project Name:	I-20/26/126 Corridor Improvements	**Project No.:**	G5662.01
Sample Location:	AP-9	**Sample/Boring No.:**	18-1031
Description of Soil (Group Name & Symbol):	Elastic SILT (ML/A-7-5(20))	**Elevation/Depth of Sample:**	12' - 14.2'
% of Soils Passing #4 Sieve:		**Date Received:**	7/31/2018
Material Excluded:	**Yes**	X	**No**
Description of Excluded Material:			
Method:	**A**	X	**B**
Tested By:	William Pitts	**Date Tested:**	8/1/2018

Test No.	1			
Volume of Flask at 20° C	500ml			
Method of Air Removal	Boil			
Mass Flask + Water + Soil (Wb)	807.1			
Test Temperature ° C (Tx)	25			
Mass Flask + Water (Wa)	685.1			
Container No.	C			
Mass of Container + Oven Dry Soil	379.7			
Mass of Container	188.5			
Mass of Oven Dry Soil (Wo)	191.2			
Specific Gravity @ Test Temperature **Wo/[Wo+(Wa-Wb)]**	2.763			
Specific Gravity (SG) **K x Specific Gravity @ Test Temperature**	2.760			

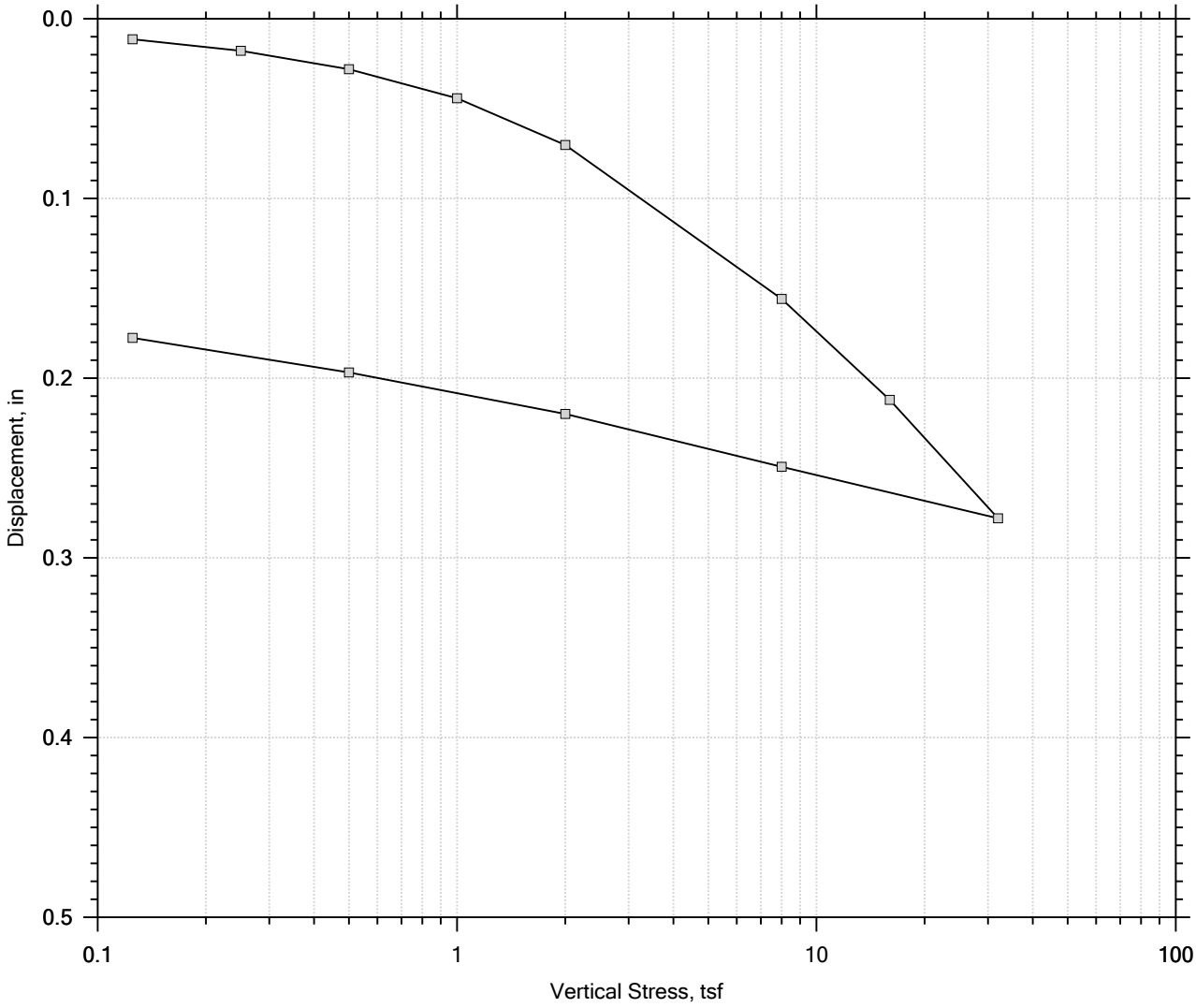
$$K = \frac{\text{Related Density of Water @ Test Temperature}}{\text{Relative Density of Water @ 20° C}}$$

Average Specific Gravity of Soils = _____

Remarks: _____

One-Dimensional Consolidation by ASTM D2435 - Method B

Summary Report

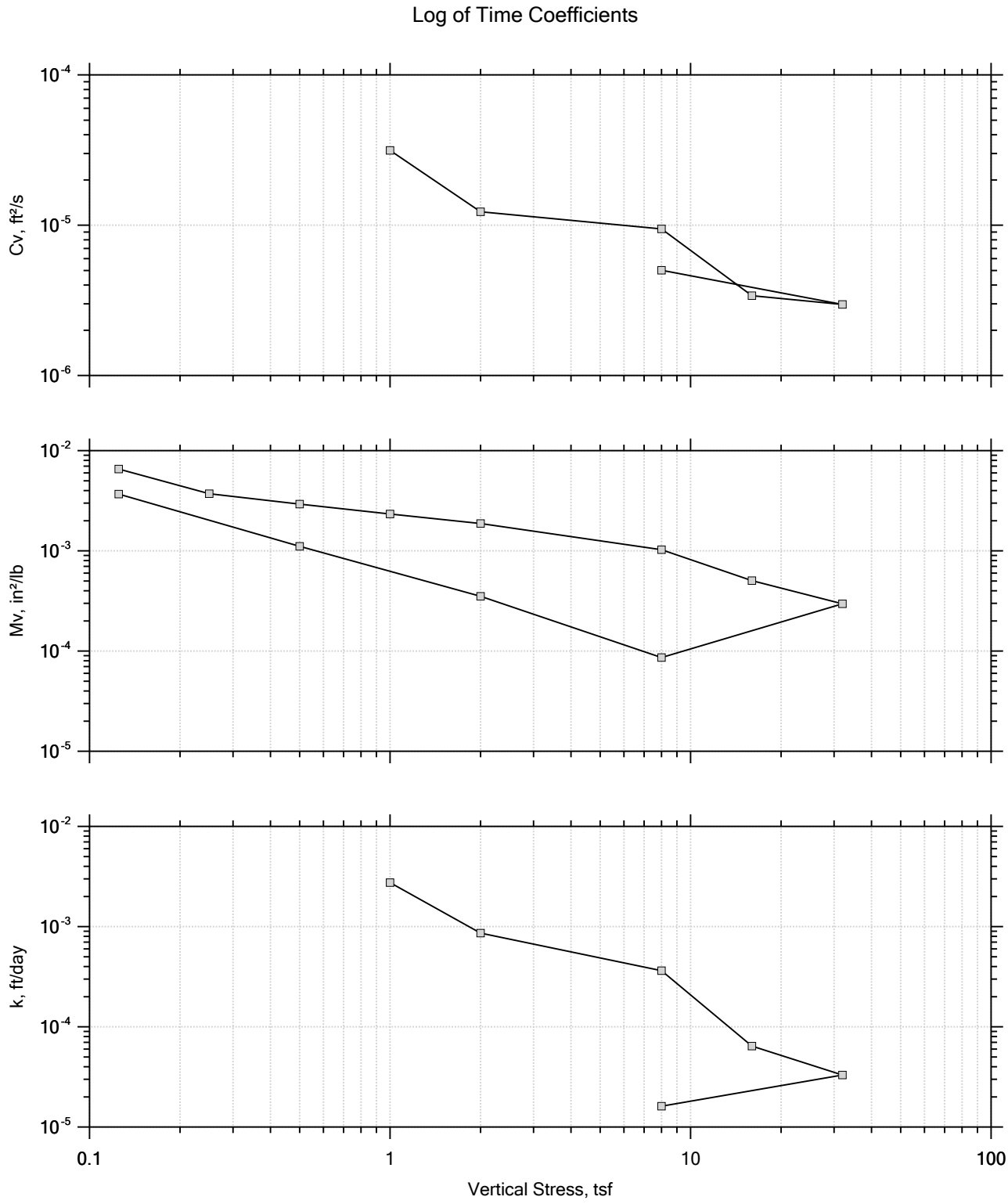


					Before Test	After Test
Current Vertical Effective Stress: 0 tsf				Water Content, %	27.78	26.89
Preconsolidation Stress: 0 tsf				Dry Unit Weight, pcf	92.096	103.08
Compression Ratio: 0				Saturation, %	88.03	110.54
Diameter: 2.5 in		Height: 1 in		Void Ratio	0.87	0.67
LL: 65	PL: 36	PI: 29	GS: 2.76			

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-9	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1031	Test Date: 07/31/2018	Depth: 12.0' - 14.2'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Elastic SILT (ML/A-7-5(20)) LL: 65 PL: 36 PI: 29 %#200 Finer: 97.0		
Remarks:		
Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

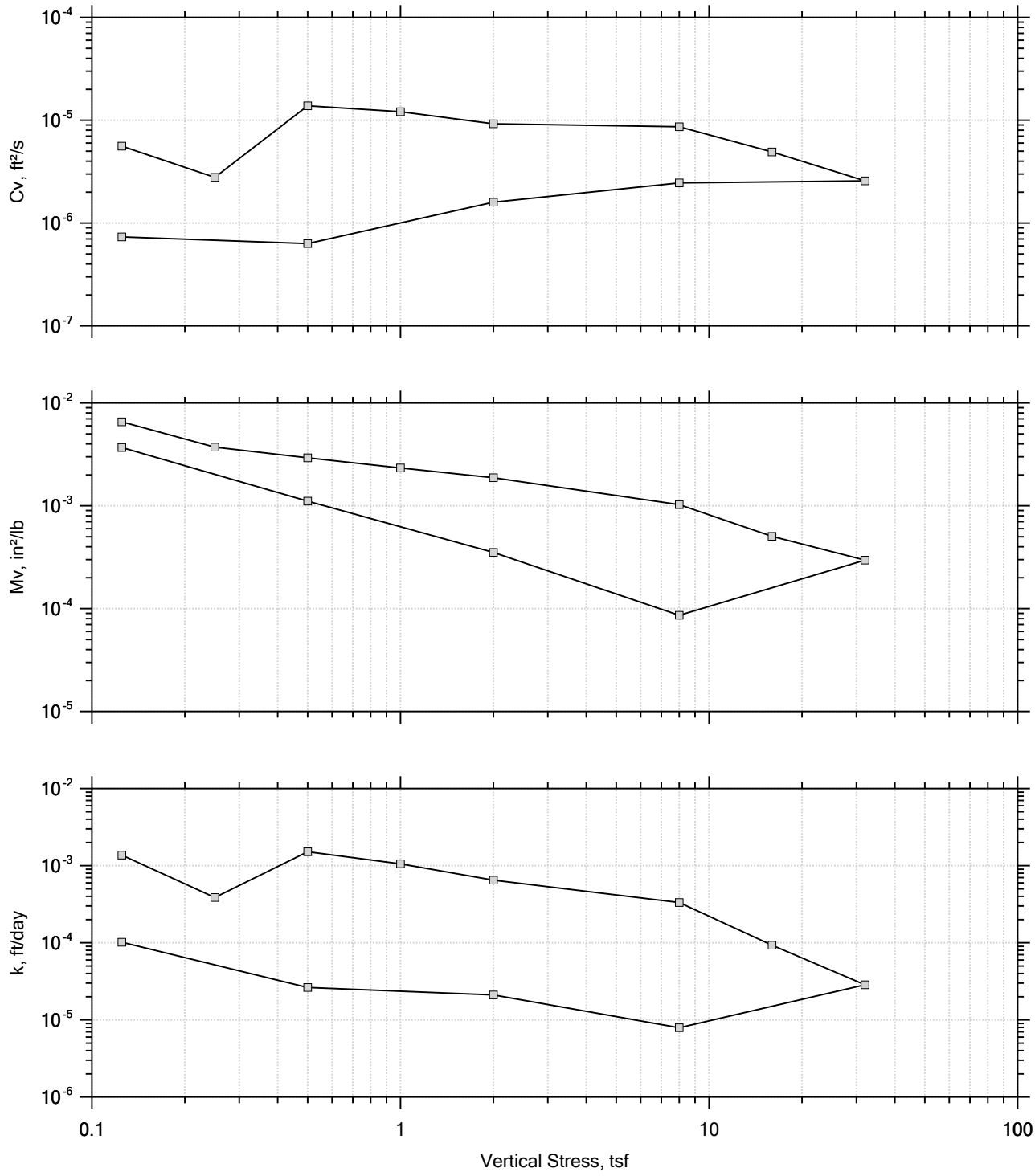


F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-9	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1031	Test Date: 07/31/2018	Depth: 12.0' - 14.2'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Elastic SILT (ML/A-7-5(20)) LL: 65 PL: 36 PI: 29 %#200 Finer: 97.0		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Square Root of Time Coefficients

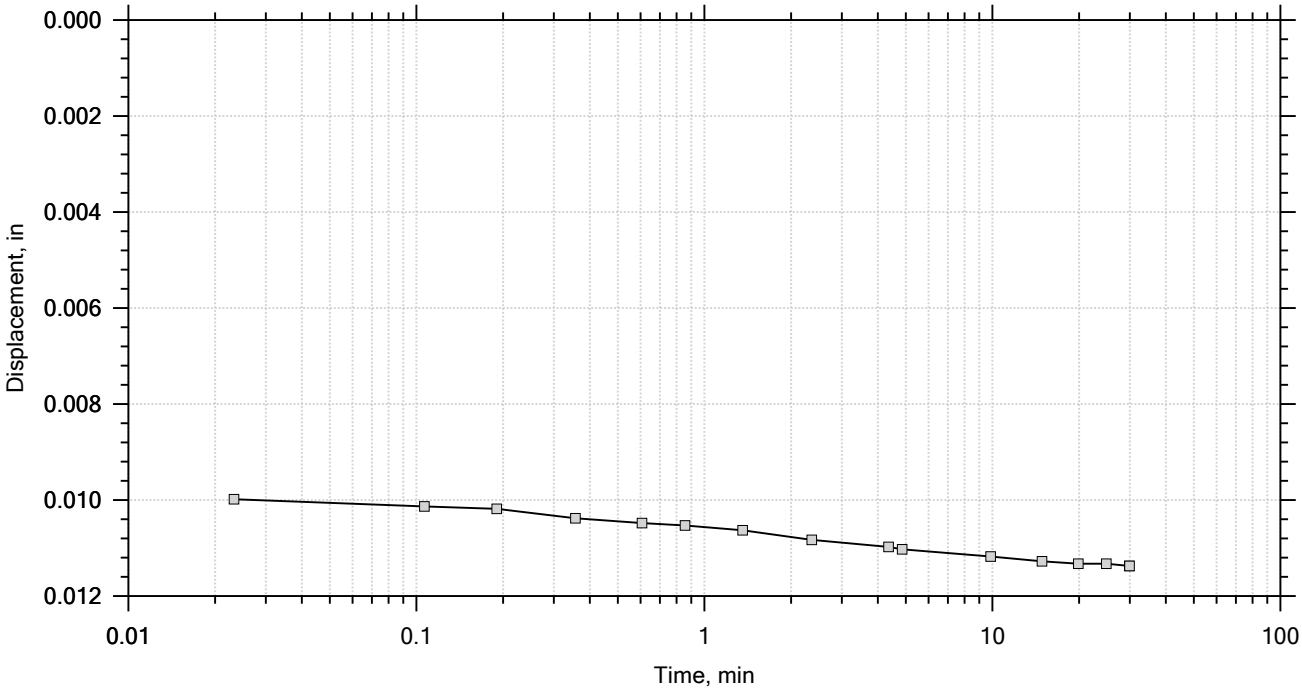


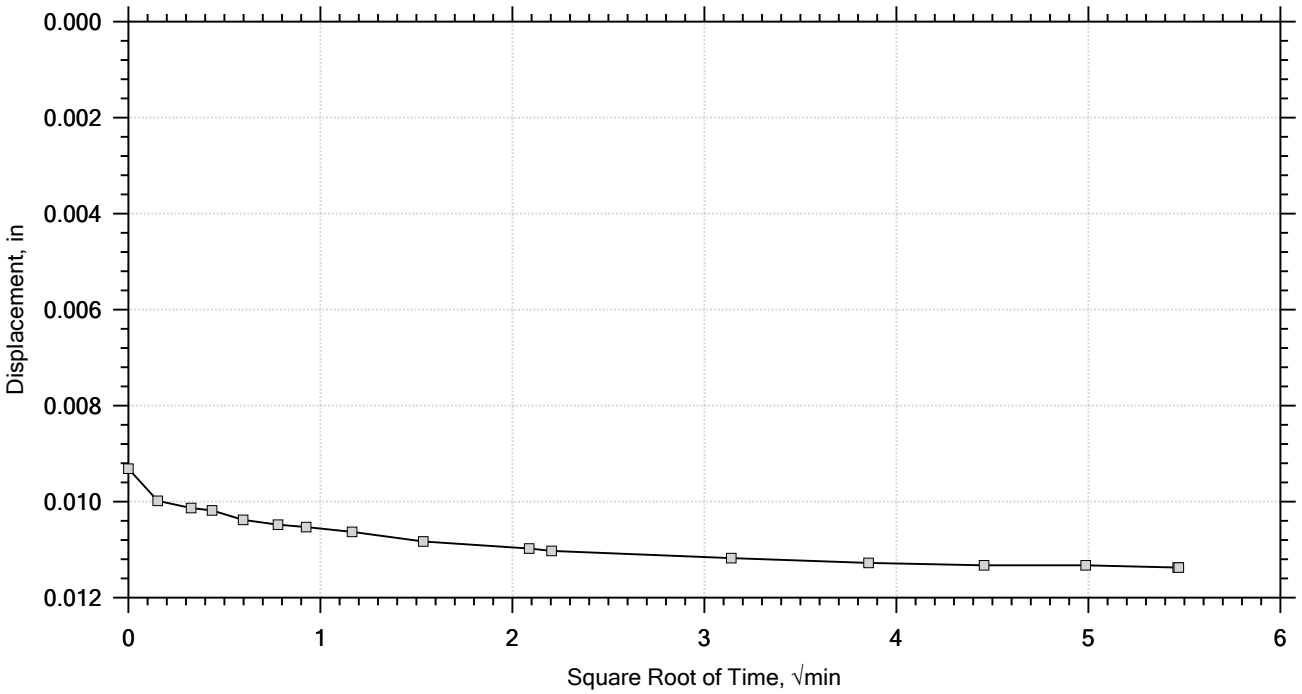
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-9	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1031	Test Date: 07/31/2018	Depth: 12.0' - 14.2'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Elastic SILT (ML/A-7-5(20)) LL: 65 PL: 36 PI: 29 %#200 Finer: 97.0		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 12
Constant Load Step
Stress: 0.125 tsf



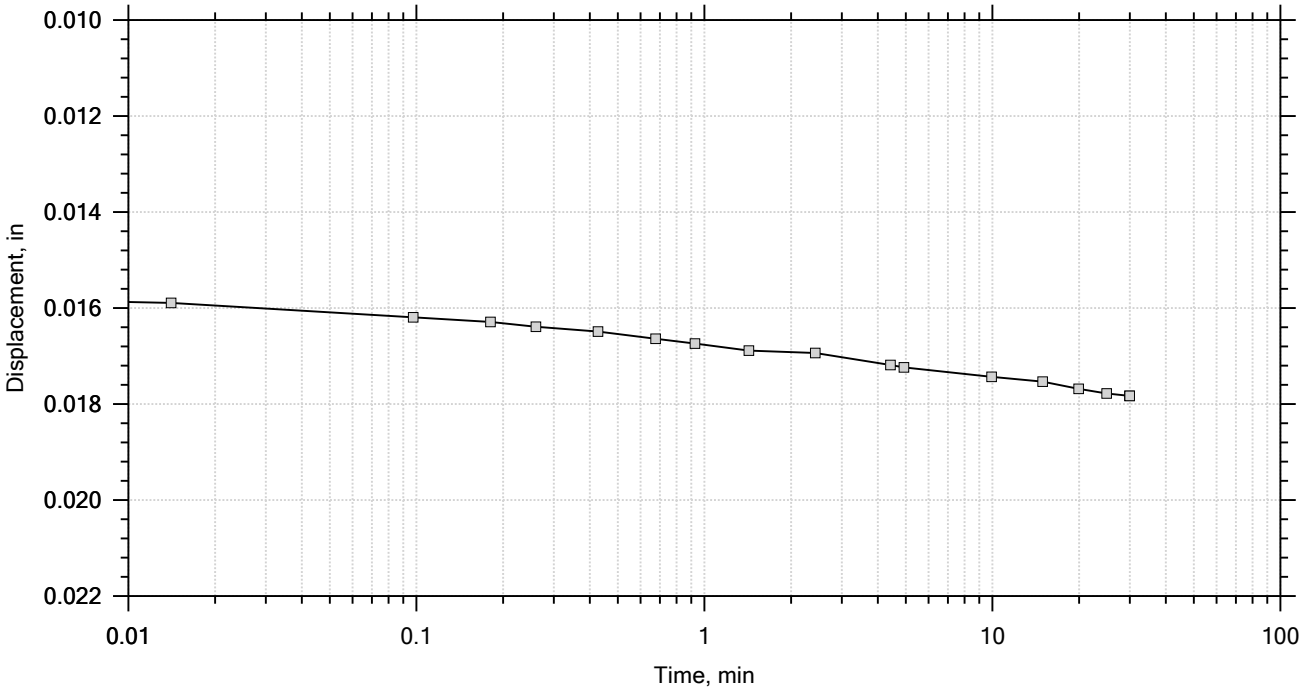


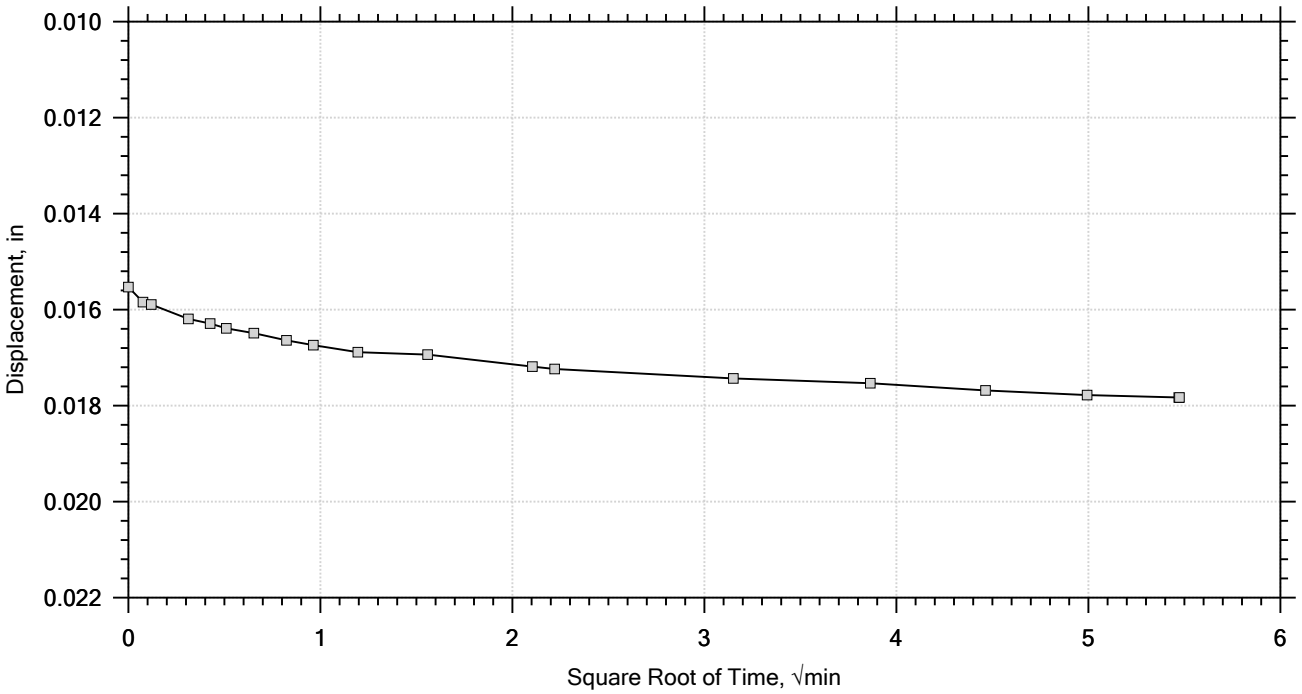
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-9	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1031	Test Date: 07/31/2018	Depth: 12.0' - 14.2'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Elastic SILT (ML/A-7-5(20)) LL: 65 PL: 36 PI: 29 %#200 Finer: 97.0		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 12
Constant Load Step
Stress: 0.25 tsf



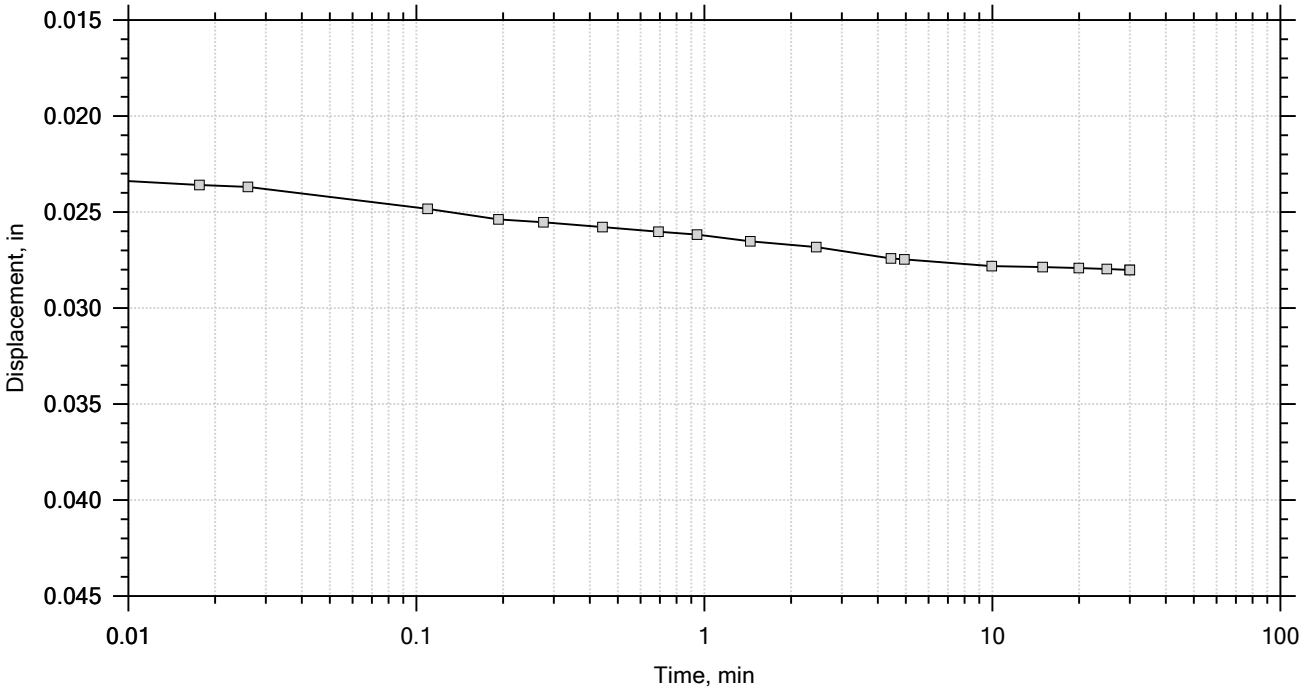


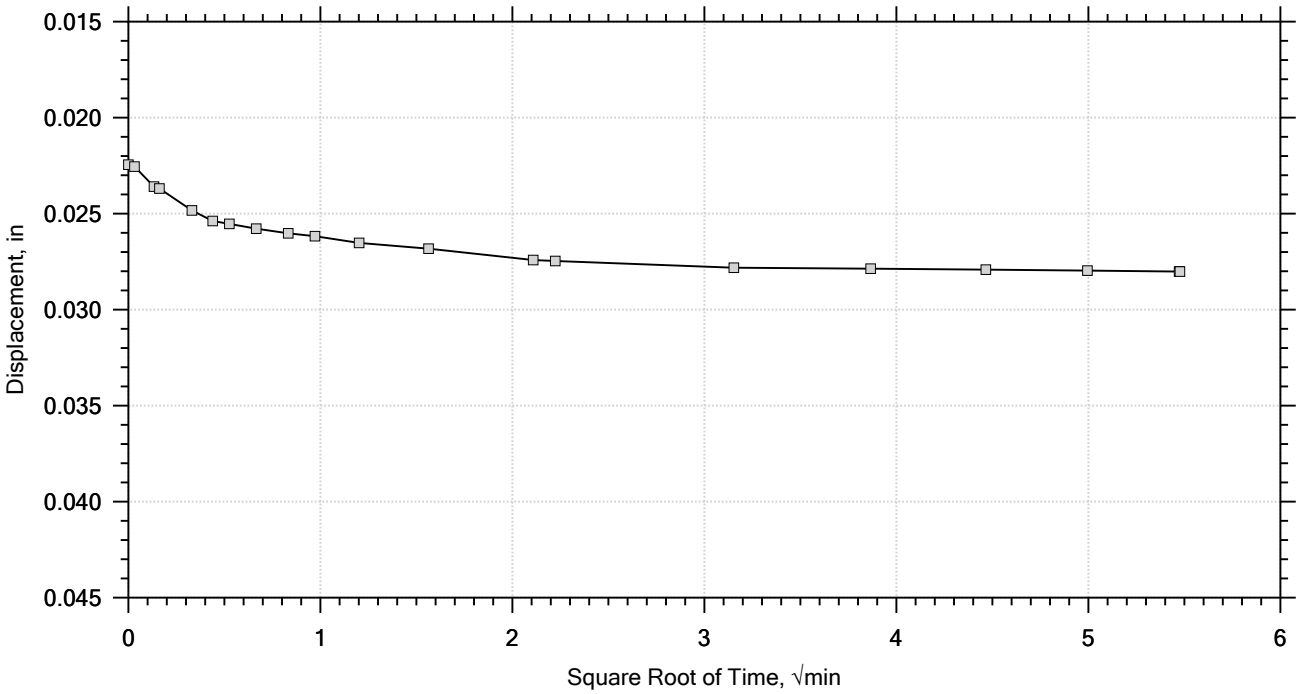
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-9	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1031	Test Date: 07/31/2018	Depth: 12.0' - 14.2'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Elastic SILT (ML/A-7-5(20)) LL: 65 PL: 36 PI: 29 %#200 Finer: 97.0		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 12
Constant Load Step
Stress: 0.5 tsf



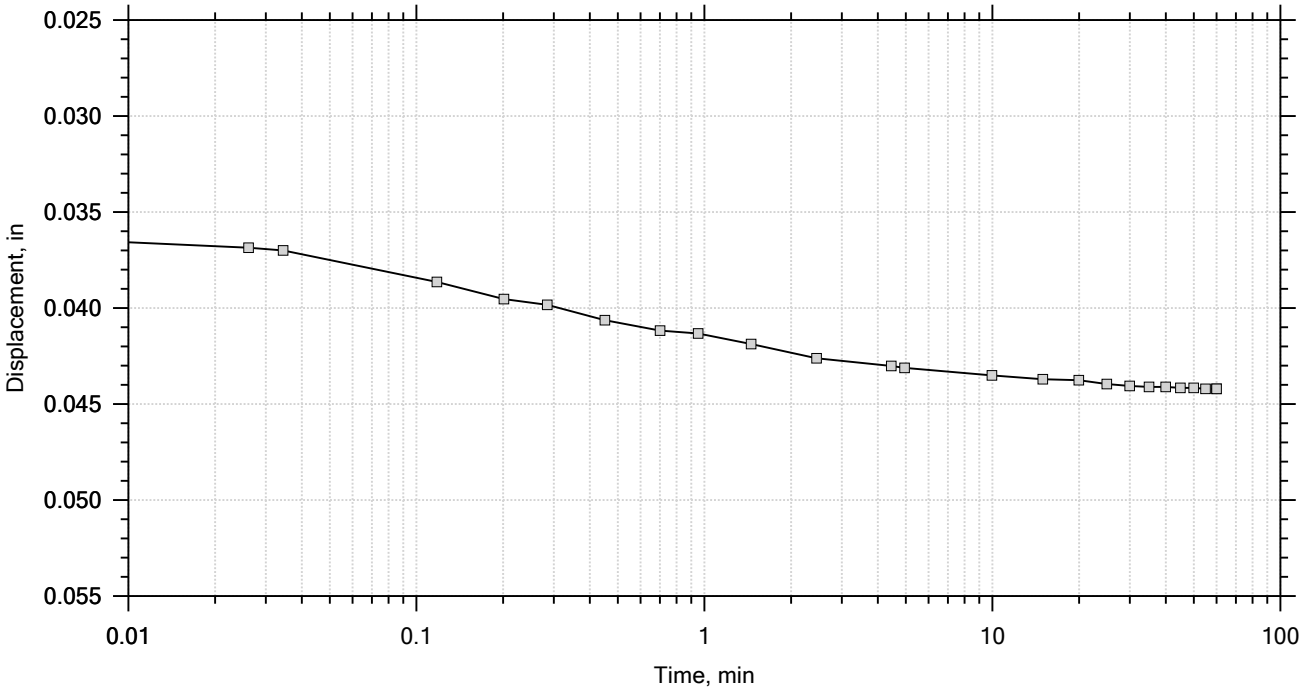


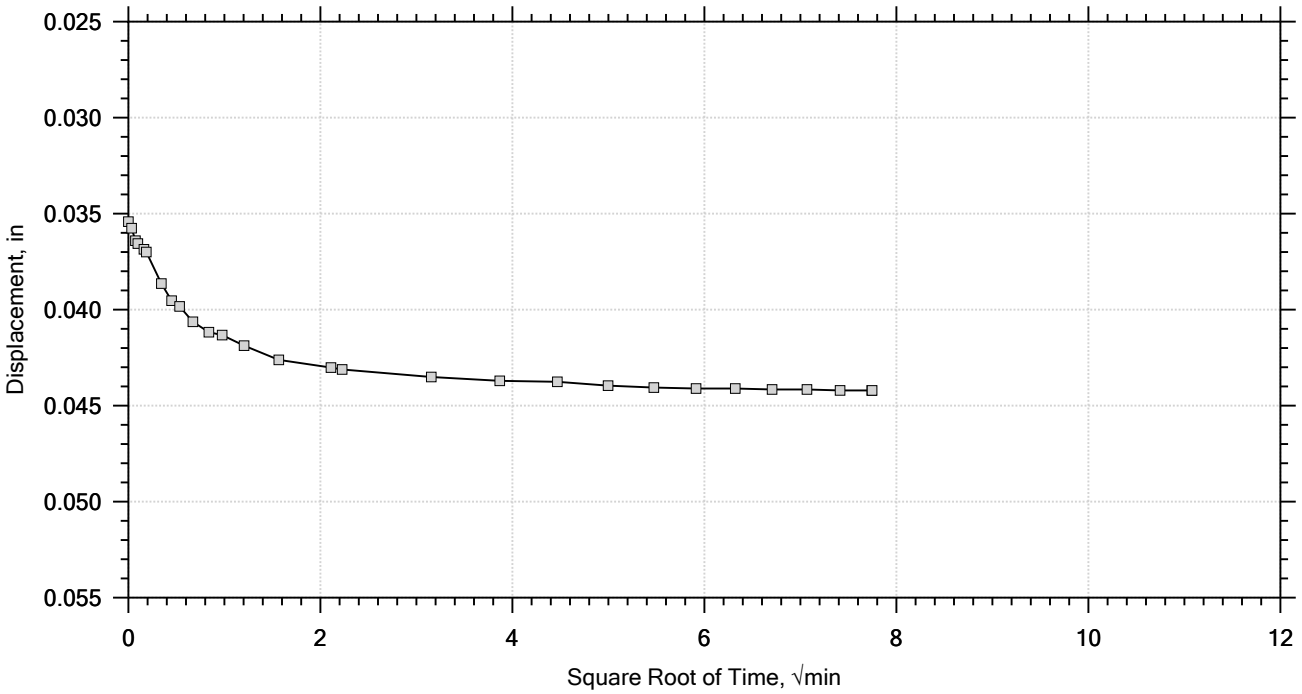
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-9	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1031	Test Date: 07/31/2018	Depth: 12.0' - 14.2'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Elastic SILT (ML/A-7-5(20)) LL: 65 PL: 36 PI: 29 %#200 Finer: 97.0		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 12
Constant Load Step
Stress: 1 tsf

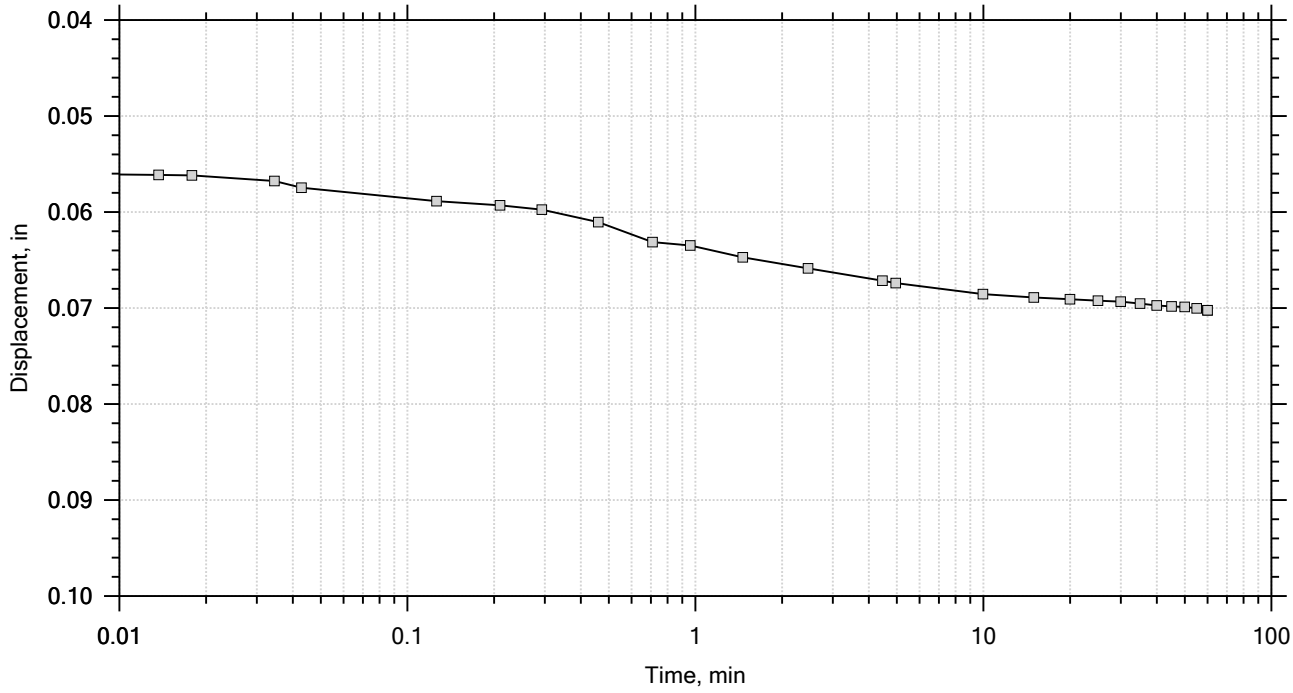


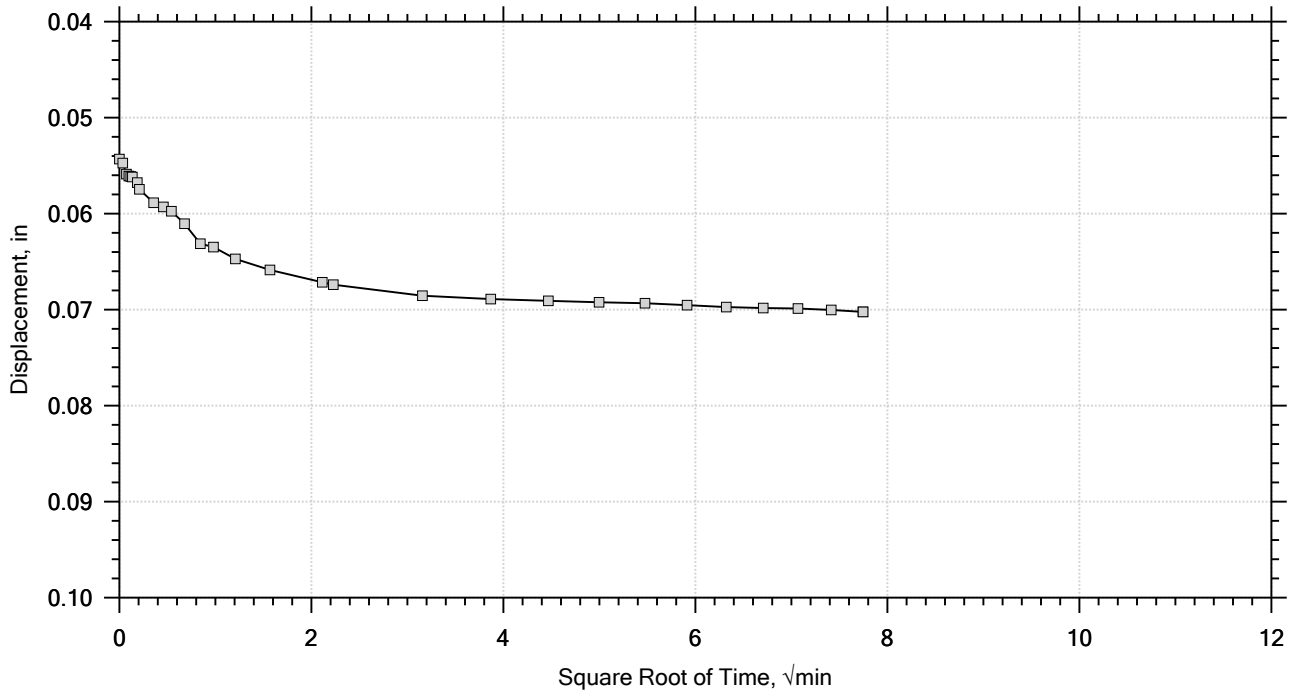


F&ME CONSULTANTS	Project: CCR	Location: Columbia, SC	Project No.: G5662.01
	Boring No.: AP-9	Tested By: WAP	Checked By: RS/JFH
	Sample No.: 18-1031	Test Date: 07/31/2018	Depth: 12.0' - 14.2'
	Test No.: A	Sample Type: Undisturbed	Elevation: --
	Description: Elastic SILT (ML/A-7-5(20)) LL: 65 PL: 36 PI: 29 %#200 Finer: 97.0		
	Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 12
Constant Load Step
Stress: 2 tsf



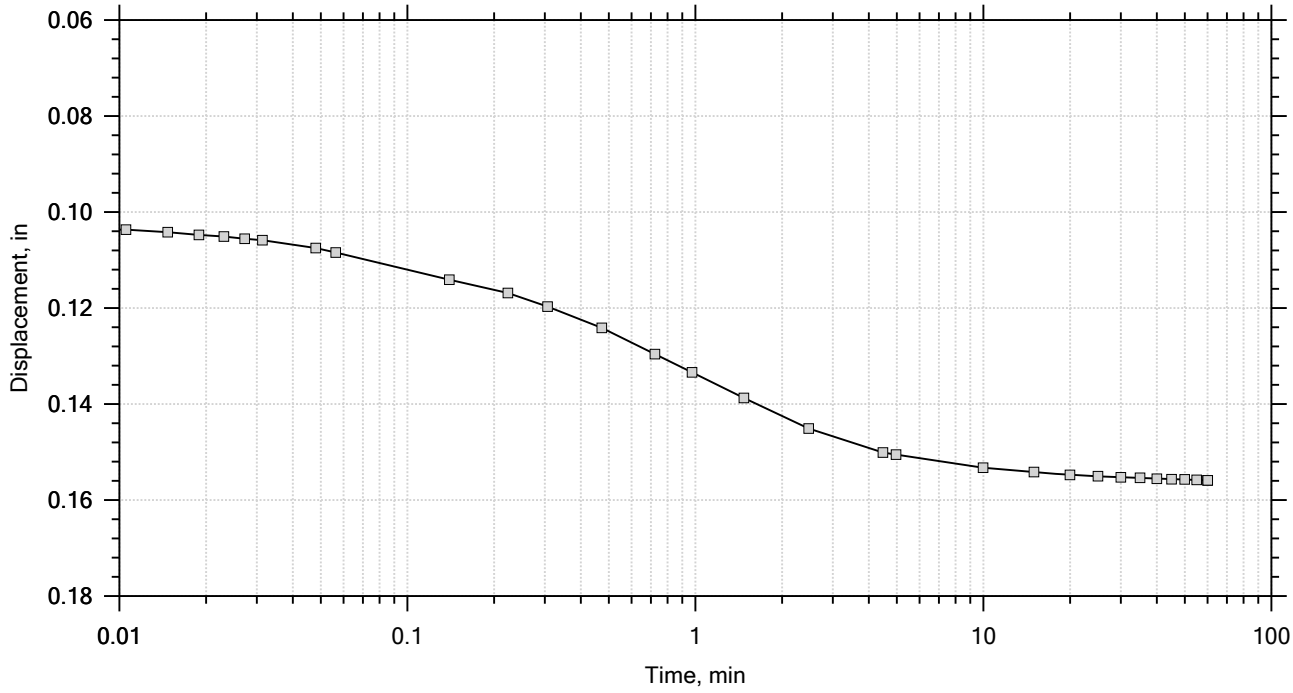


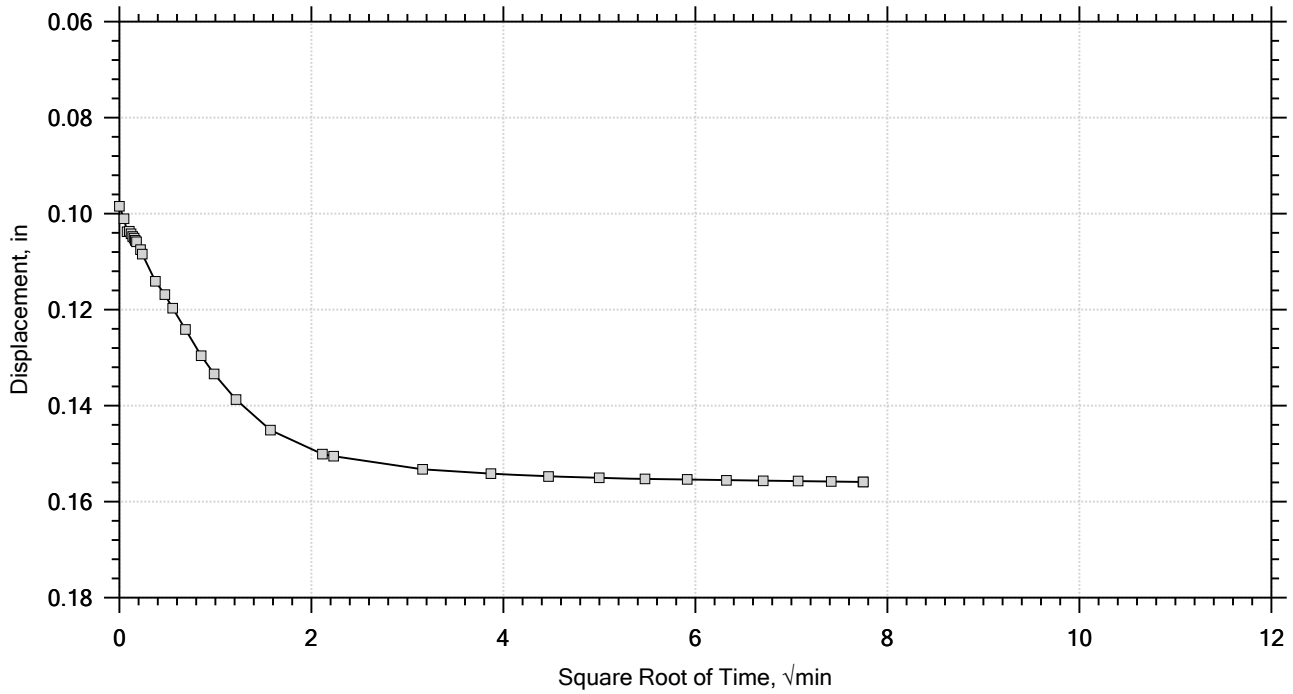
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-9	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1031	Test Date: 07/31/2018	Depth: 12.0' - 14.2'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Elastic SILT (ML/A-7-5(20)) LL: 65 PL: 36 PI: 29 %#200 Finer: 97.0		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 12
Constant Load Step
Stress: 8 tsf



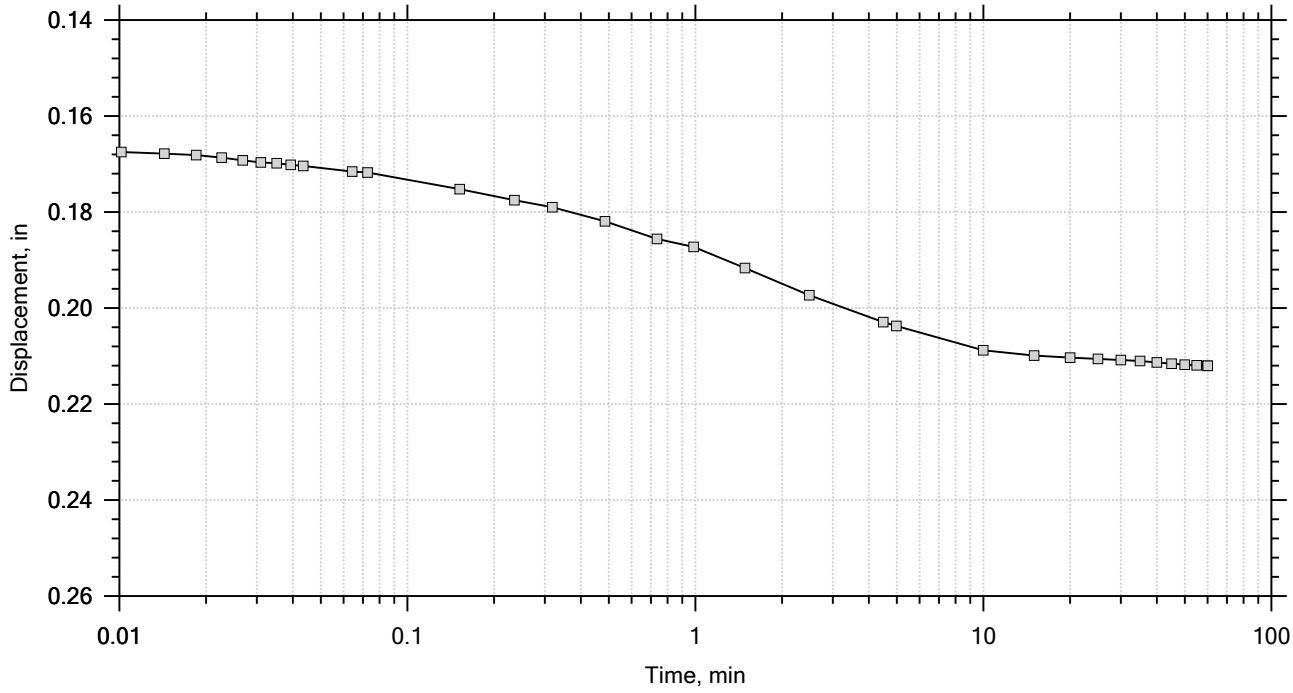


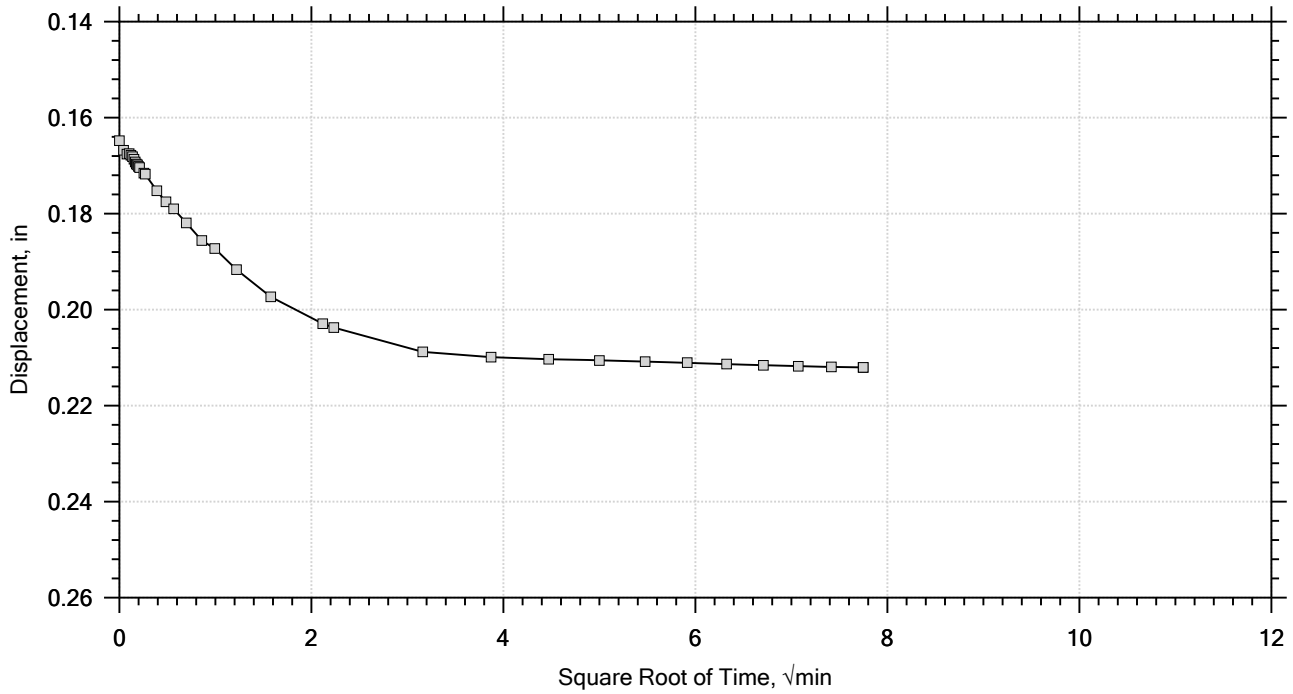
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-9	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1031	Test Date: 07/31/2018	Depth: 12.0' - 14.2'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Elastic SILT (ML/A-7-5(20)) LL: 65 PL: 36 PI: 29 %#200 Finer: 97.0		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 12
Constant Load Step
Stress: 16 tsf



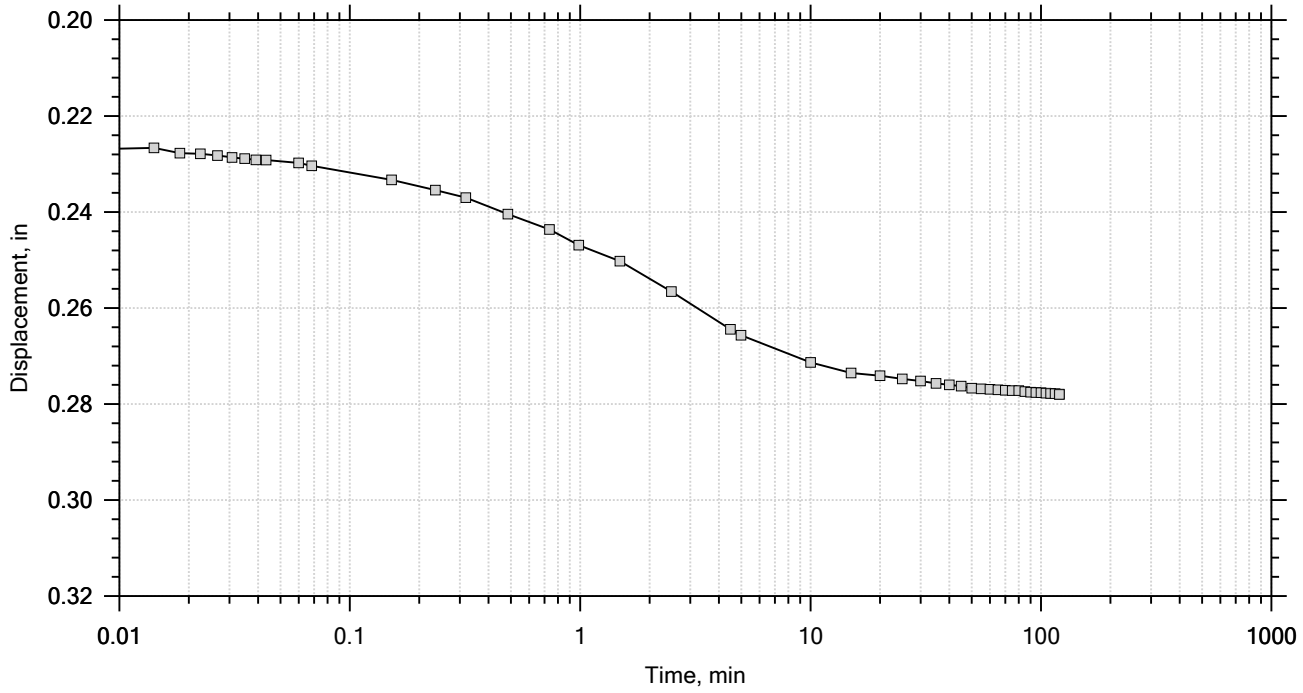


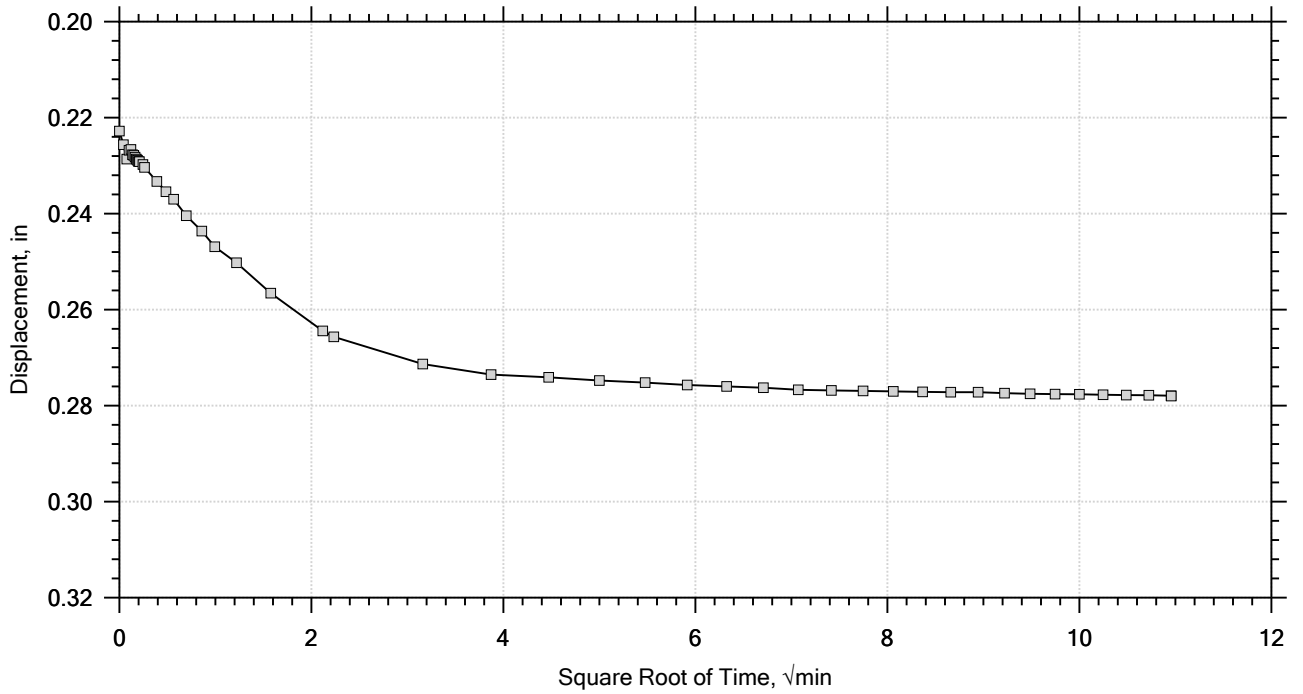
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-9	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1031	Test Date: 07/31/2018	Depth: 12.0' - 14.2'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Elastic SILT (ML/A-7-5(20)) LL: 65 PL: 36 PI: 29 %#200 Finer: 97.0		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 12
Constant Load Step
Stress: 32 tsf



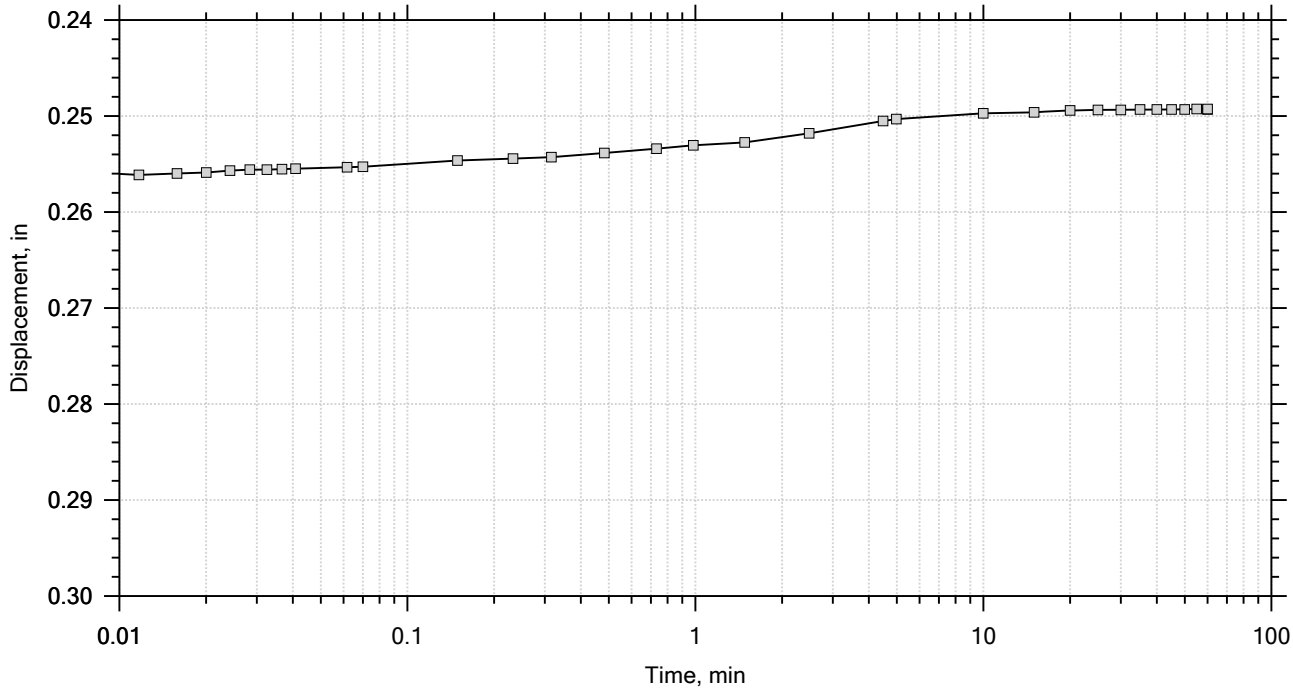


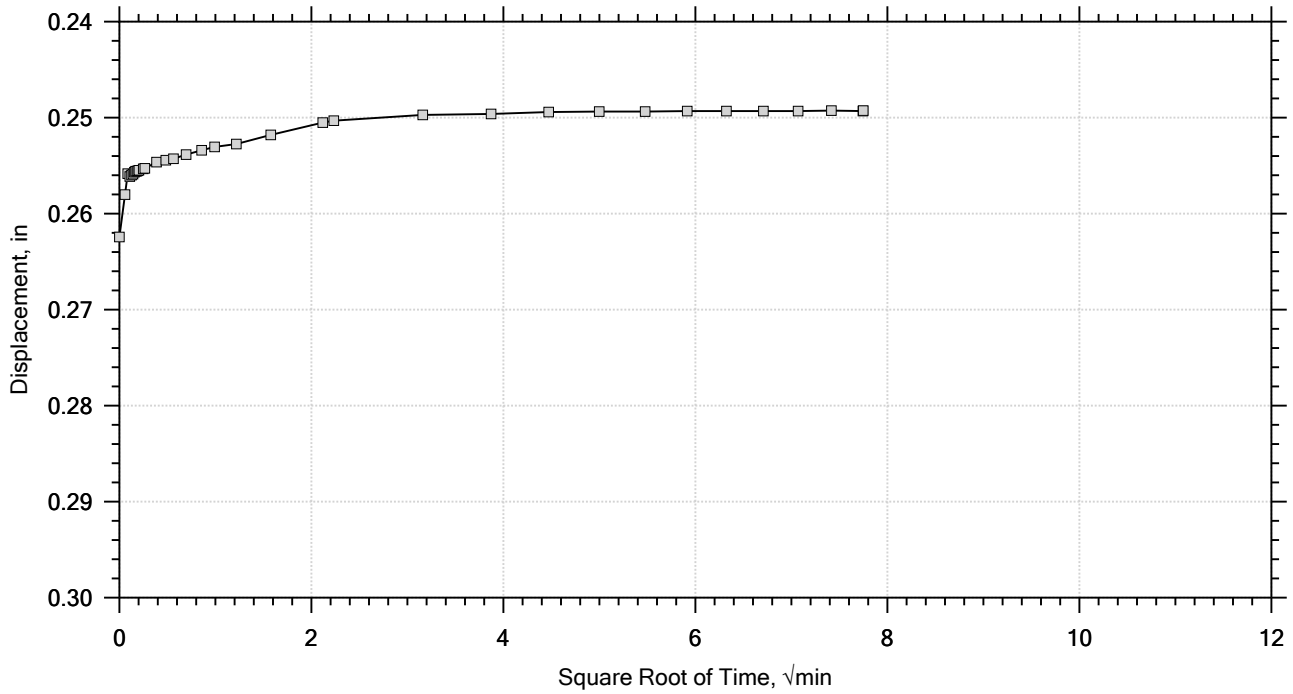
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-9	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1031	Test Date: 07/31/2018	Depth: 12.0' - 14.2'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Elastic SILT (ML/A-7-5(20)) LL: 65 PL: 36 PI: 29 %#200 Finer: 97.0		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 12
Constant Load Step
Stress: 8 tsf



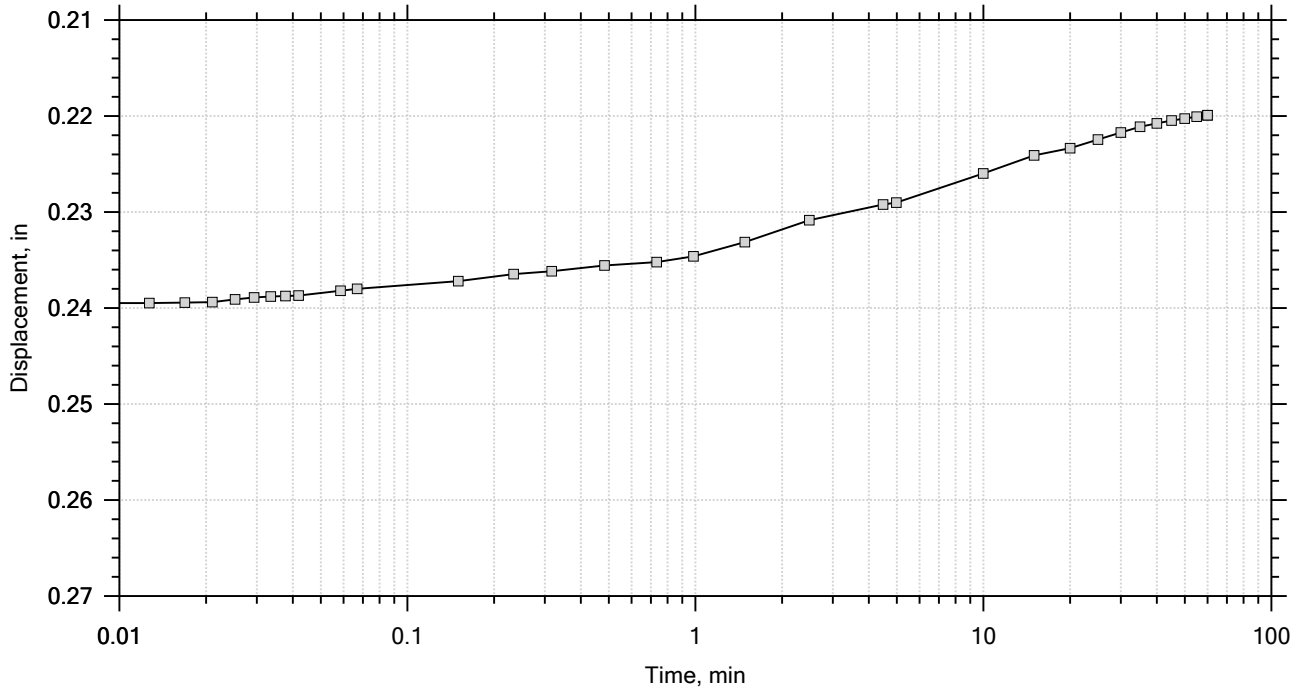


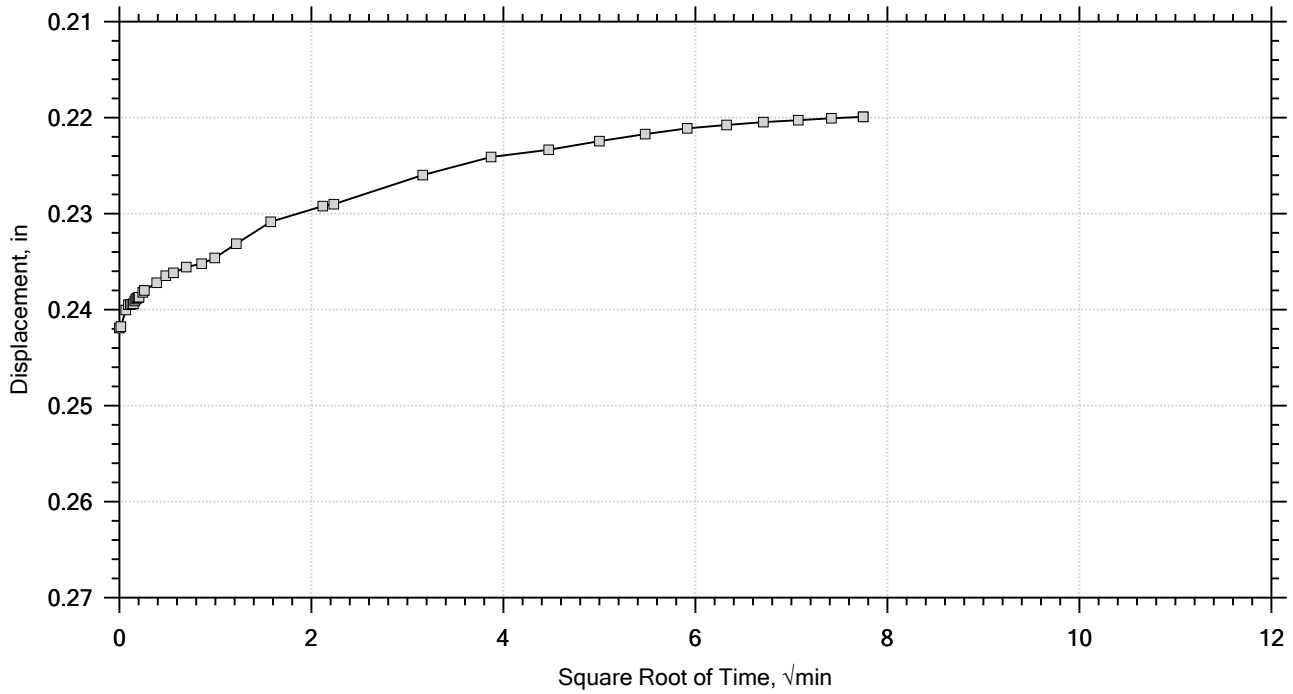
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-9	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1031	Test Date: 07/31/2018	Depth: 12.0' - 14.2'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Elastic SILT (ML/A-7-5(20)) LL: 65 PL: 36 PI: 29 %#200 Finer: 97.0		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 12
Constant Load Step
Stress: 2 tsf



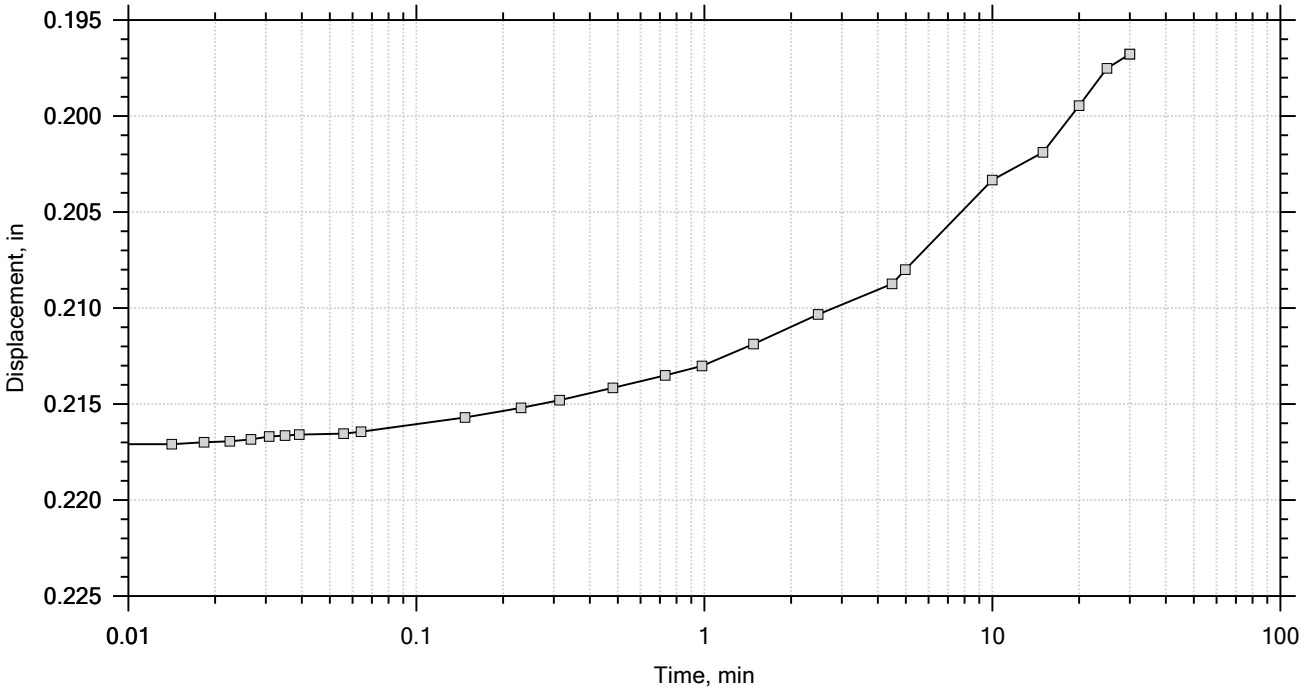


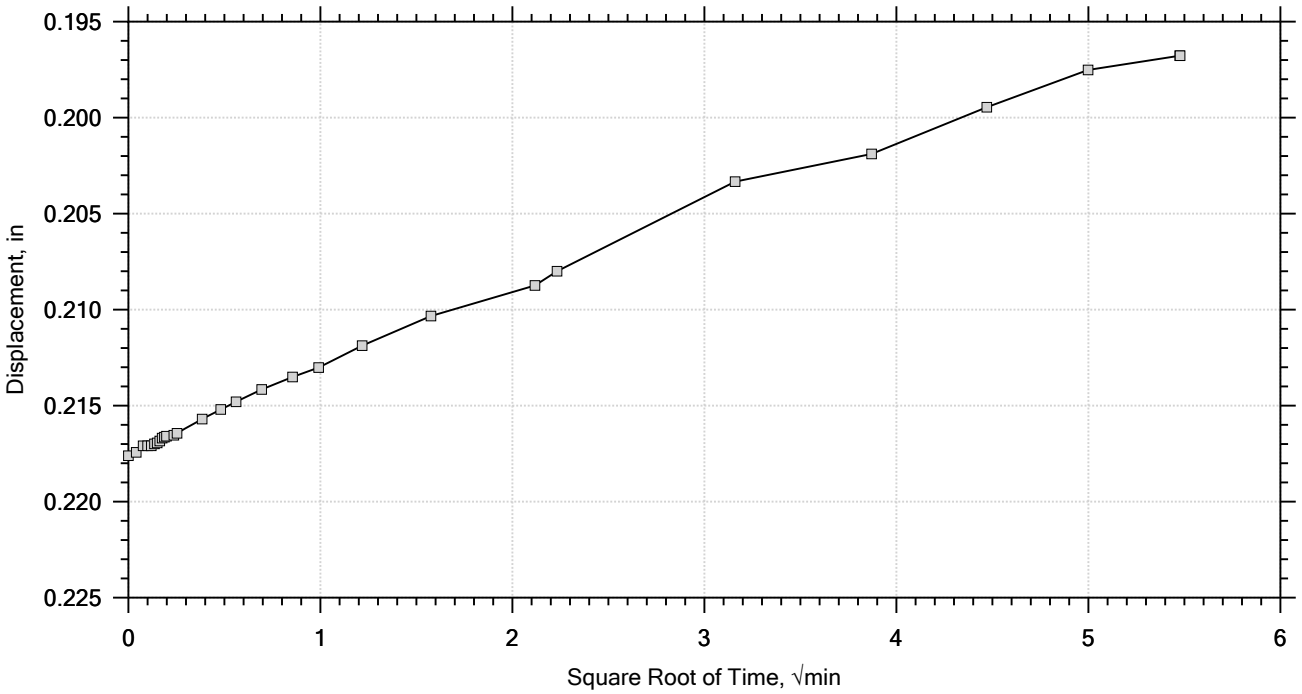
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-9	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1031	Test Date: 07/31/2018	Depth: 12.0' - 14.2'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Elastic SILT (ML/A-7-5(20)) LL: 65 PL: 36 PI: 29 %#200 Finer: 97.0		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 12
Constant Load Step
Stress: 0.5 tsf



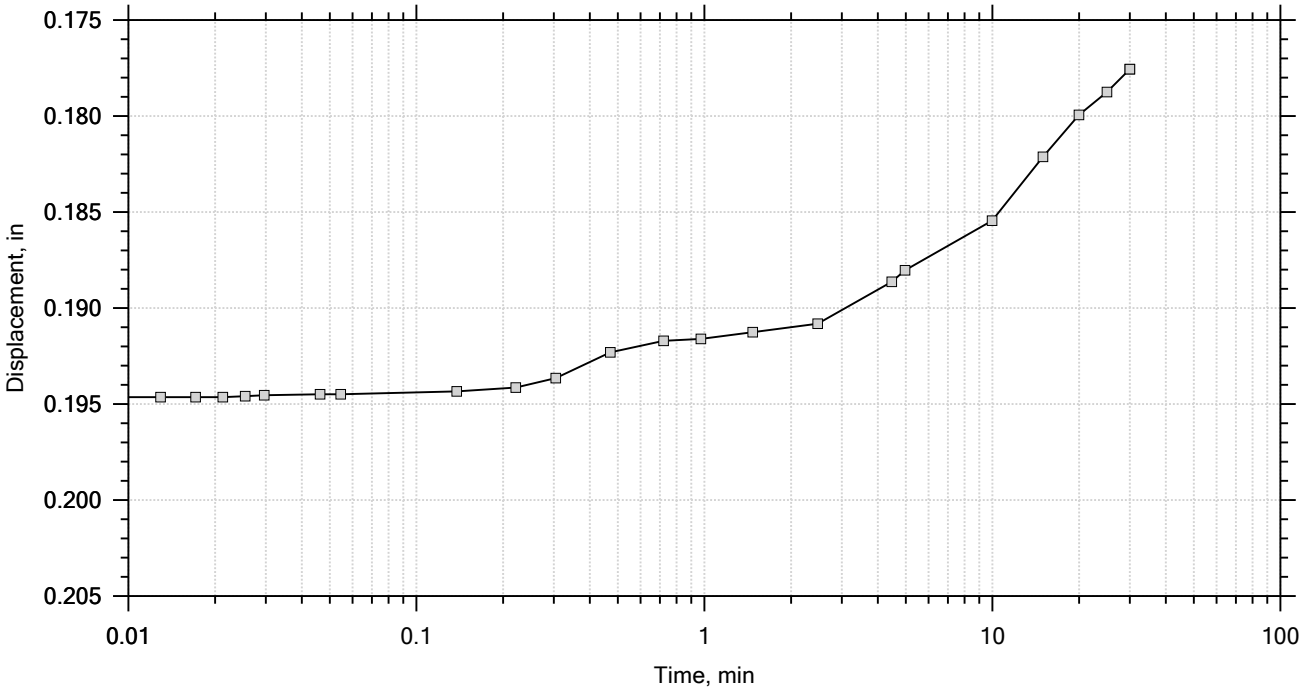


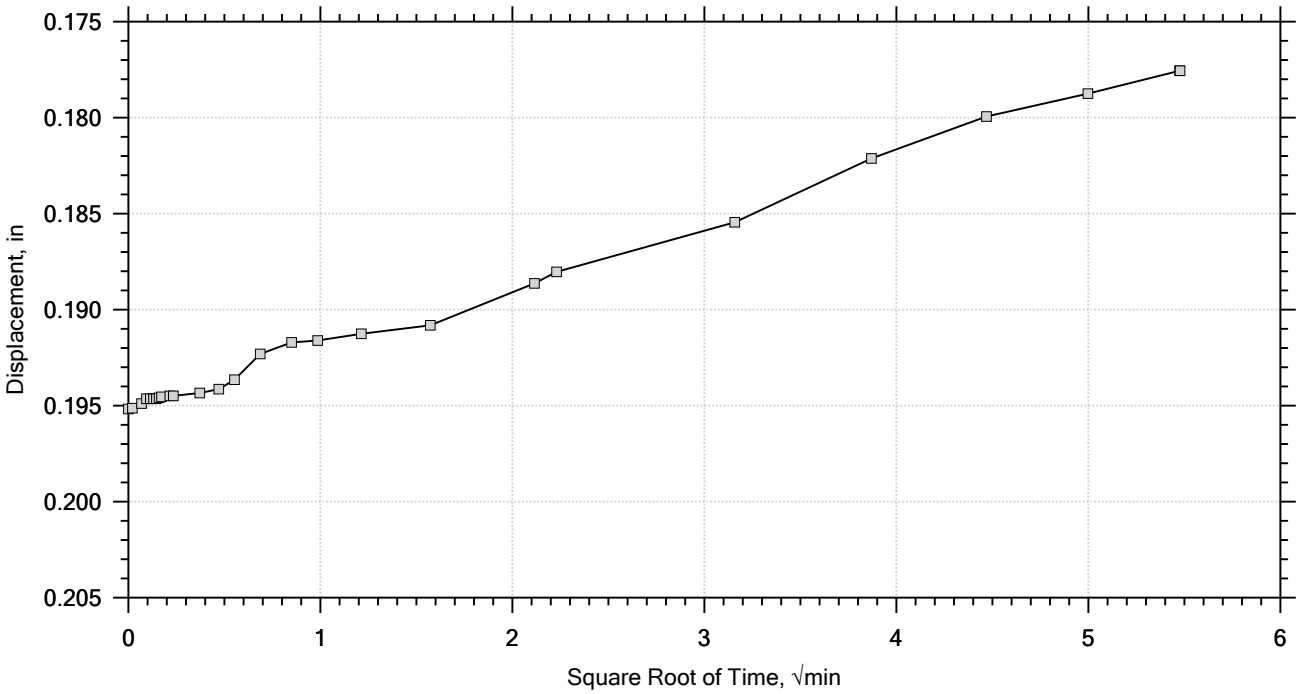
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-9	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1031	Test Date: 07/31/2018	Depth: 12.0' - 14.2'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Elastic SILT (ML/A-7-5(20)) LL: 65 PL: 36 PI: 29 %#200 Finer: 97.0		
Remarks:		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 12
Constant Load Step
Stress: 0.125 tsf





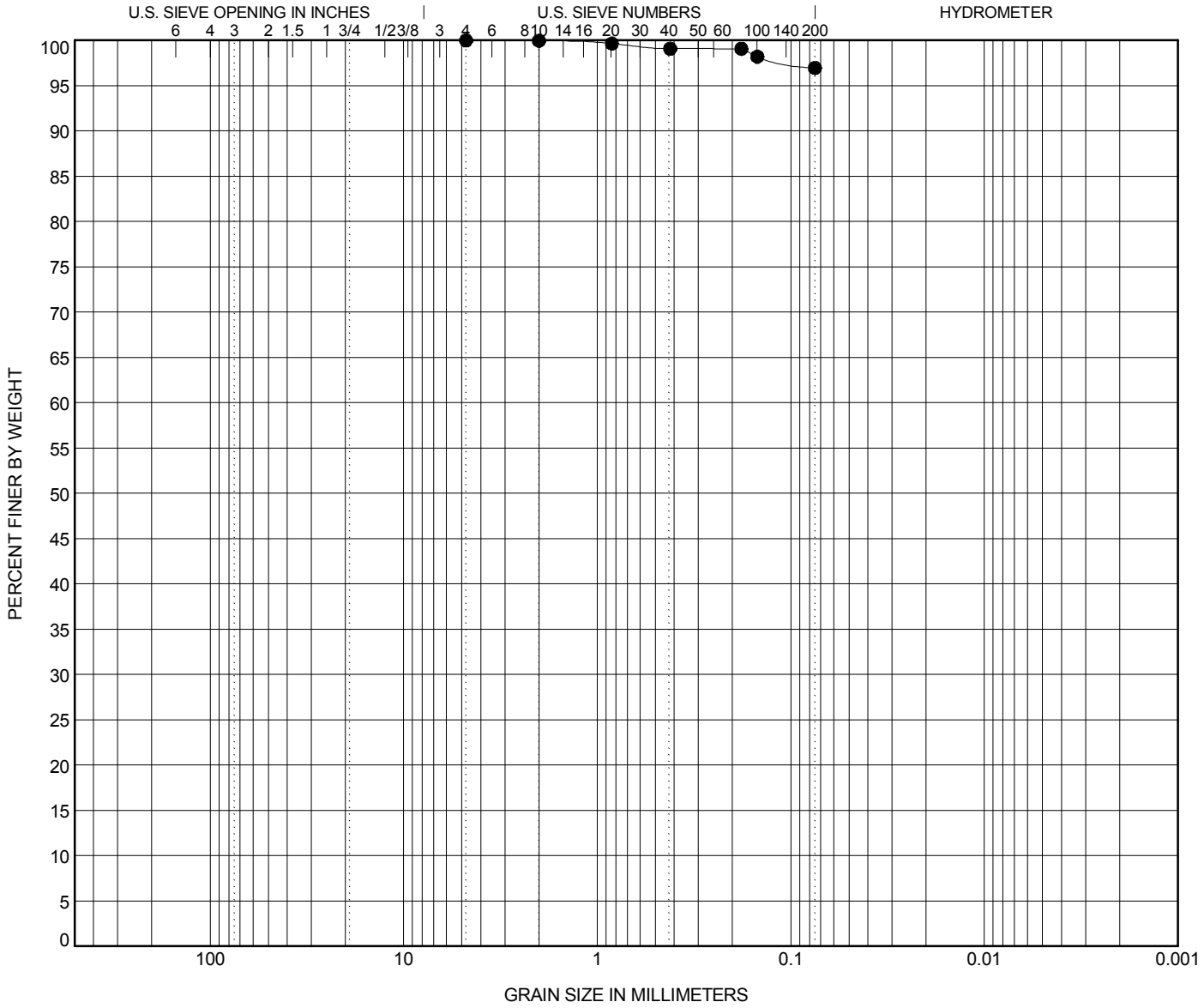
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-9	Tested By: WAP	Checked By: RS/JFH
Sample No.: 18-1031	Test Date: 07/31/2018	Depth: 12.0' - 14.2'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: Elastic SILT (ML/A-7-5(20)) LL: 65 PL: 36 PI: 29 %#200 Finer: 97.0		
Remarks:		

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
● **AP-10**	**13.1**	**Elastic SILT (MH) A-7-5(20)**	**65**	**36**	**29**		

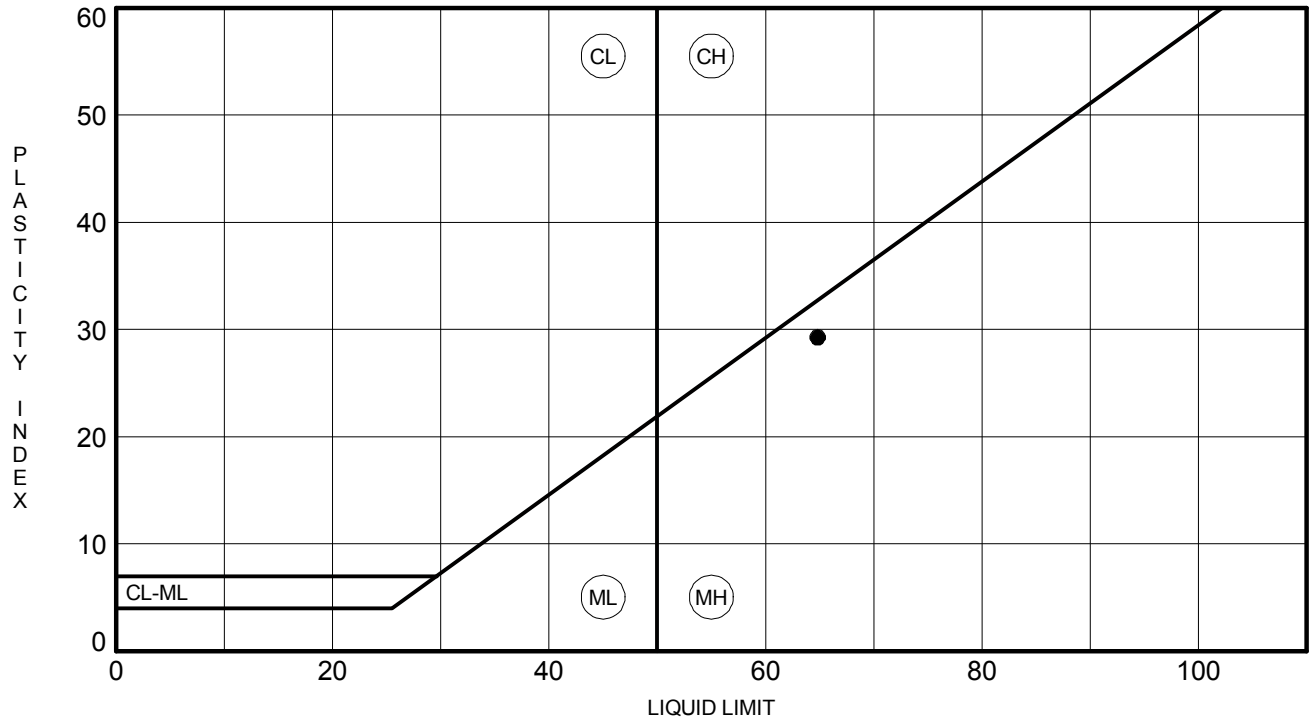
BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
● **AP-10**	**13.1**	**4.76**				**0.0**	**3.0**	**97.0**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 8/2/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

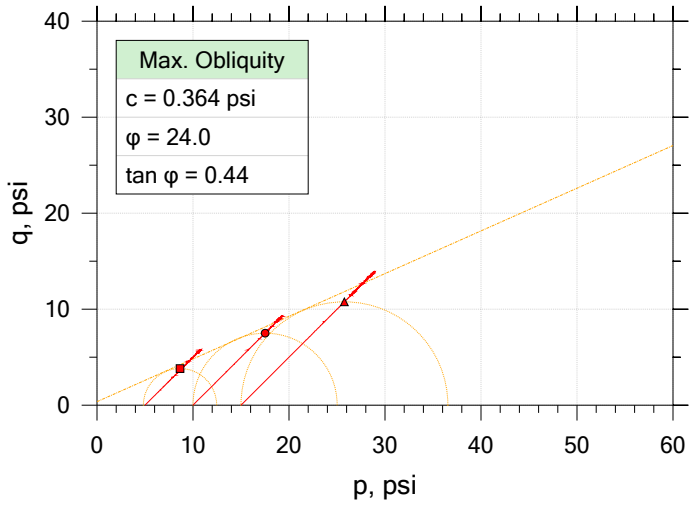
PROJECT COUNTY Richland/Lexington

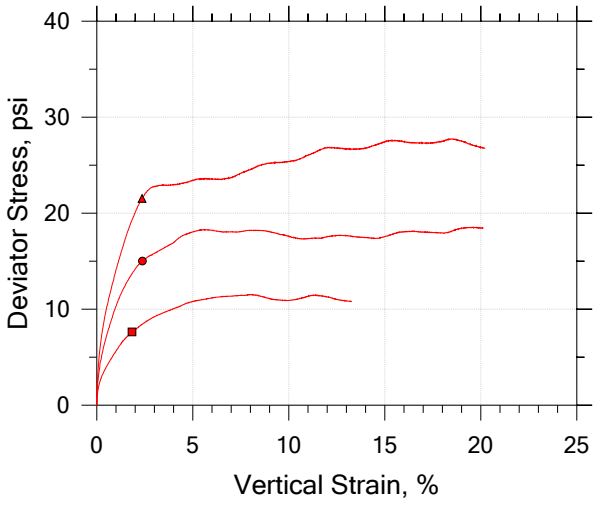


	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**AP-10**	**13.1**	**65**	**36**	**29**	**97**	**Elastic SILT (MH) A-7-5(20)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 8/2/18

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297





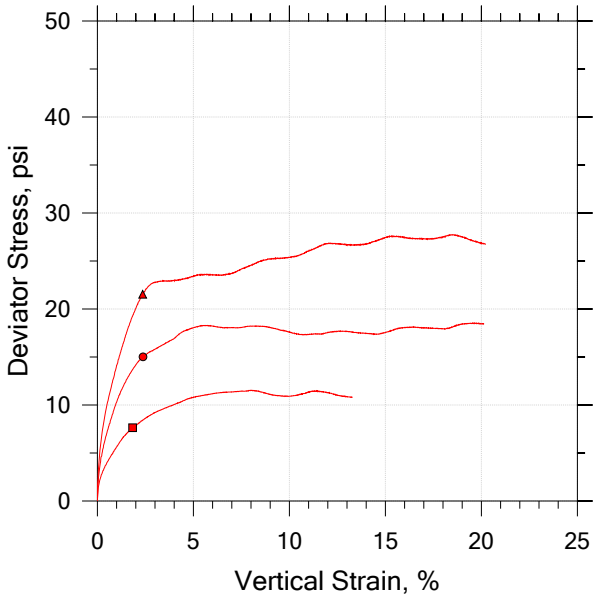
		■	●	▲	
Symbol					
Sample ID		18-1032	18-1032	18-1032	
Depth, ft		11' - 13'	11' - 13'	11' - 13'	
Test Number		A	B	C	
Initial	Height, in	6.030	5.981	5.932	
	Diameter, in	2.856	2.836	2.850	
	Moisture Content (from Cuttings), %	30.4	30.0	25.4	
	Dry Density, pcf	91.3	93.6	98.1	
	Saturation (Wet Method), %	97.9	102.1	96.6	
	Void Ratio	0.833	0.788	0.706	
Final	Moisture Content, %	30.8	28.3	25.0	
	Dry Density, pcf	91.7	95.1	100.	
	Cross-Sectional Area (Method A), in²	6.392	6.258	6.313	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.824	0.760	0.669	
	Back Pressure, %	79.99	74.00	101.0	
Vertical Effective Consolidation Stress, psi		4.966	9.940	14.92	
Horizontal Effective Consolidation Stress, psi		4.991	9.996	15.00	
Vertical Strain after Consolidation, %		0.4244	0.8383	1.189	
Volumetric Strain after Consolidation, %		0.9223	2.001	2.357	
Time to 50% Consolidation, min		0.0000	0.0000	0.0000	
Shear Strength, psi		3.817	7.512	10.77	
Strain at Failure, %		1.84	2.38	2.36	
Strain Rate, %/min		0.07500	0.07500	0.07500	
Deviator Stress at Failure, psi		7.635	15.02	21.54	
Effective Minor Principal Stress at Failure, psi		1.908	5.100	6.701	
Effective Major Principal Stress at Failure, psi		9.543	20.12	28.24	
B-Value		0.95	0.95	0.95	

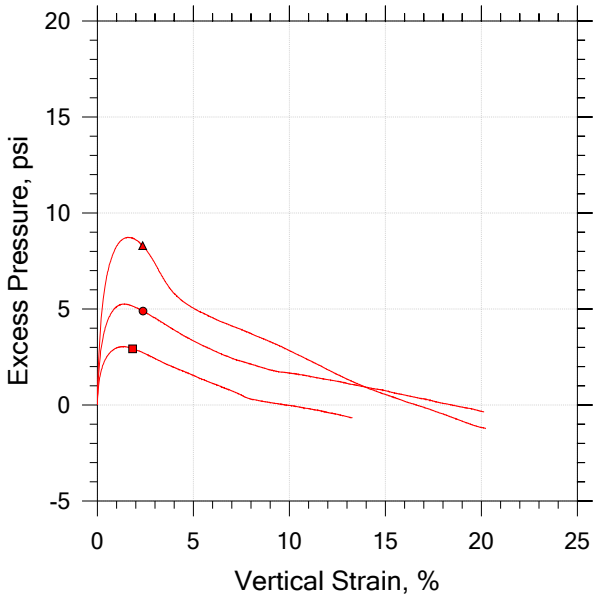
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

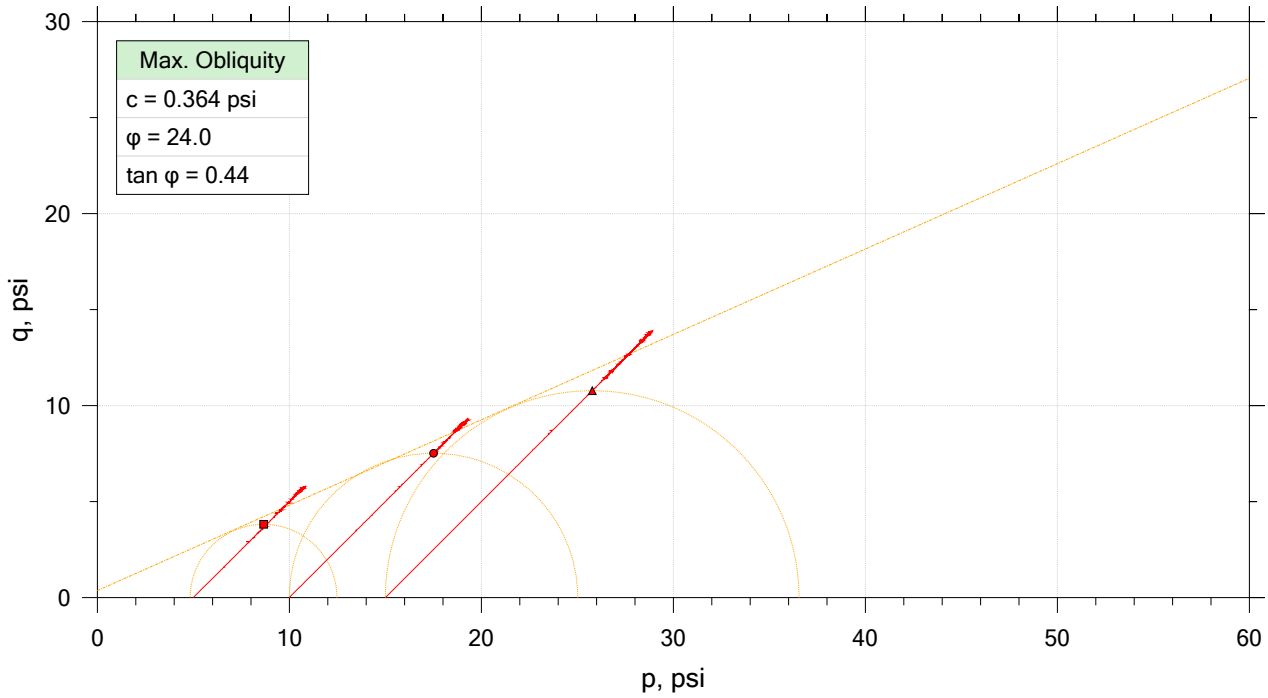
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-10	Tested By: RS	Checked By: JFH
Sample No.: 18-1032	Test Date: 6/7/2018 - 6/11/2018	Depth: 11' - 13'
Test No.: ABC	Sample Type: Undisturbed	Elevation: --
Description: Elastic SILT (ML/A-7-5(20)) LL: 65 PL: 36 PI: 29 %#200 Finer: 97.0		
Remarks:		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297





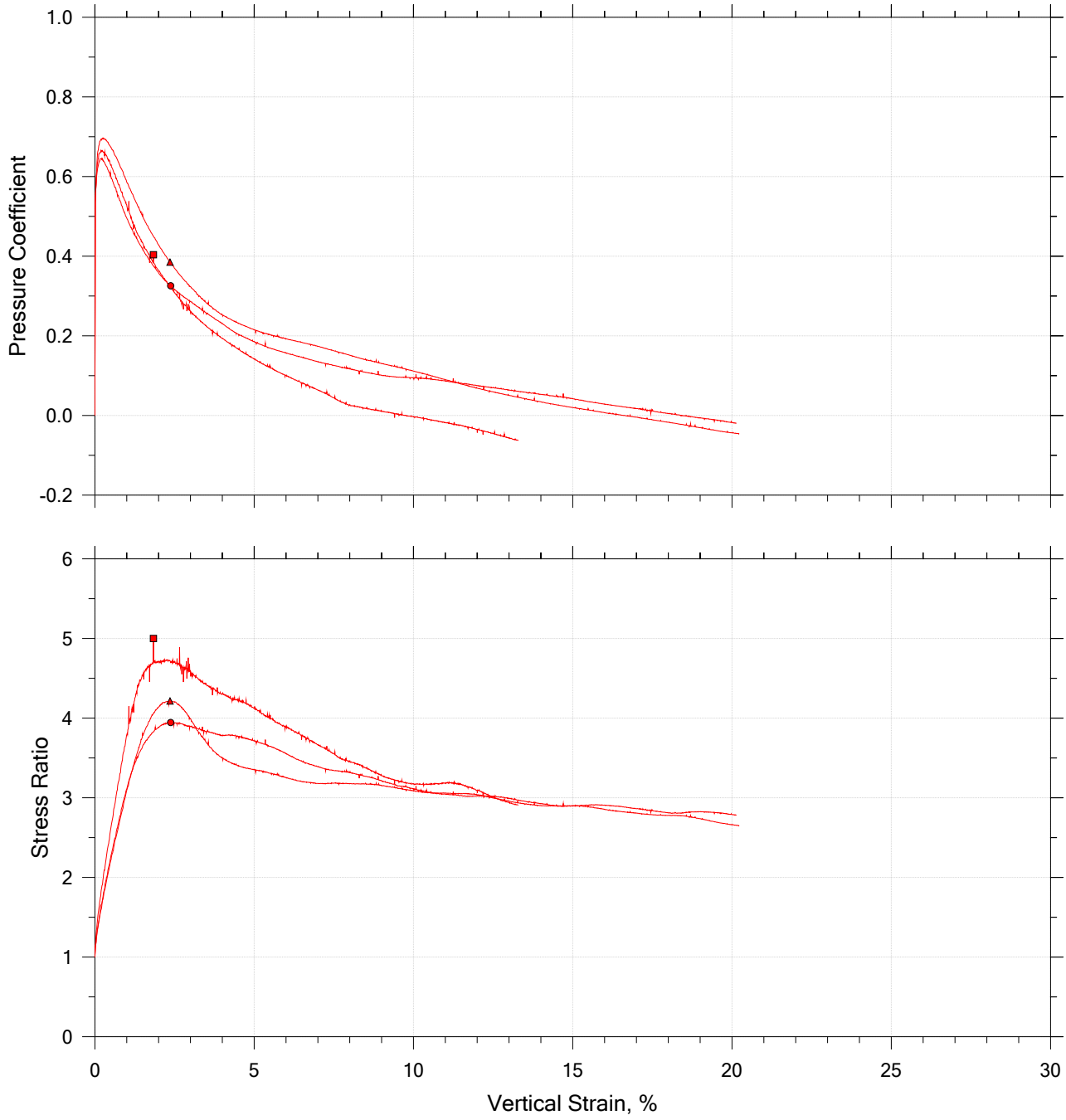


	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-1032	A	11' - 13'	RS	6/7/2018	JFH		18-1032_AP-14(1)_test A.dat
●	18-1032	B	11' - 13'	RS	6/8/2018	JFH		18-1032_AP-14(1)_test B.dat
▲	18-1032	C	11' - 13'	RS	6/10/2018	JFH		18-1032_AP-14(1)_test C-2.dat

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-10	Tested By: RS	Checked By: JFH
Sample No.: 18-1032	Test Date: 6/7/2018 - 6/11/2018	Depth: 11' - 13'
Test No.: ABC	Sample Type: Undisturbed	Elevation: --
Description: Elastic SILT (ML/A-7-5(20)) LL: 65 PL: 36 PI: 29 %#200 Finer: 97.0		
Remarks:		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297

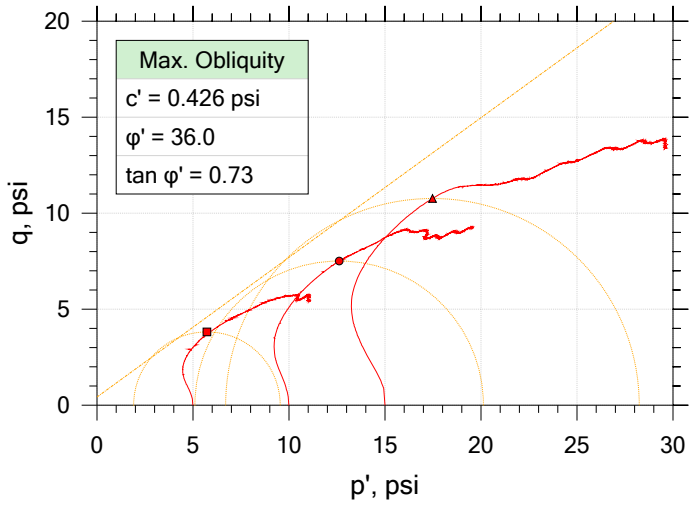


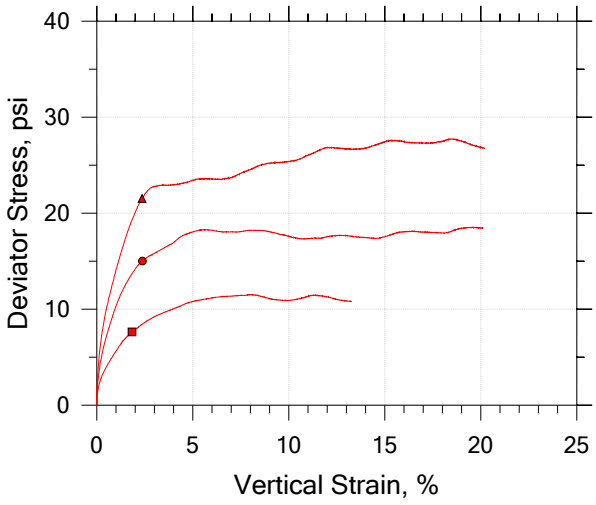
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-1032	A	11' - 13'	RS	6/7/2018	JFH		18-1032_AP-14(1)_test A.dat
●	18-1032	B	11' - 13'	RS	6/8/2018	JFH		18-1032_AP-14(1)_test B.dat
▲	18-1032	C	11' - 13'	RS	6/10/2018	JFH		18-1032_AP-14(1)_test C-2.dat

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-10	Tested By: RS	Checked By: JFH
Sample No.: 18-1032	Test Date: 6/7/2018 - 6/11/2018	Depth: 11' - 13'
Test No.: ABC	Sample Type: Undisturbed	Elevation: --
Description: Elastic SILT (ML/A-7-5(20)) LL: 65 PL: 36 PI: 29 %#200 Finer: 97.0		
Remarks:		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297





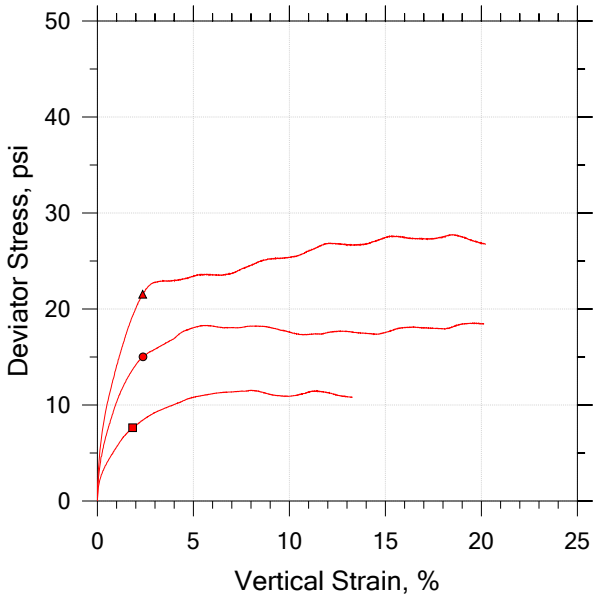
		■	●	▲
Symbol				
Sample ID		18-1032	18-1032	18-1032
Depth, ft		11' - 13'	11' - 13'	11' - 13'
Test Number		A	B	C
Initial	Height, in	6.030	5.981	5.932
	Diameter, in	2.856	2.836	2.850
	Moisture Content (from Cuttings), %	30.4	30.0	25.4
	Dry Density, pcf	91.3	93.6	98.1
	Saturation (Wet Method), %	97.9	102.1	96.6
	Void Ratio	0.833	0.788	0.706
Final	Moisture Content, %	30.8	28.3	25.0
	Dry Density, pcf	91.7	95.1	100.
	Cross-Sectional Area (Method A), in²	6.392	6.258	6.313
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.824	0.760	0.669
	Back Pressure, %	79.99	74.00	101.0
Vertical Effective Consolidation Stress, psi		4.966	9.940	14.92
Horizontal Effective Consolidation Stress, psi		4.991	9.996	15.00
Vertical Strain after Consolidation, %		0.4244	0.8383	1.189
Volumetric Strain after Consolidation, %		0.9223	2.001	2.357
Time to 50% Consolidation, min		0.0000	0.0000	0.0000
Shear Strength, psi		3.817	7.512	10.77
Strain at Failure, %		1.84	2.38	2.36
Strain Rate, %/min		0.07500	0.07500	0.07500
Deviator Stress at Failure, psi		7.635	15.02	21.54
Effective Minor Principal Stress at Failure, psi		1.908	5.100	6.701
Effective Major Principal Stress at Failure, psi		9.543	20.12	28.24
B-Value		0.95	0.95	0.95

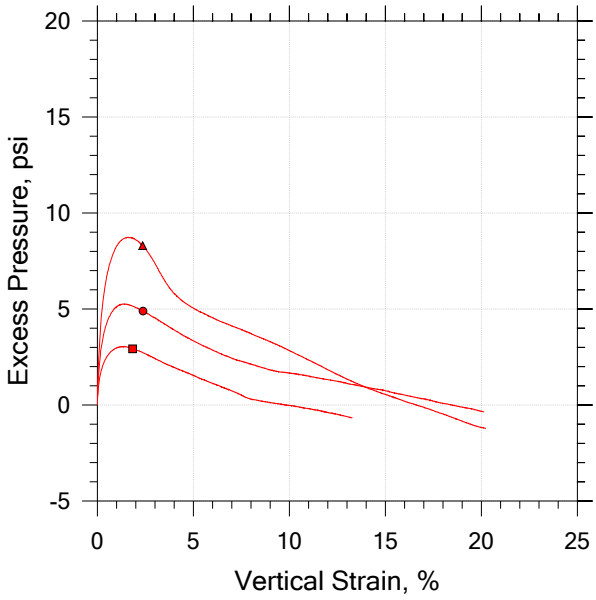
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

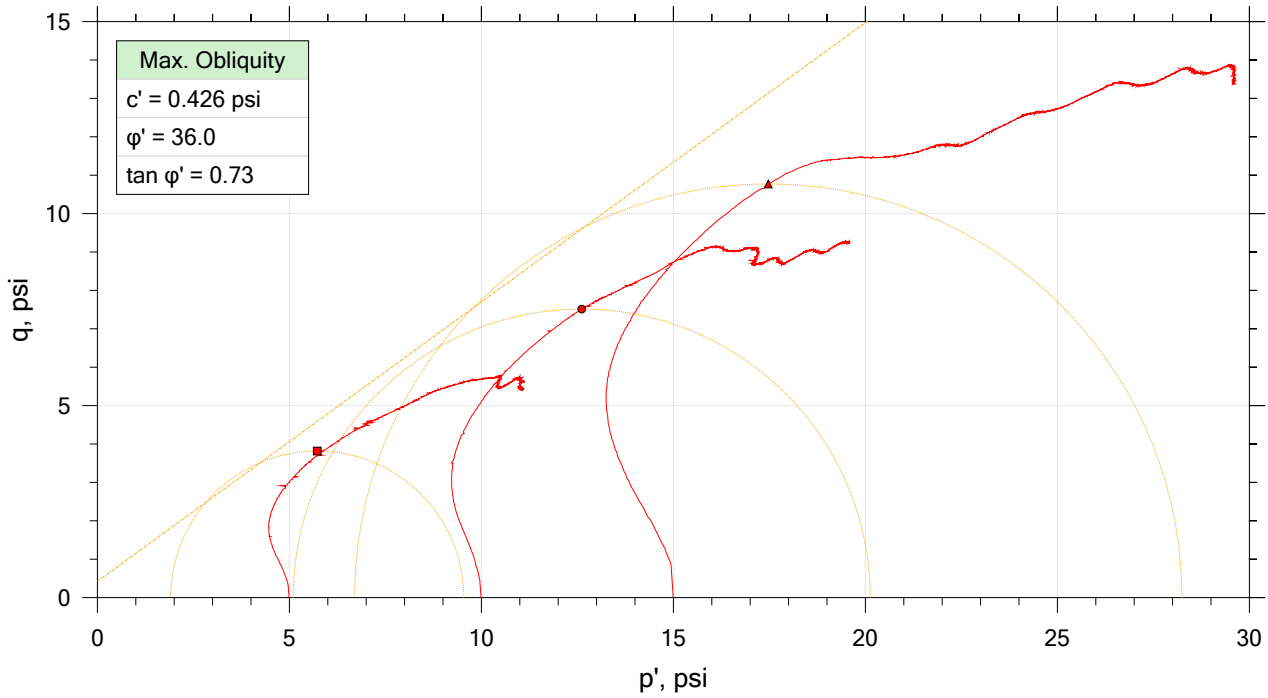
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-10	Tested By: RS	Checked By: JFH
Sample No.: 18-1032	Test Date: 6/7/2018 - 6/11/2018	Depth: 11' - 13'
Test No.: ABC	Sample Type: Undisturbed	Elevation: --
Description: Elastic SILT (ML/A-7-5(20)) LL: 65 PL: 36 PI: 29 %#200 Finer: 97.0		
Remarks:		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297





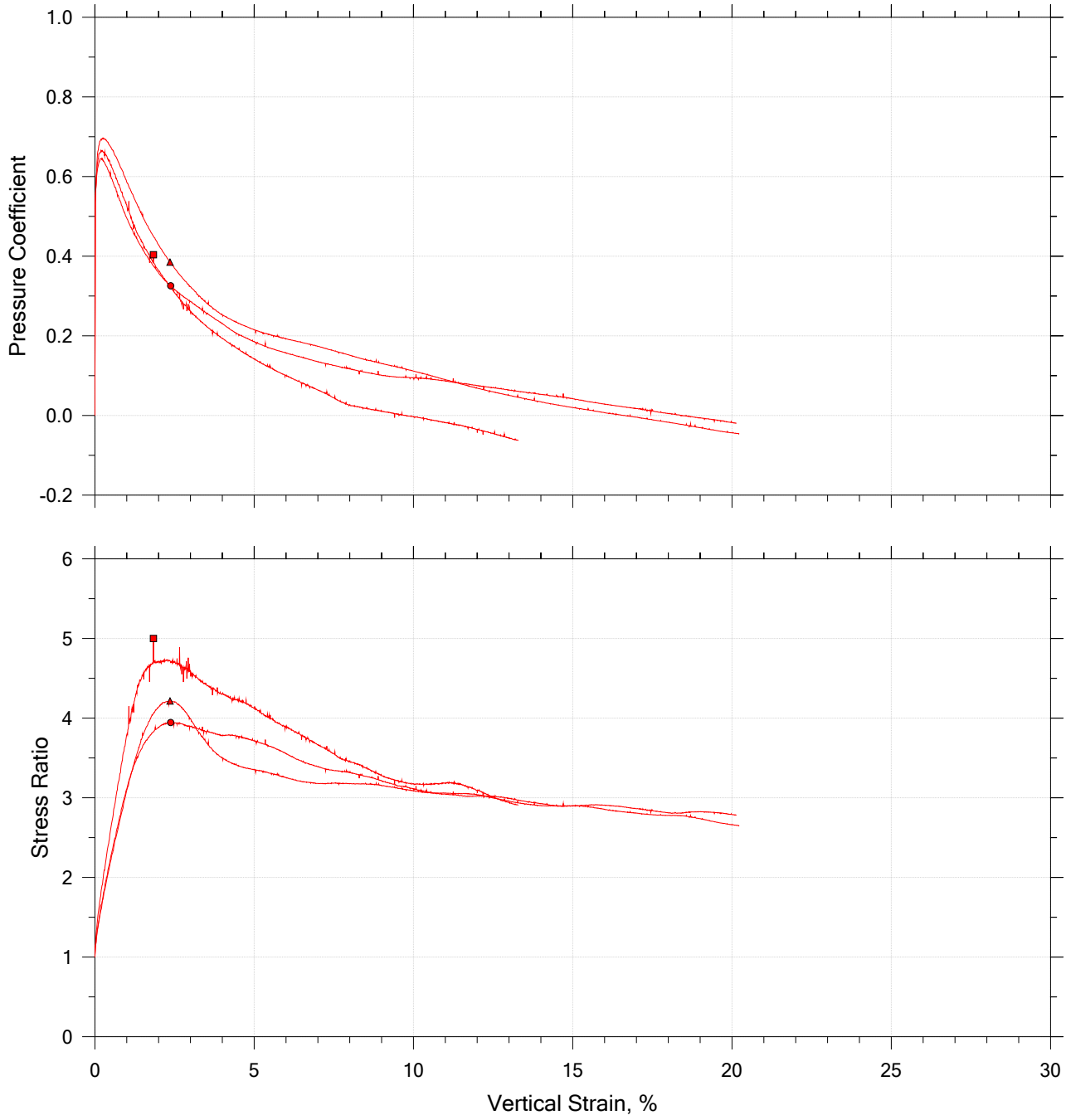


	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-1032	A	11' - 13'	RS	6/7/2018	JFH		18-1032_AP-14(1)_test A.dat
●	18-1032	B	11' - 13'	RS	6/8/2018	JFH		18-1032_AP-14(1)_test B.dat
▲	18-1032	C	11' - 13'	RS	6/10/2018	JFH		18-1032_AP-14(1)_test C-2.dat

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-10	Tested By: RS	Checked By: JFH
Sample No.: 18-1032	Test Date: 6/7/2018 - 6/11/2018	Depth: 11' - 13'
Test No.: ABC	Sample Type: Undisturbed	Elevation: --
Description: Elastic SILT (ML/A-7-5(20)) LL: 65 PL: 36 PI: 29 %#200 Finer: 97.0		
Remarks:		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297



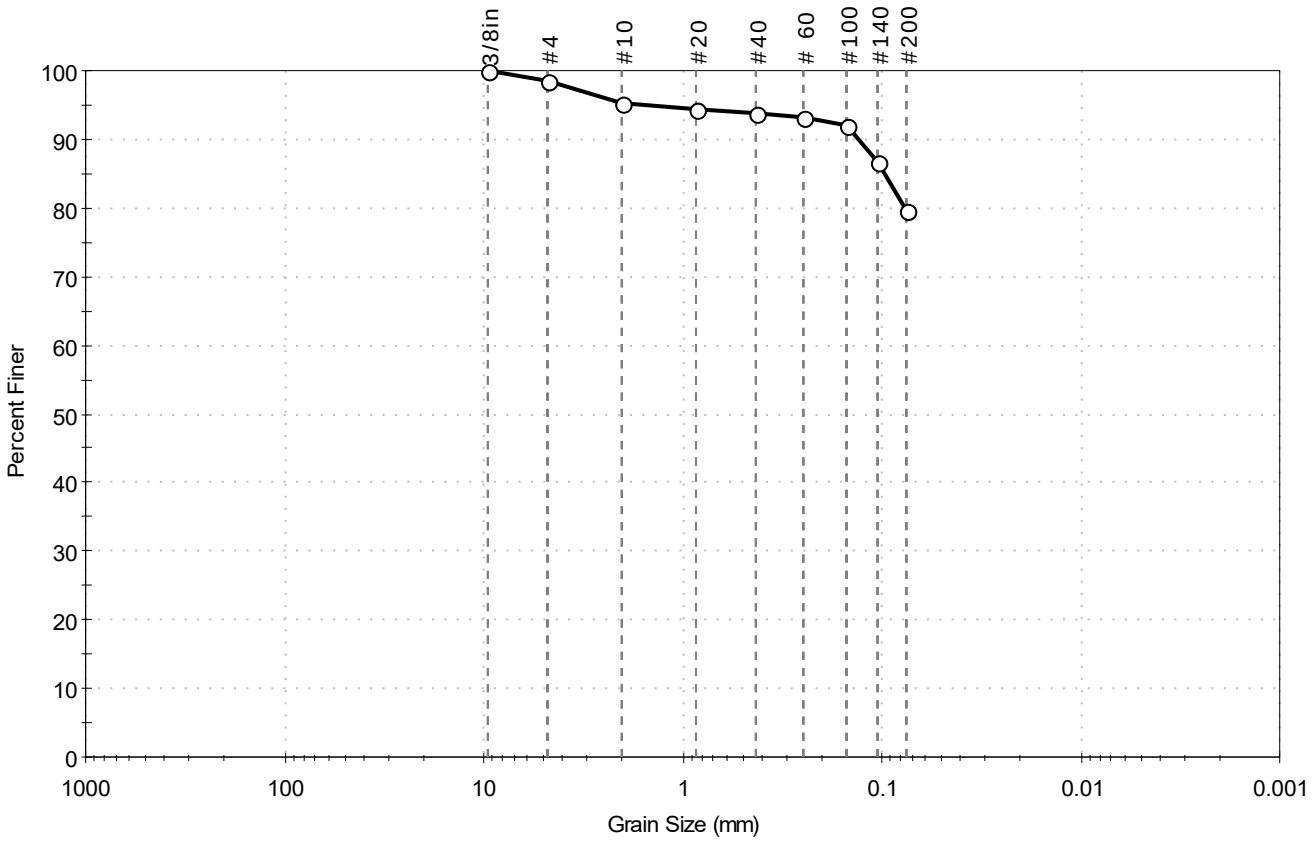
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-1032	A	11' - 13'	RS	6/7/2018	JFH		18-1032_AP-14(1)_test A.dat
●	18-1032	B	11' - 13'	RS	6/8/2018	JFH		18-1032_AP-14(1)_test B.dat
▲	18-1032	C	11' - 13'	RS	6/10/2018	JFH		18-1032_AP-14(1)_test C-2.dat

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-10	Tested By: RS	Checked By: JFH
Sample No.: 18-1032	Test Date: 6/7/2018 - 6/11/2018	Depth: 11' - 13'
Test No.: ABC	Sample Type: Undisturbed	Elevation: --
Description: Elastic SILT (ML/A-7-5(20)) LL: 65 PL: 36 PI: 29 %#200 Finer: 97.0		
Remarks:		

Client:	F&ME Consultants				
Project:	I-20/26/126 Corridor Improvements				
Location:	---			Project No:	GTX-307802
Boring ID:	---	Sample Type:	tube	Tested By:	twh
Sample ID:	AP-11	Test Date:	08/02/18	Checked By:	jm
Depth :	24-26.5 ft	Test Id:	299284		
Test Comment:	---				
Visual Description:	Moist, reddish brown silt with sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	1.5	18.7	79.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
3/8in	9.50	100		
#4	4.75	98		
#10	2.00	95		
#20	0.85	94		
#40	0.42	94		
# 60	0.25	93		
#100	0.15	92		
#140	0.11	87		
#200	0.075	80		

Coefficients

D_{85} = 0.0971 mm	D_{30} = N/A
D_{60} = N/A	D_{15} = N/A
D_{50} = N/A	D_{10} = N/A
C_u = N/A	C_c = N/A

Classification

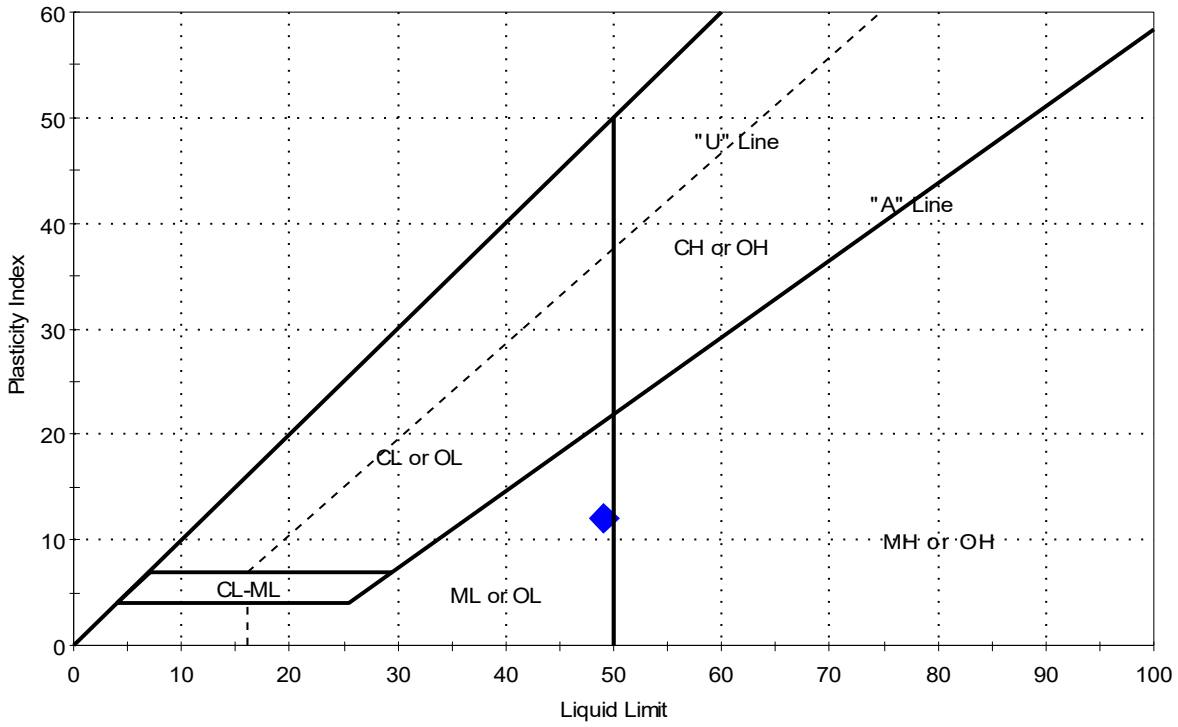
ASTM SILT with Sand (ML)

AASHTO Clayey Soils (A-7-5 (12))

Sample / Test Description

Client:	F&ME Consultants				
Project:	I-20/26/126 Corridor Improvements				
Location:	---			Project No:	GTX-307802
Boring ID:	---	Sample Type:	tube	Tested By:	twh
Sample ID:	AP-11	Test Date:	08/02/18	Checked By:	jm
Depth :	24-26.5 ft	Test Id:	299287		
Test Comment:	---				
Visual Description:	Moist, reddish brown silt with sand				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	AP-11	---	24-26.5 ft	32	49	37	12	-0.4	SILT with Sand (ML)

Sample Prepared using the WET method

6% Retained on #40 Sieve

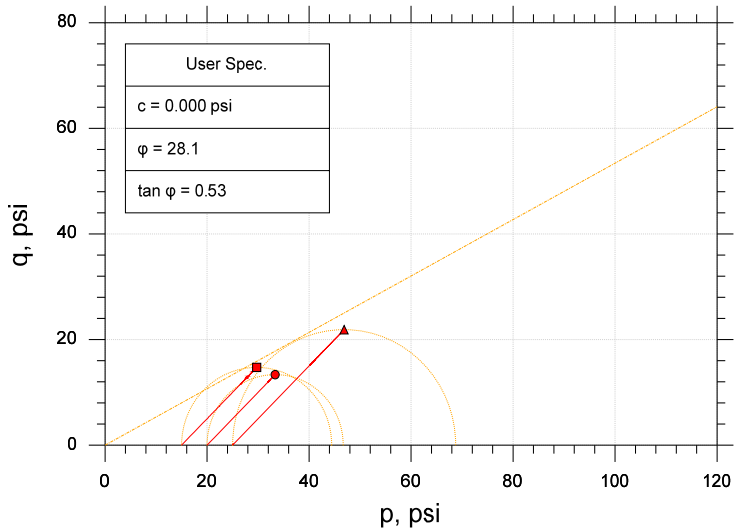
Dry Strength: HIGH

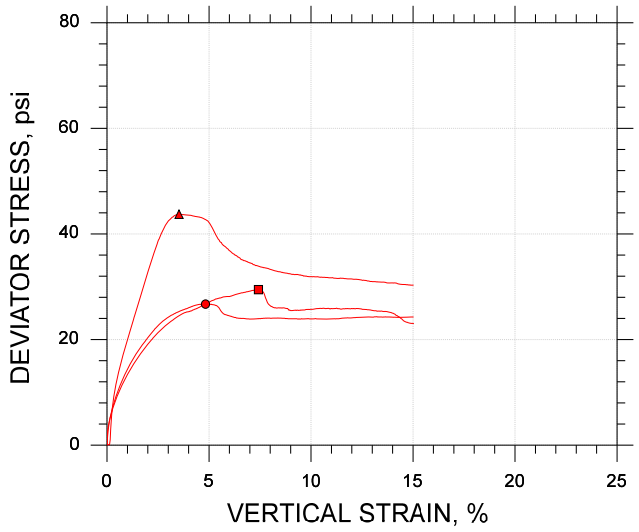
Dilatancy: RAPID

Toughness: LOW

Client: F&ME Consultants	
Project Name: I-20/26/126 Corridor Improv.	
Project Location: ---	
Project Number: GTX-307802	
Tested By: jm	Checked By: mcm
Boring ID: ---	
Preparation: intact	
Description: Moist, reddish brown silt	
Classification: ---	
Group Symbol: ---	
Liquid Limit: ---	Plastic Limit: ---
Plasticity Index: ---	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





		■	●	▲	
Symbol					
Sample ID		AP-11	AP-11	AP-11	
Depth, ft		24-26 ft	24-26 ft	24-26 ft	
Test Number		CU-14-1	CU-14-2	CU-14-3	
Initial	Height, in	6.223	6.078	6.172	
	Diameter, in	2.870	2.880	2.880	
	Moisture Content (from Cuttings), %	34.8	32.3	31.2	
	Dry Density, pcf	85.4	87.3	91.3	
	Saturation (Wet Method), %	96.7	93.7	99.4	
	Void Ratio	0.973	0.931	0.847	
Before Shear	Moisture Content, %	34.5	32.7	30.2	
	Dry Density, pcf	87.2	89.6	92.8	
	Cross-sectional Area (Method A), in²	6.377	6.398	6.432	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.933	0.882	0.816	
	Back Pressure, psi	55.00	53.00	70.99	
Vertical Effective Consolidation Stress, psi		14.97	19.98	24.99	
Horizontal Effective Consolidation Stress, psi		14.99	20.00	25.00	
Vertical Strain after Consolidation, %		0.6733	0.8273	0.7111	
Volumetric Strain after Consolidation, %		2.210	2.759	2.528	
Time to 50% Consolidation, min		1.690	0.8100	1.000	
Shear Strength, psi		14.72	13.35	21.87	
Strain at Failure, %		7.42	4.83	3.53	
Strain Rate, %/min		0.06000	0.06000	0.06000	
Deviator Stress at Failure, psi		29.45	26.70	43.73	
Effective Minor Principal Stress at Failure, psi		9.942	10.81	14.36	
Effective Major Principal Stress at Failure, psi		39.39	37.51	58.09	
B-Value		0.95	0.96	0.95	

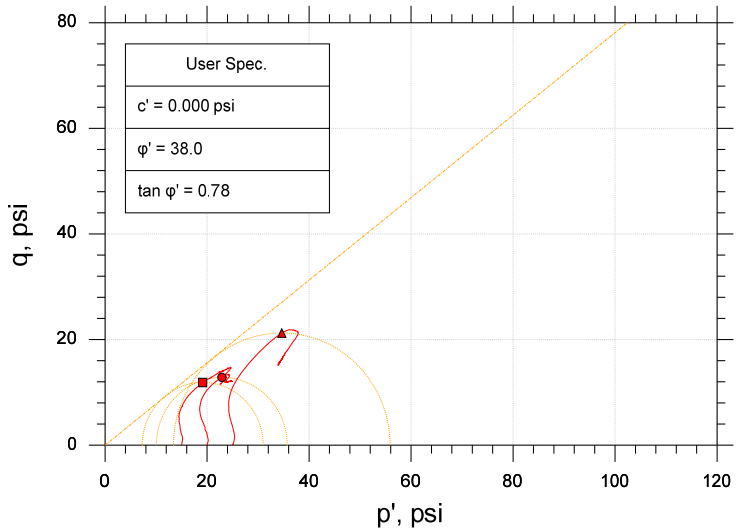
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

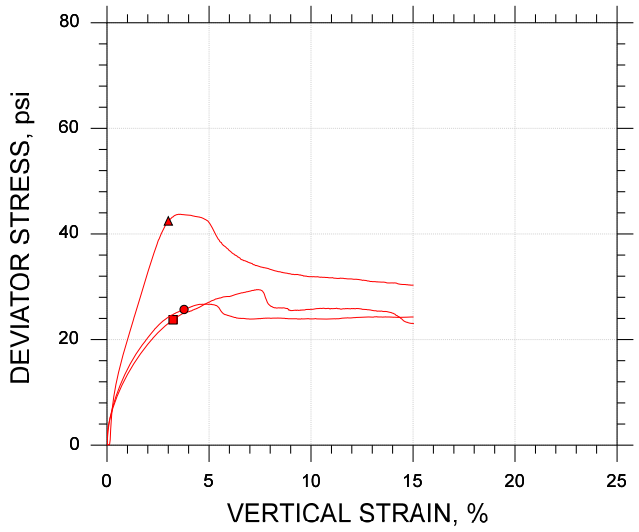
Remarks:

System 1057

Client: F&ME Consultants	
Project Name: I-20/26/126 Corridor Improv.	
Project Location: ---	
Project Number: GTX-307802	
Tested By: jm	Checked By: mcm
Boring ID: ---	
Preparation: intact	
Description: Moist, reddish brown silt	
Classification: ---	
Group Symbol: ---	
Liquid Limit: ---	Plastic Limit: ---
Plasticity Index: ---	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





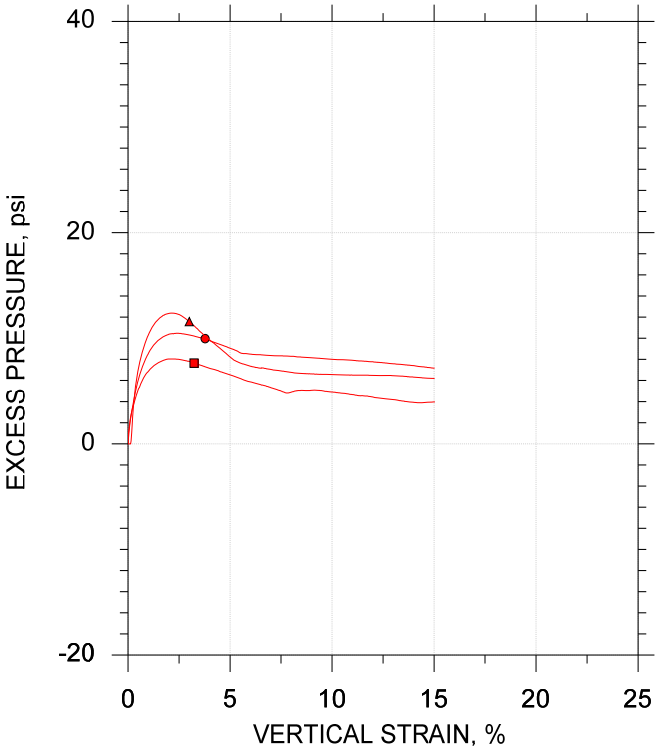
Symbol		■	●	▲	
Sample ID		AP-11	AP-11	AP-11	
Depth, ft		24-26 ft	24-26 ft	24-26 ft	
Test Number		CU-14-1	CU-14-2	CU-14-3	
Initial	Height, in	6.223	6.078	6.172	
	Diameter, in	2.870	2.880	2.880	
	Moisture Content (from Cuttings), %	34.8	32.3	31.2	
	Dry Density, pcf	85.4	87.3	91.3	
	Saturation (Wet Method), %	96.7	93.7	99.4	
	Void Ratio	0.973	0.931	0.847	
Before Shear	Moisture Content, %	34.5	32.7	30.2	
	Dry Density, pcf	87.2	89.6	92.8	
	Cross-sectional Area (Method A), in²	6.377	6.398	6.432	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.933	0.882	0.816	
	Back Pressure, psi	55.00	53.00	70.99	
Vertical Effective Consolidation Stress, psi		14.97	19.98	24.99	
Horizontal Effective Consolidation Stress, psi		14.99	20.00	25.00	
Vertical Strain after Consolidation, %		0.6733	0.8273	0.7111	
Volumetric Strain after Consolidation, %		2.210	2.759	2.528	
Time to 50% Consolidation, min		1.690	0.8100	1.000	
Shear Strength, psi		11.87	12.85	21.23	
Strain at Failure, %		3.23	3.78	3.00	
Strain Rate, %/min		0.06000	0.06000	0.06000	
Deviator Stress at Failure, psi		23.74	25.69	42.46	
Effective Minor Principal Stress at Failure, psi		7.272	10.03	13.42	
Effective Major Principal Stress at Failure, psi		31.01	35.73	55.88	
B-Value		0.95	0.96	0.95	

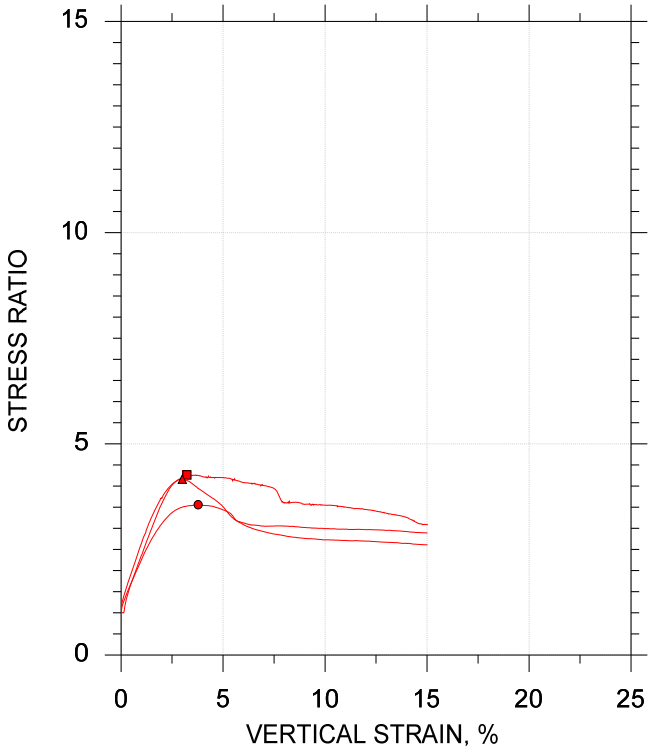
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

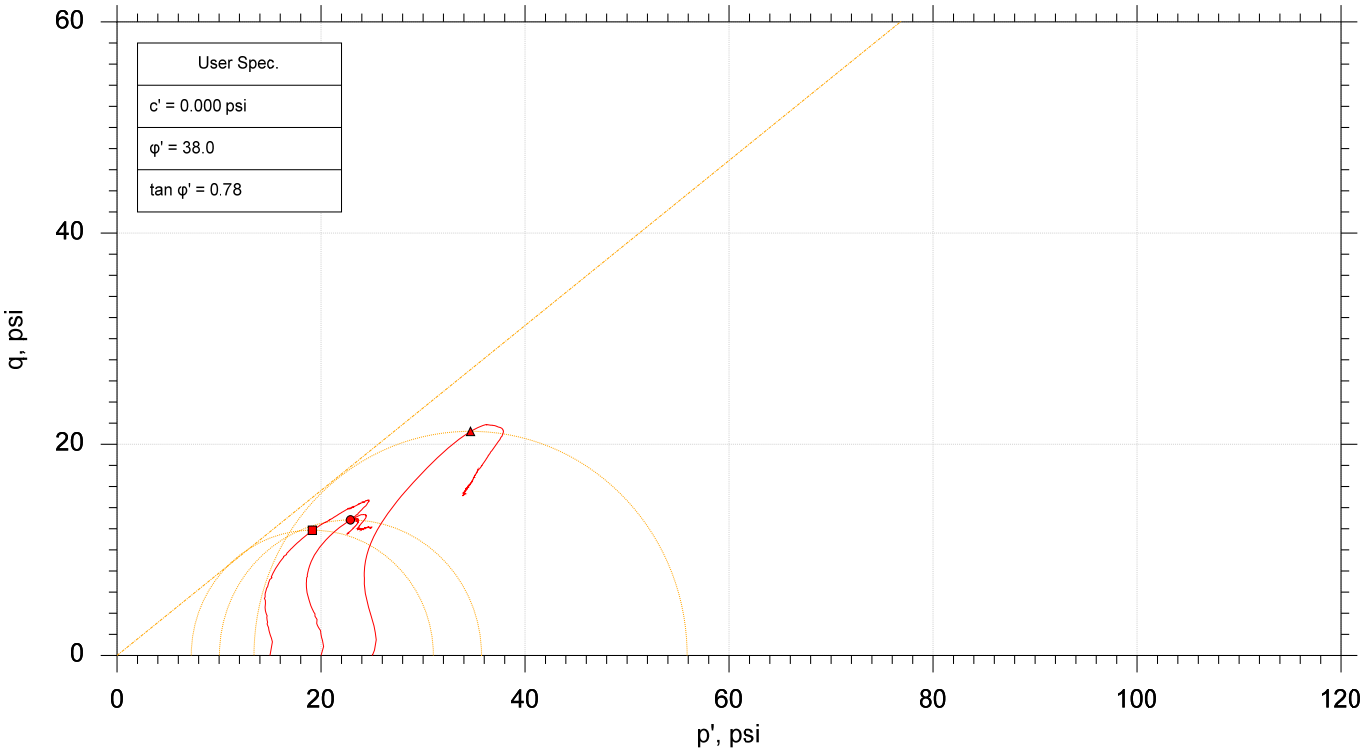
Remarks:

System 1057

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







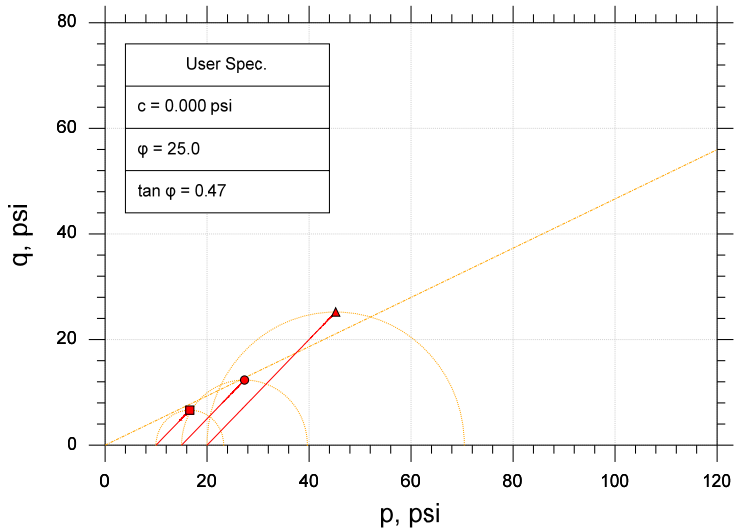
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	AP-11	CU-14-1	24-26 ft	jm	7/3/18	mcm	7/16/18	307802-CU-14-1m.dat
●	AP-11	CU-14-2	24-26 ft	jm	7/5/18	mcm	7/16/18	307802-CU-14-2m.dat
▲	AP-11	CU-14-3	24-26 ft	jm	7/3/18	mcm	7/16/18	307802-CU-14-3m.dat

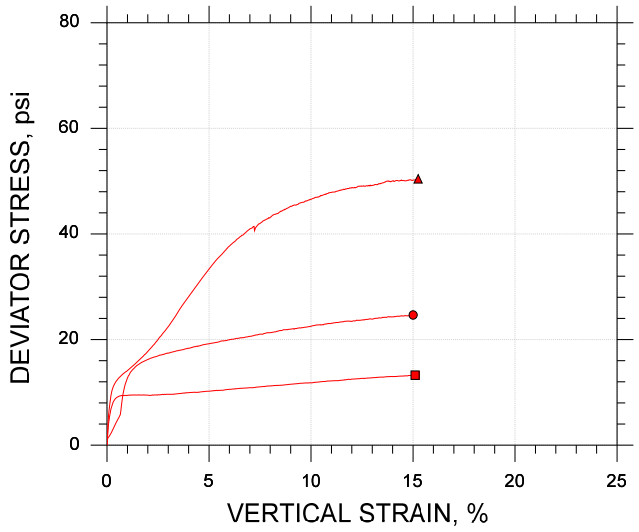
GeoTesting EXPRESS

Project: I-20/26/126 Corridor Improv.	Location: ---	Project No.: GTX-307802
Boring No.: ---	Sample Type: intact	
Description: Moist, reddish brown silt		
Remarks: System 1057		

Client: F&ME Consultants	
Project Name: I-20/26/126 Corridor Improv.	
Project Location: ---	
Project Number: GTX-307802	
Tested By: jm	Checked By: mcm
Boring ID: ---	
Preparation: intact	
Description: Moist, yellowish red clayey sand with gravel	
Classification: ---	
Group Symbol: ---	
Liquid Limit: ---	Plastic Limit: ---
Plasticity Index: ---	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		■	●	▲	
Sample ID		AP-12	AP-12	AP-12	
Depth, ft		18-20 ft	18-20.4 ft	18-20.4 ft	
Test Number		CU-16-1	CU-16-2	CU-16-3	
Initial	Height, in	6.073	5.999	5.982	
	Diameter, in	2.880	2.880	2.880	
	Moisture Content (from Cuttings), %	14.9	16.2	15.0	
	Dry Density, pcf	98.5	105.	108.	
	Saturation (Wet Method), %	56.7	72.8	71.5	
	Void Ratio	0.711	0.601	0.566	
Before Shear	Moisture Content, %	26.0	21.7	20.2	
	Dry Density, pcf	99.1	106.	109.	
	Cross-sectional Area (Method A), in²	6.481	6.466	6.461	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.701	0.585	0.546	
	Back Pressure, psi	111.0	109.0	84.99	
Vertical Effective Consolidation Stress, psi		10.01	14.99	20.00	
Horizontal Effective Consolidation Stress, psi		10.00	14.99	20.00	
Vertical Strain after Consolidation, %		0.1391	0.2104	0.3964	
Volumetric Strain after Consolidation, %		0.7034	0.9130	1.113	
Time to 50% Consolidation, min		1.440	1.440	1.440	
Shear Strength, psi		6.631	12.33	25.22	
Strain at Failure, %		15.1	15.0	15.3	
Strain Rate, %/min		0.06000	0.06000	0.06000	
Deviator Stress at Failure, psi		13.26	24.66	50.44	
Effective Minor Principal Stress at Failure, psi		5.769	9.853	20.99	
Effective Major Principal Stress at Failure, psi		19.03	34.51	71.43	
B-Value		0.96	0.96	0.95	

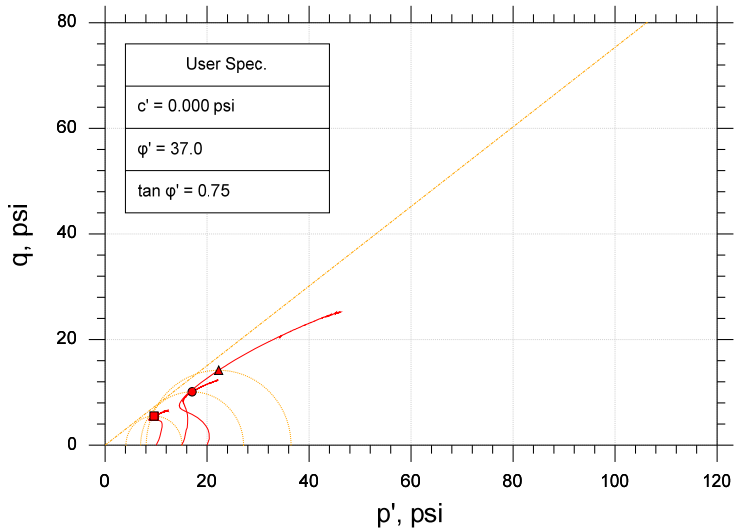
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

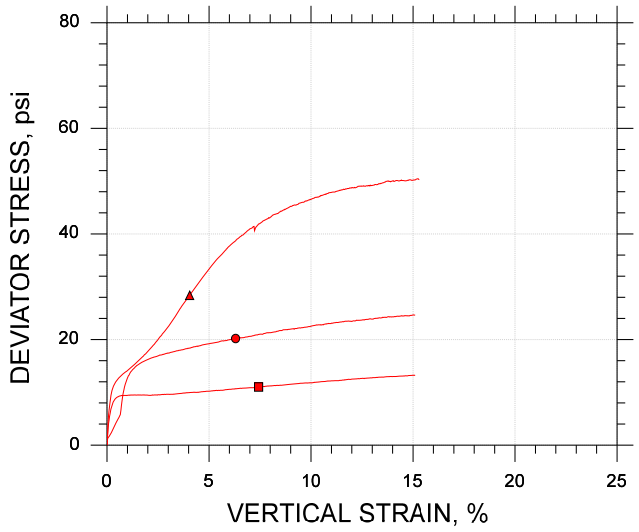
Remarks:

System 1057

Client: F&ME Consultants	
Project Name: I-20/26/126 Corridor Improv.	
Project Location: ---	
Project Number: GTX-307802	
Tested By: jm	Checked By: mcm
Boring ID: ---	
Preparation: intact	
Description: Moist, yellowish red clayey sand with gravel	
Classification: ---	
Group Symbol: ---	
Liquid Limit: ---	Plastic Limit: ---
Plasticity Index: ---	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767

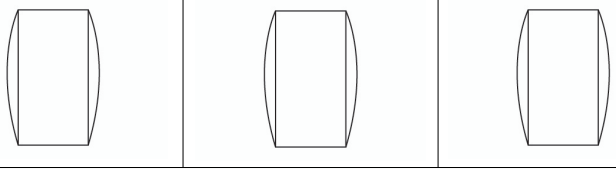




Symbol		■	●	▲	
Sample ID		AP-12	AP-12	AP-12	
Depth, ft		18-20 ft	18-20.4 ft	18-20.4 ft	
Test Number		CU-16-1	CU-16-2	CU-16-3	
Initial	Height, in	6.073	5.999	5.982	
	Diameter, in	2.880	2.880	2.880	
	Moisture Content (from Cuttings), %	14.9	16.2	15.0	
	Dry Density, pcf	98.5	105.	108.	
	Saturation (Wet Method), %	56.7	72.8	71.5	
	Void Ratio	0.711	0.601	0.566	
Before Shear	Moisture Content, %	26.0	21.7	20.2	
	Dry Density, pcf	99.1	106.	109.	
	Cross-sectional Area (Method A), in²	6.481	6.466	6.461	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.701	0.585	0.546	
	Back Pressure, psi	111.0	109.0	84.99	
Vertical Effective Consolidation Stress, psi		10.01	14.99	20.00	
Horizontal Effective Consolidation Stress, psi		10.00	14.99	20.00	
Vertical Strain after Consolidation, %		0.1391	0.2104	0.3964	
Volumetric Strain after Consolidation, %		0.7034	0.9130	1.113	
Time to 50% Consolidation, min		1.440	1.440	1.440	
Shear Strength, psi		5.510	10.10	14.19	
Strain at Failure, %		7.43	6.30	4.05	
Strain Rate, %/min		0.06000	0.06000	0.06000	
Deviator Stress at Failure, psi		11.02	20.20	28.38	
Effective Minor Principal Stress at Failure, psi		4.086	6.961	8.076	
Effective Major Principal Stress at Failure, psi		15.11	27.16	36.46	
B-Value		0.96	0.96	0.95	

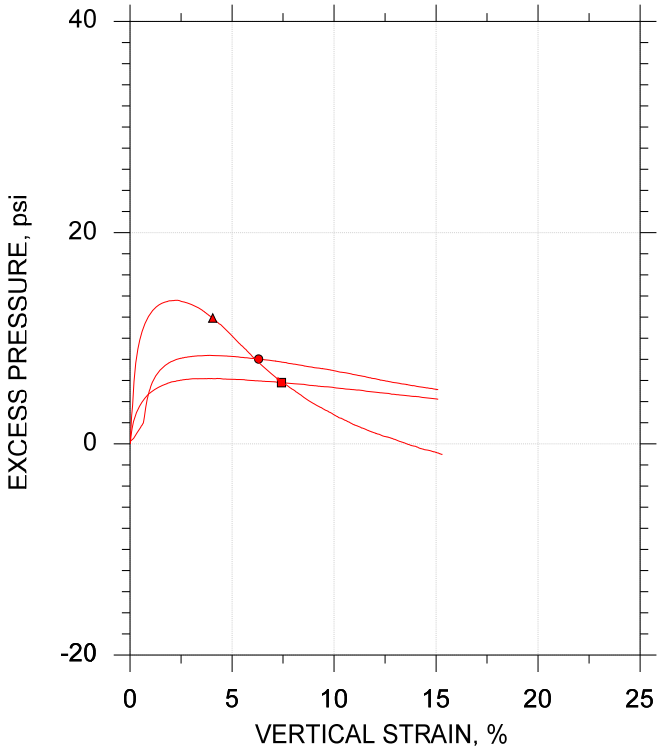
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

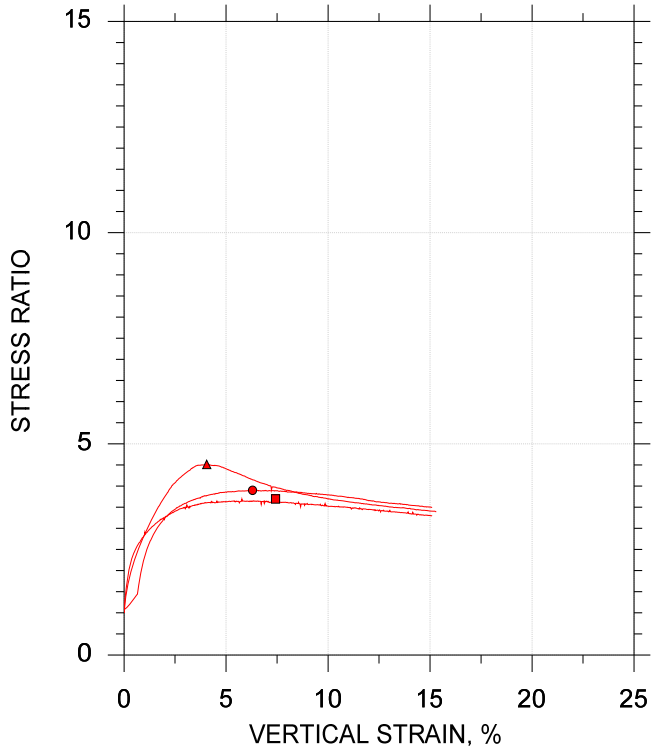
Remarks:

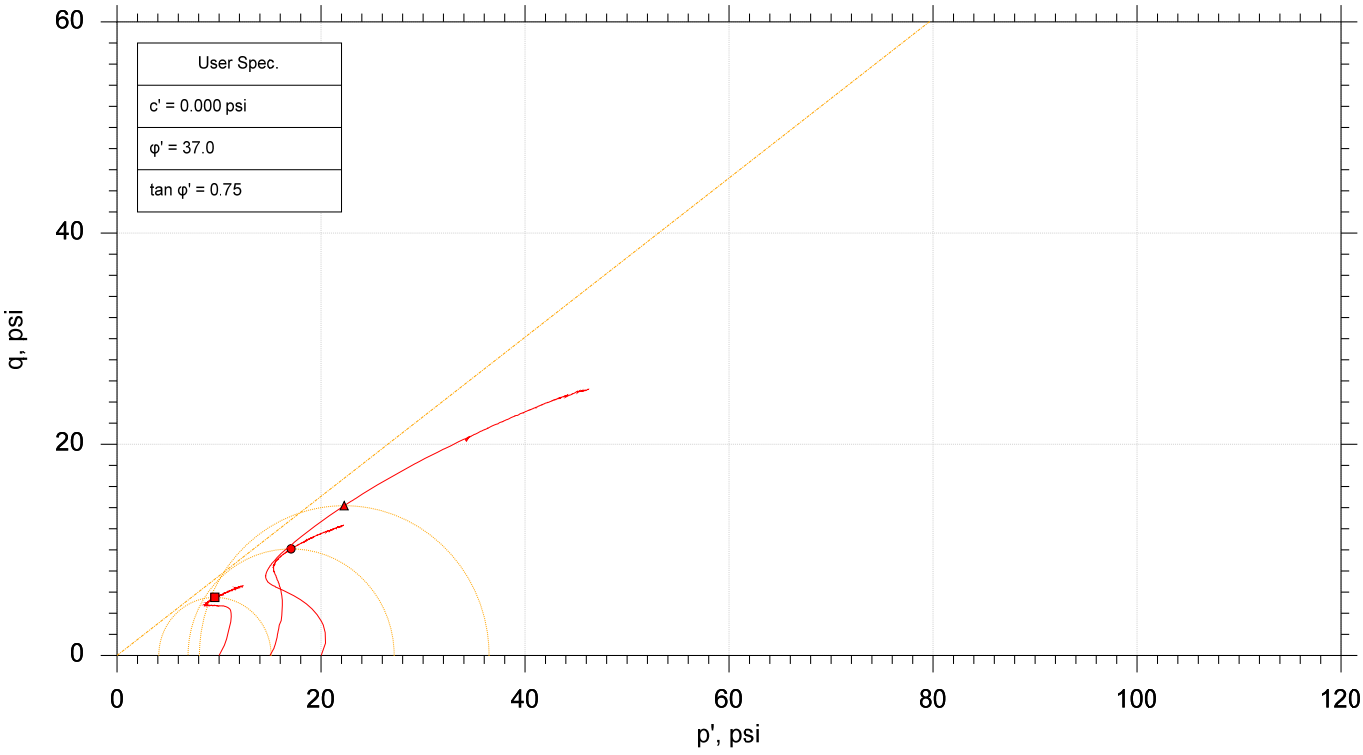


System 1057

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	AP-12	CU-16-1	18-20 ft	jm	7/10/18	mcm	7/16/18	307802-CU-16-1m.dat
●	AP-12	CU-16-2	18-20.4 ft	jm	7/10/18	mcm	7/16/18	307802-CU-16-2m.dat
▲	AP-12	CU-16-3	18-20.4 ft	jm	7/9/18	mcm	7/16/18	307802-CU-16-3m.dat

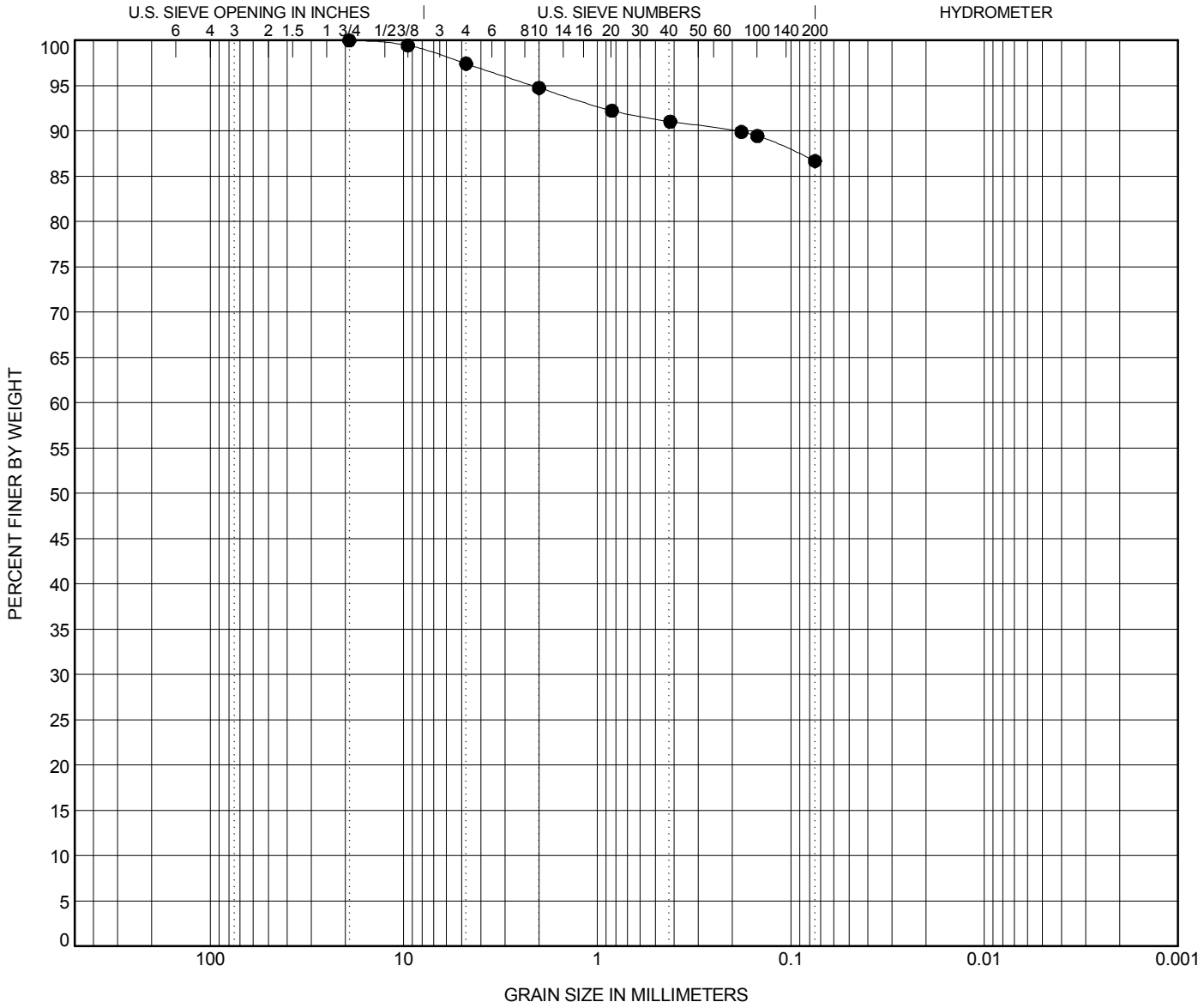
GeoTesting EXPRESS

Project: I-20/26/126 Corridor Improv.	Location: ---	Project No.: GTX-307802
Boring No.: ---	Sample Type: intact	
Description: Moist, yellowish red clayey sand with gravel		
Remarks: System 1057		

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

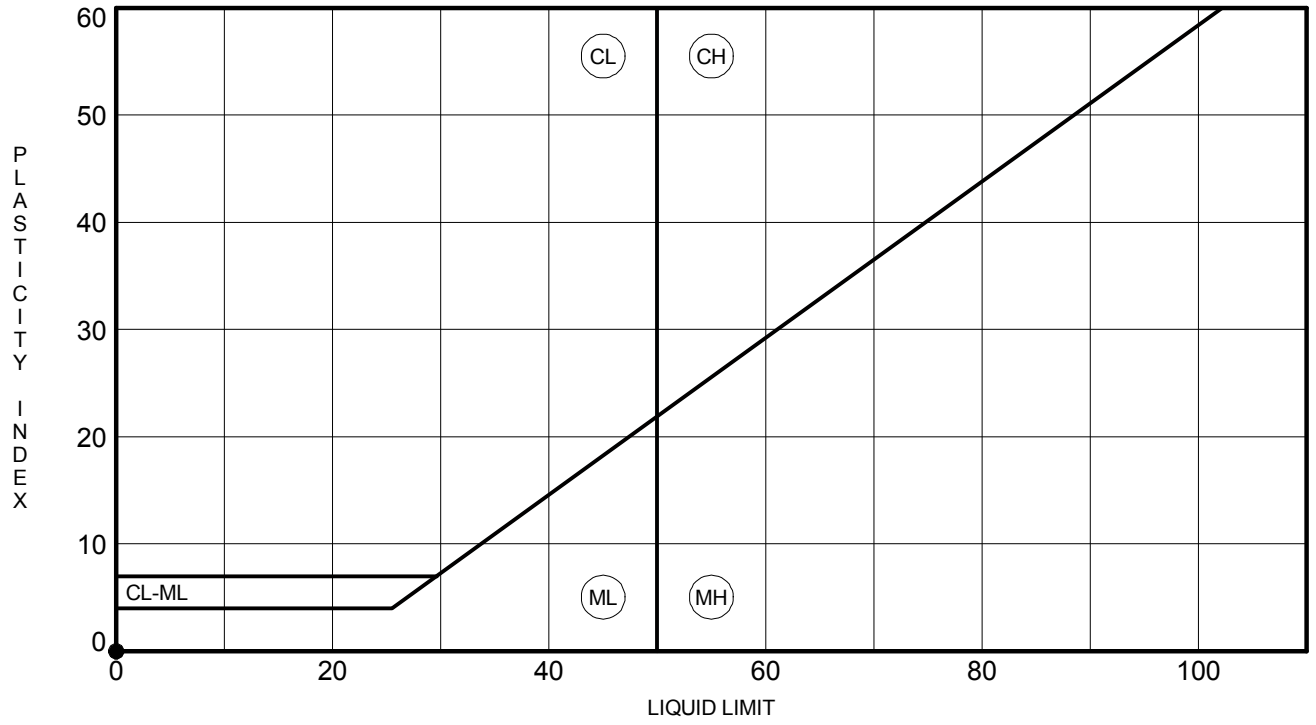
	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**AP-14**	**20.5**	**SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		

	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**AP-14**	**20.5**	**19.1**	**2.156**			**2.6**	**10.7**	**86.7**	

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

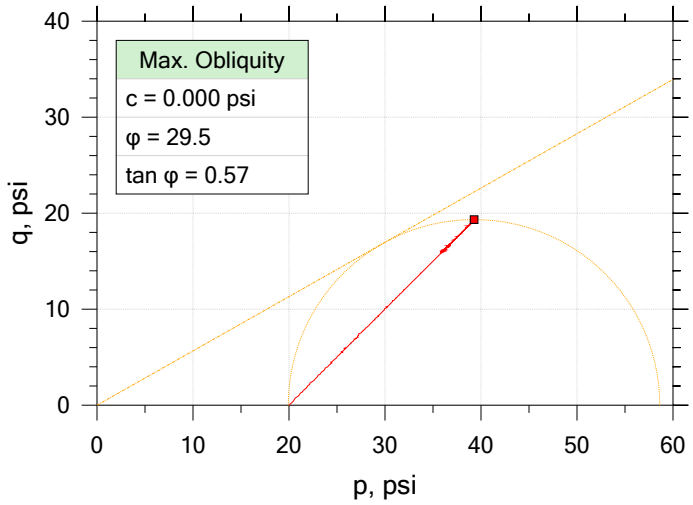
PROJECT COUNTY Richland/Lexington

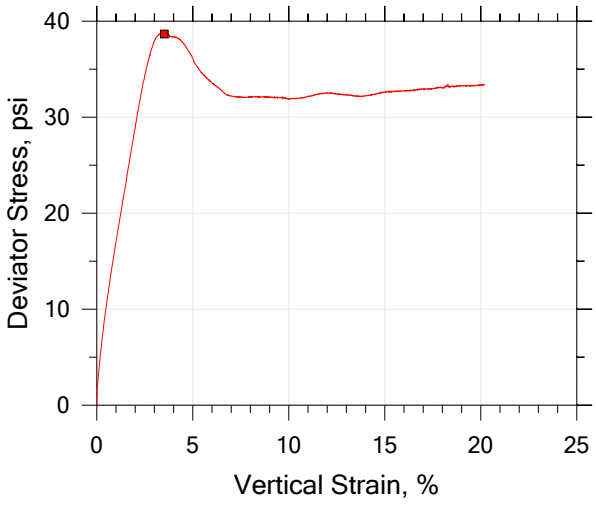


	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**AP-14**	**20.5**	**NP**	**NP**	**NP**	**87**	**SILT (ML) A-4(0)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 8/2/18

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297





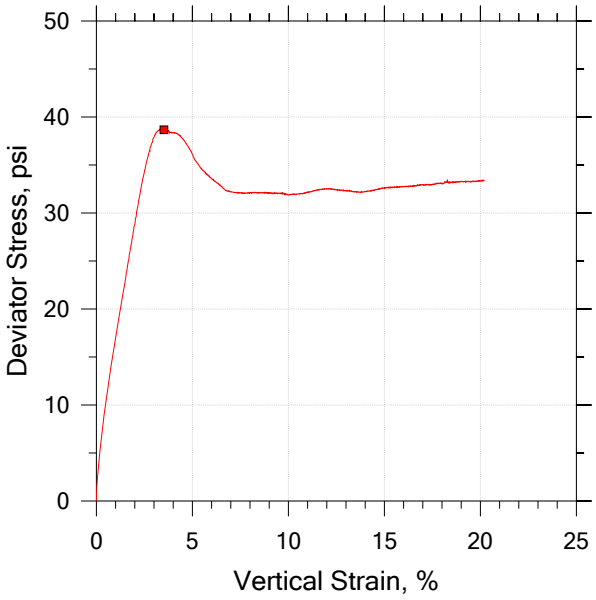
Symbol		■
Sample ID		18-1009
Depth, ft		18' - 20.5'
Test Number		A
Initial	Height, in	5.849
	Diameter, in	2.889
	Moisture Content (from Cuttings), %	23.1
	Dry Density, pcf	102.
	Saturation (Wet Method), %	97.5
	Void Ratio	0.635
Final	Moisture Content, %	21.7
	Dry Density, pcf	106.
	Cross-Sectional Area (Method A), in²	6.416
	Saturation, %	100.0
	Void Ratio	0.583
	Back Pressure, %	0.0000
Vertical Effective Consolidation Stress, psi		19.99
Horizontal Effective Consolidation Stress, psi		20.00
Vertical Strain after Consolidation, %		0.0000
Volumetric Strain after Consolidation, %		0.0000
Time to 50% Consolidation, min		0.0000
Shear Strength, psi		19.34
Strain at Failure, %		3.52
Strain Rate, %/min		0.07500
Deviator Stress at Failure, psi		38.68
Effective Minor Principal Stress at Failure, psi		19.99
Effective Major Principal Stress at Failure, psi		58.67
B-Value		---

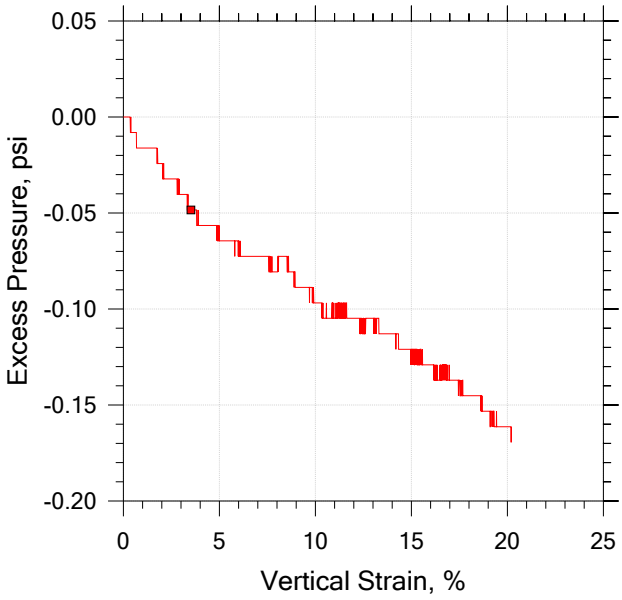
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

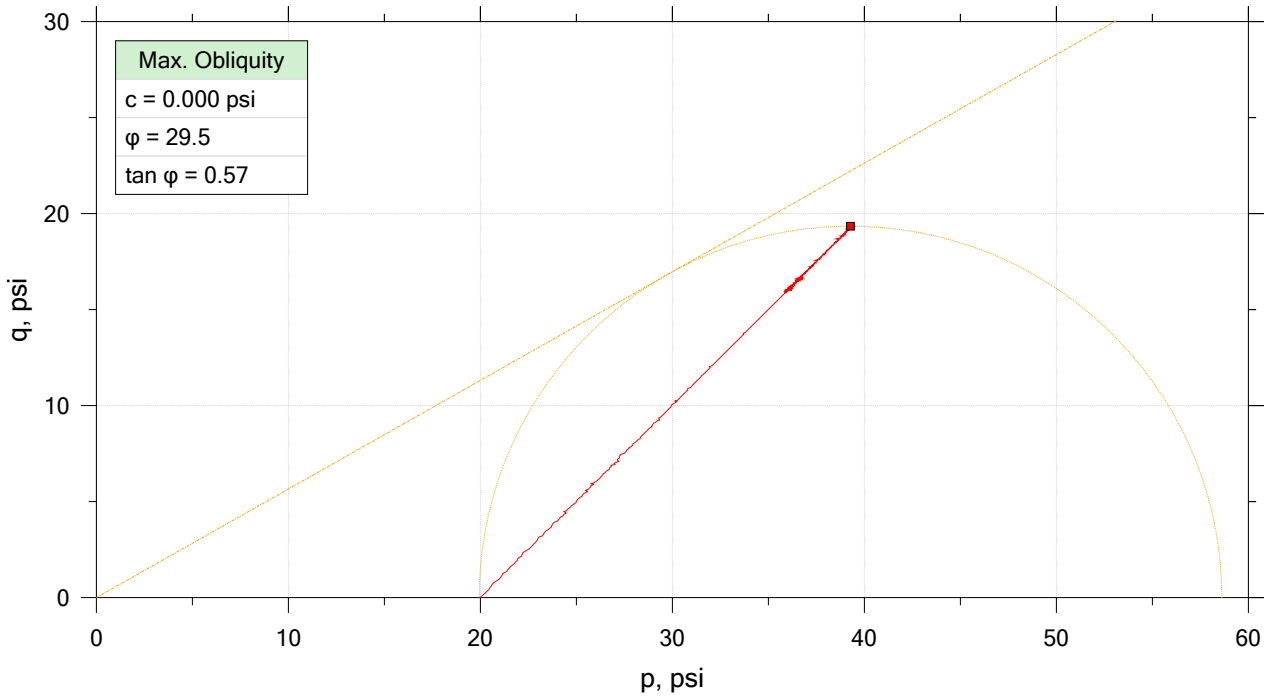
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-14	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1009	Test Date: 7/16/2018	Depth: 18' - 20.5'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: SILT (ML/A-4(0)) LL: NP PL: NP PI: NP %#200 Finer: 86.7		
Remarks:		

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297





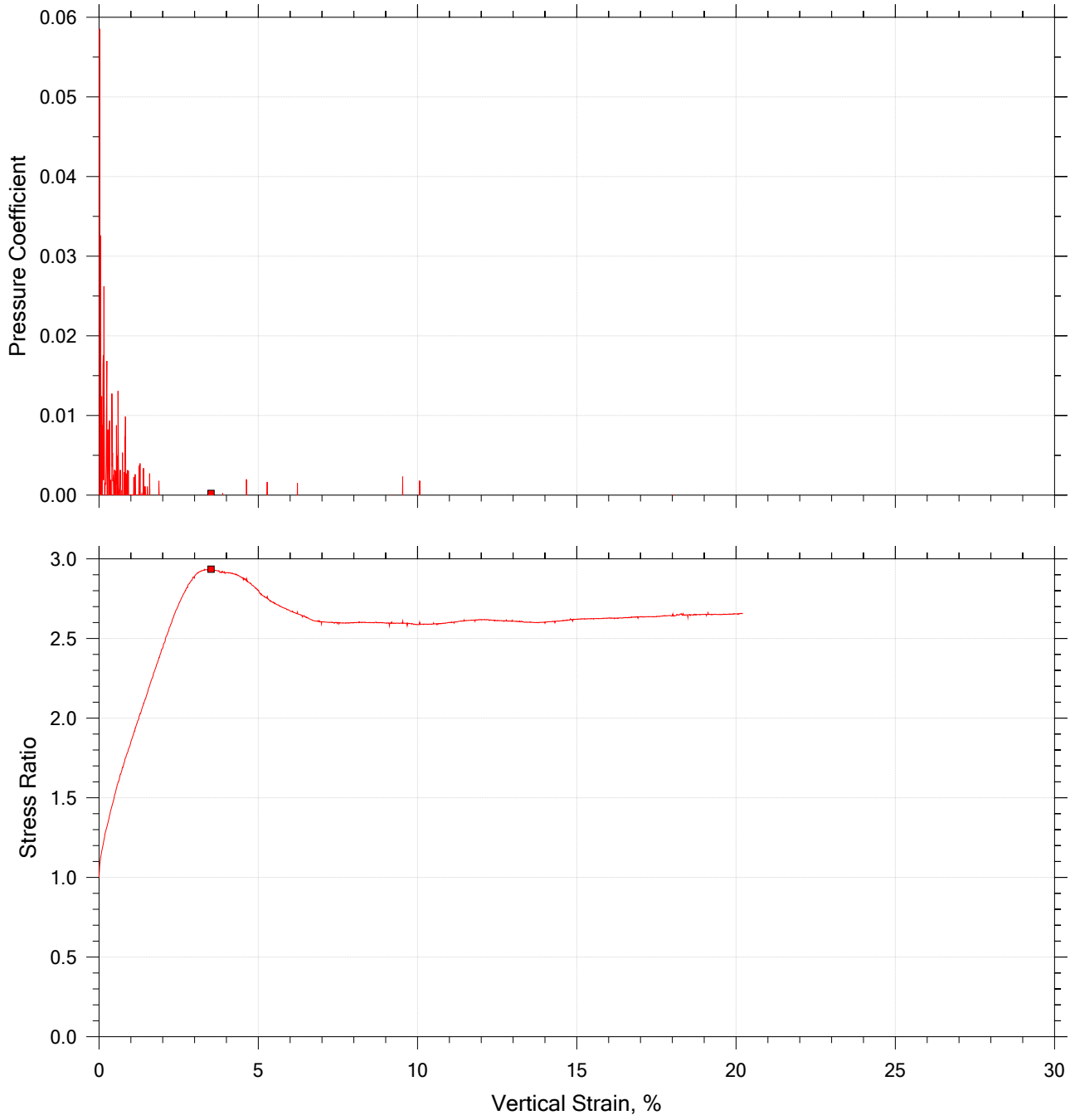


	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-1009	A	18' - 20.5'	WAP	7/16/2018	JFH/RS		18-1009_AP-22_test A.dat

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-14	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1009	Test Date: 7/16/2018	Depth: 18' - 20.5'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: SILT (ML/A-4(0)) LL: NP PL: NP PI: NP %#200 Finer: 86.7		
Remarks:		

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297



	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-1009	A	18' - 20.5'	WAP	7/16/2018	JFH/RS		18-1009_AP-22_test A.dat

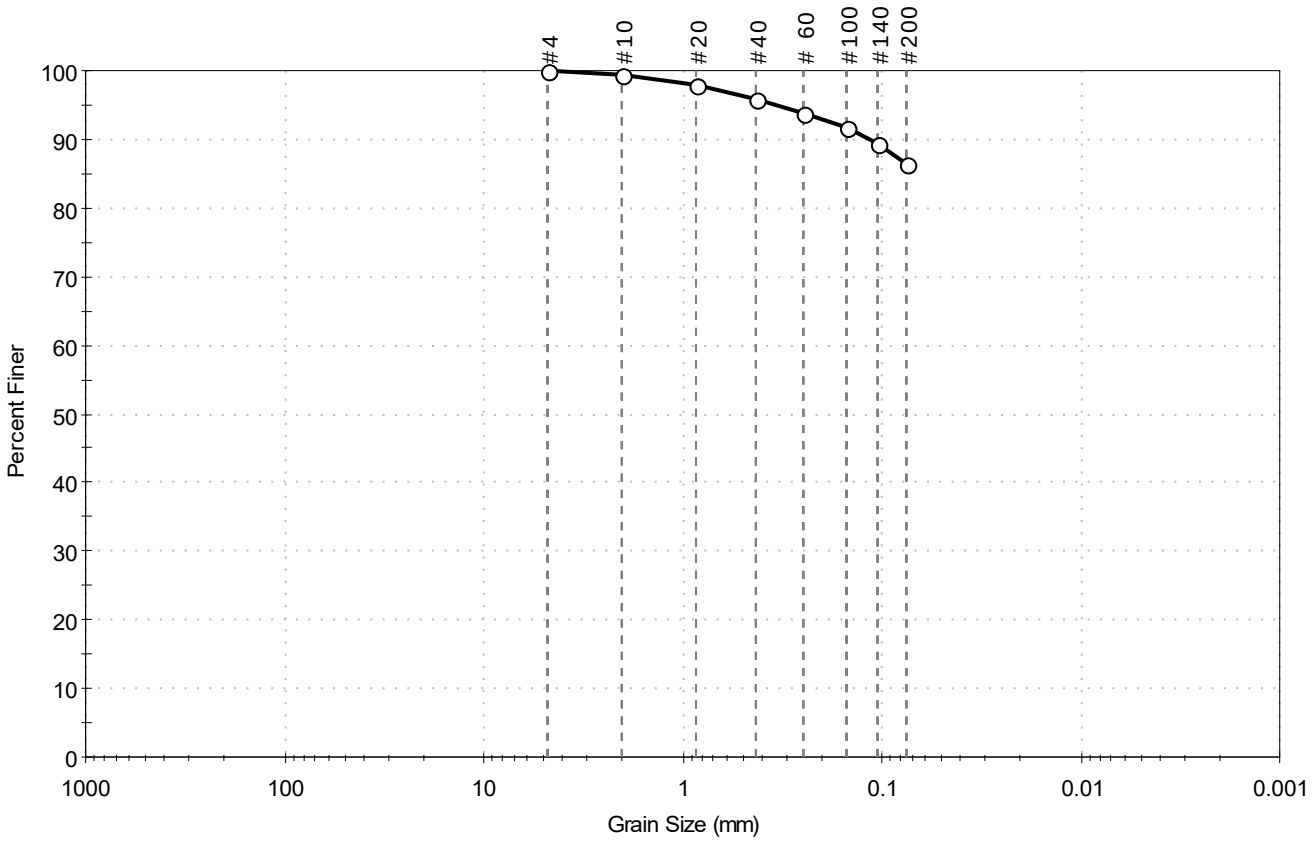
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-14	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1009	Test Date: 7/16/2018	Depth: 18' - 20.5'
Test No.: A	Sample Type: Undisturbed	Elevation: --
Description: SILT (ML/A-4(0)) LL: NP PL: NP PI: NP %#200 Finer: 86.7		
Remarks:		

Client:	F&ME Consultants				
Project:	I-20/26/126 Corridor Improvements				
Location:	---			Project No:	GTX-307802
Boring ID:	---	Sample Type:	tube	Tested By:	twh
Sample ID:	AP-18	Test Date:	08/02/18	Checked By:	jm
Depth :	16-18.3 ft	Test Id:	299285		

Test Comment: ---
Visual Description: Moist, yellow silt
Sample Comment: ---

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	13.5	86.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	98		
#40	0.42	96		
# 60	0.25	94		
#100	0.15	92		
#140	0.11	89		
#200	0.075	87		

Coefficients

D_{85} = N/A	D_{30} = N/A
D_{60} = N/A	D_{15} = N/A
D_{50} = N/A	D_{10} = N/A
C_u = N/A	C_c = N/A

Classification

ASTM SILT (ML)

AASHTO Clayey Soils (A-7-5 (14))

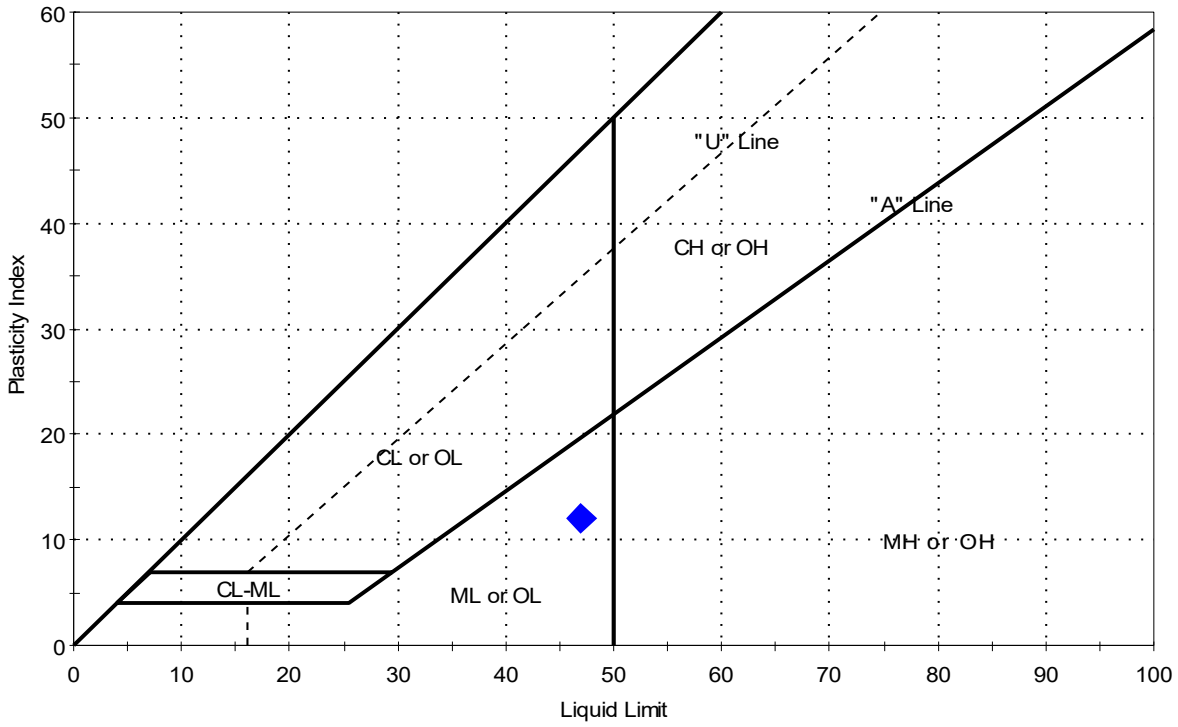
Sample / Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

Client:	F&ME Consultants				
Project:	I-20/26/126 Corridor Improvements				
Location:	---			Project No:	GTX-307802
Boring ID:	---	Sample Type:	tube	Tested By:	twh
Sample ID:	AP-18	Test Date:	08/02/18	Checked By:	jm
Depth :	16-18.3 ft	Test Id:	299288		
Test Comment:	---				
Visual Description:	Moist, yellow silt				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	AP-18	---	16-18.3 ft	24	47	35	12	-0.9	SILT (ML)

Sample Prepared using the WET method

4% Retained on #40 Sieve

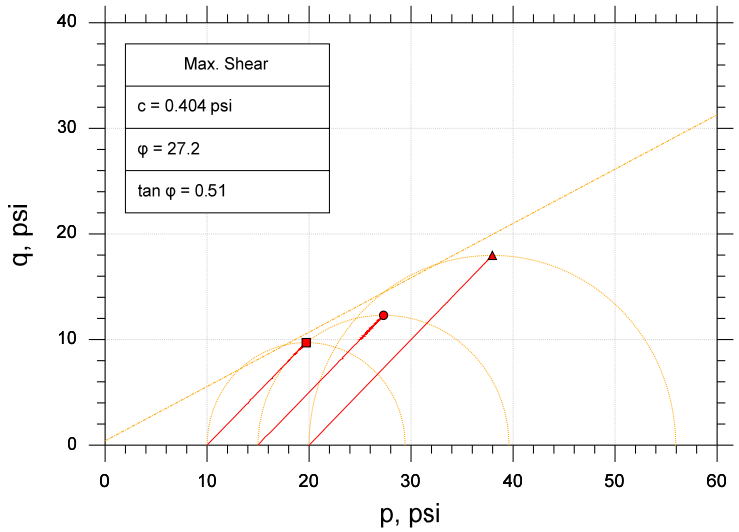
Dry Strength: HIGH

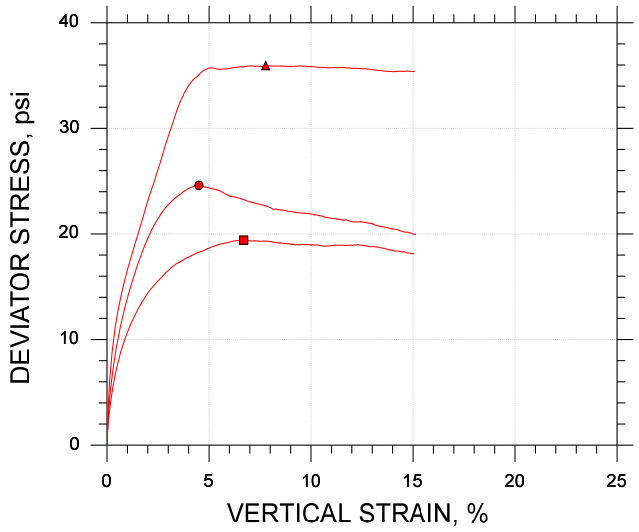
Dilatancy: SLOW

Toughness: LOW

Client: F&ME Consultants	
Project Name: I-20/26/126 Corridor Improv.	
Project Location: ---	
Project Number: GTX-307802	
Tested By: jm	Checked By: mcm
Boring ID: ---	
Preparation: intact	
Description: Moist, yellow silt with sand	
Classification: ---	
Group Symbol: ---	
Liquid Limit: ---	Plastic Limit: ---
Plasticity Index: ---	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





		■	●	▲	
Symbol					
Sample ID		AP-18	AP-18	AP-18	
Depth, ft		16-18.3 ft	16-18.3 ft	16-18.3	
Test Number		CU-17-1	CU-17-2	CU-17-3	
Initial	Height, in	6.047	6.143	6.257	
	Diameter, in	2.880	2.880	2.880	
	Moisture Content (from Cuttings), %	23.7	24.3	22.0	
	Dry Density, pcf	82.4	84.5	93.2	
	Saturation (Wet Method), %	61.3	65.9	73.4	
	Void Ratio	1.05	0.995	0.809	
Before Shear	Moisture Content, %	39.2	37.4	30.0	
	Dry Density, pcf	81.9	83.9	93.2	
	Cross-sectional Area (Method A), in²	6.540	6.550	6.516	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	1.06	1.01	0.809	
	Back Pressure, psi	134.9	117.0	111.0	
Vertical Effective Consolidation Stress, psi		9.990	14.98	19.97	
Horizontal Effective Consolidation Stress, psi		9.997	15.00	20.00	
Vertical Strain after Consolidation, %		0.4685	0.7767	1.030	
Volumetric Strain after Consolidation, %		1.412	2.147	2.988	
Time to 50% Consolidation, min		1.960	1.960	1.960	
Shear Strength, psi		9.705	12.30	17.97	
Strain at Failure, %		6.70	4.50	7.78	
Strain Rate, %/min		0.06000	0.06000	0.06000	
Deviator Stress at Failure, psi		19.41	24.59	35.94	
Effective Minor Principal Stress at Failure, psi		8.063	10.15	14.34	
Effective Major Principal Stress at Failure, psi		27.47	34.74	50.28	
B-Value		0.96	0.95	0.95	

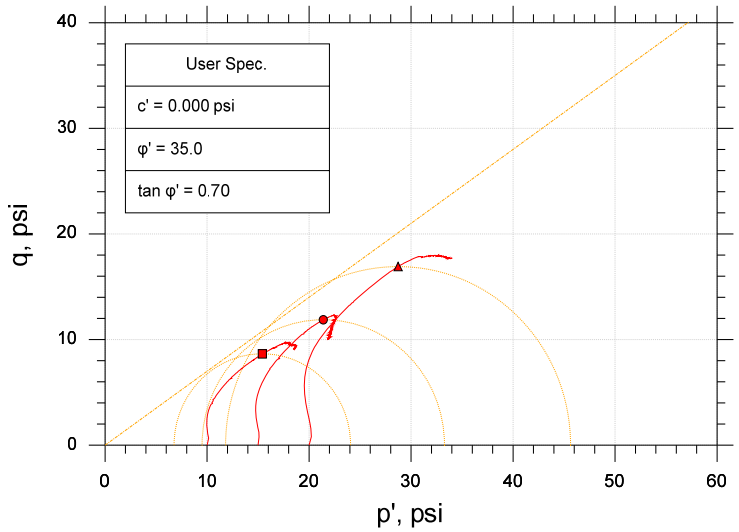
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

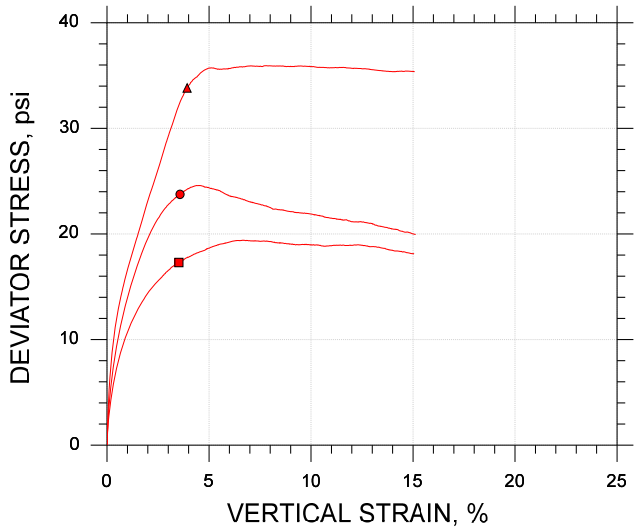
Remarks:

System 1057

Client: F&ME Consultants	
Project Name: I-20/26/126 Corridor Improv.	
Project Location: ---	
Project Number: GTX-307802	
Tested By: jm	Checked By: mcm
Boring ID: ---	
Preparation: intact	
Description: Moist, yellow silt with sand	
Classification: ---	
Group Symbol: ---	
Liquid Limit: ---	Plastic Limit: ---
Plasticity Index: ---	Estimated Specific Gravity: 2.7

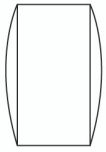
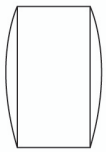
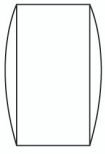
CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		■	●	▲
Sample ID		AP-18	AP-18	AP-18
Depth, ft		16-18.3 ft	16-18.3 ft	16-18.3
Test Number		CU-17-1	CU-17-2	CU-17-3
Initial	Height, in	6.047	6.143	6.257
	Diameter, in	2.880	2.880	2.880
	Moisture Content (from Cuttings), %	23.7	24.3	22.0
	Dry Density, pcf	82.4	84.5	93.2
	Saturation (Wet Method), %	61.3	65.9	73.4
	Void Ratio	1.05	0.995	0.809
Before Shear	Moisture Content, %	39.2	37.4	30.0
	Dry Density, pcf	81.9	83.9	93.2
	Cross-sectional Area (Method A), in²	6.540	6.550	6.516
	Saturation, %	100.0	100.0	100.0
	Void Ratio	1.06	1.01	0.809
	Back Pressure, psi	134.9	117.0	111.0
Vertical Effective Consolidation Stress, psi		9.990	14.98	19.97
Horizontal Effective Consolidation Stress, psi		9.997	15.00	20.00
Vertical Strain after Consolidation, %		0.4685	0.7767	1.030
Volumetric Strain after Consolidation, %		1.412	2.147	2.988
Time to 50% Consolidation, min		1.960	1.960	1.960
Shear Strength, psi		8.646	11.88	16.91
Strain at Failure, %		3.53	3.58	3.93
Strain Rate, %/min		0.06000	0.06000	0.06000
Deviator Stress at Failure, psi		17.29	23.75	33.82
Effective Minor Principal Stress at Failure, psi		6.768	9.518	11.82
Effective Major Principal Stress at Failure, psi		24.06	33.27	45.64
B-Value		0.96	0.95	0.95

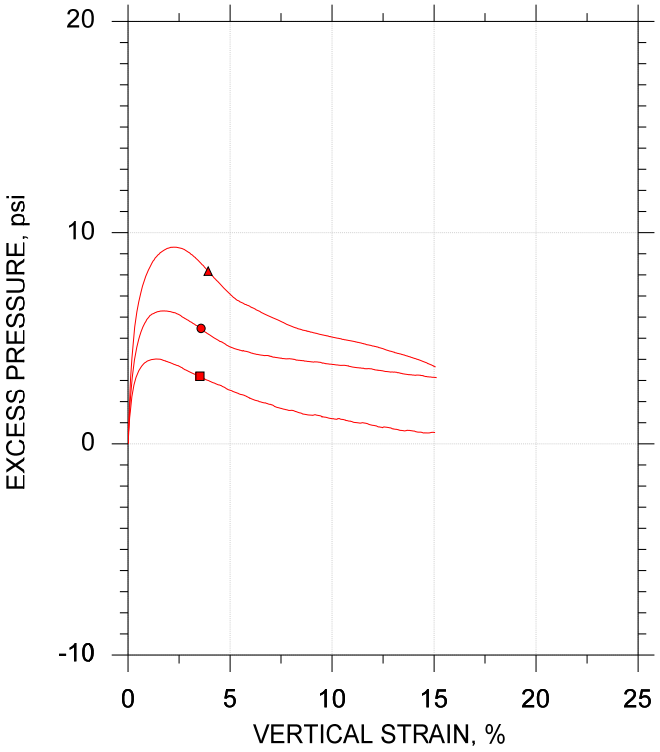
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

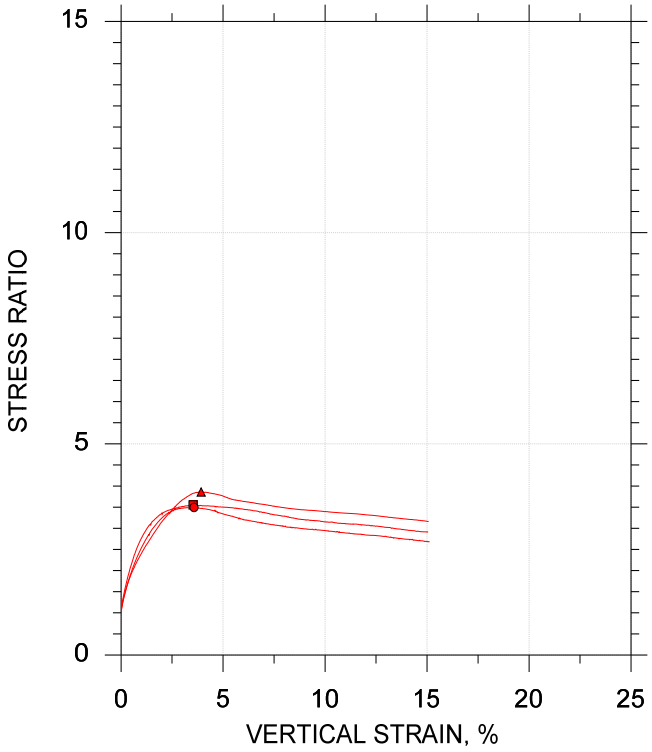




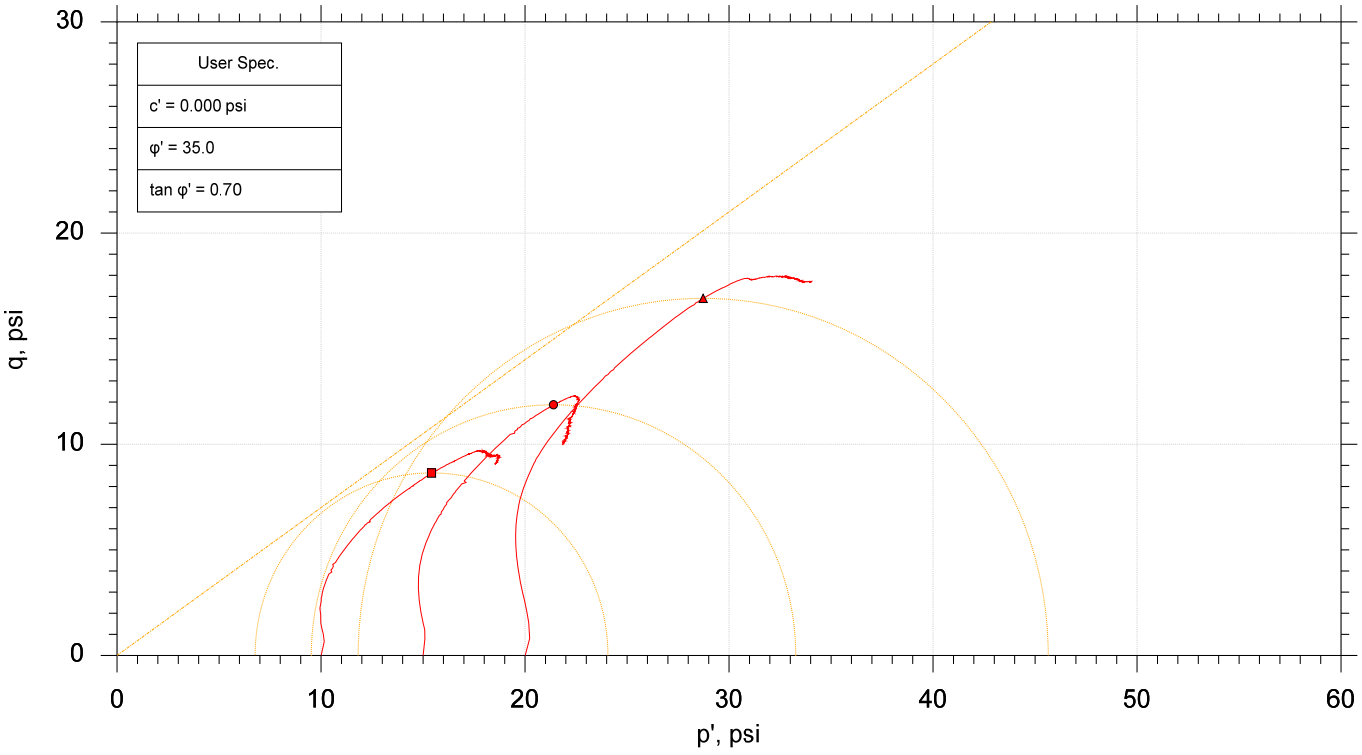
Remarks:

System 1057

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	AP-18	CU-17-1	16-18.3 ft	jm	7/11/18	mcm	7/17/18	307802-CU-17-1m.dat
●	AP-18	CU-17-2	16-18.3 ft	jm	7/12/18	mcm	7/17/18	307802-CU-17-2m.dat
▲	AP-18	CU-17-3	16-18.3	jm	7/11/18	mcm	7/17/18	307802-CU-17-3m.dat

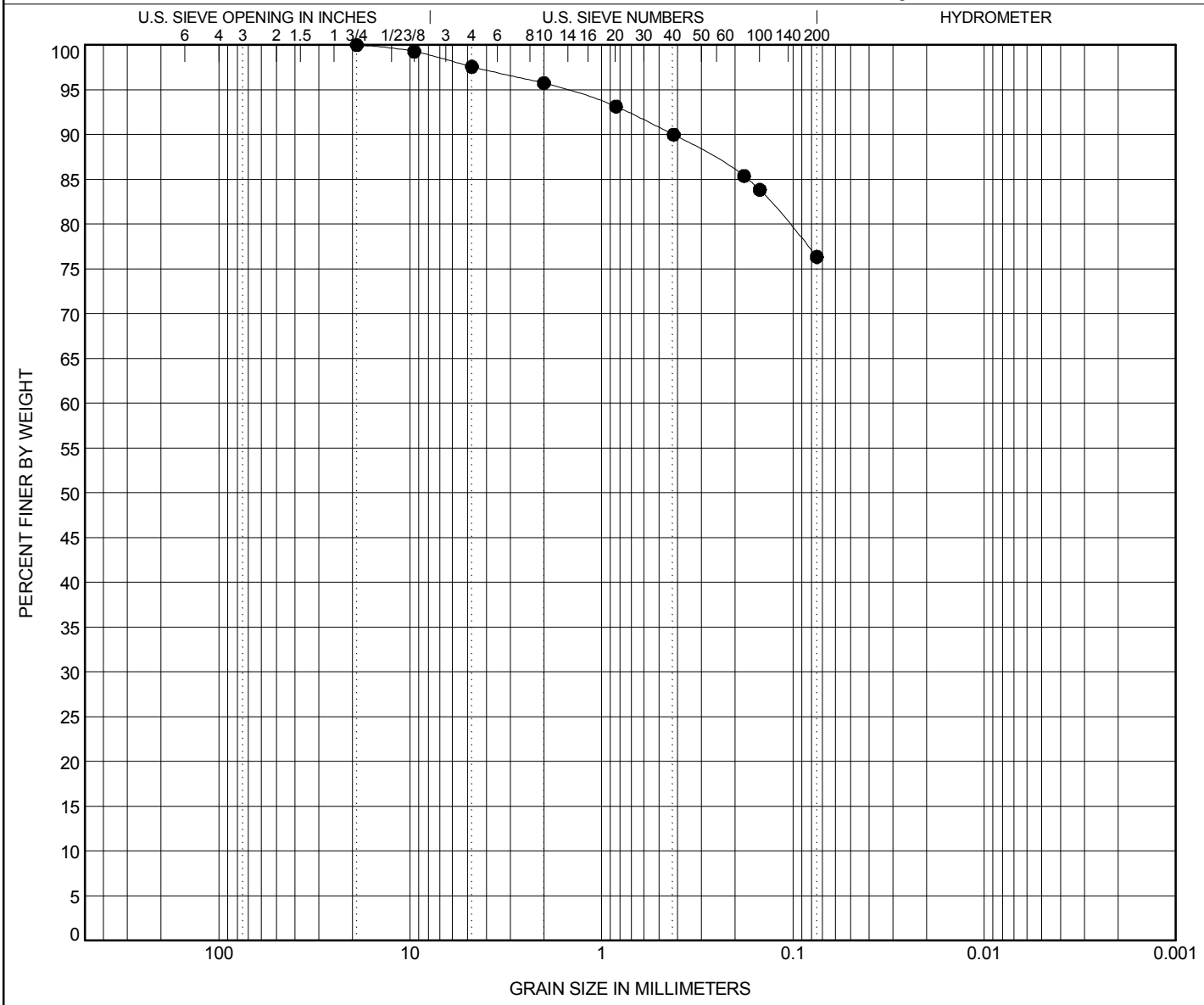
GeoTesting EXPRESS

Project: I-20/26/126 Corridor Improv.	Location: ---	Project No.: GTX-307802
Boring No.: ---	Sample Type: intact	
Description: Moist, yellow silt with sand		
Remarks: System 1057		

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**AP-19**	**8.5**	**SILT (ML) with Sand A-4(5)**	**34**	**27**	**7**		

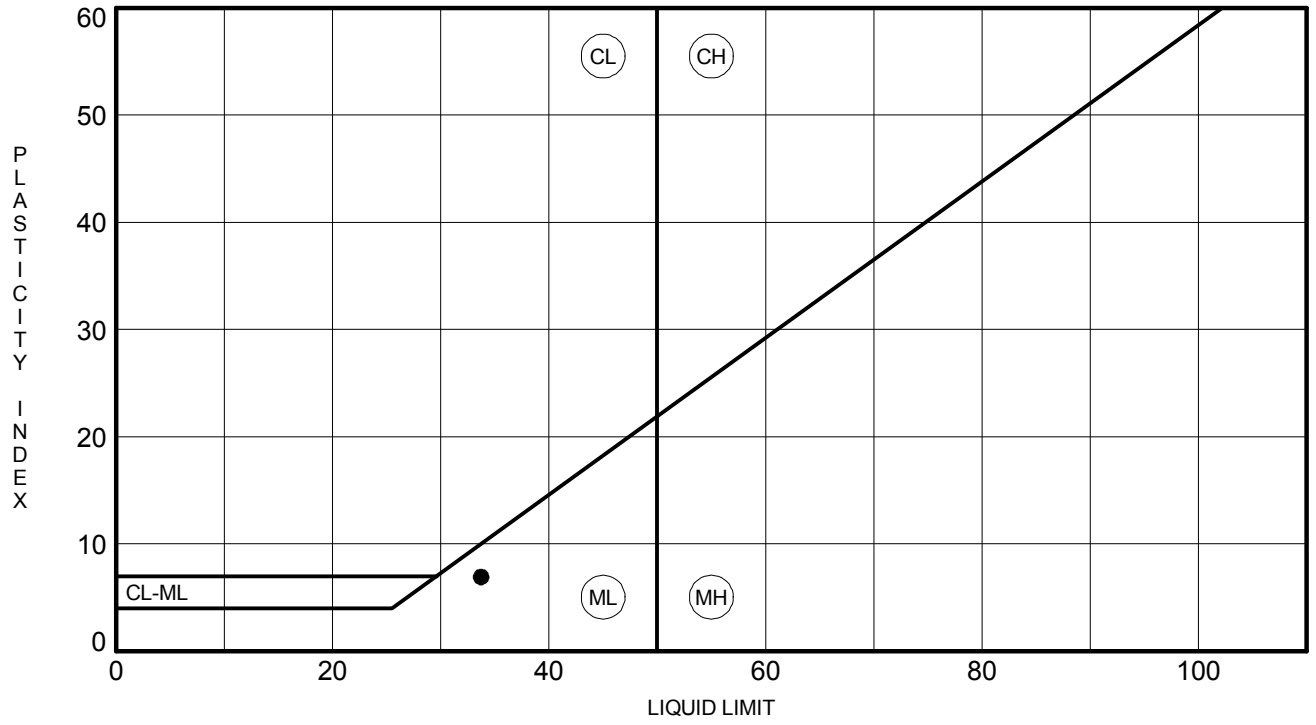
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**AP-19**	**8.5**	**19**	**1.557**			**2.4**	**21.2**	**76.3**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 8/2/18

ATTERBERG LIMITS' RESULTS

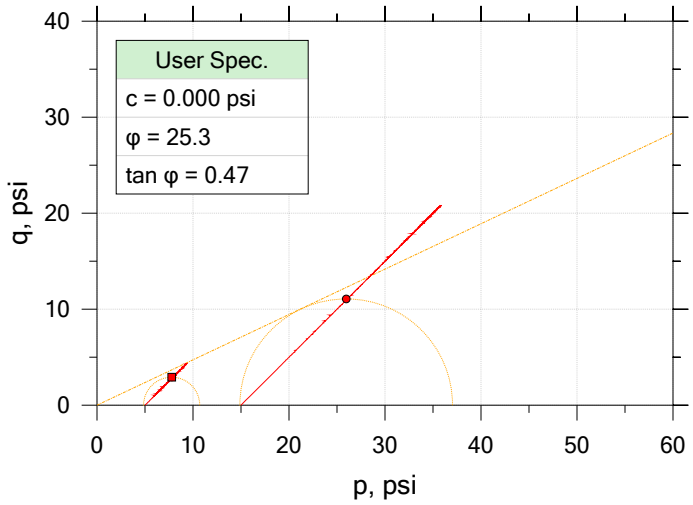
PROJECT ID P027662 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

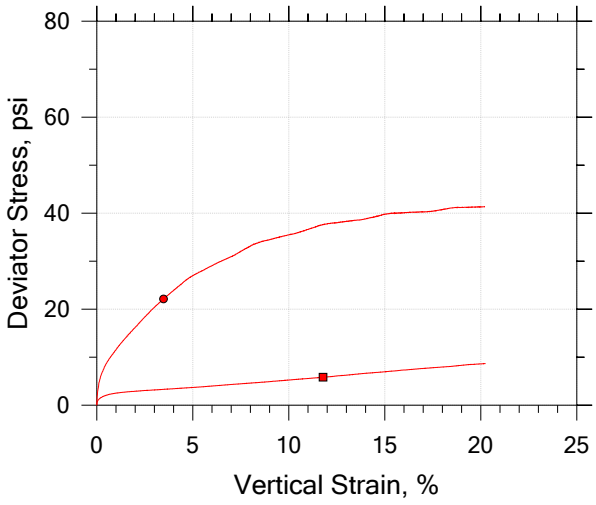
PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**AP-19**	**8.5**	**34**	**27**	**7**	**76**	**SILT (ML) with Sand A-4(5)**

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297





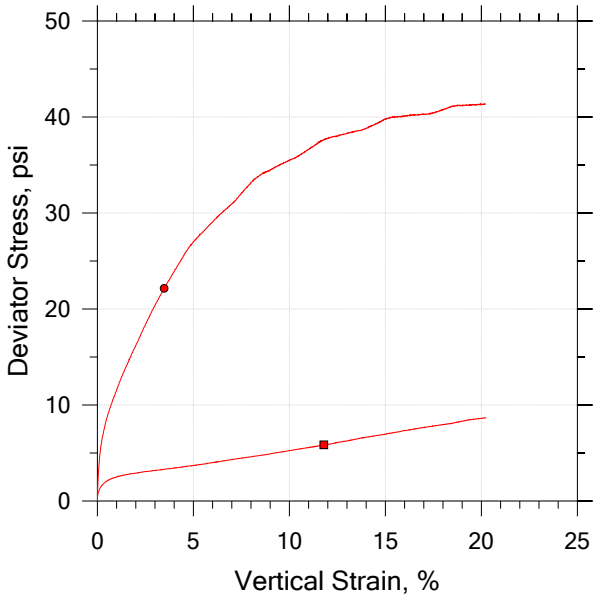
Symbol		■	●		
Sample ID		18-1007	18-1007		
Depth, ft		6' - 8.5'	6' - 8.5'		
Test Number		A	B		
Initial	Height, in	5.950	5.885		
	Diameter, in	2.866	2.856		
	Moisture Content (from Cuttings), %	16.8	22.7		
	Dry Density, pcf	97.3	102.		
	Saturation (Wet Method), %	62.5	94.4		
	Void Ratio	0.719	0.644		
Final	Moisture Content, %	24.3	21.9		
	Dry Density, pcf	101.	105.		
	Cross-Sectional Area (Method A), in²	6.272	6.249		
	Saturation, %	100.0	100.0		
	Void Ratio	0.651	0.587		
	Back Pressure, %	79.99	101.0		
Vertical Effective Consolidation Stress, psi		4.952	14.94		
Horizontal Effective Consolidation Stress, psi		4.999	15.00		
Vertical Strain after Consolidation, %		0.8016	0.9739		
Volumetric Strain after Consolidation, %		2.667	3.219		
Time to 50% Consolidation, min		0.0000	0.0000		
Shear Strength, psi		2.922	11.08		
Strain at Failure, %		11.8	3.48		
Strain Rate, %/min		0.07500	0.07500		
Deviator Stress at Failure, psi		5.845	22.15		
Effective Minor Principal Stress at Failure, psi		2.271	7.724		
Effective Major Principal Stress at Failure, psi		8.116	29.87		
B-Value		0.95	0.95		

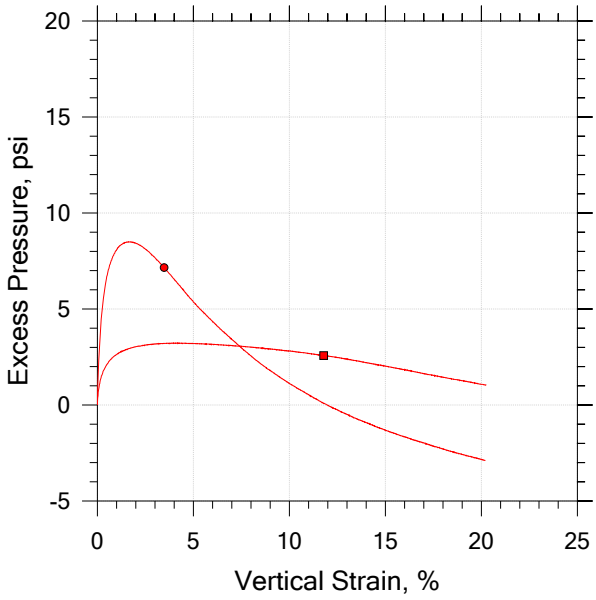
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

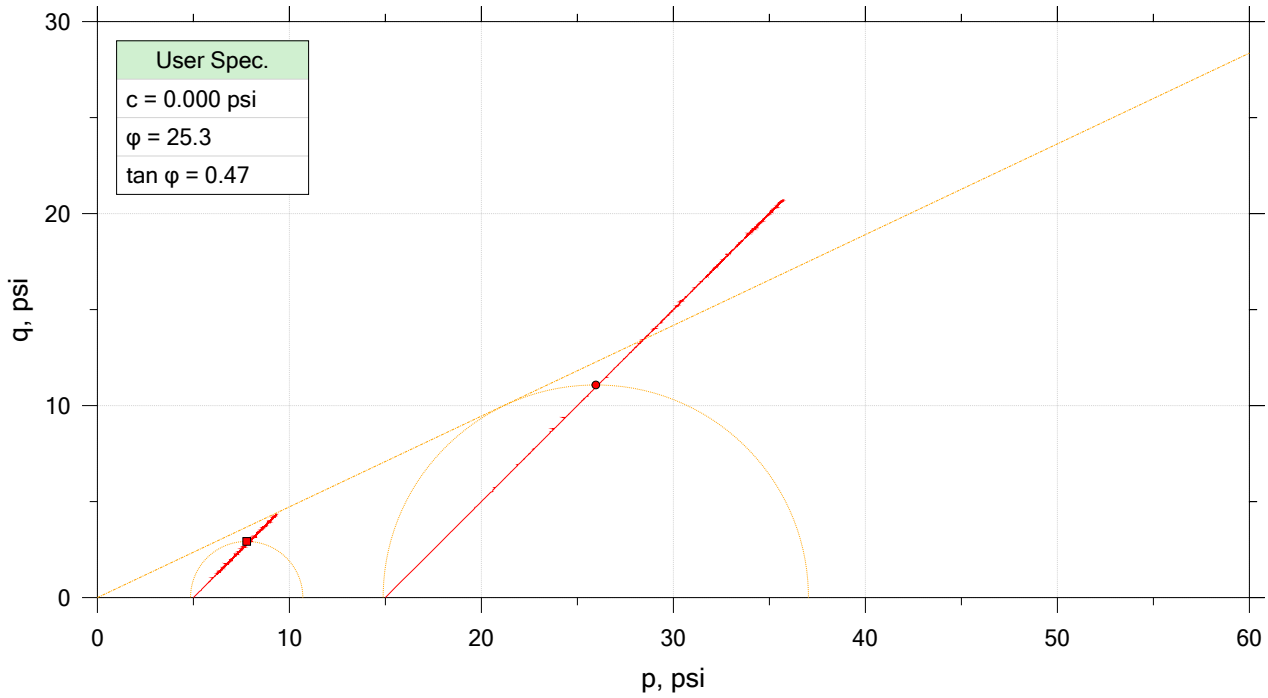
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-19	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1007	Test Date: 5/31/2018 - 6/7/2018	Depth: 6' - 8.5'
Test No.: AB	Sample Type: Undisturbed	Elevation: --
Description: SILT (ML/A-4(5)) with Sand LL: 34 PL: 27 PI: 7 %#200 Finer: 76.3		
Remarks:		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297





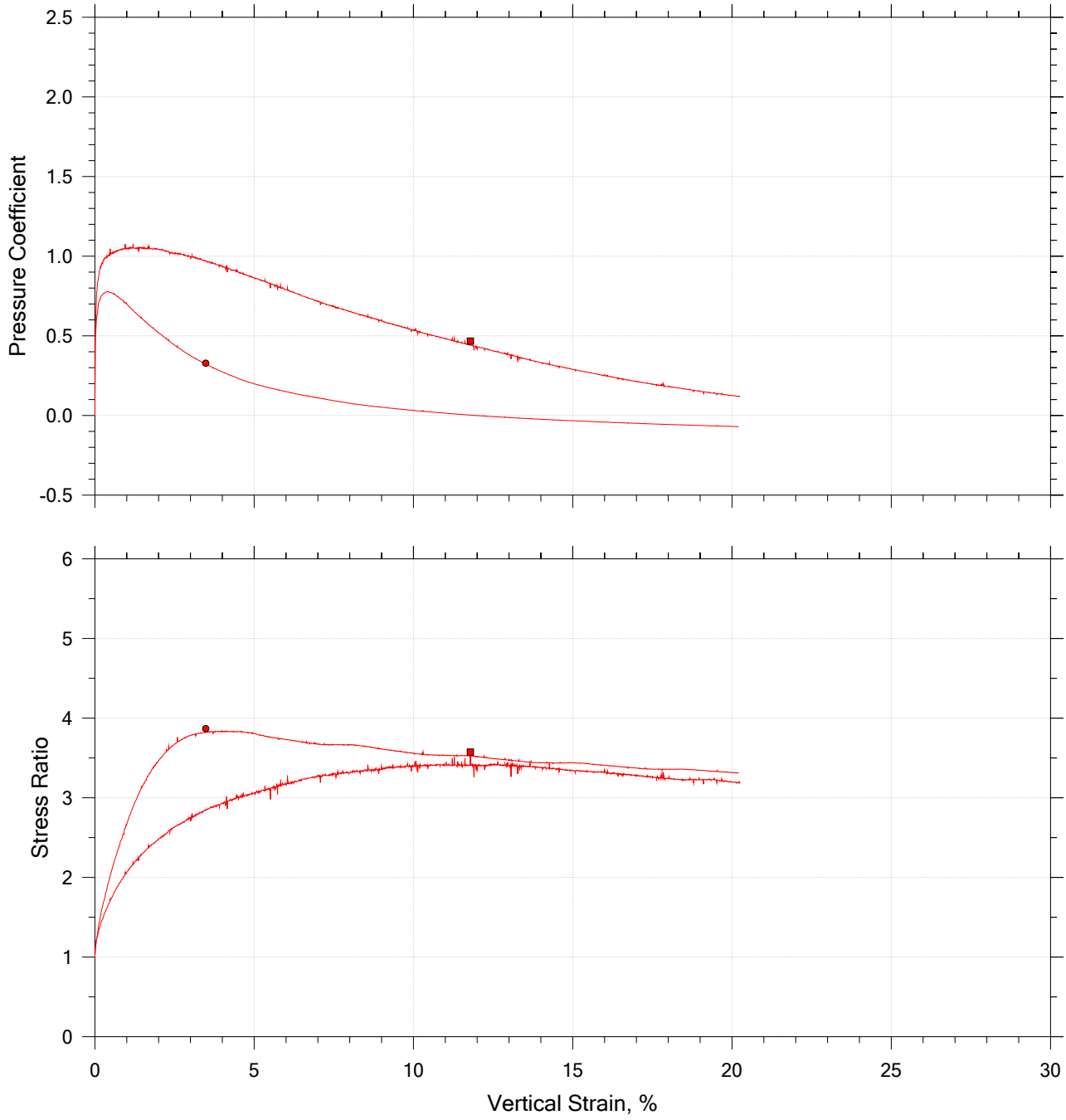


	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-1007	A	6' - 8.5'	WAP	5/31/2018	JFH/RS		18-1007_AP-4_test A.dat
●	18-1007	B	6' - 8.5'	RS	6/6/2018	JH		18-1007_AP-4_test B.dat

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-19	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1007	Test Date: 5/31/2018 - 6/7/2018	Depth: 6' - 8.5'
Test No.: AB	Sample Type: Undisturbed	Elevation: --
Description: SILT (ML/A-4(5)) with Sand LL: 34 PL: 27 PI: 7 %#200 Finer: 76.3		
Remarks:		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297

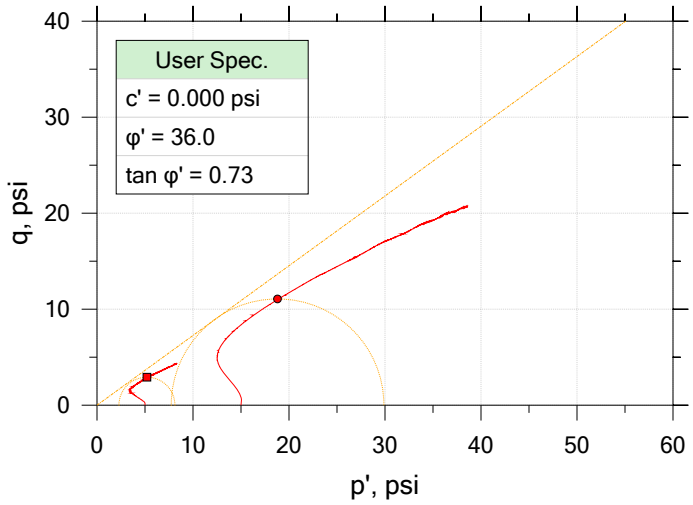


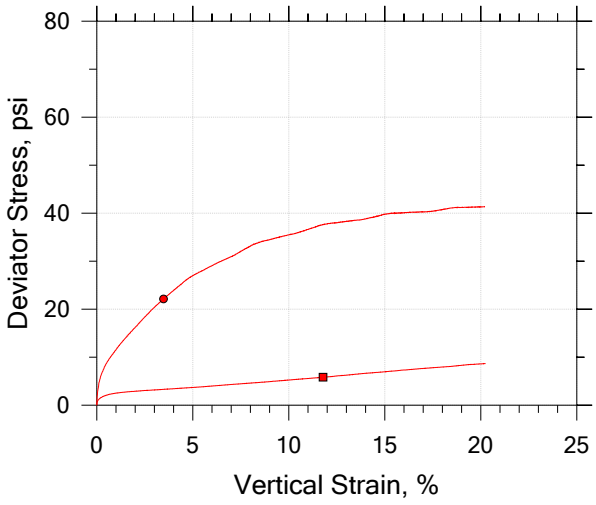
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-1007	A	6' - 8.5'	WAP	5/31/2018	JFH/RS		18-1007_AP-4_test A.dat
●	18-1007	B	6' - 8.5'	RS	6/6/2018	JH		18-1007_AP-4_test B.dat

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-19	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1007	Test Date: 5/31/2018 - 6/7/2018	Depth: 6' - 8.5'
Test No.: AB	Sample Type: Undisturbed	Elevation: --
Description: SILT (ML/A-4(5)) with Sand LL: 34 PL: 27 PI: 7 %#200 Finer: 76.3		
Remarks:		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297





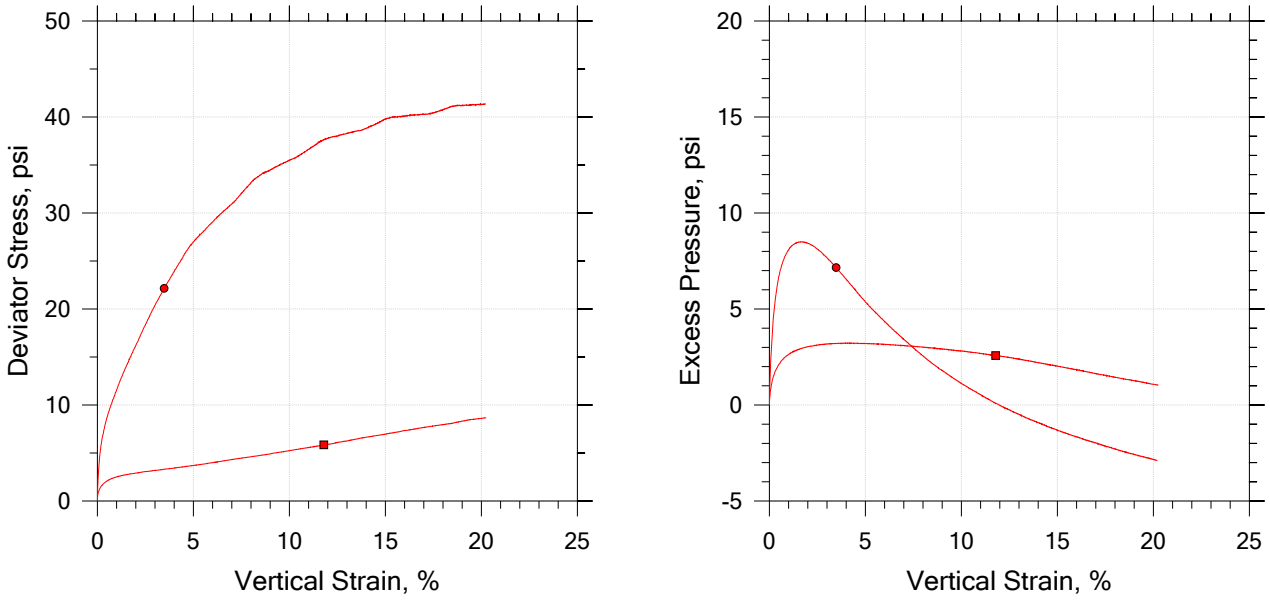
Symbol		■	●		
Sample ID		18-1007	18-1007		
Depth, ft		6' - 8.5'	6' - 8.5'		
Test Number		A	B		
Initial	Height, in	5.950	5.885		
	Diameter, in	2.866	2.856		
	Moisture Content (from Cuttings), %	16.8	22.7		
	Dry Density, pcf	97.3	102.		
	Saturation (Wet Method), %	62.5	94.4		
	Void Ratio	0.719	0.644		
Final	Moisture Content, %	24.3	21.9		
	Dry Density, pcf	101.	105.		
	Cross-Sectional Area (Method A), in²	6.272	6.249		
	Saturation, %	100.0	100.0		
	Void Ratio	0.651	0.587		
	Back Pressure, %	79.99	101.0		
Vertical Effective Consolidation Stress, psi		4.952	14.94		
Horizontal Effective Consolidation Stress, psi		4.999	15.00		
Vertical Strain after Consolidation, %		0.8016	0.9739		
Volumetric Strain after Consolidation, %		2.667	3.219		
Time to 50% Consolidation, min		0.0000	0.0000		
Shear Strength, psi		2.922	11.08		
Strain at Failure, %		11.8	3.48		
Strain Rate, %/min		0.07500	0.07500		
Deviator Stress at Failure, psi		5.845	22.15		
Effective Minor Principal Stress at Failure, psi		2.271	7.724		
Effective Major Principal Stress at Failure, psi		8.116	29.87		
B-Value		0.95	0.95		

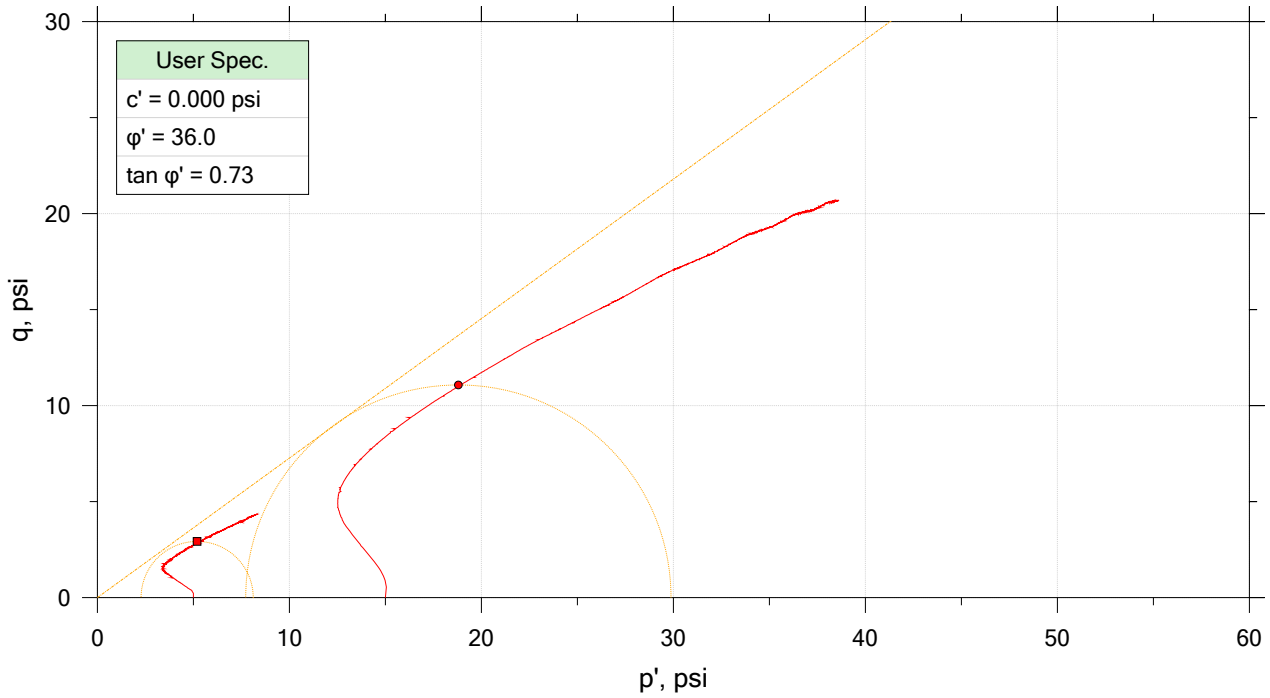
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-19	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1007	Test Date: 5/31/2018 - 6/7/2018	Depth: 6' - 8.5'
Test No.: AB	Sample Type: Undisturbed	Elevation: --
Description: SILT (ML/A-4(5)) with Sand LL: 34 PL: 27 PI: 7 %#200 Finer: 76.3		
Remarks:		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297



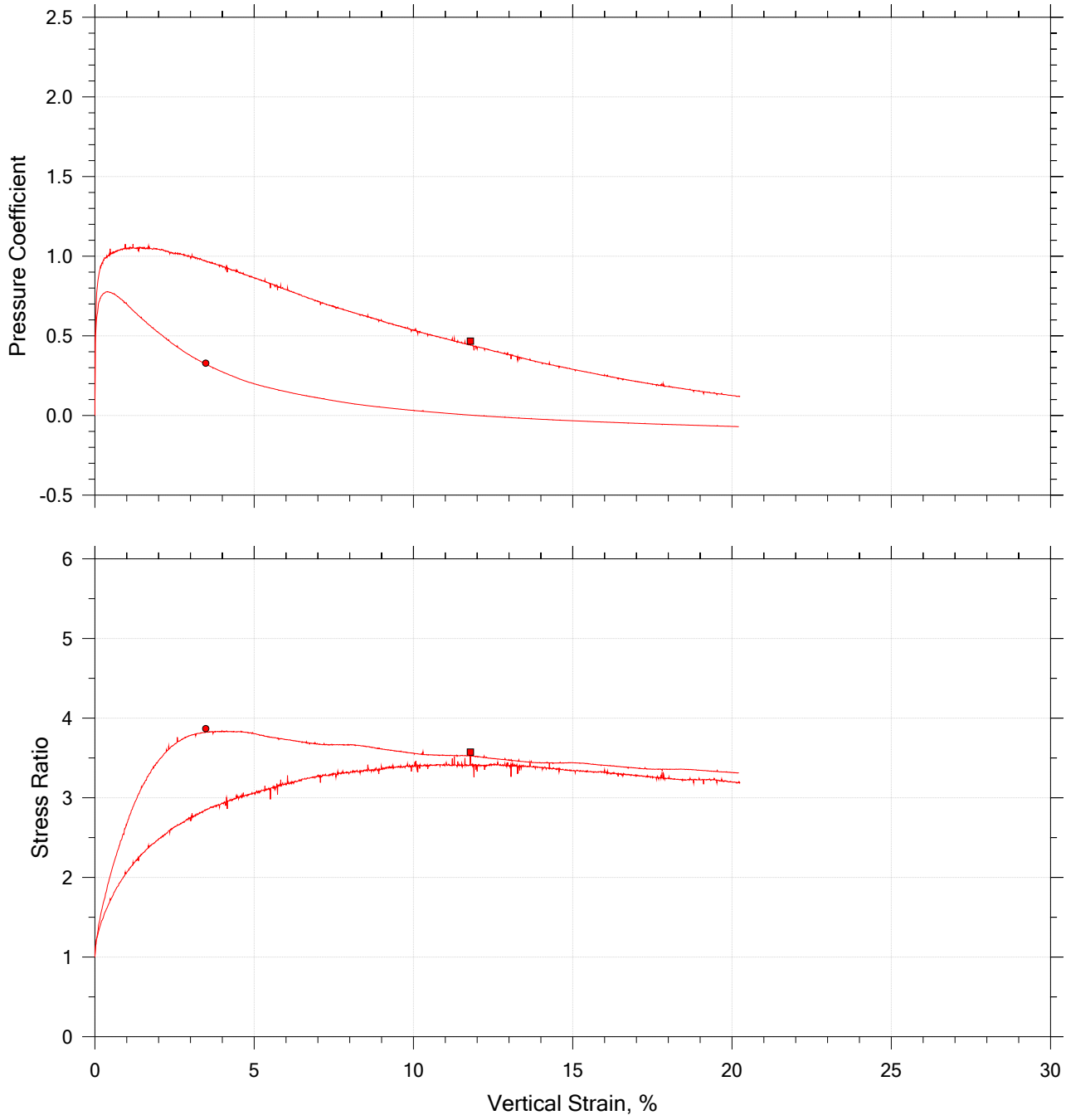


	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-1007	A	6' - 8.5'	WAP	5/31/2018	JFH/RS		18-1007_AP-4_test A.dat
●	18-1007	B	6' - 8.5'	RS	6/6/2018	JH		18-1007_AP-4_test B.dat

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-19	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1007	Test Date: 5/31/2018 - 6/7/2018	Depth: 6' - 8.5'
Test No.: AB	Sample Type: Undisturbed	Elevation: --
Description: SILT (ML/A-4(5)) with Sand LL: 34 PL: 27 PI: 7 %#200 Finer: 76.3		
Remarks:		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297



	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-1007	A	6' - 8.5'	WAP	5/31/2018	JFH/RS		18-1007_AP-4_test A.dat
●	18-1007	B	6' - 8.5'	RS	6/6/2018	JH		18-1007_AP-4_test B.dat

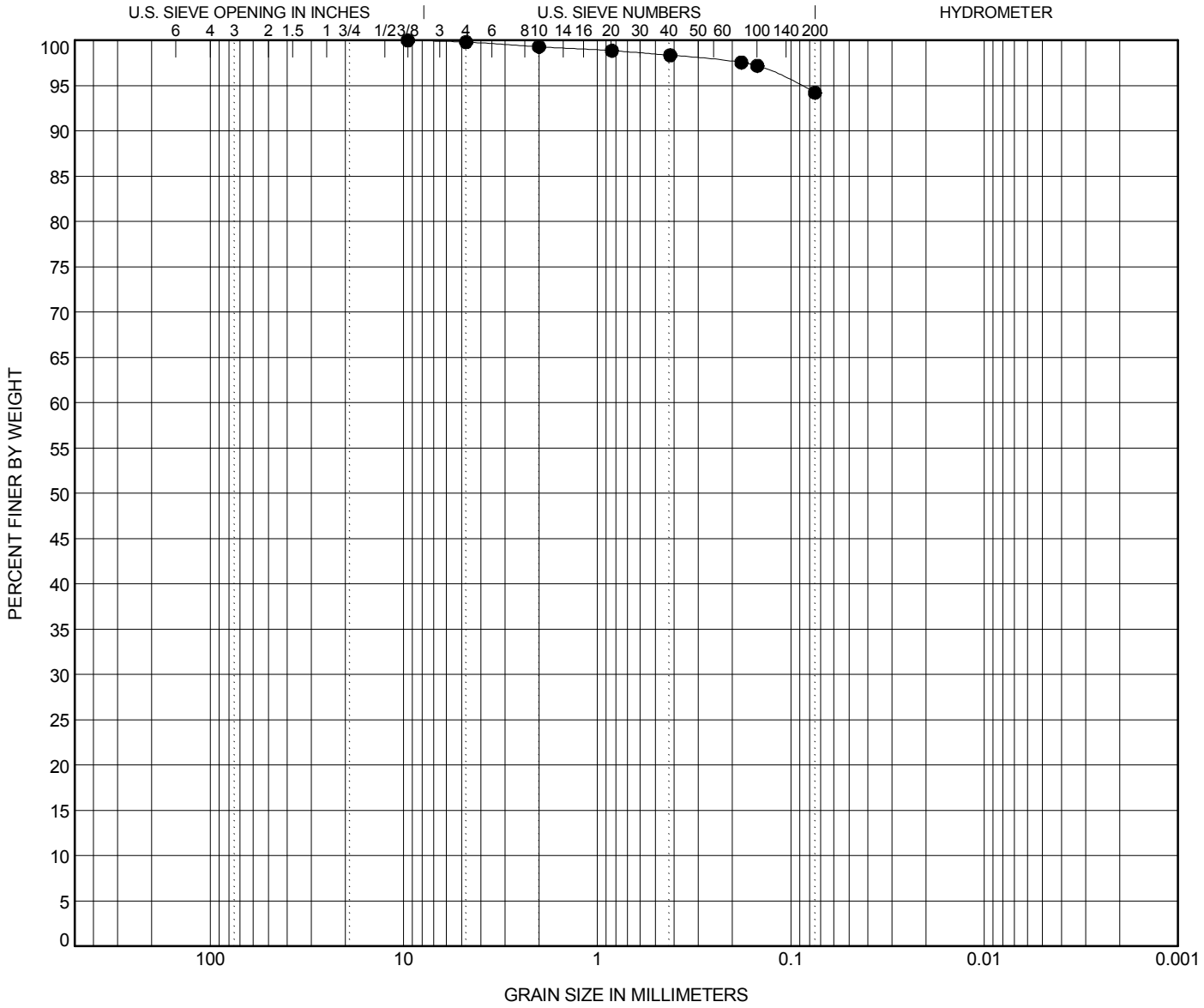
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-19	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1007	Test Date: 5/31/2018 - 6/7/2018	Depth: 6' - 8.5'
Test No.: AB	Sample Type: Undisturbed	Elevation: --
Description: SILT (ML/A-4(5)) with Sand LL: 34 PL: 27 PI: 7 %#200 Finer: 76.3		
Remarks:		

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**AP-20**	**40.5**	**Elastic SILT (MH) A-7-5(20)**	**62**	**43**	**19**		

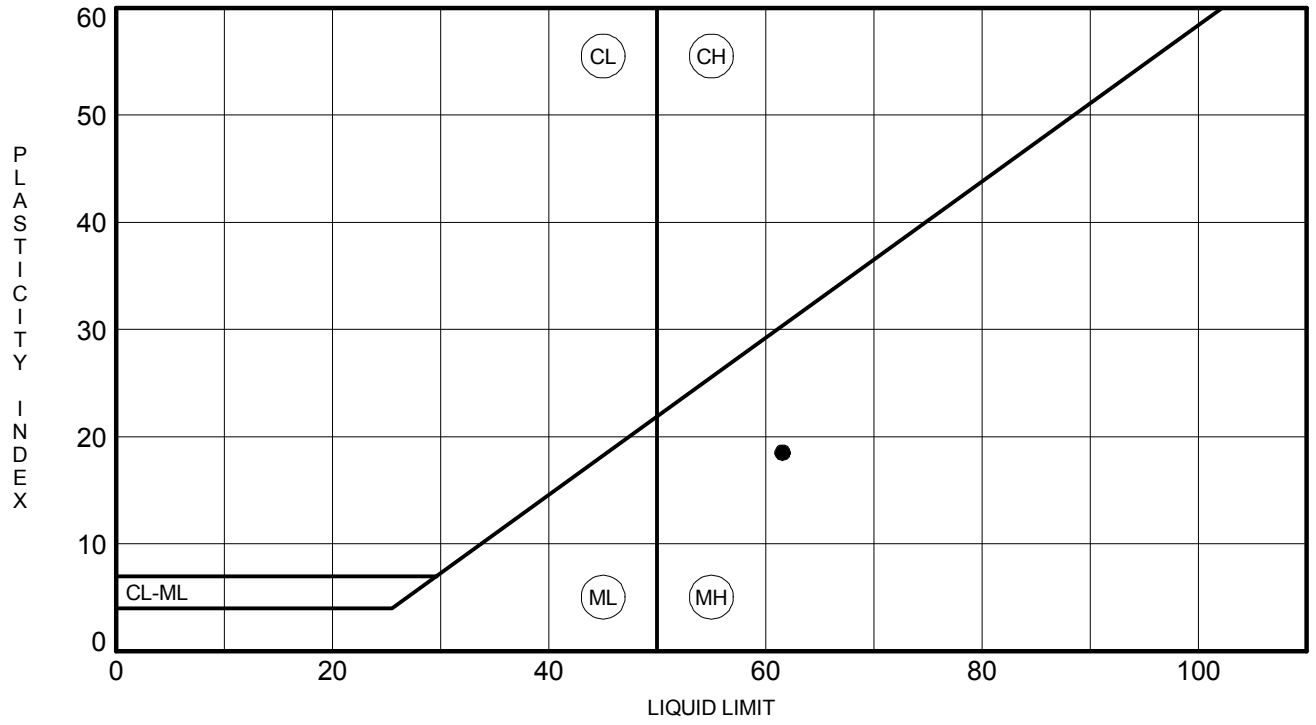
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**AP-20**	**40.5**	**9.52**	**0.089**			**0.2**	**5.6**	**94.2**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 8/2/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

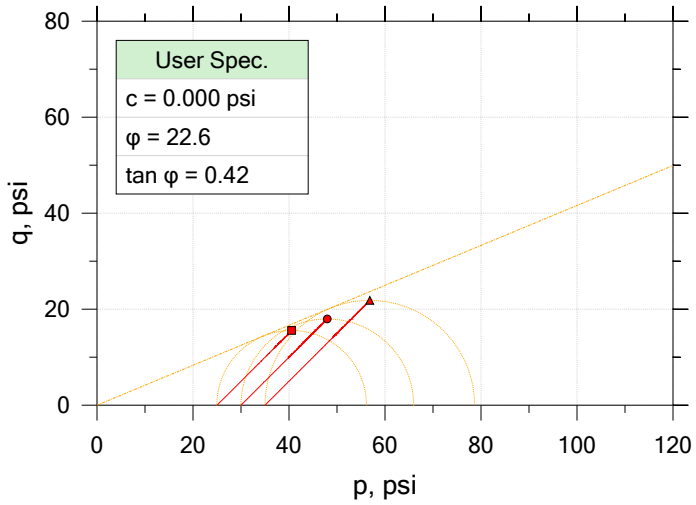
PROJECT COUNTY Richland/Lexington

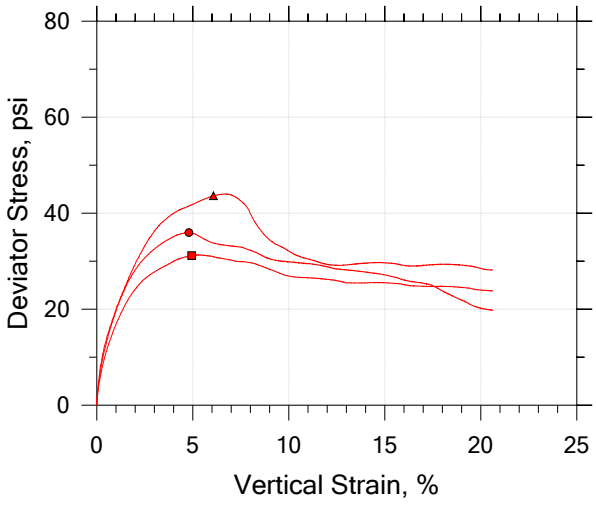


	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**AP-20**	**40.5**	**62**	**43**	**19**	**94**	**Elastic SILT (MH) A-7-5(20)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 8/2/18

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297





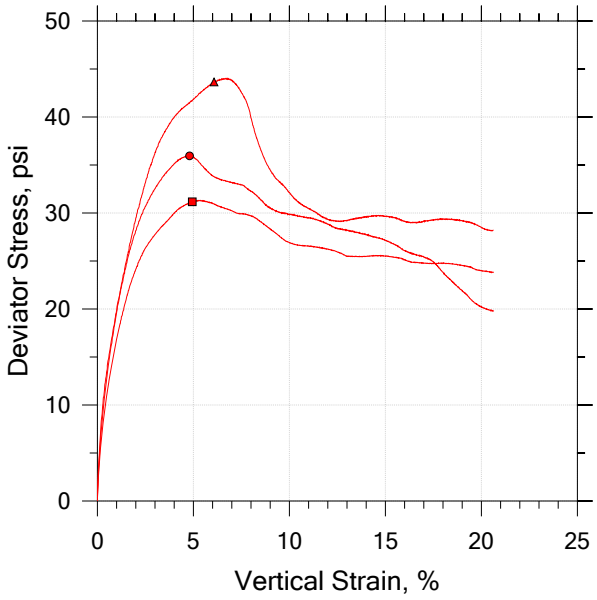
Symbol		■	●	▲	
Sample ID		18-1011	18-1011	18-1011	
Depth, ft		6' - 8.5'	6' - 8.5'	6' - 8.5'	
Test Number		A	B	C	
Initial	Height, in	5.854	5.680	4.962	
	Diameter, in	2.857	2.859	2.860	
	Moisture Content (from Cuttings), %	46.5	45.9	45.9	
	Dry Density, pcf	74.0	77.4	77.8	
	Saturation (Wet Method), %	98.8	105.9	107.0	
	Void Ratio	1.26	1.16	1.15	
Final	Moisture Content, %	40.8	36.3	35.7	
	Dry Density, pcf	79.9	84.8	85.5	
	Cross-Sectional Area (Method A), in²	6.121	6.044	6.027	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	1.09	0.973	0.957	
	Back Pressure, %	70.99	47.00	67.99	
Vertical Effective Consolidation Stress, psi		24.84	29.83	34.82	
Horizontal Effective Consolidation Stress, psi		25.01	30.00	35.00	
Vertical Strain after Consolidation, %		2.748	2.776	3.047	
Volumetric Strain after Consolidation, %		6.564	7.849	9.114	
Time to 50% Consolidation, min		0.0000	0.0000	0.0000	
Shear Strength, psi		15.58	17.98	21.83	
Strain at Failure, %		4.94	4.80	6.07	
Strain Rate, %/min		0.07500	0.07500	0.07500	
Deviator Stress at Failure, psi		31.16	35.96	43.65	
Effective Minor Principal Stress at Failure, psi		10.35	13.42	17.45	
Effective Major Principal Stress at Failure, psi		41.51	49.38	61.10	
B-Value		0.95	0.96	0.95	

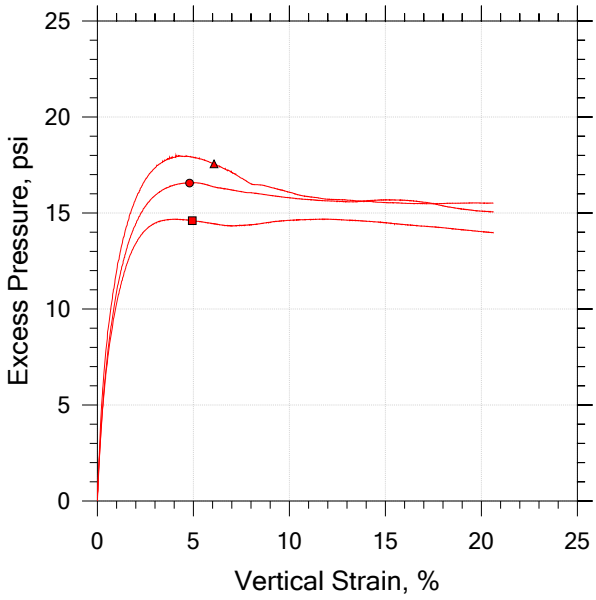
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

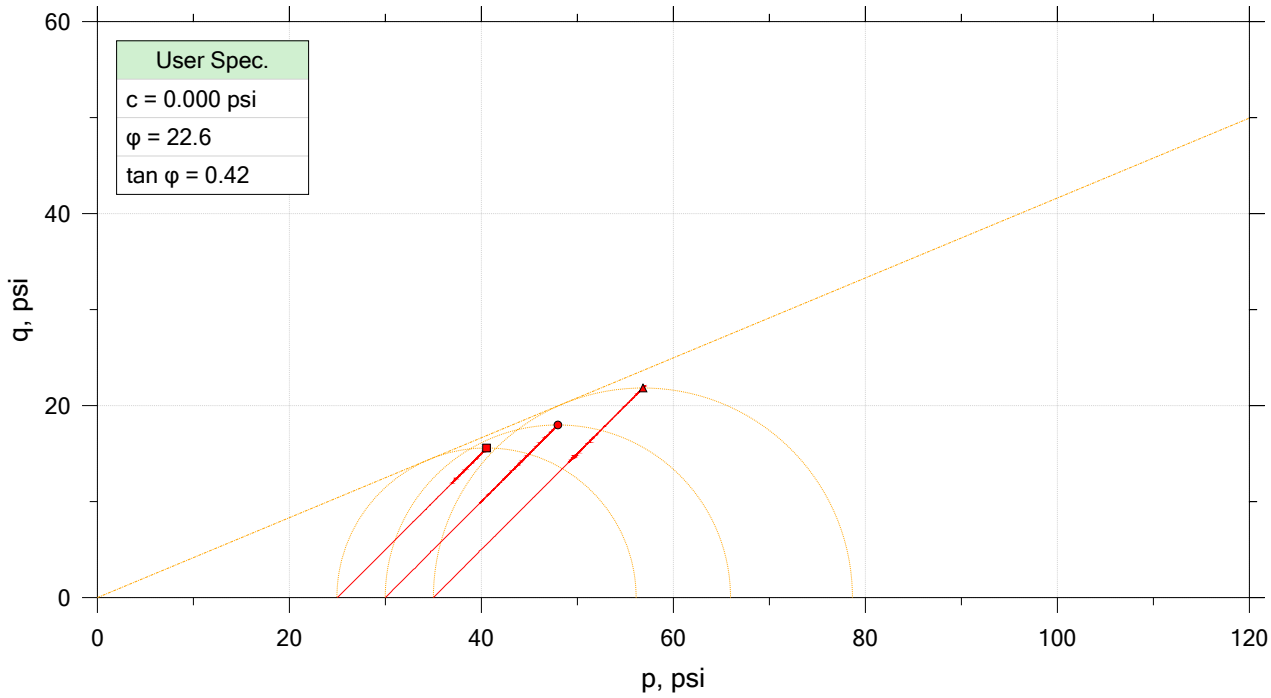
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-20	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1011	Test Date: 7/17/2018 - 7/19/2018	Depth: 6' - 8.5'
Test No.: ABC	Sample Type: Undisturbed	Elevation: --
Description: Elastic SILT (MH/A-7-5(20)) LL: 62 PL: 43 PI: 19 %#200 Finer: 94.2		
Remarks:		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297





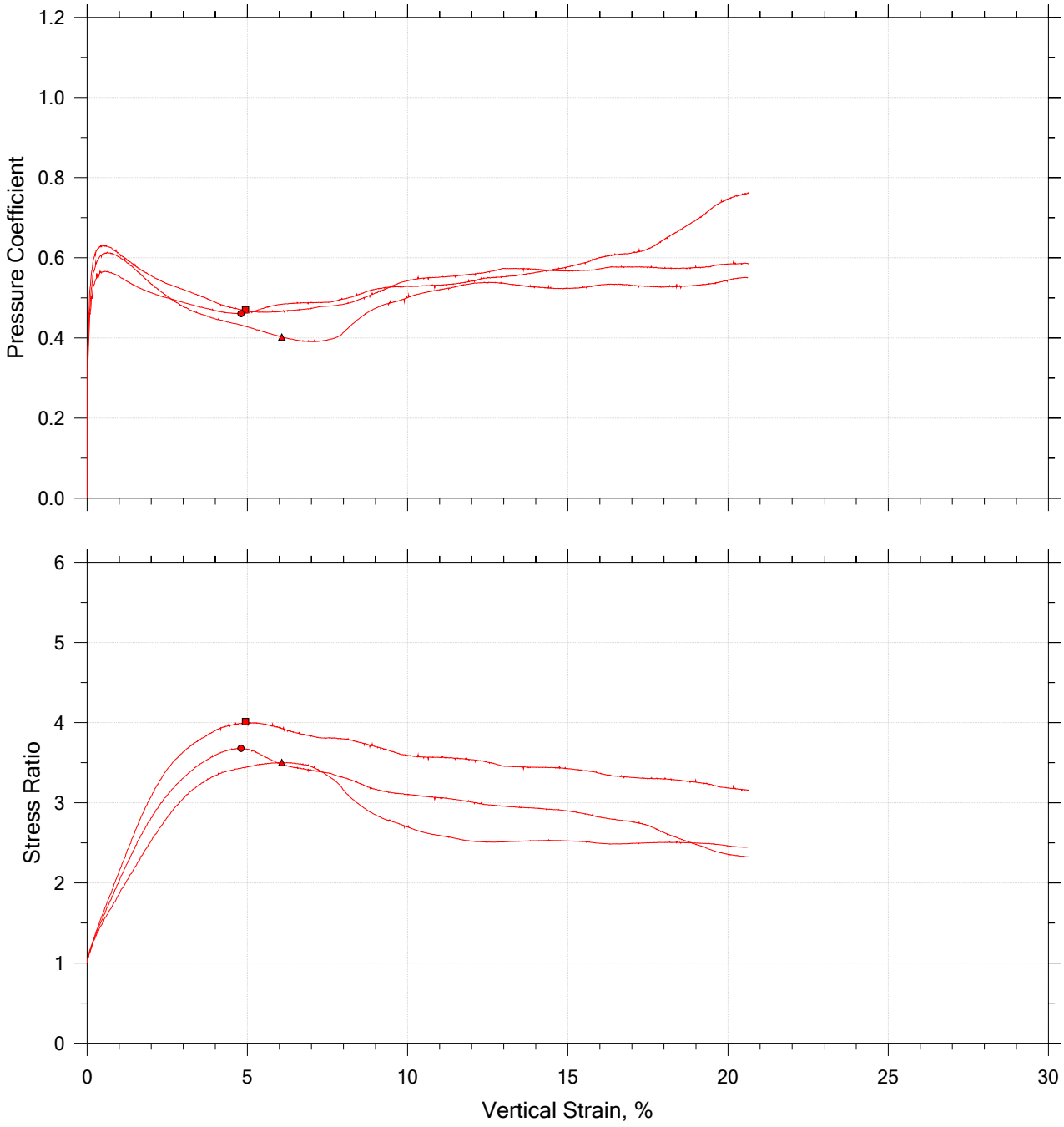


	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-1011	A	6' - 8.5'	WAP	7/17/2018	JFH/RS		18-1011_AP-24_test A.dat
●	18-1011	B	6' - 8.5'	WAP	7/18/2018	JFH/RS		18-1011_AP-24_test B.dat
▲	18-1011	C	6' - 8.5'	WAP	7/19/2018	JFH/RS		18-1011_AP-24_test C.dat

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-20	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1011	Test Date: 7/17/2018 - 7/19/2018	Depth: 6' - 8.5'
Test No.: ABC	Sample Type: Undisturbed	Elevation: --
Description: Elastic SILT (MH/A-7-5(20)) LL: 62 PL: 43 PI: 19 %#200 Finer: 94.2		
Remarks:		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297

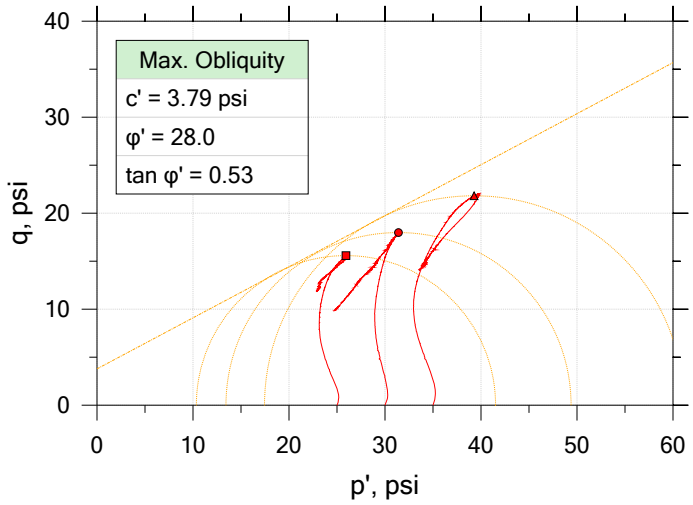


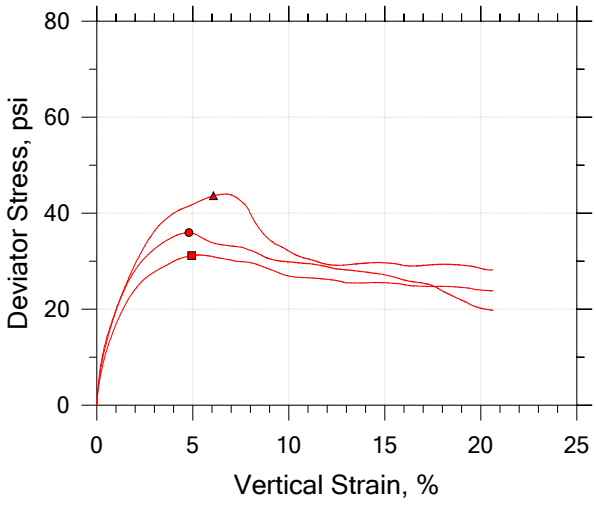
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-1011	A	6' - 8.5'	WAP	7/17/2018	JFH/RS		18-1011_AP-24_test A.dat
●	18-1011	B	6' - 8.5'	WAP	7/18/2018	JFH/RS		18-1011_AP-24_test B.dat
▲	18-1011	C	6' - 8.5'	WAP	7/19/2018	JFH/RS		18-1011_AP-24_test C.dat

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-20	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1011	Test Date: 7/17/2018 - 7/19/2018	Depth: 6' - 8.5'
Test No.: ABC	Sample Type: Undisturbed	Elevation: --
Description: Elastic SILT (MH/A-7-5(20)) LL: 62 PL: 43 PI: 19 %#200 Finer: 94.2		
Remarks:		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297





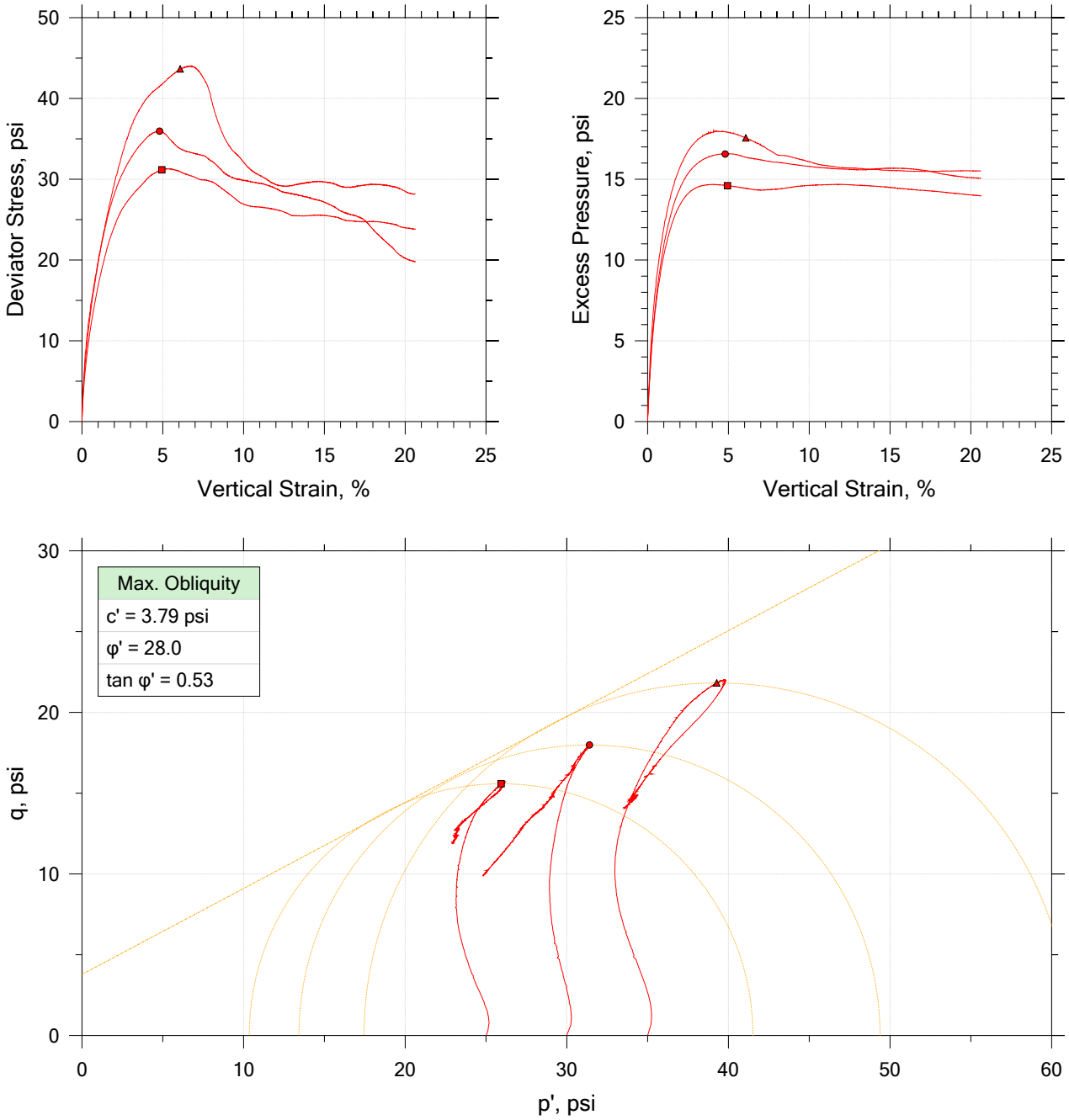
		■	●	▲	
Symbol					
Sample ID		18-1011	18-1011	18-1011	
Depth, ft		6' - 8.5'	6' - 8.5'	6' - 8.5'	
Test Number		A	B	C	
Initial	Height, in	5.854	5.680	4.962	
	Diameter, in	2.857	2.859	2.860	
	Moisture Content (from Cuttings), %	46.5	45.9	45.9	
	Dry Density, pcf	74.0	77.4	77.8	
	Saturation (Wet Method), %	98.8	105.9	107.0	
	Void Ratio	1.26	1.16	1.15	
Final	Moisture Content, %	40.8	36.3	35.7	
	Dry Density, pcf	79.9	84.8	85.5	
	Cross-Sectional Area (Method A), in²	6.121	6.044	6.027	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	1.09	0.973	0.957	
	Back Pressure, %	70.99	47.00	67.99	
Vertical Effective Consolidation Stress, psi		24.84	29.83	34.82	
Horizontal Effective Consolidation Stress, psi		25.01	30.00	35.00	
Vertical Strain after Consolidation, %		2.748	2.776	3.047	
Volumetric Strain after Consolidation, %		6.564	7.849	9.114	
Time to 50% Consolidation, min		0.0000	0.0000	0.0000	
Shear Strength, psi		15.58	17.98	21.83	
Strain at Failure, %		4.94	4.80	6.07	
Strain Rate, %/min		0.07500	0.07500	0.07500	
Deviator Stress at Failure, psi		31.16	35.96	43.65	
Effective Minor Principal Stress at Failure, psi		10.35	13.42	17.45	
Effective Major Principal Stress at Failure, psi		41.51	49.38	61.10	
B-Value		0.95	0.96	0.95	

Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-20	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1011	Test Date: 7/17/2018 - 7/19/2018	Depth: 6' - 8.5'
Test No.: ABC	Sample Type: Undisturbed	Elevation: --
Description: Elastic SILT (MH/A-7-5(20)) LL: 62 PL: 43 PI: 19 %#200 Finer: 94.2		
Remarks:		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297

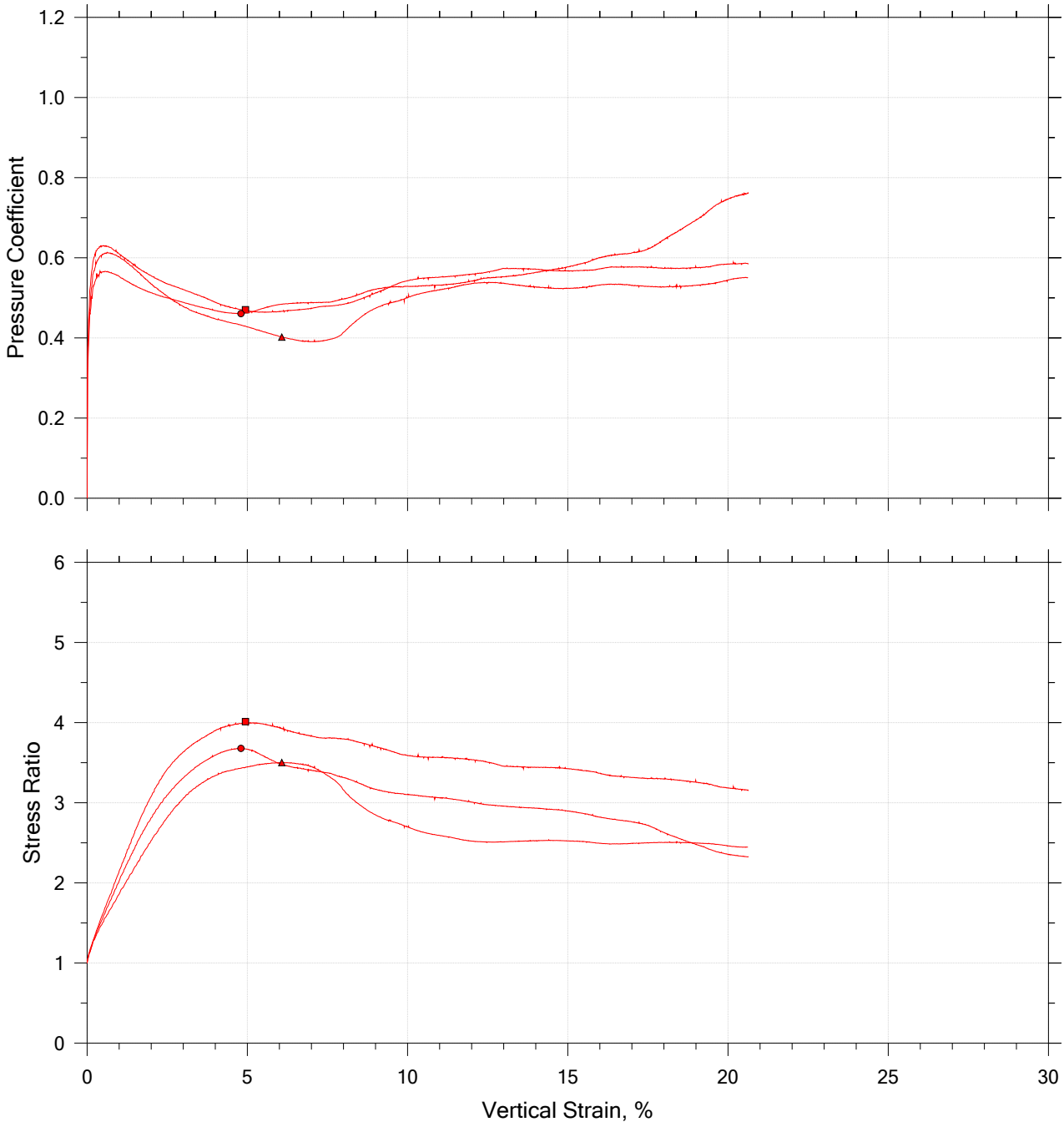


	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-1011	A	6' - 8.5'	WAP	7/17/2018	JFH/RS		18-1011_AP-24_test A.dat
●	18-1011	B	6' - 8.5'	WAP	7/18/2018	JFH/RS		18-1011_AP-24_test B.dat
▲	18-1011	C	6' - 8.5'	WAP	7/19/2018	JFH/RS		18-1011_AP-24_test C.dat

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-20	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1011	Test Date: 7/17/2018 - 7/19/2018	Depth: 6' - 8.5'
Test No.: ABC	Sample Type: Undisturbed	Elevation: --
Description: Elastic SILT (MH/A-7-5(20)) LL: 62 PL: 43 PI: 19 %#200 Finer: 94.2		
Remarks:		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297



	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-1011	A	6' - 8.5'	WAP	7/17/2018	JFH/RS		18-1011_AP-24_test A.dat
●	18-1011	B	6' - 8.5'	WAP	7/18/2018	JFH/RS		18-1011_AP-24_test B.dat
▲	18-1011	C	6' - 8.5'	WAP	7/19/2018	JFH/RS		18-1011_AP-24_test C.dat

F&ME CONSULTANTS

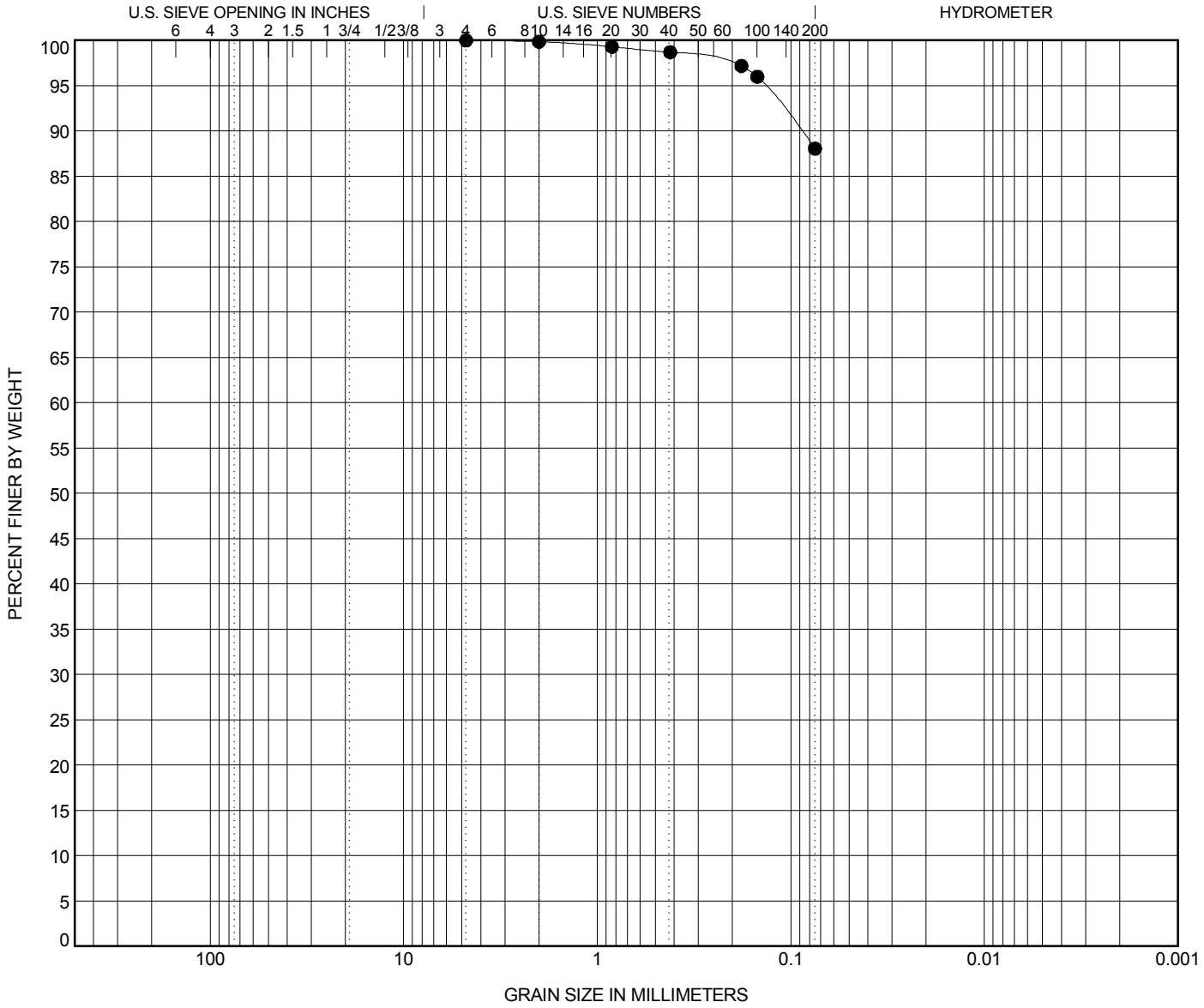
Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-20	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1011	Test Date: 7/17/2018 - 7/19/2018	Depth: 6' - 8.5'
Test No.: ABC	Sample Type: Undisturbed	Elevation: --
Description: Elastic SILT (MH/A-7-5(20)) LL: 62 PL: 43 PI: 19 %#200 Finer: 94.2		
Remarks:		

F&ME CONSULTANTS

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

PROJECT LOCATION - South Carolina



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

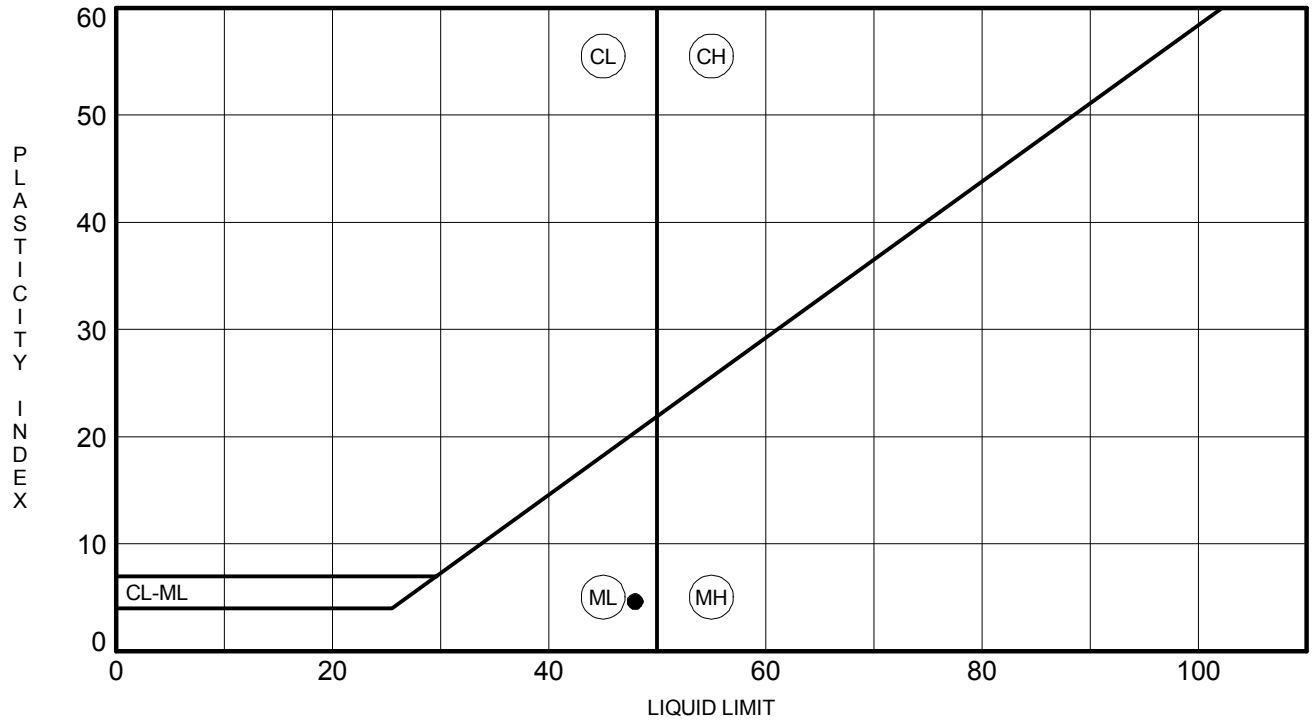
BOREHOLE	DEPTH	Classification	MC%	LL	PL	PI	Cc	Cu
● **AP-21**	**20.5**	**SILT (ML) A-5(9)**		**48**	**43**	**5**		

BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
● **AP-21**	**20.5**	**4.76**	**0.137**			**0.0**	**11.9**	**88.1**	

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** Carolina Crossroads I-20/26/126 Corridor Improvements

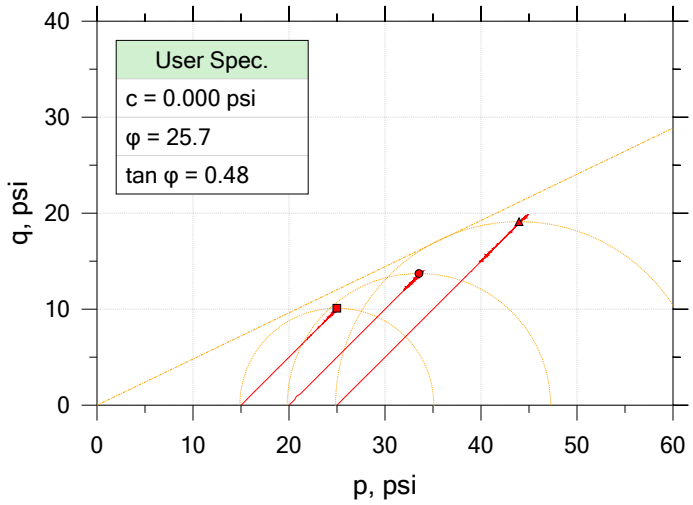
PROJECT COUNTY Richland/Lexington

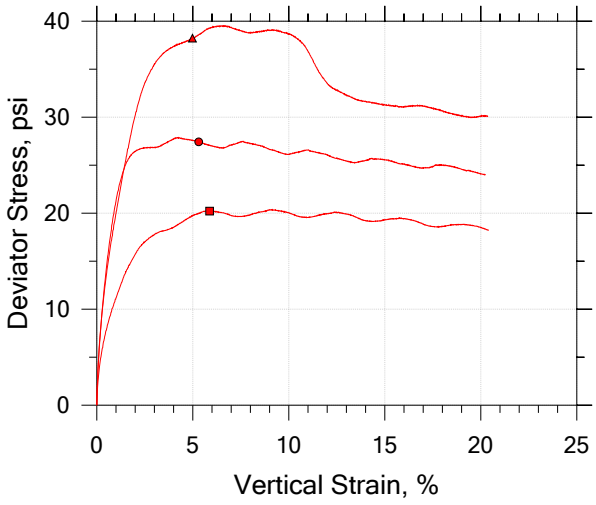


	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**AP-21**	**20.5**	**48**	**43**	**5**	**88**	**SILT (ML) A-5(9)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 8/2/18

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297





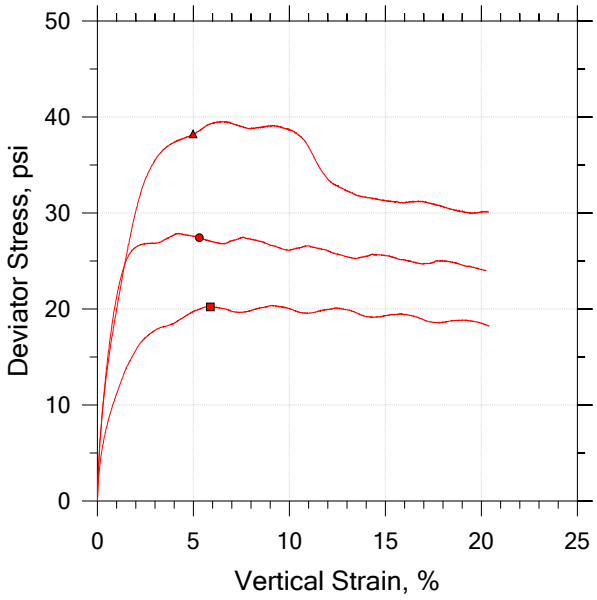
		■	●	▲	
Symbol					
Sample ID		18-1036	18-1036	18-1036	
Depth, ft		18' - 20.5'	18' - 20.5'	18' - 20.5'	
Test Number		A	B	C	
Initial	Height, in	6.033	5.958	6.044	
	Diameter, in	2.834	2.842	2.854	
	Moisture Content (from Cuttings), %	51.0	39.1	39.1	
	Dry Density, pcf	72.1	76.2	78.8	
	Saturation (Wet Method), %	103.6	87.7	93.3	
	Void Ratio	1.32	1.20	1.12	
Final	Moisture Content, %	43.6	40.6	37.2	
	Dry Density, pcf	77.2	80.1	83.8	
	Cross-Sectional Area (Method A), in²	6.018	6.108	6.123	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	1.17	1.09	0.996	
	Back Pressure, %	64.99	61.99	61.99	
Vertical Effective Consolidation Stress, psi		14.90	19.93	24.92	
Horizontal Effective Consolidation Stress, psi		15.00	20.00	25.01	
Vertical Strain after Consolidation, %		1.619	1.027	1.484	
Volumetric Strain after Consolidation, %		5.349	4.334	5.035	
Time to 50% Consolidation, min		0.0000	0.0000	0.0000	
Shear Strength, psi		10.11	13.72	19.12	
Strain at Failure, %		5.88	5.31	4.98	
Strain Rate, %/min		0.07500	0.07500	0.07500	
Deviator Stress at Failure, psi		20.21	27.43	38.24	
Effective Minor Principal Stress at Failure, psi		6.295	8.656	11.51	
Effective Major Principal Stress at Failure, psi		26.51	36.09	49.75	
B-Value		0.95	0.95	0.95	

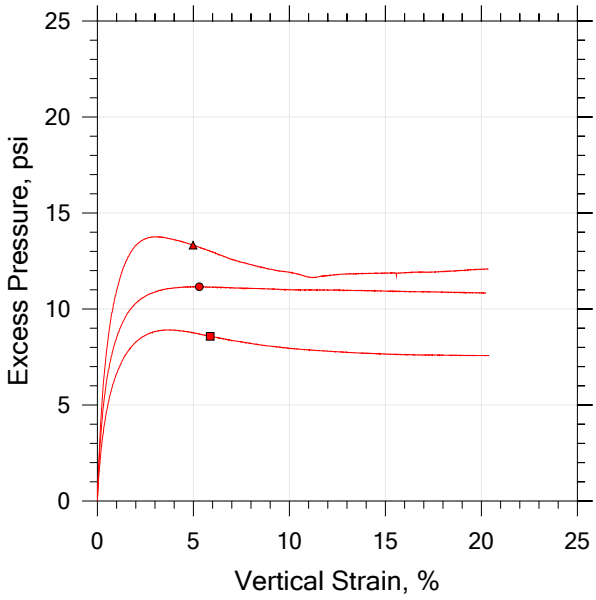
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

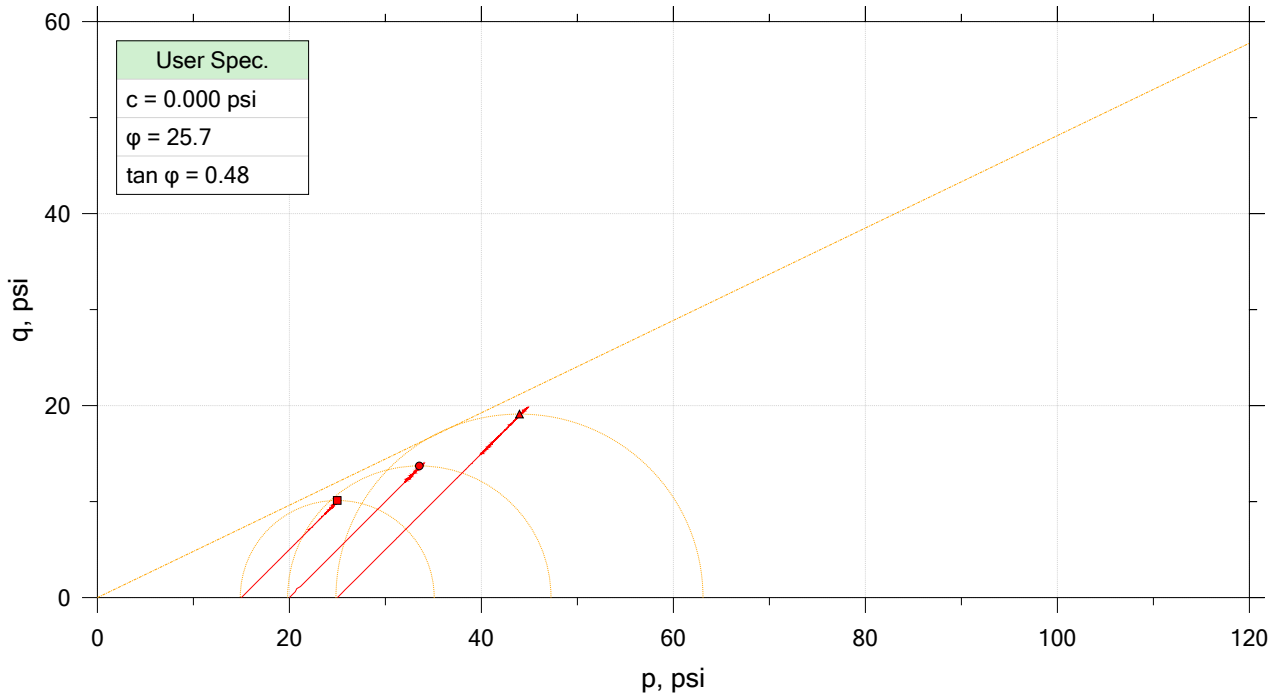
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-21	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1036	Test Date: 6/28/2018 - 7/1/2018	Depth: 18' - 20.5'
Test No.: ABC	Sample Type: Undisturbed	Elevation: --
Description: SILT (ML/A-5(9)) LL: 48 PL: 43 PI: 5 %#200 Finer: 88.1		
Remarks:		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297





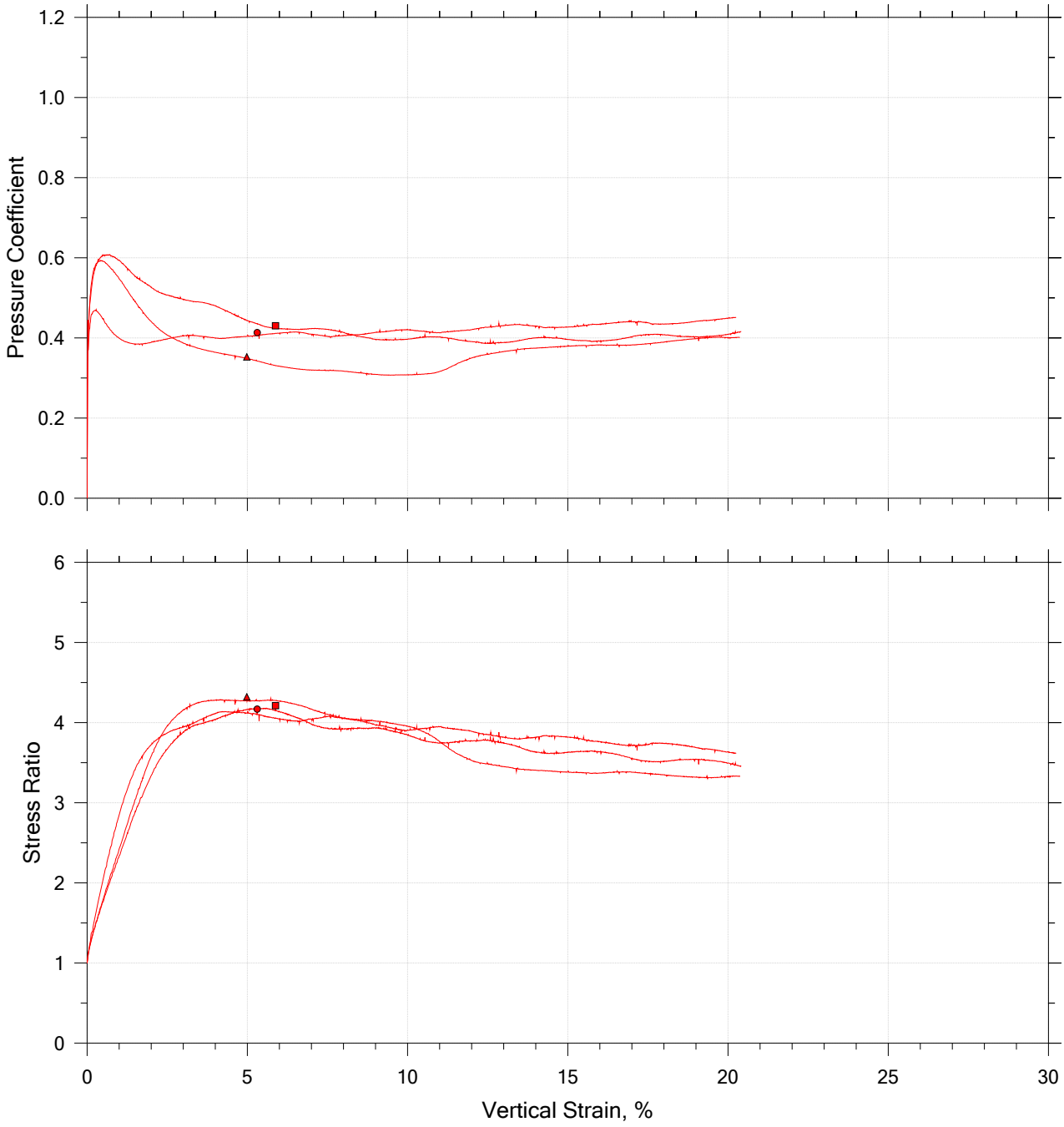


	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-1036	A	18' - 20.5'	WAP	6/28/2018	JFH/RS		18-1036_AP-21_test A.dat
●	18-1036	B	18' - 20.5'	WAP	6/29/2018	JFH/RS		18-1036_AP-21_test B.dat
▲	18-1036	C	18' - 20.5'	WAP	6/30/2018	JFH/RS		18-1036_AP-21_test C.dat

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-21	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1036	Test Date: 6/28/2018 - 7/1/2018	Depth: 18' - 20.5'
Test No.: ABC	Sample Type: Undisturbed	Elevation: --
Description: SILT (ML/A-5(9)) LL: 48 PL: 43 PI: 5 %#200 Finer: 88.1		
Remarks:		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297

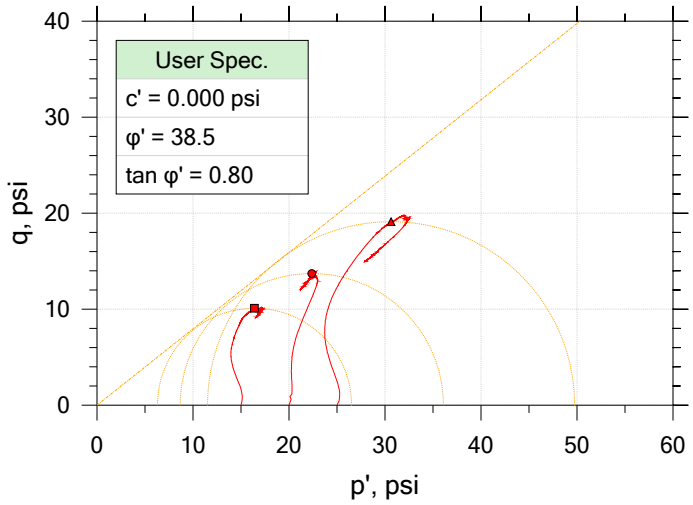


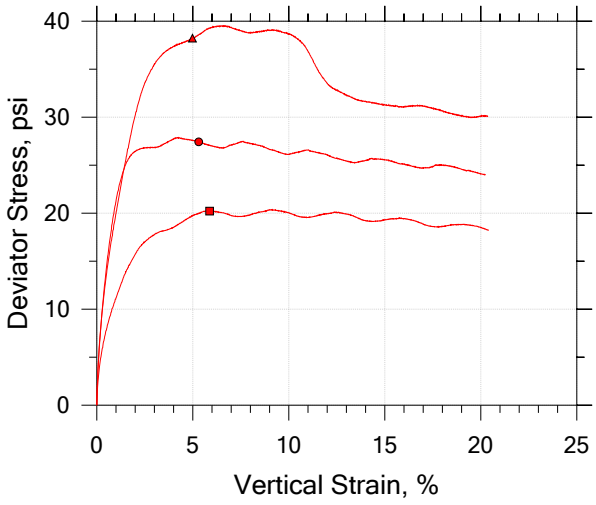
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-1036	A	18' - 20.5'	WAP	6/28/2018	JFH/RS		18-1036_AP-21_test A.dat
●	18-1036	B	18' - 20.5'	WAP	6/29/2018	JFH/RS		18-1036_AP-21_test B.dat
▲	18-1036	C	18' - 20.5'	WAP	6/30/2018	JFH/RS		18-1036_AP-21_test C.dat

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-21	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1036	Test Date: 6/28/2018 - 7/1/2018	Depth: 18' - 20.5'
Test No.: ABC	Sample Type: Undisturbed	Elevation: --
Description: SILT (ML/A-5(9)) LL: 48 PL: 43 PI: 5 %#200 Finer: 88.1		
Remarks:		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297





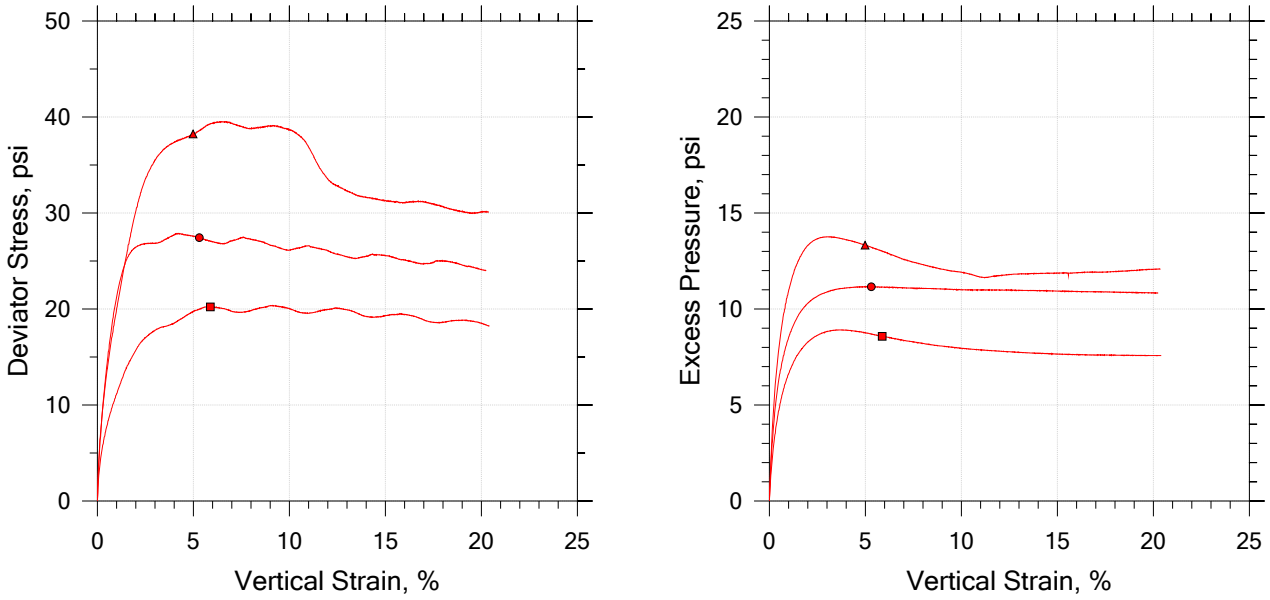
Symbol		■	●	▲	
Sample ID		18-1036	18-1036	18-1036	
Depth, ft		18' - 20.5'	18' - 20.5'	18' - 20.5'	
Test Number		A	B	C	
Initial	Height, in	6.033	5.958	6.044	
	Diameter, in	2.834	2.842	2.854	
	Moisture Content (from Cuttings), %	51.0	39.1	39.1	
	Dry Density, pcf	72.1	76.2	78.8	
	Saturation (Wet Method), %	103.6	87.7	93.3	
	Void Ratio	1.32	1.20	1.12	
Final	Moisture Content, %	43.6	40.6	37.2	
	Dry Density, pcf	77.2	80.1	83.8	
	Cross-Sectional Area (Method A), in²	6.018	6.108	6.123	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	1.17	1.09	0.996	
	Back Pressure, %	64.99	61.99	61.99	
Vertical Effective Consolidation Stress, psi		14.90	19.93	24.92	
Horizontal Effective Consolidation Stress, psi		15.00	20.00	25.01	
Vertical Strain after Consolidation, %		1.619	1.027	1.484	
Volumetric Strain after Consolidation, %		5.349	4.334	5.035	
Time to 50% Consolidation, min		0.0000	0.0000	0.0000	
Shear Strength, psi		10.11	13.72	19.12	
Strain at Failure, %		5.88	5.31	4.98	
Strain Rate, %/min		0.07500	0.07500	0.07500	
Deviator Stress at Failure, psi		20.21	27.43	38.24	
Effective Minor Principal Stress at Failure, psi		6.295	8.656	11.51	
Effective Major Principal Stress at Failure, psi		26.51	36.09	49.75	
B-Value		0.95	0.95	0.95	

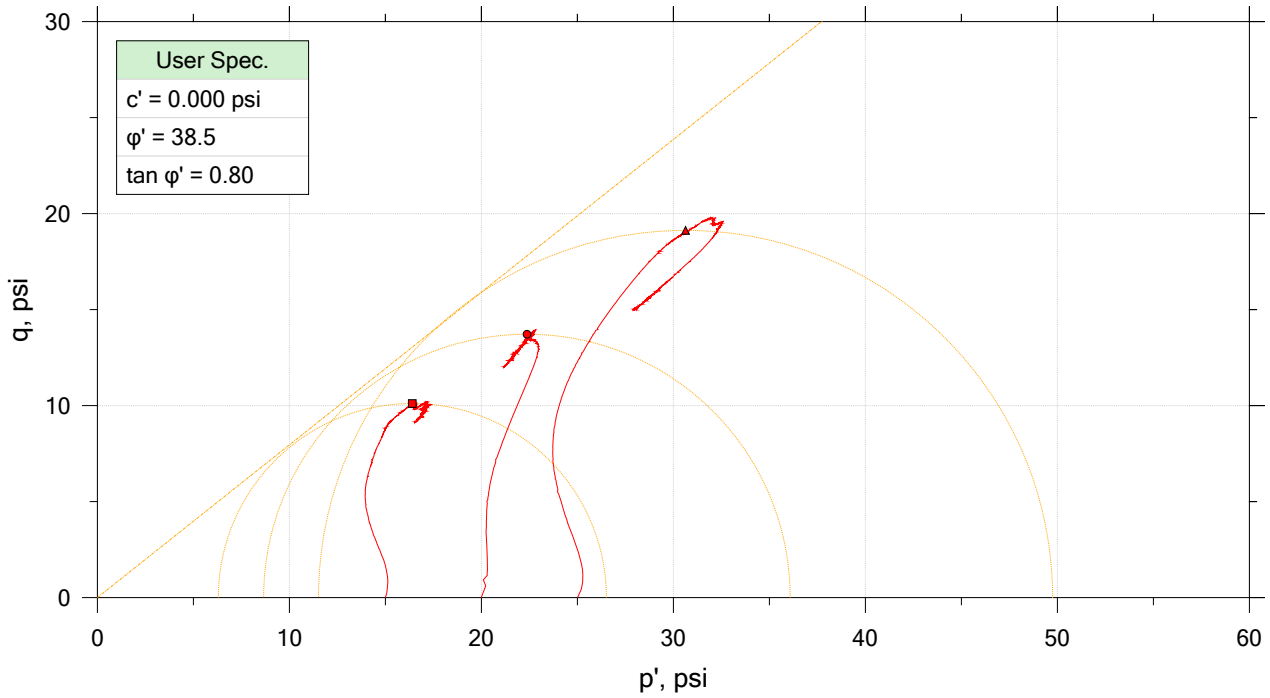
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-21	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1036	Test Date: 6/28/2018 - 7/1/2018	Depth: 18' - 20.5'
Test No.: ABC	Sample Type: Undisturbed	Elevation: --
Description: SILT (ML/A-5(9)) LL: 48 PL: 43 PI: 5 %#200 Finer: 88.1		
Remarks:		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297



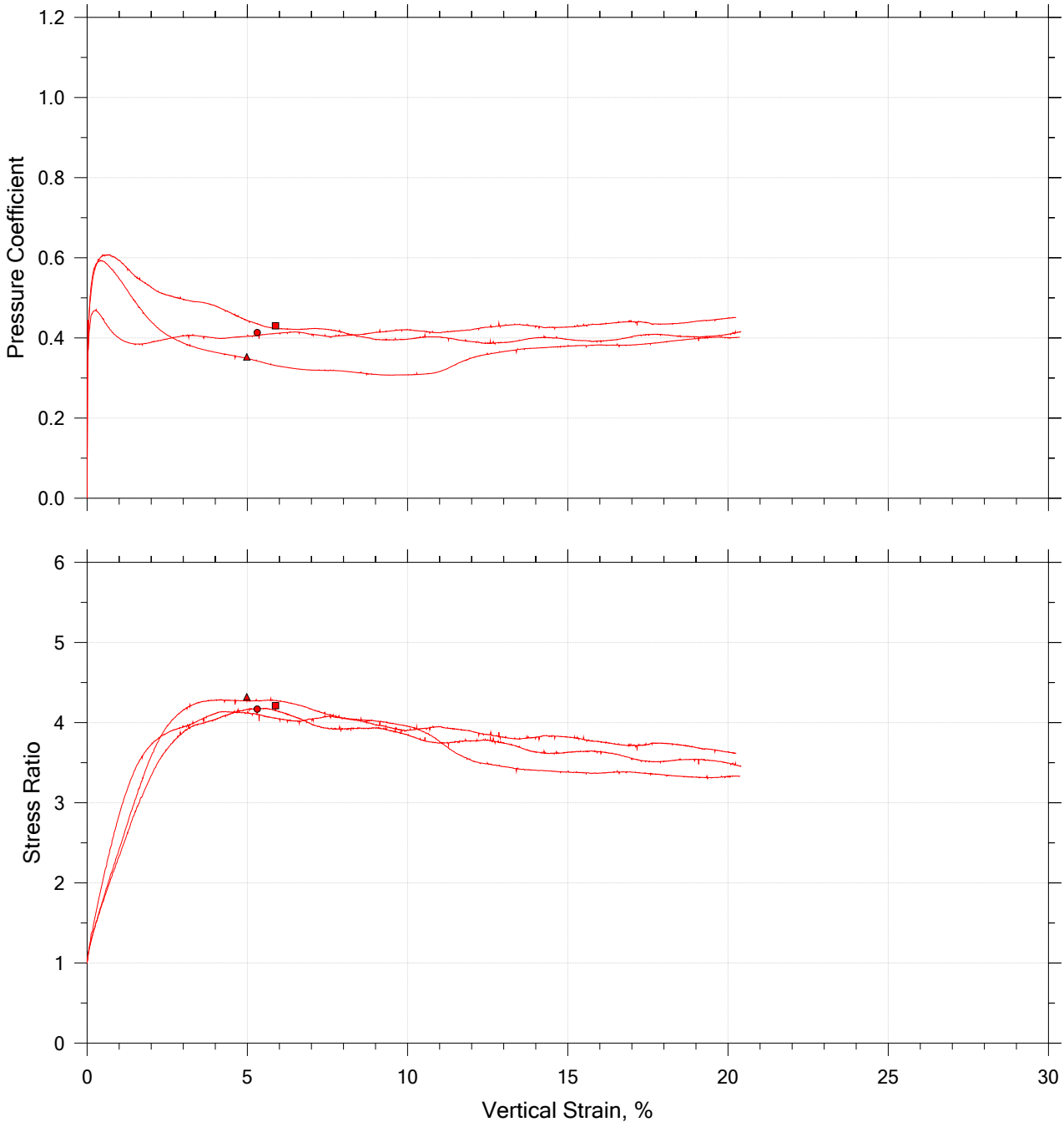


	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-1036	A	18' - 20.5'	WAP	6/28/2018	JFH/RS		18-1036_AP-21_test A.dat
●	18-1036	B	18' - 20.5'	WAP	6/29/2018	JFH/RS		18-1036_AP-21_test B.dat
▲	18-1036	C	18' - 20.5'	WAP	6/30/2018	JFH/RS		18-1036_AP-21_test C.dat

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-21	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1036	Test Date: 6/28/2018 - 7/1/2018	Depth: 18' - 20.5'
Test No.: ABC	Sample Type: Undisturbed	Elevation: --
Description: SILT (ML/A-5(9)) LL: 48 PL: 43 PI: 5 %#200 Finer: 88.1		
Remarks:		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297



	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-1036	A	18' - 20.5'	WAP	6/28/2018	JFH/RS		18-1036_AP-21_test A.dat
●	18-1036	B	18' - 20.5'	WAP	6/29/2018	JFH/RS		18-1036_AP-21_test B.dat
▲	18-1036	C	18' - 20.5'	WAP	6/30/2018	JFH/RS		18-1036_AP-21_test C.dat

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: AP-21	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-1036	Test Date: 6/28/2018 -7/1/2018	Depth: 18' - 20.5'
Test No.: ABC	Sample Type: Undisturbed	Elevation: --
Description: SILT (ML/A-5(9)) LL: 48 PL: 43 PI: 5 %#200 Finer: 88.1		
Remarks:		

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0394	**DATE SAMPLE RECEIVED:**	3/1/2018
DESCRIPTION OF SOIL:	Sandy SILT (ML) A-4(3)		
TESTED BY:	MB	**DATE OF TESTING:**	3/2/2018
		DATE OF WEIGHING:	3/5/2018

BORING NO.	BS-1				
SAMPLE NO.	18-0394C				
SAMPLE DEPTH	0.0-1.0'				
WATER CONTENT, W%	21.4				

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

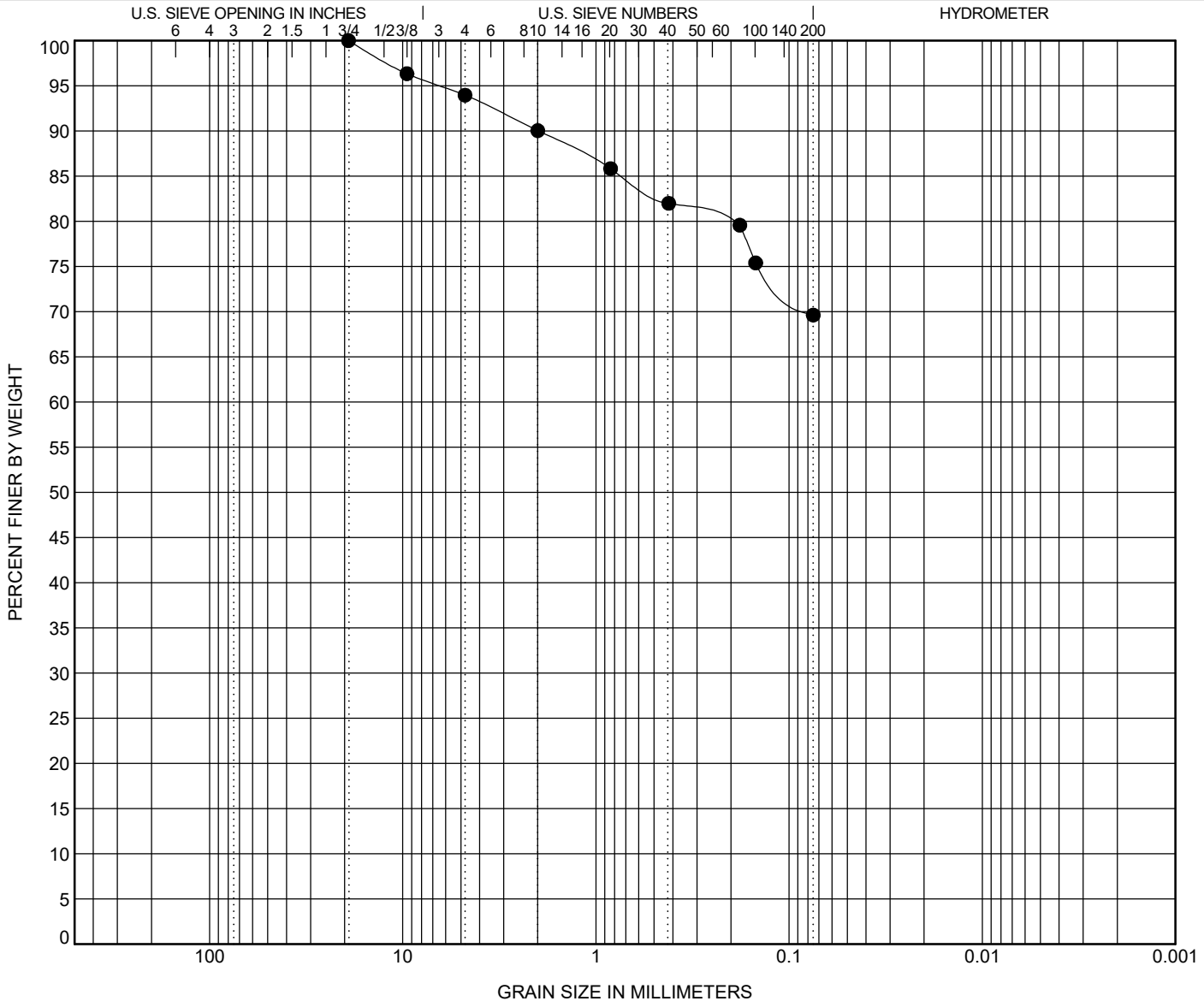
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

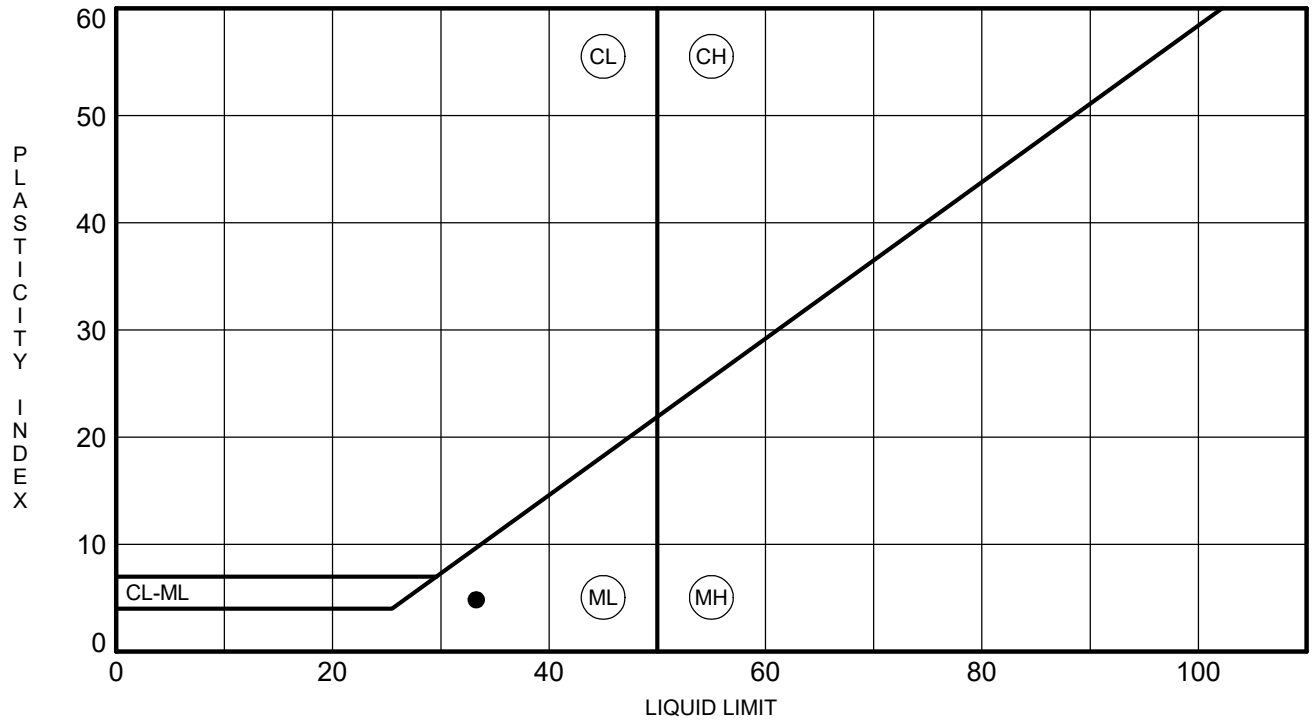
	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**BS-1**	**1.0**	**Sandy SILT (ML) A-4(3)**	**33**	**28**	**5**		

	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**BS-1**	**1.0**	**19.1**	**6.442**			**6.0**	**24.4**	**69.6**	

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



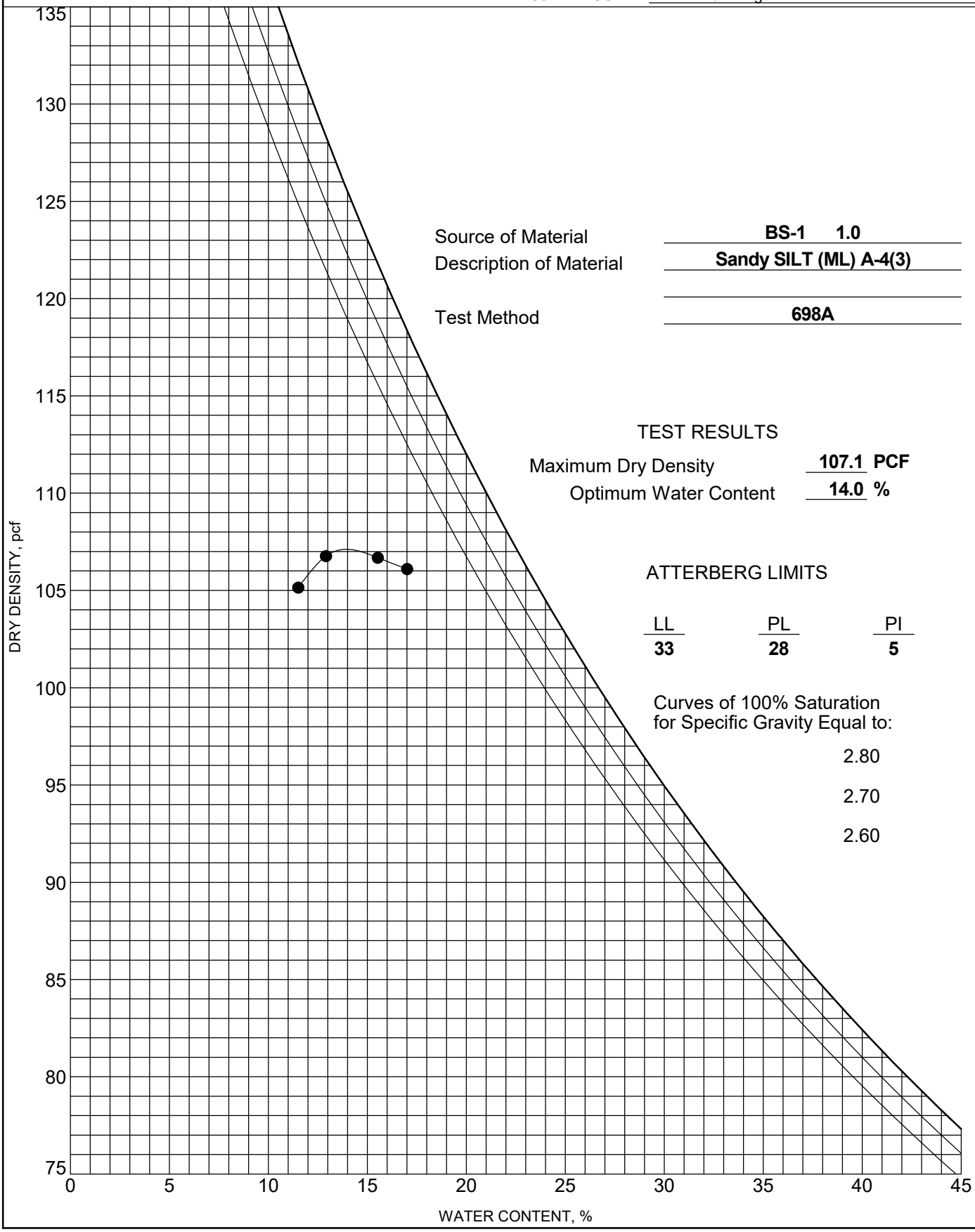
	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**BS-1**	**1.0**	**33**	**28**	**5**	**70**	**Sandy SILT (ML) A-4(3)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 3/9/18

MOISTURE-DENSITY RELATIONSHIP

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



Source of Material **BS-1 1.0**

Description of Material **Sandy SILT (ML) A-4(3)**

Test Method **698A**

TEST RESULTS

Maximum Dry Density **107.1** **PCF**

Optimum Water Content **14.0** **%**

ATTERBERG LIMITS

LL	PL	PI
33	**28**	**5**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

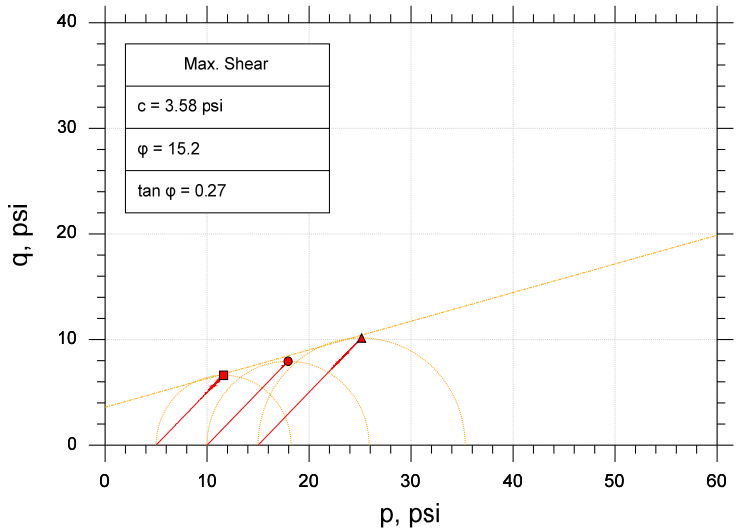
2.70

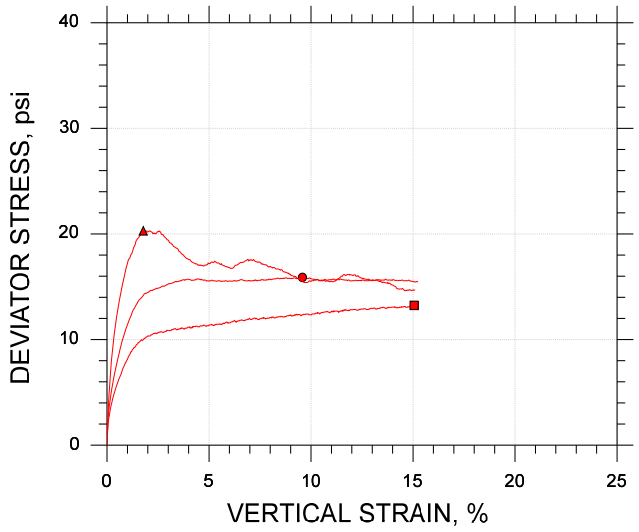
2.60

COMPACTION - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 3/9/18

Client: F&ME Consultants	
Project Name: I-20/26/126 Corridor Improvemen	
Project Location: ---	
Project Number: GTX-307802	
Tested By: jm	Checked By: mcm
Boring ID: ---	
Preparation: reconstituted	
Description: Moist, yellowish brown sandy silt	
Classification: ---	
Group Symbol: ---	
Liquid Limit: 33	Plastic Limit: 28
Plasticity Index: 5	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		■	●	▲	
Sample ID		BS-1	BS-1	BS-1	
Depth, ft		0-1 ft	0-1 ft	0-1 ft	
Test Number		CU-1-1	CU-1-2	CU-1-3	
Initial	Height, in	4.097	4.099	4.101	
	Diameter, in	2.020	2.020	2.020	
	Moisture Content (from Cuttings), %	16.3	16.4	16.2	
	Dry Density, pcf	102.	101.	102.	
	Saturation (Wet Method), %	66.8	66.9	66.4	
	Void Ratio	0.660	0.662	0.659	
Before Shear	Moisture Content, %	24.4	23.3	23.1	
	Dry Density, pcf	102.	103.	104.	
	Cross-sectional Area (Method A), in²	3.203	3.156	3.153	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.660	0.629	0.623	
	Back Pressure, psi	134.6	129.0	128.8	
Vertical Effective Consolidation Stress, psi		5.026	10.01	14.89	
Horizontal Effective Consolidation Stress, psi		4.996	9.998	15.00	
Vertical Strain after Consolidation, %		0.06230	0.4981	0.7249	
Volumetric Strain after Consolidation, %		0.3228	2.061	2.538	
Time to 50% Consolidation, min		32.49	29.16	12.25	
Shear Strength, psi		6.617	7.944	10.15	
Strain at Failure, %		15.1	9.58	1.78	
Strain Rate, %/min		0.01600	0.01600	0.01600	
Deviator Stress at Failure, psi		13.23	15.89	20.29	
Effective Minor Principal Stress at Failure, psi		5.659	6.736	8.075	
Effective Major Principal Stress at Failure, psi		18.89	22.62	28.37	
B-Value		0.96	0.96	0.97	

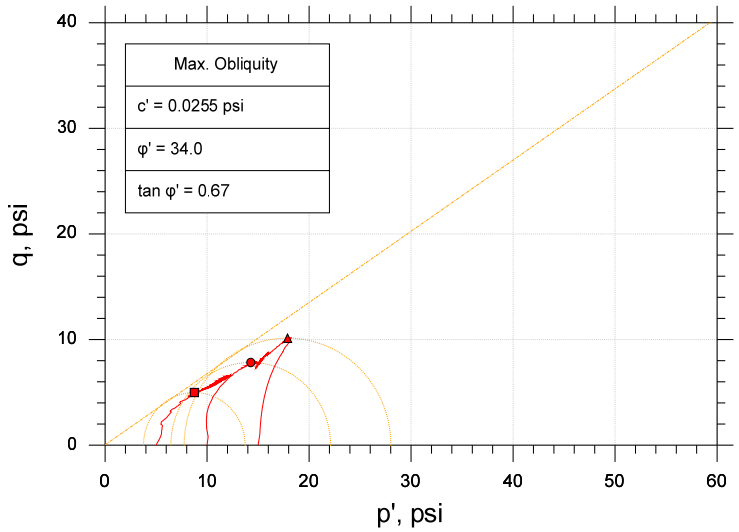
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Atterberg Limits determined by ASTM D4318.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

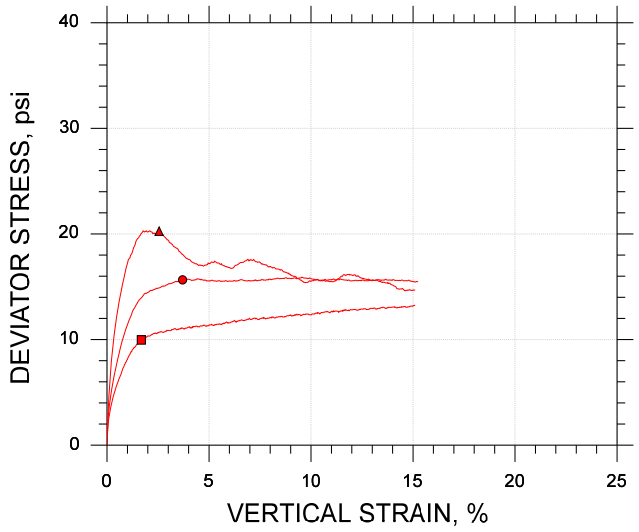
Remarks:

Target Compaction: 95% of (107.1 pcf) at Optimum Moisture Content (14.0%) + 2% - As Requested by Client

Client: F&ME Consultants	
Project Name: I-20/26/126 Corridor Improvemen	
Project Location: ---	
Project Number: GTX-307802	
Tested By: jm	Checked By: mcm
Boring ID: ---	
Preparation: reconstituted	
Description: Moist, yellowish brown sandy silt	
Classification: ---	
Group Symbol: ---	
Liquid Limit: 33	Plastic Limit: 28
Plasticity Index: 5	Estimated Specific Gravity: 2.7

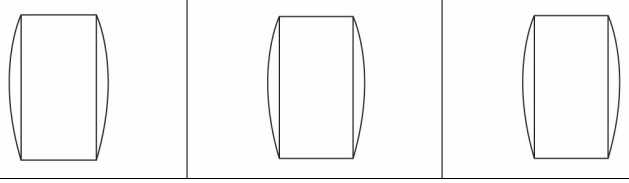
CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		■	●	▲	
Sample ID		BS-1	BS-1	BS-1	
Depth, ft		0-1 ft	0-1 ft	0-1 ft	
Test Number		CU-1-1	CU-1-2	CU-1-3	
Initial	Height, in	4.097	4.099	4.101	
	Diameter, in	2.020	2.020	2.020	
	Moisture Content (from Cuttings), %	16.3	16.4	16.2	
	Dry Density, pcf	102.	101.	102.	
	Saturation (Wet Method), %	66.8	66.9	66.4	
	Void Ratio	0.660	0.662	0.659	
Before Shear	Moisture Content, %	24.4	23.3	23.1	
	Dry Density, pcf	102.	103.	104.	
	Cross-sectional Area (Method A), in²	3.203	3.156	3.153	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.660	0.629	0.623	
	Back Pressure, psi	134.6	129.0	128.8	
Vertical Effective Consolidation Stress, psi		5.026	10.01	14.89	
Horizontal Effective Consolidation Stress, psi		4.996	9.998	15.00	
Vertical Strain after Consolidation, %		0.06230	0.4981	0.7249	
Volumetric Strain after Consolidation, %		0.3228	2.061	2.538	
Time to 50% Consolidation, min		32.49	29.16	12.25	
Shear Strength, psi		4.983	7.825	10.13	
Strain at Failure, %		1.68	3.70	2.55	
Strain Rate, %/min		0.01600	0.01600	0.01600	
Deviator Stress at Failure, psi		9.965	15.65	20.26	
Effective Minor Principal Stress at Failure, psi		3.766	6.454	7.761	
Effective Major Principal Stress at Failure, psi		13.73	22.10	28.02	
B-Value		0.96	0.96	0.97	

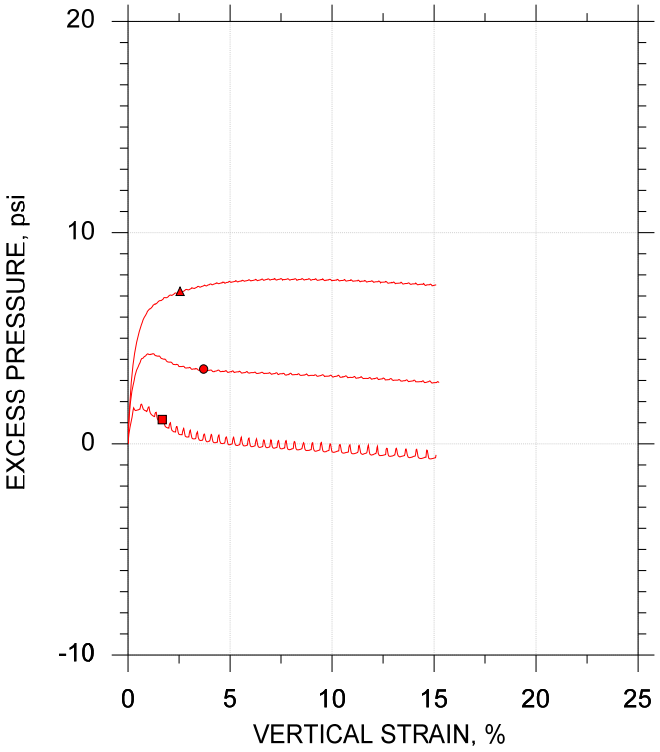
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Atterberg Limits determined by ASTM D4318.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

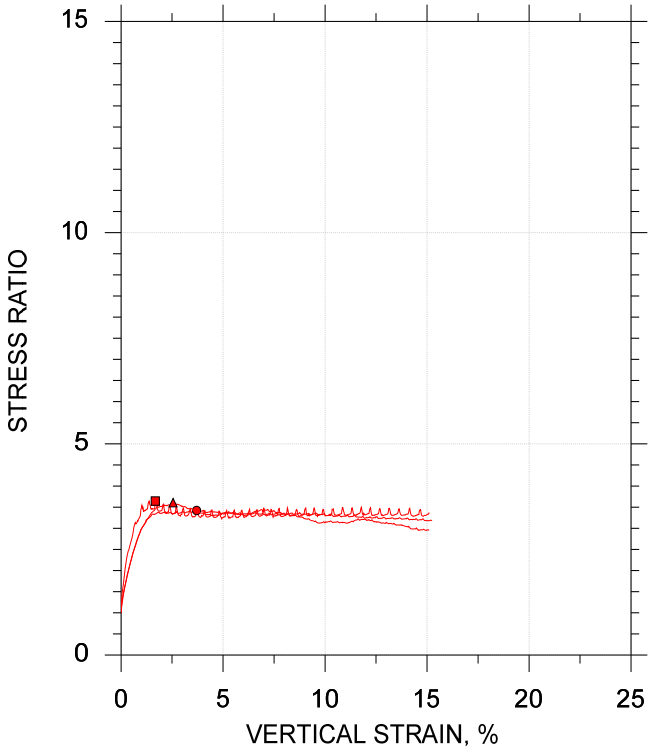


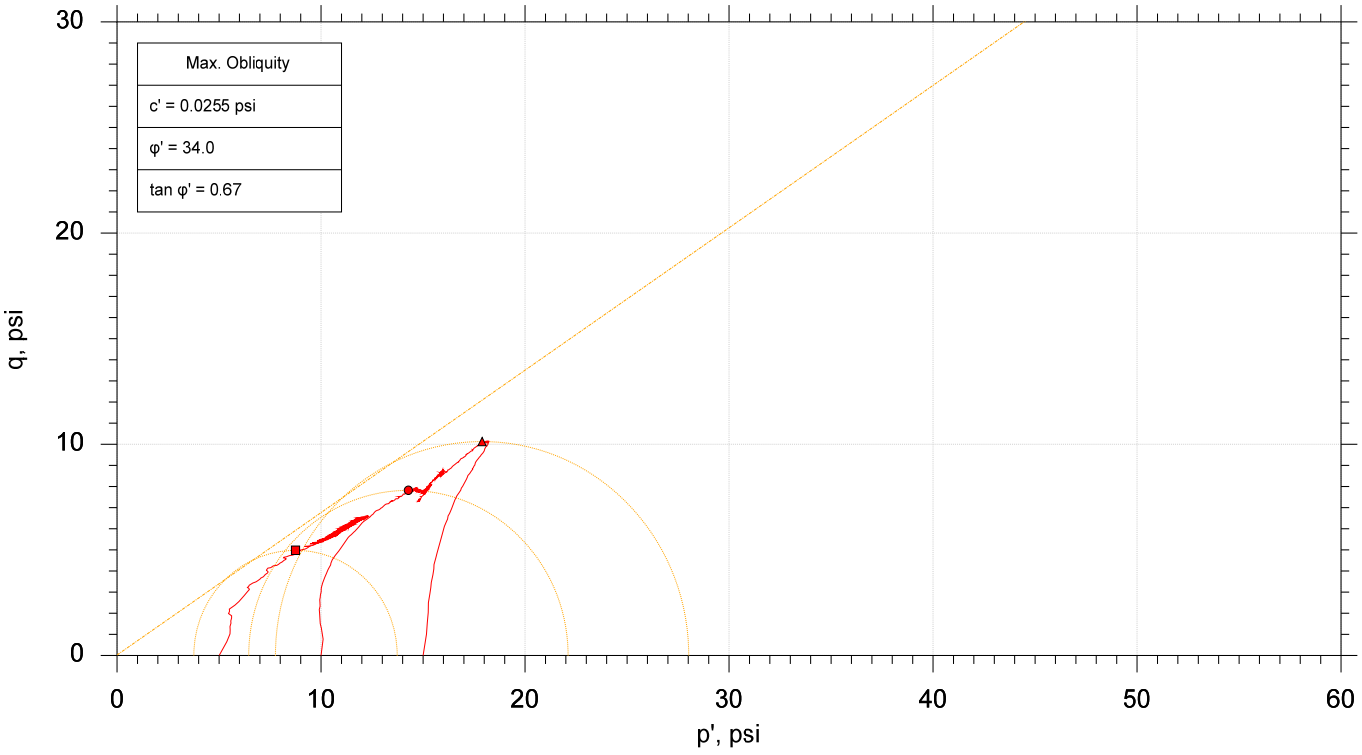
Remarks:

Target Compaction: 95% of (107.1 pcf) at Optimum Moisture Content (14.0%) + 2% - As Requested by Client

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	BS-1	CU-1-1	0-1 ft	jm	3/20/18	mcm	3/27/18	307802-CU-1-1Am.dat
●	BS-1	CU-1-2	0-1 ft	jm	3/14/18	mcm	3/27/18	307802-CU-1-2m.dat
▲	BS-1	CU-1-3	0-1 ft	jm	3/12/18	mcm	3/27/18	307802-CU-1-3m.dat

GeoTesting EXPRESS

Project: I-20/26/126 Corridor Improvemen	Location: ---	Project No.: GTX-307802
Boring No.: ---	Sample Type: reconstituted	
Description: Moist, yellowish brown sandy silt		
Remarks: Target Compaction: 95% of (107.1 pcf) at Optimum Moisture Content (14.0%) + 2% - As Requested by Client		

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0392	**DATE SAMPLE RECEIVED:**	3/1/2018
DESCRIPTION OF SOIL:	Sandy Lean CLAY (CL) A-6 (6)		
TESTED BY:	MB	**DATE OF TESTING:**	3/2/2018
		DATE OF WEIGHING:	3/5/2018

BORING NO.	BS-2				
SAMPLE NO.	18-0392C				
SAMPLE DEPTH	0.0-5.0'				
WATER CONTENT, W%	22.4				

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

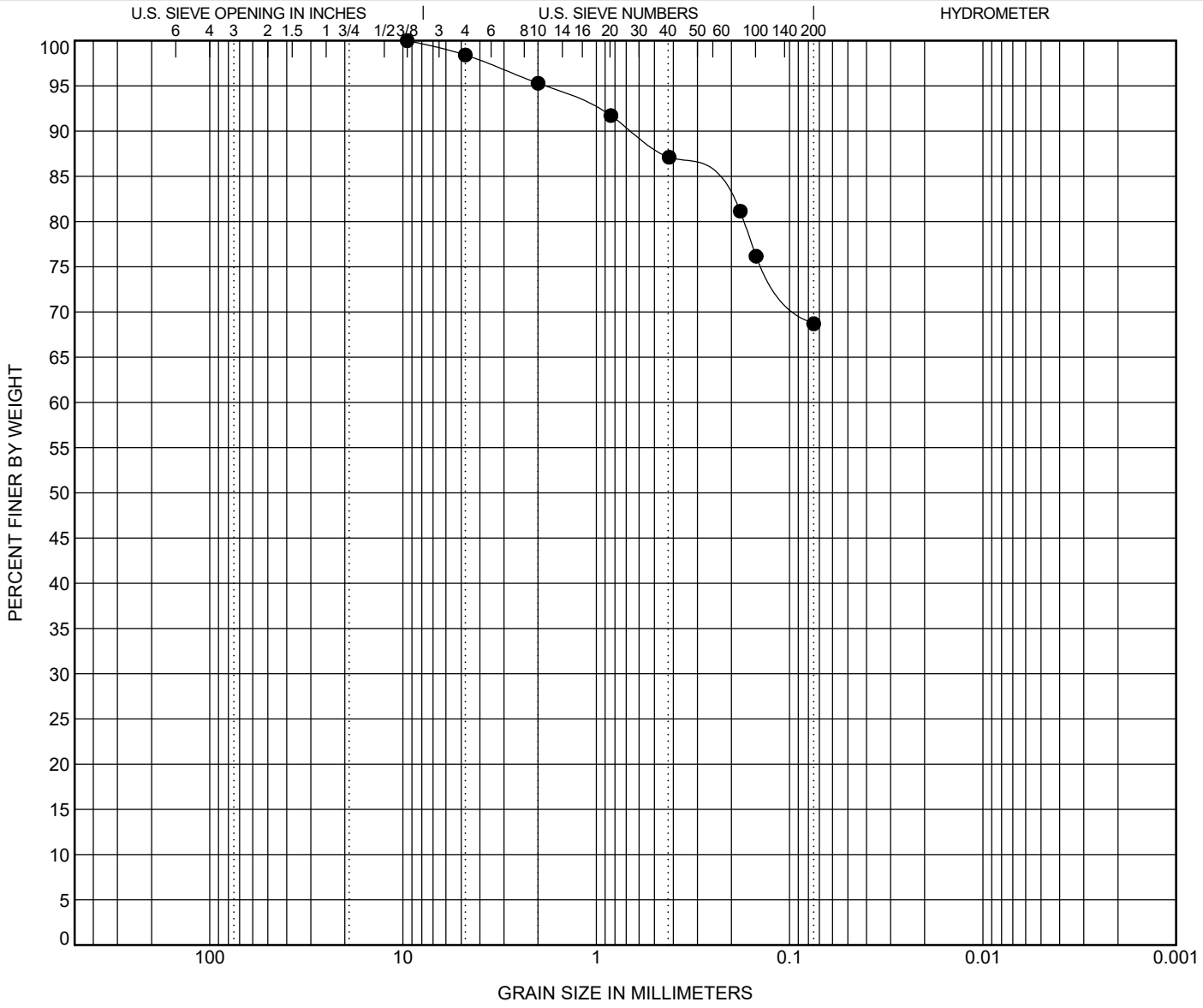
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**BS-2**	**5.0**	**Sandy Lean CLAY (CL) A-6(6)**	**35**	**24**	**11**		

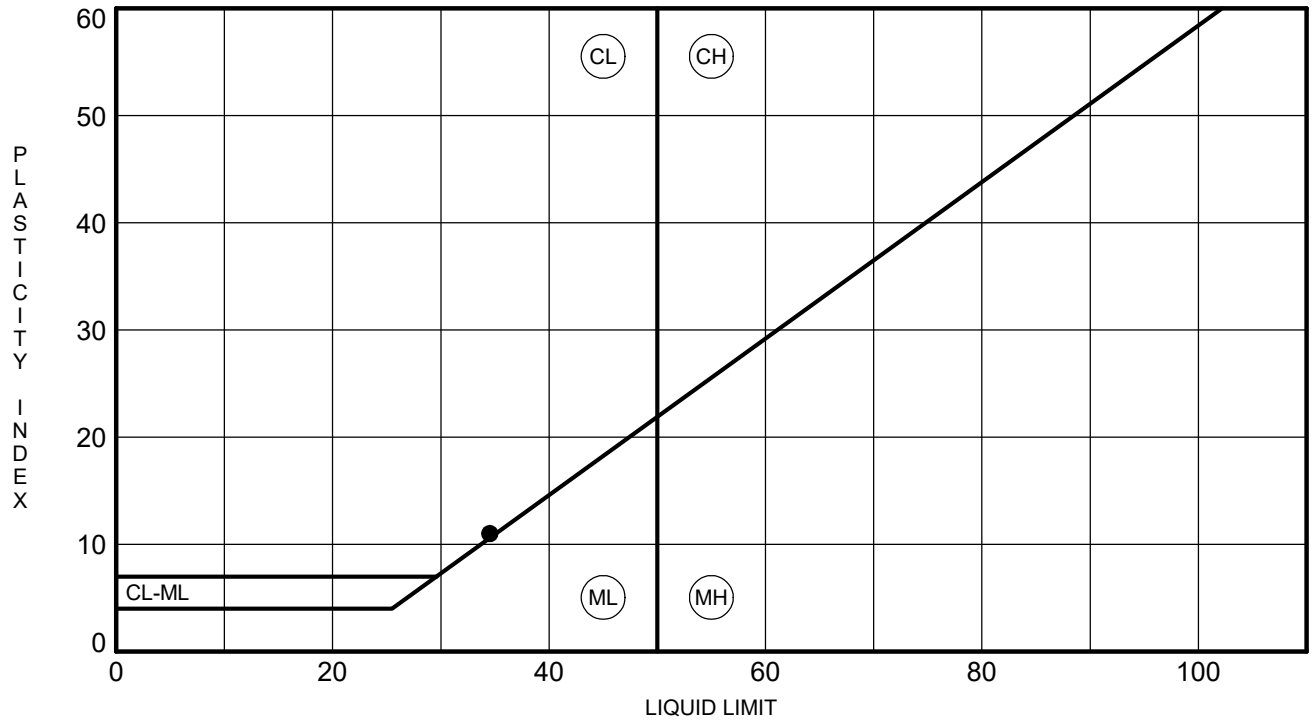
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**BS-2**	**5.0**	**9.52**	**1.866**			**1.6**	**29.7**	**68.7**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 3/9/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



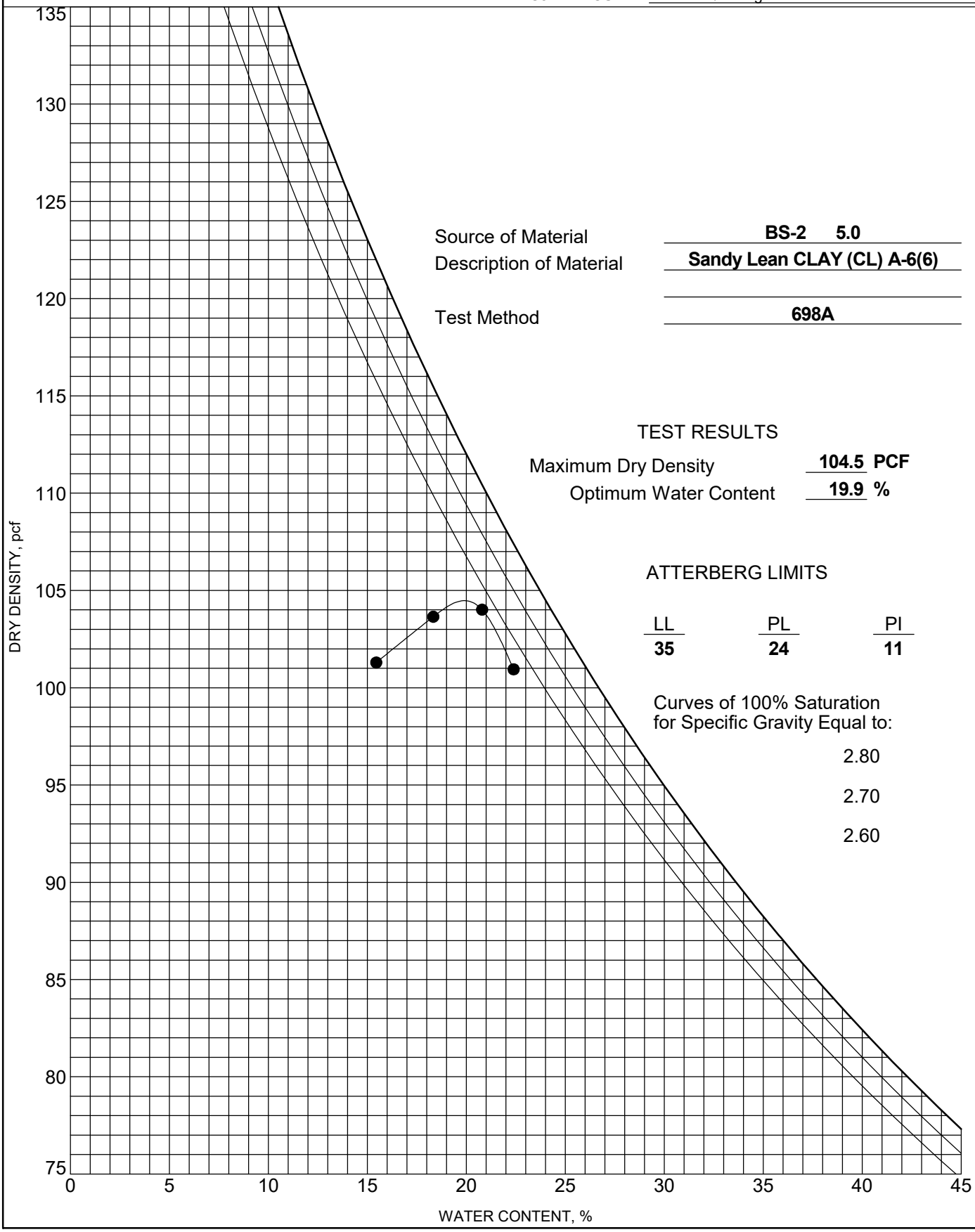
	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**BS-2**	**5.0**	**35**	**24**	**11**	**69**	**Sandy Lean CLAY (CL) A-6(6)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 3/9/18

MOISTURE-DENSITY RELATIONSHIP

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



Source of Material **BS-2 5.0**

Description of Material **Sandy Lean CLAY (CL) A-6(6)**

Test Method **698A**

TEST RESULTS

Maximum Dry Density **104.5** **PCF**

Optimum Water Content **19.9** **%**

ATTERBERG LIMITS

LL	PL	PI
35	**24**	**11**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

COMPACTION - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 3/9/18

Boring or Test Pit:	BS-2		Boring or Test Pit:	BS-2		Boring or Test Pit:	BS-2	
Sample:	-		Sample:	-		Sample:	-	
Depth:	0.0-5.0	ft	Depth:	0.0-5.0	ft	Depth:	0.0-5.0	ft
Point No.:	1		Point No.:	2		Point No.:	3	
	Initial			**Initial**			**Initial**	
Length =	6.002	in	Length =	5.991	in	Length =	6.002	in
Diameter =	2.790	in	Diameter =	2.790	in	Diameter =	2.790	in
Wet Mass =	2.572	lb	Wet Mass =	2.575	lb	Wet Mass =	2.572	lb
Area =	6.114	in^2	Area =	6.114	in^2	Area =	6.114	in^2
Volume =	36.694	in^3	Volume =	36.627	in^3	Volume =	36.694	in^3
Specific Gravity =	2.71	(ASTM D854)	Specific Gravity =	2.71	(ASTM D854)	Specific Gravity =	2.71	(ASTM D854)
Dry Mass of Solids =	2.112	lb	Dry Mass of Solids =	2.111	lb	Dry Mass of Solids =	2.105	lb
Moisture Content =	21.8%		Moisture Content =	22.0%		Moisture Content =	22.2%	
Wet Unit Weight =	121.1	pcf	Wet Unit Weight =	121.5	pcf	Wet Unit Weight =	121.1	pcf
Dry Unit Weight =	99.5	pcf	Dry Unit Weight =	99.6	pcf	Dry Unit Weight =	99.1	pcf
Void Ratio =	0.70		Void Ratio =	0.70		Void Ratio =	0.71	
Percent Saturation =	84%		Percent Saturation =	86%		Percent Saturation =	85%	
	After Consolidation			**After Consolidation**			**After Consolidation**	
Length =	5.951	in	Length =	5.961	in	Length =	5.942	in
Diameter =	2.759	in	Diameter =	2.755	in	Diameter =	2.731	in
Area =	5.977	in^2 (Method B)	Area =	5.962	in^2 (Method B)	Area =	5.860	in^2 (Method B)
Volume =	35.569	in^3	Volume =	35.539	in^3	Volume =	34.816	in^3
Moisture Content =	23.9%		Moisture Content =	23.9%		Moisture Content =	22.8%	
Wet Unit Weight =	127.1	pcf	Wet Unit Weight =	127.1	pcf	Wet Unit Weight =	128.3	pcf
Dry Unit Weight =	102.6	pcf	Dry Unit Weight =	102.6	pcf	Dry Unit Weight =	104.5	pcf
Void Ratio =	0.65		Void Ratio =	0.65		Void Ratio =	0.62	
Percent Saturation =	100%		Percent Saturation =	100%		Percent Saturation =	100%	
B Parameter =	0.99		B Parameter =	0.98		B Parameter =	0.99	
Shear Rate =	0.091%	/min.	Shear Rate =	0.090%	/min.	Shear Rate =	0.091%	/min.
t_{50} =	1.77	min.	t_{50} =	0.37	min.	t_{50} =	0.37	min.
Strain at Failure =	5.7%		Strain at Failure =	6.8%		Strain at Failure =	10.4%	
Cell Pressure =	75.0	psi	Cell Pressure =	80.0	psi	Cell Pressure =	85.0	psi
Back Pressure =	70.0	psi	Back Pressure =	70.0	psi	Back Pressure =	70.0	psi
Confining Pressure =	5.0	psi	Confining Pressure =	10.0	psi	Confining Pressure =	15.0	psi

Notes: Sample description: Sandy Lean CLAY (CL) A-6(6)

Atterberg limits: LL = 35 PL = 24 PI = 11 (ASTM D4318)

Percent finer: 3/4 in. = - No. 4 = - No. 200 = - (ASTM D422, refer to separate report for gradation curve)

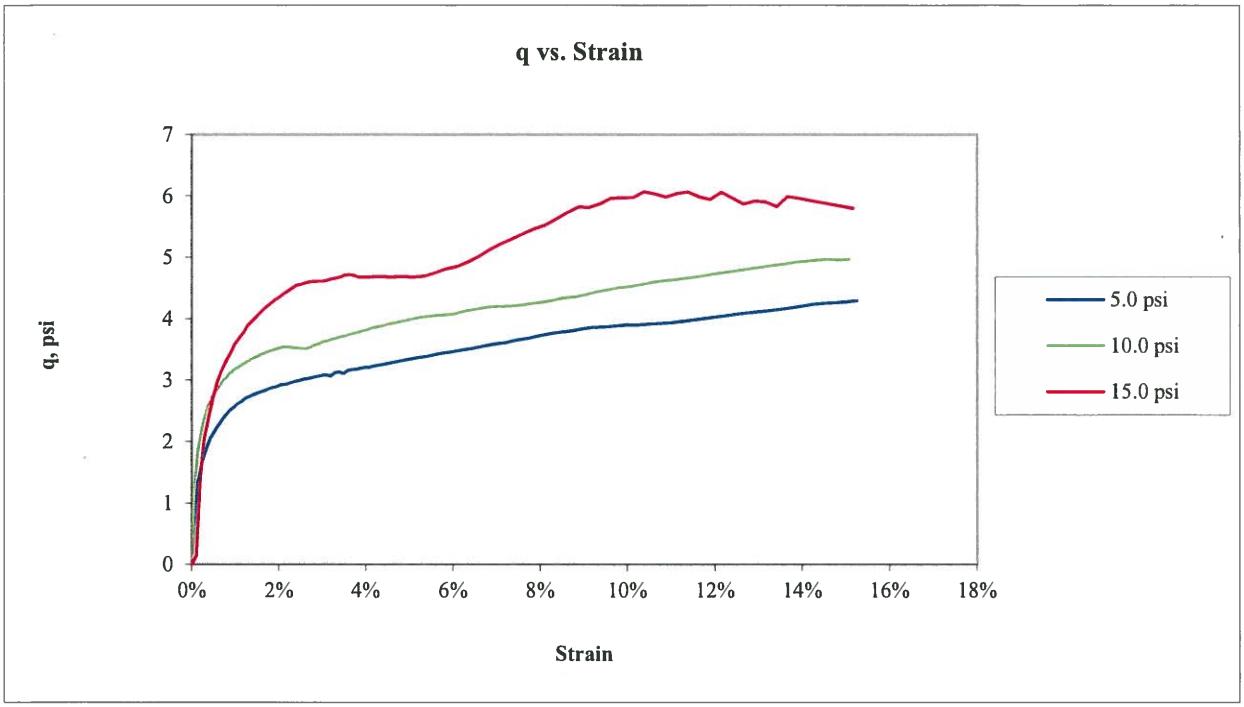
Specimen type:		Intact	X	Reconstituted	Remold targets:	99.3 pcf	21.8% moisture
Moisture from:		Cuttings	X	Entire specimen			
Saturation method:	X	Wet		Dry			
Failure criterion:	X	$(\sigma'_1/\sigma'_3)_{max}$		$(\sigma'_1-\sigma'_3)_{max}$		% strain	
Membrane effect:	X	Corrected		Not Corrected			

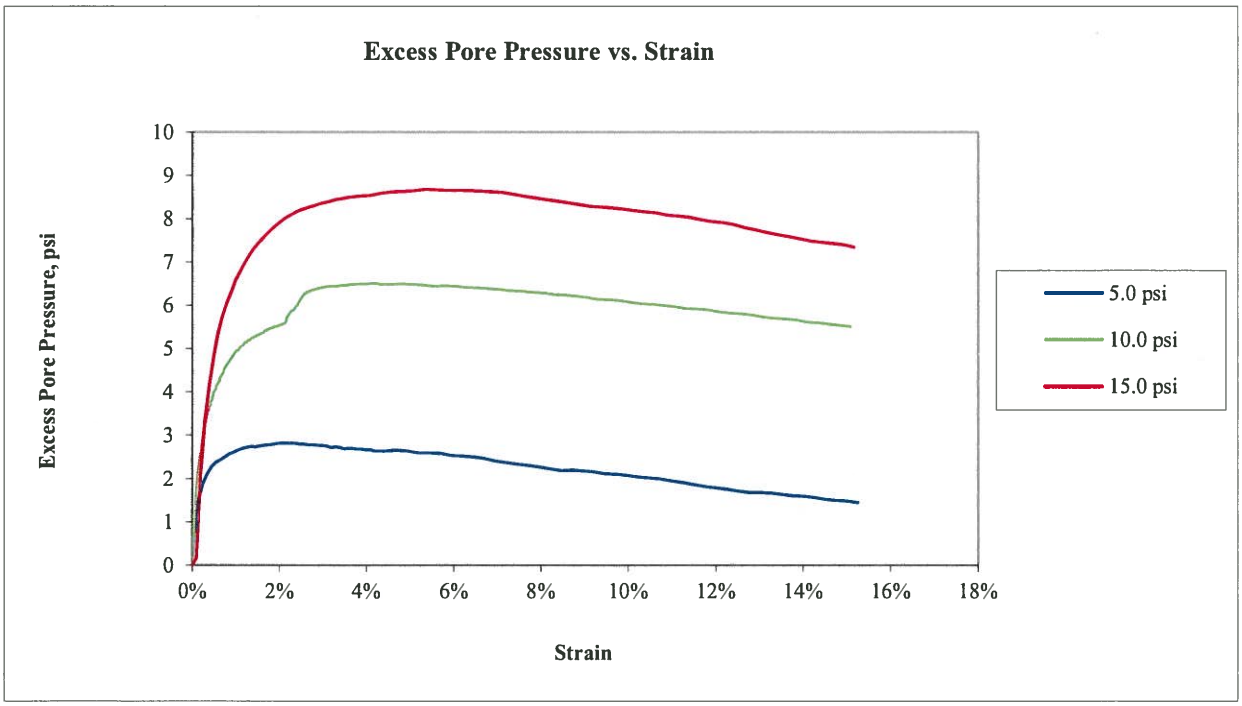
Golder Associates Inc.
Atlanta, Georgia

Title:
ASTM D4767
CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST REPORT
SAMPLE AND TEST DATA

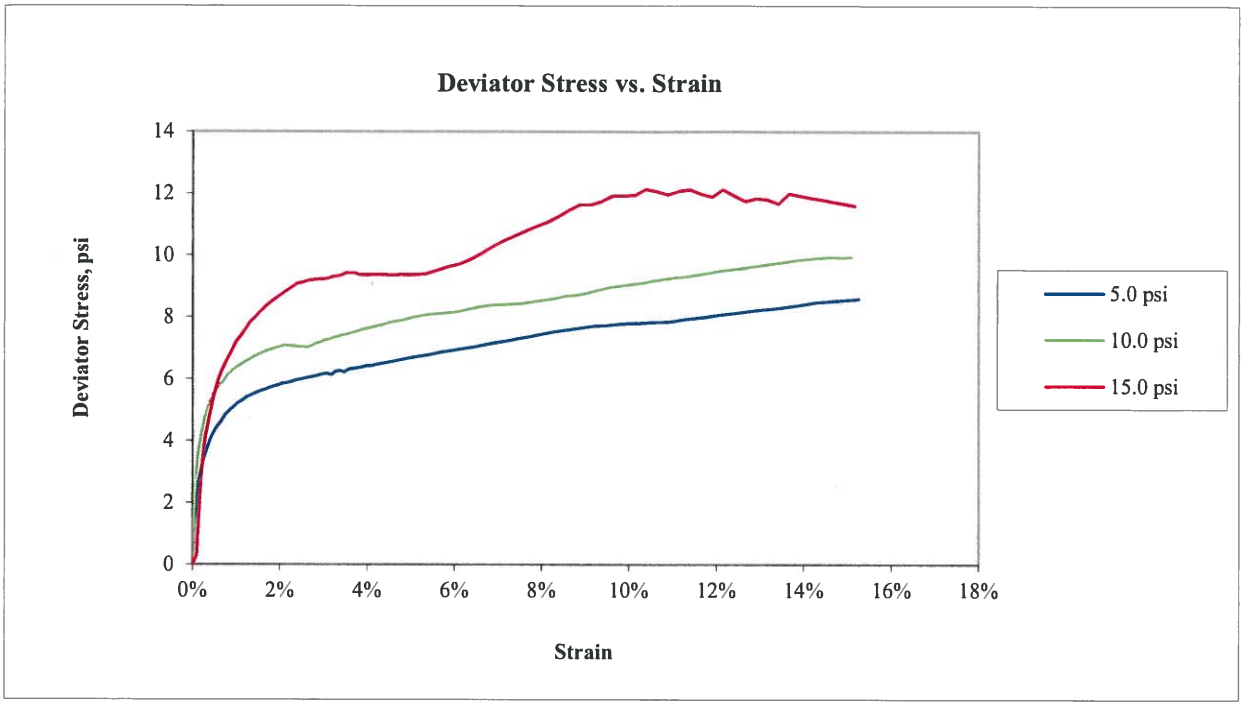
Job Short Title:
F&ME/G5662.01 - I-20/26-126 CORRIDOR IMPROVEMENT/SC

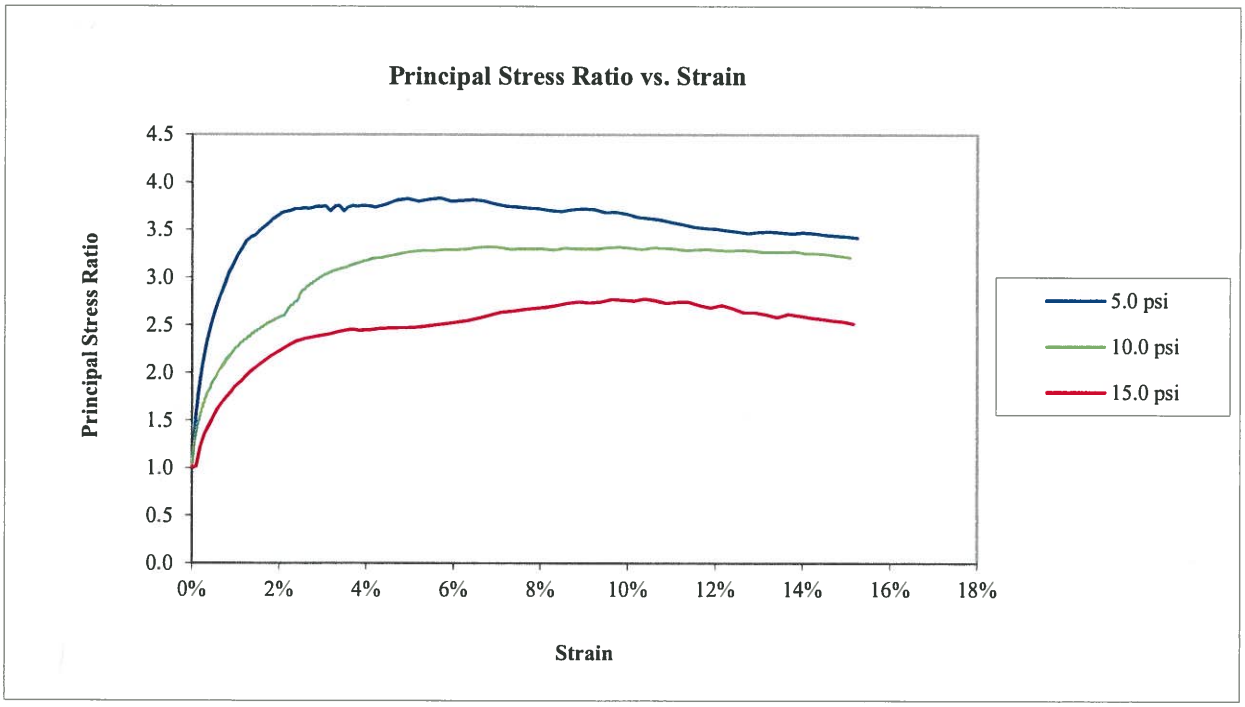
Sample:	Technician:	Reviewed:	Start Date:	Job Number:	Figure:
BS-2 0.0-5.0'	PWM/FT	DA	3/27/2018	1898300	1
	Check: PWM	Approved:			





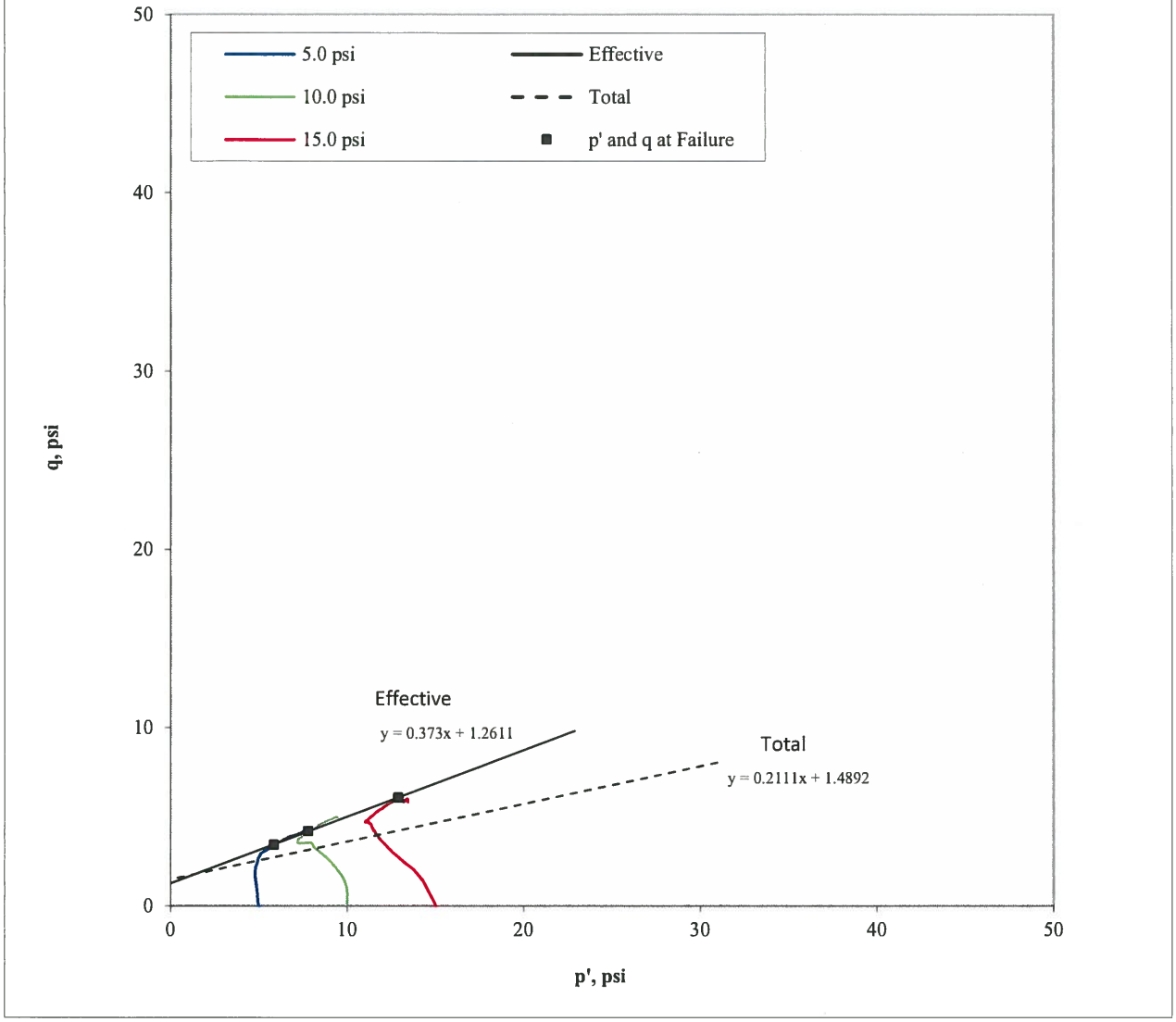
Golder Associates Inc. Atlanta, Georgia	Title: ASTM D4767 CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST REPORT q AND EXCESS PORE PRESSURE PLOTS				
Job Short Title: F&ME/G5662.01 - I-20/26-126 CORRIDOR IMPROVEMENT/SC					
Sample: BS-2 0.0-5.0'	Technician: PWM/FT Check: MH	Reviewed: DA Approved:	Start Date: 3/27/2018	Job Number: 1898300	Figure: 2





Golder Associates Inc. **Atlanta, Georgia**	**Title:** **ASTM D4767** **CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST REPORT** **DEVIATOR STRESS AND PRINCIPAL STRESS RATIO PLOT**				
Job Short Title: **F&ME/G5662.01 - I-20/26-126 CORRIDOR IMPROVEMENT/SC**					
Sample: **BS-2 0.0-5.0'**	**Technician:** **PWM/FT** **Check:** MWL	**Reviewed:** DA **Approved:**	**Start Date:** **3/27/2018**	**Job Number:** **1898300**	**Figure:** **3**

Stress Path (p'-q) Plot



Confining Pressure (psi)	p at failure (psi)	p' at failure (psi)	q at failure (psi)
5.0	8.4	5.8	3.4
10.0	14.2	7.8	4.2
15.0	21.1	12.9	6.1

Effective

α ' =	20.5	degree
a' =	1.3	psi

Total

α =	11.9	degree
a =	1.5	psi

Note: The laboratory testing relates only to the sample tested. GAI neither accepts responsibility for nor makes claims to the final use and purpose of the material.

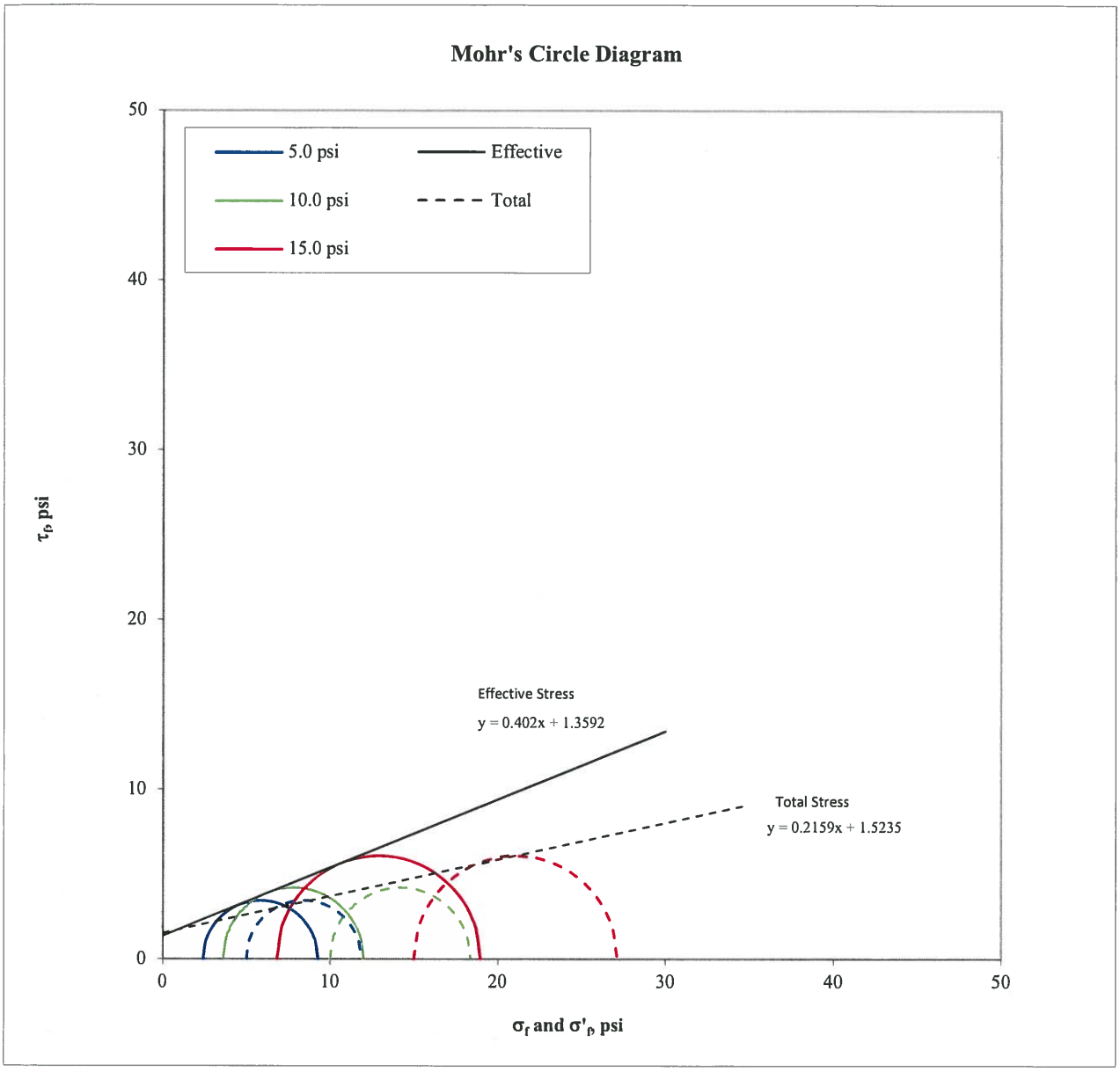
Golder Associates Inc.
Atlanta, Georgia

Title:
ASTM D4767
CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST REPORT
STRESS PATH PLOT

Job Short Title:
F&ME/G5662.01 - I-20/26-126 CORRIDOR IMPROVEMENT/SC

Sample:	Technician:	Reviewed:	Start Date:	Job Number:	Figure:
BS-2 0.0-5.0'	PWM/FT Check: PWM	DA Approved:	3/27/2018	1898300	4

Mohr's Circle Diagram



Confining Pressure (psi)	σ'_1 at failure (psi)	σ'_3 at failure (psi)	σ_1 at failure (psi)	σ_3 at failure (psi)
5.0	9.3	2.4	11.9	5.0
10.0	12.0	3.6	18.4	10.0
15.0	19.0	6.8	27.1	15.0

Effective

ϕ' =	21.9	degree
c' =	1.4	psi

Total

ϕ =	12.2	degree
c =	1.5	psi

Note: The laboratory testing relates only to the sample tested. GAI neither accepts responsibility for nor makes claims to the final use and purpose of the material.

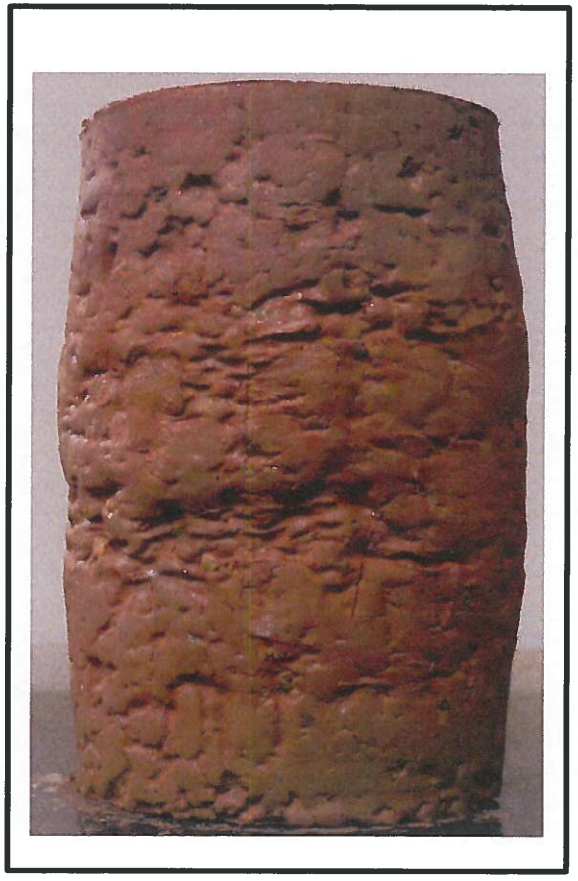
Golder Associates Inc. **Atlanta, Georgia**	**Title:** **ASTM D4767** **CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST REPORT** **MOHR'S CIRCLE DIAGRAM**
Job Short Title: **F&ME/G5662.01 - I-20/26-126 CORRIDOR IMPROVEMENT/SC**	

Sample:	Technician:	Reviewed:	Start Date:	Job Number:	Figure:
BS-2 0.0-5.0'	PWM/FT Check:	DA Approved:	3/27/2018	1898300	5

5.0 psi

10.0 psi

15.0 psi



Golder Associates Inc. **Atlanta, Georgia**	**Title:** ASTM D4767 CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST REPORT SPECIMENS PHOTOGRAPH - 5.0 / 10.0 / 15.0 psi				
Job Short Title: F&ME/G5662.01 - I-20/26-126 CORRIDOR IMPROVEMENT/SC					
Sample: BS-2 0.0-5.0'	**Technician:** PWM/FT **Check:**	**Reviewed:** DCA **Approved:**	**Start Date:** 3/27/2018	**Job Number:** 1898300	**Figure:** 6

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0395	**DATE SAMPLE RECEIVED:**	3/1/2018
DESCRIPTION OF SOIL:	SILT (ML) with Sand A-4(0)		
TESTED BY:	MB	**DATE OF TESTING:**	3/2/2018
		DATE OF WEIGHING:	3/5/2018

BORING NO.	BS-3				
SAMPLE NO.	18-0395C				
SAMPLE DEPTH	0.0-5.0'				
WATER CONTENT, W%	26.0				

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

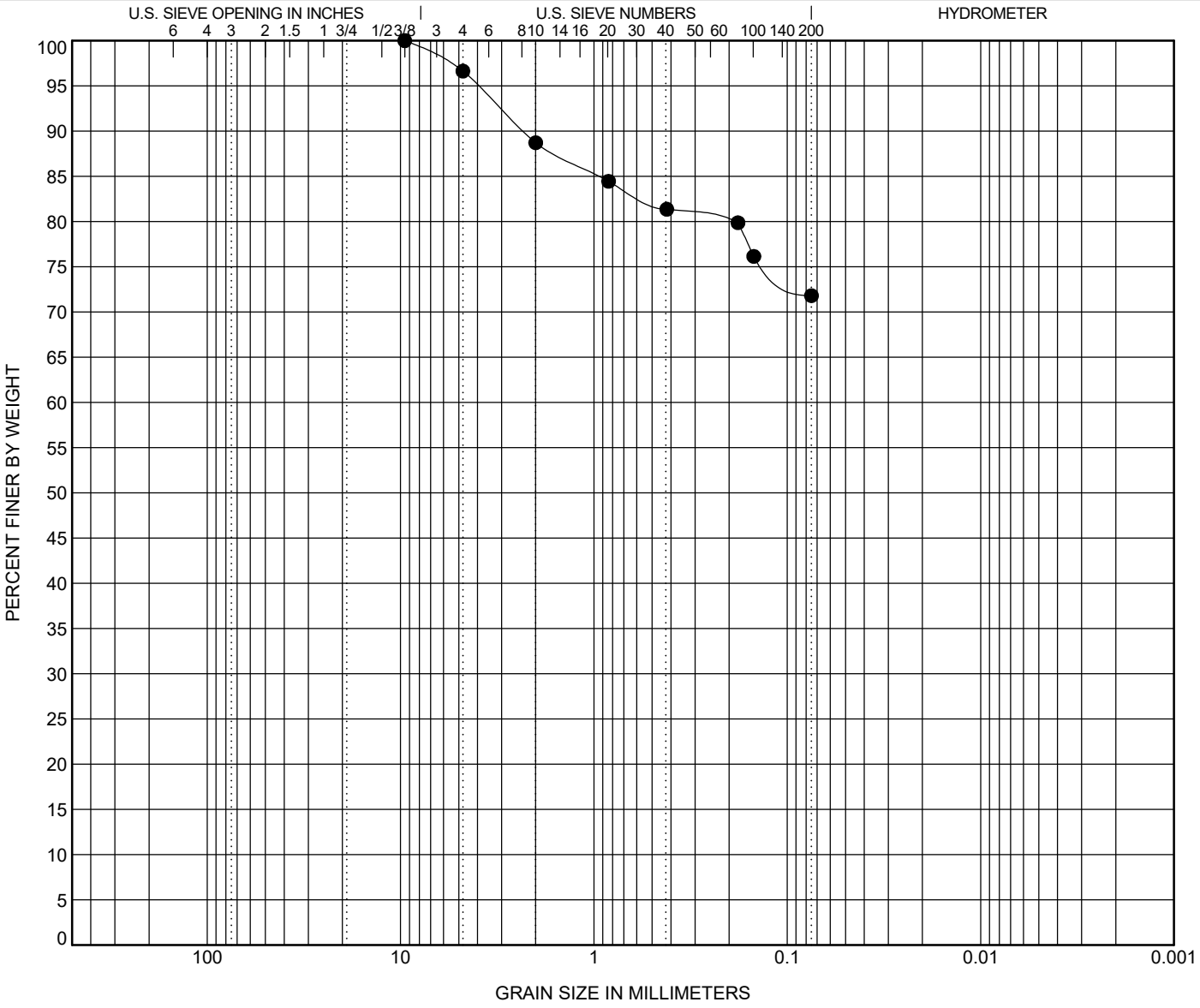
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**BS-3**	**5.0**	**SILT (ML) with F/C Sand A-4(0)**	**NP**	**NP**	**NP**		

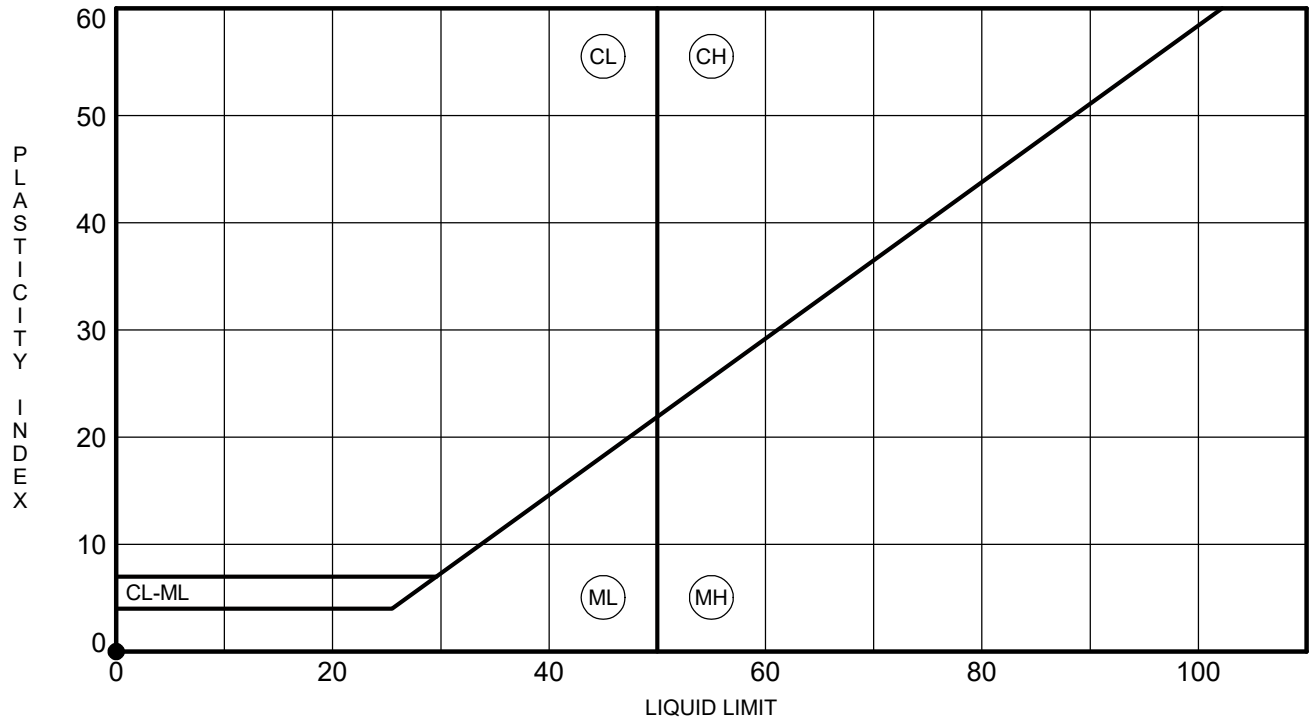
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**BS-3**	**5.0**	**9.52**	**3.981**			**3.4**	**24.8**	**71.8**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 3/9/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



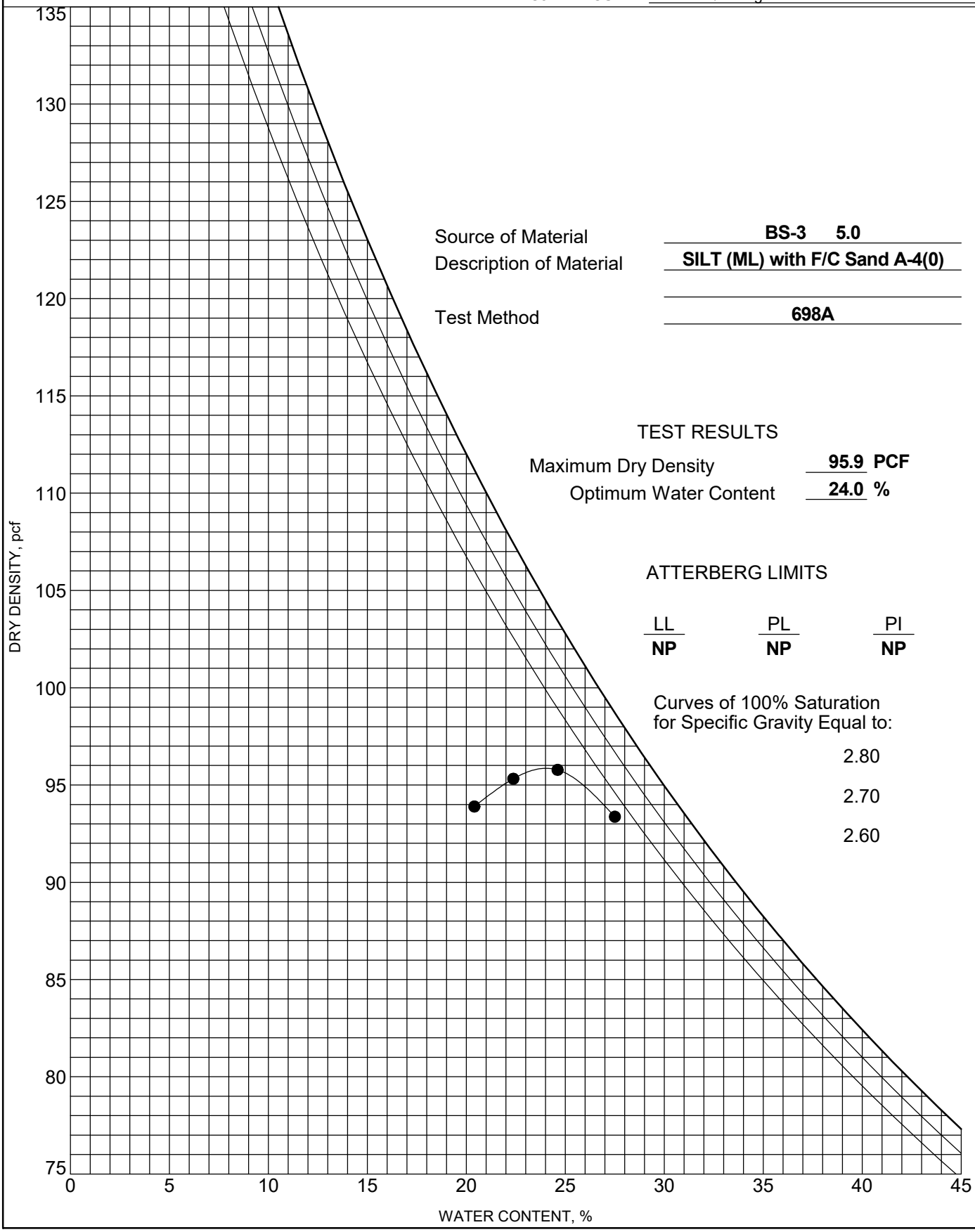
	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**BS-3**	**5.0**	**NP**	**NP**	**NP**	**72**	**SILT (ML) with F/C Sand A-4(0)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 3/9/18

MOISTURE-DENSITY RELATIONSHIP

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



Source of Material **BS-3 5.0**

Description of Material **SILT (ML) with F/C Sand A-4(0)**

Test Method **698A**

TEST RESULTS

Maximum Dry Density **95.9** **PCF**

Optimum Water Content **24.0** **%**

ATTERBERG LIMITS

LL	PL	PI
NP	**NP**	**NP**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

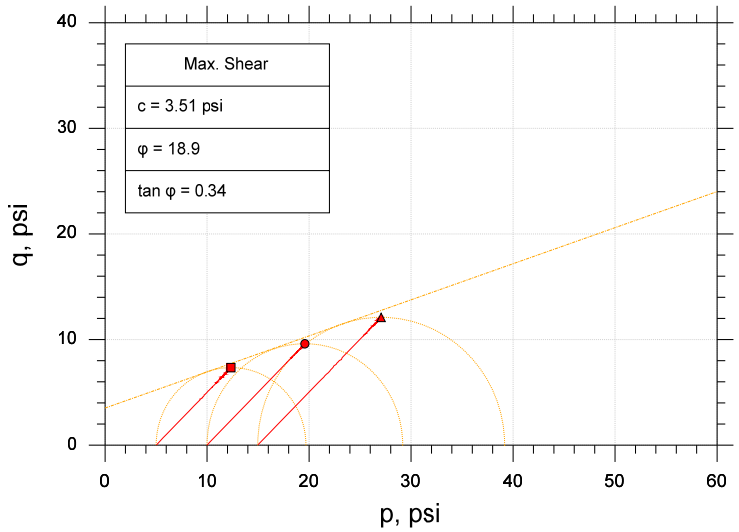
2.70

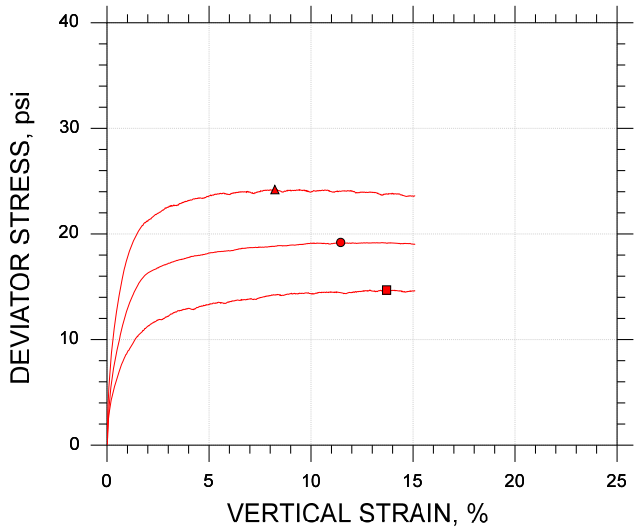
2.60

COMPACTION - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 3/9/18

Client: F&ME Consultants	
Project Name: I-20/26/126 Corridor Improvemen	
Project Location: ---	
Project Number: GTX-307802	
Tested By: jm	Checked By: mcm
Boring ID: ---	
Preparation: reconstituted	
Description: Moist, reddish yellow silt with sand	
Classification: ---	
Group Symbol: ---	
Liquid Limit: NP	Plastic Limit: NP
Plasticity Index: NP	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		■	●	▲	
Sample ID		BS-3	BS-3	BS-3	
Depth, ft		0-5 ft	0-5 ft	0-5 ft	
Test Number		CU-2-1	CU-2-2	CU-2-3	
Initial	Height, in	4.100	4.103	4.096	
	Diameter, in	2.020	2.020	2.020	
	Moisture Content (from Cuttings), %	25.9	26.0	26.0	
	Dry Density, pcf	91.7	91.5	91.6	
	Saturation (Wet Method), %	83.3	83.5	83.7	
	Void Ratio	0.839	0.842	0.840	
Before Shear	Moisture Content, %	30.9	31.0	30.2	
	Dry Density, pcf	91.9	91.8	92.9	
	Cross-sectional Area (Method A), in²	3.201	3.198	3.177	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.835	0.836	0.815	
	Back Pressure, psi	94.99	121.0	129.0	
Vertical Effective Consolidation Stress, psi		5.040	9.974	14.98	
Horizontal Effective Consolidation Stress, psi		5.022	9.990	14.96	
Vertical Strain after Consolidation, %		0.1741	0.4430	0.6989	
Volumetric Strain after Consolidation, %		0.5053	1.245	1.920	
Time to 50% Consolidation, min		3.240	2.250	1.000	
Shear Strength, psi		7.342	9.598	12.10	
Strain at Failure, %		13.7	11.5	8.23	
Strain Rate, %/min		0.06000	0.06000	0.06000	
Deviator Stress at Failure, psi		14.68	19.20	24.20	
Effective Minor Principal Stress at Failure, psi		6.511	8.202	10.66	
Effective Major Principal Stress at Failure, psi		21.20	27.40	34.86	
B-Value		0.96	0.95	0.97	

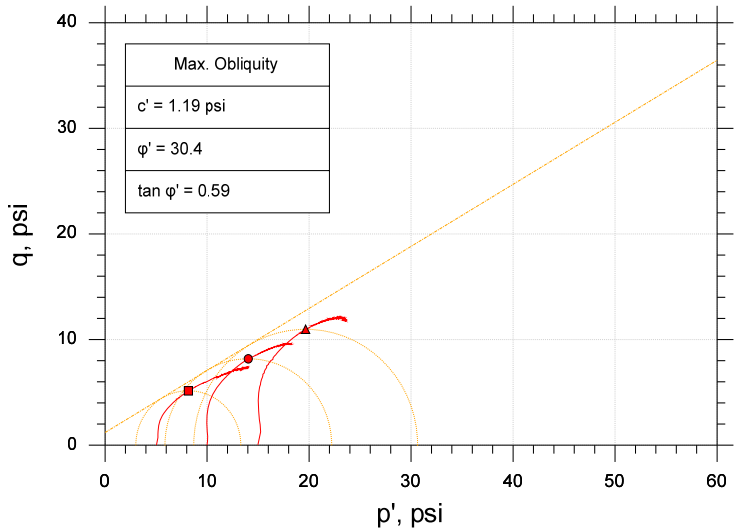
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Atterberg Limits determined by ASTM D4318.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

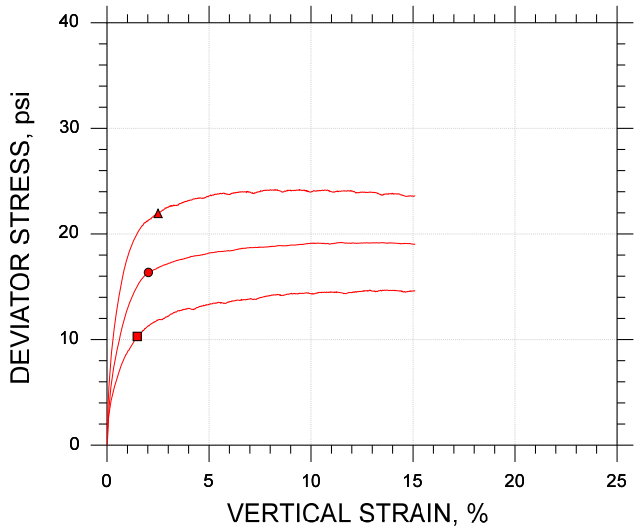
Remarks:

Target Compaction: 95% of (95.9 pcf) at Optimum Moisture Content (24.0%) + 2% - As Requested by Client

Client: F&ME Consultants	
Project Name: I-20/26/126 Corridor Improvemen	
Project Location: ---	
Project Number: GTX-307802	
Tested By: jm	Checked By: mcm
Boring ID: ---	
Preparation: reconstituted	
Description: Moist, reddish yellow silt with sand	
Classification: ---	
Group Symbol: ---	
Liquid Limit: NP	Plastic Limit: NP
Plasticity Index: NP	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767

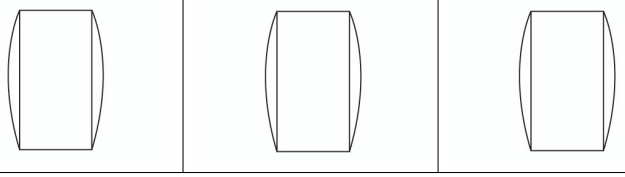




Symbol		■	●	▲	
Sample ID		BS-3	BS-3	BS-3	
Depth, ft		0-5 ft	0-5 ft	0-5 ft	
Test Number		CU-2-1	CU-2-2	CU-2-3	
Initial	Height, in	4.100	4.103	4.096	
	Diameter, in	2.020	2.020	2.020	
	Moisture Content (from Cuttings), %	25.9	26.0	26.0	
	Dry Density, pcf	91.7	91.5	91.6	
	Saturation (Wet Method), %	83.3	83.5	83.7	
	Void Ratio	0.839	0.842	0.840	
Before Shear	Moisture Content, %	30.9	31.0	30.2	
	Dry Density, pcf	91.9	91.8	92.9	
	Cross-sectional Area (Method A), in²	3.201	3.198	3.177	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.835	0.836	0.815	
	Back Pressure, psi	94.99	121.0	129.0	
Vertical Effective Consolidation Stress, psi		5.040	9.974	14.98	
Horizontal Effective Consolidation Stress, psi		5.022	9.990	14.96	
Vertical Strain after Consolidation, %		0.1741	0.4430	0.6989	
Volumetric Strain after Consolidation, %		0.5053	1.245	1.920	
Time to 50% Consolidation, min		3.240	2.250	1.000	
Shear Strength, psi		5.148	8.176	10.97	
Strain at Failure, %		1.48	2.03	2.50	
Strain Rate, %/min		0.06000	0.06000	0.06000	
Deviator Stress at Failure, psi		10.30	16.35	21.95	
Effective Minor Principal Stress at Failure, psi		3.016	5.866	8.691	
Effective Major Principal Stress at Failure, psi		13.31	22.22	30.64	
B-Value		0.96	0.95	0.97	

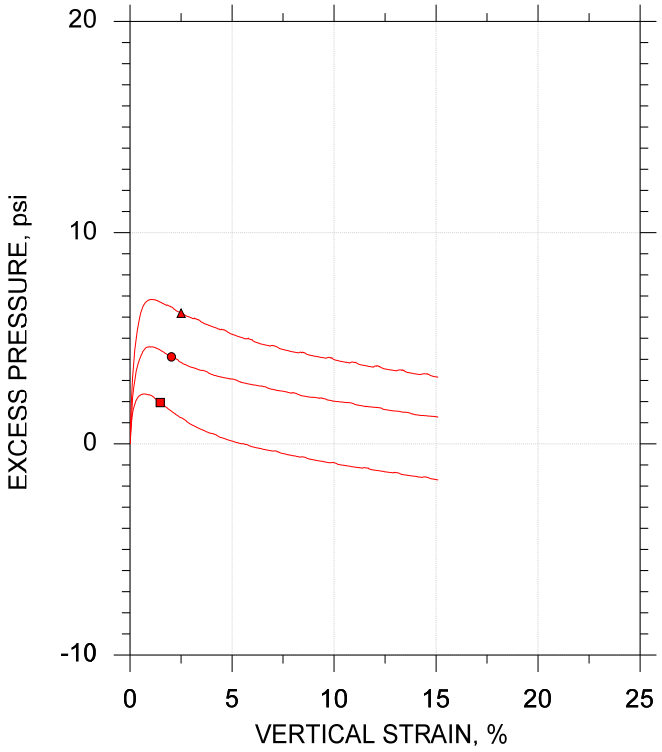
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Atterberg Limits determined by ASTM D4318.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

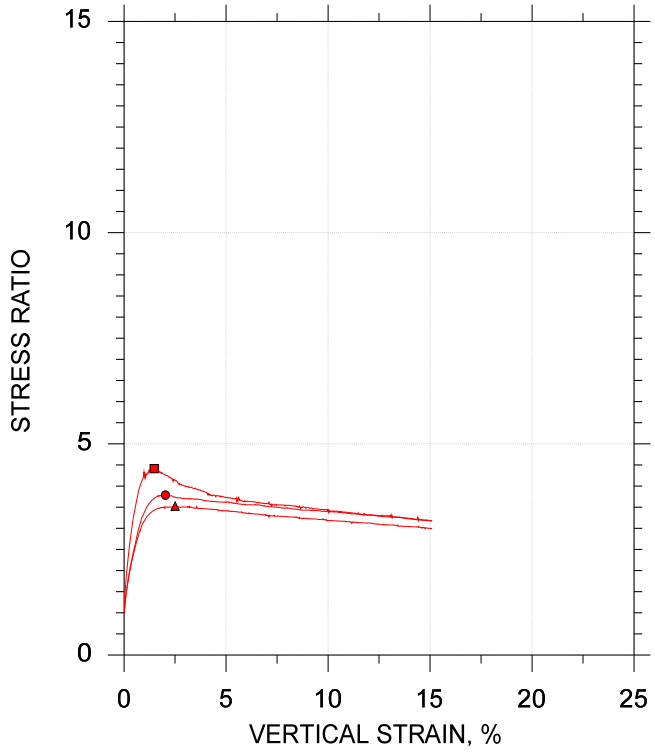
Remarks:

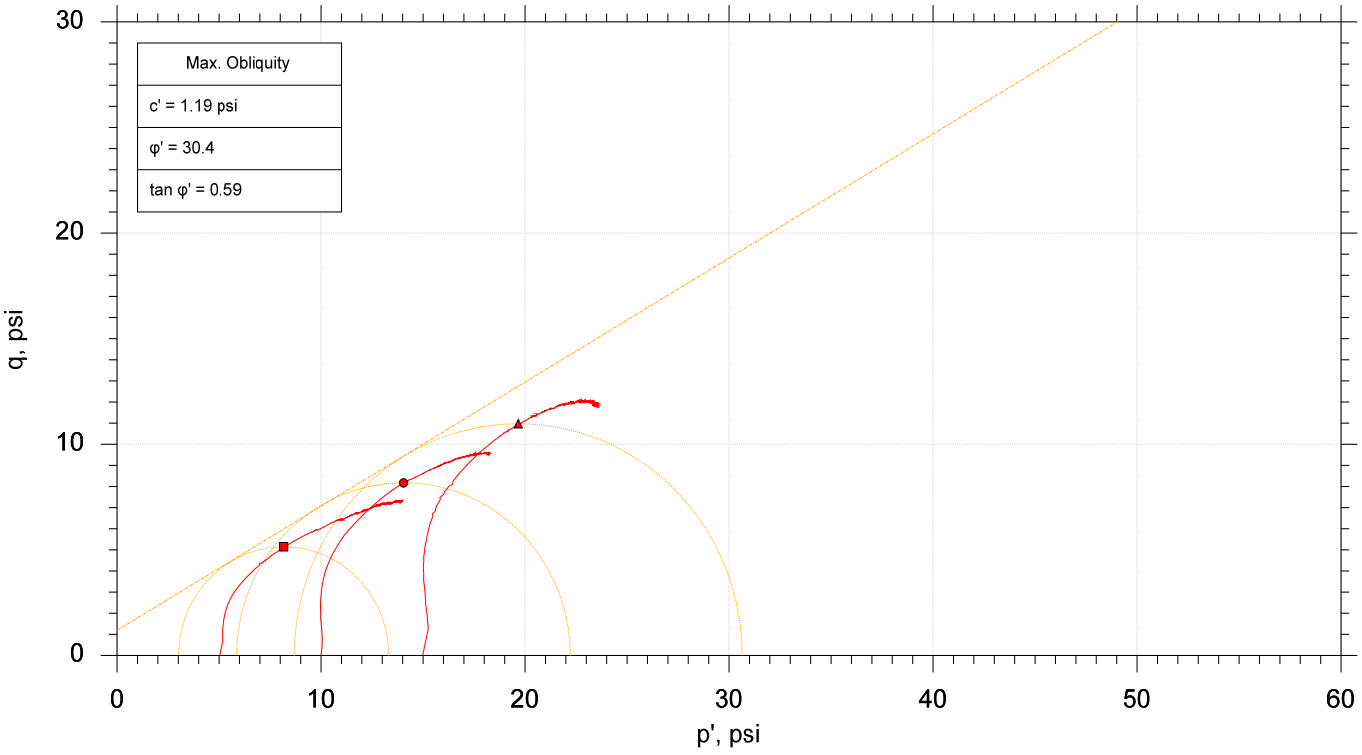


Target Compaction: 95% of (95.9 pcf) at Optimum Moisture Content (24.0%) + 2% - As Requested by Client

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	BS-3	CU-2-1	0-5 ft	jm	3/16/18	mcm	3/27/18	307802-CU-2-1m.dat
●	BS-3	CU-2-2	0-5 ft	jm	3/14/18	mcm	3/27/18	307802-CU-2-2m.dat
▲	BS-3	CU-2-3	0-5 ft	jm	3/15/18	mcm	3/27/18	307802-CU-2-3m.dat

GeoTesting EXPRESS

Project: I-20/26/126 Corridor Improvemen	Location: ---	Project No.: GTX-307802
Boring No.: ---	Sample Type: reconstituted	
Description: Moist, reddish yellow silt with sand		
Remarks: Target Compaction: 95% of (95.9 pcf) at Optimum Moisture Content (24.0%) + 2% - As Requested by Client		

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0396	**DATE SAMPLE RECEIVED:**	3/1/2018
DESCRIPTION OF SOIL:	Clayey F/M SAND (SC) A-4(1)		
TESTED BY:	MB	**DATE OF TESTING:**	3/2/2018
		DATE OF WEIGHING:	3/5/2018

BORING NO.	BS-4				
SAMPLE NO.	18-0396C				
SAMPLE DEPTH	0.0-3.0'				
WATER CONTENT, W%	21.8				

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

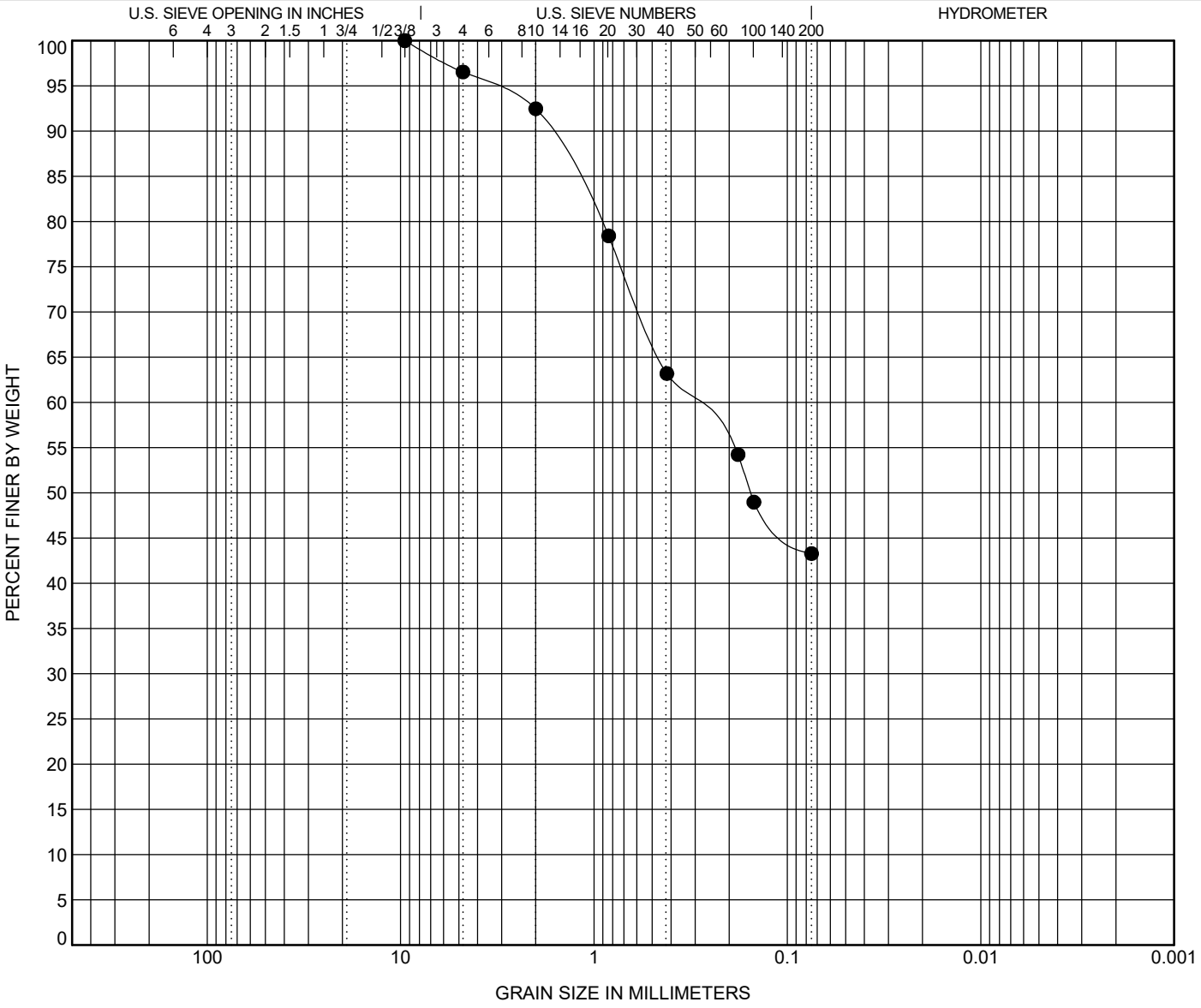
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**BS-4**	**3.0**	**Clayey F/M SAND (SC) A-4(1)**	**31**	**21**	**10**		

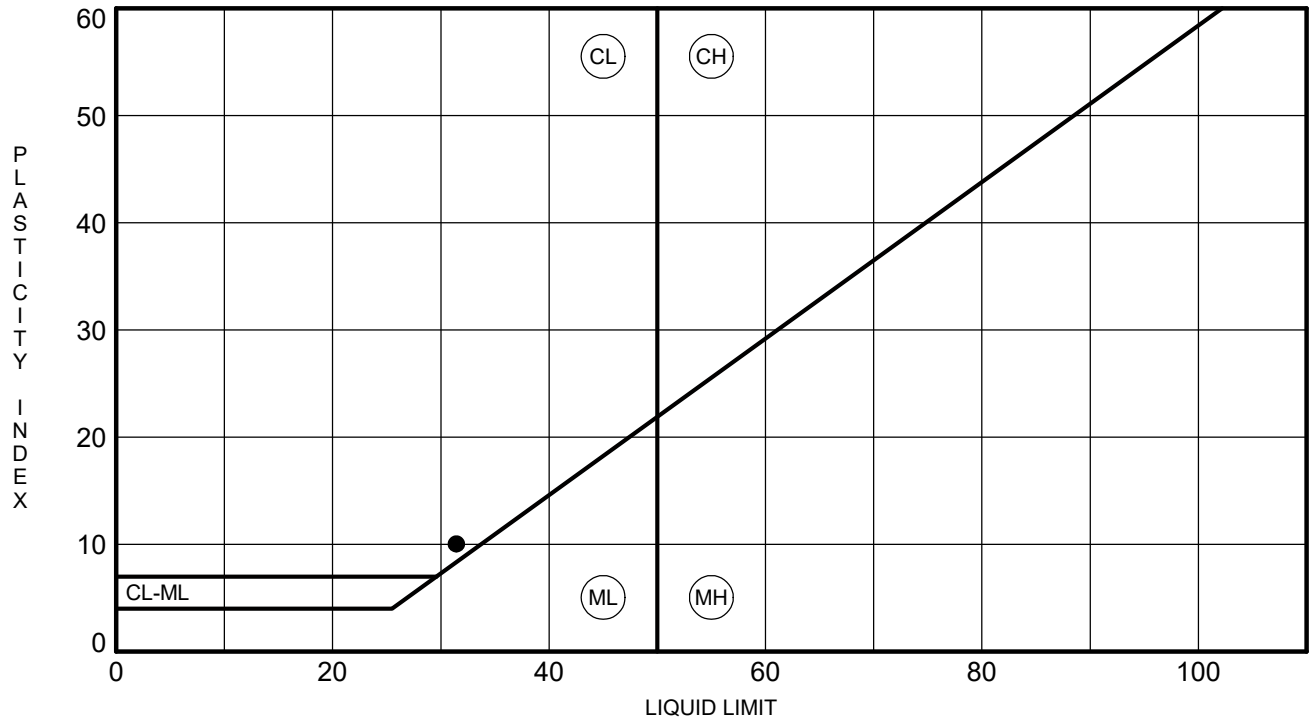
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**BS-4**	**3.0**	**9.52**	**3.43**	**0.155**		**3.4**	**53.3**	**43.3**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 3/9/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



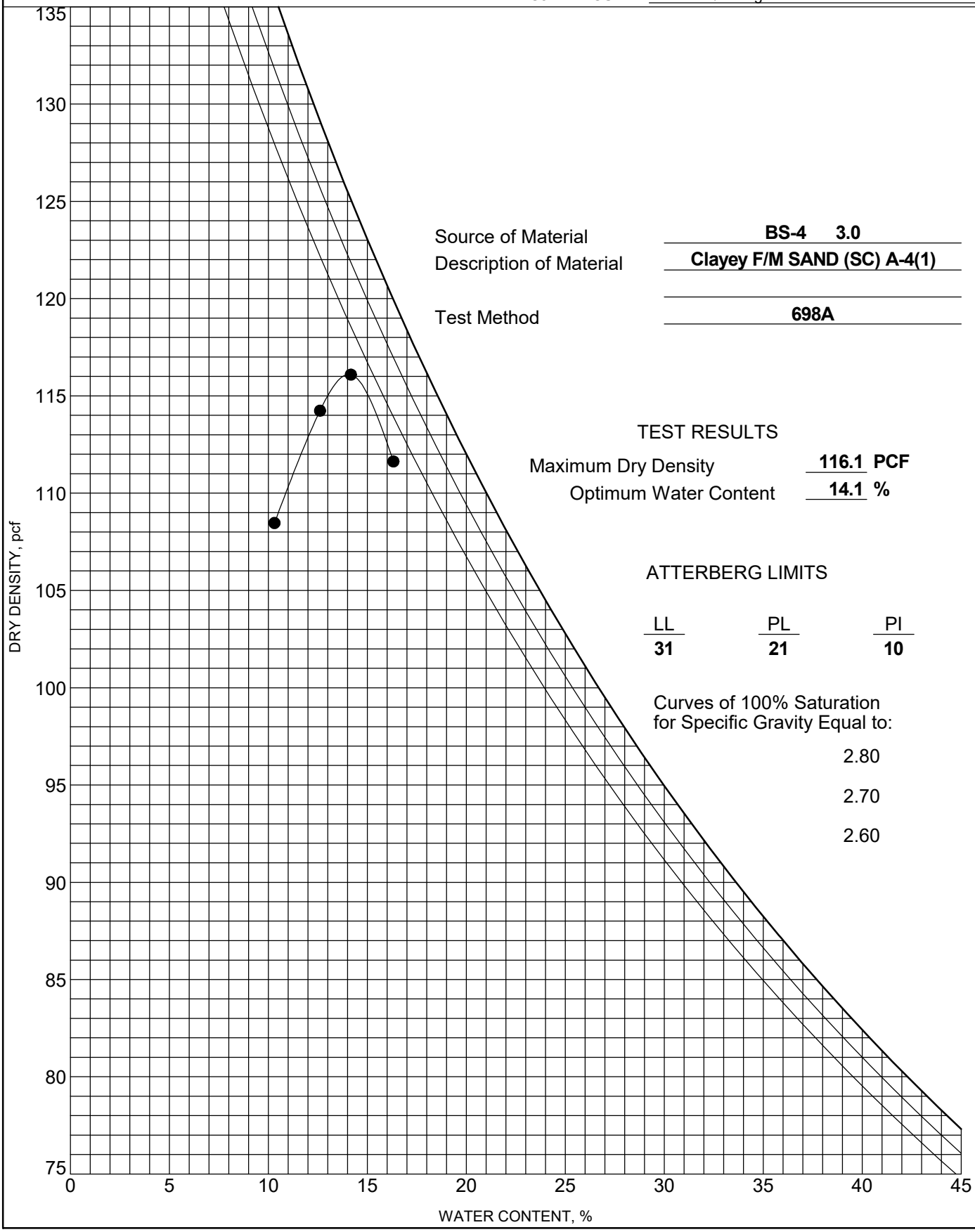
	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**BS-4**	**3.0**	**31**	**21**	**10**	**43**	**Clayey F/M SAND (SC) A-4(1)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 3/9/18

MOISTURE-DENSITY RELATIONSHIP

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



Source of Material **BS-4 3.0**

Description of Material **Clayey F/M SAND (SC) A-4(1)**

Test Method **698A**

TEST RESULTS

Maximum Dry Density **116.1** **PCF**

Optimum Water Content **14.1** **%**

ATTERBERG LIMITS

LL	PL	PI
31	**21**	**10**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

COMPACTION - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 3/9/18

Boring or Test Pit:	BS-4		Boring or Test Pit:	BS-4		Boring or Test Pit:	BS-4	
Sample:	-		Sample:	-		Sample:	-	
Depth:	0.0-3.0	ft	Depth:	0.0-3.0	ft	Depth:	0.0-3.0	ft
Point No.:	1		Point No.:	2		Point No.:	3	
	Initial			**Initial**			**Initial**	
Length =	5.982	in	Length =	5.985	in	Length =	5.989	in
Diameter =	2.790	in	Diameter =	2.790	in	Diameter =	2.790	in
Wet Mass =	2.715	lb	Wet Mass =	2.718	lb	Wet Mass =	2.717	lb
Area =	6.114	in^2	Area =	6.114	in^2	Area =	6.114	in^2
Volume =	36.572	in^3	Volume =	36.590	in^3	Volume =	36.614	in^3
Specific Gravity =	2.65	(ASTM D854)	Specific Gravity =	2.65	(ASTM D854)	Specific Gravity =	2.65	(ASTM D854)
Dry Mass of Solids =	2.349	lb	Dry Mass of Solids =	2.344	lb	Dry Mass of Solids =	2.348	lb
Moisture Content =	15.6%		Moisture Content =	15.9%		Moisture Content =	15.7%	
Wet Unit Weight =	128.3	pcf	Wet Unit Weight =	128.4	pcf	Wet Unit Weight =	128.2	pcf
Dry Unit Weight =	111.0	pcf	Dry Unit Weight =	110.7	pcf	Dry Unit Weight =	110.8	pcf
Void Ratio =	0.49		Void Ratio =	0.49		Void Ratio =	0.49	
Percent Saturation =	85%		Percent Saturation =	86%		Percent Saturation =	85%	
	After Consolidation			**After Consolidation**			**After Consolidation**	
Length =	5.932	in	Length =	5.915	in	Length =	5.921	in
Diameter =	2.798	in	Diameter =	2.788	in	Diameter =	2.759	in
Area =	6.150	in^2 (Method B)	Area =	6.104	in^2 (Method B)	Area =	5.977	in^2 (Method B)
Volume =	36.482	in^3	Volume =	36.107	in^3	Volume =	35.387	in^3
Moisture Content =	18.2%		Moisture Content =	17.7%		Moisture Content =	16.5%	
Wet Unit Weight =	131.5	pcf	Wet Unit Weight =	132.1	pcf	Wet Unit Weight =	133.6	pcf
Dry Unit Weight =	111.2	pcf	Dry Unit Weight =	112.2	pcf	Dry Unit Weight =	114.7	pcf
Void Ratio =	0.48		Void Ratio =	0.47		Void Ratio =	0.44	
Percent Saturation =	100%		Percent Saturation =	100%		Percent Saturation =	100%	
B Parameter =	1.00		B Parameter =	0.99		B Parameter =	1.00	
Shear Rate =	0.091%	/min.	Shear Rate =	0.091%	/min.	Shear Rate =	0.045%	/min.
t_{50} =	0.46	min.	t_{50} =	1.46	min.	t_{50} =	7.86	min.
Strain at Failure =	10.8%		Strain at Failure =	13.1%		Strain at Failure =	11.8%	
Cell Pressure =	85.0	psi	Cell Pressure =	90.0	psi	Cell Pressure =	95.0	psi
Back Pressure =	80.0	psi	Back Pressure =	80.0	psi	Back Pressure =	80.0	psi
Confining Pressure =	5.0	psi	Confining Pressure =	10.0	psi	Confining Pressure =	15.0	psi

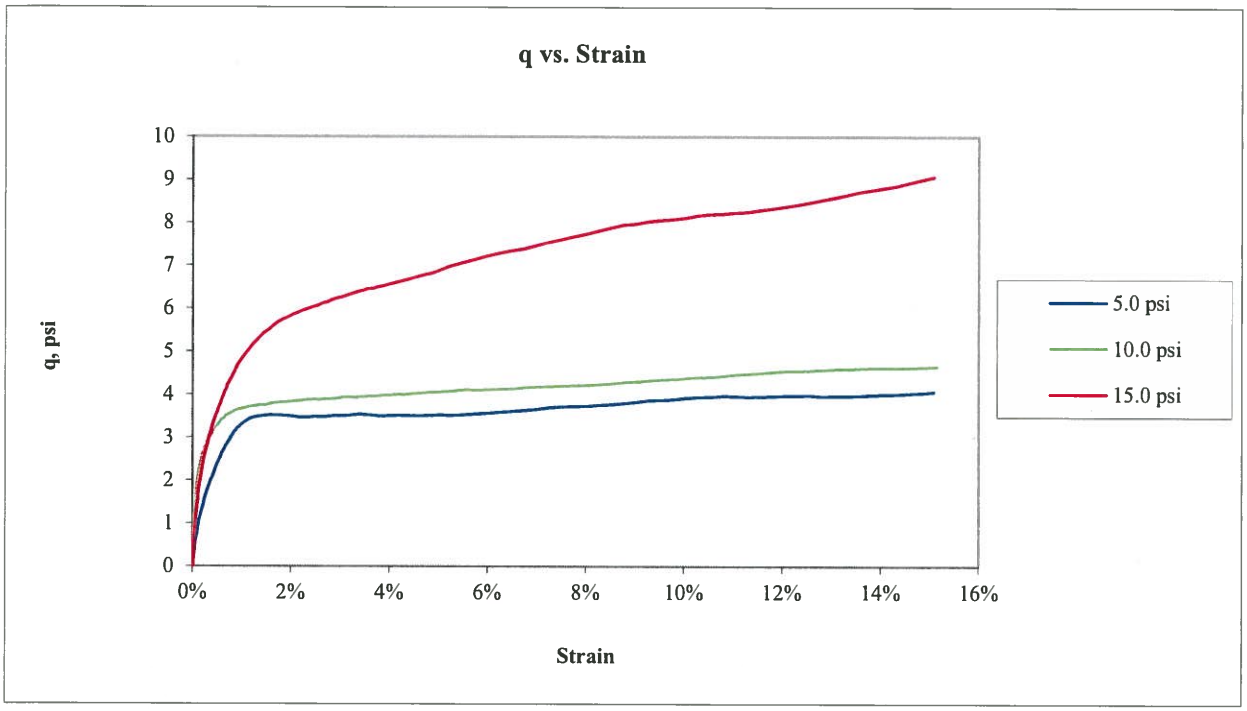
Notes: Sample description: Clayey F/M SAND (SC) A-4(1)

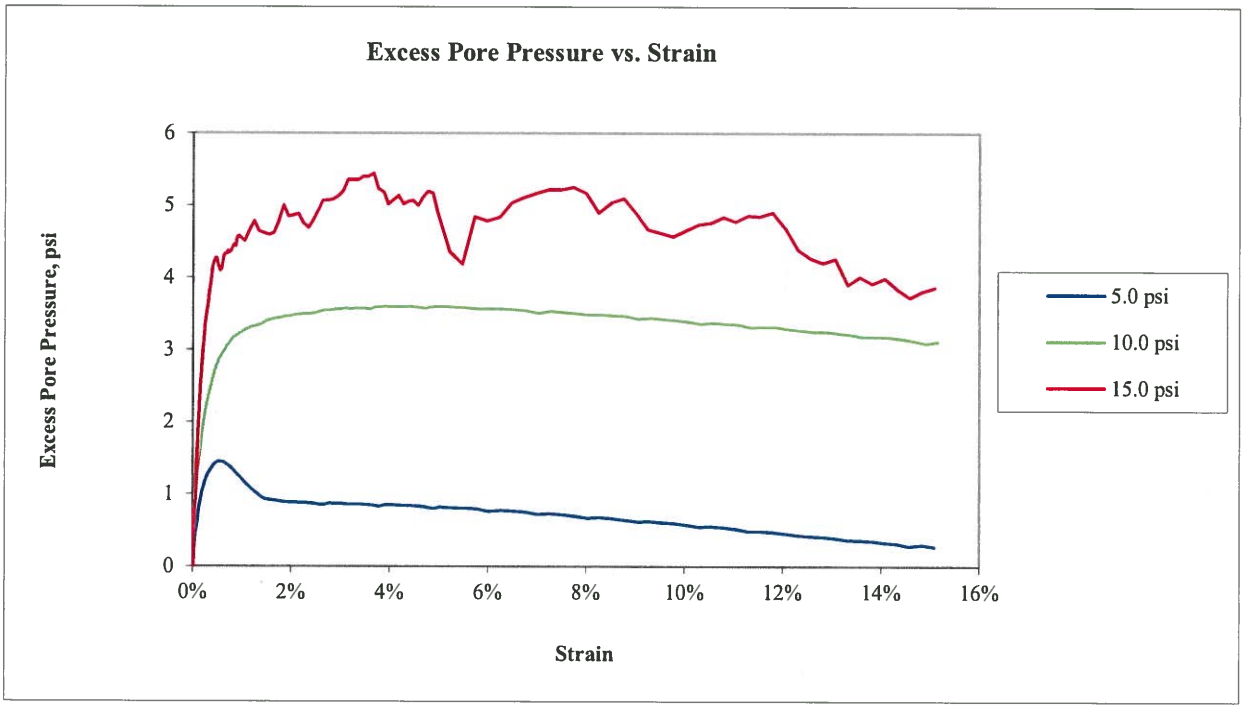
Atterberg limits: LL = 31 PL = 21 PI = 10 (ASTM D4318)

Percent finer: 3/4 in. = - No. 4 = - No. 200 = - (ASTM D422, refer to separate report for gradation curve)

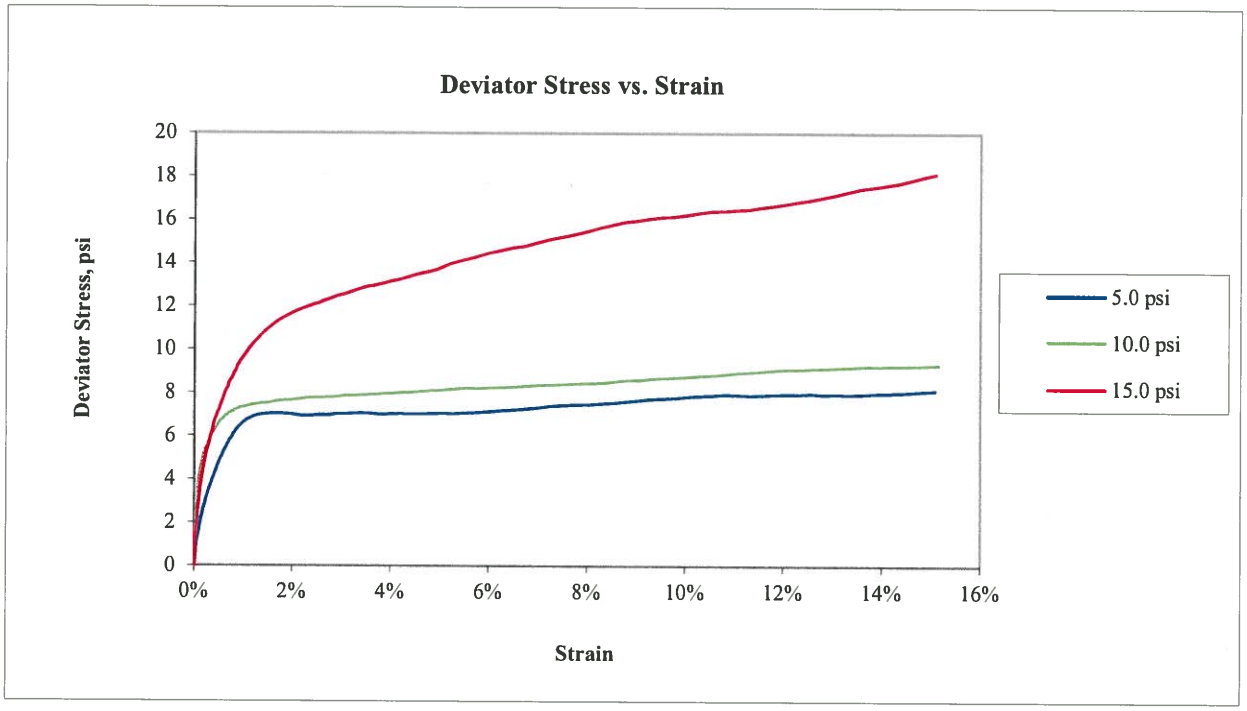
Specimen type:		Intact	X	Reconstituted	Remold targets:	110.3 pcf	16.0% moisture
Moisture from:		Cuttings	X	Entire specimen			
Saturation method:	X	Wet		Dry			
Failure criterion:	X	$(\sigma'_1/\sigma'_3)_{max}$		$(\sigma'_1-\sigma'_3)_{max}$		% strain	
Membrane effect:	X	Corrected		Not Corrected			

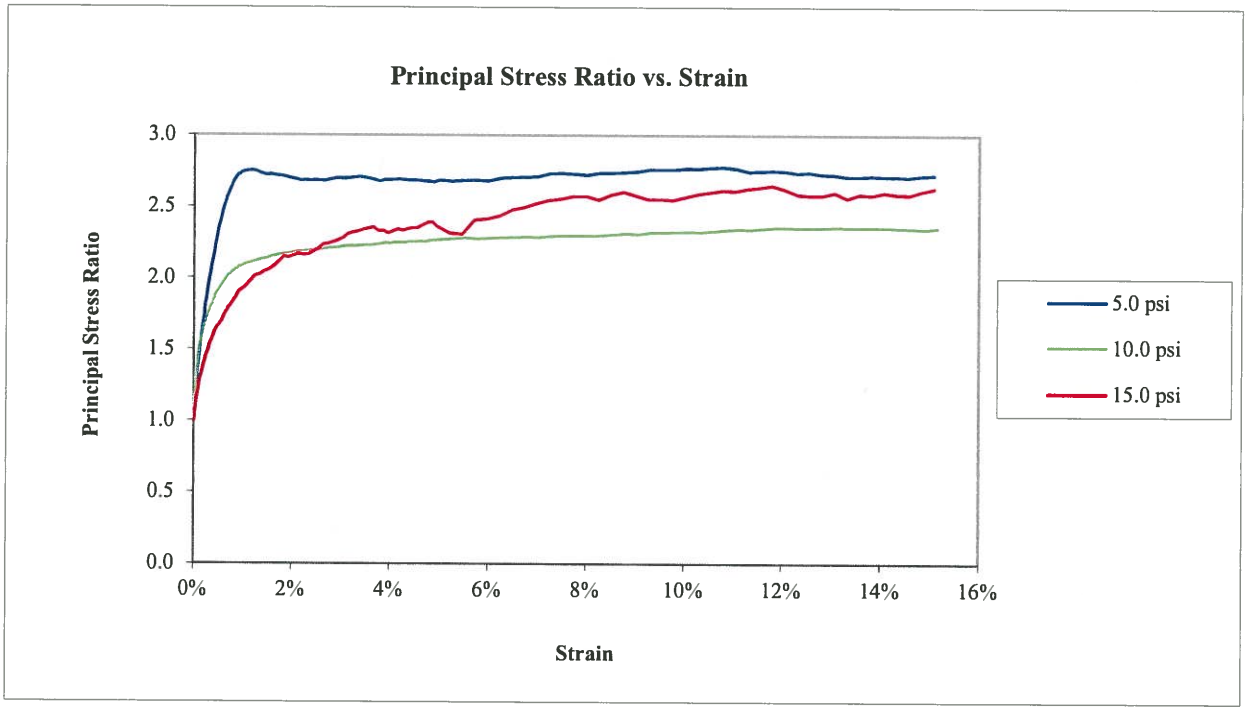
Golder Associates Inc. **Atlanta, Georgia**	**Title:** **ASTM D4767** **CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST REPORT** **SAMPLE AND TEST DATA**				
Job Short Title: **F&ME/G5662.01-I-20/26-126 CORRIDOR IMPROVEMENT/SC**					
Sample: **BS-4 0.0-3.0'**	**Technician:** **PWM/FT** **Check:** PWM	**Reviewed:** DA **Approved:**	**Start Date:** **3/20/2018**	**Job Number:** **1898300**	**Figure:** **1**





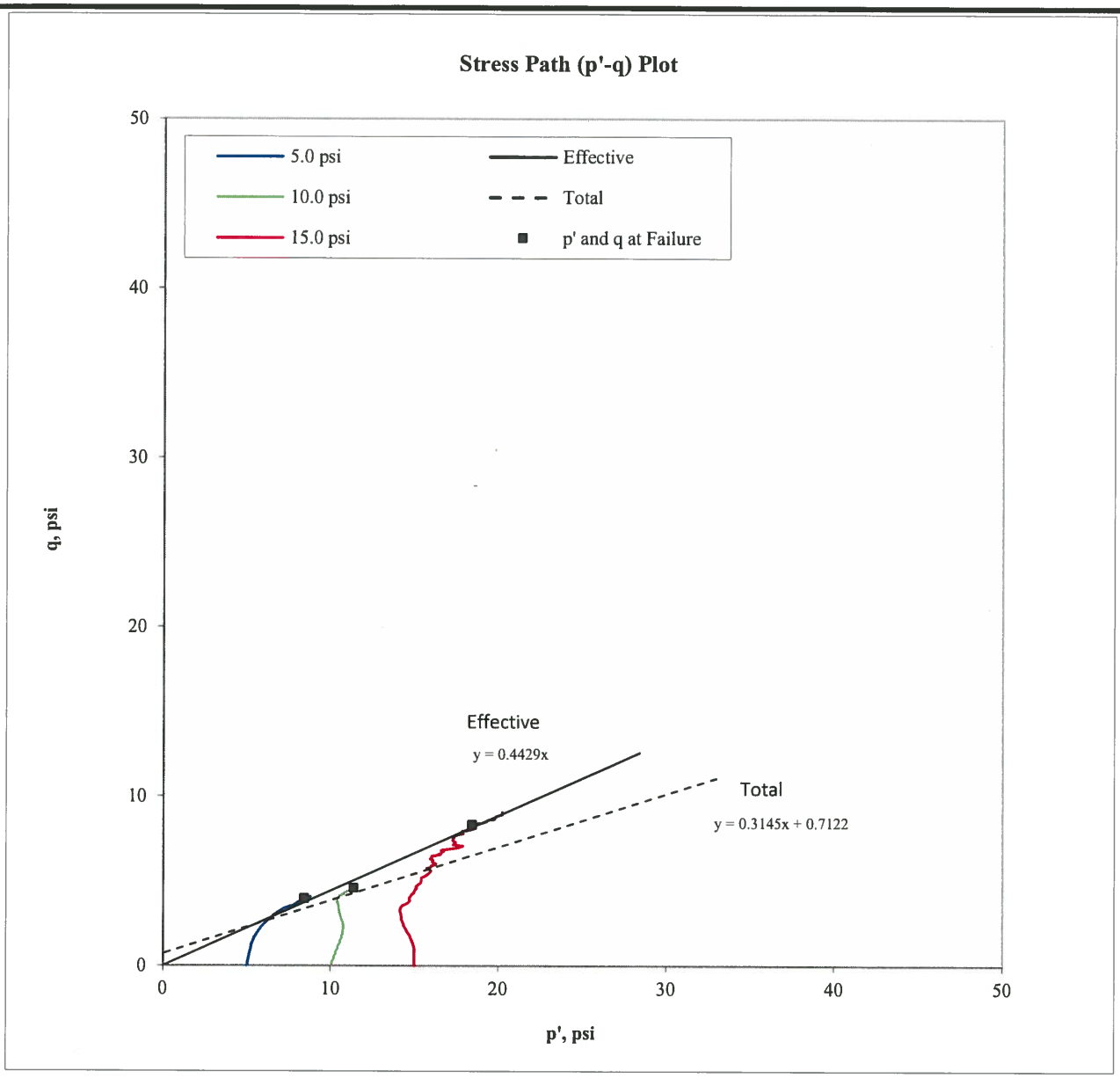
Golder Associates Inc. **Atlanta, Georgia**	**Title:** **ASTM D4767** **CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST REPORT** **q AND EXCESS PORE PRESSURE PLOTS**				
Job Short Title: **F&ME/G5662.01-I-20/26-126 CORRIDOR IMPROVEMENT/SC**					
Sample: **BS-4 0.0-3.0'**	**Technician:** **PWM/FT** **Check:**	**Reviewed:** DA **Approved:**	**Start Date:** **3/20/2018**	**Job Number:** **1898300**	**Figure:** **2**





Golder Associates Inc. **Atlanta, Georgia**	**Title:** **ASTM D4767** **CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST REPORT** **DEVIATOR STRESS AND PRINCIPAL STRESS RATIO PLOT**				
Job Short Title: **F&ME/G5662.01-I-20/26-126 CORRIDOR IMPROVEMENT/SC**					
Sample: **BS-4 0.0-3.0'**	**Technician:** **PWM/FT** **Check:**	**Reviewed:** DA **Approved:**	**Start Date:** **3/20/2018**	**Job Number:** **1898300**	**Figure:** **3**

Stress Path (p'-q) Plot



Confining Pressure (psi)	p at failure (psi)	p' at failure (psi)	q at failure (psi)
5.0	9.0	8.4	4.0
10.0	14.6	11.4	4.6
15.0	23.3	18.4	8.3

Effective

α ' =	23.9	degree
a' =	0.0	psi

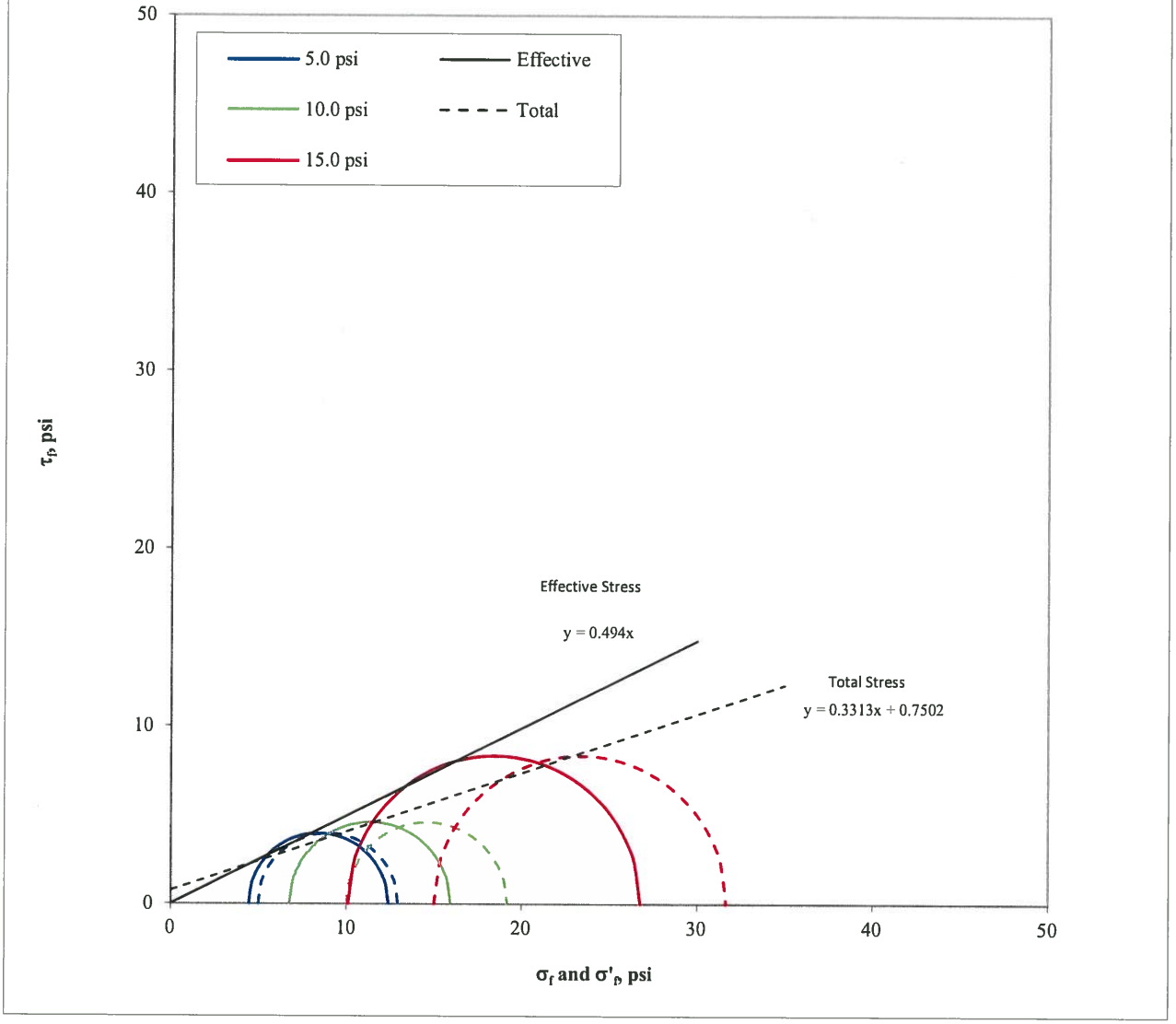
Total

α =	17.5	degree
a =	0.7	psi

Note: The laboratory testing relates only to the sample tested. GAI neither accepts responsibility for nor makes claims to the final use and purpose of the material.

Golder Associates Inc. Atlanta, Georgia	**Title:** ASTM D4767 CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST REPORT STRESS PATH PLOT				
Job Short Title: F&ME/G5662.01-I-20/26-126 CORRIDOR IMPROVEMENT/SC					
Sample: BS-4 0.0-3.0'	**Technician:** PWM/FT **Check:**	**Reviewed:** DA **Approved:**	**Start Date:** 3/20/2018	**Job Number:** 1898300	**Figure:** 4

Mohr's Circle Diagram



Confining Pressure (psi)	σ'_1 at failure (psi)	σ'_3 at failure (psi)	σ_1 at failure (psi)	σ_3 at failure (psi)
5.0	12.4	4.5	12.9	5.0
10.0	15.9	6.8	19.2	10.0
15.0	26.8	10.1	31.7	15.0

Effective

ϕ' =	26.3	degree
c' =	0.0	psi

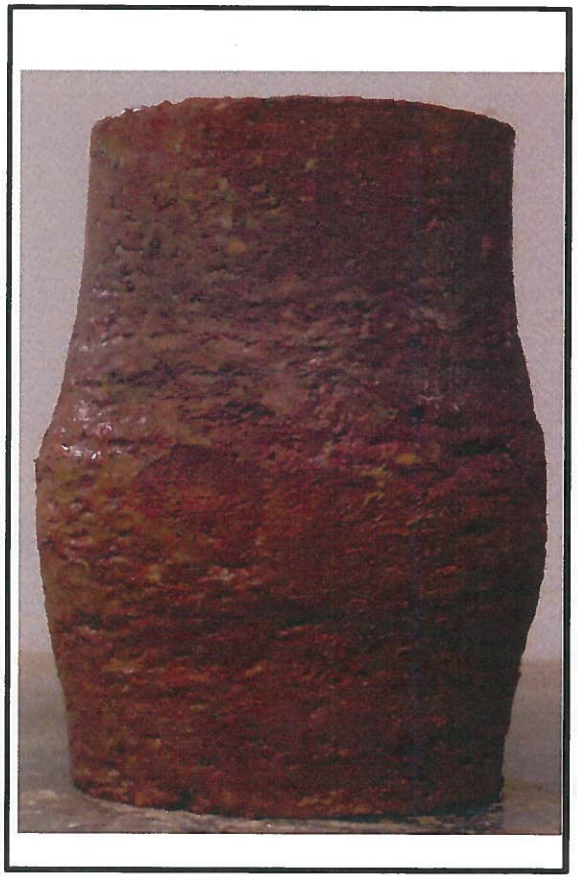
Total

ϕ =	18.3	degree
c =	0.8	psi

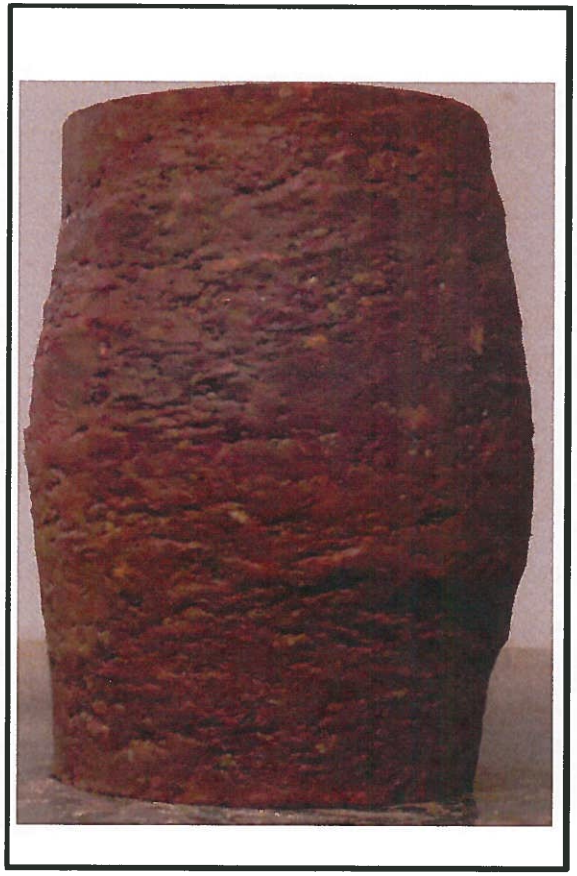
Note: The laboratory testing relates only to the sample tested. GAI neither accepts responsibility for nor makes claims to the final use and purpose of the material.

Golder Associates Inc. Atlanta, Georgia	**Title:** ASTM D4767 CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST REPORT MOHR'S CIRCLE DIAGRAM				
Job Short Title: F&ME/G5662.01-I-20/26-126 CORRIDOR IMPROVEMENT/SC					
Sample: BS-4 0.0-3.0'	**Technician:** PWM/FT **Check:** PWM	**Reviewed:** DA **Approved:**	**Start Date:** 3/20/2018	**Job Number:** 1898300	**Figure:** 5

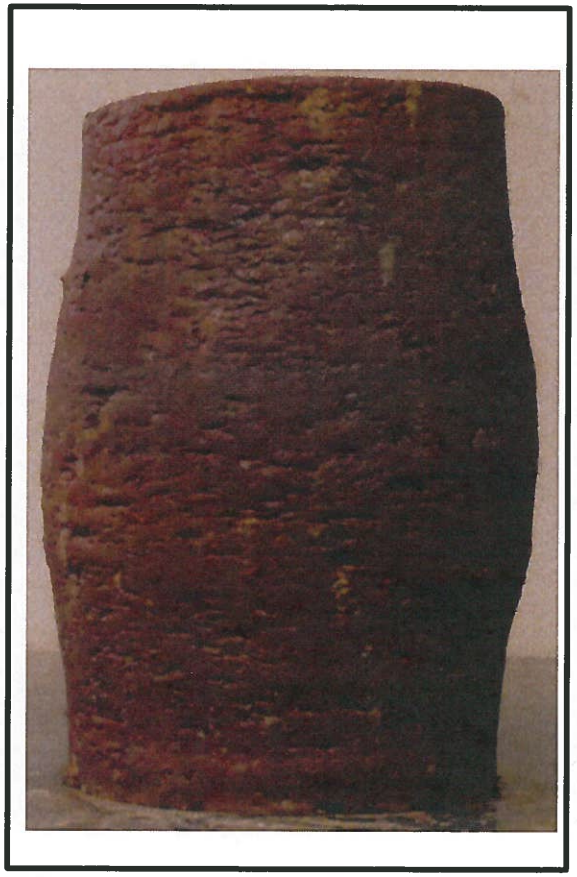
5.0 psi



10.0 psi



15.0 psi



Golder Associates Inc. **Atlanta, Georgia**	**Title:** ASTM D4767 CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST REPORT SPECIMENS PHOTOGRAPH - 5.0 | 10.0 | 15.0 psi				
Job Short Title: F&ME/G5662.01-I-20/26-126 CORRIDOR IMPROVEMENT/SC					
Sample: BS-4 0.0-3.0'	**Technician:** PWM/FT **Check:**	**Reviewed:** DA **Approved:**	**Start Date:** 3/20/2018	**Job Number:** 1898300	**Figure:** 6

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0575	**DATE SAMPLE RECEIVED:**	3/27/2018
DESCRIPTION OF SOIL:	Lean CLAY (CL) with F/M Sand A-7-6(14)		
TESTED BY:	MB	**DATE OF TESTING:**	3/30/2018
		DATE OF WEIGHING:	4/2/2018

BORING NO.	BS-5				
SAMPLE NO.	18-0575C				
SAMPLE DEPTH	0.0-5.0'				
WATER CONTENT, W%	16.0				

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

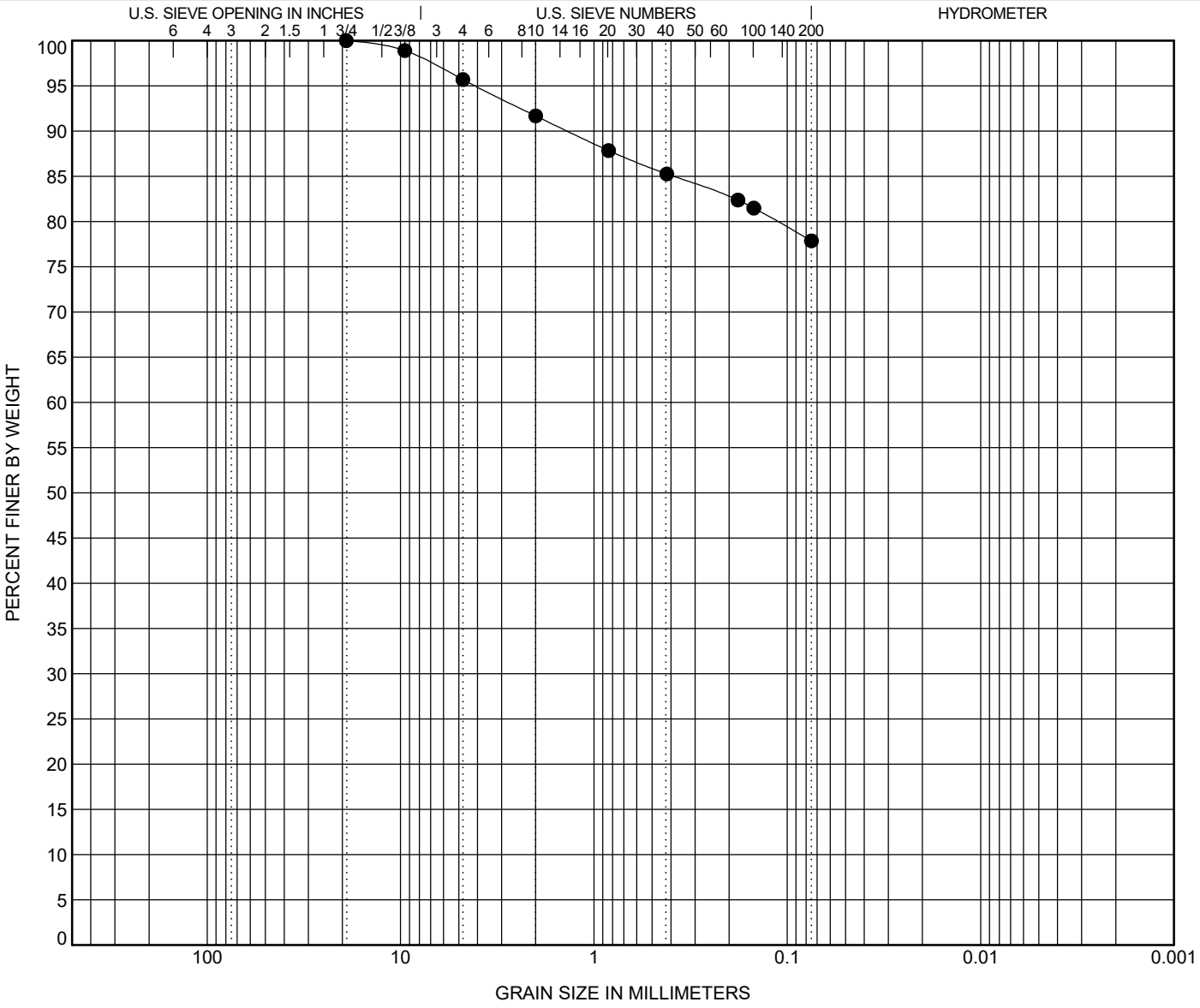
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**BS-5**	**5.0**	**Lean CLAY (CL) with F/M Sand A-7-6(14)**	**41**	**23**	**18**		

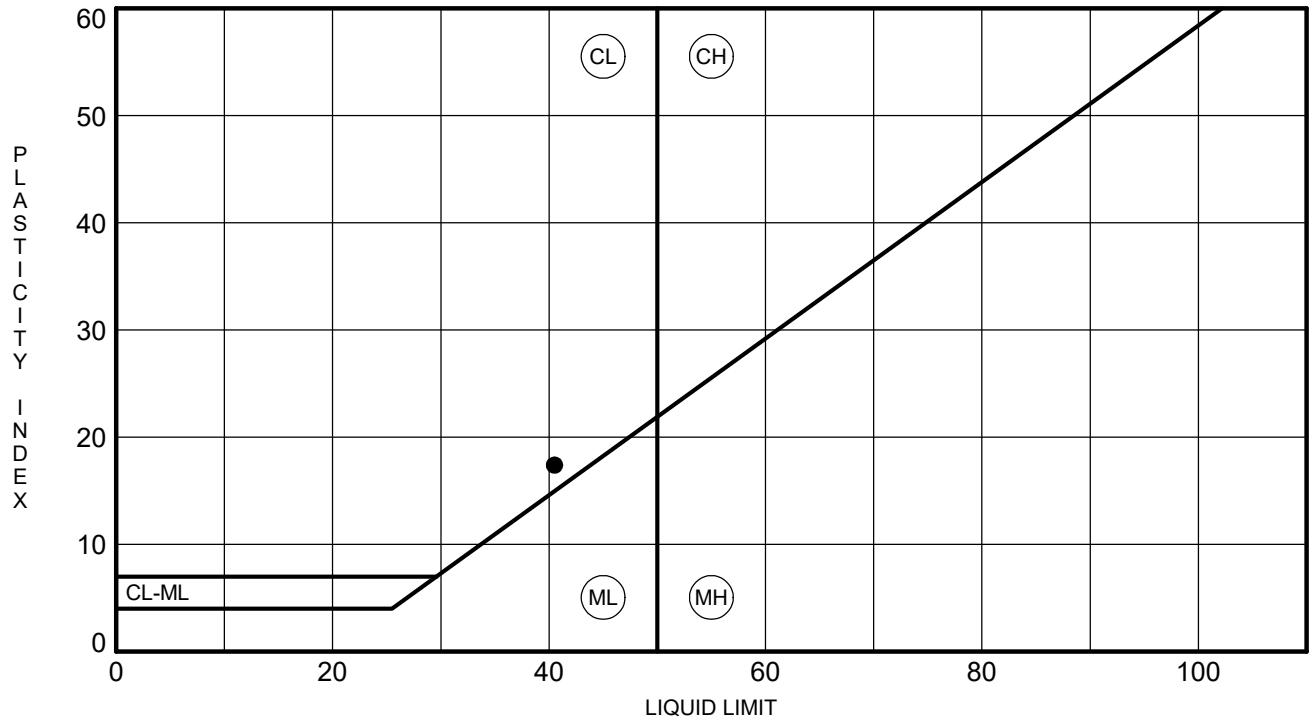
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**BS-5**	**5.0**	**19.1**	**4.096**			**4.3**	**17.8**	**77.9**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/13/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



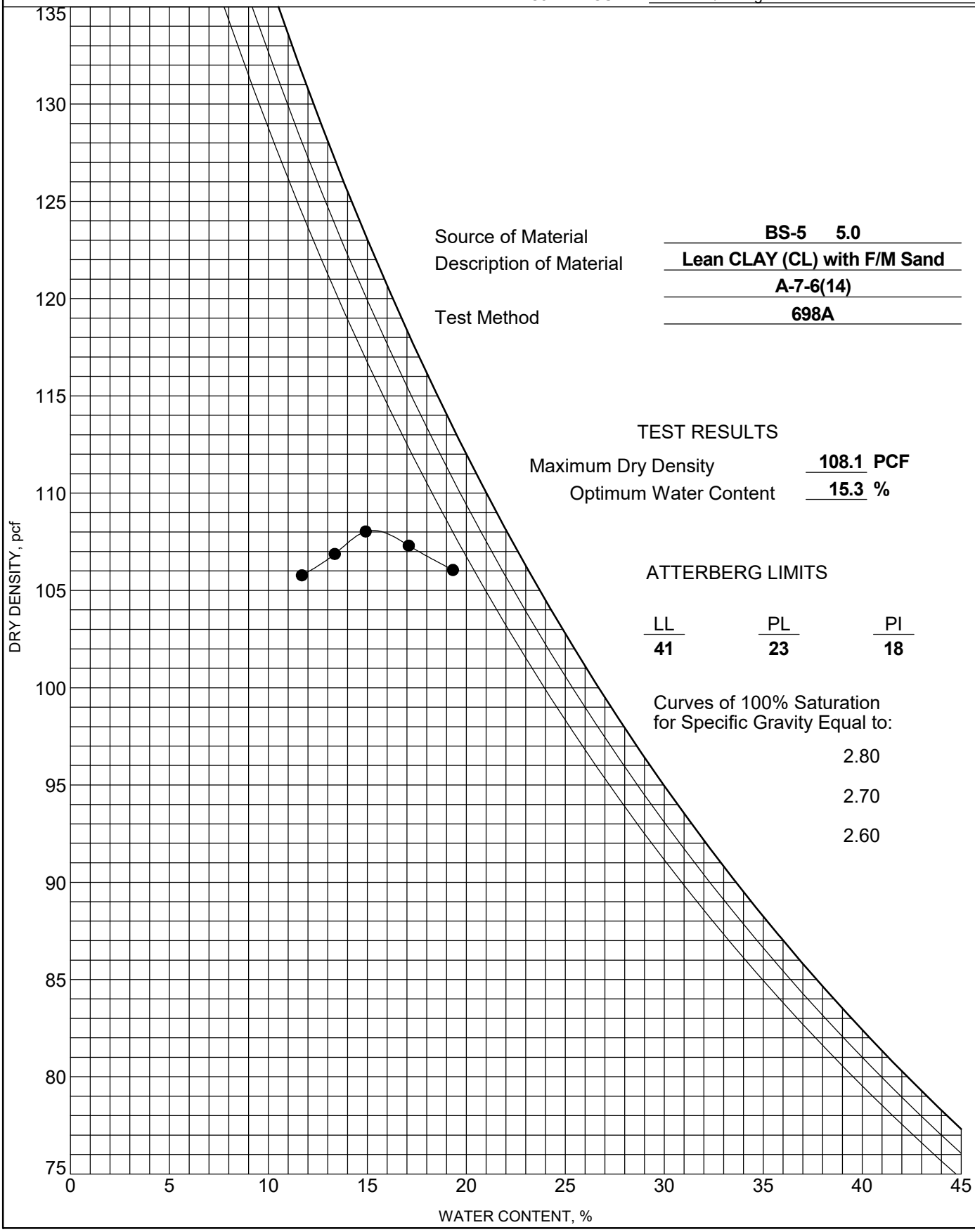
	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**BS-5**	**5.0**	**41**	**23**	**18**	**78**	**Lean CLAY (CL) with F/M Sand A-7-6(14)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/13/18

MOISTURE-DENSITY RELATIONSHIP

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



Source of Material	**BS-5 5.0**
Description of Material	**Lean CLAY (CL) with F/M Sand**
	A-7-6(14)
Test Method	**698A**

TEST RESULTS

Maximum Dry Density	**108.1**	**PCF**
Optimum Water Content	**15.3**	**%**

ATTERBERG LIMITS

LL	PL	PI
41	**23**	**18**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

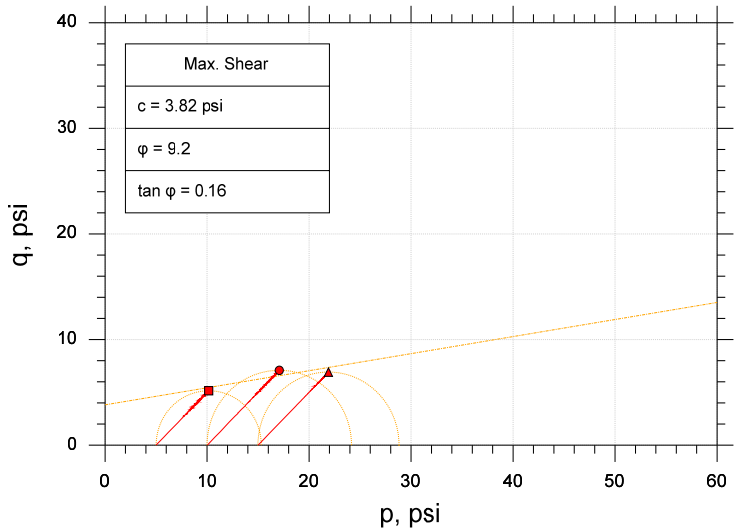
2.70

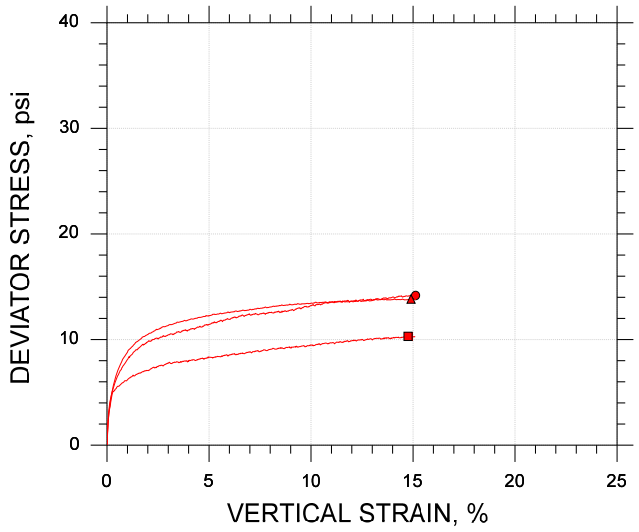
2.60

COMPACTION - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/13/18

Client: F&ME Consultants	
Project Name: I-20/26/126 Corridor Improv.	
Project Location: ---	
Project Number: GTX-307802	
Tested By: jm	Checked By: mcm
Boring ID: ---	
Preparation: reconstituted	
Description: Moist, yellwoish brown clay with sand	
Classification: ---	
Group Symbol: ---	
Liquid Limit: ---	Plastic Limit: ---
Plasticity Index: ---	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





		■	●	▲	
Symbol					
Sample ID		BS-5	BS-5	BS-5	
Depth, ft		0-5 ft	0-5 ft	0-5 ft	
Test Number		CU-5-1	CU-5-2	CU-5-3	
Initial	Height, in	4.097	4.099	4.097	
	Diameter, in	2.020	2.020	2.020	
	Moisture Content (from Cuttings), %	17.2	16.9	16.8	
	Dry Density, pcf	103.	103.	103.	
	Saturation (Wet Method), %	72.7	71.8	71.8	
	Void Ratio	0.638	0.634	0.633	
Before Shear	Moisture Content, %	24.5	23.4	23.5	
	Dry Density, pcf	101.	103.	103.	
	Cross-sectional Area (Method A), in²	3.236	3.203	3.200	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.663	0.633	0.633	
	Back Pressure, psi	134.4	134.4	128.5	
Vertical Effective Consolidation Stress, psi		5.029	10.04	14.98	
Horizontal Effective Consolidation Stress, psi		4.987	10.03	15.00	
Vertical Strain after Consolidation, %		0.01773	0.2196	0.7367	
Volumetric Strain after Consolidation, %		0.06235	0.6927	2.604	
Time to 50% Consolidation, min		36.00	49.00	56.25	
Shear Strength, psi		5.150	7.087	6.917	
Strain at Failure, %		14.8	15.1	14.9	
Strain Rate, %/min		0.01600	0.01600	0.01600	
Deviator Stress at Failure, psi		10.30	14.17	13.83	
Effective Minor Principal Stress at Failure, psi		7.431	10.50	9.417	
Effective Major Principal Stress at Failure, psi		17.73	24.67	23.25	
B-Value		0.96	0.96	0.97	

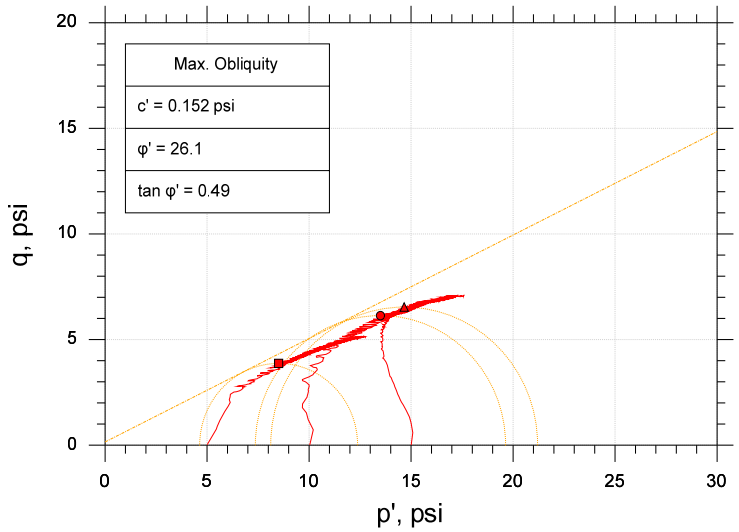
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

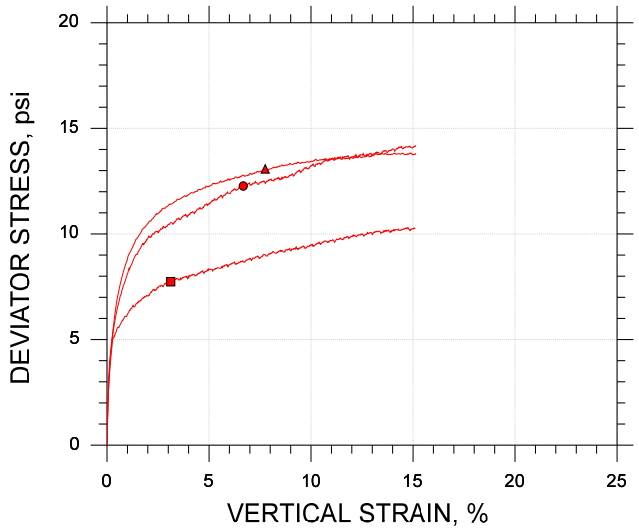
Remarks:

Target Compaction: 95% of (108.1 pcf) at Optimum Moisture Content (15.3%) + 2% - As Requested by Client

Client: F&ME Consultants	
Project Name: I-20/26/126 Corridor Improv.	
Project Location: ---	
Project Number: GTX-307802	
Tested By: jm	Checked By: mcm
Boring ID: ---	
Preparation: reconstituted	
Description: Moist, yellwoish brown clay with sand	
Classification: ---	
Group Symbol: ---	
Liquid Limit: ---	Plastic Limit: ---
Plasticity Index: ---	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





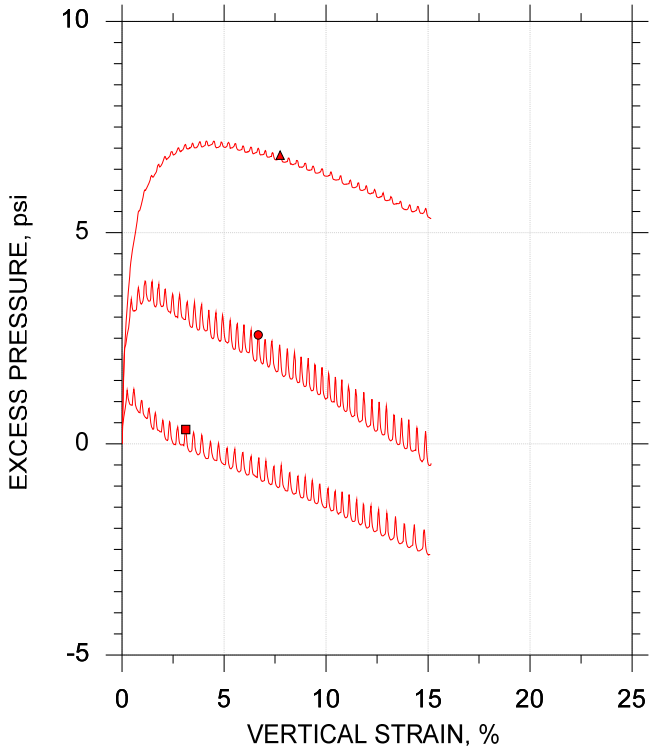
Symbol		■	●	▲	
Sample ID		BS-5	BS-5	BS-5	
Depth, ft		0-5 ft	0-5 ft	0-5 ft	
Test Number		CU-5-1	CU-5-2	CU-5-3	
Initial	Height, in	4.097	4.099	4.097	
	Diameter, in	2.020	2.020	2.020	
	Moisture Content (from Cuttings), %	17.2	16.9	16.8	
	Dry Density, pcf	103.	103.	103.	
	Saturation (Wet Method), %	72.7	71.8	71.8	
	Void Ratio	0.638	0.634	0.633	
Before Shear	Moisture Content, %	24.5	23.4	23.5	
	Dry Density, pcf	101.	103.	103.	
	Cross-sectional Area (Method A), in²	3.236	3.203	3.200	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.663	0.633	0.633	
	Back Pressure, psi	134.4	134.4	128.5	
Vertical Effective Consolidation Stress, psi		5.029	10.04	14.98	
Horizontal Effective Consolidation Stress, psi		4.987	10.03	15.00	
Vertical Strain after Consolidation, %		0.01773	0.2196	0.7367	
Volumetric Strain after Consolidation, %		0.06235	0.6927	2.604	
Time to 50% Consolidation, min		36.00	49.00	56.25	
Shear Strength, psi		3.870	6.133	6.541	
Strain at Failure, %		3.13	6.68	7.75	
Strain Rate, %/min		0.01600	0.01600	0.01600	
Deviator Stress at Failure, psi		7.740	12.27	13.08	
Effective Minor Principal Stress at Failure, psi		4.639	7.366	8.120	
Effective Major Principal Stress at Failure, psi		12.38	19.63	21.20	
B-Value		0.96	0.96	0.97	

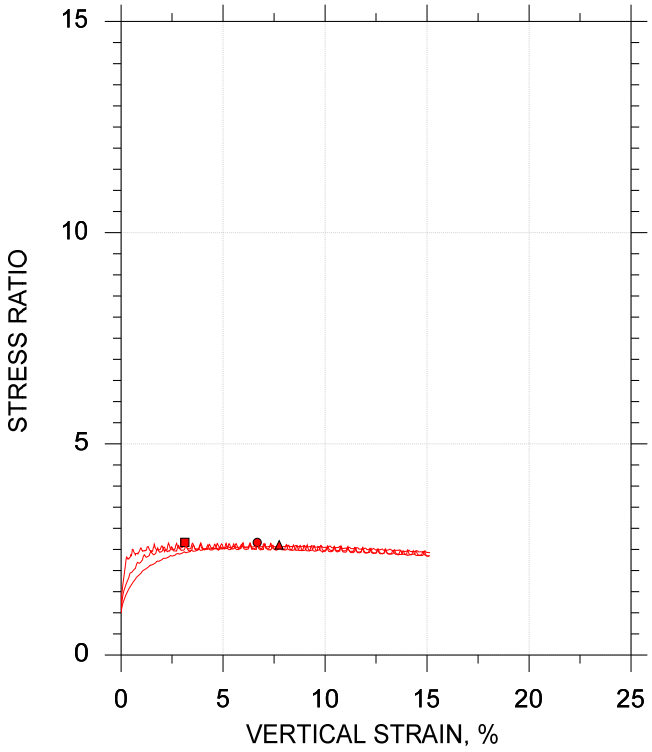
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

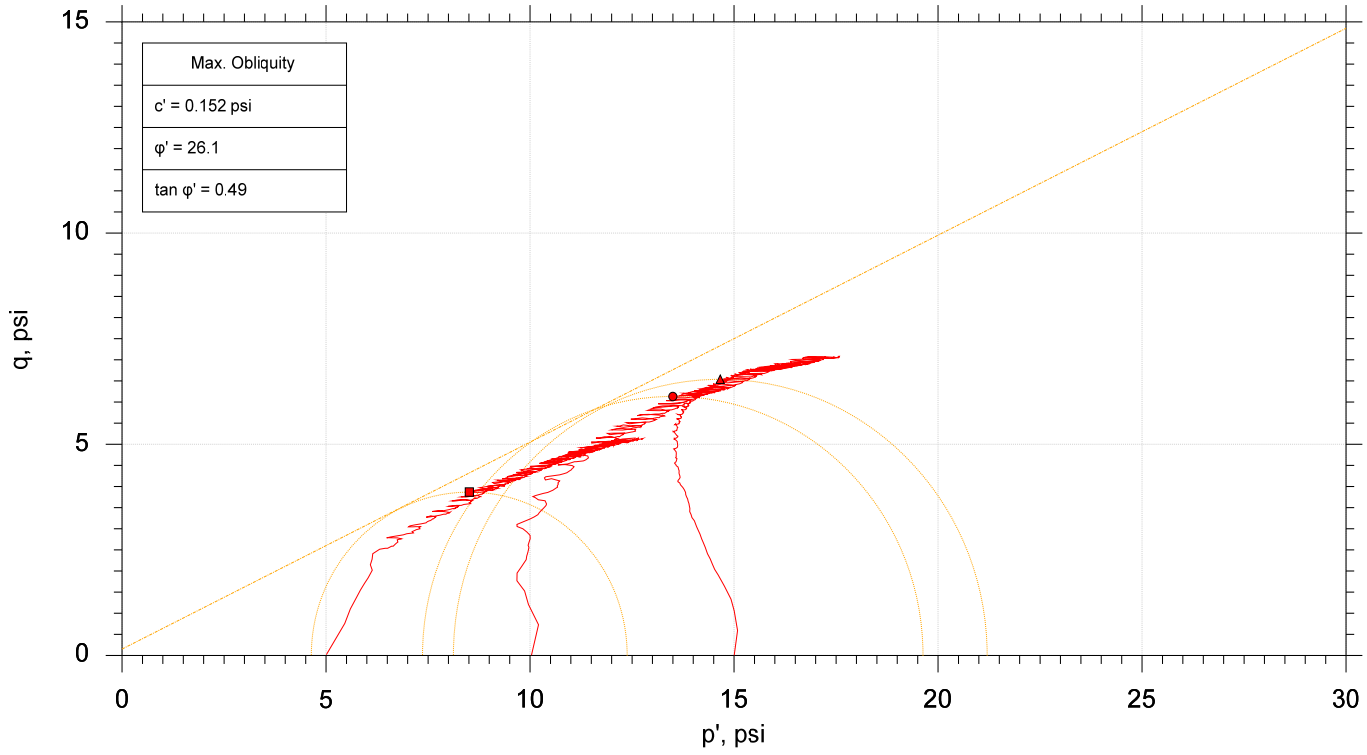
Remarks:

Target Compaction: 95% of (108.1 pcf) at Optimum Moisture Content (15.3%) + 2% - As Requested by Client

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	BS-5	CU-5-1	0-5 ft	jm	4/25/18	mcm	5/10/18	307802-CU-5-1m.dat
●	BS-5	CU-5-2	0-5 ft	jm	4/23/18	mcm	5/10/18	307802-CU-5-2m.dat
▲	BS-5	CU-5-3	0-5 ft	jm	4/23/18	mcm	5/10/18	307802-CU-5-3m.dat

GeoTesting EXPRESS

Project: I-20/26/126 Corridor Improv.	Location: ---	Project No.: GTX-307802
Boring No.: ---	Sample Type: reconstituted	
Description: Moist, yellwoish brown clay with sand		
Remarks: Target Compaction: 95% of (108.1 pcf) at Optimum Moisture Content (15.3%) + 2% - As Requested by Client		

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0397	**DATE SAMPLE RECEIVED:**	3/1/2018
DESCRIPTION OF SOIL:	SILT (ML) with Sand A-4(0)		
TESTED BY:	MB	**DATE OF TESTING:**	3/2/2018
		DATE OF WEIGHING:	3/5/2018

BORING NO.	BS-6				
SAMPLE NO.	18-0397C				
SAMPLE DEPTH	0.0-4.0'				
WATER CONTENT, W%	21.9				

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

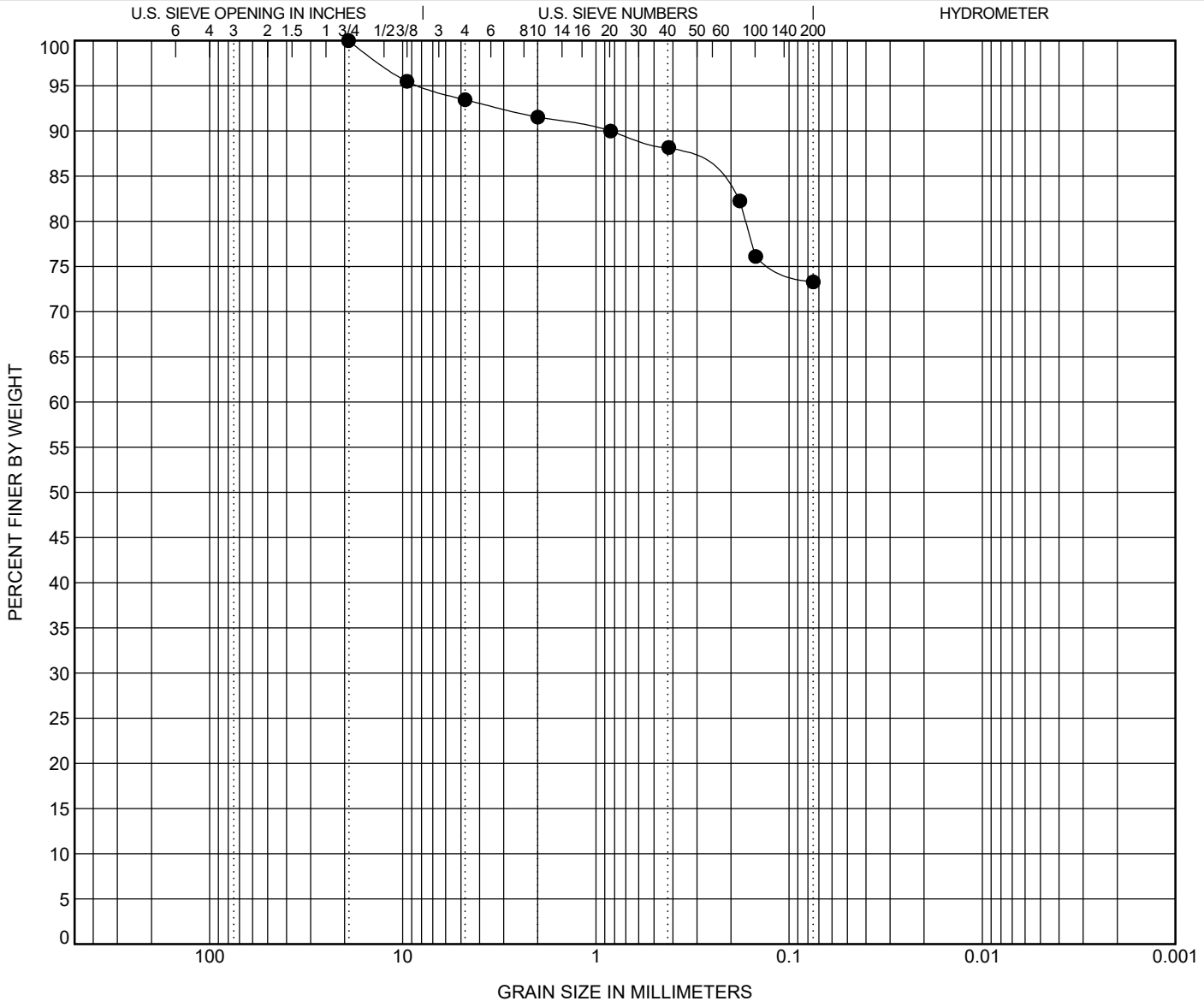
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

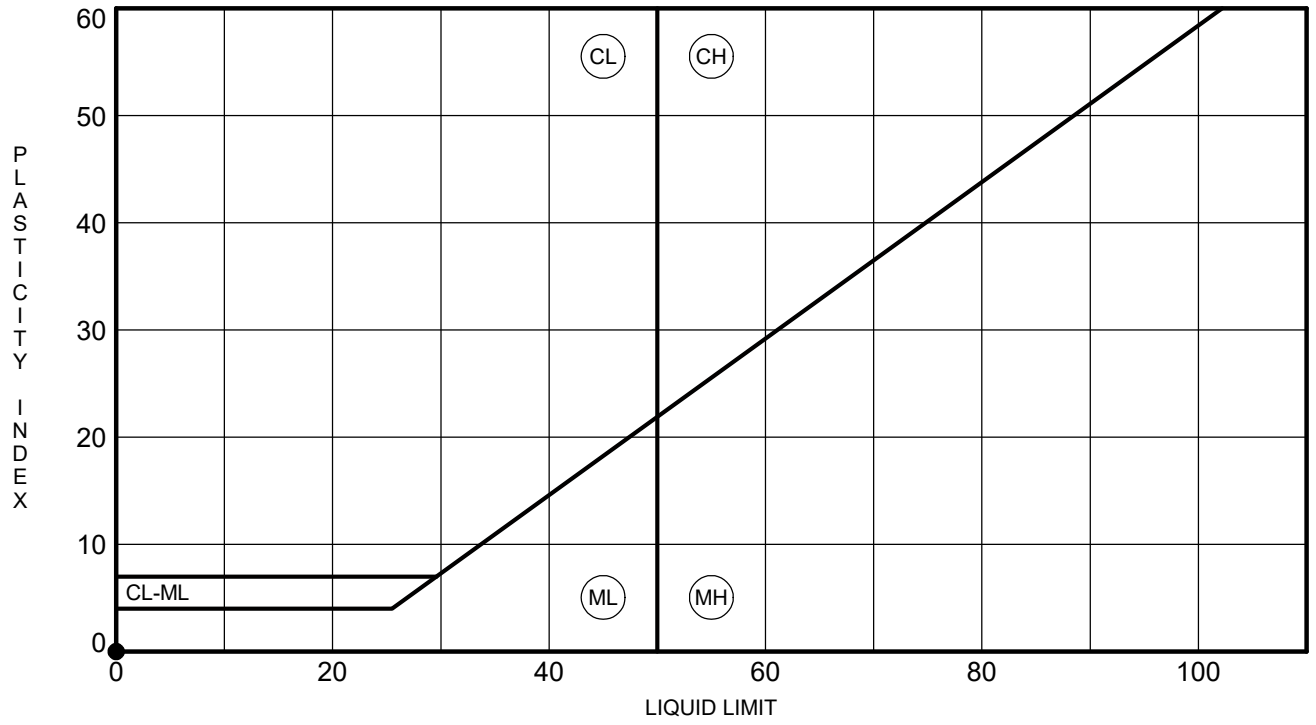
	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**BS-6**	**4.0**	**SILT (ML) with F/M Sand A-4(0)**	**NP**	**NP**	**NP**		

	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**BS-6**	**4.0**	**19.1**	**8.05**			**6.5**	**20.2**	**73.3**	

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



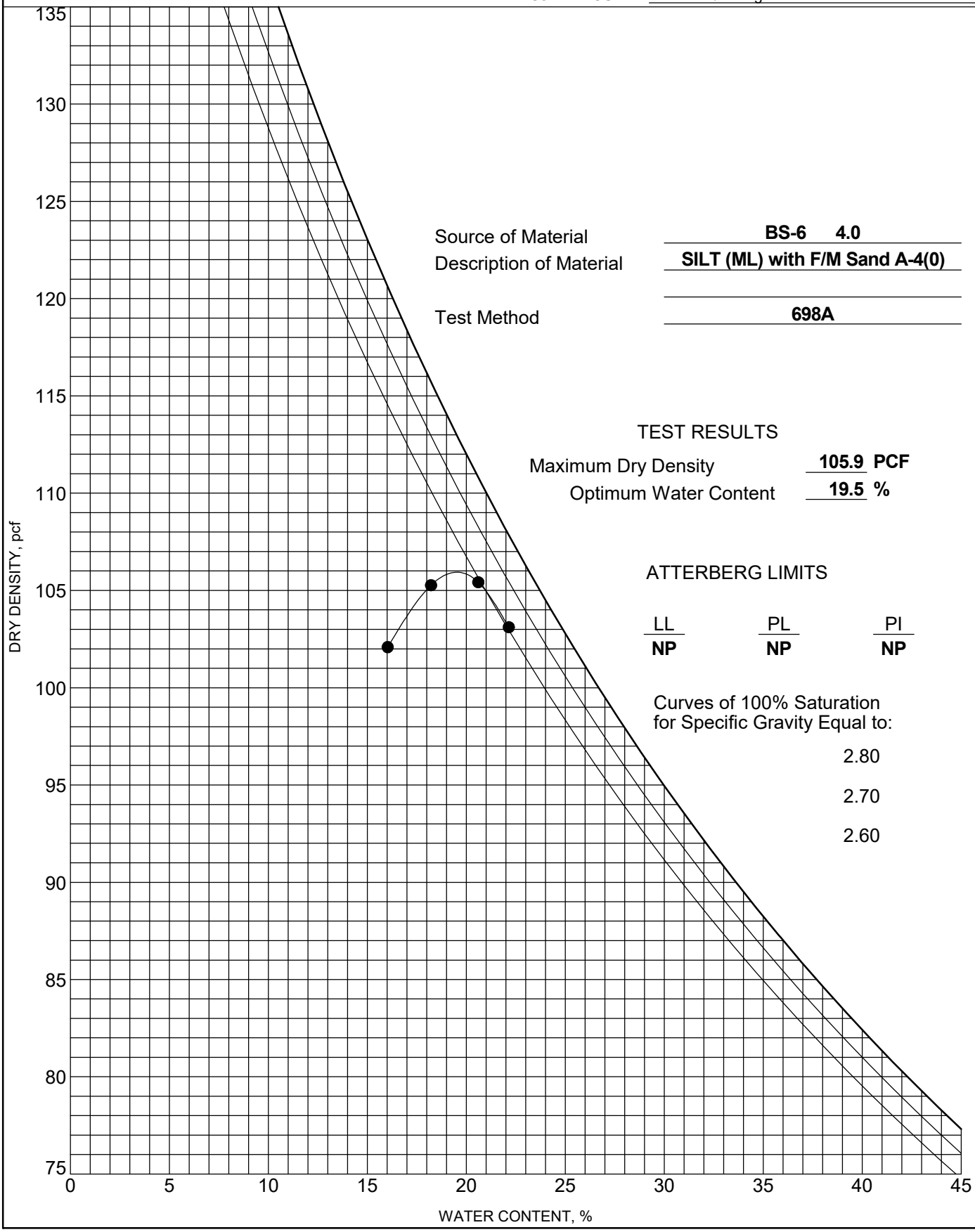
	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**BS-6**	**4.0**	**NP**	**NP**	**NP**	**73**	**SILT (ML) with F/M Sand A-4(0)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 3/9/18

MOISTURE-DENSITY RELATIONSHIP

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



Source of Material **BS-6 4.0**

Description of Material **SILT (ML) with F/M Sand A-4(0)**

Test Method **698A**

TEST RESULTS

Maximum Dry Density **105.9** **PCF**

Optimum Water Content **19.5** **%**

ATTERBERG LIMITS

LL	PL	PI
NP	**NP**	**NP**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

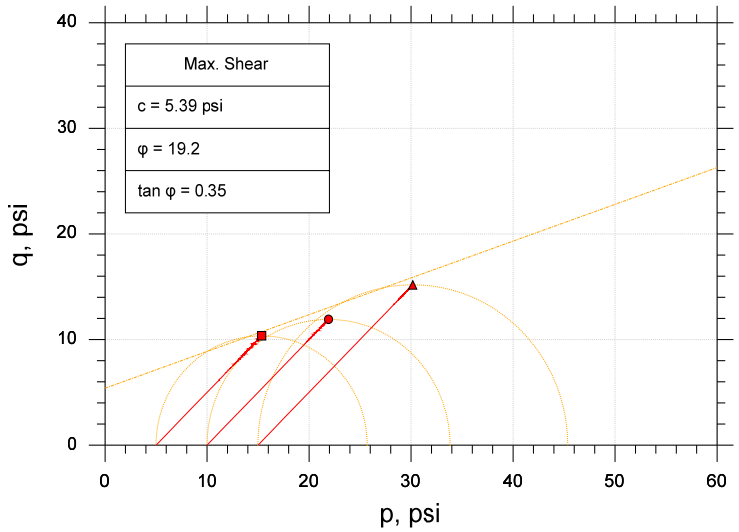
2.70

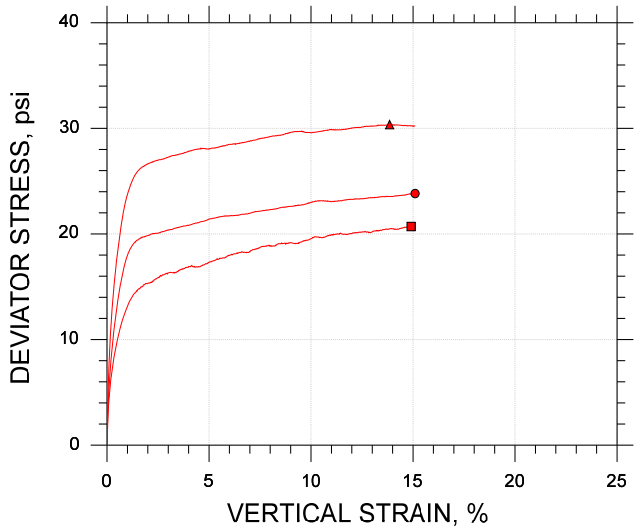
2.60

COMPACTION - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 3/9/18

Client: F&ME Consultants	
Project Name: I-20/26/126 Corridor Improvemen	
Project Location: ---	
Project Number: GTX-307802	
Tested By: jm	Checked By: mcm
Boring ID: ---	
Preparation: reconstituted	
Description: Moist, yellowish red silt with sand	
Classification: ---	
Group Symbol: ---	
Liquid Limit: NP	Plastic Limit: NP
Plasticity Index: NP	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		■	●	▲	
Sample ID		BS-6	BS-6	BS-6	
Depth, ft		0-4 ft	0-4 ft	0-4 ft	
Test Number		CU-3-1	CU-3-2	CU-3-3	
Initial	Height, in	4.096	4.097	4.092	
	Diameter, in	2.020	2.020	2.020	
	Moisture Content (from Cuttings), %	21.5	21.4	21.2	
	Dry Density, pcf	101.	101.	101.	
	Saturation (Wet Method), %	86.1	85.8	85.8	
	Void Ratio	0.673	0.672	0.669	
Before Shear	Moisture Content, %	25.1	24.5	23.9	
	Dry Density, pcf	100.	101.	102.	
	Cross-sectional Area (Method A), in²	3.210	3.190	3.170	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.677	0.662	0.644	
	Back Pressure, psi	93.00	111.0	95.00	
Vertical Effective Consolidation Stress, psi		4.999	9.984	15.01	
Horizontal Effective Consolidation Stress, psi		5.000	9.992	15.01	
Vertical Strain after Consolidation, %		0.08388	0.2701	0.4477	
Volumetric Strain after Consolidation, %		0.2288	0.9746	1.636	
Time to 50% Consolidation, min		1.690	2.250	0.8100	
Shear Strength, psi		10.35	11.91	15.18	
Strain at Failure, %		14.9	15.1	13.9	
Strain Rate, %/min		0.06000	0.06000	0.06000	
Deviator Stress at Failure, psi		20.70	23.83	30.36	
Effective Minor Principal Stress at Failure, psi		8.964	10.28	13.04	
Effective Major Principal Stress at Failure, psi		29.66	34.11	43.40	
B-Value		0.95	0.95	0.95	

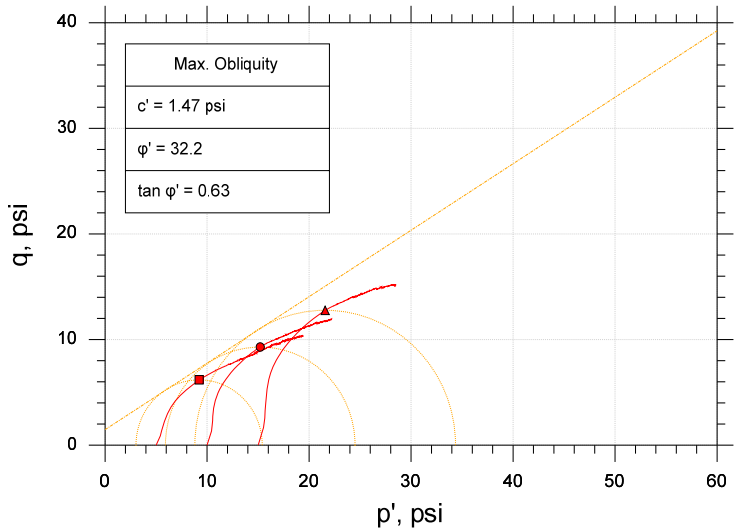
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Atterberg Limits determined by ASTM D4318.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

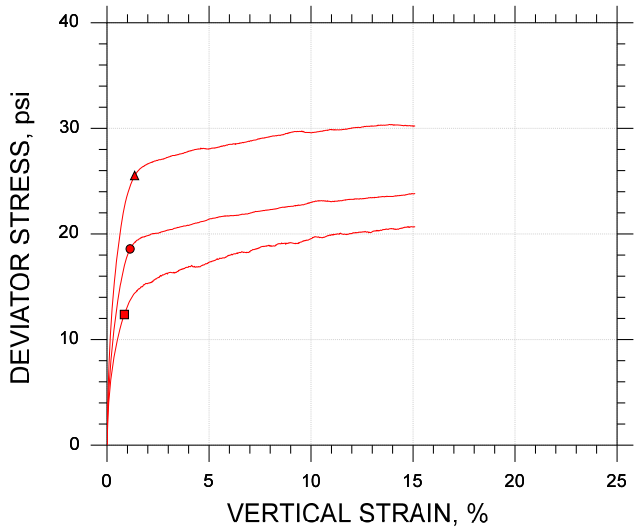
Remarks:

Target Compaction: 95% of (105.9 pcf) at Optimum Moisture Content (19.5%) + 2% - As Requested by Client

Client: F&ME Consultants	
Project Name: I-20/26/126 Corridor Improvemen	
Project Location: ---	
Project Number: GTX-307802	
Tested By: jm	Checked By: mcm
Boring ID: ---	
Preparation: reconstituted	
Description: Moist, yellowish red silt with sand	
Classification: ---	
Group Symbol: ---	
Liquid Limit: NP	Plastic Limit: NP
Plasticity Index: NP	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767

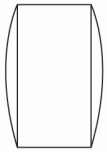


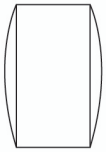


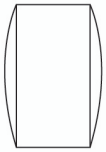
Symbol		■	●	▲	
Sample ID		BS-6	BS-6	BS-6	
Depth, ft		0-4 ft	0-4 ft	0-4 ft	
Test Number		CU-3-1	CU-3-2	CU-3-3	
Initial	Height, in	4.096	4.097	4.092	
	Diameter, in	2.020	2.020	2.020	
	Moisture Content (from Cuttings), %	21.5	21.4	21.2	
	Dry Density, pcf	101.	101.	101.	
	Saturation (Wet Method), %	86.1	85.8	85.8	
	Void Ratio	0.673	0.672	0.669	
Before Shear	Moisture Content, %	25.1	24.5	23.9	
	Dry Density, pcf	100.	101.	102.	
	Cross-sectional Area (Method A), in²	3.210	3.190	3.170	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.677	0.662	0.644	
	Back Pressure, psi	93.00	111.0	95.00	
Vertical Effective Consolidation Stress, psi		4.999	9.984	15.01	
Horizontal Effective Consolidation Stress, psi		5.000	9.992	15.01	
Vertical Strain after Consolidation, %		0.08388	0.2701	0.4477	
Volumetric Strain after Consolidation, %		0.2288	0.9746	1.636	
Time to 50% Consolidation, min		1.690	2.250	0.8100	
Shear Strength, psi		6.188	9.292	12.77	
Strain at Failure, %		0.851	1.13	1.35	
Strain Rate, %/min		0.06000	0.06000	0.06000	
Deviator Stress at Failure, psi		12.38	18.58	25.54	
Effective Minor Principal Stress at Failure, psi		3.034	5.917	8.812	
Effective Major Principal Stress at Failure, psi		15.41	24.50	34.35	
B-Value		0.95	0.95	0.95	

Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Atterberg Limits determined by ASTM D4318.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

Remarks:

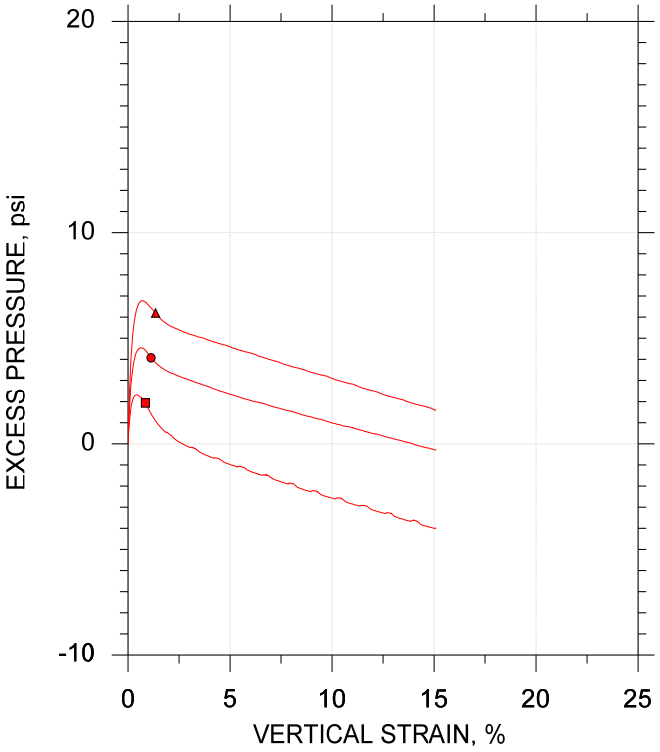


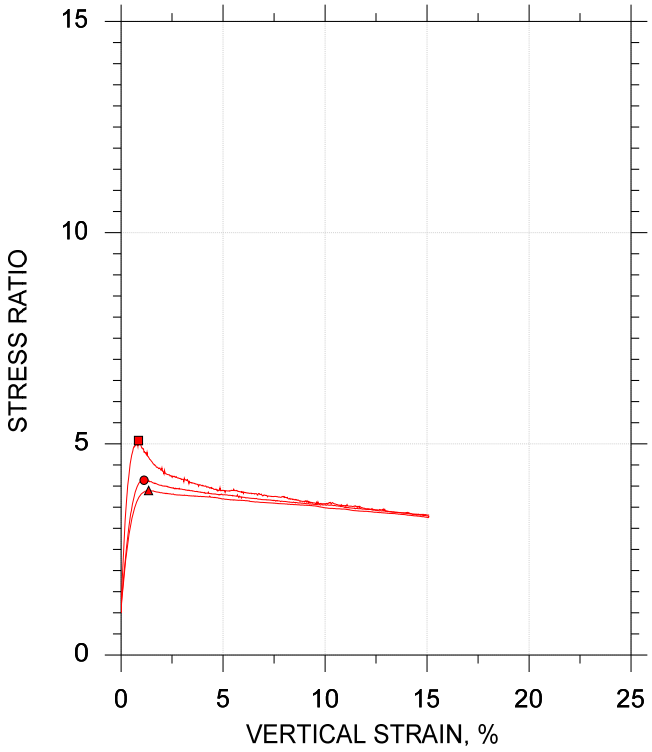


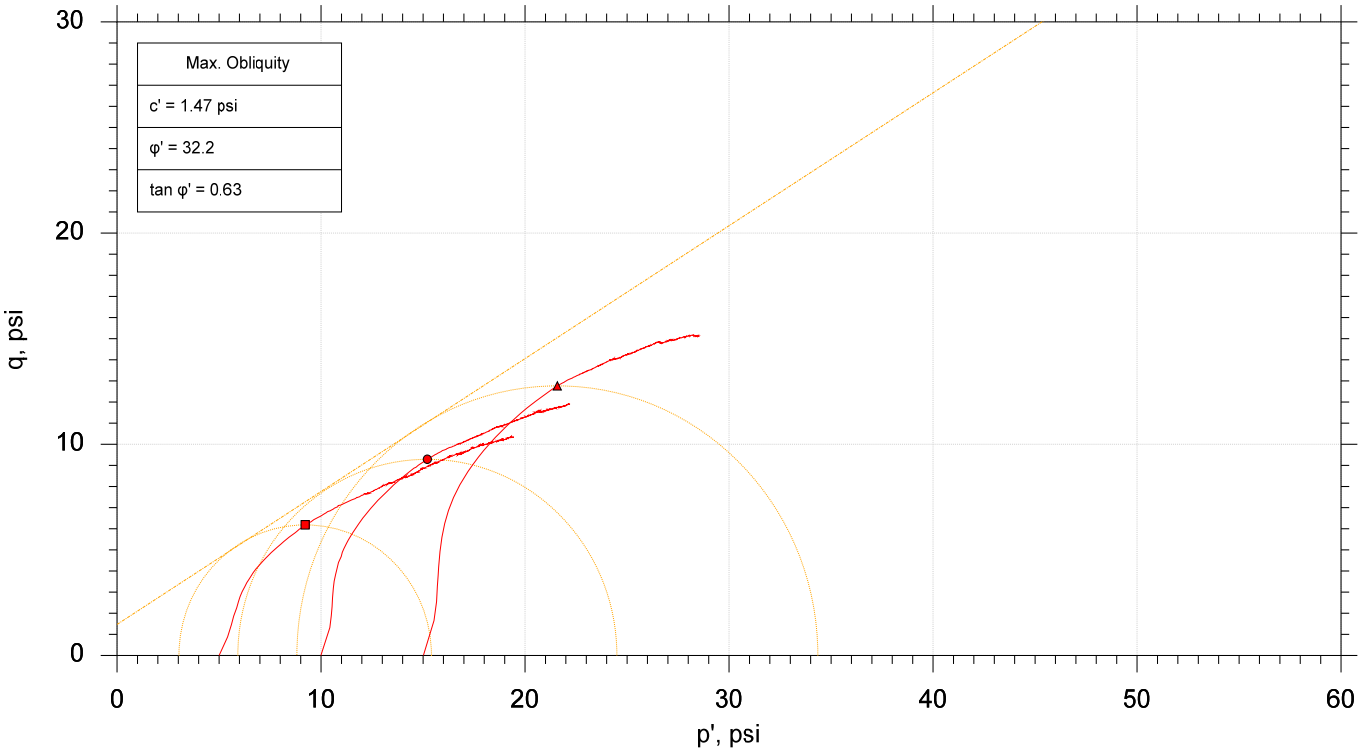


Target Compaction: 95% of (105.9 pcf) at Optimum Moisture Content (19.5%) + 2% - As Requested by Client

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	BS-6	CU-3-1	0-4 ft	jm	3/19/18	mcm	3/27/18	307802-CU-3-1m.dat
●	BS-6	CU-3-2	0-4 ft	jm	3/20/18	mcm	3/27/18	307802-CU-3-2m.dat
▲	BS-6	CU-3-3	0-4 ft	jm	3/19/18	mcm	3/27/18	307802-CU-3-3m.dat

GeoTesting EXPRESS

Project: I-20/26/126 Corridor Improvemen	Location: ---	Project No.: GTX-307802
Boring No.: ---	Sample Type: reconstituted	
Description: Moist, yellowish red silt with sand		
Remarks: Target Compaction: 95% of (105.9 pcf) at Optimum Moisture Content (19.5%) + 2% - As Requested by Client		

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0576	**DATE SAMPLE RECEIVED:**	3/27/2018
DESCRIPTION OF SOIL:	SILT (ML) A-7-6(17)		
TESTED BY:	MB	**DATE OF TESTING:**	3/30/2018
		DATE OF WEIGHING:	4/2/2018

BORING NO.	BS-7				
SAMPLE NO.	18-0576C				
SAMPLE DEPTH	0.0-5.0'				
WATER CONTENT, W%	23.1				

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

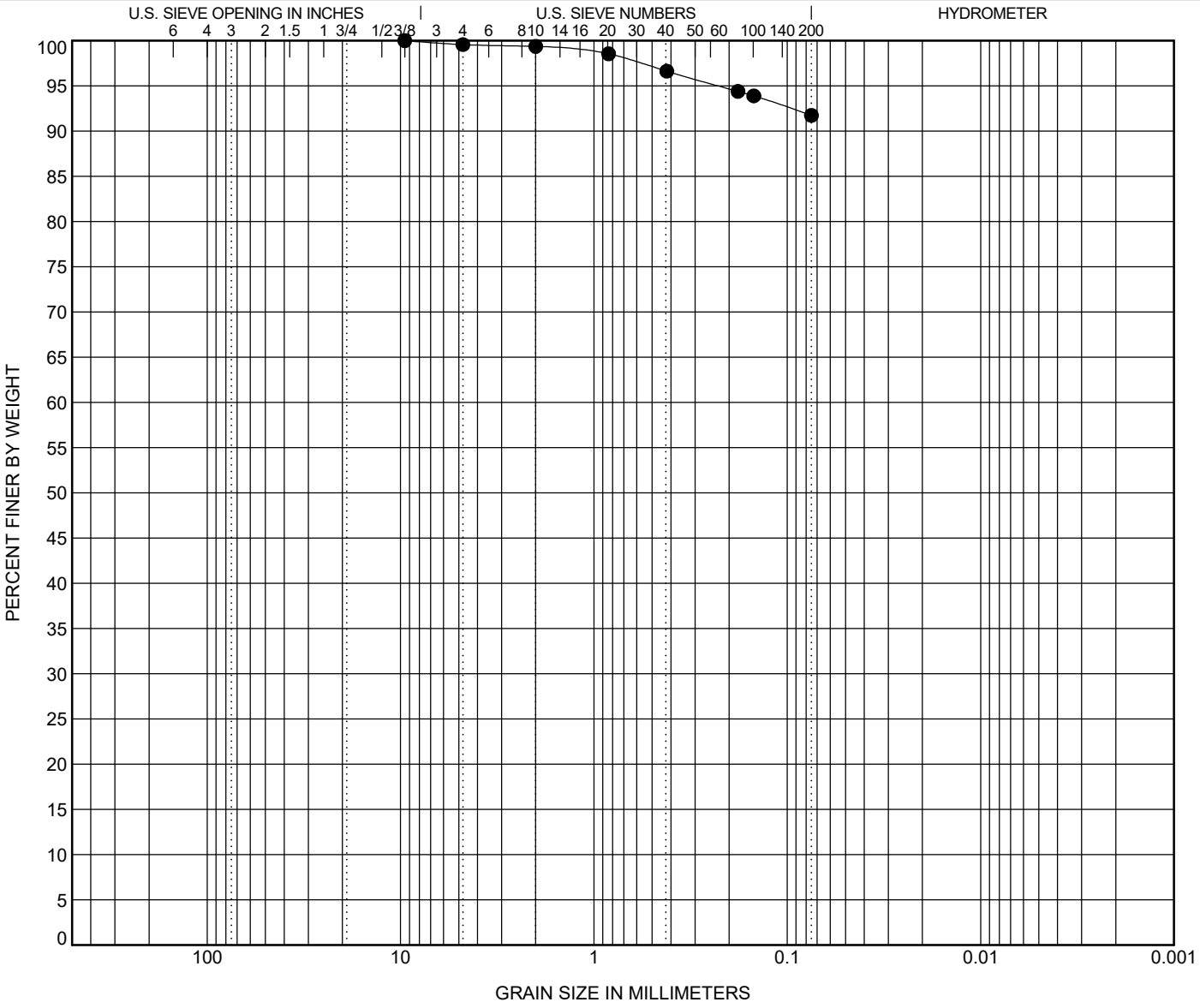
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**BS-7**	**5.0**	**SILT (ML) A-7-6(17)**	**45**	**29**	**16**		

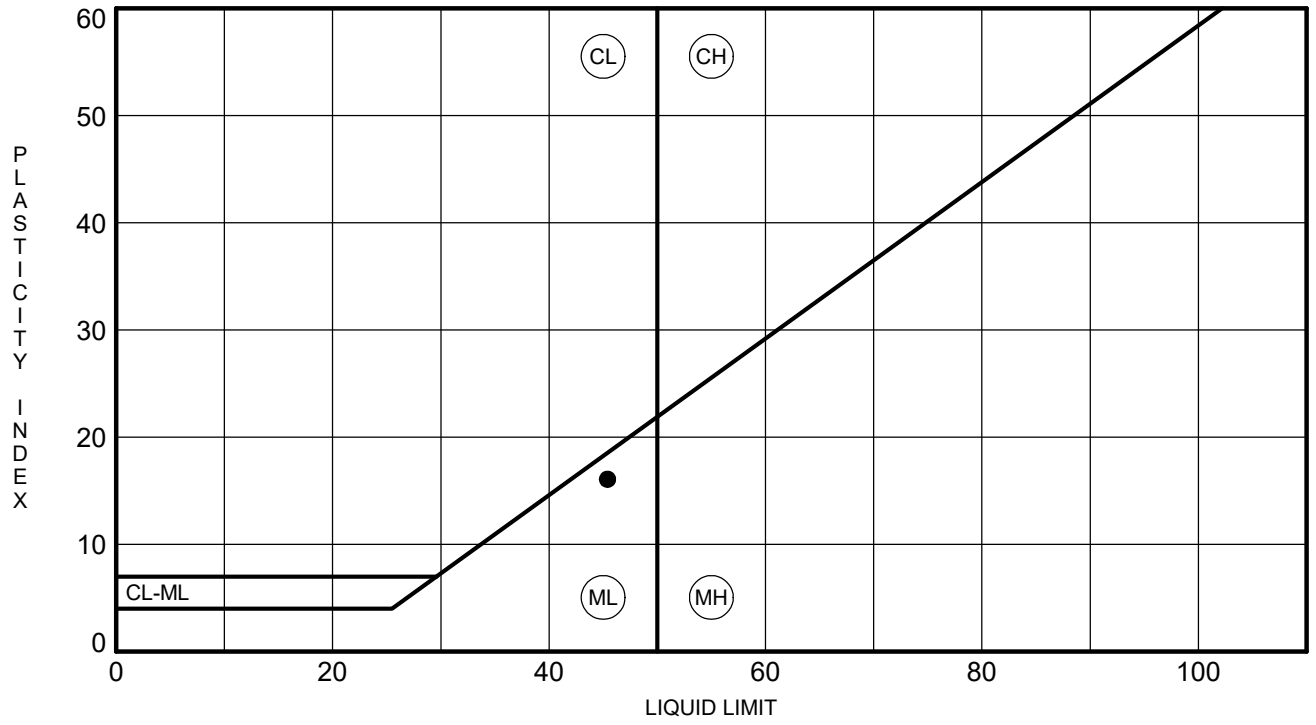
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**BS-7**	**5.0**	**9.52**	**0.227**			**0.5**	**7.8**	**91.7**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/13/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



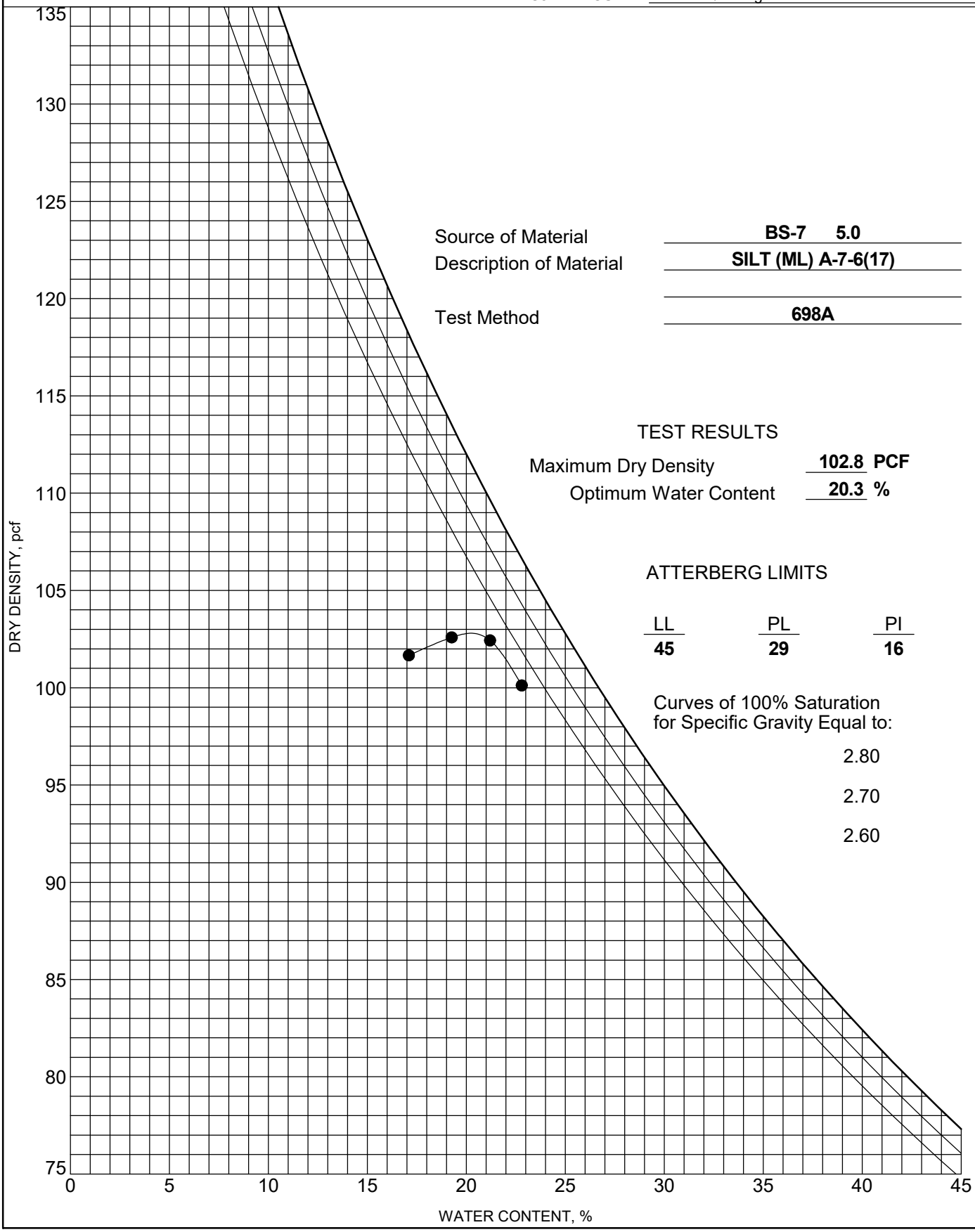
	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**BS-7**	**5.0**	**45**	**29**	**16**	**92**	**SILT (ML) A-7-6(17)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/13/18

MOISTURE-DENSITY RELATIONSHIP

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



Source of Material **BS-7 5.0**

Description of Material **SILT (ML) A-7-6(17)**

Test Method **698A**

TEST RESULTS

Maximum Dry Density **102.8** **PCF**

Optimum Water Content **20.3** **%**

ATTERBERG LIMITS

LL	PL	PI
45	**29**	**16**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

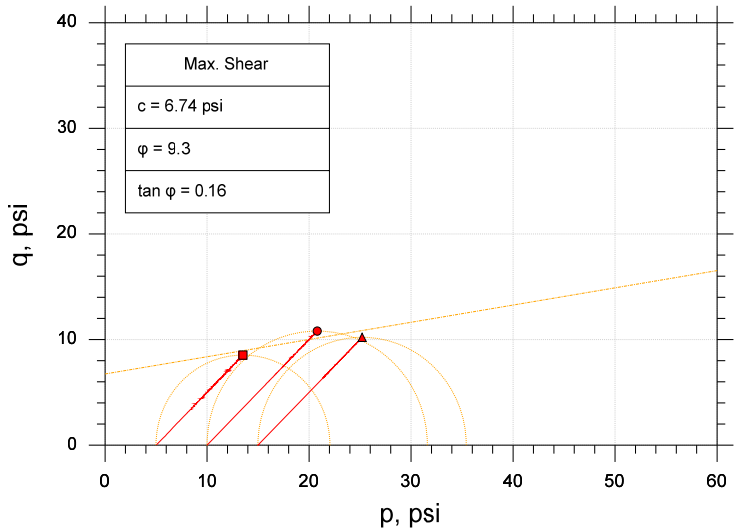
2.70

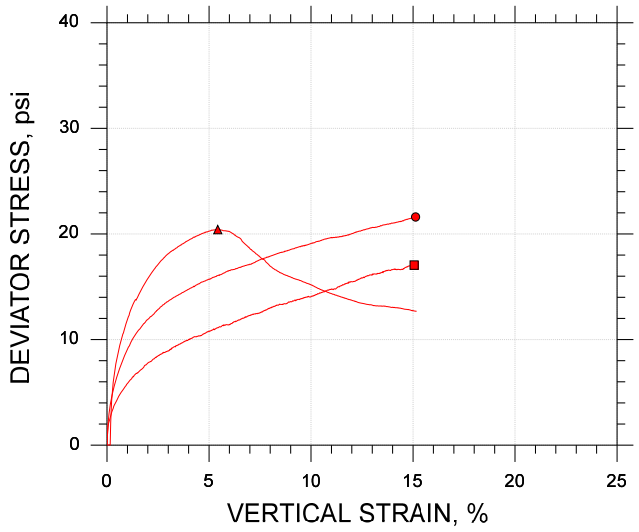
2.60

COMPACTION - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/13/18

Client: F&ME Consultants	
Project Name: I-20/26/126 Corridor Improv.	
Project Location: ---	
Project Number: GTX-307802	
Tested By: jm	Checked By: mcm
Boring ID: ---	
Preparation: reconstituted	
Description: Moist, reddish yellow silt	
Classification: ---	
Group Symbol: ---	
Liquid Limit: ---	Plastic Limit: ---
Plasticity Index: ---	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		■	●	▲	
Sample ID		BS-7	BS-7	BS-7	
Depth, ft		0-5 ft	0-5 ft	0-5 ft	
Test Number		CU-6-1	CU-6-2	CU-6-3	
Initial	Height, in	4.101	4.102	4.093	
	Diameter, in	2.020	2.020	2.020	
	Moisture Content (from Cuttings), %	22.3	22.3	22.2	
	Dry Density, pcf	97.7	97.6	97.9	
	Saturation (Wet Method), %	82.8	82.9	83.2	
	Void Ratio	0.726	0.727	0.722	
Before Shear	Moisture Content, %	26.8	26.7	25.4	
	Dry Density, pcf	97.9	98.0	100.	
	Cross-sectional Area (Method A), in²	3.199	3.196	3.143	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.723	0.720	0.685	
	Back Pressure, psi	111.0	129.0	117.0	
Vertical Effective Consolidation Stress, psi		5.048	9.976	14.95	
Horizontal Effective Consolidation Stress, psi		5.009	9.998	14.99	
Vertical Strain after Consolidation, %		0.2145	0.7031	0.9171	
Volumetric Strain after Consolidation, %		0.7884	2.119	4.163	
Time to 50% Consolidation, min		2.890	2.560	2.250	
Shear Strength, psi		8.529	10.80	10.21	
Strain at Failure, %		15.1	15.1	5.43	
Strain Rate, %/min		0.06000	0.06000	0.06000	
Deviator Stress at Failure, psi		17.06	21.61	20.42	
Effective Minor Principal Stress at Failure, psi		8.399	10.79	9.844	
Effective Major Principal Stress at Failure, psi		25.46	32.39	30.26	
B-Value		0.95	0.97	0.95	

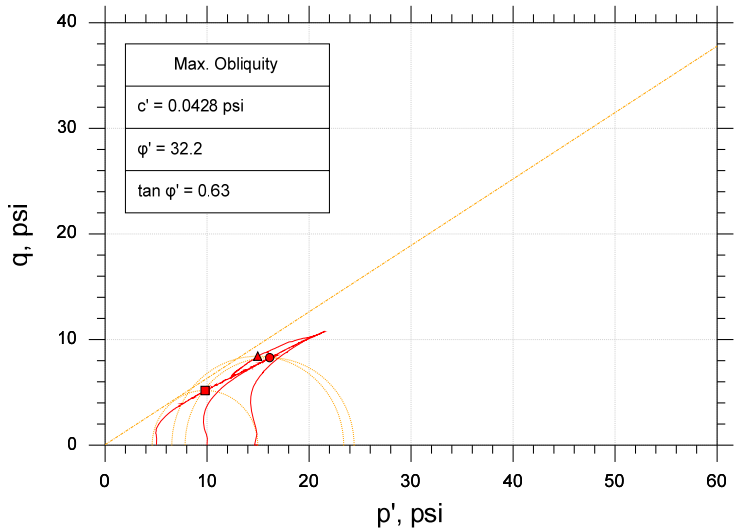
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

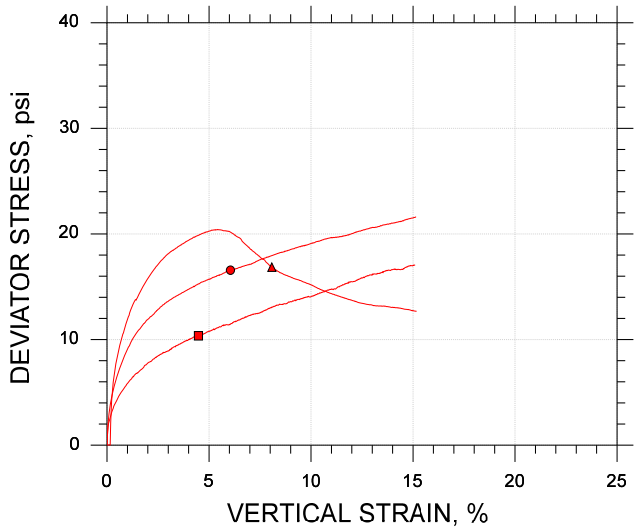
Remarks:

Target Compaction: 95% of (102.8 pcf) at Optimum Moisture Content (22.3%) + 2% - As Requested by Client

Client: F&ME Consultants	
Project Name: I-20/26/126 Corridor Improv.	
Project Location: ---	
Project Number: GTX-307802	
Tested By: jm	Checked By: mcm
Boring ID: ---	
Preparation: reconstituted	
Description: Moist, reddish yellow silt	
Classification: ---	
Group Symbol: ---	
Liquid Limit: ---	Plastic Limit: ---
Plasticity Index: ---	Estimated Specific Gravity: 2.7

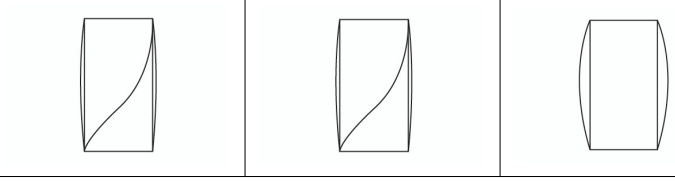
CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		■	●	▲	
Sample ID		BS-7	BS-7	BS-7	
Depth, ft		0-5 ft	0-5 ft	0-5 ft	
Test Number		CU-6-1	CU-6-2	CU-6-3	
Initial	Height, in	4.101	4.102	4.093	
	Diameter, in	2.020	2.020	2.020	
	Moisture Content (from Cuttings), %	22.3	22.3	22.2	
	Dry Density, pcf	97.7	97.6	97.9	
	Saturation (Wet Method), %	82.8	82.9	83.2	
	Void Ratio	0.726	0.727	0.722	
Before Shear	Moisture Content, %	26.8	26.7	25.4	
	Dry Density, pcf	97.9	98.0	100.	
	Cross-sectional Area (Method A), in²	3.199	3.196	3.143	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.723	0.720	0.685	
	Back Pressure, psi	111.0	129.0	117.0	
Vertical Effective Consolidation Stress, psi		5.048	9.976	14.95	
Horizontal Effective Consolidation Stress, psi		5.009	9.998	14.99	
Vertical Strain after Consolidation, %		0.2145	0.7031	0.9171	
Volumetric Strain after Consolidation, %		0.7884	2.119	4.163	
Time to 50% Consolidation, min		2.890	2.560	2.250	
Shear Strength, psi		5.176	8.286	8.425	
Strain at Failure, %		4.48	6.05	8.08	
Strain Rate, %/min		0.06000	0.06000	0.06000	
Deviator Stress at Failure, psi		10.35	16.57	16.85	
Effective Minor Principal Stress at Failure, psi		4.620	7.848	6.542	
Effective Major Principal Stress at Failure, psi		14.97	24.42	23.39	
B-Value		0.95	0.97	0.95	

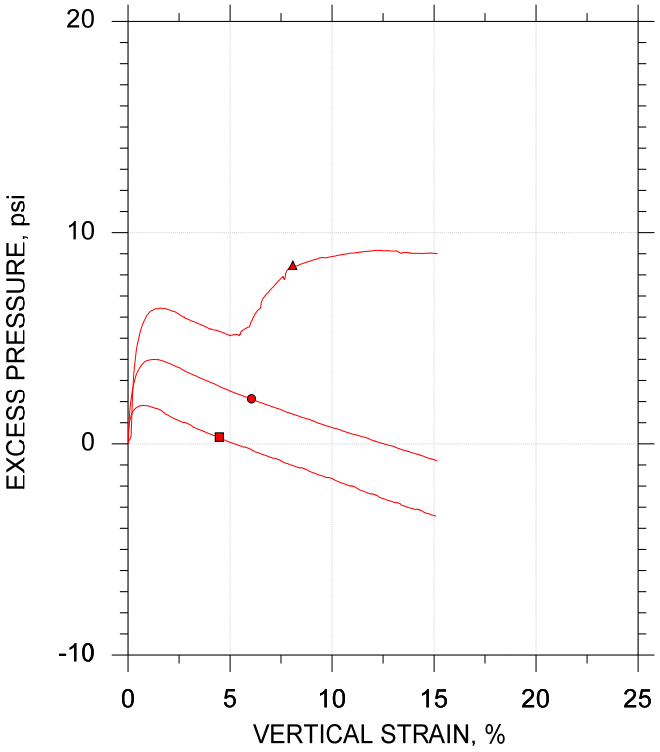
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

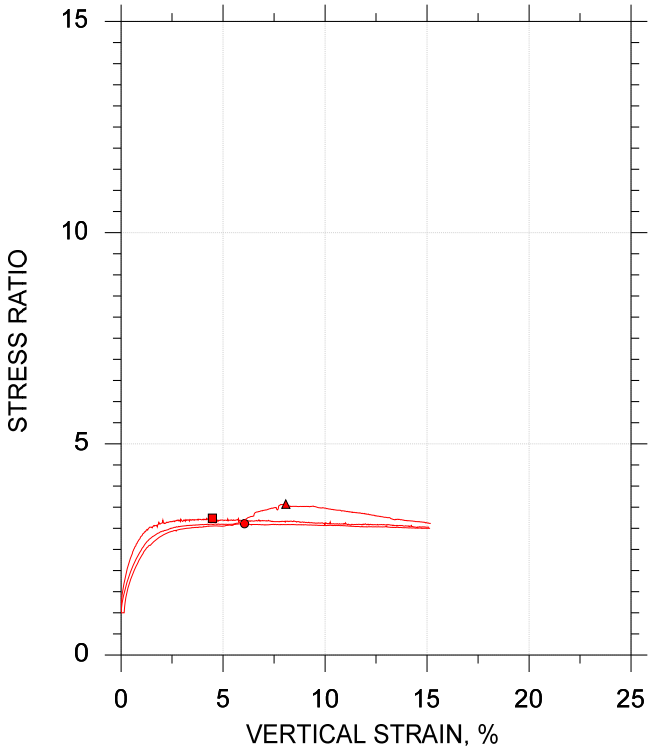


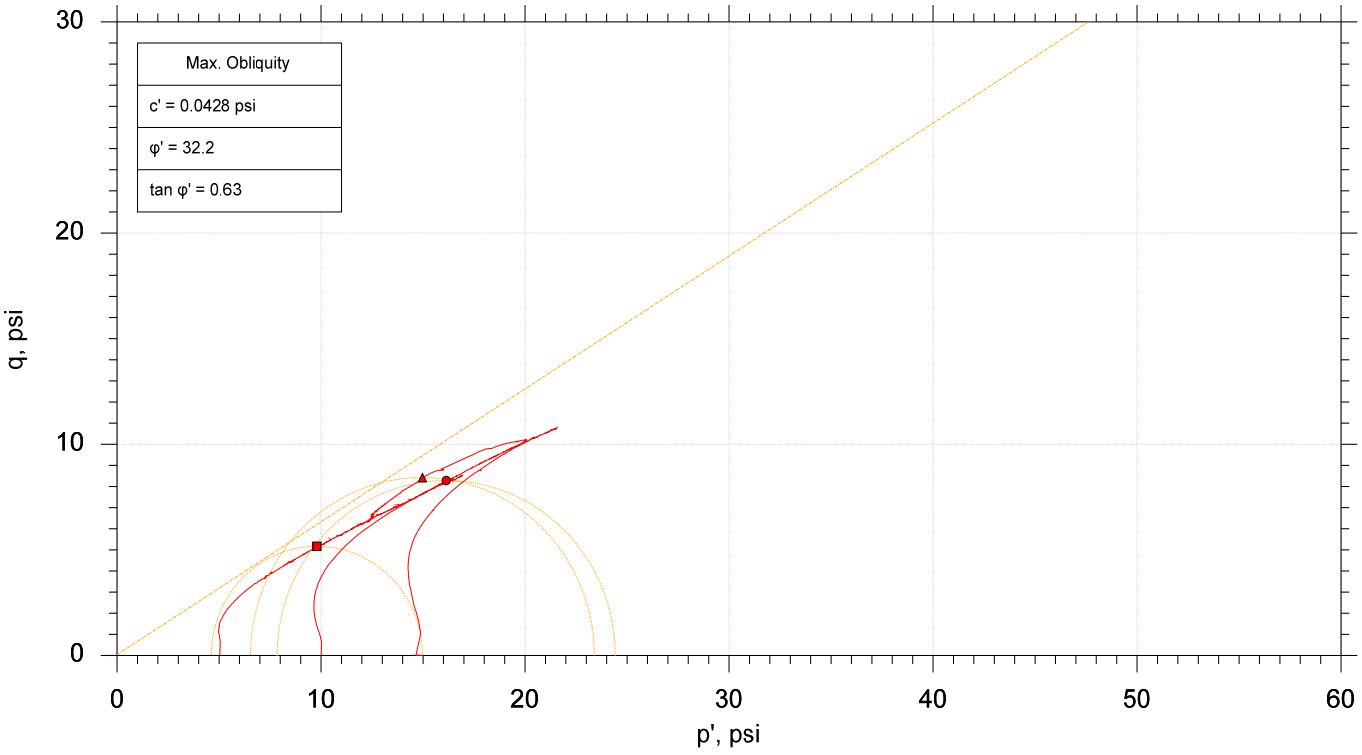
Remarks:

Target Compaction: 95% of (102.8 pcf) at Optimum Moisture Content (22.3%) + 2% - As Requested by Client

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	BS-7	CU-6-1	0-5 ft	jm	5/4/18	mcm	5/14/18	307802-CU-6-1m.dat
●	BS-7	CU-6-2	0-5 ft	jm	4/26/18	mcm	5/18/18	307802-CU-6-2m.dat
▲	BS-7	CU-6-3	0-5 ft	jm	4/25/18	mcm	5/14/18	307802-CU-6-3m.dat

GeoTesting EXPRESS

Project: I-20/26/126 Corridor Improv.	Location: ---	Project No.: GTX-307802
Boring No.: ---	Sample Type: reconstituted	
Description: Moist, reddish yellow silt		
Remarks: Target Compaction: 95% of (102.8 pcf) at Optimum Moisture Content (22.3%) + 2% - As Requested by Client		

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0291	**DATE SAMPLE RECEIVED:**	2/15/2018
DESCRIPTION OF SOIL:	Sandy Lean CLAY (CL) A-6(8)		
TESTED BY:	MB	**DATE OF TESTING:**	2/16/2018
		DATE OF WEIGHING:	2/19/2018

BORING NO.	BS-8				
SAMPLE NO.	18-0291C				
SAMPLE DEPTH	0.0-5.0'				
WATER CONTENT, W%	18.5				

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

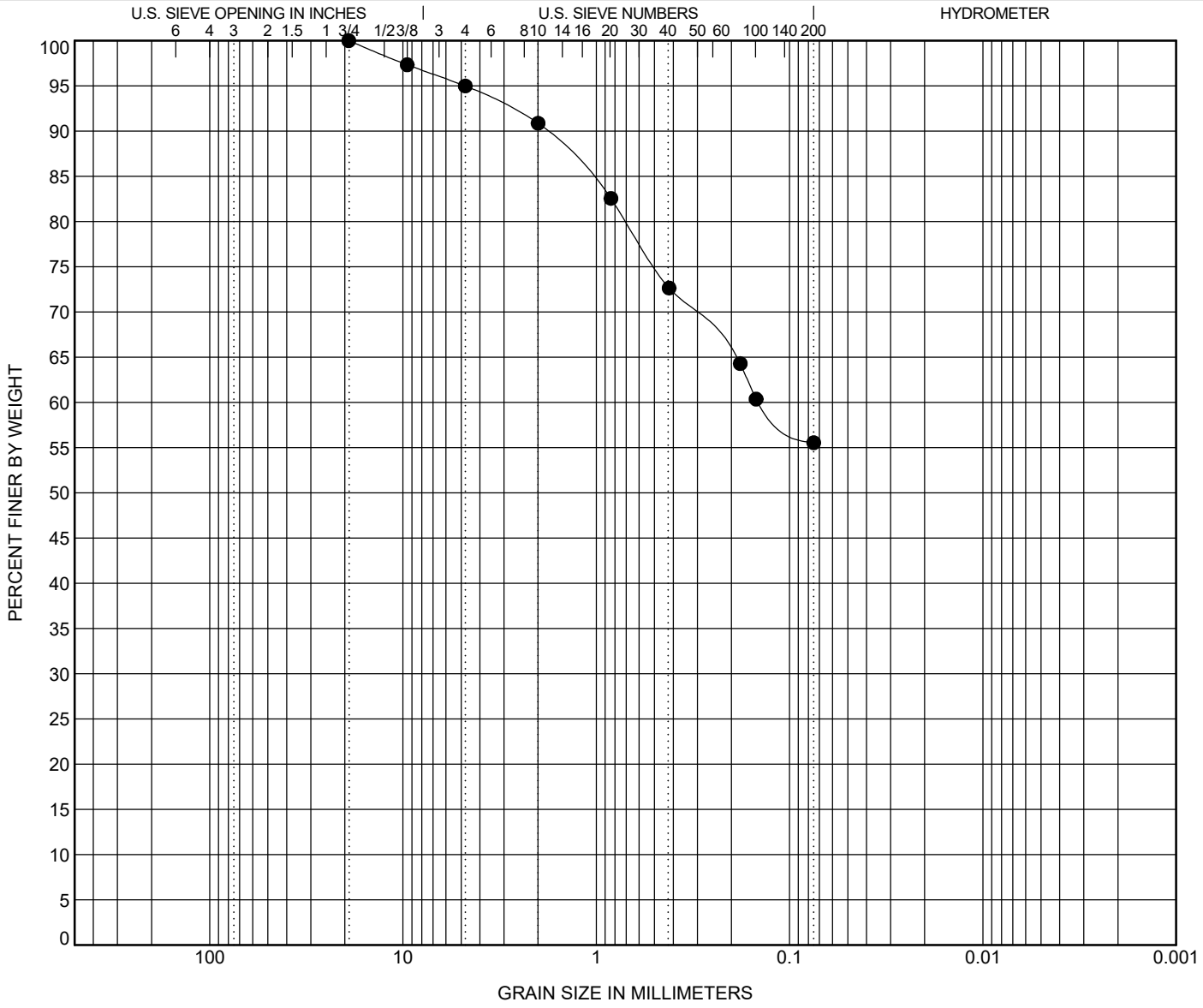
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

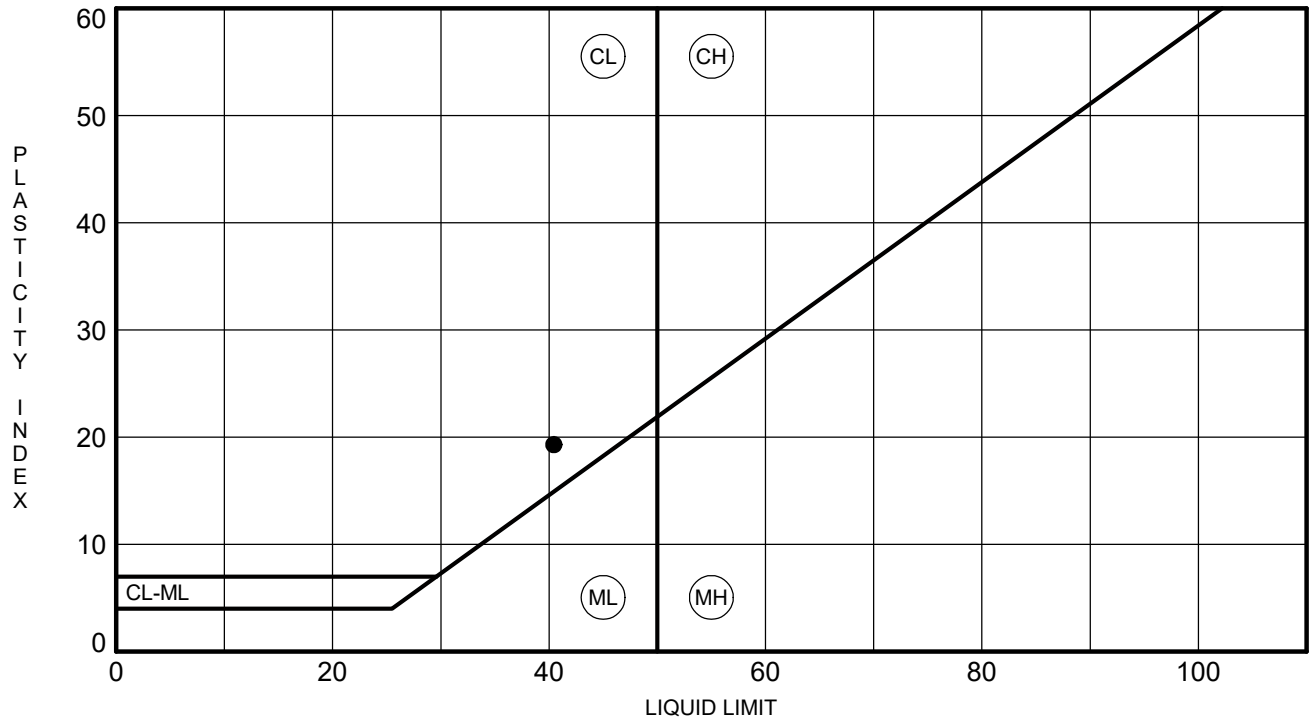
	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**BS-8**	**5.0**	**Sandy Lean CLAY (CL) A-6(8)**	**40**	**21**	**19**		

	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**BS-8**	**5.0**	**19.1**	**4.78**			**5.0**	**39.5**	**55.5**	

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



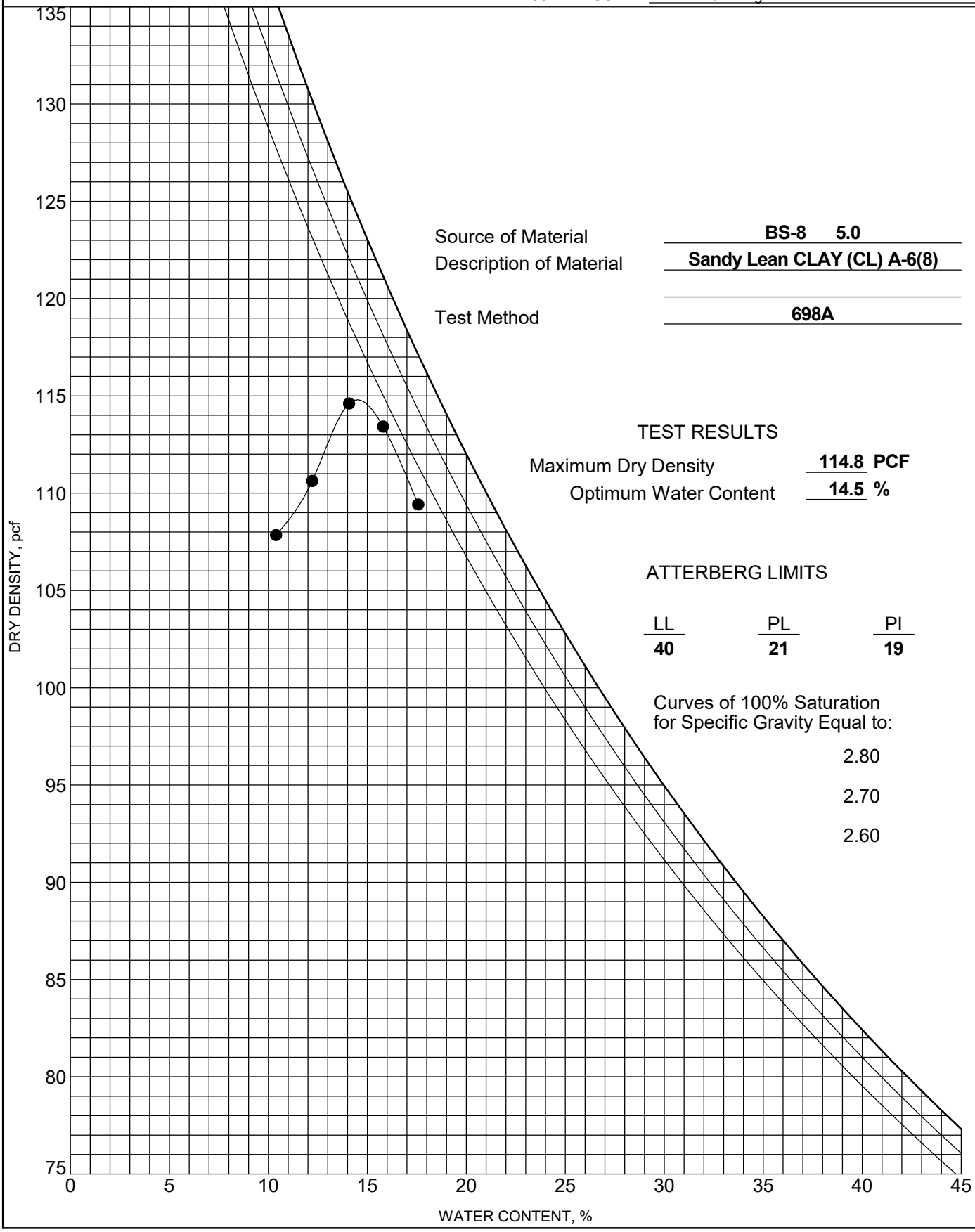
	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**BS-8**	**5.0**	**40**	**21**	**19**	**56**	**Sandy Lean CLAY (CL) A-6(8)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 3/2/18

MOISTURE-DENSITY RELATIONSHIP

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



Source of Material **BS-8 5.0**

Description of Material **Sandy Lean CLAY (CL) A-6(8)**

Test Method **698A**

TEST RESULTS

Maximum Dry Density **114.8 PCF**

Optimum Water Content **14.5 %**

ATTERBERG LIMITS

LL	PL	PI
40	**21**	**19**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

COMPACTION - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 3/2/18

Boring or Test Pit:	BS-8		Boring or Test Pit:	BS-8		Boring or Test Pit:	BS-8	
Sample:	-		Sample:	-		Sample:	-	
Depth:	0.0-5.0	ft	Depth:	0.0-5.0	ft	Depth:	0.0-5.0	ft
Point No.:	1		Point No.:	2		Point No.:	3	
	Initial			**Initial**			**Initial**	
Length =	5.990	in	Length =	6.007	in	Length =	5.997	in
Diameter =	2.803	in	Diameter =	2.790	in	Diameter =	2.790	in
Wet Mass =	2.697	lb	Wet Mass =	2.697	lb	Wet Mass =	2.697	lb
Area =	6.169	in^2	Area =	6.114	in^2	Area =	6.114	in^2
Volume =	36.949	in^3	Volume =	36.725	in^3	Volume =	36.663	in^3
Specific Gravity =	2.64	(ASTM D854)	Specific Gravity =	2.64	(ASTM D854)	Specific Gravity =	2.64	(ASTM D854)
Dry Mass of Solids =	2.322	lb	Dry Mass of Solids =	2.326	lb	Dry Mass of Solids =	2.327	lb
Moisture Content =	16.1%		Moisture Content =	15.9%		Moisture Content =	15.9%	
Wet Unit Weight =	126.1	pcf	Wet Unit Weight =	126.9	pcf	Wet Unit Weight =	127.1	pcf
Dry Unit Weight =	108.6	pcf	Dry Unit Weight =	109.4	pcf	Dry Unit Weight =	109.7	pcf
Void Ratio =	0.52		Void Ratio =	0.51		Void Ratio =	0.50	
Percent Saturation =	82%		Percent Saturation =	83%		Percent Saturation =	84%	
	After Consolidation			**After Consolidation**			**After Consolidation**	
Length =	5.968	in	Length =	5.975	in	Length =	5.945	in
Diameter =	2.806	in	Diameter =	2.785	in	Diameter =	2.811	in
Area =	6.186	in^2 (Method B)	Area =	6.094	in^2 (Method B)	Area =	6.206	in^2 (Method B)
Volume =	36.916	in^3	Volume =	36.411	in^3	Volume =	36.896	in^3
Moisture Content =	19.5%		Moisture Content =	18.6%		Moisture Content =	19.4%	
Wet Unit Weight =	129.9	pcf	Wet Unit Weight =	130.9	pcf	Wet Unit Weight =	130.1	pcf
Dry Unit Weight =	108.7	pcf	Dry Unit Weight =	110.4	pcf	Dry Unit Weight =	109.0	pcf
Void Ratio =	0.52		Void Ratio =	0.49		Void Ratio =	0.51	
Percent Saturation =	100%		Percent Saturation =	100%		Percent Saturation =	100%	
B Parameter =	0.97		B Parameter =	0.96		B Parameter =	0.98	
Shear Rate =	0.090%	/min.	Shear Rate =	0.090%	/min.	Shear Rate =	0.090%	/min.
t_{50} =	0.64	min.	t_{50} =	0.56	min.	t_{50} =	0.98	min.
Strain at Failure =	0.7%		Strain at Failure =	4.0%		Strain at Failure =	3.9%	
Cell Pressure =	85.0	psi	Cell Pressure =	90.0	psi	Cell Pressure =	95.0	psi
Back Pressure =	80.0	psi	Back Pressure =	80.0	psi	Back Pressure =	80.0	psi
Confining Pressure =	5.0	psi	Confining Pressure =	10.0	psi	Confining Pressure =	15.0	psi

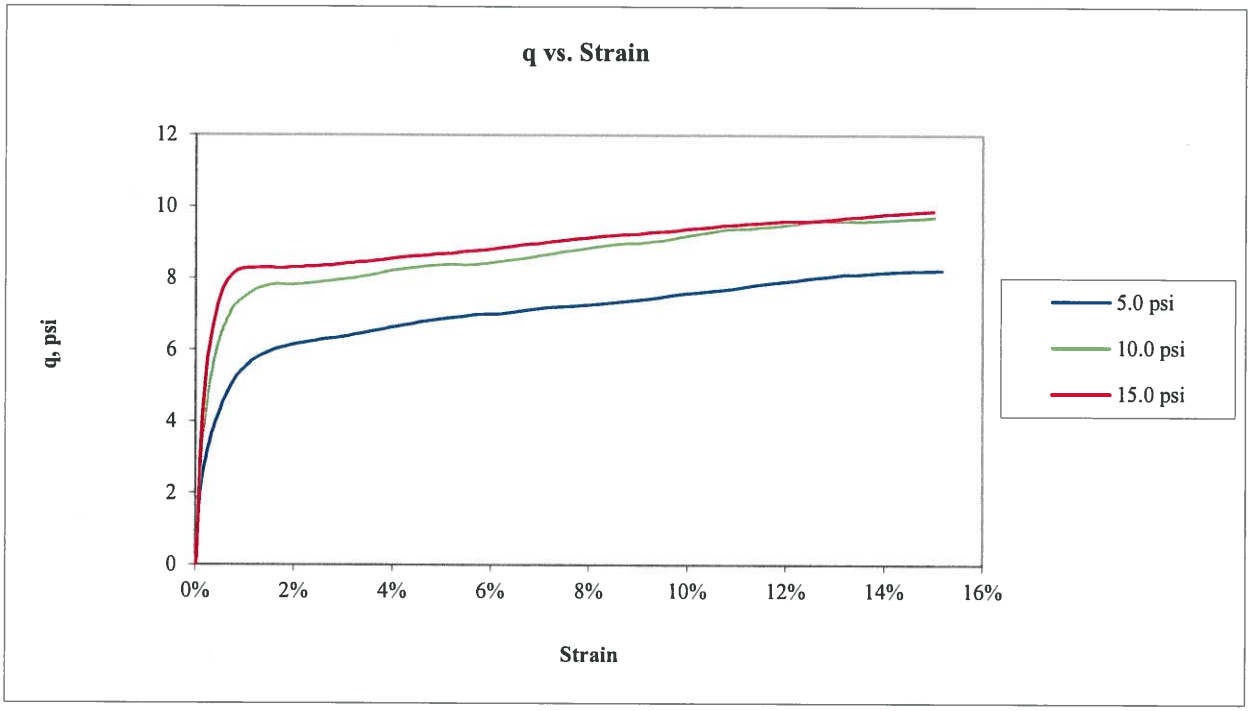
Notes: Sample description: Sandy Lean CLAY (CL) A-6(8)

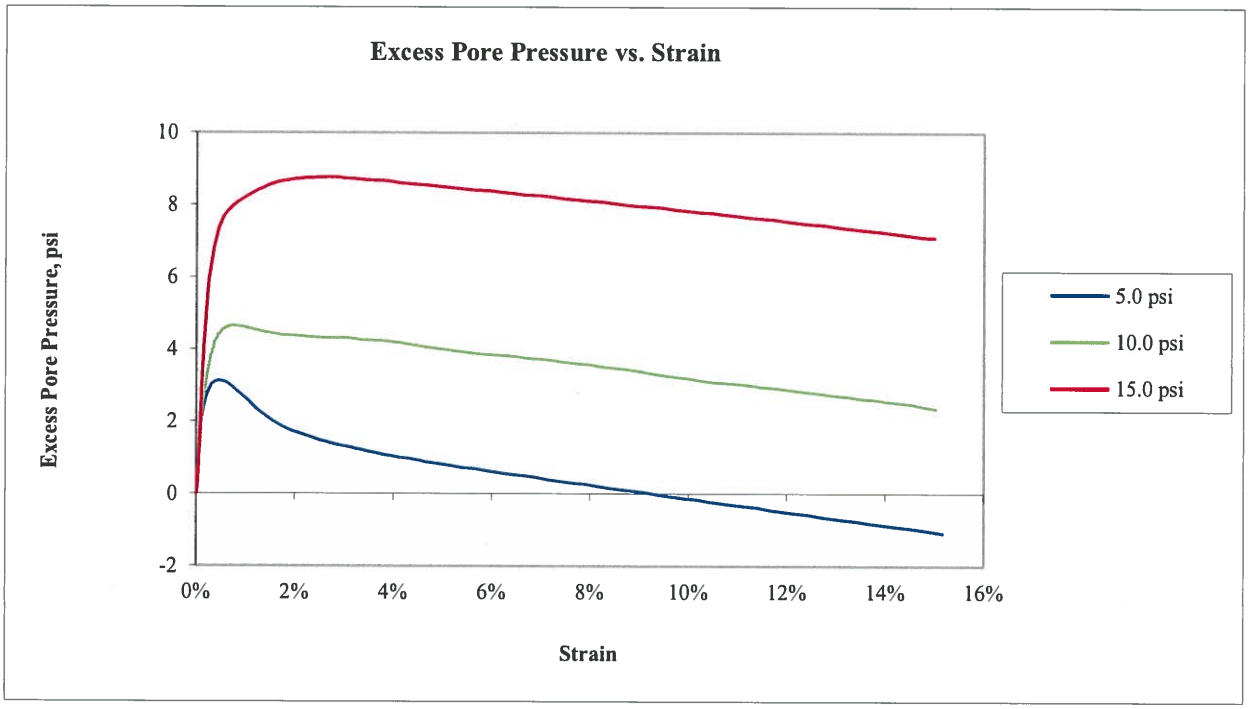
Atterberg limits: LL = 40 PL = 21 PI = 19 (ASTM D4318)

Percent finer: 3/4 in. = - No. 4 = - No. 200 = - (ASTM D422, refer to separate report for gradation curve)

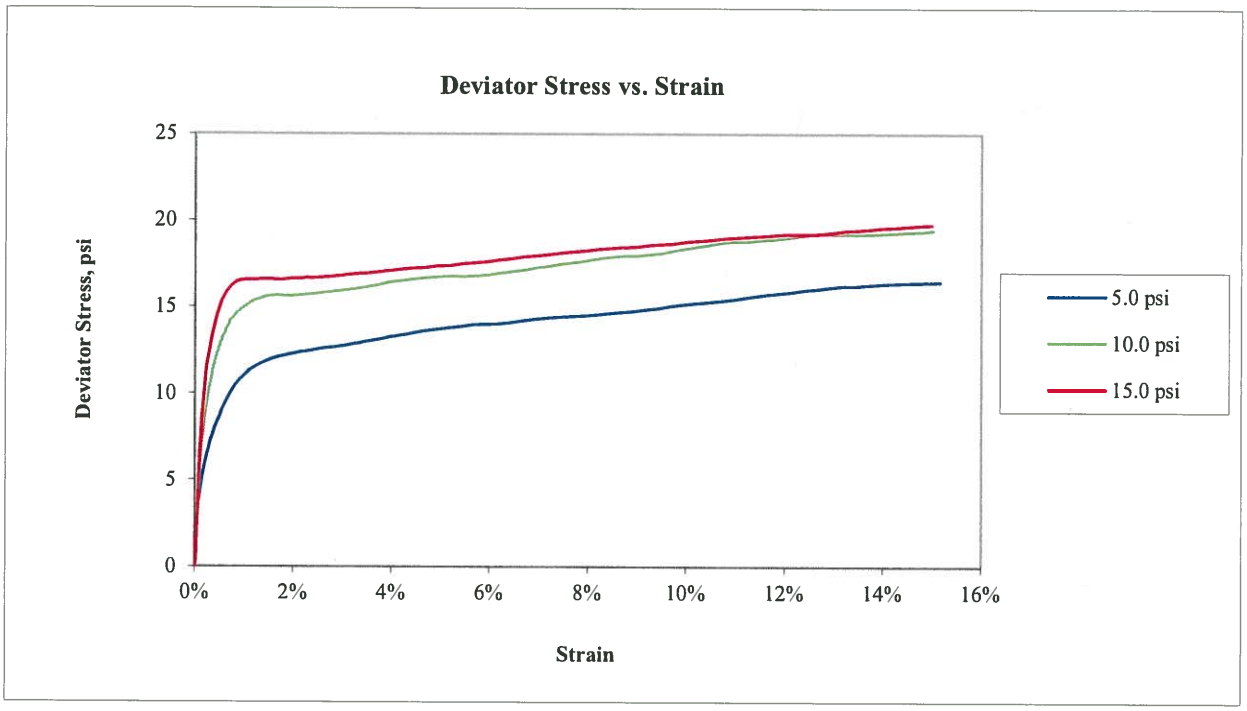
Specimen type:		Intact	X	Reconstituted	Remold targets:	109.1 pcf	16.5% moisture
Moisture from:		Cuttings	X	Entire specimen			
Saturation method:	X	Wet		Dry			
Failure criterion:	X	$(\sigma'_1/\sigma'_3)_{max}$		$(\sigma'_1-\sigma'_3)_{max}$		% strain	
Membrane effect:	X	Corrected		Not Corrected			

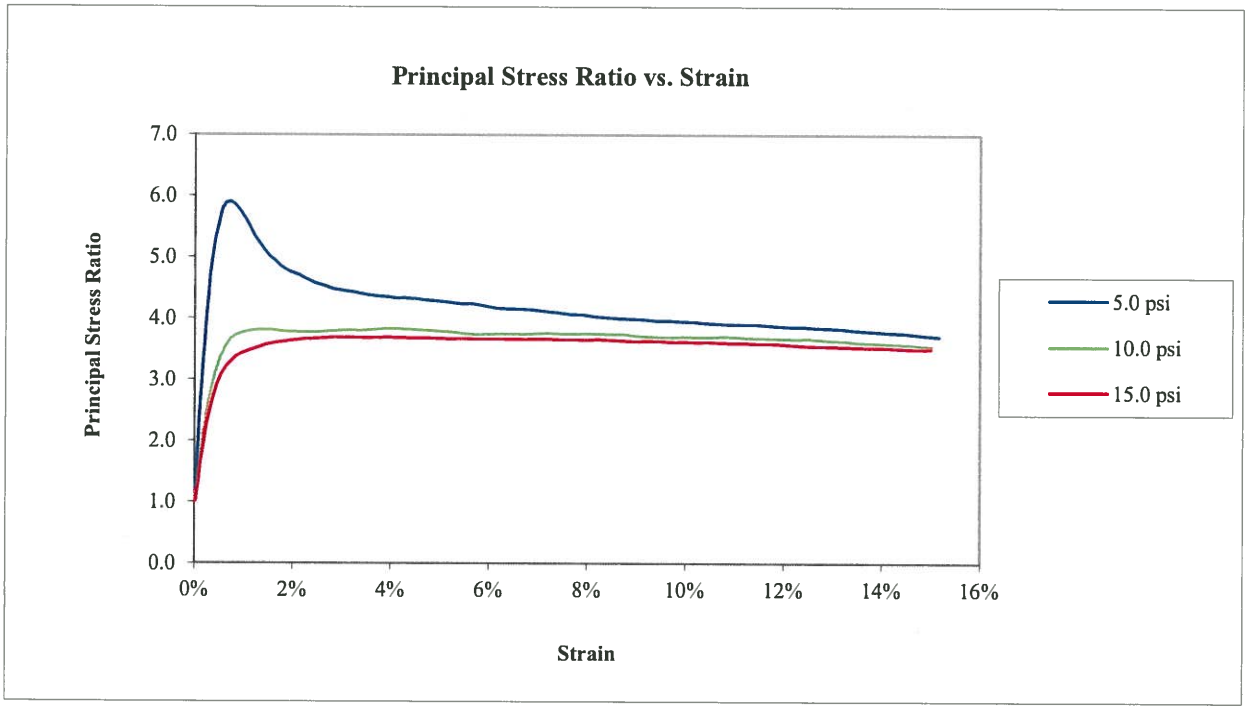
Golder Associates Inc. **Atlanta, Georgia**	**Title:** **ASTM D4767** **CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST REPORT** **SAMPLE AND TEST DATA**			
Job Short Title: **F&ME/G5662.01-I-20/26-126 CORRIDOR IMPROVEMENT/SC**				
Sample: **BS-8 0.0-5.0'**	**Technician:** **PWM/FT** **Check:** FWT	**Reviewed:** DA **Approved:**	**Start Date:** **3/22/2018**	**Job Number:** **1898300**	**Figure:** **1**





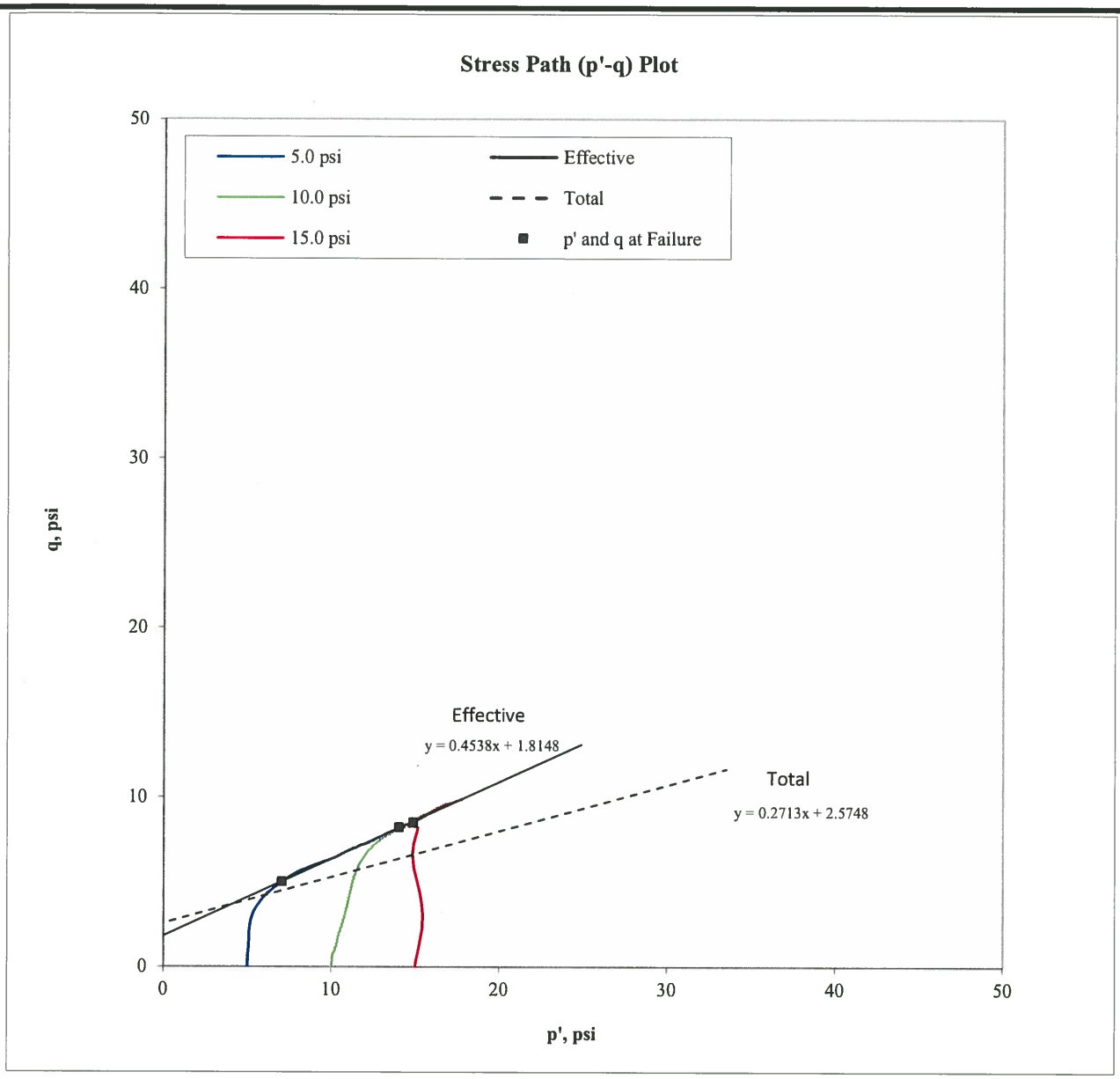
Golder Associates Inc. **Atlanta, Georgia**	**Title:** **ASTM D4767** **CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST REPORT** **q AND EXCESS PORE PRESSURE PLOTS**				
Job Short Title: **F&ME/G5662.01-I-20/26-126 CORRIDOR IMPROVEMENT/SC**					
Sample: **BS-8 0.0-5.0'**	**Technician:** **PWM/FT** **Check:**	**Reviewed:** DR **Approved:**	**Start Date:** **3/22/2018**	**Job Number:** **1898300**	**Figure:** **2**





Golder Associates Inc. Atlanta, Georgia	Title: ASTM D4767 CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST REPORT DEVIATOR STRESS AND PRINCIPAL STRESS RATIO PLOT				
Job Short Title: F&ME/G5662.01-I-20/26-126 CORRIDOR IMPROVEMENT/SC					
Sample: BS-8 0.0-5.0'	Technician: PWM/FT Check:	Reviewed: DA Approved:	Start Date: 3/22/2018	Job Number: 1898300	Figure: 3

Stress Path (p'-q) Plot



Confining Pressure (psi)	p at failure (psi)	p' at failure (psi)	q at failure (psi)
5.0	10.0	7.1	5.0
10.0	18.2	14.0	8.2
15.0	23.5	14.9	8.5

Effective

α ' =	24.4	degree
a' =	1.8	psi

Total

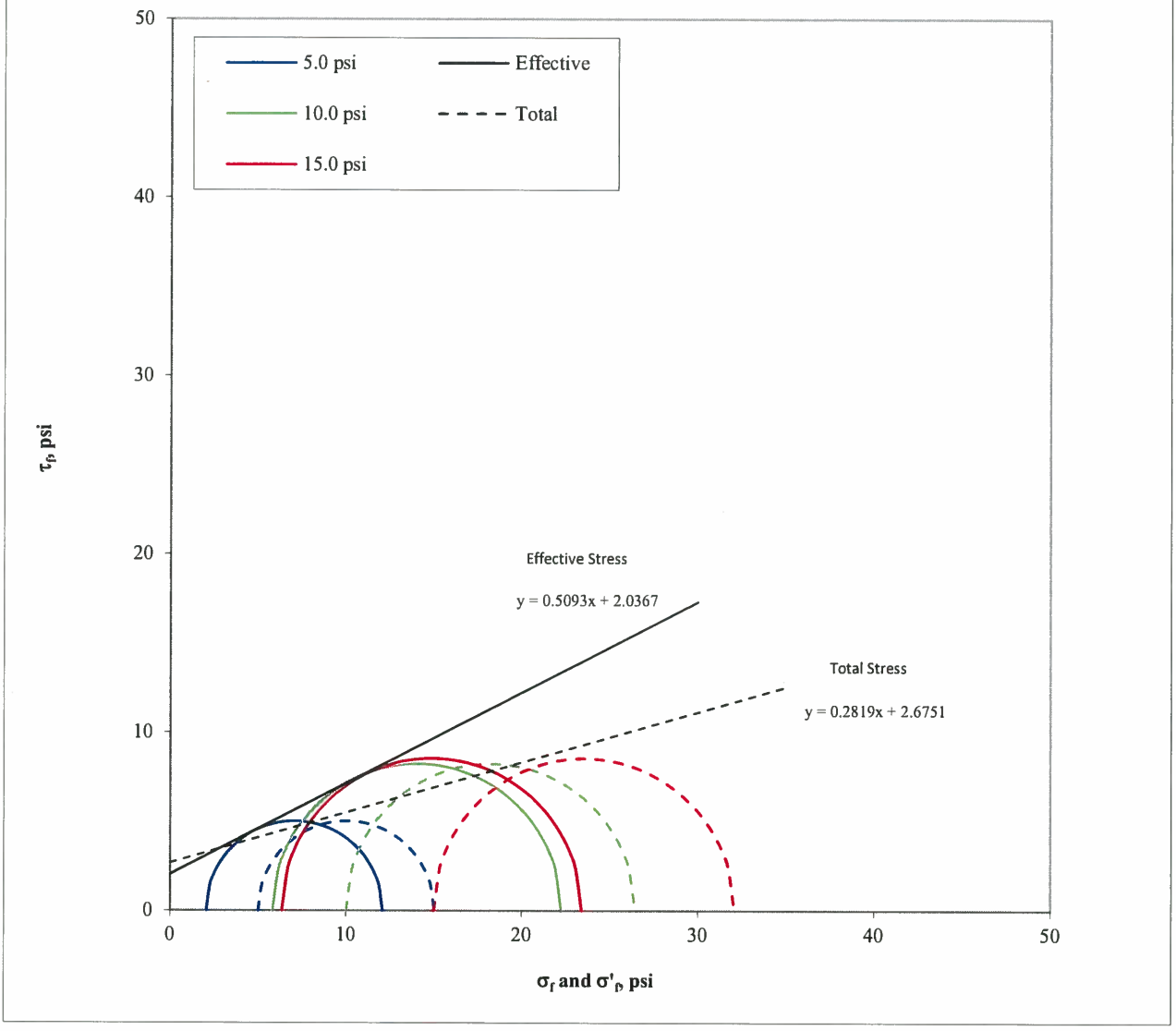
α =	15.2	degree
a =	2.6	psi

Note: The laboratory testing relates only to the sample tested. GAI neither accepts responsibility for nor makes claims to the final use and purpose of the material.

Golder Associates Inc. **Atlanta, Georgia**	**Title:** **ASTM D4767** **CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST REPORT** **STRESS PATH PLOT**
Job Short Title: **F&ME/G5662.01-I-20/26-126 CORRIDOR IMPROVEMENT/SC**	

Sample:	Technician:	Reviewed:	Start Date:	Job Number:	Figure:
BS-8 0.0-5.0'	PWM/FT Check:	DA Approved:	3/22/2018	1898300	4

Mohr's Circle Diagram



Confining Pressure (psi)	σ'_1 at failure (psi)	σ'_3 at failure (psi)	σ_1 at failure (psi)	σ_3 at failure (psi)
5.0	12.1	2.0	15.0	5.0
10.0	22.3	5.8	26.4	10.0
15.0	23.4	6.3	32.1	15.0

Effective

ϕ' =	27.0	degree
c' =	2.0	psi

Total

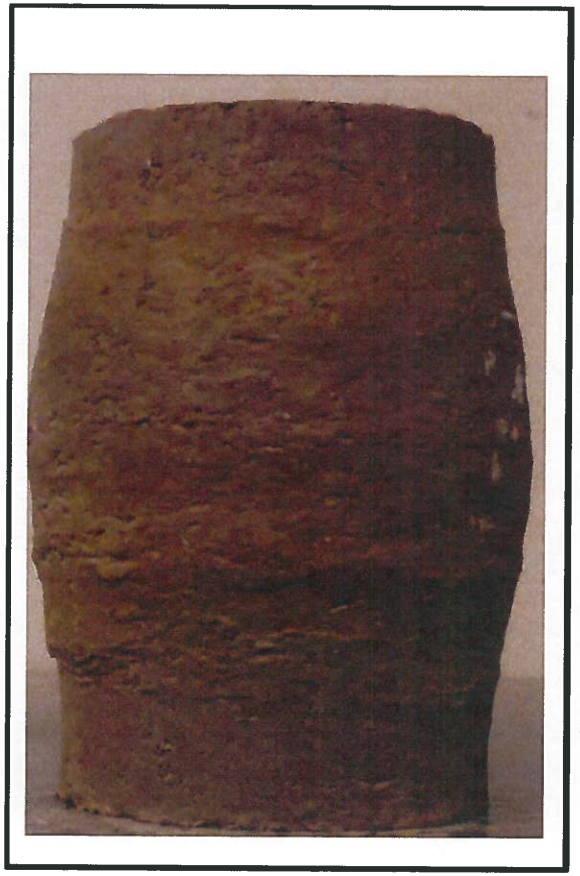
ϕ =	15.7	degree
c =	2.7	psi

Note: The laboratory testing relates only to the sample tested. GAI neither accepts responsibility for nor makes claims to the final use and purpose of the material.

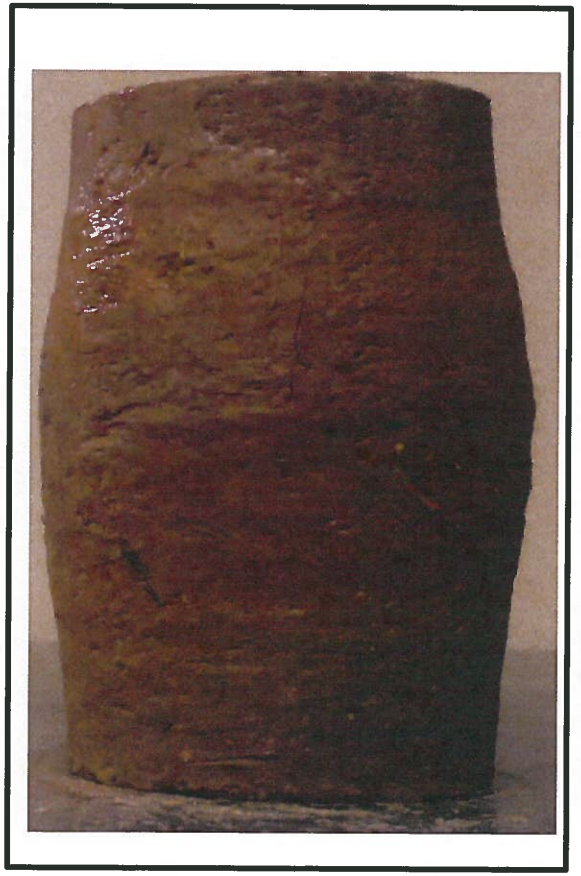
Golder Associates Inc. Atlanta, Georgia	**Title:** ASTM D4767 CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST REPORT MOHR'S CIRCLE DIAGRAM				
Job Short Title: F&ME/G5662.01-I-20/26-126 CORRIDOR IMPROVEMENT/SC					
Sample: BS-8 0.0-5.0'	**Technician:** PWM/FT **Check:**	**Reviewed:** DA **Approved:**	**Start Date:** 3/22/2018	**Job Number:** 1898300	**Figure:** 5

5.0 psi

10.0 psi



15.0 psi

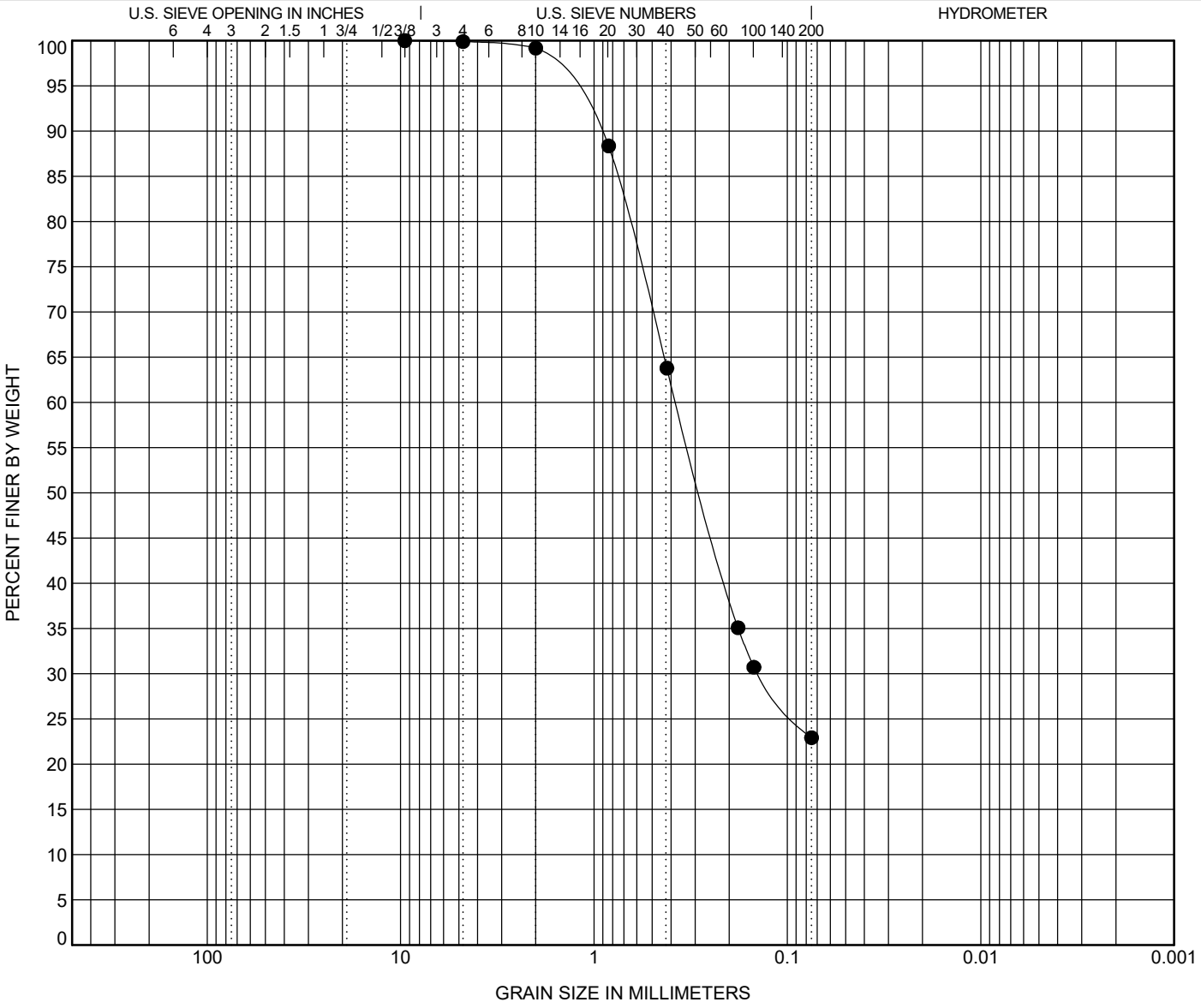


Golder Associates Inc. **Atlanta, Georgia**	**Title:** ASTM D4767 CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST REPORT SPECIMENS PHOTOGRAPH - 5.0 10.0 15.0 psi				
Job Short Title: F&ME/G5662.01-I-20/26-126 CORRIDOR IMPROVEMENT/SC					
Sample: BS-8 0.0-5.0'	**Technician:** PWM/FT **Check:**	**Reviewed:** DA **Approved:**	**Start Date:** 3/22/2018	**Job Number:** 1898300	**Figure:** 6

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**BS-9**	**5.0**	**Silty F/M SAND (SM) A-2-4**	**15**	**14**	**1**		

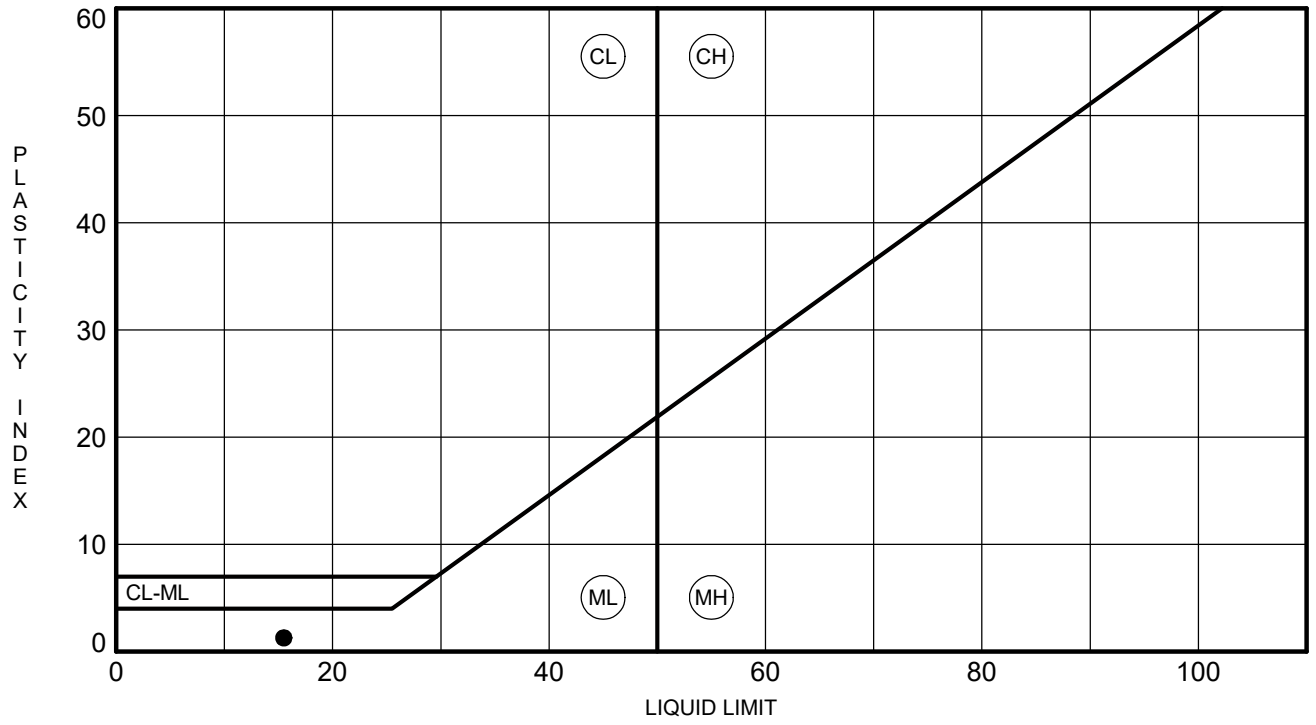
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**BS-9**	**5.0**	**9.52**	**1.431**	**0.28**		**0.1**	**77.0**	**22.9**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/11/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



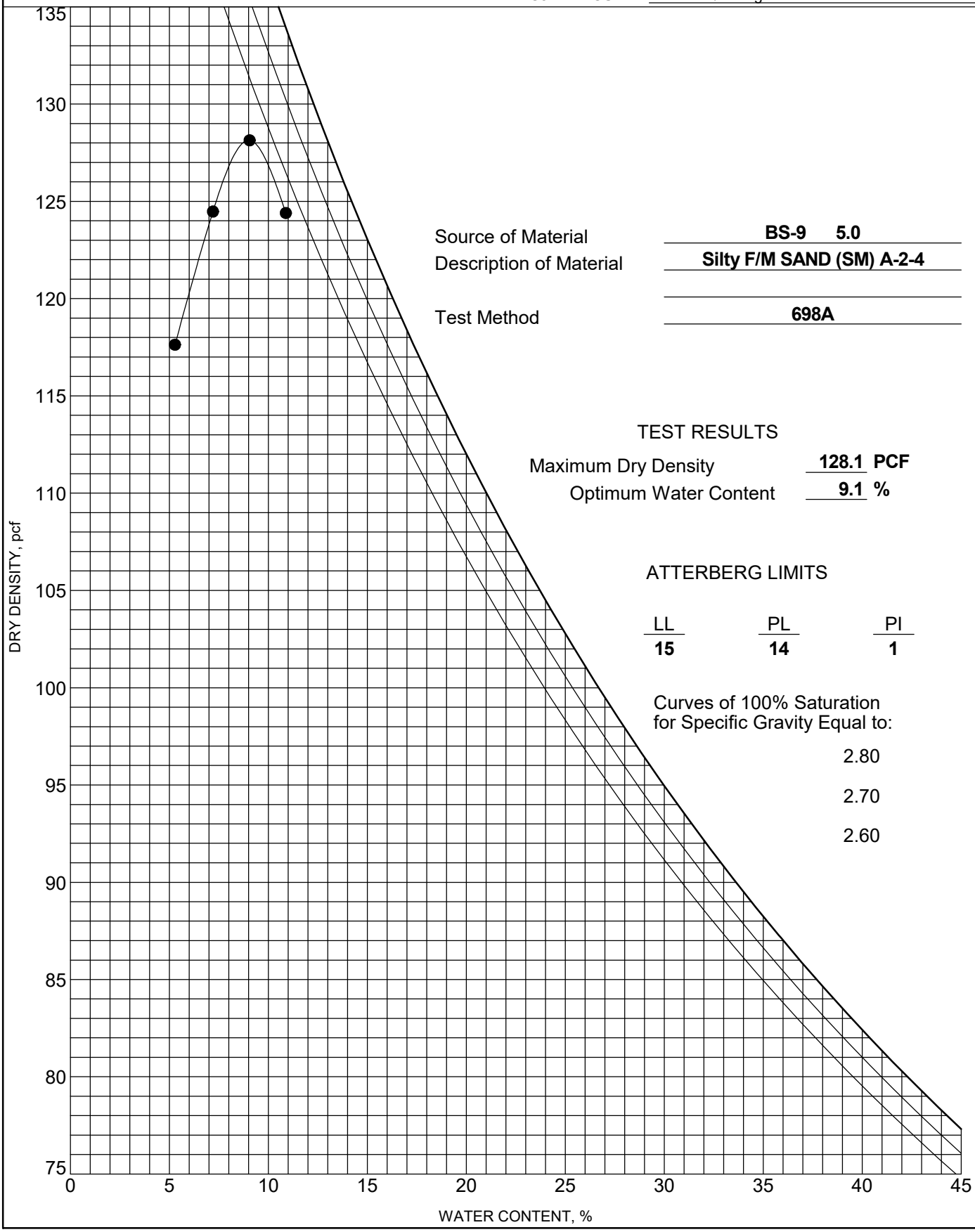
	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**BS-9**	**5.0**	**15**	**14**	**1**	**23**	**Silty F/M SAND (SM) A-2-4**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/11/18

MOISTURE-DENSITY RELATIONSHIP

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



Source of Material **BS-9 5.0**

Description of Material **Silty F/M SAND (SM) A-2-4**

Test Method **698A**

TEST RESULTS

Maximum Dry Density **128.1** **PCF**

Optimum Water Content **9.1** **%**

ATTERBERG LIMITS

LL	PL	PI
15	**14**	**1**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

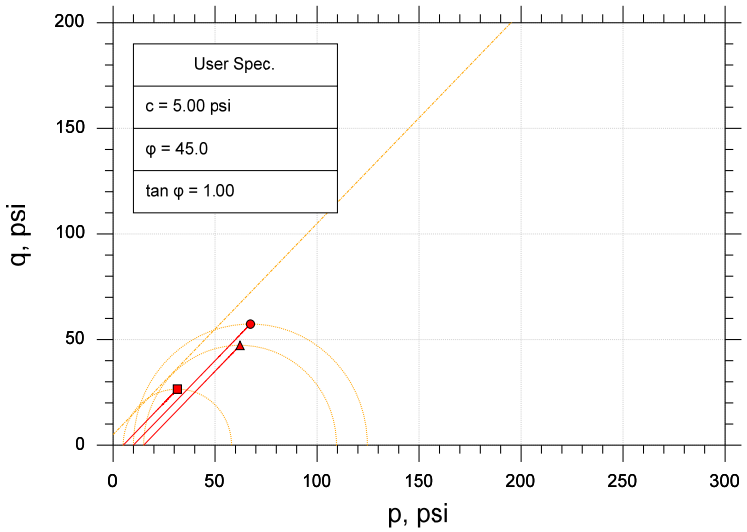
2.70

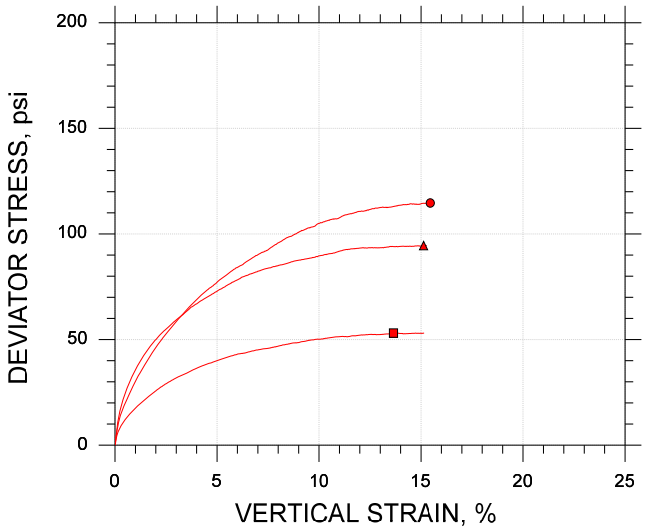
2.60

COMPACTION - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/11/18

Client: F&ME Consultants	
Project Name: I-20/26/126 Corridor Improv.	
Project Location: ---	
Project Number: GTX-307802	
Tested By: jm	Checked By: mcm
Boring ID: ---	
Preparation: reconstituted	
Description: Moist, yellowish brown clay with sand	
Classification: ---	
Group Symbol: ---	
Liquid Limit: ---	Plastic Limit: ---
Plasticity Index: ---	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		■	●	▲	
Sample ID		BS-9	BS-9	BS-9	
Depth, ft		0-5 ft	0-5 ft	0-5 ft	
Test Number		CU-7-1	CU-7-2	CU-7-3	
Initial	Height, in	4.094	4.090	4.095	
	Diameter, in	2.020	2.020	2.020	
	Moisture Content (from Cuttings), %	10.9	11.2	11.0	
	Dry Density, pcf	122.	122.	122.	
	Saturation (Wet Method), %	77.4	78.5	77.4	
	Void Ratio	0.382	0.384	0.383	
Before Shear	Moisture Content, %	14.0	13.9	13.7	
	Dry Density, pcf	122.	122.	123.	
	Cross-sectional Area (Method A), in²	3.197	3.188	3.178	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.378	0.376	0.370	
	Back Pressure, psi	88.99	98.99	90.99	
Vertical Effective Consolidation Stress, psi		5.012	10.04	15.00	
Horizontal Effective Consolidation Stress, psi		5.003	9.994	14.99	
Vertical Strain after Consolidation, %		0.02929	0.04589	0.07399	
Volumetric Strain after Consolidation, %		0.2818	0.6125	0.9540	
Time to 50% Consolidation, min		0.1300	0.1300	0.1300	
Shear Strength, psi		26.54	57.32	47.24	
Strain at Failure, %		13.6	15.5	15.1	
Strain Rate, %/min		0.06000	0.06000	0.06000	
Deviator Stress at Failure, psi		53.09	114.6	94.49	
Effective Minor Principal Stress at Failure, psi		23.11	51.45	40.54	
Effective Major Principal Stress at Failure, psi		76.20	166.1	135.0	
B-Value		0.96	0.96	0.95	

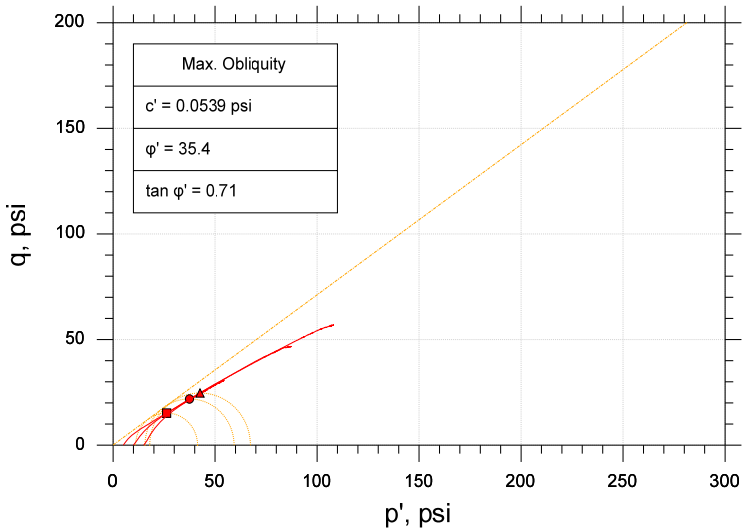
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

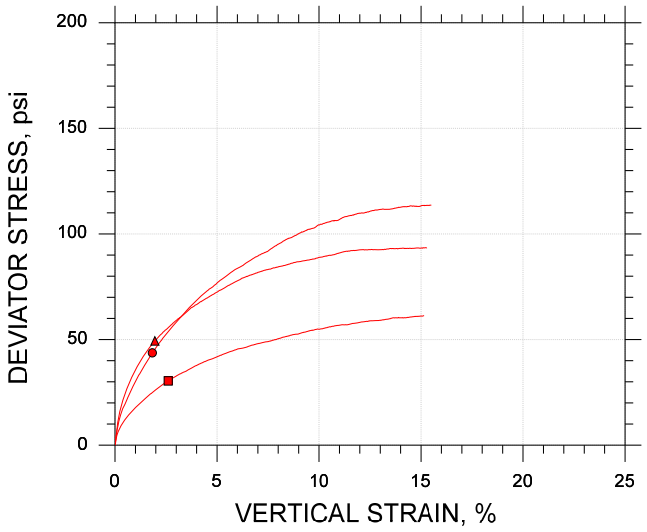
Remarks:

Target Compaction: 95% of (128.1 pcf) at Optimum Moisture Content (9.1%) + 2% - As Requested by Client

Client: F&ME Consultants	
Project Name: I-20/26/126 Corridor Improv.	
Project Location: ---	
Project Number: GTX-307802	
Tested By: jm	Checked By: mcm
Boring ID: ---	
Preparation: reconstituted	
Description: Moist, yellowish brown clay with sand	
Classification: ---	
Group Symbol: ---	
Liquid Limit: ---	Plastic Limit: ---
Plasticity Index: ---	Estimated Specific Gravity: 2.7

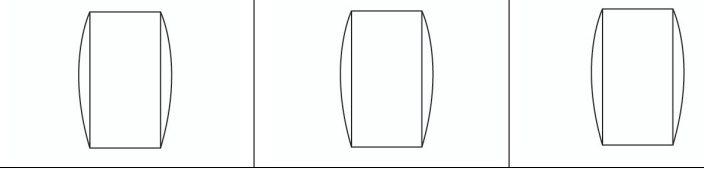
CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		■	●	▲	
Sample ID		BS-9	BS-9	BS-9	
Depth, ft		0-5 ft	0-5 ft	0-5 ft	
Test Number		CU-7-1	CU-7-2	CU-7-3	
Initial	Height, in	4.094	4.090	4.095	
	Diameter, in	2.020	2.020	2.020	
	Moisture Content (from Cuttings), %	10.9	11.2	11.0	
	Dry Density, pcf	122.	122.	122.	
	Saturation (Wet Method), %	77.4	78.5	77.4	
	Void Ratio	0.382	0.384	0.383	
Before Shear	Moisture Content, %	14.0	13.9	13.7	
	Dry Density, pcf	122.	122.	123.	
	Cross-sectional Area (Method A), in²	3.197	3.188	3.178	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.378	0.376	0.370	
	Back Pressure, psi	88.99	98.99	90.99	
Vertical Effective Consolidation Stress, psi		5.014	10.04	15.00	
Horizontal Effective Consolidation Stress, psi		5.003	9.994	14.99	
Vertical Strain after Consolidation, %		0.02929	0.04589	0.07399	
Volumetric Strain after Consolidation, %		0.2818	0.6125	0.9540	
Time to 50% Consolidation, min		0.1300	0.1300	0.1300	
Shear Strength, psi		15.21	21.85	24.69	
Strain at Failure, %		2.60	1.83	1.95	
Strain Rate, %/min		0.06000	0.06000	0.06000	
Deviator Stress at Failure, psi		30.42	43.70	49.38	
Effective Minor Principal Stress at Failure, psi		11.01	15.59	17.96	
Effective Major Principal Stress at Failure, psi		41.43	59.29	67.33	
B-Value		0.96	0.96	0.95	

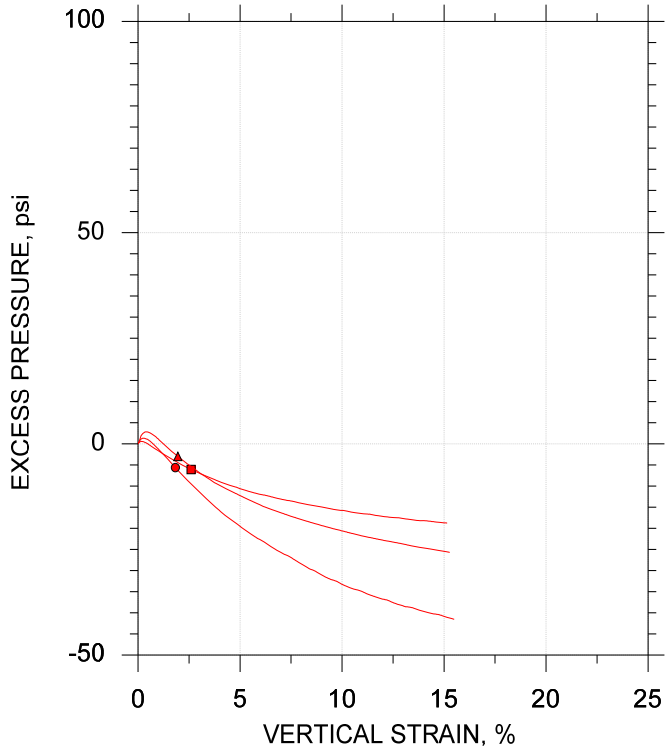
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

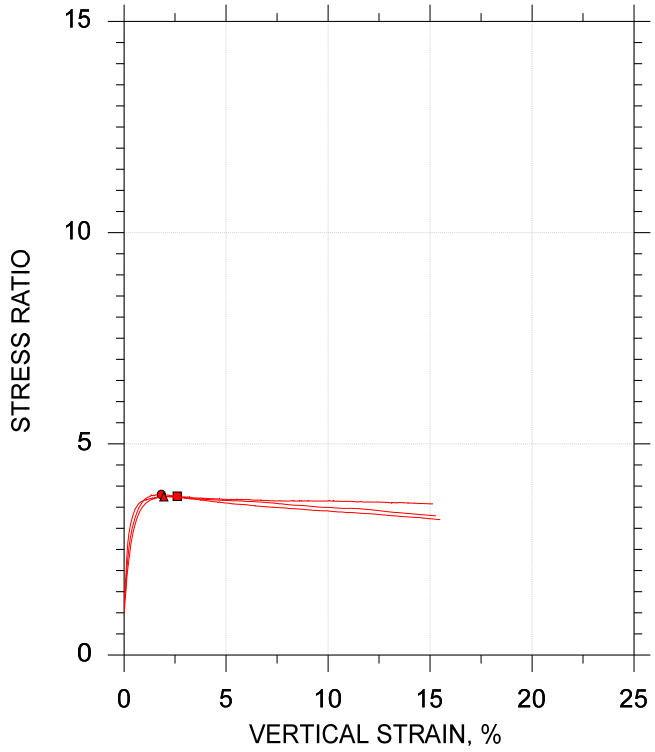


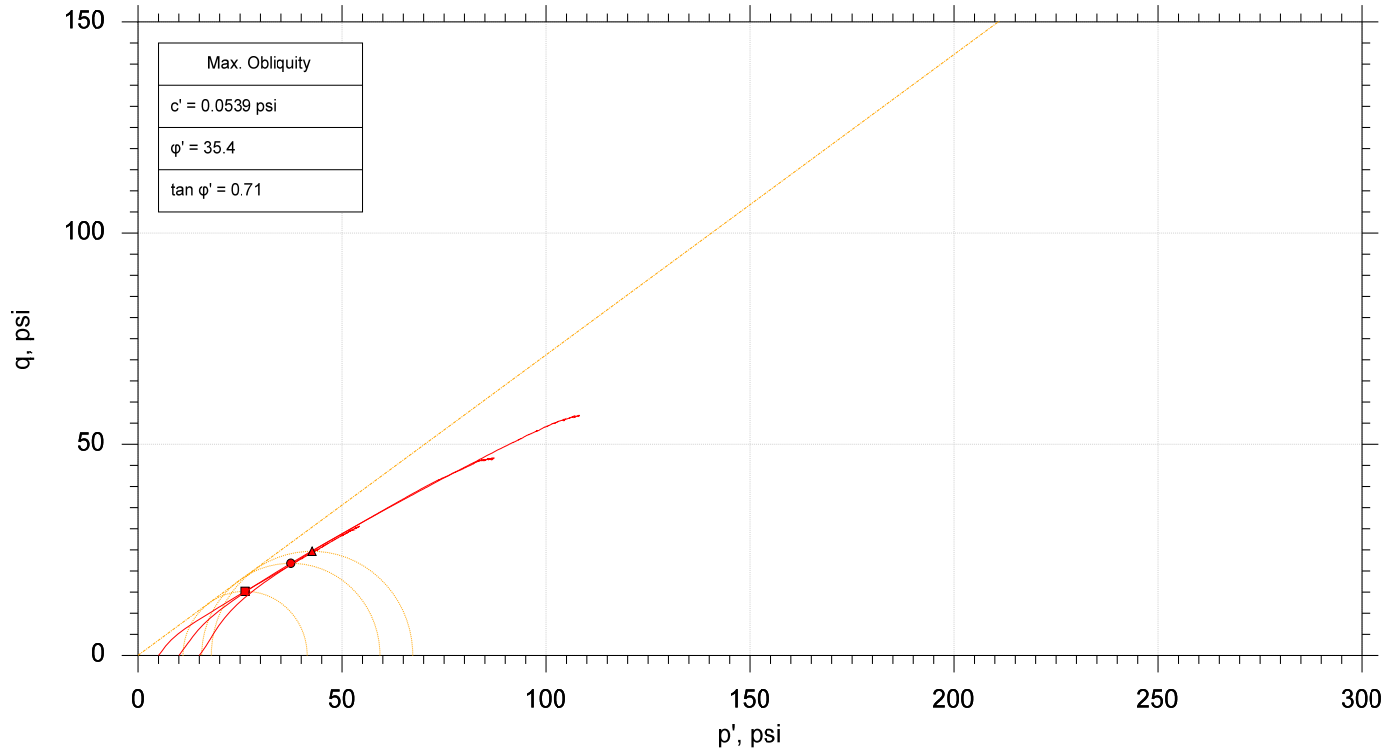
Remarks:

Target Compaction: 95% of (128.1 pcf) at Optimum Moisture Content (9.1%) + 2% - As Requested by Client

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	BS-9	CU-7-1	0-5 ft	jm	5/8/18	mcm	5/14/18	307802-CU-7-1m.dat
●	BS-9	CU-7-2	0-5 ft	jm	5/7/18	mcm		307802-CU-7-2m.dat
▲	BS-9	CU-7-3	0-5 ft	jm	5/7/18	mcm	5/14/18	307802-CU-7-3m.dat

GeoTesting EXPRESS

Project: I-20/26/126 Corridor Improv.	Location: ---	Project No.: GTX-307802
Boring No.: ---	Sample Type: reconstituted	
Description: Moist, yellowish brown clay with sand		
Remarks: Target Compaction: 95% of (128.1 pcf) at Optimum Moisture Content (9.1%) + 2% - As Requested by Client		

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0398	**DATE SAMPLE RECEIVED:**	3/1/2018
DESCRIPTION OF SOIL:	Sandy Lean CLAY (CL) A-4(3)		
TESTED BY:	MB	**DATE OF TESTING:**	3/2/2018
		DATE OF WEIGHING:	3/5/2018

BORING NO.	BS-10				
SAMPLE NO.	18-0398C				
SAMPLE DEPTH	0.0-5.0'				
WATER CONTENT, W%	17.3				

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

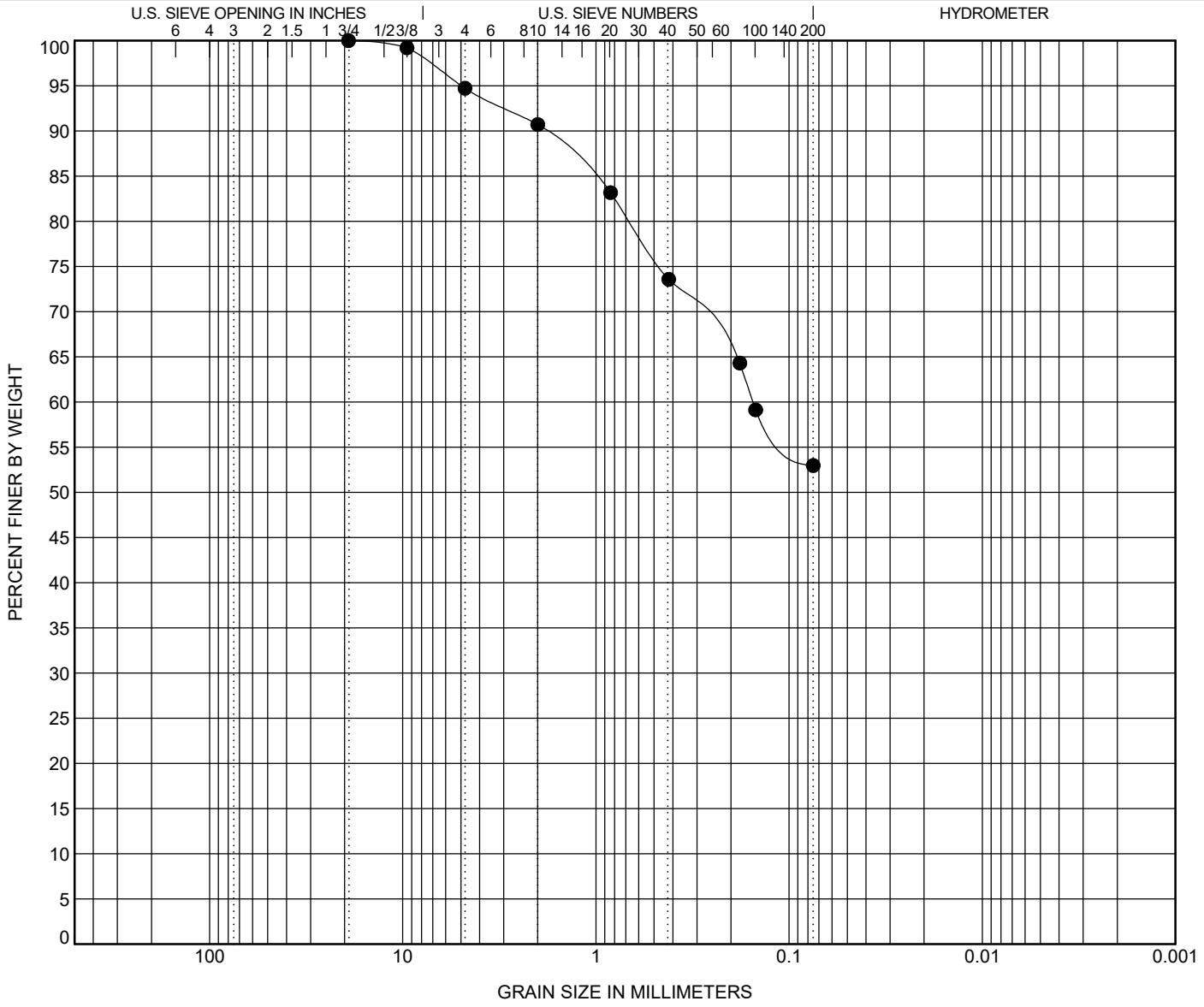
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**BS-10**	**5.0**	**Sandy Lean CLAY (CL) A-4(3)**	**29**	**19**	**10**		

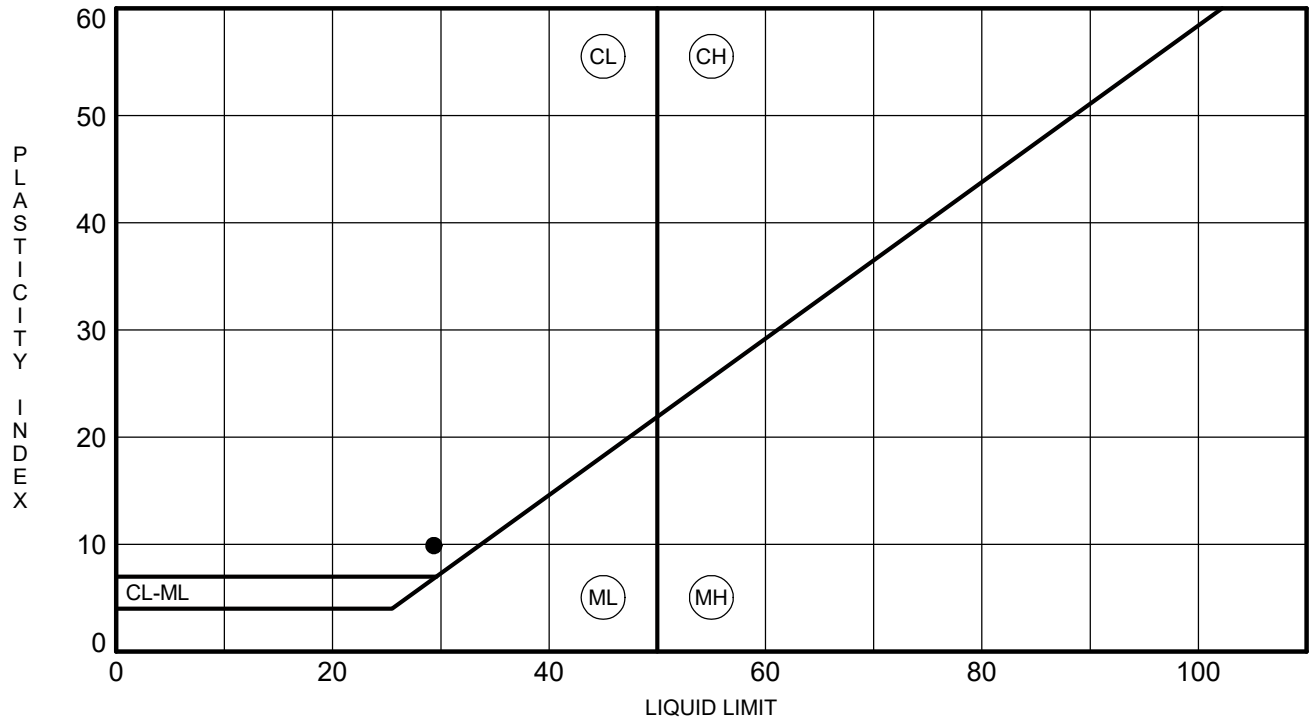
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**BS-10**	**5.0**	**19.1**	**4.966**			**5.3**	**41.7**	**53.0**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 3/9/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



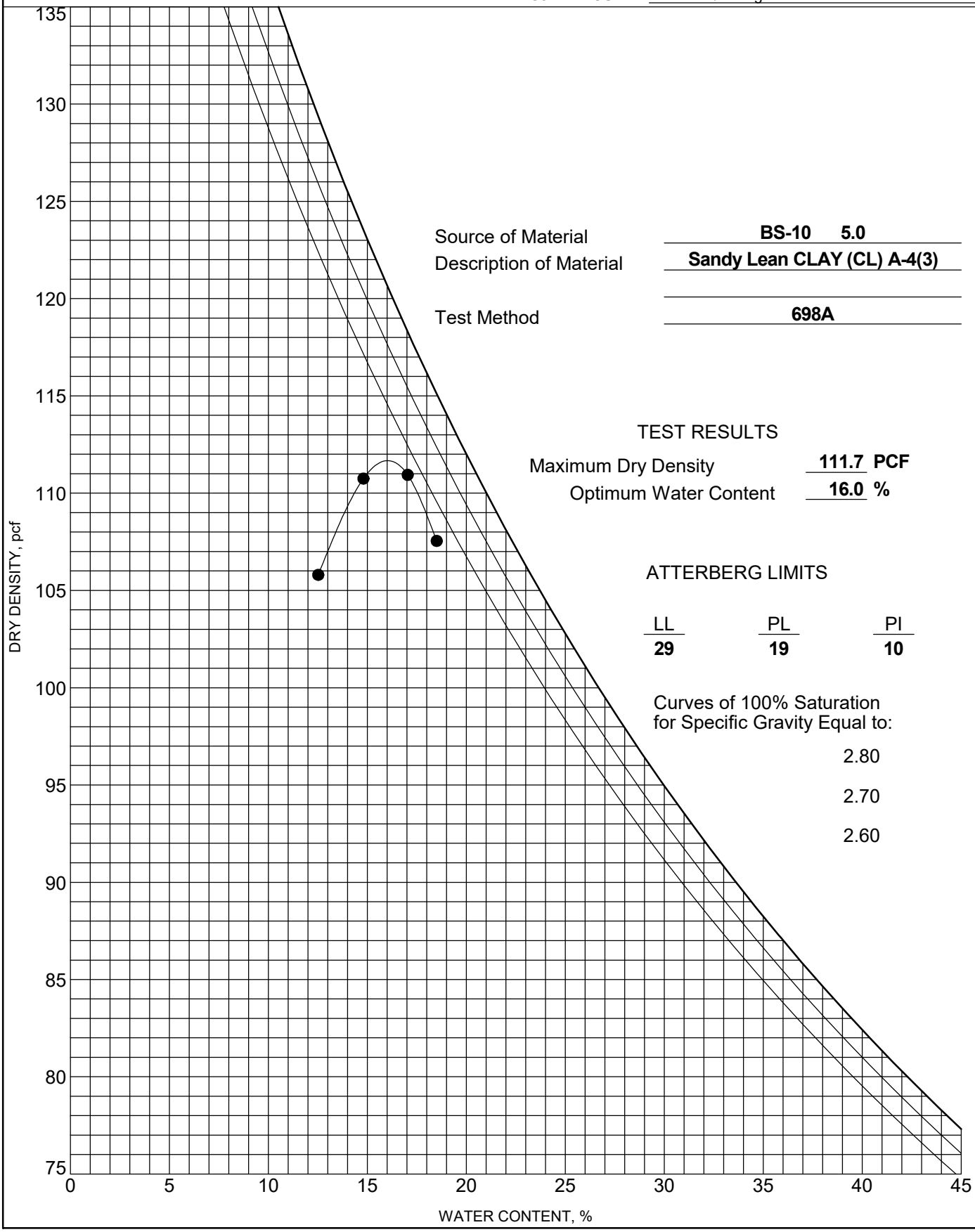
	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**BS-10**	**5.0**	**29**	**19**	**10**	**53**	**Sandy Lean CLAY (CL) A-4(3)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 3/9/18

MOISTURE-DENSITY RELATIONSHIP

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



Source of Material **BS-10 5.0**

Description of Material **Sandy Lean CLAY (CL) A-4(3)**

Test Method **698A**

TEST RESULTS

Maximum Dry Density **111.7** **PCF**

Optimum Water Content **16.0** **%**

ATTERBERG LIMITS

LL	PL	PI
29	**19**	**10**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

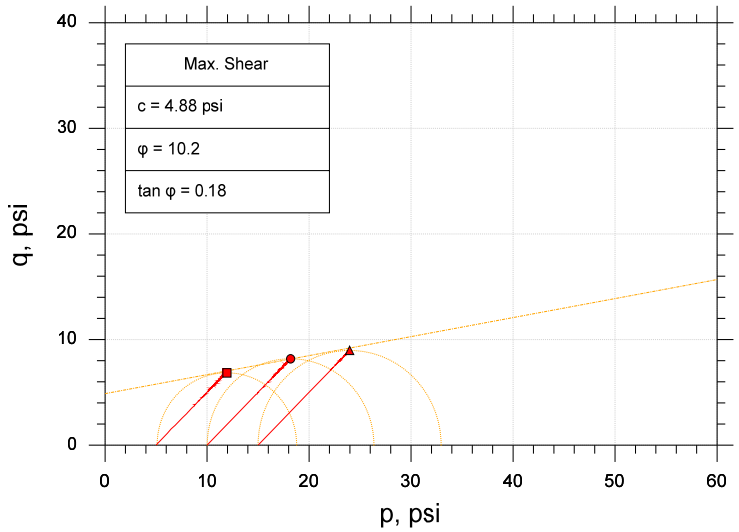
2.70

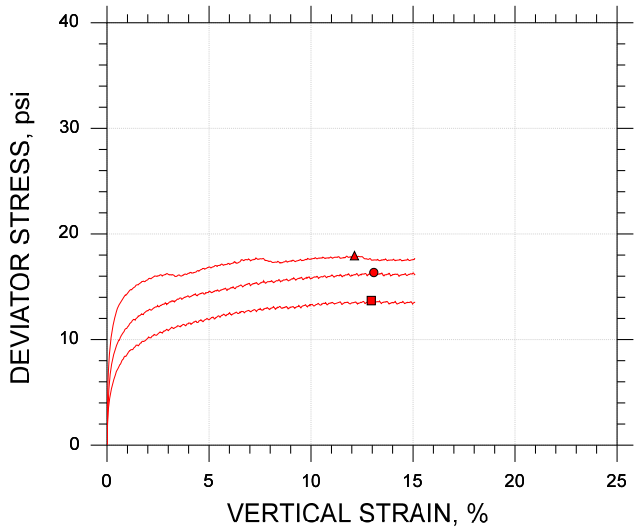
2.60

COMPACTION - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 3/9/18

Client: F&ME Consultants	
Project Name: I-20/26/126 Corridor Improvemen	
Project Location: ---	
Project Number: GTX-307802	
Tested By: jm	Checked By: mcm
Boring ID: ---	
Preparation: reconstituted	
Description: Moist, reddish brown sandy clay	
Classification: ---	
Group Symbol: ---	
Liquid Limit: 29	Plastic Limit: 19
Plasticity Index: 10	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		■	●	▲	
Sample ID		BS-10	BS-10	BS-10	
Depth, ft		0-5 ft	0-5 ft	0-5 ft	
Test Number		CU-4-1	CU-4-2	CU-4-3	
Initial	Height, in	4.091	4.095	4.085	
	Diameter, in	2.020	2.020	2.020	
	Moisture Content (from Cuttings), %	18.4	18.2	18.3	
	Dry Density, pcf	106.	106.	106.	
	Saturation (Wet Method), %	84.0	83.3	84.1	
	Void Ratio	0.591	0.591	0.589	
Before Shear	Moisture Content, %	21.2	21.1	20.6	
	Dry Density, pcf	107.	107.	108.	
	Cross-sectional Area (Method A), in²	3.179	3.173	3.150	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.573	0.568	0.555	
	Back Pressure, psi	127.0	121.0	95.00	
Vertical Effective Consolidation Stress, psi		5.020	10.02	15.02	
Horizontal Effective Consolidation Stress, psi		5.004	9.992	15.01	
Vertical Strain after Consolidation, %		0.06649	0.1992	0.3202	
Volumetric Strain after Consolidation, %		0.2251	0.6992	1.804	
Time to 50% Consolidation, min		9.000	36.00	49.00	
Shear Strength, psi		6.843	8.174	8.971	
Strain at Failure, %		13.0	13.1	12.1	
Strain Rate, %/min		0.01600	0.01600	0.01600	
Deviator Stress at Failure, psi		13.69	16.35	17.94	
Effective Minor Principal Stress at Failure, psi		5.854	7.104	7.144	
Effective Major Principal Stress at Failure, psi		19.54	23.45	25.09	
B-Value		0.96	0.97	0.95	

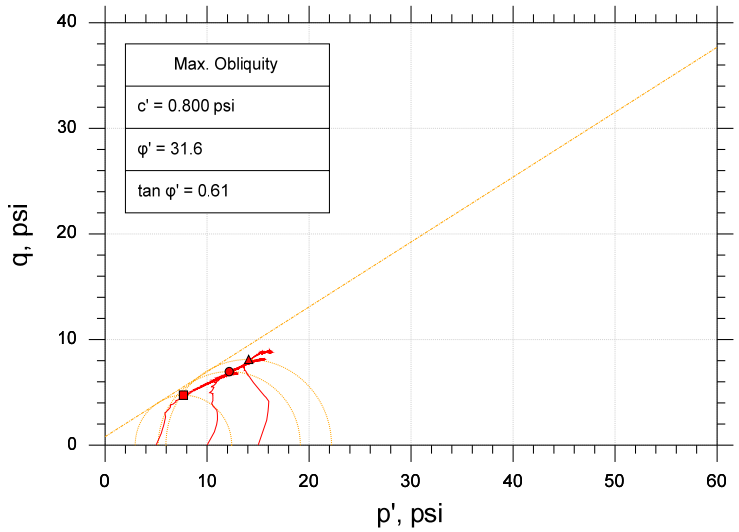
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Atterberg Limits determined by ASTM D4318.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

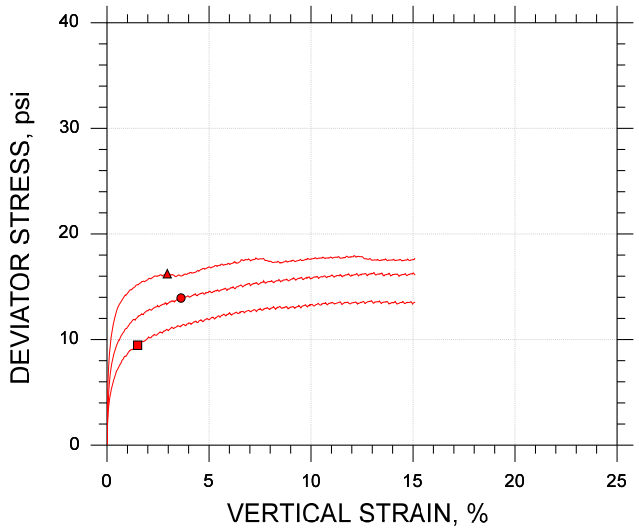
Remarks:

Target Compaction: 95% of (111.7 pcf) at Optimum Moisture Content (16%) + 2% - As Requested by Client

Client: F&ME Consultants	
Project Name: I-20/26/126 Corridor Improvemen	
Project Location: ---	
Project Number: GTX-307802	
Tested By: jm	Checked By: mcm
Boring ID: ---	
Preparation: reconstituted	
Description: Moist, reddish brown sandy clay	
Classification: ---	
Group Symbol: ---	
Liquid Limit: 29	Plastic Limit: 19
Plasticity Index: 10	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767

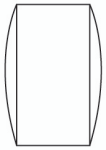


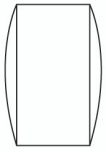


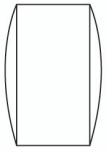
Symbol		■	●	▲	
Sample ID		BS-10	BS-10	BS-10	
Depth, ft		0-5 ft	0-5 ft	0-5 ft	
Test Number		CU-4-1	CU-4-2	CU-4-3	
Initial	Height, in	4.091	4.095	4.085	
	Diameter, in	2.020	2.020	2.020	
	Moisture Content (from Cuttings), %	18.4	18.2	18.3	
	Dry Density, pcf	106.	106.	106.	
	Saturation (Wet Method), %	84.0	83.3	84.1	
	Void Ratio	0.591	0.591	0.589	
Before Shear	Moisture Content, %	21.2	21.1	20.6	
	Dry Density, pcf	107.	107.	108.	
	Cross-sectional Area (Method A), in²	3.179	3.173	3.150	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.573	0.568	0.555	
	Back Pressure, psi	127.0	121.0	95.00	
Vertical Effective Consolidation Stress, psi		5.020	10.02	15.02	
Horizontal Effective Consolidation Stress, psi		5.004	9.992	15.01	
Vertical Strain after Consolidation, %		0.06649	0.1992	0.3202	
Volumetric Strain after Consolidation, %		0.2251	0.6992	1.804	
Time to 50% Consolidation, min		9.000	36.00	49.00	
Shear Strength, psi		4.731	6.965	8.120	
Strain at Failure, %		1.50	3.63	2.95	
Strain Rate, %/min		0.01600	0.01600	0.01600	
Deviator Stress at Failure, psi		9.461	13.93	16.24	
Effective Minor Principal Stress at Failure, psi		2.949	5.211	5.960	
Effective Major Principal Stress at Failure, psi		12.41	19.14	22.20	
B-Value		0.96	0.97	0.95	

Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Atterberg Limits determined by ASTM D4318.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

Remarks:

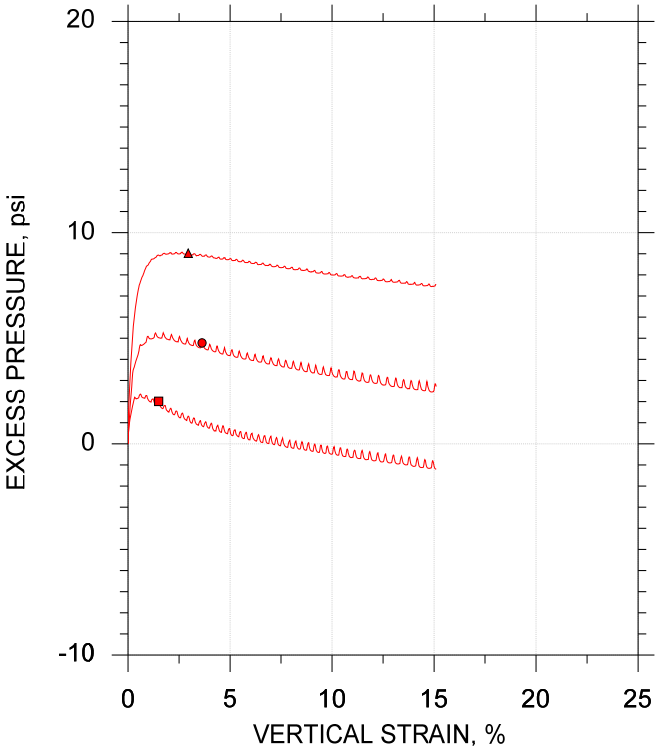


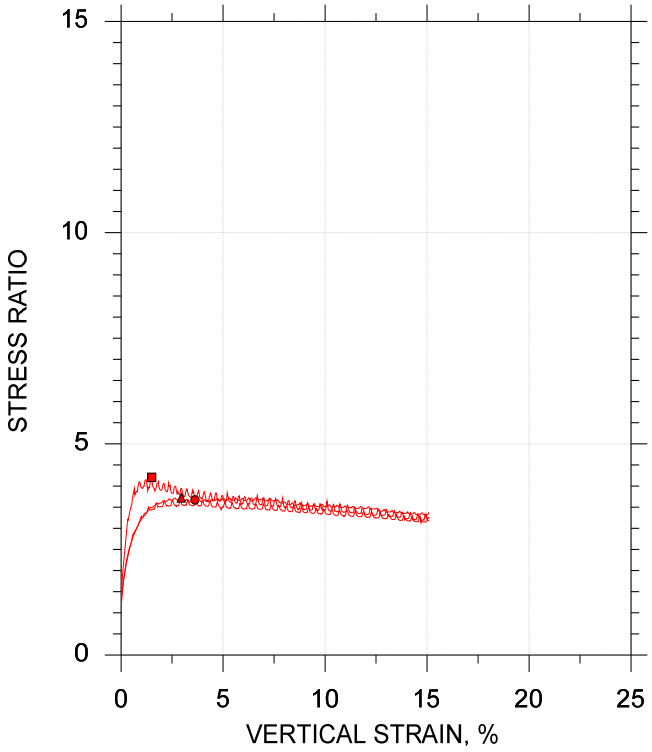


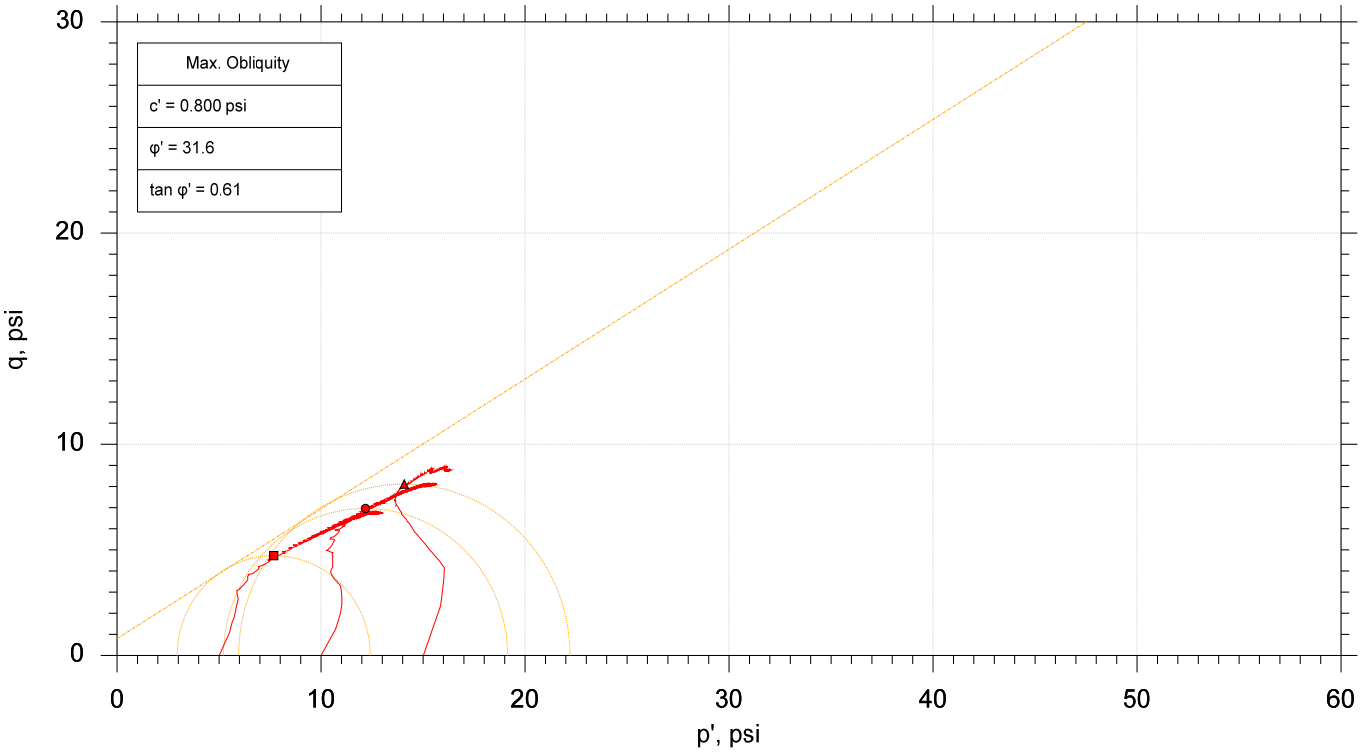


Target Compaction: 95% of (111.7 pcf) at Optimum Moisture Content (16%) + 2% - As Requested by Client

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	BS-10	CU-4-1	0-5 ft	jm	3/22/18	mcm	3/27/18	307802-CU-4-1m.dat
●	BS-10	CU-4-2	0-5 ft	jm	3/24/18	mcm	3/27/18	307802-CU-4-2m.dat
▲	BS-10	CU-4-3	0-5 ft	jm	3/21/18	mcm	3/27/18	307802-CU-4-3m.dat

GeoTesting EXPRESS

Project: I-20/26/126 Corridor Improvemen	Location: ---	Project No.: GTX-307802
Boring No.: ---	Sample Type: reconstituted	
Description: Moist, reddish brown sandy clay		
Remarks: Target Compaction: 95% of (111.7 pcf) at Optimum Moisture Content (16%) + 2% - As Requested by Client		

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0634	**DATE SAMPLE RECEIVED:**	4/6/2018
DESCRIPTION OF SOIL:	SILT (ML) A-4(0)		
TESTED BY:	MB	**DATE OF TESTING:**	4/6/2018
		DATE OF WEIGHING:	4/6/2018

BORING NO.	BS-11				
SAMPLE NO.	18-0634C				
SAMPLE DEPTH	0.0-5.0'				
WATER CONTENT, W%	9.1				

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

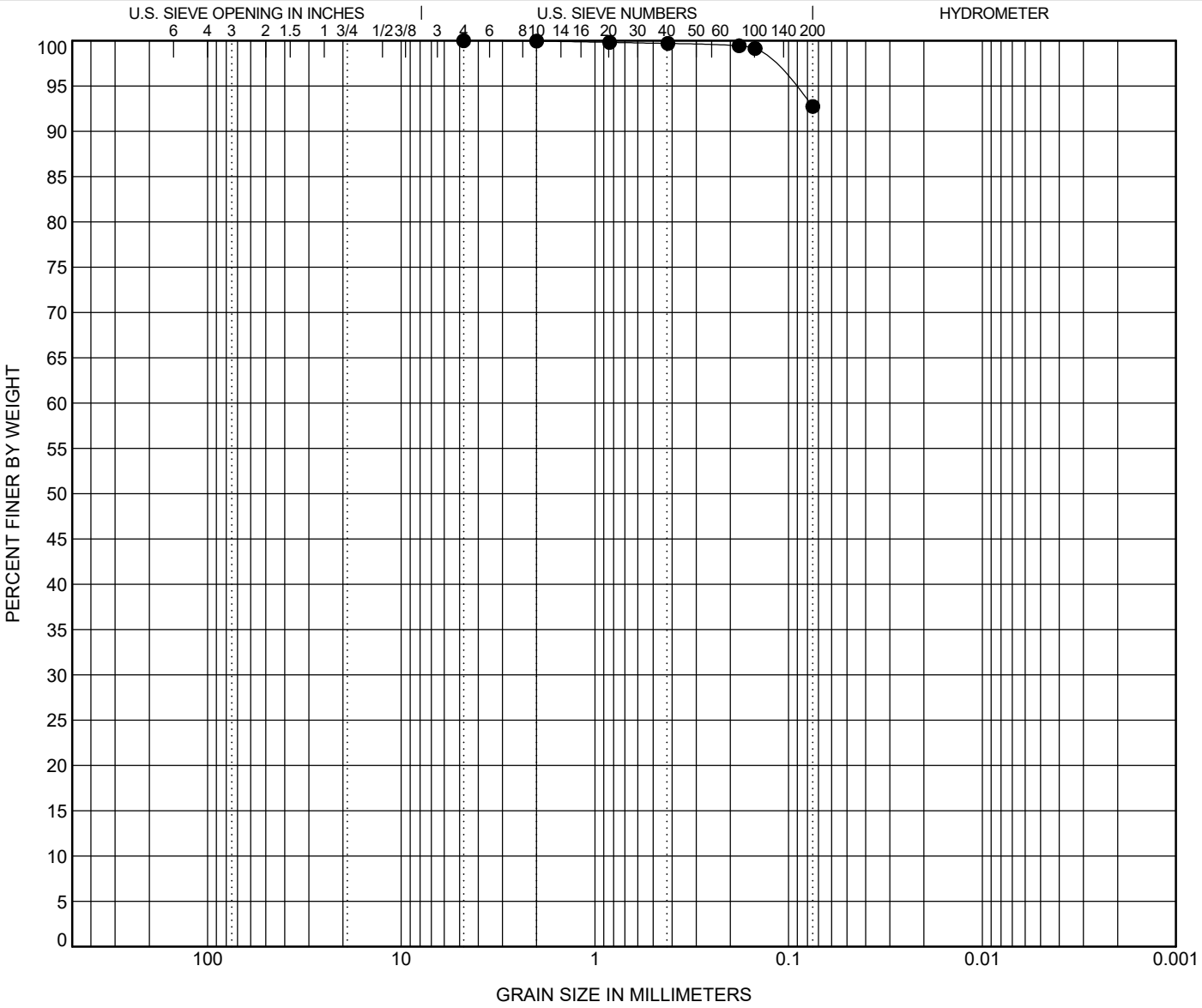
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**BS-11**	**5.0**	**SILT (ML) A-4(0)**	**NP**	**NP**	**NP**		

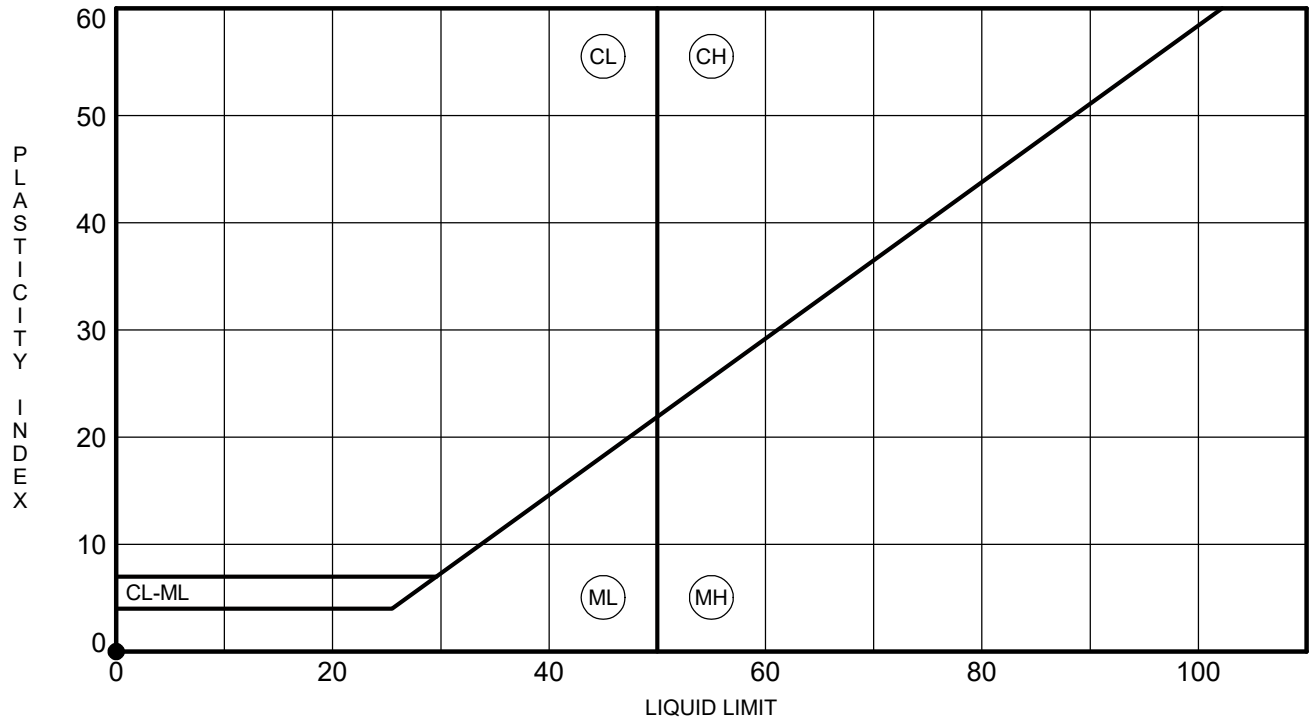
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**BS-11**	**5.0**	**4.76**	**0.096**			**0.0**	**7.3**	**92.7**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/26/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



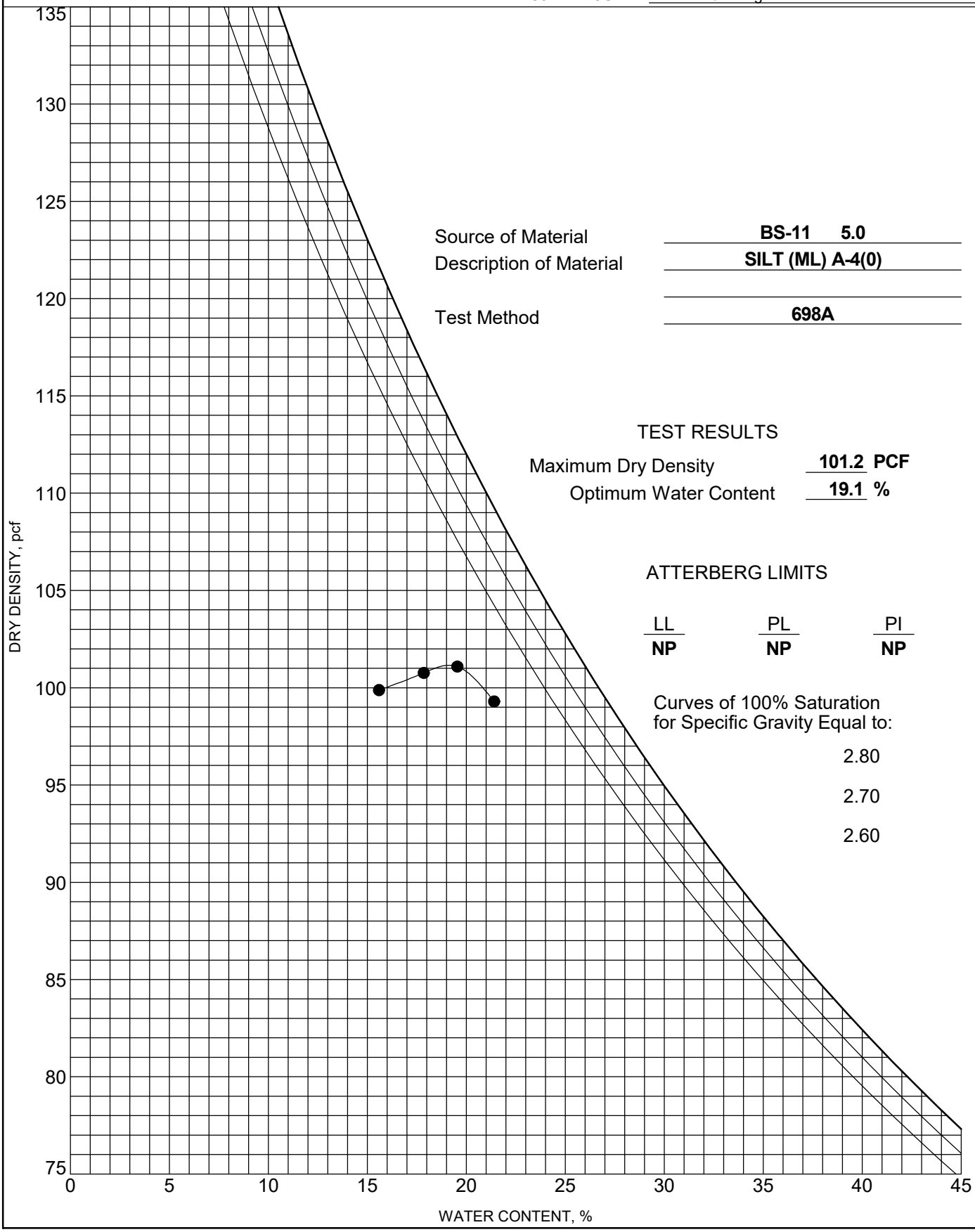
	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**BS-11**	**5.0**	**NP**	**NP**	**NP**	**93**	**SILT (ML) A-4(0)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/26/18

MOISTURE-DENSITY RELATIONSHIP

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



Source of Material **BS-11 5.0**

Description of Material **SILT (ML) A-4(0)**

Test Method **698A**

TEST RESULTS

Maximum Dry Density **101.2** **PCF**

Optimum Water Content **19.1** **%**

ATTERBERG LIMITS

LL	PL	PI
NP	**NP**	**NP**

Curves of 100% Saturation for Specific Gravity Equal to:

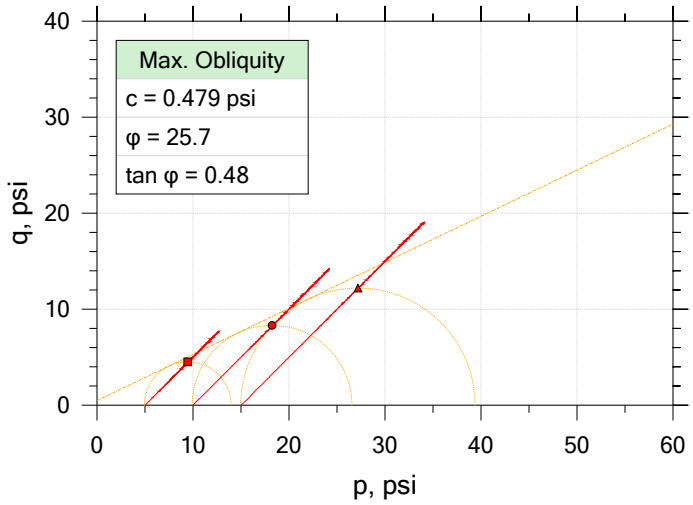
2.80

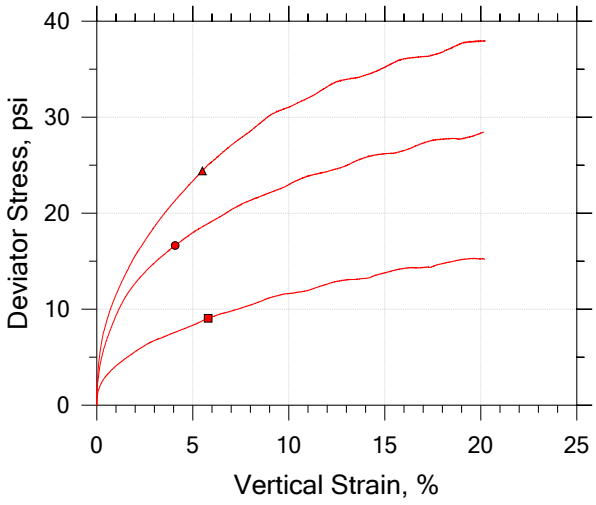
2.70

2.60

COMPACTION - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/26/18

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297





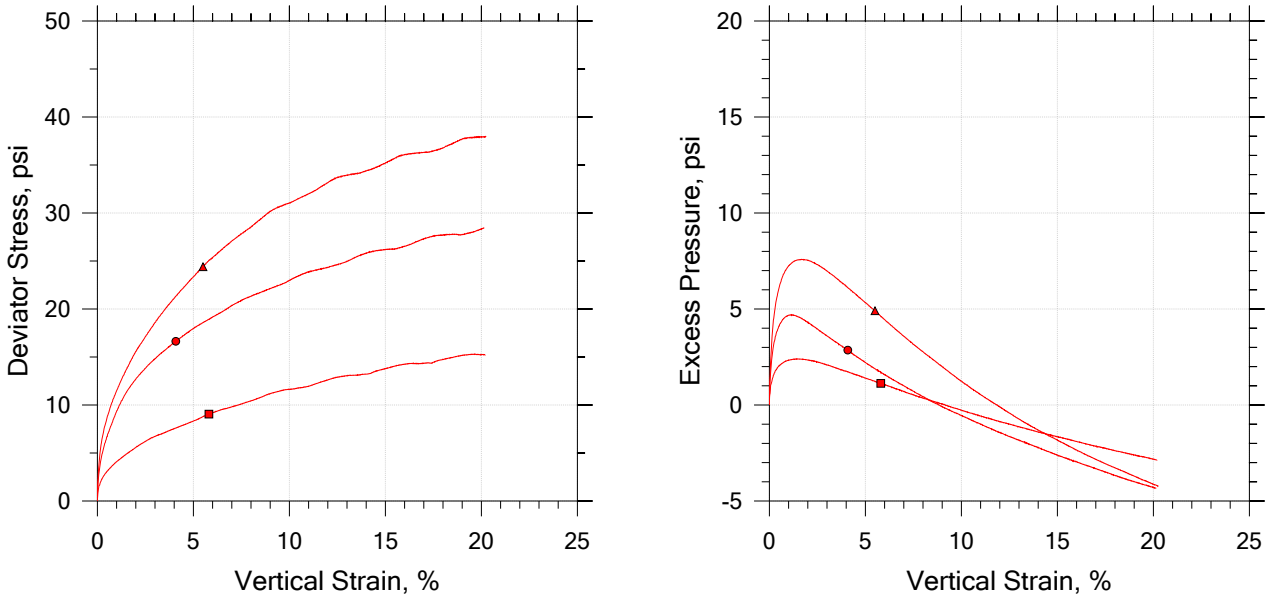
		■	●	▲	
Symbol					
Sample ID		18-0634	18-0634	18-0634	
Depth, ft		0' - 5'	0' - 5'	0' - 5'	
Test Number		A	B	C	
Initial	Height, in	6.000	5.984	5.953	
	Diameter, in	2.800	2.803	2.808	
	Moisture Content (from Cuttings), %	0.0	1.2	0.8	
	Dry Density, pcf	118.	115.	115.	
	Saturation (Wet Method), %	0.2	7.1	4.5	
	Void Ratio	0.414	0.461	0.453	
Final	Moisture Content, %	13.8	16.0	14.8	
	Dry Density, pcf	122.	117.	120.	
	Cross-Sectional Area (Method A), in²	6.017	6.085	6.028	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.370	0.430	0.396	
	Back Pressure, %	101.0	101.0	101.0	
Vertical Effective Consolidation Stress, psi		4.954	9.921	14.91	
Horizontal Effective Consolidation Stress, psi		4.998	9.999	15.00	
Vertical Strain after Consolidation, %		0.5417	1.149	1.373	
Volumetric Strain after Consolidation, %		2.085	3.339	4.258	
Time to 50% Consolidation, min		0.0000	0.0000	0.0000	
Shear Strength, psi		4.523	8.322	12.20	
Strain at Failure, %		5.80	4.08	5.50	
Strain Rate, %/min		0.07500	0.07500	0.07500	
Deviator Stress at Failure, psi		9.046	16.64	24.41	
Effective Minor Principal Stress at Failure, psi		3.795	7.046	10.07	
Effective Major Principal Stress at Failure, psi		12.84	23.69	34.48	
B-Value		0.97	0.96	0.95	

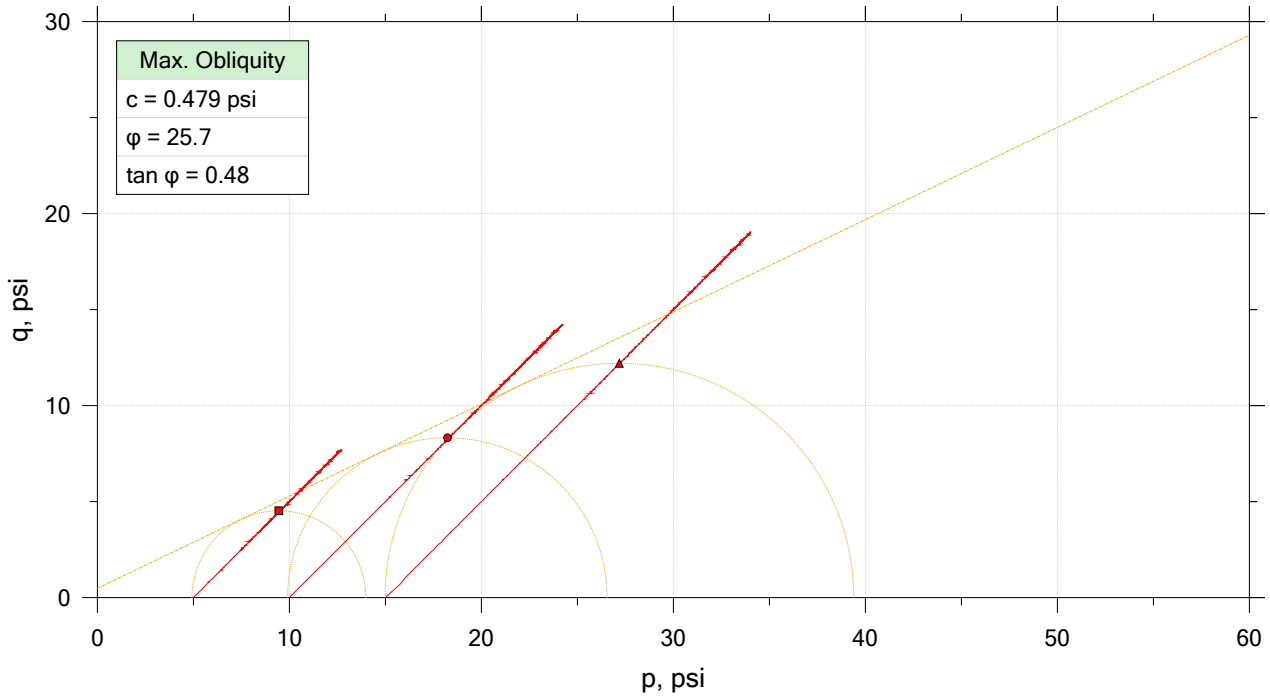
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: BS-11	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-0634	Test Date: 5/8/2018 - 5/15/2018	Depth: 0' - 5'
Test No.: ABC	Sample Type: Remolded	Elevation: --
Description: SILT (ML/A-4(0)) LL: NP PL: NP PI: NP %#200 Finer: 92.7		
Remarks: Max Dry Density - 101.2 pcf at OMC - 19.1% + 2%		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297





	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-0634	A	0' - 5'	WAP	5/8/2018	JFH/RS	1/25/18	18-0634_BS-11_test A.dat
●	18-0634	B	0' - 5'	WAP	5/11/2018	JFH/RS	1/25/18	18-0634_BS-11_test B.dat
▲	18-0634	C	0' - 5'	WAP	5/14/2018	JFH/RS	1/25/18	18-0634_BS-11_test C.dat

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: BS-11	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-0634	Test Date: 5/8/2018 - 5/15/2018	Depth: 0' - 5'
Test No.: ABC	Sample Type: Remolded	Elevation: --
Description: SILT (ML/A-4(0)) LL: NP PL: NP PI: NP %#200 Finer: 92.7		
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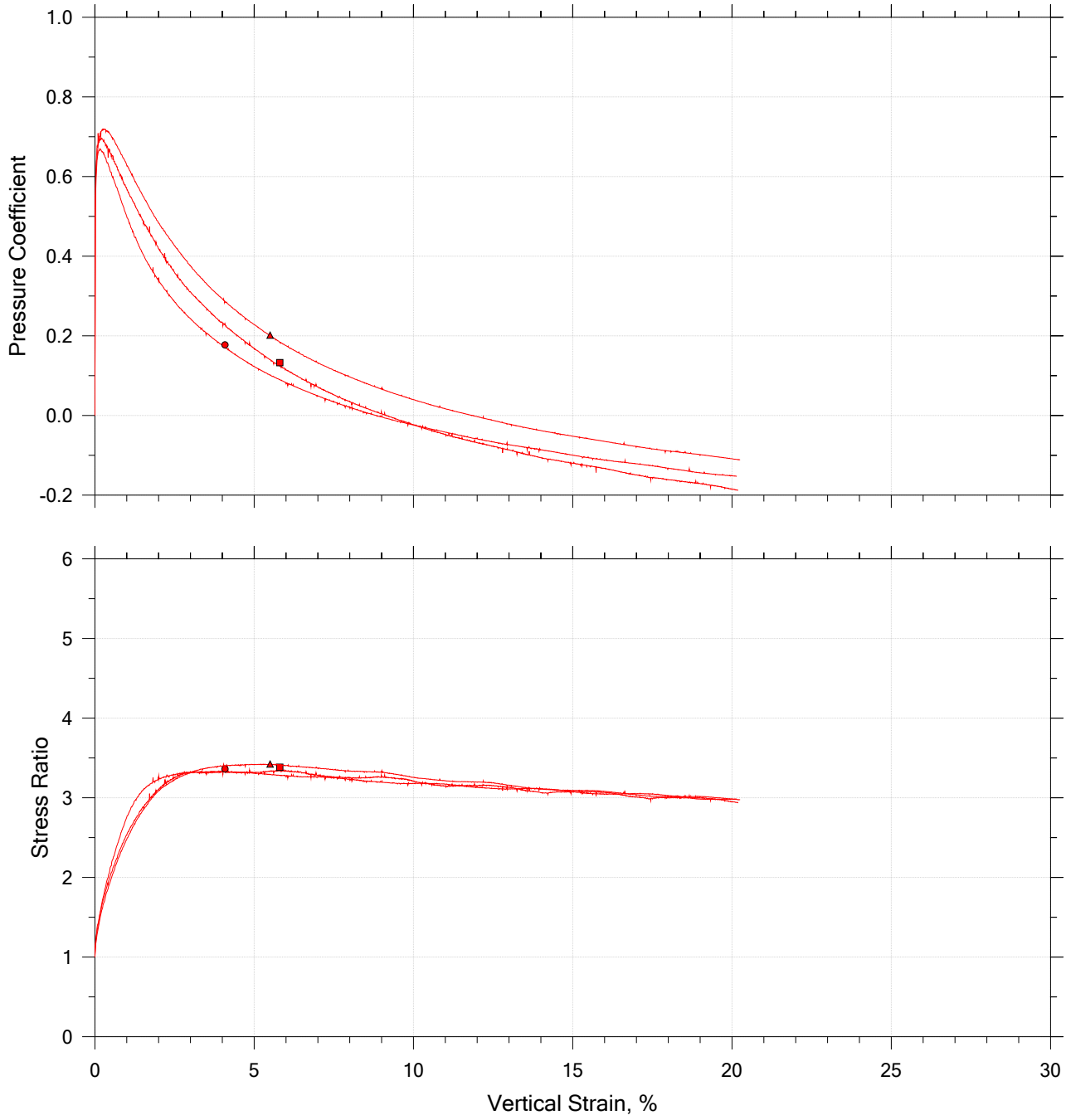
CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297



	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-0634	A	0' - 5'	WAP	5/8/2018	JFH/RS	1/25/18	18-0634_BS-11_test A.dat
●	18-0634	B	0' - 5'	WAP	5/11/2018	JFH/RS	1/25/18	18-0634_BS-11_test B.dat
▲	18-0634	C	0' - 5'	WAP	5/14/2018	JFH/RS	1/25/18	18-0634_BS-11_test C.dat

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: BS-11	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-0634	Test Date: 5/8/2018 - 5/15/2018	Depth: 0' - 5'
Test No.: ABC	Sample Type: Remolded	Elevation: --
Description: SILT (ML/A-4(0)) LL: NP PL: NP PI: NP %#200 Finer: 92.7		
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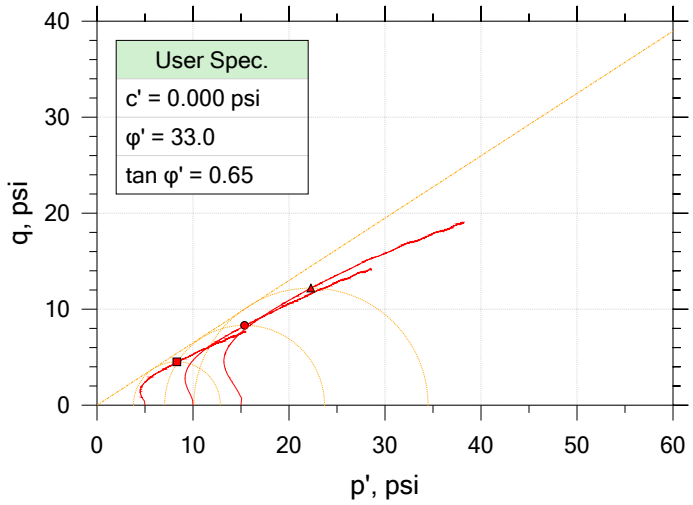
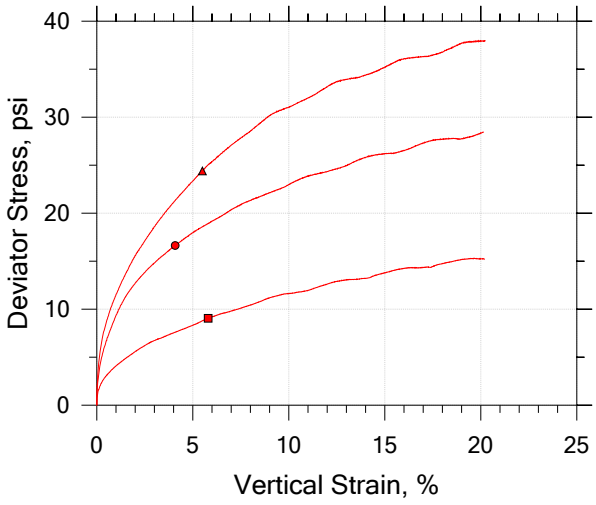
CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297





		■	●	▲	
Symbol					
Sample ID		18-0634	18-0634	18-0634	
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Time to 50% Consolidation, min		0.0000	0.0000	0.0000	
Shear Strength, psi		4.523	8.322	12.20	
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Strain Rate, %/min		0.07500	0.07500	0.07500	
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- Deviator Stress includes membrane correction.
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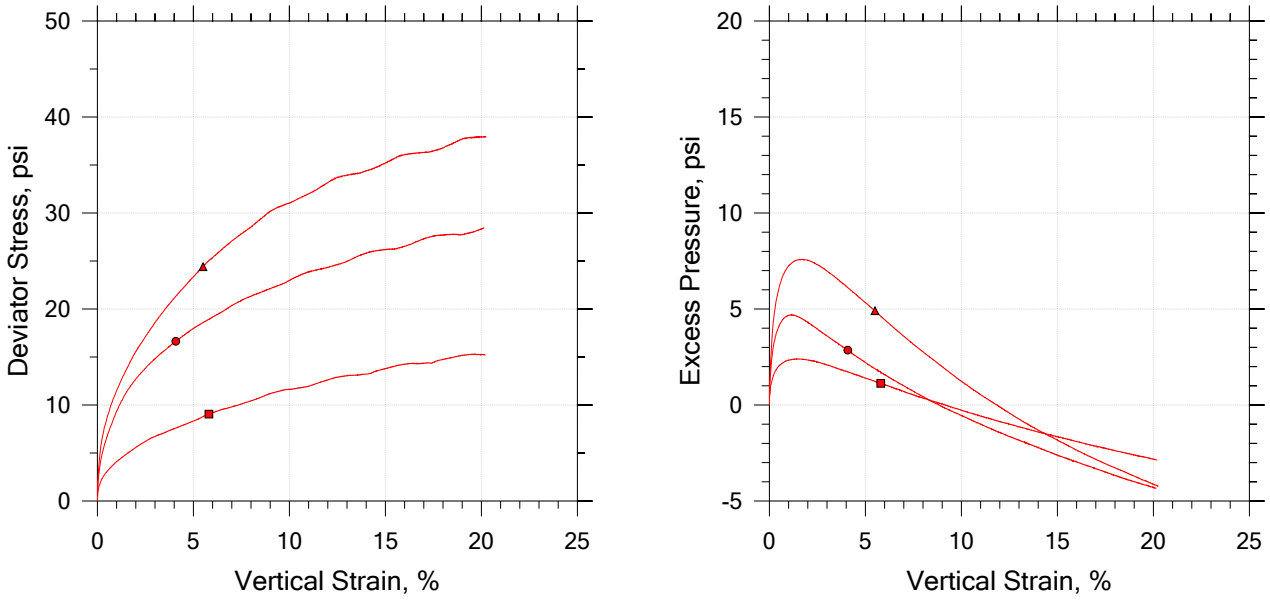
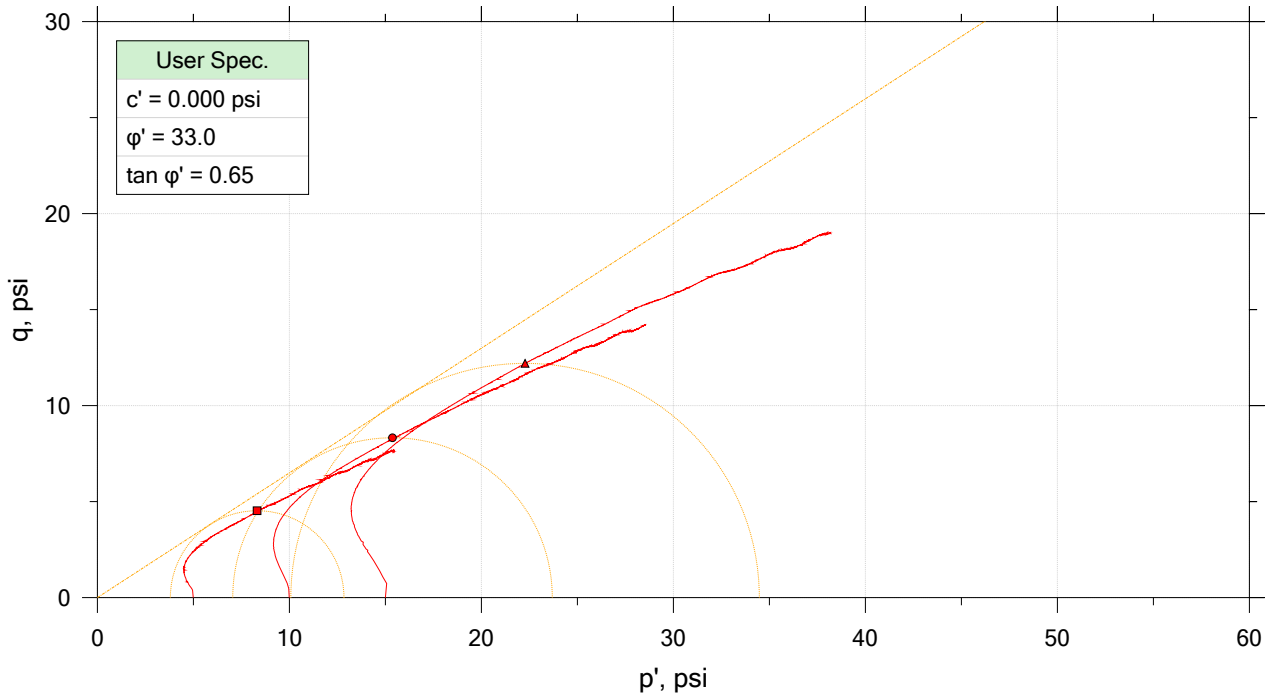
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: BS-11	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-0634	Test Date: 5/8/2018 - 5/15/2018	Depth: 0' - 5'
Test No.: ABC	Sample Type: Remolded	Elevation: --
Description: SILT (ML/A-4(0)) LL: NP PL: NP PI: NP %#200 Finer: 92.7		
Remarks: Max Dry Density - 101.2 pcf at OMC - 19.1% + 2%		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297



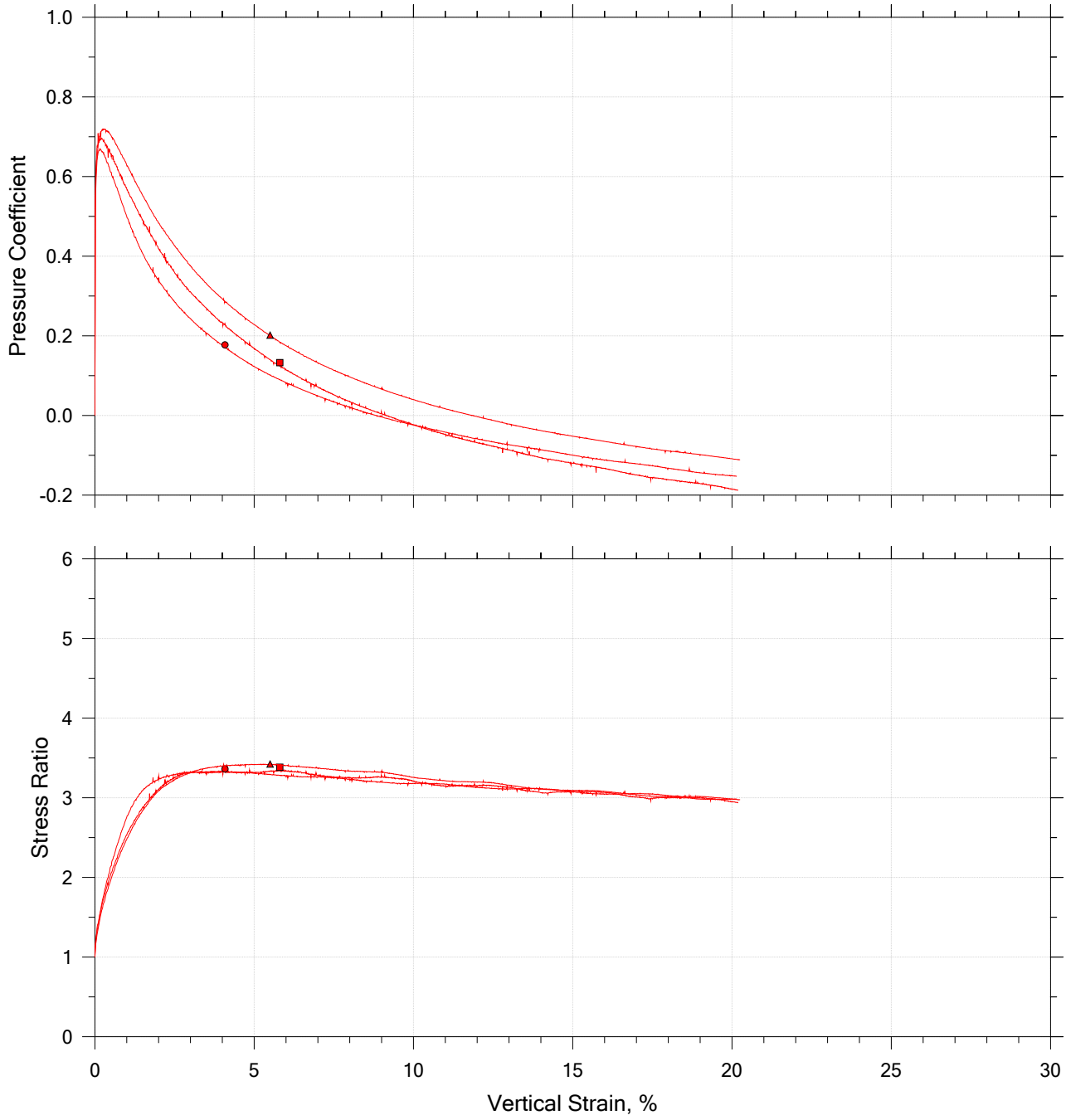


	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-0634	A	0' - 5'	WAP	5/8/2018	JFH/RS	1/25/18	18-0634_BS-11_test A.dat
●	18-0634	B	0' - 5'	WAP	5/11/2018	JFH/RS	1/25/18	18-0634_BS-11_test B.dat
▲	18-0634	C	0' - 5'	WAP	5/14/2018	JFH/RS	1/25/18	18-0634_BS-11_test C.dat

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: BS-11	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-0634	Test Date: 5/8/2018 - 5/15/2018	Depth: 0' - 5'
Test No.: ABC	Sample Type: Remolded	Elevation: --
Description: SILT (ML/A-4(0)) LL: NP PL: NP PI: NP %#200 Finer: 92.7		
Remarks: Max Dry Density - 101.2 pcf at OMC - 19.1% + 2%		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297



	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-0634	A	0' - 5'	WAP	5/8/2018	JFH/RS	1/25/18	18-0634_BS-11_test A.dat
●	18-0634	B	0' - 5'	WAP	5/11/2018	JFH/RS	1/25/18	18-0634_BS-11_test B.dat
▲	18-0634	C	0' - 5'	WAP	5/14/2018	JFH/RS	1/25/18	18-0634_BS-11_test C.dat

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: BS-11	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-0634	Test Date: 5/8/2018 - 5/15/2018	Depth: 0' - 5'
Test No.: ABC	Sample Type: Remolded	Elevation: --
Description: SILT (ML/A-4(0)) LL: NP PL: NP PI: NP %#200 Finer: 92.7		
Remarks: Max Dry Density - 101.2 pcf at OMC - 19.1% + 2%		

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0399	**DATE SAMPLE RECEIVED:**	3/1/2018
DESCRIPTION OF SOIL:	Sandy SILT (ML) A-4(4)		
TESTED BY:	MB	**DATE OF TESTING:**	3/2/2018
		DATE OF WEIGHING:	3/5/2018

BORING NO.	BS-12				
SAMPLE NO.	18-0399C				
SAMPLE DEPTH	0.0-5.0'				
WATER CONTENT, W%	22.0				

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

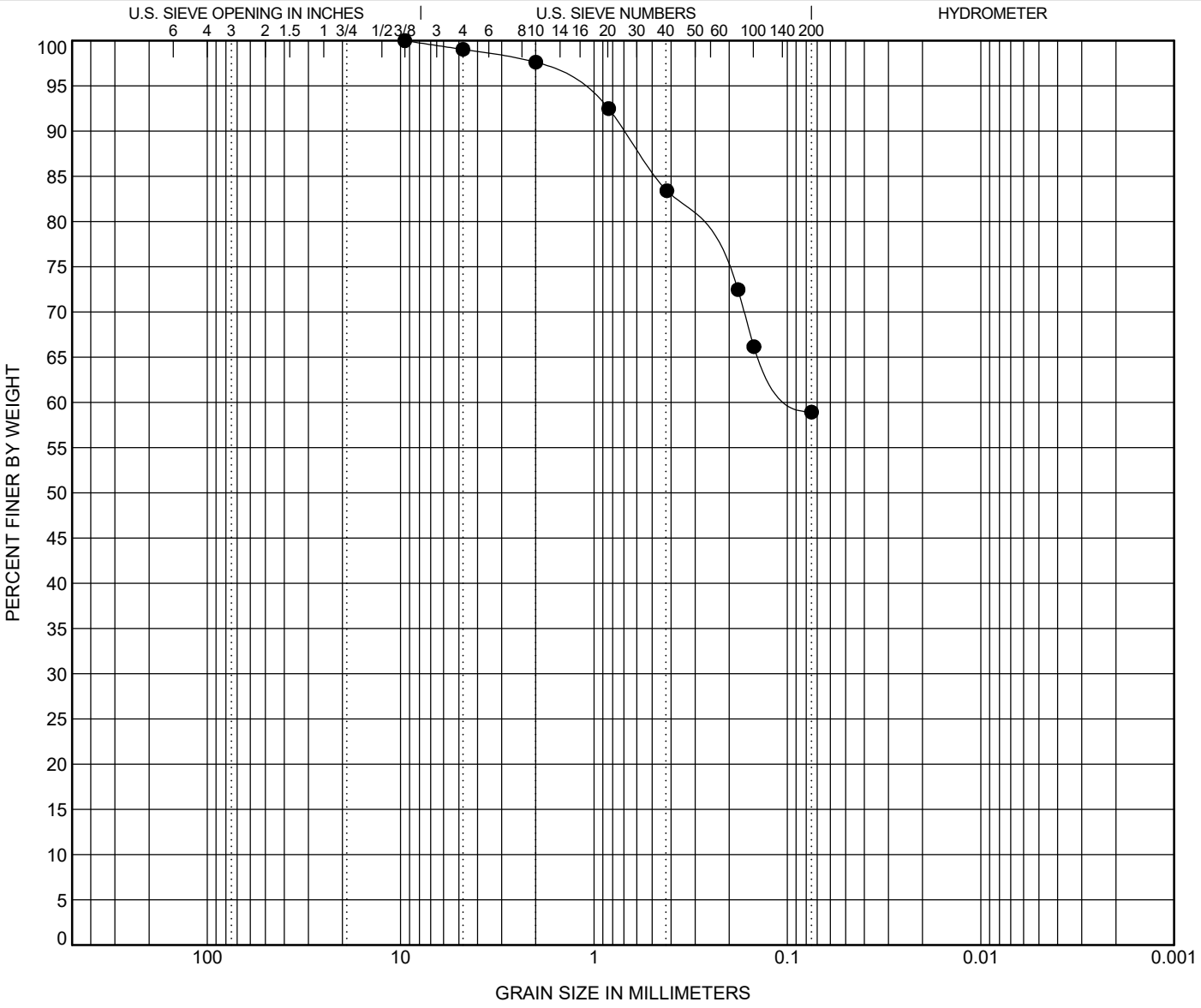
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
● **BS-12**	**5.0**	**Sandy SILT (ML) A-4(4)**	**37**	**28**	**9**		

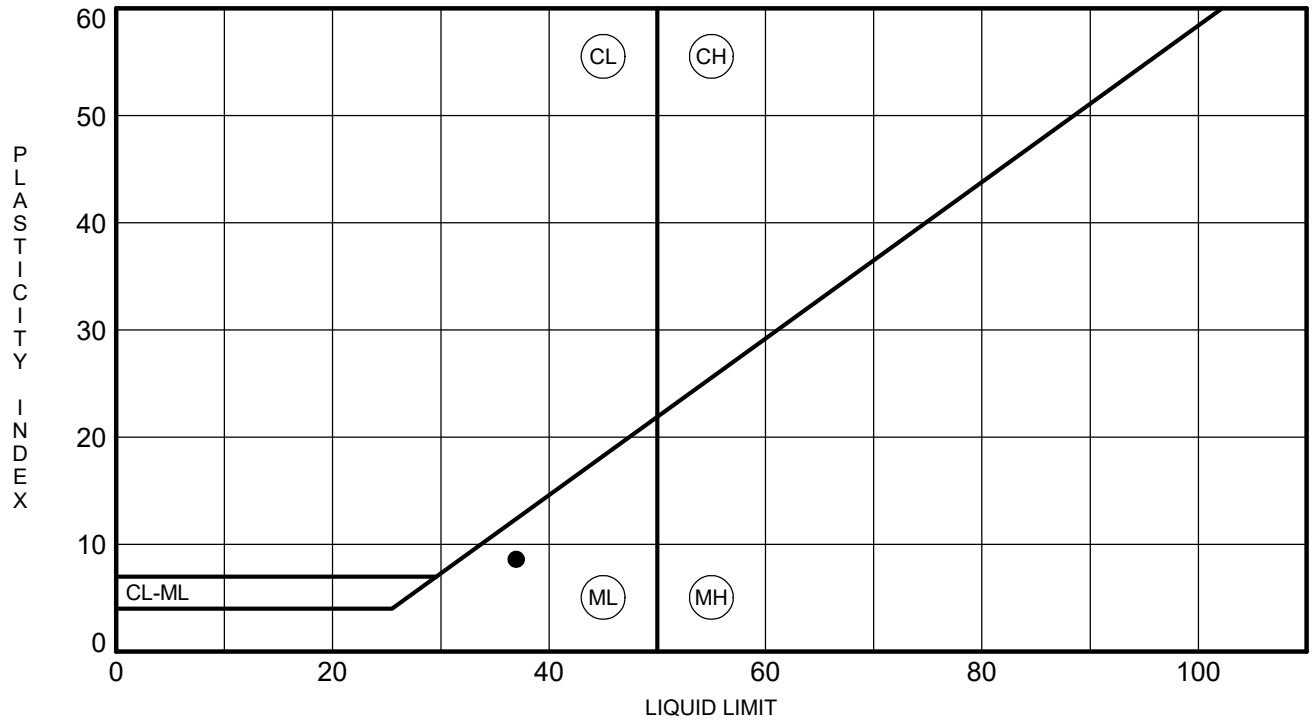
BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
● **BS-12**	**5.0**	**9.52**	**1.284**			**1.0**	**40.1**	**58.9**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 3/9/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**BS-12**	**5.0**	**37**	**28**	**9**	**59**	**Sandy SILT (ML) A-4(4)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 3/9/18

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

INORGANIC IMPURITIES DETERMINATION
(SC-T-36)

PROJECT: Carolina Crossroads **PROJECT NO.:** G5662.01

SAMPLE NUMBER: 18-0399F/BS-12 **DATE SAMPLE RECEIVED:**

DESCRIPTION OF SOIL:

TESTED BY: JH **DATE OF TESTING:** 3/15/2018

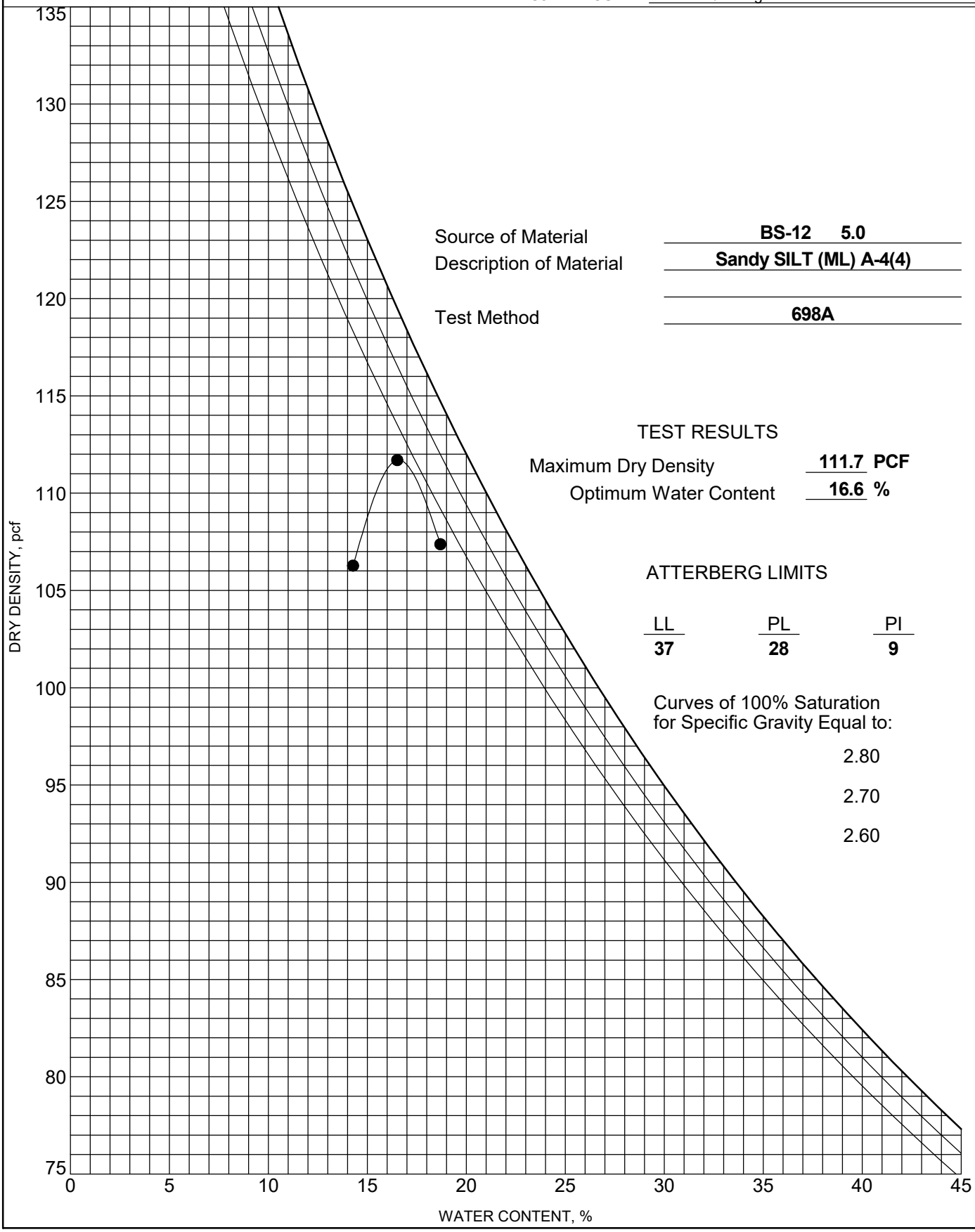
DATE OF WEIGHING: 3/15/2018

BORING NO.	BS-12				
SAMPLE NO.	18-0399F				
SAMPLE DEPTH					
200 WASH PAN NUMBER	3066				
WEIGHT OF PAN	8.04				
WEIGHT OF SAMPLE & PAN (BEFORE WASH)	108.04				
WEIGHT OF SAMPLE (BEFORE WASH)	100.00				
WEIGHT OF SAMPLE PASSING #10 & PAN (AFTER WASH)	29.84				
WEIGHT OF SAMPLE PASSING #10 (AFTER WASH)	21.80				
MATERIAL >#10 PAN NUMBER	3066				
MATERIAL >#10 PAN WEIGHT	8.10				
WEIGHT OF SAMPLE RETAINED #10 & PAN (AFTER WASH)	10.25				
WEIGHT OF SAMPLE RETAINED #10 (AFTER WASH)	2.15				
PERCENT PASSING #10 & RETAINED ON #200 (% SANDS)	22.3%				
ORGANIC PAN NUMBER	A				
WT. OF CRUCIBLE + DRY SOIL (BEFORE IGNITION) (GRAMS)	81.07				
WT. OF CRUCIBLE + DRY SOIL (AFTER IGNITION) (GRAMS)	80.96				
WT. OF CRUCIBLE (GRAMS)	61.07				
WT. OF DRY SOIL (BEFORE IGNITION) (GRAMS)	20.00				
WT. OF DRY SOIL (AFTER IGNITION) (GRAMS)	19.89				
IGNITION LOSS (GRAMS)	0.11				
INORGANIC IMPURITIES %	0.1%				

MOISTURE-DENSITY RELATIONSHIP

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



Source of Material **BS-12 5.0**

Description of Material **Sandy SILT (ML) A-4(4)**

Test Method **698A**

TEST RESULTS

Maximum Dry Density **111.7** **PCF**

Optimum Water Content **16.6** **%**

ATTERBERG LIMITS

LL	PL	PI
37	**28**	**9**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

COMPACTION - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 3/9/18

Boring or Test Pit:	BS-12		Boring or Test Pit:	BS-12		Boring or Test Pit:	BS-12	
Sample:	-		Sample:	-		Sample:	-	
Depth:	0.0-5.0	ft	Depth:	0.0-5.0	ft	Depth:	0.0-5.0	ft
Point No.:	1		Point No.:	2		Point No.:	3	
	Initial			**Initial**			**Initial**	
Length =	5.997	in	Length =	5.995	in	Length =	5.993	in
Diameter =	2.790	in	Diameter =	2.790	in	Diameter =	2.790	in
Wet Mass =	2.651	lb	Wet Mass =	2.651	lb	Wet Mass =	2.651	lb
Area =	6.114	in^2	Area =	6.114	in^2	Area =	6.114	in^2
Volume =	36.663	in^3	Volume =	36.651	in^3	Volume =	36.639	in^3
Specific Gravity =	2.65	(ASTM D854)	Specific Gravity =	2.65	(ASTM D854)	Specific Gravity =	2.65	(ASTM D854)
Dry Mass of Solids =	2.262	lb	Dry Mass of Solids =	2.261	lb	Dry Mass of Solids =	2.260	lb
Moisture Content =	17.2%		Moisture Content =	17.3%		Moisture Content =	17.3%	
Wet Unit Weight =	125.0	pcf	Wet Unit Weight =	125.0	pcf	Wet Unit Weight =	125.0	pcf
Dry Unit Weight =	106.6	pcf	Dry Unit Weight =	106.6	pcf	Dry Unit Weight =	106.6	pcf
Void Ratio =	0.55		Void Ratio =	0.55		Void Ratio =	0.55	
Percent Saturation =	83%		Percent Saturation =	84%		Percent Saturation =	84%	
	After Consolidation			**After Consolidation**			**After Consolidation**	
Length =	5.967	in	Length =	5.958	in	Length =	5.980	in
Diameter =	2.788	in	Diameter =	2.772	in	Diameter =	2.782	in
Area =	6.104	in^2 (Method B)	Area =	6.037	in^2 (Method B)	Area =	6.081	in^2 (Method B)
Volume =	36.421	in^3	Volume =	35.967	in^3	Volume =	36.364	in^3
Moisture Content =	20.3%		Moisture Content =	19.6%		Moisture Content =	20.3%	
Wet Unit Weight =	129.1	pcf	Wet Unit Weight =	129.9	pcf	Wet Unit Weight =	129.1	pcf
Dry Unit Weight =	107.3	pcf	Dry Unit Weight =	108.6	pcf	Dry Unit Weight =	107.4	pcf
Void Ratio =	0.54		Void Ratio =	0.52		Void Ratio =	0.54	
Percent Saturation =	100%		Percent Saturation =	100%		Percent Saturation =	100%	
B Parameter =	0.95		B Parameter =	0.98		B Parameter =	0.95	
Shear Rate =	0.090%	/min.	Shear Rate =	0.090%	/min.	Shear Rate =	0.090%	/min.
t_{50} =	0.12	min.	t_{50} =	0.08	min.	t_{50} =	0.10	min.
Strain at Failure =	0.3%		Strain at Failure =	0.8%		Strain at Failure =	2.9%	
Cell Pressure =	95.0	psi	Cell Pressure =	100.0	psi	Cell Pressure =	105.0	psi
Back Pressure =	90.0	psi	Back Pressure =	90.0	psi	Back Pressure =	90.0	psi
Confining Pressure =	5.0	psi	Confining Pressure =	10.0	psi	Confining Pressure =	15.0	psi

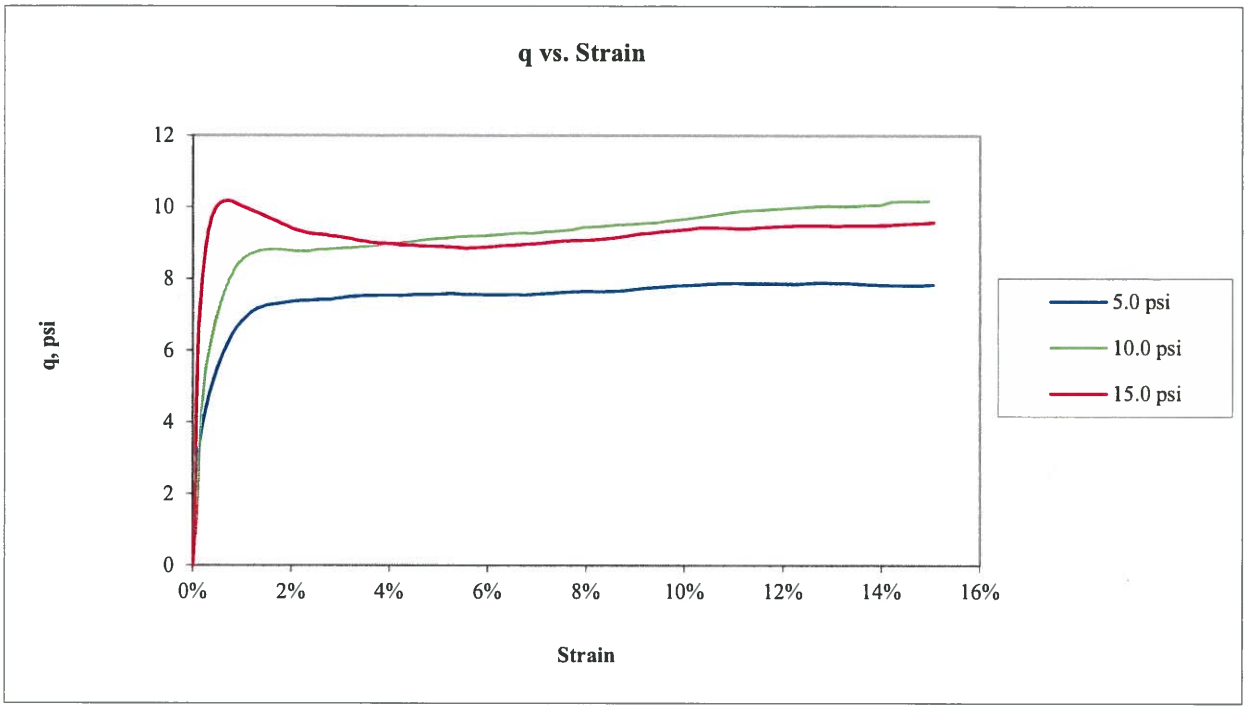
Notes: Sample description: Sandy SILT (ML) A-4(4)

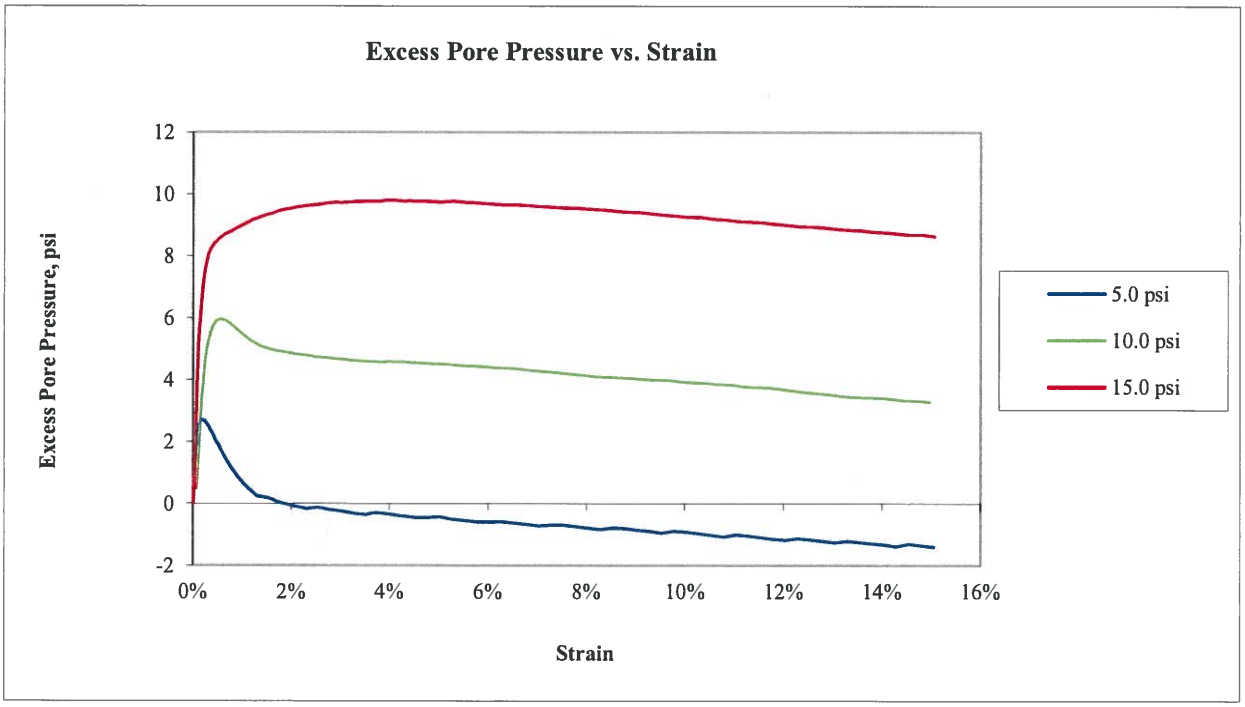
Atterberg limits: LL = 37 PL = 28 PI = 9 (ASTM D4318)

Percent finer: 3/4 in. = - No. 4 = - No. 200 = - (ASTM D422, refer to separate report for gradation curve)

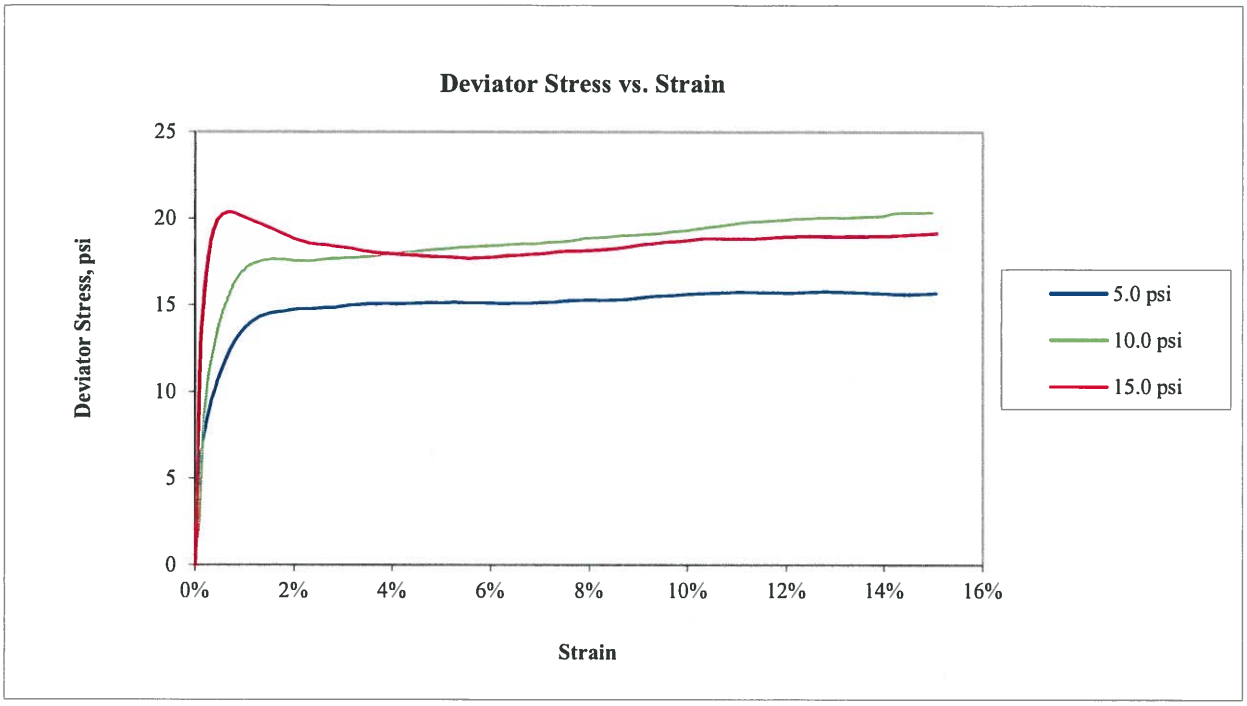
Specimen type:		Intact	X	Reconstituted	Remold targets:	106.1 pcf	17.7% moisture
Moisture from:		Cuttings	X	Entire specimen			
Saturation method:	X	Wet		Dry			
Failure criterion:	X	$(\sigma'_1/\sigma'_3)_{max}$		$(\sigma'_1-\sigma'_3)_{max}$		% strain	
Membrane effect:	X	Corrected		Not Corrected			

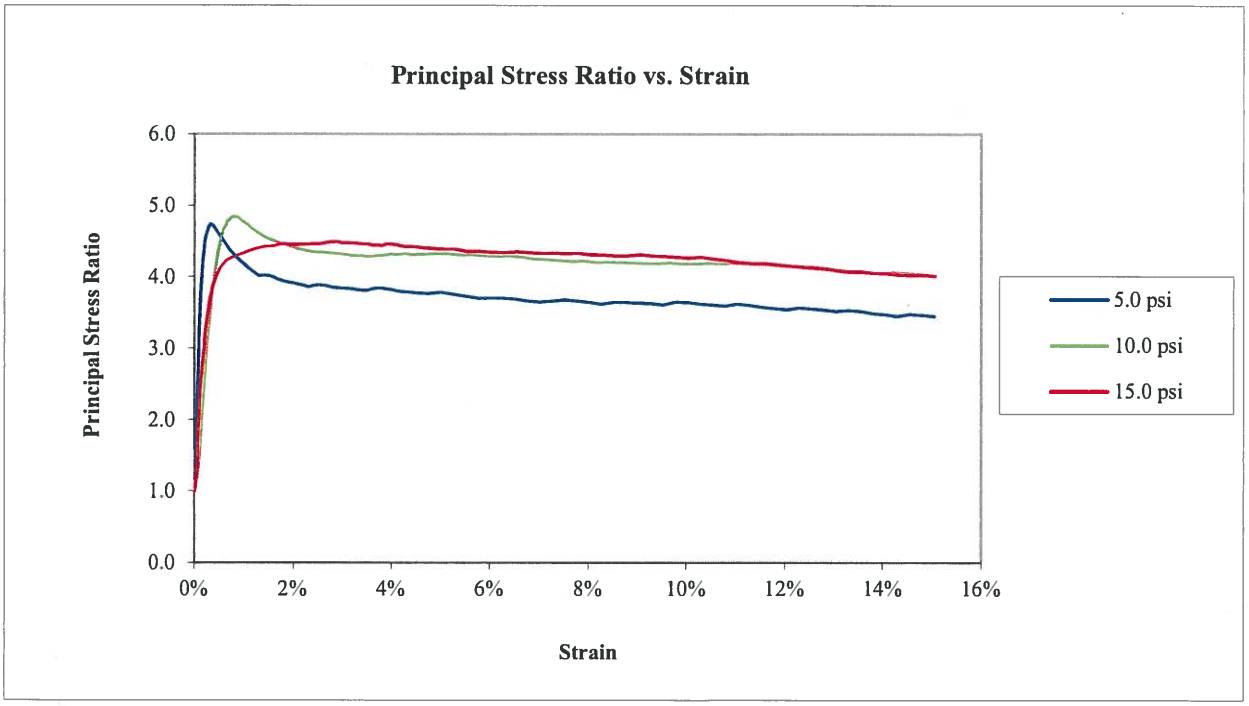
Golder Associates Inc. **Atlanta, Georgia**	**Title:** **ASTM D4767** **CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST REPORT** **SAMPLE AND TEST DATA**			
Job Short Title: **F&ME/G5662.01-I-20/26-126 CORRIDOR IMPROVEMENT/SC**				
Sample: **BS-12 0.0-5.0'**	**Technician:** **PWM/FT** **Check:** PWM	**Reviewed:** DA **Approved:**	**Start Date:** **3/26/2018**	**Job Number:** **1898300**	**Figure:** **1**





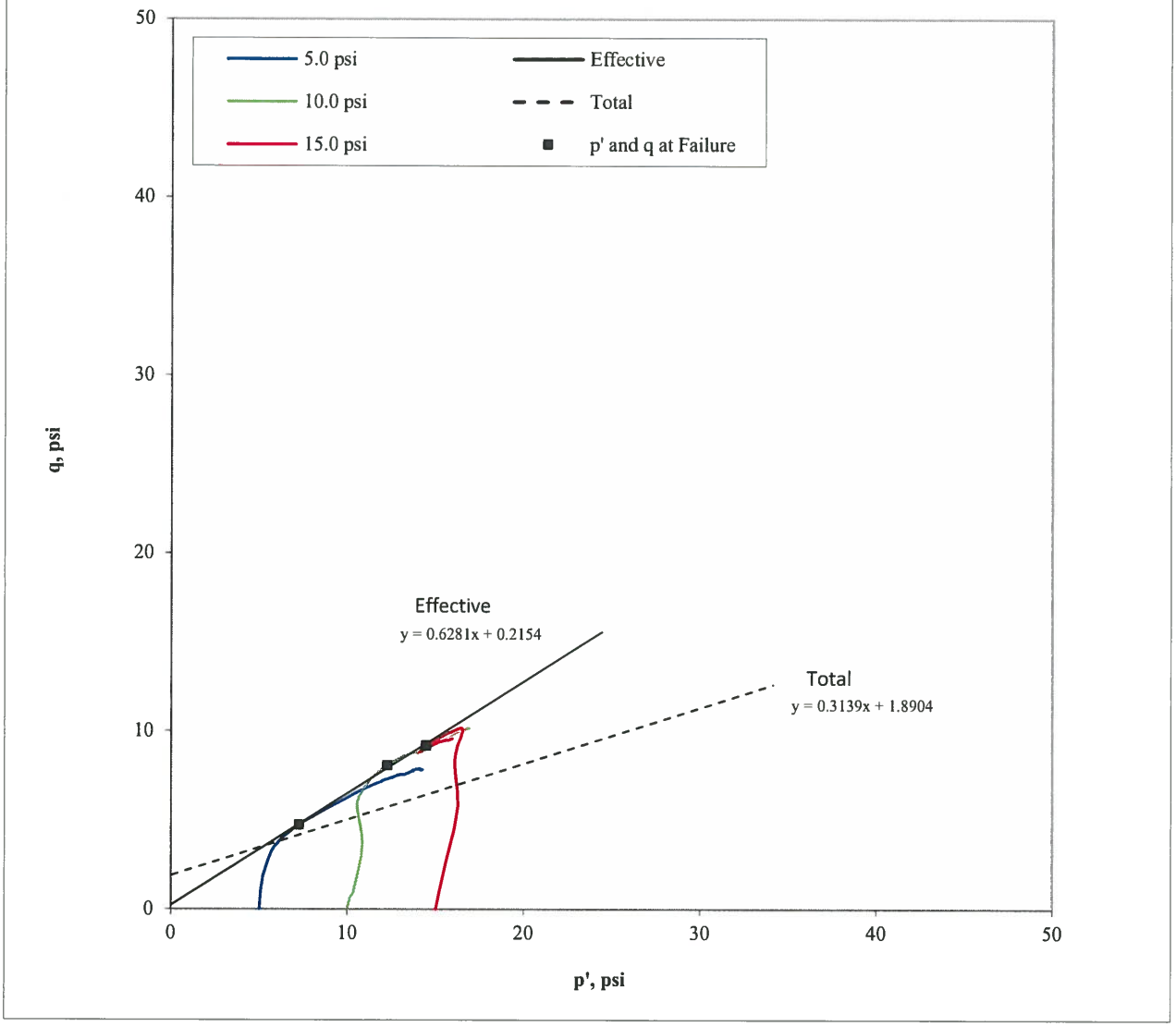
Golder Associates Inc. **Atlanta, Georgia**	**Title:** **ASTM D4767** **CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST REPORT** **q AND EXCESS PORE PRESSURE PLOTS**				
Job Short Title: **F&ME/G5662.01-I-20/26-126 CORRIDOR IMPROVEMENT/SC**					
Sample: **BS-12 0.0-5.0'**	**Technician:** **PWM/FT** **Check:**	**Reviewed:** **DA** **Approved:**	**Start Date:** **3/26/2018**	**Job Number:** **1898300**	**Figure:** **2**





Golder Associates Inc. **Atlanta, Georgia**	**Title:** **ASTM D4767** **CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST REPORT** **DEVIATOR STRESS AND PRINCIPAL STRESS RATIO PLOT**				
Job Short Title: **F&ME/G5662.01-I-20/26-126 CORRIDOR IMPROVEMENT/SC**					
Sample: **BS-12 0.0-5.0'**	**Technician:** **PWM/FT** **Check:**	**Reviewed:** DA **Approved:**	**Start Date:** **3/26/2018**	**Job Number:** **1898300**	**Figure:** **3**

Stress Path (p'-q) Plot



Confining Pressure (psi)	p at failure (psi)	p' at failure (psi)	q at failure (psi)
5.0	9.7	7.3	4.7
10.0	18.1	12.3	8.1
15.0	24.2	14.4	9.2

Effective

α ' =	32.1	degree
a' =	0.2	psi

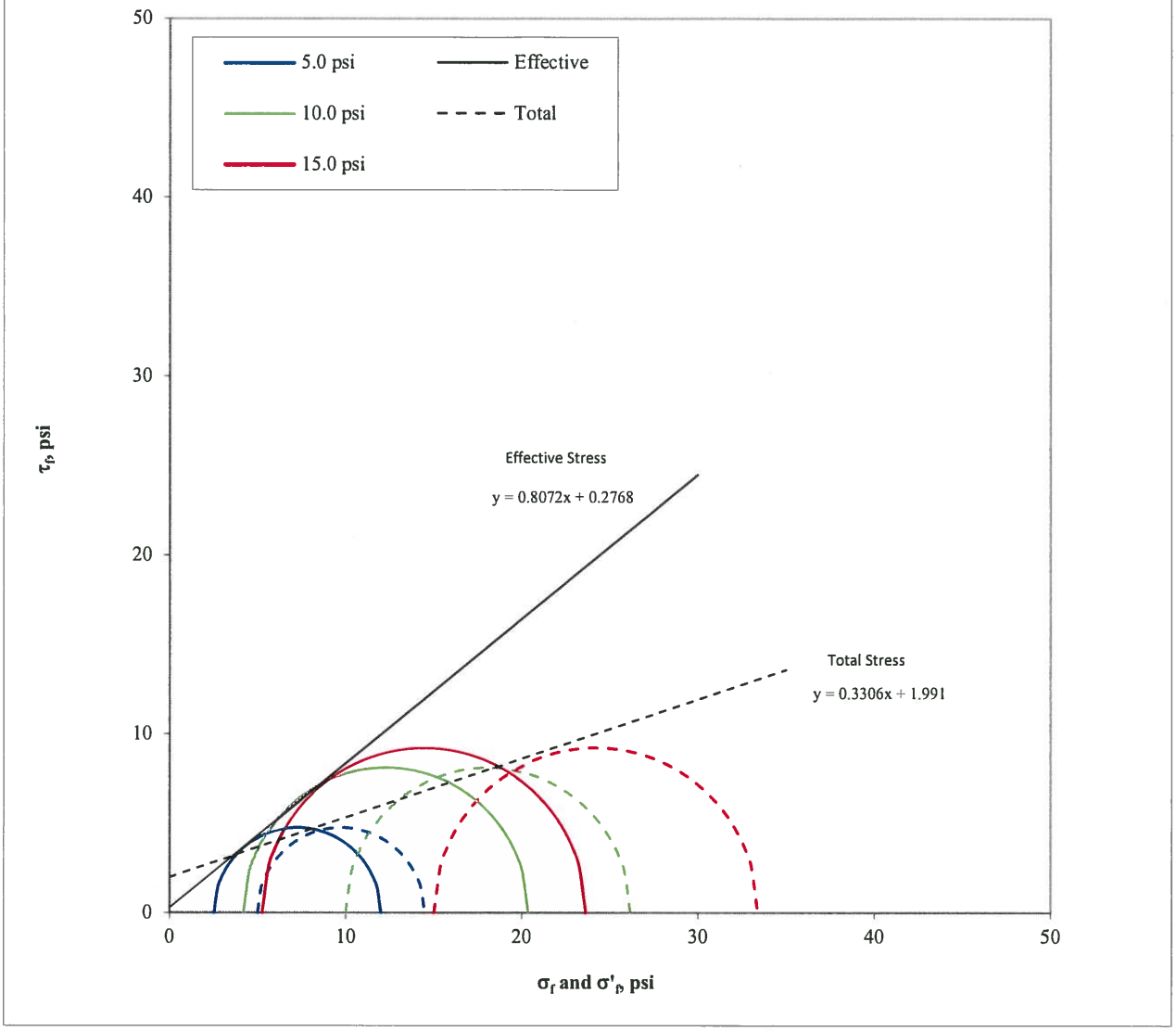
Total

α =	17.4	degree
a =	1.9	psi

Note: The laboratory testing relates only to the sample tested. GAI neither accepts responsibility for nor makes claims to the final use and purpose of the material.

Golder Associates Inc. Atlanta, Georgia	**Title:** ASTM D4767 CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST REPORT STRESS PATH PLOT				
Job Short Title: F&ME/G5662.01-I-20/26-126 CORRIDOR IMPROVEMENT/SC					
Sample: BS-12 0.0-5.0'	**Technician:** PWM/FT **Check:** PWM	**Reviewed:** DA **Approved:**	**Start Date:** 3/26/2018	**Job Number:** 1898300	**Figure:** 4

Mohr's Circle Diagram



Confining Pressure (psi)	σ'_1 at failure (psi)	σ'_3 at failure (psi)	σ_1 at failure (psi)	σ_3 at failure (psi)
5.0	12.0	2.5	14.5	5.0
10.0	20.4	4.2	26.2	10.0
15.0	23.6	5.3	33.4	15.0

Effective

ϕ' =	38.9	degree
c' =	0.3	psi

Total

ϕ =	18.3	degree
c =	2.0	psi

Note: The laboratory testing relates only to the sample tested. GAI neither accepts responsibility for nor makes claims to the final use and purpose of the material.

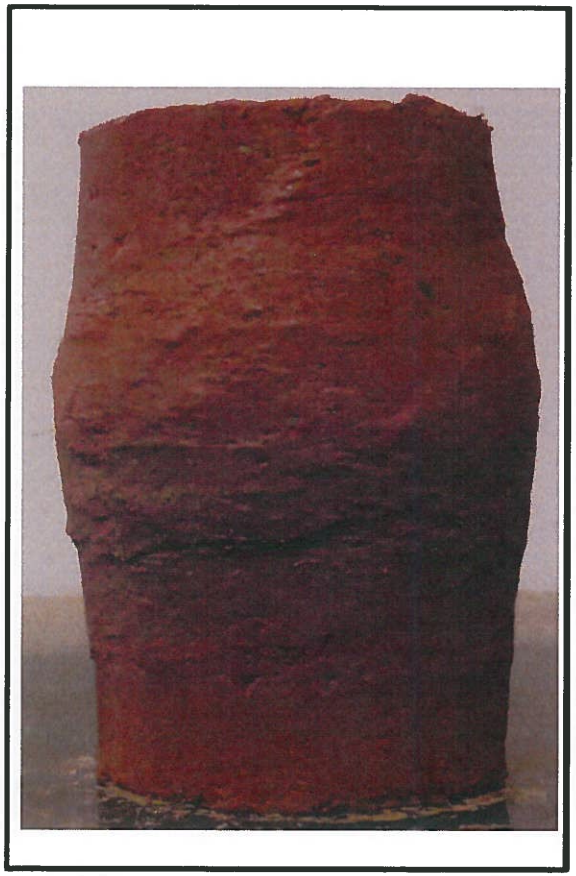
Golder Associates Inc.
Atlanta, Georgia

Title:
ASTM D4767
CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST REPORT
MOHR'S CIRCLE DIAGRAM

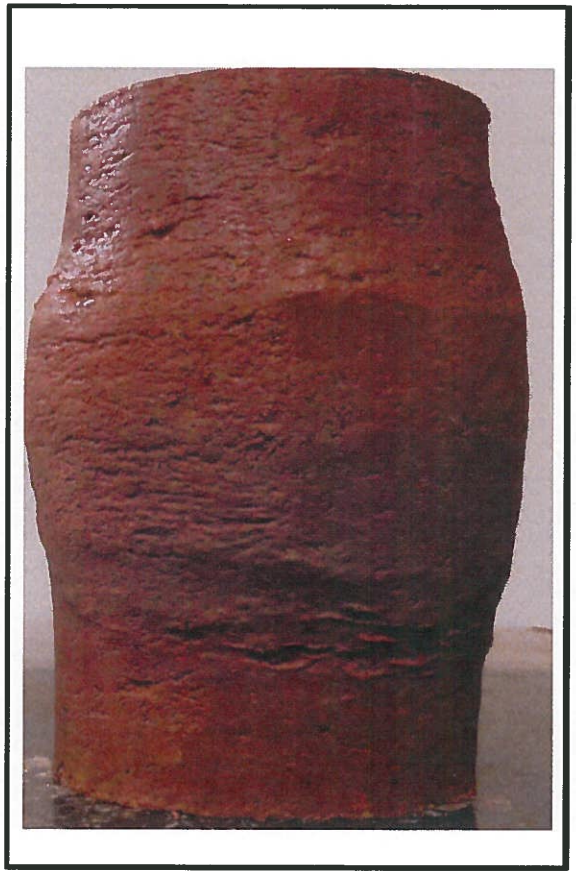
Job Short Title:
F&ME/G5662.01-I-20/26-126 CORRIDOR IMPROVEMENT/SC

Sample:	Technician:	Reviewed:	Start Date:	Job Number:	Figure:
BS-12 0.0-5.0'	PWM/FT Check:	DA Approved:	3/26/2018	1898300	5

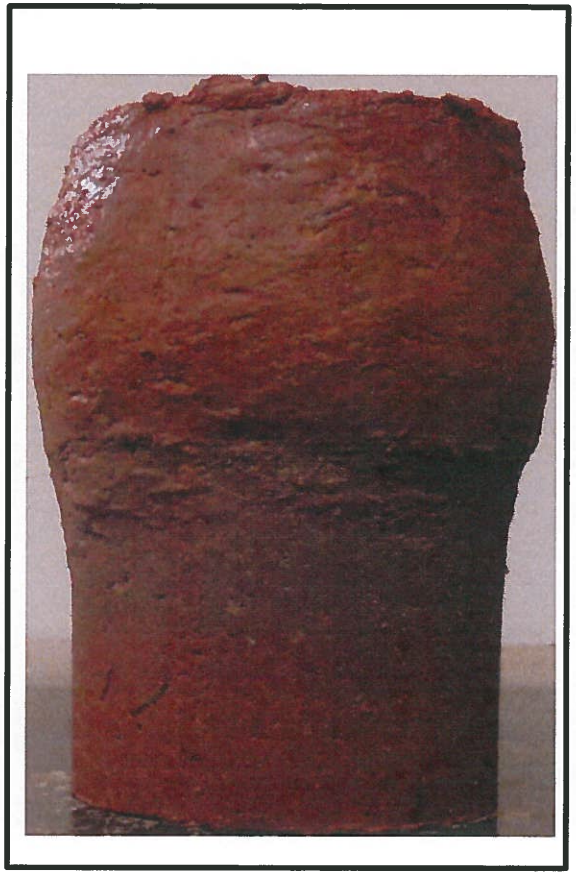
5.0 psi



10.0 psi



15.0 psi



Golder Associates Inc. **Atlanta, Georgia**	**Title:** ASTM D4767 CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST REPORT SPECIMENS PHOTOGRAPH - 5.0 | 10.0 | 15.0 psi				
Job Short Title: F&ME/G5662.01-I-20/26-126 CORRIDOR IMPROVEMENT/SC					
Sample: BS-12 0.0-5.0'	**Technician:** PWM/FT **Check:**	**Reviewed:** DA **Approved:**	**Start Date:** 3/26/2018	**Job Number:** 1898300	**Figure:** 6

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-1006	**DATE SAMPLE RECEIVED:**	5/30/2018
DESCRIPTION OF SOIL:	SILT (ML) with Sand A-4(0)		
TESTED BY:	MB	**DATE OF TESTING:**	5/30/2018
		DATE OF WEIGHING:	5/31/2018

BORING NO.	BS-13				
SAMPLE NO.	18-1006C				
SAMPLE DEPTH	1.0-8.0'				
WATER CONTENT, W%	29.5				

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

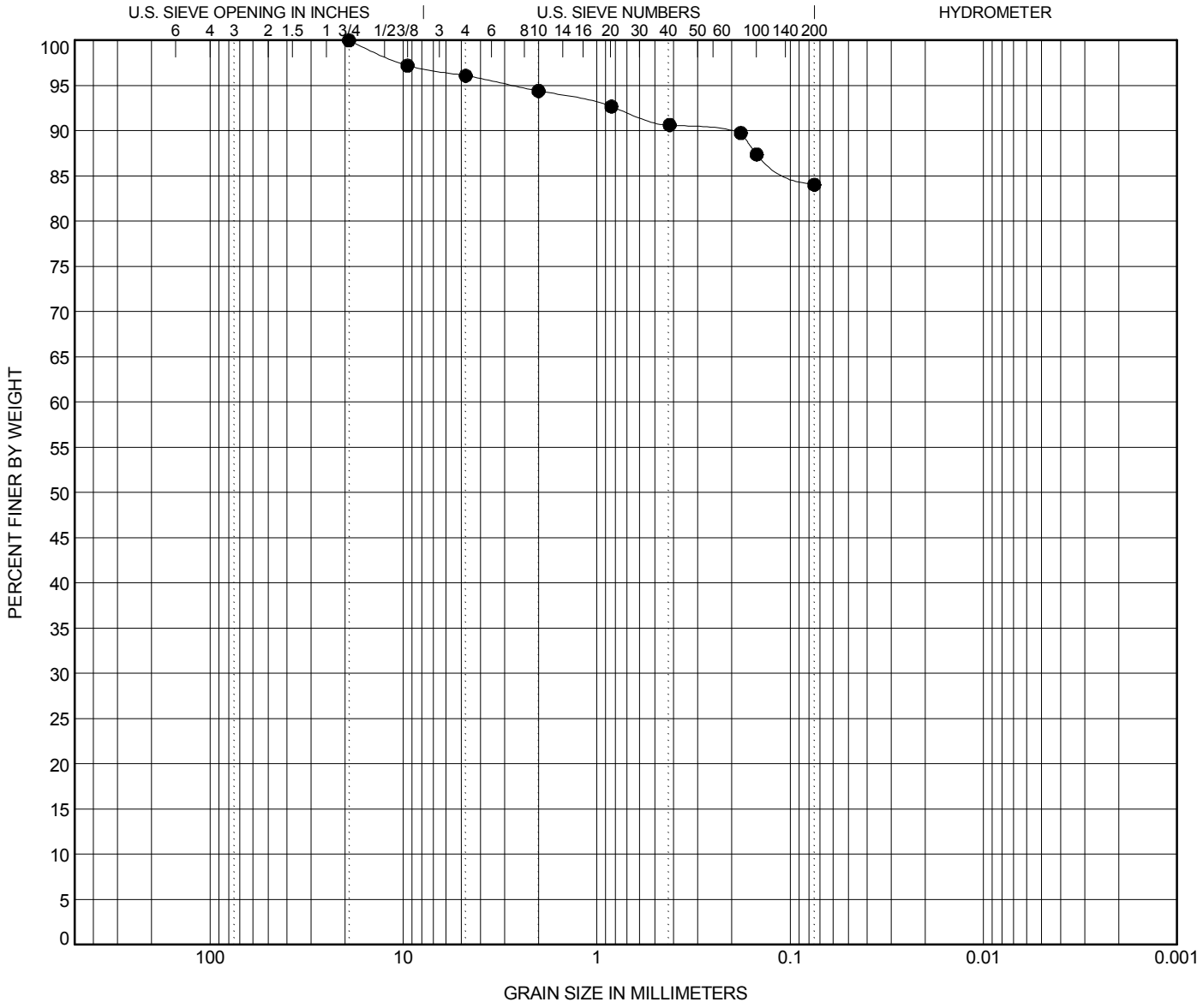
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**BS-13**	**8.0**	**SILT (ML) with Sand A-4(0)**	**NP**	**NP**	**NP**		

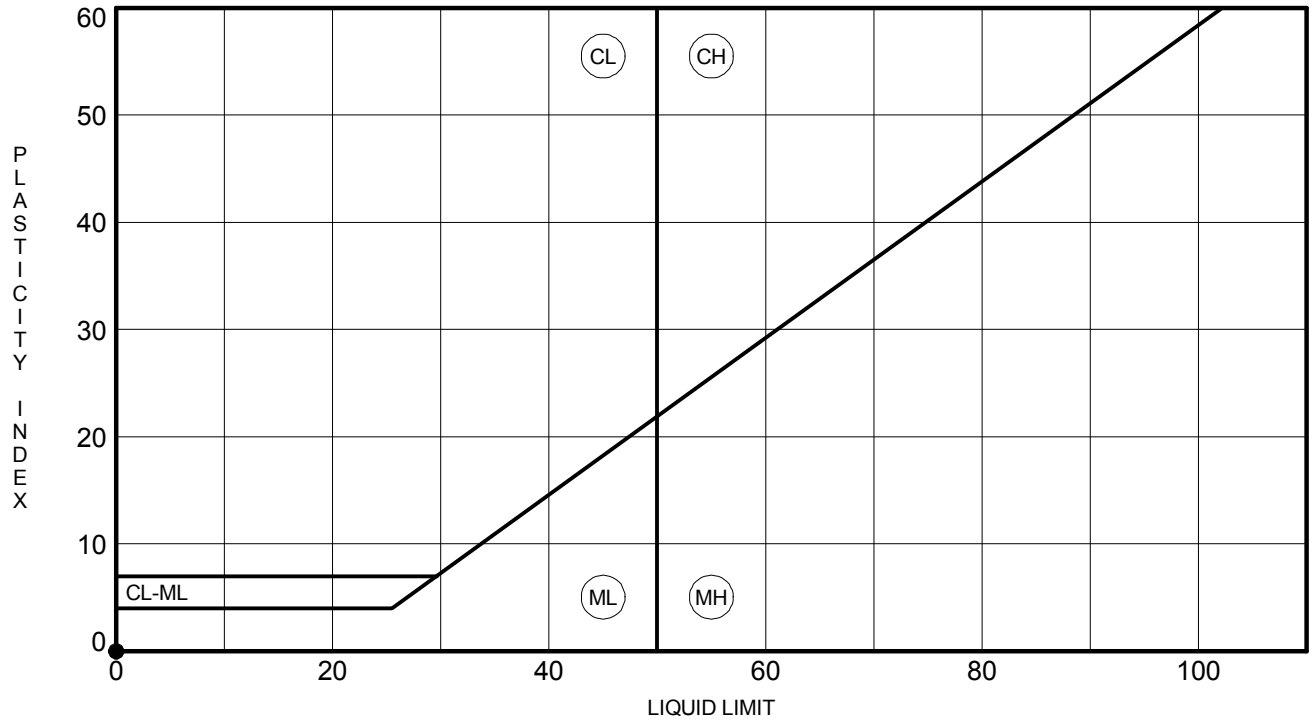
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**BS-13**	**8.0**	**19.1**	**2.712**			**3.9**	**12.0**	**84.0**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/7/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



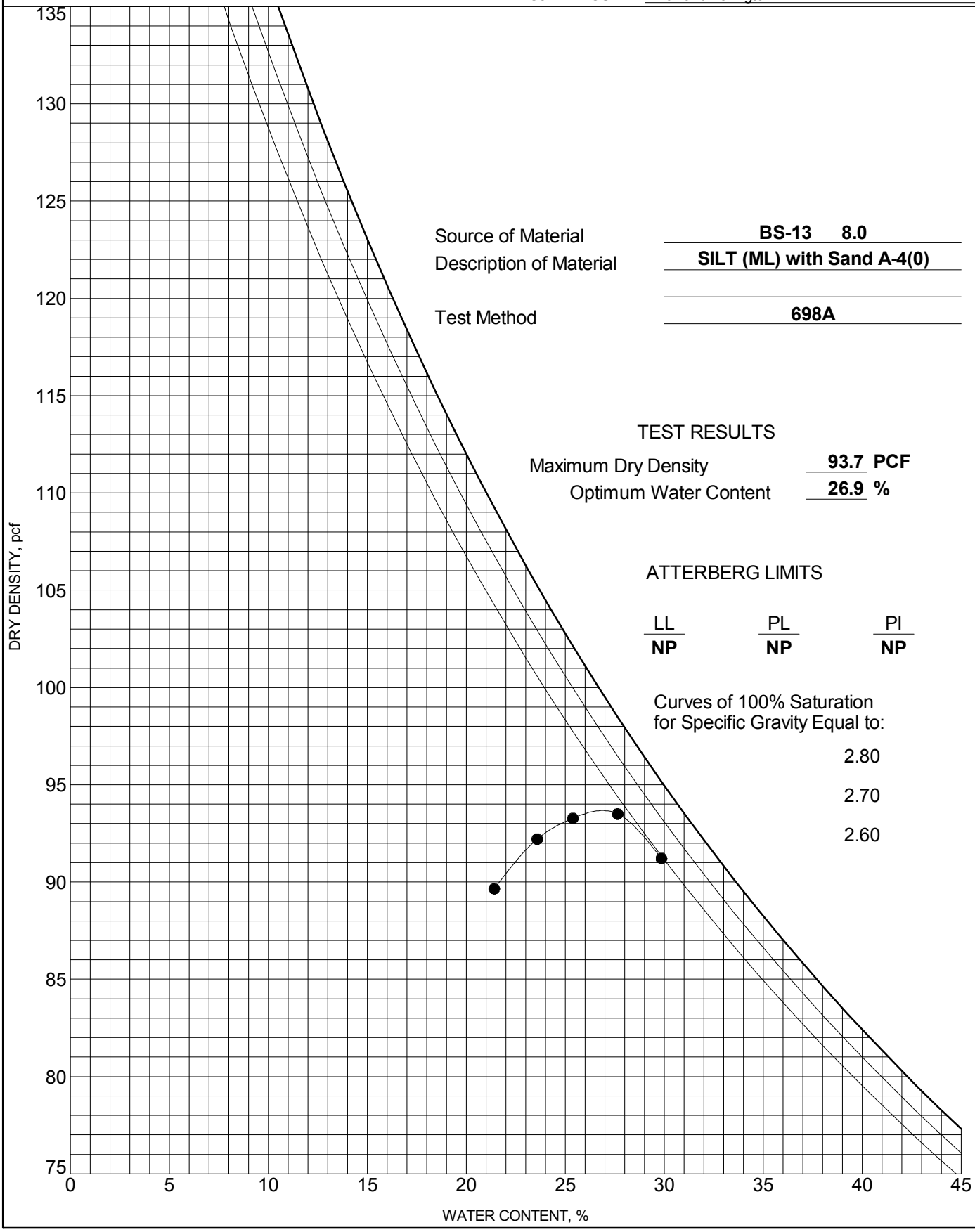
	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**BS-13**	**8.0**	**NP**	**NP**	**NP**	**84**	**SILT (ML) with Sand A-4(0)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/7/18

MOISTURE-DENSITY RELATIONSHIP

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



Source of Material **BS-13 8.0**

Description of Material **SILT (ML) with Sand A-4(0)**

Test Method **698A**

TEST RESULTS

Maximum Dry Density **93.7** **PCF**

Optimum Water Content **26.9** **%**

ATTERBERG LIMITS

LL	PL	PI
NP	**NP**	**NP**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

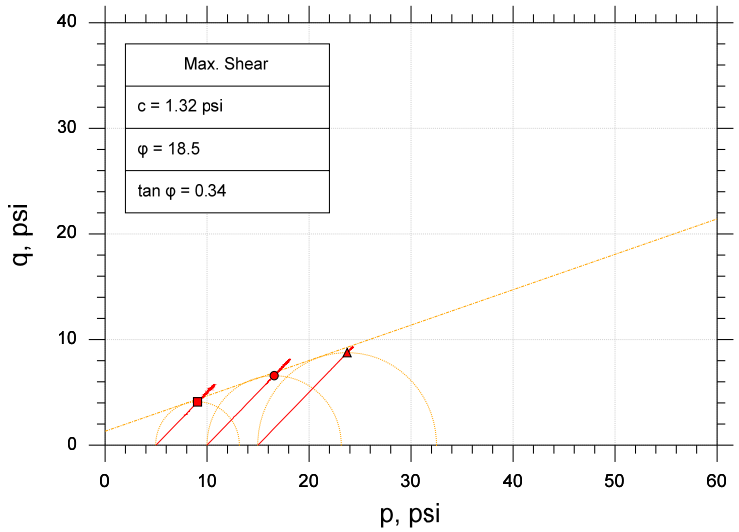
2.70

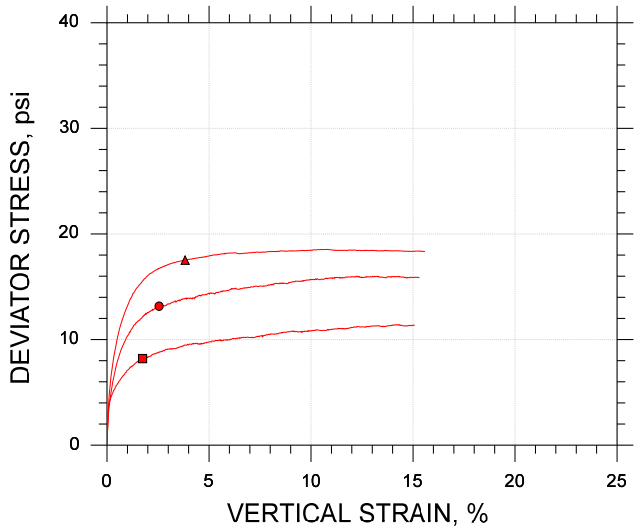
2.60

COMPACTION - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/7/18

Client: F&ME Consultants	
Project Name: I-20/26/126 Corridor Improv.	
Project Location: ---	
Project Number: GTX-307802	
Tested By: jm	Checked By: mcm
Boring ID: ---	
Preparation: reconstituted	
Description: SILT (ML) with Sand A-4(0)	
Classification: ---	
Group Symbol: ---	
Liquid Limit: ---	Plastic Limit: ---
Plasticity Index: ---	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





		■	●	▲	
Symbol					
Sample ID		BS-13	BS-13	BS-13	
Depth, ft		1-8 ft	1-8 ft	1-8 ft	
Test Number		CU-13-1	CU-13-2	CU-13-3	
Initial	Height, in	4.103	4.090	4.098	
	Diameter, in	2.020	2.020	2.020	
	Moisture Content (from Cuttings), %	25.9	26.2	0.0	
	Dry Density, pcf	89.7	89.7	113.	
	Saturation (Wet Method), %	79.4	80.5	0.0	
	Void Ratio	0.880	0.878	0.491	
Before Shear	Moisture Content, %	34.7	33.9	18.1	
	Dry Density, pcf	87.0	88.1	113.	
	Cross-sectional Area (Method A), in²	3.303	3.245	3.197	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.938	0.914	0.487	
	Back Pressure, psi	134.9	128.8	122.9	
Vertical Effective Consolidation Stress, psi		4.960	9.989	14.97	
Horizontal Effective Consolidation Stress, psi		4.997	9.985	14.99	
Vertical Strain after Consolidation, %		1.190	0.6493	0.9107	
Volumetric Strain after Consolidation, %		0.5350	1.975	2.885	
Time to 50% Consolidation, min		1.000	1.960	169.0	
Shear Strength, psi		4.098	6.581	8.760	
Strain at Failure, %		1.74	2.55	3.83	
Strain Rate, %/min		0.06000	0.06000	0.06000	
Deviator Stress at Failure, psi		8.196	13.16	17.52	
Effective Minor Principal Stress at Failure, psi		3.176	5.859	8.693	
Effective Major Principal Stress at Failure, psi		11.37	19.02	26.21	
B-Value		0.97	0.96	0.97	

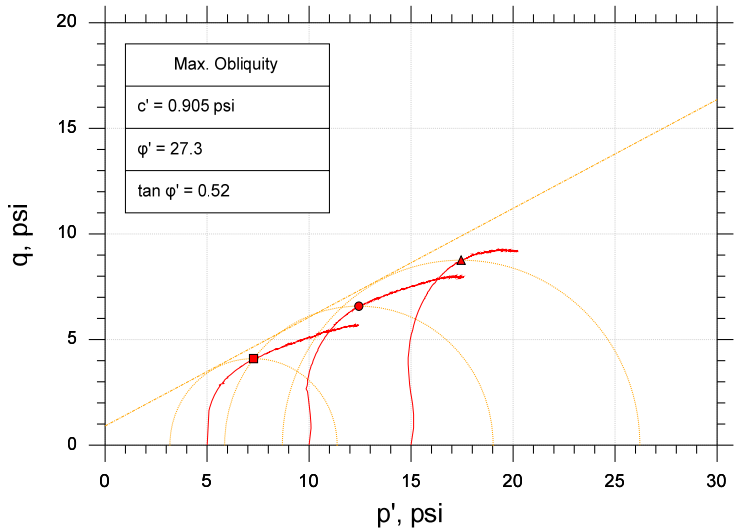
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

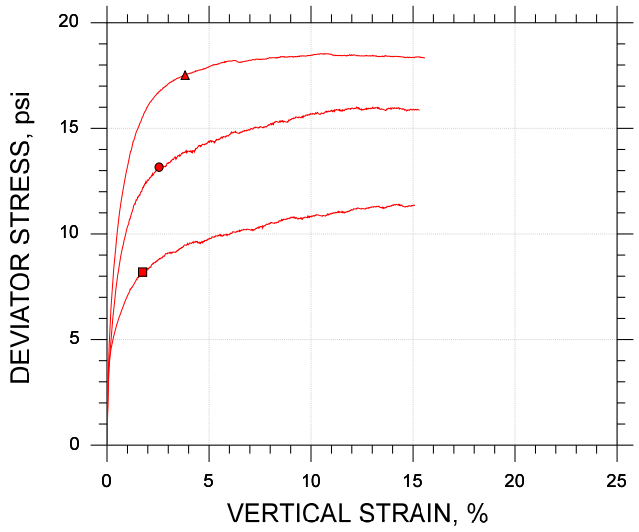
Remarks:

Target Compaction: 95% of (93.7 pcf) at Optimum Moisture Content (26.9%) + 2% - As Requested by Client

Client: F&ME Consultants	
Project Name: I-20/26/126 Corridor Improv.	
Project Location: ---	
Project Number: GTX-307802	
Tested By: jm	Checked By: mcm
Boring ID: ---	
Preparation: reconstituted	
Description: SILT (ML) with Sand A-4(0)	
Classification: ---	
Group Symbol: ---	
Liquid Limit: ---	Plastic Limit: ---
Plasticity Index: ---	Estimated Specific Gravity: 2.7

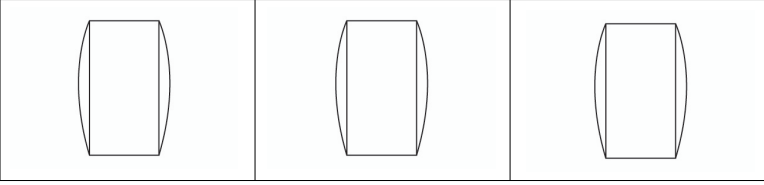
CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		■	●	▲	
Sample ID		BS-13	BS-13	BS-13	
Depth, ft		1-8 ft	1-8 ft	1-8 ft	
Test Number		CU-13-1	CU-13-2	CU-13-3	
Initial	Height, in	4.103	4.090	4.098	
	Diameter, in	2.020	2.020	2.020	
	Moisture Content (from Cuttings), %	25.9	26.2	0.0	
	Dry Density, pcf	89.7	89.7	113.	
	Saturation (Wet Method), %	79.4	80.5	0.0	
	Void Ratio	0.880	0.878	0.491	
Before Shear	Moisture Content, %	34.7	33.9	18.1	
	Dry Density, pcf	87.0	88.1	113.	
	Cross-sectional Area (Method A), in²	3.303	3.245	3.197	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.938	0.914	0.487	
	Back Pressure, psi	134.9	128.8	122.9	
Vertical Effective Consolidation Stress, psi		4.960	9.989	14.97	
Horizontal Effective Consolidation Stress, psi		4.997	9.985	14.99	
Vertical Strain after Consolidation, %		1.190	0.6493	0.9107	
Volumetric Strain after Consolidation, %		0.5350	1.975	2.885	
Time to 50% Consolidation, min		1.000	1.960	169.0	
Shear Strength, psi		4.098	6.581	8.760	
Strain at Failure, %		1.74	2.55	3.83	
Strain Rate, %/min		0.06000	0.06000	0.06000	
Deviator Stress at Failure, psi		8.196	13.16	17.52	
Effective Minor Principal Stress at Failure, psi		3.176	5.859	8.693	
Effective Major Principal Stress at Failure, psi		11.37	19.02	26.21	
B-Value		0.97	0.96	0.97	

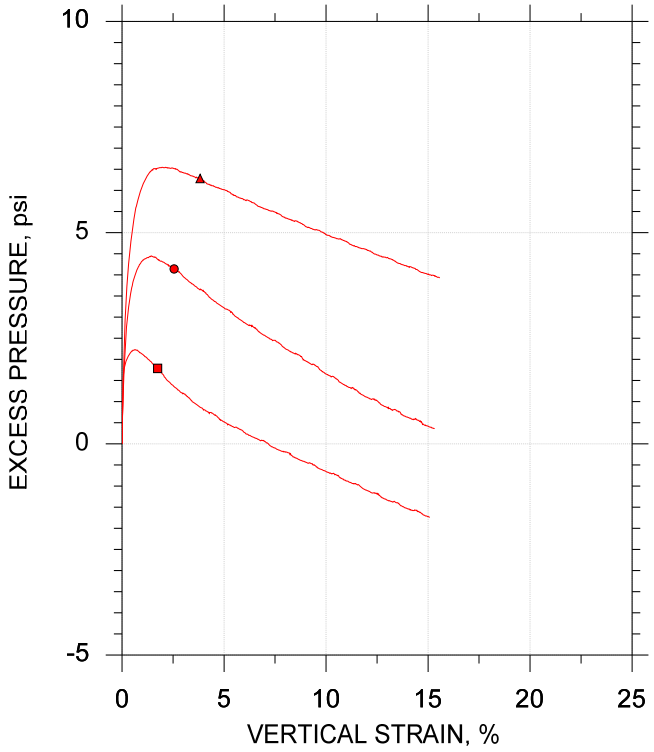
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

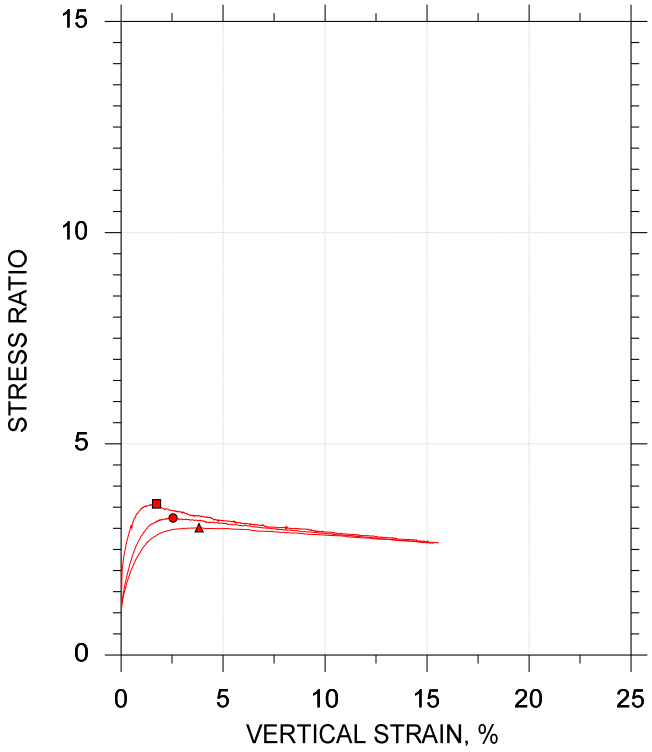


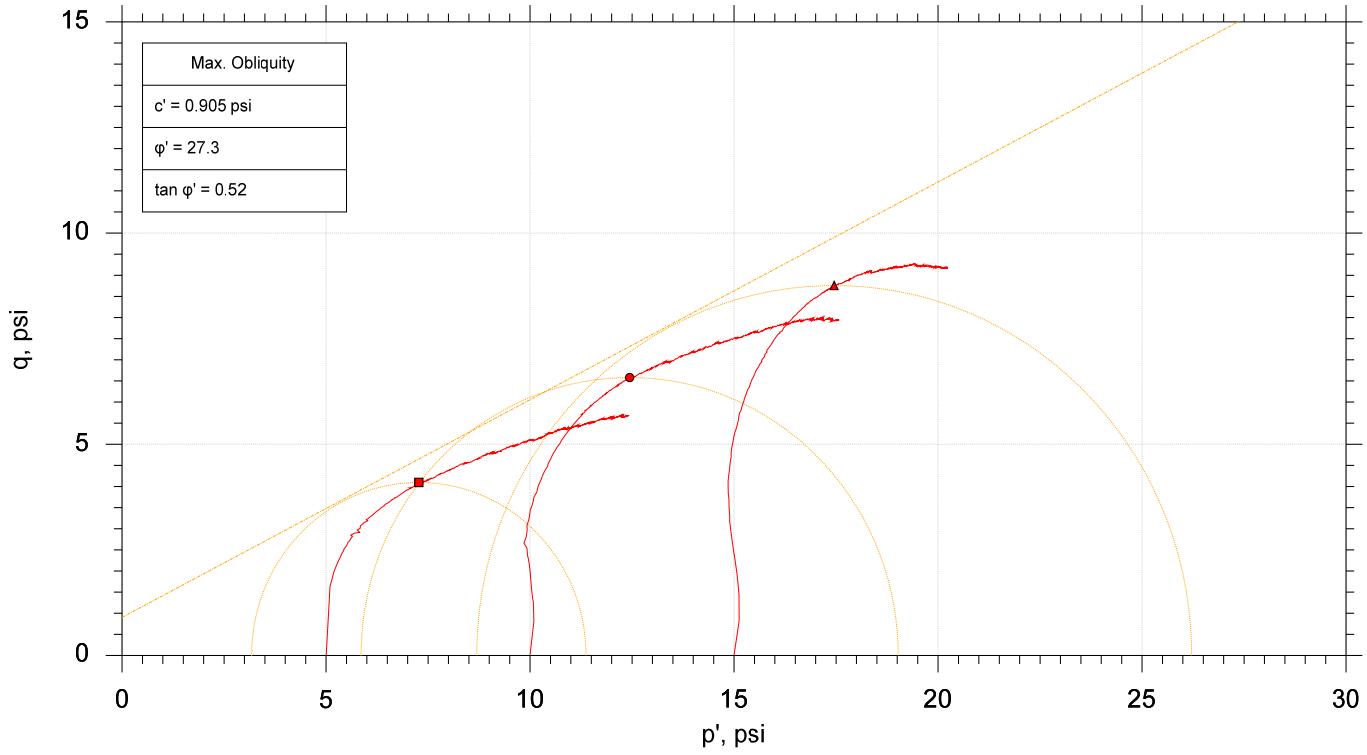
Remarks:

Target Compaction: 95% of (93.7 pcf) at Optimum Moisture Content (26.9%) + 2% - As Requested by Client

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	BS-13	CU-13-1	1-8 ft	jm	6/20/18	mcm	7/16/18	307802-CU-13-1m.dat
●	BS-13	CU-13-2	1-8 ft	jm	6/19/18	mcm	7/16/18	307802-CU-13-2m.dat
▲	BS-13	CU-13-3	1-8 ft	jm	5/8/18	mcm	7/16/18	307802-CU-13-3m.dat

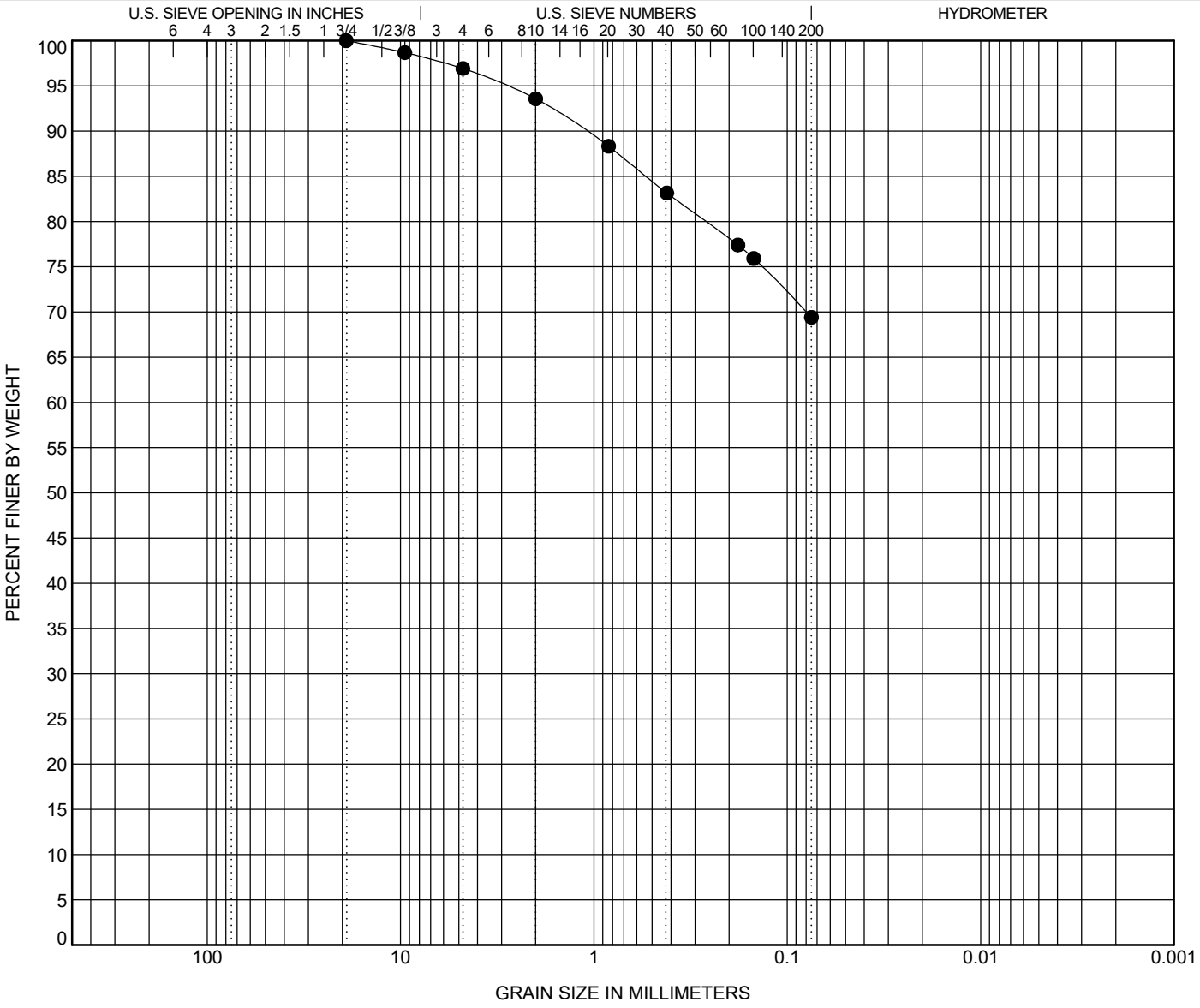
GeoTesting EXPRESS

Project: I-20/26/126 Corridor Improv.	Location: ---	Project No.: GTX-307802
Boring No.: ---	Sample Type: reconstituted	
Description: SILT (ML) with Sand A-4(0)		
Remarks: Target Compaction: 95% of (93.7 pcf) at Optimum Moisture Content (26.9%) + 2% - As Requested by Client		

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**BS-14**	**5.0**	**Sandy SILT (ML) A-4(6)**	**37**	**28**	**9**		

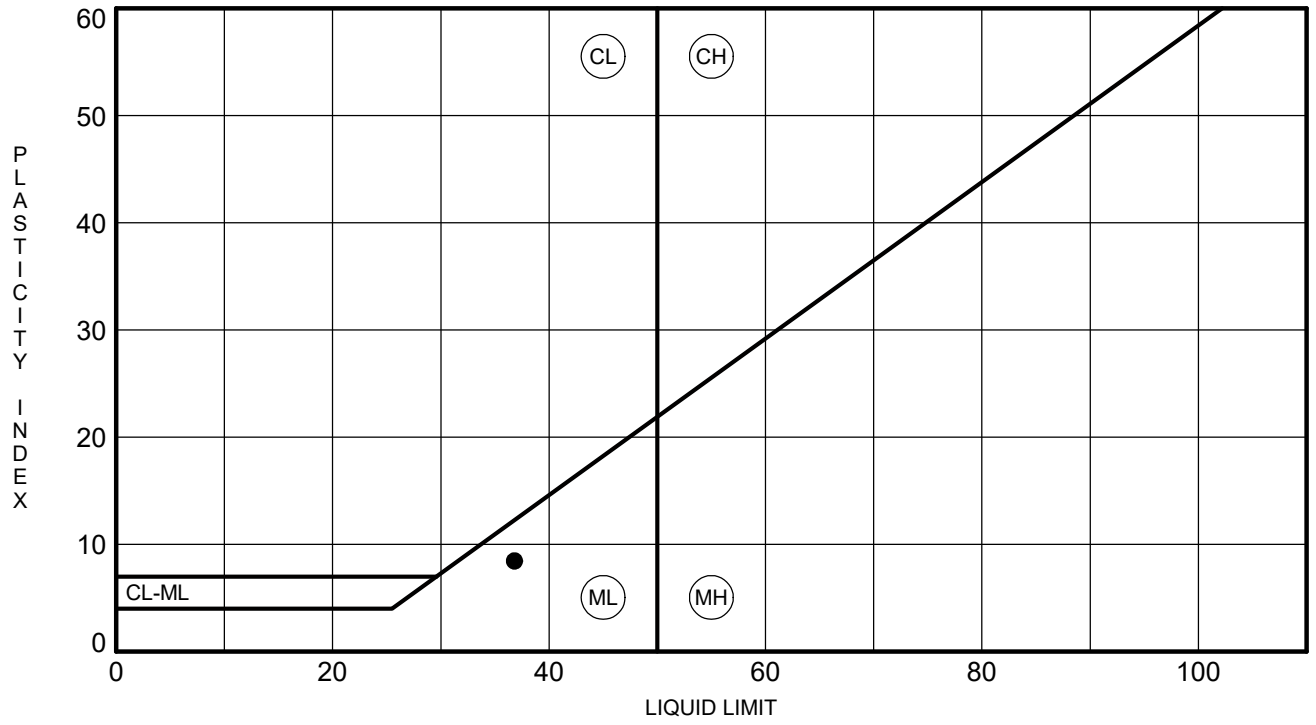
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**BS-14**	**5.0**	**19.1**	**2.899**			**3.1**	**27.5**	**69.4**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/11/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**BS-14**	**5.0**	**37**	**28**	**9**	**69**	**Sandy SILT (ML) A-4(6)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/11/18

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

INORGANIC IMPURITIES DETERMINATION
(SC-T-36)

PROJECT: Carolina Crossroads **PROJECT NO.:** G5662.01

SAMPLE NUMBER: 18-0489E/BS-14 **DATE SAMPLE RECEIVED:** 3/20/2018

DESCRIPTION OF SOIL:

TESTED BY: JH **DATE OF TESTING:** 3/27/2018

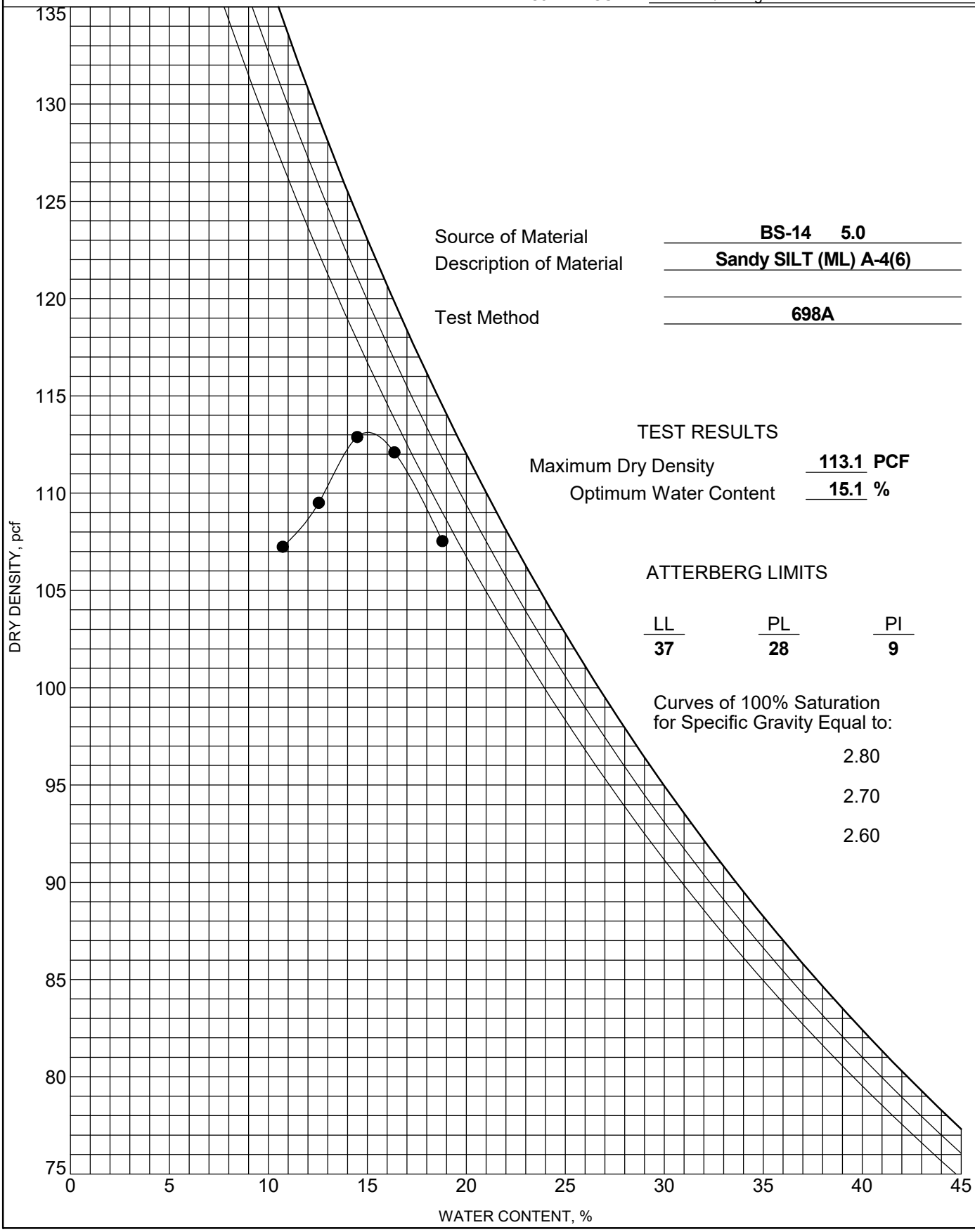
DATE OF WEIGHING: 2/27/2018

BORING NO.	BS-14				
SAMPLE NO.	18-0489E				
SAMPLE DEPTH	0-5'				
200 WASH PAN NUMBER	3030				
WEIGHT OF PAN	8.06				
WEIGHT OF SAMPLE & PAN (BEFORE WASH)	50.84				
WEIGHT OF SAMPLE (BEFORE WASH)	42.78				
WEIGHT OF SAMPLE PASSING #10 & PAN (AFTER WASH)	10.70				
WEIGHT OF SAMPLE PASSING #10 (AFTER WASH)	2.64				
MATERIAL >#10 PAN NUMBER	3042				
MATERIAL >#10 PAN WEIGHT	8.06				
WEIGHT OF SAMPLE RETAINED #10 & PAN (AFTER WASH)	10.81				
WEIGHT OF SAMPLE RETAINED #10 (AFTER WASH)	2.75				
PERCENT PASSING #10 & RETAINED ON #200 (% SANDS)	6.6%				
ORGANIC PAN NUMBER	A				
WT. OF CRUCIBLE + DRY SOIL (BEFORE IGNITION) (GRAMS)	76.97				
WT. OF CRUCIBLE + DRY SOIL (AFTER IGNITION) (GRAMS)	76.85				
WT. OF CRUCIBLE (GRAMS)	66.27				
WT. OF DRY SOIL (BEFORE IGNITION) (GRAMS)	10.70				
WT. OF DRY SOIL (AFTER IGNITION) (GRAMS)	10.58				
IGNITION LOSS (GRAMS)	0.12				
INORGANIC IMPURITIES %	0.1%				

MOISTURE-DENSITY RELATIONSHIP

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



Source of Material **BS-14 5.0**

Description of Material **Sandy SILT (ML) A-4(6)**

Test Method **698A**

TEST RESULTS

Maximum Dry Density **113.1** **PCF**

Optimum Water Content **15.1** **%**

ATTERBERG LIMITS

LL	PL	PI
37	**28**	**9**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

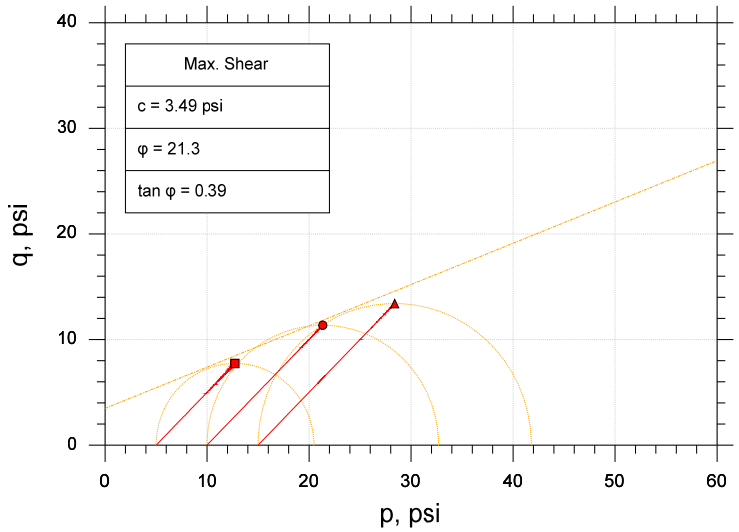
2.70

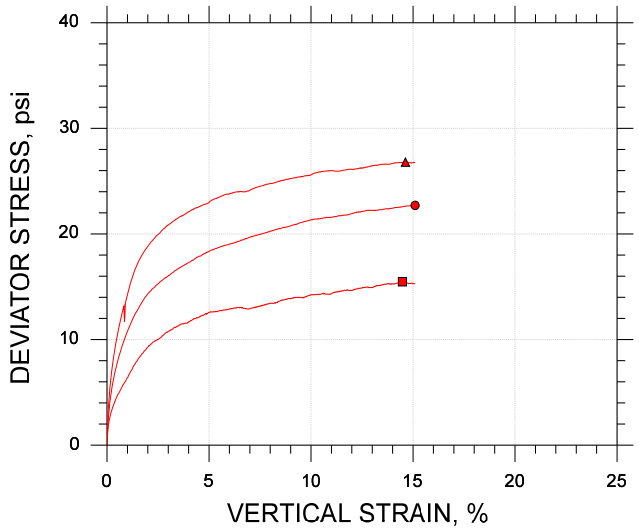
2.60

COMPACTION - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 4/11/18

Client: F&ME Consultants	
Project Name: I-20/26/126 Corridor Improv.	
Project Location: ---	
Project Number: GTX-307802	
Tested By: jm	Checked By: mcm
Boring ID: ---	
Preparation: reconstituted	
Description: Moist, reddish brown sandy silt	
Classification: ---	
Group Symbol: ---	
Liquid Limit: ---	Plastic Limit: ---
Plasticity Index: ---	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		■	●	▲	
Sample ID		BS-14	BS-14	BS-14	
Depth, ft		0-5 ft	0-5 ft	0-5 ft	
Test Number		CU-8-1	CU-8-2	CU-8-3	
Initial	Height, in	4.105	4.105	4.104	
	Diameter, in	2.020	2.020	2.020	
	Moisture Content (from Cuttings), %	16.6	17.0	16.6	
	Dry Density, pcf	108.	107.	108.	
	Saturation (Wet Method), %	79.3	80.4	79.7	
	Void Ratio	0.565	0.571	0.564	
Before Shear	Moisture Content, %	21.1	20.5	20.5	
	Dry Density, pcf	107.	109.	109.	
	Cross-sectional Area (Method A), in²	3.211	3.179	3.193	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.569	0.553	0.553	
	Back Pressure, psi	136.8	135.0	128.9	
Vertical Effective Consolidation Stress, psi		5.056	9.987	14.97	
Horizontal Effective Consolidation Stress, psi		5.027	9.992	14.99	
Vertical Strain after Consolidation, %		0.2128	0.5183	0.7055	
Volumetric Strain after Consolidation, %		0.5945	1.620	1.807	
Time to 50% Consolidation, min		2.250	2.250	2.250	
Shear Strength, psi		7.736	11.35	13.40	
Strain at Failure, %		14.5	15.1	14.6	
Strain Rate, %/min		0.06000	0.06000	0.06000	
Deviator Stress at Failure, psi		15.47	22.70	26.80	
Effective Minor Principal Stress at Failure, psi		8.053	11.76	14.33	
Effective Major Principal Stress at Failure, psi		23.52	34.46	41.13	
B-Value		0.96	0.96	0.97	

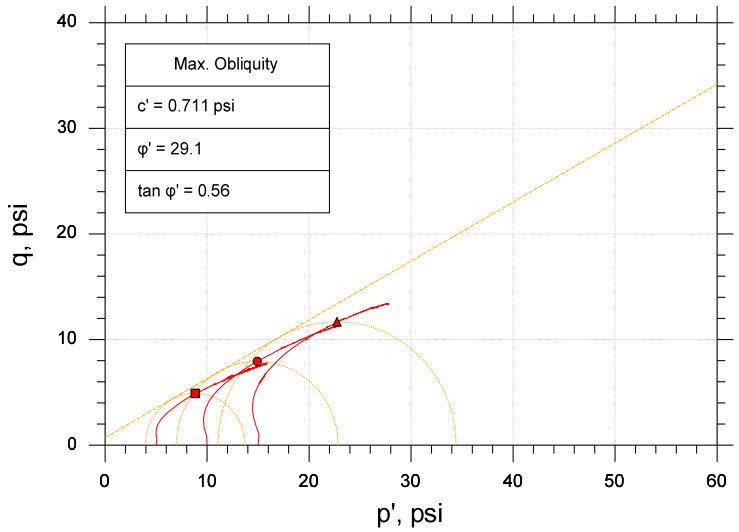
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

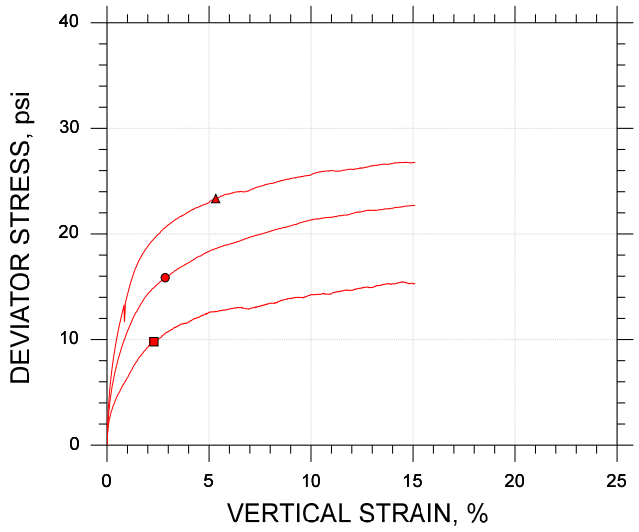
Remarks:

Target Compaction: 95% of (113.1 pcf) at Optimum Moisture Content (15.1%) + 2% - As Requested by Client

Client: F&ME Consultants	
Project Name: I-20/26/126 Corridor Improv.	
Project Location: ---	
Project Number: GTX-307802	
Tested By: jm	Checked By: mcm
Boring ID: ---	
Preparation: reconstituted	
Description: Moist, reddish brown sandy silt	
Classification: ---	
Group Symbol: ---	
Liquid Limit: ---	Plastic Limit: ---
Plasticity Index: ---	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767

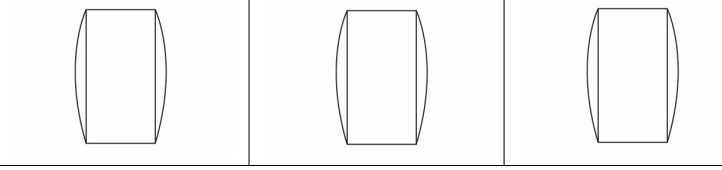




Symbol		■	●	▲	
Sample ID		BS-14	BS-14	BS-14	
Depth, ft		0-5 ft	0-5 ft	0-5 ft	
Test Number		CU-8-1	CU-8-2	CU-8-3	
Initial	Height, in	4.105	4.105	4.104	
	Diameter, in	2.020	2.020	2.020	
	Moisture Content (from Cuttings), %	16.6	17.0	16.6	
	Dry Density, pcf	108.	107.	108.	
	Saturation (Wet Method), %	79.3	80.4	79.7	
	Void Ratio	0.565	0.571	0.564	
Before Shear	Moisture Content, %	21.1	20.5	20.5	
	Dry Density, pcf	107.	109.	109.	
	Cross-sectional Area (Method A), in²	3.211	3.179	3.193	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.569	0.553	0.553	
	Back Pressure, psi	136.8	135.0	128.9	
Vertical Effective Consolidation Stress, psi		5.056	9.987	14.97	
Horizontal Effective Consolidation Stress, psi		5.027	9.992	14.99	
Vertical Strain after Consolidation, %		0.2128	0.5183	0.7055	
Volumetric Strain after Consolidation, %		0.5945	1.620	1.807	
Time to 50% Consolidation, min		2.250	2.250	2.250	
Shear Strength, psi		4.897	7.927	11.67	
Strain at Failure, %		2.30	2.85	5.33	
Strain Rate, %/min		0.06000	0.06000	0.06000	
Deviator Stress at Failure, psi		9.794	15.85	23.35	
Effective Minor Principal Stress at Failure, psi		3.935	6.988	11.06	
Effective Major Principal Stress at Failure, psi		13.73	22.84	34.41	
B-Value		0.96	0.96	0.97	

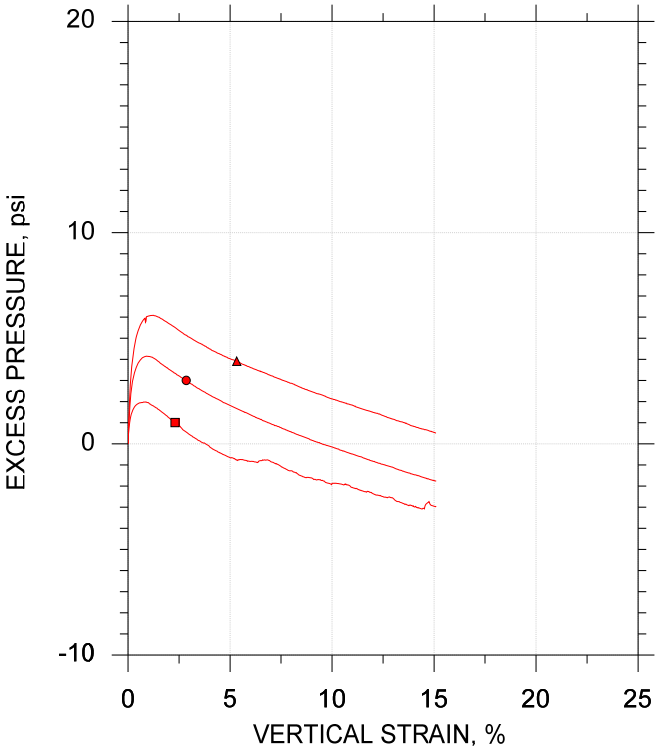
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

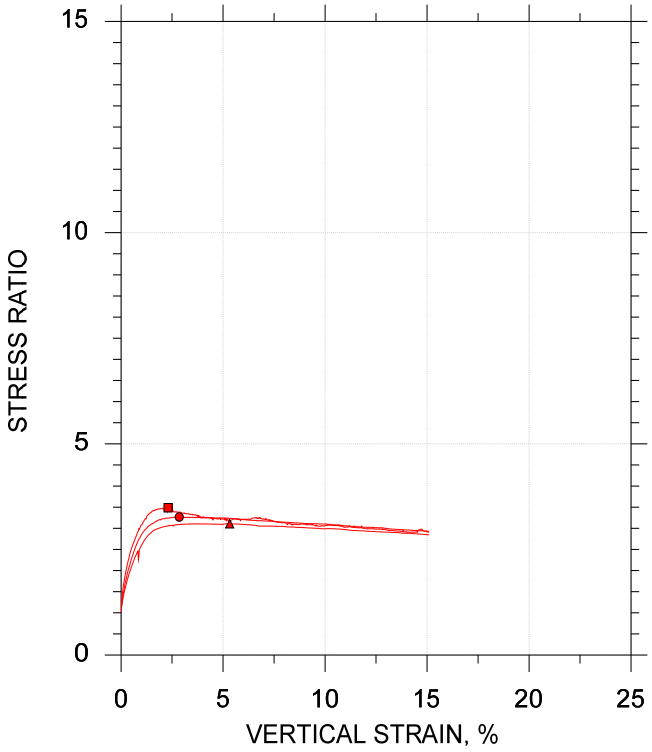
Remarks:

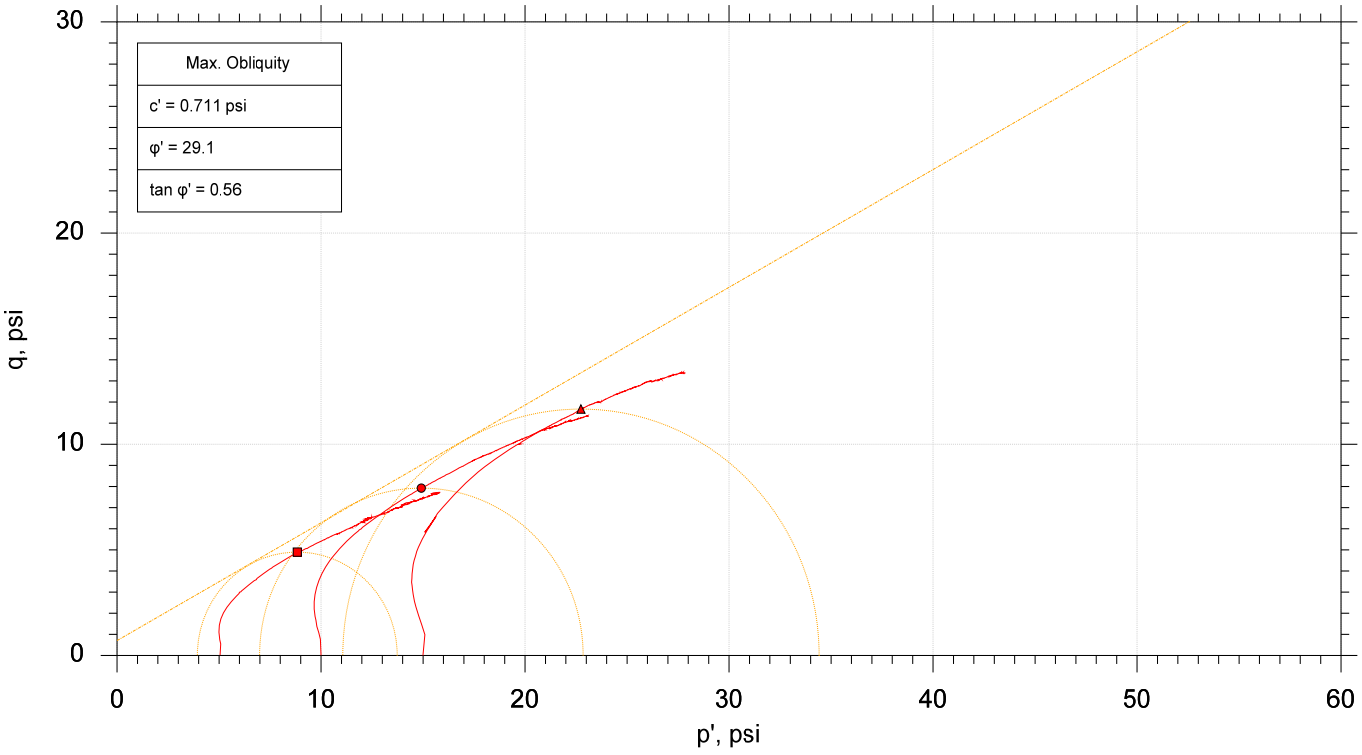


Target Compaction: 95% of (113.1 pcf) at Optimum Moisture Content (15.1%) + 2% - As Requested by Client

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	BS-14	CU-8-1	0-5 ft	jm	5/8/18	mcm	5/14/18	307802-CU-8-1m.dat
●	BS-14	CU-8-2	0-5 ft	jm	5/9/18	mcm	5/14/18	307802-CU-8-2m.dat
▲	BS-14	CU-8-3	0-5 ft	jm	5/8/18	mcm	5/14/18	307802-CU-8-3m.dat

GeoTesting EXPRESS

Project: I-20/26/126 Corridor Improv.	Location: ---	Project No.: GTX-307802
Boring No.: ---	Sample Type: reconstituted	
Description: Moist, reddish brown sandy silt		
Remarks: Target Compaction: 95% of (113.1 pcf) at Optimum Moisture Content (15.1%) + 2% - As Requested by Client		

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0771	**DATE SAMPLE RECEIVED:**	4/30/2018
DESCRIPTION OF SOIL:	SILT (ML) with Sand A-4(6)		
TESTED BY:	MB	**DATE OF TESTING:**	4/30/2018
		DATE OF WEIGHING:	5/1/2018

BORING NO.	BS-15				
SAMPLE NO.	18-0771C				
SAMPLE DEPTH	0.0-5.0'				
WATER CONTENT, W%	17.6				

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

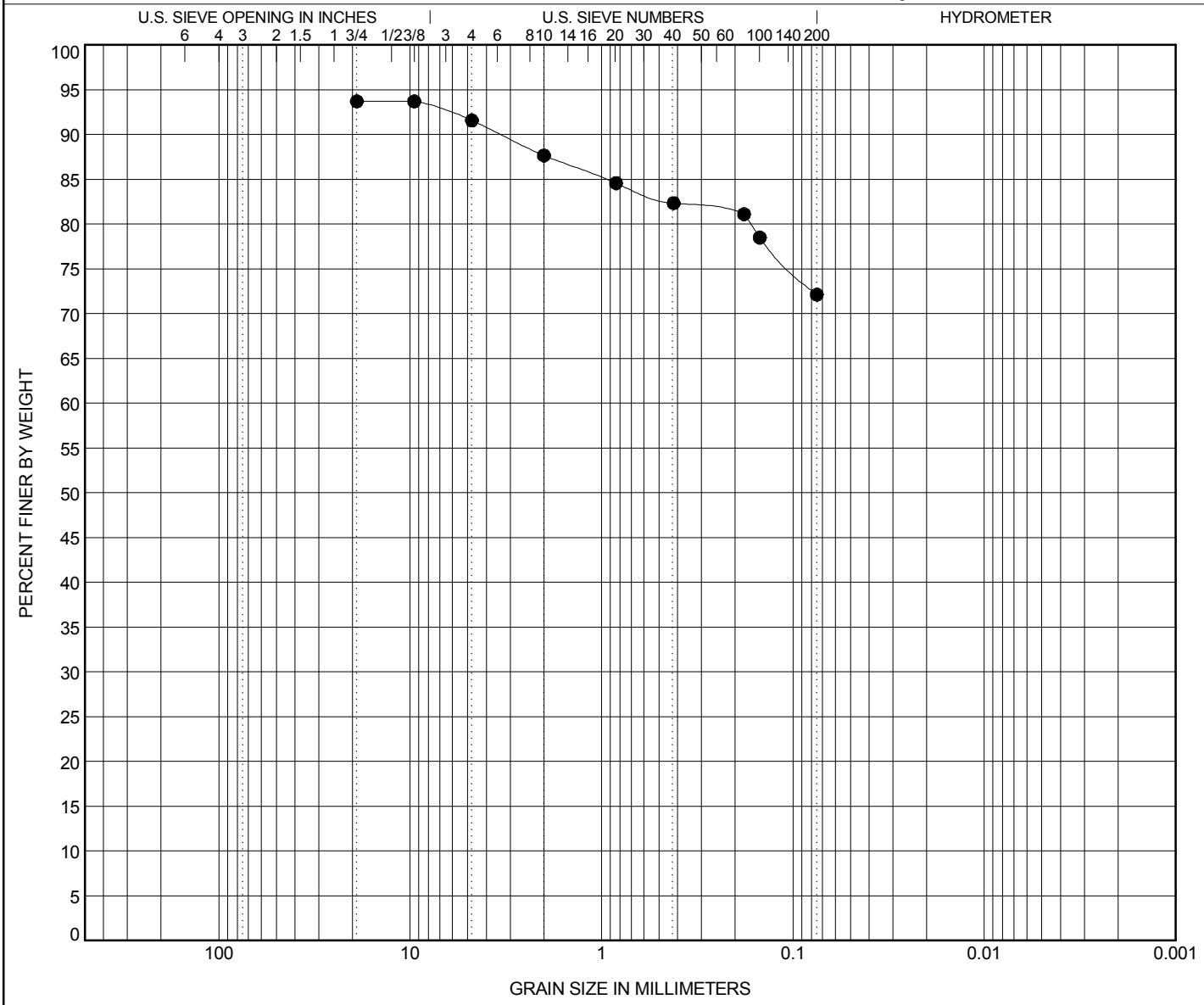
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**BS-15**	**5.0**	**SILT (ML) with Sand A-4(6)**	**34**	**25**	**9**		

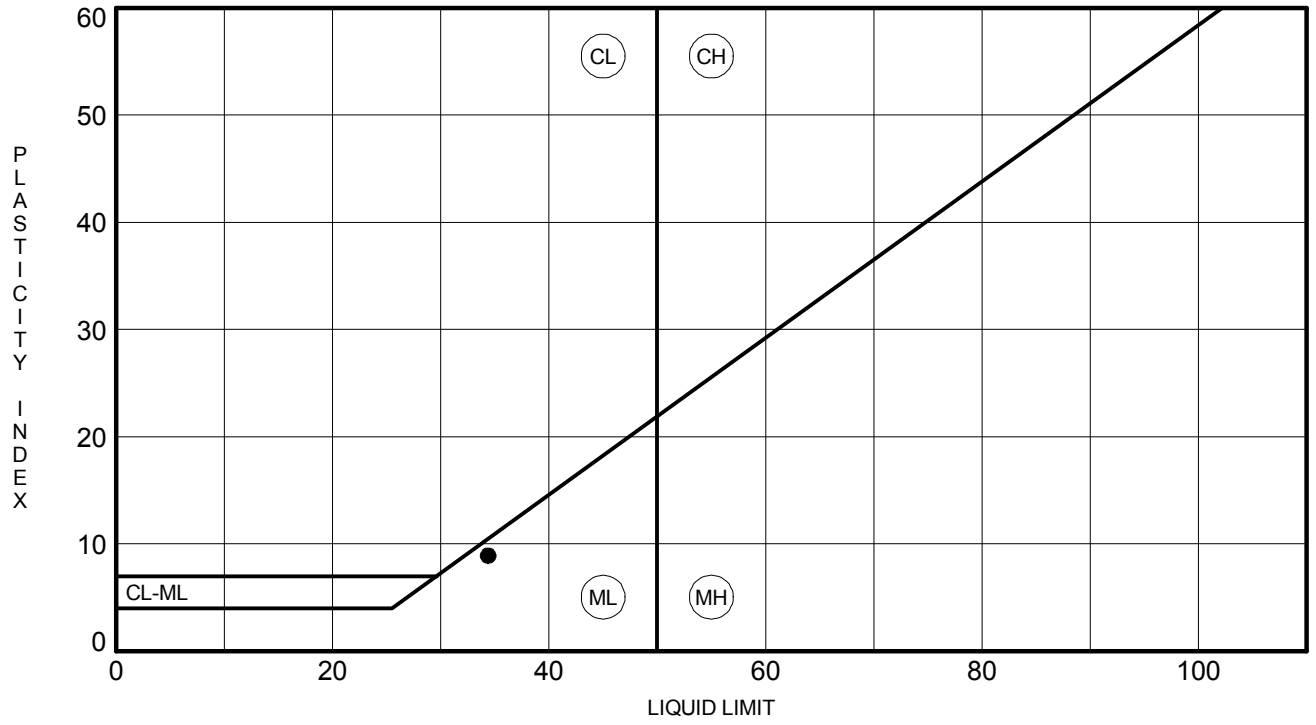
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**BS-15**	**5.0**	**19**				**8.5**	**19.4**	**72.1**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 5/14/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



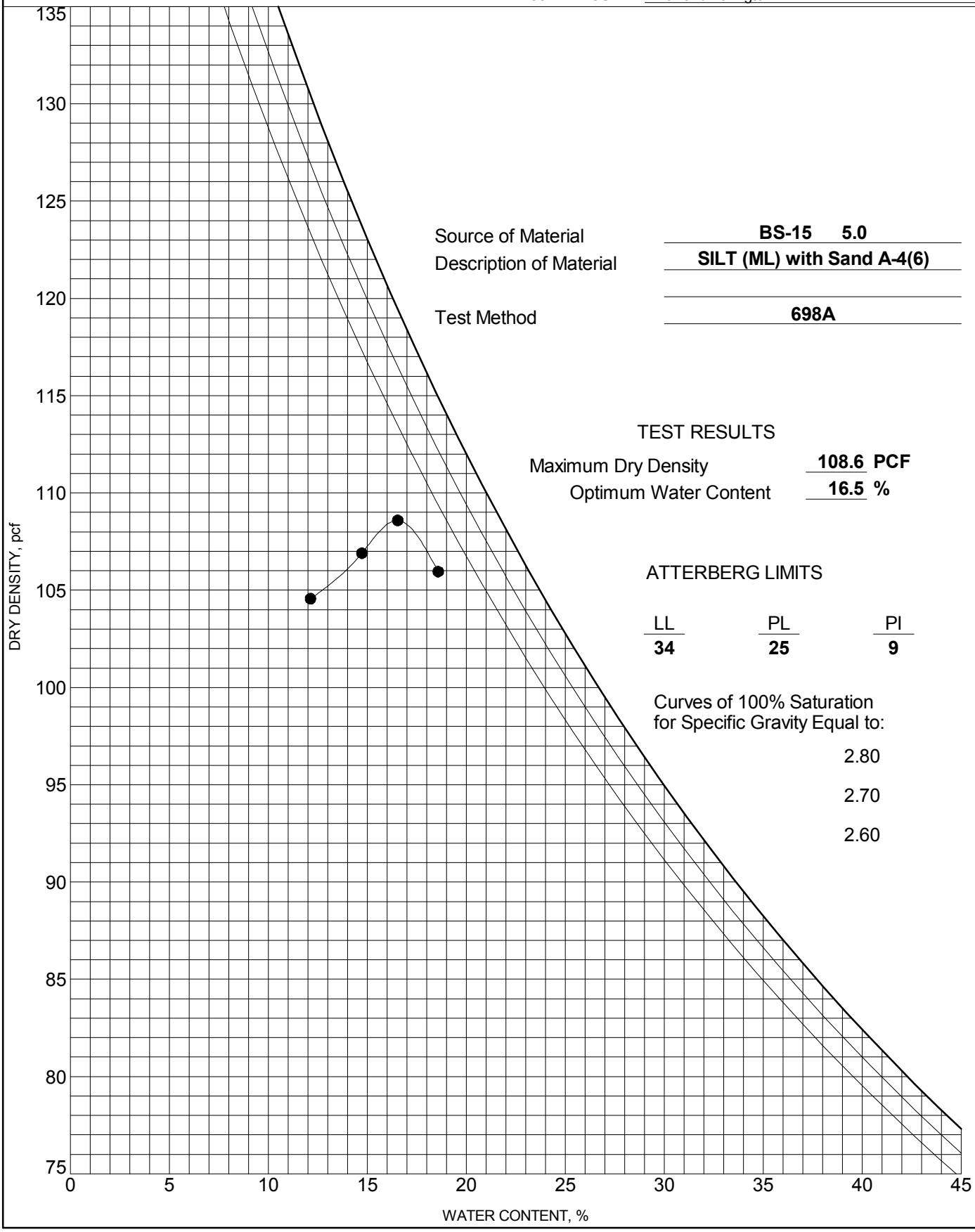
	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**BS-15**	**5.0**	**34**	**25**	**9**	**72**	**SILT (ML) with Sand A-4(6)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 5/14/18

MOISTURE-DENSITY RELATIONSHIP

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



Source of Material **BS-15 5.0**

Description of Material **SILT (ML) with Sand A-4(6)**

Test Method **698A**

TEST RESULTS

Maximum Dry Density **108.6** **PCF**

Optimum Water Content **16.5** **%**

ATTERBERG LIMITS

LL	PL	PI
34	**25**	**9**

Curves of 100% Saturation for Specific Gravity Equal to:

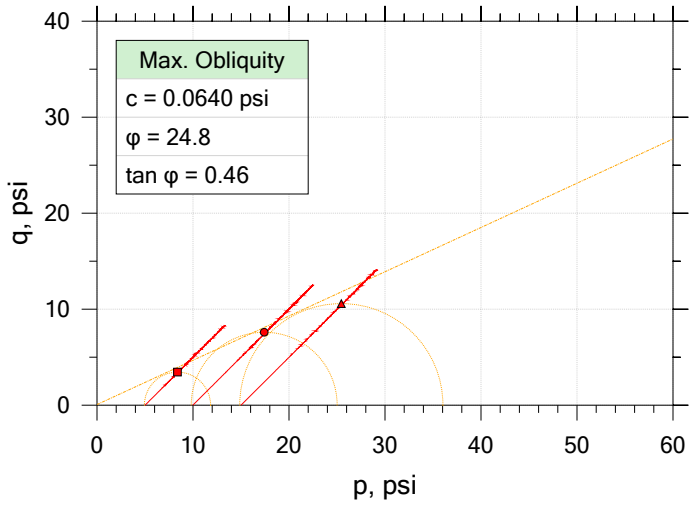
2.80

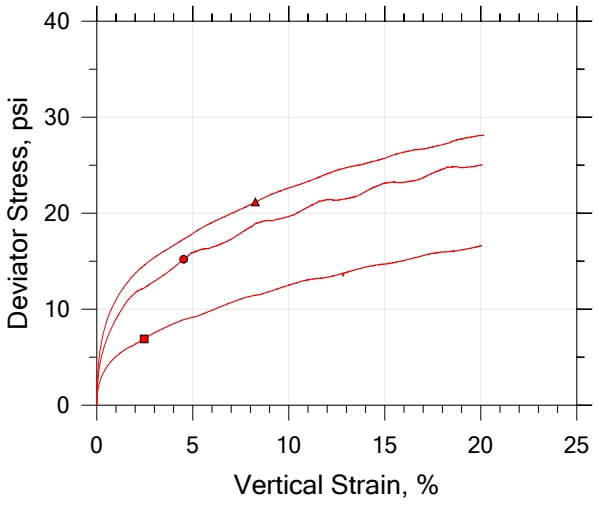
2.70

2.60

COMPACTION - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 5/17/18

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297





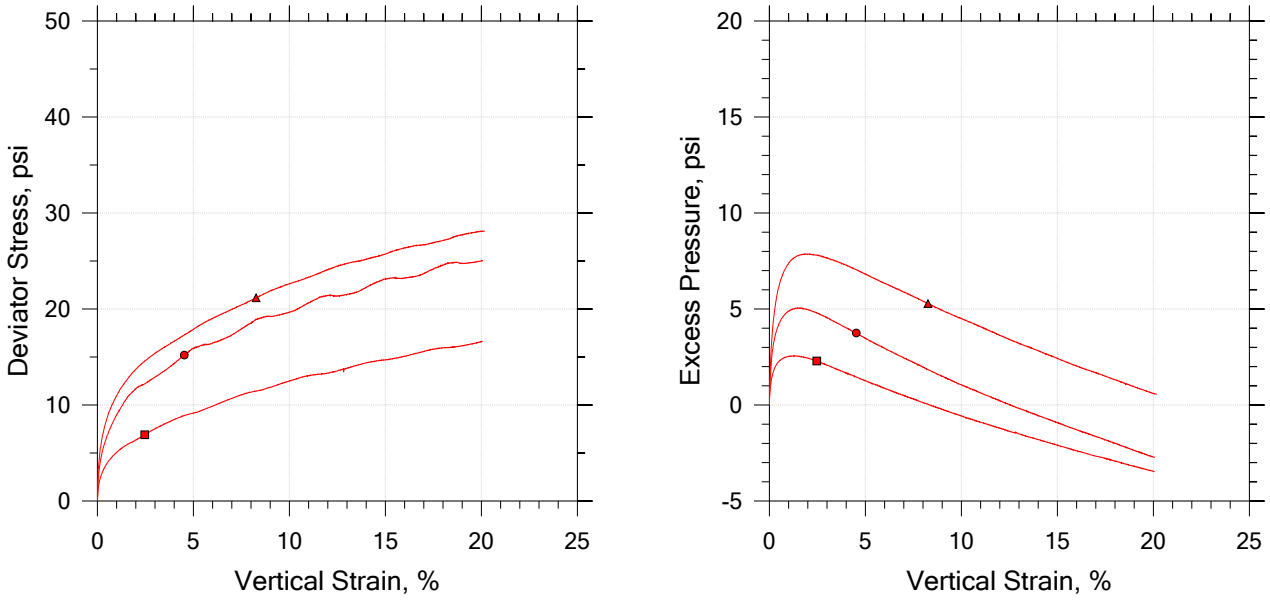
		■	●	▲	
Symbol					
Sample ID		18-0771	18-0771	18-0771	
Depth, ft		0' - 5'	0' - 5'	0' - 5'	
Test Number		A	B	C	
Initial	Height, in	6.022	6.015	6.015	
	Diameter, in	2.800	2.795	2.794	
	Moisture Content (from Cuttings), %	29.0	29.0	29.0	
	Dry Density, pcf	94.1	94.7	94.5	
	Saturation (Wet Method), %	99.8	101.3	100.8	
	Void Ratio	0.779	0.767	0.771	
Final	Moisture Content, %	28.3	27.7	27.0	
	Dry Density, pcf	95.1	96.0	97.1	
	Cross-Sectional Area (Method A), in²	6.105	6.071	6.018	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.759	0.743	0.723	
	Back Pressure, %	97.99	101.0	101.0	
Vertical Effective Consolidation Stress, psi		4.975	9.936	14.93	
Horizontal Effective Consolidation Stress, psi		5.004	9.983	15.01	
Vertical Strain after Consolidation, %		0.4315	0.8420	1.201	
Volumetric Strain after Consolidation, %		1.546	2.881	3.697	
Time to 50% Consolidation, min		0.0000	0.0000	0.0000	
Shear Strength, psi		3.453	7.600	10.59	
Strain at Failure, %		2.47	4.53	8.26	
Strain Rate, %/min		0.07500	0.07500	0.07500	
Deviator Stress at Failure, psi		6.905	15.20	21.17	
Effective Minor Principal Stress at Failure, psi		2.640	6.061	9.579	
Effective Major Principal Stress at Failure, psi		9.545	21.26	30.75	
B-Value		0.95	0.95	0.95	

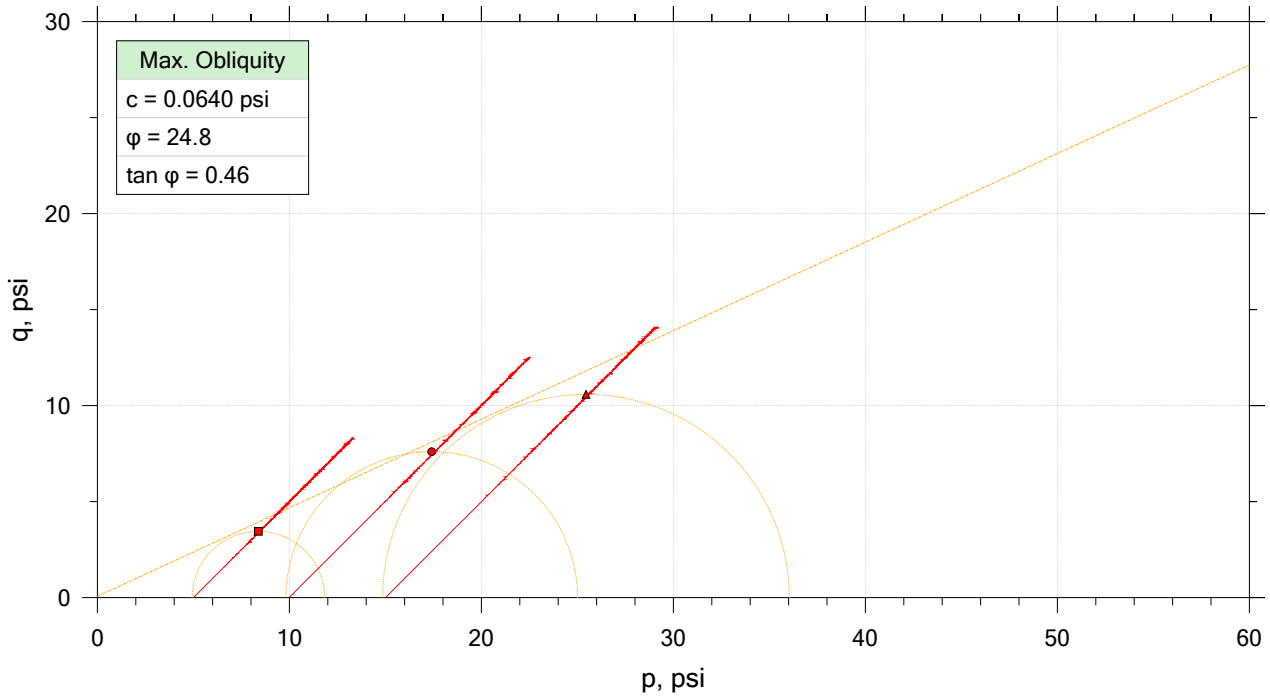
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: BS-15	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-0771	Test Date: 5/21/2018 - 5/24/2018	Depth: 0' - 5'
Test No.: ABC	Sample Type: Remolded	Elevation: --
Description: SILT (ML/A-4(0)) with Sand LL: 34 PL: 25 PI: 9 %#200 Finer: 72.1		
Remarks: Max Dry Density - 108.6 pcf at OMC - 16.5% + 2%		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297



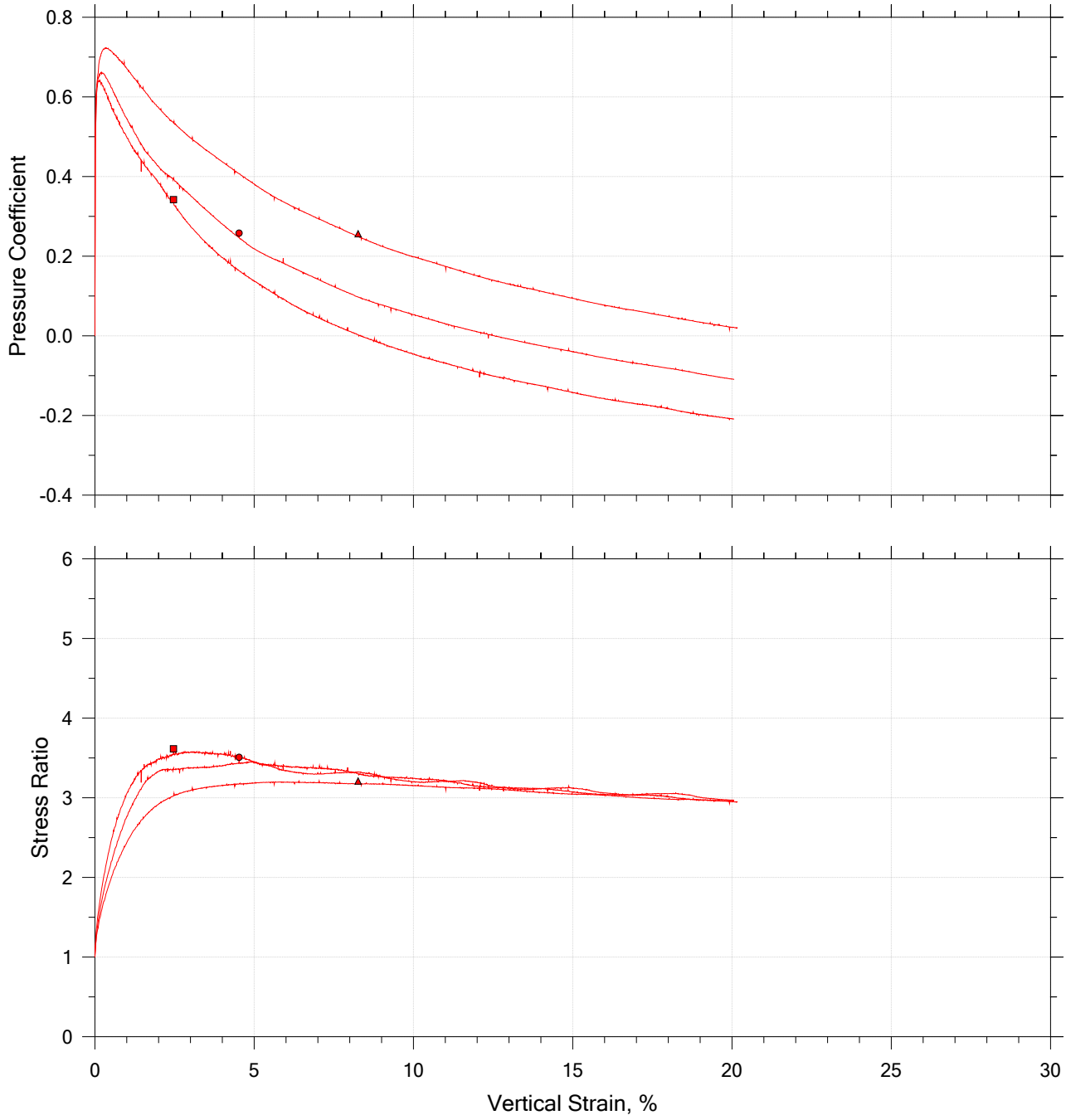


	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-0771	A	0' - 5'	WAP	5/21/2018	JFH/RS		18-0771_BS-15_test A.dat
●	18-0771	B	0' - 5'	WAP	5/22/2018	JFH/RS		18-0771_BS-15_test B.dat
▲	18-0771	C	0' - 5'	WAP	5/23/2018	JFH/RS		18-0771_BS-15_test C.dat

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: BS-15	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-0771	Test Date: 5/21/2018 - 5/24/2018	Depth: 0' - 5'
Test No.: ABC	Sample Type: Remolded	Elevation: --
Description: SILT (ML/A-4(0)) with Sand LL: 34 PL: 25 PI: 9 %#200 Finer: 72.1		
Remarks: Max Dry Density - 108.6 pcf at OMC - 16.5% + 2%		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297

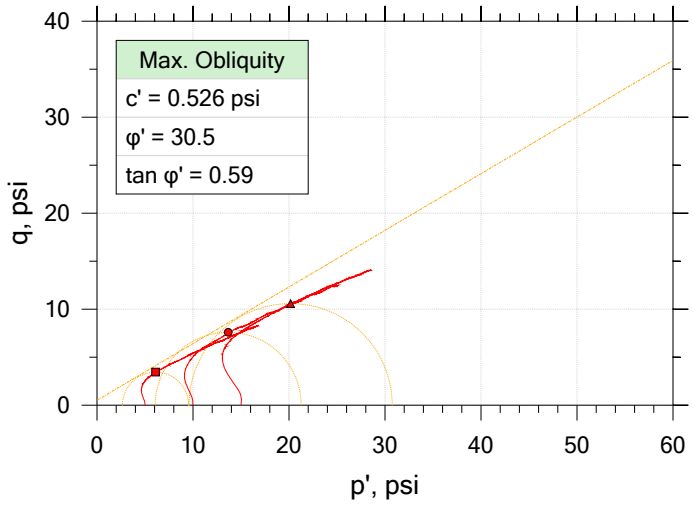


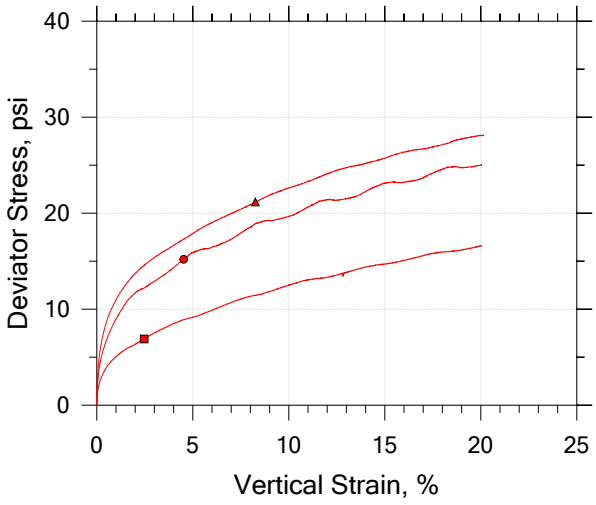
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-0771	A	0' - 5'	WAP	5/21/2018	JFH/RS		18-0771_BS-15_test A.dat
●	18-0771	B	0' - 5'	WAP	5/22/2018	JFH/RS		18-0771_BS-15_test B.dat
▲	18-0771	C	0' - 5'	WAP	5/23/2018	JFH/RS		18-0771_BS-15_test C.dat

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: BS-15	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-0771	Test Date: 5/21/2018 - 5/24/2018	Depth: 0' - 5'
Test No.: ABC	Sample Type: Remolded	Elevation: --
Description: SILT (ML/A-4(0)) with Sand LL: 34 PL: 25 PI: 9 %#200 Finer: 72.1		
Remarks: Max Dry Density - 108.6 pcf at OMC - 16.5% + 2%		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297





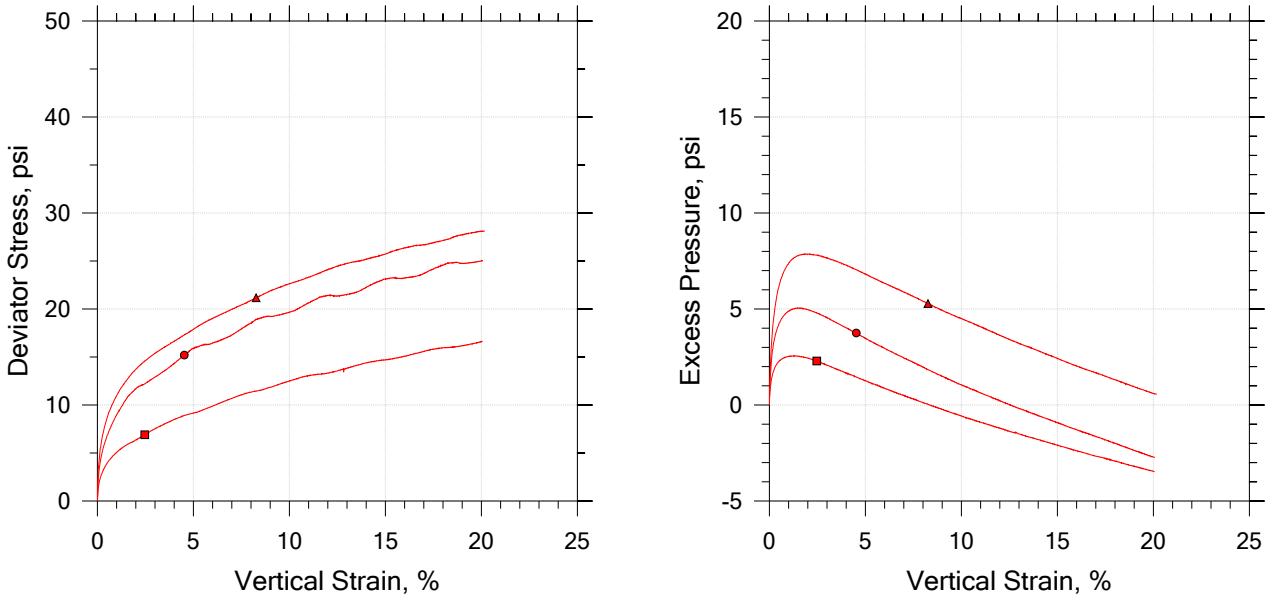
		■	●	▲	
Symbol					
Sample ID		18-0771	18-0771	18-0771	
Depth, ft		0' - 5'	0' - 5'	0' - 5'	
Test Number		A	B	C	
Initial	Height, in	6.022	6.015	6.015	
	Diameter, in	2.800	2.795	2.794	
	Moisture Content (from Cuttings), %	29.0	29.0	29.0	
	Dry Density, pcf	94.1	94.7	94.5	
	Saturation (Wet Method), %	99.8	101.3	100.8	
	Void Ratio	0.779	0.767	0.771	
Final	Moisture Content, %	28.3	27.7	27.0	
	Dry Density, pcf	95.1	96.0	97.1	
	Cross-Sectional Area (Method A), in²	6.105	6.071	6.018	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.759	0.743	0.723	
	Back Pressure, %	97.99	101.0	101.0	
Vertical Effective Consolidation Stress, psi		4.975	9.936	14.93	
Horizontal Effective Consolidation Stress, psi		5.004	9.983	15.01	
Vertical Strain after Consolidation, %		0.4315	0.8420	1.201	
Volumetric Strain after Consolidation, %		1.546	2.881	3.697	
Time to 50% Consolidation, min		0.0000	0.0000	0.0000	
Shear Strength, psi		3.453	7.600	10.59	
Strain at Failure, %		2.47	4.53	8.26	
Strain Rate, %/min		0.07500	0.07500	0.07500	
Deviator Stress at Failure, psi		6.905	15.20	21.17	
Effective Minor Principal Stress at Failure, psi		2.640	6.061	9.579	
Effective Major Principal Stress at Failure, psi		9.545	21.26	30.75	
B-Value		0.95	0.95	0.95	

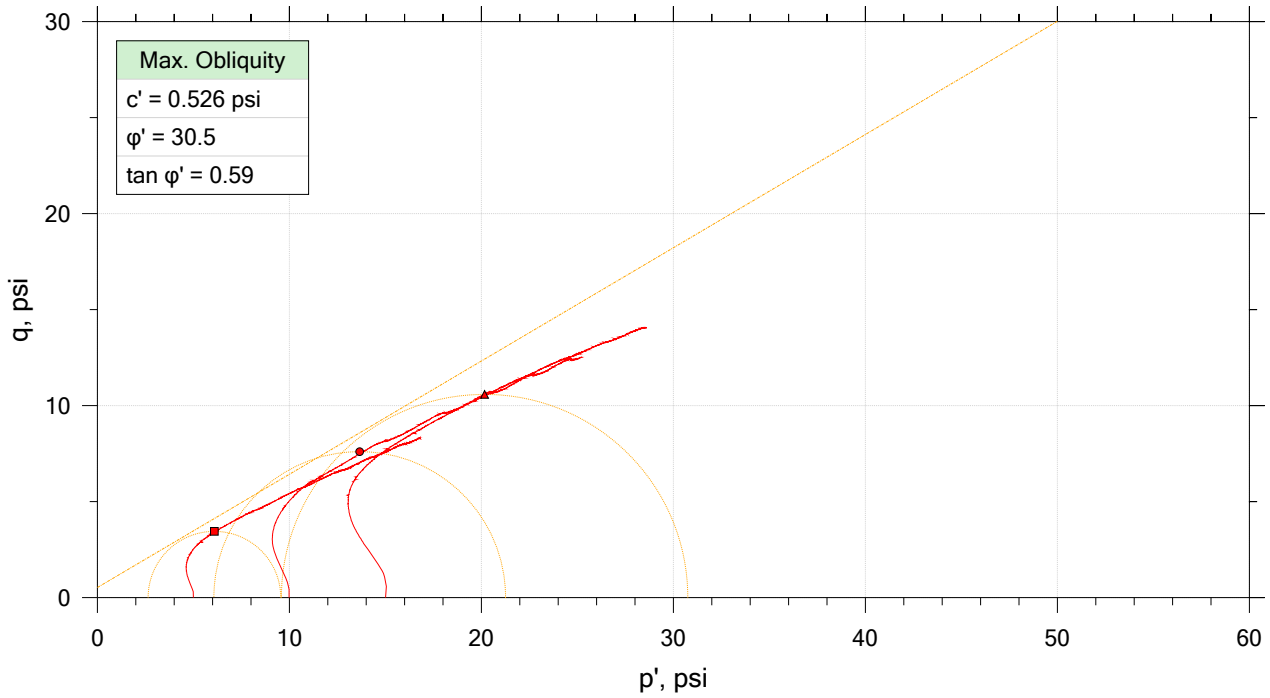
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: BS-15	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-0771	Test Date: 5/21/2018 - 5/24/2018	Depth: 0' - 5'
Test No.: ABC	Sample Type: Remolded	Elevation: --
Description: SILT (ML/A-4(0)) with Sand LL: 34 PL: 25 PI: 9 %#200 Finer: 72.1		
Remarks: Max Dry Density - 108.6 pcf at OMC - 16.5% + 2%		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297



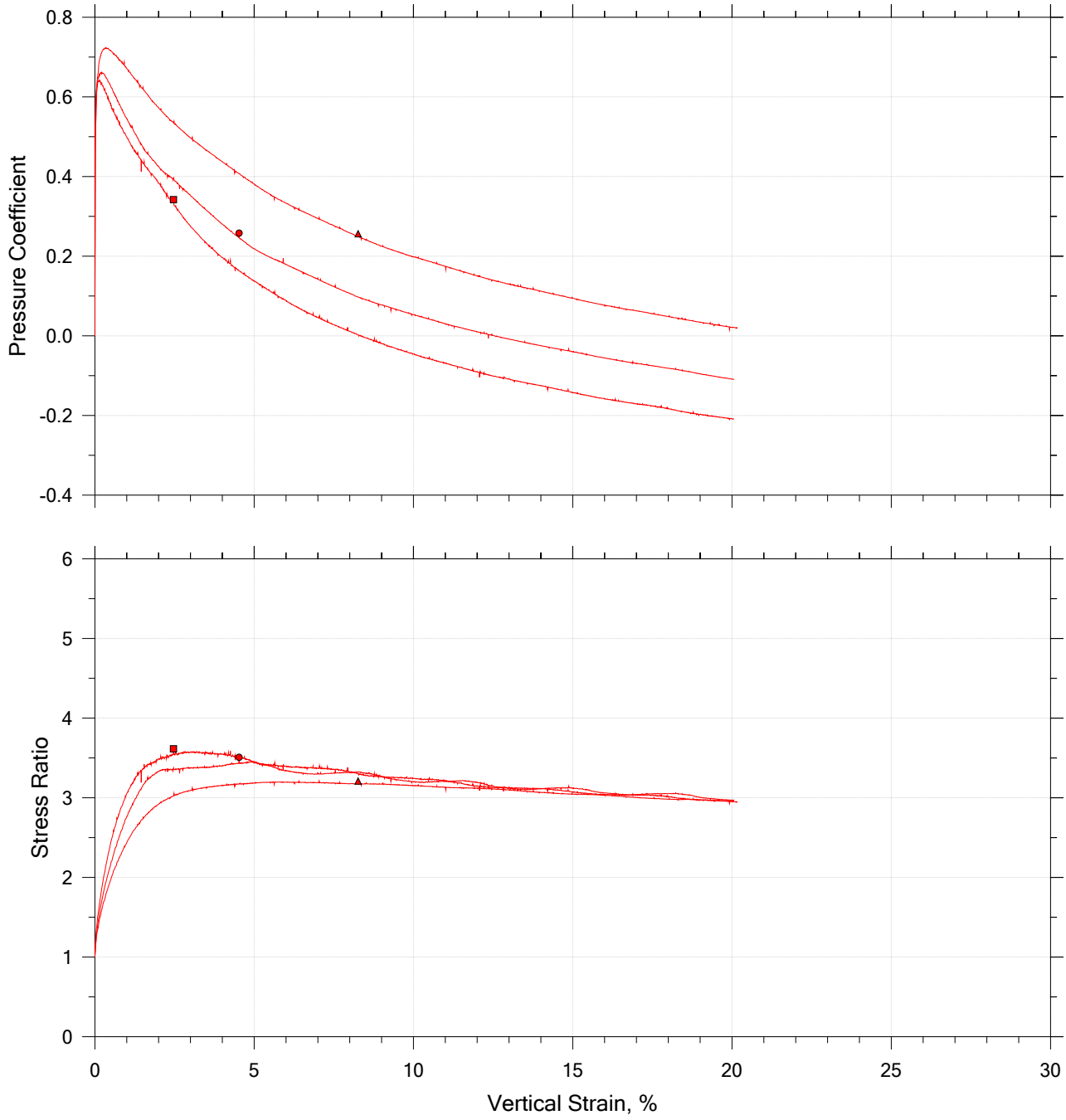


	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-0771	A	0' - 5'	WAP	5/21/2018	JFH/RS		18-0771_BS-15_test A.dat
●	18-0771	B	0' - 5'	WAP	5/22/2018	JFH/RS		18-0771_BS-15_test B.dat
▲	18-0771	C	0' - 5'	WAP	5/23/2018	JFH/RS		18-0771_BS-15_test C.dat

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: BS-15	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-0771	Test Date: 5/21/2018 - 5/24/2018	Depth: 0' - 5'
Test No.: ABC	Sample Type: Remolded	Elevation: --
Description: SILT (ML/A-4(0)) with Sand LL: 34 PL: 25 PI: 9 %#200 Finer: 72.1		
Remarks: Max Dry Density - 108.6 pcf at OMC - 16.5% + 2%		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297



	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-0771	A	0' - 5'	WAP	5/21/2018	JFH/RS		18-0771_BS-15_test A.dat
●	18-0771	B	0' - 5'	WAP	5/22/2018	JFH/RS		18-0771_BS-15_test B.dat
▲	18-0771	C	0' - 5'	WAP	5/23/2018	JFH/RS		18-0771_BS-15_test C.dat

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: BS-15	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-0771	Test Date: 5/21/2018 - 5/24/2018	Depth: 0' - 5'
Test No.: ABC	Sample Type: Remolded	Elevation: --
Description: SILT (ML/A-4(0)) with Sand LL: 34 PL: 25 PI: 9 %#200 Finer: 72.1		
Remarks: Max Dry Density - 108.6 pcf at OMC - 16.5% + 2%		

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-1038	**DATE SAMPLE RECEIVED:**	5/30/2018
DESCRIPTION OF SOIL:	Sandy Lean CLAY (CL) A-4(2)		
TESTED BY:	MB	**DATE OF TESTING:**	5/30/2018
		DATE OF WEIGHING:	5/31/2018

BORING NO.	BS-16				
SAMPLE NO.	18-1038C				
SAMPLE DEPTH	0.0-5.0'				
WATER CONTENT, W%	12.2				

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

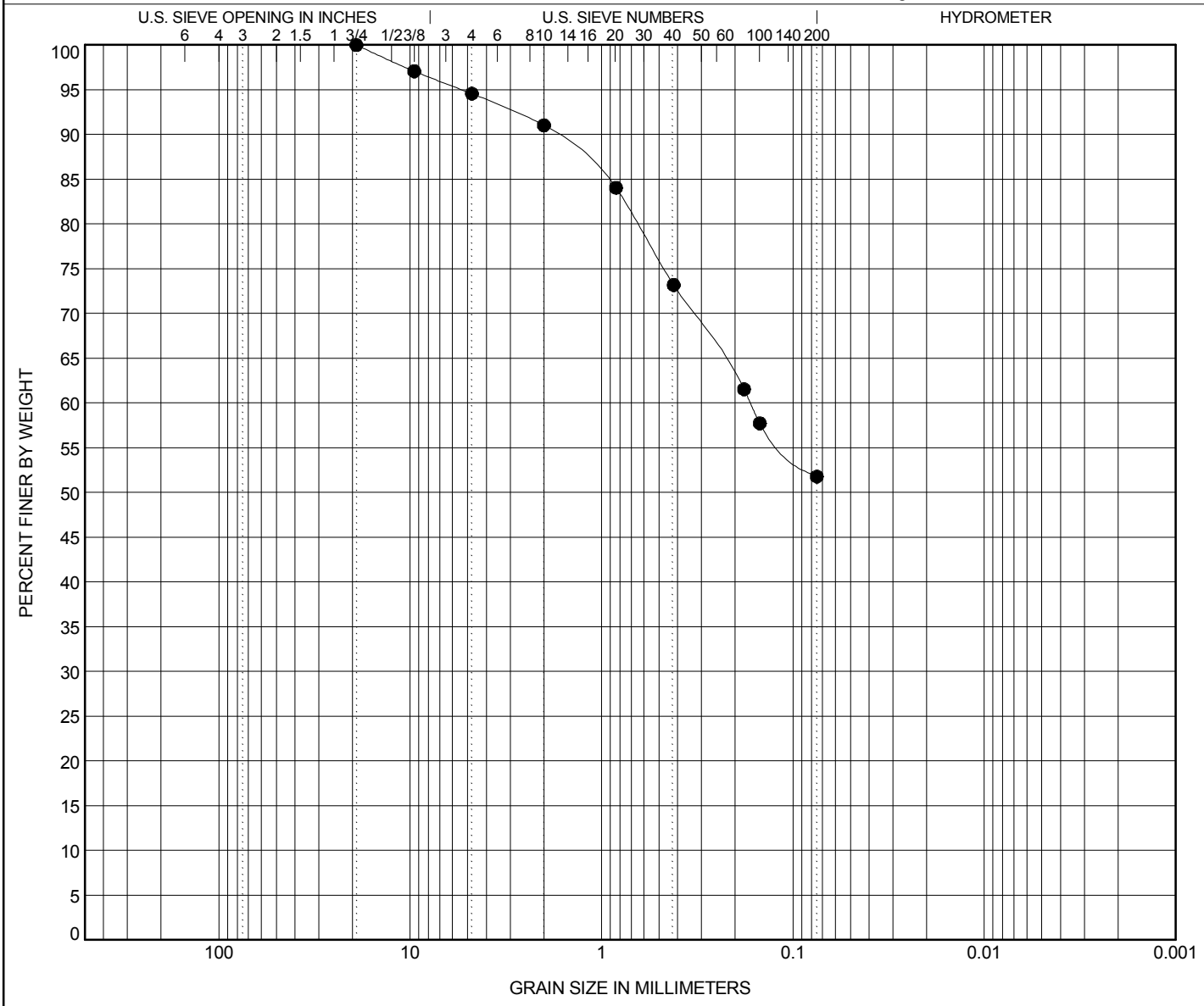
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**BS-16**	**5.0**	**Sandy Lean CLAY (CL) A-4(2)**	**27**	**19**	**8**		

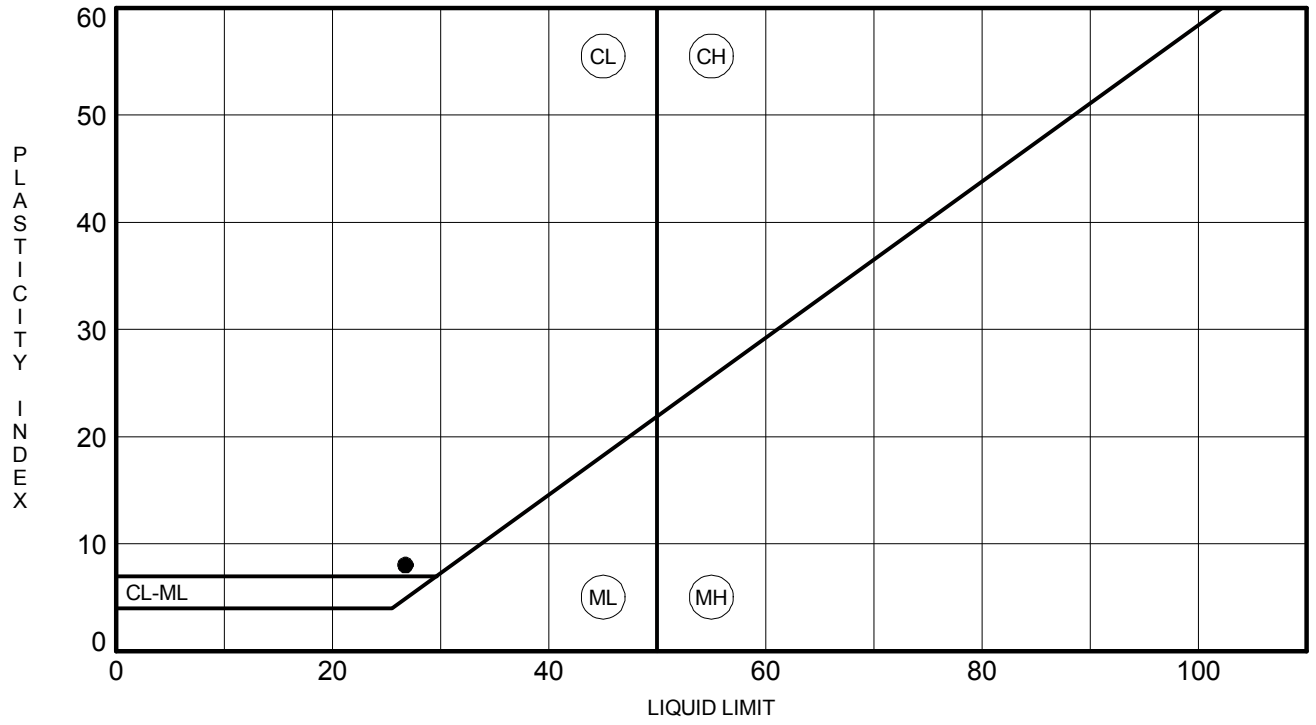
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**BS-16**	**5.0**	**19.1**	**5.358**			**5.4**	**42.8**	**51.8**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/7/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



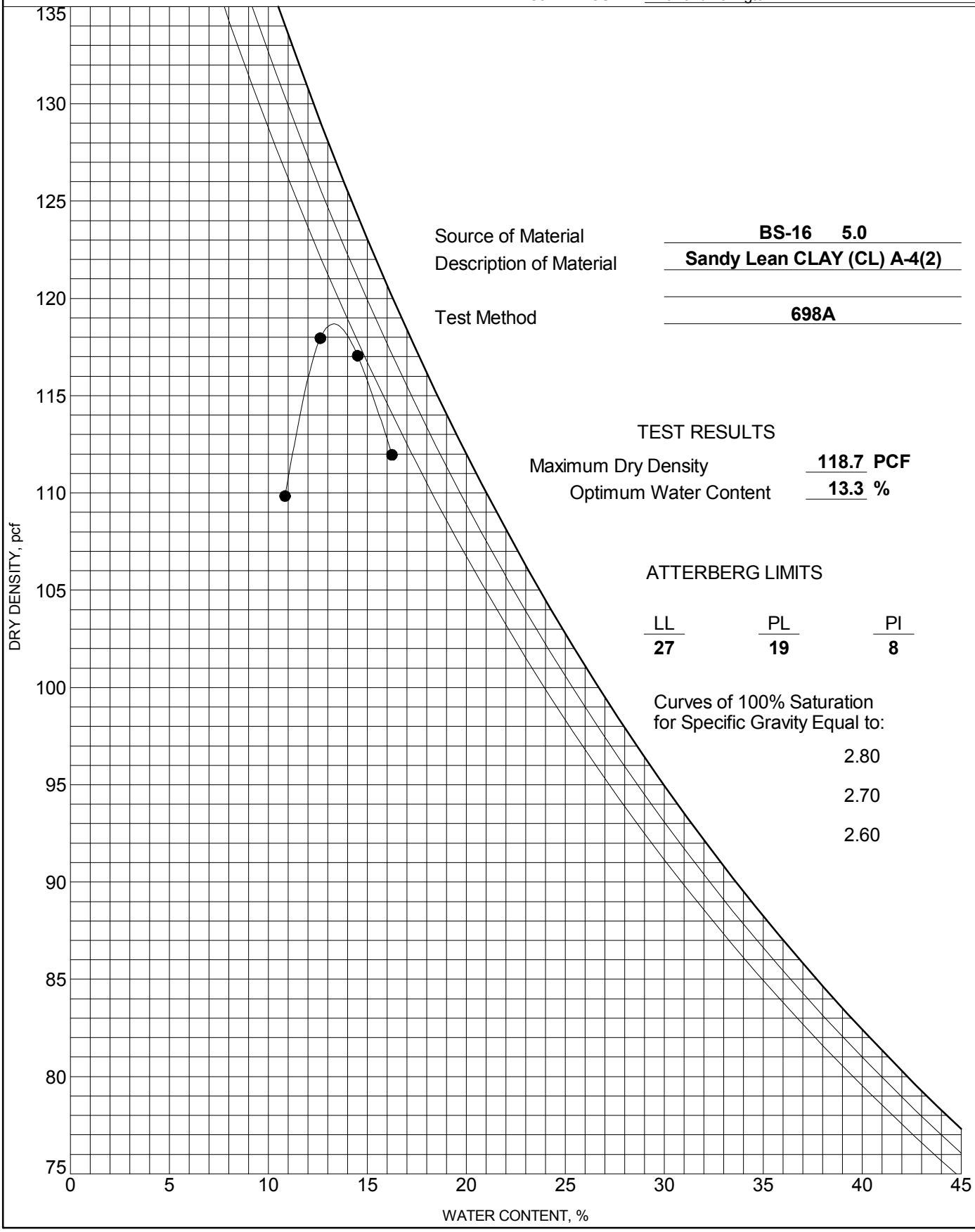
	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**BS-16**	**5.0**	**27**	**19**	**8**	**52**	**Sandy Lean CLAY (CL) A-4(2)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/7/18

MOISTURE-DENSITY RELATIONSHIP

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



Source of Material **BS-16 5.0**

Description of Material **Sandy Lean CLAY (CL) A-4(2)**

Test Method **698A**

TEST RESULTS

Maximum Dry Density **118.7** **PCF**

Optimum Water Content **13.3** **%**

ATTERBERG LIMITS

LL	PL	PI
27	**19**	**8**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

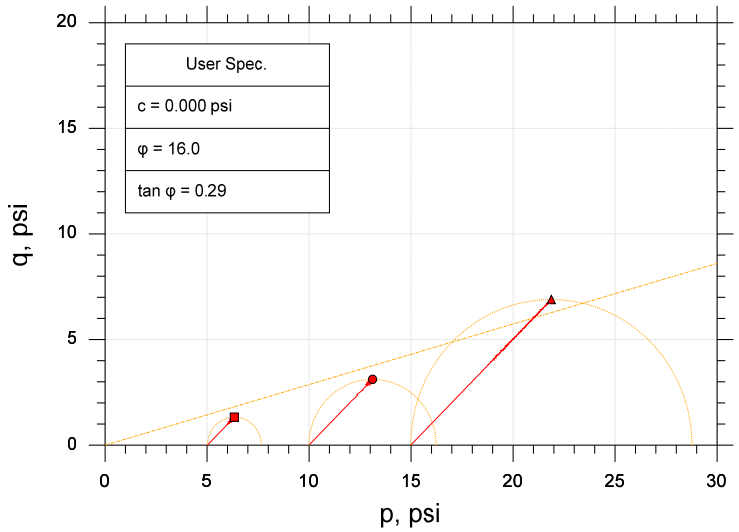
2.70

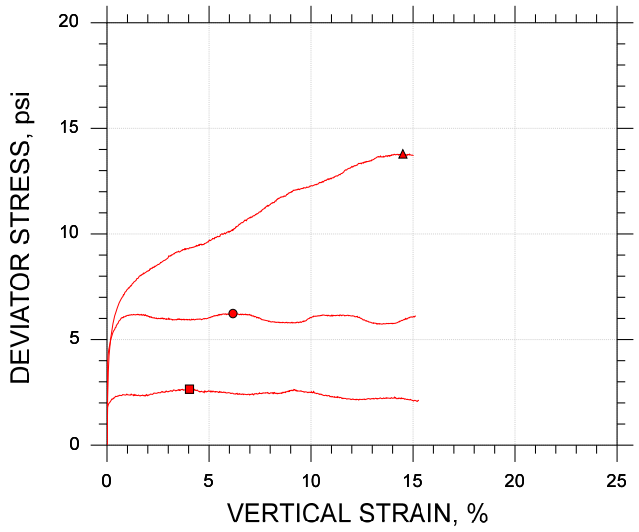
2.60

COMPACTION - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/7/18

Client: F&ME Consultants	
Project Name: I-20/26/126 Corridor Improv.	
Project Location: ---	
Project Number: GTX-307802	
Tested By: trm	Checked By: mcm
Boring ID: ---	
Preparation: reconstituted	
Description: Sandy Lean CLAY (CL) A-4 (2)	
Classification: ---	
Group Symbol: ---	
Liquid Limit: 27	Plastic Limit: 19
Plasticity Index: 8	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		■	●	▲	
Sample ID		BS-16	BS-16	BS-16	
Depth, ft		---	---	---	
Test Number		CU-10-1	CU-10-2	CU-10-3	
Initial	Height, in	4.000	4.000	4.000	
	Diameter, in	2.000	2.000	2.000	
	Moisture Content (from Cuttings), %	14.1	14.1	14.1	
	Dry Density, pcf	112.	112.	112.	
	Saturation (Wet Method), %	75.3	75.3	75.3	
	Void Ratio	0.506	0.506	0.506	
Before Shear	Moisture Content, %	17.3	16.8	16.6	
	Dry Density, pcf	115.	116.	116.	
	Cross-sectional Area (Method A), in²	3.099	3.077	3.085	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.467	0.454	0.447	
	Back Pressure, psi	199.0	151.0	198.9	
Vertical Effective Consolidation Stress, psi		4.939	9.926	14.82	
Horizontal Effective Consolidation Stress, psi		5.014	9.996	14.98	
Vertical Strain after Consolidation, %		1.068	1.088	1.972	
Volumetric Strain after Consolidation, %		1.967	2.430	3.344	
Time to 50% Consolidation, min		2.250	2.560	1.960	
Shear Strength, psi		1.325	3.116	6.894	
Strain at Failure, %		4.04	6.17	14.5	
Strain Rate, %/min		0.01600	0.01600	0.01600	
Deviator Stress at Failure, psi		2.651	6.233	13.79	
Effective Minor Principal Stress at Failure, psi		1.424	3.230	8.879	
Effective Major Principal Stress at Failure, psi		4.075	9.462	22.67	
B-Value		0.94	0.96	0.95	

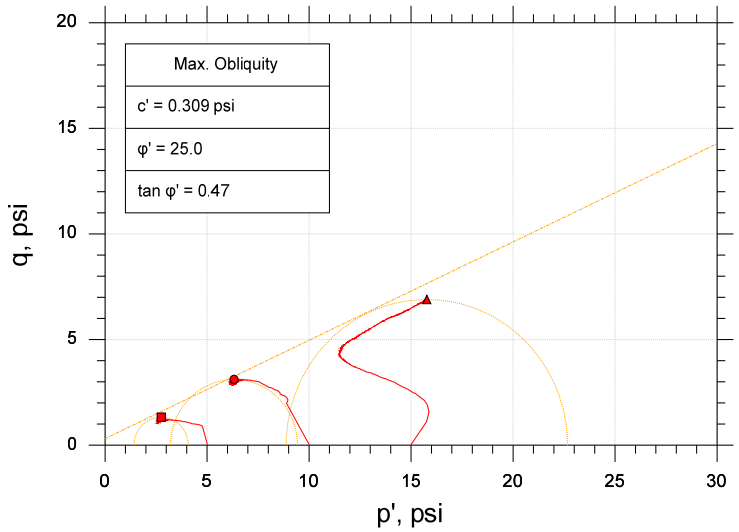
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Atterberg Limits determined by ASTM D4318.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

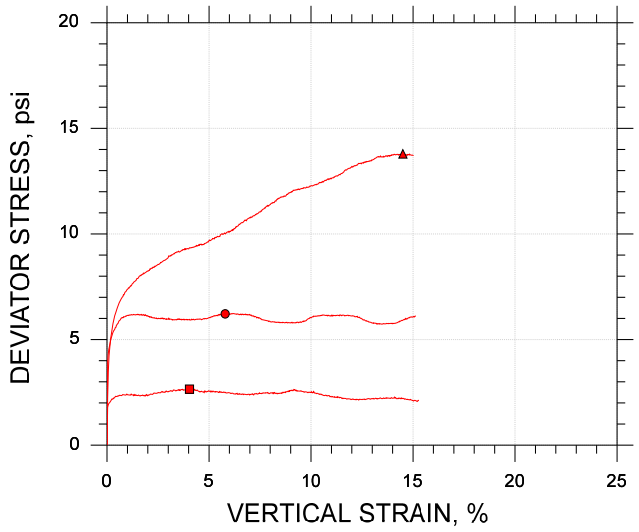
Remarks:

Target Compaction: 95% of (118.7 pcf) at Optimum Moisture Content (13.3%) + 2% - As Requested by Client

Client: F&ME Consultants	
Project Name: I-20/26/126 Corridor Improv.	
Project Location: ---	
Project Number: GTX-307802	
Tested By: trm	Checked By: mcm
Boring ID: ---	
Preparation: reconstituted	
Description: Sandy Lean CLAY (CL) A-4 (2)	
Classification: ---	
Group Symbol: ---	
Liquid Limit: 27	Plastic Limit: 19
Plasticity Index: 8	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767

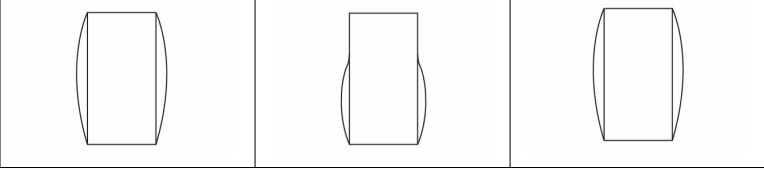




Symbol		■	●	▲	
Sample ID		BS-16	BS-16	BS-16	
Depth, ft		---	---	---	
Test Number		CU-10-1	CU-10-2	CU-10-3	
Initial	Height, in	4.000	4.000	4.000	
	Diameter, in	2.000	2.000	2.000	
	Moisture Content (from Cuttings), %	14.1	14.1	14.1	
	Dry Density, pcf	112.	112.	112.	
	Saturation (Wet Method), %	75.3	75.3	75.3	
	Void Ratio	0.506	0.506	0.506	
Before Shear	Moisture Content, %	17.3	16.8	16.6	
	Dry Density, pcf	115.	116.	116.	
	Cross-sectional Area (Method A), in²	3.099	3.077	3.085	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.467	0.454	0.447	
	Back Pressure, psi	199.0	151.0	198.9	
Vertical Effective Consolidation Stress, psi		4.939	9.926	14.82	
Horizontal Effective Consolidation Stress, psi		5.014	9.996	14.98	
Vertical Strain after Consolidation, %		1.068	1.088	1.972	
Volumetric Strain after Consolidation, %		1.967	2.430	3.344	
Time to 50% Consolidation, min		2.250	2.560	1.960	
Shear Strength, psi		1.325	3.108	6.894	
Strain at Failure, %		4.04	5.79	14.5	
Strain Rate, %/min		0.01600	0.01600	0.01600	
Deviator Stress at Failure, psi		2.651	6.216	13.79	
Effective Minor Principal Stress at Failure, psi		1.424	3.214	8.879	
Effective Major Principal Stress at Failure, psi		4.075	9.430	22.67	
B-Value		0.94	0.96	0.95	

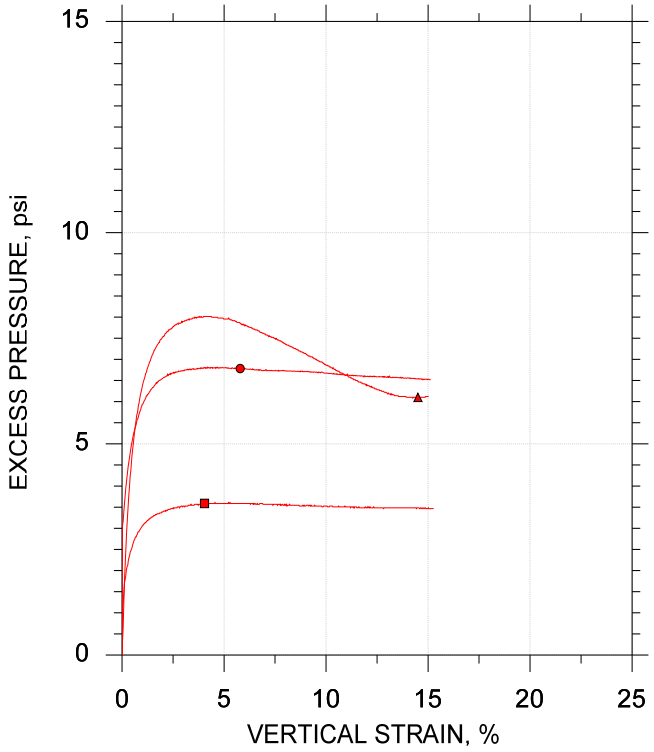
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Atterberg Limits determined by ASTM D4318.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

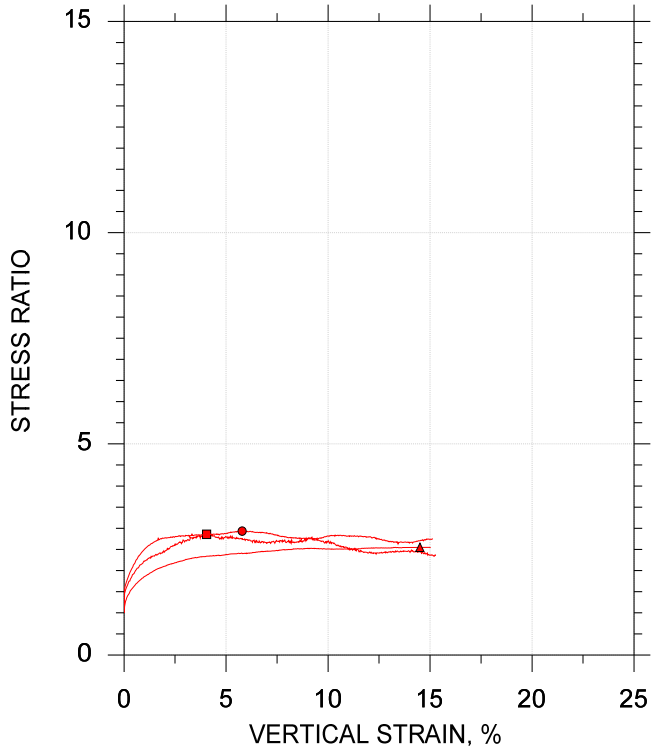
Remarks:

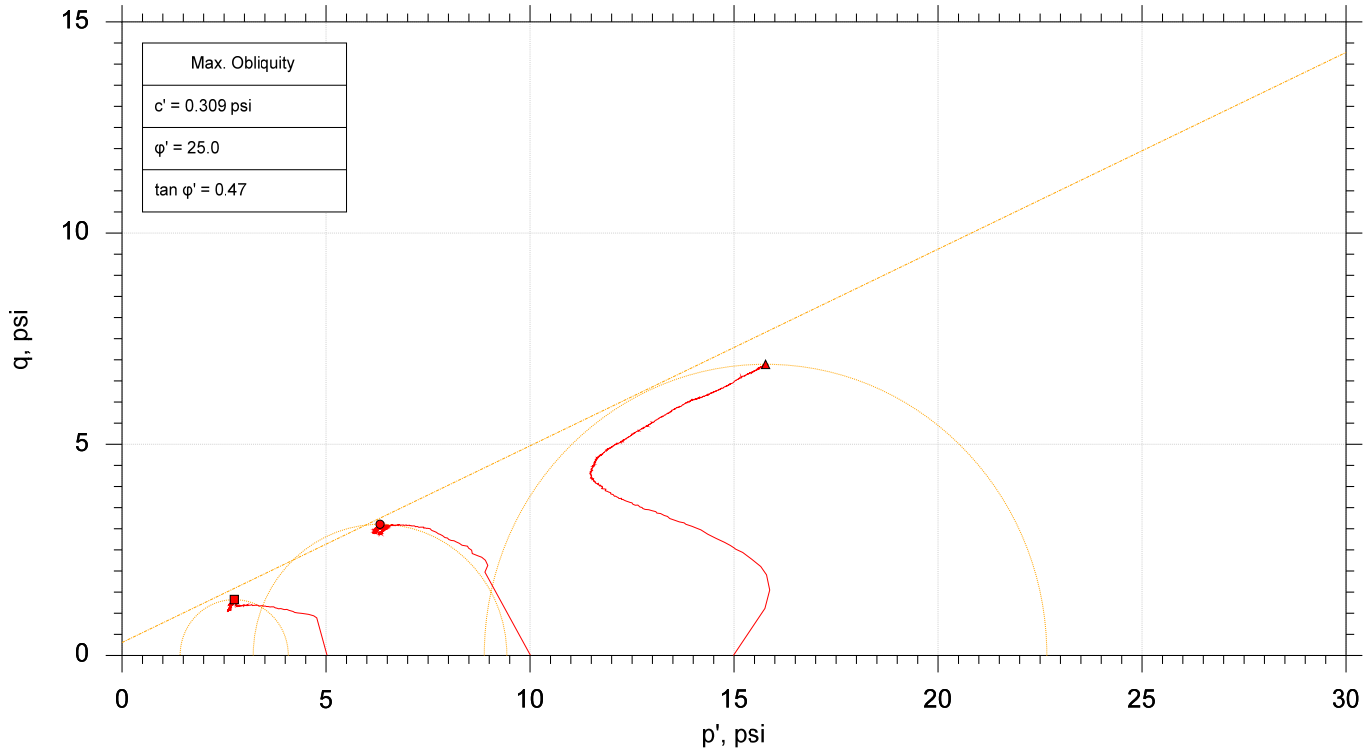


Target Compaction: 95% of (118.7 pcf) at Optimum Moisture Content (13.3%) + 2% - As Requested by Client

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	BS-16	CU-10-1	---	trm	6/25/18	mcm	7/11/18	307802-CU-10-1m.dat
●	BS-16	CU-10-2	---	trm	6/25/2018	mcm	7/11/18	307802-CU-10-2m.dat
▲	BS-16	CU-10-3	---	trm	6/25/2018	mcm	7/12/18	307802-CU-10-3m.dat

GeoTesting EXPRESS

Project: I-20/26/126 Corridor Improv.	Location: ---	Project No.: GTX-307802
Boring No.: ---	Sample Type: reconstituted	
Description: Sandy Lean CLAY (CL) A-4 (2)		
Remarks: Target Compaction: 95% of (118.7 pcf) at Optimum Moisture Content (13.3%) + 2% - As Requested by Client		

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-1039	**DATE SAMPLE RECEIVED:**	5/30/2018
DESCRIPTION OF SOIL:	Clayey Fine SAND (SC) with Gravel A-6(2)		
TESTED BY:	MB	**DATE OF TESTING:**	5/30/2018
		DATE OF WEIGHING:	5/31/2018

BORING NO.	BS-17				
SAMPLE NO.	18-1039C				
SAMPLE DEPTH	0.0-3.0'				
WATER CONTENT, W%	8.2				

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

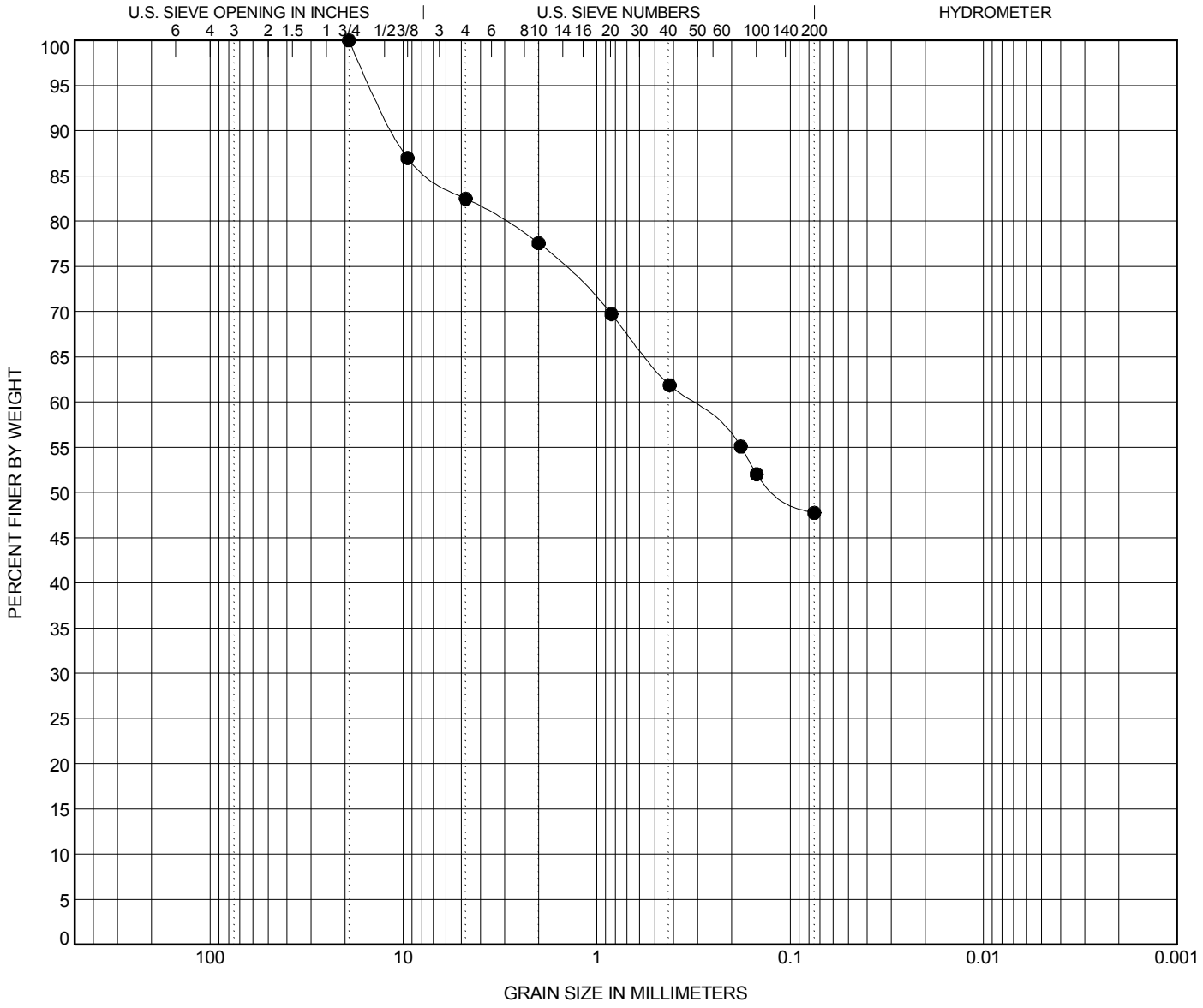
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**BS-17**	**3.0**	**Clayey Fine SAND (SC) with Gravel A-6(2)**	**28**	**17**	**11**		

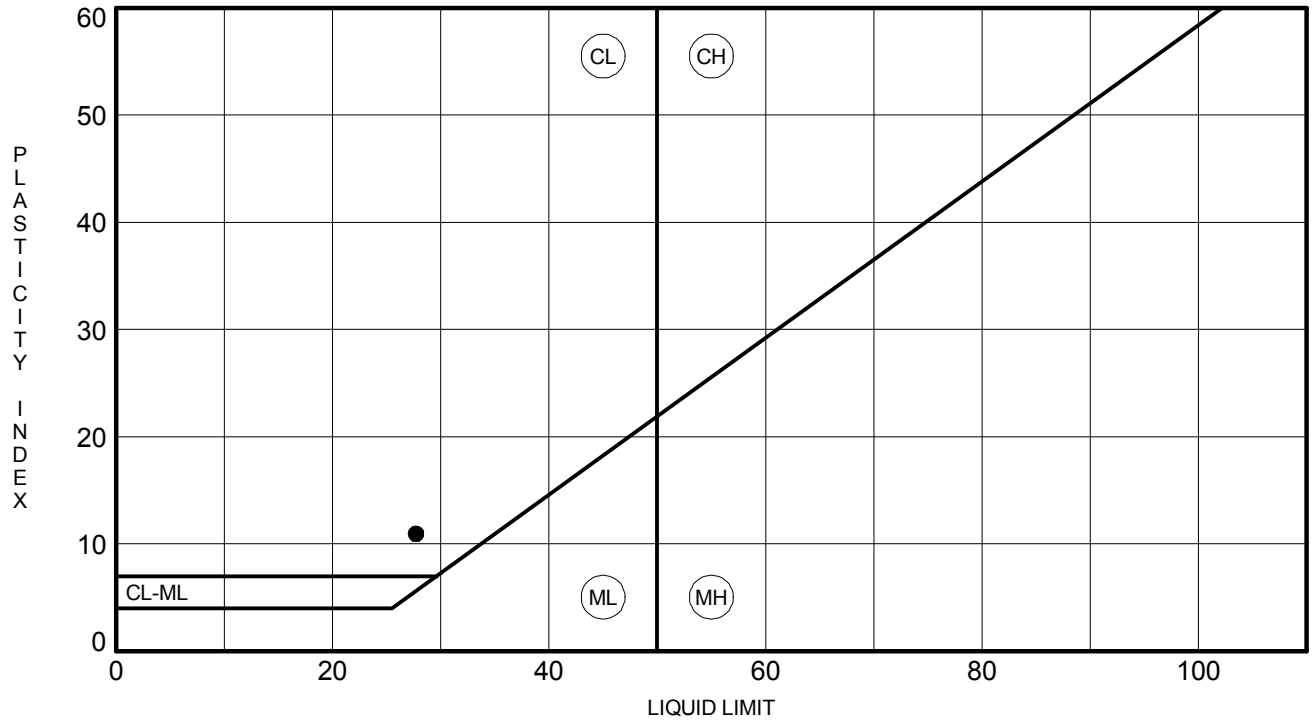
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**BS-17**	**3.0**	**19.1**	**14.614**	**0.107**		**17.5**	**34.7**	**47.8**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/7/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



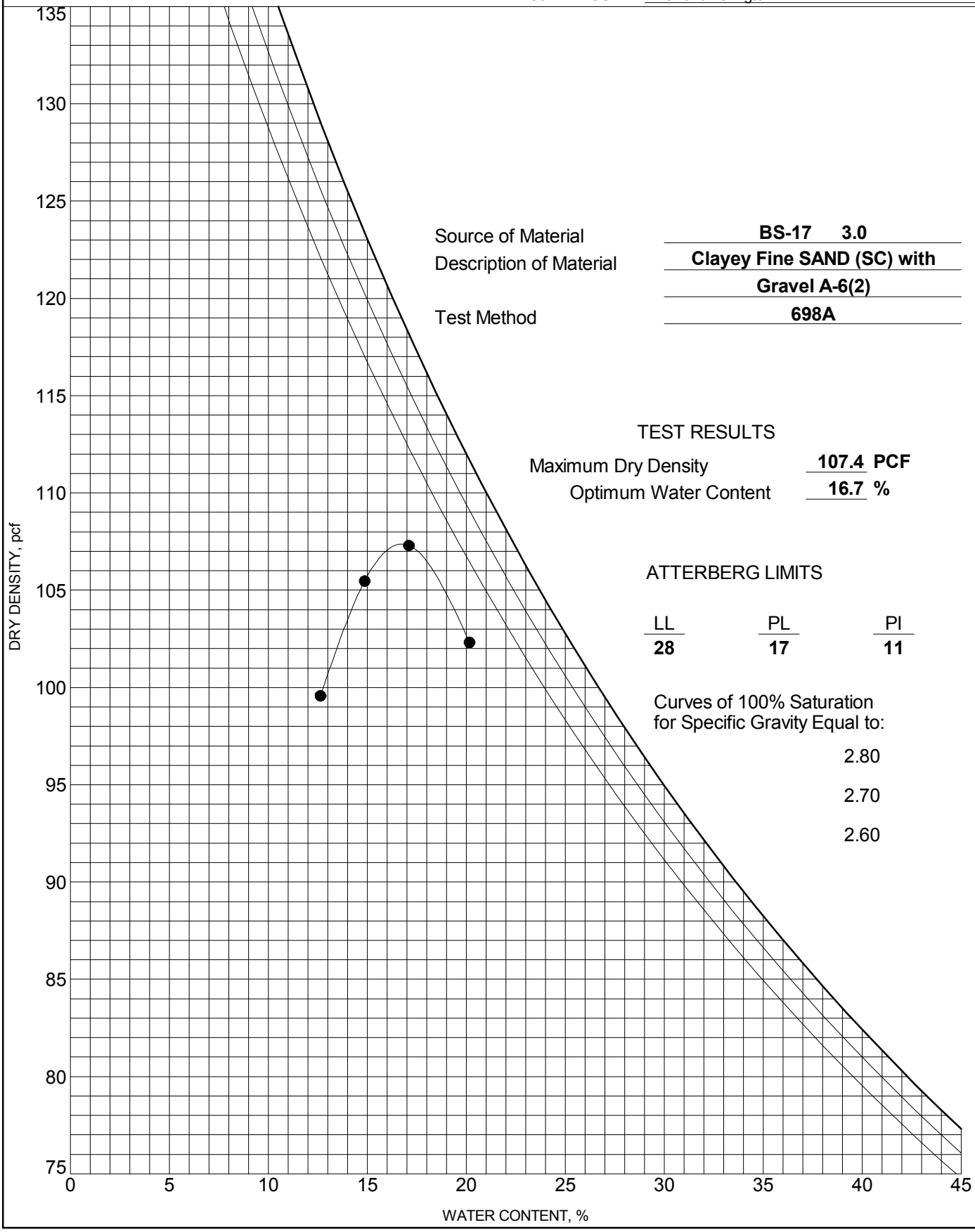
	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**BS-17**	**3.0**	**28**	**17**	**11**	**48**	**Clayey Fine SAND (SC) with Gravel A-6(2)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/7/18

MOISTURE-DENSITY RELATIONSHIP

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



Source of Material	**BS-17 3.0**
Description of Material	**Clayey Fine SAND (SC) with Gravel A-6(2)**
Test Method	**698A**

TEST RESULTS

Maximum Dry Density	**107.4**	**PCF**
Optimum Water Content	**16.7**	**%**

ATTERBERG LIMITS

LL	PL	PI
28	**17**	**11**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

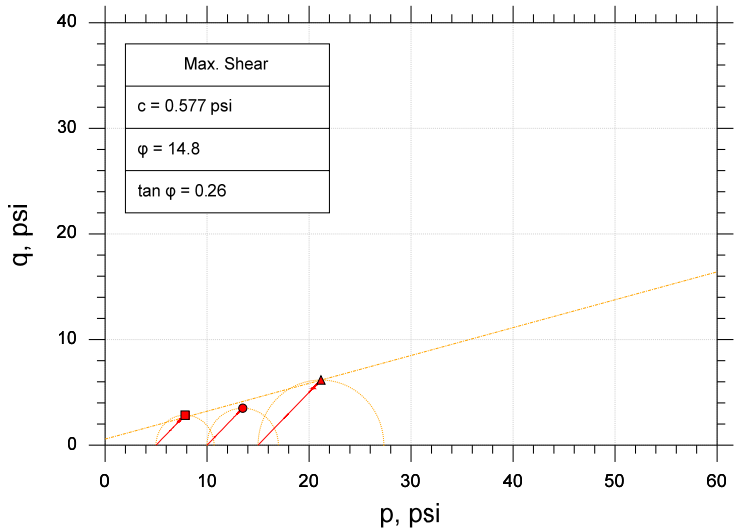
2.70

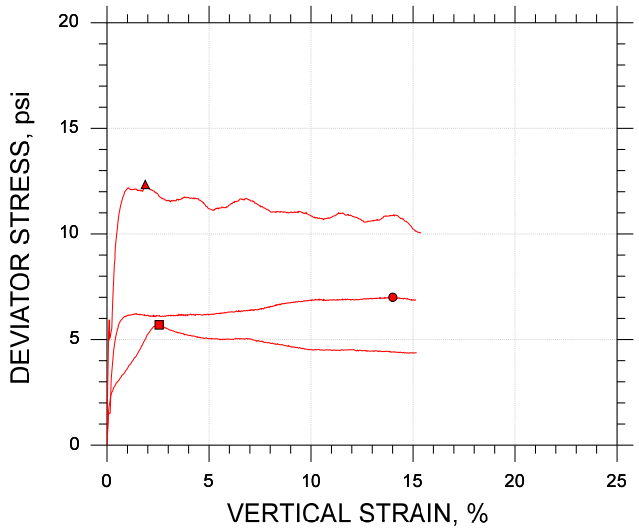
2.60

COMPACTION - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/7/18

Client: F&ME Consultants	
Project Name: I-20/26/126 Corridor Improv.	
Project Location: ---	
Project Number: GTX-307802	
Tested By: trm	Checked By: mcm
Boring ID: ---	
Preparation: intact	
Description: Clayey fine SAND (SC) with Gravel-A-6 (2)	
Classification: ---	
Group Symbol: ---	
Liquid Limit: 28	Plastic Limit: 11
Plasticity Index: 17	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		■	●	▲	
Sample ID		BS-17	BS-17	BS-17	
Depth, ft		---	---	---	
Test Number		CU-9-1	CU-9-2	CU-9-3	
Initial	Height, in	4.060	4.020	4.000	
	Diameter, in	2.000	2.000	2.000	
	Moisture Content (from Cuttings), %	16.3	16.9	17.2	
	Dry Density, pcf	102.	102.	102.	
	Saturation (Wet Method), %	68.0	70.0	70.5	
	Void Ratio	0.647	0.651	0.661	
Before Shear	Moisture Content, %	23.2	22.0	22.9	
	Dry Density, pcf	104.	106.	104.	
	Cross-sectional Area (Method A), in²	3.116	3.062	3.078	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.626	0.595	0.618	
	Back Pressure, psi	181.0	150.8	180.9	
Vertical Effective Consolidation Stress, psi		4.999	9.947	14.95	
Horizontal Effective Consolidation Stress, psi		5.006	9.997	15.00	
Vertical Strain after Consolidation, %		0.1351	0.6736	0.5663	
Volumetric Strain after Consolidation, %		0.3619	2.805	2.661	
Time to 50% Consolidation, min		0.8100	1.690	1.690	
Shear Strength, psi		2.845	3.499	6.170	
Strain at Failure, %		2.55	14.0	1.87	
Strain Rate, %/min		0.01600	0.01600	0.01600	
Deviator Stress at Failure, psi		5.690	6.999	12.34	
Effective Minor Principal Stress at Failure, psi		1.729	2.172	3.546	
Effective Major Principal Stress at Failure, psi		7.419	9.171	15.89	
B-Value		0.93	0.95	0.96	

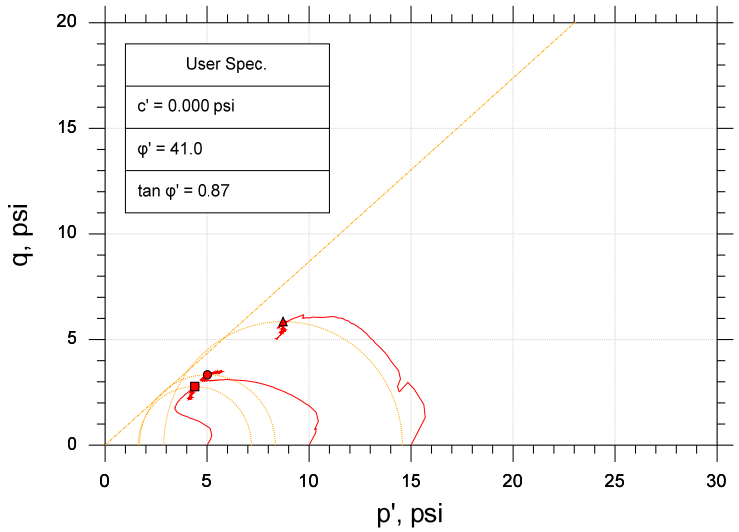
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Atterberg Limits determined by ASTM D4318.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

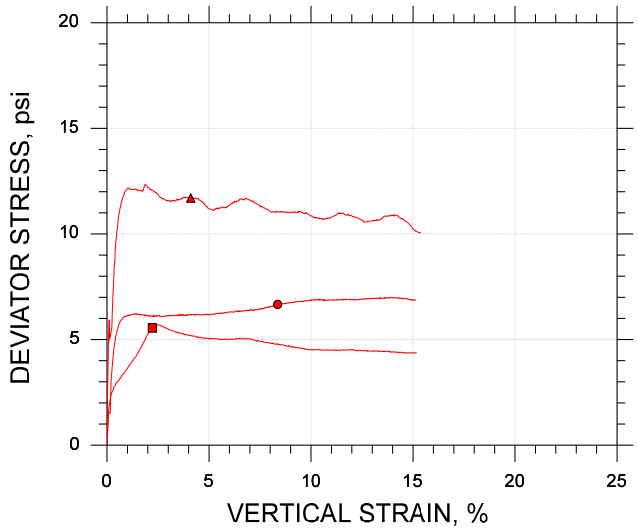
Remarks:

Target Compaction: 95% of (107.4 pcf) at Optimum Moisture Content (16.7%) + 2% - As Requested by Client

Client: F&ME Consultants	
Project Name: I-20/26/126 Corridor Improv.	
Project Location: ---	
Project Number: GTX-307802	
Tested By: trm	Checked By: mcm
Boring ID: ---	
Preparation: intact	
Description: Clayey fine SAND (SC) with Gravel-A-6 (2)	
Classification: ---	
Group Symbol: ---	
Liquid Limit: 28	Plastic Limit: 11
Plasticity Index: 17	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767

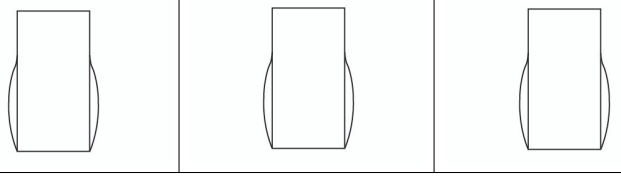




Symbol		■	●	▲	
Sample ID		BS-17	BS-17	BS-17	
Depth, ft		---	---	---	
Test Number		CU-9-1	CU-9-2	CU-9-3	
Initial	Height, in	4.060	4.020	4.000	
	Diameter, in	2.000	2.000	2.000	
	Moisture Content (from Cuttings), %	16.3	16.9	17.2	
	Dry Density, pcf	102.	102.	102.	
	Saturation (Wet Method), %	68.0	70.0	70.5	
	Void Ratio	0.647	0.651	0.661	
Before Shear	Moisture Content, %	23.2	22.0	22.9	
	Dry Density, pcf	104.	106.	104.	
	Cross-sectional Area (Method A), in²	3.116	3.062	3.078	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.626	0.595	0.618	
	Back Pressure, psi	181.0	150.8	180.9	
Vertical Effective Consolidation Stress, psi		4.999	9.947	14.95	
Horizontal Effective Consolidation Stress, psi		5.006	9.997	15.00	
Vertical Strain after Consolidation, %		0.1351	0.6736	0.5663	
Volumetric Strain after Consolidation, %		0.3619	2.805	2.661	
Time to 50% Consolidation, min		0.8100	1.690	1.690	
Shear Strength, psi		2.775	3.330	5.850	
Strain at Failure, %		2.22	8.36	4.10	
Strain Rate, %/min		0.01600	0.01600	0.01600	
Deviator Stress at Failure, psi		5.550	6.660	11.70	
Effective Minor Principal Stress at Failure, psi		1.624	1.687	2.877	
Effective Major Principal Stress at Failure, psi		7.174	8.347	14.58	
B-Value		0.93	0.95	0.96	

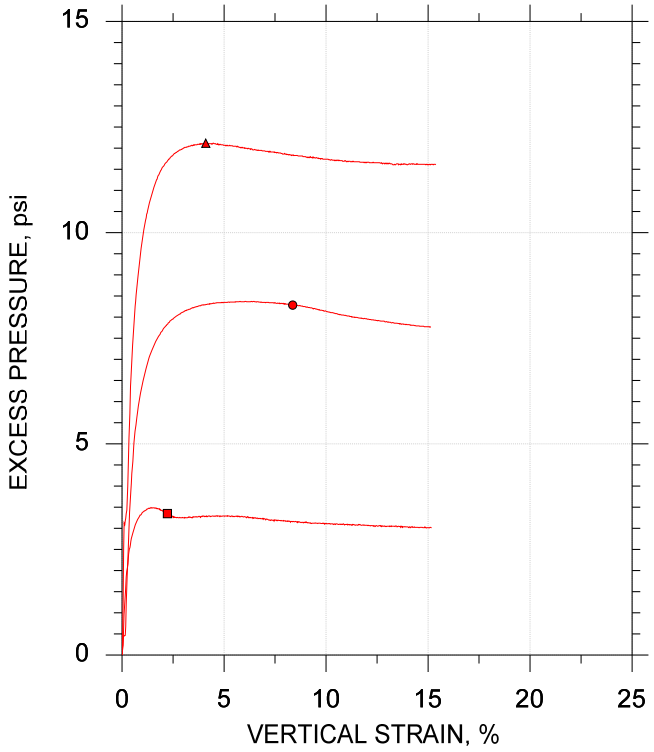
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Atterberg Limits determined by ASTM D4318.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

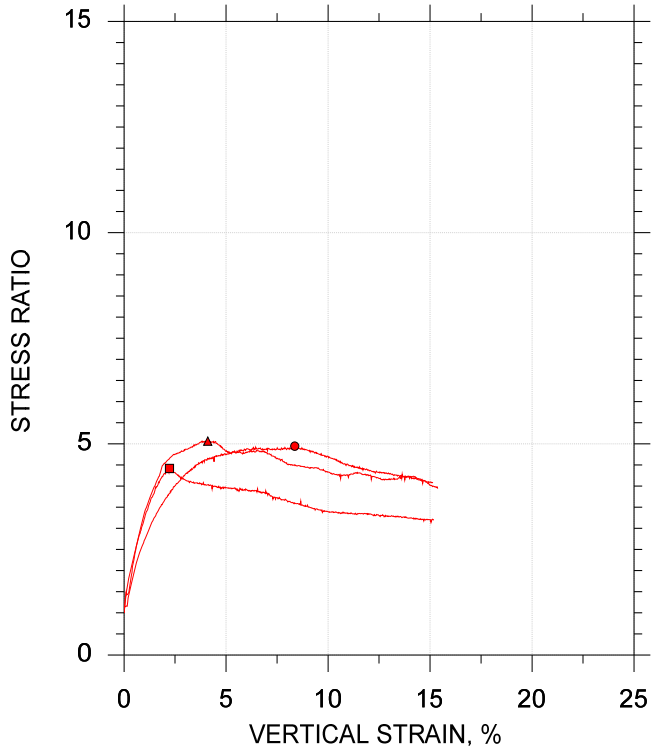
Remarks:

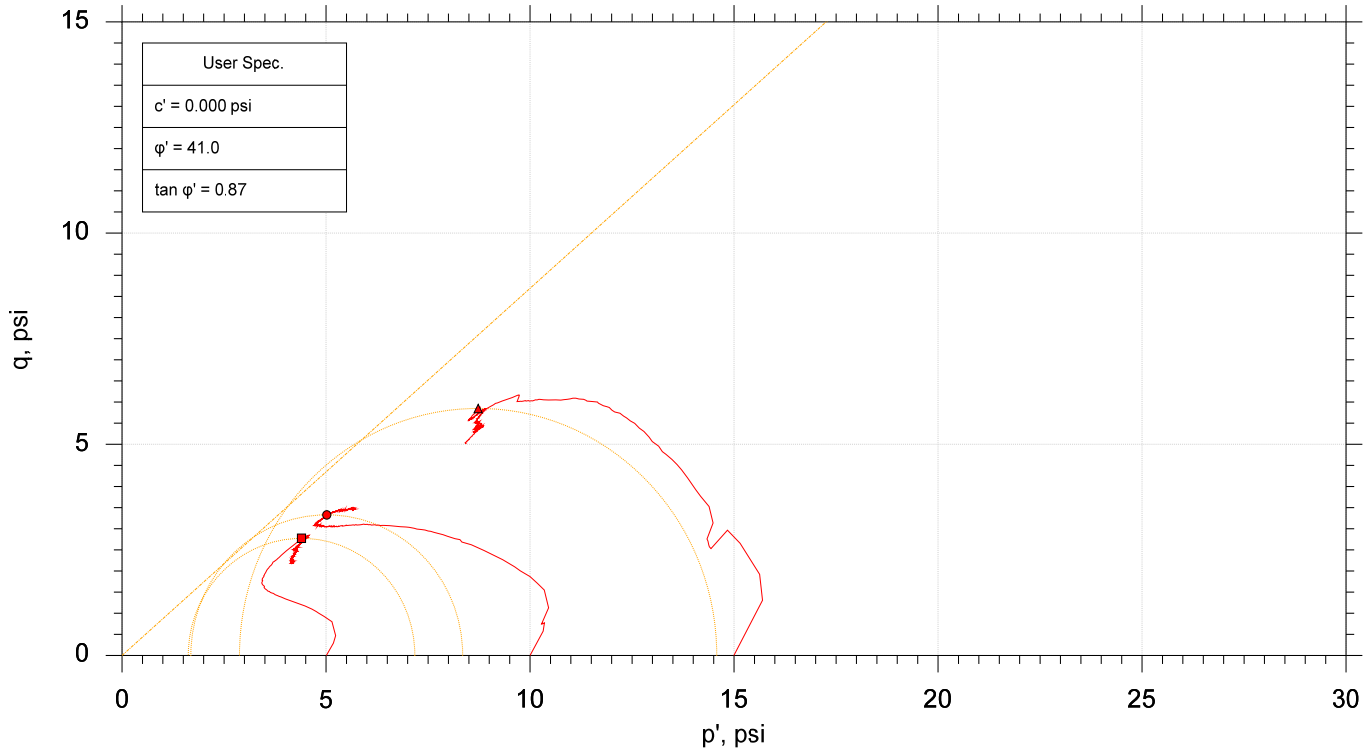


Target Compaction: 95% of (107.4 pcf) at Optimum Moisture Content (16.7%) + 2% - As Requested by Client

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	BS-17	CU-9-1	---	trm	6/25/18	mcm	7/11/18	307802-CU-9-1m.dat
●	BS-17	CU-9-2	---	trm	6/22/18	mcm	7/11/18	307802-CU-9-2m.dat
▲	BS-17	CU-9-3	---	trm	6/25/18	mcm	7/11/18	307802-CU-9-3m.dat

GeoTesting EXPRESS

Project: I-20/26/126 Corridor Improv.	Location: ---	Project No.: GTX-307802
Boring No.: ---	Sample Type: intact	
Description: Clayey fine SAND (SC) with Gravel-A-6 (2)		
Remarks: Target Compaction: 95% of (107.4 pcf) at Optimum Moisture Content (16.7%) + 2% - As Requested by Client		

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-0935	**DATE SAMPLE RECEIVED:**	5/30/2018
DESCRIPTION OF SOIL:	Fat CLAY (CH) A-7-5(20)		
TESTED BY:	MB	**DATE OF TESTING:**	5/30/2018
		DATE OF WEIGHING:	5/31/2018

BORING NO.	BS-18				
SAMPLE NO.	18-0935D				
SAMPLE DEPTH	0.0-5.0'				
WATER CONTENT, W%	22.5				

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

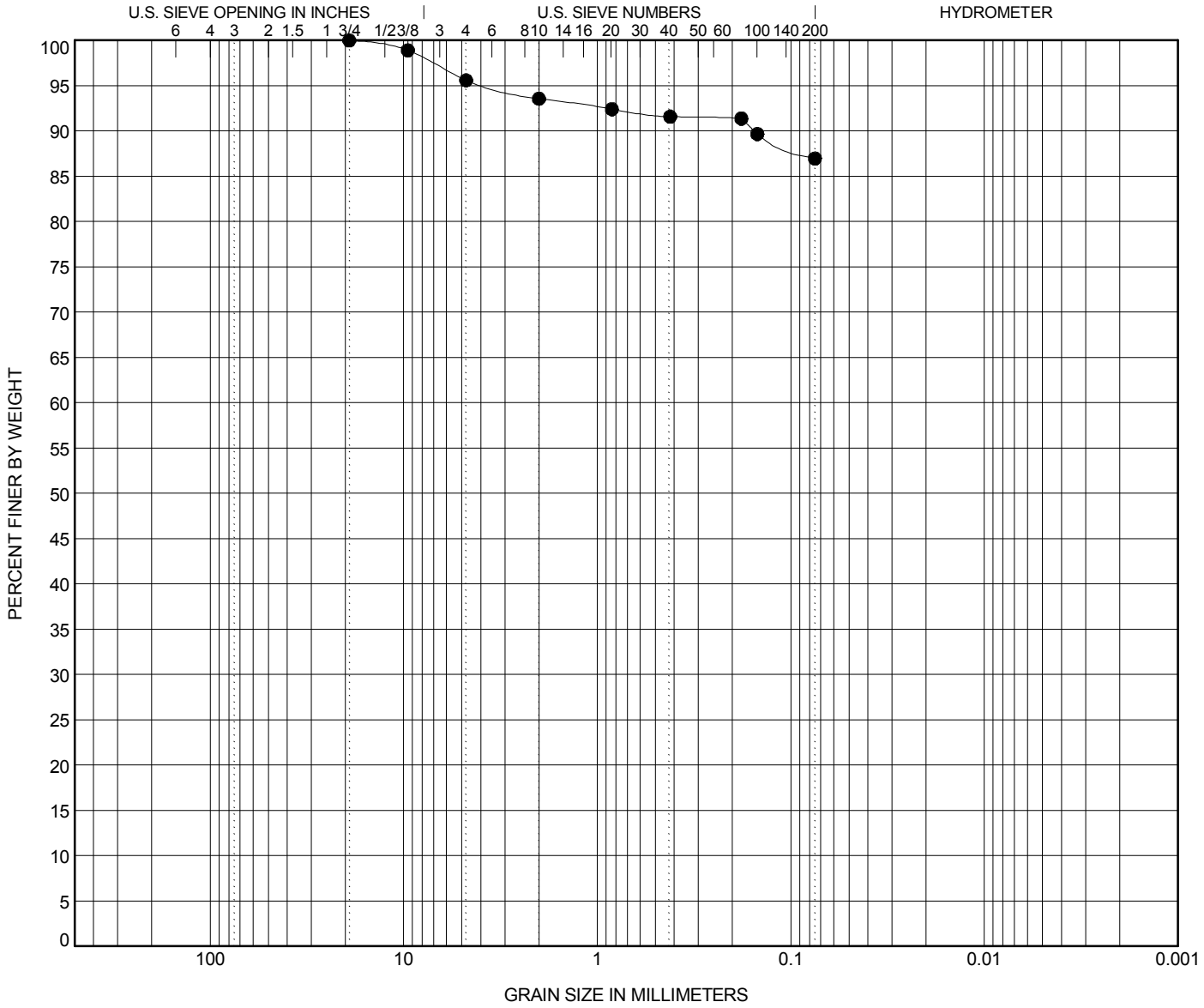
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
● **BS-18**	**5.0**	**Fat CLAY (CH) A-7-5(20)**	**64**	**30**	**34**		

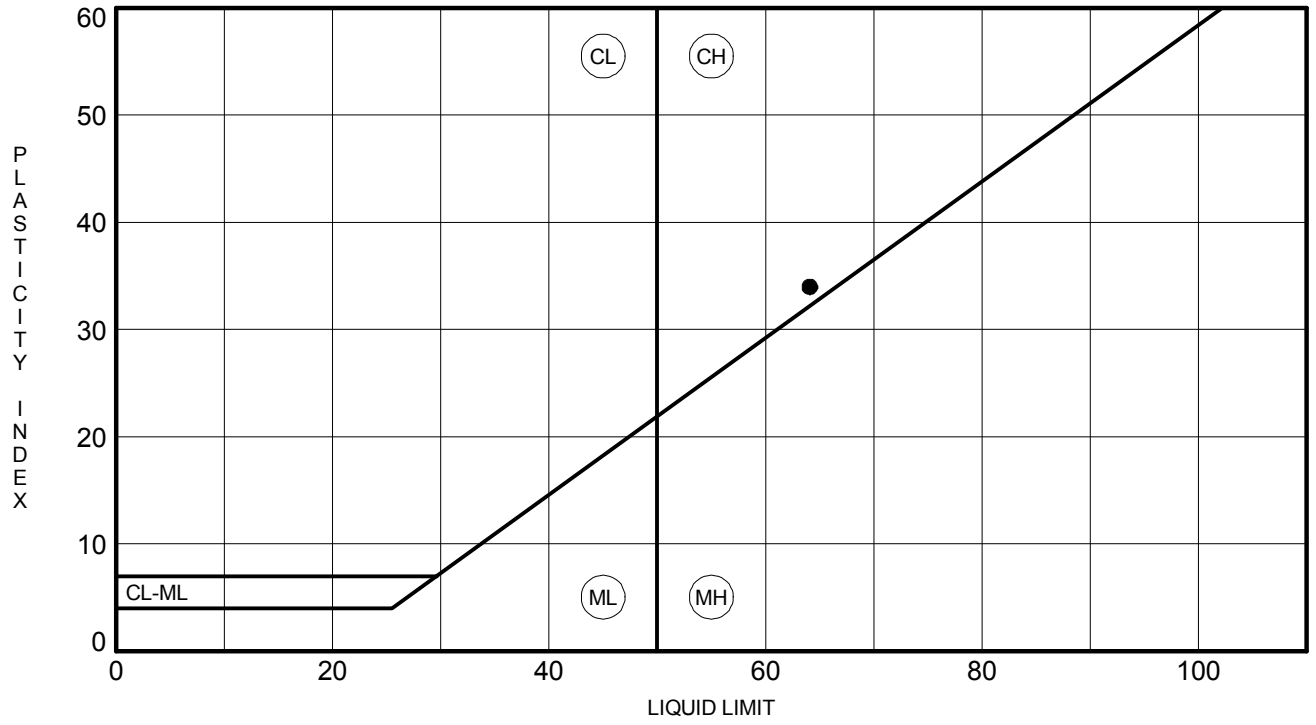
BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
● **BS-18**	**5.0**	**19.1**	**3.692**			**4.4**	**8.6**	**87.0**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/7/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**BS-18**	**5.0**	**64**	**30**	**34**	**87**	**Fat CLAY (CH) A-7-5(20)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/7/18

F&ME CONSULTANTS
Columbia, South Carolina 29205
Columbia, South Carolina 29205

INORGANIC IMPURITIES DETERMINATION
(SC-T-36)

PROJECT: Carolina Crossroads **PROJECT NO.:** G5662.01

SAMPLE NUMBER: 18-0935F **DATE SAMPLE RECEIVED:** 5/31/2018

DESCRIPTION OF SOIL: Fat CLAY (CH) A-7-5(20)

TESTED BY: JH **DATE OF TESTING:** 6/6/2018

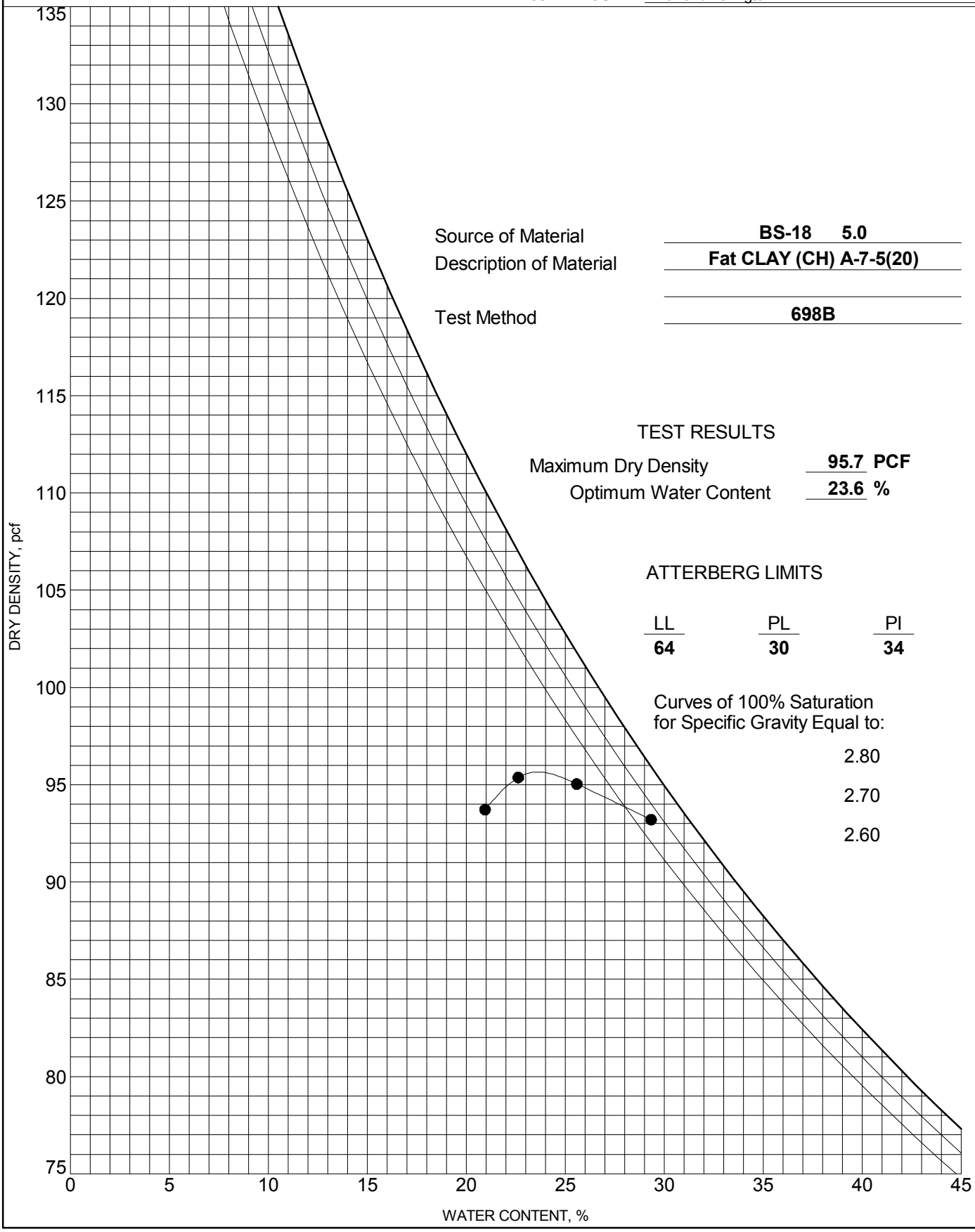
DATE OF WEIGHING: 6/6/2018

BORING NO.	BS-18				
SAMPLE NO.	18-0935F				
SAMPLE DEPTH	0-5'				
200 WASH PAN NUMBER	3098				
WEIGHT OF PAN	8.15				
WEIGHT OF SAMPLE & PAN (BEFORE WASH)	108.15				
WEIGHT OF SAMPLE (BEFORE WASH)	100.00				
WEIGHT OF SAMPLE PASSING #10 & PAN (AFTER WASH)	15.45				
WEIGHT OF SAMPLE PASSING #10 (AFTER WASH)	7.30				
MATERIAL >#10 PAN NUMBER	3010				
MATERIAL >#10 PAN WEIGHT	8.15				
WEIGHT OF SAMPLE RETAINED #10 & PAN (AFTER WASH)	11.29				
WEIGHT OF SAMPLE RETAINED #10 (AFTER WASH)	3.14				
PERCENT PASSING #10 & RETAINED ON #200 (% SANDS)	7.5%				
ORGANIC PAN NUMBER	1				
WT. OF CRUCIBLE + DRY SOIL (BEFORE IGNITION) (GRAMS)	118.06				
WT. OF CRUCIBLE + DRY SOIL (AFTER IGNITION) (GRAMS)	117.71				
WT. OF CRUCIBLE (GRAMS)	110.78				
WT. OF DRY SOIL (BEFORE IGNITION) (GRAMS)	7.28				
WT. OF DRY SOIL (AFTER IGNITION) (GRAMS)	6.93				
IGNITION LOSS (GRAMS)	0.35				
INORGANIC IMPURITIES %	0.4%				

MOISTURE-DENSITY RELATIONSHIP

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



Source of Material **BS-18 5.0**

Description of Material **Fat CLAY (CH) A-7-5(20)**

Test Method **698B**

TEST RESULTS

Maximum Dry Density **95.7** **PCF**

Optimum Water Content **23.6** **%**

ATTERBERG LIMITS

LL	PL	PI
64	**30**	**34**

Curves of 100% Saturation for Specific Gravity Equal to:

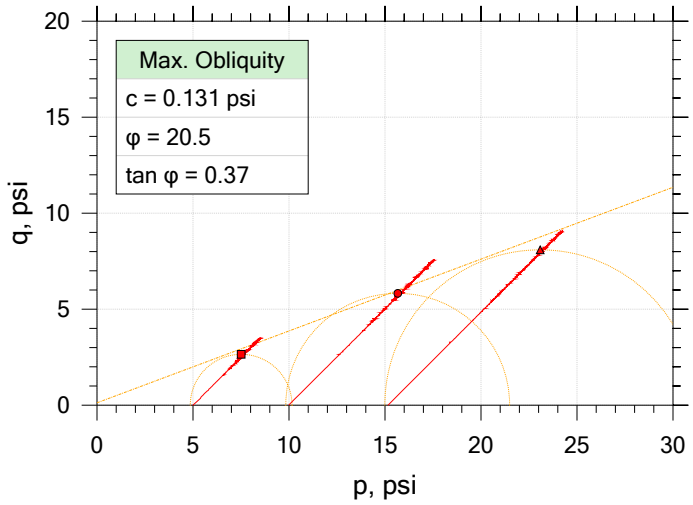
2.80

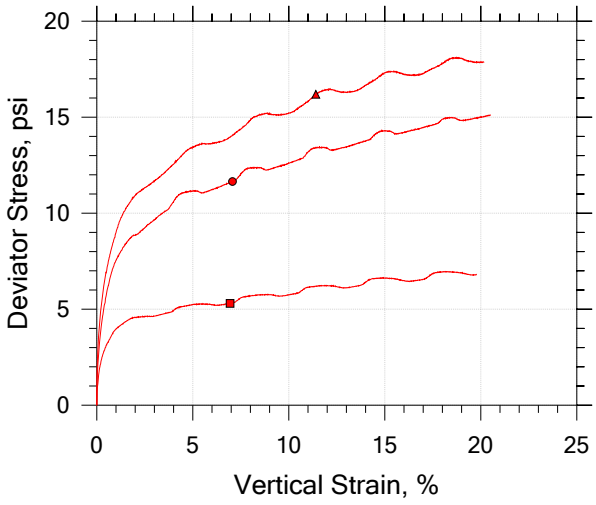
2.70

2.60

COMPACTION - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/7/18

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297





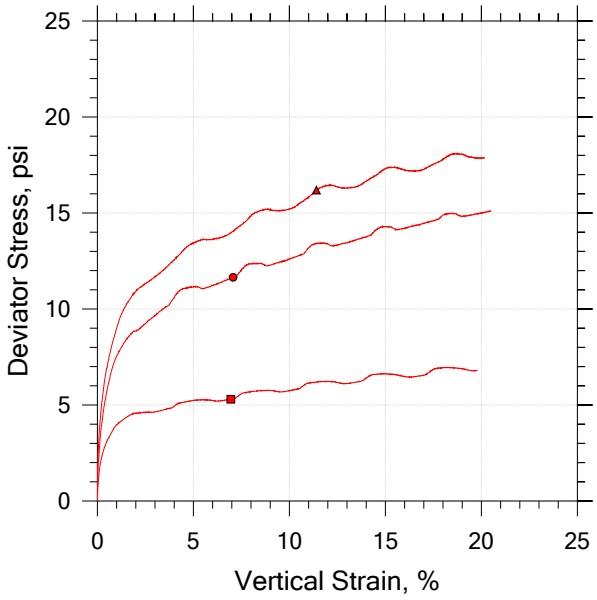
		■	●	▲	
Symbol					
Sample ID		18-0935	18-0935	18-0935	
Depth, ft		0' - 5'	0' - 5'	0' - 5'	
Test Number		A	B	C	
Initial	Height, in	6.006	6.019	5.939	
	Diameter, in	2.794	2.793	2.794	
	Moisture Content (from Cuttings), %	25.6	24.2	25.3	
	Dry Density, pcf	87.7	93.2	89.4	
	Saturation (Wet Method), %	75.7	81.6	77.8	
	Void Ratio	0.907	0.794	0.870	
Final	Moisture Content, %	35.8	24.5	30.5	
	Dry Density, pcf	85.4	101.	92.0	
	Cross-Sectional Area (Method A), in²	6.234	5.803	6.011	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.959	0.657	0.818	
	Back Pressure, %	101.0	101.0	97.84	
Vertical Effective Consolidation Stress, psi		4.941	9.876	15.01	
Horizontal Effective Consolidation Stress, psi		4.990	9.983	15.15	
Vertical Strain after Consolidation, %		0.6349	1.847	2.109	
Volumetric Strain after Consolidation, %		2.303	5.735	6.345	
Time to 50% Consolidation, min		0.0000	0.0000	0.0000	
Shear Strength, psi		2.650	5.826	8.097	
Strain at Failure, %		6.95	7.07	11.4	
Strain Rate, %/min		0.07500	0.07500	0.07500	
Deviator Stress at Failure, psi		5.300	11.65	16.19	
Effective Minor Principal Stress at Failure, psi		1.883	4.070	6.229	
Effective Major Principal Stress at Failure, psi		7.183	15.72	22.42	
B-Value		0.95	0.95	0.95	

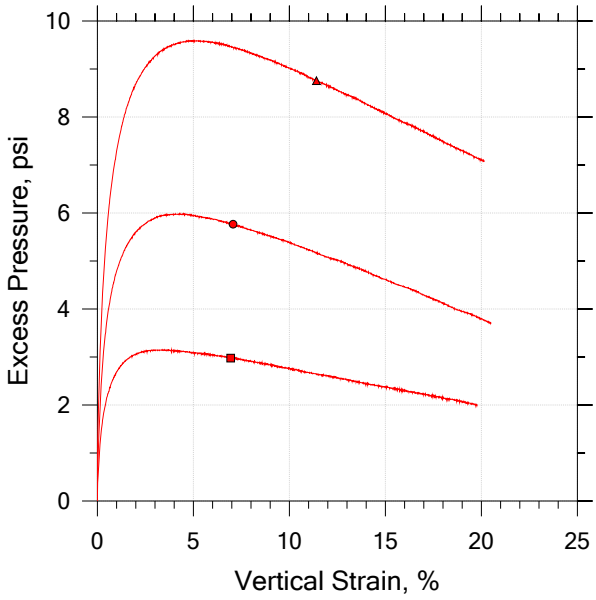
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

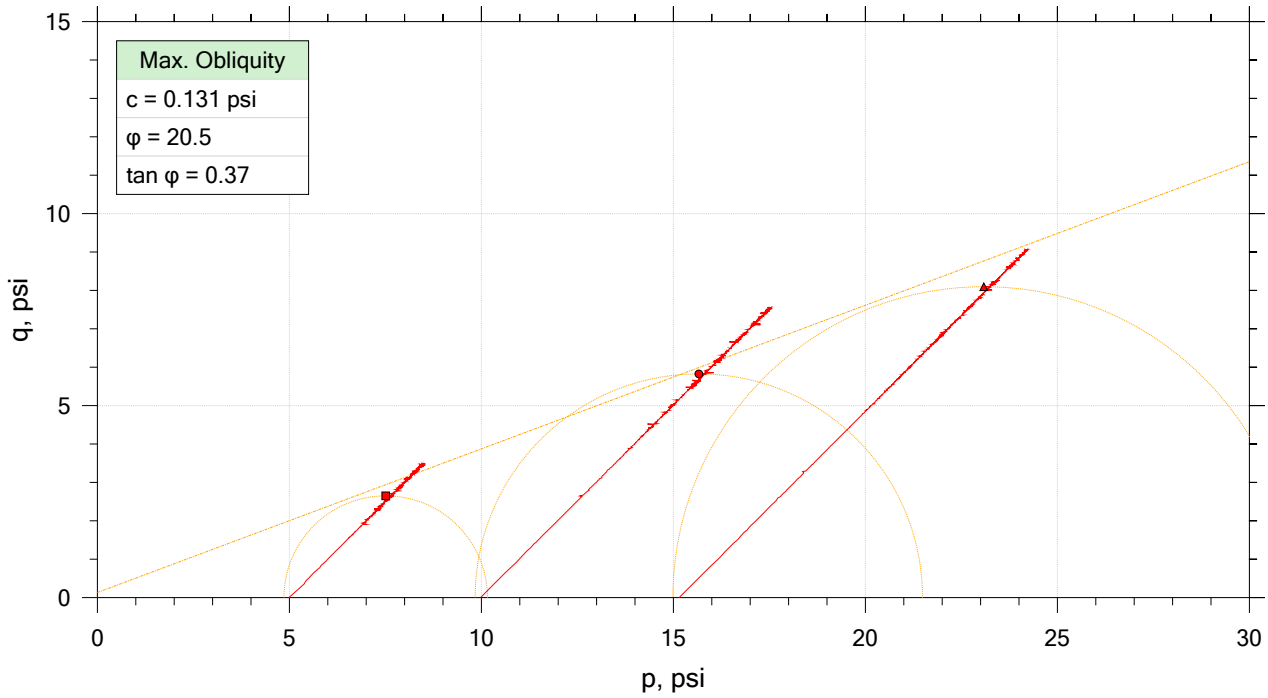
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: BS-18	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-0935	Test Date: 7/10/2018 - 7/14/2018	Depth: 0' - 5'
Test No.: ABC	Sample Type: Remolded	Elevation: --
Description: Fat CLAY (CH/A-7-5(20)) LL: 64 PL: 30 PI: 34 %#200 Finer: 87.0		
Remarks: Max Dry Density - 95.7 pcf at OMC - 23.6% + 2%		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297





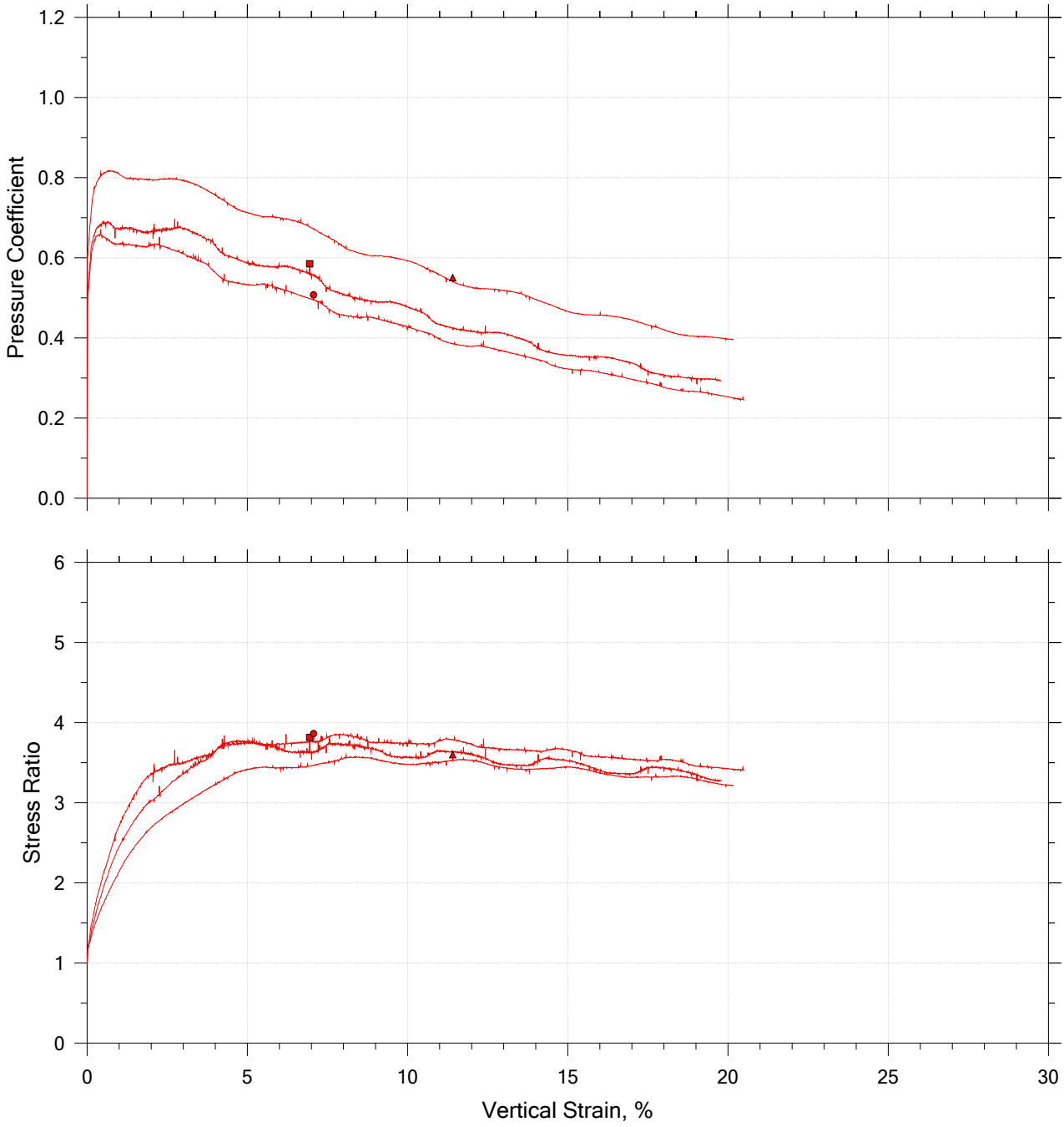


	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-0935	A	0' - 5'	WAP	7/10/2018	JFH/RS		18-0935_BS-18_test A.dat
●	18-0935	B	0' - 5'	WAP	7/12/2018	JFH/RS		18-0935_BS-18_test B.2.dat
▲	18-0935	C	0' - 5'	WAP	7/13/2018	JFH/RS		18-0935_BS-18_test C.dat

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: BS-18	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-0935	Test Date: 7/10/2018 - 7/14/2018	Depth: 0' - 5'
Test No.: ABC	Sample Type: Remolded	Elevation: --
Description: Fat CLAY (CH/A-7-5(20)) LL: 64 PL: 30 PI: 34 %#200 Finer: 87.0		
Remarks: Max Dry Density - 95.7 pcf at OMC - 23.6% + 2%		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297

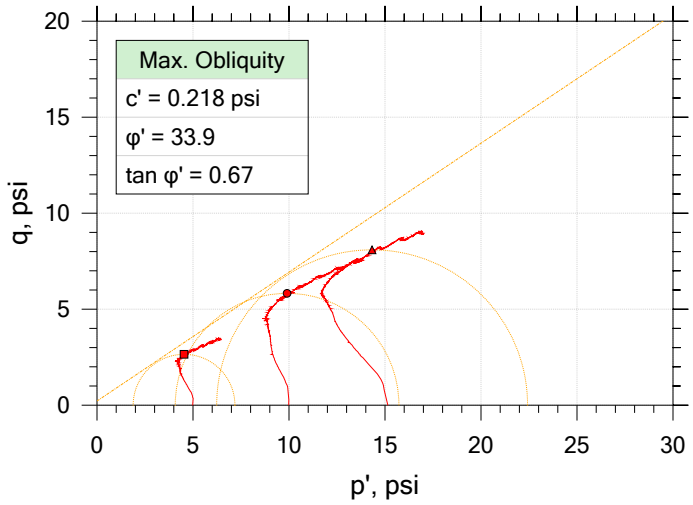


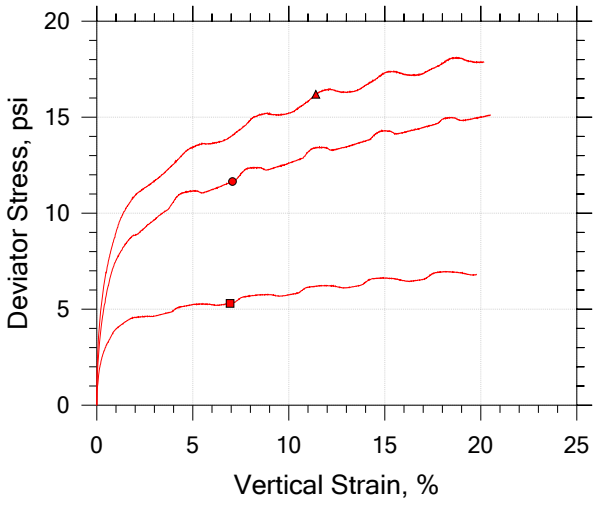
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-0935	A	0' - 5'	WAP	7/10/2018	JFH/RS		18-0935_BS-18_test A.dat
●	18-0935	B	0' - 5'	WAP	7/12/2018	JFH/RS		18-0935_BS-18_test B.2.dat
▲	18-0935	C	0' - 5'	WAP	7/13/2018	JFH/RS		18-0935_BS-18_test C.dat

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: BS-18	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-0935	Test Date: 7/10/2018 - 7/14/2018	Depth: 0' - 5'
Test No.: ABC	Sample Type: Remolded	Elevation: --
Description: Fat CLAY (CH/A-7-5(20)) LL: 64 PL: 30 PI: 34 %#200 Finer: 87.0		
Remarks: Max Dry Density - 95.7 pcf at OMC - 23.6% + 2%		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297





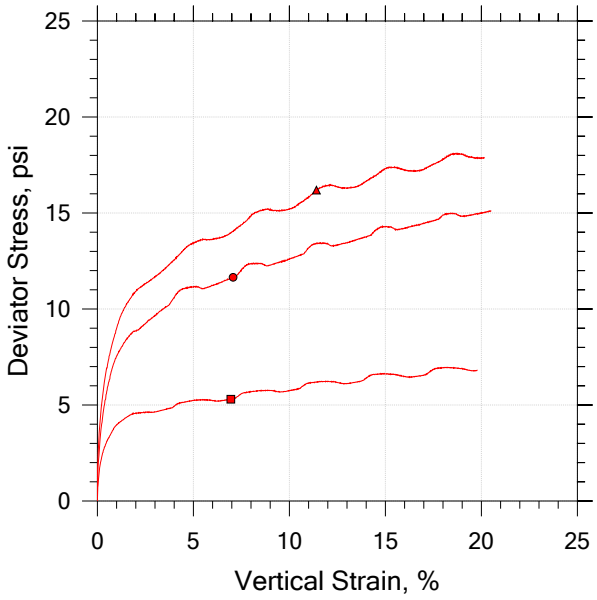
Symbol		■	●	▲	
Sample ID		18-0935	18-0935	18-0935	
Depth, ft		0' - 5'	0' - 5'	0' - 5'	
Test Number		A	B	C	
Initial	Height, in	6.006	6.019	5.939	
	Diameter, in	2.794	2.793	2.794	
	Moisture Content (from Cuttings), %	25.6	24.2	25.3	
	Dry Density, pcf	87.7	93.2	89.4	
	Saturation (Wet Method), %	75.7	81.6	77.8	
	Void Ratio	0.907	0.794	0.870	
Final	Moisture Content, %	35.8	24.5	30.5	
	Dry Density, pcf	85.4	101.	92.0	
	Cross-Sectional Area (Method A), in²	6.234	5.803	6.011	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.959	0.657	0.818	
	Back Pressure, %	101.0	101.0	97.84	
Vertical Effective Consolidation Stress, psi		4.941	9.876	15.01	
Horizontal Effective Consolidation Stress, psi		4.990	9.983	15.15	
Vertical Strain after Consolidation, %		0.6349	1.847	2.109	
Volumetric Strain after Consolidation, %		2.303	5.735	6.345	
Time to 50% Consolidation, min		0.0000	0.0000	0.0000	
Shear Strength, psi		2.650	5.826	8.097	
Strain at Failure, %		6.95	7.07	11.4	
Strain Rate, %/min		0.07500	0.07500	0.07500	
Deviator Stress at Failure, psi		5.300	11.65	16.19	
Effective Minor Principal Stress at Failure, psi		1.883	4.070	6.229	
Effective Major Principal Stress at Failure, psi		7.183	15.72	22.42	
B-Value		0.95	0.95	0.95	

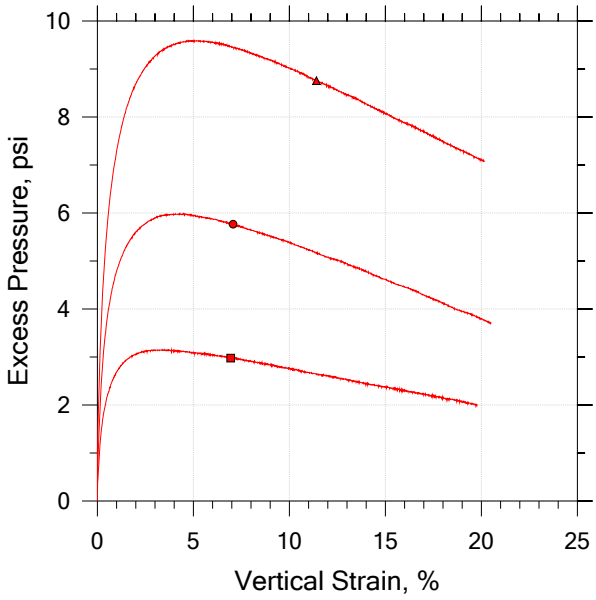
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

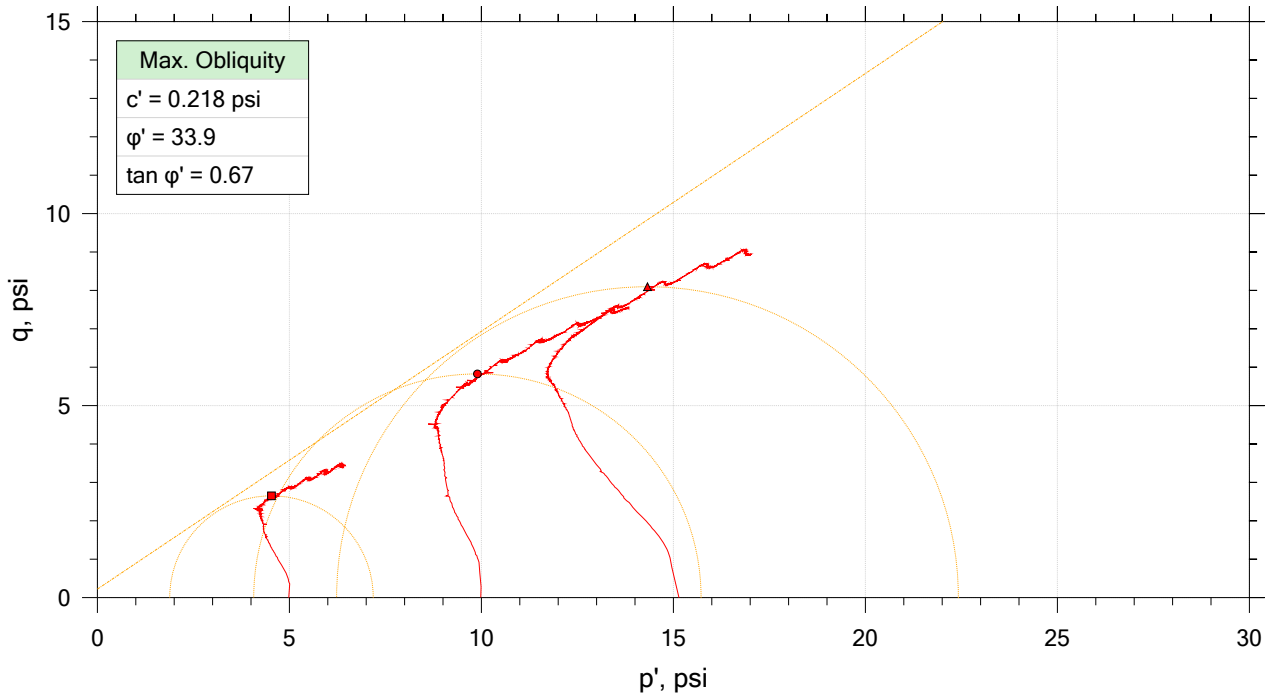
F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: BS-18	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-0935	Test Date: 7/10/2018 - 7/14/2018	Depth: 0' - 5'
Test No.: ABC	Sample Type: Remolded	Elevation: --
Description: Fat CLAY (CH/A-7-5(20)) LL: 64 PL: 30 PI: 34 %#200 Finer: 87.0		
Remarks: Max Dry Density - 95.7 pcf at OMC - 23.6% + 2%		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297





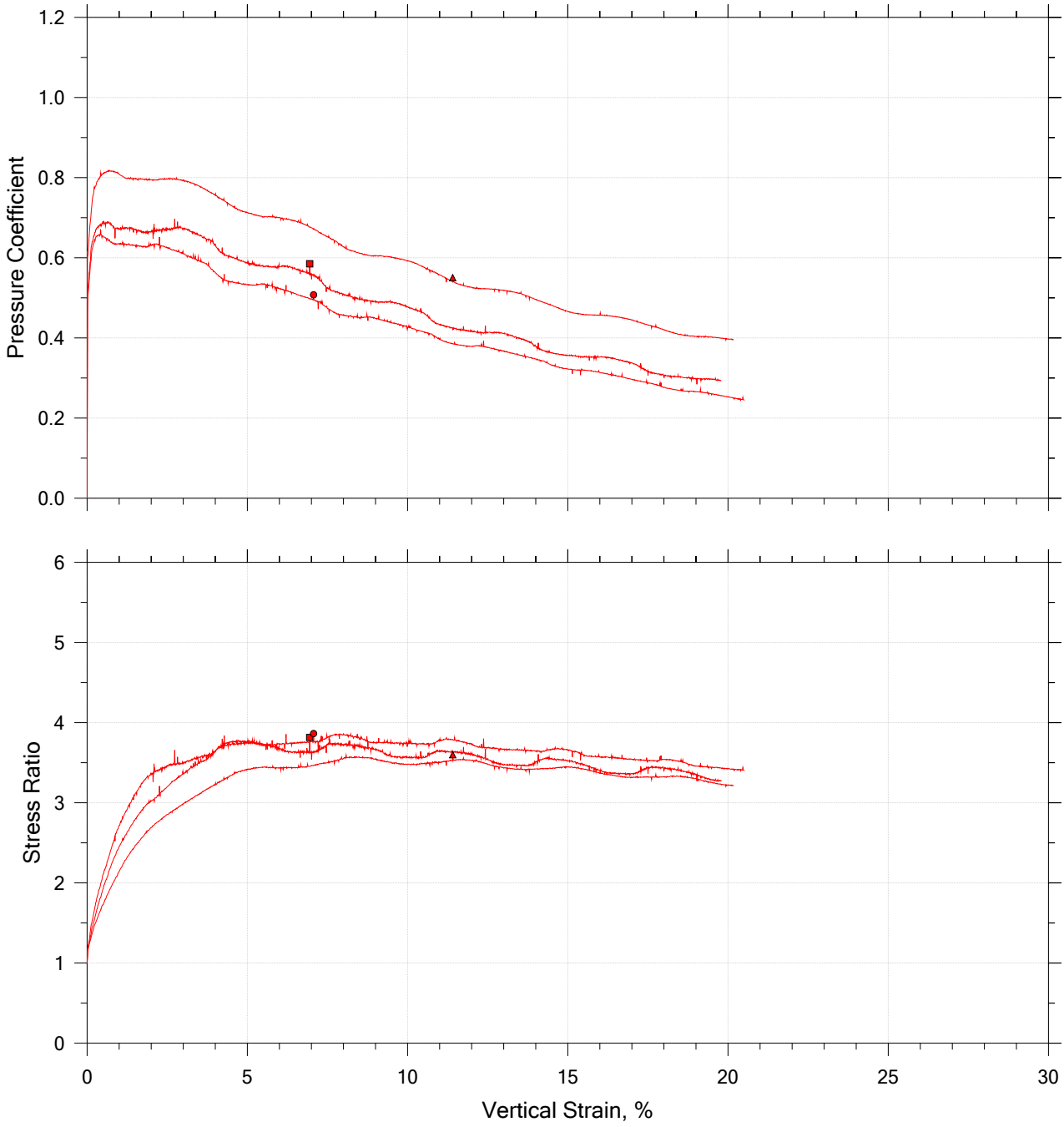


	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-0935	A	0' - 5'	WAP	7/10/2018	JFH/RS		18-0935_BS-18_test A.dat
●	18-0935	B	0' - 5'	WAP	7/12/2018	JFH/RS		18-0935_BS-18_test B.2.dat
▲	18-0935	C	0' - 5'	WAP	7/13/2018	JFH/RS		18-0935_BS-18_test C.dat

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: BS-18	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-0935	Test Date: 7/10/2018 - 7/14/2018	Depth: 0' - 5'
Test No.: ABC	Sample Type: Remolded	Elevation: --
Description: Fat CLAY (CH/A-7-5(20)) LL: 64 PL: 30 PI: 34 %#200 Finer: 87.0		
Remarks: Max Dry Density - 95.7 pcf at OMC - 23.6% + 2%		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by AASHTO T297



	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	18-0935	A	0' - 5'	WAP	7/10/2018	JFH/RS		18-0935_BS-18_test A.dat
●	18-0935	B	0' - 5'	WAP	7/12/2018	JFH/RS		18-0935_BS-18_test B.2.dat
▲	18-0935	C	0' - 5'	WAP	7/13/2018	JFH/RS		18-0935_BS-18_test C.dat

F&ME CONSULTANTS

Project: CCR	Location: Columbia, SC	Project No.: G5662.01
Boring No.: BS-18	Tested By: WAP	Checked By: JFH/RS
Sample No.: 18-0935	Test Date: 7/10/2018 - 7/14/2018	Depth: 0' - 5'
Test No.: ABC	Sample Type: Remolded	Elevation: --
Description: Fat CLAY (CH/A-7-5(20)) LL: 64 PL: 30 PI: 34 %#200 Finer: 87.0		
Remarks: Max Dry Density - 95.7 pcf at OMC - 23.6% + 2%		

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-1040	**DATE SAMPLE RECEIVED:**	5/30/2018
DESCRIPTION OF SOIL:	Sandy Lean CLAY (CL) A-7-6(12)		
TESTED BY:	MB	**DATE OF TESTING:**	5/30/2018
		DATE OF WEIGHING:	5/31/2018

BORING NO.	BS-19				
SAMPLE NO.	18-1040C				
SAMPLE DEPTH	0.0-3.0'				
WATER CONTENT, W%	16.4				

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

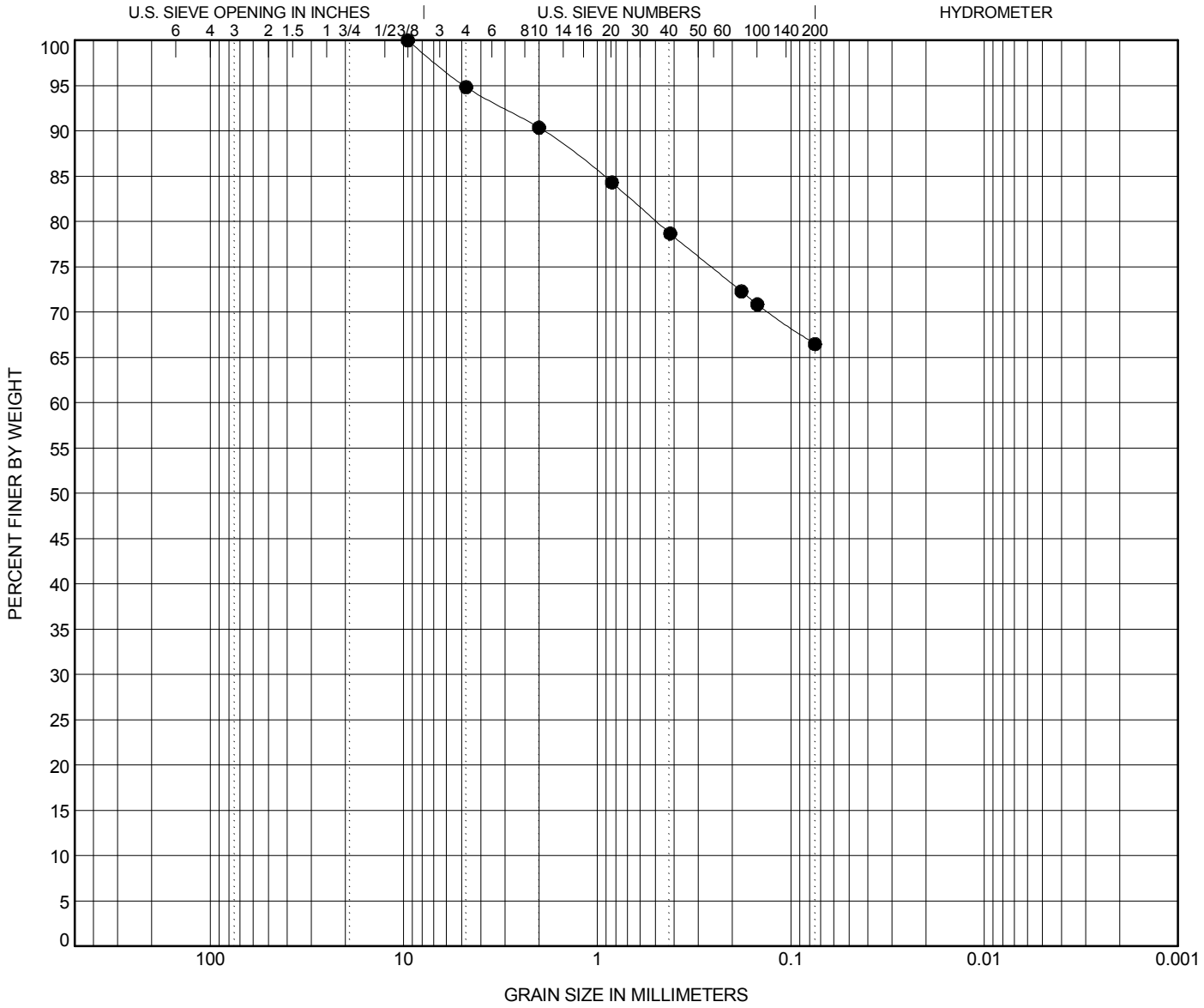
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**BS-19**	**3.0**	**Sandy Lean CLAY (CL) A-7-6(12)**	**45**	**25**	**20**		

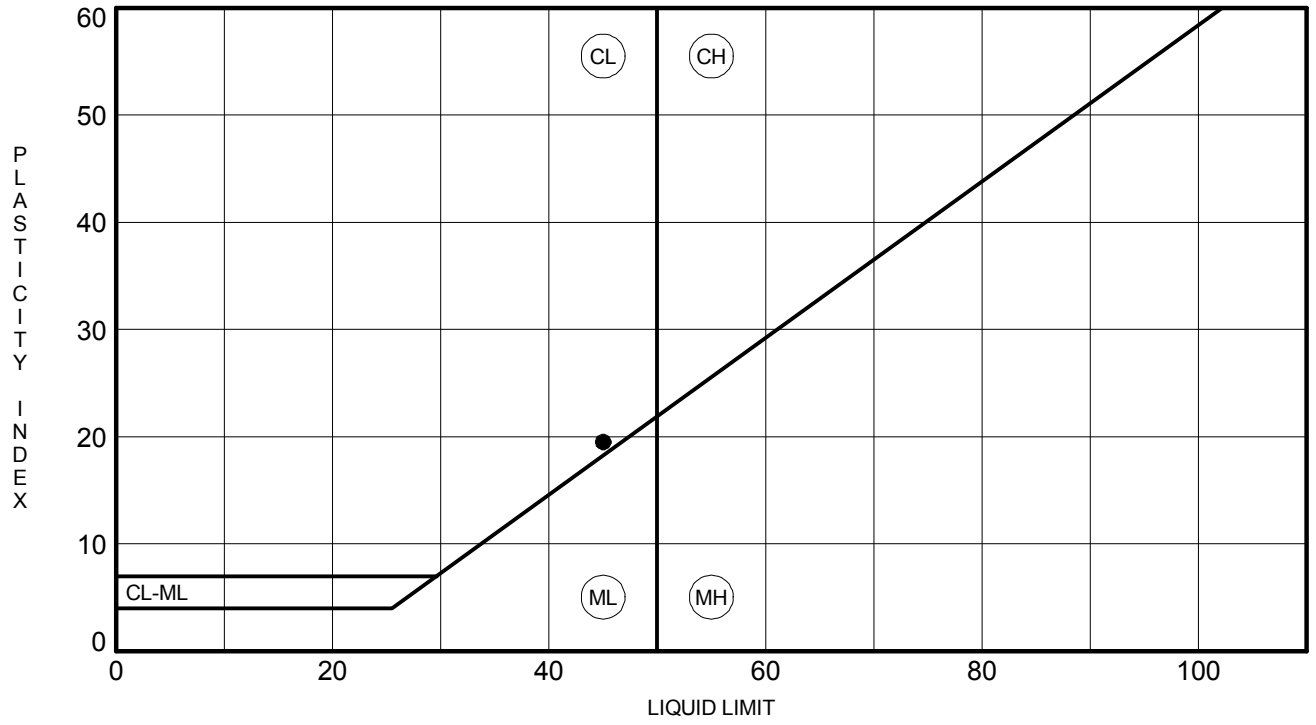
	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**BS-19**	**3.0**	**9.52**	**4.854**			**5.2**	**28.4**	**66.5**	

GRAIN SIZE - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/7/18

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



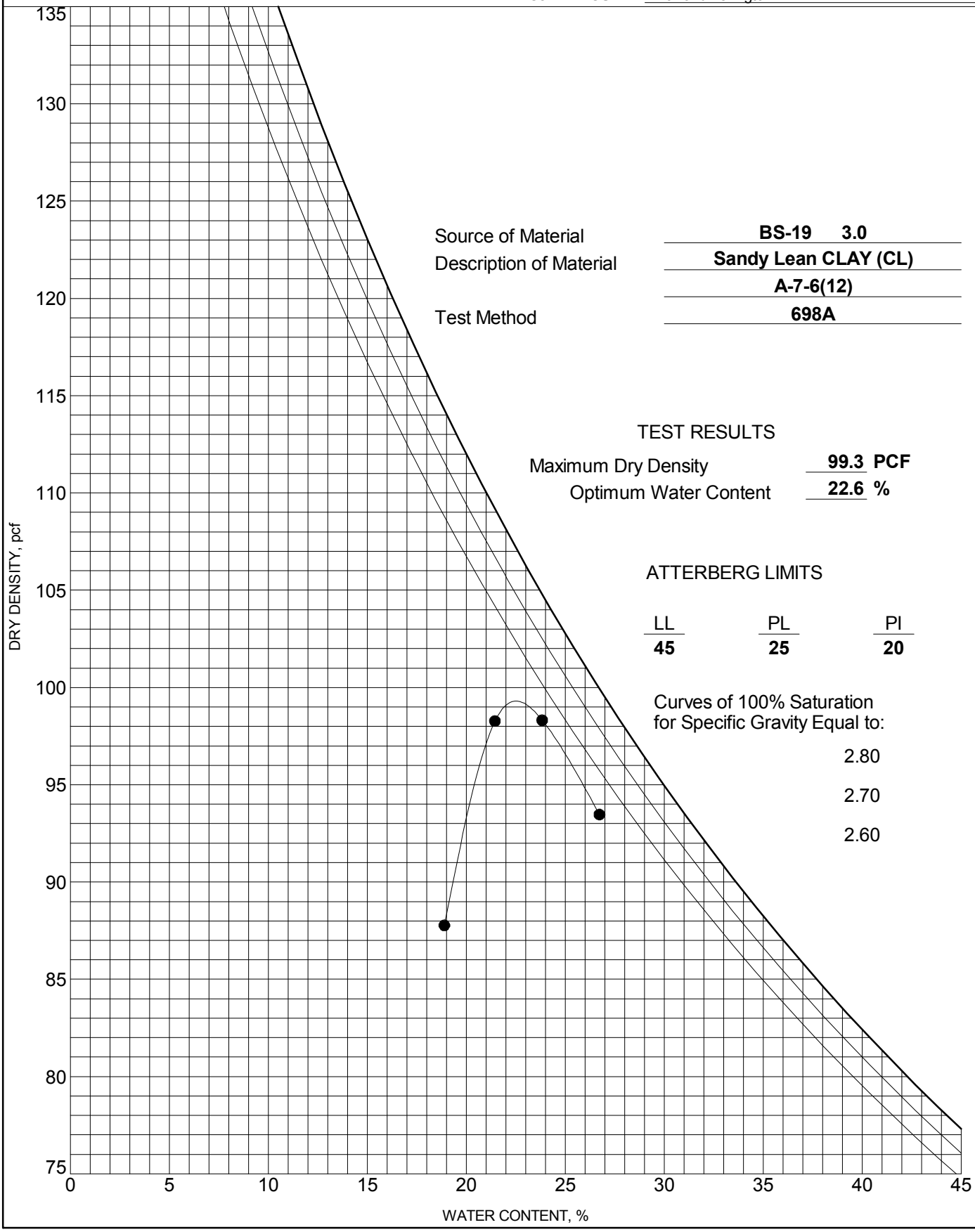
	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**BS-19**	**3.0**	**45**	**25**	**20**	**66**	**Sandy Lean CLAY (CL) A-7-6(12)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/7/18

MOISTURE-DENSITY RELATIONSHIP

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



Source of Material	**BS-19 3.0**
Description of Material	**Sandy Lean CLAY (CL)**
	A-7-6(12)
Test Method	**698A**

TEST RESULTS

Maximum Dry Density	**99.3 PCF**
Optimum Water Content	**22.6 %**

ATTERBERG LIMITS

LL	PL	PI
45	**25**	**20**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

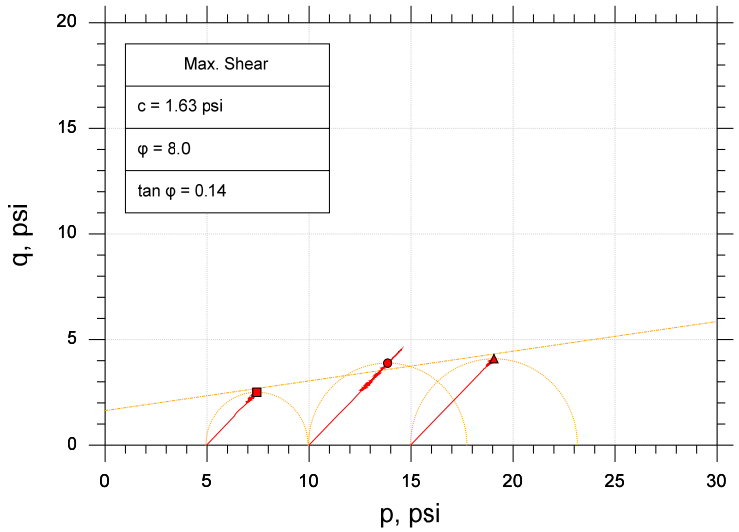
2.70

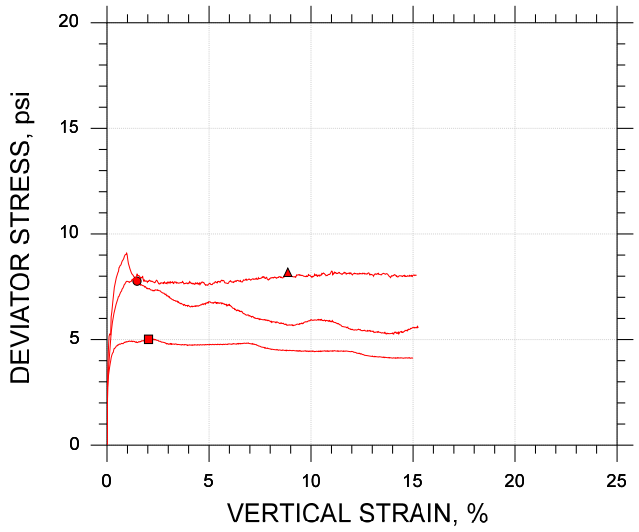
2.60

COMPACTION - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/7/18

Client: F&ME Consultants	
Project Name: I-20/26/126 Corridor Improv.	
Project Location: ---	
Project Number: GTX-307802	
Tested By: trm	Checked By: mcm
Boring ID: ---	
Preparation: reconstituted	
Description: Moist, red sandy lean clay (CL) A-7-6 (12)	
Classification: ---	
Group Symbol: ---	
Liquid Limit: 45	Plastic Limit: 25
Plasticity Index: 20	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		■	●	▲	
Sample ID		BS-19	BS-19	BS-19	
Depth, ft		---	---	---	
Test Number		CU-12-1	CU-12-2	CU-12-3	
Initial	Height, in	4.000	4.000	4.000	
	Diameter, in	2.000	2.000	2.000	
	Moisture Content (from Cuttings), %	22.7	22.9	23.3	
	Dry Density, pcf	94.7	94.5	94.4	
	Saturation (Wet Method), %	78.6	79.0	80.0	
	Void Ratio	0.780	0.783	0.786	
Before Shear	Moisture Content, %	28.8	27.8	25.9	
	Dry Density, pcf	94.8	96.3	99.3	
	Cross-sectional Area (Method A), in²	3.147	3.092	3.026	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.778	0.750	0.698	
	Back Pressure, psi	158.9	158.8	158.9	
Vertical Effective Consolidation Stress, psi		4.958	9.972	14.89	
Horizontal Effective Consolidation Stress, psi		4.980	9.991	14.97	
Vertical Strain after Consolidation, %		0.3470	0.2828	1.239	
Volumetric Strain after Consolidation, %		0.4019	1.905	4.747	
Time to 50% Consolidation, min		0.2500	6.250	2.250	
Shear Strength, psi		2.505	3.882	4.091	
Strain at Failure, %		2.03	1.47	8.86	
Strain Rate, %/min		0.01600	0.01600	0.01600	
Deviator Stress at Failure, psi		5.011	7.764	8.182	
Effective Minor Principal Stress at Failure, psi		0.9826	1.421	3.898	
Effective Major Principal Stress at Failure, psi		5.994	9.185	12.08	
B-Value		0.93	0.90	0.94	

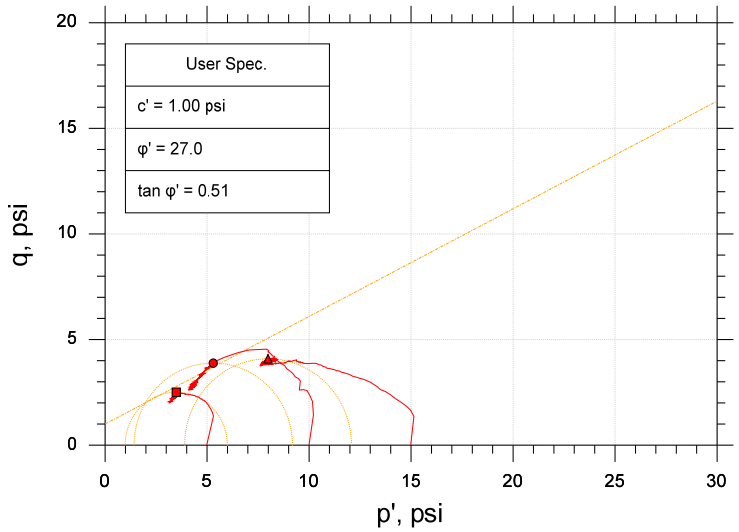
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Atterberg Limits determined by ASTM D4318.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

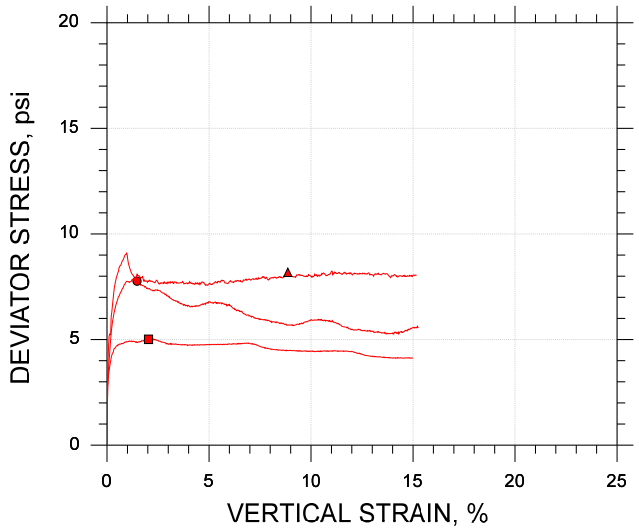
Remarks:

Target Compaction: 95% of (99.3 pcf) at Optimum Moisture Content (22.6%) + 2% - As Requested by Client

Client: F&ME Consultants	
Project Name: I-20/26/126 Corridor Improv.	
Project Location: ---	
Project Number: GTX-307802	
Tested By: trm	Checked By: mcm
Boring ID: ---	
Preparation: reconstituted	
Description: Moist, red sandy lean clay (CL) A-7-6 (12)	
Classification: ---	
Group Symbol: ---	
Liquid Limit: 45	Plastic Limit: 25
Plasticity Index: 20	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767

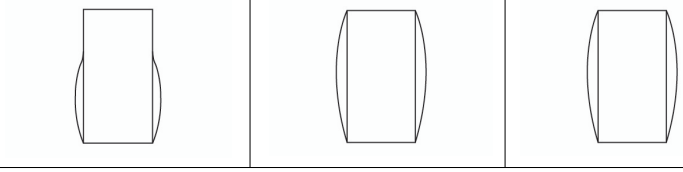




Symbol		■	●	▲	
Sample ID		BS-19	BS-19	BS-19	
Depth, ft		---	---	---	
Test Number		CU-12-1	CU-12-2	CU-12-3	
Initial	Height, in	4.000	4.000	4.000	
	Diameter, in	2.000	2.000	2.000	
	Moisture Content (from Cuttings), %	22.7	22.9	23.3	
	Dry Density, pcf	94.7	94.5	94.4	
	Saturation (Wet Method), %	78.6	79.0	80.0	
	Void Ratio	0.780	0.783	0.786	
Before Shear	Moisture Content, %	28.8	27.8	25.9	
	Dry Density, pcf	94.8	96.3	99.3	
	Cross-sectional Area (Method A), in²	3.147	3.092	3.026	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.778	0.750	0.698	
	Back Pressure, psi	158.9	158.8	158.9	
Vertical Effective Consolidation Stress, psi		4.958	9.972	14.89	
Horizontal Effective Consolidation Stress, psi		4.980	9.991	14.97	
Vertical Strain after Consolidation, %		0.3470	0.2828	1.239	
Volumetric Strain after Consolidation, %		0.4019	1.905	4.747	
Time to 50% Consolidation, min		0.2500	6.250	2.250	
Shear Strength, psi		2.505	3.882	4.091	
Strain at Failure, %		2.03	1.47	8.86	
Strain Rate, %/min		0.01600	0.01600	0.01600	
Deviator Stress at Failure, psi		5.011	7.764	8.182	
Effective Minor Principal Stress at Failure, psi		0.9826	1.421	3.898	
Effective Major Principal Stress at Failure, psi		5.994	9.185	12.08	
B-Value		0.93	0.90	0.94	

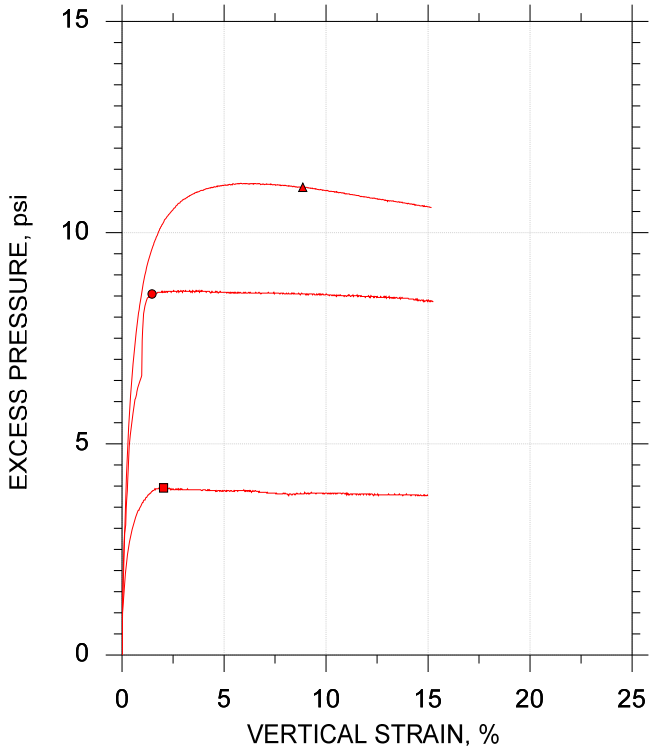
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Atterberg Limits determined by ASTM D4318.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

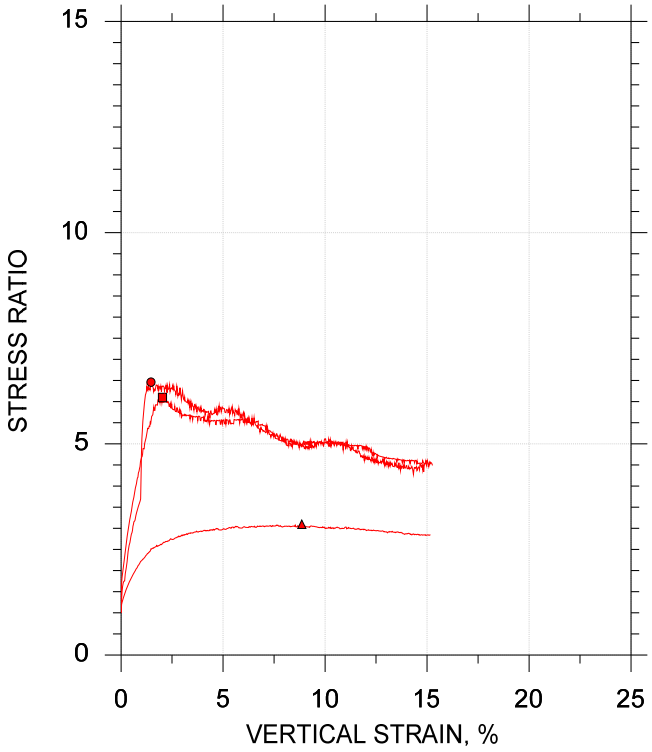
Remarks:

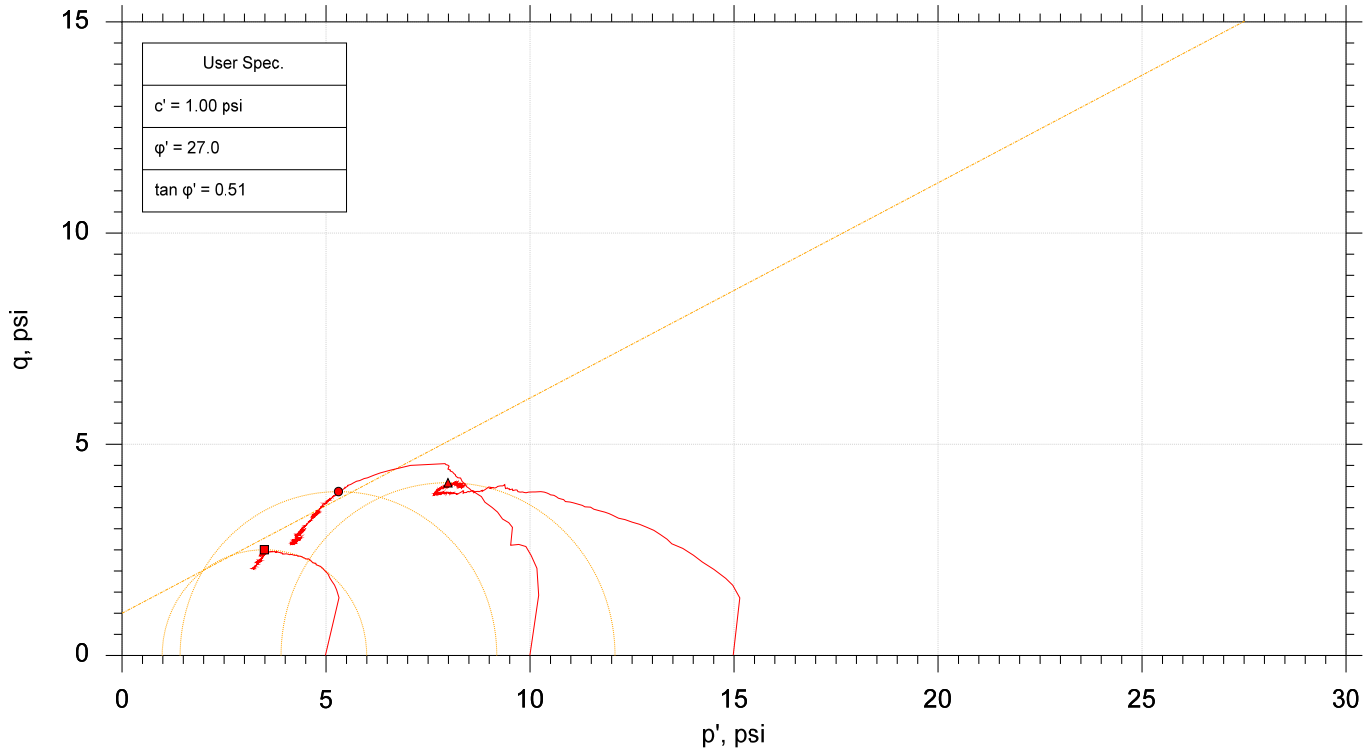


Target Compaction: 95% of (99.3 pcf) at Optimum Moisture Content (22.6%) + 2% - As Requested by Client

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	BS-19	CU-12-1	---	trm	6/27/2018	mcm	7/16/18	307802-CU-12-1m.dat
●	BS-19	CU-12-2	---	trm	6/27/2018	mcm	7/18/18	307802-CU-12-2m.dat
▲	BS-19	CU-12-3	---	trm	6/27/2018	mcm	7/18/18	307802-CU-12-3m.dat

GeoTesting EXPRESS

Project: I-20/26/126 Corridor Improv.	Location: ---	Project No.: GTX-307802
Boring No.: ---	Sample Type: reconstituted	
Description: Moist, red sandy lean clay (CL) A-7-6 (12)		
Remarks: Target Compaction: 95% of (99.3 pcf) at Optimum Moisture Content (22.6%) + 2% - As Requested by Client		

F&ME CONSULTANTS
3112 Devine Street
Columbia, South Carolina 29205

MOISTURE CONTENT DETERMINATION
(AASHTO T265)

PROJECT:	I-20/26/126 Corridor Improvements	**PROJECT NO.:**	G5662.01
SAMPLE NUMBER:	18-1005	**DATE SAMPLE RECEIVED:**	5/30/2018
DESCRIPTION OF SOIL:	Elastic SILT (MH) A-7-5(19)		
TESTED BY:	MB	**DATE OF TESTING:**	5/30/2018
		DATE OF WEIGHING:	5/31/2018

BORING NO.	BS-20				
SAMPLE NO.	18-1005C				
SAMPLE DEPTH	0.0-5.0'				
WATER CONTENT, W%	21.9				

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

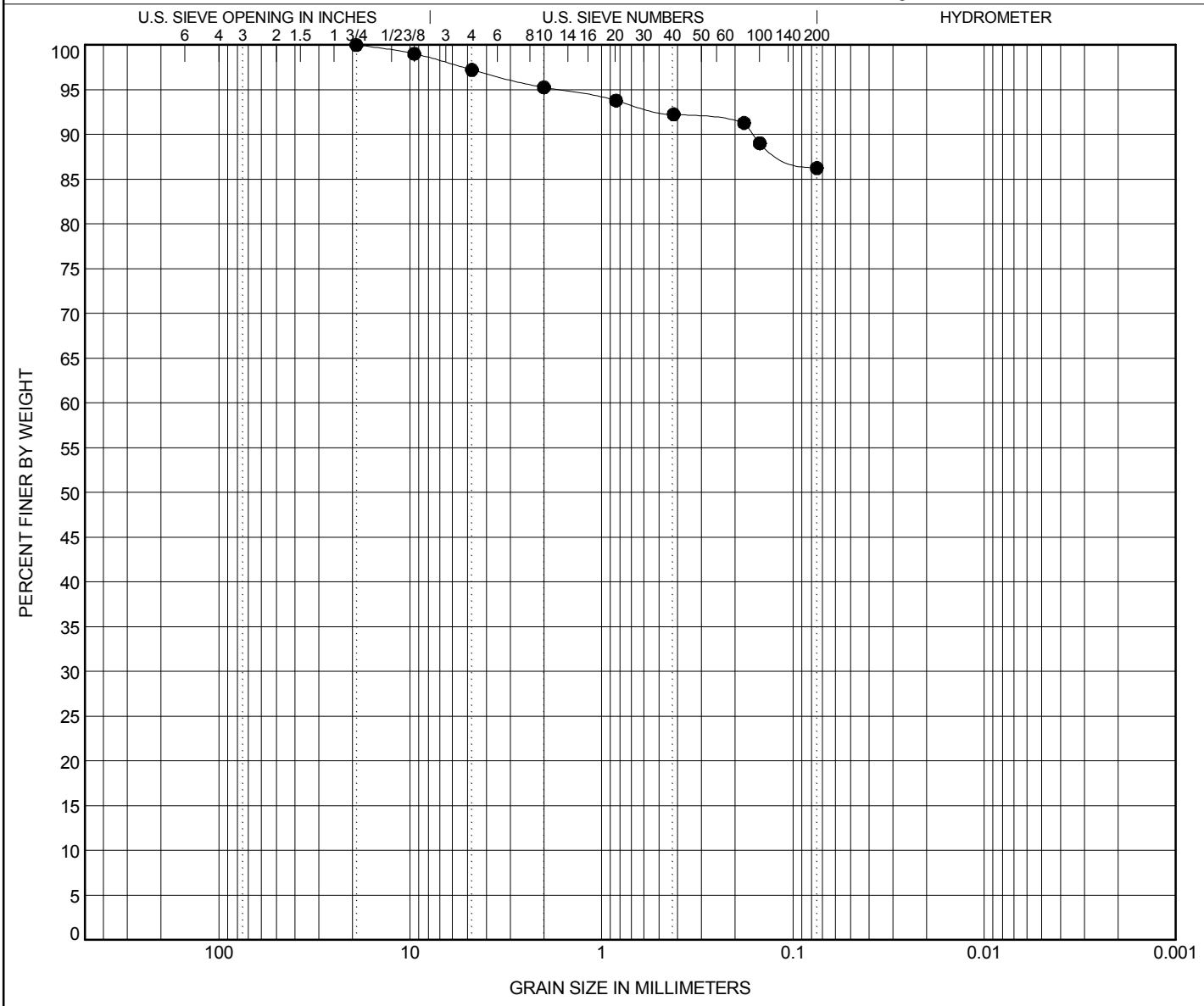
BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

BORING NO.					
SAMPLE NO.					
SAMPLE DEPTH					
WATER CONTENT, W%					

GRAIN SIZE DISTRIBUTION

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

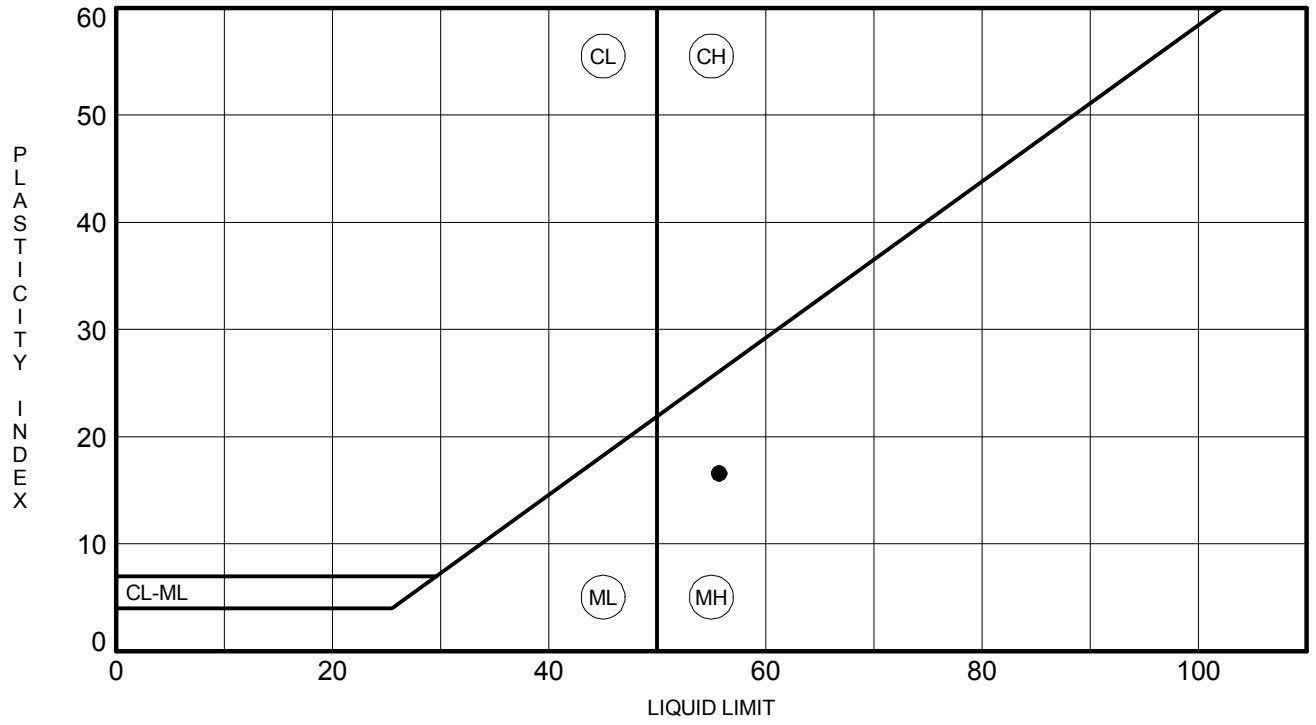
	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**BS-20**	**5.0**	**Elastic SILT (MH) A-7-5(19)**	**56**	**39**	**17**		

	BOREHOLE	DEPTH	D100	D95	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**BS-20**	**5.0**	**19.1**	**1.704**			**2.8**	**11.0**	**86.3**	

ATTERBERG LIMITS' RESULTS

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



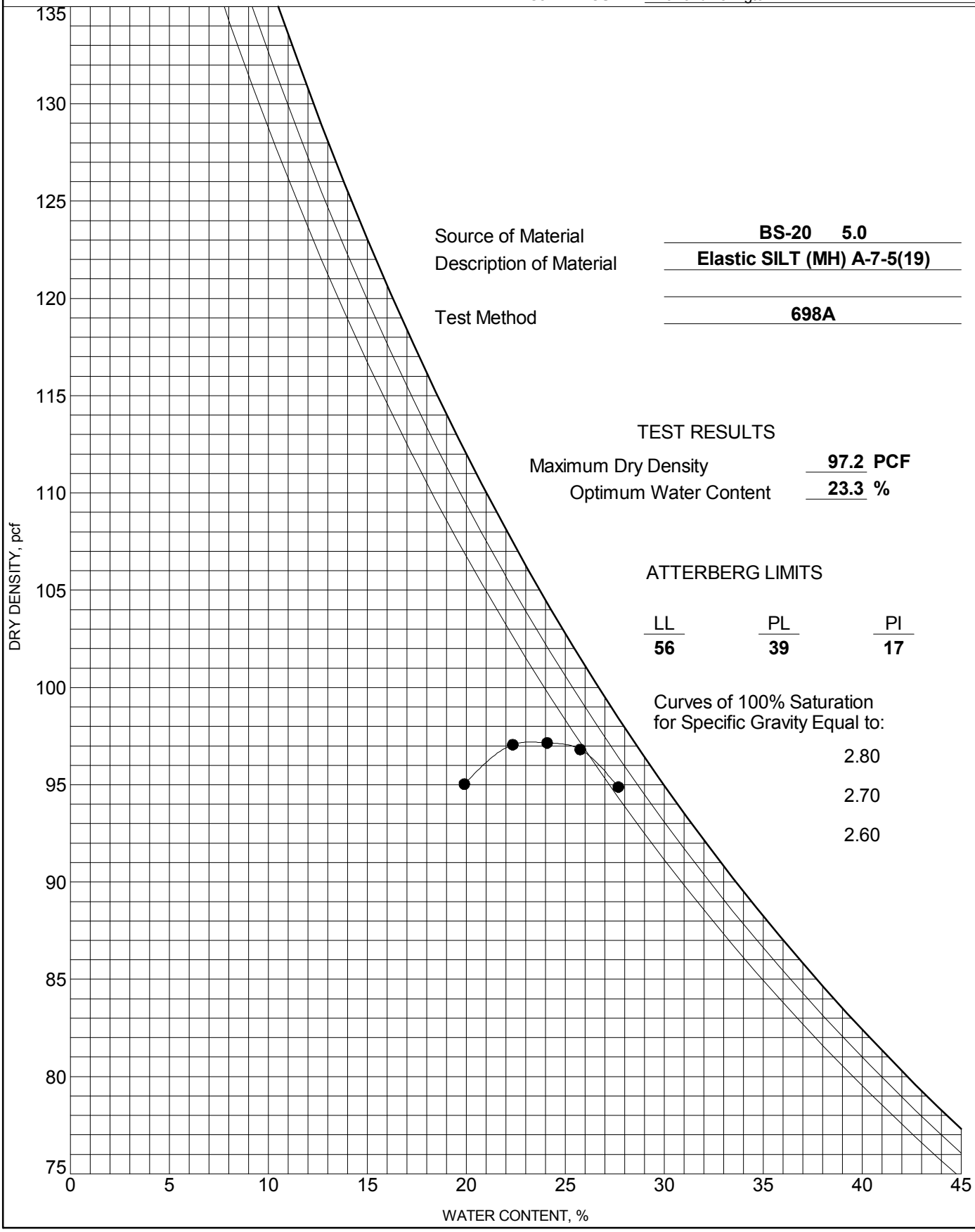
	BOREHOLE	DEPTH	LL	PL	PI	Fines	Classification
●	**BS-20**	**5.0**	**56**	**39**	**17**	**86**	**Elastic SILT (MH) A-7-5(19)**

ATTERBERG LIMITS - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/7/18

MOISTURE-DENSITY RELATIONSHIP

PROJECT ID P027662 **PROJECT NAME** I-20/26/126 Corridor Improvements

PROJECT COUNTY Richland/Lexington



Source of Material **BS-20 5.0**

Description of Material **Elastic SILT (MH) A-7-5(19)**

Test Method **698A**

TEST RESULTS

Maximum Dry Density **97.2** **PCF**

Optimum Water Content **23.3** **%**

ATTERBERG LIMITS

LL	PL	PI
56	**39**	**17**

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

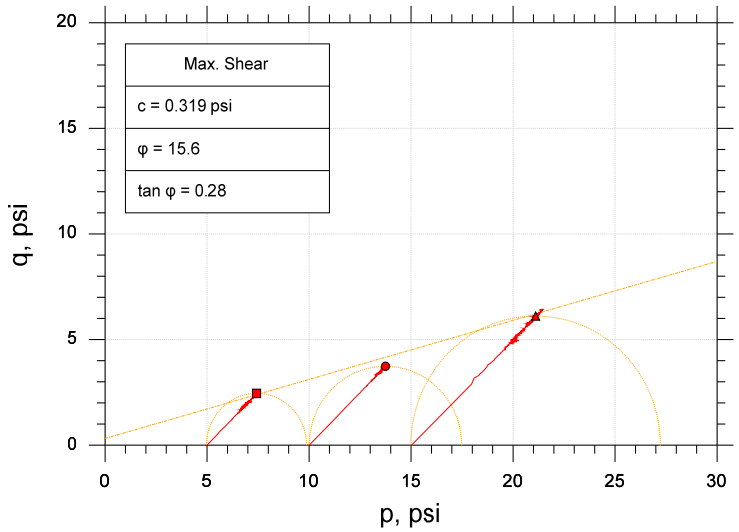
2.60

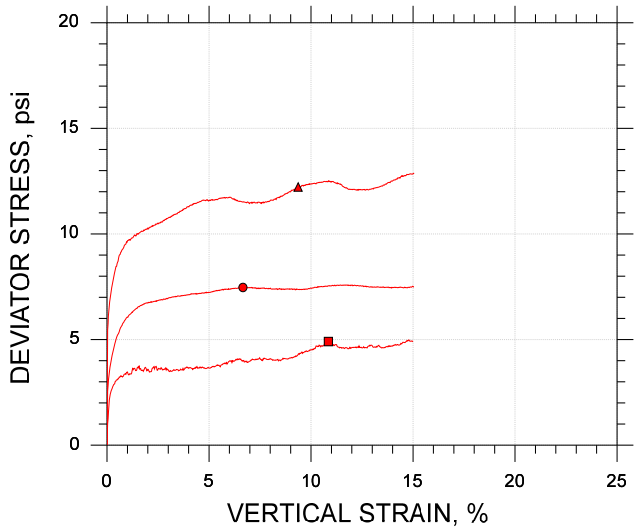
COMPACTION - SCDOT G5662.01 - CAROLINA CROSSROADS.GPJ FME2017.GDT 6/7/18

GeoTesting EXPRESS

Client: F&ME Consultants	
Project Name: I-20/26/126 Corridor Improv.	
Project Location: ---	
Project Number: GTX-307802	
Tested By: trm	Checked By: mcm
Boring ID: ---	
Preparation: reconstituted	
Description: Elastic SILT (MH) A-7 5 (19)	
Classification: ---	
Group Symbol: ---	
Liquid Limit: 56	Plastic Limit: 39
Plasticity Index: 17	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		■	●	▲	
Sample ID		BS-20	BS-20	BS-20	
Depth, ft		---	---	---	
Test Number		CU-11-1	CU-11-2	CU-11-3	
Initial	Height, in	4.000	4.000	4.000	
	Diameter, in	2.000	2.000	2.000	
	Moisture Content (from Cuttings), %	24.0	24.0	24.3	
	Dry Density, pcf	92.5	92.4	92.3	
	Saturation (Wet Method), %	78.7	78.7	79.3	
	Void Ratio	0.822	0.825	0.826	
Before Shear	Moisture Content, %	30.2	27.1	26.5	
	Dry Density, pcf	92.8	97.4	98.2	
	Cross-sectional Area (Method A), in²	3.130	3.012	3.037	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.816	0.731	0.716	
	Back Pressure, psi	153.0	161.0	165.0	
Vertical Effective Consolidation Stress, psi		4.997	9.915	14.81	
Horizontal Effective Consolidation Stress, psi		4.994	10.01	15.03	
Vertical Strain after Consolidation, %		0.1588	1.245	2.841	
Volumetric Strain after Consolidation, %		0.9569	5.682	6.222	
Time to 50% Consolidation, min		1.000	2.560	3.240	
Shear Strength, psi		2.452	3.734	6.112	
Strain at Failure, %		10.9	6.66	9.37	
Strain Rate, %/min		0.01600	0.01600	0.01600	
Deviator Stress at Failure, psi		4.904	7.467	12.22	
Effective Minor Principal Stress at Failure, psi		1.755	2.687	3.782	
Effective Major Principal Stress at Failure, psi		6.660	10.15	16.01	
B-Value		0.95	0.96	0.96	

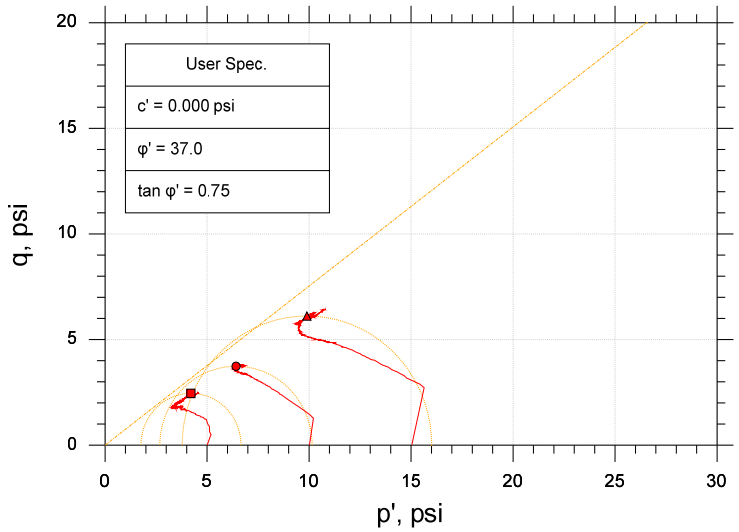
Notes:
- Before Shear Saturation set to 100% for phase calculation.
- Moisture Content determined by ASTM D2216.
- Atterberg Limits determined by ASTM D4318.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

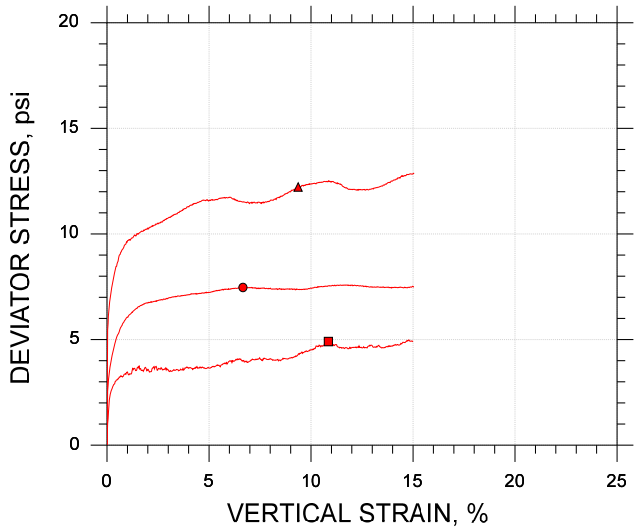
Remarks:

Target Compaction: 95% of (97.2 pcf) at Optimum Moisture Content (23.3%) + 2% - As Requested by Client

Client: F&ME Consultants	
Project Name: I-20/26/126 Corridor Improv.	
Project Location: ---	
Project Number: GTX-307802	
Tested By: trm	Checked By: mcm
Boring ID: ---	
Preparation: reconstituted	
Description: Elastic SILT (MH) A-7 5 (19)	
Classification: ---	
Group Symbol: ---	
Liquid Limit: 56	Plastic Limit: 39
Plasticity Index: 17	Estimated Specific Gravity: 2.7

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		■	●	▲	
Sample ID		BS-20	BS-20	BS-20	
Depth, ft		---	---	---	
Test Number		CU-11-1	CU-11-2	CU-11-3	
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	Diameter, in	2.000	2.000	2.000	
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	Dry Density, pcf	92.5	92.4	92.3	
	Saturation (Wet Method), %	78.7	78.7	79.3	
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	Cross-sectional Area (Method A), in²	3.130	3.012	3.037	
	Saturation, %	100.0	100.0	100.0	
	Void Ratio	0.816	0.731	0.716	
	Back Pressure, psi	153.0	161.0	165.0	
Vertical Effective Consolidation Stress, psi		4.997	9.915	14.81	
Horizontal Effective Consolidation Stress, psi		4.994	10.01	15.03	
Vertical Strain after Consolidation, %		0.1588	1.245	2.841	
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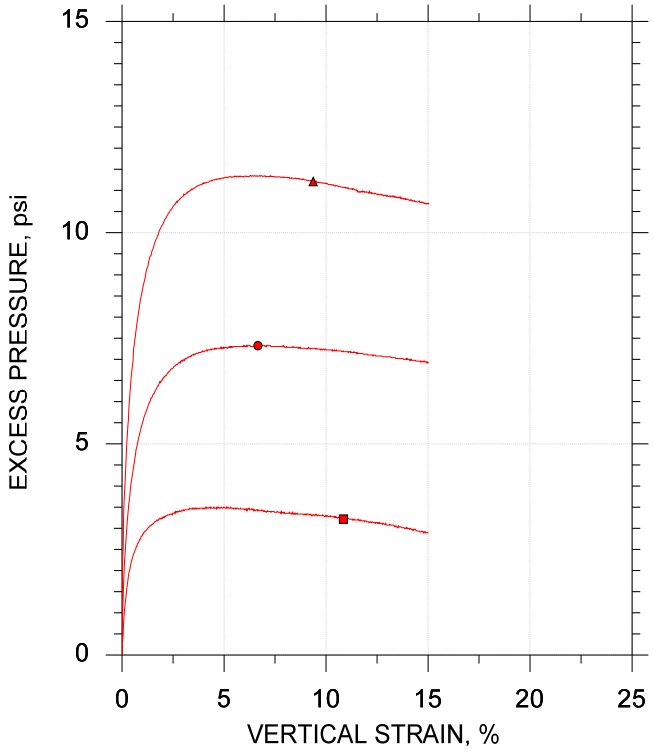
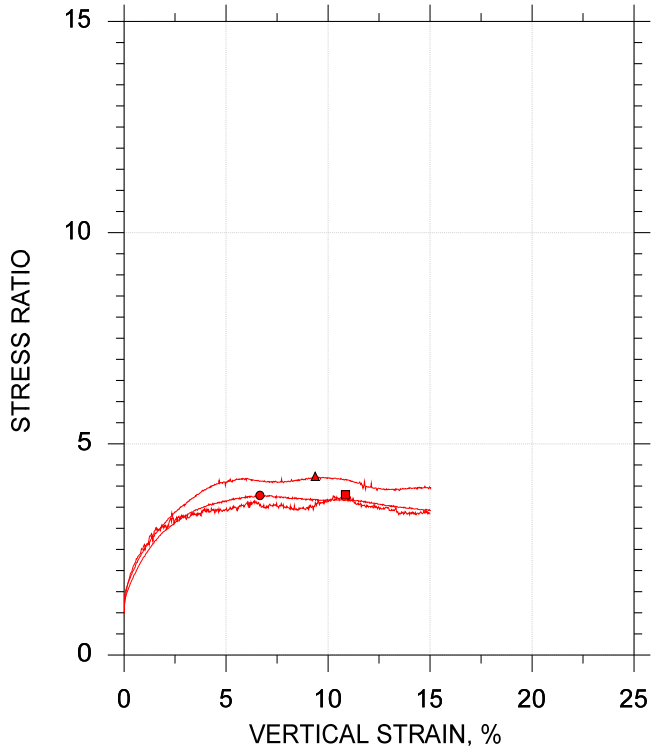
- Atterberg Limits determined by ASTM D4318.
- Deviator Stress includes membrane correction.
- Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

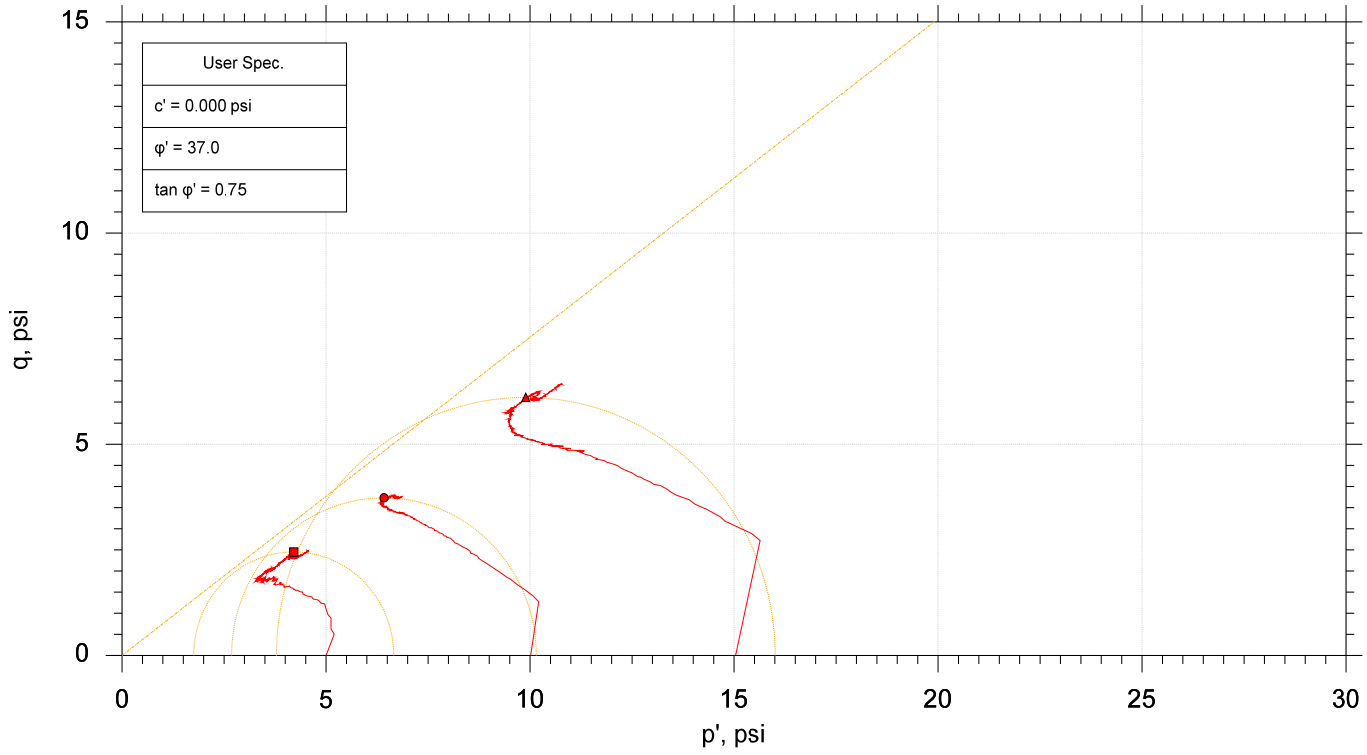
Remarks:

Target Compaction: 95% of (97.2 pcf) at Optimum Moisture Content (23.3%) + 2% - As Requested by Client

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
■	BS-20	CU-11-1	---	trm	6/25/2018	mcm	7/16/18	307802-CU-11-1m.dat
●	BS-20	CU-11-2	---	trm	6/25/2018	mcm	7/16/18	307802-CU-11-2m.dat
▲	BS-20	CU-11-3	---	trm	6/25/2018	mcm	7/16/18	307802-CU-11-3m.dat

GeoTesting EXPRESS

Project: I-20/26/126 Corridor Improv.	Location: ---	Project No.: GTX-307802
Boring No.: ---	Sample Type: reconstituted	
Description: Elastic SILT (MH) A-7 5 (19)		
Remarks: Target Compaction: 95% of (97.2 pcf) at Optimum Moisture Content (23.3%) + 2% - As Requested by Client		

APPENDIX C

S&ME GEOTECHNICAL DATA REPORT

Geotechnical Subsurface Data Report (GSDR), Revision 1

Carolina Crossroads I-20/I-26/I-126 Improvement Project Phase 2B

Lexington and Richland Counties, South Carolina

SCDOT Project ID P027662

S&ME Project No. 1461-16-047

PREPARED FOR:

HDR Engineering, Inc. of the Carolinas
4400 Leeds Avenue, Suite 450
North Charleston, South Carolina 29405

PREPARED BY:

S&ME, Inc.
134 Suber Road
Columbia, South Carolina 29210

October 23, 2018

October 23, 2018

HDR Engineering, Inc. of the Carolinas
4400 Leeds Avenue, Suite 450
North Charleston, South Carolina 29405

Attention: Mr. David Kinard, P.E.

Reference: **Geotechnical Subsurface Data Report (GSDR), Revision 1**
Carolina Crossroads I-20/I-26/I-126 Improvement Project Phase 2B
Project ID P027662, Lexington and Richland Counties, South Carolina
S&ME Project No. 1461-16-047

Dear Mr. Kinard:

The purpose of this report is to convey geotechnical subsurface data to HDR Engineering, Inc. (HDR) and the South Carolina Department of Transportation (SCDOT) for use by a contractor in a future design-build project. Test locations are widely spaced and therefore only fulfill a portion of the subsurface exploration required by SCDOT for Bridge and Roadway Geotechnical Engineering Reports. Our services were performed in general accordance with the Sub-Consultant Agreement between HDR and S&ME, Inc. dated August 17, 2016, including subcontract modification dated January 24, 2018, and portions of the SCDOT *Geotechnical Design Manual* (GDM), 2010 version.

S&ME appreciates this opportunity to work with you on this important project. Please contact us at (803) 561-9024 if you have any questions or need any additional information regarding this report.

Sincerely,

S&ME, Inc.

SOUTH CAROLINA
S & ME, INC.
No. C00473
CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA
REGISTERED PROFESSIONAL ENGINEER
No. 21304
10-23-18
AARON DURANT GOLDBERG

Hunter G. McKenzie, E.I.T.
Staff Geotechnical Professional

Aaron D. Goldberg, P.E., D.GE.
Principal Engineer/Senior Project Manager

Matthew F. Cooke, P.G.
Columbia Geotechnical Group Leader/Project Manager

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Appendix VI – Dilatometer Sounding Data

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1.0 Project Description

The proposed construction for this project includes the improvement of the existing I-20, I-26, and I-126 corridor, including new bridges, overpasses, interchanges, ramps, and widening. The associated roadway realignment will also be included. The project includes approximately four miles of I-20, nine miles of I-26, and one mile of I-126, located in Lexington and Richland Counties in the Columbia, South Carolina metropolitan area. The approximate project location is shown on the *Overall Site Plan*, provided as Figure 1 in Appendix I.

2.0 Objective

The objective of our services was to explore the subsurface conditions along the I-20, I-26, and I-126 corridor as they pertain to the proposed improvements, and in conjunction with field and laboratory testing, to provide limited geotechnical data.

3.0 Scope of Work

Representatives of S&ME were present for on-site field activities between January 4, 2018, and June 6, 2018, to conduct the following testing:

- 129 total Standard Penetration Test (SPT) borings with wireline rock coring in applicable borings;
- Downhole seismic testing at three boring locations;
- 30 bulk samples at selected pavement and embankment boring locations;
- 20 undisturbed samples (Shelby tubes) obtained at selected bridge, embankment, and wall boring locations;
- Ten Cone Penetrometer (CPT) soundings;
- Two Marchetti Dilatometer Test (DMT) soundings

Testing was conducted at or near the proposed locations provided in the *Phase 2B Subsurface Exploration Plan*, by S&ME, Inc., dated January 10, 2018. Testing locations were modified as necessary due to utilities, terrain, to minimize traffic control impacts, and to facilitate safe working conditions.

Additionally, laboratory testing was performed on disturbed and undisturbed soil samples, bulk soil samples, and rock core samples collected in the field. The Laboratory testing program is described in more detail in the following sections.

4.0 Test Locations

The testing locations were initially established in the field by representatives of S&ME using our hand-held sub-meter GPS unit. As-built survey of the testing locations was performed by Glenn Associates Surveying, Inc., under subcontract to S&ME. The approximate testing locations are shown on the *Test Location Plan,* included as Figures 2 through 11 in Appendix I. A summary of testing locations, depths and elevations are presented in Table 1, *Test Location Summary*, in Appendix II. Surveyed coordinates are tabulated in decimal degree latitude and longitude

coordinates. The station and offset presented for each test location was referenced to proposed alignments shown in the electronic drawing file, *RA1_STV_Alignments.dgn*, dated 2/7/2018, provided by HDR, Inc. Where applicable, the associated Site number for each test location is provided as referenced from the structures numbering scheme, provided in *RA1 Structures Numbering – 2-12-18.pdf*, provided by HDR, Inc.

5.0 Exploration Procedures

As previously mentioned, the subsurface exploration of this project included SPT borings, wireline rock coring, downhole seismic testing, bulk sampling, undisturbed sampling, CPT soundings, and DMT soundings. The following sections summarize the field test procedures. The field testing data are organized into appendices of this report as follows:

- Appendix III - Soil and Rock Core Boring Records
- Appendix IV – Rock Core Box Photographs
- Appendix V – CPT Sounding Logs
- Appendix VI – DMT Sounding Data
- Appendix VII – Downhole Seismic Data

5.1 Traffic Control

Traffic control was required for a majority of the borings performed. In general, traffic control consisted of nighttime lane closures on Interstate and multi-lane primary and secondary routes. Daytime Interstate shoulder closures, as well as lane closures with flagging operations on primary and secondary routes were also utilized. Traffic control was performed by Area Wide Protective, under subcontract to S&ME, Inc. Traffic control configurations and work hours were in accordance with applicable SCDOT standard drawings and hourly lane closure restrictions.

5.2 Site Clearing

Several test locations for the proposed alignments were located in wooded areas off the existing roadways where mechanized clearing was necessary to provide access for our drilling equipment. The clearing was performed by Carolina Brushcutters, Inc. under subcontract to S&ME, using a skid steer-mounted forestry grinder and operator to create access pathways and drill pads at the boring locations. Trails of approximately 12 to 15 feet wide were cleared with trees chipped in-place. At the boring location itself, an approximate 30x30 foot work area was cleared as necessary to facilitate operations. No attempt was made to stack or remove downed trees from the site. Care was taken to limit site disturbance during this process.

5.3 Standard Penetration Test (SPT) Borings

One hundred and twenty nine (129) soil test borings with SPT sampling were performed for this project between the dates of January 4, 2018, and April 13, 2018, using three drill rigs as follows:

Table 5-1 – S&ME Drilling Equipment Summary

Rig Make/Model	Serial No.	Carrier Type	Average SPT Energy Transfer Ratio (ETR), %
Diedrich D-50	382	ATV	86.5
CME-55	328245	Truck Mounted	84.1
CME-750	322938	ATV	86.0

Bridge (B-series), Retaining Wall (W-series), Embankment (RW-series), and Seismic (DH-series) SPT borings were advanced using mud rotary drilling techniques. Pavement (P-series) SPT borings were advanced using hollow stem auger drilling techniques. Soil sampling and penetration testing were performed in general accordance with ASTM D1586 *Standard Test Method for Penetration Test and Split Barrel Sampling of Soils*. The borings were extended to the planned termination depths, auger or drill bit refusal depths, followed by wireline rock coring, where applicable, at seismic, bridge and wall boring locations. A summary of the borings performed is provided in the table below.

Table 5-2 – Boring Summary

Purpose	Boring No.	Quantity
Seismic Borings	DH-4 through DH-6	3
Bridge Borings	B-29 through B-62	35
Retaining Wall Borings	W-18, W-19, W-22 through W-25, and W-27 through W-32	12
Embankment Borings	RW-35 through RW-43	9
Pavement Borings (1)	P-1 through P-45 and P-47 through P-71	70

(1) The P-Series borings were performed at their designated locations within the paved shoulder area located outside of the travel lanes along I-20, I-26, and I-126.

The originally planned pavement boring P-46 was deleted from the scope due to the proximity of bridge boring B-47 to this location. Boring B-47 was performed in the paved shoulder to provide pavement information at this location. In addition, boring W-26, which was originally planned under the Phase 2B scope of work, was shifted to the Phase 2A scope of work and will be reported by F&ME under separate cover.

Pavement coring was performed at the Pavement Boring locations and other boring locations within the roadway or shoulder. The pavement coring was performed using a 4 to 8-inch outer diameter, diamond-tipped, core barrel attached to the drill rig. The cores were performed to obtain a sample for thickness measurements and evaluation, and to provide a clean cut through the existing pavements to allow access to the underlying materials. A photograph log of recovered existing pavement cores can be found in Appendix XIV.

Soil sampling and penetration testing were performed in general accordance with ASTM D1586 *Standard Test Method for Penetration Test and Split Barrel Sampling of Soils*. SPT was performed in each boring continuously in the upper 10 feet, and at approximate 5-foot intervals thereafter. The split-barrel sampler was opened at the drill

site and sloughed material was identified and separated from the recovered sample. The recovered sample was visually described and classified by S&ME's rig geologist or engineer. A selected portion of the sample was placed in a glass jar with a moisture-proof lid. Where materials changed over the sample drive length, a sample of each material was retained. The sample jars were labeled, placed in cardboard boxes, and transported to the S&ME Columbia Office at the end of each work day.

Water level measurements were attempted immediately after completion of drilling and, where feasible, were repeated after a period of 24 hours. We note that due to the use of drilling fluid additives, the water level readings recorded in the soil borings may not accurately reflect the ground water conditions at the site. Stabilized ground water readings were conducted in general accordance with ASTM D4750 *Standard Test Method for Determining Subsurface Liquid Levels in a Borehole or Monitoring Well (Observation Well)*.

After ground water measurements were complete, borings conducted within existing pavements were abandoned with Portland cement/bentonite grout. The boreholes performed outside the existing roadway and existing paved shoulder were backfilled with drill cuttings and/or bentonite chips up to an approximate depth of 10 ft. The upper 10 feet was then filled with Portland cement/bentonite grout. The pavement section of boreholes within the existing roadway and paved shoulders were patched with commercially available bagged asphalt, as necessary. The concrete section for borings conducted through existing bridge decks was patched with Repcon 928, a high performance, high strength, non-shrink, fast-setting concrete.

SPT hammer energy measurements with a Pile Driving Analyzer (PDA) were previously performed by S&ME at off-site locations for the drill rigs used on the project in general accordance with ASTM D4633. The SPT Energy test results are provided in Appendix XIII. The N-values indicated on the logs are field values and were not corrected for overburden stress, rod length, borehole diameter or hammer efficiency. The hammer energy ratios are reported on the individual soil test boring records in Appendix III.

5.4 Wireline Rock Coring

At applicable seismic, bridge, and wall boring locations, wireline rock coring was performed to explore the refusal materials in general accordance with ASTM D2113. Rock coring was performed in the majority of the borings using an NQ-size core barrel and wireline retrieval system. A larger, HQ-sized core barrel was utilized for seismic borings DH-4 through DH-6 to facilitate installation of PVC casing for downhole testing as described below. The recovered rock cores were visually logged by the S&ME rig geologist or engineer. The rock core samples were placed in wooden core boxes labeled with appropriate project information. Photographs were taken of each completed core box prior to any core being removed for laboratory testing. Completed core boxes were transported to the S&ME Columbia Office at the end of each work day. The rock cores were preserved, handled and transported in general accordance with ASTM D5079-08.

5.5 Bulk Samples

Thirty (30) bulk samples were obtained from the site at selected pavement and embankment borings. The representative bulk samples of near-surface soils were obtained by randomly taking shovel loads of the cuttings brought to the surface by the hollow stem augers until approximately two, 5-gallon buckets of materials was obtained at each location. The buckets were sealed with lids and marked with appropriate project information.

5.6 Undisturbed Samples (Shelby Tubes)

Undisturbed samples (Shelby tubes) were obtained in companion off-set borings adjacent to eight selected bridge, embankment, and wall boring locations. Twenty (20) relatively undisturbed (UD) samples, or Shelby Tubes, were performed between March 26, 2018, and April 3, 2018, in general accordance with ASTM D1587 *Standard Practice for Thin-Walled Tube Sampling of Fine Grained Soils for Geotechnical Purposes*. Shelby tube sample depths were selected by S&ME upon review of the SPT logs, and assigned accordingly.

Shelby Tubes provide sufficiently intact samples for laboratory testing. Samples were obtained by pushing a 3-inch outer diameter, 16-guage, steel tube into the soil at the desired sampling intervals in mud-rotary drilled borehole adjacent to the original SPT location. The tube, together with the encased soil, was carefully removed from the ground and length of the recovered soil measured. The ends of the tube were sealed with microcrystalline wax and labeled with applicable project information before being transported to our laboratory. Shelby tube samples were transported and stored in general accordance with ASTM D4220-14 for Group C samples.

5.7 Shear Wave Velocity Test by Down Hole Method

Upon completion of drilling activities for seismic borings DH-4, DH-5, and DH-6, flush-threaded schedule 40 PVC casing was installed and the annulus grouted in place for down-hole shear wave testing activities using a cement/bentonite grout mixture to support shear wave velocity testing.

Shear wave velocity measurements were performed between January 17 and January 30th, 2017, in cased boreholes DH-4, DH-5, and DH-6, using downhole methods in general accordance with ASTM D7400 *Standard Test Methods for Downhole Seismic Testing*. The testing at the site was conducted using a Geometrics ES3000 seismograph and a 14 Hz downhole triaxial geophone. Measurements were taken at depth intervals of approximately 3 feet. Shear and compression waves were generated by a 16-pound sledgehammer striking a wooden plank. The analysis was conducted using the OYO Corporation's SeisImager/SW software (Pickwin). The Shear Wave Velocity Profile and tabulated data are attached in Appendix VII. After completion of down-hole shear wave velocity testing, the PVC casing was abandoned in place by tremie grouting the inside of the casing with a cement/bentonite slurry approximately flush with the ground surface.

5.8 Cone Penetrometer (CPT) Soundings

Ten (10) CPT soundings were performed between May 21, 2018, and June 6, 2018, using both a truck-mounted and an ATV-mounted drill rig. Locations of CPT soundings were selected by S&ME upon review of the SPT logs, and assigned accordingly. CPT soundings consist of a conical pointed penetrometer which is hydraulically pushed into the soil at a slow, measured rate. Procedures for measurement of the tip resistance and side friction resistance to push generally follow those described by ASTM D-5778 *Standard Test Method for Performing Electronic Friction Cone and Piezocone Penetration Testing of Soils*. The Cone Penetration Test records are provided in Appendix V. The calibration records for cone serial nos. 4444.177 and 4433.102, used to perform the soundings for this project, is presented in Appendix V. The calibrations were performed by the cone manufacturer, Vertek, on April 11, 2018 and July 7, 2017, respectively.

5.9 Marchetti Dilatometer Test (DMT) Soundings

Two (2) DMT soundings were performed between June 5 and 6, 2018, using a truck-mounted CPT rig. Locations of DMT soundings were selected by S&ME upon review of the SPT logs, and assigned accordingly. The DMT soundings were performed in general accordance with procedures described in FHWA Publication SA-91-044, *The Flat Dilatometer Test*. The Dilatometer Test records are provided in Appendix VI.

6.0 Classification of Recovered Soil and Rock Core Samples

Recovered split spoon and bulk samples were initially classified in general accordance with ASTM D2488 *Standard Practice for Description and Identification of Soils (Visual-Manual Method)*. After laboratory testing was completed, provisional field classifications were revised as necessary to provide a soil description that generally follows the terminology given by ASTM D2487 *Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)* and AASHTO M145 *Recommended Practice for Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes*.

Recovered rock core samples were reviewed and classified in general accordance with the SCDOT GDM Chapter 6, Section 6.3. Upon return to our laboratory, the rock core samples were reviewed and classified by a Professional Geologist (PG). Recovered core examined in the laboratory were assigned descriptive terms using tables 6-13 through 6-19 of the SCDOT Geotechnical Design Manual (GDM) where applicable to the rock type. Foliation within the rock was judged as very thick using Table 6-15. Rock lithologic descriptions, and applicable descriptive information are included on the Soil Test Boring Records in Appendix III. Discontinuities in the recovered cores were evaluated using the terminology in GDM Table 6-21. The results of the discontinuity examination are tabulated in the *Rock Core Discontinuity Worksheets* for each cored borehole, included in Appendix III. After logging, selected sections of rock core were removed and prepared for laboratory compressive strength testing.

After laboratory testing was completed, the Rock Mass Rating (RMR) was computed in general accordance with the SCDOT GDM and Section 10 of the 2014 AASHTO LRFD *Bridge Design Specifications*. Additionally, the Geological Strength Index (GSI) was determined in general accordance with the 2014 AASHTO LRFD *Bridge Design Specifications*. A summary of the Rock Core Testing is provided in Table 8, Appendix II of this report.

Interpreted subsurface conditions encountered by the borings are shown on the Soil and Rock Core Boring records in Appendix III. These records represent our interpretation of the subsurface conditions based on the test data. Stratification lines on the boring records represent approximate boundaries between soil and rock types; however, the actual transition may be gradual and the thicknesses of the strata will vary across the site. The soil and rock samples will be retained at our laboratory for a period of seven years, or until substructure completion, whichever comes first.

7.0 Laboratory Tests

Index property testing consisting of Atterberg limits, particle-size distribution, percent finer #200 sieve, and natural moisture content tests were performed on split-spoon soil samples to assist in classifying the soils. Additionally, organic content and corrosion series (pH, chloride, sulfate, and resistivity) testing were performed on

selected split-spoon samples. Atterberg limits, particle-size distribution, natural moisture content, standard proctor moisture-density, California bearing ratio (CBR), and ignition loss testing were performed on bulk soil samples. Atterberg limits, particle-size distribution, natural moisture content, one-dimensional consolidation, and consolidated undrained triaxial shear testing were performed on undisturbed samples. Uniaxial compressive strength testing was performed on selected rock core specimen. Tables summarizing the laboratory test results are provided in Appendix II as follows:

- Table 2: Split Spoon Samples – Laboratory Classification Testing Summary
- Table 3: Bulk Samples – Laboratory Classification & Ignition Loss Testing Summary
- Table 4: Bulk Samples – Standard Proctor and CBR Testing Summary
- Table 5: Corrosion Series Testing Summary
- Table 6: Undisturbed Samples – Consolidation Testing Summary
- Table 7: Undisturbed Samples – Consolidated Undrained Triaxial Testing Summary
- Table 8: Rock Core Testing Summary

Testing was performed in general accordance with ASTM, AASHTO, or SC state test procedures as follows:

- Atterberg limits – ASTM D4318 / AASHTO T89/90
- Particle-size distribution – ASTM D422 / AASHTO T88
- Percent-finer 200 sieve – ASTM D1140 / AASHTO T11
- Natural moisture content – ASTM D2216 / AASHTO T265
- Organic content – ASTM D2974 / AASHTO T267
- Corrosion Series:
  - pH – ASTM G51 / AASHTO T289
  - Chloride – AASHTO T291
  - Sulfate – ASTM C1580 / AASHTO T290
  - Resistivity – AASHTO T288
- Standard proctor moisture-density – ASTM D698 / AASHTO T99
- California Bearing Ratio (CBR) – ASTM D1883 / AASHTO T193
- Ignition loss – SC-T-36
- One-dimensional consolidation – ASTM D2435
- Consolidated undrained triaxial shear – ASTM D4767
- Compressive strength of rock cores – ASTM D7012 (Methods C&D)

The individual laboratory test data sheets are organized into appendices of this report as summarized below:

- Appendix VIII: Laboratory Test Data Sheets – Split Spoon Samples
- Appendix IX: Laboratory Test Data Sheets – Bulk Samples
- Appendix X: Laboratory Test Data Sheets – Corrosion Series Testing
- Appendix XI: Laboratory Test Data Sheets – Undisturbed Samples
- Appendix XII: Laboratory Test Data Sheets – Rock Core Samples

8.0 Shear Wave Velocity Test by Down Hole Method

Velocity measurements were obtained to depths of approximately 117 feet below the existing ground surface at Seismic Borings DH-4, DH-5, and DH-6. A summary of the testing is provided in the table below. In addition, the plots of shear wave velocity as a function of depth are provided in Appendix VII.

Table 9-1 – Shear Wave Velocity Summary

Boring No.	Total Test Depth (ft.)	Weighted Average Shear Wave Velocity (ft./s)	Weighted Average Depth Interval (ft.)
DH-4	117.1	3,232	6.1 to 105.1
DH-5	117.3	2,775	6.3 to 105.3
DH-6	117.8	3,207	6.8 to 105.8

9.0 Closing and Qualification of Report

This data report has been prepared in general accordance with procedures in SCDOT GDM Chapter 21 and with generally applicable standards of our practice in this geographic area at the time this report was prepared. No other warranty, express or implied, is made. The Geotechnical Engineer of Record for the project must review the data submitted in this report and develop their own interpretation of the testing results as they apply to design.

We relied on project information given to us to develop our exploration program. If project information described in this report is not accurate, or if it changes during project development, we should be notified of the changes.

This report presents data from a limited field exploration program. Subsurface conditions will vary widely between explored areas. Some variations may not become evident until construction. If conditions are encountered which appear different than those described in our report, we should be notified. This report should not be construed to represent subsurface conditions for the entire site.

Unless specifically noted otherwise, our field exploration program did not include an assessment of regulatory compliance, environmental conditions or pollutants or presence of any biological materials (mold, fungi, bacteria). If there is a concern about these items, other studies should be performed.

Appendices

Appendix I –Figures

FIG. 2
FIG. 3
FIG. 4
FIG. 5
FIG. 6
FIG. 7
FIG. 8
FIG. 9
FIG. 10
FIG. 11
Broad River Rd
Kinley Rd
Kennerly Rd
St Andrews Rd
Bush River Rd
Lake Murray Blvd
Irmo
Columbia
Chapin
Harbison Blvd
Piney Grove Rd
Piney Woods Rd
Sunset Blvd
Soluda River
Lost Creek Dr
Riverwalk Way
Fairforest Rd
Seven Oaks
Whitehall
Chatfield
Leisure Ln
Nursery Rd
Ripley Station Rd
Club at Rawls Creek
Soluda Shoals Park
Lexington Medical Center
Broad River
Bush River Rd
Gracern Rd
Averyt Ave
Sidney Rd
Fairview Dr
Doncaster Dr
Woodrow St
Friarsgate Blvd
Weed Dr
Cascade Dr
Radio Ln
Pine Lake Dr
Hilton Ln
Terrace View Dr
Nursemaster Dr
Garner Ln
Adella St
Bentley Dr
Luster Ln
Faraway Ln
Sidney Rd
Zimalcrest Dr
Metts Rd
Shivers Rd
Pine Valley
Riverside Forest
Saint Andrews
Glenridge
Harbison Blvd
Lost Creek Dr
Water View Dr
Geology Rd
Hemingshire Rd
Dutch Creek
Lakes Ln
Deltaire Dr
Woods Dr
Pass Pl
Lake Murray Blvd
Coldstream Dr
Nursery Rd
Murraywood
Hillsborough Rd
Cambridge Ct
Century Dr
Emory Ln
Wescott Rd
Carnoustie Ln
Hampshire Rd
Lochcrest Rd
Hunters Blind Dr
Quail Valley
Mitchell Ln
Meadowlake Ln
Collegiate Ln
Hollingsworth Rd
Sawgrass Dr
Seven Oaks Park
Cedar Creek Dr
Club Rd
Riverside Dr
Ephrata Dr
Chanel Meadow Ln
Sawgrass Dr
Bentley Dr
Broad River Rd
Bush River Rd
Averyt Ave
Gracern Rd
Sidney Rd
Faraway Ln

LEGEND

S&ME TEST LOCATIONS

0 500 1000

GRAPHIC SCALE (IN FEET)

TEST LOCATION PLAN
PHASE 2B

I-26 STATION 10+00 TO STATION 80+00
I-20,26,126 CORRIDOR IMPROVEMENT PROJECT - PHASE 2B
COLUMBIA, SOUTH CAROLINA

SCALE:	AS SHOWN
DATE:	8-03-2018
PROJECT NUMBER	1461-16-047
FIGURE NO.	2

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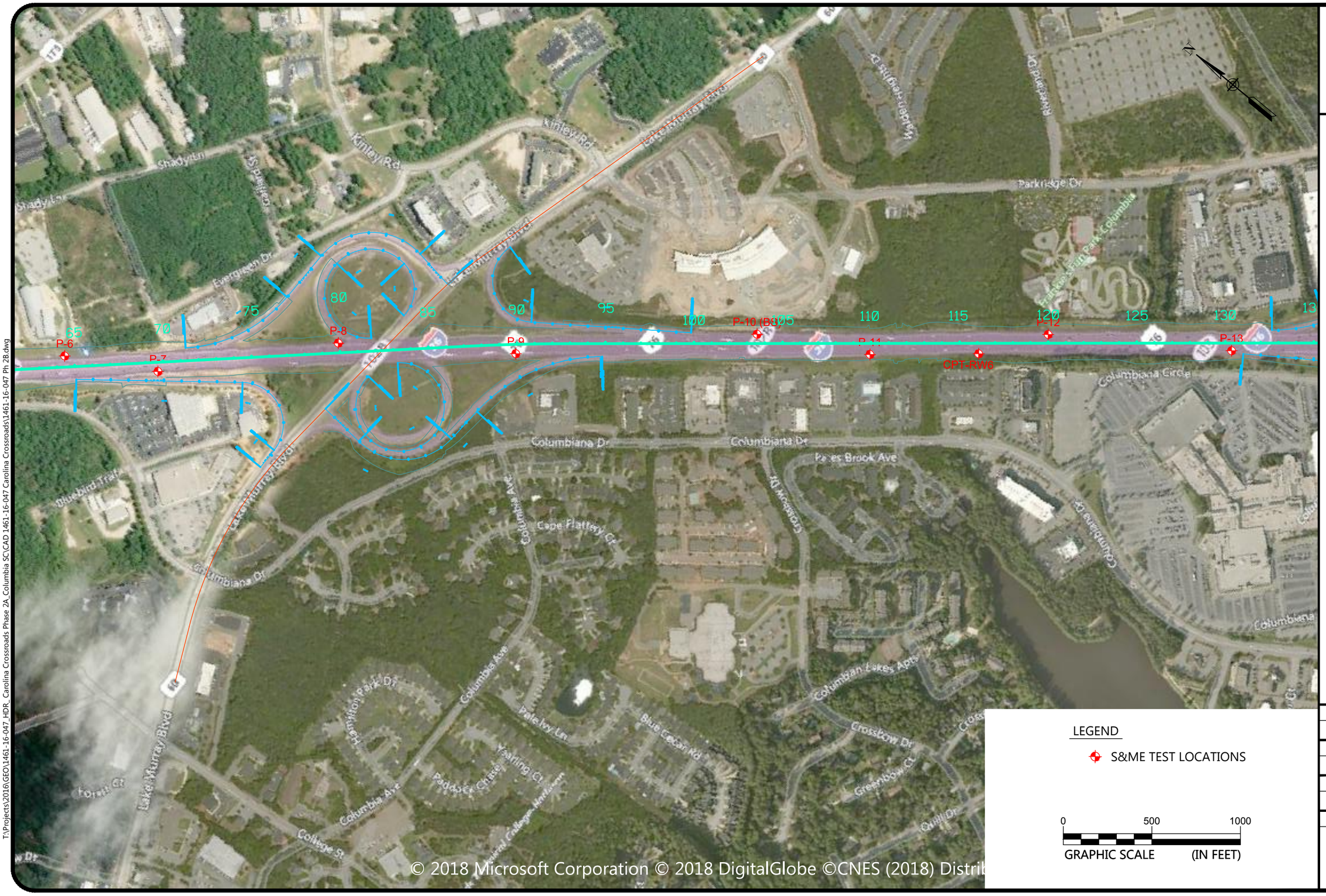

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TEST LOCATION PLAN
PHASE 2B

I-26 STATION 70+00 TO STATION 140+00
I-20,26,126 CORRIDOR IMPROVEMENT PROJECT - PHASE 2B
COLUMBIA, SOUTH CAROLINA

SCALE:	AS SHOWN
DATE:	8-03-2018
PROJECT NUMBER	1461-16-047
FIGURE NO.	3

LEGEND

S&ME TEST LOCATIONS

0 500 1000

GRAPHIC SCALE (IN FEET)

TEST LOCATION PLAN
PHASE 2B

I-26 STATION 135+00 TO STATION 200+00
I-20,26,126 CORRIDOR IMPROVEMENT PROJECT - PHASE 2B
COLUMBIA, SOUTH CAROLINA

SCALE: AS SHOWN

DATE: 8-03-2018

PROJECT NUMBER 1461-16-047

FIGURE NO. 4

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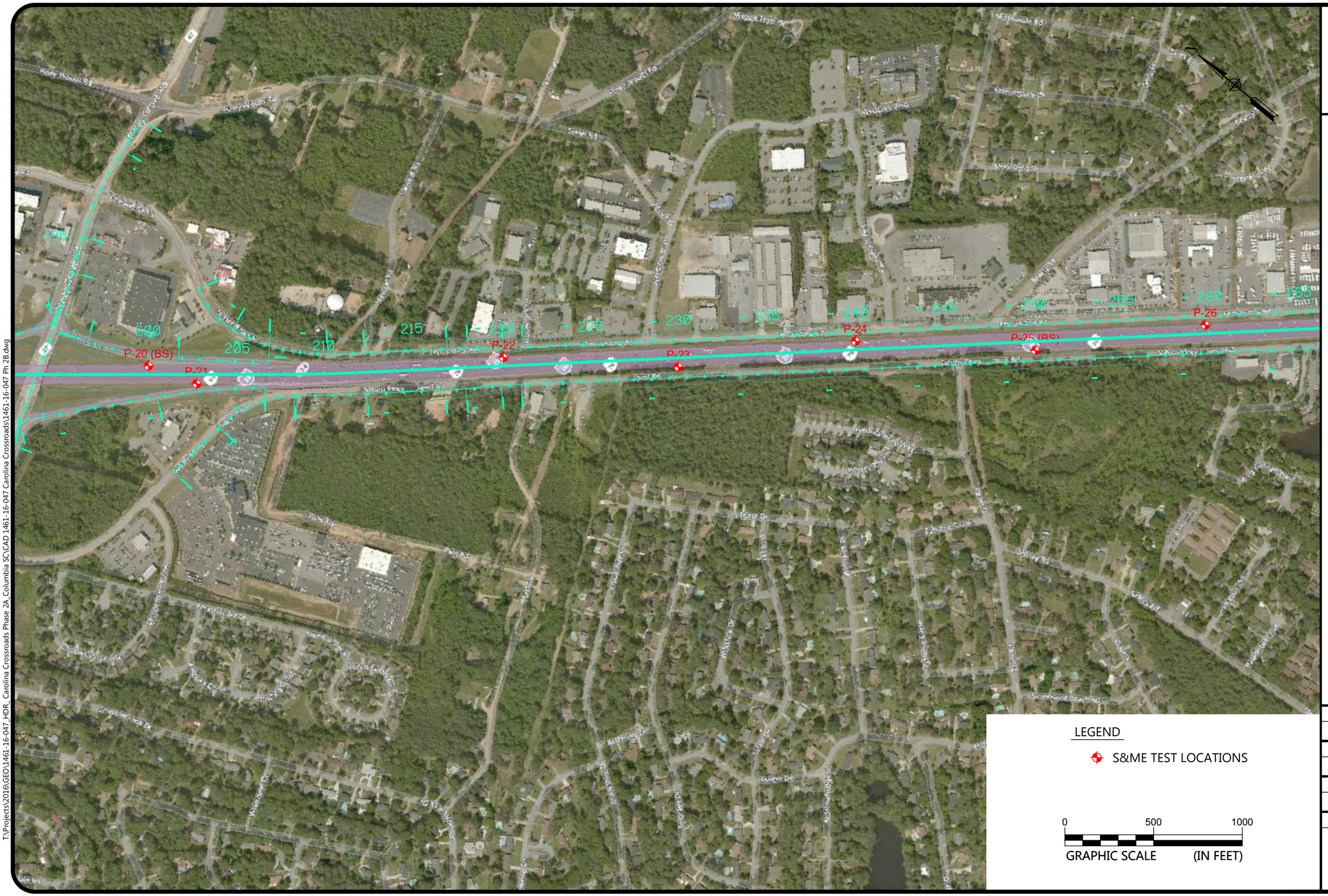
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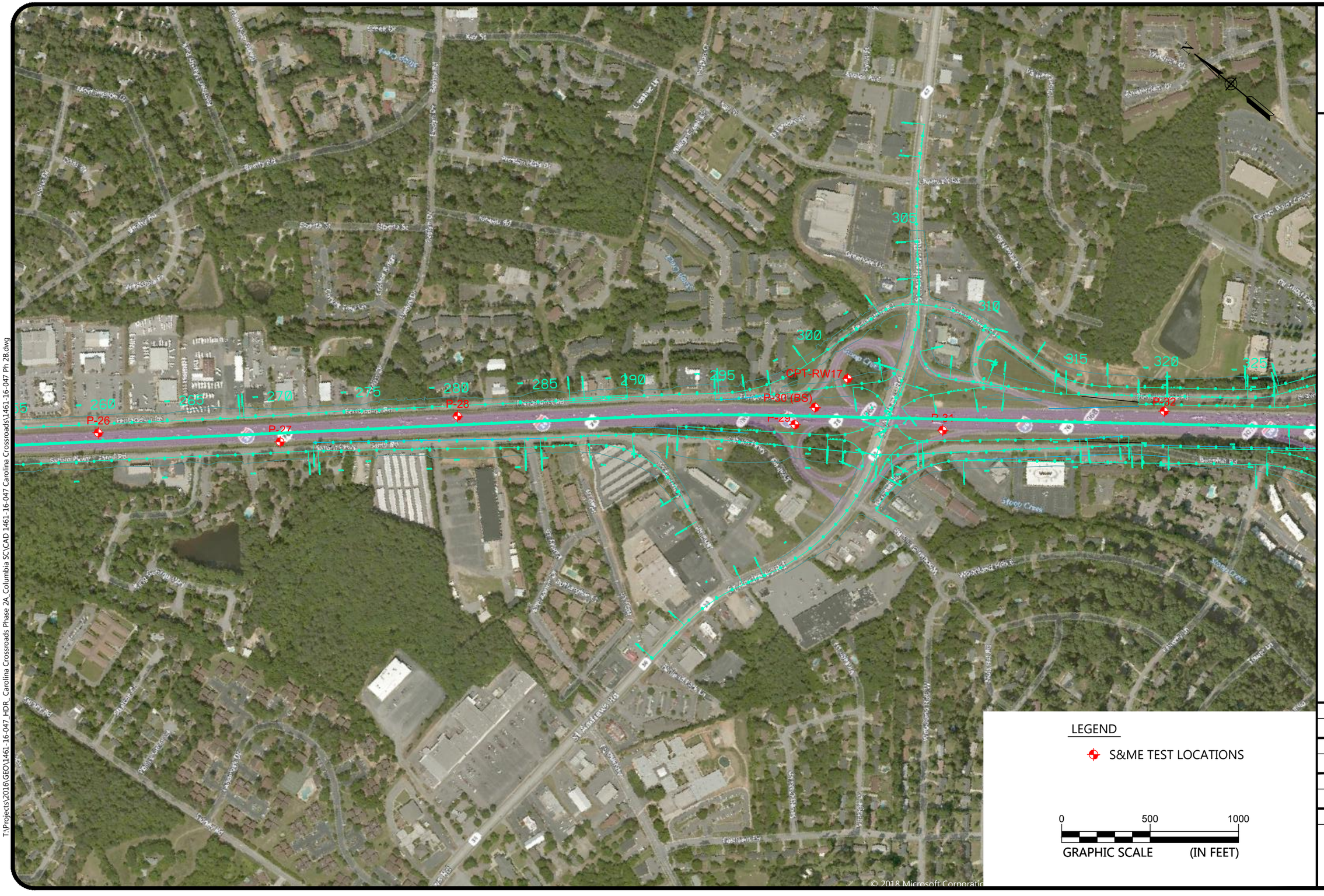

TEST LOCATION PLAN
PHASE 2B

I-26 STATION 260+00 TO STATION 325+00
I-20,26,126 CORRIDOR IMPROVEMENT PROJECT - PHASE 2B
COLUMBIA, SOUTH CAROLINA

SCALE:	AS SHOWN
DATE:	8-03-2018
PROJECT NUMBER	1461-16-047
FIGURE NO.	6

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TEST LOCATION PLAN
PHASE 2B

I-26 STATION 320+00 TO STATION 385+00
I-20,26,126 CORRIDOR IMPROVEMENT PROJECT - PHASE 2B
COLUMBIA, SOUTH CAROLINA

SCALE:	AS SHOWN
DATE:	8-03-2018
PROJECT NUMBER	1461-16-047
FIGURE NO.	7

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TEST LOCATION PLAN
PHASE 2B

I-26 STATION 405+00 TO STATION 465+00
I-20,26,126 CORRIDOR IMPROVEMENT PROJECT - PHASE 2B
COLUMBIA, SOUTH CAROLINA

SCALE:	AS SHOWN
DATE:	8-03-2018
PROJECT NUMBER	1461-16-047
FIGURE NO.	8

TEST LOCATION PLAN
PHASE 2B

I-126 STATION 0+00 TO STATION 65+00
I-20,26,126 CORRIDOR IMPROVEMENT PROJECT - PHASE 2B
COLUMBIA, SOUTH CAROLINA

SCALE:	AS SHOWN
DATE:	8-03-2018
PROJECT NUMBER	1461-16-047
FIGURE NO.	9

LEGEND

S&ME TEST LOCATIONS

0 500 1000
GRAPHIC SCALE (IN FEET)

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LEGEND

S&ME TEST LOCATIONS

0 500 1000

GRAPHIC SCALE (IN FEET)

TEST LOCATION PLAN
PHASE 2B

I-20 STATION 70+00 TO STATION 135+00
I-20,26,126 CORRIDOR IMPROVEMENT PROJECT - PHASE 2B
COLUMBIA, SOUTH CAROLINA

SCALE: AS SHOWN

DATE: 8-03-2018

PROJECT NUMBER 1461-16-047

FIGURE NO. 10

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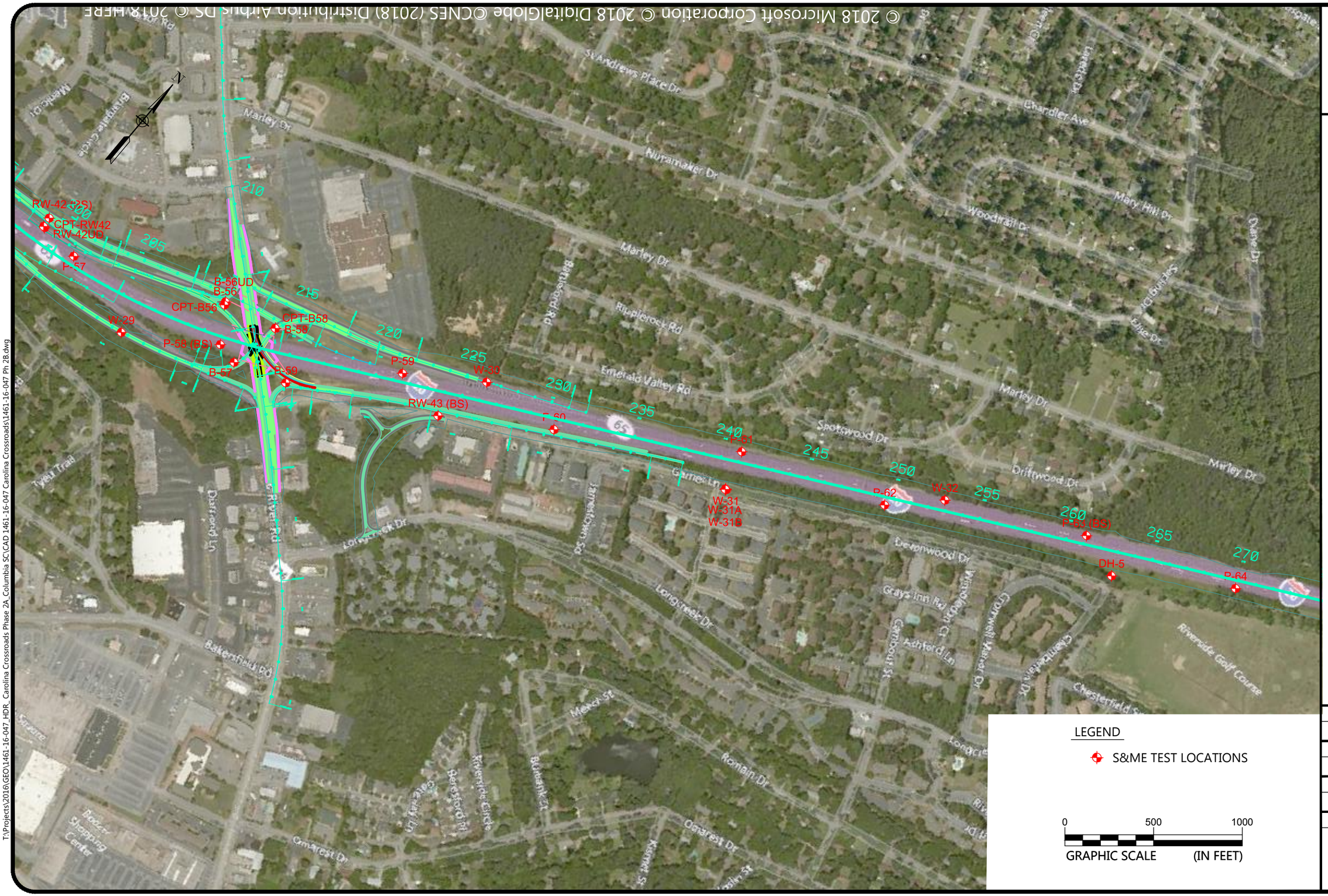

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LEGEND

S&ME TEST LOCATIONS

0 500 1000

GRAPHIC SCALE (IN FEET)

TEST LOCATION PLAN
PHASE 2B

I-20 STATION 200+00 TO STATION 270+00
I-20,26,126 CORRIDOR IMPROVEMENT PROJECT - PHASE 2B
COLUMBIA, SOUTH CAROLINA

SCALE:	AS SHOWN
DATE:	8-03-2018
PROJECT NUMBER	1461-16-047
FIGURE NO.	11

Appendix II –Tables

Table 1: Test Location Summary

Boring/CPT Number	Test/SampleType(s)				Northing (ft.)	Easting (ft.)	Latitude (degrees)	Longitude (degrees)	Elevation (ft-msl)	Route	Station	Offset (ft)
	SPT	Rock Core	Bulk	UD								
Bridge Borings												
B-29	X	X			799581.2	1967990.4	34.030949	-81.105665	225.1	Site 26 Bush River Road over I-26	78+44.84	L:37.56'
B-30	X				799421.7	1968868.7	34.030514	-81.102766	234.1	Site 26 Bush River Road over I-26	87+38.05	L:42.04'
B-31	X	X			798614.4	1968802.4	34.028294	-81.102982	205.7	Site 27 - I-126 C/D E Over I-26	8379+65.67	L:42.91'
B-32	X	X			798319.3	1968957.9	34.027484	-81.102468	194.7	Site 27 - I-126 C/D E Over I-26	8382+97.01	R:19.22'
B-33	X	X			798082.0	1968923.6	34.026832	-81.102580	183.3	Site 30 - I-26 Over CSX	385+33.31	L:2.608'
B-34	X	X			797694.0	1968896.9	34.025765	-81.102667	196.8	Site 33 - I-26 Over Saluda River	389+21.02	L:14.330'
B-34UD	X			X	797698.7	1968898.6	34.025778	-81.102661	196.7	Site 33 - I-26 Over Saluda River	389+16.20	L:15.195'
B-35	X	X			797942.7	1969287.7	34.026450	-81.101378	185.2	Site 31 - I-126 Ramp CA Over CSX	7388+25.51	L:145.51'
B-36	X	X			798093.3	1969190.2	34.026863	-81.101700	216.5	Site 29 - I-126 Ramp CA Over I-26 C/D E	7387+13.79	L:11.09'
B-36A		X			798101.0	1969190.2	34.026884	-81.101700	217.2	Site 29 - I-126 Ramp CA Over I-26 C/D E	7387+06.35	L:9.39'
B-37	X	X			797641.9	1970074.9	34.025625	-81.098778	185.2	Site 32 - I-126 Ramp DB Over I-26	6013+18.37	L:9.63'
B-38	X	X			796497.3	1970910.2	34.022482	-81.096018	184.6	Site 34 - Colonial Life Parkway Ramp A Over I-126 Ramp	3027+51.37	R:55.40'
B-39	X	X			796308.8	1970608.6	34.021963	-81.097012	177.1	Site 35 - I-26 Ramp C Over Wetlands to Colonial Life Parkway	5027+19.37	L:9.50'
B-40	X	X			795908.4	1971184.2	34.020864	-81.095111	193.8	Site 41 - Colonial Life Parkway Over I-126	11+56.38	L:7.30'
B-41	X	X			795928.3	1971304.4	34.020919	-81.094715	192.8	Site 41 - Colonial Life Parkway Over I-126	12+62.91	R:51.93'
B-41UD	X			X	795922.8	1971306.9	34.020904	-81.094706	192.5	Site 41 - Colonial Life Parkway Over I-126	12+61.44	R:57.82
B-42	X	X			796180.6	1971424.0	34.021612	-81.094321	218.6	Site 42 - Colonial Life Parkway Over Arrowood Road	15+14.99	L:70.78'
B-43	X	X			797147.8	1968668.9	34.024263	-81.103418	181.0	Site 33 - I-26 Over Saluda River	395+13.46	R:34.908'
B-44	X	X			796798.3	1968667.4	34.023303	-81.103422	165.5	Site 33 - I-26 Over Saluda River	398+36.32	L:98.897'
B-45	X	X			796553.3	1968540.2	34.022629	-81.103841	183.3	Site 33 - I-26 Over Saluda River	401+11.44	L:76.366'
B-46	X	X			796524.3	1968194.2	34.022548	-81.104982	168.9	Site 32 - I-126 Ramp DB Over I-26	5987+47.92	L:48.77'
B-47	X	X			797946.7	1961317.2	34.026437	-81.127687	198.1	Site 43 - I-20 Over Saluda River	86+30.73	L:46.226'
B-48	X	X			797445.7	1960995.4	34.025058	-81.128747	173.3	Site 43 - I-20 Over Saluda River	80+47.91	R:75.741'

Table 1: Test Location Summary												
Boring/CPT Number	Test/SampleType(s)				Northing (ft.)	Easting (ft.)	Latitude (degrees)	Longitude (degrees)	Elevation (ft-msl)	Route	Station	Offset (ft)
	SPT	Rock Core	Bulk	UD								
B-49	X	X			797785.7	1961164.4	34.025993	-81.128191	194.4	Site 43 - I-20 Over Saluda River	84+08.75	L:42.286'
B-50	X	X			798254.7	1961750.6	34.027285	-81.126258	212.6	Site 44 - I-20 Over CSX	91+54.21	R:46.690'
B-50UD	X			X	798252.0	1961750.6	34.027277	-81.126258	212.3	Site 44 - I-20 Over CSX	91+52.23	R:48.640'
B-51	X	X			798545.4	1961746.4	34.028083	-81.126273	214.8	Site 44 - I-20 Over CSX	93+58.51	L:160.130'
B-52	X	X			799928.5	1963107.4	34.031889	-81.121786	247.7	Site 40 - Bush River Road Eastbound Over I-20 (referenced to CL Bush River Road)	27+51.00	L:38.36'
B-53	X	X			799769.6	1963428.3	34.031454	-81.120726	246.2	Site 40 - Bush River Road Eastbound Over I-20 (referenced to CL Bush River Road)	31+09.08	L:38.31'
B-54	X	X			800824.9	1964119.4	34.034356	-81.118449	226.4	Site 36 - Executive Center Drive Over I-20	9138+98.59	L:7.78'
B-55	X	X			800694.0	1964259.4	34.033997	-81.117986	222.3	Site 36 - Executive Center Drive Over I-20	9140+89.58	L:23.76'
B-56	X	X			802730.8	1971322.3	34.039615	-81.094676	305.8	Site 38 - I-20 Broad River Road and Broad River Road Ramp F1 over I-20 C/D W1	201+60.83	L:183.302'
B-56UD	X			X	802739.7	1971317.7	34.039639	-81.094691	305.8	Site 38 - I-20 Broad River Road and Broad River Road Ramp F1 over I-20 C/D W1	201+59.65	L:193.265'
B-57	X	X			802509.4	1971574.2	34.039007	-81.093844	311.6	Site 37 - Broad River Road over I-20	203+12.24	R:116.704'
B-58	X				802805.9	1971629.1	34.039822	-81.093664	318.6	Site 39 - Broad River Road Ramp E1 over I-20 C/D W1	204+85.63	L:130.273'
B-59	X	X			802608.1	1971871.4	34.039279	-81.092863	322.4	Site 37 - Broad River Road over I-20	206+15.30	R:154.848'
B-60	X	X			796684.3	1970396.7	34.022994	-81.097713	173.8	Site 35 - I-26 Ramp C Over Wetlands to Colonial Life Parkway	5022+82.85	L:80.55'
B-61	X	X			797478.1	1969704.1	34.025174	-81.100002	171.5	Site 35 - I-26 Ramp C Over Wetlands to Colonial Life Parkway	5012+32.75	L:7.70'
B-62	X	X			797410.5	1968509.9	34.024985	-81.103943	167.2	Site 32 - I-126 Ramp DB Over I-26	5996+61.92	L:82.84'
DH-4	X	X			797125.3	1960695.8	34.024177	-81.129735	185.7	Site 43 - I-20 Over Saluda River	76+09.40	R:86.778'
DH-5	X	X			804767.0	1976137.4	34.045222	-81.078785	165.6	I-20	262+96.46	R:138.025'
DH-6	X	X			793186.3	1966980.6	34.013371	-81.108977	241.1	I-26	438+20.13	R:100.215'
Pavement Borings												
P-1	X		X		826771.2	1944939.7	34.105588	-81.181915	322.6	I-26	9+96.46	R:54.189'
P-2	X				825938.3	1945802.7	34.103304	-81.179059	313.3	I-26	21+90.37	L:59.876'
P-3	X				825274.3	1946223.4	34.101481	-81.177665	316.4	I-26	29+68.41	R:52.400'
P-4	X				824624.7	1946943.0	34.099699	-81.175284	328.7	I-26	39+31.76	L:49.101'

Table 1: Test Location Summary												
Boring/CPT Number	Test/SampleType(s)				Northing (ft.)	Easting (ft.)	Latitude (degrees)	Longitude (degrees)	Elevation (ft-msl)	Route	Station	Offset (ft)
	SPT	Rock Core	Bulk	UD								
P-5	X		X		823809.4	1947553.3	34.097461	-81.173264	325.5	I-26	49+45.25	R:51.233'
P-6	X				822778.8	1948651.3	34.094634	-81.169631	329.5	I-26	64+46.81	L:62.779'
P-7	X				822316.9	1948918.5	34.093365	-81.168746	333.3	I-26	69+67.88	R:52.021'
P-8	X				821633.1	1949690.0	34.091489	-81.166193	299.1	I-26	79+93.28	L:55.315'
P-9	X				820821.8	1950281.1	34.089262	-81.164236	300.8	I-26	89+92.10	R:49.026'
P-10	X		X		819840.2	1951232.6	34.086569	-81.161088	286.8	I-26	103+56.27	L:52.118'
P-11	X				819275.8	1951550.0	34.085019	-81.160037	273.9	I-26	109+93.55	R:62.520'
P-12	X				818571.0	1952277.1	34.083085	-81.157632	285.9	I-26	119+99.95	L:49.323'
P-13	X				817713.9	1952864.8	34.080732	-81.155686	305.6	I-26	130+35.10	R:43.277'
P-14	X				817035.1	1953547.2	34.078869	-81.153429	320.6	I-26	139+93.05	L:50.625'
P-15	X		X		816201.4	1954109.2	34.076580	-81.151569	298.4	I-26	149+93.71	R:46.977'
P-16	X				815489.1	1954823.5	34.074625	-81.149206	269.5	I-26	159+97.75	L:50.299'
P-17	X				814655.9	1955383.9	34.072338	-81.147351	248.8	I-26	169+97.02	R:48.231'
P-18	X				813342.0	1956596.5	34.068731	-81.143340	251.6	I-26	187+82.27	L:50.143'
P-19	X				813120.5	1956646.2	34.068123	-81.143175	253.3	I-26	189+84.74	R:52.628'
P-20	X		X		812394.4	1957377.1	34.066130	-81.140758	265.7	I-26	200+10.01	L:48.555'
P-21	X				812120.9	1957472.0	34.065378	-81.140443	276.7	I-26	202+81.38	R:52.389'
P-22	X				810880.8	1958686.5	34.061975	-81.136427	280.6	I-26	220+13.96	L:47.810'
P-23	X				810085.4	1959273.1	34.059791	-81.134487	289.0	I-26	229+97.30	R:50.727'
P-24	X				809407.1	1960020.0	34.057929	-81.132018	313.4	I-26	240+01.36	L:48.122'
P-25	X		X		808591.7	1960624.5	34.055690	-81.130018	306.6	I-26	250+11.59	R:50.568'
P-26	X				807943.8	1961344.7	34.053912	-81.127638	290.6	I-26	259+75.18	L:48.881'
P-27	X				807117.6	1961959.2	34.051643	-81.125605	253.7	I-26	270+00.20	R:49.706'
P-28	X				806436.2	1962709.9	34.049773	-81.123124	244.9	I-26	280+09.08	L:49.923'

Table 1: Test Location Summary												
Boring/CPT Number	Test/SampleType(s)				Northing (ft.)	Easting (ft.)	Latitude (degrees)	Longitude (degrees)	Elevation (ft-msl)	Route	Station	Offset (ft)
	SPT	Rock Core	Bulk	UD								
P-29	X				804933.8	1963886.6	34.045648	-81.119233	229.0	I-26	299+16.78	R:48.984'
P-30	X		X		804907.6	1964033.6	34.045576	-81.118747	223.6	I-26	300+28.37	L:50.329'
P-31	X				804268.4	1964393.7	34.043821	-81.117556	211.8	I-26	307+53.30	R:62.276'
P-32	X				803370.2	1965273.3	34.041355	-81.114649	220.4	I-26	320+03.12	L:72.950'
P-33	X				802506.7	1965782.4	34.038983	-81.112965	261.0	I-26	329+96.47	R:61.411'
P-34	X				800951.4	1967063.8	34.034713	-81.108729	269.3	I-26	350+08.46	R:60.765'
P-35	X		X		800246.7	1967870.7	34.032778	-81.106063	234.3	I-26	360+71.55	L:71.788'
P-36	X				799408.2	1968441.9	34.030475	-81.104174	214.3	I-26	370+82.46	R:51.185'
P-37	X				798778.1	1969119.7	34.028745	-81.101935	209.6	I-26	379+06.59	L:288.751'
P-38	X				797413.0	1970040.2	34.024996	-81.098892	184.0	I-126	5+98.81	R:47.194'
P-39	X				797184.6	1970336.8	34.024369	-81.097912	184.1	I-126	9+60.12	L:50.775'
P-40	X				796376.1	1970830.1	34.022148	-81.096282	186.3	I-126	19+02.35	R:45.668'
P-41	X		X		795663.6	1971525.7	34.020192	-81.093984	199.1	I-126	28+96.62	L:60.981'
P-42	X		X		794943.4	1972218.6	34.018214	-81.091694	212.0	I-126	38+95.07	R:46.322'
P-43	X		X		794574.4	1973182.3	34.017202	-81.088513	184.4	I-126	49+18.58	L:70.173'
P-44	X		X		796483.0	1959875.5	34.022409	-81.132440	220.3	I-20	74+76.27	L:47.554'
P-45	X				797124.9	1960638.9	34.024176	-81.129923	193.4	I-20	84+69.20	R:46.558'
P-47	X		X		798561.3	1962050.8	34.028128	-81.125269	220.7	I-20	104+83.25	R:45.744'
P-48	X				799406.5	1962748.0	34.030453	-81.122970	217.0	I-20	115+74.80	L:49.969'
P-49	X				800015.9	1963500.1	34.032131	-81.120490	232.7	I-20	125+36.64	R:58.851'
P-50	X		X		800783.4	1964155.3	34.034242	-81.118330	228.6	I-20	135+36.40	L:59.711'
P-51	X				801154.4	1965053.2	34.035264	-81.115367	209.7	I-20	145+03.22	R:56.389'
P-52	X				801537.7	1965827.7	34.036320	-81.112812	233.5	I-20	153+63.31	L:49.364'
P-53	X		X		801970.2	1967089.2	34.037513	-81.108649	278.2	I-20	166+96.89	L:49.023'

Table 1: Test Location Summary												
Boring/CPT Number	Test/SampleType(s)				Northing (ft.)	Easting (ft.)	Latitude (degrees)	Longitude (degrees)	Elevation (ft-msl)	Route	Station	Offset (ft)
	SPT	Rock Core	Bulk	UD								
P-54	X				801990.5	1967455.4	34.037569	-81.107440	287.5	I-20	170+49.83	R:50.696'
P-55	X				802313.0	1968378.5	34.038459	-81.104394	289.1	I-20	180+24.57	L:46.514'
P-56	X		X		802260.1	1969533.5	34.038316	-81.100580	314.9	I-20	191+75.79	R:50.067'
P-57	X				802386.5	1970497.2	34.038666	-81.097399	311.6	I-20	201+46.64	L:49.658'
P-58	X		X		802536.3	1971450.8	34.039080	-81.094251	306.2	I-20	211+10.61	R:44.689'
P-59	X				803072.7	1972341.5	34.040557	-81.091312	308.6	I-20	221+43.83	L:49.641'
P-60	X				803378.4	1973199.2	34.041399	-81.088482	276.7	I-20	230+47.56	R:61.676'
P-61	X				803963.1	1974090.3	34.043008	-81.085541	234.0	I-20	241+06.24	L:61.325'
P-62	X				804250.7	1974900.6	34.043800	-81.082867	200.3	I-20	249+59.48	R:44.881'
P-63	X		X		804849.9	1975883.3	34.045449	-81.079624	179.2	I-20	261+06.50	L:50.047'
P-64	X				805161.9	1976718.5	34.046308	-81.076867	177.4	I-20	269+92.95	R:45.622'
P-65	X		X		798850.6	1968889.1	34.028944	-81.102697	207.9	I-26	377+80.48	L:89.300'
P-66	X				797429.7	1968908.4	34.025039	-81.102628	188.3	I-26	391+69.40	L:88.718'
P-67	X		X		796311.9	1968315.9	34.021965	-81.104580	184.6	I-26	404+20.26	R:38.874'
P-68	X				795404.2	1968061.9	34.019470	-81.105415	199.5	I-26	413+57.20	L:63.70'
P-69	X				794300.8	1967497.4	34.016435	-81.107275	196.1	I-26	425+91.48	R:48.896'
P-70	X		X		793377.8	1967235.4	34.013898	-81.108136	225.0	I-26	435+44.66	L:60.234'
P-71	X				792536.2	1966761.3	34.011584	-81.109698	265.1	I-26	445+04.36	R:49.610'
Embankment Borings												
RW-35	X		X		799067.7	1968905.5	34.029541	-81.102643	210.8	I-26	375+94.91	L:182.418'
RW-36	X		X		797897.7	1969505.0	34.026327	-81.100660	188.5	Site 29 - I-126 Ramp CA Over I-26 C/D E	8389+85.83	R:0.33'
RW-37	X		X		794575.7	1972825.8	34.017205	-81.089689	191.1	I-126	45+97.78	R:85.435'
RW-38	X		X		796334.8	1968135.7	34.022027	-81.105175	169.4	Site 32 - I-126 Ramp DB Over I-26	5985+51.15	L:73.93'
RW-39	X		X		794716.8	1967789.7	34.017580	-81.106312	199.3	I-26	420+96.48	L:67.234'

Table 1: Test Location Summary												
Boring/CPT Number	Test/SampleType(s)				Northing (ft.)	Easting (ft.)	Latitude (degrees)	Longitude (degrees)	Elevation (ft-msl)	Route	Station	Offset (ft)
	SPT	Rock Core	Bulk	UD								
RW-40	X		X		796143.3	1959522.5	34.021474	-81.133604	238.9	I-20	69+86.46	L:60.995'
RW-41	X		X		801090.2	1965456.0	34.035089	-81.114037	211.1	Site 15 - I-20 Ramp C1 Over I-26 Ramp BD & I-20 Ramp AC	5148+49.42	L:22.05'
RW-42	X		X		802462.7	1970253.1	34.038875	-81.098205	312.4	I-20	199+04.58	L:148.652'
RW-42UD	X			X	802404.5	1970267.1	34.038715	-81.098159	313.7	I-20	199+15.15	L:89.726'
RW-43	X		X		803017.8	1972648.6	34.040407	-81.090298	304.1	I-20	223+93.71	R:137.088'
Wall Borings												
W-18	X	X			801270.1	1964835.3	34.035582	-81.116087	194.2	Site 24 - I-20 C/C W2 Over Bush River Road E	3144+03.93	R:35.75'
W-18UD	X			X	801268.8	1964830.5	34.035578	-81.116103	194.3	Site 24 - I-20 C/C W2 Over Bush River Road E	3143+99.08	R:34.55'
W-19	X	X			800941.1	1965443.3	34.034679	-81.114079	201.9	Site 21 - I-20 Ramp C2 Over I-126 C/D E	5148+29.97	R:38.10'
W-22	X	X			795991.8	1968312.5	34.021085	-81.104590	185.9	I-26	407+18.51	L:77.239'
W-23	X	X			796966.2	1970751.3	34.023770	-81.096544	185.6	Site 32 - I-126 Ramp DB Over I-26	6022+73.17	L:53.37'
W-23UD	X			X	796959.8	1970750.5	34.023752	-81.096546	185.8	Site 32 - I-126 Ramp DB Over I-26	6022+77.81	L:49.00'
W-24	X	X			792639.3	1966988.6	34.011868	-81.108948	277.3	I-26	443+21.08	L:119.722'
W-25	X	X			792304.1	1966545.8	34.010945	-81.110409	275.7	I-26	448+01.98	R:158.081'
W-27	X	X			802157.0	1968592.6	34.038030	-81.103686	275.3	I-20	182+20.61	R:133.688'
W-27UD	X			X	802153.0	1968590.9	34.038019	-81.103692	275.2	I-20	182+18.46	R:137.491'
W-28	X				802227.7	1969995.0	34.038228	-81.099057	319.9	I-20	196+37.42	R:79.032'
W-29	X	X			802230.4	1970978.7	34.038238	-81.095809	284.2	I-20	205+83.54	R:192.263'
W-30	X	X			803339.1	1972737.1	34.041290	-81.090007	292.4	I-20	226+16.92	L:110.400'
W-31	X				803742.1	1974159.7	34.042401	-81.085312	224.7	I-20	240+69.16	R:167.336'
W-31A					803744.7	1974156.2	34.042408	-81.085323	223.9	I-20	240+67.18	R:163.335'
W-31B					803741.1	1974155.9	34.042398	-81.085324	224.2	I-20	240+65.25	R:166.494'
W-32	X	X			804490.3	1975143.3	34.044459	-81.082066	189.8	I-20	252+83.83	L:60.487'
CPT and DMT Soundings												

Table 1: Test Location Summary												
Boring/CPT Number	Test/SampleType(s)				Northing (ft.)	Easting (ft.)	Latitude (degrees)	Longitude (degrees)	Elevation (ft-msl)	Route	Station	Offset (ft)
	SPT	Rock Core	Bulk	UD								
CPT-B41					795923.9	1971303.3	34.020907	-81.094718	192.5	Site 41 - Colonial Life Parkway Over I-126	12+59.25	R:54.70'
DMT-B41					795927.8	1971300.3	34.020917	-81.094728	192.4	Site 41 - Colonial Life Parkway Over I-126	12+29.35	R:49.89'
CPT-RW42					802406.6	1970259.1	34.038721	-81.098185	313.3	I-20	199+07.03	L:92.27'
CPT-B34					797618.6	1968988.3	34.025558	-81.102365	195.5	I-26	7392+28.70	R:9.45'
DMT-B34					797621.9	1968989.7	34.025567	-81.102360	195.7	I-26	7392+25.09	R:9.46'
CPT-RW17					804869.1	1964276.6	34.045472	-81.117945	213.0	I-26	302+08.92	L:217.42'
CPT-B12					801172.6	1966717.0	34.035320	-81.109875	270.2	Site 9 - I-20 Ramp C over I-26 C/D/E & I-26	5161+13.11	L17.95'
CPT-B56					802722.6	1971324.6	34.039592	-81.094669	305.3	Site 38 - I-20 Broad River Road and Broad River Road Ramp F1 over I-20 C/D W1	201+59.94	L:174.84'
CPT-B58					802805.6	1971628.3	34.039821	-81.093666	318.1	Site 39 - Broad River Road Ramp E1 over I-20 C/D W1	204+84.79	L:130.37'
CPT-RW6					818804.7	1951943.3	34.083726	-81.158735	277.2	I-26	116+07.20	R:59.21'
CPT-RW24					802137.3	1966242.2	34.037969	-81.111446	274.9	I-26	335+71.21	L:71.25'
CPT-RW32					800464.4	1967475.8	34.033375	-81.107367	249.7	I-26	356+46.09	R:77.77

Table 2: Split Spoon Samples – Laboratory Classification Testing Summary

Boring Number	Sample Number	Sample Depth (ft)	Natural Moisture (%)	Atterberg Limits			Percent Finer #200 (%)	Organic Content (%)	Soil Classification	
				LL	PL	PI			AASHTO	USCS
B-29	SS-1	1.0 - 3.0	12.7	23	12	11	32.4	TNP	A-2-6 (0)	SC
	SS-5	9.0 - 11.0	23.7	58	25	33	74.4	TNP	A-7-6 (25)	CH
	SS-8	24.5 - 26.0	45.7	89	31	58	96.7	TNP	A-7-5 (67)	CH
	SS-12	44.5 - 46.0	22.6	42	28	14	89.8	TNP	A-7-6 (15)	ML
B-30	SS-3	4.0 - 6.0	15.9	37	16	21	45.3	TNP	A-6 (5)	SC
	SS-8	23.5 - 25.0	39.3	50	26	24	91.4	TNP	A-7-6 (25)	CH
	SS-16	63.5 - 65.0	20.3	39	28	11	77.9	TNP	A-6 (9)	ML
	SS-19	78.5 - 80.0	18.3	36	25	11	74.1	TNP	A-6 (8)	ML
B-31	SS-1	0.0 - 2.0	25.3	45	28	17	72.6	TNP	A-7-6 (13)	ML
	SS-5	8.0 - 10.0	27.8	45	32	13	82.5	TNP	A-7-5 (13)	ML
B-32	SS-1	0.0 - 2.0	26.3	45	21	24	48.0	TNP	A-7-6 (8)	SC
	SS-2	2.0 - 4.0	10.9	32	17	15	17.4	TNP	A-2-6 (0)	GC
	SS-4	6.0 - 8.0	34.6	43	32	11	70.3	TNP	A-7-5 (8)	ML
B-33	SS-1	0.0 - 2.0	17.0	38	18	20	75.9	TNP	A-6 (14)	CL
	SS-3	4.0 - 6.0	20.8	50	29	21	68.1	TNP	A-7-6 (14)	MH
	SS-5	8.0 - 10.0	40.9	42	31	11	92.4	TNP	A-7-5 (13)	ML
B-34	SS-2	3.0 - 5.0	29.0	43	27	16	62.2	TNP	A-7-6 (9)	ML
	SS-5	9.0 - 11.0	18.5	39	18	21	41.6	TNP	A-6 (4)	SC
	SS-10	33.5 - 35.0	24.5	23	16	7	69.0	TNP	A-4 (2)	CL-ML
	SS-11	38.5 - 40.0	30.9	37	23	14	69.3	TNP	A-6 (8)	CL
B-35	SS-1	0.0 - 2.0	22.6	47	29	18	75.8	TNP	A-7-6 (15)	ML
	SS-5	8.0 - 10.0	17.3	29	20	9	73.1	TNP	A-4 (5)	CL
B-36	SS-1	0.0 - 2.0	10.2	21	12	9	24.3	TNP	A-2-4	SC
	SS-2	2.0 - 4.0	13.2	37	15	22	30.4	TNP	A-2-6	SC
	SS-5	8.0 - 10.0	18.8	52	23	29	44.5	TNP	A-7-6 (8)	SC
	SS-8	23.5 - 25.0	38.0	87	30	57	82.8	TNP	A-7-5 (53)	CH
	SS-10	33.5 - 35.0	21.0	NP**	NP**	NP**	83.6	TNP	A-4 (0)	ML
B-37	SS-1	0.4 - 2.4	18.9	49	22	27	51.4	TNP	A-7-6 (10)	CL
	SS-3	4.4 - 6.4	32.9	77	23	54	85.8	TNP	A-7-6 (51)	CH
	SS-6	9.5 - 11.5	28.0	TNP	TNP	TNP	88.1	TNP	N/A	ML
	SS-8	18.5 - 20.0	15.8	26	19	7	36.1	TNP	A-4 (0)	SC-SM
B-38	SS-2	2.0 - 4.0	16.3	36	17	19	46.0	TNP	A-6 (5)	SC
	SS-4	6.0 - 8.0	22.1	53	27	26	66.4	TNP	A-7-6 (16)	CH
	SS-5	8.0 - 10.0	27.1	54	23	31	42.6	TNP	A-7-6 (8)	SC
B-39	SS-1	0.0 - 2.0	14.2	37	20	17	48.4	TNP	A-6 (5)	SC
	SS-2	2.0 - 4.0	8.5	NP**	NP**	NP**	34.2	TNP	A-2-4	SM
	SS-3	6.0 - 8.0	18.2	TNP	TNP	TNP	52.7	1.3	N/A	CL
B-40	SS-3	4.8 - 6.8	13.0	26	17	9	39.6	TNP	A-4 (0)	SC
	SS-5	8.8 - 10.8	21.7	55	25	30	58.3	TNP	A-7-6 (15)	CH
	SS-7	18.5 - 20.0	37.8	60	33	27	96.4	TNP	A-7-5 (32)	MH
	SS-8	23.5 - 25.0	25.1	38	20	18	59.8	TNP	A-6 (8)	CL

Table 2: Split Spoon Samples – Laboratory Classification Testing Summary

Boring Number	Sample Number	Sample Depth (ft)	Natural Moisture (%)	Atterberg Limits			Percent Finer #200 (%)	Organic Content (%)	Soil Classification	
				LL	PL	PI			AASHTO	USCS
B-41	SS-2	2.8 - 4.8	16.4	40	22	18	74.5	TNP	A-6 (13)	CL
	SS-4	6.8 - 8.8	22.0	51	25	26	52.1	TNP	A-7-6 (10)	CH
	SS-7	18.5 - 20.0	30.0	50	21	29	80.1	TNP	A-7-6 (24)	CH
	SS-9	28.5 - 30.0	24.5	NP**	NP**	NP**	12.9	TNP	A-2-4	SM
B-42	SS-1	0.8 - 2.8	17.3	29	17	12	42.4	TNP	A-6 (2)	SC
	SS-3	4.8 - 6.8	23.9	51	29	22	59.7	TNP	A-7-6 (12)	MH
	SS-7	18.5 - 20.0	27.1	39	28	11	40.8	TNP	A-6 (1)	SM
	SS-10	33.5 - 35.0	25.7	32	29	3	41.1	TNP	A-4 (0)	SM
B-43	SS-1	14.8 - 16.8	18.6	NP**	NP**	NP**	30.7	TNP	A-2-4	SM
	SS-2	16.8 - 18.8	20.6	34	19	15	68.3	TNP	A-6 (8)	CL
	SS-6	28.3 - 29.8	19.2	NP**	NP**	NP**	33.9	TNP	A-2-4	SM
B-44	SS-1	0.0 - 2.0	16.6	25	19	6	59.6	TNP	A-4 (1)	CL-ML
B-45	SS-1	0.8 - 2.8	11.0	20	16	4	24.0	TNP	A-2-4	SC-SM
B-46	SS-1	0.0 - 2.0	28.7	32	21	11	80	TNP	A-6 (8)	CL
	SS-2	2.0 - 4.0	20.7	32	19	13	73	TNP	A-6 (8)	CL
B-47	SS-1	1.0 - 3.0	15.3	30	17	13	57.2	TNP	A-6 (5)	CL
	SS-4	7.0 - 9.0	17.7	35	26	9	71.7	TNP	A-4 (6)	ML
	SS-8	24.5 - 26.0	23.5	39	25	14	41.5	TNP	A-6 (2)	SC
B-48	SS-1	0.0 - 2.0	13.0	30	18	12	57	TNP	A-6 (4)	CL
	SS-2	2.0 - 4.0	29.3	40	24	16	84	TNP	A-6 (14)	CL
	SS-4	6.0 - 8.0	17.0	32	23	9	39	TNP	A-4 (0)	SM
B-49	SS-1	24.5 - 26.5	24.0	32	23	9	35.0	3.0	A-2-4	SC
	SS-2	26.5 - 28.5	23.0	25	17	8	43.3	TNP	A-4 (0)	SC
	SS-4	30.5 - 32.5	49.0	39	25	14	75.5	TNP	A-6 (10)	CL
	SS-5	32.5 - 34.5	47.0	25	NP**	NP**	35.8	TNP	A-4 (0)	SM
B-50	SS-4	7.0 - 9.0	14.5	35	28	7	80.7	TNP	A-4 (6)	ML
	SS-6	13.5 - 15.0	13.9	37	23	14	67.3	TNP	A-6 (8)	CL
	SS-8	23.5 - 25.0	18.7	42	28	14	62.7	TNP	A-7-6 (8)	ML
	SS-10	33.5 - 35.0	28.8	51	32	19	75.8	2.1	A-7-5 (16)	MH
	SS-14	53.5 - 55.0	28.0	26	22	4	32.6	TNP	A-2-4	SC-SM
B-51	SS-1	0.0 - 2.0	18.2	50	26	24	46.5	TNP	A-7-6 (7)	SC
	SS-6	13.5 - 15.0	16.5	43	28	15	46.4	TNP	A-7-6 (4)	SM
	SS-9	28.5 - 30.0	23.4	39	26	13	80.4	TNP	A-6 (11)	ML
B-52	SS-1	0.0 - 2.0	14.0	46	21	24	44.4	TNP	A-7-6 (6)	SC
	SS-2	2.0 - 4.0	11.9	36	27	9	76.7	TNP	A-4 (7)	ML
	SS-6	13.5 - 15.0	22.3	67	30	37	54.7	TNP	A-7-5 (17)	CH
	SS-9	28.5 - 30.0	22.5	41	33	8	78.7	TNP	A-5 (8)	ML
B-53	SS-1	0.0 - 2.0	10.8	--*	--*	--*	30.2	TNP	A-2-4*	SM
	SS-5	8.0 - 10.0	22.4	37	28	8	70.9	TNP	A-4 (6)	ML
	SS-1	0.4 - 2.4	22.3	48	26	22	84	TNP	A-7-6 (20)	CL

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Boring Number	Sample Number	Sample Depth (ft)	Natural Moisture (%)	Atterberg Limits			Percent Finer #200 (%)	Organic Content (%)	Soil Classification	
				LL	PL	PI			AASHTO	USCS
B-54	SS-2	2.4 - 4.4	25.6	51	32	19	91	TNP	A-7-5 (21)	MH
	SS-10	33.9 - 35.4	34.0	38	26	12	81	TNP	A-6 (10)	ML
B-55	SS-1	1.2 - 3.2	25.8	49	30	19	87.1	2.3	A-7-5 (19)	ML
	SS-5	9.2 - 11.2	16.5	28	23	5	65.3	TNP	A-4 (2)	ML
	SS-9	28.5 - 30.0	20.6	32	26	6	83.8	TNP	A-4 (5)	ML
B-56	SS-1	0.0 - 2.0	21.0	44	23	21	61.8	TNP	A-7-6 (11)	CL
	SS-2	2.0 - 4.0	19.3	57	29	28	61.2	TNP	A-7-6 (16)	CH
	SS-10	33.5 - 35.0	38.6	60	36	24	75.8	TNP	A-7-5 (21)	MH
B-57	SS-1	0.0 - 2.0	17.2	41	33	8	65.5	TNP	A-5 (8)	ML
	SS-6	13.5 - 15.0	19.9	55	29	26	34.8	TNP	A-2-7 (3)	SC
	SS-11	38.5 - 40.0	39.1	49	30	19	82.6	TNP	A-7-5 (18)	ML
	SS-15	58.5 - 60.0	20.0	41	27	14	66.4	TNP	A-7-6 (8)	ML
B-58	SS-1	0.0 - 2.0	13.0	66	25	41	46	TNP	A-7-6 (13)	SC
	SS-6	13.5 - 15.0	20.8	83	32	51	43	TNP	A-7-5 (15)	SC
	SS-8	23.5 - 25.0	18.1	45	23	22	26	TNP	A-2-7 (0)	SC
	SS-10	33.5 - 35.0	22.1	45	27	18	26	TNP	A-2-7 (0)	SM
	SS-13	48.5 - 50.0	28.0	48	30	18	78	TNP	A-7-5 (15)	ML
B-59	SS-3	4.0 - 6.0	14.8	53	27	26	35.3	TNP	A-2-7 (3)	SC
	SS-7	18.5 - 20.0	26.6	58	33	25	66.1	TNP	A-7-5 (17)	MH
	SS-10	33.5 - 35.0	45.4	47	34	13	92.9	TNP	A-7-5 (16)	ML
	SS-14	53.5 - 55.0	27.2	31	23	8	90.3	TNP	A-4 (7)	CL
B-60	SS-1	0.0 - 2.0	19.2	51	24	27	56	TNP	A-7-6 (12)	CH
	SS-2	2.0 - 4.0	11.0	20	13	7	35	TNP	A-2-4	SC-SM
	SS-3	4.0 - 6.0	17.1	35	20	15	35	TNP	A-2-6	SC
B-61	SS-1	0.0 - 2.0	14.7	56	27	29	43	TNP	A-7-6 (8)	SC
	SS-6	13.5 - 15.0	25.0	39	17	22	50	TNP	A-6 (7)	CL
	SS-7	18.5 - 20.0	17.0	40	28	12	47	TNP	A-6 (3)	SM
B-62	SS-1	0.0 - 2.0	19.6	25	16	9	56	TNP	A-4 (2)	CL
	SS-2	2.0 - 4.0	11.2	NP**	NP**	NP**	17	TNP	A-2-4	SM
	SS-5	8.0 - 10.0	27.1	45	30	15	81	TNP	A-7-5 (14)	ML
DH-4	SS-1	0.0 - 2.0	10.5	24	14	10	28.4	TNP	A-2-4	SC
	SS-2	2.0 - 4.0	17.2	42	23	19	65.6	TNP	A-7-6 (11)	CL
	SS-4	6.0 - 8.0	16.7	44	21	23	27.1	TNP	A-2-7 (2)	SC
	SS-6	13.5 - 15.0	31.2	63	38	25	80.9	TNP	A-7-5 (24)	MH
DH-5	SS-1	0.0 - 2.0	13.6	24	17	7	70.8	TNP	A-4 (3)	CL-ML
	SS-2	2.0 - 4.0	26.3	50	22	28	79.5	TNP	A-7-6 (23)	CH
	SS-3	4.0 - 6.0	20.0	38	24	14	66.6	TNP	A-6 (8)	CL
	SS-4	6.0 - 8.0	13.1	32	25	7	49.5	TNP	A-4 (1)	SM
	SS-1	0.0 - 2.0	19.4	50	23	27	52.1	TNP	A-7-6 (11)	CH

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Boring Number	Sample Number	Sample Depth (ft)	Natural Moisture (%)	Atterberg Limits			Percent Finer #200 (%)	Organic Content (%)	Soil Classification	
				LL	PL	PI			AASHTO	USCS
DH-6	SS-2	2.0 - 4.0	17.2	50	26	24	46.9	TNP	A-7-6 (7)	SC
	SS-3	4.0 - 6.0	20.9	48	25	23	46.3	TNP	A-7-6 (7)	SC
P-1	SS-1	0.5 - 2.5	16	30	22	8	55	TNP	A-4 (2)	CL
P-2	SS-1	1.0 - 3.0	15	29	18	11	40.5	TNP	A-6 (1)	SC
P-3	SS-1	0.9 - 2.9	22	27	19	8	43	TNP	A-4 (1)	SC
P-4	SS-1	0.8 - 2.2	4	--*	--*	--*	12.3	TNP	A-1-b*	SM
P-5	SS-1	0.4 - 2.4	21	37	22	15	47	TNP	A-6 (4)	SC
P-6	SS-1	1.1 - 3.1	42	97	37	60	93	TNP	A-7-5 (67)	CH
P-7	SS-1	1.0 - 3.0	19	36	24	12	66	TNP	A-6 (7)	CL
P-8	SS-1	0.8 - 2.8	31	--*	--*	--*	70.3	TNP	A-4 (0)	ML
P-9	SS-1	0.7 - 2.7	8	22	15	7	23	TNP	A-2-4	SC-SM
P-10	SS-1	1.2 - 3.0	10	31	23	8	16.4	TNP	A-2-4	SM
P-11	SS-1	1.5 - 3.5	23	46	25	21	70	TNP	A-7-6 (14)	CL
P-12	SS-1	1.3 - 2.7	6	27	21	6	17.1	TNP	A-1-b	SC-SM
P-13	SS-1	1.5 - 3.5	15	31	21	10	52	TNP	A-4 (3)	CL
P-14	SS-1	0.7 - 2.7	26	51	25	26	64.7	TNP	A-7-6 (16)	CH
P-15	SS-1	1.0 - 3.0	9	NP**	NP**	NP**	15	TNP	A-2-4	SM
P-16	SS-1	0.8 - 2.8	10	23	15	8	23.9	TNP	A-2-4	SC
P-17	SS-1	0.7 - 2.7	15	37	19	18	58	TNP	A-6 (8)	CL
P-18	SS-1	1.3 - 3.3	20	46	31	15	56.7	TNP	A-7-5 (7)	ML
P-19	SS-1	1.3 - 2.7	10	40	26	14	65	TNP	A-6 (8)	ML
P-20	SS-1	1.5 - 3.5	22	30	17	13	26.4	TNP	A-2-6	SC
P-21	SS-1	1.4 - 3.4	28	62	31	31	77	TNP	A-7-5 (26)	CH
P-22	SS-1	0.8 - 2.8	10	20	15	5	24.3	TNP	A-2-4	SC-SM
P-23	SS-1	0.9 - 2.9	9	25	19	6	33	TNP	A-2-4	SC-SM
P-24	SS-1	0.7 - 2.7	9	33	27	6	33.0	TNP	A-2-4	SM
P-25	SS-1	0.9 - 2.9	13	28	16	12	18	TNP	A-2-6	SC
P-26	SS-1	0.6 - 2.6	38	55	38	17	93.6	TNP	A-7-5 (22)	MH
P-27	SS-1	1.1 - 3.1	19	21	17	4	19	TNP	A-2-4	SC-SM
P-28	SS-1	0.7 - 2.7	10	19	16	3	16.5	TNP	A-2-4	SM
P-29	SS-1	1.3 - 3.3	9	18	16	2	19	TNP	A-2-4	SM
P-30	SS-1	0.7 - 2.7	17	33	20	13	38.7	TNP	A-6 (1)	SC
P-31	SS-1	1.2 - 3.2	11	21	16	5	23	TNP	A-2-4	SC-SM
P-32	SS-1	0.9 - 2.9	23	54	30	24	69	TNP	A-7-5 (17)	MH
P-33	SS-1	1.3 - 3.3	20	50	24	26	52	TNP	A-7-6 (10)	CH
P-34	SS-1	0.7 - 2.7	19	34	17	17	66	TNP	A-6 (10)	CL
P-35	SS-1	0.8 - 2.8	25	33	19	14	46	TNP	A-6 (3)	SC
P-36	SS-1	0.9 - 2.9	12	--*	--*	--*	19	TNP	A-1-b*	SM
P-37	SS-1	2.0 - 4.0	44	58	39	19	66	TNP	A-7-5 (14)	MH

Table 2: Split Spoon Samples – Laboratory Classification Testing Summary

Boring Number	Sample Number	Sample Depth (ft)	Natural Moisture (%)	Atterberg Limits			Percent Finer #200 (%)	Organic Content (%)	Soil Classification	
				LL	PL	PI			AASHTO	USCS
P-38	SS-1	0.8 - 2.8	14	32	14	18	27.9	TNP	A-2-6	SC
P-39	SS-1	0.8 - 2.8	11	32	15	17	39	TNP	A-6 (2)	SC
P-40	SS-1	0.9 - 2.9	14	27	18	9	26	TNP	A-2-4	SC
P-41	SS-1	2.0 - 4.0	23	42	32	10	30	TNP	A-2-5	SM
P-42	SS-1	0.8 - 2.8	17.6	44	19	25	49.3	TNP	A-7-6 (8)	SC
P-43	SS-1	0.5 - 2.5	19	38	20	18	39	TNP	A-6 (3)	SC
P-44	SS-1	1.1 - 3.1	30.1	62	25	37	83.5	TNP	A-7-6 (34)	CH
P-45	SS-1	1.0 - 3.0	13.6	42	19	23	33.3	TNP	A-2-7 (2)	SC
P-47	SS-1	1.4 - 3.4	14.1	36	13	23	52.8	TNP	A-6 (8)	CL
P-48	SS-1	1.0 - 3.0	19	51	30	21	51.1	TNP	A-7-5 (8)	MH
P-49	SS-1	1.0 - 3.0	20.8	48	22	26	50.7	TNP	A-7-6 (9)	CL
P-50	SS-1	1.0 - 3.0	25	53	33	20	92.8	TNP	A-7-5 (23)	MH
P-51	SS-1	2.6 - 3.6	18.6	33	27	6	66.6	TNP	A-4 (3)	ML
P-52	SS-1	1.2 - 3.2	18	48	35	13	77.1	TNP	A-7-5 (12)	ML
P-53	SS-1	0.6 - 2.6	26	61	25	36	44.5	TNP	A-7-6 (11)	SC
P-54	SS-1	0.7 - 2.7	17.4	62	24	38	29.0	TNP	A-2-7 (2)	SC
P-55	SS-1	0.9 - 2.9	19	46	20	26	48.4	TNP	A-7-6 (8)	SC
P-56	SS-1	0.9 - 2.9	16.2	46	23	23	43.7	TNP	A-7-6 (6)	SC
P-57	SS-1	1.1 - 3.1	16	55	24	31	35.8	TNP	A-7-6 (5)	SC
P-58	SS-1	1.1 - 3.1	15.3	43	19	24	46.0	TNP	A-7-6 (6)	SC
P-59	SS-1	1.4 - 3.4	20	60	24	36	40.8	TNP	A-7-6 (8)	SC
P-60	SS-1	1.0 - 3.0	35.1	62	41	21	96.6	TNP	A-7-5 (28)	MH
P-61	SS-1	1.4 - 3.4	22	53	27	26	61.0	TNP	A-7-6 (14)	CH
P-62	SS-1	1.1 - 3.1	20.7	56	26	30	59.4	TNP	A-7-6 (16)	CH
P-63	SS-1	1.3 - 3.3	11	53	22	31	46.9	TNP	A-7-6 (10)	SC
P-64	SS-1	1.1 - 3.1	18.3	62	25	37	50.3	TNP	A-7-6 (14)	CH
P-65	SS-1	0.8 - 2.8	28	--*	--*	--*	34	TNP	A-2-4*	SM
P-66	SS-1	0.8 - 2.8	9.7	21	12	9	15.7	TNP	A-2-4	SC
P-67	SS-1	0.6 - 2.6	22	52	23	29	63.1	TNP	A-7-6 (16)	CH
P-68	SS-1	1.1 - 3.1	8	NP**	NP**	NP**	13.0	TNP	A-2-4	SM
P-69	SS-1	1.0 - 3.0	19	39	26	13	40.6	TNP	A-6 (2)	SM
P-70	SS-1	0.6 - 2.6	18	50	27	23	60.3	TNP	A-7-6 (12)	CH
P-71	SS-1	1.3 - 3.3	9	NP**	NP**	NP**	17.0	TNP	A-2-4	SM
RW-35	SS-3	4.0 -6.0	37.7	49	31	18	64.2	TNP	A-7-5 (11)	ML
	SS-5	8.0 - 10.0	16.7	30	22	8	92.8	TNP	A-4 (7)	CL
	SS-8	23.5 - 25.0	22.1	36	26	10	70.3	TNP	A-4 (6)	ML
RW-36	SS-1	0.0 - 2.0	25.2	55	25	30	75.6	TNP	A-7-6 (23)	CH
	SS-4	6.0 - 8.0	15.1	37	23	14	80.3	TNP	A-6 (11)	CL
	SS-3	4.0 - 6.0	14.3	27	18	9	34.8	TNP	A-2-4	SC

Table 2: Split Spoon Samples – Laboratory Classification Testing Summary

Boring Number	Sample Number	Sample Depth (ft)	Natural Moisture (%)	Atterberg Limits			Percent Finer #200 (%)	Organic Content (%)	Soil Classification	
				LL	PL	PI			AASHTO	USCS
RW-37	SS-6	13.5 - 15.0	26.4	45	30	15	33.3	TNP	A-2-7 (1)	SM
	SS-8	23.5 - 25.0	19.1	NP**	NP**	NP**	24.4	TNP	A-2-4	SM
RW-38	SS-1A	0.0 - 1.0	8.1	17	12	5	16	TNP	A-2-4	SC-SM
	SS-2	2.0 - 4.0	23.3	39	21	18	76	TNP	A-6 (13)	CL
	SS-4	6.0 - 8.0	25.9	33	19	14	85	TNP	A-6 (11)	CL
RW-39	SS-2	2.0 - 4.0	13.1	27	18	9	41.2	TNP	A-4 (1)	SC
	SS-4	6.0 - 8.0	17.3	50	24	26	60.2	TNP	A-7-6 (13)	CH
	SS-7	18.5 - 20	22.1	34	28	6	38.7	TNP	A-4 (0)	SM
RW-40	SS-2	2.0 - 4.0	30.8	43	32	11	83.2	TNP	A-7-5 (11)	ML
RW-41	SS-1	0.0 - 2.0	10.1	22	15	7	42.1	TNP	A-4 (0)	SC-SM
	SS-2	2.0 - 4.0	14.0	31	17	14	55.1	TNP	A-6 (5)	CL
	SS-4	6.0 - 8.0	23.6	50	30	20	83.3	TNP	A-7-5 (19)	MH
RW-42	SS-1	0.0 - 2.0	10.5	17	11	6	39.6	TNP	A-4 (0)	SC-SM
	SS-4	6.0 - 8.0	23.9	53	31	22	67.8	TNP	A-7-5 (15)	MH
	SS-7	18.5 - 20.0	19.4	47	19	28	66.0	TNP	A-7-6 (16)	CL
	SS-10	33.5 - 35.0	19.7	61	30	31	29.7	TNP	A-2-7 (3)	SC
	SS-12	43.5 - 45.0	28.3	44	26	18	17.5	TNP	A-2-7 (0)	SC
RW-43	SS-1A	0.0 - 1.0	4.5	18	14	4	24	TNP	A-2-4	SC-SM
	SS-2	2.0 - 4.0	25.6	69	33	36	70	TNP	A-7-5 (26)	CH
	SS-3	4.0 - 6.0	14.1	60	23	37	39	TNP	A-7-6 (8)	SC
	SS-8	23.5 - 25.0	60.7	80	42	38	71	TNP	A-7-5 (30)	MH
W-18	SS-1	0.4 - 2.4	18.5	32	18	14	78.6	TNP	A-6 (10)	CL
	SS-2	2.4 - 4.4	23.3	44	26	18	81.3	TNP	A-7-6 (15)	CL
	SS-3	4.4 - 6.4	14.2	22	17	5	46.5	TNP	A-4 (0)	SC-SM
	SS-5	8.4 - 10.4	18.5	27	15	12	85.7	TNP	A-6 (8)	CL
	SS-6	13.5 - 15.0	21.4	41	29	12	89.5	TNP	A-7-6 (13)	ML
W-19	SS-1	0.0 - 2.0	11.3	23	16	7	47.3	TNP	A-4 (0)	SC-SM
	SS-2	2.0 - 4.0	26.3	50	27	23	84.7	TNP	A-7-6 (22)	CH
	SS-5	8.0 - 10.0	23.9	40	25	15	75.9	TNP	A-6 (11)	CL
W-22	SS-1	0.0 - 2.0	14.8	20	14	6	23.8	TNP	A-2-4	SC-SM
	SS-4	6.0 - 8.0	20.4	36	25	11	44.6	TNP	A-6 (2)	SM
	SS-6	13.5 - 15.0	22.7	30	23	7	21.2	TNP	A-2-4	SC-SM
	SS-8	23.5 - 25.0	16.5	NP**	NP**	NP**	20.6	TNP	A-2-4	SM
W-23	SS-1	0.2 - 2.2	17.2	29	14	15	35.4	TNP	A-2-6	SC
	SS-4	6.2 - 8.2	26.2	60	21	39	80.3	TNP	A-2-6	CH
W-24	SS-1	0.0 - 2.0	6.8	18	14	4	21.5	TNP	A-2-6	SC-SM
	SS-2	2.0 - 4.0	16.2	41	22	19	45.5	TNP	A-2-6	SC
	SS-5	8.0 - 10.0	23.4	40	27	13	48.9	TNP	A-2-6	SM
	SS-7	18.5 - 20.0	30.8	42	30	12	46.0	TNP	A-2-6	SM

Table 2: Split Spoon Samples – Laboratory Classification Testing Summary

Boring Number	Sample Number	Sample Depth (ft)	Natural Moisture (%)	Atterberg Limits			Percent Finer #200 (%)	Organic Content (%)	Soil Classification	
				LL	PL	PI			AASHTO	USCS
W-25	SS-2	2.0 - 4.0	31.7	69	39	30	74.9	TNP	A-2-6	MH
	SS-5	8.0 - 10.0	19.7	28	24	4	22.5	TNP	A-2-6	SM
	SS-8	23.5 - 25.0	27.1	32	29	3	29.3	TNP	A-2-6	SM
W-27	SS-1	0.4 - 2.4	16.1	36	15	21	34	TNP	A-2-6	SC
	SS-2	2.4 - 4.4	23.3	66	30	36	56	TNP	A-7-5 (18)	CH
	SS-4	6.4 - 8.4	20.5	51	19	32	42	TNP	A-7-6 (8)	SC
	SS-5	8.4 - 10.4	17.5	26	13	13	15	TNP	A-2-4	SC
	SS-6	13.5 - 15.0	45.4	54	29	25	90	TNP	A-7-6 (26)	CH
	SS-10	33.5 - 35.0	41.1	56	36	20	72	TNP	A-7-5 (16)	MH
W-28	SS-2	2.0 - 4.0	14.5	49	25	24	27.8	TNP	A-2-7 (0)	SC
	SS-6	13.5 - 15.0	18.4	48	19	29	27.3	TNP	A-2-7 (0)	SC
	SS-8	23.5 - 25.0	20.3	46	20	26	16.5	TNP	A-2-7 (0)	SC
	SS-10	33.5 - 35.0	27.7	56	28	28	20.7	TNP	A-2-7 (0)	SC
	SS-12	43.5 - 45.0	33.0	48	30	18	78.5	TNP	A-7-5 (16)	ML
	SS-16	63.5 - 65.0	23.7	48	29	19	68.5	TNP	A-7-6 (13)	ML
W-29	SS-2	2.0 - 4.0	7.4	NP**	NP**	NP**	18.7	TNP	A-1-b	SM
	SS-4	6.0 - 8.0	11.9	--*	--*	--*	12.2	TNP	A-1-b*	SM
	SS-5	8.0 - 10.0	31.0	33	24	9	37.3	TNP	A-4 (0)	SM
	SS-6	13.5 - 15.0	24.4	44	29	15	22.5	TNP	A-2-7 (0)	SM
	SS-7	18.5 - 20.0	25.8	--*	--*	--*	21.8	TNP	A-1-b*	SM
	SS-8	23.5 - 25.0	37.6	48	27	21	78.6	TNP	A-7-6 (18)	CL
W-30	SS-1	1.7 - 3.7	47.7	80	49	31	79.2	TNP	A-7-5 (31)	MH
	SS-4	7.7 - 9.7	44.3	68	52	16	75.7	TNP	A-7-5 (17)	MH
	SS-9	28.5 - 30.0	35.7	72	35	37	84.3	TNP	A-7-5 (36)	MH
	SS-11	38.5 - 40.0	31.6	65	30	35	85.5	TNP	A-7-5 (34)	CH
W-31	SS-1	0.0 - 2.0	14.0	36	16	20	57.9	TNP	A-6 (8)	CL
	SS-3	4.0 - 6.0	28.0	58	20	38	79.4	TNP	A-7-6 (31)	CH
	SS-7	18.5 - 20.0	24.2	46	31	15	80.5	TNP	A-7-5 (14)	ML
W-32	SS-2	2.0 - 4.0	17.5	33	25	8	69.2	TNP	A-4 (5)	ML
	SS-5	8.0 - 10.0	15.0	29	16	13	44.1	TNP	A-6 (2)	SC
	SS-6	13.5 - 15.0	7.6	24	21	3	20.5	TNP	A-1-b	SM
	SS-11	38.5 - 40.0	24.3	53	29	24	81.1	TNP	A-7-6 (21)	CH

* = not enough fine material for Atterberg testing, AASHTO classification assumes non-plastic

** = non-plastic

TNP = Test not Performed

Table 3: Bulk Samples – Laboratory Classification & Ignition Loss Testing Summary

Boring Number	Sample Depth (ft)	Natural Moisture (%)	Atterberg Limits		Percent Finer #200 (%)	Soil Classification		Max. Dry Density (pcf)	Optimum Moisture (%)	Ignition Loss (%)
			LL	PI		AASHTO	USCS			
P-1	0.5 - 10.5	13.5	36	9	59.1	A-4 (4)	ML	112.6	15.7	TNP
P-5	0.4 - 10.4	11.7	35	10	45.1	A-4 (2)	SM	117.0	13.7	TNP
P-10	1.2 - 5.0	9.7	24	8	29.9	A-2-4	SC	130.6	9.2	TNP
P-15	1.0 - 11.0	13.7	25	7	34.4	A-2-4	SC	125.0	9.7	TNP
P-20	1.5 - 11.4	27.0	45	25	70.5	A-7-6 (16)	CL	108.7	17.8	TNP
P-25	0.8 - 9.8	18.5	41	19	51.4	A-7-6 (7)	CL	118.0	12.4	TNP
P-30	0.7 - 10.7	23.0	43	21	53.2	A-7-6 (8)	CL	114.1	15.0	TNP
P-35	0.8 - 10.8	18.3	30	14	41.0	A-6 (2)	SC	119.6	12.6	TNP
P-41	1.0 - 10.0	30.2	34	9	27.9	A-2-4	SM	118.3	11.6	TNP
P-42	0.8 - 10.8	15.6	43	23	40.6	A-7-6 (5)	SC	118.1	12.6	TNP
P-43	0.5 - 10.5	19.6	23	11	42.7	A-6 (1)	SC	114.5	13.3	TNP
P-44	1.1 - 11.1	25.9	50	27	66.6	A-7-6 (17)	CH	105.2	20.0	TNP
P-47	1.4 - 11.4	16.6	29	15	42.8	A-6 (3)	SC	123.2	10.7	TNP
P-50	1.0 - 11.0	23.1	45	18	79.8	A-7_6 (15)	ML	108.5	17.0	TNP
P-53	0.6 - 10.6	15.3	41	12	81.1	A-7-6 (11)	ML	109.4	15.0	TNP
P-56	0.9 - 10.9	22.0	46	26	43.2	A-7-6 (6)	SC	114.8	14.4	TNP
P-58	1.1 - 11.1	13.0	37	20	42.4	A-6 (4)	SC	118.0	13.0	TNP
P-63	1.3 - 11.3	21.4	53	28	54.6	A-7-6 (12)	CH	111.4	16.8	TNP
P-65	0.8 - 10.8	35.0	38	17	54.2	A-7-6 (6)	CL	105.0	19.1	TNP
P-67	0.6 - 10.6	13.1	34	19	37.1	A-6 (2)	SC	120.1	12.2	TNP
P-70	0.6 - 10.6	11.2	28	12	34.8	A-2-6	SC	122.0	10.6	TNP
RW-35	0.1 - 10.0	32.0	48	26	66.8	A-7-6 (16)	CL	104.3	19.5	0.5
RW-36	0.2 - 10.0	23.2	58	35	81.3	A-7-6 (30)	CH	97.3	21.0	0.3
RW-37	0.3 - 10.0	15.1	33	14	43.1	A-6 (2)	SC	117.4	12.9	0.1
RW-38	0.0 - 10.0	19.9	30	13	69.4	A-6 (7)	CL	112.9	13.9	0.3
RW-39	0.3 - 10.0	14.5	26	9	36.4	A-4 (0)	SC	118.2	12.4	0.4
RW-40	0.0 - 10.0	16.9	42	19	79.0	A-7-6 (15)	CL	108.3	17.0	0.3
RW-41	0.1 - 10.0	13.3	41	17	58.5	A-7-6 (8)	CL	119.2	12.5	2.2
RW-42	0.3 - 10.0	10.3	17	6	33.0	A-2-4	SC-SM	126.4	9.3	0.2
RW-43	0.1 - 10.0	14.5	45	23	45.1	A-7-6 (6)	SC	109.8	16.3	0.1

TNP = Test Not Performed

Table 4: Bulk Samples – Standard Proctor and CBR Testing Summary					
Boring Number	Sample Depth (ft)	Max. Dry Density (pcf)	Optimum Moisture (%)	% Compaction	Corrected CBR Value at 0.1 in.
P-1	0.5 - 10.5	112.6	15.7	90.8	1.3
				97.0	2.4
				99.8	4.7
P-5	0.4 - 10.4	117.0	13.7	92.4	1.4
				95.5	1.8
				99.9	3.6
P-10	1.2 - 5.0	130.6	9.2	90.0	5.5
				95.0	10.6
				100.0	16.6
P-15	1.0 - 11.0	125.0	9.7	91.2	5.3
				96.7	17.4
				99.0	26.2
P-20	1.5 - 11.4	108.7	17.8	90.0	1.3
				95.0	5.1
				100.0	7.0
P-25	0.8 - 9.8	118.0	12.4	88.3	2.1
				95.4	7.3
				98.7	10.1
P-30	0.7 - 10.7	114.1	15.0	90.0	3.4
				95.0	7.5
				100.0	9.5
P-35	0.8 - 10.8	119.6	12.6	90.0	2.6
				95.0	5.8
				100.0	10.7
P-41	2.0 - 10.0	118.3	11.6	94.1	7.4
				99.3	6.9
				100.0	5.2
P-42	0.8 - 10.8	118.1	12.6	90.0	4.0
				95.0	9.0
				100.0	12.5
P-43	0.5 - 10.5	114.5	13.3	90.6	2.7
				95.4	6.4
				101.0	10.6
P-44	1.1 - 11.1	105.2	20.0	90.0	2.2
				95.0	6.6
				100.0	9.3
P-47	1.4 - 11.4	123.2	10.7	90.0	4.2
				95.0	7.9
				100.0	8.0
P-50	1.0 - 11.0	108.5	17.0	92.7	2.9
				96.8	5.3
				99.3	5.9

Table 4: Bulk Samples – Standard Proctor and CBR Testing Summary					
Boring Number	Sample Depth (ft)	Max. Dry Density (pcf)	Optimum Moisture (%)	% Compaction	Corrected CBR Value at 0.1 in.
P-53	0.6 - 10.6	109.4	15.0	92.6	1.9
				94.8	1.8
				98.8	4.6
P-56	0.9 - 10.9	114.8	14.4	92.0	8.2
				96.9	11.8
				99.5	6.2
P-58	1.1 - 11.1	118.0	13.0	91.9	9.8
				95.8	14.9
				97.1	15.4
P-63	1.3 - 11.3	111.4	16.8	85.0	2.5
				96.2	9.7
				98.5	12.6
P-65	0.8 - 10.8	105.0	19.1	79.7	0.3
				92.4	1.1
				95.8	1.8
P-67	0.6 - 10.6	120.1	12.2	93.0	10.1
				97.5	13.4
				100.0	14.8
P-70	0.6 - 10.6	122.0	10.6	93.1	4.5
				97.4	12.3
				99.8	17.3

Table 5: Corrosion Series Testing Summary

Boring Number	Sample Depth (ft)	Sample No(s).	As-Rec'd Resistivity (Ohm-cm)	Min-Resistivity (Ohm-cm)	Sulfates		Chlorides		pH
					(mg/kg)	(wt%)	(mg/kg)	(wt%)	
B-29	14.5 - 21.0	SS-6, SS-7	7,370	7,370	9	0.0009	12	0.0012	7.83
B-30	38.5 - 45.0	SS-11, SS-12	1,943	1,943	120	0.012	120	0.012	7.78
B-31	18.5 - 25.0	SS-7, SS-8	3,752	3,752	30	0.003	63	0.0063	6.43
B-32	8.0 - 15.0	SS-5, SS-6	7,370	7,370	12	0.0012	174	0.0174	7.09
B-33	13.5 - 20.0	SS-6, SS-7	17,420	12,060	18	0.0018	57	0.0057	6.82
B-34	23.5 - 30.0	SS-8, SS-9	8,040	8,040	3	0.0003	9	0.0009	7.15
B-35	13.5 - 20.0	SS-6, SS-7	14,070	8,710	30	0.003	72	0.0072	6.99
B-36	38.5 - 50.0	SS-11, SS-13	3,752	3,484	18	0.0018	24	0.0024	7.18
B-37	13.5 - 20.0	SS-6, SS-7	8,040	6,700	90	0.009	168	0.0168	7.00
B-38	0.0 - 6.0	SS-1, SS-3	67,670	41,540	12	0.0012	6	0.0006	5.02
B-39	6.0 - 10.0	SS-4, SS-5	4,355	4,355	420	0.042	765	0.0765	6.84
B-41	8.8 - 15.0	SS-5, SS-6	19,430	16,750	9	0.0009	24	0.0024	7.25
B-42	23.5 - 30.0	SS-8, SS-9	50,920	50,920	30	0.003	3	0.0003	5.97
B-43	18.8 - 22.8	SS-3, SS-4	3,417	3,283	90	0.009	300	0.03	6.75
B-44	2.0 - 6.0	SS-2, SS-3	9,380	9,380	300	0.03	390	0.039	6.11
B-46	6.0 - 10.0	SS-4, SS-5	1,608	1,474	270	0.027	642	0.0642	6.88
B-47	29.5 - 36.0	SS-9, SS-10	12,730	10,050	60	0.006	138	0.0138	7.15
B-50	38.5 - 45.0	SS-11, SS-12	54,270	50,920	15	0.0015	3	0.0003	7.18
B-51	4.0 - 8.0	SS-3, SS-4	61,640	46,230	6	0.0006	12	0.0012	6.81
B-52	33.5 - 40.0	SS-10, SS-11	50,920	36,180	21	0.0021	6	0.0006	6.57
B-53	33.5 - 40.0	SS-10, SS-11	63,650	47,570	3	0.0003	6	0.0006	6.55
B-54	13.9 - 20.4	SS-6, SS-7	63,650	60,300	15	0.0015	6	0.0006	4.96
B-55	18.5 - 25.0	SS-7, SS-8	33,500	30,150	12	0.0012	9	0.0009	6.31
B-56	18.5 - 30.0	SS-7, SS-9	18,090	17,420	24	0.0024	33	0.0033	4.84
B-57	6.0 - 10.0	SS-4, SS-5	16,080	15,410	18	0.0018	6	0.0006	5.68
B-58	38.5 - 45.0	SS-11, SS-12	100,500	100,500	30	0.003	3	0.0003	5.10
B-59	8.0 - 15.0	SS-5, SS-6	120,600	87,100	15	0.0015	9	0.0009	5.86
B-61	6.0 - 10.0	SS-4, SS-5	14,070	1,407	6	0.0006	3	0.0003	7.90
B-62	4.0 - 8.0	SS-3, SS-4	36,850	36,850	9	0.0009	3	0.0003	6.12
DH-4	4.0 - 10.0	SS-3, SS-5	60,300	17,420	21	0.0021	9	0.0009	7.68
DH-5	8.2 - 20.0	SS-5, SS-6, SS-7	4,154	3,953	60	0.006	75	0.0075	7.34
DH-6	8.3 - 15.0	SS-5, SS-6	30,820	8,710	30	0.003	33	0.0033	7.12

Table 6: Undisturbed Samples - Consolidation Testing Summary

Boring Number	Sample Number	Sample Depth (ft)	Atterberg Limits		Percent Finer #200 (%)	USCS	AASHTO	Specific Gravity	Initial Void Ratio (%)	Final Void Ratio (%)	Initial Dry Unit Weight (pcf)	Initial Moisture Content (%)
			LL	PI								
B-34UD	UD-1	33.5 - 35.0	29	13	51.9	CL	A-6 (4)	2.69	40.3	32.8	119.7	13.9
B-41UD	UD-1	18.5 - 20.0	41	23	79.4	CL	A-7-6 (17)	2.65	68.6	57.7	100.3	25.4
B-56UD	UD-1	18.5 - 20.5	46	17	27.3	SM	A-2-7 (1)	2.66	70.2	47.6	97.3	19.9
W-23UD	UD-2	8.5 - 10.5	59	35	90.8	CH	A-7-6 (35)	2.70	74.6	63.9	95.6	25.0

Table 7: Undisturbed Samples - Consolidated Undrained Triaxial Testing Summary

Boring Number	Sample Number	Sample Depth (ft)	Atterberg Limits		Percent Finer #200 (%)	USCS	AASHTO	Specific Gravity	Test Specimen Number	Dry Unit Weight (pcf)	Moisture Content (%)	CU Triaxial Strength Parameters			
												Total		Effective	
			LL	PI								c (ksf)	ϕ (degrees)	c' (ksf)	ϕ' (degrees)
B-34UD	UD-2	36.0 - 38.0	31	17	23.9	SC	A-2-6 (1)	2.68	1	106.4	17.2	0.297	22	0.270	31
									2	111.0	15.6				
									3	106.9	18.4				
B-50UD	UD-1	13.5 - 15.5	38	9	74.2	ML	A-4 (7)	2.74	1	99.2	18.8	0.271	22	0.072	32
									2	104.5	20.4				
									3	103.1	20.0				
B-50UD	UD-2	35.0 - 37.0	51	23	51.0	CH	A-7-6 (9)	2.72	1	116.9	15.1	0.074	23	0.333	35
									2	108.8	20.5				
									3	103.5	23.0				
B-56UD	UD-2	23.5 - 25.5	39	12	47.1	SM	A-6 (3)	2.66	1	98.8	22.2	0.455	14	0.040	35
									2	97.7	21.5				
									3	101.6	21.4				
W-18UD	UD-1	2.0 - 4.0	49	21	83.3	CL	A-7-6 (19)	2.70	1	105.4	20.8	0.420	14.6	0.150	32.7
									2	108.9	16.1				
									3	103.0	20.1				
W-23UD	UD-2	8.5 - 10.5	59	35	90.8	CH	A-7-6 (35)	2.65	1	84.3	25.0	0.080	20.0	0.340	30.0
									2	96.2	25.0				
W-27UD	UD-1	13.5 - 15.5	44	15	55.8	ML	A-7-6 (7)	2.65	1	84.9	29.4	0.070	13.2	0.100	29.0
									2	90.7	29.4				
									3	78.9	40.7				

Table 8: Rock Core Testing Summary

Boring Number	Core Run No.	Core Run Top Depth	Core Run Bottom Depth	Recovery (%)	RQD	Sample Top Depth (ft)	Sample Bottom Depth (ft)	Unit Weight (pcf)	Unconfined Compressive Strength (psi)	RMR[1]	GSI [2] Range
B-29	RC-1	56.8	60	100	32	TNP	TNP	TNP	TNP	TNP	60-70
B-29	RC-2	60	65	72	10	TNP	TNP	TNP	TNP	TNP	60-70
B-29	RC-3	65	70	100	80	65.4	66.1	183.1	42892	61	70-80
B-29	RC-4	70	75	100	93	70.3	70.9	180.9	19690	61	70-80
B-29	RC-5	75	76.8	89	73	75.6	76.4	182.3	22407	54	70-80
B-31	RC-1	25.9	30.5	93	53	26.7	27.4	186.6	52272	47	45-55
B-31	RC-2	30.5	35.5	48	0	TNP	TNP	TNP	TNP	TNP	30-40
B-31	RC-3	35.5	40.5	46	0	TNP	TNP	TNP	TNP	TNP	30-40
B-31	RC-4	40.5	45.5	80	43	41.3	42	187	30261	42	30-40
B-31	RC-5	45.5	50.5	44	13.3	TNP	TNP	TNP	TNP	TNP	30-40
B-31	RC-6	50.5	55.5	66	0	TNP	TNP	TNP	TNP	TNP	10-20
B-32	RC-1	55.7	60.7	18	0	TNP	TNP	TNP	TNP	TNP	10-20
B-32	RC-2	60.7	65.7	30	0	TNP	TNP	TNP	TNP	TNP	10-20
B-32	RC-3	65.7	70.7	60	20	67.2	68.1	178.7	30222	24	10-20
B-32	RC-4	70.7	75.7	32	0	TNP	TNP	TNP	TNP	TNP	10-20
B-32	RC-5	75.7	80.7	24	0	TNP	TNP	TNP	TNP	TNP	10-20
B-32	RC-6	80.7	85.7	16	0	TNP	TNP	TNP	TNP	TNP	10-20
B-33	RC-1	45.9	50.6	21.3	0	TNP	TNP	TNP	TNP	TNP	10-20
B-33	RC-2	50.6	55.6	12	0	TNP	TNP	TNP	TNP	TNP	10-20
B-33	RC-3	55.6	60.6	20	0	TNP	TNP	TNP	TNP	TNP	10-20
B-33	RC-4	60.6	65.6	30	0	TNP	TNP	TNP	TNP	TNP	10-20
B-33	RC-5	65.6	70.6	80	0	TNP	TNP	TNP	TNP	TNP	10-20
B-33	RC-6	70.6	75.6	100	19	72.2	73	166.7	30472	37	30-40
B-34	RC-1	41.3	44.6	9.1	0	TNP	TNP	TNP	TNP	TNP	10-20
B-34	RC-2	44.6	49.6	16	0	TNP	TNP	TNP	TNP	TNP	10-20
B-34	RC-3	49.6	54.6	20	0	TNP	TNP	TNP	TNP	TNP	10-20
B-34	RC-4	56	59.6	63.8	0	TNP	TNP	TNP	TNP	TNP	10-20
B-34	RC-5	59.6	64.6	80	0	TNP	TNP	TNP	TNP	TNP	10-20
B-34	RC-6	64.6	69.6	24	0	TNP	TNP	TNP	TNP	TNP	10-20
B-34	RC-7	69.6	74.6	54	0	TNP	TNP	TNP	TNP	TNP	10-20
B-35	RC-1	33	35.3	34.8	0	TNP	TNP	TNP	TNP	TNP	10-20
B-35	RC-2	35.3	40.3	44	0	TNP	TNP	TNP	TNP	TNP	10-20
B-35	RC-3	40.3	45.3	32	0	TNP	TNP	TNP	TNP	TNP	10-20
B-35	RC-4	45.3	50.3	40	0	TNP	TNP	TNP	TNP	TNP	10-20
B-35	RC-5	50.3	53	40.7	0	TNP	TNP	TNP	TNP	TNP	10-20
B-35	RC-6	53	55	60	0	TNP	TNP	TNP	TNP	TNP	10-20
B-36	RC-1	66	68	75	0	TNP	TNP	TNP	TNP	TNP	10-20
B-36	RC-2	68	68.4	100	0	TNP	TNP	TNP	TNP	TNP	10-20
B-36	RC-3	68.4	71.2	100	34	69.3	69.9	198.6	22476	25	10-20
B-36	RC-4	71.2	73.4	73	24	TNP	TNP	TNP	TNP	TNP	10-20
B-36	RC-5	73.4	76.6	47	0	TNP	TNP	TNP	TNP	TNP	10-20
B-36	RC-6	76.6	77.2	100	0	TNP	TNP	TNP	TNP	TNP	10-20
B-36A	RC-1	42.4	45	3.8	0	TNP	TNP	TNP	TNP	TNP	10-20
B-36A	RC-2	55.4	59.4	8	0	TNP	TNP	TNP	TNP	TNP	10-20
B-36A	RC-3	60.4	65.4	12	0	TNP	TNP	TNP	TNP	TNP	10-20
B-36A	RC-4	65.4	70.4	24	0	TNP	TNP	TNP	TNP	TNP	10-20
B-36A	RC-5	70.4	73.4	63.3	0	TNP	TNP	TNP	TNP	TNP	10-20

Table 8: Rock Core Testing Summary

Boring Number	Core Run No.	Core Run Top Depth	Core Run Bottom Depth	Recovery (%)	RQD	Sample Top Depth (ft)	Sample Bottom Depth (ft)	Unit Weight (pcf)	Unconfined Compressive Strength (psi)	RMR[1]	GSI [2] Range
B-36A	RC-6	73.4	75.4	40	0	TNP	TNP	TNP	TNP	TNP	10-20
B-36A	RC-7	75.4	78.6	31.3	0	TNP	TNP	TNP	TNP	TNP	10-20
B-37	RC-1	7.7	9.5	50	0	TNP	TNP	TNP	TNP	TNP	10-20
B-37	RC-2	39.7	44.3	37	0	TNP	TNP	TNP	TNP	TNP	10-20
B-37	RC-3	44.3	49.3	70	13.3	TNP	TNP	TNP	TNP	TNP	15-25
B-37	RC-4	49.3	54.3	100	30	52.6	53.3	176	14914	26	20-30
B-37	RC-5	54.3	59.3	96	32	57.2	58	183.6	21778	26	20-30
B-37	RC-6	59.3	64.3	92	80	63.2	63.8	176.9	10352	58	50-60
B-38	RC-1	11.7	15.5	97	89	11.9	13.1	168.9	23144	43	60-70
B-38	RC-2	15.5	20.5	100	100	TNP	TNP	TNP	TNP	TNP	65-75
B-38	RC-3	20.5	25.5	100	100	20.5	21.6	165.4	32079	82	65-75
B-38	RC-4	25.5	30.5	100	100	TNP	TNP	TNP	TNP	TNP	80-90
B-38	RC-5	30.5	31.7	100	100	30.5	31.7	166	32728	87	80-90
B-39	RC-1	12.2	14.1	100	47.8	TNP	TNP	TNP	TNP	TNP	60-70
B-39	RC-2	14.1	19.1	100	91	15.8	16.8	165.5	37115	72	60-70
B-39	RC-3	19.1	24.1	100	100	22.1	23.1	165.6	35517	72	75-85
B-39	RC-4	24.1	29.1	100	100	TNP	TNP	TNP	TNP	TNP	75-85
B-39	RC-5	29.1	32.1	100	100	29.1	30.1	166.5	34736	72	75-85
B-40	RC-1	76.5	79	96	50	77.7	78.5	163	13225	46	50-60
B-40	RC-2	79	84	92	68	TNP	TNP	TNP	TNP	TNP	50-60
B-40	RC-3	84	89	100	70	84.3	85.1	165.8	18610	47	50-60
B-40	RC-4	89	94	100	84	TNP	TNP	TNP	TNP	TNP	40-50
B-41	RC-1	58.5	60	20	0	TNP	TNP	TNP	TNP	TNP	30-40
B-41	RC-2	60	65	32	32	60.2	61.3	158.8	4944	39	35-45
B-41	RC-3	65	70	78	42	TNP	TNP	TNP	TNP	TNP	35-45
B-41	RC-4	70	75	46	0	TNP	TNP	TNP	TNP	TNP	25-35
B-41	RC-5	75	78.5	100	57	75.5	76.4	164.5	23663	52	30-40
B-42	RC-1	66.5	69.5	83.3	44.4	TNP	TNP	TNP	TNP	TNP	40-50
B-42	RC-2	69.5	74.5	100	58	70.8	71.7	166	31990	47	45-55
B-42	RC-3	74.5	79.5	90	51.7	TNP	TNP	TNP	TNP	TNP	45-55
B-42	RC-4	79.5	84.5	100	63	79.5	80.4	165.9	25409	52	35-45
B-42	RC-5	84.5	87	100	83.3	TNP	TNP	TNP	TNP	TNP	35-45
B-43	RC-1	53	55.5	60	0	TNP	TNP	TNP	TNP	TNP	25-35
B-43	RC-2	55.5	60.5	100	8	TNP	TNP	TNP	TNP	TNP	35-45
B-43	RC-3	60.5	65.5	80	0	TNP	TNP	TNP	TNP	TNP	30-40
B-43	RC-4	65.5	70.5	100	31.7	TNP	TNP	TNP	TNP	TNP	45-55
B-43	RC-5	70.5	73.5	100	26.7	TNP	TNP	TNP	TNP	TNP	45-55
B-44	RC-1	6.2	11.2	100	30	9.2	9.9	163.5	32832	53	45-55
B-44	RC-2	11.2	16.2	100	18	16.2	17.1	162.7	30278	45	45-55
B-44	RC-3	16.2	21.2	100	40	23.2	23.9	162.4	3328	37	45-55
B-44	RC-4	21.2	26.2	94	25	TNP	TNP	TNP	TNP	TNP	45-55
B-45	RC-1	27	30.4	68	21.4	TNP	TNP	TNP	TNP	TNP	70-80
B-45	RC-2	30.4	35.4	100	75	30.6	31.4	163.5	24237	42	70-80
B-45	RC-3	35.4	40.4	100	76.7	37.9	38.5	163.9	30585	45	70-80
B-45	RC-4	40.4	42	100	100	TNP	TNP	TNP	TNP	TNP	70-80
B-45	RC-5	42	42.5	100	100	TNP	TNP	TNP	TNP	TNP	70-80
B-45	RC-6	42.5	45.5	100	90.3	42.9	43.4	163.3	22213	45	70-80

Table 8: Rock Core Testing Summary

Boring Number	Core Run No.	Core Run Top Depth	Core Run Bottom Depth	Recovery (%)	RQD	Sample Top Depth (ft)	Sample Bottom Depth (ft)	Unit Weight (pcf)	Unconfined Compressive Strength (psi)	RMR[1]	GSI [2] Range
B-45	RC-7	45.5	47	100	100	TNP	TNP	TNP	TNP	TNP	70-80
B-46	RC-1	18.6	23.6	6	0	TNP	TNP	TNP	TNP	TNP	10-20
B-46	RC-2	23.6	28.6	6	0	TNP	TNP	TNP	TNP	TNP	10-20
B-46	RC-3	33.6	38.6	94	35	TNP	TNP	TNP	TNP	TNP	50-60
B-46	RC-4	38.6	43.6	100	38.3	TNP	TNP	TNP	TNP	TNP	50-60
B-46	RC-5	43.6	46.6	100	38.9	TNP	TNP	TNP	TNP	TNP	55-65
B-46	RC-6	46.6	48.6	95	0	TNP	TNP	TNP	TNP	TNP	55-65
B-47	RC-1	46.9	50.4	94	69	47.2	47.8	166.4	6260	22	20-30
B-47	RC-2	50.4	55.4	74	40	TNP	TNP	TNP	TNP	TNP	20-30
B-47	RC-3	55.4	60.4	100	60	55.4	56.2	170.6	4824	22	20-30
B-47	RC-4	60.4	65.4	100	83.3	64	65	169.3	3260	26	20-30
B-47	RC-5	65.4	66.9	100	0	TNP	TNP	TNP	TNP	TNP	20-30
B-48	RC-1	14.7	19.7	96	22	15.1	15.9	178.5	11152	24	50-60
B-48	RC-2	19.7	24.7	100	65	19.7	20.6	175.9	10712	39	55-65
B-48	RC-3	24.7	29.7	88	8.3	TNP	TNP	TNP	TNP	TNP	45-55
B-48	RC-4	29.7	34.7	100	40	34	34.7	179.1	19123	34	40-50
B-49	RC-1	38.3	40.3	100	20.8	TNP	TNP	TNP	TNP	TNP	55-65
B-49	RC-2	40.3	45.3	58	0	TNP	TNP	TNP	TNP	TNP	45-55
B-49	RC-3	45.3	50.3	100	57	49.2	50.3	167.8	5919	51	55-65
B-49	RC-4	50.3	55.3	100	31.7	TNP	TNP	TNP	TNP	TNP	50-60
B-49	RC-5	55.3	58.3	100	67	56.6	57.6	169.4	6493	38	60-70
B-50	RC-1	72.2	77.2	98	80	73.7	74.3	170.8	1969	40	15-25
B-50	RC-2	77.2	82.2	100	90	81.2	82.2	172.5	4745	35	15-25
B-50	RC-3	82.2	87.2	80	46	TNP	TNP	TNP	TNP	TNP	15-25
B-50	RC-4	87.2	92.2	100	64	87.7	88.5	167.6	866	19	15-25
B-51	RC-1	39.7	44.7	100	0	TNP	TNP	TNP	TNP	TNP	10-20
B-51	RC-2	44.7	49.7	76	21.7	TNP	TNP	TNP	TNP	TNP	10-20
B-51	RC-3	49.7	54.7	50	26.7	TNP	TNP	TNP	TNP	TNP	10-20
B-51	RC-4	54.7	59.7	48	20	TNP	TNP	TNP	TNP	TNP	10-20
B-52	RC-1	73.2	75.4	100	0	TNP	TNP	TNP	TNP	TNP	65-75
B-52	RC-2	75.4	80.4	100	60	75.4	76.4	166	12987	41	65-75
B-52	RC-3	80.4	85.4	80	17	TNP	TNP	TNP	TNP	TNP	50-60
B-52	RC-4	85.4	90.4	100	12	TNP	TNP	TNP	TNP	TNP	50-60
B-52	RC-5	90.4	93.2	100	100	90.4	91.4	164.7	4743	45	65-75
B-53	RC-1	82.8	85.8	86.7	13.9	TNP	TNP	TNP	TNP	TNP	45-55
B-53	RC-2	85.8	90.8	36	11.7	TNP	TNP	TNP	TNP	TNP	45-55
B-53	RC-3	90.8	95.8	92	60	TNP	TNP	TNP	TNP	TNP	50-60
B-53	RC-4	95.8	100.8	100	51.7	TNP	TNP	TNP	TNP	TNP	50-60
B-53	RC-5	100.8	102.8	100	75	TNP	TNP	TNP	TNP	TNP	55-65
B-54	RC-1	70.6	75.6	100	36.7	74.6	75.3	179.1	2699	10	65-75
B-54	RC-2	75.6	80.6	80	23.3	TNP	TNP	TNP	TNP	TNP	65-75
B-54	RC-3	80.6	85.6	92	61.7	82.6	83.4	166.9	8285	44	65-75
B-54	RC-4	85.6	90.6	100	73	86.2	86.9	165.4	22971	36	70-80
B-55	RC-1	56	59.6	100	57	TNP	TNP	TNP	TNP	TNP	35-45
B-55	RC-2	59.6	64.6	96	73	59.6	60.6	163.6	5906	28	40-50
B-55	RC-3	64.6	69.6	80	40	65.5	66.4	155.9	1659	16	35-45
B-55	RC-4	69.6	74.6	98	85	72.9	73.6	160	2926	30	40-50

Table 8: Rock Core Testing Summary

Boring Number	Core Run No.	Core Run Top Depth	Core Run Bottom Depth	Recovery (%)	RQD	Sample Top Depth (ft)	Sample Bottom Depth (ft)	Unit Weight (pcf)	Unconfined Compressive Strength (psi)	RMR[1]	GSI [2] Range
B-55	RC-5	74.6	76.6	100	100	TNP	TNP	TNP	TNP	TNP	40-50
B-56	RC-1	80.8	85.4	100	73	84.7	85.4	173.5	4437	28	60-70
B-56	RC-2	85.4	90.4	96	30	TNP	TNP	TNP	TNP	TNP	60-70
B-56	RC-3	90.4	95.4	100	78	94.4	95.3	169.3	4702	42	60-70
B-56	RC-4	95.4	100.4	86	33	TNP	TNP	TNP	TNP	TNP	55-65
B-56	RC-5	100.4	105.4	100	0	TNP	TNP	TNP	TNP	TNP	50-60
B-57	RC-1	65.9	70	90.2	48.8	TNP	TNP	TNP	TNP	TNP	20-30
B-57	RC-2	70	75	14	0	TNP	TNP	TNP	TNP	TNP	15-25
B-59	RC-1	111	114.6	14	57	TNP	TNP	TNP	TNP	TNP	10-20
B-59	RC-2	114.6	119.6	40	14	115.4	116.1	170.6	1311	34	10-20
B-60	RC-1	6.5	10.7	85.7	20	TNP	TNP	TNP	TNP	TNP	45-55
B-60	RC-2	10.7	15.7	90	23	TNP	TNP	TNP	TNP	TNP	50-60
B-60	RC-3	15.7	20.7	100	63	16.2	16.9	165.2	12540	47	60-70
B-60	RC-4	20.7	25.7	100	78	23.3	24.3	165.8	40627	69	65-75
B-60	RC-5	25.7	26.5	100	100	26.2	26.7	165.7	32094	82	65-75
B-61	RC-1	22.5	25.2	25.9	0	TNP	TNP	TNP	TNP	TNP	10-20
B-61	RC-2	25.2	30.2	42	0	TNP	TNP	TNP	TNP	TNP	10-20
B-61	RC-3	30.2	35.2	100	70	TNP	TNP	TNP	TNP	TNP	60-70
B-61	RC-4	35.2	40.2	100	52	38.7	39.4	176.3	15571	49	60-70
B-61	RC-5	40.2	42.5	100	14.3	TNP	TNP	TNP	TNP	TNP	50-60
B-62	RC-1	23.7	25.7	35	0	TNP	TNP	TNP	TNP	TNP	10-20
B-62	RC-2	25.7	30.7	56	0	TNP	TNP	TNP	TNP	TNP	10-20
B-62	RC-3	30.7	35.7	36	0	TNP	TNP	TNP	TNP	TNP	10-20
B-62	RC-4	35.7	40.7	40	0	TNP	TNP	TNP	TNP	TNP	10-20
B-62	RC-5	40.7	43.7	100	0	TNP	TNP	TNP	TNP	TNP	20-30
B-62	RC-6	43.7	45.7	100	50	TNP	TNP	TNP	TNP	TNP	30-40
DH-4	RC-1	51.9	55.2	78.9	78.9	TNP	TNP	TNP	TNP	TNP	45-55
DH-4	RC-2	55.2	60.2	100	86	55.2	56.4	176	1091	52	50-60
DH-4	RC-3	60.2	65.2	100	94.2	TNP	TNP	TNP	TNP	TNP	70-80
DH-4	RC-4	65.2	70.2	98	98	65.2	66.3	170.1	11795	61	70-80
DH-4	RC-5	70.2	75.2	100	100	TNP	TNP	TNP	TNP	TNP	70-80
DH-4	RC-6	75.2	80.2	100	100	75.2	76.3	169.5	13569	61	70-80
DH-4	RC-7	80.2	85.2	100	94	TNP	TNP	TNP	TNP	TNP	70-80
DH-4	RC-8	85.2	90.2	100	88	85.2	86.7	178.5	9134	58	65-75
DH-4	RC-9	90.2	95.2	100	94	TNP	TNP	TNP	TNP	TNP	75-85
DH-4	RC-10	95.2	100.2	100	100	96.7	97.5	169.5	14660	66	70-80
DH-4	RC-11	100.2	105.2	100	96	TNP	TNP	TNP	TNP	TNP	75-85
DH-4	RC-12	105.2	110.2	102	83	106.2	107.5	171.3	12748	48	70-80
DH-4	RC-13	110.2	115.2	100	100	TNP	TNP	TNP	TNP	TNP	70-80
DH-4	RC-14	115.2	120.2	96	96	115.2	116.4	170.9	7611	61	70-80
DH-5	RC-1	42	45.6	86	58	TNP	TNP	TNP	TNP	TNP	70-80
DH-5	RC-2	45.6	50.6	100	74	45.6	46.8	178.5	3849	46	0-10
DH-5	RC-3	50.6	55.6	100	57	TNP	TNP	TNP	TNP	TNP	0-10
DH-5	RC-4	55.6	60.6	100	67.5	56.2	57.3	170.9	1521	44	0-10
DH-5	RC-5	60.6	65.6	100	95	60.6	62.1	171.1	5342	29	10-20
DH-5	RC-6	65.6	70.6	94	25	TNP	TNP	TNP	TNP	TNP	10-20

Table 8: Rock Core Testing Summary

Boring Number	Core Run No.	Core Run Top Depth	Core Run Bottom Depth	Recovery (%)	RQD	Sample Top Depth (ft)	Sample Bottom Depth (ft)	Unit Weight (pcf)	Unconfined Compressive Strength (psi)	RMR[1]	GSI [2] Range
DH-5	RC-7	70.6	75.6	94	45	TNP	TNP	TNP	TNP	TNP	0-10
DH-5	RC-8	75.6	80.6	100	90	75.9	76.9	172.4	5049	45	10-20
DH-5	RC-9	80.6	85.6	100	82	TNP	TNP	TNP	TNP	TNP	10-20
DH-5	RC-10	85.6	90.6	100	82	88.4	89.4	171.2	10860	35	0-10
DH-5	RC-11	90.6	95.6	100	81	TNP	TNP	TNP	TNP	TNP	10-20
DH-5	RC-12	95.6	100.6	100	90	95.6	96.5	174.8	7448	50	10-20
DH-5	RC-13	100.6	105.6	100	98	TNP	TNP	TNP	TNP	TNP	10-20
DH-5	RC-14	105.6	110.6	100	43	106.2	107.3	176	13235	36	0-10
DH-5	RC-15	110.6	115.6	96	46	112.5	113.5	171.5	4285	17	10-20
DH-5	RC-16	115.6	120.6	100	41	TNP	TNP	TNP	TNP	TNP	0-10
DH-6	RC-1	25.6	30.4	100	100	25.6	26.6	165.1	27947	64	80-90
DH-6	RC-2	30.4	35.4	100	100	TNP	TNP	TNP	TNP	TNP	80-90
DH-6	RC-3	35.4	40.4	100	100	35.4	36.5	165.7	33085	77	75-85
DH-6	RC-4	40.4	45.4	98	94.9	TNP	TNP	TNP	TNP	TNP	70-80
DH-6	RC-5	45.4	50.4	100	73.3	47.3	48.6	165.4	29957	57	70-80
DH-6	RC-6	50.4	55.4	100	100	TNP	TNP	TNP	TNP	TNP	70-80
DH-6	RC-7	55.4	59.3	100	100	58.2	59.2	165.2	30803	67	50-60
DH-6	RC-8	59.3	60.6	92.3	96.7	TNP	TNP	TNP	TNP	TNP	75-85
DH-6	RC-9	60.6	65.6	100	95.8	60.6	61.7	165.4	33938	77	75-85
DH-6	RC-10	65.6	70.6	100	96.7	TNP	TNP	TNP	TNP	TNP	75-85
DH-6	RC-11	70.6	75.6	100	100	70.6	71.8	165.9	34197	82	75-85
DH-6	RC-12	75.6	80.6	100	90.8	TNP	TNP	TNP	TNP	TNP	75-85
DH-6	RC-13	80.6	85.6	100	100	80.6	81.8	165.6	36215	82	80-90
DH-6	RC-14	85.6	90.6	100	98	TNP	TNP	TNP	TNP	TNP	80-90
DH-6	RC-15	90.6	95.6	100	90	94.4	95.6	165.8	34646	82	75-85
DH-6	RC-16	95.6	100.6	100	100	TNP	TNP	TNP	TNP	TNP	75-85
DH-6	RC-17	100.6	105.6	100	100	TNP	TNP	TNP	TNP	TNP	80-90
DH-6	RC-18	105.6	110.6	100	100	TNP	TNP	TNP	TNP	TNP	75-85
DH-6	RC-19	110.6	115.6	100	100	TNP	TNP	TNP	TNP	TNP	70-80
DH-6	RC-20	115.6	120.6	100	100	TNP	TNP	TNP	TNP	TNP	75-85
W-18	RC-1	22.6	24.3	88.2	0	TNP	TNP	TNP	TNP	TNP	10-20
W-18	RC-2	24.3	29.3	90	0	TNP	TNP	TNP	TNP	TNP	10-20
W-18	RC-3	29.3	34.3	62	8	TNP	TNP	TNP	TNP	TNP	10-20
W-19	RC-1	44.1	44.8	0	0	TNP	TNP	TNP	TNP	TNP	10-20
W-19	RC-2	44.8	49.8	70	15	TNP	TNP	TNP	TNP	TNP	10-20
W-19	RC-3	49.8	54.8	96	50	53.5	54.1	151.6	1038	25	10-20
W-22	RC-1	15	15.5	80	0	TNP	TNP	TNP	TNP	TNP	75-85
W-22	RC-2	15.5	16.5	20	0	TNP	TNP	TNP	TNP	TNP	75-85
W-22	RC-3	16.5	17.5	90	67	48	48.7	164.2	26378	62	75-85
W-23	RC-1	18.5	19.1	100	0	TNP	TNP	TNP	TNP	TNP	55-65
W-23	RC-2	19.1	24.1	100	0	20.7	21.5	164.2	29167	34	60-70
W-23	RC-3	24.1	28.6	100	100	TNP	TNP	TNP	TNP	TNP	70-80
W-24	RC-1	24.8	29.2	100	92	27.2	28.2	165	21812	61	60-70
W-24	RC-2	29.2	34.2	18	0	TNP	TNP	TNP	TNP	TNP	20-30
W-24	RC-3	34.2	39.2	52	40	TNP	TNP	TNP	TNP	TNP	60-70
W-25	RC-1	25.5	29.6	95.1	75.2	TNP	TNP	TNP	TNP	TNP	80-90

Table 8: Rock Core Testing Summary

Boring Number	Core Run No.	Core Run Top Depth	Core Run Bottom Depth	Recovery (%)	RQD	Sample Top Depth (ft)	Sample Bottom Depth (ft)	Unit Weight (pcf)	Unconfined Compressive Strength (psi)	RMR[1]	GSI [2] Range
W-25	RC-2	29.6	33.6	82.5	78.3	TNP	TNP	TNP	TNP	TNP	80-90
W-25	RC-3	33.6	36.2	100	100	30.5	31.3	165.3	31854	57	80-90
W-29	RC-1	49.3	50.6	100	0	TNP	TNP	TNP	TNP	TNP	50-60
W-29	RC-2	50.6	55.6	100	38	TNP	TNP	TNP	TNP	TNP	45-55
W-29	RC-3	55.6	59.9	100	14	TNP	TNP	TNP	TNP	TNP	40-50
W-30	RC-1	53.7	55	30.8	0	TNP	TNP	TNP	TNP	TNP	10-20
W-30	RC-2	55	60	52	0	TNP	TNP	TNP	TNP	TNP	10-20
W-30	RC-3	60	64	10	0	TNP	TNP	TNP	TNP	TNP	10-20
W-32	RC-1	44.7	49.7	92	36.7	48	48.7	179	20015	39	10-20
W-32	RC-2	49.7	54.7	82	0	TNP	TNP	TNP	TNP	TNP	10-20

Notes:

[1] RMR = Rock Mass Rating (Refer to SCDOT Geotechnical Design Manual, Chapter 6)

[2] GSI = Geologic Strength Index (Refer to AASHTO LRFD Bridge Design Specifications, Seventh Edition, Section 10.4.6.4

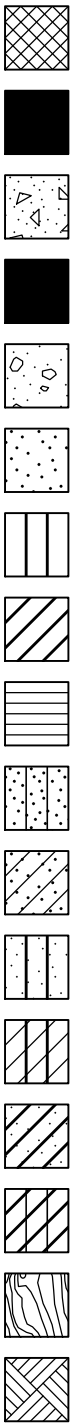
TNP = Test Not Performed

Appendix III – Soil and Rock Core Boring Records

LEGEND TO SOIL CLASSIFICATION AND SYMBOLS

SOIL TYPES

(Shown in Graphic Log)



Fill

Asphalt

Concrete

Topsoil

Gravel

Sand

Silt

Clay

Organic

Silty Sand

Clayey Sand

Sandy Silt

Clayey Silt

Sandy Clay

Silty Clay

Partially Weathered Rock

Cored Rock

WATER LEVELS

(Shown in Water Level Column)

▽ = Water Level At Termination of Boring
▼ = Water Level Taken After 24 Hours
◄ = Loss of Drilling Water
HC = Hole Cave

CONSISTENCY OF COHESIVE SOILS

CONSISTENCY	STD. PENETRATION RESISTANCE BLOWS/FOOT
Very Soft	0 to 2
Soft	3 to 4
Firm	5 to 8
Stiff	9 to 15
Very Stiff	16 to 30
Hard	31 to 50
Very Hard	Over 50

RELATIVE DENSITY OF COHESIONLESS SOILS

RELATIVE DENSITY	STD. PENETRATION RESISTANCE BLOWS/FOOT
Very Loose	0 to 4
Loose	5 to 10
Medium Dense	11 to 30
Dense	31 to 50
Very Dense	Over 50

TERMS

Standard Penetration Resistance - The Number of Blows of 140 lb. Hammer Falling 30 in. Required to Drive 1.4 in. I.D. Split Spoon Sampler 1 Foot. As Specified in ASTM D-1586.

REC - Total Length of Rock Recovered in the Core Barrel Divided by the Total Length of the Core Run Times 100%.

RQD - Total Length of Sound Rock Segments Recovered that are Longer Than or Equal to 4" (mechanical breaks excluded) Divided by the Total Length of the Core Run Times 100%.

SCDOT Soil Test Boring Log Descriptors

ROCK WEATHERING / ALTERATION

Description	Recognition
Residual Soil	Original minerals of rock have been entirely decomposed to secondary minerals, and original rock fabric is not apparent; material can be easily broken by hand
Completely Weathered / Altered	Original minerals of rock have been almost entirely decomposed to secondary minerals, although the original fabric may be intact; material can be granulated by hand
Highly Weathered / Altered	More than half of the rock is decomposed; rock is weakened so that a minimum 1-7/8 inch diameter sample can be easily broken readily by hand across rock fabric
Moderately Weathered / Altered	Rock is discolored and noticeably weakened, but less than half is decomposed; a minimum 1-7/8 inch diameter sample cannot be broken readily by hand across rock fabric
Slightly Weathered / Altered	Rock is slightly discolored, but not noticeably lower in strength than fresh rock
Fresh	Rock shows no discoloration, loss of strength, or other effect of weathering / alteration

ROCK STRENGTH

Description	Recognition	Approximately Uniaxial Compressive Strength (psi)
Extremely Weak Rock	Can be indented by thumbnail	35 – 150
Very Weak Rock	Can be peeled by pocket knife	150 –700
Weak Rock	Can be peeled with difficulty by pocket knife	700 – 3,500
Medium Strong Rock	Can be indented 3/16 inch with sharp end of pick	3,500 – 7,200
Strong Rock	Requires one hammer blow to fracture	7,200 – 14,500
Very Strong Rock	Requires many hammer blows to fracture	14,500 – 35,000
Extremely Strong Rock	Can only be chipped with hammer blows	> 35,000

DISCONTINUITY DESCRIPTORS

[k] - Dip of fracture surface measured relative to horizontal with bearing and direction

[l] Discontinuity Type
- F - Fault
- J - Joint
- Sh - Shear
- Fo - Foliation
- V - Vein
- B - Bedding

[m] Discontinuity Width (millimeters)
- W - Wide (12.5 – 50)
- MW - Moderately Wide (2.5 – 12.5)
- N - Narrow (1.25 – 2.5)
- VN - Very Narrow (< 1.25)
- T - Tight (0)

[n] Amount of Infilling
- Su - Surface Stain
- Sp - Spotty
- Pa - Partially Filled
- Fi - Filled
- No - None

[o] Type of Infilling
- Cl - Clay
- Ca - Calcite
- Ch - Chloride
- Fe - Iron Oxide
- Gy - Gypsum/Talc
- H - Healed
- No - None
- Py - Pyrite
- Qz - Quartz
- Sd - Sand

[p] Surface Shape of Joint
- Wa - Wavy
- Pl - Planar
- St - Stepped
- Ir - Irregular

[q] Discontinuity Spacing (feet)
- EW Extremely Wide (> 65)
- W Wide (22 – 65)
- M Moderate (7.5 – 22)
- C Close (2 – 7.5)
- VC Very Close (< 2)

[r] Roughness of Surface
- Slk - Slickensided (surface has smooth, glassy finish with visual evidence of striations)
- S - Smooth (surface appears smooth and feels so to the touch)
- SR - Slightly Rough (asperities on the discontinuity surfaces are distinguishable and can be felt)
- R - Rough (some ridges and side-angle steps are evident; asperities are clearly visible, and discontinuity surface feels very abrasive
- VR - Very Rough (near-vertical steps and ridges occur on the discontinuity surface)

Figure 6-12, SCDOT Soil Test Boring Log Descriptors - Rock

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-29
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 26
Eng./Geo.:	AKS	**Boring Location:**	78+44.84	**Offset:**	L:37.56'	**Alignment:**	Proposed
Elev.:	225.1 ft	**Latitude:**	34.030949	**Longitude:**	-81.105665	**Date Started:**	2/14/2018
Total Depth:	76.8 ft	**Soil Depth:**	56.8 ft	**Core Depth:**	20 ft	**Date Completed:**	2/14/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 18.4 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 12 inches of ASPHALT.								
	1.0	**FILL - CLAYEY SAND (SC)** - medium dense, moist, weak red (5R 4/3), subangular, mostly fine to medium sands, some low plasticity fines, [LL=23, PL=12, PI=11, NMC=12.7%, %#200=32.4], AASHTO = A-2-6 (0).		1.0	SS-1	5	6	6	8	12
		@ 3 feet - loose.		3.0	SS-2	5	3	5	12	8
220.1		@ 5 feet - medium dense, reddish-yellow (7.5YR 6/6).		5.0	SS-3	13	18	12	10	30
				7.0	SS-4	12	13	17	19	30
	9.0	**PIEDMONT RESIDUUM - FAT CLAY WITH SAND (CH)** - hard, moist, reddish-yellow (7.5YR 6/6), mostly high plasticity fines, little fine to medium sands, [LL=58, PL=25, PI=33, NMC=23.7%, %#200=74.4], AASHTO = A-7-6 (25).		9.0	SS-5	12	16	18	19	34
215.1										
		@ 14.5 feet - stiff.		14.5	SS-6	3	4	6		10
210.1										
				19.5						

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-29
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 26
Eng./Geo.:	AKS	**Boring Location:**	78+44.84	**Offset:**	L:37.56'	**Alignment:**	Proposed
Elev.:	225.1 ft	**Latitude:**	34.030949	**Longitude:**	-81.105665	**Date Started:**	2/14/2018
Total Depth:	76.8 ft	**Soil Depth:**	56.8 ft	**Core Depth:**	20 ft	**Date Completed:**	2/14/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 18.4 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
					SS-7	5	6	8		14
	24.5			24.5						
200.1		**FAT CLAY (CH)** - firm, moist, reddish-yellow (7.5YR 6/6), mostly high plasticity fines, trace fine sands, [LL=89, PL=31, PI=58, NMC=45.7%, %#200=96.7], AASHTO = A-7-5 (67).			SS-8	2	2	3		5
	29.5			29.5						
195.1		**PARTIALLY WEATHERED ROCK (PWR) - SANDY SILT (ML)** - very hard, dry to moist, greenish-gray (6/10Y), mostly low plasticity fines, some fine sands, relict rock structure.			SS-9	32	50/5"	-		100
				34.5						
					SS-10	50/5"-		-		100
190.1										
	39.5			39.5						

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-29
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 26
Eng./Geo.:	AKS	**Boring Location:**	78+44.84	**Offset:**	L:37.56'	**Alignment:**	Proposed
Elev.:	225.1 ft	**Latitude:**	34.030949	**Longitude:**	-81.105665	**Date Started:**	2/14/2018
Total Depth:	76.8 ft	**Soil Depth:**	56.8 ft	**Core Depth:**	20 ft	**Date Completed:**	2/14/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 18.4 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
		PIEDMONT RESIDUUM - SILT (ML) - very stiff, dry to moist, greenish-gray (6/10Y), mostly low plasticity fines, few fine sands, relict rock structure.			SS-11	11	10	16		26
				44.5						
180.1		@ 44.5 feet - stiff, [LL=42, PL=28, PI=14, NMC=22.6%, %#200=89.8], AASHTO = A-7-6 (15).			SS-12	5	8	7		15
				49.5						
175.1					SS-13	8	7	7		14
	54.5			54.5						
170.1		**PARTIALLY WEATHERED ROCK (PWR) - SANDY SILT (ML)** - very hard, dry to moist, greenish-gray (6/10Y), mostly low plasticity fines, some fine sands, relict rock structure.			SS-14	5	8	50/3"		100
	56.8	Tri-Cone Bit Refusal at 56.8 feet. Install NW Casing to 56.8 feet for NQ wireline coring.		56.8						
		For discontinuity descriptors, see discontinuity worksheet.			RC-1					
		METAMORPHIC BEDROCK - SCHIST -		60.0						

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-29
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 26
Eng./Geo.:	AKS	**Boring Location:**	78+44.84	**Offset:**	L:37.56'	**Alignment:**	Proposed
Elev.:	225.1 ft	**Latitude:**	34.030949	**Longitude:**	-81.105665	**Date Started:**	2/14/2018
Total Depth:	76.8 ft	**Soil Depth:**	56.8 ft	**Core Depth:**	20 ft	**Date Completed:**	2/14/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 18.4 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		gray (GLEY 1 4/), fine grained, laminated, moderately weathered, strong rock.						
		RC-1: Rec= 100%, RQD= 32.0%, GSI= 40-50.						
		@ 60 feet - highly weathered zone, weak rock.			RC-2			
		@ 62.7 feet - residual soil seam.						
		@ 63.5 feet - moderately weathered, medium strong rock.						
160.1		RC-2: Rec= 72.0%, RQD= 10.0%, GSI= 60-70.		65.0				
		@ 65.2 feet - fresh, very strong rock.			RC-3			
		RC-3: Rec= 100%, RQD= 80.0%, GSI= 70-80, RMR = 61.						
155.1				70.0				
		RC-4: Rec= 100%, RQD= 93.0%, GSI= 70-80, RMR = 61.			RC-4			
150.1				75.0				
		RC-5: Rec= 88.9%, RQD= 73.0%, GSI= 70-80, RMR = 54.			RC-5			
	76.8	Boring Terminated at 76.8 feet.						

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Millwood
Logged By: Austin Syms
Date: 2/14/2018

Boring Number: B-29
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 2

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
57.2	1	J	45	VN	No	N/A	St	SR	
57.8	2	J	30	T	No	N/A	Pl	S	
57.9	3	J	30	T	No	N/A	Pl	S	
65.4	4	J	2	N	No	N/A	Pl	SR	
66.1	5	J	5	T	No	N/A	Pl	SR	
66.7	6	J	32	T	No	N/A	St	R	
66.8	7	J	45	VN	No	N/A	Pl	SR	
68.8	8	J	41	T	No	N/A	Pl	SR	
69.4	9	J	27	T	No	N/A	Pl	SR	
70.3	10	J	21	N	No	N/A	Pl	SR	
71.3	11	J	36	VN	No	N/A	Pl	SR	
71.7	12	J	7	T	No	N/A	Pl	SR	
72.4	13	J	44	N	No	N/A	Pl	SR	
73.7	14	J	23	T	No	N/A	Pl	SR	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-30
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 26
Eng./Geo.:	AKS	**Boring Location:**	87+38.05	**Offset:**	L:42.04'	**Alignment:**	Proposed
Elev.:	234.2 ft	**Latitude:**	34.030514	**Longitude:**	-81.102766	**Date Started:**	2/15/2018
Total Depth:	98.6 ft	**Soil Depth:**	98.6 ft	**Core Depth:**	0 ft	**Date Completed:**	2/15/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 38.7 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.2	**SURFACE MATERIALS** - 2 inches of TOPSOIL.		0.0	SS-1	3	2	4	4	6
		FILL - CLAYEY SAND (SC) - loose, moist, weak red (10R 4/4), subangular, mostly fine to medium sands, some low plasticity fines.		2.0	SS-2	6	5	7	8	12
		@ 2 feet - medium dense.								
229.2		@ 4 feet - [LL=37, PL=16, PI=21, NMC=15.9%, %#200=45.3], AASHTO = A-6 (5).		4.0	SS-3	5	5	9	10	14
				6.0	SS-4	9	10	11	14	21
		@ 8 feet - loose, brown (7.5YR 5/4).		8.0	SS-5	2	3	3	3	6
224.2										
		@ 13.5 feet - very loose.		13.5	SS-6	3	2	2		4
219.2										
	18.5	**PIEDMONT RESIDUUM - FAT CLAY (CH)** - very stiff, moist, reddish-yellow (7.5YR 6/6), mostly high plasticity fines, few fine sands.		18.5	SS-7	9	14	14		28

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-30
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 26
Eng./Geo.:	AKS	**Boring Location:**	87+38.05	**Offset:**	L:42.04'	**Alignment:**	Proposed
Elev.:	234.2 ft	**Latitude:**	34.030514	**Longitude:**	-81.102766	**Date Started:**	2/15/2018
Total Depth:	98.6 ft	**Soil Depth:**	98.6 ft	**Core Depth:**	0 ft	**Date Completed:**	2/15/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 38.7 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
		@ 23.5 feet - stiff, [LL=50, PL=26, PI=24, NMC=39.3%, %#200=91.4], AASHTO = A-7-6 (25).		23.5	SS-8	9	5	8		13
209.2										
	28.5	**SILTY SAND (SM)** - medium dense, moist, reddish-yellow (7.5YR 6/6), subangular, mostly fine sands, some low plasticity fines.		28.5	SS-9	5	6	8		14
204.2										
				33.5	SS-10	5	8	10		18
199.2										
		▽ @ 38.5 feet - dense.		38.5	SS-11	5	14	18		32

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-30
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 26
Eng./Geo.:	AKS	**Boring Location:**	87+38.05	**Offset:**	L:42.04'	**Alignment:**	Proposed
Elev.:	234.2 ft	**Latitude:**	34.030514	**Longitude:**	-81.102766	**Date Started:**	2/15/2018
Total Depth:	98.6 ft	**Soil Depth:**	98.6 ft	**Core Depth:**	0 ft	**Date Completed:**	2/15/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 38.7 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				43.5				
		@ 43.5 feet - medium dense.			SS-12	9 11 12	23	●
189.2								
				48.5				
					SS-13	10 12 16	28	●
184.2								
	53.5			53.5				
		PARTIALLY WEATHRED ROCK (PWR) - SILTY SAND (SM) - very dense, moist, reddish-yellow (7.5YR 6/6), subangular, mostly fine sands, some low plasticity fines.			SS-14	16 29 50/5"	100	●
179.2								
	58.5			58.5				
		PIEDMONT RESIDUUM - SILT WITH SAND (ML) - hard, moist, reddish-yellow (7.5YR 6/6), mostly low plasticity fines, little fine sands.			SS-15	12 18 25	43	●

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-30
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 26
Eng./Geo.:	AKS	**Boring Location:**	87+38.05	**Offset:**	L:42.04'	**Alignment:**	Proposed
Elev.:	234.2 ft	**Latitude:**	34.030514	**Longitude:**	-81.102766	**Date Started:**	2/15/2018
Total Depth:	98.6 ft	**Soil Depth:**	98.6 ft	**Core Depth:**	0 ft	**Date Completed:**	2/15/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 38.7 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				63.5				
		@ 63.5 feet - very hard, [LL=39, PL=28, PI=11, NMC=20.3%, %#200=77.9], AASHTO = A-6 (9)			SS-16	13 32 40	72	
169.2								
				68.5				
					SS-17	17 28 35	63	
164.2								
	73.5			73.5				
		PARTIALLY WEATHRED ROCK (PWR) - SILTY SAND (SM) - very dense, moist, reddish-yellow (7.5YR 6/6), subangular, mostly fine sands, some low plasticity fines.			SS-18	32 38 50/4"	100	
159.2								
	78.5			78.5				
		PIEDMONT RESIDUUM - SILT WITH SAND (SM) - very hard, moist, reddish-yellow (7.5YR 6/6), mostly low plasticity fines, some fine sands, [LL=36,			SS-19	20 30 35	65	

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-30
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 26
Eng./Geo.:	AKS	**Boring Location:**	87+38.05	**Offset:**	L:42.04'	**Alignment:**	Proposed
Elev.:	234.2 ft	**Latitude:**	34.030514	**Longitude:**	-81.102766	**Date Started:**	2/15/2018
Total Depth:	98.6 ft	**Soil Depth:**	98.6 ft	**Core Depth:**	0 ft	**Date Completed:**	2/15/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 38.7 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
		PL=25, PI=11, NMC=18.3%, %#200=74.1], AASHTO = A-6 (8).					
	83.5			83.5			
149.2		**PARTIALLY WEATHRED ROCK (PWR) - SILTY SAND (SM)** - very dense, moist, reddish-yellow (7.5YR 6/6), subangular, mostly fine sands, some low plasticity fines.			SS-20	50/5"- -	100
				88.5	SS-21	45 50/5"	100
144.2							
				93.5	SS-22	50/3"- -	100
139.2							
	98.6			98.5	SS-23	50/1"- -	100
		Boring Terminated at 98.6 feet.					

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-31
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 27
Eng./Geo.:	AKS	**Boring Location:**	8379+65.67	**Offset:**	L:42.91'	**Alignment:**	Proposed
Elev.:	205.7 ft	**Latitude:**	34.028294	**Longitude:**	-81.102982	**Date Started:**	3/5/2018
Total Depth:	55.5 ft	**Soil Depth:**	25.9 ft	**Core Depth:**	29.6 ft	**Date Completed:**	3/5/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 11.2 ft	**24HR**	23.3 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0								
	0.2	**SURFACE MATERIALS** - 2 inches of TOPSOIL.	0.0	SS-1	3	3	5	7	8
		PIEDMONT RESIDUUM - SILT WITH SAND (ML) - firm, moist, light brownish-gray (10YR 6/2), mostly low plasticity fines, little fine to medium sands, relict rock structure, [LL=45, PL=28, PI=17, NMC=25.3%, %#200=72.6], AASHTO = A-7-6 (13).	2.0	SS-2	12	18	20	26	38
		@ 2 feet - hard, bluish-gray (6/5 B).							
		@ 4 feet - very stiff.	4.0	SS-3	6	10	12	12	22
200.7									
		@ 6 feet - hard.	6.0	SS-4	12	14	17	19	31
			8.0	SS-5	12	13	14	19	27
		@ 8 feet - very stiff, brownish-yellow (10YR 6/6), little fine sands, [LL=45, PL=32, PI=13, NMC=27.8%, %#200=82.5], AASHTO = A-7-5 (13).							
195.7									
		▽							
			13.5	SS-6	7	10	16		26
		@ 13.5 feet - bluish-gray (GLEY 2 6/5B).							
190.7									
			18.5	SS-7	5	7	9		16

SPT N VALUE ●

PL ⨯ MC ○ LL ⨯

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-31
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 27
Eng./Geo.:	AKS	**Boring Location:**	8379+65.67	**Offset:**	L:42.91'	**Alignment:**	Proposed
Elev.:	205.7 ft	**Latitude:**	34.028294	**Longitude:**	-81.102982	**Date Started:**	3/5/2018
Total Depth:	55.5 ft	**Soil Depth:**	25.9 ft	**Core Depth:**	29.6 ft	**Date Completed:**	3/5/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 11.2 ft	**24HR**	23.3 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		@ 23.5 feet - hard.		23.5	SS-8	5	9	32		41	
180.7	25.9	Tri-cone bit refusal at 25.9 feet. Install NW casing to 25.9 for NQ wireline coring.		25.9							
		For discontinuity descriptors, see discontinuity worksheet.									
		METAMORPHIC BEDROCK - SCHIST - gray (GLEY 1 4/), fine grained, foliated, slightly weathered, strong rock.			RC-1						
175.7		RC-1: Rec= 93.5%, RQD= 52.3%, GSI= 45-55, RMR = 47.		30.5							
		@ 30.7 feet - greenish-gray (GLEY 1 6/), residual soil.									
		@ 31 feet - dark greenish-gray (GLEY 1 4/), moderately weathered, medium strong rock.			RC-2						
		RC-2: Rec= 48.0%, RQD= 0.0%, GSI= 30-40.									
170.7		@ 35.4 feet - greenish-gray (GLEY 1 6/), residual soil.		35.5							
		@ 35.9 feet - dark greenish-gray (GLEY 1 4/), moderately weathered, medium rock.									
		@ 37 feet - greenish-gray (GLEY 1 6/), residual soil.			RC-3						
		RC-3: Rec= 46.0%, RQD= 0.0%, GSI= 30-40.									

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-31
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 27
Eng./Geo.:	AKS	**Boring Location:**	8379+65.67	**Offset:**	L:42.91'	**Alignment:**	Proposed
Elev.:	205.7 ft	**Latitude:**	34.028294	**Longitude:**	-81.102982	**Date Started:**	3/5/2018
Total Depth:	55.5 ft	**Soil Depth:**	25.9 ft	**Core Depth:**	29.6 ft	**Date Completed:**	3/5/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 11.2 ft	**24HR**	23.3 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		@ 40.5 feet - dark greenish-gray (GLEY 1 4/), moderately weathered, medium strong rock.		40.5				
		@ 42 feet - greenish-gray (GLEY 1 6/), residual soil.			RC-4			
		@ 42.2 feet - dark greenish-gray (GLEY 1 4/), moderately weathered, weak rock.						
		42.7 feet - fresh, strong rock.						
		RC-4: Rec= 80.0%, RQD= 43.3%, GSI= 30-40, RMR = 42.						
160.7				45.5				
		@ 46.7 feet - residual soil, greenish-gray (GLEY 1 6/).			RC-5			
		RC-5: Rec= 44.0%, RQD= 13.3%, GSI= 30-40.						
155.7				50.5				
		RC-6: Rec= 66.0%, RQD= 0.0%, GSI= 10-20.			RC-6			
150.7								
	55.5	@ 55.1 feet - dark greenish-gray (GLEY 1 4/), moderately weathered, medium strong rock.						
		Boring Terminated at 55.5 feet.						

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Millwood
Logged By: Austin Syms
Date: 3/7/2018

Boring Number: B-31
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 2

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
26.3	1	J	90	VN	No	N/A	Pl	SR	
26.5	2	J	140	T	No	N/A	Pl	SR	
26.7	3	J	90	VN	No	N/A	Pl	SR	
27.4	4	J	36	T	Pa	Fe	Pl	SR	
27.8	5	J	72	N	No	N/A	Pl	SR	
28.4	6	J	28	T	Pa	Fe	Pl	SR	
29	7	J	41	VN	Pa	Fe	Pl	SR	
29.2	8	J	49	VN	Pa	Fe	Pl	SR	
30.7	9	J	N/A	N/A	No	N/A	Ir	SR	Fractured zone 30.7' - 30.9'
31	10	J	90	N	No	N/A	Pl	SR	
31.3	11	J	90	N	No	N/A	Pl	SR	
31.8	12	J	58	N	No	N/A	Pl	SR	
32.1	13	J	33	VN	Pa	Fe	Pl	SR	
32.7	14	J	33	VN	Pa	Fe	Pl	SR	
34.8	15	J	N/A	N/A	No	N/A	Ir	SR	Fractured zone 34.8' - 35.5'
35.5	16	J	N/A	N/A	No	N/A	Ir	SR	Fractured zone 35.5' - 35.9'
36.2	17	J	22	N	No	N/A	Pl	SR	
40.6	18	J	42	VN	No	N/A	Pl	SR	
40.9	19	J	42	VN	No	N/A	Pl	SR	
41.2	20	J	80	N	No	N/A	Pl	SR	
42.3	21	J	36	N	No	N/A	Pl	SR	
42.7	22	J	68	N	No	N/A	Pl	SR	
43.7	23	J	83	N	No	N/A	Pl	SR	
43.8	24	J	29	VN	No	N/A	Pl	SR	
45.5	25	J	42	VN	Pa	Cl	Pl	SR	
46.1	26	J	70	T	No	N/A	Pl	SR	
55	27	J	N/A	N/A	No	N/A	Ir	SR	Fractured zone 55' - 55.5'

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-32
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 27
Eng./Geo.:	AKS	**Boring Location:**	8382+97.01	**Offset:**	R:19.22'	**Alignment:**	Proposed
Elev.:	194.7 ft	**Latitude:**	34.027484	**Longitude:**	-81.102468	**Date Started:**	3/13/2018
Total Depth:	85.7 ft	**Soil Depth:**	55.7 ft	**Core Depth:**	30 ft	**Date Completed:**	3/14/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	19.7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.1	**SURFACE MATERIALS** - 1 inch of TOPSOIL.		0.0	SS-1	2	2	3	3	5
	2.0	**ALLUVIUM - CLAYEY SAND WITH GRAVEL (SC)** - loose, moist, strong brown (7.5YR 4/6), mostly fine to coarse sands, some low plasticity fines, few fine gravel, [LL=45, PL=21, PI=24, NMC=26.3%, %#200=48.0], AASHTO = A-7-6 (8).		2.0	SS-2	7	14	12	10	26
				4.0	SS-3	8	7	10	10	17
189.7	6.0	**CLAYEY GRAVEL WITH SAND (GC)** - medium dense, reddish-yellow (5YR 6/6) and dark greenish-gray (GLEY 1 4/1), mostly fine quartz gravel, some fine to coarse sands, little low plasticity fines, [LL=32, PL=17, PI=15, NMC=10.9%, %#200=17.4], AASHTO = A-2-6 (0).		6.0	SS-4	5	8	11	9	19
				8.0	SS-5	7	8	12	27	20
184.7		**PIEDMONT RESIDUUM - SILT WITH SAND (ML)** - very stiff, moist, grayish-green (GLEY 1 4/2), mostly low plasticity fines, little fine to coarse sands, trace weathered rock fragments, [LL=43, PL=32, PI=11, NMC=34.6%, %#200=70.3], AASHTO = A-7-5 (8). @ 8 feet - grayish-green (GLEY 1 4/2) and brownish-yellow (10YR 6/8).								
		@ 13.5 feet - hard.		13.5	SS-6	15	17	15		32
179.7										
	18.5	**PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM)** - very dense, moist to wet, very dark greenish-gray (GLEY 1 3/1), mostly fine to coarse sands, little low		18.5	SS-7	27	37	50/4"		100

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-32
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 27
Eng./Geo.:	AKS	**Boring Location:**	8382+97.01	**Offset:**	R:19.22'	**Alignment:**	Proposed
Elev.:	194.7 ft	**Latitude:**	34.027484	**Longitude:**	-81.102468	**Date Started:**	3/13/2018
Total Depth:	85.7 ft	**Soil Depth:**	55.7 ft	**Core Depth:**	30 ft	**Date Completed:**	3/14/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	19.7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		plasticity fines, weathered rock fragments.						
				23.5	SS-8	50/5"- -	100	
169.7								
	28.5			28.5				
		SANDY SILT (ML) - very hard, moist, dark yellowish-brown (10YR 4/6) and dark greenish-gray (GLEY 1 3/1), mostly low plasticity fines, some fine to coarse sands, weathered rock fragments.			SS-9	43 45 50/5"	100	
164.7								
				33.5	SS-10	50/4"- -	100	
159.7								
				38.5	SS-11	50/5"- -	100	

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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-32
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 27
Eng./Geo.:	AKS	**Boring Location:**	8382+97.01	**Offset:**	R:19.22'	**Alignment:**	Proposed
Elev.:	194.7 ft	**Latitude:**	34.027484	**Longitude:**	-81.102468	**Date Started:**	3/13/2018
Total Depth:	85.7 ft	**Soil Depth:**	55.7 ft	**Core Depth:**	30 ft	**Date Completed:**	3/14/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	19.7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	43.5			43.5	SS-12	50/3"- -	100	
149.7		**SILTY SAND (SM)** - very dense, moist to wet, very dark greenish-gray (GLEY 1 3/2), mostly fine to coarse sands, little low plasticity fines, weathered rock fragments.						
				48.5	SS-13	50/5"- -	100	
144.7								
		@ 53.5 feet - no recovery.		53.5	SS-14	50/1"- -	100	
139.7								
	55.7	Tri-Cone Bit Refusal at 55.7 feet. Install NW Casing to 55.7 feet for NQ wireline coring.		55.7				
		For discontinuity descriptors, see discontinuity worksheet.						
		<u>METAMORPHIC BEDROCK</u> - SCHIST - gray (GLEY 1 4/), fine grained, foliated, moderately weathered, medium strong rock.			RC-1			
		@ 55.7 feet - 3-inch quartz epidote vein.						

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-32
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 27
Eng./Geo.:	AKS	**Boring Location:**	8382+97.01	**Offset:**	R:19.22'	**Alignment:**	Proposed
Elev.:	194.7 ft	**Latitude:**	34.027484	**Longitude:**	-81.102468	**Date Started:**	3/13/2018
Total Depth:	85.7 ft	**Soil Depth:**	55.7 ft	**Core Depth:**	30 ft	**Date Completed:**	3/14/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	19.7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		RC-1: Rec= 18.0%, RQD= 0.0%, GSI=10-20.		60.7				
		@ 60.8 feet - highly weathered.			RC-2			
		RC-2: Rec= 30.0%, RQD= 0.0%, GSI=10-20.						
129.7				65.7				
		@ 65.8 feet - brownish-yellow (10YR 6/8), residual soil.			RC-3			
		@ 66.4 feet - gray (GLEY 1 4/), highly weathered, weak rock.						
		RC-3: Rec= 60.0%, RQD= 20.0%, GSI=10-20, RMR = 24.						
124.7				70.7				
		@ 70.7 feet - moderately weathered, medium strong rock.			RC-4			
		RC-4: Rec= 32.0%, RQD= 0.0%, GSI= 10-20.						
119.7				75.7				
		RC-5: Rec= 24.0%, RQD= 0.0%, GSI= 10-20.			RC-5			

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-32
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 27
Eng./Geo.:	AKS	**Boring Location:**	8382+97.01	**Offset:**	R:19.22'	**Alignment:**	Proposed
Elev.:	194.7 ft	**Latitude:**	34.027484	**Longitude:**	-81.102468	**Date Started:**	3/13/2018
Total Depth:	85.7 ft	**Soil Depth:**	55.7 ft	**Core Depth:**	30 ft	**Date Completed:**	3/14/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	19.7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		@ 80.7 feet - highly weathered, weak rock.		80.7				
		@ 81.3 feet - moderately weathered, medium strong rock.			RC-6			
		RC-6: Rec= 16.0%, RQD= 0.0%, GSI= 10-20.						
109.7	85.7	Boring Terminated at 85.7 feet.						
104.7								
99.7								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Millwood
Logged By: Austin Syms
Date: 3/14/2018

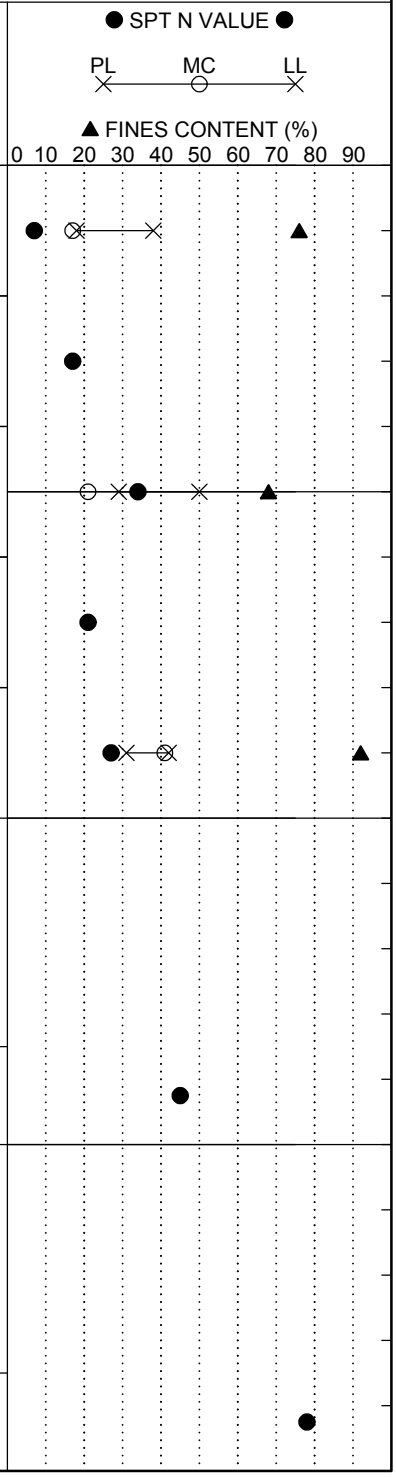
Boring Number: B-32
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 1

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
55.7	1	J	N/A	N/A	Pa	Fe	Ir	SR	Fractured zone 55.7' - 56.1'
56.1	2	J	59	W	Pa	Fe	Pl	SR	
56.3	3	J	N/A	N/A	No	N/A	Ir	SR	Fractured zone 56.3' - 67.1'
67.1	4	J	38	W	No	N/A	Pl	SR	
68.1	5	J	N/A	N/A	No	N/A	Ir	SR	Fractured zone 68.1' - 76.5'
76.5	6	J	21	VN	Pa	Fe	Pl	SR	
76.9	7	J	N/A	N/A	No	N/A	Ir	SR	Fractured zone 76.9' - 95.7'

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-33
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 30
Eng./Geo.:	AKS	**Boring Location:**	385+33.31	**Offset:**	L:2.608'	**Alignment:**	Proposed
Elev.:	183.3 ft	**Latitude:**	34.026832	**Longitude:**	-81.102580	**Date Started:**	3/8/2018
Total Depth:	74.6 ft	**Soil Depth:**	45.9 ft	**Core Depth:**	28.7 ft	**Date Completed:**	3/9/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 9.9 ft	**24HR**	8.2 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0		0.0						
	0.1	**SURFACE MATERIALS** - 1 inch of TOPSOIL.							
		ALLUVIUM - LEAN CLAY WITH SAND (CL) - firm, moist, red (10R 4/6), mostly low plasticity fines, little fine to medium sands, [LL=38, PL=18, PI=20, NMC=17.0%, %#200=75.9], AASHTO = A-6 (14).		SS-1	2	4	3	5	7
		@ 2 feet - very stiff.	2.0						
				SS-2	5	7	10	12	17
	4.0		4.0						
178.3		**SANDY ELASTIC SILT (MH)** - hard, moist, red (10R 4/6), mostly high plasticity fines, some fine to medium sands, [LL=50, PL=29, PI=21, NMC=20.8%, %#200=68.1], AASHTO = A-7-6 (14).		SS-3	7	12	22	26	34
		@ 6 feet - very stiff, brownish-yellow (10YR 6/8).	6.0						
				SS-4	7	10	11	15	21
	8.0		8.0						
		PIEDMONT RESIDUUM - SILT (ML) - hard, moist, brownish-yellow (10YR 6/8) and greenish-gray (GLEY 1 5/1), mostly low plasticity fines, few fine sands, [LL=42, PL=31, PI=11, NMC=40.9%, %#200=92.4], AASHTO = A-7-5 (13).		SS-5	7	12	15	17	27
173.3									
			13.5						
				SS-6	20	22	23		45
168.3									
			18.5						
		@ 18.5 feet - very hard.		SS-7	20	32	46		78



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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-33
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 30
Eng./Geo.:	AKS	**Boring Location:**	385+33.31	**Offset:**	L:2.608'	**Alignment:**	Proposed
Elev.:	183.3 ft	**Latitude:**	34.026832	**Longitude:**	-81.102580	**Date Started:**	3/8/2018
Total Depth:	74.6 ft	**Soil Depth:**	45.9 ft	**Core Depth:**	28.7 ft	**Date Completed:**	3/9/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 9.9 ft	**24HR**	8.2 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
	23.5	**PARTIALLY WEATHERED ROCK (PWR) - SANDY SILT (ML)** - very hard, moist, brownish-yellow (10YR 6/8) and greenish-gray (GLEY 1 5/1), mostly low plasticity fines, some fine to medium sands, relict rock structure.		23.5	SS-8	50/5"- -	100
158.3				28.5	SS-9	50/4"- -	100
153.3				33.5	SS-10	50/4"- -	100
148.3				38.5	SS-11	50/0"- -	100

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-33
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 30
Eng./Geo.:	AKS	**Boring Location:**	385+33.31	**Offset:**	L:2.608'	**Alignment:**	Proposed
Elev.:	183.3 ft	**Latitude:**	34.026832	**Longitude:**	-81.102580	**Date Started:**	3/8/2018
Total Depth:	74.6 ft	**Soil Depth:**	45.9 ft	**Core Depth:**	28.7 ft	**Date Completed:**	3/9/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 9.9 ft	**24HR**	8.2 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				43.5	SS-12	50/0"- -	100	
138.3	45.9	Tri-Cone Bit Refusal at 45.9 feet. Install NW Casing to 45.9 feet for NQ wireline coring.		45.9				
		For discontinuity descriptors, see discontinuity worksheet.						
		METAMORPHIC BEDROCK - SCHIST - gray (GLEY 1 4/), fine grained, foliated, moderately weathered, medium strong rock, coarse grained quartz veins.			RC-1			
133.3		@ 46.1 feet - light yellowish-brown (10YR 6/4), residual soil.		50.6				
		RC-1: Rec= 21.3%, RQD= 0.0%, GSI= 10-20.						
		@ 46.7 feet - gray (GLEY 1 4/), moderately weathered, medium strong rock.			RC-2			
		RC-2: Rec= 12.0%, RQD= 0.0%, GSI= 10-20.						
128.3				55.6				
					RC-3			
		RC-3: Rec= 20.0%, RQD= 0.0%, GSI= 10-20.						

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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-33
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 30
Eng./Geo.:	AKS	**Boring Location:**	385+33.31	**Offset:**	L:2.608'	**Alignment:**	Proposed
Elev.:	183.3 ft	**Latitude:**	34.026832	**Longitude:**	-81.102580	**Date Started:**	3/8/2018
Total Depth:	74.6 ft	**Soil Depth:**	45.9 ft	**Core Depth:**	28.7 ft	**Date Completed:**	3/9/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 9.9 ft	**24HR**	8.2 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				60.6				
		RC-4: Rec= 30.0%, RQD= 0.0%, GSI= 10-20.			RC-4			
118.3				65.6				
		@ 65.9 feet - dark yellowish-brown (10YR 4/6), residual soil.						
		@ 67.4 feet - gray (GLEY 1 4/), highly weathered, weak rock.			RC-5			
		68.3 feet - medium strong rock.						
		RC-5: Rec= 80.0%, RQD= 0.0%, GSI= 10-20.						
113.3		@ 69 feet - moderately weathered, medium strong rock.		70.6				
		@ 72.2 feet - quartz vein.			RC-6			
		RC-6: Rec= 100%, RQD= 18.8%, GSI= 30-40, RMR = 37.						
	74.6							
108.3		Boring Terminated at 74.6 feet.						

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Millwood
Logged By: Austin Syms
Date: 3/9/2018

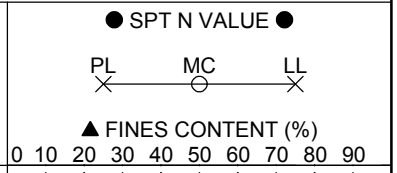
Boring Number: B-33
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 1

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
45.9	1	J	N/A	N/A	No	N/A	Pl	SR	Fractured zone 45.9' - 69'
69	2	J	55	N	No	N/A	Pl	SR	
69.4	3	J	55	VN	No	N/A	Pl	SR	
71	4	J	53	N	No	N/A	Pl	SR	
71.3	5	J	69	VN	No	N/A	Pl	SR	
71.5	6	J	72	VN	No	N/A	Pl	SR	
71.6	7	J	N/A	N/A	Pa	Fe	Ir	SR	Fractured zone 71.6' - 771.8'
72	8	J	88	VN	Pa	Fe	Pl	SR	
72.2	9	J	31	N	Pa	Fe	Pl	SR	
72.3	10	J	N/A	N/A	Pa	Fe	Ir	SR	Fractured zone 72.3' - 72.7'
73	11	J	19	T	Pa	Fe	Pl	SR	
73.2	12	J	79	T	Pa	Fe	Ir	SR	
73.4	13	J	31	T	Pa	Fe	Pl	SR	
73.6	14	J	90	T	No	N/A	Pl	SR	
73.7	15	J	90	T	No	N/A	Pl	SR	
74.2	16	J	82	VN	No	N/A	Pl	SR	
75.2	17	J	25	N	No	N/A	Pl	SR	
75.4	18	J	5	N/A	No	N/A	Ir	SR	Fractured zone 75.4' - 75.6'

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-34
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 33
Eng./Geo.:	ELF	**Boring Location:**	389+21.02	**Offset:**	L:14.330'	**Alignment:**	Proposed
Elev.:	196.8 ft	**Latitude:**	34.025765	**Longitude:**	-81.102667	**Date Started:**	2/5/18
Total Depth:	74.6 ft	**Soil Depth:**	41.3 ft	**Core Depth:**	33.3 ft	**Date Completed:**	2/6/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	25 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 12 inches of ASPHALT.								
	1.0	**FILL - SANDY SILT (ML)** - soft, wet, yellowish red (5YR 5/6), mostly low plasticity fines, some fine to medium sands.		1.0	SS-1	3	3	1	1	4
		@ 3 feet - stiff, [LL=43, PL=27, PI=16, NMC=29.0%, %#200=62.2], AASHTO = A-7-6 (9).		3.0	SS-2	2	5	4	5	9
191.8	5.0	**CLAYEY SAND (SC)** - loose, moist, gray (5YR 6/1), mostly fine to medium sand, some low plasticity fines.		5.0	SS-3	3	4	4	5	8
				7.0	SS-4	2	3	4	4	7
		@ 9 feet - grayish-green (GLEY 1 5G 5/2), trace roots, [LL=39, PL=18, PI=21, NMC=18.5%, %#200=41.6], AASHTO = A-6 (4).		9.0	SS-5	3	2	4	4	6
186.8										
				13.5	SS-6	3	4	4		8
181.8										
		@ 18.5 feet - medium dense, dark gray (5YR 4/1), mostly fine to coarse sands.		18.5	SS-7	2	5	6		11



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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-34
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 33
Eng./Geo.:	ELF	**Boring Location:**	389+21.02	**Offset:**	L:14.330'	**Alignment:**	Proposed
Elev.:	196.8 ft	**Latitude:**	34.025765	**Longitude:**	-81.102667	**Date Started:**	2/5/18
Total Depth:	74.6 ft	**Soil Depth:**	41.3 ft	**Core Depth:**	33.3 ft	**Date Completed:**	2/6/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	25 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				23.5	SS-8	4	4	4		8	
171.8		@ 23.5 feet - loose, gray to yellowish red (5YR 5/11 to 5/6), mostly fine to medium sands.									
				28.5	SS-9	3	4	4		8	
166.8		@ 28.5 feet - dark gray to yellowish red (5YR 4/1 to 4/6).									
	32.0	**ALLUVIUM - SANDY SILTY CLAY (CL-ML)** - very soft, moist, dark gray (5YR 4/1), mostly low plasticity fines, some fine to medium sands, [LL=23, PL=16, PI=7, NMC=24.5%, %#200=69.0], AASHTO = A-4 (2).		33.5	SS-10	1	1	1		2	
161.8											
	36.0	**CLAYEY SAND (SC)** - very loose, moist, dark gray (5YR 4/1), mostly fine to medium sands, little low plasticity fines.									
	38.5	**SANDY LEAN CLAY (CL)** - soft, wet, dark gray (5YR 4/1), mostly low plasticity fines, some fine to medium sands, trace mica, [LL=37, PL=23, PI=14, NMC=30.9%,		38.5	SS-11	4	2	2		4	

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-34
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 33
Eng./Geo.:	ELF	**Boring Location:**	389+21.02	**Offset:**	L:14.330'	**Alignment:**	Proposed
Elev.:	196.8 ft	**Latitude:**	34.025765	**Longitude:**	-81.102667	**Date Started:**	2/5/18
Total Depth:	74.6 ft	**Soil Depth:**	41.3 ft	**Core Depth:**	33.3 ft	**Date Completed:**	2/6/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	25 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		%#200=69.3], AASHTO = A-6 (8).						
	41.3	Tri-Cone Bit Refusal at 41.3 feet. Install NW Casing to 41.3 feet for NQ wireline coring.		41.3				
		For discontinuity descriptors, see discontinuity worksheet.			RC-1			
		METAMORPHIC BEDROCK - SCHIST - dark greenish-gray (10GY 4/1), fine grained to very fine grained, subrounded, moderately weathered, medium strong rock, low core recovery 41.3 to 55 feet likely due to residual soil seams washed away by drilling process.		44.6				
151.8		RC-1 : Rec= 9.1%, RQD= 0.0%, GSI= 10-20.			RC-2			
		RC-2 : Rec= 16.0%, RQD= 0.0%, GSI= 10-20.		49.6				
146.8		@ 49.6 feet - highly weathered zone, extremely weak rock.			RC-3			
		RC-3 : Rec= 20.0%, RQD= 0.0%, GSI= 10-20.						
	54.6			55.0				
141.8		**PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM)** - very dense, wet, gray (5YR 5/1), mostly fine to coarse sands, few non-plastic fines, gravel-sized rock fragments.			SS-12	50/5" - -	100	
	56.0	Tri-Cone Bit Refusal at 56 feet. Advance NW Casing to 56 feet to continue NQ wireline coring.		56.0				
		METAMORPHIC BEDROCK - SCHIST - pinkish-gray (5YR 6/2), coarse grained to fine grained, foliated, moderately to highly weathered, medium strong to weak rock, quartz epidote.			RC-4			
				59.6				

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-34
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 33
Eng./Geo.:	ELF	**Boring Location:**	389+21.02	**Offset:**	L:14.330'	**Alignment:**	Proposed
Elev.:	196.8 ft	**Latitude:**	34.025765	**Longitude:**	-81.102667	**Date Started:**	2/5/18
Total Depth:	74.6 ft	**Soil Depth:**	41.3 ft	**Core Depth:**	33.3 ft	**Date Completed:**	2/6/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	25 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		@ 56.7 feet - dark greenish-gray (10GY 4/1), fine grained to very fine grained, moderately weathered, medium strong rock, low to moderate core recovery likely due to residual soil seams washed away by drilling process.			RC-5			
		@ 57.6 feet - moderately weathered, weak rock.						
		RC-4 : Rec= 63.8%, RQD= 0.0%, GSI= 10-20.						
		@ 61.5 feet - highly weathered, extremely weak rock.		64.6				
131.8		RC-5 : Rec= 80.0%, RQD= 0.0%, GSI= 10-20.						
					RC-6			
		RC-6 : Rec= 24.0%, RQD= 0.0%, GSI= 10-20.						
				69.6				
126.8		@ 70.1 feet - completely weathered.						
					RC-7			
		@ 72 feet - moderately weathered, weak rock.						
	74.6	RC-7 : Rec= 54.0%, RQD= 0.0%, GSI= 10-20.						
121.8		Boring Terminated at 74.6 feet.						

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Miller
Logged By: Lehe Fender
Date: 2/5/2018

Boring Number: B-34
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 1

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
56.2	1	J	31	W	No	N/A	Pl	SR	
56.4	2	J	26	N	No	N/A	Pl	SR	
56.7	3	J	N/A	W	Su	Fe	Ir	SR	Fractured zone 56.7' to 57.3'
57.6	4	J	N/A	W	Su	Cl	Ir	SR	Fractured zone 57.6' to 58.3'
59.6	5	J	N/A	W	Su	Fe	Ir	SR	Fractured zone 59.6' to 60.1'
60.3	6	J	N/A	W	Su	Fe	Pl	SR	
60.5	7	J	N/A	W	Su	Fe	Pl	SR	
60.8	8	J	N/A	W	Su	Sd/Cl	Ir	SR	Fractured zone 60.8' to 61.0'
61.2	9	J	31	W	Su	Sd/Cl	Pl	SR	
61.4	10	J	20	MW	Su	Sd/Cl	Pl	SR	
61.6	11	J	N/A	W	Su	Sd/Cl	Ir	SR	Fractured zone 61.6' to 64.6'
64.6	12	J	N/A	W	Su	Fe	Ir	SR	Fractured zone 64.6' to 69.6'
69.6	13	J	N/A	W	Su	Fe	Ir	SR	Fractured zone 69.6' to 70'
70.3	14	J	N/A	W	Su	Fe	Ir	SR	Fractured zone 70.3' to 74.6'

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-34UD
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 33
Eng./Geo.:	NGS	**Boring Location:**	389+16.20	**Offset:**	L:15.195'	**Alignment:**	Proposed
Elev.:	196.7 ft	**Latitude:**	34.025778	**Longitude:**	-81.102661	**Date Started:**	3/29/2018
Total Depth:	39.5 ft	**Soil Depth:**	39.5 ft	**Core Depth:**	0 ft	**Date Completed:**	3/29/2018
Bore Hole Diameter (in):	4.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 9 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0	**SURFACE MATERIALS** - 12 inches of ASPHALT.						
	1.0							
191.7								
		▽						
186.7								
181.7		Drilled without sampling to 32 feet.						

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-34UD
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 33
Eng./Geo.:	NGS	**Boring Location:**	389+16.20	**Offset:**	L:15.195'	**Alignment:**	Proposed
Elev.:	196.7 ft	**Latitude:**	34.025778	**Longitude:**	-81.102661	**Date Started:**	3/29/2018
Total Depth:	39.5 ft	**Soil Depth:**	39.5 ft	**Core Depth:**	0 ft	**Date Completed:**	3/29/2018
Bore Hole Diameter (in):	4.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 9 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
171.7											
166.7											
	32.0	**<u>ALLUVIUM</u> - ELASTIC SILT WITH SAND (MH)** - soft, moist, dark reddish-gray (7.5R 3/1), mostly medium to high plasticity fines, little fine sands.		32.0	SS-1	1	2	2		4	●
	33.5	**SANDY LEAN CLAY (CL)** - moist, dark reddish-gray (7.5R 3/1), mostly low plasticity fines, some fine to medium sands, trace fine gravel, [LL=29, PL=16, PI=13, %#200=51.9]. AASHTO = A-6 (4).		33.5	UD-1						
161.7	35.5	**CLAYEY SAND (SC)** - moist, gray (GLEY 1 6/N) and (7.5YR 5/4), mostly fine to medium sands, little low to medium plasticity fines.		36.0	UD-2						
	38.0	@ 36 feet - gray (GLEY 1 6/N), [LL=31, PL=14, PI=17, %#200=23.9]. AASHTO = A-2-6 (1).		38.0	SS-2	1	3	8		11	●
	39.5	**POORLY GRADED SAND (SP)** - medium dense, moist, light gray (GLEY 1 7/), mostly fine to medium sands, trace									

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-34UD
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 33
Eng./Geo.:	NGS	**Boring Location:**	389+16.20	**Offset:**	L:15.195'	**Alignment:**	Proposed
Elev.:	196.7 ft	**Latitude:**	34.025778	**Longitude:**	-81.102661	**Date Started:**	3/29/2018
Total Depth:	39.5 ft	**Soil Depth:**	39.5 ft	**Core Depth:**	0 ft	**Date Completed:**	3/29/2018
Bore Hole Diameter (in):	4.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 9 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		non-plastic fines.						
		Boring Terminated at 39.5 feet.						
151.7								
146.7								
141.7								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-35
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 31
Eng./Geo.:	AKS	**Boring Location:**	7388+25.51	**Offset:**	L:145.51'	**Alignment:**	Proposed
Elev.:	185.2 ft	**Latitude:**	34.026450	**Longitude:**	-81.101378	**Date Started:**	3/2/2018
Total Depth:	55 ft	**Soil Depth:**	33.0 ft	**Core Depth:**	22 ft	**Date Completed:**	3/2/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 12.0 ft	**24HR**	13.9 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.1	**SURFACE MATERIALS** - 1 inch TOPSOIL.		0.0						
		ALLUVIUM - SILT WITH SAND (ML) - stiff, moist, red (10R 5/8), mostly low plasticity fines, little fine to medium sands, [LL=47, PL=29, PI=18, NMC=22.6%, %#200=75.8], AASHTO = A-7-6 (15).			SS-1	5	5	6	8	11
		@ 2 feet - hard.		2.0	SS-2	8	14	17	18	31
		@ 4 feet - very stiff.		4.0	SS-3	7	9	9	10	18
180.2		@ 6 feet - very hard.		6.0	SS-4	7	37	29	32	66
	8.0	**PIEDMONT RESIDUUM - LEAN CLAY WITH SAND (CL)** - very hard, dry to moist, greenish gray (GLEY 1 6/5GY), mostly low plasticity fines, little fine to coarse sands, relict rock structure, [LL=29, PL=20, PI=9, NMC=17.3%, %#200=73.1], AASHTO = A-4 (5).		8.0	SS-5	14	44	22	39	66
175.2		▽								
	13.5	**PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM)** - very dense, dry to moist, greenish gray (6/5GY), subangular, mostly fine to medium sands, some low plasticity fines, relict rock structure.		13.5	SS-6	50/5"-		-		100
170.2										
				18.5	SS-7	28	50/5"	-		100

SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-35
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 31
Eng./Geo.:	AKS	**Boring Location:**	7388+25.51	**Offset:**	L:145.51'	**Alignment:**	Proposed
Elev.:	185.2 ft	**Latitude:**	34.026450	**Longitude:**	-81.101378	**Date Started:**	3/2/2018
Total Depth:	55 ft	**Soil Depth:**	33.0 ft	**Core Depth:**	22 ft	**Date Completed:**	3/2/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 12.0 ft	**24HR**	13.9 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				23.5				
					SS-8	12 50/5" -	100	
160.2								
				28.5				
					SS-9	50/4"- -	100	
155.2								
		Tri-Cone Bit Refusal at 33 feet. Install NW Casing to 33 feet for NQ wireline coring.						
	33.0	For discontinuity descriptors, see discontinuity worksheet.		33.0				
		METAMORPHIC - SCHIST - gray (GLEY 1 4/), fine grained, foliated, moderately weathered, strong rock, low to moderate recovery likely due to seams of completely weathered rock or residual soil washed away by drilling process.			RC-1			
150.2		RC-1: Rec= 34.8%, RQD= 0.0%, GSI= 10-20, RMR =		35.3				
		@ 35.7 feet - residual soil, weak.			RC-2			
		RC-2: Rec= 44.0%, RQD= 0.0%, GSI= 10-20.						

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-35
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 31
Eng./Geo.:	AKS	**Boring Location:**	7388+25.51	**Offset:**	L:145.51'	**Alignment:**	Proposed
Elev.:	185.2 ft	**Latitude:**	34.026450	**Longitude:**	-81.101378	**Date Started:**	3/2/2018
Total Depth:	55 ft	**Soil Depth:**	33.0 ft	**Core Depth:**	22 ft	**Date Completed:**	3/2/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 12.0 ft	**24HR**	13.9 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				40.3				
					RC-3			
		RC-3: Rec= 32.0%, RQD= 0.0%, GSI= 10-20.						
140.2				45.3				
		@ 45.5 feet - moderately weathered, strong rock.						
		@ 46.1 feet - epidote vein.			RC-4			
		RC-4: Rec= 40.0%, RQD= 0.0%, GSI= 10-20.						
135.2				50.3				
					RC-5			
		RC-5: Rec= 40.7%, RQD= 0.0%, GSI= 10-20.						
		@ 52.5 feet - some quartz.		53.0				
					RC-6			
		RC-6: Rec= 60.0%, RQD= 0.0%, GSI= 10-20.						
130.2	55.0	Boring Terminated at 55 feet.						

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Millwood
Logged By: Austin Syms
Date: 3/2/2018

Boring Number: B-35
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 2

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
33.1	1	J	0	N	No	No	Ir	SR	
33.3	2	J	90	N/A	No	No	N/A	SR	Fractured zone 33.3' - 45.8'
45.8	3	J	0	N	Pa	Fe	Pl	SR	
46.4	4	J	0	N	Pa	Fe	Pl	SR	
50.3	5	J	50	N	Pa	Fe	Pl	SR	
50.9	6	J	73	N	No	No	St	SR	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-36
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 29
Eng./Geo.:	ELF	**Boring Location:**	7387+13.79	**Offset:**	L:11.09'	**Alignment:**	Proposed
Elev.:	216.5 ft	**Latitude:**	34.026863	**Longitude:**	-81.101700	**Date Started:**	2/12/2018
Total Depth:	77.2 ft	**Soil Depth:**	66.0 ft	**Core Depth:**	11.2 ft	**Date Completed:**	2/13/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	44 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.3	**SURFACE MATERIALS** - 3 inches of TOPSOIL.		0.0	SS-1	3	4	9	13	13
		FILL - CLAYEY SAND (SC) - medium dense, moist, red (2.5YR 4/6), mostly fine sands, little low plasticity fines, [LL=21, PL=12, PI=9, NMC=10.2%, %#200=24.3], AASHTO = A-2-4.		2.0	SS-2	10	10	8	8	18
		@ 2 feet - reddish-gray (2.5YR 6/1), mostly fine to medium sands, some low plasticity fines, [LL=37, PL=15, PI=22, NMC=13.2%, %#200=30.4], AASHTO = A-2-6.		4.0	SS-3	4	4	5	6	9
211.5	4.0	**ALLUVIUM - CLAYEY SAND (SC)** - loose, moist, red (2.5YR 5/8), mostly fine to coarse sands, little low plasticity fines, trace quartz gravel.		6.0	SS-4	2	4	6	10	10
		@ 8 feet - medium dense, some high plasticity fines, [LL=52, PL=23, PI=29, NMC=18.8%, %#200=44.5], AASHTO = A-7-6 (8).		8.0	SS-5	9	9	10	11	19
206.5										
		@ 13.5 feet - loose.		13.5	SS-6	3	3	4		7
201.5										
	18.5	**FAT CLAY WITH SAND (CH)** - stiff, moist, pale green (5G 6/2), mostly high plasticity fines, little fine sands, trace quartz gravel.		18.5	SS-7	4	5	5		10

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-36
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 29
Eng./Geo.:	ELF	**Boring Location:**	7387+13.79	**Offset:**	L:11.09'	**Alignment:**	Proposed
Elev.:	216.5 ft	**Latitude:**	34.026863	**Longitude:**	-81.101700	**Date Started:**	2/12/2018
Total Depth:	77.2 ft	**Soil Depth:**	66.0 ft	**Core Depth:**	11.2 ft	**Date Completed:**	2/13/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	44 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
			23.5	SS-8	3	4	5		9
191.5		@ 23.5 feet - very dark gray (5YR 3/1), [LL=87, PL=30, PI=57, NMC=38.06%, %#200=82.8], AASHTO = A-7-5 (53).							
	28.5	**PIEDMONT RESIDUUM - SILT WITH SAND (ML)** - stiff, moist, very dark gray (5YR 3/1), mostly non-plastic fines, little fine sands.	28.5	SS-9	4	4	6		10
186.5									
			33.5	SS-10	7	10	12		22
181.5		@ 33.5 feet - very stiff, olive (5Y 4/3), [LL=NP, PL=NP, PI=NP, NMC=21.0%, %#200=83.6], AASHTO = A-4 (0).							
			38.5	SS-11	8	14	7		21
		@ 38.5 feet - olive (5Y 4/3) and yellowish-red (5YR 5/6), few gravel sized rock fragments.							

SPT N VALUE ●

PL ⨯ MC ○ LL ⨯

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-36
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 29
Eng./Geo.:	ELF	**Boring Location:**	7387+13.79	**Offset:**	L:11.09'	**Alignment:**	Proposed
Elev.:	216.5 ft	**Latitude:**	34.026863	**Longitude:**	-81.101700	**Date Started:**	2/12/2018
Total Depth:	77.2 ft	**Soil Depth:**	66.0 ft	**Core Depth:**	11.2 ft	**Date Completed:**	2/13/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	44 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
				43.5						
		@ 43.5 feet - stiff, no recovery.			SS-12	3	5	6		11
171.5										
				48.5						
		@ 48.5 feet - very stiff, dark reddish-gray (5YR 4/2), trace mica.			SS-13	28	10	6		16
166.5										
	53.5			53.5						
		PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM) - very dense, grayish-brown (2.5Y 5/2), mostly fine sands, little low plasticity fines, trace gravel sized rock fragments, trace mica.			SS-14	12	32	50/3"		100
161.5										
				58.5						
					SS-15	50/3"-		-		100

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-36
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 29
Eng./Geo.:	ELF	**Boring Location:**	7387+13.79	**Offset:**	L:11.09'	**Alignment:**	Proposed
Elev.:	216.5 ft	**Latitude:**	34.026863	**Longitude:**	-81.101700	**Date Started:**	2/12/2018
Total Depth:	77.2 ft	**Soil Depth:**	66.0 ft	**Core Depth:**	11.2 ft	**Date Completed:**	2/13/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	44 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				63.5	SS-16	34 50/1" -	100	
151.5		@ 63.5 feet - dark yellowish-brown (10YR 3/4).						
	66.0	Tri-Cone Bit Refusal at 66 feet. Install NW Casing to 66 feet for NQ wireline coring.		66.0	RC-1			
		For discontinuity descriptors, see discontinuity worksheet.						
		METAMORPHIC BEDROCK - SCHIST - greenish-gray (5GY 5/1), fine grained to very fine grained, foliated, moderately weathered, strong rock.		68.0	RC-2			
		RC-1: Rec= 75.0%, RQD= 0.0%, GSI= 10-20.		68.4	RC-3			
146.5		RC-2: Rec= 100.0%, RQD= 0.0%, GSI= 10-20.						
		@ 70.7 feet - dark grayish-brown (10YR 4/2), highly weathered, extremely weak rock.		71.2	RC-4			
		@ 70.9 feet - residual soil.						
		RC-3: Rec= 100.0%, RQD= 34.2%, GSI= 10-20, RMR = 25.		73.4	RC-5			
		@ 71.2 feet - very dark gray (10YR 3/1), moderately weathered, strong rock.						
141.5		RC-4: Rec= 72.7%, RQD= 17.0%, GSI= 10-20.						
		RC-5: Rec= 46.9%, RQD= 0.0%, GSI= 10-20.		76.6	RC-6			
	77.2	RC-6: Rec= 100.0%, RQD= 0.0%, GSI= 10-20.						
		Boring Terminated at 77.2 feet.						

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Miller
Logged By: Lehe Fender
Date: 2/13/2018

Boring Number: B-36
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 1

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
68.9	1	J	20	W	Su	Sd/Cl	Ir	N/A	
69.3	2	J	42	MW	Su	Fe	Pl	S	
70	3	J	90	N	Su	Fe	Pl	S	Fractured zone 70' to 70.4'
71.2	4	J	20	W	Su	Fe	Ir	SR	Fractured zone 71.2' to 71.9'
72.3	5	J	10	W	Su	Fe	Ir	R	
73.5	6	J	N/A	W	Pa	Sd/Cl	Ir	R	Fractured zone 73.5' to 74.5'
74.8	7	J	20	W	Pa/Su	Sd/Cl/Fe	Ir	R	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-36A
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 29
Eng./Geo.:	ELF	**Boring Location:**	7387+06.35	**Offset:**	L:9.39'	**Alignment:**	Proposed
Elev.:	217.2 ft	**Latitude:**	34.026884	**Longitude:**	-81.101700	**Date Started:**	2/14/2018
Total Depth:	78.6 ft	**Soil Depth:**	52.8 ft	**Core Depth:**	25.8 ft	**Date Completed:**	2/14/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	44 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0							
212.2		Drilled without sampling to 42.4 feet. Tri-Cone Bit Refusal at 42.4 feet. Install NW Casing to 42.4 feet for NQ wireline coring.						
207.2								
202.2								

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-36A
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 29
Eng./Geo.:	ELF	**Boring Location:**	7387+06.35	**Offset:**	L:9.39'	**Alignment:**	Proposed
Elev.:	217.2 ft	**Latitude:**	34.026884	**Longitude:**	-81.101700	**Date Started:**	2/14/2018
Total Depth:	78.6 ft	**Soil Depth:**	52.8 ft	**Core Depth:**	25.8 ft	**Date Completed:**	2/14/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	44 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
192.2		Drilled without sampling to 42.4 feet. Tri-Cone Bit Refusal at 42.4 feet. Install NW Casing to 42.4 feet for NQ wireline coring.						
187.2								
182.2								

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-36A
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 29
Eng./Geo.:	ELF	**Boring Location:**	7387+06.35	**Offset:**	L:9.39'	**Alignment:**	Proposed
Elev.:	217.2 ft	**Latitude:**	34.026884	**Longitude:**	-81.101700	**Date Started:**	2/14/2018
Total Depth:	78.6 ft	**Soil Depth:**	52.8 ft	**Core Depth:**	25.8 ft	**Date Completed:**	2/14/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	44 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	42.4	For discontinuity descriptors, see attached worksheet.		42.4				
		▼ **METAMORPHIC BEDROCK - SCHIST** - pinkish-white (5YR 8/2), very coarse grained, quartz epidote, massive, highly weathered, mostly extremely weak rock not recovered by coring process, recovered rock fragments were strong rock.			RC-1			
172.2	45.0	RC-1: Rec= 3.8%, RQD= 0.0%, GSI= 10-20.						
		Drilled without sampling to 55.4 feet. Tri-Cone Bit Refusal at 55.4 feet. Install NW Casing to 55.4 feet for NQ wireline coring.						
167.2								
162.2	55.4	For discontinuity descriptors, see discontinuity worksheet.		55.4				
		METAMORPHIC BEDROCK - SCHIST - grayish-green (5GY 5/2), fine grained to very fine grained, foliated, highly weathered, strong rock.			RC-2			

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-36A
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 29
Eng./Geo.:	ELF	**Boring Location:**	7387+06.35	**Offset:**	L:9.39'	**Alignment:**	Proposed
Elev.:	217.2 ft	**Latitude:**	34.026884	**Longitude:**	-81.101700	**Date Started:**	2/14/2018
Total Depth:	78.6 ft	**Soil Depth:**	52.8 ft	**Core Depth:**	25.8 ft	**Date Completed:**	2/14/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	44 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
		RC-2: Rec= 8.0%, RQD= 0.0%, GSI= 10-20.	60.4			
				RC-3		
152.2		RC-3: Rec= 12.0%, RQD= 0.0%, GSI= 10-20.	65.4			
		@ 65.6 feet - completely weathered, extremely weak rock.		RC-4		
147.2		RC-4: Rec= 24.0%, RQD= 0.0%, GSI= 10-20.	70.4			
		@ 70.4 feet - moderately weathered, strong rock.		RC-5		
		@ 70.8 feet - completely weathered, extremely weak rock.	73.4			
		@ 71.6 feet - moderately weathered, strong rock.		RC-6		
		@ 72.5 feet - completely weathered.				
		RC-5: Rec= 63.3%, RQD= 0.0%, GSI= 10-20.				
142.2		@ 73.2 feet - moderately weathered.	75.4			
		RC-6: Rec= 40.0%, RQD= 0.0%, GSI= 10-20.		RC-7		
	78.6	RC-7: Rec= 31.3%, RQD= 0.0%, GSI= 10-20.				
		Boring Terminated at 78.6 feet.				

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Miller
Logged By: Lehe Fender
Date: 2/14/2018

Boring Number: B-36A
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 1

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
73.7	1	J	5	W	Pa	Sd/Cl	Ir	R	Fractured zone 73.7' to 74'

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-37
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 32
Eng./Geo.:	NGS	**Boring Location:**	6013+18.37	**Offset:**	L:9.63'	**Alignment:**	Proposed
Elev.:	185.2 ft	**Latitude:**	34.025625	**Longitude:**	-81.098778	**Date Started:**	3/7/2018
Total Depth:	64.3 ft	**Soil Depth:**	39.7 ft	**Core Depth:**	24.6 ft	**Date Completed:**	3/7/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 6 ft	**24HR**	10 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.4	**SURFACE MATERIALS** - 5 inches of ASPHALT.		0.4						
		ALLUVIUM - SANDY LEAN CLAY (CL) - firm, moist, brown (7.5YR 4/4), mostly low plasticity fines, some fine to medium sands, [LL=49, PL=22, PI=27, NMC=18.9%, %#200=51.4], AASHTO = A-7-6 (10).			SS-1	3	3	4	3	7
				2.4	SS-2	3	2	3	1	5
	4.4			4.4						
180.2		**FAT CLAY WITH SAND (CH)** - stiff, moist, dark gray (7.5YR 4/1), mostly high plasticity fines, little fine to medium sands, trace fine gravel, [LL=77, PL=23, PI=54, NMC=32.9%, %#200=85.8], AASHTO = A-7-6 (51).			SS-3	2	3	8	11	11
	6.4			6.4	SS-4	50/4"-		-	-	100
		PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM) - very dense, moist, pink (2.5YR 8/4) and pinkish-gray (5YR 7/2), mostly fine to meduim sands, little non-plastic fines.		7.5	SS-5	50/2"-		-	-	100
	7.7	Tri-cone bit refusal at 7.7 feet. Install NW Casing to 7.7 feet for NQ wireline coring.		7.7	RC-1					
	9.5			9.5						
175.2		**POSSIBLE BOULDER - GRANITE** - pinkish-white (7.5YR 8/2), coarse grained, moderately weathered, medium strong rock.			SS-6	7	11	14	15	25
		RC-1 : Rec= 50.0%, RQD= 0.0%, GSI= 10-20.								
		PIEDMONT RESIDUUM - SILT (ML) - very stiff, moist, yellowish-red (5YR 4/6) and very dark gray (5YR 3/1), mostly low plasticity fines, few fine sands, [NMC=28.0%, %#200=88.1].		13.5	SS-7	7	8	14		22
170.2										
	17.1									
		SILTY CLAYEY SAND WITH GRAVEL (SC-SM) - dense, moist, yellowish-red (5YR 4/6) and very dark gray (5YR 3/1), mostly fine to coarse sands, some low plasticity fines, little fine gravel-sized rock fragments, [LL=26, PL=19, PI=7, NMC=15.8%, %#200=36.1], AASHTO = A-4		18.5	SS-8	11	15	18		33

SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-37
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 32
Eng./Geo.:	NGS	**Boring Location:**	6013+18.37	**Offset:**	L:9.63'	**Alignment:**	Proposed
Elev.:	185.2 ft	**Latitude:**	34.025625	**Longitude:**	-81.098778	**Date Started:**	3/7/2018
Total Depth:	64.3 ft	**Soil Depth:**	39.7 ft	**Core Depth:**	24.6 ft	**Date Completed:**	3/7/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 6 ft	**24HR**	10 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		(0).						
	21.8	**PARTIALLY WEATHERED ROCK (PWR) - SILTY GRAVEL WITH SAND (GM)** - very dense, moist, yellowish-red (5YR 4/6) and very dark gray (5YR 3/1), mostly fine weathered rock fragments, little non-plastic fines, little medium to coarse sands.		22.2	SS-9	26 44 50/5"	100	
160.2								
	27.0	**PIEDMONT RESIDUUM - SILT WITH GRAVEL (ML)** - very hard, moist, brown (10YR 5/3), mostly non-plastic to low plasticity fines, little weathered rock fragments, few fine sands.		28.5	SS-10	17 34 44	78	
155.2								
	32.0	**PARTIALLY WEATHERED ROCK (PWR) - SILT WITH SAND (ML)** - very hard, moist, light brown (7.5YR 6/3) and gray (GLEY 1 5/), mostly low plasticity fines, little fine sands, trace weathered rock fragments.		33.5	SS-11	18 50/5" -	100	
150.2								
				38.5	SS-12	50/4"- -	100	
	39.7	Tri-cone bit refusal at 39.7 feet. Advance		39.7				

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-37
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 32
Eng./Geo.:	NGS	**Boring Location:**	6013+18.37	**Offset:**	L:9.63'	**Alignment:**	Proposed
Elev.:	185.2 ft	**Latitude:**	34.025625	**Longitude:**	-81.098778	**Date Started:**	3/7/2018
Total Depth:	64.3 ft	**Soil Depth:**	39.7 ft	**Core Depth:**	24.6 ft	**Date Completed:**	3/7/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 6 ft	**24HR**	10 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		NW casing to 39.7 for NQ wireline coring.						
		For discontinuity descriptors, see discontinuity worksheet.			RC-2			
		<u>METAMORPHIC BEDROCK</u> - SCHIST - gray (GLEY 1 5/) and dark gray (GLEY 1 4/), fine grained, foliated, moderately weathered, medium strong rock, chlorite epidote, low to moderate recovery 39.7 to 49.3 likely due to seams of completed weathered rock or residual soil washed away by drilling process.		44.3				
140.2		RC-2 : Rec= 37.0%, RQD= 0.0%, GSI= 10-20.			RC-3			
		RC-3 : Rec= 70.0%, RQD= 13.3%, GSI= 15-25.						
		@ 47.5 feet - slightly weathered, strong rock.		49.3				
135.2					RC-4			
		RC-4 : Rec= 100.0%, RQD= 30.0%, GSI= 20-30, RMR= 26.		54.3				
130.2		@ 55 feet - moderately weathered, medium strong rock.			RC-5			
		@ 55.8 feet - fine grained to very fine grained, slightly weathered, very strong rock.						
		RC-5 : Rec= 96.0%, RQD= 31.7%, GSI= 20-30, RMR= 26.		59.3				

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-37
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 32
Eng./Geo.:	NGS	**Boring Location:**	6013+18.37	**Offset:**	L:9.63'	**Alignment:**	Proposed
Elev.:	185.2 ft	**Latitude:**	34.025625	**Longitude:**	-81.098778	**Date Started:**	3/7/2018
Total Depth:	64.3 ft	**Soil Depth:**	39.7 ft	**Core Depth:**	24.6 ft	**Date Completed:**	3/7/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 6 ft	**24HR**	10 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		RC-6 : Rec= 100.0%, RQD= 80.0%, GSI= 50-60, RMR= 58.			RC-6			
120.2	64.3	Boring Terminated at 64.3 feet.						
115.2								
110.2								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Miller
Logged By: Nathaniel Shuff
Date: 3/7/2018

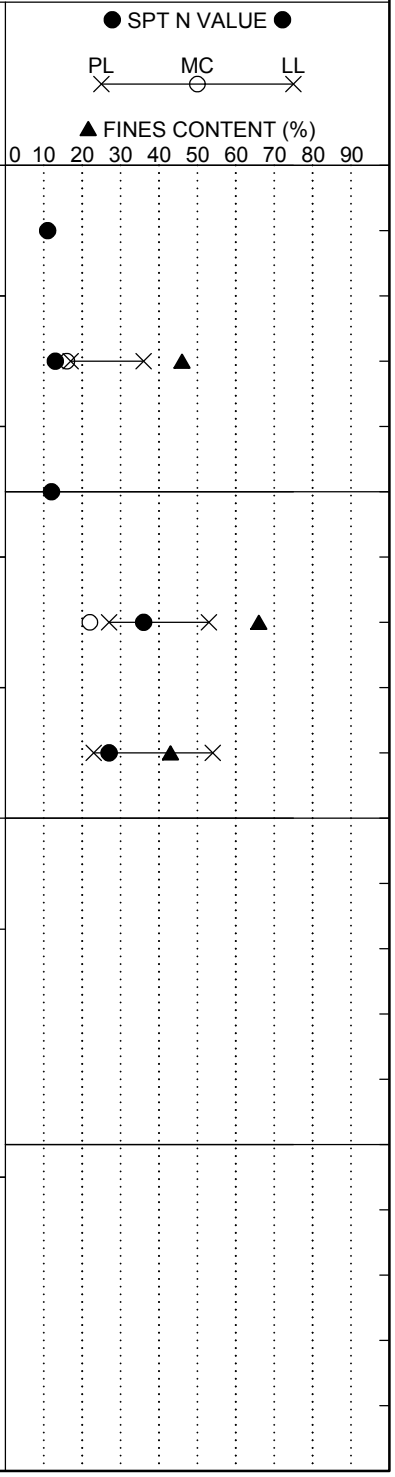
Boring Number: B-37
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 2

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
39.4	1	N/A	N/A	W	Pa	Sd/Cl	Ir	R	Fractured zone 39.4' - 40.3'
40.6	2	J	50	VN	Pa	Sd	Pl	SR	
40.8	3	N/A	N/A	N/A	Sp	Fe	Pl	SR	Fractured zone 40.8' - 46.3'
46.8	4	J	50	VN	Sp	Fe	Pl	SR	
47	5	J	50	VN	Sp	Fe	Pl	SR	
47.2	6	J	50	VN	Sp	Fe	Ir	SR	
48.4	7	J	50	VN	Sp	Fe/Sd	Ir	SR	
48.6	8	J	50	N/A	Sp	Fe/Sd	Ir	SR	
49.5	9	J	0	N	Sp	Fe	Ir	SR	
50.2	10	J	0	N	Su	Fe	Ir	R	
50.4	11	J	20	N	Pa	Sd	Ir	R	
50.9	12	J	90	T	Fi	Fe	Pl	SR	
51.9	13	J	10	VN	Pa	Qz/Fe	Pl	SR	
52.3	14	J	60	VN	No	N/A	Pl	SR	
52.6	15	J	10	VN	Su	Fe	Pl	SR	
53.3	16	J	60	VN	Pa	Qz/Fe	Pl	SR	
53.8	17	J	0	VN	Su	Fe	Ir	R	
53.9	18	J	0	VN	Su	Fe	Ir	R	
54.8	19	N/A	N/A	N	Su	Fe	Ir	R	Fractured zone 54.8' - 55.7'
56.2	20	J	60	VN	Pa	Cl/Ca	Pl	SR	
56.7	21	J	60	N	Pa	N/A	Pl	SR	
56.9	22	J	60	VN	Pa	Sd/Cl	Pl	SR	
59.7	23	J	20	N	No	N/A	Pl	R	
59.8	24	J	0	N	Su	Fe	Ir	R	
59.9	25	J	0	N	Su	Fe	Ir	R	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-38
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 34
Eng./Geo.:	AKS	**Boring Location:**	3027+51.37	**Offset:**	R:55.40'	**Alignment:**	Proposed
Elev.:	184.6 ft	**Latitude:**	34.022482	**Longitude:**	-81.096018	**Date Started:**	1/23/2018
Total Depth:	31.7 ft	**Soil Depth:**	11.7 ft	**Core Depth:**	20 ft	**Date Completed:**	1/23/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.3	**SURFACE MATERIALS** - 3 inches of TOPSOIL.		0.0	SS-1	4	4	7	8	11
		FILL - CLAYEY SAND (SC) - medium dense, dry to moist, yellowish red (5YR 5/8), light reddish brown (5YR 6/3) and gray (5YR 6/1), subangular, mostly fine to medium sands, some low plasticity fines, [LL=36, PL=17, PI=19, NMC=16.3%, %#200=46.0], AASTHO = A-6 (5).		2.0	SS-2	5	6	7	10	13
				4.0	SS-3	5	6	6	8	12
179.6	6.0			6.0	SS-4	8	16	20	23	36
	8.0	**ALLUVIUM - SANDY FAT CLAY (CH)** - hard, moist, light reddish brown (5YR 6/3) and gray (5YR 6/1), mostly high plasticity fines, some fine to medium sands, [LL=53, PL=27, PI=26, NMC=22.1%, %#200=66.4], AASTHO = A-7-6 (16).		8.0	SS-5	11	12	15	17	27
174.6		**CLAYEY SAND (SC)** - medium dense, moist, yellowish red (5YR 5/6) and gray (5YR 6/1), mostly fine to medium sands, some high plasticity fines, [LL=54, PL=23, PI=31, NMC=27.1%, %#200=42.6], AASTHO = A-7-6 (8).								
	11.7	Tri-Cone Bit Refusal at 11.7 feet. Install NW Casing to 11.7 feet for NQ wireline coring.		11.7						
		For discontinuity descriptors, see discontinuity worksheet.			RC-1					
169.6		**IGNEOUS BEDROCK - GRANITE** - black (7.5YR 2.5/1), light gray (7.5YR 7/1) and red (7.5YR 6/6), coarse grained, subangular, massive, fresh, very strong rock.		15.5						
		RC-1: Rec= 97.0%, RQD= 89.0%, GSI= 60-70, RMR = 43.			RC-2					
		RC-2: Rec= 100.0%, RQD= 100.0%, GSI= 65-75.								



LEGEND

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SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-38
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 34
Eng./Geo.:	AKS	**Boring Location:**	3027+51.37	**Offset:**	R:55.40'	**Alignment:**	Proposed
Elev.:	184.6 ft	**Latitude:**	34.022482	**Longitude:**	-81.096018	**Date Started:**	1/23/2018
Total Depth:	31.7 ft	**Soil Depth:**	11.7 ft	**Core Depth:**	20 ft	**Date Completed:**	1/23/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				20.5				
					RC-3			
		RC-3: Rec= 100.0%, RQD= 100.0%, GSI= 65-75, RMR = 82.						
159.6				25.5				
					RC-4			
		RC-4: Rec= 100.0%, RQD= 100.0%, GSI= 80-90.						
154.6				30.5				
		RC-5: Rec= 100.0%, RQD= 100.0%, GSI= 80-90, RMR = 87.			RC-5			
	31.7							
		Boring Terminated at 31.7 feet.						
149.6								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Millwood
Logged By: Austin Syms
Date: 1/23/2018

Boring Number: B-38
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 2

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
11.8	1	J	0	N	Su	Fe	Pl	SR	
11.9	2	J	0	N	Su	Fe	Pl	SR	
13.1	3	J	4	N/A	No	N/A	Pl	SR	
14.5	4	J	2	N/A	No	N/A	Pl	SR	
16	5	J	0	N/A	No	N/A	W	SR	
17	6	J	0	N/A	No	N/A	Pl	SR	
23	7	J	77	N/A	Fi	Qz	Pl	N/A	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-39
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 35
Eng./Geo.:	NGS/HGM	**Boring Location:**	5027+19.37	**Offset:**	L:9.50'	**Alignment:**	Proposed
Elev.:	177.1 ft	**Latitude:**	34.021963	**Longitude:**	-81.097012	**Date Started:**	4/9/2018
Total Depth:	32.2 ft	**Soil Depth:**	12.2 ft	**Core Depth:**	20 ft	**Date Completed:**	4/10/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 3 ft	**24HR**	3 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.1	**SURFACE MATERIALS** - 1 inch of TOPSOIL.		0.0						
		ALLUVIUM - CLAYEY SAND (SC) - medium dense, moist, red (10R 4/8) and reddish-yellow (5YR 7/6), mostly fine to medium sands, some low plasticity fines, trace fine gravel, [LL=37, PL=20, PI=17, NMC=14.2%, %#200=48.4], AASHTO = A-6 (5).			SS-1	7	8	9	12	17
	2.0			2.0						
					SS-2	16	12	9	8	21
	4.0	**SILTY SAND (SM)** - medium dense, moist, light brown (7.5YR 6/4), mostly fine to medium sands, some non-plastic fines, trace organics, [LL=NP, PL=NP, PI=NP, NMC=8.5%, %#200=34.2], AASHTO = A-2-4.		4.0						
172.1					SS-3	5	9	9	10	18
				6.0						
		SANDY LEAN CLAY (CL) - medium dense, moist, red (10R 4/6), reddish-gray (10R 6/1), and brownish-yellow (10YR 6/8), mostly low plasticity fines, some fine to medium sands, trace organics.			SS-4	3	6	7	10	13
		@ 6 feet - light greenish-gray (GLEY 1 8/1), [NMC=18.2%, %#200=52.7].		8.0						
					SS-5	9	9	6	7	15
167.1										
		Tri-Cone Bit Refusal at 12.2 feet. Install NW Casing to 12.2 feet for NQ wireline coring.								
	12.2			12.2	SS-6	50/0"	-	-		100
		RC-1: Rec= 100%, RQD= 47.8%, GSI= 60-70.		12.2	RC-1					
		For discontinuity descriptors, see discontinuity worksheet.		14.1						
162.1		**IGNEOUS BEDROCK - GRANITE** - gray (GLEY 1 6/N) and dark reddish-gray (7.5R 3/1), coarse grained, massive, fresh to slightly weathered, strong rock.			RC-2					
		@ 14 feet - fresh, very strong rock.								
		RC-2: Rec= 92.0%, RQD= 91.7%, GSI= 60-70, RMR = 72.								
		@ 18.2 feet to 18.3 feet - highly weathered, weak rock.								
		@ 18.3 feet - fresh, very strong rock.		19.1						

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-39
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 35
Eng./Geo.:	NGS/HGM	**Boring Location:**	5027+19.37	**Offset:**	L:9.50'	**Alignment:**	Proposed
Elev.:	177.1 ft	**Latitude:**	34.021963	**Longitude:**	-81.097012	**Date Started:**	4/9/2018
Total Depth:	32.2 ft	**Soil Depth:**	12.2 ft	**Core Depth:**	20 ft	**Date Completed:**	4/10/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 3 ft	**24HR**	3 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		RC-3: Rec= 100%, RQD= 100%, GSI= 75-85, RMR = 72.			RC-3			
				24.1				
152.1		RC-4: Rec= 100%, RQD= 100%, GSI= 75-85.			RC-4			
				29.1				
147.1		@ 30.4 feet - quartz vein.			RC-5			
	32.2	RC-5: Rec= 100%, RQD= 100%, GSI= 75-85, RMR = 72.						
		Boring Terminated at 32.2 feet.						
142.1								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Miller
Logged By: Nat Shuff/Hunter McKenzie
Date: 4/9/2018

Boring Number: B-39
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 2

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
13.3	1	J	70	VN	No	N/A	Wa	R	
13.8	2	J	70	VN	No	N/A	Wa	R	
14.6	3	J	0	N	No	N/A	Ir	R	
17.1	4	J	50	VN	No	N/A	Wa	SR	
26	5	J	55	N	No	N/A	Pl	R	
26.3	6	J	10	N	No	N/A	Pl	R	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-40
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 41
Eng./Geo.:	HGM	**Boring Location:**	11+56.38	**Offset:**	L:7.30'	**Alignment:**	Proposed
Elev.:	193.8 ft	**Latitude:**	34.020864	**Longitude:**	-81.095111	**Date Started:**	1/29/2018
Total Depth:	94 ft	**Soil Depth:**	76.5 ft	**Core Depth:**	17.5 ft	**Date Completed:**	1/30/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 15.3 ft	**24HR**	15 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.8	**SURFACE MATERIALS** - 9.5 inches of ASPHALT.		0.8						
		FILL - CLAYEY SAND (SC) - medium dense, moist, yellowish-red (5YR 5/8), mostly fine to coarse sands, some low plasticity fines.			SS-1	13	14	8	8	22
		@ 2.8 feet - red (2.5YR 4/8).		2.8	SS-2	6	7	10	8	17
188.8		@ 4.8 feet - yellowish-red (5YR 5/8), [LL=26, PL=17, PI=9, NMC=13.0%, %#200=39.6], AASHTO = A-4 (0).		4.8	SS-3	6	13	10	12	23
		@ 6.8 feet - dark red (2.5YR 3/6).		6.8	SS-4	7	8	8	9	16
	8.8	**ALLUVIUM - SANDY FAT CLAY (CH)** - very stiff, moist, mottled red (2.5YR 4/8) and light reddish-gray (2.5YR 7/1), mostly high plasticity fines, some fine to medium sands, trace fine gravel, [LL=55, PL=25, PI=30, NMC=21.7%, %#200=58.3], AASHTO = A-7-6 (15).		8.8	SS-5	10	11	10	14	21
183.8	13.5	**SILTY SAND (SM)** - medium dense, moist, red (2.5YR 4/8), mostly fine to medium sands, some low to medium plasticity fines.		13.5	SS-6	7	7	9		16
178.8		▼ ▽								
	18.5	**ELASTIC SILT (MH)** - firm, moist, reddish-yellow (7.5YR 6/8) and light gray (7.5YR 7/1), mostly high plasticity fines, trace fine sands, [LL=60, PL=33, PI=27,		18.5	SS-7	2	3	5		8

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-40
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 41
Eng./Geo.:	HGM	**Boring Location:**	11+56.38	**Offset:**	L:7.30'	**Alignment:**	Proposed
Elev.:	193.8 ft	**Latitude:**	34.020864	**Longitude:**	-81.095111	**Date Started:**	1/29/2018
Total Depth:	94 ft	**Soil Depth:**	76.5 ft	**Core Depth:**	17.5 ft	**Date Completed:**	1/30/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 15.3 ft	**24HR**	15 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
		NMC=37.8%, %#200=96.4], AASHTO = A-7-5 (32).							
	23.5	**SANDY LEAN CLAY (CL)** - loose, moist to wet, light brown (7.5YR 6/3), mostly low plasticity fines, some fine sands, trace mica, [LL=38, PL=20, PI=18, NMC=25.1%, %#200=59.8], AASHTO = A-6 (8).	23.5	SS-8	3	4	5		9
168.8									
			28.5	SS-9	2	2	3		5
163.8									
	33.5	**POORLY GRADED GRAVEL WITH CLAY (GP-GC)** - dense, wet, pink (7.5YR 7/4), mostly fine to coarse gravel, little coarse sands, few low plasticity fines.	33.5	SS-10	24	14	17		31
158.8									
	38.5	**PIEDMONT RESIDUUM - SILTY SAND (SM)** - very dense, wet, light brown (7.5YR 6/3), mostly medium to coarse sands, little low plasticity fines.	38.5	SS-11	24	28	33		61

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-40
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 41
Eng./Geo.:	HGM	**Boring Location:**	11+56.38	**Offset:**	L:7.30'	**Alignment:**	Proposed
Elev.:	193.8 ft	**Latitude:**	34.020864	**Longitude:**	-81.095111	**Date Started:**	1/29/2018
Total Depth:	94 ft	**Soil Depth:**	76.5 ft	**Core Depth:**	17.5 ft	**Date Completed:**	1/30/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 15.3 ft	**24HR**	15 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
	43.5	**PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM)** - very dense, wet, light brown, (7.5YR 6/3), mostly fine to coarse sands, little low plasticity fines.		43.5	SS-12	31 41 50/5"	100
148.8							
		@ 48.5 feet - gravel-sized rock fragments.		48.5	SS-13	16 50/4" -	100
143.8							
				53.5	SS-14	50/2" - -	100
138.8							
				58.5	SS-15	50/3" - -	100

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-40
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 41
Eng./Geo.:	HGM	**Boring Location:**	11+56.38	**Offset:**	L:7.30'	**Alignment:**	Proposed
Elev.:	193.8 ft	**Latitude:**	34.020864	**Longitude:**	-81.095111	**Date Started:**	1/29/2018
Total Depth:	94 ft	**Soil Depth:**	76.5 ft	**Core Depth:**	17.5 ft	**Date Completed:**	1/30/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 15.3 ft	**24HR**	15 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				63.5	SS-16	50/2" - -	100	
128.8								
				68.5	SS-17	50/3" - -	100	
123.8								
		@ 73.5 feet - no recovery.		73.5	SS-18	50/1" - -	100	
118.8								
	76.5	Tri-Cone Bit Refusal at 76.5 feet. Install NW Casing to 76.5 feet for NQ wireline coring.		76.5				
		For discontinuity descriptors, see discontinuity worksheet.			RC-1			
		IGNEOUS BEDROCK - GRANITE - gray (GLEY 1 6/), pink (2.5YR 8/3) and black (5YR 2.5/1), coarse grained, massive,		79.0				

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-40
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 41
Eng./Geo.:	HGM	**Boring Location:**	11+56.38	**Offset:**	L:7.30'	**Alignment:**	Proposed
Elev.:	193.8 ft	**Latitude:**	34.020864	**Longitude:**	-81.095111	**Date Started:**	1/29/2018
Total Depth:	94 ft	**Soil Depth:**	76.5 ft	**Core Depth:**	17.5 ft	**Date Completed:**	1/30/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 15.3 ft	**24HR**	15 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		slightly weathered, medium strong rock.						
		RC-1 : Rec= 96.0%, RQD= 50.0%, GSI= 50-60, RMR= 46.						
		@ 80 feet - fresh, very strong rock.			RC-2			
		RC-2 : Rec= 92.0%, RQD= 68.0%, GSI= 50-60.						
		@ 83.5 feet - slightly weathered, strong rock.		84.0				
108.8		@ 84 feet - very coarse grained pegmatitic zone from 84 feet to 89 feet.						
		@ 85.5 feet - moderately weathered, medium strong rock.			RC-3			
		RC-3 : Rec= 100%, RQD= 70.0%, GSI= 50-60, RMR= 47.						
		@ 88 feet slightly weathered, strong rock.		89.0				
		@ 89 feet - slightly foliated texture from 89 feet to 94 feet.						
103.8					RC-4			
		RC-4 : Rec= 100%, RQD= 84.0%, GSI= 40-50.						
	94.0	Boring Terminated at 94 feet.						
98.8								

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Miller
Logged By: Hunter McKenzie
Date: 1/30/2018

Boring Number: B-40
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 2

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
76.6	1	J	N/A	N/A	No	N/A	Ir	R	Fractured zone 76.6' to 76.9'
77	2	J	15	VN	Su	Fe	Pl	R	
77.3	3	J	5	N	Su	Fe	Pl	R	
77.4	4	J	5	N	Su	Fe	Pl	R	
77.5	5	J	5	N	Su	Fe	Pl	R	
77.7	6	J	5	N	Su	Fe	Pl	R	
78.5	7	J	20	N	No	N/A	Pl	R	
79.5	8	J	N/A	N/A	No	N/A	Ir	R	Fractured zone 79.5' to 80'
82	9	J	30	N	No	N/A	Pl	R	
83.1	10	J	10	VN	No	N/A	Ir	R	
83.3	11	J	N/A	N/A	No	N/A	Ir	R	Fractured zone 83.3' to 84'
85.1	12	J	65	W	No	N/A	St	R	
85.9	13	J	50	N/A	Fi	Mn	Ir	R	Fractured zone 85.9' to 86.2'
86.5	14	J	65	T	Fi	Mn	St	R	
86.9	15	J	N/A	N/A	Fi	Mn	Ir	R	Fractured zone 86.9' to 87.4'
87.8	16	J	N/A	N/A	No	N/A	Ir	R	Fractured zone 87.8' to 89'
89.5	17	J	25	N	No	N/A	Pl	R	
89.7	18	J	25	N	No	N/A	Pl	R	
89.9	19	J	25	N	No	N/A	Pl	R	
90.7	20	J	25	N	No	N/A	Pl	R	
91.2	21	J	30	N	No	N/A	Wa	R	
91.7	22	J	15	N	No	N/A	Pl	R	
92.6	23	J	25	N	No	N/A	Pl	R	
93.5	24	J	N/A	N/A	No	N/A	Ir	R	Fractured zone 93.5' to 94'

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-41
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 41
Eng./Geo.:	AKS	**Boring Location:**	12+62.91	**Offset:**	R:51.93'	**Alignment:**	Proposed
Elev.:	192.8 ft	**Latitude:**	34.020919	**Longitude:**	-81.094715	**Date Started:**	1/21/2018
Total Depth:	78.5 ft	**Soil Depth:**	58.5 ft	**Core Depth:**	20 ft	**Date Completed:**	1/21/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	12.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.2	**SURFACE MATERIALS** - 2 inches of ASPHALT.								
	0.8	8 inches of GRADED AGGREGATE BASE.		0.8						
		FILL - SILTY SAND (SM) - medium dense, moist, yellowish red (5YR 5/8), reddish yellow (7.5YR 7/8) and white (2.5Y 8/1), subangular, mostly fine to coarse sands, some low plasticity fines, trace fine gravel.			SS-1	4	5	7	7	12
	2.8			2.8						
		ALLUVIUM - LEAN CLAY WITH SAND (CL) - stiff, moist, reddish-yellow (7.5YR 7/8) and white (2.5YR 8/1), mostly low plasticity fines, little fine sands, [LL=40, PL=22, PI=18, NMC=16.4%, %#200=74.5], AASHTO = A-6 (13).			SS-2	4	5	7	6	12
187.8				4.8						
		@ 4.8 feet - very soft, wet, reddish-yellow (7.5YR 7/8).			SS-3	1	1	1	2	2
	6.8			6.8						
		SANDY FAT CLAY (CH) - very soft, moist to wet, reddish-yellow (7.5YR 7/8), mostly high plasticity fines, some fine to medium sands, [LL=51, PL=25, PI=26, NMC=22.0%, %#200=52.1], AASHTO = A-7-6 (10).			SS-4	WOH / 18"			5	0
		@ 8.8 feet - stiff.		8.8						
182.8					SS-5	5	10	4	7	14
		▼								
		@ 13.5 feet - red (2.5YR 4/6).		13.5						
					SS-6	3	5	5		10
177.8										
	18.5			18.5						
		FAT CLAY WITH SAND (CH) - firm, moist, light gray (GLEY 1 8/), mostly high plasticity fines, little fine to medium sands, [LL=50, PL=21, PI=29, NMC=30.0%,			SS-7	3	2	3		5

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-41
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 41
Eng./Geo.:	AKS	**Boring Location:**	12+62.91	**Offset:**	R:51.93'	**Alignment:**	Proposed
Elev.:	192.8 ft	**Latitude:**	34.020919	**Longitude:**	-81.094715	**Date Started:**	1/21/2018
Total Depth:	78.5 ft	**Soil Depth:**	58.5 ft	**Core Depth:**	20 ft	**Date Completed:**	1/21/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	12.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		%#200=80.1], AASHTO = A-7-6 (24).									
	23.5			23.5							
167.8		**SILTY SAND (SM)** - loose, moist, light gray (7.5YR 7/1), mostly fine to medium sands, some non-plastic fines, micaceous.			SS-8	3	4	4		8	●
				28.5							
162.8		@ 28.5 feet - medium dense, [LL=NP, PL=NP, PI=NP, NMC=24.5%, %#200=12.9], AASHTO = A-2-4.			SS-9	5	7	9		16	× ▲ ○
				33.5							
157.8		@ 33.5 feet - dense, light brown (7.5YR 6/3), trace fine gravel.			SS-10	9	12	24		36	●
	38.5			38.5							
		PIEDMONT RESIDUUM - SILTY SAND (SM) - very dense, moist, light brown (7.5YR 6/3), mostly fine to medium sands, little low plasticity fines.			SS-11	26	29	49		78	●

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
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Total Depth:	78.5 ft	**Soil Depth:**	58.5 ft	**Core Depth:**	20 ft	**Date Completed:**	1/21/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	12.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		@ 43.5 feet - dense.		43.5	SS-12	22 26 23	49	
147.8	48.5	**PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM)** - very dense, moist to wet, light brown (7.5YR 6/3), mostly fine to coarse sands, little low plasticity fines, gravel-sized rock fragments.		48.5	SS-13	50/4"- -	100	
142.8				53.5	SS-14	50/2"- -	100	
137.8	58.5	Tri-Cone Bit Refusal at 58.5 feet. Install NW Casing to 58.5 feet for NQ wireline coring.		58.5	RC-1			
				60.0				

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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 41
Eng./Geo.:	AKS	**Boring Location:**	12+62.91	**Offset:**	R:51.93'	**Alignment:**	Proposed
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Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	12.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		For discontinuity descriptors, see discontinuity worksheet.						
		IGNEOUS BEDROCK - GRANITE- dark brown (7.5YR 4/4), pink (7.5YR 8/4), coarse, subangular, massive, highly weathered, weak rock, low to moderate recoveries 58.5 to 75 feet likely due to seams of completely weather rock or residual soil wshed away by drilling process.			RC-2			
127.8		RC-1: Rec= 20.0%, RQD= 0%, GSI= 30-40.		65.0				
		@ 60.2 feet - moderately weathered, strong rock.						
		@ 61.7 feet - highly weathered, medium strong rock.			RC-3			
		RC-2: Rec= 32%, RQD= 32%, GSI= 35-45, RMR = 39.						
		@ 65.7 feet - slightly weathered, strong rock.						
		@ 67.2 feet - moderatly weathered.						
		@ 67.8 feet - slightly weathered.						
122.8		RC-3: Rec= 78%, RQD= 42%, GSI= 35-45.		70.0				
		@ 70.0 feet - moderatly weathered.						
		@ 71.1 feet - completely weathered, extremely weak rock.			RC-4			
		RC-4: Rec= 46%, RQD= 0%, GSI= 40-50.						
117.8		@ 75 feet - red (2.5YR 5/6), reddish gray (5R 5/1) and black (5YR 2.5/1), slightly weathered, strong rock.		75.0				
					RC-5			
	78.5	RC-5: Rec= 100%, RQD= 57%, GSI= 25-35, RMR = 52.						
		Boring Terminated at 78.5 feet.						

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Millwood
Logged By: Austin Syms
Date: 1/21/2018

Boring Number: B-41
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 1

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
60.1	1	J	N/A	N/A	No	N/A	Ir	SR	
61.7	2	J	N/A	N/A	No	N/A	Ir	SR	
65.2	3	J	0	N/A	No	N/A	Pl	SR	
66	4	J	79	N/A	No	N/A	Pl	SR	
67.3	5	J	N/A	N/A	No	N/A	Ir	SR	
68.9	6	J	N/A	N/A	No	N/A	Ir	SR	
75.4	7	J	4	N/A	No	N/A	Pl	SR	
76.7	8	J	N/A	N/A	No	N/A	Ir	SR	
77.5	9	J	21	N/A	No	N/A	Pl	SR	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-41UD
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 41
Eng./Geo.:	NGS	**Boring Location:**	12+61.44	**Offset:**	R:57.82	**Alignment:**	Proposed
Elev.:	192.5 ft	**Latitude:**	34.020904	**Longitude:**	-81.094706	**Date Started:**	3/26/2018
Total Depth:	24.5 ft	**Soil Depth:**	24.5 ft	**Core Depth:**	0 ft	**Date Completed:**	3/26/2018
Bore Hole Diameter (in):	4.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 1 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0							
	0.8	**SURFACE MATERIALS** - 10 inches of ASPHALT.						
187.5								
		Drilled without sampling to 17 feet.						
182.5								
177.5								
	17.0			17.0				
		RIVER TERRACE ALLUVIUM - SILTY CLAY WITH SAND (CL-ML) - firm, moist, white (2.5YR 8/1) and reddish-yellow (7.5YR 7/8), mostly low plasticity fines, little fine sands, [LL=41, PL=18, PI=23, %#200=79.4]. AASHTO = A-7-6 (17).			SS-1	3 4 4	8	●
				18.5	UD-1			

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-41UD
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 41
Eng./Geo.:	NGS	**Boring Location:**	12+61.44	**Offset:**	R:57.82	**Alignment:**	Proposed
Elev.:	192.5 ft	**Latitude:**	34.020904	**Longitude:**	-81.094706	**Date Started:**	3/26/2018
Total Depth:	24.5 ft	**Soil Depth:**	24.5 ft	**Core Depth:**	0 ft	**Date Completed:**	3/26/2018
Bore Hole Diameter (in):	4.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 1 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	20.5									
		LEAN CLAY WITH SAND (CL) - moist, light gray (GLEY 1 8/), mostly low to medium plasticity fines, little fine to medium sands.		21.0						
	22.0				UD-2					
		POORLY GRADED SAND WITH SILT (SP-SM) - medium dense, moist, reddish-yellow (7.5YR 7/8) and light gray (7.5YR 7/1), mostly fine to medium sands, few low plasticity fines.		23.0						
					SS-2	6	5	6		11
	24.5									
167.5		Boring Terminated at 24.5 feet.								
162.5										
157.5										

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-42
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 42
Eng./Geo.:	NGS	**Boring Location:**	15+14.99	**Offset:**	L:70.78'	**Alignment:**	Proposed
Elev.:	218.6 ft	**Latitude:**	34.021612	**Longitude:**	-81.094321	**Date Started:**	3/1/2018
Total Depth:	87 ft	**Soil Depth:**	66.5 ft	**Core Depth:**	20.5 ft	**Date Completed:**	3/2/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 5 ft	**24HR**	21 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0								
	0.8	**SURFACE MATERIALS** - 9 inches of ASPHALT.	0.8						
		ALLUVIUM - CLAYEY SAND (SC) - loose, moist, yellow (2.5YR 7/8) and white (2.5YR 8/1), mostly fine to medium sands, some low plasticity fines, [LL=29, PL=17, PI=12, NMC=17.3%, %#200=42.4], AASHTO = A-6 (2).		SS-1	2	4	6	4	10
		@ 2.8 feet - medium dense.	2.8	SS-2	5	5	7	8	12
	4.8		4.8						
213.6		**PIEDMONT RESIDUUM - SANDY ELASTIC SILT (MH)** - stiff, moist, white (2.5YR 8/1), red (2.5YR 5/6), and yellowish-brown (10YR 5/8), mostly high plasticity fines, some fine to coarse sands,		SS-3	4	5	7	10	12
	6.8	[LL=51, PL=29, PI=22, NMC=23.9%, %#200=59.7], AASHTO = A-7-6 (12).	6.8	SS-4	3	7	7	13	14
		SILTY SAND (SM) - medium dense, moist, white (2.5YR 8/1), red (2.5YR 5/6), and yellowish-brown (10YR 5/8), mostly fine to medium sands, some low plasticity fines.	8.8	SS-5	8	11	10	11	21
208.6									
			13.5	SS-6	3	5	6		11
203.6									
		@ 18.5 feet - [LL=39, PL=28, PI=11, NMC=27.1%, %#200=40.8], AASHTO = A-6 (1).	18.5	SS-7	3	5	7		12

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-42
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 42
Eng./Geo.:	NGS	**Boring Location:**	15+14.99	**Offset:**	L:70.78'	**Alignment:**	Proposed
Elev.:	218.6 ft	**Latitude:**	34.021612	**Longitude:**	-81.094321	**Date Started:**	3/1/2018
Total Depth:	87 ft	**Soil Depth:**	66.5 ft	**Core Depth:**	20.5 ft	**Date Completed:**	3/2/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 5 ft	**24HR**	21 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		▼									
		@ 23.5 feet - moist to wet.		23.5	SS-8	3	6	8		14	●
193.6				28.5	SS-9	3	5	7		12	●
188.6		@ 33.5 feet - [LL=32, PL=29, PI=3, NMC=25.7%, %#200=41.1], AASHTO = A-4 (0).		33.5	SS-10	4	6	7		13	● ○ ▲
183.6				38.5	SS-11	5	4	9		13	●

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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-42
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 42
Eng./Geo.:	NGS	**Boring Location:**	15+14.99	**Offset:**	L:70.78'	**Alignment:**	Proposed
Elev.:	218.6 ft	**Latitude:**	34.021612	**Longitude:**	-81.094321	**Date Started:**	3/1/2018
Total Depth:	87 ft	**Soil Depth:**	66.5 ft	**Core Depth:**	20.5 ft	**Date Completed:**	3/2/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 5 ft	**24HR**	21 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				43.5	SS-12	9 12 16	28	
173.6								
				48.5	SS-13	3 1 14	15	
168.6								
	53.5	**PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM)** - very dense, moist, pale brown (10YR 6/3), white (10YR 8/1), and brown (10YR 4/3), mostly medium to coarse sands, little low plasticity fines, weathered rock fragments.		53.5	SS-14	30 50/3" -	100	
163.6								
				58.5	SS-15	40 50/4" -	100	

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-42
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 42
Eng./Geo.:	NGS	**Boring Location:**	15+14.99	**Offset:**	L:70.78'	**Alignment:**	Proposed
Elev.:	218.6 ft	**Latitude:**	34.021612	**Longitude:**	-81.094321	**Date Started:**	3/1/2018
Total Depth:	87 ft	**Soil Depth:**	66.5 ft	**Core Depth:**	20.5 ft	**Date Completed:**	3/2/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 5 ft	**24HR**	21 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				63.5	SS-16	50/2" - -	100	
153.6		Tri-Cone Bit Refusal at 66.5 feet. Install NW Casing to 66.5 feet for NQ wireline coring.						
	66.5	For discontinuity descriptors, see discontinuity worksheet.		66.5				
		IGNEOUS BEDROCK - GRANITE - pinkish-gray (5R 7/1), pale red (5R 7/3), and reddish-brown (5R 2.5/1), coarse grained, massive, moderately weathered, medium strong rock.			RC-1			
148.6		RC-1: Rec= 83.3%, RQD= 44.4%, GSI= 40-50.		69.5				
		@ 69.1 feet - slightly weathered, strong rock.						
		RC-2: Rec= 100%, RQD= 58.3%, GSI= 45-55, RMR = 47.			RC-2			
		@ 73.8 feet - moderately weathered, medium strong rock.		74.5				
143.6		@ 75 feet - slightly weathered, strong rock.						
		RC-3: Rec= 90.0%, RQD= 51.7%, GSI= 45-55.			RC-3			
				79.5				

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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-42
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 42
Eng./Geo.:	NGS	**Boring Location:**	15+14.99	**Offset:**	L:70.78'	**Alignment:**	Proposed
Elev.:	218.6 ft	**Latitude:**	34.021612	**Longitude:**	-81.094321	**Date Started:**	3/1/2018
Total Depth:	87 ft	**Soil Depth:**	66.5 ft	**Core Depth:**	20.5 ft	**Date Completed:**	3/2/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 5 ft	**24HR**	21 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		RC-4: Rec= 100%, RQD= 65.0%, GSI= 35-45, RMR = 52.			RC-4			
133.6				84.5				
		RC-5: Rec= 100%, RQD= 83.3%, GSI= 35-45.			RC-5			
	87.0	Boring Terminated at 87 feet.						
128.6								
123.6								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Miller
Logged By: Nat Shuff
Date: 3/1/2018

Boring Number: B-42
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 2

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
66.5	1	J	N/A	N/A	Pa	Cl/Sd	N/A	R	Fractured zone 66.5' - 68'
68	2	J	70	VN	Sp	Cl/Sd	Ir	R	
68.3	3	J	40	VN	Sp	Cl/Sd	Ir	SR	
68.5	4	J	40	N	Sp	Sd	Ir	R	
69	5	J	50	N	Sp	Sd	St	VR	
70.5	6	J	60	VN	Su	Fe	Pl	SR	
71.5	7	J	30	VN	No	N/A	Pl	R	
72	8	J	40	N	No	N/A	Ir	R	
72.5	9	J	30	VN	Pa	Sd	Ir	R	
72.7	10	J	60	VN	Pa	Sd	Ir	R	
73	11	J	15	N	Pa	Sd	Ir	R	
73.2	12	J	30	VN	Pa	Sd	Ir	R	
73.7	13	J	N/A	N/A	Pa	Sd	Ir	R	Fractured zone 73.7' - 74.5'
74.5	14	J	90	VN	Pa	Sd	Ir	R	
74.7	15	J	15	VN	No	N/A	Ir	R	
74.9	16	J	40	VN	Pa	Cl/Sd	Ir	R	
75.6	17	J	15	N	No	N/A	Ir	R	
75.8	18	J	20	VN	No	N/A	Ir	R	
76	19	J	50	VN	No	N/A	Ir	R	
76.5	20	J	40	VN	Pa	Cl/Sd	Ir	SR	
77.1	21	J	35	N	No	N/A	Ir	R	
77.3	22	J	40	VN	No	N/A	Ir	R	
77.5	23	J	75	VN	Pa	Cl	Ir	SR	
78.5	24	J	15	N	Pa	Sd	Ir	R	
78.6	25	J	40	N	Pa	Sd	Ir	R	
80.5	26	J	40	VN	No	N/A	Pl	SR	
80.8	27	J	30	VN	Pa	Sd	Ir	SR	
81.5	28	J	40	VN	No	N/A	Pl	SR	
81.7	29	J	N/A	N/A	Pa	Sd	Ir	R	Fractured zone 81.7' - 82.5'
82	30	J	40	N	No	N/A	Ir	R	
83.1	31	J	55	N	Su	Fe	Pl	SR	
83.6	32	J	55	N	Pa	Sd	St	R	
84.3	33	J	N/A	N/A	Pa	Sd	Ir	R	Fractured zone 84.3' - 84.5'
84.6	34	J	40	N/A	Pa	Cl/Sd/Fe	Pl	SR	
85.7	35	J	5	VN	No	N/A	Ir	R	
86.3	36	J	40	VN	Su	Fe	Pl	SR	
86.4	37	J	45	N/A	Su	Fe	Ir	R	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-43
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 33
Eng./Geo.:	AKS	**Boring Location:**	395+13.46	**Offset:**	R:34.908'	**Alignment:**	Proposed
Elev.:	181.0 ft	**Latitude:**	34.024263	**Longitude:**	-81.103418	**Date Started:**	2/26/2018
Total Depth:	73 ft	**Soil Depth:**	53 ft	**Core Depth:**	20 ft	**Date Completed:**	2/26/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 19.1 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0										
	0.7	**SURFACE MATERIALS** - 8 inches of CONCRETE BRIDGE DECK.									
176.0		14.8 feet from top of bridge deck to ground surface.									
171.0											
	14.8			14.8							
166.0		**ALLUVIUM - SILTY SAND (SM)** - loose, moist, reddish-brown (5YR 5/4), subangular, mostly fine to medium sands, some non-plastic fines, [LL=NP, PL=NP, PI=NP, NMC=18.6%, %#200=30.7], AASHTO = A-2-4.			SS-1	3	2	3	3	5	
	16.8	**SANDY LEAN CLAY (CL)** - stiff, moist, gray (5YR 5/1), mostly low plasticity fines, some fine to medium sands, [LL=34, PL=19, PI=15, NMC=20.6%, %#200=68.3], AASHTO = A-6 (8).		16.8	SS-2	3	4	5	5	9	
	18.8	**ELASTIC SILT WITH SAND (MH)** - stiff,		18.8	SS-3	6	5	5	5	10	

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-43
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 33
Eng./Geo.:	AKS	**Boring Location:**	395+13.46	**Offset:**	R:34.908'	**Alignment:**	Proposed
Elev.:	181.0 ft	**Latitude:**	34.024263	**Longitude:**	-81.103418	**Date Started:**	2/26/2018
Total Depth:	73 ft	**Soil Depth:**	53 ft	**Core Depth:**	20 ft	**Date Completed:**	2/26/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 19.1 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
		wet, gray (5YR 5/1), mostly high plasticity fines, little fine to medium sands.		20.8						
					SS-4	5	6	5	5	11
				22.8						
					SS-5	6	6	5	5	11
156.0										
	28.3	**SILTY SAND WITH GRAVEL (SM)** - medium dense, moist, light reddish-brown (5YR 6/3), subangular, mostly fine to medium sands, some non-plastic fines, little fine to medium gravel, [LL=NP, PL=NP, PI=NP, NMC=19.2%, %#200=33.9], AASHTO = A-2-4.		28.3						
151.0					SS-6	8	5	7		12
	33.3	**PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM)** - very dense, moist, bluish-gray (5/5B), mostly fine to medium sands, some low plasticity fines.		33.3						
					SS-7	28	40	50/4"		100
146.0										
				38.3						
					SS-8	50/4"-		-		100

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-43
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 33
Eng./Geo.:	AKS	**Boring Location:**	395+13.46	**Offset:**	R:34.908'	**Alignment:**	Proposed
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Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 19.1 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				43.3	SS-9	50/1"- -	100	
136.0								
				48.3	SS-10	50/5"- -	100	
131.0								
	53.0	Tri-Cone Bit Refusal at 53 feet. Install NW Casing to 53 feet for NQ wireline coring.		53.0				
		For discontinuity descriptors, see discontinuity worksheet.			RC-1			
126.0		**METAMORPHIC BEDROCK - SCHIST** - gray (GLEY 1 4/N), fine grained, foliated, highly weathered, weak rock.		55.5				
		RC-1: Rec= 60.0%, RQD= 0.0%, GSI= 25-35.						
		@ 55.5 feet - moderately weathered, medium strong rock.						
		@ 56.2 feet - highly weathered, weak rock.			RC-2			
		@ 56.5 feet - moderatly weathered, medium strong rock.						

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-43
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 33
Eng./Geo.:	AKS	**Boring Location:**	395+13.46	**Offset:**	R:34.908'	**Alignment:**	Proposed
Elev.:	181.0 ft	**Latitude:**	34.024263	**Longitude:**	-81.103418	**Date Started:**	2/26/2018
Total Depth:	73 ft	**Soil Depth:**	53 ft	**Core Depth:**	20 ft	**Date Completed:**	2/26/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 19.1 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		RC-2: Rec= 100%, RQD= 8.0%, GSI= 35-45.		60.5				
		@ 61.1 feet - completely weathered to residual soil, extremely weak rock.			RC-3			
116.0		@ 64.8 feet - granitic dike, light pink (7.5YR 8/3), coarse grained, slightly weathered, medium strong rock.		65.5				
		RC-3: Rec= 80.0%, RQD= 0.0%, GSI= 30-40.						
		@ 66.5 feet - gray (GLEY 1 4/N), fine grained, foliated.			RC-4			
111.0		RC-4: Rec= 100%, RQD= 31.7%, GSI= 45-55.		70.5				
		@ 71.1 feet - granitic dike, light pink (7.5YR 8/3), coarse grained, fresh, strong rock.			RC-5			
	73.0	@ 72.1 feet - gray (GLEY 1 4/N), fine grained, foliated, slightly weathered, medium strong rock.						
		RC-5: Rec= 100%, RQD= 26.7%, GSI= 45-55.						
		Boring Terminated at 73 feet.						
106.0								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Millwood
Logged By: Austin Syms
Date: 2/26/2018

Boring Number: B-43
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 2

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
53	1	J	N/A	N/A	No	N/A	Ir	SR	Fractured zone 53' - 55.5'
55.9	2	J	15	W	No	N/A	Ir	SR	
56.2	3	J	N/A	N/A	No	N/A	Ir	SR	Fractured zone 56.2' - 56.5'
26.6	4	J	15	MW	No	N/A	Ir	SR	
26.9	5	J	10	W	No	N/A	Pl	SR	
57.3	6	J	10	VN	No	N/A	Ir	SR	
57.5	7	J	N/A	N/A	No	N/A	Pl	SR	Fractured zone 57.5' - 58'
58.1	8	J	0	N/A	No	N/A	Ir	SR	
58.5	9	J	15	N/A	No	N/A	Pl	SR	
59	10	J	25	N/A	No	N/A	Pl	SR	
59.1	11	J	0	N/A	No	N/A	N/A	SR	
59.5	12	J	N/A	N/A	No	N/A	St	SR	Fractured zone 59.5' - 64.8'
65	13	J	20	VN	No	N/A	Pl	SR	
65.2	14	J	45	VN	No	N/A	Ir	SR	
65.7	15	J	40	N	No	N/A	Ir	SR	
66.5	16	J	10	N/A	No	N/A	Ir	SR	Fractured zone 66.5' - 67.5'
67.8	17	J	20	W	No	N/A	Pl	SR	
69	18	J	10	MW	No	N/A	Pl	SR	
69.6	19	J	15	N	No	N/A	Pl	SR	
69.7	20	J	N/A	N/A	No	N/A	Ir	SR	Fractured zone 69.7' - 71'
72	21	J	N/A	N/A	No	N/A	Ir	SR	Fractured zone 72' - 73'

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-44
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 33
Eng./Geo.:	AKS	**Boring Location:**	398+36.32	**Offset:**	L:98.897'	**Alignment:**	Proposed
Elev.:	165.5 ft	**Latitude:**	34.023303	**Longitude:**	-81.103422	**Date Started:**	3/21/2018
Total Depth:	26.2 ft	**Soil Depth:**	6.2 ft	**Core Depth:**	20 ft	**Date Completed:**	3/22/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 4.8 ft	**24HR**	0.9 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.4	**SURFACE MATERIALS** - 5 inches of TOPSOIL.		0.0	SS-1	3	4	6	4	10
		ALLUVIUM - SANDY SILTY CLAY (CL-ML) - stiff, moist, pale brown (10YR 6/3), mostly low plasticity fines, some fine sands, [LL=25, PL=19, PI=6, NMC=16.6%, %#200=59.6], AASHTO = A-4 (1).		2.0	SS-2	4	5	7	7	12
		@ 4 feet - very stiff.		4.0	SS-3	7	8	10	50/1"	18
160.5										
	6.0			6.0	SS-4	50/0"	-	-	-	100
	6.2	**PARTIALLY WEATHERED ROCK (PWR)** - no recovery. Tri-Cone Bit Refusal at 6.2 feet. Install NW Casing to 6.2 feet for NQ wireline coring.		6.2						
		For discontinuity descriptors, see discontinuity worksheet.			RC-1					
155.5		**IGNEOUS BEDROCK - GRANITE** - pale red (7.5YR 6/4), coarse grained, massive slightly weathered, strong rock.								
		RC-1 : Rec= 100%, RQD= 30.0%, GSI= 45-55, RMR = 53.		11.2						
		@ 11.2 feet - fresh, very strong rock.			RC-2					
150.5										
		@ 15.8 feet - slightly weathered, strong rock.		16.2						
		RC-2 : Rec= 100%, RQD= 18.3%, GSI= 45-55, RMR = 53.			RC-3					

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-44
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 33
Eng./Geo.:	AKS	**Boring Location:**	398+36.32	**Offset:**	L:98.897'	**Alignment:**	Proposed
Elev.:	165.5 ft	**Latitude:**	34.023303	**Longitude:**	-81.103422	**Date Started:**	3/21/2018
Total Depth:	26.2 ft	**Soil Depth:**	6.2 ft	**Core Depth:**	20 ft	**Date Completed:**	3/22/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 4.8 ft	**24HR**	0.9 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		RC-3 : Rec= 100%, RQD= 40.0%, GSI= 45-55, RMR = 37.		21.2				
	22.2	**QUARTZ DIKE** - white (10R 8/1), massive, moderately weathered, massive strong rock.						
	23.0	**GRANITE** - pale red (7.5YR 6/4), coarse grained, slightly weathered, strong rock.			RC-4			
140.5								
	26.2	RC-4 : Rec= 94.0%, RQD= 25.0%, GSI= 45-55.						
		Boring Terminated at 26.2 feet.						
135.5								
130.5								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Millwood
Logged By: Austin Syms
Date: 3/21/2018

Boring Number: B-44
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 2

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
6.3	1	J	71	N	Pa	Sd	Pl	SR	
6.7	2	J	44	VN	Pa	Sd	Pl	SR	
7	3	J	40	N	Pa	Sd	Pl	SR	
7.4	4	J	86	VN	Pa	Sd	Pl	SR	
7.7	5	J	63	T	Pa	Sd	Pl	SR	
8	6	J	48	W	Pa	Sd	Pl	SR	
8.5	7	J	20	VN	Pa	Sd	Pl	SR	
9.1	8	J	45	T	No	N/A	St	SR	
9.7	9	J	40	VN	Pa	Sd	St	SR	
9.9	10	J	54	T	No	N/A	Pl	SR	
10.1	11	J	53	VN	Pa	Sd	Pl	SR	
10.8	12	J	24	N	Pa	Sd	Pl	SR	
11.2	13	J	84	T	No	N/A	Wa	SR	
11.6	14	J	39	T	Pa	Sd	Pl	SR	
12.3	15	J	45	T	No	N/A	Pl	SR	
12.7	16	J	37	T	No	N/A	Pl	R	
13.4	17	J	88	T	No	N/A	Pl	SR	
13.6	18	J	29	T	Pa	Sd	Pl	SR	
13.8	19	J	26	VN	Pa	Sd	Pl	SR	
15	20	J	9	N	Pa	Sd	Pl	SR	
17	21	J	41	T	No	N/A	Pl	SR	
18	22	J	40	VN	Pa	Sd	Pl	SR	
18.1	23	J	39	T	No	N/A	Pl	R	
18.8	24	J	14	VN	Pa	Sd	Pl	SR	
20	25	J	35	T	Pa	Sd	Pl	SR	
20.2	26	J	22	VN	Pa	Sd	Pl	SR	
20.7	27	J	10	VN	Pa	Sd	Pl	SR	
22.7	28	J	32	T	No	N/A	Pl	SR	
23.1	29	J	17	T	No	N/A	Pl	R	
23.2	30	J	N/A	N/A	No	N/A	Ir	SR	Fractured zone 23.2' - 24.2'
24.9	31	J	50	VN	No	N/A	Pl	SR	
25.2	32	J	36	N	Pa	Sd	Pl	SR	
25.5	33	J	31	N	No	N/A	Pl	SR	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-45
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 33
Eng./Geo.:	ELF	**Boring Location:**	401+11.44	**Offset:**	L:76.366'	**Alignment:**	Proposed
Elev.:	183.3 ft	**Latitude:**	34.022629	**Longitude:**	-81.103841	**Date Started:**	2/8/2018
Total Depth:	47 ft	**Soil Depth:**	27 ft	**Core Depth:**	20 ft	**Date Completed:**	2/8/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 12 ft	**24HR**	10.7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.8	**SURFACE MATERIALS** - 10 inches of ASPHALT.		0.8						
		FILL - SILTY CLAYEY SAND (SC-SM) - medium dense, wet, strong brown (7.5YR 5/8), mostly fine to medium sands, little low plasticity fines, trace fine gravel, [LL=20, PL=16, PI=4, NMC=11.0%, %#200=24.0], AASHTO = A-2-4.			SS-1	7	10	10	8	20
	2.8			2.8	SS-2	7	50/5"	-	-	100
		PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM) - very dense, wet, black (7.5YR 2.5/1) and light brown (7.5YR 6/3), mostly fine sands, little low plasticity fines.		4.8	SS-3	50/2"	-	-	-	100
178.3		@ 4.8 feet - yellowish-red (7.5YR 6/6), mostly fine to coarse sands, weathered rock fragments.		6.8	SS-4	50/1"	-	-	-	100
		@ 6.8 feet - no recovery.		8.8	SS-5	50/2"	-	-	-	100
173.3										
				13.5	SS-6	50/1"	-	-	-	100
		@ 13.5 feet - no recovery.								
168.3										
				18.5	SS-7	50/3"	-	-	-	100

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-45
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 33
Eng./Geo.:	ELF	**Boring Location:**	401+11.44	**Offset:**	L:76.366'	**Alignment:**	Proposed
Elev.:	183.3 ft	**Latitude:**	34.022629	**Longitude:**	-81.103841	**Date Started:**	2/8/2018
Total Depth:	47 ft	**Soil Depth:**	27 ft	**Core Depth:**	20 ft	**Date Completed:**	2/8/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 12 ft	**24HR**	10.7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				23.5	SS-8	25 50/1" -	100	
158.3	27.0	Tri-Cone Bit Refusal at 27.0 feet. Install NW Casing to 27.0 feet for NQ wireline coring.		27.0				
		For discontinuity descriptors, see discontinuity worksheet.			RC-1			
153.3		**IGNEOUS BEDROCK - GRANITE** - reddish-brown (2.5YR 5/4), coarse grained to fine grained, massive, slightly weathered, strong rock.		30.4				
		RC-1: Rec= 67.6%, RQD= 21.4%, GSI= 70-80.			RC-2			
148.3		RC-2: Rec= 100%, RQD= 75.0%, GSI= 70-80, RMR = 42.		35.4				
		@ 35.4 feet - fresh, very strong rock.			RC-3			

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-45
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 33
Eng./Geo.:	ELF	**Boring Location:**	401+11.44	**Offset:**	L:76.366'	**Alignment:**	Proposed
Elev.:	183.3 ft	**Latitude:**	34.022629	**Longitude:**	-81.103841	**Date Started:**	2/8/2018
Total Depth:	47 ft	**Soil Depth:**	27 ft	**Core Depth:**	20 ft	**Date Completed:**	2/8/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 12 ft	**24HR**	10.7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		RC-3: Rec= 100%, RQD= 76.7%, GSI= 70-80, RMR = 45.		40.4				
					RC-4			
		RC-4: Rec= 100%, RQD= 100%, GSI= 70-80.		42.0				
				42.5	RC-5			
		RC-5: Rec= 100%, RQD= 100%, GSI= 70-80.						
					RC-6			
138.3		@ 44.8 feet - slightly weathered, medium strong rock.		45.5				
		RC-6: Rec= 100%, RQD= 90.3%, GSI= 70-80, RMR = 45.			RC-7			
	47.0	@ 46.3 feet - moderately weathered.						
		RC-7: Rec= 100%, RQD= 100%, GSI= 70-80.						
		Boring Terminated at 47 feet.						
133.3								
128.3								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Miller
Logged By: Lehe Fender
Date: 2/8/2018

Boring Number: B-45
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 2

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
27.1	1	J	17	MW	Su	Fe	Pl	SR	
27.3	2	J	15	MW	Su	Fe	Pl	SR	
27.4	3	J	38	MW	No	N/A	Pl	S	
27.9	4	J	90	MW	Su	Fe	Pl	SR	Fractured zone 27.9' to 29.2'
31.9	5	J	61	N	Su	Fe	Pl	S	
32.9	6	J	18	MW	No	N/A	Pl	SR	
33.7	7	J	N/A	W	Su	Fe	Pl	N/A	Fractured zone 33.7' to 34.2'
34.9	8	J	40	W	Su	Fe	Pl	SR	Fractured zone 34.9' to 35.3'
35.3	9	J	5	MW	Su	Fe	Pl	SR	
35.9	10	J	12	N	No	N/A	Ir	SR	
36.2	11	V	67	W	Fi	Qz	Pl	N/A	
37.2	12	J	50	N	No	N/A	Pl	SR	Fractured zone 37.2' to 37.5'
38.6	13	J	5	MW	No	N/A	Pl	SR	
38.7	14	J	83	N	No	N/A	Pl	SR	Fractured zone 38.7' to 39.6'
40	15	J	5	N	No	N/A	Pl	SR	
40.8	16	V	40	W	Fi	Qz	Pl	N/A	
41.9	17	J	5	W	No	N/A	Ir	R	Fractured zone 41.9' to 42'
43.4	18	J	N/A	MW	No	N/A	Pl	SR	
43.7	19	J	64	VN	Su	Fe	Pl	S	
44.4	20	J	11	N	No	N/A	Ir	SR	Fractured zone 44.4' to 44.8'
46.3	21	J	N/A	W	Su	Fe	Ir	R	Fractured zone 46.3' to 46.4'
46.7	22	J	N/A	N	No	N/A	Pl	SR	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-46
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 32
Eng./Geo.:	NGS	**Boring Location:**	5987+47.92	**Offset:**	L:48.77'	**Alignment:**	Proposed
Elev.:	168.9 ft	**Latitude:**	34.022548	**Longitude:**	-81.104982	**Date Started:**	4/2/2018
Total Depth:	48.6 ft	**Soil Depth:**	23.6 ft	**Core Depth:**	25 ft	**Date Completed:**	4/3/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 6 ft	**24HR**	8 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.2	**SURFACE MATERIALS** - 2 inches of TOPSOIL.		0.0	SS-1	4	3	3	3	6
		PIEDMONT RESIDUUM - LEAN CLAY WITH SAND (CL) - firm, moist, brown (7.5YR 5/5) and strong brown (7.5YR 5/6), mostly low plasticity fines, little fine sands, micaceous, [LL=32, PL=21, PI=11, NMC=28.7%, %#200=80], AASHTO = A-6 (8).		2.0	SS-2	4	6	6	8	12
		@ 2 feet - stiff, brown (7.5YR 5/5), trace organics, [LL=32, PL=19, PI=13, NMC=20.7%, %#200=73], AASHTO = A-6 (8).		4.0	SS-3	8	11	10	9	21
163.9		@ 4 feet - very stiff.		6.0	SS-4	8	10	11	9	21
				8.0	SS-5	9	8	9	8	17
158.9										
	13.0	**PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM)** - very dense, moist, gray (GLEY 1 5/), mostly fine to medium sands, little low plasticity fines, trace weathered rock fragments, relict rock structure.		13.5	SS-6	23	39	50/3"		100
153.9										
	18.5			18.5	SS-7	50/1"				100
	18.6	**POORLY GRADED SAND (SP)** - very dense, moist, light red (2.5YR 6/8), mostly fine to medium sands, trace non-plastic fines.		18.6						

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-46
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 32
Eng./Geo.:	NGS	**Boring Location:**	5987+47.92	**Offset:**	L:48.77'	**Alignment:**	Proposed
Elev.:	168.9 ft	**Latitude:**	34.022548	**Longitude:**	-81.104982	**Date Started:**	4/2/2018
Total Depth:	48.6 ft	**Soil Depth:**	23.6 ft	**Core Depth:**	25 ft	**Date Completed:**	4/3/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 6 ft	**24HR**	8 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
		Tri-Cone Bit Refusal at 18.6 feet. Install NW Casing to 18.6 feet for NQ wireline coring.		RC-1		
		For discontinuity descriptors, see discontinuity worksheet.				
		IGNEOUS BEDROCK - GRANITE - light red (10R 7/6), coarse grained, highly weathered, extremely weak rock, possible boulder.	23.6			
143.9		RC-1: Rec= 6.0%, RQD= 0.0%, GSI= 10-20.		RC-2		
	28.6	RC-2: Rec= 6.0%, RQD= 0.0%, GSI= 10-20.	28.6			
		Switched back to Tri-Cone Bit at 28.6 feet. SPT mud rotary drilling to 33.6 feet.		SS-8	26 12 50	62
138.9		**PIEDMONT RESIDUUM - SILTY SAND (SM)** - very dense, moist, light red (2.5YR 6/8), mostly fine to medium sands, little non-plastic fines.				
		Tri-Cone Bit Refusal at 33.6 feet. Install NW Casing to 33.6 feet for NQ wireline coring.	33.5	SS-9	50/0"- -	100
	33.6	**IGNEOUS BEDROCK - GRANITE** - light red (10R 7/6), coarse grained, slightly weathered, medium strong rock.	33.6			
133.9		@ 34.8 feet - strong rock.		RC-3		
		RC-3: Rec= 94.0%, RQD= 35.0%, GSI= 50-60.	38.6			

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-46
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 32
Eng./Geo.:	NGS	**Boring Location:**	5987+47.92	**Offset:**	L:48.77'	**Alignment:**	Proposed
Elev.:	168.9 ft	**Latitude:**	34.022548	**Longitude:**	-81.104982	**Date Started:**	4/2/2018
Total Depth:	48.6 ft	**Soil Depth:**	23.6 ft	**Core Depth:**	25 ft	**Date Completed:**	4/3/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 6 ft	**24HR**	8 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		RC-4: Rec= 100%, RQD= 38.3%, GSI= 50-60.		43.6	RC-4			
		@ 43.3 feet - quartzite dike, gray (GLEY 1 5/N), very fine grained, fresh.						
123.9		@ 43.6 feet - light red (10R 7/6), coarse grained, slightly weathered.			RC-5			
		@ 45.1 feet - quartzite dike, gray (GLEY 1 5/N), very fine grained, fresh.		46.6				
		RC-5: Rec= 100%, RQD= 38.9%, GSI= 55-65.						
		@ 46.6 feet - light red (10R 7/6), coarse grained, slightly weathered, medium strong rock.			RC-6			
	48.6	RC-6: Rec= 95.0%, RQD= 0.0%, GSI= 55-65.						
118.9		Boring Terminated at 48.6 feet.						
113.9								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Miller
Logged By: Nat Shuff
Date: 4/3/2018

Boring Number: B-46
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 2

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
18.6	1	N/A	N/A	W	Pa/Fi	Sd	Ir	SR	Fractured zone 18.6' - 28.6'
35.2	2	J	30	VN	No	N/A	Ir	SR	
35.6	3	J	20	T	Su	Cl	Wa	SR	
36.6	4	J	40	MW	Pa	Cl/Sd	Ir	R	
37.9	5	J	0	VN	Pa	Sd	Ir	R	
38.2	6	J	0	VN	Pa	Sd	Ir	R	
38.4	7	J	0	VN	No	N/A	Ir	R	
38.8	8	J	70	VN	Su	Fe	Wa	SR	
40	9	J	55	VN	Su	Fe	Wa	SR	
40.3	10	J	90	VN	Su	Fe	Wa	SR	
40.4	11	J	0	N	No	N/A	Ir	R	
41.4	12	N/A	N/A	W	Pa	Sd	Ir	R	Fractured zone 41.4' - 42'
42.4	13	J	50	VN	Su	Fe/Cl	Wa	SR	
43.6	14	J	0	N	Su	Fe	Wa	SR	
44.1	15	J	20	N	Su	Fe	Wa	SR	
44.6	16	J	40	N	Su	Fe	Wa	SR	
44.9	17	J	0	VN	Su	Fe	Ir	R	
45	18	N/A	N/A	N/A	No	N/A	Ir	R	Fractured zone 45' - 46.5'
46.6	19	J	0	VN	Su	Fe	Ir	R	
47.1	20	J	70	VN	Su	Fe	Ir	R	
47.9	21	J	0	VN	No	N/A	Ir	SR	
48.2	22	J	0	VN	No	N/A	Ir	SR	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-47
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 43
Eng./Geo.:	AKS	**Boring Location:**	86+30.73	**Offset:**	L:46.226'	**Alignment:**	Proposed
Elev.:	198.1 ft	**Latitude:**	34.026437	**Longitude:**	-81.127687	**Date Started:**	2/12/2018
Total Depth:	66.9 ft	**Soil Depth:**	46.9 ft	**Core Depth:**	20 ft	**Date Completed:**	2/12/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 31.7 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 12 inches of ASPHALT.								
	1.0	**FILL - SANDY LEAN CLAY (CL)** - very stiff, moist, red (10R 5/6), mostly low plasticity fines, some fine to medium sands, [LL=30, PL=17, PI=13, NMC=15.3%, %#200=57.2], AASHTO = A-6 (5).		1.0	SS-1	11	9	6	7	16
	3.0	**PIEDMONT RESIDUUM - SILT WITH SAND (ML)** - stiff, moist, red (10R 5/6), mostly low plasticity fines, little fine sands, few weathered rock fragments.		3.0	SS-2	6	7	8	8	15
193.1		@ 5 feet - very stiff.		5.0	SS-3	7	8	9	11	17
		@ 7 feet - [LL=35, PL=26, PI=9, NMC=17.7%, %#200=71.7], AASHTO = A-4 (6).		7.0	SS-4	11	12	14	14	26
		@ 9 feet - hard.		9.0						
188.1					SS-5	16	18	19	20	37
				14.5						
183.1		@ 14.5 feet - medium dense, trace weathered rock fragments.			SS-6	6	5	6		11
				19.5						
		@ 19.5 feet - firm, wet.								

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-47
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 43
Eng./Geo.:	AKS	**Boring Location:**	86+30.73	**Offset:**	L:46.226'	**Alignment:**	Proposed
Elev.:	198.1 ft	**Latitude:**	34.026437	**Longitude:**	-81.127687	**Date Started:**	2/12/2018
Total Depth:	66.9 ft	**Soil Depth:**	46.9 ft	**Core Depth:**	20 ft	**Date Completed:**	2/12/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 31.7 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
					SS-7	6	4	4		8
	24.5			24.5						
173.1		**CLAYEY SAND WITH GRAVEL (SC)** - medium dense, wet, red (10R 5/6), mostly fine to coarse sands, some low plasticity fines, little weathered rock fragments, [LL=39, PL=25, PI=14, NMC=23.5%, %#200=41.5], AASHTO = A-6 (2).			SS-8	5	5	7		12
				29.5						
168.1					SS-9	3	6	7		13
		▽								
				34.5						
163.1		@ 34.5 feet - loose, brown (7.5YR 4/3).			SS-10	3	4	4		8
	39.5			39.5						
		PARTIALLY WEATHERED ROCK (PWR)			SS-11	50/4"-		-		100

SPT N VALUE

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-47
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 43
Eng./Geo.:	AKS	**Boring Location:**	86+30.73	**Offset:**	L:46.226'	**Alignment:**	Proposed
Elev.:	198.1 ft	**Latitude:**	34.026437	**Longitude:**	-81.127687	**Date Started:**	2/12/2018
Total Depth:	66.9 ft	**Soil Depth:**	46.9 ft	**Core Depth:**	20 ft	**Date Completed:**	2/12/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 31.7 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		- SILTY SAND (SM) - very dense, moist, dark gray (GLEY 1 4/), mostly fine to medium sands, some low plasticity fines.						
				44.5	SS-12	50/4"- -	100	
153.1								
	46.9	Tri-Cone Bit Refusal at 46.9 feet. Install NW Casing to 46.9 feet for NQ wireline coring.		46.9				
		For discontinuity descriptors, see discontinuity worksheet.			RC-1			
		<u>METAMORPHIC BEDROCK</u> - SCHIST - dark gray (GLEY 1 4/), fine grained, foliated, with pyrite quartz and epidote, slightly weathered, strong rock.						
148.1		@ 50 feet - moderately weathered.		50.4				
		RC-1 : Rec= 94.3%, RQD= 69.0%, GSI= 20-30, RMR = 22.						
		@ 52 feet - slightly weathered.			RC-2			
		RC-2 : Rec= 86.0%, RQD= 40.0%, GSI= 20-30.						
143.1		@ 54.7 feet - moderately weathered.		55.4				
		@ 55.4 feet - slightly weathered.			RC-3			
		@ 58.2 feet - absent pyrite and foliations.						
		RC-3 : Rec= 100%, RQD= 60.0%, GSI= 20-30, RMR = 22.						

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-47
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 43
Eng./Geo.:	AKS	**Boring Location:**	86+30.73	**Offset:**	L:46.226'	**Alignment:**	Proposed
Elev.:	198.1 ft	**Latitude:**	34.026437	**Longitude:**	-81.127687	**Date Started:**	2/12/2018
Total Depth:	66.9 ft	**Soil Depth:**	46.9 ft	**Core Depth:**	20 ft	**Date Completed:**	2/12/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 31.7 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				60.4				
		RC-4 : Rec= 100%, RQD= 83.3%, GSI= 20-30, RMR = 26.			RC-4			
133.1		@ 64.5 feet - moderately weathered.		65.4				
	66.9	RC-5 : Rec= 100%, RQD= 0.0%, GSI= 20-30.			RC-5			
		Boring Terminated at 66.9 feet.						
128.1								
123.1								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Millwood
Logged By: Austin Syms
Date: 2/12/2018

Boring Number: B-47
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 2

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
47.2	1	J	26	N/A	Su	Fe	Pl	S	
48.1	2	J	33	N/A	No	N/A	Pl	S	
48.8	3	J	N/A	N/A	Su	Fe	Ir	SR	
50	4	J	N/A	N/A	No	N/A	Ir	SR	Fractured zone 50 - 50.4
50.6	5	J	36	N/A	Su	Fe	Pl	SR	
51	6	J	N/A	N/A	Su	Fe	Ir	SR	Fractured zone 51 - 51.5
53.1	7	J	N/A	N/A	No	N/A	Ir	SR	Fractured zone 53.1 - 53.4
53.8	8	J	10	N/A	No	N/A	Ir	SR	
57.4	9	J	23	N/A	Fi	Qz	Pl	R	
57.8	10	J	29	N/A	No	N/A	St	SR	
59.7	11	J	52	N/A	Su	Fe	Pl	SR	
60	12	J	54	N/A	Su	Fe	Pl	SR	Fractured zone 60 - 60.4
62.2	13	J	41	N/A	Su	Fe	Pl	SR	
62.7	14	J	39	N/A	Su	Fe	Pl	SR	
63.2	15	J	19	N/A	No	N/A	St	SR	
63.5	16	J	37	N/A	No	N/A	Pl	SR	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-48
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 43
Eng./Geo.:	AKS	**Boring Location:**	80+47.91	**Offset:**	R:75.741'	**Alignment:**	Proposed
Elev.:	173.3 ft	**Latitude:**	34.025058	**Longitude:**	-81.128747	**Date Started:**	3/30/2018
Total Depth:	34.7 ft	**Soil Depth:**	14.7 ft	**Core Depth:**	20 ft	**Date Completed:**	3/31/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 6.3 ft	**24HR**	15.3 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.2	**SURFACE MATERIALS** - 2 inches of TOPSOIL.		0.0	SS-1	2	4	9	9	13
	2.0	**ALLUVIUM - SANDY LEAN CLAY (CL)** - stiff, moist, very dark gray (7.5YR 3/1), mostly low plasticity fines, some fine to medium sands, [LL=30, PL=18, PI=12, NMC=13.0%, %#200=57], AASHTO = A-6 (4).		2.0	SS-2	6	8	4	5	12
168.3		**LEAN CLAY WITH SAND (CL)** - stiff, moist, gray (7.5YR 5/1), mostly low plasticity fines, little fine sands, trace mica, [LL=40, PL=24, PI=16, NMC=29.3%, %#200=84], AASHTO = A-6 (14). @ 4 feet - very stiff.		4.0	SS-3	6	8	13	14	21
	6.0	▽**PIEDMONT RESIDUUM - SILTY SAND WITH GRAVEL (SM)** - medium dense, moist, strong brown (7.5YR 4/6), subangular, mostly fine to coarse sands, some low plasticity fines, little weathered rock fragments, [LL=32, PL=23, PI=9, NMC=17.0%, %#200=39], AASHTO = A-4 (0).		6.0	SS-4	5	7	10	11	17
	8.0			8.0	SS-5	41	50/3"	-	-	100
163.3		**PARTIALLY WEATHERED ROCK (PWR) - SANDY SILT (ML)** - very hard, moist, gray (7.5YR 5/1) and strong brown (7.5YR 4/6), mostly low plasticity fines, some fine sands, relict rock structure.								
	13.5	**SILTY GRAVEL (GM)** - very dense, moist, very dark gray (7.5YR 3/1), mostly fine to coarse weathered rock fragments, little low plasticity fines.		13.5	SS-6	50/1"	-			100
	14.7	Tri-Cone Bit Refusal at 14.7 feet. Install NW Casing to 14.7 feet for NQ wireline coring.		14.7						
158.3		For discontinuity descriptors, see discontinuity worksheet.			RC-1					
		METAMORPHIC BEDROCK - SCHIST - gray (GLEY 1 4/), fine grained, foliated, slightly weathered, medium strong rock, trace epidote alteration. @ 15.7 feet - few pyrite veins.		19.7						

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-48
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 43
Eng./Geo.:	AKS	**Boring Location:**	80+47.91	**Offset:**	R:75.741'	**Alignment:**	Proposed
Elev.:	173.3 ft	**Latitude:**	34.025058	**Longitude:**	-81.128747	**Date Started:**	3/30/2018
Total Depth:	34.7 ft	**Soil Depth:**	14.7 ft	**Core Depth:**	20 ft	**Date Completed:**	3/31/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 6.3 ft	**24HR**	15.3 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		RC-1: Rec= 96.0%, RQD= 25.0%, GSI= 50-60, RMR = 24.						
		@ 21 feet - absent pyrite veins.			RC-2			
		RC-2: Rec= 100%, RQD= 65.0%, GSI= 55-65, RMR = 39.		24.7				
148.3		@ 25.1 feet - moderately weathered.			RC-3			
		RC-3: Rec= 88.0%, RQD= 8.3%, GSI= 45-55.		29.7				
143.3		@ 29.7 feet - quartz vein.						
		@ 32 feet - slightly weathered.			RC-4			
		@ 33 feet - pyrite vein.						
	34.7	RC-4: Rec= 100%, RQD= 40.0%, GSI= 45-55, RMR = 34.						
138.3		Boring Terminated at 34.7 feet.						

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Millwood
Logged By: Austin Syms
Date: 4/2/2018

Boring Number: B-48
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 2

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
15.1	1	J	28	VN	Pa	Cl	Pl	SR	
16.2	2	J	35	N	Pa	Cl	Ir	SR	
16.7	3	J	N/A	N/A	Pa	Cl	Ir	SR	Fractured zone 16.7' - 17.6'
18.1	4	J	N/A	N/A	Pa	Cl	Ir	SR	Fractured zone 18.1' - 19.7'
20.9	5	J	70	N	No	N/A	Pl	SR	
21.2	6	J	90	VN	No	N/A	Pl	SR	
21.3	7	J	64	VN	Pa	Cl	Pl	SR	
21.7	8	J	51	N	Pa	Cl	St	SR	
22.6	9	J	838	VN	Pa	Cl	St	SR	
23.1	10	J	17	T	No	N/A	Pl	SR	
23.4	11	J	79	N	No	N/A	St	SR	
23.9	12	J	88	N	No	N/A	Pl	SR	
24.3	13	J	56	T	No	N/A	Pl	SR	
25.1	14	J	39	N	Pa	Cl	Pl	SR	
26.2	15	J	N/A	N/A	Pa	Cl	Ir	SR	Fractured zone 26.2' - 31.1'
30.6	16	J	3	N	No	N/A	Pl	SR	
30.8	17	J	5	VN	Pa	Cl	Pl	SR	
30.9	18	J	N/A	N/A	No	N/A	Ir	SR	Fractured zone 30.9' - 31.2'
31.6	19	J	2	VN	No	N/A	Wa	SR	
31.8	20	J	86	VN	No	N/A	Ir	SR	
32.3	21	J	N/A	N/A	Pa	Cl	Ir	SR	Fractured zone 32.3' - 32.9'
33.5	22	J	76	VN	Pa	Cl	Pl	SR	
33.6	23	J	19	T	No	N/A	Pl	SR	
33.9	24	J	4	VN	No	N/A	Pl	SR	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-49
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 43
Eng./Geo.:	AKS	**Boring Location:**	84+08.75	**Offset:**	L:42.286'	**Alignment:**	Proposed
Elev.:	194.4 ft	**Latitude:**	34.025993	**Longitude:**	-81.128191	**Date Started:**	2/22/2018
Total Depth:	58.3 ft	**Soil Depth:**	38.3 ft	**Core Depth:**	20 ft	**Date Completed:**	2/22/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 31.1 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0							
	0.8	**SURFACE MATERIALS** - 10 inches of BRIDGE DECK CONCRETE.						
189.4								
184.4		24.5 feet from top of bridge deck to existing ground surface.						
179.4								

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-49
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 43
Eng./Geo.:	AKS	**Boring Location:**	84+08.75	**Offset:**	L:42.286'	**Alignment:**	Proposed
Elev.:	194.4 ft	**Latitude:**	34.025993	**Longitude:**	-81.128191	**Date Started:**	2/22/2018
Total Depth:	58.3 ft	**Soil Depth:**	38.3 ft	**Core Depth:**	20 ft	**Date Completed:**	2/22/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 31.1 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	24.5		24.5						
169.4		**ALLUVIUM - CLAYEY SAND WITH GRAVEL (SC)** - loose, moist, dark grayish-brown (2.5Y 4/2), subangular, mostly fine to medium sands, some low plasticity fines, little fine gravel, few wood organics, [LL=32, PL=23, PI=9, NMC=24%, %#200=35.0], AASHTO = A-2-4.		SS-1	3	2	3	2	5
	26.5	**CLAYEY SAND (SC)** - loose, moist, brown (2.5Y 4/3), mostly fine to medium sands, some low plasticity fines, [LL=25, PL=17, PI=8, NMC=23%, %#200=43.3], AASHTO = A-4 (0).	26.5	SS-2	2	3	3	4	6
			28.5	SS-3	5	5	5	6	10
164.4	30.5	**LEAN CLAY WITH SAND (CL)** - stiff, wet, dark gray (2.5Y 4/1), mostly low plasticity fines, little fine sands, [LL=39, PL=25, PI=14, NMC=49%, %#200=75.5], AASHTO = A-6 (10).	30.5	SS-4	5	5	6	7	11
	32.5	**SILTY SAND (SM)** - very loose, wet, dark gray (2.5Y 4/1), mostly fine sands, some low plasticity fines, [LL=25, PL=NP, PI=NP, NMC=47%, %#200=35.8], AASHTO = A-4 (0).	32.5	SS-5	1	1	1	3	2
159.4									
	38.0		38.0	SS-6	50/0"	-	-		100
	38.3	**PARTIALLY WEATHERED ROCK (PWR)** - no recovery. Tri-cone bit refusal at 38.3 feet. Install NW casing to 38.3 for NQ wireline coring.	38.3	RC-1					

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-49
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 43
Eng./Geo.:	AKS	**Boring Location:**	84+08.75	**Offset:**	L:42.286'	**Alignment:**	Proposed
Elev.:	194.4 ft	**Latitude:**	34.025993	**Longitude:**	-81.128191	**Date Started:**	2/22/2018
Total Depth:	58.3 ft	**Soil Depth:**	38.3 ft	**Core Depth:**	20 ft	**Date Completed:**	2/22/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 31.1 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		For discontinuity descriptors, see discontinuity worksheet.		40.3				
		<u>METAMORPHIC BEDROCK</u> - SCHIST - very dark gray (GLEY 1 3/N), fine grained, foliated (foliation angles ranging from 30 degrees to 90 degrees), moderately weathered, medium strong rock, trace pyrite on foliation surfaces.			RC-2			
		RC-1: Rec= 100%, RQD= 20.8%, GSI= 55-65.						
149.4		@ 40.3 feet - highly weathered.		45.3				
		@ 41.3 feet - moderately weathered.						
		RC-2: Rec= 58.0%, RQD= 0.0%, GSI= 45-55, low core recovery likely due to seams of completely weathered rock or residual soil washed away by drilling process.			RC-3			
		@ 45.5 feet - slightly weathered, strong rock.						
		@ 48.9 feet - moderately weathered, medium strong rock.						
144.4		@ 49.2 feet - slightly weathered, strong rock.		50.3				
		RC-3: Rec= 100%, RQD= 56.7%, GSI= 55-65, RMR = 51.			RC-4			
139.4		RC-4: Rec= 100%, RQD= 31.7%, GSI= 50-60.		55.3				
		@ 55.3 feet to 55.5 feet - quartz vein.			RC-5			
	58.3	RC-5: Rec= 100%, RQD= 67.7%, GSI= 60-70, RMR = 38.						
		Boring Terminated at 58.3 feet.						

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Millwood
Logged By: Austin Syms
Date: 2/22/2018

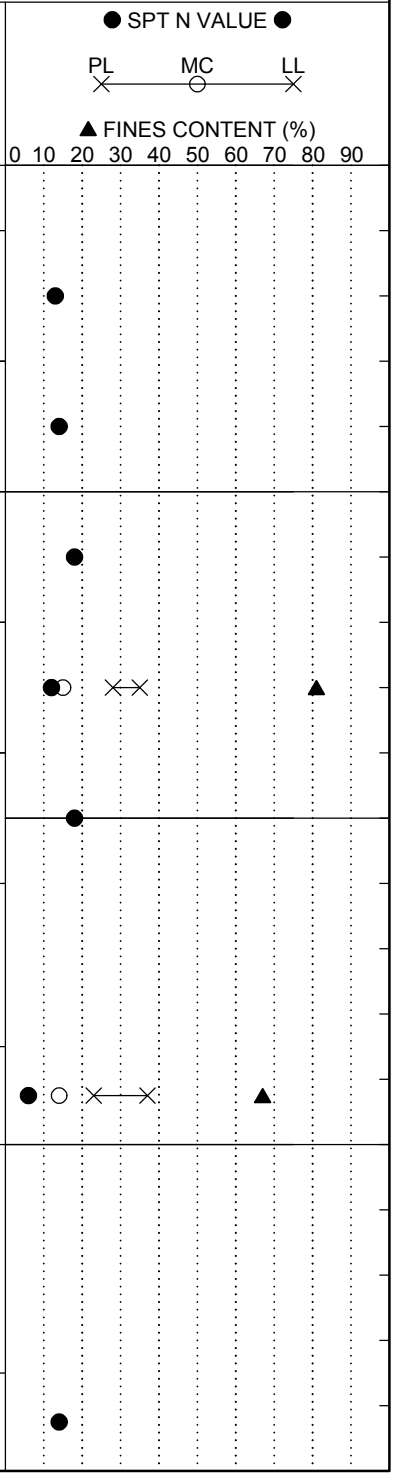
Boring Number: B-49
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 2

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
39	1	J	79	N	Pa	Cl	Ir	SR	
40.3	2	J	N/A	N/A	Pa	Cl	Ir	SR	Fractured zone 40.3' - 45.6'
47.2	3	J	50	VN	Pa	Cl	Pl	SR	
47.7	4	J	3	T	Pa	Cl	Pl	SR	
48.1	5	J	9	T	No	N/A	St	SR	
48.4	6	J	7	T	No	N/A	Ir	SR	
49.1	7	J	N/A	N/A	Pa	Cl	Ir	SR	Fractured zone 49.1' - 49.5'
50.4	8	J	54	VN	Pa	Cl	Pl	SR	
52.3	9	J	52	T	Pa	Cl	Wa	SR	Fractured zone 52.3' - 55.6'
52.8	10	J	60	T	No	N/A	Ir	SR	
52.9	11	J	70	T	No	N/A	Ir	SR	
53.1	12	J	65	T	No	N/A	Ir	SR	
53.3	13	J	70	T	No	N/A	St	SR	
53.5	14	J	30	T	No	N/A	St	SR	
53.9	15	J	65	T	No	N/A	Ir	SR	
54.7	16	J	N/A	N/A	Pa	Cl	Ir	SR	Fractured zone 54.7' - 55.6'
57.6	17	J	0	N	Pa	Cl	Ir	SR	
58.1	18	J	N/A	N/A	Pa	Cl	Ir	SR	Fractured zone 58.1' - 58.3'

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-50
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 44
Eng./Geo.:	NGS	**Boring Location:**	91+54.21	**Offset:**	R:46.690'	**Alignment:**	Proposed
Elev.:	212.6 ft	**Latitude:**	34.027285	**Longitude:**	-81.126258	**Date Started:**	2/18/2018
Total Depth:	92.2 ft	**Soil Depth:**	72.2 ft	**Core Depth:**	20 ft	**Date Completed:**	2/18/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 20.1 ft	**24HR**	38 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 12 inches of ASPHALT.								
	1.0	**FILL - SILTY SAND (SM)** - medium dense, moist, strong brown (7.5YR 5/8), mostly fine to medium sands, some low plasticity fines.		1.0	SS-1	10	5	8	7	13
	3.0	**SILT WITH SAND (ML)** - stiff, moist, light red (2.5YR 6/6) and reddish-yellow (7.5YR 6/6), mostly low plasticity fines, little fine sands.		3.0	SS-2	8	7	7	11	14
207.6		@ 5 feet - very stiff.		5.0	SS-3	5	9	9	6	18
		@ 7 feet - stiff, little fine to medium sands, [LL=35, PL=28, PI=7, NMC=14.5%, %#200=80.7], AASHTO = A-4 (6).		7.0	SS-4	4	6	6	8	12
		@ 9 feet - very stiff.		9.0	SS-5	9	8	10	12	18
202.6	13.5	**SANDY LEAN CLAY (CL)** - firm, moist, yellowish-red (5YR 5/8), mostly low plasticity fines, little fine to medium sands, trace fine gravel, [LL=37, PL=23, PI=14, NMC=18.7%, %#200=67.3], AASHTO = A-6 (8).		13.5	SS-6	3	3	3		6
197.6	18.5	**SANDY SILT (ML)** - stiff, moist, reddish-yellow (7.5YR 6/6), mostly low plasticity fines, little fine to medium sands, few quartz gravel.		18.5	SS-7	3	7	7		14



LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-50
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 44
Eng./Geo.:	NGS	**Boring Location:**	91+54.21	**Offset:**	R:46.690'	**Alignment:**	Proposed
Elev.:	212.6 ft	**Latitude:**	34.027285	**Longitude:**	-81.126258	**Date Started:**	2/18/2018
Total Depth:	92.2 ft	**Soil Depth:**	72.2 ft	**Core Depth:**	20 ft	**Date Completed:**	2/18/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 20.1 ft	**24HR**	38 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
		▽								
		@ 23.5 feet - [LL=42, PL=28, PI=14, NMC=18.7%, %#200=62.7], AASHTO = A-7-6 (8).		23.5	SS-8	5	5	5		10
187.6										
		@ 28.5 feet - firm.		28.5	SS-9	4	4	4		8
182.6										
	33.5	**ALLUVIUM - ELASTIC SILT WITH SAND (MH)** - stiff, moist, reddish-brown (5YR 5/4) and black (5YR 2.5/1), mostly high plasticity fines, little fine to coarse sands, trace fine gravel, trace wood/organics, [LL=51, PL=32, PI=19, NMC=28.8%, %#200=75.8], AASHTO = A-7-5 (16).		33.5	SS-10	2	7	7		14
177.6										
	38.5	**LEAN CLAY WITH SAND (CL)** - firm, moist, reddish-brown (5YR 5/4) and black (5YR 2.5/1), mostly low to medium plasticity fines, little fine sands, few wood organics.		38.5	SS-11	2	3	5		8

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-50
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 44
Eng./Geo.:	NGS	**Boring Location:**	91+54.21	**Offset:**	R:46.690'	**Alignment:**	Proposed
Elev.:	212.6 ft	**Latitude:**	34.027285	**Longitude:**	-81.126258	**Date Started:**	2/18/2018
Total Depth:	92.2 ft	**Soil Depth:**	72.2 ft	**Core Depth:**	20 ft	**Date Completed:**	2/18/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 20.1 ft	**24HR**	38 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				43.5							
		@ 43.5 feet - stiff, greenish-gray (GLEY 1 5/1).			SS-12	3	4	6		10	●
167.6											
	47.0	**PIEDMONT RESIDUUM - SILTY CLAYEY SAND (SC-SM)** - loose, moist, dark yellowish-brown (10YR 4/6), mostly fine sands, some low plasticity fines, micaceous.		48.5							
					SS-13	1	4	4		8	●
162.6											
				53.5							
		@ 53.5 feet - medium dense, [LL=26, PL=22, PI=4, NMC=28%, %#200=32.6], AASHTO = A-2-4.			SS-14	8	9	15		24	● ○ ▲
157.6											
				58.5							
		@ 58.5 feet- very dense, greenish-gray (GLEY 1 5/1).			SS-15	28	45	49		94	●

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-50
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 44
Eng./Geo.:	NGS	**Boring Location:**	91+54.21	**Offset:**	R:46.690'	**Alignment:**	Proposed
Elev.:	212.6 ft	**Latitude:**	34.027285	**Longitude:**	-81.126258	**Date Started:**	2/18/2018
Total Depth:	92.2 ft	**Soil Depth:**	72.2 ft	**Core Depth:**	20 ft	**Date Completed:**	2/18/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 20.1 ft	**24HR**	38 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	63.5	**PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM)** - very dense, moist, greenish-gray (GLEY 1 5/1), mostly fine to medium sands, some low plasticity fines, micaceous.		63.5	SS-16	24 43 50/5"	100	
147.6	66.0	**SILT WITH SAND (ML)** - very hard, moist, gray (GLEY 1 5/), mostly non-plastic fines, little fine sands.		68.5	SS-17	31 41 50/4"	100	
142.6	72.2	Tri-Cone Bit Refusal at 72.2 feet. Install NW Casing to 72.2 feet for NQ wireline coring.		72.2				
		For discontinuity descriptors, see discontinuity worksheet.			RC-1			
137.6		**METAMORPHIC BEDROCK - SCHIST** - dark greenish-gray (GLEY 1 4/1), fine grained, foliated, tightly laminated to laminated, fresh, medium strong rock.						
		RC-1: Rec= 98.0%, RQD= 80.0%, GSI= 15-25, RMR = 40.		77.2				
		@ 78.6 feet - slightly weathered.			RC-2			

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-50
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 44
Eng./Geo.:	NGS	**Boring Location:**	91+54.21	**Offset:**	R:46.690'	**Alignment:**	Proposed
Elev.:	212.6 ft	**Latitude:**	34.027285	**Longitude:**	-81.126258	**Date Started:**	2/18/2018
Total Depth:	92.2 ft	**Soil Depth:**	72.2 ft	**Core Depth:**	20 ft	**Date Completed:**	2/18/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 20.1 ft	**24HR**	38 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		RC-2: Rec= 100.0%, RQD= 90.0%, GSI= 15-25, RMR = 35.		82.2				
127.6					RC-3			
		RC-3: Rec= 80.0%, RQD= 46.0%, GSI= 15-25.		87.2				
122.6					RC-4			
		@ 91 feet - moderately weathered.						
	92.2	RC-4: Rec= 100.0%, RQD= 64.0%, GSI= 15-25, RMR = 19.						
		Boring Terminated at 92.2 feet.						
117.6								

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Miller
Logged By: Nathaniel Shuff
Date: 2/18/2018

Boring Number: B-50
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 2

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
73.2	1	J	60	VN	Su	Fe	Pl	SR	
73.7	2	J	5	MW	No	N/A	Wa	SR	
74.3	3	J	50	VN	Sp	Ca	Pl	SR	
76.9	4	J	25	MW	No	N/A	Pl	SR	
77.7	5	J	5	MW	No	N/A	Pl	SR	
79.4	6	J	60	N	No	N/A	Wa	SR	
79.7	7	J	60	VN	No	N/A	Wa	SR	
80.7	8	J	60	VN	No	N/A	Wa	S	
80.9	9	J	60	N	Su	Fe	Wa	SR	
81.3	10	J	60	VN	No	N/A	Wa	SR	
82.7	11	J	55	N	No	N/A	Wa	S	
82.9	12	J	55	VN	No	N/A	Wa	S	
83	13	J	55	VN	Sp	Cl	Wa	S	
83.1	14	J	60	VN	No	N/A	Wa	SR	
83.5	15	J	55	VN	No	N/A	Wa	SR	
83.8	16	J	60	VN	No	N/A	Wa	S	
84.2	17	J	60	VN	Sp	Cl	Wa	S	
84.8	18	J	60	N	No	N/A	Wa	SR	
85.3	19	J	55	VN	Sp	Fe	Wa	S	
85.9	20	J	55	N	No	N/A	Wa	S	
86.1	21	J	55	N	No	N/A	Wa	S	
87.7	22	J	55	N	No	N/A	Wa	S	
88.5	23	J	55	VN	No	N/A	Wa	S	
88.9	24	J	55	VN	No	N/A	Wa	S	
89.1	25	J	60	N	Su	Fe	Wa	SR	
89.6	26	J	60	N	Su	Fe	Wa	SR	
80.2	27	J	60	N	Su	Fe/Cl	Wa	SR	
91.2	28	J	55	N	Su	Cl	Wa	SR	
91.4	29	J	60	N	Su	Fe	Wa	SR	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-50UD
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 44
Eng./Geo.:	NGS	**Boring Location:**	91+52.23	**Offset:**	R:48.640'	**Alignment:**	Proposed
Elev.:	212.3 ft	**Latitude:**	34.027277	**Longitude:**	-81.126258	**Date Started:**	3/27/2018
Total Depth:	42.5 ft	**Soil Depth:**	42.5 ft	**Core Depth:**	0 ft	**Date Completed:**	3/27/2018
Bore Hole Diameter (in):	4.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 12 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 12 inches of ASPHALT.								
	1.0									
207.3		Drilled without sampling to 12 feet.								
202.3										
	12.0 ▽	**FILL - SILT WITH SAND (ML)** - stiff, moist, light brown (7.5YR 6/5), mostly low plasticity fines, little fine sands, trace fine gravel.		12.0	SS-1	4	5	4		9
		@ 13.5 feet - light red (2.5YR 6/6), micaceous, [LL=38, PL=29, PI=9, %#200=74.2], AASHTO = A-4 (7).		13.5	UD-1					
197.3		@ 15.5 feet - light brown (7.5YR 6/5).		15.5	SS-2	5	5	6		11
	17.0									

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-50UD
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 44
Eng./Geo.:	NGS	**Boring Location:**	91+52.23	**Offset:**	R:48.640'	**Alignment:**	Proposed
Elev.:	212.3 ft	**Latitude:**	34.027277	**Longitude:**	-81.126258	**Date Started:**	3/27/2018
Total Depth:	42.5 ft	**Soil Depth:**	42.5 ft	**Core Depth:**	0 ft	**Date Completed:**	3/27/2018
Bore Hole Diameter (in):	4.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 12 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
187.3		Drilled without sampling to 33.5 feet.								
182.3										
	33.5	**RIVER TERRACE ALLUVIUM - LEAN CLAY WITH SAND (CL)** - firm, moist, dark reddish-brown (2.5YR 3/4), mostly low to medium plasticity fines, little fine to medium sands, trace wood/organics.		33.5	SS-3	3	3	3		6
177.3	35.0	**SANDY FAT CLAY (CH)** - moist, dark reddish-brown (2.5YR 3/4), mostly high plasticity fines, some fine to medium sands, trace fine gravel, [LL=51, PL=28, PI=23, %#200=51.0], AASHTO = A-7-6 (9).		35.0	UD-2					
	37.0	**CLAYEY SAND (SC)** - medium dense, moist, light brownish-gray (10YR 6/2), mostly fine to medium sands, some low to medium plasticity fines.		37.0	SS-4	6	7	6		13
		@ 39 feet - light brownish-gray (1YR 6/2).		39.0						

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-50UD
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 44
Eng./Geo.:	NGS	**Boring Location:**	91+52.23	**Offset:**	R:48.640'	**Alignment:**	Proposed
Elev.:	212.3 ft	**Latitude:**	34.027277	**Longitude:**	-81.126258	**Date Started:**	3/27/2018
Total Depth:	42.5 ft	**Soil Depth:**	42.5 ft	**Core Depth:**	0 ft	**Date Completed:**	3/27/2018
Bore Hole Diameter (in):	4.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 12 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
					UD-3					
	41.0			41.0						
		LEAN CLAY WITH SAND (CL) - firm, moist, greenish-gray (GLEY 1 5/1), mostly low to medium plasticity fines, little fine sands, trace wood/organics.			SS-5	3	2	3		5
	42.5	Boring Terminated at 42.5 feet.								
167.3										
162.3										
157.3										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-51
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 44
Eng./Geo.:	AKS	**Boring Location:**	93+58.51	**Offset:**	L:160.130'	**Alignment:**	Proposed
Elev.:	214.8 ft	**Latitude:**	34.028083	**Longitude:**	-81.126273	**Date Started:**	2/8/2018
Total Depth:	59.7 ft	**Soil Depth:**	39.7 ft	**Core Depth:**	20 ft	**Date Completed:**	2/8/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 6.5 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.3	**SURFACE MATERIALS** - 3 inches of TOPSOIL.		0.0	SS-1	2	3	3	10	6
	2.0	**FILL - CLAYEY SAND (SC)** - loose, moist, red (10R 4/6), mostly fine to coarse sands, some high plasticity fines, few fine gravel, [LL=50, PL=26, PI=24, NMC=18.2%, %#200=46.5], AASHTO = A-7-6 (7).		2.0	SS-2	10	12	15	30	27
209.8		**PIEDMONT RESIDUUM - SILTY SAND WITH GRAVEL (SM)** - medium dense, moist, red (10R 4/6), gray (10YR 5/1) and yellow (10YR 7/6), mostly fine to coarse sands, some low plasticity fines, little fine gravel-sized rock fragments.		4.0	SS-3	15	18	20	28	38
		@ 4 feet - dense.		6.0	SS-4	15	18	22	29	40
		@ 6 feet - relict rock structure.		8.0	SS-5	13	15	18	24	33
204.8										
	13.5	**SILT SAND WITH GRAVEL (SM)** - medium dense, moist, red (10R 4/6), gray (10YR 5/1) and yellow (10YR 7/6), mostly fine to coarse sand, some low plasticity fines, little fine to medium gravel-sized rock fragments, [LL=43, PL=28, PI=15, NMC=16.5%, %#200=46.4], AASTHO = A-7-6 (4).		13.5	SS-6	10	14	14		28
199.8										
				18.5	SS-7	14	17	17		34

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-51
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 44
Eng./Geo.:	AKS	**Boring Location:**	93+58.51	**Offset:**	L:160.130'	**Alignment:**	Proposed
Elev.:	214.8 ft	**Latitude:**	34.028083	**Longitude:**	-81.126273	**Date Started:**	2/8/2018
Total Depth:	59.7 ft	**Soil Depth:**	39.7 ft	**Core Depth:**	20 ft	**Date Completed:**	2/8/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 6.5 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
				23.5	SS-8	14 17 23	40
189.8	28.5	**SILT WITH SAND (ML)** - hard, moist, light greenish-gray (5YR 8/10), mostly low plasticity fines, little fine sands, [LL=39, PL=26, PI=13, NMC=23.4%, %#200=80.4], AASHTO = A-6 (11).		28.5	SS-9	13 14 18	32
184.8	33.5	**PARTIALLY WEATHERED ROCK (PWR) - SILT (ML)** - very hard, moist, light greenish-gray (5YR 8/1), mostly low plasticity fines, trace fine sands.		33.5	SS-10	50/4"- -	100
179.8							
		@ 38.5 feet - no recovery		38.5	SS-11	50/1"- -	100
	39.7	Tri-Cone Refusal at 39.7 feet. Install NW Casing to 39.7 feet for NQ wireline coring.		39.7			

SPT N VALUE: PL MC LL

FINES CONTENT (%): 0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-51
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 44
Eng./Geo.:	AKS	**Boring Location:**	93+58.51	**Offset:**	L:160.130'	**Alignment:**	Proposed
Elev.:	214.8 ft	**Latitude:**	34.028083	**Longitude:**	-81.126273	**Date Started:**	2/8/2018
Total Depth:	59.7 ft	**Soil Depth:**	39.7 ft	**Core Depth:**	20 ft	**Date Completed:**	2/8/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 6.5 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		For discontinuity descriptors, see discontinuity worksheet.						
		<u>METAMORPHIC BEDROCK</u> - SCHIST - gray (GLEY 1 5/), very fine grained, thinly laminated, highly weathered, extremely weak rock, quartz veins and stringer throughout.			RC-1			
		@ 39.9 feet - completely weathered.						
		RC-1 : Rec= 100%, RQD= 0.0%, GSI= 10-20.		44.7				
169.8		@ 44.8 feet - highly weathered.						
		Moderate recoveries below 44.7 feet likely due to seams of completely weathered rock or residual soil.			RC-2			
		RC-2 : Rec= 76.0%, RQD= 21.7%, GSI= 10-20.		49.7				
164.8					RC-3			
		RC-3 : Rec= 50.0%, RQD= 26.7%, GSI= 10-20.		54.7				
159.8					RC-4			
	59.7	RC-4 : Rec= 48.0%, RQD= 20.0%, GSI= 10-20.						

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-51
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 44
Eng./Geo.:	AKS	**Boring Location:**	93+58.51	**Offset:**	L:160.130'	**Alignment:**	Proposed
Elev.:	214.8 ft	**Latitude:**	34.028083	**Longitude:**	-81.126273	**Date Started:**	2/8/2018
Total Depth:	59.7 ft	**Soil Depth:**	39.7 ft	**Core Depth:**	20 ft	**Date Completed:**	2/8/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 6.5 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		Boring Terminated at 59.7 feet.						
149.8								
144.8								
139.8								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Millwood
Logged By: Austin Syms
Date: 2/8/2018

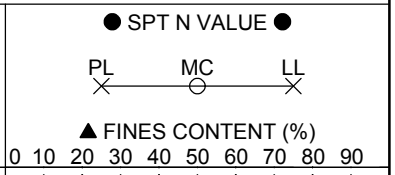
Boring Number: B-51
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 1

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
40.8	1	J	5	N	No	N/A	Pl	SR	
41.8	2	J	55	N	No	N/A	Ir	R	
42.1	3	J	5	N	No	N/A	Ir	R	
42.7	4	J	10	VN	No	N/A	Ir	R	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-52
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 40
Eng./Geo.:	AKS	**Boring Location:**	27+51.00	**Offset:**	L:38.36'	**Alignment:**	Proposed
Elev.:	247.7 ft	**Latitude:**	34.031889	**Longitude:**	-81.121786	**Date Started:**	2/20/2018
Total Depth:	93.2 ft	**Soil Depth:**	73.2 ft	**Core Depth:**	20 ft	**Date Completed:**	2/21/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 8 ft	**24HR**	33.9 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.8	**SURFACE MATERIALS** - 10 inches of TOPSOIL.		0.0	SS-1	3	3	3	5	6
	2.0	**FILL - CLAYEY SAND (SC)** - loose, moist, red (10R 4/8), subangular, mostly fine to medium sands, some low plasticity fines, trace fine gravel, [LL=46, PL=21, PI=24, NMC=14.0%, %#200=44.4], AASHTO = A-7-6 (6).		2.0	SS-2	4	5	7	8	12
242.7		**PIEDMONT RESIDUUM - SILT WITH SAND (ML)** - stiff, moist, very pale brown (10YR 7/4), mostly low plasticity fines, little fine to medium sands, few gravel-sized rock fragments, [LL=36, PL=27, PI=9, NMC=11.9%, %#200=76.7], AASHTO = A-4 (7).		4.0	SS-3	8	9	11	12	20
		@ 4 feet - very stiff.		6.0	SS-4	8	12	14	18	26
		▽		8.0	SS-5	6	8	8	9	16
237.7	13.5	**SANDY FAT CLAY (CH)** - very stiff, moist, pale red (10R 7/4), mostly high plasticity fines, some fine to medium sands, few gravel-sized rock fragments, [LL=67, PL=30, PI=37, NMC=22.3%, %#200=54.7], AASHTO = A-7-5 (17).		13.5	SS-6	6	10	13		23
232.7	18.5	**CLAYEY SAND (SC)** - medium dense, moist, pale red (10R 7/4), subangular, mostly fine to coarse sands, some high plasticity fines, trace fine gravel-sized rock		18.5	SS-7	7	9	12		21



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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-52
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 40
Eng./Geo.:	AKS	**Boring Location:**	27+51.00	**Offset:**	L:38.36'	**Alignment:**	Proposed
Elev.:	247.7 ft	**Latitude:**	34.031889	**Longitude:**	-81.121786	**Date Started:**	2/20/2018
Total Depth:	93.2 ft	**Soil Depth:**	73.2 ft	**Core Depth:**	20 ft	**Date Completed:**	2/21/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 8 ft	**24HR**	33.9 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
		fragments.								
				23.5	SS-8	8	12	16		28
222.7										
	28.5	**SILT WITH SAND (ML)** - hard, moist, yellowish-brown (10YR 5/6), mostly low plasticity fines, little fine sands, trace gravel-sized rock fragments, relict rock structure, [LL=41, PL=33, PI=8, NMC=22.5%, %#200=78.7], AASHTO = A-5 (8).		28.5	SS-9	12	17	17		34
217.7										
		▼@ 33.5 feet - very stiff, light red (5R 7/8).		33.5	SS-10	9	10	10		20
212.7										
		@ 38.5 feet - yellowish-brown (10YR 5/6).		38.5	SS-11	15	11	10		21

SPT N VALUE ●

PL ✕ MC ○ LL ✕

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-52
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 40
Eng./Geo.:	AKS	**Boring Location:**	27+51.00	**Offset:**	L:38.36'	**Alignment:**	Proposed
Elev.:	247.7 ft	**Latitude:**	34.031889	**Longitude:**	-81.121786	**Date Started:**	2/20/2018
Total Depth:	93.2 ft	**Soil Depth:**	73.2 ft	**Core Depth:**	20 ft	**Date Completed:**	2/21/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 8 ft	**24HR**	33.9 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
			43.5			
		@ 43.5 feet - very hard, light gray (GLEY 1 7/).		SS-12	15 38 24	62
202.7			48.5			
		@ 48.5 feet - hard.		SS-13	14 23 26	49
197.7						
	53.5	**PARTIALLY WEATHERED ROCK (PWR) - SANDY SILT (ML)** - very hard, moist, light gray (GLEY 1 7/), mostly low plasticity fines, some fine sands, relict rock structure.	53.5	SS-14	50/5"- -	100
192.7						
			58.5	SS-15	32 50/4" -	100

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-52
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 40
Eng./Geo.:	AKS	**Boring Location:**	27+51.00	**Offset:**	L:38.36'	**Alignment:**	Proposed
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Total Depth:	93.2 ft	**Soil Depth:**	73.2 ft	**Core Depth:**	20 ft	**Date Completed:**	2/21/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 8 ft	**24HR**	33.9 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
				63.5	SS-16	50/3"- -	100
182.7							
				68.5	SS-17	50/4"- -	100
177.7		Tri-Cone Bit Refusal at 73.2 feet. Install NW Casing to 73.2 feet for NQ wireline coring.					
	73.2			73.2			
		For discontinuity descriptors, see discontinuity worksheet.			RC-1		
172.7		**METAMORPHIC BEDROCK - SCHIST** - gray (GLEY 1 4/), fine grained, laminated, slighly weathered, strong rock, foliations (90 degrees).		75.4			
		RC-1 : Rec= 100.0%, RQD= 0.0%, GSI= 65-75.			RC-2		

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-52
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 40
Eng./Geo.:	AKS	**Boring Location:**	27+51.00	**Offset:**	L:38.36'	**Alignment:**	Proposed
Elev.:	247.7 ft	**Latitude:**	34.031889	**Longitude:**	-81.121786	**Date Started:**	2/20/2018
Total Depth:	93.2 ft	**Soil Depth:**	73.2 ft	**Core Depth:**	20 ft	**Date Completed:**	2/21/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 8 ft	**24HR**	33.9 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		RC-2 : Rec= 100.0%, RQD= 60.0%, GSI= 65-75, RMR= 41.		80.4				
		@ 82.9 feet - moderately weathered, medium strong rock.			RC-3			
162.7		RC-3 : Rec= 80.0%, RQD= 17.0%, GSI= 50-60.		85.4				
		@ 85.4 feet - slightly weathered, strong rock.			RC-4			
		@ 88.7 feet - highly weathered, weak rock.						
157.7		RC-4 : Rec= 100.0%, RQD= 12.0%, GSI= 50-60.		90.4				
		@ 90.4 feet - slightly weathered.			RC-5			
	93.2	RC-5 : Rec= 100.0%, RQD= 100.0%, GSI= 65-75, RMR= 45.						
		Boring Terminated at 93.2 feet.						
152.7								

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Millwood
Logged By: Austin Syms
Date: 2/20/2018

Boring Number: B-52
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 2

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
73.2	1	J	N/A	N/A	No	N/A	Ir	SR	Fractured zone 73.2' - 75.4'
76.4	2	J	2	N	No	N/A	Ir	SR	Fractured zone 76.4' - 76.6'
77	3	J	5	VN	No	N/A	Ir	SR	
77.8	4	J	0	VN	No	N/A	Pl	SR	
79	5	J	N/A	N/A	No	N/A	Ir	SR	Fractured zone 79.0' - 79.5'
80.1	6	J	43	N	No	N/A	St	SR	
80.5	7	J	N/A	N/A	No	N/A	Ir	SR	Fractured zone 80.5' - 81.9'
82.7	8	J	76	T	No	N/A	Pl	SR	
82.8	9	J	N/A	N/A	No	N/A	Ir	SR	Fractured zone 82.8' - 83.8'
86.1	10	J	0	VN	No	N/A	Pl	SR	
86.5	11	J	73	VN	No	N/A	Pl	SR	
86.9	12	J	0	N	No	N/A	Pl	SR	Fractured zone 86.9' - 88.2'
88.7	13	J	N/A	N/A	No	N/A	Ir	SR	Fractured zone 88.7' - 90.4'
91.5	14	J	2	N	No	N/A	Pl	SR	
92.6	15	J	4	N	No	N/A	Pl	SR	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-53
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 40
Eng./Geo.:	AKS	**Boring Location:**	31+09.08	**Offset:**	L:38.31'	**Alignment:**	Proposed
Elev.:	246.2 ft	**Latitude:**	34.031454	**Longitude:**	-81.120726	**Date Started:**	2/18/2018
Total Depth:	102.8 ft	**Soil Depth:**	82.8 ft	**Core Depth:**	20 ft	**Date Completed:**	2/18/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 27.7 ft	**24HR**	34.2 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.5	**SURFACE MATERIALS** - 6 inches of TOPSOIL.		0.0	SS-1	2	1	2	1	3
	2.0	**FILL - SILTY SAND (SM)** - very loose, moist, dark reddish-brown (5YR 4/2), subangular, mostly fine to coarse sands, some non-plastic fines, few fine to medium gravel, [NMC=10.8%, %#200=30.2], AASHTO = A-2-4.		2.0	SS-2	3	3	5	5	8
		PIEDMONT RESIDUUM - SILT WITH SAND (ML) - firm, moist, red (10R 5/6), mostly low plasticity fines, little fine sands, few gravel-sized rock fragments.		4.0	SS-3	3	6	7	7	13
241.2		@ 4 feet - stiff.								
		@ 6 feet - very stiff.		6.0	SS-4	6	9	12	12	21
		@ 8 feet - [LL=37, PL=28, PI=8, NMC=22.4%, %#200=70.9], AASHTO = A-4 (6).		8.0	SS-5	6	7	9	10	16
236.2										
		@ 13.5 feet - stiff.		13.5	SS-6	2	6	8		14
231.2										
				18.5	SS-7	4	5	7		12

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-53
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 40
Eng./Geo.:	AKS	**Boring Location:**	31+09.08	**Offset:**	L:38.31'	**Alignment:**	Proposed
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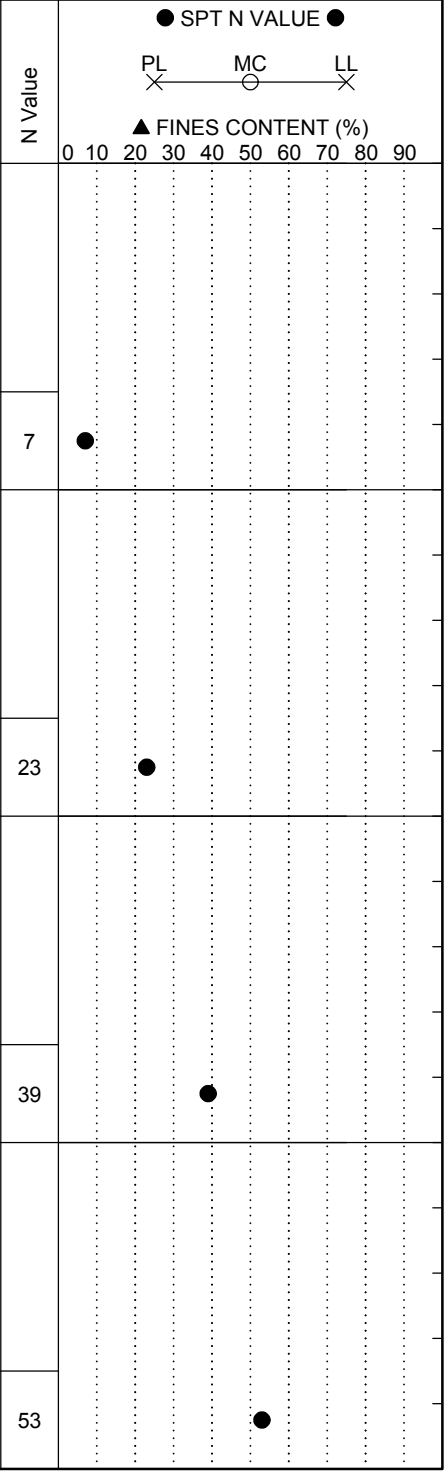
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 27.7 ft	**24HR**	34.2 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
			23.5	SS-8	3	3	4		7
221.2		@ 23.5 feet - firm.							
		▽	28.5	SS-9	6	10	13		23
		@ 28.5 feet - very stif.							
216.2			33.5	SS-10	10	13	16		39
		▼							
211.2			38.5	SS-11	14	21	32		53
		@ 38.5 feet - hard, pinkish-gray (10R 7/1).							



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SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

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Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 27.7 ft	**24HR**	34.2 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				43.5	SS-12	14 19 24	43	
201.2								
				48.5	SS-13	9 10 15	25	
		@ 48.5 feet - very stiff.						
196.2								
				53.5	SS-14	12 15 25	40	
		@ 53.5 feet - hard.						
191.2								
	58.5			58.5	SS-15	30 50/4" -	100	

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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
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SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

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Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 27.7 ft	**24HR**	34.2 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		PARTIALLY WEATHERED ROCK (PWR) - SANDY SILT (ML) - very hard, moist, pinkish-gray (10R 7/1), mostly low plasticity fines, some fine sands, relict rock structure.		63.5	SS-16	50/5"- -	100	
181.2				68.5	SS-17	50/3"- -	100	
176.2				73.5	SS-18	50/5"- -	100	
171.2				78.5	SS-19	50/3"- -	100	

LEGEND

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SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-53
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 40
Eng./Geo.:	AKS	**Boring Location:**	31+09.08	**Offset:**	L:38.31'	**Alignment:**	Proposed
Elev.:	246.2 ft	**Latitude:**	34.031454	**Longitude:**	-81.120726	**Date Started:**	2/18/2018
Total Depth:	102.8 ft	**Soil Depth:**	82.8 ft	**Core Depth:**	20 ft	**Date Completed:**	2/18/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 27.7 ft	**24HR**	34.2 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		Tri-Cone Bit Refusal at 82.8 feet. Install NW Casing to 82.8 feet for NQ wireline coring.						
	82.8	For discontinuity descriptors, see discontinuity worksheet.		82.8				
161.2		**<u>METAMORPHIC BEDROCK</u> - SCHIST** - gray (GLEY 1 6/), fine grained, foliated, some quartz veins, moderately weathered, strong rock.			RC-1			
		@ 83.8 feet - slightly weathered.		85.8				
		RC-1: Rec= 86.7%, RQD= 13.9%, GSI= 45-55.			RC-2			
156.2		RC-2: Rec= 36.0%, RQD= 11.7%, GSI= 45-55.		90.8				
					RC-3			
151.2		@ 94.7 feet - dark greenish-gray (GLEY 1 4/), moderately weathered.						
		RC-3: Rec= 92.0%, RQD= 60.0%, GSI= 50-60.		95.8				
		@ 95.8 feet - gray (GLEY 1 6/), slightly weathered.						
		@ 97.5 feet - dark greenish-gray (GLEY 1 4/), highly weathered, quartz veins.			RC-4			
		@ 98.4 feet - residual soil.						
		@ 98.6 feet - gray (GLEY 1 6/), slightly weathered.						

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-53
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 40
Eng./Geo.:	AKS	**Boring Location:**	31+09.08	**Offset:**	L:38.31'	**Alignment:**	Proposed
Elev.:	246.2 ft	**Latitude:**	34.031454	**Longitude:**	-81.120726	**Date Started:**	2/18/2018
Total Depth:	102.8 ft	**Soil Depth:**	82.8 ft	**Core Depth:**	20 ft	**Date Completed:**	2/18/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 27.7 ft	**24HR**	34.2 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		RC-4: Rec= 100.0%, RQD= 51.7%, GSI= 50-60.		100.8				
					RC-5			
	102.8	RC-5: Rec= 100.0%, RQD= 75.0%, GSI= 55-65.						
		Boring Terminated at 102.8 feet.						
141.2								
136.2								
131.2								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Millwood
Logged By: Austin Syms
Date: 2/19/2018

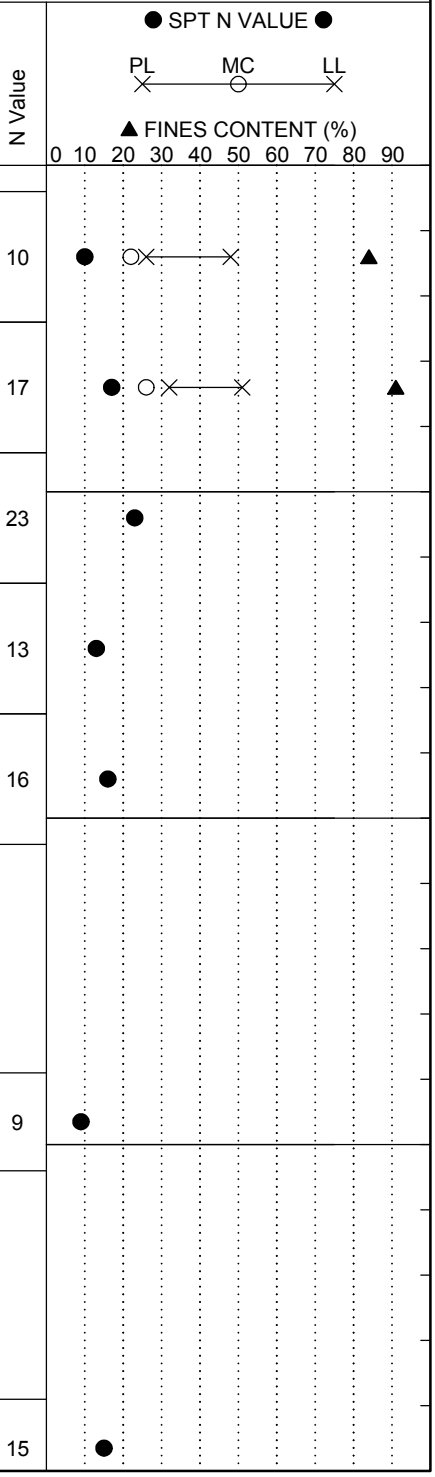
Boring Number: B-53
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 2

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
82.8	1	J	N/A	W	No	N/A	Ir	SR	Fractured zone 82.8' to 83.8'
84.4	2	J	47	VN	No	N/A	Pl	SR	
84.8	3	J	N/A	W	No	N/A	Ir	SR	Fractured zone 84.8' to 85.8'
86.5	4	J	19	N	No	N/A	Pl	R	
86.6	5	J	69	VN	No	N/A	Pl	SR	
87.2	6	J	N/A	W	No	N/A	Ir	SR	Fractured zone 87.2' to 91.1'
92.2	7	J	22	N	No	N/A	Wa	SR	
92.8	8	J	N/A	W	No	N/A	Ir	SR	Fractured zone 92.8' to 95.8'
96.4	9	J	46	N	No	N/A	St	SR	
96.7	10	J	0	VN	No	N/A	Pl	SR	
97.5	11	J	N/A	W	No	N/A	Ir	SR	Fractured zone 97.5' to 98.7'
98.9	12	J	53	T	No	N/A	Pl	SR	
99.1	13	J	0	N	No	N/A	Pl	SR	
99.4	14	J	0	T	No	N/A	Wa	SR	
99.7	15	J	0	T	No	N/A	Pl	SR	
100.8	16	J	2	N	No	N/A	Pl	SR	
101.7	17	J	3	VN	No	N/A	Wa	SR	
102.4	18	J	0	VN	No	N/A	Wa	SR	
102.6	19	J	3	VN	No	N/A	P	SR	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-54
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 36
Eng./Geo.:	AKS	**Boring Location:**	9138+98.59	**Offset:**	L:7.78'	**Alignment:**	Proposed
Elev.:	226.4 ft	**Latitude:**	34.034356	**Longitude:**	-81.118449	**Date Started:**	3/28/2018
Total Depth:	90.6 ft	**Soil Depth:**	70.6 ft	**Core Depth:**	20 ft	**Date Completed:**	3/28/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 17.3 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0								
	0.4	**SURFACE MATERIALS** - 5 inches of ASPHALT.	0.4						
		FILL - LEAN CLAY WITH SAND (CL) - stiff, moist, red (7.5R 5/6), mostly low plasticity fines, little fine to medium sands, [LL=48, PL=26, PI=22, NMC=22.3%, %#200=84], AASHTO = A-7-6 (20).		SS-1	7	4	6	7	10
	2.4		2.4						
		PIEDMONT RESIDUUM - ELASTIC SILT (MH) - very stiff, moist, red (7.5R 5/6), mostly high plasticity fines, few fine sands, [LL=51, PL=32, PI=19, NMC=25.6%, %#200=91], AASHTO = A-7-5 (21).		SS-2	7	8	9	10	17
	4.4		4.4						
221.4		**SILT WITH SAND (ML)** - very stiff, moist, red (7.5R 5/6), mostly low plasticity fines, little fine sands.		SS-3	9	11	12	14	23
		@ 6.4 feet - stiff.	6.4	SS-4	5	6	7	9	13
		@ 8.4 feet - very stiff.	8.4	SS-5	6	7	9	13	16
216.4									
			13.9						
		@ 13.9 feet - stiff.		SS-6	3	4	5		9
211.4									
			18.9						
				SS-7	6	6	9		15



LEGEND

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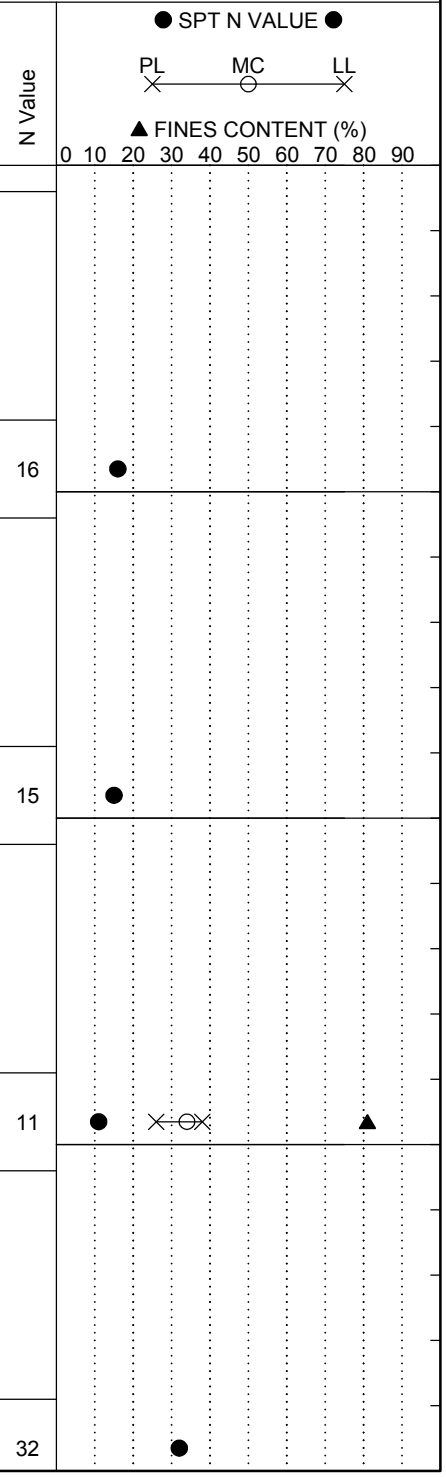
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-54
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 36
Eng./Geo.:	AKS	**Boring Location:**	9138+98.59	**Offset:**	L:7.78'	**Alignment:**	Proposed
Elev.:	226.4 ft	**Latitude:**	34.034356	**Longitude:**	-81.118449	**Date Started:**	3/28/2018
Total Depth:	90.6 ft	**Soil Depth:**	70.6 ft	**Core Depth:**	20 ft	**Date Completed:**	3/28/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 17.3 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
			23.9	SS-8	6	7	9		16
201.4		@ 23.9 feet - very stiff, reddish-yellow (7.5YR 6/8).							
			28.9	SS-9	5	7	8		15
196.4		@ 28.9 feet - stiff.							
			33.9	SS-10	3	4	7		11
191.4		@ 33.9 feet - [LL=38, PL=26, PI=12, NMC=34.0%, %#200=81], AASHTO = A-6 (10).							
			38.9	SS-11	9	12	20		32
		@ 38.9 feet - hard, pinkish-gray (7.5YR 6/2), micaceous.							



LEGEND

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SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-54
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 36
Eng./Geo.:	AKS	**Boring Location:**	9138+98.59	**Offset:**	L:7.78'	**Alignment:**	Proposed
Elev.:	226.4 ft	**Latitude:**	34.034356	**Longitude:**	-81.118449	**Date Started:**	3/28/2018
Total Depth:	90.6 ft	**Soil Depth:**	70.6 ft	**Core Depth:**	20 ft	**Date Completed:**	3/28/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 17.3 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
				43.9			
		@ 43.9 feet - reddish-yellow (7.5YR 6/8), absent mica.			SS-12	19 25 32	57
181.4							
				48.9			
		@ 48.9 feet - pinkish-gray (7.5YR 6/2), micaceous.			SS-13	12 15 35	50
176.4							
	53.9			53.9			
		PARTIALLY WEATHERED ROCK (PWR) - SANDY SILT (ML) - very hard, moist, pinkish-gray (7.5YR 6/2), mostly low plasticity fines, some fine sands.			SS-14	50/5"- -	100
171.4							
				58.9			
					SS-15	50/4"- -	100

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-54
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 36
Eng./Geo.:	AKS	**Boring Location:**	9138+98.59	**Offset:**	L:7.78'	**Alignment:**	Proposed
Elev.:	226.4 ft	**Latitude:**	34.034356	**Longitude:**	-81.118449	**Date Started:**	3/28/2018
Total Depth:	90.6 ft	**Soil Depth:**	70.6 ft	**Core Depth:**	20 ft	**Date Completed:**	3/28/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 17.3 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				63.9	SS-16	50/3"- -	100	
161.4								
156.4	70.6	Tri-Cone Bit Refusal at 70.6 feet. Install NW Casing to 70.6 feet for NQ wireline coring.		70.6				
		For discontinuity descriptors, see discontinuity worksheet.						
		<u>METAMORPHIC BEDROCK</u> - PHYLLITE - gray (GLEY 1 4/), very fine grained, foliated, slightly weathered, medium strong rock.			RC-1			
		@ 71.2 feet - quartz vein.						
151.4		RC-1: Rec= 100%, RQD= 36.7%, GSI= 65-75, RMR = 10.		75.6				
		@ 77.1 feet - residual soil.						
		@ 77.9 feet - no recovery.			RC-2			
		@ 79.6 feet - slightly weathered, medium						

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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-54
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 36
Eng./Geo.:	AKS	**Boring Location:**	9138+98.59	**Offset:**	L:7.78'	**Alignment:**	Proposed
Elev.:	226.4 ft	**Latitude:**	34.034356	**Longitude:**	-81.118449	**Date Started:**	3/28/2018
Total Depth:	90.6 ft	**Soil Depth:**	70.6 ft	**Core Depth:**	20 ft	**Date Completed:**	3/28/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 17.3 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		strong rock.		80.6				
		RC-2: Rec= 80.0%, RQD= 23.3%, GSI= 65-75.			RC-3			
141.4		RC-3: Rec= 92.0%, RQD= 61.7%, GSI= 65-75, RMR = 44.		85.6				
					RC-4			
136.4	90.6	RC-4: Rec= 100%, RQD= 73.3%, GSI= 70-80, RMR = 36.						
		Boring Terminated at 90.6 feet.						
131.4								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Millwood
Logged By: Austin Syms
Date: 3/28/2018

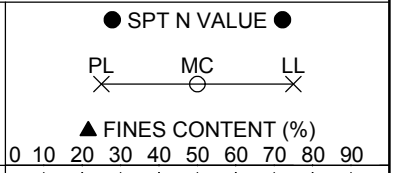
Boring Number: B-54
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 2

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
70.9	1	J	39	VN	No	N/A	Pl	SR	
71.4	2	J	45	N	No	N/A	St	SR	
71.6	3	J	86	N	No	N/A	Ir	SR	
71.8	4	J	81	N	No	N/A	Ir	SR	
72.3	5	J	2	N	No	N/A	Ir	SR	
72.6	6	J	19	T	No	N/A	Wa	SR	
73.5	7	J	51	T	No	N/A	Pl	SR	
73.7	8	J	44	T	No	N/A	Pl	SR	
74	9	J	46	T	No	N/A	Pl	SR	
74.3	10	J	51	VN	No	N/A	Ir	SR	
74.6	11	J	43	VN	No	N/A	Pl	SR	
75.3	12	J	24	W	No	N/A	Ir	SR	
75.6	13	J	34	T	No	N/A	St	SR	
76	14	J	26	T	No	N/A	Pl	SR	
76.8	15	J	25	T	Pa	Sd	Pl	SR	
77.1	16	J	41	MW	Fi	Sd	Ir	SR	
77.4	17	J	34	VN	No	N/A	Pl	SR	
77.9	18	J	51	MW	No	N/A	Ir	SR	
78.3	19	J	52	W	No	N/A	Ir	SR	
80.7	20	J	38	N	No	N/A	Pl	SR	
81	21	J	30	T	No	N/A	Pl	SR	
82.6	22	J	59	T	No	N/A	Pl	SR	
84.1	23	J	84	T	No	N/A	Wa	SR	
86.2	24	J	74	N	No	N/A	Pl	SR	
87.5	25	J	72	MW	Pa	Cl	Ir	SR	
88.1	26	J	71	T	Pa	Cl	Pl	SR	
88.8	27	J	79	N	No	N/A	Pl	SR	
90.2	28	J	3	N	No	N/A	Pl	SR	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-55
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 36
Eng./Geo.:	NGS	**Boring Location:**	9140+89.58	**Offset:**	L:23.76'	**Alignment:**	Proposed
Elev.:	222.3 ft	**Latitude:**	34.033997	**Longitude:**	-81.117986	**Date Started:**	2/19/2018
Total Depth:	76.6 ft	**Soil Depth:**	56 ft	**Core Depth:**	20.1 ft	**Date Completed:**	2/20/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 5 ft	**24HR**	17 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 14 inches of ASPHALT.								
	1.2	**FILL - SILT (ML)** - firm, dry, strong brown (7.5YR 5/6) and very dark brown (7.5YR 2.5/2), mostly low plasticity fines, few fine sands, trace wood organics, [LL=49, PL=30, PI=19, NMC=25.8%, %#200=87.1], AASHTO = A-7-5 (19).		1.2	SS-1	3	2	4	5	6
	3.2	**PIEDMONT RESIDUUM - SANDY SILT (ML)** - very stiff, dry, pale red (7.5R 6/4), light pink (7.5R 8/3) and yellowish red (5YR 5/8), mostly low plasticity fines, little fine sands, few weathered rock fragments.		3.2	SS-2	6	9	9	11	18
217.3		@ 5.2 feet - hard.		5.2	SS-3	9	13	18	14	41
		@ 7.2 feet - very stiff.		7.2	SS-4	9	11	14	16	25
212.3		@ 9.2 feet - hard, [LL=28, PL=23, PI=5, NMC=16.5%, %#200=65.3], AASHTO = A-4 (2).		9.2	SS-5	10	17	19	19	36
		@ 13.5 feet - very stiff.		13.5	SS-6	16	15	13		28
207.3										
	18.5	**SILT (ML)** - very stiff, moist, reddish-yellow (7.5YR 7/8) and white (7.5YR 8/1), mostly low plasticity fines, trace fine sands, trace mica.		18.5	SS-7	8	9	8		17



LEGEND

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SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-55
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 36
Eng./Geo.:	NGS	**Boring Location:**	9140+89.58	**Offset:**	L:23.76'	**Alignment:**	Proposed
Elev.:	222.3 ft	**Latitude:**	34.033997	**Longitude:**	-81.117986	**Date Started:**	2/19/2018
Total Depth:	76.6 ft	**Soil Depth:**	56 ft	**Core Depth:**	20.1 ft	**Date Completed:**	2/20/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 5 ft	**24HR**	17 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
	23.5	**SILT WITH SAND (ML)** - hard, moist, light gray (GLEY 1 7/), mostly low plasticity fines, little fine sands.		23.5	SS-8	12 16 20	36
197.3		@ 28.5 feet - [LL=32, PL=26, PI=6, NMC=20.6%, %#200=83.8], AASHTO = A-4 (5).		28.5	SS-9	13 25 23	48
192.3	33.5	**PARTIALLY WEATHERED ROCK (PWR) - SANDY SILT (ML)** - very hard, moist, reddish-yellow (7.5YR 6/8), mostly low plasticity fines, some fine sands.		33.5	SS-10	50/5"- -	100
187.3				38.5	SS-11	50/3"- -	100

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-55
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 36
Eng./Geo.:	NGS	**Boring Location:**	9140+89.58	**Offset:**	L:23.76'	**Alignment:**	Proposed
Elev.:	222.3 ft	**Latitude:**	34.033997	**Longitude:**	-81.117986	**Date Started:**	2/19/2018
Total Depth:	76.6 ft	**Soil Depth:**	56 ft	**Core Depth:**	20.1 ft	**Date Completed:**	2/20/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 5 ft	**24HR**	17 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
				43.5	SS-12	50/3" - -	100
177.3				48.5	SS-13	35 50/3" -	100
172.3				53.5	SS-14	50/1" -	100
167.3	56.0	Tri-Cone Bit Refusal at 56.0 feet. Install NW Casing to 56.0 feet for NQ wireline coring.		56.0	RC-1		
		For discontinuity descriptors, see discontinuity worksheet.					
		METAMORPHIC BEDROCK - PHYLLITE - light greenish-gray (GLEY 1 7/), fine grained to very fine grained, foliated, moderately weathered, medium strong rock.		59.6			

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-55
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 36
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Total Depth:	76.6 ft	**Soil Depth:**	56 ft	**Core Depth:**	20.1 ft	**Date Completed:**	2/20/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 5 ft	**24HR**	17 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		@ 57.2 feet - quartz and epidote vein.						
		@ 58.2 feet - highly weathered, weak rock.						
		@ 59 feet - slightly weathered, strong rock.						
		RC-1 : Rec= 100.0%, RQD= 57.0%, GSI= 35-45.			RC-2			
		@ 62.1 feet - moderately weathered, medium strong rock.						
		RC-2 : Rec= 96.0%, RQD= 73.0%, GSI= 40-50, RMR = 28.		64.6				
157.3		@ 65.1=2 feet - slightly weathered, strong rock.			RC-3			
		RC-3 : Rec= 80.0%, RQD= 40.0%, GSI= 35-45, RMR = 16.		69.6				
152.3					RC-4			
		RC-4 : Rec= 100.0%, RQD= 85.0%, GSI= 40-50, RMR = 30.		74.6				
147.3					RC-5			
	76.6	RC-5 : Rec= 100.0%, RQD= 100.0%, GSI= 40-50.						
		Boring Terminated at 76.6 feet.						

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Millwood
Logged By: Austin Syms
Date: 2/22/2018

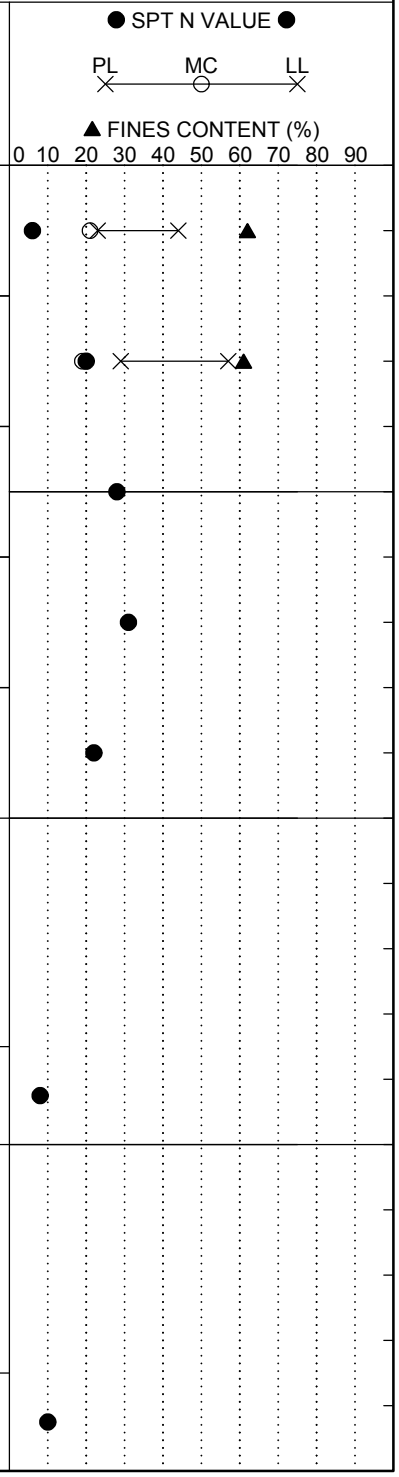
Boring Number: B-55
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 2

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
56	1	J	N/A	N/A	No	N/A	Ir	SR	Fractured zone 56' - 56.5'
56.7	2	J	20	MW	Su	Fe	Wa	SR	
57.4	3	J	20	MW	Su	Fe	Ir	SR	
57.7	4	J	65	VN	Su	Fe	Ir	S	Fractured zone 57.7' - 59'
61.2	5	J	80	N	Su	Fe	Wa	SR	
62.7	6	J	15	N	Su	Fe	Pl	SR	
63	7	J	15	N	Su	Fe	Pl	SR	
63.4	8	J	65	N	Su	Fe	Wa	S	
64	9	J	65	N	Su	Fe	Wa	SR	Fractured zone 64' - 64.6'
64.6	10	J	N/A	N/A	Su	Fe	Ir	SR	Fractured zone 64.6' - 65'
66.4	11	J	N/A	MW	Su	Fe	Ir	SR	
66.6	12	J	60	VN	Su	Fe	Wa	SR	
68.4	13	J	N/A	VN	Su	Fe	Ir	SR	Fractured zone 68.4' - 69.6'
70.6	14	J	0	N	Su	Fe	Wa	SR	
71.1	15	J	60	VN	Su	Fe	Pl	SR	
71.6	16	J	60	N	Su	Fe	Pl	SR	
73.7	17	J	60	VN	Su	Fe	Wa	SR	
75	18	J	55	N	Su	Fe	Pl	SR	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-56
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	SIte 38
Eng./Geo.:	AKS	**Boring Location:**	201+60.83	**Offset:**	L:183.302'	**Alignment:**	Proposed
Elev.:	305.8 ft	**Latitude:**	34.039615	**Longitude:**	-81.094676	**Date Started:**	3/16/2018
Total Depth:	101.4 ft	**Soil Depth:**	80.8 ft	**Core Depth:**	20.6 ft	**Date Completed:**	3/20/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 12.9 ft	**24HR**	20.7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0								
	0.2	**SURFACE MATERIALS** - 2 inches of TOPSOIL.	0.0	SS-1	3	3	3	3	6
	2.0	**FILL - SANDY LEAN CLAY (CL)** - firm, moist, red (2.5YR 4/6), mostly low plasticity fines, some fine to medium sands, [LL=44, PL=23, PI=21, NMC=21.0%, %#200=61.8], AASHTO = A-7-6 (11).	2.0	SS-2	5	9	11	18	20
	4.0	**COASTAL PLAIN - SANDY FAT CLAY (CH)** - very stiff, moist, red (2.5YR 4/6) and yellow (10YR 7/6), mostly high plasticity fines, some fine to medium sands, [LL=57, PL=29, PI=28, NMC=19.3%, %#200=61.2], AASHTO = A-7-6 (16).	4.0	SS-3	10	12	16	18	28
300.8		**SILTY SAND (SM)** - medium dense, moist, red (2.5YR 4/6) and yellow (10YR 7/6), subangular, mostly fine to medium sands, some low plasticity fines.	6.0	SS-4	9	12	19	23	31
		@ 6 feet - dense.	8.0	SS-5	9	10	12	14	22
295.8		@ 8 feet - medium dense, mostly fine to coarse sands.							
		@ 13.5 feet - loose.	13.5	SS-6	3	4	4		8
290.8									
			18.5	SS-7	4	4	6		10



LEGEND

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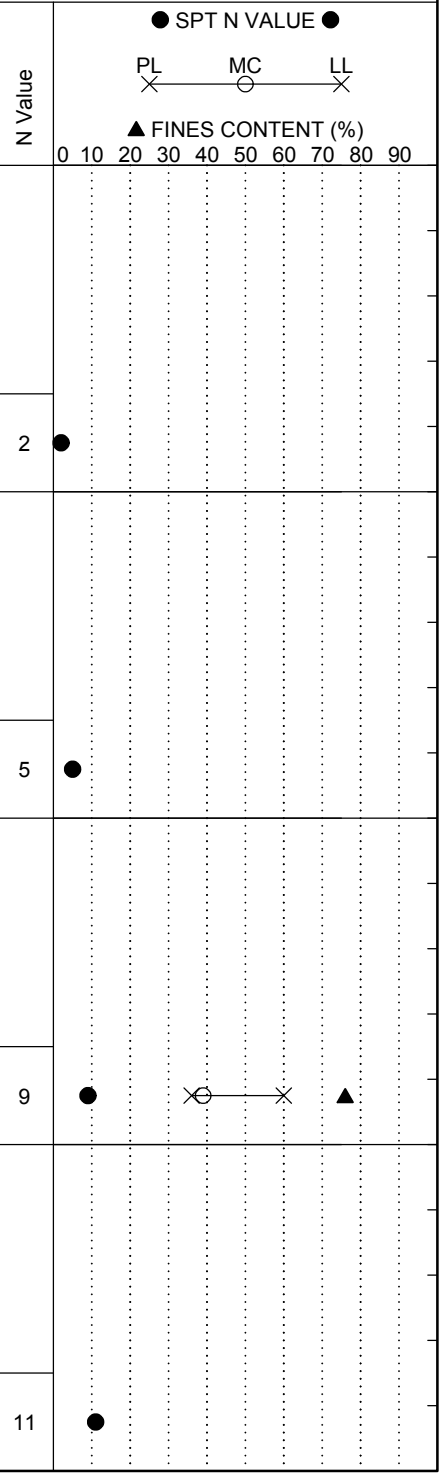
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-56
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	SIte 38
Eng./Geo.:	AKS	**Boring Location:**	201+60.83	**Offset:**	L:183.302'	**Alignment:**	Proposed
Elev.:	305.8 ft	**Latitude:**	34.039615	**Longitude:**	-81.094676	**Date Started:**	3/16/2018
Total Depth:	101.4 ft	**Soil Depth:**	80.8 ft	**Core Depth:**	20.6 ft	**Date Completed:**	3/20/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 12.9 ft	**24HR**	20.7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
		▼								
		@ 23.5 feet - very loose.		23.5	SS-8	1	1	1		2
280.8										
		@ 28.5 feet - loose.		28.5	SS-9	2	1	4		5
275.8										
	33.5	**PIEDMONT RESIDUUM - ELASTIC SILT WITH SAND (MH)** - stiff, moist, yellowish brown (10YR 5/4), mostly high plasticity fines, little fine sands, trace weathered rock fragments, [LL=60, PL=36, PI=24, NMC=38.6%, %#200=75.8], AASHTO = A-7-5 (21).		33.5	SS-10	1	4	5		9
270.8										
		@ 38.5 feet - trace mica.		38.5	SS-11	3	5	6		11



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SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-56
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	SIte 38
Eng./Geo.:	AKS	**Boring Location:**	201+60.83	**Offset:**	L:183.302'	**Alignment:**	Proposed
Elev.:	305.8 ft	**Latitude:**	34.039615	**Longitude:**	-81.094676	**Date Started:**	3/16/2018
Total Depth:	101.4 ft	**Soil Depth:**	80.8 ft	**Core Depth:**	20.6 ft	**Date Completed:**	3/20/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 12.9 ft	**24HR**	20.7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
		@ 43.5 feet - very stiff.		43.5	SS-12	8 12 14	26
260.8	48.5	**PARTIALLY WEATHERED ROCK - SANDY SILT (ML)** - very hard, moist, yellowish brown (10YR 5/4), mostly low plasticity fines, some fine sands.		48.5	SS-13	20 50/5" -	100
255.8		@ 53.5 feet - gray (10YR 5/1).		53.5	SS-14	46 45 50/4"	100
250.8		@ 58.5 feet - yellowish brown (10YR 5/4).		58.5	SS-15	50/3"- -	100

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-56
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	SIte 38
Eng./Geo.:	AKS	**Boring Location:**	201+60.83	**Offset:**	L:183.302'	**Alignment:**	Proposed
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Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 12.9 ft	**24HR**	20.7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
				63.5	SS-16	50/3"-		-		100
		@ 63.5 feet - light gray (10YR 7/1).								
240.8										
				68.5	SS-17	50/1"		-		100
		@ 68.5 feet - yellowish brown (10YR 5/4).								
235.8										
				73.5	SS-18	50/3"-		-		100
230.8										
	78.5			78.5	SS-19	50/3"-		-		100
		SILTY SAND (SM) - very dense, moist, yellowish brown (10YR 5/4), subangular, mostly fine to coarse sands, some low plasticity fines, trace weathered rock								

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
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SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-56
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	SIte 38
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Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 12.9 ft	**24HR**	20.7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		fragments.						
	80.8	Tri-Cone Bit Refusal at 80.8 feet. Install NW Casing to 80.8 feet for NQ wireline coring.		80.8				
		For discontinuity descriptors, see discontinuity worksheet.			RC-1			
220.8		**<u>METAMORPHIC BEDROCK</u> - SCHIST** - bluish gray (GLEY 2 5/10B), fine to medium grained, slightly weathered, foliated strong rock, quartz veins and stringers throughout.		85.4				
		@ 84 feet - moderately weathered, medium strong rock.						
		RC-1: Rec= 100%, RQD= 73%, GSI= 60-70, RMR = 28.						
		@ 85.6 feet - quartz vein.			RC-2			
		RC-2: Rec= 96%, RQD= 30%, GSI= 60-70.						
215.8				90.4				
		@ 91.1 feet - slightly weathered, strong rock.			RC-3			
		RC-3: Rec= 100%, RQD= 78%, GSI= 60-70, RMR = 42.						
210.8				95.4				
		@ 97.6 - 98.4 feet - brown (10YR 4/3), residual soil zone.			RC-4			
		@ 98.4 feet - bluish gray (5/10B), moderately weathered, medium strong rock.						

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-56
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	SIte 38
Eng./Geo.:	AKS	**Boring Location:**	201+60.83	**Offset:**	L:183.302'	**Alignment:**	Proposed
Elev.:	305.8 ft	**Latitude:**	34.039615	**Longitude:**	-81.094676	**Date Started:**	3/16/2018
Total Depth:	101.4 ft	**Soil Depth:**	80.8 ft	**Core Depth:**	20.6 ft	**Date Completed:**	3/20/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 12.9 ft	**24HR**	20.7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		RC-4: Rec= 86%, RQD= 33%, GSI= 55-65.		100.4				
	101.4	RC-5: Rec= 100.0%, RQD= 0%, GSI= 50-60.			RC-5			
		Boring Terminated at 101.4 feet.						
200.8								
195.8								
190.8								

LEGEND

SAMPLER TYPE				DRILLING METHOD			
SS	- Split Spoon	NQ	- Rock Core, 1-7/8"	HSA	- Hollow Stem Auger	RW	- Rotary Wash
UD	- Undisturbed Sample	CU	- Cuttings	CFA	- Continuous Flight Augers	RC	- Rock Core
AWG	- Rock Core, 1-1/8"	CT	- Continuous Tube	DC	- Driving Casing		

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Millwood
Logged By: Austin Syms
Date: 3/20/2018

Boring Number: B-56
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 2

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
81.1	1	J	23	VN	Pa	Fe	St	SR	
81.6	2	J	90	N	No	N/A	Pl	SR	
82.7	3	J	85	N	No	N/A	Pl	SR	
83.8	4	J	N/A	N/A	Fi	Fe	Ir	SR	Fractured zone 83.8' - 84.7'
84.7	5	J	90	T	No	N/A	Pl	SR	
86.1	6	J	83	VN	Pa	Fe	Pl	SR	
86.5	7	J	84	VN	Pa	Fe	Pl	SR	
86.9	8	J	90	N	Pa	Fe	Pl	SR	
87.1	9	J	91	N	Pa	Fe	Pl	SR	
87.9	10	J	89	N	Pa	Fe	Pl	SR	
88.6	11	J	90	VN	Fi	Fe	Pl	SR	
90	12	J	0	VN	Fi	Fe	Ir	SR	
90.9	13	J	28	VN	Fi	Fe	Pl	SR	
91.1	14	J	N/A	N/A	Fi	Fe	Ir	SR	Fractured zone 91.1' - 91.6'
92.9	15	J	83	VN	Fi	Fe	Pl	SR	
93.4	16	J	84	VN	Fi	Fe	Pl	SR	
94.4	17	J	57	N	Fi	Fe	Pl	SR	
95.3	18	J	79	N	Fi	Fe	Pl	SR	
95.8	19	J	88	VN	No	N/A	St	SR	
96.6	20	J	89	N	No	N/A	Ir	SR	
97	21	J	31	T	Fi	Fe	Pl	SR	
97.6	22	J	N/A	N/A	No	N/A	Ir	R	Fractured zone 97.6' - 98.4'
98.7	23	J	50	VN	No	N/A	St	SR	
99.2	24	J	72	T	No	N/A	St	SR	
99.8	25	J	34	VN	Fi	Fe	Pl	SR	
100.4	26	J	N/A	N/A	No	N/A	Ir	SR	Fractured zone 100.4' - 101.4'

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-56UD
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 38
Eng./Geo.:	AKS	**Boring Location:**	201+59.65	**Offset:**	L:193.265'	**Alignment:**	Proposed
Elev.:	305.8 ft	**Latitude:**	34.039639	**Longitude:**	-81.094691	**Date Started:**	4/3/2018
Total Depth:	32 ft	**Soil Depth:**	32 ft	**Core Depth:**	0 ft	**Date Completed:**	4/3/2018
Bore Hole Diameter (in):	4.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	T. Millwood	**Groundwater:**	**TOB** 5.6 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0							
300.8		▽						
		Drilled without sampling to 18.5 feet.						
295.8								
290.8								
	18.5	**COASTAL PLAIN - SILTY SAND (SM)** - moist, light red (2.5YR 6/8), mostly fine to medium sands, some low plasticity fines, [LL=46, PL=29, PI=17, %#200=27.3].		18.5	UD-1			

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-56UD
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 38
Eng./Geo.:	AKS	**Boring Location:**	201+59.65	**Offset:**	L:193.265'	**Alignment:**	Proposed
Elev.:	305.8 ft	**Latitude:**	34.039639	**Longitude:**	-81.094691	**Date Started:**	4/3/2018
Total Depth:	32 ft	**Soil Depth:**	32 ft	**Core Depth:**	0 ft	**Date Completed:**	4/3/2018
Bore Hole Diameter (in):	4.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	T. Millwood	**Groundwater:**	**TOB** 5.6 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
		AASHTO = A-2-7 (1).		20.5			
		@ 20.5 feet - very loose, moist, pinkish-white (2.5YR 8/2).			SS-1	2 1 2	3
				23.5			
		@ 23.5 feet - pink (5YR 7/3), [LL=39, PL=27, PI=12, %#200=47.1], AASHTO = A-6 (3).			UD-2		
280.8				25.5			
		@ 25.5 feet - white (5YR 8/1).			SS-2	1 WOH	0
	27.0	**POORLY GRADED SAND (SP)** - wet, white (7.5YR 8/1), subangular, mostly fine to medium sands, trace non-plastic fines.		28.5			
					UD-3		
275.8	30.5	**PIEDMONT RESIDUUM - SILT WITH SAND (ML)** - stiff, moist, yellow (2.5Y 7/6), mostly low plasticity fines, little fine to medium sands.		30.5	SS-3	3 4 5	9
	32.0	Boring Terminated at 32 feet.					
270.8							

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90

LEGEND

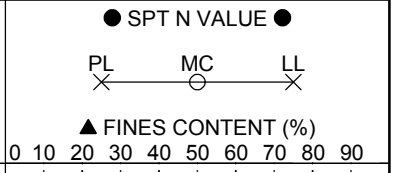
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-57
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 37
Eng./Geo.:	ELF/MFC	**Boring Location:**	203+12.24	**Offset:**	R:116.704'	**Alignment:**	Proposed
Elev.:	311.6 ft	**Latitude:**	34.039007	**Longitude:**	-81.093844	**Date Started:**	1/9/2018
Total Depth:	105.2 ft	**Soil Depth:**	96.1 ft	**Core Depth:**	9.1 ft	**Date Completed:**	1/12/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 750	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.0%
Core Size:	NQ	**Driller:**	S. Gowan	**Groundwater:**	**TOB** 11.5 ft	**24HR**	10.2 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.1	**SURFACE MATERIALS** - 1 inch of TOPSOIL.		0.0	SS-1	1	2	2	4	4
		FILL - GRAVELLY SILT WITH SAND (ML) - soft, moist, light red (10R 6/8), mostly low plasticity fines, little gravel-sized quartz, little fine sands, [LL=41, PL=33, PI=8, NMC=17.2%, %#200=65.5], AASHTO = A-5 (8).		2.0	SS-2	3	3	6	9	9
	3.3	**POORLY GRADED SAND WITH SILT (SP-SM)** - loose, moist, strong brown (7.5YR 4/6), mostly fine to coarse sand, few low plasticity fines, trace gravel-sized quartz.		4.0	SS-3	10	6	4	4	10
306.6	5.0	**COASTAL PLAIN - CLAYEY SAND (SC)** - loose, wet, strong brown (7.5YR 5/6), mostly fine to coarse sand, little low plasticity fines, trace gravel-sized quartz.		6.0	SS-4	5	6	8	11	14
		@ 6 feet - medium dense, strong brown (7.5YR 5/8).		8.0	SS-5	11	13	16	13	29
301.6		▼								
		▽								
		@ 13.5 feet - red (2.5YR 5/8), mostly fine to medium sands, some high plasticity fines, [LL=55, PL=29, PI=26, NMC=19.9%, %#200=34.8], AASHTO = A-2-7 (3).		13.5	SS-6	6	6	6		12
296.6				18.5	SS-7	6	7	6		13



LEGEND

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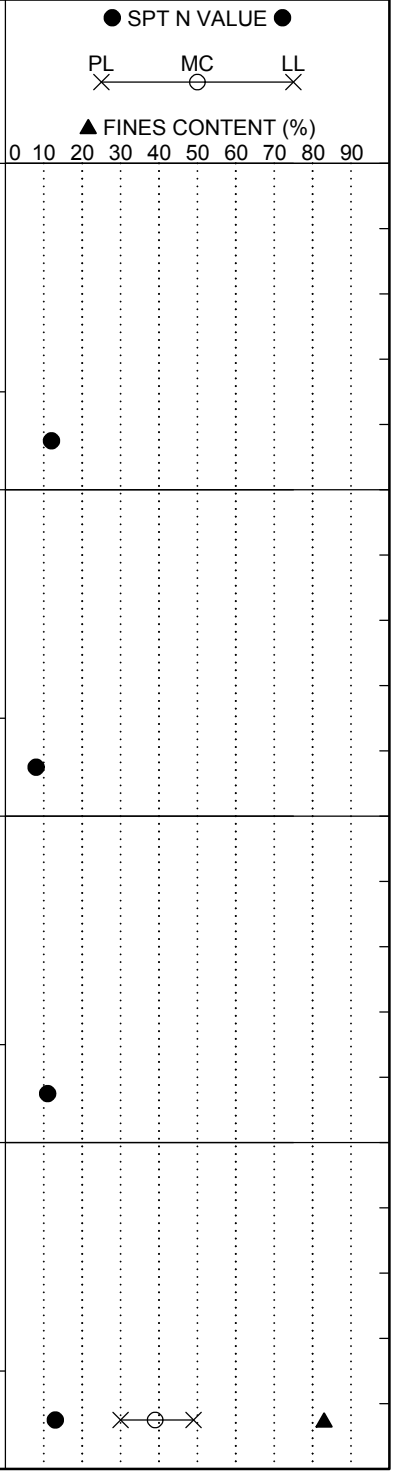
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-57
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 37
Eng./Geo.:	ELF/MFC	**Boring Location:**	203+12.24	**Offset:**	R:116.704'	**Alignment:**	Proposed
Elev.:	311.6 ft	**Latitude:**	34.039007	**Longitude:**	-81.093844	**Date Started:**	1/9/2018
Total Depth:	105.2 ft	**Soil Depth:**	96.1 ft	**Core Depth:**	9.1 ft	**Date Completed:**	1/12/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 750	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.0%
Core Size:	NQ	**Driller:**	S. Gowan	**Groundwater:**	**TOB** 11.5 ft	**24HR**	10.2 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
			23.5	SS-8	1	5	7		12
286.6									
	28.5	**PIEDMONT RESIDUUM - SILT WITH SAND (ML)** - firm, moist, strong brown (7.5YR 5/8), mostly low plasticity fines, little fine sands.	28.5	SS-9	6	4	4		8
281.6									
		@ 33.5 feet - no recovery, stiff.	33.5	SS-10	8	5	6		11
276.6									
		@ 38.5 feet - [LL=49, PL=30, PI=19, NMC=39.1%, %#200=82.6], AASHTO = A-7-5 (18).	38.5	SS-11	5	7	6		13



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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-57
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 37
Eng./Geo.:	ELF/MFC	**Boring Location:**	203+12.24	**Offset:**	R:116.704'	**Alignment:**	Proposed
Elev.:	311.6 ft	**Latitude:**	34.039007	**Longitude:**	-81.093844	**Date Started:**	1/9/2018
Total Depth:	105.2 ft	**Soil Depth:**	96.1 ft	**Core Depth:**	9.1 ft	**Date Completed:**	1/12/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 750	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.0%
Core Size:	NQ	**Driller:**	S. Gowan	**Groundwater:**	**TOB** 11.5 ft	**24HR**	10.2 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
				43.5						
		@ 43.5 feet - very stiff, few gravel-sized quartz.			SS-12	7	9	11		20
266.6										
	48.5			48.5	SS-13	50/3"	-	-		100
		PARTIALLY WEATHERED ROCK (PWR) - SANDY SILT (ML) - very hard, wet, strong brown (7.5YR 5/8), mostly low plasticity fines, some gravel-sized rock fragments, little fine to coarse sands.								
261.6										
	53.5			53.5						
		PIEDMONT RESIDUUM - SANDY SILT (ML) - hard, wet, strong brown (7.5YR 5/8), mostly low plasticity fines, some fine to medium sands, trace gravel-sized rock fragments.			SS-14	12	14	22		36
256.6										
				58.5						
		@ 58.5 feet - very hard, [LL=41, PL=27, PI=14, NMC=20.0%, %#200=66.4], AASHTO = A-7-6 (8).			SS-15	14	24	30		54

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-57
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 37
Eng./Geo.:	ELF/MFC	**Boring Location:**	203+12.24	**Offset:**	R:116.704'	**Alignment:**	Proposed
Elev.:	311.6 ft	**Latitude:**	34.039007	**Longitude:**	-81.093844	**Date Started:**	1/9/2018
Total Depth:	105.2 ft	**Soil Depth:**	96.1 ft	**Core Depth:**	9.1 ft	**Date Completed:**	1/12/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 750	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.0%
Core Size:	NQ	**Driller:**	S. Gowan	**Groundwater:**	**TOB** 11.5 ft	**24HR**	10.2 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	63.5	**PARTIALLY WEATHERED ROCK (PWR) - SANDY SILT (ML)** - very hard, wet, strong brown (7.5YR 5/8), mostly low plasticity fines, some fine to medium sands, trace gravel-sized rock fragments.		63.5	SS-16	50/5" - -	100	
246.6	65.9	Tri-Cone Bit Refusal at 65.9 feet. Install NW Casing to 65.9 feet for NQ wireline coring.		65.9				
		For discontinuity descriptors, see discontinuity worksheet.			RC-1			
		METAMORPHIC BEDROCK - SCHIST- strong brown (7.5YR5/8), fine-grained, foliated, completely weathered to residual soil, extremely weak rock.						
241.6		RC-1 : Rec= 90.2%, RQD= 0%, GSI= 20-30.		70.0				
		@ 70 feet - completely weathered to residual soil.			RC-2			
		RC-2 : Rec= 14.0%, RQD= 0.0%, GSI= 15-25.						
236.6	75.0	**PARTIALLY WEATHERED ROCK (PWR) - SANDY SILT (ML)** - very hard, wet, strong brown (7.5YR 5/8), few coarse sands, few gravel-sized rock fragments.		75.0	SS-17	50/2" - -	100	
	80.0			80.0				

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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-57
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 37
Eng./Geo.:	ELF/MFC	**Boring Location:**	203+12.24	**Offset:**	R:116.704'	**Alignment:**	Proposed
Elev.:	311.6 ft	**Latitude:**	34.039007	**Longitude:**	-81.093844	**Date Started:**	1/9/2018
Total Depth:	105.2 ft	**Soil Depth:**	96.1 ft	**Core Depth:**	9.1 ft	**Date Completed:**	1/12/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 750	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.0%
Core Size:	NQ	**Driller:**	S. Gowan	**Groundwater:**	**TOB** 11.5 ft	**24HR**	10.2 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
		PIEDMONT RESIDUUM - SANDY ELASTIC SILT (MH) - very hard, wet, reddish yellow (7.5YR 7/6), few gravel-sized rock fragments.			SS-18	13	25	49		74
	83.5			83.5	SS-19	50/2"	-	-		100
226.6		**PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM)** - very dense, moist, light brown (7.5YR 6/4), few gravel-sized rock fragments.								
				88.5	SS-20	15	36	50/5"		100
221.6		@ 88.5 feet - trace gravel-sized rock fragments.								
				93.5	SS-21	18	47	50/4"		100
216.6										
				98.5	SS-22	14	43	50/2"		100
		@ 98.5 feet - reddish yellow (7.5YR 7/6), absent gravel-sized rock fragments.								

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-57
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 37
Eng./Geo.:	ELF/MFC	**Boring Location:**	203+12.24	**Offset:**	R:116.704'	**Alignment:**	Proposed
Elev.:	311.6 ft	**Latitude:**	34.039007	**Longitude:**	-81.093844	**Date Started:**	1/9/2018
Total Depth:	105.2 ft	**Soil Depth:**	96.1 ft	**Core Depth:**	9.1 ft	**Date Completed:**	1/12/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 750	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.0%
Core Size:	NQ	**Driller:**	S. Gowan	**Groundwater:**	**TOB** 11.5 ft	**24HR**	10.2 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		@ 103.5 feet - dark gray (7.5YR 4/1).		103.5	SS-23	50/1" - -	100	
206.6	105.2	Boring Terminated at 105.2 feet.						
201.6								
196.6								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Gowan
Logged By: Lehe Fender
Date: 1/10/2018

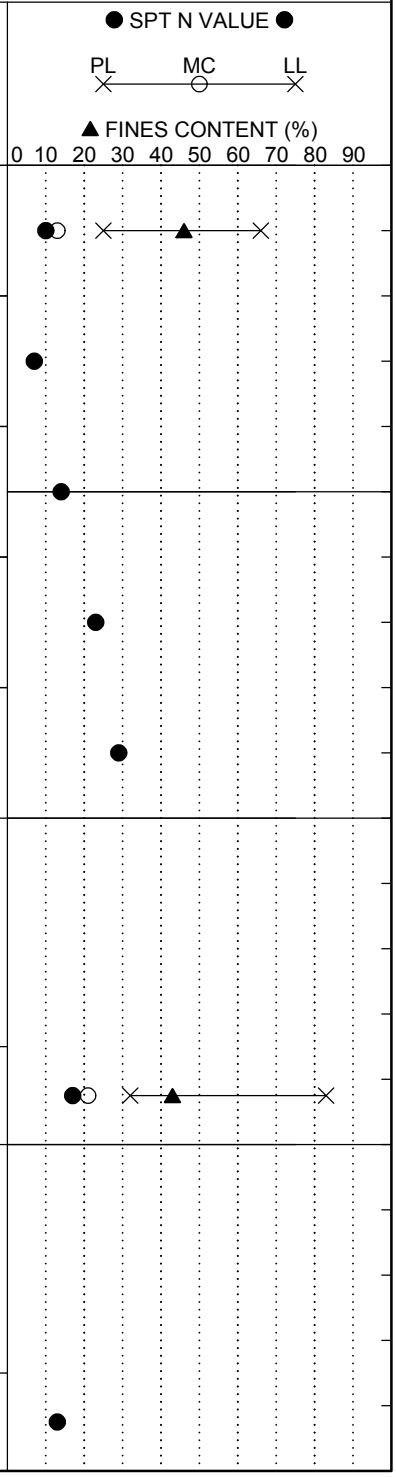
Boring Number: B-57
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 1

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
65.9	1	J	72	W	Pa	Sd/Cl	Ir	SR	Fractured zone 65.9' - 67'
69	2	J	55	W	Pa	Sd/Cl	Ir	SR	Fractured zone 69' - 69.6'

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-58
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 39
Eng./Geo.:	AKS	**Boring Location:**	204+85.63	**Offset:**	L:130.273'	**Alignment:**	Proposed
Elev.:	318.6 ft	**Latitude:**	34.039822	**Longitude:**	-81.093664	**Date Started:**	4/4/2018
Total Depth:	102.4 ft	**Soil Depth:**	102.4 ft	**Core Depth:**	0 ft	**Date Completed:**	4/6/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 14.9 ft	**24HR**	32.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.3	**SURFACE MATERIALS** - 3 inches of TOPSOIL.		0.0	SS-1	6	6	4	3	10
		FILL - CLAYEY SAND (SC) - loose, moist, red (2.5YR 5/6), mostly fine to medium sands, some high plasticity fines, [LL=66, PL=25, PI=41, NMC=13.0%, %#200=46], AASHTO = A-7-6 (13).		2.0	SS-2	3	3	4	6	7
		@ 4 feet - medium dense.		4.0	SS-3	6	5	9	13	14
313.6	6.0	**COASTAL PLAIN - CLAYEY SAND (SC)** - medium dense, moist, red (2.5YR 5/6), mostly fine to medium sands, some high plasticity fines.		6.0	SS-4	6	10	13	19	23
				8.0	SS-5	12	13	16	18	29
308.6				13.5	SS-6	6	8	9		17
303.6		@ 13.5 feet - reddish-yellow (5YR 6/6), subangular, mostly fine to coarse sands, few fine gravel, [LL=83, PL=32, PI=51, NMC=20.8%, %#200=43], AASHTO = A-7-5 (15).		18.5	SS-7	4	5	8		13



LEGEND

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SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-58
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 39
Eng./Geo.:	AKS	**Boring Location:**	204+85.63	**Offset:**	L:130.273'	**Alignment:**	Proposed
Elev.:	318.6 ft	**Latitude:**	34.039822	**Longitude:**	-81.093664	**Date Started:**	4/4/2018
Total Depth:	102.4 ft	**Soil Depth:**	102.4 ft	**Core Depth:**	0 ft	**Date Completed:**	4/6/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 14.9 ft	**24HR**	32.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
				23.5	SS-8	3	3	4		7
293.6		@ 23.5 feet - loose, reddish-yellow (5YR 7/8), mostly fine to medium sands, little low plasticity fines, [LL=45, PL=23, PI=22, NMC=18.1%, %#200=26], AASHTO = A-2-7 (0).								
				28.5	SS-9	3	3	3		6
288.6		@ 28.5 feet - yellow (10YR 8/8).								
	33.5			33.5	SS-10	2	1	2		3
283.6		**SILTY SAND (SM)** - very loose, moist, yellow (10YR 8/8), mostly fine to medium sands, little low plasticity fines, [LL=45, PL=27, PI=18, NMC=22.1%, %#200=26], AASHTO = A-2-7 (0).								
				38.5	SS-11	2	3	3		6
		@ 38.5 feet - loose.								

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

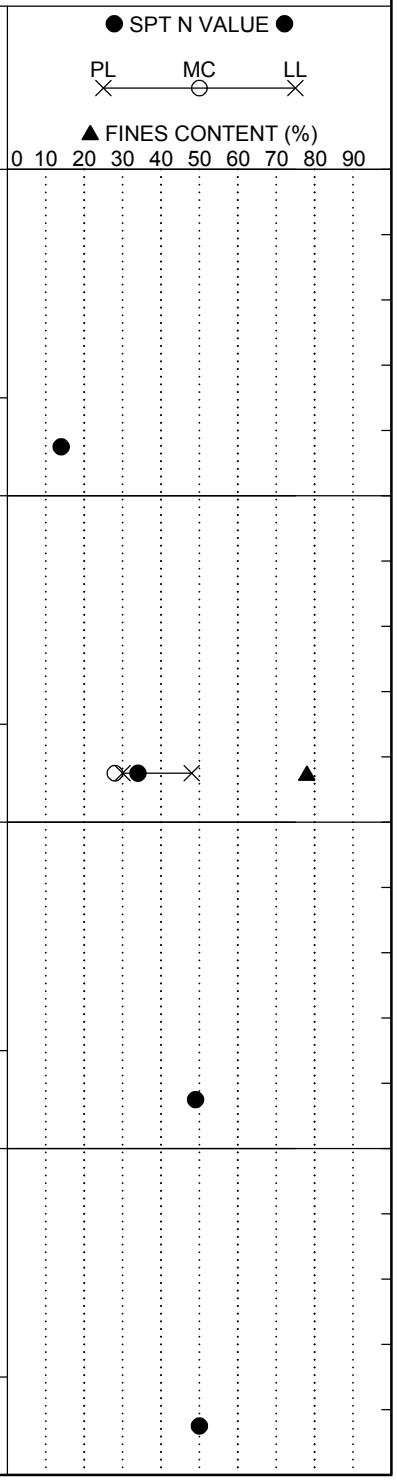
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-58
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 39
Eng./Geo.:	AKS	**Boring Location:**	204+85.63	**Offset:**	L:130.273'	**Alignment:**	Proposed
Elev.:	318.6 ft	**Latitude:**	34.039822	**Longitude:**	-81.093664	**Date Started:**	4/4/2018
Total Depth:	102.4 ft	**Soil Depth:**	102.4 ft	**Core Depth:**	0 ft	**Date Completed:**	4/6/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 14.9 ft	**24HR**	32.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
		@ 43.5 feet - medium dense.		43.5	SS-12	5	7	7		14
273.6	48.5	**PIEDMONT RESIDUUM - SILT WITH SAND (ML)** - hard, moist, gray (10YR 6/1), yellow (10YR 8/8), and brown (10YR 4/3), mostly low plasticity fines, little fine sands, [LL=48, PL=30, PI=18, NMC=28.0%, %#200=78], AASHTO = A-7-5 (15).		48.5	SS-13	10	14	20		34
268.6		@ 53.5 feet - yellow (10YR 7/6).		53.5	SS-14	14	21	28		49
263.6				58.5	SS-15	15	17	33		50



LEGEND

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SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-58
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 39
Eng./Geo.:	AKS	**Boring Location:**	204+85.63	**Offset:**	L:130.273'	**Alignment:**	Proposed
Elev.:	318.6 ft	**Latitude:**	34.039822	**Longitude:**	-81.093664	**Date Started:**	4/4/2018
Total Depth:	102.4 ft	**Soil Depth:**	102.4 ft	**Core Depth:**	0 ft	**Date Completed:**	4/6/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 14.9 ft	**24HR**	32.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
	63.5	**PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM)** - very dense, moist, grayish-brown (10YR 4/2).		63.5	SS-16	50/5"- -	100
253.6		@ 68.5 feet - light gray (10YR 7/1).		68.5	SS-17	27 40 50/5"	100
248.6				73.5	SS-18	50/3"- -	100
243.6				78.5	SS-19	50/2"- -	100

SPT N VALUE ●

PL ⨯ MC ○ LL ⨯

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-58
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 39
Eng./Geo.:	AKS	**Boring Location:**	204+85.63	**Offset:**	L:130.273'	**Alignment:**	Proposed
Elev.:	318.6 ft	**Latitude:**	34.039822	**Longitude:**	-81.093664	**Date Started:**	4/4/2018
Total Depth:	102.4 ft	**Soil Depth:**	102.4 ft	**Core Depth:**	0 ft	**Date Completed:**	4/6/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 14.9 ft	**24HR**	32.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
		@ 83.5 feet - pale brown (10YR 6/3).		83.5	SS-19	42 50/3" -	100
233.6				88.5	SS-20	50/1" -	100
228.6				93.5	SS-21	50/2" - -	100
223.6				98.5	SS-22	50/3" - -	100

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-58
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 39
Eng./Geo.:	AKS	**Boring Location:**	204+85.63	**Offset:**	L:130.273'	**Alignment:**	Proposed
Elev.:	318.6 ft	**Latitude:**	34.039822	**Longitude:**	-81.093664	**Date Started:**	4/4/2018
Total Depth:	102.4 ft	**Soil Depth:**	102.4 ft	**Core Depth:**	0 ft	**Date Completed:**	4/6/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 14.9 ft	**24HR**	32.5 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	102.4	Boring Terminated at 102.4 feet.						
213.6								
208.6								
203.6								

LEGEND

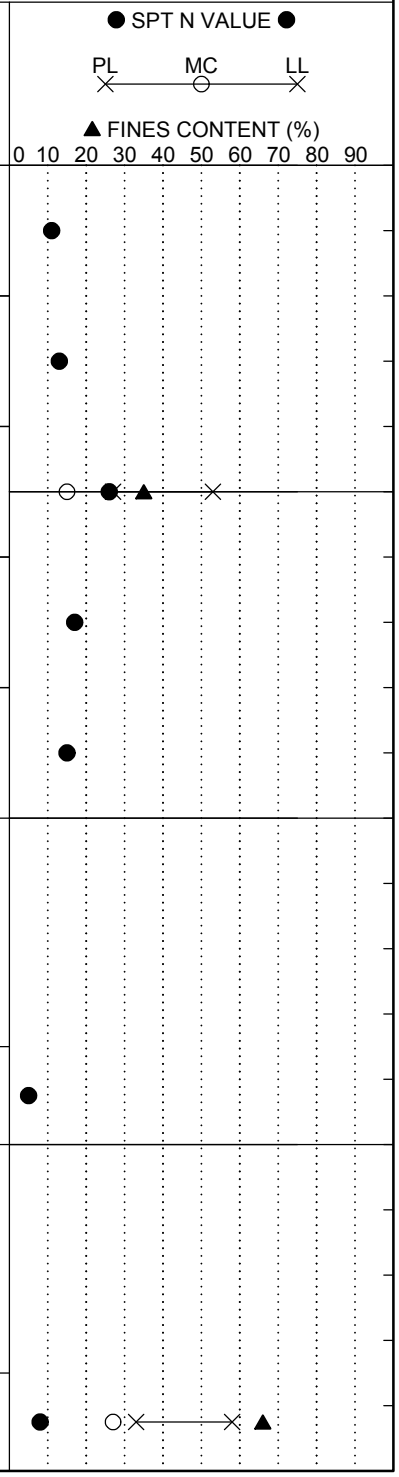
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-59
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 37
Eng./Geo.:	ELF/MFC	**Boring Location:**	206+15.30	**Offset:**	R:154.848'	**Alignment:**	Proposed
Elev.:	322.4 ft	**Latitude:**	34.039279	**Longitude:**	-81.092863	**Date Started:**	1/15/2018
Total Depth:	119.6 ft	**Soil Depth:**	110 ft	**Core Depth:**	9.6 ft	**Date Completed:**	1/19/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	10.2 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.3	**SURFACE MATERIALS** - 4 inches of TOPSOIL.		0.0	SS-1	7	6	5	6	11
		FILL - CLAYEY SAND (SC) - medium dense, moist, reddish-brown (2.5YR 4/3) and red (2.5YR 4/8), mostly medium to coarse sands, some high plasticity fines, trace fine gravel.		2.0	SS-2	7	6	7	10	13
		@ 4 feet - light red (2.5YR 6/8), [LL=53, PL=27, PI=26, NMC=14.8%, %#200=35.3], AASHTO = A-2-7 (3).		4.0	SS-3	9	13	13	14	26
317.4				6.0	SS-4	5	6	11	10	17
	8.0	**COASTAL PLAIN - POORLY GRADED SAND WITH SILT (SP-SM)** - medium dense, moist, light red (2.5YR 4/8), mostly fine to coarse sands, few low plasticity fines, few subrounded quartz gravels.		8.0	SS-5	8	8	7	6	15
312.4		▼								
	13.5	**SANDY ELASTIC SILT (MH)** - firm, wet, light red (2.5YR 4/8), mostly high plasticity fines, some medium sands.		13.5	SS-6	4	2	3		5
307.4										
		@ 18.5 feet - [LL=58, PL=33, PI=25, NMC=26.6%, %#200=66.1], AASHTO = A-7-5 (17).		18.5	SS-7	3	4	4		8



LEGEND

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SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-59
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 37
Eng./Geo.:	ELF/MFC	**Boring Location:**	206+15.30	**Offset:**	R:154.848'	**Alignment:**	Proposed
Elev.:	322.4 ft	**Latitude:**	34.039279	**Longitude:**	-81.092863	**Date Started:**	1/15/2018
Total Depth:	119.6 ft	**Soil Depth:**	110 ft	**Core Depth:**	9.6 ft	**Date Completed:**	1/19/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	10.2 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	23.5			23.5							
297.4		**PIEDMONT RESIDUUM - SANDY SILT (ML)** - firm, moist, light red to light reddish-brown (2.5YR 4/8 to 7/4), mostly low plasticity fines, some fine to medium sands.			SS-8	3	3	5		8	●
		@ 28.5 feet - red (2.5YR 4/6).		28.5	SS-9	2	3	3		6	●
292.4											
	33.5			33.5							
287.4		**SILT (ML)** - firm, moist, red (2.5YR 4/6), mostly low plasticity fines, few fine sands, [LL=47, PL=34, PI=13, NMC=45.4%, %#200=92.9], AASHTO = A-7-5 (16).			SS-10	3	2	4		6	● ▲
				38.5							
					SS-11	2	3	4		7	●

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-59
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 37
Eng./Geo.:	ELF/MFC	**Boring Location:**	206+15.30	**Offset:**	R:154.848'	**Alignment:**	Proposed
Elev.:	322.4 ft	**Latitude:**	34.039279	**Longitude:**	-81.092863	**Date Started:**	1/15/2018
Total Depth:	119.6 ft	**Soil Depth:**	110 ft	**Core Depth:**	9.6 ft	**Date Completed:**	1/19/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	10.2 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	43.5	@ 43.5 feet - no recovery.		43.5	SS-12	2 3 4	7	●
277.4								
		@ 48.5 feet - no recovery, stiff.		48.5	SS-13	3 4 7	11	●
272.4								
	53.5	**LEAN CLAY (CL)** - very stiff, moist, reddish-yellow (7.5YR 8/6), mostly low plasticity fines, few fine sands, [LL=31, PL=23, PI=8, NMC=27.2%, %#200=90.3], AASHTO = A-4 (7).		53.5	SS-14	12 12 17	29	⊗ ▲
267.4								
	58.5	**SANDY SILT (ML)** - hard, moist, light gray (7.5YR 7/1), mostly low plasticity fines, some fine to medium sands.		58.5	SS-15	10 16 23	39	●

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-59
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 37
Eng./Geo.:	ELF/MFC	**Boring Location:**	206+15.30	**Offset:**	R:154.848'	**Alignment:**	Proposed
Elev.:	322.4 ft	**Latitude:**	34.039279	**Longitude:**	-81.092863	**Date Started:**	1/15/2018
Total Depth:	119.6 ft	**Soil Depth:**	110 ft	**Core Depth:**	9.6 ft	**Date Completed:**	1/19/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	10.2 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	63.5	**PARTIALLY WEATHERED ROCK (PWR) - SANDY SILT (ML)** - very hard, moist, light gray (7.5YR 7/1), mostly low plasticity fines, some fine to medium sands.		63.5	SS-16	23 29 50/4"	100	
257.4	68.5	**PIEDMONT RESIDUUM - SILTY SAND (SM)** - very dense, moist, very pale brown (10YR 7/4), mostly fine sands, some low plasticity fines.		68.5	SS-17	14 26 34	60	
252.4	73.5	**PARTIALLY WEATHERED ROCK (PWR) - SANDY SILT (ML)** - hard, wet, very pale brown (10YR 7/4), mostly low plasticity fines, some fine to medium sands.		73.5	SS-18	50/5"- -	100	
247.4		@ 78.5 feet - brown (10YR 5/3).		78.5	SS-19	2650/3" -	100	

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-59
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 37
Eng./Geo.:	ELF/MFC	**Boring Location:**	206+15.30	**Offset:**	R:154.848'	**Alignment:**	Proposed
Elev.:	322.4 ft	**Latitude:**	34.039279	**Longitude:**	-81.092863	**Date Started:**	1/15/2018
Total Depth:	119.6 ft	**Soil Depth:**	110 ft	**Core Depth:**	9.6 ft	**Date Completed:**	1/19/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	10.2 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				83.5				
		@ 83.5 feet - trace gravel-sized rock fragments.			SS-20	3250/5" -	100	
237.4								
	88.5			88.5				
		PIEDMONT RESIDUUM - SANDY SILT (ML) - hard, moist, dark grayish-brown (10YR 4/2), mostly low plasticity fines, some fine to medium sands, trace gravel-sized rock fragments.			SS-21	33 37 40	77	
232.4								
	93.5			93.5				
		PARTIALLY WEATHERED ROCK (PWR) - SANDY SILT (ML) - very hard, moist, dark grayish-brown (10YR 4/2), mostly low plasticity fines, some fine to medium sands, trace gravel-sized rock fragments.			SS-22	19 49 50/2"	100	
227.4								
				98.5	SS-23	50/2" - -	100	

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-59
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 37
Eng./Geo.:	ELF/MFC	**Boring Location:**	206+15.30	**Offset:**	R:154.848'	**Alignment:**	Proposed
Elev.:	322.4 ft	**Latitude:**	34.039279	**Longitude:**	-81.092863	**Date Started:**	1/15/2018
Total Depth:	119.6 ft	**Soil Depth:**	110 ft	**Core Depth:**	9.6 ft	**Date Completed:**	1/19/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	10.2 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				103.5	SS-24	50/5"- -	100	
217.4				108.5	SS-25	3150/1" -	100	
212.4	111.0	Tri-Cone Bit Refusal at 111 feet. Install NW Casing to 111 feet for NQ wireline coring.		111.0				
		For discontinuity descriptors, see discontinuity worksheet.			RC-1			
		METAMORPHIC BEDROCK - SCHIST - pale olive (10Y 6/4), fine grained to very fine grained, foliated, highly to completely weathered, weak rock, low core recoveries likely due to seams of completely weathered rock or residual soil washed away by drilling process.		114.6				
207.4		RC-1 : Rec= 14.0%, RQD= 0%, GSI= 10-20.						
		@ 114.8 feet - yellowish-brown (10YR 5/6), extremely weak rock.			RC-2			
	119.6	RC-2 : Rec= 40.0%, RQD= 0%, GSI= 10-20, RMR = 34.						

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-59
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 37
Eng./Geo.:	ELF/MFC	**Boring Location:**	206+15.30	**Offset:**	R:154.848'	**Alignment:**	Proposed
Elev.:	322.4 ft	**Latitude:**	34.039279	**Longitude:**	-81.092863	**Date Started:**	1/15/2018
Total Depth:	119.6 ft	**Soil Depth:**	110 ft	**Core Depth:**	9.6 ft	**Date Completed:**	1/19/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	10.2 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		Boring Terminated at 119.6 feet.						
197.4								
192.4								
187.4								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Miller
Logged By: Lehe Fender
Date(s) Drilled: 1/19/2018

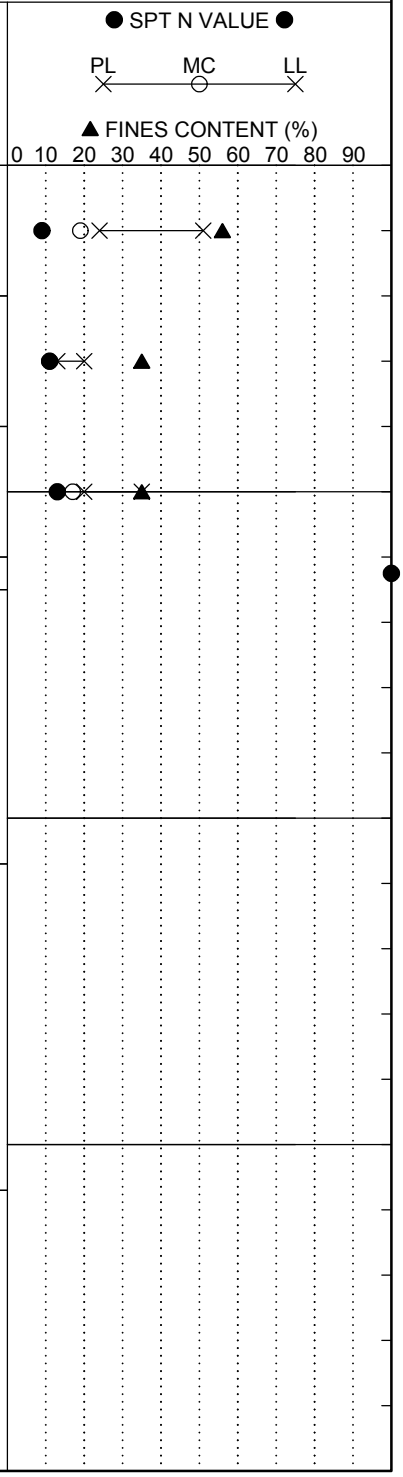
Boring Number: B-59
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 1

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
111.1	1	J	10	W	Pa	Qz	St	VR	
111.2	2	J	0	W	No	No	Ir	VR	Fractured zone 111.2' - 115.2'
115.4	4	J	0	W	No	No	Pl	S	
116.1	5	J	8	MW	Su	Fe	Pl	SR	Fractured zone 116.1' - 119.6'

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-60
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 35
Eng./Geo.:	AKS	**Boring Location:**	5022+82.85	**Offset:**	L:80.55'	**Alignment:**	Proposed
Elev.:	173.8 ft	**Latitude:**	34.022994	**Longitude:**	-81.097713	**Date Started:**	4/11/2018
Total Depth:	26.7 ft	**Soil Depth:**	6.5 ft	**Core Depth:**	20.2 ft	**Date Completed:**	4/12/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 0.8 ft	**24HR**	6.1 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**<u>ALLUVIUM</u> - SANDY FAT CLAY (CH)** - stiff, dry to moist, red (10R 5/6), mostly high plasticity fines, some fine to medium sands, [LL=51, PL=24, PI=27, NMC=19.2%, %#200=56], AASHTO = A-7-6 (12).		0.0	SS-1	4	4	5	5	9
	2.0	**SILTY CLAYEY SAND (SC-SM)** - medium dense, moist, brown (10YR 5/3), subangular, mostly fine to medium sands, some low plasticity fines, [LL=20, PL=13, PI=7, NMC=11.0%, %#200=35], AASHTO = A-2-4.		2.0	SS-2	4	5	6	7	11
168.8	4.0	**CLAYEY SAND (SC)** - medium dense, moist, brown (10YR 5/3), subangular, mostly fine to coarse sands, some low plasticity fines, [LL=35, PL=20, PI=15, NMC=17.1%, %#200=35], AASHTO = A-2-6.		4.0	SS-3	5	7	6	7	13
	6.0			6.0						
	6.5	**<u>PARTIALLY WEATHERED ROCK (PWR)</u> - CLAYEY SAND (SC)** - very dense, moist, brown (10YR 5/3), subangular, mostly fine to coarse sands, little low plasticity fines. Tri-Cone Bit Refusal at 6.5 feet. Install NW Casing to 6.5 feet for NQ wireline coring.		6.5	SS-4	20	50/1"	-	-	100
163.8		RC-1: Rec= 85.7%, RQD= 20.0%, GSI= 45-55. For discontinuity descriptors, see discontinuity worksheet.		10.7	RC-1					
158.8		**<u>IGNEOUS BEDROCK</u> - GRANITE** - reddish yellow (5YR 7/6), coarse grained, subangular, massive, moderately weathered, weak rock. @ 7 feet - medium strong rock. @ 8.7 feet - pale red (10R 6/4), slightly weathered, strong rock. RC-2: Rec= 90.0%, RQD= 23.0%, GSI= 50-60. @ 12.5 feet - fresh, very strong rock. RC-3: Rec= 100.0%, RQD= 63.0%, GSI= 60-70, RMR = 47.		15.7	RC-2					
					RC-3					



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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-60
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 35
Eng./Geo.:	AKS	**Boring Location:**	5022+82.85	**Offset:**	L:80.55'	**Alignment:**	Proposed
Elev.:	173.8 ft	**Latitude:**	34.022994	**Longitude:**	-81.097713	**Date Started:**	4/11/2018
Total Depth:	26.7 ft	**Soil Depth:**	6.5 ft	**Core Depth:**	20.2 ft	**Date Completed:**	4/12/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 0.8 ft	**24HR**	6.1 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		RC-4: Rec= 100.0%, RQD= 78.0%, GSI= 65-75, RMR = 69.		20.7	RC-4			
148.8				25.7				
	26.7	RC-5: Rec= 100.0%, RQD= 100.0%, GSI= 65-75, RMR = 82.			RC-5			
		Boring Terminated at 26.7 feet.						
143.8								
138.8								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Millwood
Logged By: Austin Syms
Date: 4/2/2018

Boring Number: B-60
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 2

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
65	1	J	N/A	N/A	Pa	Sa	Ir	R	Fractured zone 6.5' - 7'
7.8	2	J	16	VN	Fi	Fe	Pl	SR	
8	3	J	N/A	N/A	Pa	Fe/Sa	Ir	SR	Fractured zone 8' - 8.3'
8.7	4	J	N/A	N/A	Pa	Fe/Sa	Ir	SR	Fractured zone 8.7' - 9.2'
9.8	5	J	27	VN	Pa	Cl	Pl	SR	
11	6	J	34	T	Pa	Cl	Pl	SR	
11.2	7	J	38	T	No	N/A	Pl	SR	
11.8	8	J	39	T	Pa	Sa	Pl	SR	
12	9	J	40	N	Pa	Sa	Pl	SR	
12.2	10	J	31	VN	Pa	Sa	W	R	
12.4	11	J	8	VN	Pa	Sa	W	SR	
12.7	12	J	61	N	Pa	Sa	Pl	SR	
13.2	13	J	28	VN	Fi	Fe/Sa	Pl	SR	
13.4	14	J	21	VN	Fi	Fe/Sa	Pl	SR	
14.3	15	J	22	VN	Pa	Cl	Pl	SR	
15.3	16	J	N/A	N/A	Pa	Sa	Ir	SR	Fractured zone 15.3' - 15.6'
15.7	17	J	78	N	No	N/A	Pl	SR	
15.9	18	J	79	N	Pa	Fe	Pl	SR	
16.2	19	J	78	N	Pa	Cl	Ir	SR	
17.3	20	J	73	T	No	N/A	Pl	SR	
18.1	21	J	28	T	Pa	Sa	Pl	SR	
18.8	22	J	21	T	No	N/A	St	SR	
19.9	23	J	90	N	Pa	Sa	Pl	R	
20.5	24	J	27	T	No	N/A	Pl	SR	
20.7	25	J	36	T	No	N/A	Pl	SR	
21	26	J	29	N	Fi	Qz	Pl	SR	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-61
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 35
Eng./Geo.:	AKS	**Boring Location:**	5012+32.75	**Offset:**	L:7.70'	**Alignment:**	Proposed
Elev.:	171.5 ft	**Latitude:**	34.025174	**Longitude:**	-81.100002	**Date Started:**	4/12/2018
Total Depth:	42.5 ft	**Soil Depth:**	22.5 ft	**Core Depth:**	20 ft	**Date Completed:**	4/13/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 3.8 ft	**24HR**	10.2 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**<u>ALLUVIUM</u> - CLAYEY SAND (SC)** - medium dense, moist, red (2.5YR 5/8), subangular, mostly fine to medium sands, some high plasticity fines, trace fine gravel, [LL=56, PL=27, PI=29, NMC=14.7%, %#200=43], AASHTO = A-7-6 (8).		0.0	SS-1	5	6	8	8	14
				2.0	SS-2	3	7	9	11	16
		@ 4 feet - dark reddish-gray (2.5YR 4/1).		4.0	SS-3	4	7	8	9	15
166.5		@ 6 feet - mostly fine to medium sands.		6.0	SS-4	8	10	9	11	19
				8.0	SS-5	10	12	16	19	28
161.5	10.0	**SANDY LEAN CLAY (CL)** - hard, moist to wet, light brownish-gray (10YR 6/2), mostly low plasticity fines, some fine sands, few fine gravel, [LL=39, PL=17, PI=22, NMC=25.0%, %#200=50], AASHTO = A-6 (7).		13.5	SS-6	14	19	13		32
156.5	15.0	**<u>PIEDMONT RESIDUUM</u> - SILTY SAND (SM)** - very dense, moist, light brownish-gray (10YR 6/2), subangular, mostly fine to medium sands, some low plasticity fines, [LL=40, PL=28, PI=12, NMC=17.0%, %#200=47], AASHTO = A-6 (3).		18.5	SS-7	31	32	30		62

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-61
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 35
Eng./Geo.:	AKS	**Boring Location:**	5012+32.75	**Offset:**	L:7.70'	**Alignment:**	Proposed
Elev.:	171.5 ft	**Latitude:**	34.025174	**Longitude:**	-81.100002	**Date Started:**	4/12/2018
Total Depth:	42.5 ft	**Soil Depth:**	22.5 ft	**Core Depth:**	20 ft	**Date Completed:**	4/13/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 3.8 ft	**24HR**	10.2 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	22.5	Tri-Cone Bit Refusal at 22.5 feet. Install NW Casing to 22.5 feet for NQ wireline coring.		22.5				
146.5		For discontinuity descriptors, see discontinuity worksheet. **<u>METAMORPHIC BEDROCK</u> - SCHIST** - light greenish-gray (GLEY 1 8/10GY), very fine grained, foliated, highly weathered, weak rock, some epidote alteration, few quartz veins. RC-1: Rec= 25.9%, RQD= 0.0%, GSI= 10-20. @ 25.8 feet - greenish-gray (GLEY 1 5/10GY), moderately weathered.		25.2	RC-1			
141.5		RC-2: Rec= 42.0%, RQD= 0.0%, GSI= 10-20. @ 31.1 feet - slightly weathered, medium strong rock. @ 31.5 feet - strong rock.		30.2	RC-2			
136.5		RC-3: Rec= 100%, RQD= 70.0%, GSI= 60-70.		35.2	RC-3			
					RC-4			

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-61
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 35
Eng./Geo.:	AKS	**Boring Location:**	5012+32.75	**Offset:**	L:7.70'	**Alignment:**	Proposed
Elev.:	171.5 ft	**Latitude:**	34.025174	**Longitude:**	-81.100002	**Date Started:**	4/12/2018
Total Depth:	42.5 ft	**Soil Depth:**	22.5 ft	**Core Depth:**	20 ft	**Date Completed:**	4/13/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 3.8 ft	**24HR**	10.2 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		RC-4: Rec= 100%, RQD= 51.7%, GSI= 60-70, RMR = 49.		40.2				
		@ 40.1 feet - medium strong rock.			RC-5			
	42.5	RC-5: Rec= 100%, RQD= 14.3%, GSI= 50-60.						
		Boring Terminated at 42.5 feet.						
126.5								
121.5								
116.5								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Millwood
Logged By: Austin Syms
Date: 4/13/2018

Boring Number: B-61
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 1

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
22.5	1	J	N/A	N/A	Pa	Fe	Ir	SR	Fractured zone 22.5' - 31.2'
31.7	2	J	66	N	Fi	Cl	Pl	SR	
32.8	3	J	58	T	No	N/A	Wa	SR	
33.5	4	J	71	T	No	N/A	St	SR	
33.7	5	J	53	N	No	N/A	Ir	SR	
33.8	6	J	64	VN	No	N/A	Pl	SR	
34.4	7	J	55	T	Pa	Cl	St	SR	
35	8	J	64	T	Pa	Sa	Pl	SR	
36.3	9	J	52	VN	Pa	Cl	Ir	SR	
36.7	10	J	84	N	Pa	Sa	Pl	SR	
37.2	11	J	77	VN	Pa	Sa	Pl	SR	
37.7	12	J	85	N	Pa	Sa	Pl	SR	
38	13	J	77	N	Pa	Cl	Pl	SR	
38.3	14	J	32	T	Pa	Cl	Pl	SR	
38.7	15	J	39	T	Pa	Cl	Pl	SR	
39.9	16	J	N/A	N/A	Pa	Cl/Sa	Ir	SR	Fractured zone 39.9' - 41'
41.3	17	J	85	N	No	N/A	Pl	SR	
41.6	18	J	89	VN	No	N/A	Pl	SR	
42	19	J	N/A	N/A	No	N/A	Ir	SR	Fractured zone 42' - 42.5'

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-62
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 32
Eng./Geo.:	AKS	**Boring Location:**	5996+61.92	**Offset:**	L:82.84'	**Alignment:**	Proposed
Elev.:	167.2 ft	**Latitude:**	34.024985	**Longitude:**	-81.103943	**Date Started:**	4/10/2018
Total Depth:	45.7 ft	**Soil Depth:**	23.7 ft	**Core Depth:**	22 ft	**Date Completed:**	4/12/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 5.8 ft	**24HR**	5.8 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.1	**SURFACE MATERIALS** - 1 inch of TOPSOIL.		0.0	SS-1	2	2	2	3	4
	2.0	**ALLUVIUM - SANDY LEAN CLAY (CL)** - soft, moist, red (2.5YR 5/6), mostly low plasticity fines, some fine sands, [LL=25, PL=16, PI=9, NMC=19.6%, %#200=56], AASHTO = A-4 (2).		2.0	SS-2	4	5	5	6	10
162.2		**SILTY SAND (SM)** - loose, moist, brownish-yellow (10YR 6/6), mostly fine sands, little non-plastic fines, trace mica, [LL=NP, PL=NP, PI=NP, NMC=11.2%, %#200=17], AASHTO = A-2-4.		4.0	SS-3	6	5	5	6	10
		@ 6 feet - medium dense.		6.0	SS-4	6	8	8	10	16
	8.0	**PIEDMONT RESIDUUM - SILT WITH SAND (ML)** - very stiff, moist, brownish-yellow (10YR 6/6), mostly low plasticity fines, little fine sands, [LL=45, PL=30, PI=15, NMC=27.1%, %#200=81], AASHTO = A-7-5 (14).		8.0	SS-5	7	7	9	8	16
157.2		@ 9 feet - wet, light brownish-gray (10YR 6/2).								
	13.5	**PARTIALLY WEATHERED ROCK (PWR) - SANDY SILT (ML)** - very hard, moist, light brownish-gray (10YR 6/2), mostly low plasticity fines, some fine sands.		13.5	SS-6	36	50/4"	-		100
152.2										
	18.5	**PIEDMONT RESIDUUM - SANDY SILT (ML)** - very stiff, moist, light brownish-gray (10YR 6/2), mostly low plasticity fines, some fine sands.		18.5	SS-7	15	25	43		68

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-62
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 32
Eng./Geo.:	AKS	**Boring Location:**	5996+61.92	**Offset:**	L:82.84'	**Alignment:**	Proposed
Elev.:	167.2 ft	**Latitude:**	34.024985	**Longitude:**	-81.103943	**Date Started:**	4/10/2018
Total Depth:	45.7 ft	**Soil Depth:**	23.7 ft	**Core Depth:**	22 ft	**Date Completed:**	4/12/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 5.8 ft	**24HR**	5.8 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	23.5			23.5	SS-8	50/0"- -	100	
	23.7	no recovery		23.7				
		Tri-Cone Bit Refusal at 23.7 feet. Install NW Casing to 23.7 feet for NQ wireline coring.			RC-1			
142.2		For discontinuity descriptors, see discontinuity worksheet.		25.7				
		<u>METAMORPHIC BEDROCK</u> - SCHIST - gray (GLEY 1 4/), fine grained, foliated, moderately weathered, medium strong rock.			RC-2			
		RC-1: Rec= 35.0%, RQD= 0.0%, GSI= 10-20.						
		@ 28 feet - residual soil.						
137.2		@ 29.1 feet - moderately weathered, medium strong rock.		30.7				
		RC-2: Rec= 56.0%, RQD= 0.0%, GSI= 10-20.			RC-3			
132.2		RC-3: Rec= 36.0%, RQD= 0.0%, GSI= 10-20.		35.7				
		@ 35.7 feet - trace manganese coating on fractures, some epidote alteration.			RC-4			

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	B-62
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 32
Eng./Geo.:	AKS	**Boring Location:**	5996+61.92	**Offset:**	L:82.84'	**Alignment:**	Proposed
Elev.:	167.2 ft	**Latitude:**	34.024985	**Longitude:**	-81.103943	**Date Started:**	4/10/2018
Total Depth:	45.7 ft	**Soil Depth:**	23.7 ft	**Core Depth:**	22 ft	**Date Completed:**	4/12/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 5.8 ft	**24HR**	5.8 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		RC-4: Rec= 40.0%, RQD= 0.0%, GSI= 10-20.		40.7				
		@ 41 feet - slightly weathered.			RC-5			
		RC-5: Rec= 100%, RQD= 0.0%, GSI= 20-30.		43.7				
		@ 43.7 feet - epidote alteration.			RC-6			
122.2		RC-6: Rec= 100%, RQD= 50.0%, GSI= 30-40.						
	45.7	Boring Terminated at 45.7 feet.						
117.2								
112.2								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Millwood
Logged By: Austin Syms
Date: 4/10/2018

Boring Number: B-62
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 1

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
23.7	1	N/A	N/A	N/A	Pa	Fe	Ir	SR	Fractured zone 23.7' - 26.3'
26.5	2	J	44	T	Pa	Fe	St	SR	
26.6	3	N/A	N/A	N/A	Pa	Cl/Fe	Ir	SR	Fractured zone 26.6' - 29.3'
29.3	4	J	56	VN	Pa	Fe	Pl	SR	
29.5	5	N/A	N/A	N/A	No	N/A	Ir	SR	Fractured zone 29.5' - 30'
30.6	6	N/A	N/A	N/A	No	N/A	Ir	SR	Fractured zone 30.6' - 31'
31.4	7	N/A	N/A	N/A	Pa	Fe	Ir	SR	Fractured zone 31.4' - 43'
43.1	8	J	18	VN	No	N/A	Ir	SR	
44.1	9	J	62	N	No	N/A	Pl	SR	
44.7	10	J	42	T	No	N/A	Pl	SR	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	DH-4
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 43
Eng./Geo.:	AKS	**Boring Location:**	76+09.40	**Offset:**	R:86.778'	**Alignment:**	Proposed
Elev.:	185.7 ft	**Latitude:**	34.024177	**Longitude:**	-81.129735	**Date Started:**	1/4/2018
Total Depth:	120.2 ft	**Soil Depth:**	51.8 ft	**Core Depth:**	68.4 ft	**Date Completed:**	1/9/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	HQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 12.0 ft	**24HR**	9.8 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**FILL - CLAYEY SAND (SC)** - loose, moist, brown (10YR 5/3), subangular to subrounded, mostly fine to medium sands, little low plasticity fines, [LL=24, PL=14, PI=10, NMC=10.5%, %#200=28.4], AASHTO = A-2-4.		0.0	SS-1	4	5	5	9	10
	2.0	**COASTAL PLAIN - SANDY LEAN CLAY (CL)** - stiff, moist, reddish yellow (5YR 6/8), mostly low plasticity fines, some fine to medium sands, [LL=42, PL=23, PI=19, NMC=17.2%, %#200=65.6], AASHTO = A-7-6 (11).		2.0	SS-2	3	4	9	15	13
180.7		@ 4 feet - very stiff.		4.0	SS-3	5	5	21	19	26
	6.0	**CLAYEY SAND WITH GRAVEL (SC)** - medium dense, moist, reddish brown (5YR 4/3), reddish yellow (5YR 6/8) and gray (GLEY 1 6/), subangular to subrounded, mostly fine to coarse sands, little low plasticity fines, little rounded pebbles, [LL=44, PL=21, PI=23, NMC=16.7%, %#200=27.1], AASHTO = A-2-7 (2).		6.0	SS-4	9	10	14	35	24
175.7		@ 8 feet - dense.		8.0	SS-5	18	22	16	19	38
	13.5	**PIEDMONT RESIDUUM - ELASTIC SILT WITH SAND (MH)** - very stiff, moist, gray (GLEY 1 6/), mostly high plasticity fines, little fine sands, [LL=63, PL=38, PI=25, NMC=31.2%, %#200=80.9], AASHTO = A-7-5 (24).		13.5	SS-6	11	12	16		28
170.7										
	18.5	**PARTIALLY WEATHERED ROCK (PWR) - SANDY SILT (ML)** - very hard, moist, gray (GLEY 1 6/), mostly low plasticity fines, some fine sands.		18.5	SS-7	29	50/4"	-		100

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	DH-4
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 43
Eng./Geo.:	AKS	**Boring Location:**	76+09.40	**Offset:**	R:86.778'	**Alignment:**	Proposed
Elev.:	185.7 ft	**Latitude:**	34.024177	**Longitude:**	-81.129735	**Date Started:**	1/4/2018
Total Depth:	120.2 ft	**Soil Depth:**	51.8 ft	**Core Depth:**	68.4 ft	**Date Completed:**	1/9/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	HQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 12.0 ft	**24HR**	9.8 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
				23.5	SS-8	42 50/3" -	100
160.7				28.5	SS-9	43 50/5" -	100
155.7				33.5	SS-10	50/1" - -	100
150.7				38.5	SS-11	50/4" - -	100
		@ 38.5 feet - gray (GLEY 1 6/) with mottled brown (10YR 5/3), some fine to coarse sands, trace gravel.					

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	DH-4
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 43
Eng./Geo.:	AKS	**Boring Location:**	76+09.40	**Offset:**	R:86.778'	**Alignment:**	Proposed
Elev.:	185.7 ft	**Latitude:**	34.024177	**Longitude:**	-81.129735	**Date Started:**	1/4/2018
Total Depth:	120.2 ft	**Soil Depth:**	51.8 ft	**Core Depth:**	68.4 ft	**Date Completed:**	1/9/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	HQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 12.0 ft	**24HR**	9.8 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				43.5	SS-12	50/5" - -	100	
		@ 43.5 feet - some fine to medium sands, absent gravel, relict foliation.						
140.7								
				48.5	SS-13	50/1" - -	100	
135.7								
	51.9	Tri-Cone Bit Refusal at 51.9 feet. Install HW Casing to 51.9 feet for HQ wireline coring.		51.9				
		For discontinuity descriptors, see discontinuity worksheet.			RC-1			
130.7		**METAMORPHIC BEDROCK - SCHIST**- bluish-gray (GLEY 2 5/1), fine grained, foliated, slightly weathered to fresh, strong rock, quartz veins and stringers throughout.		55.2				
		RC-1: Rec= 78.9%, RQD= 78.9%, GSI= 45-55.			RC-2			
		RC-2: Rec= 100.0%, RQD= 86.0%, GSI= 50-60, RMR = 52.						

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	DH-4
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 43
Eng./Geo.:	AKS	**Boring Location:**	76+09.40	**Offset:**	R:86.778'	**Alignment:**	Proposed
Elev.:	185.7 ft	**Latitude:**	34.024177	**Longitude:**	-81.129735	**Date Started:**	1/4/2018
Total Depth:	120.2 ft	**Soil Depth:**	51.8 ft	**Core Depth:**	68.4 ft	**Date Completed:**	1/9/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	HQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 12.0 ft	**24HR**	9.8 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				60.2				
		RC-3: Rec= 100%, RQD= 94.2%, GSI= 70-80.			RC-3			
120.7		@ 64.9 feet - very dark greenish-gray (GLEY 2 3/1), bluish-gray (GLEY 2 5/1), pale red (10R 6/3), fresh.		65.2				
					RC-4			
		RC-4: Rec= 98.0%, RQD= 98.0%, GSI= 70-80, RMR = 61.						
115.7				70.2				
		@ 70.8 feet - epidote mineralization.						
					RC-5			
		RC-5: Rec= 100.0%, RQD= 100.0%, GSI= 70-80.						
		@ 74.3 feet - epidote mineralization.						
110.7				75.2				
					RC-6			
		RC-6: Rec= 100.0%, RQD= 100.0%, GSI= 70-80, RMR = 61.						

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	DH-4
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 43
Eng./Geo.:	AKS	**Boring Location:**	76+09.40	**Offset:**	R:86.778'	**Alignment:**	Proposed
Elev.:	185.7 ft	**Latitude:**	34.024177	**Longitude:**	-81.129735	**Date Started:**	1/4/2018
Total Depth:	120.2 ft	**Soil Depth:**	51.8 ft	**Core Depth:**	68.4 ft	**Date Completed:**	1/9/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	HQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 12.0 ft	**24HR**	9.8 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		@ 80.0 feet - pyrite mineralization.		80.2				
		@ 81.8 feet - quartz veins, pyrite mineralization throughout RC-7.			RC-7			
		RC-7: Rec= 100.0%, RQD= 94.0%, GSI= 70-80.						
100.7		@ 85.2 feet - quartz veins, pyrite throughout RC-8.		85.2				
					RC-8			
		RC-8: Rec= 100.0%, RQD= 88.0%, GSI= 65-75, RMR = 58.						
95.7				90.2				
					RC-9			
		RC-9: Rec= 100.0%, RQD= 94.0%, GSI= 75-85.						
90.7				95.2				
		@ 97.6 feet - pegmatite dike (epidote and quartz), light grayish-green (GLEY 6/1) and white (10YR 8.5/1).			RC-10			
		RC-10: Rec= 100.0%, RQD= 100.0%, GSI= 70-80, RMR = 66.						

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	DH-4
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Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	HQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 12.0 ft	**24HR**	9.8 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		@ 99 feet - very dark greenish-gray (GLEY 2 3/1), bluish-gray (GLEY 2 5/1) and pale red (10R 6/3), fresh, strong rock.		100.2				
		RC-11: Rec= 100.0%, RQD= 96.0%, GSI= 75-85.			RC-11			
80.7				105.2				
		RC-12: Rec= 102.0%, RQD= 83%, GSI= 70-80, RMR = 48.			RC-12			
		@ 108.2 feet - pegmatite dike (quartz), white (10YR 8.5/1).						
75.7		@ 109.2 feet - very dark greenish-gray (GLEY 2 3/1), bluish-gray (GLEY 2 5/1), pale red (10R 6/3), fresh, strong rock.		110.2				
		@ 110.2 feet - bluish-gray (GLEY 2 5/1), foliated, slightly weathered, weak rock.						
		RC-13: Rec= 100.0%, RQD= 100%, GSI= 70-80.			RC-13			
70.7				115.2				
		RC-14: Rec= 96.0%, RQD= 96.0%, GSI= 70-80, RMR = 61.			RC-14			
		@ 119.6 feet - pegmatite dike (quartz, mica						

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
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AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

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Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 43
Eng./Geo.:	AKS	**Boring Location:**	76+09.40	**Offset:**	R:86.778'	**Alignment:**	Proposed
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Total Depth:	120.2 ft	**Soil Depth:**	51.8 ft	**Core Depth:**	68.4 ft	**Date Completed:**	1/9/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	HQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 12.0 ft	**24HR**	9.8 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	120.2	and feldspar), white (10YR 8.5/1), pale yellow (5Y 8/3), fresh, strong rock.						
		Boring Terminated at 120.2 feet.						
60.7								
55.7								
50.7								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
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Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Millwood
Logged By: Austin Syms
Date: 1/4/2018 - 1/9/2018

Boring Number: DH-4
Core Barrel Type: HQ
Core Barrel Length: 5 feet
Coring Technique: Wireline
Number of Core Boxes: 5

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
52.4	1	J	50	N	No	N/A	Pl	R	
52.9	2	J	9	N	No	N/A	W	R	
53.6	3	J	32	MW	No	N/A	Pl	R	
53.7	4	J	0	N	No	N/A	W	R	
55	5	J	43	MW	No	N/A	Pl	SR	
54.3	6	V	47	W	Fi	Ca	Pl	N/A	
55.5	7	V	55	MW	Fi	Ca	Pl	N/A	
57.4	8	J	26	T	No	N/A	W	R	
58.7	9	J	14	T	No	N/A	Pl	R	
58.9	10	J	5	T	No	N/A	Pl	R	
59.5	11	J	20	T	No	N/A	Pl	R	
63.3	12	J	63	T	No	N/A	Pl	R	
64.7	13	J	65	T	No	N/A	Pl	SR	
67.8	14	J	9	T	No	N/A	W	SR	
69.1	15	J	0	T	No	N/A	St	R	
69.7	16	J	6	T	No	N/A	Pl	SR	
71.6	17	J	27	T	No	N/A	St	R	
74.5	18	J	10	T	No	N/A	Pl	SR	
76.3	19	J	21	T	No	N/A	Pl	SR	
77.2	20	J	13	T	No	N/A	Pl	SR	
78.2	21	V	35	MW	Fi	Qz	Pl	N/A	
78.9	22	V	63	W	Fi	Qz	Pl	N/A	
81.4	23	J	25	T	No	N/A	Pl	R	
81.6	24	J	16	T	No	N/A	St	R	
82.5	25	J	11	T	No	N/A	Pl	R	
83.6	26	J	25	T	No	N/A	W	R	
84.1	27	J	18	T	No	N/A	Pl	R	
85.8	28	J	0	T	No	N/A	Pl	R	
87	29	J	0	T	No	N/A	Pl	R	

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Millwood
Logged By: Austin Syms
Date: 1/4/2018 - 1/9/2018

Boring Number: DH-4
Core Barrel Type: HQ
Core Barrel Length: 5 feet
Coring Technique: Wireline
Number of Core Boxes: 5

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
87.9	30	J	0	T	No	N/A	Pl	R	
88.2	31	J	0	T	No	N/A	W	R	
88.8	32	J	N/A	N/A	No	N/A	N/A	N/A	Fractured zone 88.8' - 89.6'
91.9	33	J	0	T	No	N/A	St	SR	
92.9	34	J	15	T	No	N/A	Pl	SR	
93.2	35	J	12	T	Fi	Qz	W	R	
91.4	36	V	46	MW	Fi	Qz/Py	W	N/A	
91.9	37	V	72	MW	Fi	Qz/Py	Pl	N/A	
95.3	42	V	44	MW	Fi	Qz	Pl	N/A	
96	43	V	83	N	Fi	Epidote	Pl	N/A	
96.5	44	V	78	N	Fi	Epidote	Pl	N/A	
96.7	40	J	12	T	No	N/A	Pl	R	
97.4	45	V	85	N	Fi	Epidote	Pl	N/A	
97.8	38	J	26	T	No	N/A	St	R	
98.2	39	J	8	T	No	N/A	Pl	R	
99.4	41	J	0	T	No	N/A	St	SR	
104.3	46	J	14	T	No	N/A	Pl	SR	
104.6	47	J	17	T	No	N/A	Pl	SR	
106.1	48	J	47	T	No	N/A	Pl	R	
106.4	49	J	46	T	No	N/A	Pl	R	
107.8	50	J	27	T	No	N/A	St	R	
108	51	J	0	T	No	N/A	Pl	R	
109.3	52	J	0	T	No	N/A	Pl	R	
111	53	Sh	63	T	No	N/A	Pl	Slk	
111.8	54	Sh	6	T	No	N/A	Pl	Slk	
113.6	55	Sh	62	T	No	N/A	Pl	Slk	
114.8	56	Sh	39	T	No	N/A	Pl	Slk	
116.5	57	J	15	T	No	N/A	Pl	R	
117.6	58	J	0	T	No	N/A	Ir	SR	

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Millwood
Logged By: Austin Syms
Date: 1/4/2018 - 1/9/2018

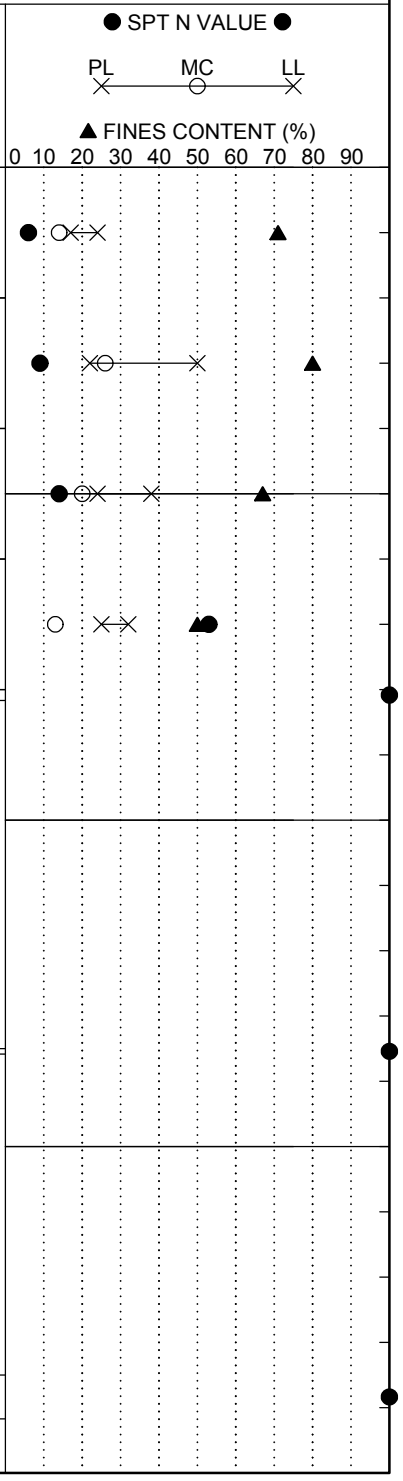
Boring Number: DH-4
Core Barrel Type: HQ
Core Barrel Length: 5 feet
Coring Technique: Wireline
Number of Core Boxes: 5

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
118.7	59	Sh	35	T	No	N/A	Pl	Slk	
119.6	60	J	0	T	No	N/A	Pl	SR	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	DH-5
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	ELF/MFC	**Boring Location:**	262+96.46	**Offset:**	R:138.025'	**Alignment:**	Proposed
Elev.:	165.7 ft	**Latitude:**	34.045222	**Longitude:**	-81.078785	**Date Started:**	1/4/2018
Total Depth:	120.6 ft	**Soil Depth:**	42 ft	**Core Depth:**	78.6 ft	**Date Completed:**	1/9/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 750	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.0%
Core Size:	HQ	**Driller:**	S. Gowan	**Groundwater:**	**TOB** N/A	**24HR**	7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0		0.0						
	0.2	**SURFACE MATERIALS** - 2 inches of TOPSOIL.							
		ALLUVIUM - SILTY CLAY WITH SAND (CL-ML) - firm, moist, brownish yellow (10YR 6/8), subangular, mostly low plasticity fines, little fine to medium sands, few gravel-sized quartz, [LL=24, PL=17, PI=7, NMC=13.6%, %#200=70.8], AASHTO = A-4 (3).		SS-1	3	4	2	3	6
	2.0		2.0						
				SS-2	3	3	6	5	9
	4.0	**PIEDMONT RESIDUUM - FAT CLAY WITH SAND (CH)** - stiff, moist, reddish yellow (7.5YR 6/8), mostly mostly high plasticity fines, little fine sands, [LL=50, PL=22, PI=28, NMC=26.3%, %#200=79.5], AASHTO = A-7-6 (23).	4.0						
160.7				SS-3	5	5	9	19	14
	5.5								
	6.0	**GRAVELLY LEAN CLAY WITH SAND (CL)** - stiff, moist, reddish yellow (7.5YR 6/8), mostly low plasticity fines, little gravel rock fragments, little fine to medium sands, [LL=38, PL=24, PI=17, NMC=20.0%, %#200=66.6], AASHTO = A-6 (8).	6.0						
				SS-4	12	11	42	56	53
			8.0	SS-5	50/2"	-	-		100
155.7		**SANDY SILT (ML)** - stiff, moist to wet, strong brown (7.5YR 4/6), subangular, mostly low plasticity fines, some fine to coarse sands, few rock fragments.							
		PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM) - very dense, moist, strong brown (7.5YR 4/6), mostly fine to medium sands, some low plasticity fines, [LL=32, PL=25, PI=7, NMC=13.1%, %#200=49.5], AASHTO = A-4 (1).							
		@ 13.5 feet - pinkish-gray (7.5YR 6/2).	13.5	SS-6	50/1"	-	-		100
150.7									
		@ 18.5 feet - strong brown (7.5YR 4/6), trace mica.	18.5	SS-7	32	50/2"	-	-	100



LEGEND

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SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
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SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	DH-5
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	ELF/MFC	**Boring Location:**	262+96.46	**Offset:**	R:138.025'	**Alignment:**	Proposed
Elev.:	165.7 ft	**Latitude:**	34.045222	**Longitude:**	-81.078785	**Date Started:**	1/4/2018
Total Depth:	120.6 ft	**Soil Depth:**	42 ft	**Core Depth:**	78.6 ft	**Date Completed:**	1/9/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 750	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.0%
Core Size:	HQ	**Driller:**	S. Gowan	**Groundwater:**	**TOB** N/A	**24HR**	7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
				23.5	SS-8	50/3"	-	-		100
140.7										
		@ 28.5 feet - dark brown (7.5YR 3/4), few gravel-sized rock fragments.		28.5	SS-9	17	50/2"	-		100
135.7										
		@ 33.5 feet - gray (7.5YR 6/1), some gravel-sized rock fragments, little low plasticity fines.		33.5	SS-10	50/2"	-	-		100
130.7										
				38.5	SS-11	50/1"	-	-		100

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
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Drill Machine:	CME 750	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.0%
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Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	42.0	Tri-Cone Bit Refusal at 42 feet. Install HW Casing to 42 feet for HQ wireline coring.		42.0				
		For discontinuity descriptors, see discontinuity worksheet.			RC-1			
120.7		**METAMORPHIC BEDROCK - SCHIST** - gray (10YR 5/1), fine-grained to very fine-grained, foliated (foliation dipping 40 to 60 degrees), fresh, strong rock.		45.6				
		@ 42 TO 43.2 feet - highly weathered, weak rock. RC-1: Rec= 86%, RQD= 58%, GSI= 70-80.			RC-2			
		RC-2: Rec= 100%, RQD= 74%, GSI= 0-10, RMR= 46.		50.6				
115.7					RC-3			
		RC-3: Rec= 100%, RQD= 57%, GSI= 0-10.		55.6				
110.7		@ 57.5 feet - moderately weathered, medium strong rock.			RC-4			

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
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Core Size:	HQ	**Driller:**	S. Gowan	**Groundwater:**	**TOB** N/A	**24HR**	7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		RC-4: Rec= 100%, RQD= 67.5%, GSI= 0-10, RMR= 44.		60.6	RC-5			
100.7		RC-5: Rec= 100%, RQD= 95%, GSI= 10-20, RMR= 29.		65.6	RC-6			
		@ 68.2 to 71 feet - highly weathered, weak.						
95.7		RC-6: Rec= 94%, RQD= 25%, GSI= 10-20.		70.6	RC-7			
90.7		RC-7: Rec= 94%, RQD= 45%, GSI= 0-10.		75.6	RC-8			

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LEGEND

SAMPLER TYPE		DRILLING METHOD	
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SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

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Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	ELF/MFC	**Boring Location:**	262+96.46	**Offset:**	R:138.025'	**Alignment:**	Proposed
Elev.:	165.7 ft	**Latitude:**	34.045222	**Longitude:**	-81.078785	**Date Started:**	1/4/2018
Total Depth:	120.6 ft	**Soil Depth:**	42 ft	**Core Depth:**	78.6 ft	**Date Completed:**	1/9/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 750	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.0%
Core Size:	HQ	**Driller:**	S. Gowan	**Groundwater:**	**TOB** N/A	**24HR**	7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		RC-8: Rec= 100%, RQD= 90%, GSI= 10-20, RMR= 45.		80.6				
		@ 82.6 to 82.9 feet - moderately weathered, medium strong. RC-9: Rec= 100%, RQD= 82%, GSI= 10-20.			RC-9			
80.7		@ 84.8 feet - moderately to slightly weathered.		85.6				
		RC-10: Rec= 100%, RQD= 73%, GSI= 0-10, RMR= 35.			RC-10			
75.7		@ 91.6 feet - slightly weathered, medium strong rock.		90.6				
		RC-11: Rec= 100%, RQD= 81%, GSI= 10-20.			RC-11			
70.7				95.6				
		RC-12: Rec= 100%, RQD= 90%, GSI= 10-20, RMR= 50.			RC-12			

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	DH-5
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	ELF/MFC	**Boring Location:**	262+96.46	**Offset:**	R:138.025'	**Alignment:**	Proposed
Elev.:	165.7 ft	**Latitude:**	34.045222	**Longitude:**	-81.078785	**Date Started:**	1/4/2018
Total Depth:	120.6 ft	**Soil Depth:**	42 ft	**Core Depth:**	78.6 ft	**Date Completed:**	1/9/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 750	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.0%
Core Size:	HQ	**Driller:**	S. Gowan	**Groundwater:**	**TOB** N/A	**24HR**	7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				100.6				
		RC-13: Rec= 100%, RQD= 98%, GSI= 10-20.			RC-13			
60.7				105.6				
		RC-14: Rec= 100%, RQD= 43%, GSI= 0-10, RMR= 36.			RC-14			
55.7				110.6				
		@ 111.6 to 112.6 feet - slightly weathered.						
		RC-15: Rec= 96%, RQD= 46%, GSI= 10-20, RMR= 17.			RC-15			
50.7				115.6				
		@ 117.4 to 118.4 feet - slightly weathered.						
		RC-16: Rec= 100%, RQD= 41%, GSI= 0-10.			RC-16			

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	DH-5
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	ELF/MFC	**Boring Location:**	262+96.46	**Offset:**	R:138.025'	**Alignment:**	Proposed
Elev.:	165.7 ft	**Latitude:**	34.045222	**Longitude:**	-81.078785	**Date Started:**	1/4/2018
Total Depth:	120.6 ft	**Soil Depth:**	42 ft	**Core Depth:**	78.6 ft	**Date Completed:**	1/9/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 750	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.0%
Core Size:	HQ	**Driller:**	S. Gowan	**Groundwater:**	**TOB** N/A	**24HR**	7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	120.6	Boring Terminated at 120.6 feet.						
40.7								
35.7								
30.7								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Gowan
Logged By: Lehe Fender
Date: 1/4/2018 - 1/9/2018

Boring Number: DH-5
Core Barrel Type: HQ
Core Barrel Length: 5 feet
Coring Technique: Wireline
Number of Core Boxes: 6

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
42.4	1	J	3	W	No	N/A	Pl	R	
43.1	2	J	31	VN	No	N/A	Pl	SR	
43.5	3	J	9	W	Fi	Sd/Cl	Ir	R	
44	4	J	11	W	Pa	Sd/Cl	Ir	R	
44.5	5	J	36	VN	No	N/A	Pl	SR	
44.8	6	V	52	W	Fi	Qz	Pl	N/A	
47.9	7	J	43	VN	No	N/A	Pl	SR	
48.3	8	J	48	W	Su	Cl	Ir	R	Fractured zone 48.3' - 49.0'
49.5	9	J	41	MW	Su	Cl	Ir	SR	
49.8	10	J	40	W	Su	Sd/Cl	Ir	SR	
50.9	11	J	39	VN	No	N/A	Pl	SR	
52.4	12	J	47	VN	No	N/A	Pl	SR	
52.7	13	J	36	W	No	N/A	Pl	SR	Fractured zone 52.7' - 53.3'
53.7	14	J	40	VN	No	N/A	Pl	S	
53.9	15	J	37	VN	Su	Ch	Pl	SR	
54.2	16	J	29	VN	No	N/A	St	SR	
54.7	17	J	39	VN	Su	Cl	Pl	SR	
54.9	18	J	30	W	No	N/A	Pl	SR	Fractured zone 54.9' - 55.1'
55.2	19	J	14	VN	No	N/A	Pl	SR	
55.9	20	J	29	MW	Su	Ch	Wa	S	
56.2	21	J	35	VN	No	N/A	Wa	SR	
57.2	22	J	39	W	Su	Sd/Cl	Ir	SR	Fractured zone 57.2' - 57.4'
58.2	23	J	50	W	Su	Sd/Cl	Ir	SR	Fractured zone 58.2' - 59.5'
60.3	24	J	54	N	Su	Sd/Cl	Ir	SR	
62	25	J	5	W	No	N/A	Ir	SR	
65.2	26	J	60	N	No	N/A	Wa	SR	
66.1	27	J	27	N	No	N/A	Pl	SR	
66.3	28	J	80	MW	No	N/A	Pl	SR	
67.5	29	J	10	VN	No	N/A	St	VR	
68.3	30	J	56	MW	No	N/A	Pl	SR	
68.5	31	J	50	W	Pa	Sd/Cl	Ir	SR	Fractured zone 68.5' - 68.9'
69.1	32	J	7	W	Pa	Sd/Cl	Ir	SR	Fractured zone 69.1' - 69.7'
69.9	33	J	15	W	Pa	Sd/Cl	Ir	R	
70.8	34	J	55	MW	Pa	Sd/Cl	Ir	SR	Fractured zone 70.8' - 71.0'
71.3	35	J	46	VN	No	N/A	Wa	VR	

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Gowan
Logged By: Lehe Fender
Date: 1/4/2018 - 1/9/2018

Boring Number: DH-5
Core Barrel Type: HQ
Core Barrel Length: 5 feet
Coring Technique: Wireline
Number of Core Boxes: 6

71.5	36	J	57	MW	Su	Qz	St	VR	
72	37	J	60	W	No	N/A	St	R	
72.4	38	J	49	MW	No	N/A	Ir	VR	
73.6	39	J	38	MW	No	N/A	St	R	
74.4	40	V	35	W	Fi	Qz	Pl	N/A	Fractured zone 74.4' - 74.6'
74.7	41	V	33	W	Fi	Qz	Pl	N/A	Fractured zone 74.7' - 75.0'
75.8	42	J	17	MW	Pa	Qz	Pl	SR	
75.9	43	J	51	N	Su	Cl	Pl	SR	
77	44	J	45	N	No	N/A	Pl	SR	
80.4	45	J	18	VN	No	N/A	Wa	SR	
81.4	46	J	5	MW	No	N/A	Ir	SR	
81.9	47	J	84	W	Su	Cl	Ir	SR	Fractured zone 81.9' - 82.2'
84	48	J	29	N	No	N/A	St	VR	
84.8	49	J	37	MW	No	N/A	Pl	SR	
84.9	50	J	32	W	No	N/A	Ir	SR	Fractured zone 84.9' - 85.1'
86.4	51	J	34	N	No	N/A	Pl	SR	
86.7	52	J	5	N	No	N/A	Pl	SR	
87.5	53	J	21	W	No	N/A	Ir	SR	
88.3	54	J	30	MW	No	N/A	Pl	SR	Fractured zone 88.3' - 88.5'
89.4	55	J	7	W	No	N/A	Wa	SR	
89.9	56	J	58	W	No	N/A	Pl	SR	
90.4	57	J	52	W	Pa	Qz	Ir	R	
91.6	58	J	67	W	Su	Fe	Ir	R	Fractured zone 91.6' - 92.0'
92.5	59	J	34	W	No	N/A	Pl	SR	
92.9	60	J	42	MW	No	N/A	Pl	SR	
93.3	61	J	8	W	No	N/A	Pl	SR	
99.1	62	J	6	MW	No	N/A	Wa	SR	
99.7	63	J	5	MW	No	N/A	Wa	SR	
99.9	64	J	9	W	Pa	Qz/Cl	Ir	R	Fractured zone 99.9' - 100.1'
100.3	65	J	19	N	Pa	Qz/Cl	Wa	R	
102.3	66	J	12	W	Su	Fe	Ir	R	
105.8	67	J	14	W	No	N/A	Wa	SR	
107.6	68	J	9	N	No	N/A	Pl	SR	
108.1	69	J	29	N	No	N/A	Pl	SR	
108.3	70	J	43	W	Pa	Qz	Ir	SR	Fractured zone 108.3' - 108.5'
108.6	71	J	27	MW	Pa	Qz	St	R	
108.7	72	J	42	W	No	N/A	St	VR	Fractured zone 108.7' - 108.9'

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Gowan
Logged By: Lehe Fender
Date: 1/4/2018 - 1/9/2018

Boring Number: DH-5
Core Barrel Type: HQ
Core Barrel Length: 5 feet
Coring Technique: Wireline
Number of Core Boxes: 6

109.2	73	J	76	W	No	N/A	Ir	VR	Fractured zone 109.2' - 109.7'
110	74	J	35	W	Pa	Qz	Ir	VR	Fractured zone 110.0' - 110.3'
111.1	75	J	85	W	Pa	Sd	Ir	VR	Fractured zone 111.1' - 112.4'
113.5	76	J	10	W	Pa	Sd	St	VR	
114	77	J	14	MW	Pa	Sd/Cl	St	SR	
114.5	78	J	12	W	Pa	Sd/Cl	Wa	SR	Fractured zone 114.5' - 114.6'
114.9	79	J	4	N	No	N/A	Pl	R	
115.6	80	J	82	N	Su	Sd	Pl	SR	Fractured zone 115.6' - 116.2'
116.5	81	J	14	W	No	N/A	Ir	R	
117.5	82	J	26	MW	No	N/A	Pl	SR	Fractured zone 117.5' - 117.6'
117.8	83	J	20	W	Su	Cl	Wa	SR	Fractured zone 117.8' - 117.9'
118.2	84	J	51	W	No	N/A	Pl	S	Fractured zone 118.2' - 118.4'
118.6	85	J	29	W	Su	Sd/Cl	Ir	SR	Fractured zone 118.6' - 118.8'
119.2	86	J	52	W	No	N/A	Ir	SR	Fractured zone 119.2' - 119.3'
119.7	87	J	20	W	No	N/A	Wa	SR	
120.4	88	J	49	W	No	N/A	Pl	S	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	DH-6
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	AKS/HGM	**Boring Location:**	438+20.13	**Offset:**	R:100.215'	**Alignment:**	Proposed
Elev.:	241.1 ft	**Latitude:**	34.013371	**Longitude:**	-81.108977	**Date Started:**	1/10/2018
Total Depth:	120.6 ft	**Soil Depth:**	25.6 ft	**Core Depth:**	95 ft	**Date Completed:**	1/16/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	HQ/NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	19.3 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0								
	0.3	**SURFACE MATERIALS** - 3 inches of TOPSOIL.	0.0	SS-1	4	4	5	8	9
	2.0	**FILL - SANDY FAT CLAY (CH)** - stiff, moist, reddish-yellow (5YR 7/8), mostly high plasticity fines, some fine to coarse sands, [LL=50, PL=23, PI=27, NMC=19.4%, %#200=52.1], AASHTO = A-7-6 (11).	2.0	SS-2	8	10	16	20	26
		PIEDMONT RESIDUUM- CLAYEY SAND (SC) - medium dense, moist, reddish-yellow (5YR 7/8) and gray (5YR 6/1), subangular, mostly fine to coarse sands, some high plasticity fines, [LL=50, PL=26, PI=24, NMC=17.2%, %#200=46.9], AASHTO = A-7-6 (7).	4.0	SS-3	10	15	35	50/2"	50
236.1	5.7	@ 4 feet - dense, reddish-yellow (5YR 7/8), white (5YR 8/1), and gray (5YR 6/1), some low plasticity fines, [LL=48, PL=25, PI=23, NMC=20.9%, %#200=46.3], AASHTO = A-7-6 (7).	6.0	SS-4	44	50/2"			100
		PARTIALLY WEATHERED ROCK (PWR) - POORLY GRADED SAND WITH SILT (SP-SM) - very dense, moist to wet, light yellowish-brown (10YR 6/4), subangular, mostly fine to coarse sands, few low plasticity fines.	8.0	SS-5	50/4"				100
231.1		@ 8 feet - light yellowish-brown (10YR 6/4) and white (10YR 8/1).	13.5	SS-6	50/5"				100
226.1									
		@ 18.5 feet - no recovery.	18.5	SS-7	50/1"				100

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	DH-6
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	AKS/HGM	**Boring Location:**	438+20.13	**Offset:**	R:100.215'	**Alignment:**	Proposed
Elev.:	241.1 ft	**Latitude:**	34.013371	**Longitude:**	-81.108977	**Date Started:**	1/10/2018
Total Depth:	120.6 ft	**Soil Depth:**	25.6 ft	**Core Depth:**	95 ft	**Date Completed:**	1/16/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	HQ/NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	19.3 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				23.5	SS-8	6 50/1"	100	
216.1	25.6	Tri-Cone Bit Refusal at 25.6 feet. Install HW Casing to 25.6 feet for HQ wireline coring.		25.6				
		For discontinuity descriptors, see discontinuity worksheet.			RC-1			
		IGNEOUS BEDROCK - GRANITE - gray (GLEY 1 6/) and light brown (7.5YR 6/3), coarse grained, massive, mostly fresh rock, some slight weathering near joints, strong to very strong rock.						
211.1		RC-1: Rec= 93.8%, RQD= 86.7%, GSI= 80-90, RMR = 64.		30.4				
		RC-2: Rec= 100%, RQD= 100%, GSI= 80-90.			RC-2			
206.1				35.4				
		RC-3: Rec= 100%, RQD= 100%, GSI= 75-85, RMR = 77.			RC-3			

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	DH-6
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	AKS/HGM	**Boring Location:**	438+20.13	**Offset:**	R:100.215'	**Alignment:**	Proposed
Elev.:	241.1 ft	**Latitude:**	34.013371	**Longitude:**	-81.108977	**Date Started:**	1/10/2018
Total Depth:	120.6 ft	**Soil Depth:**	25.6 ft	**Core Depth:**	95 ft	**Date Completed:**	1/16/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	HQ/NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	19.3 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		RC-4: Rec= 98%, RQD= 94.9%, GSI= 70-80.		40.4	RC-4			
196.1		@ 44.8 to 45.4 feet - slightly weathered.		45.4				
		@ 45.4 feet - gray (GLEY 1 6/N), light brown (7.5YR 6/3) and pink (5YR 8/4), fresh, very strong. RC-5: Rec= 100%, RQD= 73.3%, GSI= 70-80, RMR = 57.			RC-5			
191.1		RC-6: Rec= 100%, RQD= 100%, GSI= 70-80.		50.4	RC-6			
186.1		@ 55.4 feet - gray (GLEY 1 6/N) and pink (5YR 8/4), slightly weathered, strong. RC-7: Rec= 100%, RQD= 100%, GSI= 50-60, RMR = 67. @ 55.7 feet - fresh.		55.4	RC-7			
		RC-8: Rec= 92.3%, RQD= 96.7%, GSI=		59.3				

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	DH-6
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	AKS/HGM	**Boring Location:**	438+20.13	**Offset:**	R:100.215'	**Alignment:**	Proposed
Elev.:	241.1 ft	**Latitude:**	34.013371	**Longitude:**	-81.108977	**Date Started:**	1/10/2018
Total Depth:	120.6 ft	**Soil Depth:**	25.6 ft	**Core Depth:**	95 ft	**Date Completed:**	1/16/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	HQ/NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	19.3 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		75-85.		60.6	RC-8			
		RC-9: Rec= 100%, RQD= 95.8%, GSI= 75-85, RMR = 77.			RC-9			
176.1		@ 64.7 to 64.9 feet - slightly weathered.		65.6				
		RC-10: Rec= 100%, RQD= 96.7%, GSI= 75-85.			RC-10			
171.1		@ 69.1 to 70.6 feet - slightly weathered.		70.6				
		RC-11: Rec= 100%, RQD= 100%, GSI= 75-85, RMR = 82.			RC-11			
166.1				75.6				
		RC-12: Rec= 100%, RQD= 90.8%, GSI= 75-85.			RC-12			

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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	DH-6
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	AKS/HGM	**Boring Location:**	438+20.13	**Offset:**	R:100.215'	**Alignment:**	Proposed
Elev.:	241.1 ft	**Latitude:**	34.013371	**Longitude:**	-81.108977	**Date Started:**	1/10/2018
Total Depth:	120.6 ft	**Soil Depth:**	25.6 ft	**Core Depth:**	95 ft	**Date Completed:**	1/16/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	HQ/NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	19.3 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		RC-13: Rec= 100%, RQD= 100%, GSI= 80-90, RMR = 82.		80.6	RC-13			
156.1		RC-14: Rec= 100%, RQD= 98%, GSI= 80-90.		85.6	RC-14			
151.1		RC-15: Rec= 100%, RQD= 90%, GSI= 75-85, RMR = 82.		90.6	RC-15			
146.1		RC-16: Rec= 100%, RQD= 100%, GSI= 75-85.		95.6	RC-16			

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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	DH-6
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	AKS/HGM	**Boring Location:**	438+20.13	**Offset:**	R:100.215'	**Alignment:**	Proposed
Elev.:	241.1 ft	**Latitude:**	34.013371	**Longitude:**	-81.108977	**Date Started:**	1/10/2018
Total Depth:	120.6 ft	**Soil Depth:**	25.6 ft	**Core Depth:**	95 ft	**Date Completed:**	1/16/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	HQ/NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	19.3 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		RC-17: Rec= 100%, RQD= 100%, GSI= 80-90.		100.6	RC-17			
136.1		RC-18: Rec= 100%, RQD= 100%, GSI= 75-85.		105.6	RC-18			
131.1		RC-19: Rec= 100%, RQD= 100%, GSI= 70-80. @ 110.6 to 111 feet - slightly weathered. @ 111 feet - fresh.		110.6	RC-19			
126.1		RC-20: Rec= 100%, RQD= 100%, GSI= 75-85.		115.6	RC-20			

LEGEND

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SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	DH-6
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	AKS/HGM	**Boring Location:**	438+20.13	**Offset:**	R:100.215'	**Alignment:**	Proposed
Elev.:	241.1 ft	**Latitude:**	34.013371	**Longitude:**	-81.108977	**Date Started:**	1/10/2018
Total Depth:	120.6 ft	**Soil Depth:**	25.6 ft	**Core Depth:**	95 ft	**Date Completed:**	1/16/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	HQ/NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	19.3 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	120.6	Boring Terminated at 120.6 feet.						
116.1								
111.1								
106.1								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Gowan
Logged By: Austin Syms
Date: 1/10/2018 - 1/16/2018

Boring Number: DH-6
Core Barrel Type: HQ/NQ
Core Barrel Length: 5 feet
Coring Technique: Wireline
Number of Core Boxes: 8

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
26.5	1	J	4	T	N/A	N/A	Ir	Sr	
26.9	2	J	11	T	N/A	N/A	Pl	Sr	
31.8	3	V	54	MW	Fi	Qz	Pl	N/A	
38.1	4	J	N/A	N/A	N/A	N/A	Ir	R	Fractured zone 38.1' - 38.9'
40.5	5	J	10	T	N/A	N/A	Pl	R	
41.2	6	J	0	T	N/A	N/A	Pl	R	
42.2	7	J	3	T	N/A	N/A	Pl	R	
43	8	J	76	T	Fi	Fe	Pl	Sr	
44.8	9	J	N/A	N/A	N/A	N/A	Ir	R	Fractured zone 44.8' - 44.9'
47.1	10	J	5	MW	N/A	N/A	Pl	R	
47.5	11	J	5	MW	N/A	N/A	Pl	R	
48.9	12	J	0	MW	Sp	Fe	Pl	R	
49.5	13	J	60	MW	N/A	N/A	St	Sr	
51.4	14	J	5	MW	N/A	N/A	Pl	Sr	
53.7	15	J	18	MW	Fi	Ca	Pl	R	
55.7	16	J	5	W	Su	Fe	Ir	Sr	
55.9	17	J	10	MW	N/A	N/A	Wa	Sr	
56.1	18	J	5	MW	Sp	Fe	Ir	Sr	
56.3	19	J	5	MW	N/A	N/A	Pl	R	
57.1	20	J	0	MW	N/A	N/A	Pl	Sr	
57.3	21	J	5	MW	N/A	N/A	Ir	R	
58	22	J	5	MW	N/A	N/A	Pl	Sr	
58.2	23	J	5	W	Sp	Fe	Pl	Sr	
62.6	24	J	8	T	N/A	N/A	Ir	Sr	
64.5	25	J	0	T	N/A	N/A	Wa	Sr	
64.7	26	J	0	T	N/A	N/A	Ir	Sr	
68.9	27	J	0	T	N/A	N/A	Pl	Sr	
69.1	28	J	0	T	N/A	N/A	Ir	R	
74.3	29	J	0	T	N/A	N/A	Pl	Sr	
76.4	30	J	0	T	N/A	N/A	Ir	Sr	

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Gowan
Logged By: Austin Syms
Date: 1/10/2018 - 1/16/2018

Boring Number: DH-6
Core Barrel Type: HQ/NQ
Core Barrel Length: 5 feet
Coring Technique: Wireline
Number of Core Boxes: 8

76.6	31	J	3	T	N/A	N/A	Pl	Sr	
76.9	32	J	0	T	N/A	N/A	Pl	Sr	
91.7	33	J	0	T	N/A	N/A	Ir	Sr	
92.2	34	J	2	T	N/A	N/A	Wa	Sr	
97.4	35	J	6	T	N/A	N/A	Pl	Sr	
107.6	36	J	67	T	N/A	N/A	Pl	Sr	
108.1	37	J	13	T	N/A	N/A	Pl	Sr	
108.7	38	Sh	31	T	N/A	N/A	Pl	R	
110.7	39	J	N/A	N/A	N/A	N/A	Ir	Sr	Fractured zone 110.7' - 111'
112.7	40	J	0	T	N/A	N/A	Pl	Sr	
113.6	41	J	62	T	N/A	N/A	Pl	Sr	
115	42	J	3	T	N/A	N/A	Pl	R	
118.8	43	J	0	T	N/A	N/A	Pl	Sr	
119.3	44	J	0	T	N/A	N/A	Pl	Sr	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-1
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	ELF	**Boring Location:**	9+96.46	**Offset:**	R:54.189'	**Alignment:**	Proposed
Elev.:	322.7 ft	**Latitude:**	34.105588	**Longitude:**	-81.181915	**Date Started:**	1/21/2018
Total Depth:	10.5 ft	**Soil Depth:**	10.5 ft	**Core Depth:**	0 ft	**Date Completed:**	1/21/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.5	**SURFACE MATERIALS** - 6 inches of ASPHALT.		0.5						
		PIEDMONT RESIDUUM - SANDY LEAN CLAY (CL) - stiff, wet, grayish-brown (10YR 5/2), mostly low plasticity fines, some fine to coarse sands, [LL=30, PL=22, PI=8, NMC=16%, %#200=55], AASHTO = A-4 (2).			SS-1	11	5	5	5	10
		@ 2.5 feet - greenish-gray (10Y 6/1).		2.5	SS-2	5	5	6	6	11
		@ 4.5 feet - very stiff, yellowish-brown (10Y 5/6), gravel-sized rock fragments.		4.5	SS-3	7	7	16	50	23
317.7	6.5	**PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM)** - very dense, dry to moist, yellowish-brown (10YR 5/6) to greenish-gray (10Y 6/1), mostly fine to coarse sands, little low plasticity fines, gravel-sized rock fragments.		6.5	SS-4	22	50/5"			100
		@ 8.5 feet - yellowish-brown (10YR 5/6).		8.5	SS-5	50/3"				100
312.7	10.5	Boring Terminated at 10.5 feet.								
		Obtained bulk sample from auger cuttings 0.5 to 10.5 feet.								
307.7										

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

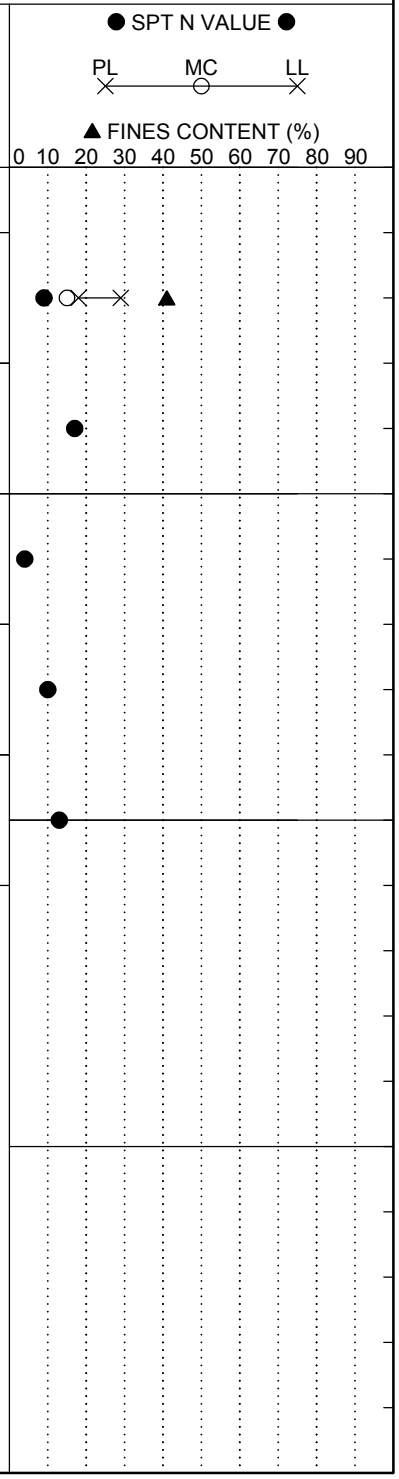
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-2
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	AKS	**Boring Location:**	21+90.37	**Offset:**	L:59.876'	**Alignment:**	Proposed
Elev.:	313.3 ft	**Latitude:**	34.103304	**Longitude:**	-81.179059	**Date Started:**	1/31/2018
Total Depth:	11 ft	**Soil Depth:**	11 ft	**Core Depth:**	0 ft	**Date Completed:**	1/31/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 12 inches of ASPHALT.								
	1.0	**PIEDMONT RESIDUUM - CLAYEY SAND (SC)** - loose, moist, yellowish-brown (10YR 5/6), mostly fine to medium sands, some low plasticity fines, relict rock structure, [LL=29, PL=18, PI=11, NMC=15%, %#200=40.5], AASHTO = A-6 (1).		1.0	SS-1	3	4	5	3	9
		@ 3 feet - medium dense.		3.0	SS-2	7	8	9	11	17
308.3		@ 5 feet - very loose, wet.		5.0	SS-3	3	2	2	4	4
		@ 7 feet - loose, moist.		7.0	SS-4	6	7	3	3	10
		@ 9 feet - medium dense.		9.0	SS-5	5	5	8	12	13
303.3	11.0	Boring Terminated at 11 feet.								
298.3										



LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-3
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	ELF	**Boring Location:**	29+68.41	**Offset:**	R:52.400'	**Alignment:**	Proposed
Elev.:	316.4 ft	**Latitude:**	34.101481	**Longitude:**	-81.177665	**Date Started:**	1/21/2018
Total Depth:	5.3 ft	**Soil Depth:**	10 ft	**Core Depth:**	0 ft	**Date Completed:**	1/21/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.9	**SURFACE MATERIALS** - 11 inches of ASPHALT.		0.9						
		PIEDMONT RESIDUUM - CLAYEY SAND (SC) - loose, wet, yellowish-brown (10YR 5/2), mostly fine to medium sands, some low plasticity fines, [LL=27, PL=19, PI=8, NMC=22%, %#200=43], AASHTO = A-4 (1).			SS-1	5	4	5	15	9
	2.9			2.9	SS-2	50/3"				100
311.4	5.3	**PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM)** - very dense, gray (10YR 5/1), mostly fine to coarse sands, little low plasticity fines, gravel-sized rock fragments.								
		Boring Terminated at 5.3 feet.								
306.4										
301.4										

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-4
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	AKS	**Boring Location:**	39+31.76	**Offset:**	L:49.101'	**Alignment:**	Proposed
Elev.:	328.7 ft	**Latitude:**	34.099699	**Longitude:**	-81.175284	**Date Started:**	1/31/2018
Total Depth:	3.6 ft	**Soil Depth:**	3.6 ft	**Core Depth:**	0 ft	**Date Completed:**	1/31/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
	0.0						
	0.8	**SURFACE MATERIALS** - 10 inches of ASPHALT.		0.8			
		PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM) - very dense, moist, light greenish-gray (GLEY 1 8/), mostly fine to coarse sands, little low plasticity fines, few weathered rock fragments, relict rock structure, [NMC=4%, %#200=12.3], AASHTO = A-1-b.			SS-1	21 27 50/5"	100
				2.8			
	3.6				SS-2	37 50/3"	100
		Boring Terminated at 3.6 feet due to auger refusal.					
323.7							
318.7							
313.7							

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

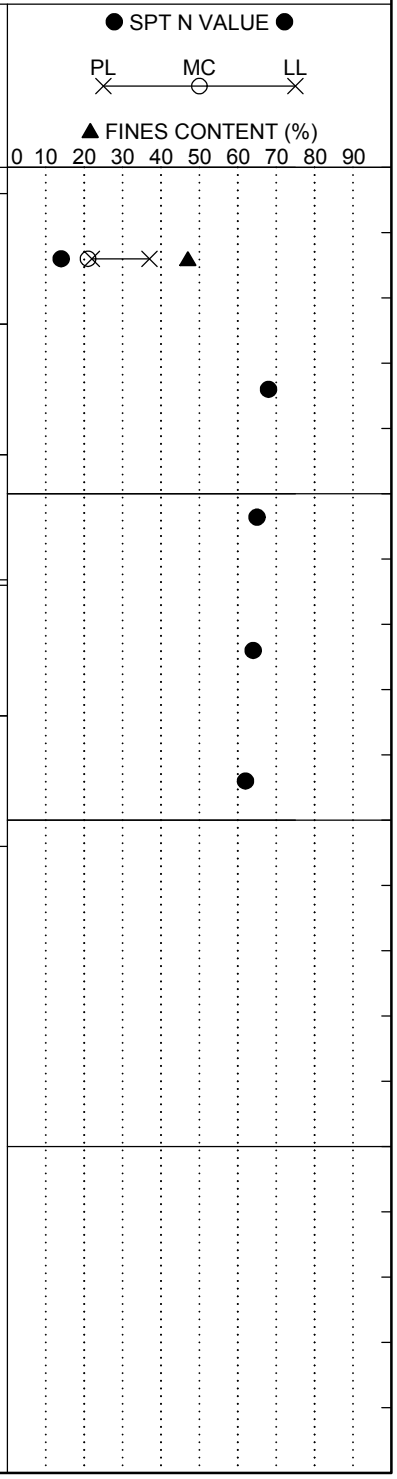
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-5
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	ELF	**Boring Location:**	49+45.25	**Offset:**	R:51.233'	**Alignment:**	Proposed
Elev.:	325.5 ft	**Latitude:**	34.097461	**Longitude:**	-81.173264	**Date Started:**	1/21/2018
Total Depth:	10.4 ft	**Soil Depth:**	10.4 ft	**Core Depth:**	0 ft	**Date Completed:**	1/21/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.4	**SURFACE MATERIALS** - 5 inches of ASPHALT.		0.4						
		PIEDMONT RESIDUUM - CLAYEY SAND (SC) - medium dense, wet, yellowish-red (5YR 5/6), mostly fine to medium sands, some low plasticity fines, few gravel-sized rock fragments, [LL=37, PL=22, PI=15, NMC=21%, %#200=47], AASHTO = A-6 (4).			SS-1	10	7	7	7	14
	2.4			2.4						
					SS-2	15	30	38	34	68
	4.4	**SILTY SAND WITH GRAVEL (SM)** - very dense, moist, brown (10YR 5/3), mostly fine to medium sands, some gravel-sized rock fragments, little low plasticity fines.		4.4						
320.5					SS-3	29	18	47	50/5"	65
		SILTY SAND (SM) - very dense, moist, light brownish-gray (10YR 6/2), mostly fine to medium sands, some mica, little low plasticity fines.		6.4						
		@ 6.4 feet - few gravel-sized rock fragments, absent mica.			SS-4	10	26	38	42	64
		@ 8.4 feet - brownish-yellow (10YR 6/6).		8.4						
					SS-5	15	25	27	34	62
315.5	10.4									
		Boring Terminated at 10.4 feet.								
		Obtained bulk sample from auger cuttings 0.4 to 10.4 feet.								
310.5										



LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-6
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	AKS	**Boring Location:**	64+46.81	**Offset:**	L:62.779'	**Alignment:**	Proposed
Elev.:	329.5 ft	**Latitude:**	34.094634	**Longitude:**	-81.169631	**Date Started:**	1/31/2018
Total Depth:	9.5 ft	**Soil Depth:**	9.5 ft	**Core Depth:**	0 ft	**Date Completed:**	1/31/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 13 inches of ASPHALT.								
	1.1	**PIEDMONT RESIDUUM - FAT CLAY (CH)** - stiff, moist, yellowish-brown (10YR 5/6), mostly high plasticity fines, few fine sands, [LL=97, PL=37, PI=60, NMC=42%, %#200=93], AASHTO = A-7-5 (67).		1.1	SS-1	3	4	5	5	9
	3.1	**SILTY SAND (SM)** - medium dense, dry to moist, light gray (10YR 7/2), mostly fine to medium sands, some low plasticity fines, relict rock structure.		3.1	SS-2	5	12	14	23	26
324.5		@ 5.1 feet - wet spoon, dark gray (10YR 4/1).		5.1	SS-3	5	7	11	19	18
	7.1	**PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM)** - very dense, dry to moist, light gray (10YR 7/2), mostly fine to medium sands, some low plasticity fines, relict rock structure.		7.1	SS-4	47 50/4"				100
	9.5			9.1	SS-5	50/5"				100
319.5		Boring Terminated at 9.5 feet.								
314.5										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-7
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	ELF	**Boring Location:**	69+67.88	**Offset:**	R:52.021'	**Alignment:**	Proposed
Elev.:	333.3 ft	**Latitude:**	34.093365	**Longitude:**	-81.168746	**Date Started:**	1/21/2018
Total Depth:	11 ft	**Soil Depth:**	11 ft	**Core Depth:**	0 ft	**Date Completed:**	1/21/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**<u>SURFACE MATERIALS</u>** - 12 inches of ASPHALT.								
	1.0	**<u>PIEDMONT RESIDUUM</u> - SANDY LEAN CLAY (CL)** - very stiff, moist, light red (2.5YR 6/6), mostly low plasticity fines, some fine to medium sands, [LL=36, PL=24, PI=12, NMC=19%, %#200=66], AASHTO = A-6 (7).		1.0						
		@ 3 feet - hard.			SS-1	15	8	8	11	16
				3.0	SS-2	6	15	19	20	34
328.3	5.0	**POORLY GRADED SAND WITH SILT (SP-SM)** - dense, moist, light red (2.5YR 6/6), mostly fine to medium sands, few gravel-sized rock fragments, few plasticity fines.		5.0	SS-3	12	13	23	27	36
		@ 7 feet - medium dense, absent rock fragments.		7.0	SS-4	11	12	14	13	26
		@ 9 feet - dense.		9.0	SS-5	18	21	19	21	40
323.3	11.0	Boring Terminated at 11 feet.								
318.3										

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

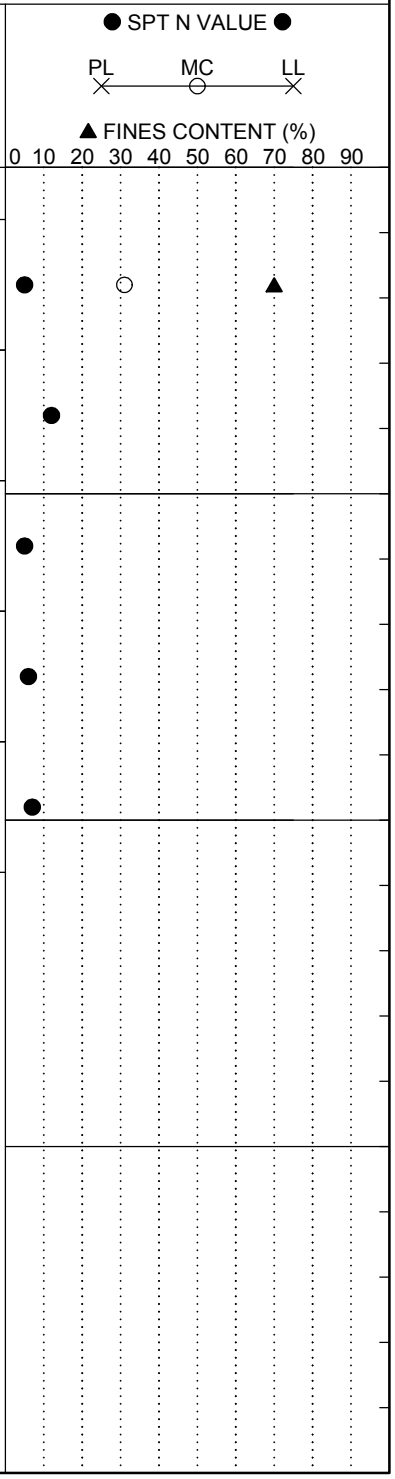
LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-8
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	AKS	**Boring Location:**	79+93.28	**Offset:**	L:55.315'	**Alignment:**	Proposed
Elev.:	299.1 ft	**Latitude:**	34.091489	**Longitude:**	-81.166193	**Date Started:**	1/31/2018
Total Depth:	10.8 ft	**Soil Depth:**	10.8 ft	**Core Depth:**	0 ft	**Date Completed:**	1/31/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.8	**SURFACE MATERIALS** - 10 inches of ASPHALT.		0.8						
		FILL - SILT WITH SAND (ML) - firm, moist, red (2.5YR 5/8), mostly low plasticity fines, little fine to medium sands, [NMC=31%, %#200=70.3], AASHTO = A-4 (0).			SS-1	6	3	2	5	5
		@ 2.8 feet - stiff.		2.8	SS-2	6	5	7	6	12
294.1		@ 4.8 feet - firm, bluish-gray (5/5B).		4.8	SS-3	3	2	3	4	5
				6.8	SS-4	3	3	3	4	6
		@ 8.8 feet - trace organics.		8.8	SS-5	3	3	4	4	7
289.1	10.8	Boring Terminated at 10.8 feet.								
284.1										



LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-9
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	ELF	**Boring Location:**	89+92.10	**Offset:**	R:49.026'	**Alignment:**	Proposed
Elev.:	300.8 ft	**Latitude:**	34.089262	**Longitude:**	-81.164236	**Date Started:**	1/21/2018
Total Depth:	10.7 ft	**Soil Depth:**	10.7 ft	**Core Depth:**	0 ft	**Date Completed:**	1/21/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.7	**SURFACE MATERIALS** - 8 inches of ASPHALT.		0.7						
		PIEDMONT RESIDUUM - SILTY CLAYEY SAND WITH GRAVEL (SC-SM) - medium dense, moist, red (2.5YR 4/6), mostly fine to medium sands, little gravel-sized rock fragments, little low plasticity fines, [LL=22, PL=15, PI=7, NMC=8%, %#200=23], AASHTO = A-2-4.			SS-1	10	7	9	10	16
	2.7	**SANDY SILT (ML)** - stiff, moist, light yellowish-brown (10YR 6/4), mostly low plasticity fines, some fine to medium sands, few gravel-sized rock fragments.		2.7	SS-2	5	6	7	7	13
295.8	4.7	**SILTY SAND WITH GRAVEL (SM)** - very dense, dry to moist, light brownish-gray (10YR 6/2), mostly fine to coarse sands, little low plasticity fines, little gravel-sized rock fragments.		4.7	SS-3	9	26	21	22	47
	6.7	**PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND WITH GRAVEL (SM)** - very dense, dry to moist, light brownish-gray (10YR 6/2), mostly fine to coarse sands, some gravel-sized rock fragments, little low plasticity fines.		6.7	SS-4	11	30	50/5"		100
290.8	8.7	**PIEDMONT RESIDUUM - SILTY SAND (SM)** - dense, relatively dry, dark yellowish-brown (10YR 4/4), few gravel-sized rock fragments, some mica.		8.7	SS-5	19	29	12	15	41
	10.7	Boring Terminated at 10.7 feet.								
285.8										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-10
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	AKS	**Boring Location:**	103+56.27	**Offset:**	L:52.118'	**Alignment:**	Proposed
Elev.:	286.8 ft	**Latitude:**	34.086569	**Longitude:**	-81.161088	**Date Started:**	1/31/2018
Total Depth:	5 ft	**Soil Depth:**	5 ft	**Core Depth:**	0 ft	**Date Completed:**	1/31/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 14 inches of ASPHALT.								
	1.2	**PIEDMONT RESIDUUM - SILTY SAND WITH GRAVEL (SM)** - dense, moist, bluish gray (5/5B), mostly fine to coarse sands, little low plasticity fines, little weathered rock fragments, trace mica, relict rock structure, [LL=31, PL=23, PI=8, NMC=10%, %#200=16.4], AASHTO = A-2-4.		1.2	SS-1	5	12	18	50/3"	30
	3.2			3.2	SS-2	50/2"	-	-	-	100
281.8	5.0	**PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM)** - very dense, moist, bluish gray (5/5B), mostly fine to coarse sands, some low plasticity fines, relict rock structure.								
		Boring Terminated at 5 feet due to Auger Refusal.								
		Obtained bulk sample from auger cuttings 1.2 to 5.0 feet.								
276.8										
271.8										

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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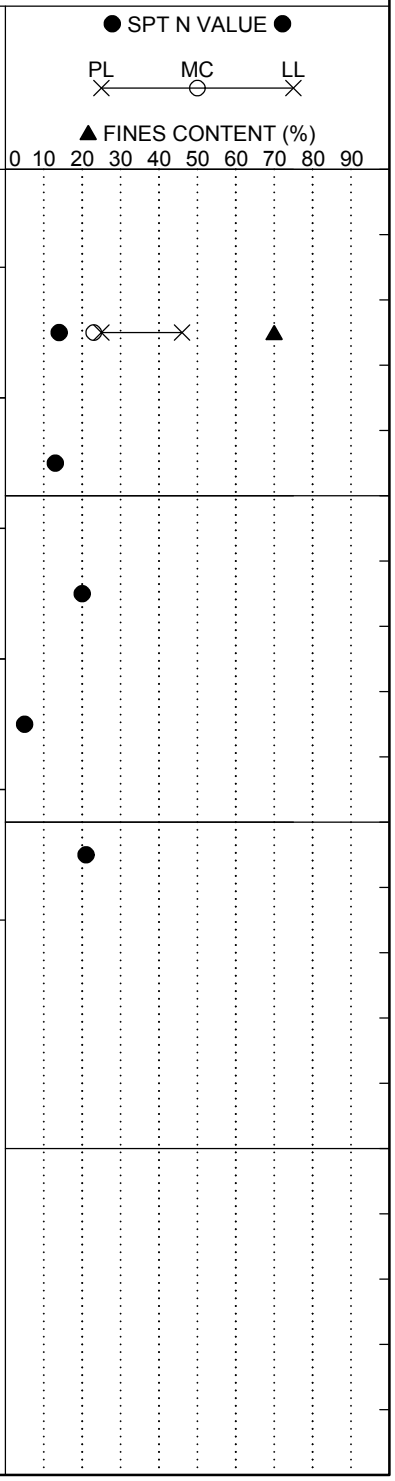
SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-11
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	HGM	**Boring Location:**	109+93.55	**Offset:**	R:62.520'	**Alignment:**	Proposed
Elev.:	273.9 ft	**Latitude:**	34.085019	**Longitude:**	-81.160037	**Date Started:**	1/22/2018
Total Depth:	11.5 ft	**Soil Depth:**	11.5 ft	**Core Depth:**	0 ft	**Date Completed:**	1/22/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 18 inches of ASPHALT.								
	1.5	**PIEDMONT RESIDUUM - SANDY LEAN CLAY (CL)** - stiff, moist, yellowish-red (5YR 4/6), mostly low plasticity fines, little fine sands, trace gravel sized rock fragments, [LL=46, PL=25, PI=21, NMC=23%, %#200=70], AASHTO = A-7-6 (14).		1.5	SS-1	3	6	8	25	14
	3.5	**SILTY SAND (SM)** - medium dense, dry to moist, light gray (10YR 7/2), mostly fine sands, some low plasticity fines, weathered rock fragments.		3.5	SS-2	7	7	6	9	13
268.9	5.5	**SILT WITH SAND (ML)** - very stiff, moist, yellowish-red (5YR 4/6), mostly low plasticity fines, little fine sands.		5.5	SS-3	9	12	8	5	20
	7.5	**ELASTIC SILT WITH SAND (MH)** - firm, moist to wet, very pale brown (10YR 7/3), high plasticity fines, little fine to medium sands.		7.5	SS-4	2	2	3	3	5
263.9		@ 9.5 feet - very stiff, yellow (10YR 8/6).		9.5	SS-5	4	9	12	13	21
	11.5	Boring Terminated at 11.5 feet.								
258.9										



LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-12
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	AKS	**Boring Location:**	119+99.95	**Offset:**	L:49.323'	**Alignment:**	Proposed
Elev.:	285.9 ft	**Latitude:**	34.083085	**Longitude:**	-81.157632	**Date Started:**	1/30/2018
Total Depth:	9.6 ft	**Soil Depth:**	9.6 ft	**Core Depth:**	0 ft	**Date Completed:**	1/30/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 15 inches of ASPHALT.					
	1.3	**PARTIALLY WEATHERED ROCK (PWR) - SILTY CLAYEY SAND (SC-SM)** - very dense, dry to moist, very pale brown (10YR 8/3), mostly fine to coarse sands, little low plasticity fines, few weathered rock fragments, relict rock structure, [LL=27, PL=21, PI=6, NMC=6%, %#200=17.1], AASHTO = A-1-b.		1.3	SS-1	10 21 50/5"	100
				3.3	SS-2	50 50/4"	100
280.9				5.3	SS-3	23 23 34 50/3"	100
				7.3	SS-4	50 50/4"	100
	9.6			9.3	SS-5	50/4"	100
275.9		Boring Terminated at 9.6 feet due to auger refusal.					
270.9							

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-13
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	HGM	**Boring Location:**	130+35.10	**Offset:**	R:43.277'	**Alignment:**	Proposed
Elev.:	305.6 ft	**Latitude:**	34.080732	**Longitude:**	-81.155686	**Date Started:**	1/22/2018
Total Depth:	11.5 ft	**Soil Depth:**	11.5 ft	**Core Depth:**	0 ft	**Date Completed:**	1/22/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 18 inches of ASPHALT.								
	1.5	**PIEDMONT RESIDUUM - SANDY LEAN CLAY (CL)** - stiff, moist, red (2.5YR 5/8), mostly low plasticity fines, some fine to medium sands, [LL=31, PL=21, PI=10, NMC=15%, %#200=52], AASHTO = A-4 (3).		1.5	SS-1	8	6	9	7	15
	3.5	**SILT WITH SAND (ML)** - stiff, dry to moist, reddish-yellow (7.5YR 7/8), mostly low plasticity fines, little fine sands.		3.5	SS-2	8	4	6	7	10
300.6		@ 5.5 feet - moist, red (2.5YR 5/8).		5.5	SS-3	5	6	7	7	13
		@ 7.5 feet - firm, brown (7.5 YR 5/3).		7.5	SS-4	2	4	4	5	8
295.6		@ 9.5 feet - stiff, mostly low to medium plasticity fines.		9.5	SS-5	4	5	6	4	11
	11.5	Boring Terminated at 11.5 feet.								
290.6										

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-14
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	AKS	**Boring Location:**	139+93.05	**Offset:**	L:50.625'	**Alignment:**	Proposed
Elev.:	320.6 ft	**Latitude:**	34.078869	**Longitude:**	-81.153429	**Date Started:**	1/30/2018
Total Depth:	10.7 ft	**Soil Depth:**	10.7 ft	**Core Depth:**	0 ft	**Date Completed:**	1/30/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.7	**SURFACE MATERIALS** - 8 inches of ASPHALT.		0.7						
	2.7	**PIEDMONT RESIDUUM - SANDY FAT CLAY (CH)** - stiff, moist, red (2.5YR 5/6), mostly high plasticity fines, some fine to medium sands, few weathered rock fragments, relict rock structure, [LL=51, PL=25, PI=26, NMC=26%, %#200=64.7], AASHTO = A-7-6 (16).		2.7	SS-1	11	8	6	7	14
					SS-2	6	7	8	10	15
315.6		**SILTY SAND (SM)** - medium dense, moist, red (2.5YR 5/6), subangular, mostly fine to medium sands, some low plasticity fines.		4.7	SS-3	2	3	4	5	7
		@ 4.7 feet - loose, moist to wet, mostly fine to coarse sands, few weathered rock fragments.		6.7	SS-4	4	3	4	4	7
		@ 6.7 feet - pink (2.5YR 8/3), absent weathered rock fragments.		8.7	SS-5	6	10	9	10	19
310.6		@ 8.7 feet - medium dense, pale yellow (5YR 8/3).								
	10.7	Boring Terminated at 10.7 feet.								
305.6										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

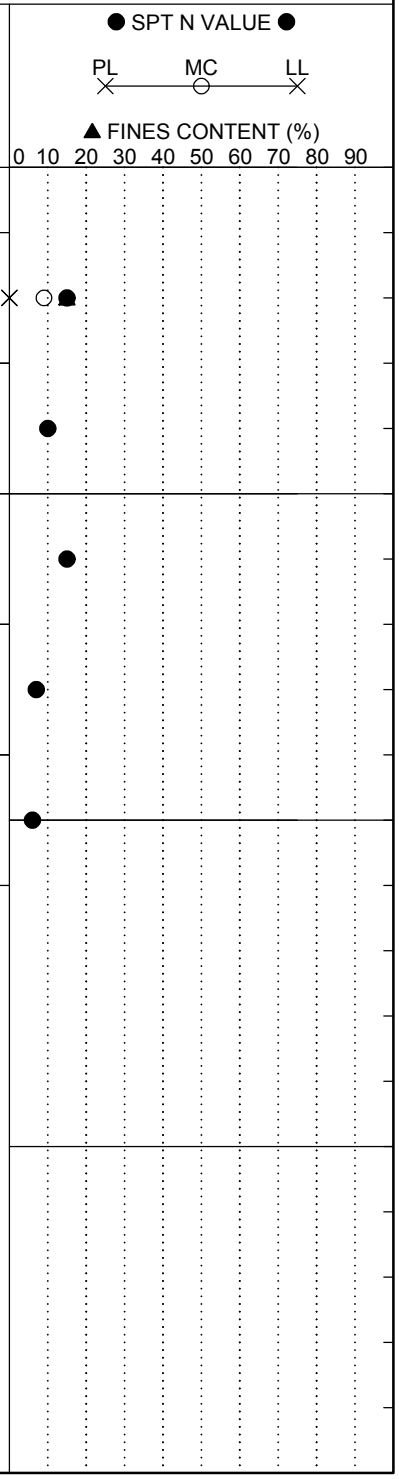
LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-15
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	HGM	**Boring Location:**	149+93.71	**Offset:**	R:46.977'	**Alignment:**	Proposed
Elev.:	298.4 ft	**Latitude:**	34.076580	**Longitude:**	-81.151569	**Date Started:**	1/22/2018
Total Depth:	11 ft	**Soil Depth:**	11 ft	**Core Depth:**	0 ft	**Date Completed:**	1/22/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 12 inches of ASPHALT.		1.0						
	1.0	**PIEDMONT RESIDUUM - SILTY SAND (SM)** - medium dense, moist, red (2.5 YR 5/8), mostly fine to medium sands, little non-plastic fines, [LL=NP, PL=NP, PI=NP, NMC=9%, %#200=15], AASHTO = A-2-4.		3.0	SS-1	6	7	8	5	15
	3.0	**SANDY SILT (ML)** - stiff, moist, light gray (5YR 7/1), mostly low plasticity fines, some fine sands, few weathered rock fragments.		3.0	SS-2	3	5	5	6	10
293.4		@ 5 feet - very pale brown and gray (10YR 7/3 & 10YR 6/1), absent rock fragments.		5.0	SS-3	5	8	7	8	15
		@ 7 feet - firm, trace fine gravel-sized rock fragments.		7.0	SS-4	1	2	5	5	7
	9.0	**ELASTIC SILT WITH SAND (MH)** - firm, moist, light yellowish-brown (10YR 6/4), mostly medium to high plasticity fines, little fine sands.		9.0	SS-5	2	3	3	4	6
288.4	11.0	Boring Terminated at 11 feet.								
		Obtained bulk sample from auger cuttings 1 to 11 feet.								
283.4										



LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-16
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	AKS	**Boring Location:**	159+97.75	**Offset:**	L:50.299'	**Alignment:**	Proposed
Elev.:	269.5 ft	**Latitude:**	34.074625	**Longitude:**	-81.149206	**Date Started:**	1/30/2018
Total Depth:	9.1 ft	**Soil Depth:**	9.1 ft	**Core Depth:**	0 ft	**Date Completed:**	1/30/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.8	**SURFACE MATERIALS** - 10 inches of ASPHALT.		0.8						
		FILL - CLAYEY SAND (SC) - medium dense, moist, red (2.5YR 5/8), subangular, mostly fine to medium sands, little low plasticity fines, [LL=23, PL=15, PI=8, NMC=10%, %#200=23.9], AASHTO = A-2-4.			SS-1	8	5	9	4	14
	2.8	**PIEDMONT RESIDUUM - SANDY LEAN CLAY (CL)** - stiff, moist, brownish-yellow (10YR 6/6), mostly low plasticity fines, some fine to medium sands.		2.8	SS-2	4	5	6	8	11
264.5		@ 4.8 feet - soft.		4.8	SS-3	2	2	2	4	4
		@ 6.8 feet - hard, dry to moist, few fine gravel.		6.8	SS-4	10	12	18	21	30
	8.8			8.8						
	9.1	**PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM)** - very dense, dry to moist, brownish-yellow (10YR 6/6), angular, mostly fine to coarse sands, little low plasticity fines, few fine gravel.			SS-5	50/4"				100
259.5		Boring Terminated at 9.1 feet due to auger refusal.								
254.5										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-17
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	HGM	**Boring Location:**	169+97.02	**Offset:**	R:48.231'	**Alignment:**	Proposed
Elev.:	248.8 ft	**Latitude:**	34.072338	**Longitude:**	-81.147351	**Date Started:**	1/22/2018
Total Depth:	10.7 ft	**Soil Depth:**	10.7 ft	**Core Depth:**	0 ft	**Date Completed:**	1/22/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.5 / 0.7	**SURFACE MATERIALS** - 6 inches of ASPHALT. 2 inches of GRADED AGGREGATE BASE.		0.7						
		PIEDMONT RESIDUUM - SANDY LEAN CLAY (CL) - stiff, moist, light brown (7.5 YR 6/4), mostly low plasticity fines, some fine to medium sands, few weathered rock fragments, [LL=37, PL=19, PI=18, NMC=15%, %#200=58], AASHTO = A-6 (8).			SS-1	6	6	5	6	11
		@ 2.7 feet - firm, gray (7.5YR 6/1).		2.7	SS-2	2	7	4	4	11
243.8		@ 4.7 feet - stiff, greenish-gray (GLEY 1 6/1), absent rock fragments.		4.7	SS-3	4	5	6	6	11
		@ 6.7 feet - light brownish-gray (10YR 6/2).		6.7	SS-4	4	4	8	9	12
	8.7	**SANDY ELASTIC SILT (MH)** - firm, moist to wet, gray (10YR 5/1), mostly medium to high plasticity fines, some fine to medium sands.		8.7	SS-5	2	2	3	3	5
238.8	10.7	Boring Terminated at 10.7 feet.								
233.8										

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

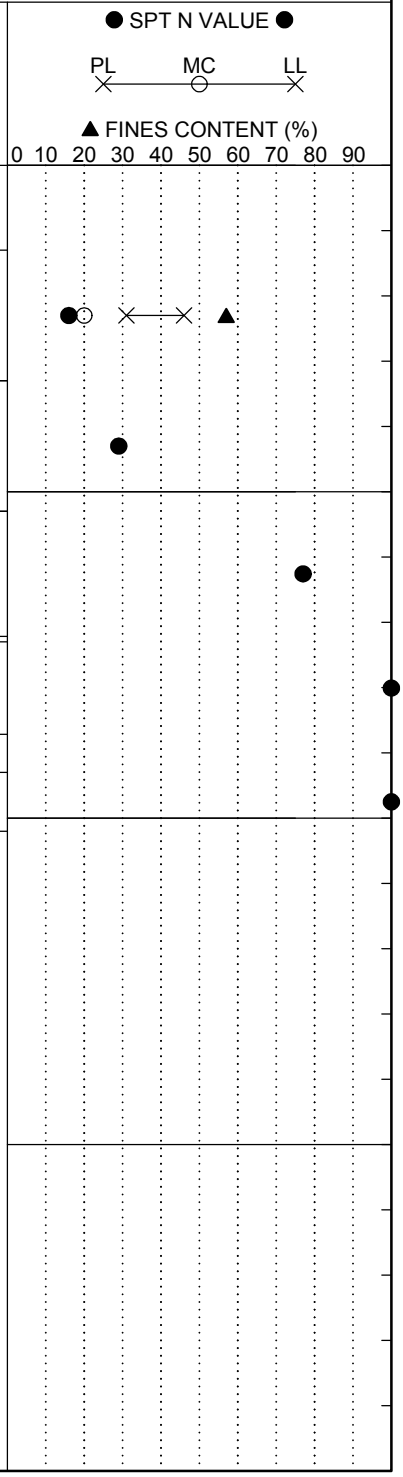
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-18
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	AKS	**Boring Location:**	187+82.27	**Offset:**	L:50.143'	**Alignment:**	Proposed
Elev.:	251.6 ft	**Latitude:**	34.068731	**Longitude:**	-81.143340	**Date Started:**	1/30/2018
Total Depth:	10.2 ft	**Soil Depth:**	10.2 ft	**Core Depth:**	0 ft	**Date Completed:**	1/30/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 16 inches of ASPHALT.								
	1.3	**PIEDMONT RESIDUUM - SANDY SILT (ML)** - very stiff, dry to moist, pale brown (2.5YR 2/4), mostly low plasticity fines, some fine to medium sands, relict rock structure, [LL=46, PL=31, PI=15, NMC=20%, %#200=56.7], AASHTO = A-7-5 (7).		1.3	SS-1	2	13	13	27	16
				3.3	SS-2	6	10	19	20	29
246.6		@ 5.3 feet - hard.		5.3	SS-3	16	32	45	50/5"	77
	7.3	**PARTIALLY WEATHERED ROCK (PWR) - SANDY SILT (ML)** - very hard, dry to moist, pale brown (2.5YR 2/4), mostly low plasticity fines, some fine to medium sands, relict rock structure.		7.3	SS-4	10	30	50/5"		100
				9.3	SS-5	39	50/5"			100
241.6	10.2	Boring Terminated at 10.2 feet.								
236.6										



LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-19
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	HGM	**Boring Location:**	189+84.74	**Offset:**	R:52.628'	**Alignment:**	Proposed
Elev.:	253.3 ft	**Latitude:**	34.068123	**Longitude:**	-81.143175	**Date Started:**	1/22/2018
Total Depth:	11.3 ft	**Soil Depth:**	11.3 ft	**Core Depth:**	0 ft	**Date Completed:**	1/22/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 15 inches of ASPHALT.					
	1.3	**PARTIALLY WEATHERED ROCK (PWR) - SANDY SILT (ML)** - very hard, dry to moist, pale brown (10YR 6/3), mostly low plasticity fines, some fine to medium sands, [LL=40, PL=26, PI=14, NMC=10%, %#200=65], AASHTO = A-6 (8).		1.3	SS-1	10 36 50/5"	100
	3.3	**PIEDMONT RESIDUUM - SANDY SILT (ML)** - very hard, dry to moist, grayish-brown (10YR 5/2), mostly low plasticity fines, some fine sands.		3.3	SS-2	9 34 24 28	58
248.3	5.3	**PARTIALLY WEATHERED ROCK (PWR) - SANDY SILT (ML)** - very hard, dry to moist, pale brown (10YR 6/3), mostly low plasticity fines, some fine sands.		5.3	SS-3	25 50/4"	100
				7.3	SS-4	29 50/5"	100
	9.3			9.3			
243.3		**PIEDMONT RESIDUUM - SANDY SILT (ML)** - very stiff, dry to moist, pale brown (10YR 6/3), mostly low plasticity fines, some fine sands.			SS-5	8 12 15 15	27
	11.3	Boring Terminated at 11.3 feet.					
238.3							

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-20
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	AKS	**Boring Location:**	200+10.01	**Offset:**	L:48.555'	**Alignment:**	Proposed
Elev.:	265.7 ft	**Latitude:**	34.066130	**Longitude:**	-81.140758	**Date Started:**	1/30/2018
Total Depth:	11.4 ft	**Soil Depth:**	11.4 ft	**Core Depth:**	0 ft	**Date Completed:**	1/30/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 18 inches of ASPHALT.								
	1.5	**FILL - CLAYEY SAND (SC)** - loose, dry to moist, brown (7.5YR 5/4), subangular, mostly fine to medium sands, little low plasticity fines, few fine gravel, [LL=30, PL=17, PI=13, NMC=22%, %#200=26.4], AASHTO = A-2-6.		1.5	SS-1	1	3	5	1	8
	3.5	**PIEDMONT RESIDUUM - SANDY SILT (ML)** - firm, dry to moist, brown (7.5YR 5/4), mostly low plasticity fines, some fine to medium sands.		3.5	SS-2	4	3	4	4	7
260.7		@ 5.5 feet - very stiff, light greenish-gray (GLEY 1 7/1), relict rock structure.		5.5	SS-3	4	6	10	10	16
		@ 7.5 feet - hard, light greenish-gray (GLEY 1 7/1) and reddish-yellow (7.5YR 7/6).		7.5	SS-4	7	14	20	25	34
255.7		@ 11.4 feet - very hard.		9.5	SS-5	32	35	42	50/5"	100
	11.4	Boring Terminated at 11.4 feet. Obtained bulk sample from auger cuttings 1.5 to 11.4 feet.								
250.7										

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-21
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	HGM	**Boring Location:**	202+81.38	**Offset:**	R:52.389'	**Alignment:**	Proposed
Elev.:	276.7 ft	**Latitude:**	34.065378	**Longitude:**	-81.140443	**Date Started:**	1/23/2018
Total Depth:	11.4 ft	**Soil Depth:**	10 ft	**Core Depth:**	0 ft	**Date Completed:**	1/23/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 17 inches of ASPHALT.								
	1.4	**PIEDMONT RESIDUUM - FAT CLAY WITH SAND (CH)** - stiff, moist, red (2.5YR 5/6), mostly high plasticity fines, little fine to medium sands, [LL=62, PL=31, PI=31, NMC=28%, %#200=77], AASHTO = A-7-5 (26).		1.4	SS-1	6	4	8	7	12
	3.4	**SANDY SILT (ML)** - stiff, moist, red (2.5YR 5/6) and reddish-brown (2.5YR 5/3), mostly low plasticity fines, little fine to medium sands.		3.4	SS-2	5	8	7	7	15
271.7				5.4	SS-3	4	8	7	7	15
	7.4	**SANDY ELASTIC SILT (MH)** - firm, moist, strong brown (7.5YR 5/6), mostly medium to high plasticity fines, little fine sands.		7.4	SS-4	1	2	3	3	5
	9.4	**SANDY SILT (ML)** - very stiff, moist, reddish-yellow (5YR 6/6), mostly low plasticity fines, little fine sands.		9.4	SS-5	5	7	9	12	16
266.7	11.4	Boring Terminated at 11.4 feet.								
261.7										

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-22
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	AKS	**Boring Location:**	220+13.96	**Offset:**	L:47.810'	**Alignment:**	Proposed
Elev.:	280.6 ft	**Latitude:**	34.061975	**Longitude:**	-81.136427	**Date Started:**	1/29/2018
Total Depth:	10.8 ft	**Soil Depth:**	10.8 ft	**Core Depth:**	0 ft	**Date Completed:**	1/29/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.8	**SURFACE MATERIALS** - 9 inches of ASPHALT.		0.8						
		FILL - SILTY CLAYEY SAND (SC-SM) - medium dense, moist, red (2.5YR 5/8), subangular, mostly fine to medium sands, little low plasticity fines, trace fine gravel, [LL=20, PL=15, PI=5, NMC=10%, %#200=24.3], AASHTO = A-2-4.			SS-1	14	11	10	10	21
	2.8	**PIEDMONT RESIDUUM - SANDY SILT (ML)** - very stiff, dry to moist, brownish-yellow (10YR 6/6), mostly low plasticity fines, little fine to medium sands, trace fine gravel, relict rock structure.		2.8	SS-2	5	7	9	10	16
275.6		@ 4.8 feet - soft.		4.8	SS-3	2	1	2	2	3
		@ 6.8 feet - stiff.		6.8	SS-4	7	7	8	10	15
		@ 8.8 feet - very stiff.		8.8	SS-5	4	6	10	13	16
270.6	10.8	Boring Terminated at 10.8 feet.								
265.6										

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-23
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	HGM	**Boring Location:**	229+97.30	**Offset:**	R:50.727'	**Alignment:**	Proposed
Elev.:	289.0 ft	**Latitude:**	34.059791	**Longitude:**	-81.134487	**Date Started:**	1/23/2018
Total Depth:	10.9 ft	**Soil Depth:**	10.9 ft	**Core Depth:**	0 ft	**Date Completed:**	1/23/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.9	**SURFACE MATERIALS** - 11 inches of ASPHALT.		0.9						
		FILL - SILTY CLAYEY SAND (SC-SM) - medium dense, moist, red (2.5YR 5/6), mostly fine to medium sands, some low plasticity fines, [LL=25, PL=19, PI=6, NMC=9%, %#200=33], AASHTO = A-2-4.			SS-1	10	10	9	10	19
		@ 2.9 feet - light brown (7.5YR 6/4), mostly fine sands.		2.9	SS-2	7	6	8	10	14
284.0	4.9	**SANDY SILT (ML)** - stiff, moist, light brown (7.5YR 6/4), mostly low plasticity fines, little fine sands.		4.9	SS-3	5	5	5	5	10
		@ 6 feet - seam of organics/black wood piece in spoon.		6.9	SS-4	2	5	8	9	13
	8.9	**PIEDMONT RESIDUUM - SANDY SILT (ML)** - stiff, moist, light brown (7.5YR 6/4), mostly low plasticity fines, little fine sands.		8.9	SS-5	7	7	8	10	15
279.0	10.9	Boring Terminated at 10.9 feet.								
274.0										

SPT N VALUE ● — PL × — MC ○ — LL × — ▲ FINES CONTENT (%) — 0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-24
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	AKS	**Boring Location:**	240+01.36	**Offset:**	L:48.122'	**Alignment:**	Proposed
Elev.:	313.4 ft	**Latitude:**	34.057929	**Longitude:**	-81.132018	**Date Started:**	1/29/2018
Total Depth:	9.1 ft	**Soil Depth:**	9.1 ft	**Core Depth:**	0 ft	**Date Completed:**	1/29/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.7	**SURFACE MATERIALS** - 8 inches of ASPHALT.		0.7						
		PIEDMONT RESIDUUM - SILTY SAND (SM) - medium dense, dry to moist, light bluish-gray (GLEY 2 8/1), mostly fine to coarse sands, some low plasticity fines, few weathered rock fragments, relict rock structure, [LL=33, PL=27, PI=6, NMC=9%, %#200=33.0], AASHTO = A-2-4.			SS-1	9	9	14	40	23
	2.7			2.7	SS-2	42	50/3"			100
308.4		**PARTIALLY WEATHERED ROCK (PWR) - SILT (ML)** - very hard, dry to moist, light bluish-gray (GLEY 2 8/1), mostly low plasticity fines, few fine to medium sands, trace fine gravel, relict rock structure.		4.7	SS-3	32	50/4"			100
				6.7	SS-4	50/4"				100
				8.7	SS-5	50/5"				100
	9.1	Boring Terminated at 9.1 feet.								
303.4										
298.4										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-25
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	HGM	**Boring Location:**	250+11.59	**Offset:**	R:50.568'	**Alignment:**	Proposed
Elev.:	306.6 ft	**Latitude:**	34.055690	**Longitude:**	-81.130018	**Date Started:**	1/23/2018
Total Depth:	9.8 ft	**Soil Depth:**	9.8 ft	**Core Depth:**	0 ft	**Date Completed:**	1/23/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.8	**SURFACE MATERIALS** - 10 inches of ASPHALT.		0.9						
	0.9	1 inch of GRADED AGGREGATE BASE.			SS-1	8	9	8	7	17
	2.9	**PIEDMONT RESIDUUM - CLAYEY SAND (SC)** - medium dense, moist, red (2.5YR 5/6), mostly fine to medium sands, little low plasticity fines, [LL=28, PL=16, PI=12, NMC=13%, %#200=18], AASHTO = A-2-6.		2.9	SS-2	8	8	10	8	18
301.6	4.9	**POORLY GRADED SAND WITH SILT (SP-SM)** - medium dense, moist to wet, brown (7.5YR 5/4), mostly fine to coarse sands, few low plasticity fines, few fine to medium gravel.		4.9	SS-3	5	7	15	22	32
	6.9	**SILT (ML)** - very stiff, moist, yellow and dark red (10YR 7/8 & 2.5YR 8/1), mostly low plasticity fines, few fine sands.		6.9	SS-4	15	23	32	35	55
	8.9	**SILTY SAND (SM)** - very dense, dry to moist, white (2.5YR 8/1), mostly fine to coarse sands, little low plasticity fines, few quartz gravel.		8.9	SS-5	3	150/5"			100
296.6	9.8	**PARTIALLY WEATHERED ROCK (PWR) - SANDY SILT (ML)** - very hard, moist, light gray (5YR 7/1), mostly low plasticity fines, few fine sands.								
		Boring Terminated at 9.8 feet.								
		Obtained bulk sample from auger cuttings 0.8 to 9.8 feet.								
291.6										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

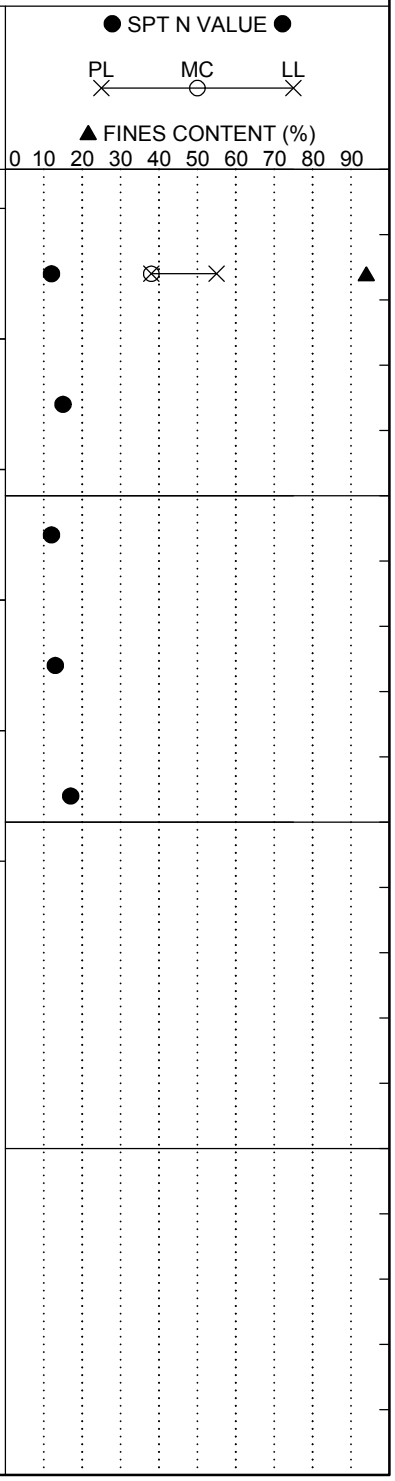
LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-26
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	AKS	**Boring Location:**	259+75.18	**Offset:**	L:48.881'	**Alignment:**	Proposed
Elev.:	290.6 ft	**Latitude:**	34.053912	**Longitude:**	-81.127638	**Date Started:**	1/29/2018
Total Depth:	10.6 ft	**Soil Depth:**	10.6 ft	**Core Depth:**	0 ft	**Date Completed:**	1/29/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.6	**SURFACE MATERIALS** - 7 inches of ASPHALT.		0.6						
		PIEDMONT RESIDUUM - ELASTIC SILT (MH) - stiff, moist, yellow (10YR 8/8) and white (10YR 8/1), mostly high plasticity fines, few fine to medium sands, [LL=55, PL=38, PI=17, NMC=38%, %#200=93.6], AASHTO = A-7-5 (22).			SS-1	5	6	6	4	12
		@ 2.6 feet - yellow (10YR 8/8) and red (5R 4/6).		2.6	SS-2	6	6	9	11	15
285.6				4.6	SS-3	4	5	7	8	12
		@ 6.6 feet - yellow (10YR 8/8).		6.6	SS-4	3	6	7	9	13
		@ 8.6 feet - very stiff.		8.6	SS-5	6	8	9	9	17
280.6	10.6	Boring Terminated at 10.6 feet.								
275.6										



LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-27
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	HGM	**Boring Location:**	270+00.20	**Offset:**	R:49.706'	**Alignment:**	Proposed
Elev.:	253.7 ft	**Latitude:**	34.051643	**Longitude:**	-81.125605	**Date Started:**	1/23/2018
Total Depth:	11.1 ft	**Soil Depth:**	11.1 ft	**Core Depth:**	0 ft	**Date Completed:**	1/23/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 13 inches of ASPHALT.								
	1.1	**PIEDMONT RESIDUUM - SILTY CLAYEY SAND (SC-SM)** - medium dense, moist, red (2.5YR 5/6), mostly fine to medium sands, little low plasticity fines, [LL=21, PL=17, PI=4, NMC=19%, %#200=19], AASHTO = A-2-4.		1.1	SS-1	7	8	5	6	13
	3.1	**SILT (ML)** - firm, moist, red (2.5YR 5/6), mostly low plasticity fines, few fine sands.		3.1	SS-2	4	3	4	7	7
248.7		@ 5.1 feet - stiff, reddish-yellow (7.5YR 6/8).		5.1	SS-3	4	5	6	7	11
		@ 7.1 feet - firm.		7.1	SS-4	2	4	4	8	8
		@ 9.1 feet - very stiff, pale brown (10YR 6/3).		9.1	SS-5	8	8	8	9	16
243.7	11.1	Boring Terminated at 11.1 feet.								
238.7										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

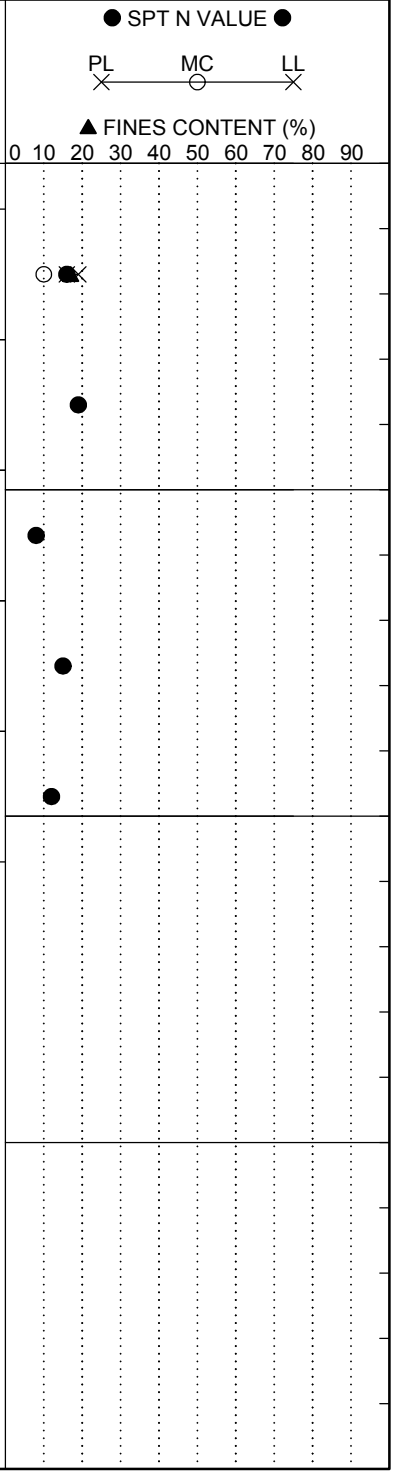
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-28
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	AKS	**Boring Location:**	280+09.08	**Offset:**	L:49.923'	**Alignment:**	Proposed
Elev.:	244.9 ft	**Latitude:**	34.049773	**Longitude:**	-81.123124	**Date Started:**	1/29/2018
Total Depth:	10.7 ft	**Soil Depth:**	10.7 ft	**Core Depth:**	0 ft	**Date Completed:**	1/29/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.7	**SURFACE MATERIALS** - 8 inches of ASPHALT.		0.7						
		PIEDMONT RESIDUUM - SILTY SAND (SM) - medium dense, moist, red (2.5YR 5/8), subangular, mostly fine to medium sands, little low plasticity fines, [LL=19, PL=16, PI=3, NMC=10%, %#200=16.5], AASHTO = A-2-4.			SS-1	7	9	7	6	16
				2.7						
					SS-2	7	9	10	11	19
				4.7						
239.9		@ 4.7 feet - loose.			SS-3	2	3	5	5	8
	6.7	**SILT (ML)** - stiff, moist, weak red (7.5YR 4/2), red (7.5YR 5/8), and white (7.5YR 8/1), mostly low plasticity fines, trace fine to medium sands.		6.7	SS-4	5	7	8	9	15
				8.7						
234.9					SS-5	4	5	7	8	12
	10.7	Boring Terminated at 10.7 feet.								
229.9										



LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-29
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	HGM	**Boring Location:**	299+16.78	**Offset:**	R:48.984'	**Alignment:**	Proposed
Elev.:	229.0 ft	**Latitude:**	34.045648	**Longitude:**	-81.119233	**Date Started:**	1/23/2018
Total Depth:	11.3 ft	**Soil Depth:**	11.3 ft	**Core Depth:**	0 ft	**Date Completed:**	1/23/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.9	**SURFACE MATERIALS** - 11 inches of ASPHALT.								
	1.3	4 inches of GRADED AGGREGATE BASE.		1.3						
		PIEDMONT RESIDUUM - SILTY SAND (SM) - medium dense, moist, red (2.5YR 5/6), mostly fine to medium sands, little low plasticity fines, [LL=18, PL=16, PI=2, NMC=9%, %#200=19], AASHTO = A-2-4.			SS-1	4	6	5	4	11
	3.3			3.3						
		SILT WITH SAND (ML) - stiff, moist, reddish-yellow (5YR 6/8), mostly low plasticity fines, little fine sands.			SS-2	4	6	6	8	12
224.0		@ 5.2 feet - firm.		5.3	SS-3	3	4	4	4	8
		@ 7.2 feet - brown (7.5YR 5/3), little fine to medium sands.		7.3	SS-4	0	3	4	6	7
	9.3			9.3						
219.0		**SANDY ELASTIC SILT (MH)** - stiff, moist, gray (7.5YR 5/1), mostly medium to high plasticity fines, some fine to medium sands.			SS-5	3	5	5	4	10
	11.3	Boring Terminated at 11.3 feet.								
214.0										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-30
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	AKS	**Boring Location:**	300+28.37	**Offset:**	L:50.329'	**Alignment:**	Proposed
Elev.:	223.6 ft	**Latitude:**	34.045576	**Longitude:**	-81.118747	**Date Started:**	1/29/2018
Total Depth:	10.7 ft	**Soil Depth:**	10.7 ft	**Core Depth:**	0 ft	**Date Completed:**	1/29/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.7	**SURFACE MATERIALS** - 8 inches of ASPHALT.		0.7						
		FILL - CLAYEY SAND (SC) - medium dense, moist, reddish-yellow (7.5YR 6/6), subangular, mostly fine to medium sands, some low plasticity fines, [LL=33, PL=20, PI=13, NMC=17%, %#200=38.7], AASHTO = A-6 (1).			SS-1	11	9	6	4	15
	2.7	**PIEDMONT RESIDUUM - CLAYEY SAND (SC)** - medium dense, moist, reddish-yellow (7.5YR 6/6), subangular, mostly fine to medium sands, some low plasticity fines.		2.7	SS-2	5	5	7	8	12
218.6		@ 4.7 feet - loose, wet, reddish-yellow (7.5YR 6/6), few weathered rock fragments.		4.7	SS-3	2	2	5	7	7
		@ 6.7 feet - moist.		6.7	SS-4	3	3	2	5	5
		@ 8.7 feet - absent weathered rock fragments.		8.7	SS-5	2	2	3	4	5
213.6	10.7	Boring Terminated at 10.7 feet.								
		Obtained bulk sample from auger cuttings 0.7 to 10.7 feet.								
208.6										

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-31
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	HGM	**Boring Location:**	307+53.30	**Offset:**	R:62.276'	**Alignment:**	Proposed
Elev.:	211.8 ft	**Latitude:**	34.043821	**Longitude:**	-81.117556	**Date Started:**	1/24/2018
Total Depth:	11.2 ft	**Soil Depth:**	11.2 ft	**Core Depth:**	0 ft	**Date Completed:**	1/24/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 14 inches of ASPHALT.								
	1.2	**FILL - SILTY CLAYEY SAND (SC-SM)** - very loose, moist, brown (7.5YR 5/3), mostly fine to medium sands, little low plasticity fines, [LL=21, PL=16, PI=5, NMC=11%, %#200=23], AASHTO = A-2-4.		1.2	SS-1	3	2	2	2	4
	3.2	**PIEDMONT RESIDUUM - SILT WITH SAND (ML)** - stiff, moist, strong brown (7.5YR 5/6), mostly low plasticity fines, little fine sands, trace fibrous organics.		3.2	SS-2	3	5	6	3	11
206.8	5.2	**SILTY SAND (SM)** - loose, moist, brown (7.5YR 5/4), mostly fine to medium sands, some low plasticity fines, few fine gravel.		5.2	SS-3	3	2	3	2	5
	7.2	**SILT WITH SAND (ML)** - firm, moist, greenish-gray (GLEY1 6/1), mostly low plasticity fines, little fine sands, relict structure.		7.2	SS-4	1	2	3	3	5
		@ 9.2 feet - gray (GLEY1 6/0).		9.2						
201.8					SS-5	3	4	4	5	8
	11.2	Boring Terminated at 11.2 feet.								
196.8										

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

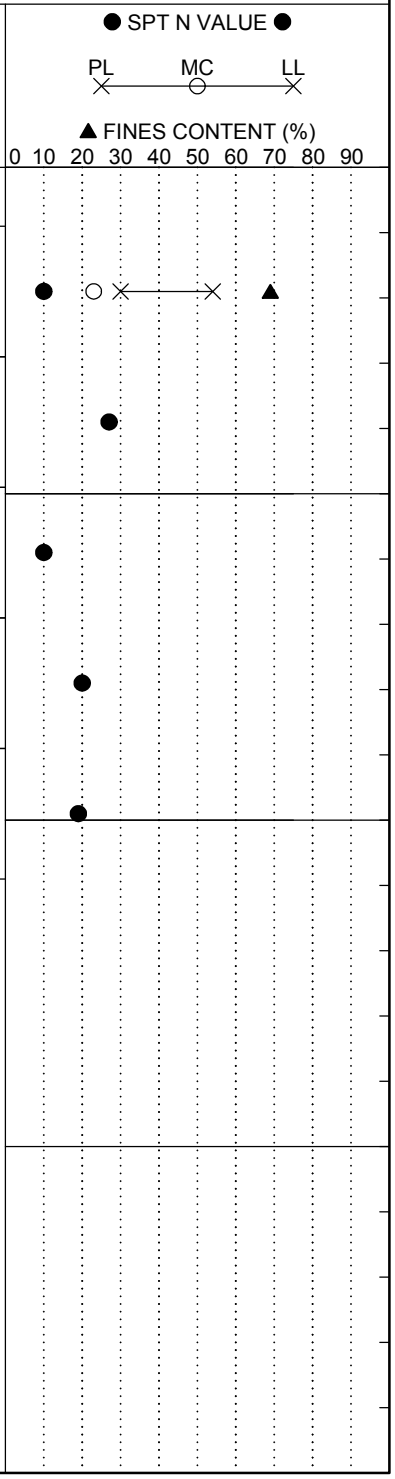
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-32
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	AKS	**Boring Location:**	320+03.12	**Offset:**	L:72.950'	**Alignment:**	Proposed
Elev.:	220.4 ft	**Latitude:**	34.041355	**Longitude:**	-81.114649	**Date Started:**	1/25/2018
Total Depth:	10.9 ft	**Soil Depth:**	10.9 ft	**Core Depth:**	0 ft	**Date Completed:**	1/25/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.9	**SURFACE MATERIALS** - 14 inches of ASPHALT.		0.9						
		PIEDMONT RESIDUUM - SANDY ELASTIC SILT (MH) - stiff, moist, dark red (2.5YR 3/8), yellow (5Y 7/6), black (5Y 2.5/1) and dusky red (5R 3/4), mostly high plasticity fines, little fine to medium sands, trace weathered rock fragments, relict rock structure, [LL=54, PL=30, PI=24, NMC=23%, %#200=69], AASHTO = A-7-5 (17).			SS-1	3	4	6	7	10
	2.9			2.9	SS-2	7	10	17	17	27
215.4		**SILT (ML)** - very stiff, dry to moist, dark red (2.5YR 3/8), yellow (5Y 7/6), black (5Y 2.5/1) and dusky red (5R 3/4), mostly low plasticity fines, few fine to medium sands, relict rock structure		4.9	SS-3	2	4	6	8	10
		@ 4.9 feet - stiff.		6.9	SS-4	6	8	12	12	20
		@ 6.9 feet - very stiff.		8.9	SS-5	5	7	12	12	19
210.4	10.9	Boring Terminated at 10.9 feet.								
205.4										



LEGEND

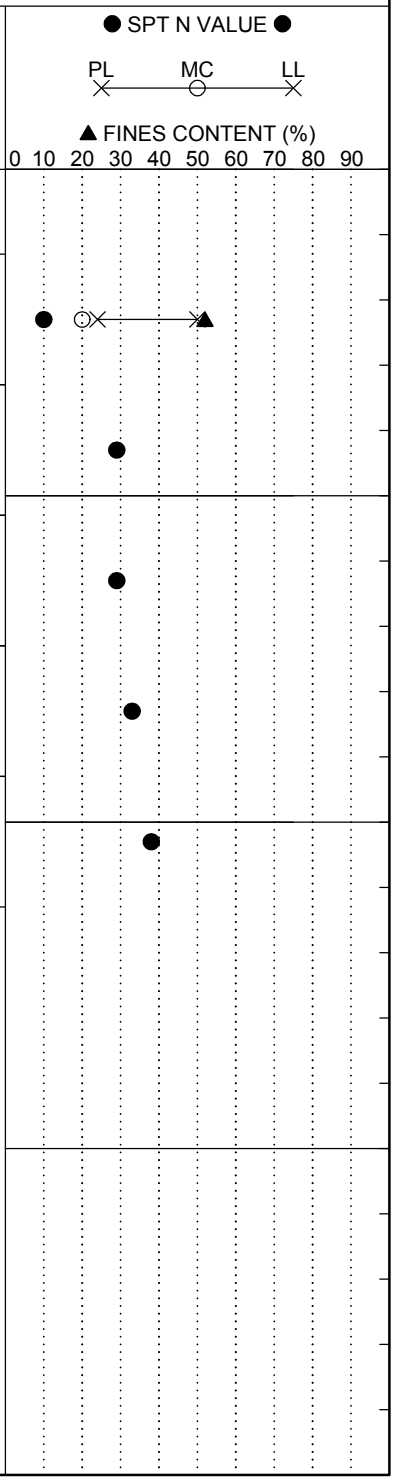
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-33
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	HGM	**Boring Location:**	329+96.47	**Offset:**	R:61.411'	**Alignment:**	Proposed
Elev.:	261.0 ft	**Latitude:**	34.038983	**Longitude:**	-81.112965	**Date Started:**	1/24/2018
Total Depth:	11.3 ft	**Soil Depth:**	11.3 ft	**Core Depth:**	0 ft	**Date Completed:**	1/24/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 15.5 inches of ASPHALT.								
	1.3	**PIEDMONT RESIDUUM - SANDY FAT CLAY (CH)** - stiff, moist, red (2.5YR 5/8), mostly high plasticity fines, some fine to medium sands, few weathered rock fragments, [LL=50, PL=24, PI=26, NMC=20%, %#200=52], AASHTO = A-7-6 (10).		1.3	SS-1	10	4	6	10	10
	3.3	**SANDY SILT (ML)** - very stiff, moist, red (2.5YR 5/8), mostly low plasticity fines, some fine sands, trace weathered rock fragments.		3.3	SS-2	9	12	17	17	29
256.0				5.3	SS-3	8	13	16	18	29
		@ 7.3 feet - trace weathered rock fragments, hard.		7.3	SS-4	10	15	18	22	33
	9.3	**SILT (ML)** - hard, moist, red (2.5YR 5/8), mostly low plasticity fines, trace fine sands.		9.3	SS-5	15	18	20	24	38
251.0	11.3	Boring Terminated at 11.3 feet.								
246.0										



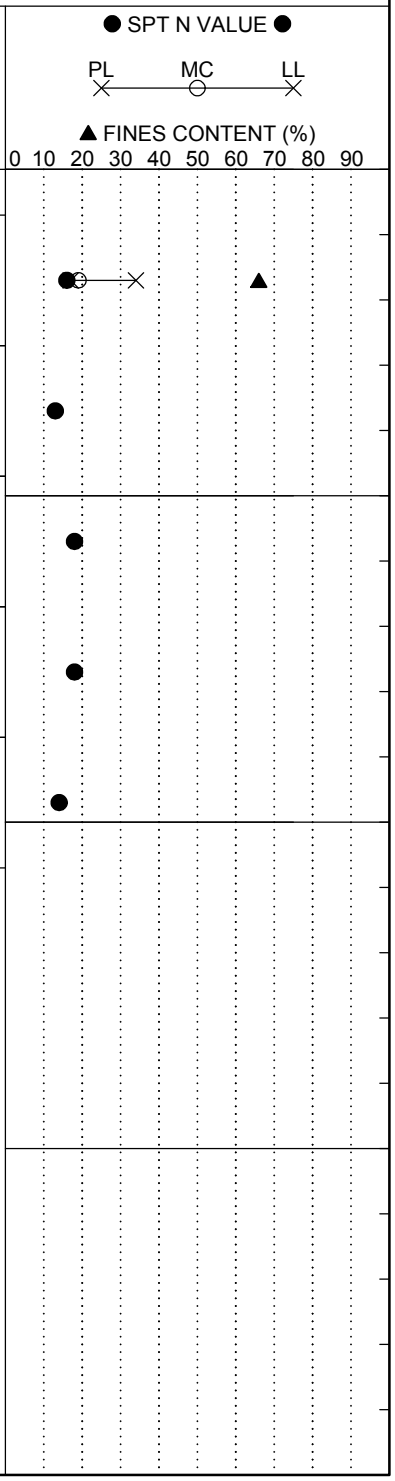
LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-34
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	HGM	**Boring Location:**	350+08.46	**Offset:**	R:60.765'	**Alignment:**	Proposed
Elev.:	269.3 ft	**Latitude:**	34.034713	**Longitude:**	-81.108729	**Date Started:**	1/24/2018
Total Depth:	10.7 ft	**Soil Depth:**	10.7 ft	**Core Depth:**	0 ft	**Date Completed:**	1/24/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.7	**SURFACE MATERIALS** - 8 inches of ASPHALT.		0.7						
		PIEDMONT RESIDUUM - SANDY LEAN CLAY (CL) - very stiff, moist, red (10R 4/8), mostly low plasticity fines, some fine to medium sands, [LL=34, PL=17, PI=17, NMC=19%, %#200=66], AASHTO = A-6 (10).			SS-1	13	10	6	4	16
		@ 2.7 feet - stiff.		2.7	SS-2	4	6	7	4	13
264.3		@ 4.7 feet - very stiff.		4.7	SS-3	5	7	11	8	18
				6.7	SS-4	4	8	10	12	18
		@ 8.7 feet - stiff, low recovery.		8.7	SS-5	7	7	7	7	14
259.3	10.7	Boring Terminated at 10.7 feet.								
254.3										



LEGEND

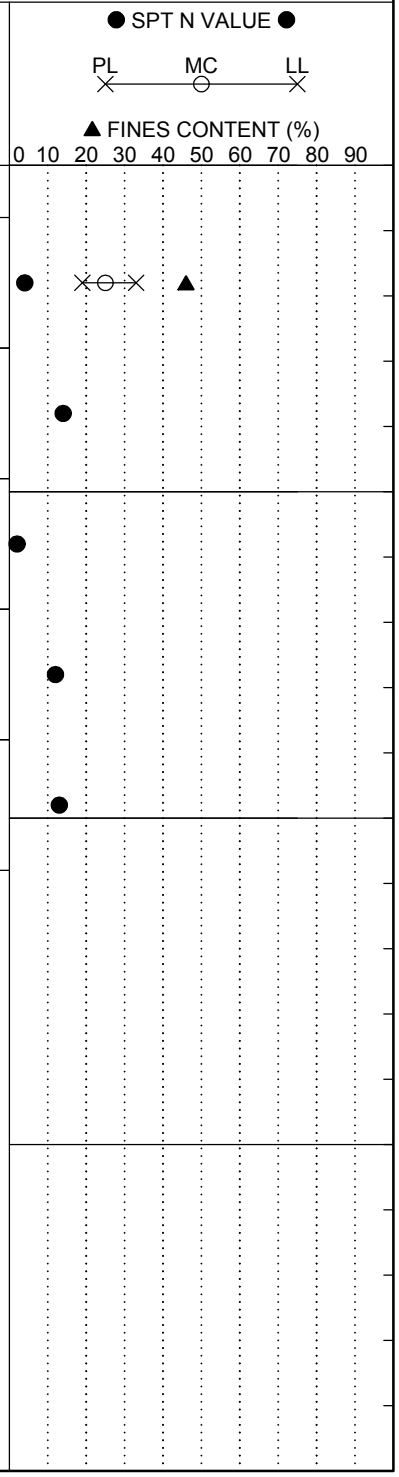
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-35
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	AKS	**Boring Location:**	360+71.55	**Offset:**	L:71.788'	**Alignment:**	Proposed
Elev.:	234.3 ft	**Latitude:**	34.032778	**Longitude:**	-81.106063	**Date Started:**	1/25/2018
Total Depth:	10.8 ft	**Soil Depth:**	10.8 ft	**Core Depth:**	0 ft	**Date Completed:**	1/25/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.8	**SURFACE MATERIALS** - 10 inches of ASPHALT.		0.8						
		PIEDMONT RESIDUUM - CLAYEY SAND (SC) - very loose, moist, brown (10YR 4/3), mostly fine to medium sands, some low plasticity fines, few weathered rock fragments, [LL=33, PL=19, PI=14, NMC=25%, %#200=46], AASHTO = A-6 (3).			SS-1	4	2	2	4	4
		@ 2.8 feet - medium dense, little low plasticity fines, absent weathered rock fragments.		2.8	SS-2	5	7	7	6	14
229.3		@ 4.8 feet - very loose.		4.8	SS-3	2	1	1	3	2
		@ 6.8 feet - medium dense, some low plasticity fines.		6.8	SS-4	5	5	7	8	12
				8.8	SS-5	5	6	7	9	13
224.3	10.8	Boring Terminated at 10.8 feet.								
		Obtained bulk sample from auger cuttings 0.8 to 10.8 feet.								
219.3										



LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-36
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	HGM	**Boring Location:**	370+82.46	**Offset:**	R:51.185'	**Alignment:**	Proposed
Elev.:	214.3 ft	**Latitude:**	34.030475	**Longitude:**	-81.104174	**Date Started:**	1/24/2018
Total Depth:	10.9 ft	**Soil Depth:**	10.9 ft	**Core Depth:**	0 ft	**Date Completed:**	1/24/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.9	**SURFACE MATERIALS** - 11 inches of ASPHALT.		0.9						
		FILL - SILTY SAND WITH GRAVEL (SM) - loose, wet due to coring, reddish-yellow (7.5YR 6/8), mostly fine to medium sands, some medium to coarse gravel, little non-plastic fines, [NMC=12%, %#200=19], AASHTO = A-1-b.			SS-1	3	4	4	2	8
	2.9			2.9						
		CLAYEY SAND (SC) - loose, wet due to coring, reddish-yellow (7.5YR), mostly fine to coarse sands, little low plasticity fines, few fine to medium gravel.			SS-2	2	5	4	3	9
209.3	4.9			4.9						
		PIEDMONT RESIDUUM - SILTY SAND (SM) - medium dense, moist, gray (7.5YR 6/1), mostly fine to medium sands, little low plasticity fines, trace fine gravel.			SS-3	4	5	11	15	16
		@ 6.9 feet - absent gravel.		6.9						
					SS-4	7	10	14	12	24
				8.9						
204.3					SS-5	10	10	9	10	19
	10.9	Boring Terminated at 10.9 feet.								
199.3										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

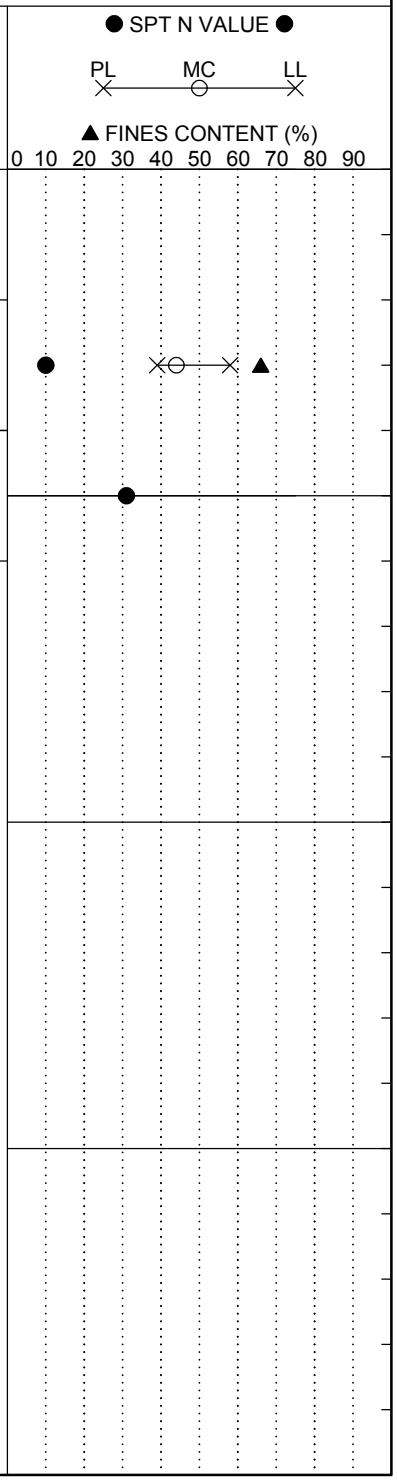
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-37
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	AKS	**Boring Location:**	379+06.59	**Offset:**	L:288.751'	**Alignment:**	Proposed
Elev.:	209.6 ft	**Latitude:**	34.028745	**Longitude:**	-81.101935	**Date Started:**	1/24/2018
Total Depth:	6 ft	**Soil Depth:**	6 ft	**Core Depth:**	0 ft	**Date Completed:**	1/24/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.2	**SURFACE MATERIALS** - 2 inches of ASPHALT.								
		18 inches of CONCRETE.								
	1.7	**PIEDMONT RESIDUUM - SANDY ELASTIC SILT (MH)** - stiff, dry to moist, gray (GLEY 1 7/10GY), mostly high plasticity fines, some fine to medium sands, relict rock structure, [LL=58, PL=39, PI=19, NMC=44%, %#200=66], AASHTO = A-7-5 (14).		2.0	SS-1	4	5	5	6	10
	4.0			4.0						
204.6		**SILTY SAND WITH GRAVEL (SM)** - medium dense, dry to moist, gray (GLEY 1 6/10GY), mostly fine to medium sands, some low plasticity fines, few weathered rock fragments, relict rock structure.			SS-2	4	6	25	32	31
	6.0	Boring Terminated at 6 feet due to auger refusal.								
199.6										
194.6										



LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-38
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-126
Eng./Geo.:	HGM	**Boring Location:**	5+98.81	**Offset:**	R:47.194'	**Alignment:**	Proposed
Elev.:	184.0 ft	**Latitude:**	34.024996	**Longitude:**	-81.098892	**Date Started:**	1/29/2018
Total Depth:	10.8 ft	**Soil Depth:**	10.8 ft	**Core Depth:**	0 ft	**Date Completed:**	1/29/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.8	**SURFACE MATERIALS** - 9.5 inches of ASPHALT.		0.8						
		FILL - CLAYEY SAND (SC) - medium dense, moist, yellowish-red (5YR 5/6), mostly fine to medium sands, little low to medium plasticity fines, [LL=32, PL=14, PI=18, NMC=14%, %#200=27.9], AASHTO = A-2-6.			SS-1	9	10	6	7	16
	2.8			2.8						
		PIEDMONT RESIDUUM - SILT WITH SAND (ML) - stiff, moist, greenish-gray (GLEY1 5/1), mostly low plasticity fines, little fine sands.			SS-2	5	5	4	5	9
	4.8			4.8						
179.0		**ELASTIC SILT WITH SAND (MH)** - firm, moist, very dark greenish-gray (GLEY1 4/1), mostly medium to high plasticity fines, little fine sands.			SS-3	3	3	4	4	7
	6.8			6.8						
		SANDY SILT (ML) - stiff, moist, gray (7.5YR 5/1) and strong brown (7.5YR 4/6), mostly low to medium plasticity fines, some fine sands.			SS-4	2	3	6	6	9
				8.8						
174.0					SS-5	6	6	5	4	11
	10.8									
		Boring Terminated at 10.8 feet.								
169.0										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-39
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-126
Eng./Geo.:	AKS	**Boring Location:**	9+60.12	**Offset:**	L:50.775'	**Alignment:**	Proposed
Elev.:	184.1 ft	**Latitude:**	34.024369	**Longitude:**	-81.097912	**Date Started:**	1/24/2018
Total Depth:	10.8 ft	**Soil Depth:**	10.8 ft	**Core Depth:**	0 ft	**Date Completed:**	1/24/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.8	**SURFACE MATERIALS** - 9.5 inches of ASPHALT.		0.8						
		FILL - CLAYEY SAND (SC) - medium dense, dry to moist, yellow (7.5YR 6/8), subangular, mostly fine to medium sands, some low plasticity fines, [LL=32, PL=15, PI=17, NMC=11%, %#200=39], AASHTO = A-6 (2).			SS-1	4	7	6	6	13
	2.8			2.8						
		FILL - POORLY GRADED SAND (SP) - loose, moist, yellow (7.5YR 6/8), subangular, mostly fine to medium sands, trace low plasticity fines.			SS-2	4	4	5	6	9
	4.8			4.8						
179.1		**PIEDMONT RESIDUUM - SANDY LEAN CLAY (CL)** - firm, moist, red (7.5YR 4/6) and gray (7.5YR 7/1), mostly low plasticity fines, little fine sands.			SS-3	3	3	4	4	7
	6.8			6.8						
		SILT (ML) - very stiff, dry to moist, very pale brown (10YR 7/3), low plasticity fines, few fine sands.			SS-4	6	7	13	20	20
				8.8						
174.1					SS-5	7	13	15	19	28
	10.8	Boring Terminated at 10.8 feet.								
169.1										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-40
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-126
Eng./Geo.:	HGM	**Boring Location:**	19+02.35	**Offset:**	R:45.668'	**Alignment:**	Proposed
Elev.:	186.3 ft	**Latitude:**	34.022148	**Longitude:**	-81.096282	**Date Started:**	1/25/2018
Total Depth:	10.9 ft	**Soil Depth:**	10.9 ft	**Core Depth:**	0 ft	**Date Completed:**	1/25/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.9	**SURFACE MATERIALS** - 11 inches of ASPHALT.		0.9						
		FILL - CLAYEY SAND (SC) - medium dense, moist, yellowish-red (5YR 5/6), mostly fine to medium sands, little low plasticity fines, trace organics, [LL=27, PL=18, PI=9, NMC=14%, %#200=30], AASHTO = A-2-4.			SS-1	13	12	10	9	22
		@ 2.9 feet - absent organics.		2.9	SS-2	5	6	6	7	12
181.3	4.9	**ALLUVIUM - SILTY SAND (SM)** - loose, moist, dark gray (7.5YR 4/1, mostly fine to medium sands, some low to medium plasticity fines.		4.9	SS-3	3	2	3	3	5
		@ 6.9 feet - very loose, some medium to high plasticity fines.		6.9	SS-4	WOH/12"	2	1		2
		@ 8.9 feet - loose, little low to medium plasticity fines, few coarse gravel.		8.9	SS-5	2	3	3	4	6
176.3	10.9	Boring Terminated at 10.9 feet.								
171.3										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-41
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-126
Eng./Geo.:	AKS	**Boring Location:**	28+96.62	**Offset:**	L:60.981'	**Alignment:**	Proposed
Elev.:	199.1 ft	**Latitude:**	34.020192	**Longitude:**	-81.093984	**Date Started:**	1/24/2018
Total Depth:	10 ft	**Soil Depth:**	10 ft	**Core Depth:**	0 ft	**Date Completed:**	1/24/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.1	**SURFACE MATERIALS** - 1 inches of ASPHALT.								
		23 inches of GRADED AGGREGATE BASE.								
	2.0	**PIEDMONT RESIDUUM - SILTY SAND (SM)** - very loose, moist to wet, yellow (2.5Y 7/8) and light gray (2.5Y 7/1), subangular, mostly fine to coarse sands, some low plasticity fines, [LL=42, PL=32, PI=10, NMC=23%, %#200=30], AASHTO = A-2-5.		2.0	SS-1	2	2	2	2	4
				4.0	SS-2	1	2	2	2	4
194.1		@ 6 feet - loose.		6.0	SS-3	2	3	5	6	8
		@ 8 feet - medium dense.		8.0	SS-4	4	5	7	8	12
189.1	10.0	Boring Terminated at 10 feet.								
		Obtained bulk sample from auger cuttings 1.0 to 10.0 feet.								
184.1										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

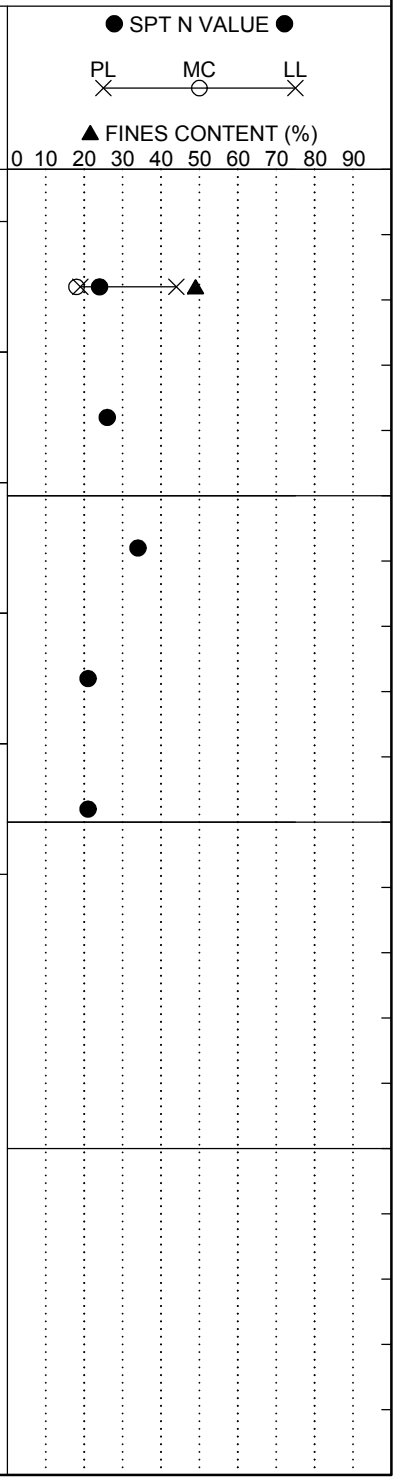
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-42
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-126
Eng./Geo.:	HGM	**Boring Location:**	38+95.07	**Offset:**	R:46.322'	**Alignment:**	Proposed
Elev.:	212.0 ft	**Latitude:**	34.018214	**Longitude:**	-81.091694	**Date Started:**	1/25/2018
Total Depth:	10.8 ft	**Soil Depth:**	10.8 ft	**Core Depth:**	0 ft	**Date Completed:**	1/25/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.8	**SURFACE MATERIALS** - 10 inches of ASPHALT.		0.8						
		ALLUVIUM - CLAYEY SAND (SC) - medium dense, moist, red (10R 5/8), reddish-gray (5YR 5/2) and pink (7.5YR 8/4), mostly fine to medium sands, some low plasticity fines, trace weathered rock fragments, [LL=44, PL=19, PI=25, NMC=17.6%, %#200=49.3], AASHTO = A-7-6 (8).			SS-1	12	15	9	9	24
				2.8	SS-2	10	10	16	18	26
207.0		@ 4.8 feet - dense, red (10R 5/8).		4.8	SS-3	12	16	18	20	34
		@ 6.8 feet - medium dense.		6.8	SS-4	8	8	13	11	21
		@ 8.8 feet - strong brown (7.5YR 5/5).		8.8	SS-5	12	11	10	11	21
202.0	10.8	Boring Terminated at 10.8 feet.								
197.0										



LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-43
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-126
Eng./Geo.:	AKS	**Boring Location:**	49+18.58	**Offset:**	L:70.173'	**Alignment:**	Proposed
Elev.:	184.4 ft	**Latitude:**	34.017202	**Longitude:**	-81.088513	**Date Started:**	1/24/2018
Total Depth:	10.5 ft	**Soil Depth:**	10.5 ft	**Core Depth:**	0 ft	**Date Completed:**	1/24/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.1	**SURFACE MATERIALS** - 1 inches of ASPHALT.		0.5						
	0.5	**SURFACE MATERIALS** - 5 inches of GRADED AGGREGATE BASE.			SS-1	2	2	4	3	6
		FILL - CLAYEY SAND WITH GRAVEL (SC) - loose, moist to wet, strong brown (7.5YR 5/8), subangular, mostly fine to medium sands, some low plasticity fines, little fine gravel, [LL=38, PL=20, PI=18, NMC=19%, %#200=39], AASHTO = A-6 (3).		2.5	SS-2	3	2	3	3	5
179.4		@ 4.5 feet - very loose, absent gravel.		4.5	SS-3	WOH / 18"		1		0
	6.5	**ALLUVIUM - CLAYEY SAND (SC)** - loose, moist, strong brown (7.5YR 5/8), subangular, mostly fine to medium sands, some low plasticity fines.		6.5	SS-4	3	4	5	3	9
		@ 8.5 feet - very loose.		8.5	SS-5	1	1	1	2	2
174.4	10.5	Boring Terminated at 10.5 feet. Obtained bulk sample from auger cuttings 0.5 to 10.5 feet.								
169.4										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-44
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	AKS	**Boring Location:**	74+76.27	**Offset:**	L:47.554'	**Alignment:**	Proposed
Elev.:	220.3 ft	**Latitude:**	34.022409	**Longitude:**	-81.132440	**Date Started:**	2/13/2018
Total Depth:	11.1 ft	**Soil Depth:**	11.1 ft	**Core Depth:**	0 ft	**Date Completed:**	2/13/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 13 inches of ASPHALT.								
	1.1	**FILL - FAT CLAY WITH SAND (CH)** - stiff, moist, dark red (2.5YR 3/6), mostly high plasticity fines, little fine to medium sands, trace fine gravel, [LL=62, PL=25, PI=37, NMC=30.1%, %#200=83.5], AASHTO = A-7-6 (34).		1.1	SS-1	7	7	5	6	12
	3.1	**PIEDMONT RESIDUUM - SILTY SAND (SM)** - medium dense, dry to moist, light gray (GLEY 1 7/), mostly fine to medium sands, some low plasticity fines.		3.1	SS-2	7	6	9	11	15
215.3				5.1	SS-3	9	10	11	13	21
		@ 7.1 feet - dense.		7.1	SS-4	18	17	16	17	33
	9.1	**LEAN CLAY (CL)** - hard, moist, very dark greenish-gray (GLEY 1 3/1), mostly low plasticity fines, trace fine sands, micaceous.		9.1	SS-5	21	22	25	30	47
210.3	11.1	Boring Terminated at 11.1 feet.								
205.3										

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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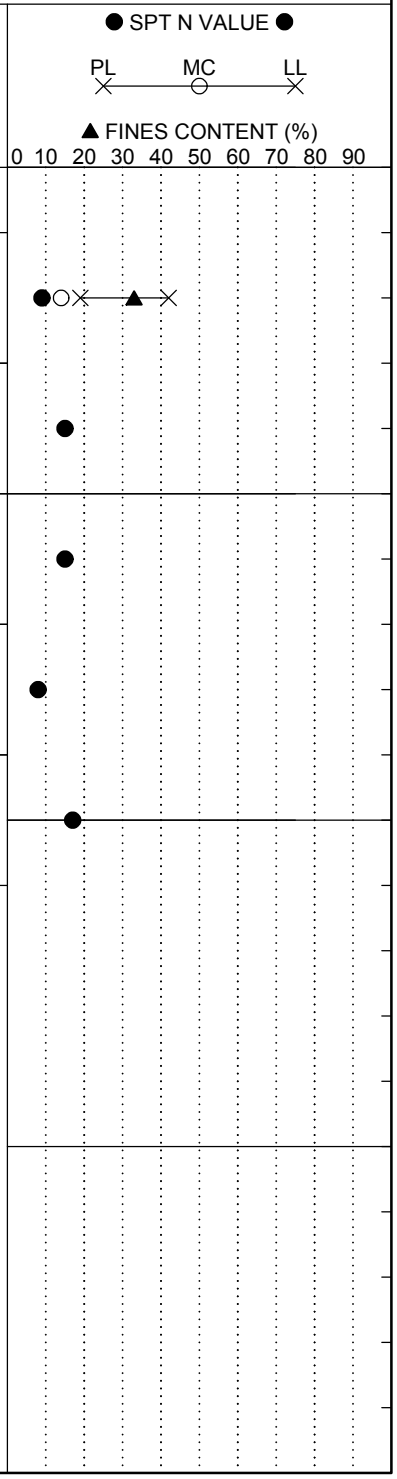
SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-45
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	ELF	**Boring Location:**	84+69.20	**Offset:**	R:46.558'	**Alignment:**	Proposed
Elev.:	193.4 ft	**Latitude:**	34.024176	**Longitude:**	-81.129923	**Date Started:**	2/15/2018
Total Depth:	11 ft	**Soil Depth:**	11 ft	**Core Depth:**	0 ft	**Date Completed:**	2/15/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 12 inches of ASPHALT.		1.0						
	1.0	**FILL - CLAYEY SAND WITH GRAVEL (SC)** - loose, moist to wet, yellowish-red (5YR 5/8), mostly fine to medium sands, some low plasticity fines, little fine gravel, [LL=42, PL=19, PI=23, NMC=13.6%, %#200=33.3], AASHTO = A-2-7 (2).			SS-1	4	4	5	5	9
		@ 3 feet - medium dense, yellowish-red (5YR 5/8) and white (5YR 8/1), mostly fine to coarse sands.		3.0	SS-2	3	6	9	9	15
188.4	5.0	**ALLUVIUM - ELASTIC SILT (MH)** - firm, moist, red (2.5YR 4/8), mosty high plasticity fines, few fine sands.		5.0	SS-3	7	7	8	9	15
	7.0	**SANDY LEAN CLAY (CL)** - soft, moist, reddish-gray (2.5YR 4/8), mostly low plasticity fines, some fine to coarse sands, trace fine gravel.		7.0	SS-4	3	3	5	6	8
	9.0	**CLAYEY SAND (SC)** - medium dense, moist, dark reddish-gray (2.5YR 3/1), mostly fine to medium sands, some low plasticity fines.		9.0	SS-5	8	8	9	7	17
183.4	11.0	Boring Terminated at 11 feet.								
178.4										



LEGEND

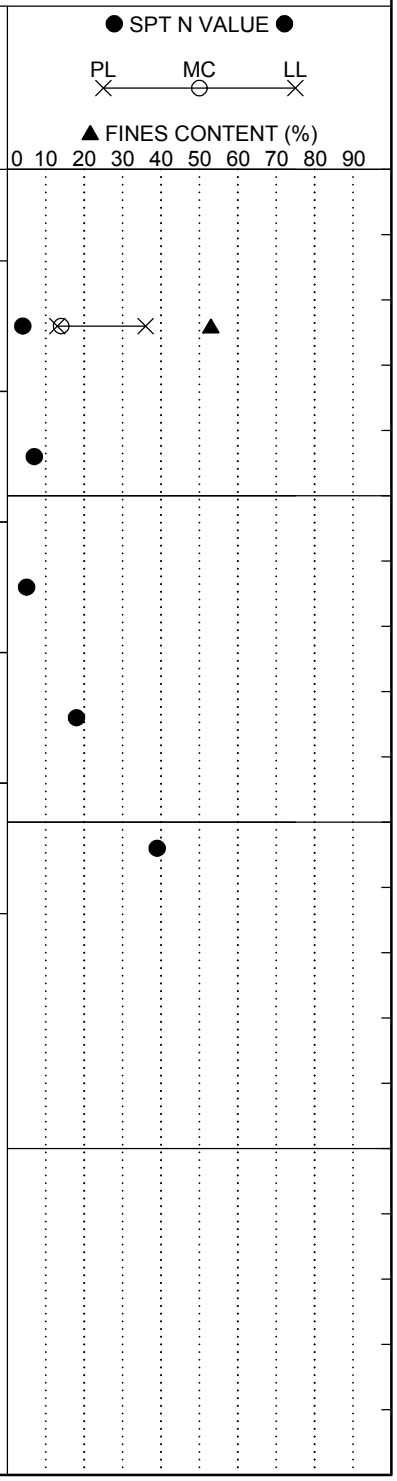
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-47
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	ELF	**Boring Location:**	104+83.25	**Offset:**	R:45.744'	**Alignment:**	Proposed
Elev.:	220.7 ft	**Latitude:**	34.028128	**Longitude:**	-81.125269	**Date Started:**	2/15/2018
Total Depth:	11.4 ft	**Soil Depth:**	11.4 ft	**Core Depth:**	0 ft	**Date Completed:**	2/15/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 17 inches of ASPHALT.								
	1.4	**FILL - SANDY LEAN CLAY (CL)** - soft, moist, dark red (2.5YR 3/6), mostly low plasticity fines, some fine to medium sands, [LL=36, PL=13, PI=23, NMC=14.1%, %#200=52.8], AASHTO = A-6 (8).		1.4	SS-1	1	2	2	4	4
	3.4	**PIEDMONT RESIDUUM - CLAYEY SAND (SC)** - loose, moist, yellowish-red (5YR 4/6) and brown (7.5YR 5/3), mostly fine to medium sands, little low plasticity fines.		3.4	SS-2	3	3	4	3	7
215.7		@ 5.4 feet - dark reddish-brown (5YR 3/3).		5.4	SS-3	3	3	2	5	5
	7.4	**SANDY SILT (ML)** - very stiff, moist, dark red (2.5YR 3/6), mostly low plasticity fines, few fine sands.		7.4	SS-4	5	7	11	12	18
210.7		@ 9.4 feet - hard, red (2.5YR 4/8) and light red (2.5YR 7/8).		9.4	SS-5	14	20	19	18	39
	11.4	Boring Terminated at 11.4 feet.								
205.7										



LEGEND

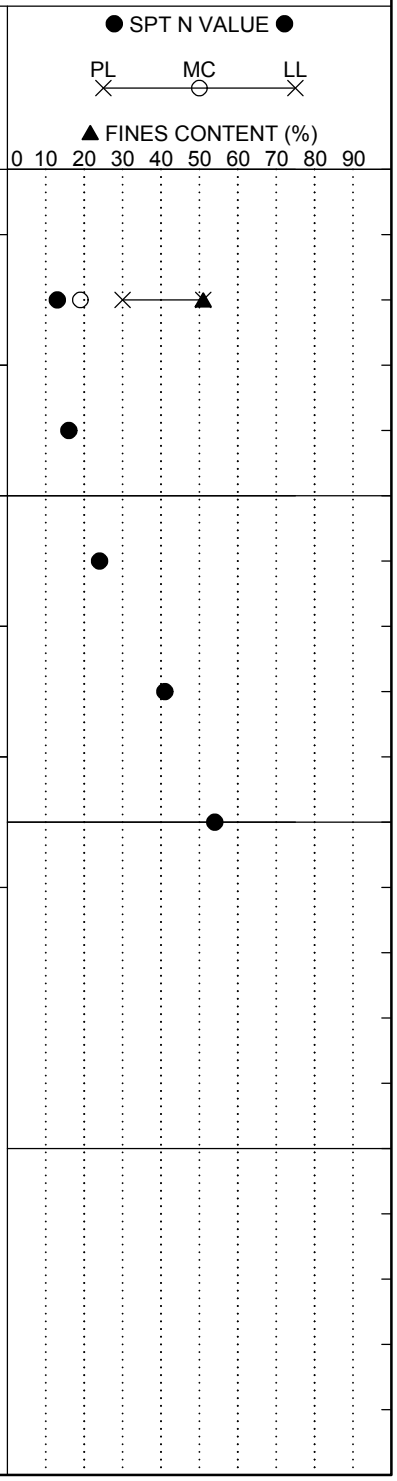
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-48
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	AKS	**Boring Location:**	115+74.80	**Offset:**	L:49.969'	**Alignment:**	Proposed
Elev.:	217.0 ft	**Latitude:**	34.030453	**Longitude:**	-81.122970	**Date Started:**	2/7/1018
Total Depth:	11 ft	**Soil Depth:**	11.0 ft	**Core Depth:**	0 ft	**Date Completed:**	2/7/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 12 inches of ASPHALT.								
	1.0	**PIEDMONT RESIDUUM - SANDY ELASTIC SILT (MH)** - stiff, moist, olive yellow (5Y 6/6), mostly high plasticity fines, some fine to coarse sands, little fine gravel, [LL=51, PL=30, PI=21, NMC=19%, %#200=51.1], AASHTO = A-7-5 (8).		1.0						
		@ 3 feet - very stiff, red (7.5YR 5/6).			SS-1	9	6	7	7	13
				3.0	SS-2	6	7	9	9	16
212.0				5.0	SS-3	9	10	14	18	24
		@ 7 feet - hard.		7.0	SS-4	15	18	23	28	41
		@ 9 feet - very hard, pale red (7.5R 7/2), trace fine gravel.		9.0	SS-5	16	24	30	32	54
207.0	11.0	Boring Terminated at 11 feet.								
202.0										



LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-49
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	ELF	**Boring Location:**	125+36.64	**Offset:**	R:58.851'	**Alignment:**	Proposed
Elev.:	232.7 ft	**Latitude:**	34.032131	**Longitude:**	-81.120490	**Date Started:**	2/15/2018
Total Depth:	11 ft	**Soil Depth:**	11 ft	**Core Depth:**	0 ft	**Date Completed:**	2/15/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 12 inches of ASPHALT.		1.0						
	1.0	**FILL - SANDY LEAN CLAY (CL)** - stiff, moist, dusky red (2.5YR 3/2), mostly low plasticity fines, some fine to medium sands, [LL=48, PL=22, PI=26, NMC=20.89%, %#200=50.7], AASHTO = A-7-6 (9).		3.0	SS-1	3	4	5	12	9
	3.0	**PIEDMONT RESIDUUM - SILTY SAND (SM)** - medium dense, moist, dark red (2.5YR 3/6) and yellowish-red (5YR 5/8), mostly fine sands, some low plasticity fines.		5.0	SS-2	7	12	13	15	25
227.7		@ 5 feet - yellowish-red (5YR 4/6) and white (5YR 8/1), mostly fine to medium sands.		7.0	SS-3	2	6	8	10	14
	8.0	**SILT (ML)** - very stiff, moist, red (2.5YR 4/8) and light red (2.5YR 6/8), mostly low plasticity fines, trace fine sands.		9.0	SS-4	7	10	11	11	21
222.7		@ 9 feet - hard, weak red (10R 4/4) and pinkish-gray (10R 7/1), few gravel sized rock fragments.			SS-5	14	15	24	28	39
	11.0	Boring Terminated at 11 feet.								
217.7										

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

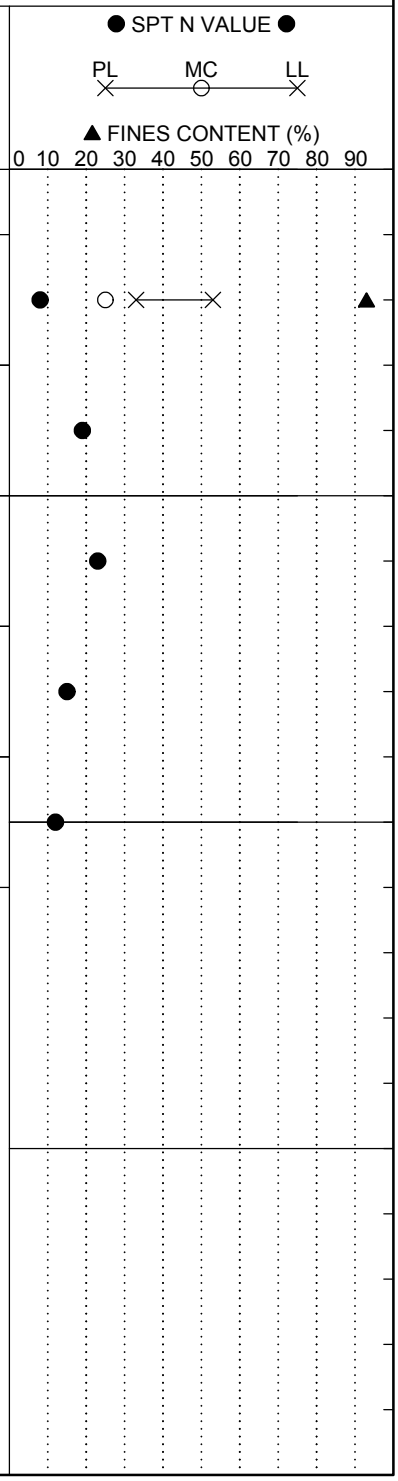
LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-50
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	AKS	**Boring Location:**	135+36.40	**Offset:**	L:59.711'	**Alignment:**	Proposed
Elev.:	228.6 ft	**Latitude:**	34.034242	**Longitude:**	-81.118330	**Date Started:**	2/7/1018
Total Depth:	11 ft	**Soil Depth:**	11.0 ft	**Core Depth:**	0 ft	**Date Completed:**	2/7/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 12 inches of ASPHALT.								
	1.0	**FILL - ELASTIC SILT (MH)** - firm, moist, red (10R 5/6), mostly high plasticity fines, few fine sands, [LL=53, PL=33, PI=20, NMC=25%, %#200=92.8], AASHTO = A-7-5 (23).		1.0	SS-1	2	3	5	7	8
	3.0	**PIEDMONT RESIDUUM - SANDY SILT (ML)** - very stiff, moist, red (10R 5/6), mostly low plasticity fines, some fine to medium sands.		3.0	SS-2	7	9	10	13	19
223.6				5.0	SS-3	7	10	13	18	23
		@ 7 feet - stiff.		7.0	SS-4	5	6	9	9	15
				9.0						
218.6					SS-5	4	5	7	10	12
	11.0	Boring Terminated at 11 feet. Obtained bulk sample from auger cuttings 1.0 to 11.0 feet.								
213.6										



LEGEND

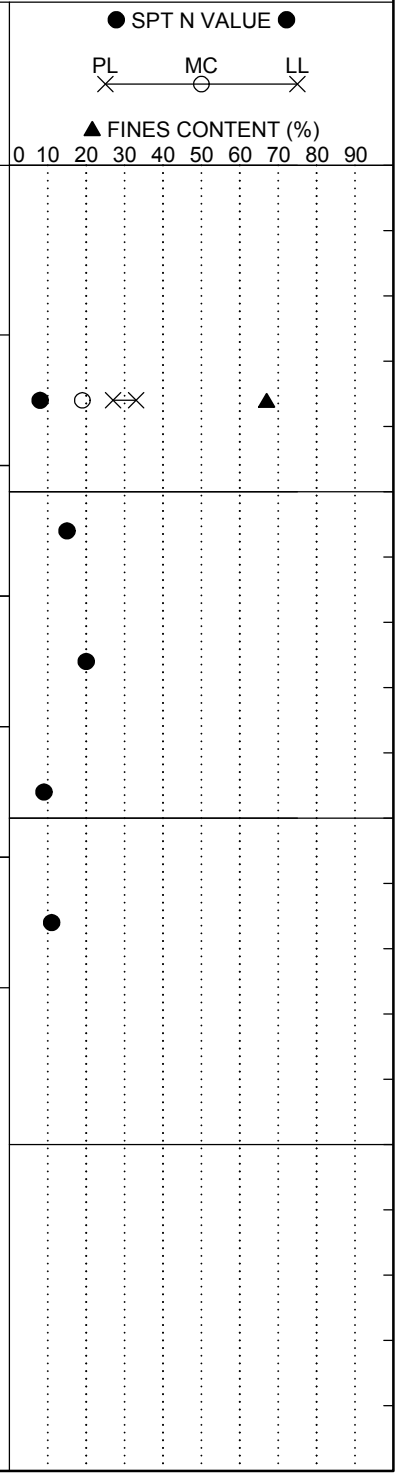
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-51
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	NGS	**Boring Location:**	145+03.22	**Offset:**	R:56.389'	**Alignment:**	Proposed
Elev.:	209.7 ft	**Latitude:**	34.035264	**Longitude:**	-81.115367	**Date Started:**	2/20/2018
Total Depth:	12.6 ft	**Soil Depth:**	12.6 ft	**Core Depth:**	0 ft	**Date Completed:**	2/20/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 31 inches of ASPHALT.								
	2.6	**PIEDMONT RESIDUUM - SANDY SILT (ML)** - firm, moist, reddish-yellow (7.5YR 7/6), pale brown (10YR 6/3), and light gray (2.5Y 7/1), mostly low plasticity fines, some fine sands, [LL=33, PL=27, PI=6, NMC=18.6%, %#200=66.6], AASHTO = A-4 (3).		2.6	SS-1	3	3	5	7	8
204.7		@ 4.6 feet - sitff.		4.6	SS-2	4	7	8	8	15
		@ 6.6 feet - very stiff.		6.6	SS-3	8	8	12	11	20
		@ 8.6 feet - stiff, trace weathered rock fragments.		8.6	SS-4	6	4	5	7	9
199.7		@ 10.6 feet - weak red (2.5 YR 4/2).		10.6	SS-5	5	4	7	10	11
	12.6	Boring Terminated at 12.6 feet.								
194.7										



LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-52
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	AKS	**Boring Location:**	153+63.31	**Offset:**	L:49.364'	**Alignment:**	Proposed
Elev.:	233.5 ft	**Latitude:**	34.036320	**Longitude:**	-81.112812	**Date Started:**	2/7/1018
Total Depth:	11.2 ft	**Soil Depth:**	11.2 ft	**Core Depth:**	0 ft	**Date Completed:**	2/7/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 14 inches of ASPHALT.								
	1.2	**PIEDMONT RESIDUUM - SILT WITH SAND (ML)** - stiff, moist, yellow (2.5Y 8/6), mostly low plasticity fines, little fine sands, [LL=48, PL=35, PI=13, NMC=18%, %#200=77.1], AASHTO = A-7-5 (12).		1.2	SS-1	5	7	8	8	15
		@ 3.2 feet - very stiff.		3.2	SS-2	10	9	10	13	19
228.5				5.2	SS-3	11	15	15	18	30
		@ 7.2 feet - hard, light gray (2.5Y 7/2).		7.2	SS-4	11	13	18	22	31
223.5				9.2	SS-5	16	18	22	24	40
	11.2	Boring Terminated at 11.2 feet.								
218.5										

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-53
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	AKS	**Boring Location:**	166+96.89	**Offset:**	L:49.023'	**Alignment:**	Proposed
Elev.:	278.2 ft	**Latitude:**	34.037513	**Longitude:**	-81.108649	**Date Started:**	2/7/2018
Total Depth:	10.6 ft	**Soil Depth:**	10.6 ft	**Core Depth:**	0 ft	**Date Completed:**	2/7/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.6	**SURFACE MATERIALS** - 7 inches of ASPHALT.		0.6						
		PIEDMONT RESIDUUM - CLAYEY SAND (SC) - medium dense, moist, red (2.5YR 5/6), mostly fine to medium sands, some high plasticity fines, [LL=61, PL=25, PI=36, NMC=26%, %#200=44.5], AASHTO = A-7-6 (11).			SS-1	12	7	6	6	13
	2.6			2.6						
		SILTY SAND (SM) - medium dense, dry to moist, reddish yellow (7.5YR 7/6), mostly fine to medium sands, some low plasticity fines.			SS-2	7	12	15	19	27
273.2				4.6						
					SS-3	7	12	15	17	27
		@ 6.6 feet - dense.		6.6						
					SS-4	17	21	24	27	45
		@ 8.6 feet - medium dense, pale red (10R 7/4).		8.6						
					SS-5	8	12	15	20	27
268.2	10.6									
		Boring Terminated at 10.6 feet.								
		Obtained bulk sample from auger cuttings 0.6 to 10.6 feet.								
263.2										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

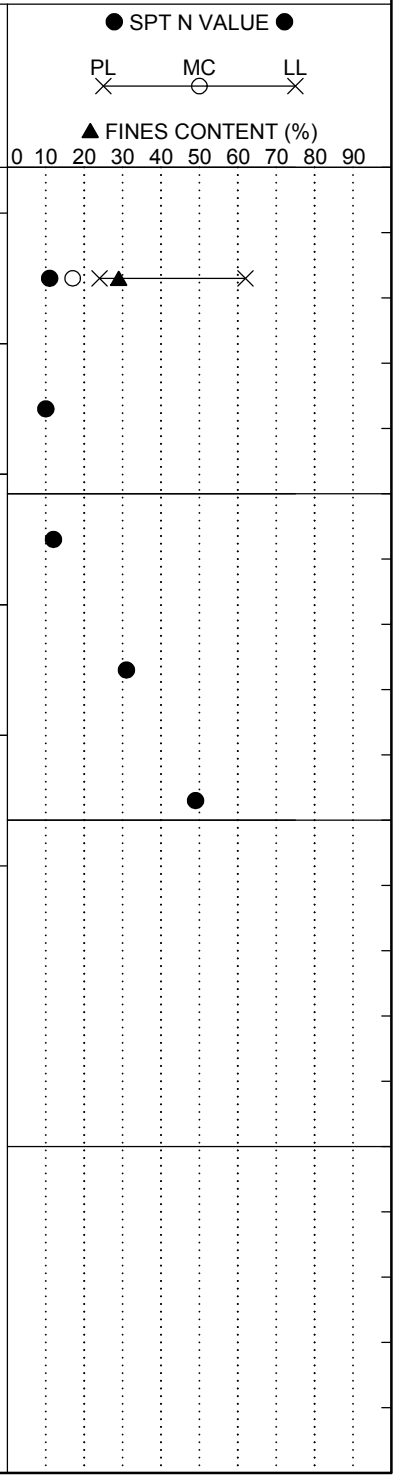
LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-54
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	NGS	**Boring Location:**	170+49.83	**Offset:**	R:50.696'	**Alignment:**	Proposed
Elev.:	287.5 ft	**Latitude:**	34.037569	**Longitude:**	-81.107440	**Date Started:**	2/21/2018
Total Depth:	10.7 ft	**Soil Depth:**	10.7 ft	**Core Depth:**	0 ft	**Date Completed:**	2/21/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.7	**SURFACE MATERIALS** - 8 inches of ASPHALT.		0.7						
		FILL - CLAYEY SAND (SC) - medium dense, moist, reddish-yellow (5YR 6/6), mostly fine to medium sands, little high plasticity fines, few fine gravel, [LL=62, PL=24, PI=38, NMC=17.4%, %#200=29.0], AASHTO = A-2-7 (2).			SS-1	6	6	5	5	11
		@ 2.7 feet - loose.		2.7	SS-2	5	5	5	6	10
282.5		@ 4.7 feet - medium dense.		4.7	SS-3	10	7	5	10	12
	6.0	**PIEDMONT RESIDUUM - SILT WITH SAND (ML)** - stiff, moist, reddish-yellow (5YR 7/6), mostly low plasticity fines, little fine sands.		6.7	SS-4	8	12	19	18	31
		@ 6.7 feet - hard, red (10R 5/6).		8.7	SS-5	20	21	28	25	49
277.5	10.7	Boring Terminated at 10.7 feet.								
272.5										



LEGEND

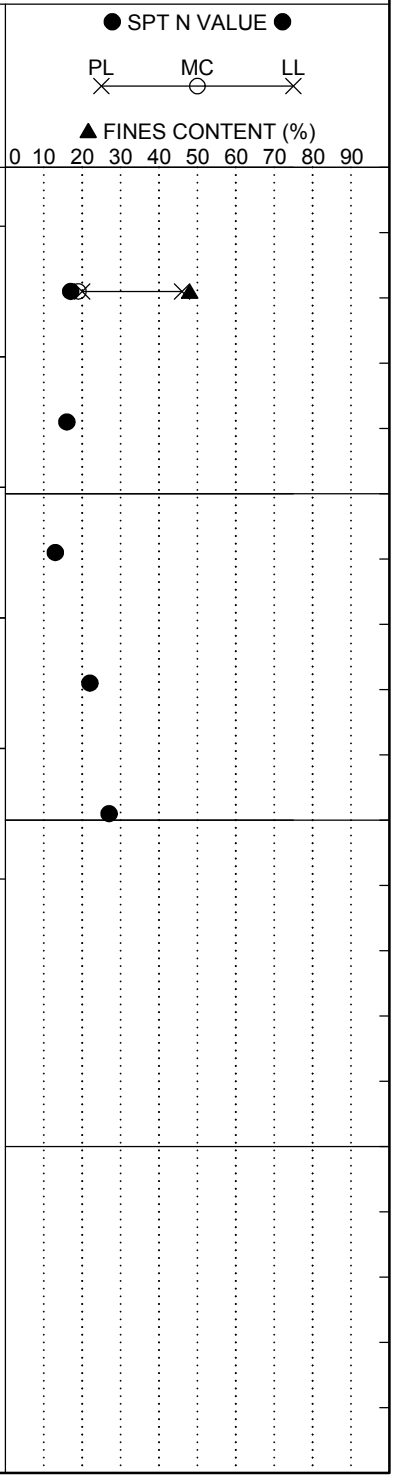
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-55
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	AKS	**Boring Location:**	180+24.57	**Offset:**	L:46.514'	**Alignment:**	Proposed
Elev.:	289.1 ft	**Latitude:**	34.038459	**Longitude:**	-81.104394	**Date Started:**	2/7/2018
Total Depth:	10.9 ft	**Soil Depth:**	10.9 ft	**Core Depth:**	0 ft	**Date Completed:**	2/7/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.9	**SURFACE MATERIALS** - 11 inches of ASPHALT.		0.9						
		COASTAL PLAIN - CLAYEY SAND (SC) - medium dense, moist, red (10R 5/8), subangular, mostly fine to medium sands, some low plasticity fines, few fine gravel, [LL=46, PL=20, PI=26, NMC=19%, %#200=48.4], AASHTO = A-7-6 (8).		2.9	SS-1	11	11	6	7	17
				4.9	SS-2	5	7	9	10	16
284.1				6.9	SS-3	6	6	7	9	13
				8.9	SS-4	9	10	12	14	22
279.1					SS-5	12	13	14	16	27
	10.9	Boring Terminated at 10.9 feet.								
274.1										



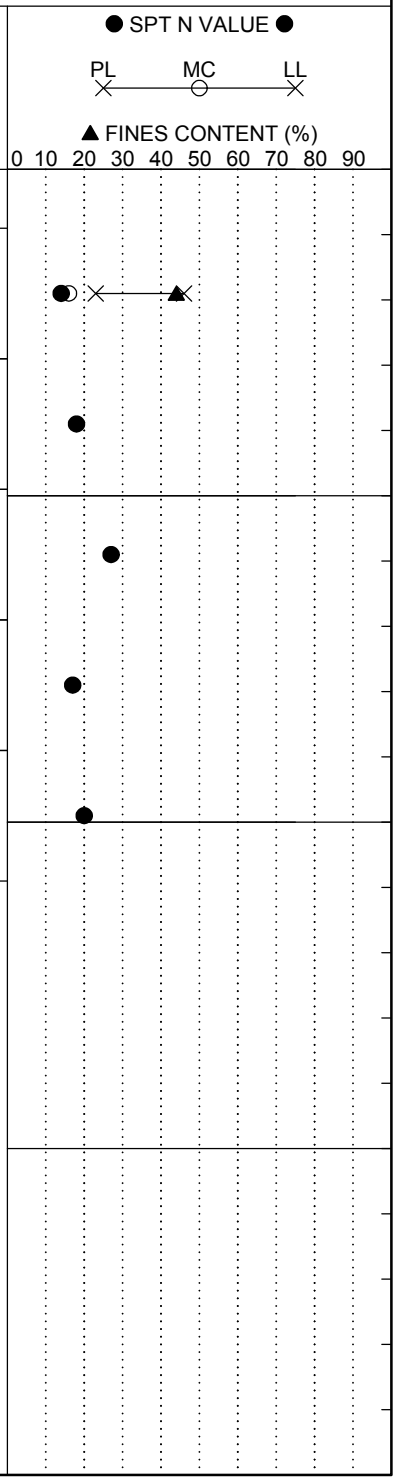
LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-56
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	NGS	**Boring Location:**	191+75.79	**Offset:**	R:50.067'	**Alignment:**	Proposed
Elev.:	314.9 ft	**Latitude:**	34.038316	**Longitude:**	-81.100580	**Date Started:**	2/21/2018
Total Depth:	10.9 ft	**Soil Depth:**	10.9 ft	**Core Depth:**	0 ft	**Date Completed:**	2/21/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.9	**SURFACE MATERIALS** - 11 inches of ASPHALT.		0.9						
		COASTAL PLAIN - CLAYEY SAND (SC) - medium dense, moist, red (10R 4/6), mostly fine to medium sands, some low plasticity fines, trace fine gravel, [LL=46, PL=23, PI=23, NMC=16.2%, %#200=43.7], AASHTO = A-7-6 (6).			SS-1	6	6	8	8	14
				2.9	SS-2	7	10	8	9	18
309.9				4.9	SS-3	10	13	14	13	27
				6.9	SS-4	5	7	10	11	17
				8.9	SS-5	11	11	9	11	20
304.9	10.9	Boring Terminated at 10.9 feet.								
299.9										



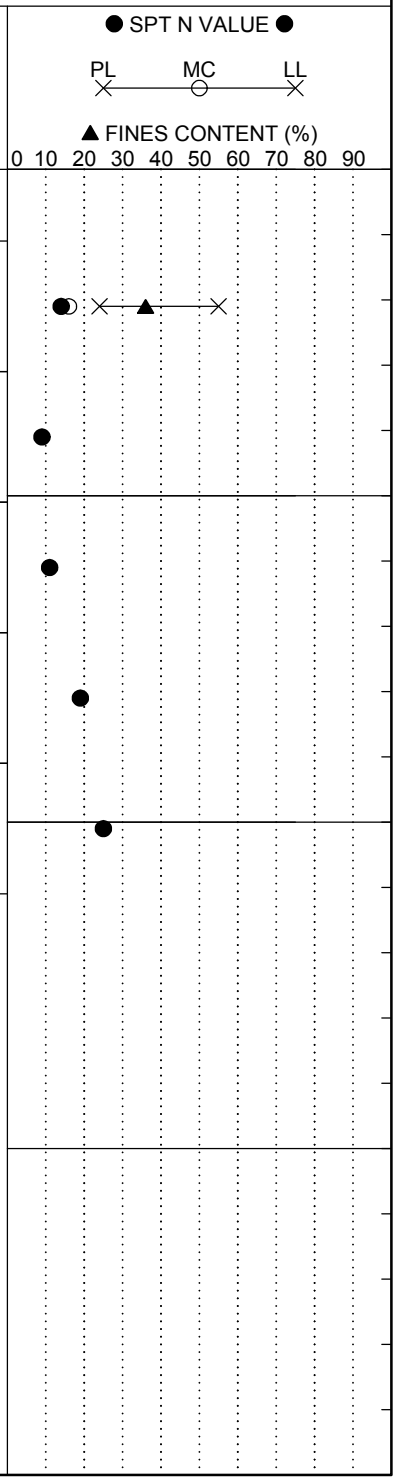
LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-57
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	AKS	**Boring Location:**	201+46.64	**Offset:**	L:49.658'	**Alignment:**	Proposed
Elev.:	311.6 ft	**Latitude:**	34.038666	**Longitude:**	-81.097399	**Date Started:**	2/6/2018
Total Depth:	11.1 ft	**Soil Depth:**	11.1 ft	**Core Depth:**	0 ft	**Date Completed:**	2/6/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 13 inches of ASPHALT.								
	1.1	**COASTAL PLAIN - CLAYEY SAND (SC)** - medium dense, moist, yellowish red (5YR 5/8), subangular, mostly fine to medium sands, some high plasticity fines, [LL=55, PL=24, PI=31, NMC=16%, %#200=35.8], AASHTO = A-7-6 (5).		1.1						
		@ 3.1 feet - loose.			SS-1	4	7	7	6	14
				3.1	SS-2	4	5	4	6	9
306.6		@ 5.1 feet - medium dense, trace fine gravel.		5.1	SS-3	4	5	6	6	11
				7.1	SS-4	7	9	10	11	19
				9.1	SS-5	11	12	13	15	25
301.6	11.1	Boring Terminated at 11.1 feet.								
296.6										



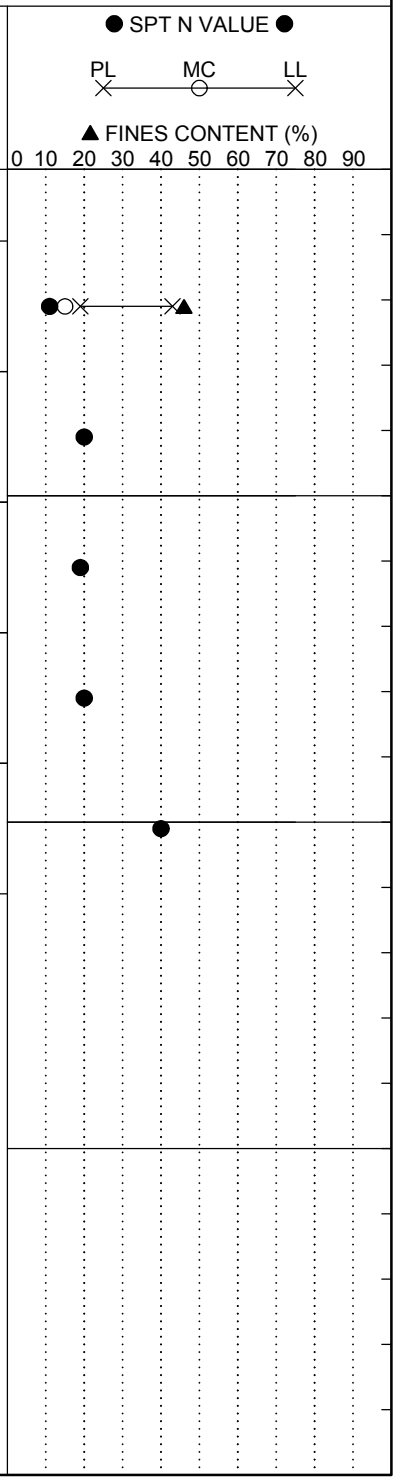
LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-58
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	NGS	**Boring Location:**	211+10.61	**Offset:**	R:44.689'	**Alignment:**	Proposed
Elev.:	306.2 ft	**Latitude:**	34.039080	**Longitude:**	-81.094251	**Date Started:**	2/26/2018
Total Depth:	11.1 ft	**Soil Depth:**	11.1 ft	**Core Depth:**	0 ft	**Date Completed:**	2/26/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 13 inches of ASPHALT.								
	1.1	**FILL - CLAYEY SAND (SC)** - medium dense, moist, brown (7.5YR 5/4) and red (2.5YR 5/6), mostly fine to medium sands, some low plasticity fines, trace fine gravel, [LL=43, PL=19, PI=24, NMC=15.3%, %#200=46.0], AASHTO = A-7-6 (6).		1.1	SS-1	6	4	7	9	11
	3.1	**COASTAL PLAIN - CLAYEY SAND (SC)** - medium dense, moist, red (2.5YR 5/6) and brown (7.5YR 5/4), mostly fine to medium sands, some low to medium plasticity fines.		3.1	SS-2	8	7	13	15	20
301.2				5.1	SS-3	4	9	10	11	19
		@ 7.1 feet - reddish-yellow (7.5YR 7/6).		7.1	SS-4	4	8	12	14	20
		@ 9.1 feet - dense.		9.1	SS-5	14	19	21	21	40
296.2	11.1	Boring Terminated at 11.1 feet.								
291.2										



LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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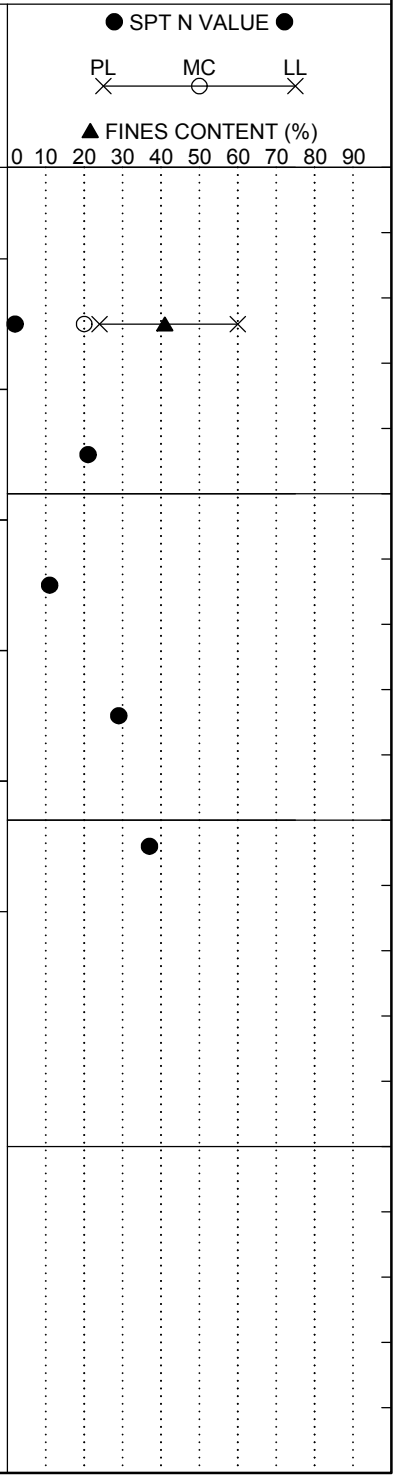
SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-59
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	AKS	**Boring Location:**	221+43.83	**Offset:**	L:49.641'	**Alignment:**	Proposed
Elev.:	308.6 ft	**Latitude:**	34.040557	**Longitude:**	-81.091312	**Date Started:**	2/6/2018
Total Depth:	11.4 ft	**Soil Depth:**	11.4 ft	**Core Depth:**	0 ft	**Date Completed:**	2/6/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 11 inches of ASPHALT.								
	0.9	6 inches of GRADED AGGREGATE BASE.		1.4						
	1.4	**COASTAL PLAIN - CLAYEY SAND (SC)** - very loose, moist, red (10R 5/8), subangular, mostly fine to coarse sands, some high plasticity fines, few fine gravel, [LL=60, PL=24, PI=36, NMC=20%, %#200=40.8], AASHTO = A-7-6 (8).			SS-1	WOH/12"	2	2		2
		@ 3.4 feet - medium dense.		3.4	SS-2	6	10	11	14	21
303.6		@ 5.4 feet - trace fine gravel.		5.4	SS-3	3	4	7	11	11
		@ 7.4 feet - absent gravel, dry to moist.		7.4	SS-4	7	11	18	29	29
	9.4	**COASTAL PLAIN - CLAYEY SAND (SC)** - dense, dry to moist, red (10R 5/8), subangular, mostly fine to medium sands, little low plasticity fines.		9.4	SS-5	14	17	20	27	37
298.6	11.4	Boring Terminated at 11.4 feet.								
293.6										



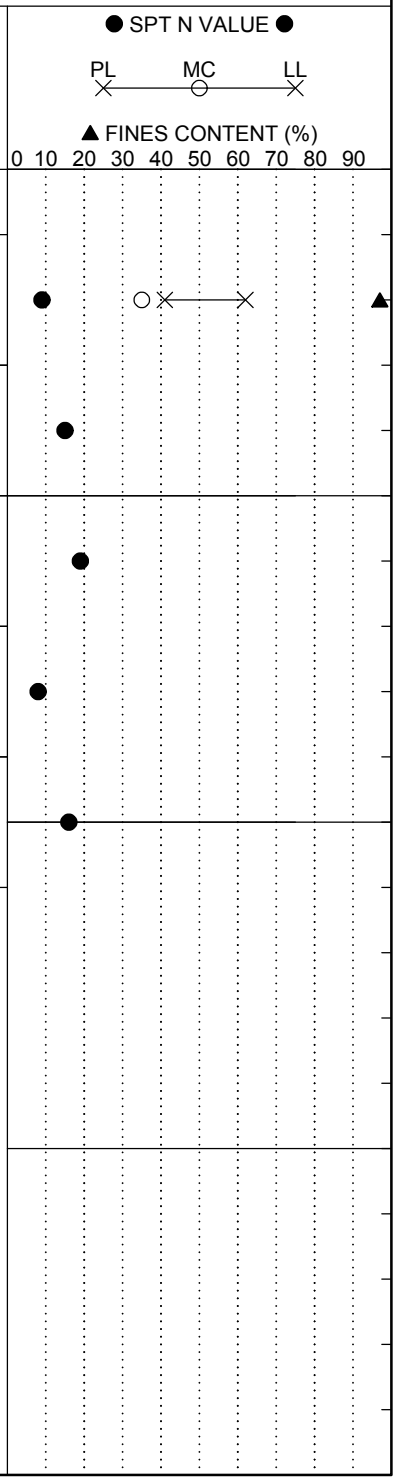
LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-60
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	NGS	**Boring Location:**	230+47.56	**Offset:**	R:61.676'	**Alignment:**	Proposed
Elev.:	276.7 ft	**Latitude:**	34.041399	**Longitude:**	-81.088482	**Date Started:**	2/26/2018
Total Depth:	11 ft	**Soil Depth:**	11 ft	**Core Depth:**	0 ft	**Date Completed:**	2/26/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 12 inches of ASPHALT.								
	1.0	**PIEDMONT RESIDUUM - ELASTIC SILT (MH)** - stiff, moist, reddish-yellow (7.5YR 7/8) and red (2.5YR 5/8), mostly high plasticity fines, trace fine sands, [LL=62, PL=41, PI=21, NMC=35.1%, %#200=96.6], AASHTO = A-7-5 (28).		1.0	SS-1	8	5	4	5	9
				3.0	SS-2	6	7	8	8	15
271.7		@ 5 feet - very stiff.		5.0	SS-3	10	9	10	9	19
	7.0	**LEAN CLAY (CL)** - firm, moist, brownish-yellow (10YR 6/8), mostly low to medium plasticity fines, few fine sands.		7.0	SS-4	3	4	4	5	8
		@ 9 feet - very stiff.		9.0	SS-5	7	8	8	11	16
266.7	11.0	Boring Terminated at 11 feet.								
261.7										



LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

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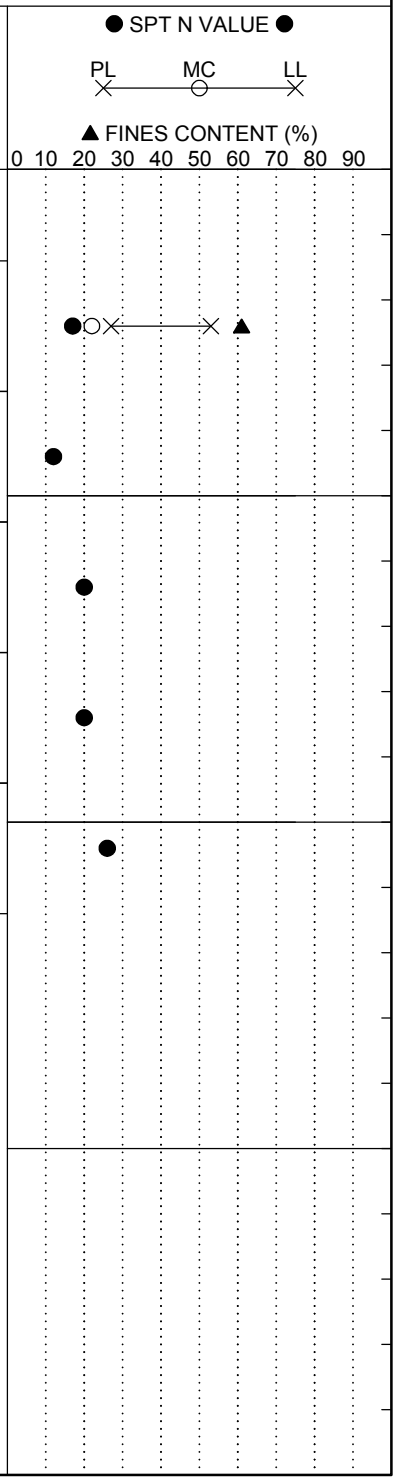
SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-61
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	AKS	**Boring Location:**	241+06.24	**Offset:**	L:61.325'	**Alignment:**	Proposed
Elev.:	234.0 ft	**Latitude:**	34.043008	**Longitude:**	-81.085541	**Date Started:**	2/6/2018
Total Depth:	11.4 ft	**Soil Depth:**	11.4 ft	**Core Depth:**	0 ft	**Date Completed:**	2/6/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 17 inches of ASPHALT.								
	1.4	**FILL - SANDY FAT CLAY (CH)** - very stiff, moist, strong brown (7.5YR 5/6), mostly high plasticity fines, some fine to medium sands, trace fine gravel, [LL=53, PL=27, PI=26, NMC=22%, %#200=61.0], AASHTO = A-7-6 (14). @ 3.4 feet - stiff.		1.4	SS-1	5	8	9	11	17
				3.4	SS-2	2	5	7	10	12
229.0		@ 5.4 feet - very stiff, dark brown (7.5YR 3/2).		5.4	SS-3	8	10	10	11	20
	7.4	**PIEDMONT RESIDUUM - LEAN CLAY (CL)** - very stiff, moist, gray (7.5YR 5/1), mostly low to medium plasticity fines, trace fine to medium sands.		7.4	SS-4	9	10	10	11	20
				9.4	SS-5	11	12	14	13	26
224.0	11.4	Boring Terminated at 11.4 feet.								
219.0										



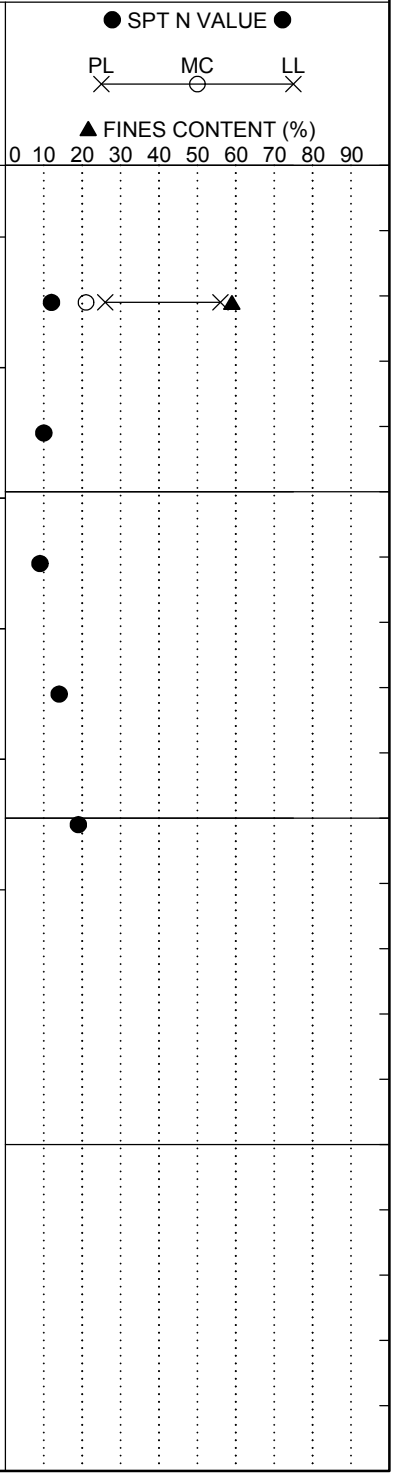
LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-62
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	NGS	**Boring Location:**	249+59.48	**Offset:**	R:44.881'	**Alignment:**	Proposed
Elev.:	200.3 ft	**Latitude:**	34.043800	**Longitude:**	-81.082867	**Date Started:**	2/26/2018
Total Depth:	11.1 ft	**Soil Depth:**	11.1 ft	**Core Depth:**	0 ft	**Date Completed:**	2/26/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 13 inches of ASPHALT.								
	1.1	**FILL - SANDY FAT CLAY (CH)** - stiff, moist, red (10R 4/8) and brownish-yellow (10YR 6/6), mostly high plasticity fines, some fine to coarse sands, trace fine gravel, [LL=56, PL=26, PI=30, NMC=20.7%, %#200=59.4], AASHTO = A-7-6 (16).		1.1	SS-1	3	5	7	10	12
				3.1	SS-2	6	6	4	5	10
195.3				5.1	SS-3	3	3	6	8	9
	7.1	**PIEDMONT RESIDUUM - SILT WITH SAND (ML)** - sitff, moist, brownish-yellow (10YR 6/6), mostly low plasticity fines, little fine sands.		7.1	SS-4	4	6	8	12	14
		@ 9.1 feet - very stiff, reddish-brown (2.5YR 4/4), little fine to coarse sands.		9.1						
190.3					SS-5	5	7	12	14	19
	11.1	Boring Terminated at 11.1 feet.								
185.3										



LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-63
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	AKS	**Boring Location:**	261+06.5	**Offset:**	L:50.047'	**Alignment:**	Proposed
Elev.:	179.2 ft	**Latitude:**	34.045449	**Longitude:**	-81.079624	**Date Started:**	2/6/2018
Total Depth:	11.3 ft	**Soil Depth:**	11.3 ft	**Core Depth:**	0 ft	**Date Completed:**	2/6/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 16 inches of ASPHALT.								
	1.3	**FILL - CLAYEY SAND (SC)** - medium dense, moist, red (10R 5/6), subangular, mostly fine to medium sands, some high plasticity fines, trace fine gravel, [LL=53, PL=22, PI=31, NMC=11%, %#200=46.9], AASHTO = A-7-6 (10).		1.3	SS-1	7	5	7	9	12
				3.3	SS-2	5	7	9	10	16
174.2		@ 5.3 feet - very loose.		5.3	SS-3	2	1	3	4	4
		@ 7.3 feet - medium dense.		7.3	SS-4	5	6	7	10	13
169.2				9.3	SS-5	5	10	6	6	16
	11.3	Boring Terminated at 11.3 feet. Obtained bulk sample from auger cuttings 1.3 to 11.3 feet.								
164.2										

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-64
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	NGS	**Boring Location:**	269+92.95	**Offset:**	R:45.622'	**Alignment:**	Proposed
Elev.:	177.4 ft	**Latitude:**	34.046308	**Longitude:**	-81.076867	**Date Started:**	2/26/2018
Total Depth:	11.1 ft	**Soil Depth:**	11.1 ft	**Core Depth:**	0 ft	**Date Completed:**	2/26/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 13 inches of ASPHALT.								
	1.1	**FILL - SANDY FAT CLAY (CH)** - stiff, moist, red (2.5YR 5/6) and brownish-yellow (10YR 6/6), mostly high plasticity fines, some fine to medium sands, trace fine gravel, [LL=62, PL=25, PI=37, NMC=18.3%, %#200=50.3], AASHTO = A-7-6 (14).		1.1	SS-1	3	5	6	7	11
	3.1	**PIEDMONT RESIDUUM - SILT (ML)** - sitff, moist, yellow (10YR 7/6) and very pale brown (10YR 2/3), mostly low plasticity fines, trace fine sands.		3.1	SS-2	6	8	7	8	15
172.4				5.1	SS-3	4	6	7	7	13
				7.1	SS-4	6	5	5	5	10
	9.1	**SANDY LEAN CLAY (CL)** - very stiff, moist, pink (7.5YR 7/4) and red (10R 4/6), mostly low to medium plasticity fines, some fine to medium sands.		9.1	SS-5	6	8	9	6	17
167.4	11.1	Boring Terminated at 11.1 feet.								
162.4										

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-65
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	HGM	**Boring Location:**	377+80.48	**Offset:**	L:89.300'	**Alignment:**	Proposed
Elev.:	207.9 ft	**Latitude:**	34.028944	**Longitude:**	-81.102697	**Date Started:**	1/24/2018
Total Depth:	10.8 ft	**Soil Depth:**	10.8 ft	**Core Depth:**	0 ft	**Date Completed:**	1/24/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 10 inches of ASPHALT.								
	0.8	**FILL - SILTY SAND (SM)** - loose, moist to wet due to coring, brown (7.5YR 5/4), mostly fine to medium sands, some non-plastic fines, trace fine to medium gravel, [NMC=28%, %#200=34], AASHTO = A-2-4.		0.8	SS-1	2	3	3	4	6
	2.8	**ALLUVIUM - SANDY ELASTIC SILT (MH)** - soft, moist, brown (7.5YR 5/4), mostly high plasticity fines, some fine to medium sands.		2.8	SS-2	2	2	2	3	4
202.9		4.8 feet - firm, yellowish-brown (10YR 5/4).		4.8	SS-3	1	2	3	5	5
	6.8	**PIEDMONT RESIDUUM - SILT WITH SAND (ML)** - very stiff, moist, very pale brown (10YR 7/4), mostly low plasticity fines, little fine sands.		6.8	SS-4	7	11	12	13	23
				8.8	SS-5	10	8	11	14	19
197.9	10.8	Boring Terminated at 10.8 feet. Obtained bulk sample from auger cuttings 0.8 to 10.8 feet.								
192.9										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-66
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	ELF	**Boring Location:**	391+69.40	**Offset:**	L:88.718'	**Alignment:**	Proposed
Elev.:	188.3 ft	**Latitude:**	34.025039	**Longitude:**	-81.102628	**Date Started:**	2/12/2018
Total Depth:	10.8 ft	**Soil Depth:**	10.8 ft	**Core Depth:**	0 ft	**Date Completed:**	2/12/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.3	**SURFACE MATERIALS** - 4 inches of ASPHALT.								
	0.8	6 inches of GRADED AGGREGATE BASE.		0.8						
		FILL - CLAYEY SAND (SC) - medium dense, moist, red (2.5YR 5/6), mostly fine to medium sands, little low plasticity fines, trace fine gravel, [LL=21, PL=12, PI=9, NMC=9.7%, %#200=15.7], AASHTO = A-2-4.			SS-1	14	9	7	5	16
	2.8			2.8						
		CLAYEY SAND WITH GRAVEL (SC) - loose, reddish-brown (2.5YR 5/4), mostly fine to coarse sands, little low plasticity fines, little fine to medium gravel.			SS-2	5	4	4	4	8
	4.8			4.8						
183.3		**ALLUVIUM - CLAYEY SAND (SC)** - medium dense, reddish-brown (2.5YR 5/3), mostly fine to coarse sands, little low plasticity fines, few quartz gravel.			SS-3	5	6	6	6	12
		@ 6.8 feet - loose, trace mica.		6.8	SS-4	3	4	5	11	9
	8.8			8.8						
178.3		**POORLY GRADED SAND WITH CLAY (SP-SC)** - medium dense, moist, red (2.5YR 4/6), mostly fine to coarse sands, few low plasticity fines, trace quartz gravel.			SS-5	12	7	5	6	12
	10.8	Boring Terminated at 10.8 feet.								
173.3										

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-67
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	HGM	**Boring Location:**	404+20.26	**Offset:**	R:38.874'	**Alignment:**	Proposed
Elev.:	184.7 ft	**Latitude:**	34.021965	**Longitude:**	-81.104580	**Date Started:**	1/31/2018
Total Depth:	10.6 ft	**Soil Depth:**	10.6 ft	**Core Depth:**	0 ft	**Date Completed:**	1/31/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.6	**SURFACE MATERIALS** - 7 inches of ASPHALT.		0.6						
		FILL - SANDY FAT CLAY (CH) - firm, moist, red (2.5YR 4/6), mostly high plasticity fines, some fine to medium sands, [LL=52, PL=23, PI=29, NMC=22%, %#200=63.1], AASHTO = A-7-6 (16).			SS-1	3	2	4	5	6
		@ 2.6 feet - stiff, reddish-brown (2.5YR 4/4), 4" seam of poorly graded sand (SP) inbedded between CH in spoon.		2.6	SS-2	4	6	4	6	10
	4.6			4.6						
179.7		**POORLY GRADED SAND WITH SILT (SP-SM)** - medium dense, moist, light yellowish-brown (10YR 6/4), mostly fine to medium sands, few non-plastic fines.			SS-3	6	8	7	7	15
	6.6			6.6						
		PIEDMONT RESIDUUM - SILTY SAND (SM) - medium dense, moist, pink (7.5YR 7/4), mostly fine to coarse sands, some low plasticity fines.			SS-4	4	7	8	10	15
		@ 8.6 feet - pinkish-gray (7.5YR 7/2).		8.6						
					SS-5	9	6	8	9	14
174.7	10.6									
		Boring Terminated at 10.6 feet.								
		Obtained bulk sample from auger cuttings 0.6 to 10.6 feet.								
169.7										

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-68
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	HGM	**Boring Location:**	425+91.48	**Offset:**	R:48.972'	**Alignment:**	Proposed
Elev.:	196.3 ft	**Latitude:**	34.016436	**Longitude:**	-81.107275	**Date Started:**	2/1/2018
Total Depth:	11.1 ft	**Soil Depth:**	11.1 ft	**Core Depth:**	0 ft	**Date Completed:**	2/1/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 13 inches of ASPHALT.								
	1.1	**FILL - SILTY SAND (SM)** - medium dense, moist, reddish-yellow (5YR 6/8), mostly fine to medium sands, little non-plastic fines, [NMC=8%, %#200=13.0], AASHTO = A-2-4.		1.1	SS-1	10	12	11	10	23
	3.1	**PIEDMONT RESIDUUM - SILTY SAND (SM)** - medium dense, moist, light yellowish-brown (10YR 6/4), mostly fine to coarse sands, some low plasticity fines.		3.1	SS-2	6	7	8	9	15
191.3		@ 5.1 feet - loose, very pale brown (10YR 7/4).		5.1	SS-3	2	4	5	4	9
				7.1	SS-4	3	4	5	5	9
				9.1	SS-5	6	5	5	6	10
186.3	11.1	Boring Terminated at 11.1 feet.								
181.3										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

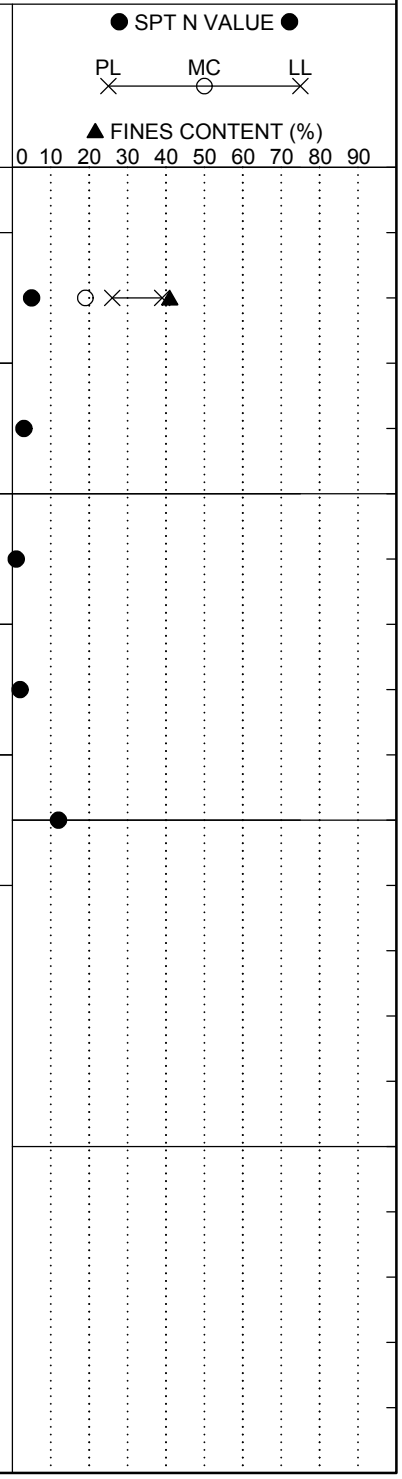
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-69
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	HGM	**Boring Location:**	425+91.48	**Offset:**	R:48.896'	**Alignment:**	Proposed
Elev.:	196.1 ft	**Latitude:**	34.016435	**Longitude:**	-81.107275	**Date Started:**	1/31/2018
Total Depth:	11 ft	**Soil Depth:**	11 ft	**Core Depth:**	0 ft	**Date Completed:**	1/31/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 12 inches of ASPHALT.								
	1.0	**FILL - SILTY SAND (SM)** - loose, wet due to coring, reddish-yellow (5YR 6/8), mostly fine to coarse sands, some low plasticity fines, [LL=39, PL=26, PI=13, NMC=19%, %#200=40.6], AASHTO = A-6 (2).		1.0						
		@ 3 feet - very loose.			SS-1	2	2	3	2	5
				3.0	SS-2	1	2	1	1	3
191.1				5.0	SS-3	WOH	1	WOH	1	1
				7.0	SS-4	1	1	1	1	2
	9.0	**PIEDMONT RESIDUUM - SILTY SAND (SM)** - medium dense, moist, very pale brown (10YR 7/4) with black staining (10YR 2/1), mostly fine to coarse sands, some low plasticity fines.		9.0	SS-5	4	6	6	5	12
186.1	11.0	Boring Terminated at 11 feet.								
181.1										



LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-70
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	HGM	**Boring Location:**	435+44.66	**Offset:**	L:60.234'	**Alignment:**	Proposed
Elev.:	225.1 ft	**Latitude:**	34.013898	**Longitude:**	-81.108136	**Date Started:**	2/1/2018
Total Depth:	10.6 ft	**Soil Depth:**	10.6 ft	**Core Depth:**	0 ft	**Date Completed:**	2/1/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.6	**SURFACE MATERIALS** - 7.5 inches of ASPHALT.		0.6						
		FILL - SANDY FAT CLAY (CH) - very stiff, moist, red (2.5YR 4/8) and white (2.5YR 8/1), mostly high plasticity fines, some fine to coarse sands, few fine gravel, [LL=50, PL=27, PI=23, NMC=18%, %#200=60.3], AASHTO = A-7-6 (12).			SS-1	2	5	12	7	17
	2.6			2.6	SS-2	6	8	50/3"		100
		PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM) - very dense, dry to moist, reddish-yellow (7.5YR 7/6), mostly fine to medium sands, little low plasticity fines.								
	4.6			4.6						
220.1		**PIEDMONT RESIDUUM - SILTY SAND (SM)** - medium dense, moist, pink (7.5YR 7/4), mostly fine to medium sands, little low plasticity fines.			SS-3	6	8	8	8	16
		@ 6.6 feet - reddish-yellow (5YR 6/8).		6.6	SS-4	3	5	6	15	11
		@ 8.6 feet - dark red (2.5YR 3/6) and pink (7.5YR 7/3).		8.6	SS-5	8	9	10	12	19
215.1	10.6	Boring Terminated at 10.6 feet.								
		Obtained bulk sample from auger cuttings 0.6 to 10.6 feet.								
210.1										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

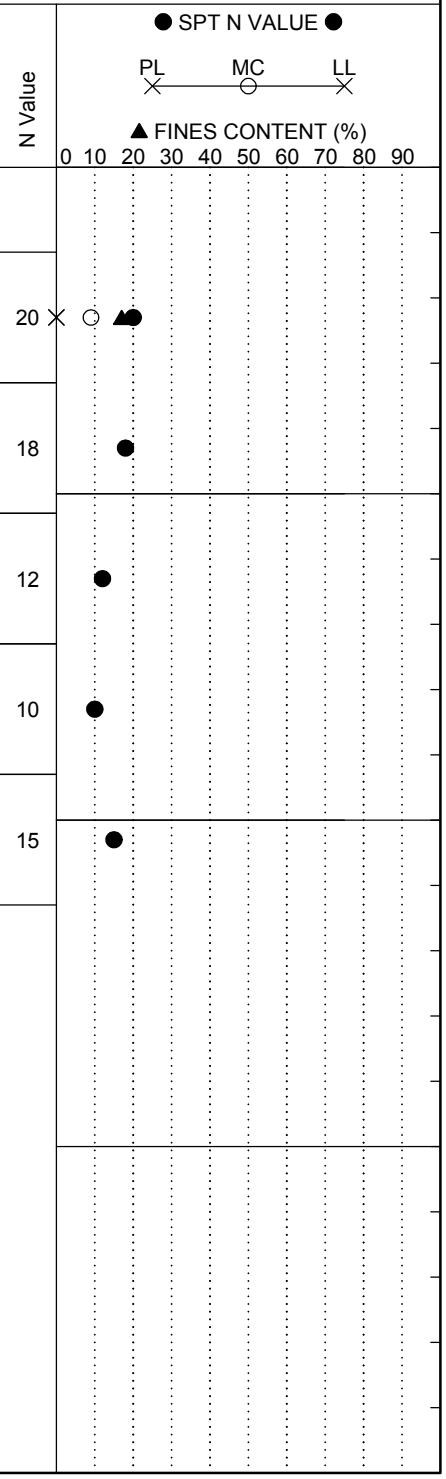
LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	P-71
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	HGM	**Boring Location:**	445+04.36	**Offset:**	R:49.610'	**Alignment:**	Proposed
Elev.:	265.1 ft	**Latitude:**	34.011584	**Longitude:**	-81.109698	**Date Started:**	2/1/2018
Total Depth:	11.3 ft	**Soil Depth:**	11.3 ft	**Core Depth:**	0 ft	**Date Completed:**	2/1/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A.	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 15.5 inches of ASPHALT.								
	1.3	**FILL - SILTY SAND (SM)** - medium dense, moist, red (2.5YR 4/8), mostly fine to medium sands, little low plasticity fines, [NMC=9%, %#200=17.0], AASHTO = A-2-4.		1.3	SS-1	9	10	10	8	20
	3.3	**PIEDMONT RESIDUUM - SILTY SAND (SM)** - medium dense, moist, reddish-yellow (5YR 6/8), mostly fine to coarse sands, some low plasticity fines.		3.3	SS-2	8	9	9	9	18
260.1	5.3	**SANDY SILT (ML)** - stiff, moist, reddish-yellow (7.5YR 7/8), mostly low plasticity fines, some fine to medium sands.		5.3	SS-3	4	5	7	8	12
		@ 7.3 feet - reddish-yellow (7.5YR 7/8) and white (7.5YR 8/1), some fine sands.		7.3	SS-4	2	4	6	7	10
				9.3	SS-5	5	8	7	10	15
255.1	11.3	Boring Terminated at 11.3 feet.								
250.1										



LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	RW-35
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	AKS	**Boring Location:**	375+94.91	**Offset:**	L:182.418'	**Alignment:**	Proposed
Elev.:	210.8 ft	**Latitude:**	34.029541	**Longitude:**	-81.102643	**Date Started:**	1/24/2018
Total Depth:	49.3 ft	**Soil Depth:**	49.3 ft	**Core Depth:**	0 ft	**Date Completed:**	1/24/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A / RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 12.3 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.1	**SURFACE MATERIALS** - 1 inch of TOPSOIL.		0.0						
		FILL - CLAYEY SAND (SC) - loose, moist, reddish brown (5YR 5/3), mostly fine to medium sands, some low plasticity fines.			SS-1	3	4	4	5	8
				2.0	SS-2	3	4	5	5	9
	4.0			4.0						
205.8		**SANDY SILT (ML)** - very loose, moist, reddish brown (5YR 5/3), mostly low plasticity fines, some fine to medium sands, trace fine gravel, [LL=49, PL=31, PI=18, NMC=37.7%, %#200=64.2], AASHTO = A-7-5 (11).			SS-3	3	2	2	5	4
	6.0			6.0						
		PIEDMONT RESIDUUM - SILTY SAND (SM) - medium dense, moist, pale brown (2.5YR 8/2), mostly fine to medium sands, some low plasticity fines.			SS-4	5	6	10	13	16
	8.0			8.0						
		LEAN CLAY (CL) - very stiff, moist, pale brown (2.5YR 8/2), mostly low plasticity fines, few fine to medium sands, [LL=30, PL=22, PI=8, NMC=16.7%, %#200=92.8], AASHTO = A-4 (7).			SS-5	6	10	13	16	23
200.8										
		▽								
	13.5			13.5						
		SILT WITH SAND (ML) - hard, dry to moist, pale yellow (5YR 8/2), mostly low plasticity fines, little fine to medium sands.			SS-6	10	14	18		32
195.8										
		@ 18.5 feet - olive gray (5YR 6/2).		18.5						
					SS-7	5	16	24		40

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	RW-35
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	AKS	**Boring Location:**	375+94.91	**Offset:**	L:182.418'	**Alignment:**	Proposed
Elev.:	210.8 ft	**Latitude:**	34.029541	**Longitude:**	-81.102643	**Date Started:**	1/24/2018
Total Depth:	49.3 ft	**Soil Depth:**	49.3 ft	**Core Depth:**	0 ft	**Date Completed:**	1/24/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A / RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 12.3 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				23.5				
		@ 23.5 feet - very stiff, [LL=36, PL=26, PI=10, NMC=22.1%, %#200=70.3], AASHTO = A-4 (6).			SS-8	7 10 18	28	
185.8								
				28.5				
		@ 28.5 feet - very hard.			SS-9	15 22 33	55	
180.8								
				33.5				
					SS-10	25 35 50	85	
175.8								
	38.5			38.5				
		PARTIALLY WEATHERED ROCK (PWR) - SILT WITH SAND (ML) - very hard, moist, olive gray (5YR 6/2), mostly low plasticity fines, little fine sands.			SS-11	50/5" - -	100

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	RW-35
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	AKS	**Boring Location:**	375+94.91	**Offset:**	L:182.418'	**Alignment:**	Proposed
Elev.:	210.8 ft	**Latitude:**	34.029541	**Longitude:**	-81.102643	**Date Started:**	1/24/2018
Total Depth:	49.3 ft	**Soil Depth:**	49.3 ft	**Core Depth:**	0 ft	**Date Completed:**	1/24/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A / RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 12.3 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	43.5	**PIEDMONT RESIDUUM - SILT WITH SAND (ML)** - hard, moist, olive gray (5YR 6/2), mostly low plasticity fines, little fine sands.		43.5	SS-12	50 20 30	50	
165.8								
	48.5			48.5				
	49.3	**PARTIALLY WEATHERED ROCK (PWR) - SILT WITH SAND (ML)** - very hard, moist, olive gray (5YR 6/2), mostly low plasticity fines, little fine sands.			SS-13	40 49 50/3"	100	
160.8		Boring Terminated at 49.3 feet.						
		Obtained bulk sample from auger cuttings 0.1 to 10.0 feet.						
155.8								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	RW-36
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 29
Eng./Geo.:	AKS	**Boring Location:**	8389+85.83	**Offset:**	R:0.33'	**Alignment:**	Proposed
Elev.:	188.5 ft	**Latitude:**	34.026327	**Longitude:**	-81.100660	**Date Started:**	3/1/2018
Total Depth:	30.1 ft	**Soil Depth:**	30.1 ft	**Core Depth:**	0 ft	**Date Completed:**	3/1/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A / RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 4.2 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.2	**SURFACE MATERIALS** - 2 inches of TOPSOIL.		0.0	SS-1	3	4	5	5	9
		ALLUVIUM - FAT CLAY WITH SAND (CH) - sitff, moist, olive gray (5Y 5/2), reddish-yellow (5YR 6/8), and yellow (5Y 8/8), mostly high plasticity fines, little fine to medium sands, [LL=55, PL=25, PI=30, NMC=25.2%, %#200=75.6], AASHTO = A-7-6 (23).		2.0	SS-2	3	6	6	5	12
		▽ @ 4 feet - firm, olive gray (5Y 5/2) and reddish-yellow (5YR 6/8).		4.0	SS-3	3	3	4	5	7
183.5	6.0	**PIEDMONT RESIDUUM - LEAN CLAY WITH SAND (CL)** - very stiff, dry to moist, pale yellow (5Y 8/2), mostly low plasticity fines, little fine to coarse sands, trace weathered rock fragments, relict rock structure, [LL=37, PL=23, PI=14, NMC=15.1%, %#200=80.3], AASHTO = A-6 (11).		6.0	SS-4	7	9	19	31	28
	8.0	**PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM)** - very dense, dry to moist, pale yellow (5Y 8/2), subangular, mostly fine to medium sands, some low plasticity fines, relict rock structure.		8.0	SS-5	46	50/3"	-	-	100
178.5										
		@ 13.5 feet - moist, trace weathered rock fragments.		13.5	SS-6	43	50/5"	-		100
173.5										
				18.5	SS-7	35	50/4"	-		100

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	RW-36
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 29
Eng./Geo.:	AKS	**Boring Location:**	8389+85.83	**Offset:**	R:0.33'	**Alignment:**	Proposed
Elev.:	188.5 ft	**Latitude:**	34.026327	**Longitude:**	-81.100660	**Date Started:**	3/1/2018
Total Depth:	30.1 ft	**Soil Depth:**	30.1 ft	**Core Depth:**	0 ft	**Date Completed:**	3/1/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A / RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 4.2 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				23.5	SS-8	8 50/1" -	100	
163.5								
				28.5	SS-9	50/1" -	100	
		@ 28.5 feet - no recovery.						
158.5	30.1							
		Boring Terminated at 30.1 feet due to Tri-Cone bit refusal.						
		Obtained bulk sample from auger cuttings 0.2 to 10.0 feet.						
153.5								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	RW-37
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-126
Eng./Geo.:	HGM	**Boring Location:**	45+97.78	**Offset:**	R:85.435'	**Alignment:**	Proposed
Elev.:	191.1 ft	**Latitude:**	34.017205	**Longitude:**	-81.089689	**Date Started:**	1/25/2018
Total Depth:	32.3 ft	**Soil Depth:**	32.3 ft	**Core Depth:**	0 ft	**Date Completed:**	1/25/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A / RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 13.5 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.3	**SURFACE MATERIALS** - 4 inches of TOPSOIL.		0.0	SS-1	2	4	5	9	9
		FILL - CLAYEY SAND (SC) - loose, moist, red (10R 4/8), mostly fine to medium sands, some low plasticity fines.		2.0	SS-2	7	10	10	12	20
		@ 2 feet - medium dense.								
186.1		@ 4 feet - loose, [LL=27, PL=18, PI=9, NMC=14.3%, %#200=34.8], AASHTO = A-2-4.		4.0	SS-3	2	4	6	8	10
		@ 6 feet - medium dense.		6.0	SS-4	8	10	10	14	20
	8.0			8.0						
		ALLUVIUM - SILTY SAND (SM) - medium dense, moist, reddish-yellow (5YR 6/6), mostly fine to coarse sands, some low plasticity fines.			SS-5	5	8	10	11	18
181.1										
		@ 13.5 feet - very loose, wet, [LL=45, PL=30, PI=15, NMC=26.4%, %#200=33.3], AASHTO = A-2-7 (1).		13.5	SS-6	2	2	2		4
176.1										
	18.5			18.5						
		PIEDMONT RESIDUUM - SILTY SAND (SM) - very loose, wet, yellowish-brown (10YR 5/8), mostly fine to coarse sands, little non-plastic fines.			SS-7	1	1	2		3

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	RW-37
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-126
Eng./Geo.:	HGM	**Boring Location:**	45+97.78	**Offset:**	R:85.435'	**Alignment:**	Proposed
Elev.:	191.1 ft	**Latitude:**	34.017205	**Longitude:**	-81.089689	**Date Started:**	1/25/2018
Total Depth:	32.3 ft	**Soil Depth:**	32.3 ft	**Core Depth:**	0 ft	**Date Completed:**	1/25/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A / RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 13.5 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				23.5				
166.1		@ 23.5 feet - medium dense, [LL=NP, PL=NP, PI=NP, NMC=19.1%, %#200=24.4], AASHTO = A-2-4.			SS-8	12 11 12	23	
	28.5	**PARTIALLY WEATHERED ROCK (PWR)** - very dense, no recovery.		28.5	SS-9	50/0" - -	100	
161.1								
	32.3	Boring Terminated at 32.3 feet due to Tri-Cone bit refusal. Obtained bulk sample from auger cuttings 0.3 to 10.0 feet.						
156.1								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	RW-38
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 32
Eng./Geo.:	NGS	**Boring Location:**	5985+51.15	**Offset:**	L:73.93'	**Alignment:**	Proposed
Elev.:	169.5 ft	**Latitude:**	34.022027	**Longitude:**	-81.105175	**Date Started:**	4/3/2018
Total Depth:	16.6 ft	**Soil Depth:**	16.6 ft	**Core Depth:**	0 ft	**Date Completed:**	4/3/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A / RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 6.2 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
		PIEDMONT RESIDUUM - SILTY CLAYEY SAND (SC-SM) - loose, moist, light red (2.5YR 7/6), subangular, mostly fine to medium sands, little low plasticity fines, few fine gravel, [LL=17, PL=12, PI=5, NMC=8.1%, %#200=16], AASHTO = A-2-4.		0.0	SS-1	5	4	3	3	7
	1.5			2.0						
		LEAN CLAY WITH SAND (CL) - stiff, moist, strong brown (7.5YR 5/6), mostly low plasticity fines, little fine sands, trace organics, micaceous.			SS-2	4	4	5	5	9
		@ 2 feet - [LL=39, PL=21, PI=18, NMC=23.3%, %#200=76], AASHTO = A-6 (13).		4.0						
164.5					SS-3	5	6	8	10	14
		@ 6 feet - [LL=33, PL=19, PI=14, NMC=25.9%, %#200=85], AASHTO = A-6 (11).		6.0						
					SS-4	2	4	5	7	9
		@ 8 feet - very stiff.		8.0						
					SS-5	8	8	9	8	17
159.5										
	13.5	**PARTIALLY WEATHERED ROCK (PWR) - WELL GRADED SAND (SW)** - very dense, moist, light red (2.5YR 7/6), subangular, mostly fine to coarse sands, trace non-plastic fines.		13.5	SS-6	50/2"	-	-		100
154.5										
	16.6	Tri-Cone Bit Refusal at 16.6 feet. Install NW Casing to 16.6 feet for NQ wireline coring.		16.6	SS-7	50/0"	-	-		100
		Boring Terminated at 16.6 feet.								
		Obtained bulk sample from auger cuttings 0.0 to 10.0 feet.								

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	RW-39
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	HGM	**Boring Location:**	420+96.48	**Offset:**	L:67.234'	**Alignment:**	Proposed
Elev.:	199.3 ft	**Latitude:**	34.017580	**Longitude:**	-81.106312	**Date Started:**	2/1/2018
Total Depth:	35.2 ft	**Soil Depth:**	35.2 ft	**Core Depth:**	0 ft	**Date Completed:**	2/1/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A / RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 14.9 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.3	**SURFACE MATERIALS** - 3 inches of TOPSOIL.		0.0	SS-1	3	3	5	7	8
		FILL - CLAYEY SAND (SC) - loose, moist, red (2.5YR 5/8), mostly fine to coarse sands, some low plasticity fines.		2.0	SS-2	4	4	6	10	10
		@ 2 feet - dark gray (5YR 4/1), some low plasticity fines, trace fibrous organics, [LL=27, PL=18, PI=9, NMC=13.1%, %#200=41.2], AASHTO = A-4 (1).								
	4.0			4.0						
194.3		**SANDY FAT CLAY (CH)** - stiff, moist, yellowish-red (5YR 5/8), mostly high plasticity fines, some fine to medium sands.			SS-3	4	5	5	6	10
		@ 6 feet - very stiff, [LL=50, PL=24, PI=26, NMC=17.3%, %#200=60.2], AASHTO = A-7-6 (13).		6.0	SS-4	8	9	15	12	24
	8.0			8.0						
		SILTY SAND (SM) - medium dense, moist, red (2.5YR 5/8), mostly fine to coarse sands, some low plasticity fines, trace fine to medium gravel.			SS-5	4	6	8	5	14
189.3										
	13.5			13.5						
		PIEDMONT RESIDUUM - SILTY SAND (SM) - medium dense, moist, reddish-yellow (7.5YR 6/6) and white (7.5YR 8/1), mostly fine to coarse sands, some low plasticity fines.			SS-6	3	6	6		12
184.3										
		@ 18.5 feet - loose, [LL=34, PL=28, PI=6, NMC=22.1%, %#200=38.7], AASHTO = A-4 (0).		18.5	SS-7	4	4	5		9

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	RW-39
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	HGM	**Boring Location:**	420+96.48	**Offset:**	L:67.234'	**Alignment:**	Proposed
Elev.:	199.3 ft	**Latitude:**	34.017580	**Longitude:**	-81.106312	**Date Started:**	2/1/2018
Total Depth:	35.2 ft	**Soil Depth:**	35.2 ft	**Core Depth:**	0 ft	**Date Completed:**	2/1/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A / RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 14.9 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				23.5	SS-8	9 12 16	28	●
174.3		@ 23.5 feet - medium dense, moist to wet, pink (7.5YR 7/3), mostly fine to coarse sands, some low plasticity fines.						
	28.5	**PARTIALLY WEATHERED ROCK (PWR) - SITLY SAND (SM)** - very dense, moist to wet, pink (7.5YR 7/3) and white (7.5YR 8/1), mostly fine to coarse sands, little low plasticity fines, trace weathered rock fragments.		28.5	SS-9	23 39 50/4"	100	●
169.3								
		@ 33.5 feet - brown (10YR 4/3) and very pale brown (10YR 7/3).		33.5	SS-10	45 50/5" -	100	●
164.3	35.2	Boring Terminated at 35.2 feet due to Tri-Cone bit refusal. Obtained bulk sample from auger cuttings 0.3 to 10.0 feet.						

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	RW-40
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	AKS	**Boring Location:**	69+86.46	**Offset:**	L:60.995'	**Alignment:**	Proposed
Elev.:	238.9 ft	**Latitude:**	34.021474	**Longitude:**	-81.133604	**Date Started:**	2/13/2018
Total Depth:	20.8 ft	**Soil Depth:**	20.8 ft	**Core Depth:**	0 ft	**Date Completed:**	2/13/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A / RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 3.3 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**<u>PIEDMONT RESIDUUM</u> - SANDY SILT (ML)** - stiff, moist, reddish yellow (7.5YR 7/8), mostly low plasticity fines, little fine sands, trace weathered rock fragments.		0.0	SS-1	3	4	5	5	9
		@ 2 feet - [LL=43, PL=32, PI=11, NMC=30.8%, %#200=83.2], AASHTO = A-7-5 (11). ▽		2.0	SS-2	3	5	7	13	12
		@ 4 feet - very stiff, pinkish-gray (7.5YR 7/2), trace fine gravel.		4.0	SS-3	5	13	17	20	30
233.9										
		@ 6 feet - brown (7.5YR 5/2), absent gravel.		6.0	SS-4	14	18	22	29	40
		@ 8 feet - hard.		8.0	SS-5	12	18	29	41	47
228.9										
	13.5	**<u>PARTIALLY WEATHERED ROCK (PWR)</u> - SANDY SILT (ML)** - very hard, moist, brown (7.5YR 5/2), mostly low plasticity fines, some fine to medium sands, relict rock structure.		13.5	SS-6	50/5"-	-			100
223.9										
				18.5	SS-7	50/1"-	-			100

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	RW-40
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	AKS	**Boring Location:**	69+86.46	**Offset:**	L:60.995'	**Alignment:**	Proposed
Elev.:	238.9 ft	**Latitude:**	34.021474	**Longitude:**	-81.133604	**Date Started:**	2/13/2018
Total Depth:	20.8 ft	**Soil Depth:**	20.8 ft	**Core Depth:**	0 ft	**Date Completed:**	2/13/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A / RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 3.3 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	20.8	Boring Terminated at 20.8 feet due to Tri-Cone but refusal. Obtained bulk sample from auger cuttings 0.0 to 10.0 feet.						
213.9								
208.9								
203.9								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	RW-41
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 15
Eng./Geo.:	NGS	**Boring Location:**	5148+49.42	**Offset:**	L:22.05'	**Alignment:**	Proposed
Elev.:	211.1 ft	**Latitude:**	34.035089	**Longitude:**	-81.114037	**Date Started:**	3/14/2018
Total Depth:	41.6 ft	**Soil Depth:**	41.6 ft	**Core Depth:**	0 ft	**Date Completed:**	2/14/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A / RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 6 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.1	**SURFACE MATERIALS** - 1 inch of TOPSOIL.		0.0	SS-1	3	3	5	7	8
	2.0	**FILL - SILTY CLAYEY SAND (SC-SM)** - loose, moist, yellowish-red (5YR 5/8), mostly fine to medium sands, some low plasticity fines, trace fine gravel, [LL=22, PL=15, PI=7, NMC=10.1%, %#200=42.1], AASHTO = A-4 (0).		2.0	SS-2	4	4	6	8	10
		ALLUVIUM - SANDY LEAN CLAY (CL) - stiff, moist, brownish-yellow (10YR 6/8) and light gray (10YR 7/1), mostly low plasticity fines, some fine to medium sands, trace fine gravel, [LL=31, PL=17, PI=14, NMC=14.0%, %#200=55.1], AASHTO = A-6 (5).		4.0	SS-3	2	3	5	8	8
206.1	6.0	@ 4 feet - firm.		6.0	SS-4	8	9	11	15	20
	8.0	**PIEDMONT RESIDUUM - ELASTIC SILT WITH SAND (MH)** - very stiff, moist, light gray (10YR 7/1) and yellowish-red (5YR 5/8), mostly high plasticity fines, little fine sands, [LL=50, PL=30, PI=20, NMC=23.6%, %#200=83.3], AASHTO = A-7-5 (19).		8.0	SS-5	8	12	17	19	29
201.1		**SILT WITH SAND (ML)** - very stiff, moist, light gray (10YR 7/1) and yellowish-red (5YR 5/8), mostly low plasticity fines, little fine to medium sands, relict rock structure.								
		@ 13.5 feet - very hard.		13.5	SS-6	9	21	35		56
196.1										
	17.7	**SANDY SILT (ML)** - very hard, moist, light gray (10YR 7/1), mostly low plasticity fines, some fine sands.		18.5	SS-7	13	26	27		53

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	RW-41
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 15
Eng./Geo.:	NGS	**Boring Location:**	5148+49.42	**Offset:**	L:22.05'	**Alignment:**	Proposed
Elev.:	211.1 ft	**Latitude:**	34.035089	**Longitude:**	-81.114037	**Date Started:**	3/14/2018
Total Depth:	41.6 ft	**Soil Depth:**	41.6 ft	**Core Depth:**	0 ft	**Date Completed:**	2/14/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A / RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 6 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		@ 23.5 feet - hard.		23.5	SS-8	16 21 23	44	
186.1	28.5	**PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM)** - very dense, moist, light gray (10YR 7/1), mostly fine to medium sands, some low plasticity fines.		28.5	SS-9	17 35 50/2"	100	
181.1				33.5	SS-10	20 50/4" -	100	
176.1	34.0	**WELL GRADED SAND (SW)** - very dense, moist, strong brown (7.5YR 5/8) and light gray (10YR 7/1), mostly fine to medium sands, trace non-plastic fines.		38.5	SS-11	50/4"- -	100	

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	RW-41
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 15
Eng./Geo.:	NGS	**Boring Location:**	5148+49.42	**Offset:**	L:22.05'	**Alignment:**	Proposed
Elev.:	211.1 ft	**Latitude:**	34.035089	**Longitude:**	-81.114037	**Date Started:**	3/14/2018
Total Depth:	41.6 ft	**Soil Depth:**	41.6 ft	**Core Depth:**	0 ft	**Date Completed:**	2/14/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	H.S.A / RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 6 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	41.6	Boring Terminated at 41.6 feet due to Tri-Cone bit refusal. Obtained bulk sample from auger cuttings 0.1 to 10.0 feet.		41.6	SS-12	50/0"- -	100	
166.1								
161.1								
156.1								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	RW-42
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	AKS	**Boring Location:**	199+04.58	**Offset:**	L:148.652'	**Alignment:**	Proposed
Elev.:	312.4 ft	**Latitude:**	34.038875	**Longitude:**	-81.098205	**Date Started:**	3/15/2018
Total Depth:	50 ft	**Soil Depth:**	50 ft	**Core Depth:**	0 ft	**Date Completed:**	3/15/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A / RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 20.5 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%)
	0.0										
	0.3	**SURFACE MATERIALS** - 3 inches of TOPSOIL.		0.0	SS-1	2	3	3	2	6	
		FILL - SILTY CLAYEY SAND (SC-SM) - loose, moist, reddish-brown (2.5YR 5/3), subangular, mostly fine to medium sands, some low plasticity fines, [LL=17, PL=11, PI=6, NMC=10.5%, %#200=39.6], AASHTO = A-4 (0).		2.0	SS-2	4	4	3	2	7	
		@ 2 feet - red (7.5YR 4/8).									
		@ 4 feet - medium dense.		4.0	SS-3	10	11	13	14	24	
307.4	6.3			6.0	SS-4	7	10	14	20	24	
		COASTAL PLAIN - SANDY ELASTIC SILT (MH) - very stiff, moist, reddish-brown (2.5YR 5/3), mostly high plasticity fines, some fine to medium sands, [LL=53, PL=31, PI=22, NMC=23.9%, %#200=67.8], AASHTO = A-7-5 (15).		8.0	SS-5	15	16	25	30	41	
		@ 8 feet - hard, red (7.5YR 4/8) and brownish-yellow (10YR 6/8).									
302.4				13.5	SS-6	9	16	20		36	
		@ 13.5 feet - brownish-yellow (10YR 6/8).									
297.4											
	18.5			18.5	SS-7	5	6	9		15	
		SANDY LEAN CLAY (CL) - stiff, moist, red (7.5YR 4/8, brownish-yellow (10YR 6/8) and white (10YR 8/1), mostly low plasticity fines, some fine sands, [LL=47, PL=19,									

Continued Next Page

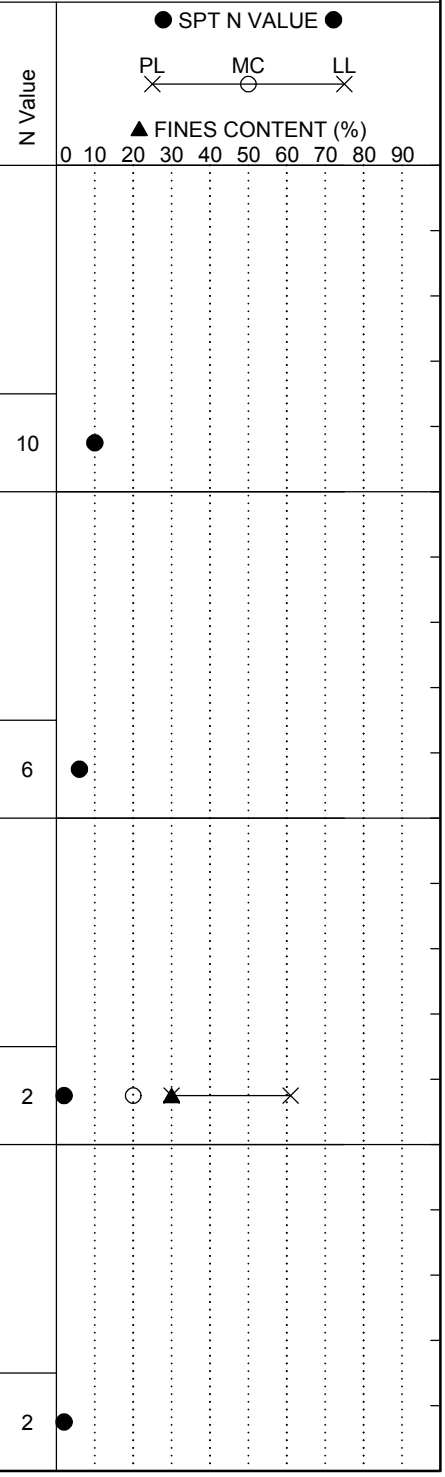
LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	RW-42
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	AKS	**Boring Location:**	199+04.58	**Offset:**	L:148.652'	**Alignment:**	Proposed
Elev.:	312.4 ft	**Latitude:**	34.038875	**Longitude:**	-81.098205	**Date Started:**	3/15/2018
Total Depth:	50 ft	**Soil Depth:**	50 ft	**Core Depth:**	0 ft	**Date Completed:**	3/15/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A / RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 20.5 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
		▽PI=28, NMC=19.4%, %#200=66.0], AASHTO = A-7-6 (16).								
		@ 23.5 feet - trace fine gravel.		23.5	SS-8	2	5	5		10
287.4										
		@ 28.5 feet - firm.		28.5	SS-9	3	2	4		6
282.4										
	33.5	**CLAYEY SAND (SC)** - very loose, moist to wet, yellow (2.5YR 7/6), mostly medium sands, little high plasticity fines, trace fine gravel, [LL=61, PL=30, PI=31, NMC=19.7%, %#200=29.7], AASHTO = A-2-7 (3).		33.5	SS-10	2	1	1		2
277.4										
				38.5	SS-11	1	1	1		2



LEGEND

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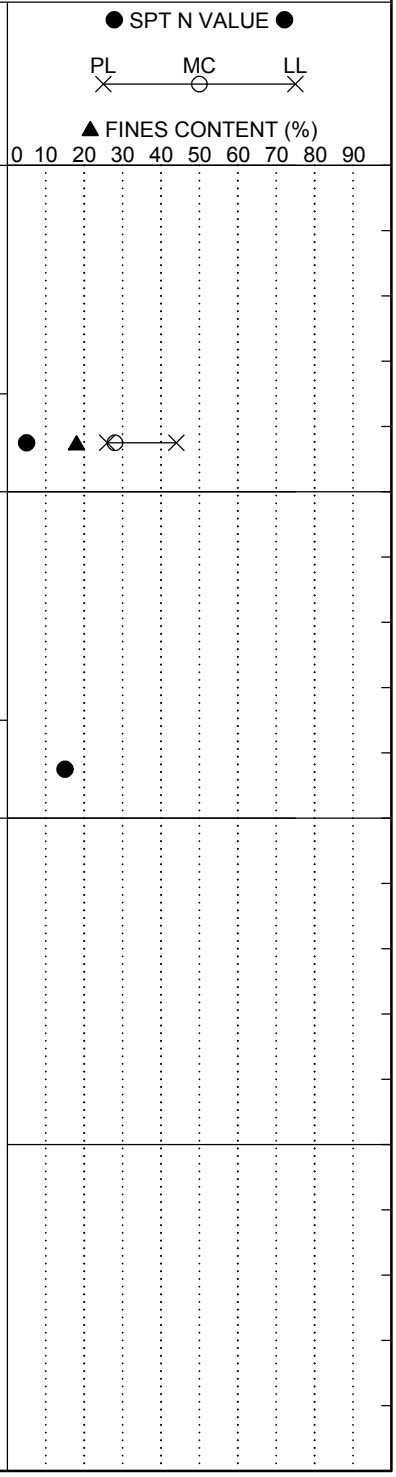
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	RW-42
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	AKS	**Boring Location:**	199+04.58	**Offset:**	L:148.652'	**Alignment:**	Proposed
Elev.:	312.4 ft	**Latitude:**	34.038875	**Longitude:**	-81.098205	**Date Started:**	3/15/2018
Total Depth:	50 ft	**Soil Depth:**	50 ft	**Core Depth:**	0 ft	**Date Completed:**	3/15/2018
Bore Hole Diameter (in):	7.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	H.S.A / RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 20.5 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
				43.5						
		@ 43.5 feet - loose, little low plasticity fines, [LL=44, PL=26, PI=18, NMC=28.3%, %#200=17.5], AASHTO = A-2-7 (0).			SS-12	3	2	3		5
267.4										
				48.5						
		@ 48.5 feet - medium dense, wet, absent gravel.			SS-13	3	7	8		15
262.4	50.0									
		Boring Terminated at 50 feet.								
		Obtained bulk sample from auger cuttings 0.3 to 10.0 feet.								
257.4										



LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	RW-42UD
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	NGS	**Boring Location:**	199+15.15	**Offset:**	L:89.726'	**Alignment:**	Proposed
Elev.:	313.7 ft	**Latitude:**	34.038715	**Longitude:**	-81.098159	**Date Started:**	3/28/2018
Total Depth:	42 ft	**Soil Depth:**	42 ft	**Core Depth:**	0 ft	**Date Completed:**	3/28/2018
Bore Hole Diameter (in):	4.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 8 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0							
	0.3	**SURFACE MATERIALS** - 3 inches of TOPSOIL.						
308.7								
		▽						
303.7								
		Drilled without sampling to 28.5 feet.						
298.7								

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	RW-42UD
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	NGS	**Boring Location:**	199+15.15	**Offset:**	L:89.726'	**Alignment:**	Proposed
Elev.:	313.7 ft	**Latitude:**	34.038715	**Longitude:**	-81.098159	**Date Started:**	3/28/2018
Total Depth:	42 ft	**Soil Depth:**	42 ft	**Core Depth:**	0 ft	**Date Completed:**	3/28/2018
Bore Hole Diameter (in):	4.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 8 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
288.7											
	28.5			28.5							
283.7		**COASTAL PLAIN - CLAYEY SAND (SC)** - very loose, moist, yellow (10YR 7/8), mostly fine to medium sands, little low to medium plasticity fines.			UD-1						
				30.5	SS-1	2	1	2		3	●
				33.5							
		@ 33.5 feet - red (10R 5/6), some low plasticity fines.			UD-2						
278.7				35.5							
		@ 35.5 feet - yellow (10YR 8/8).			SS-2	1	1	1		2	●
				38.5							
					UD-3						

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	RW-42UD
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	NGS	**Boring Location:**	199+15.15	**Offset:**	L:89.726'	**Alignment:**	Proposed
Elev.:	313.7 ft	**Latitude:**	34.038715	**Longitude:**	-81.098159	**Date Started:**	3/28/2018
Total Depth:	42 ft	**Soil Depth:**	42 ft	**Core Depth:**	0 ft	**Date Completed:**	3/28/2018
Bore Hole Diameter (in):	4.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 8 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
				40.5						
					SS-3	1	2	5		7
	42.0	Boring Terminated at 42 feet.								
268.7										
263.7										
258.7										

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

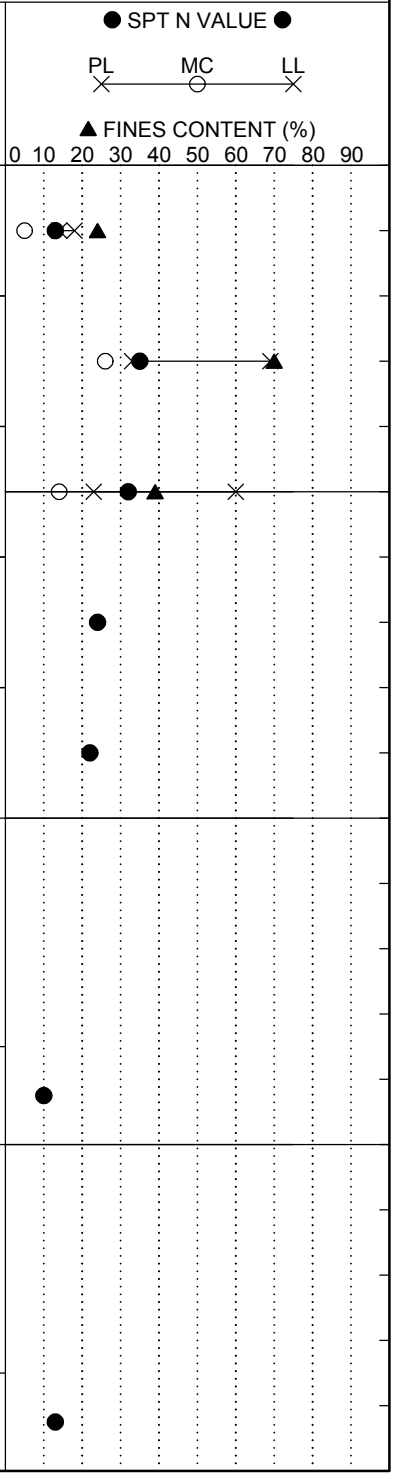
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	RW-43
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	NGS	**Boring Location:**	223+93.71	**Offset:**	R:137.088'	**Alignment:**	Proposed
Elev.:	304.1 ft	**Latitude:**	34.040407	**Longitude:**	-81.090298	**Date Started:**	4/4/2018
Total Depth:	50 ft	**Soil Depth:**	50 ft	**Core Depth:**	0 ft	**Date Completed:**	4/4/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 10.4 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0		0.0						
	0.1	**SURFACE MATERIALS** - 1 inch of TOPSOIL.							
	1.0	**FILL - SILTY CLAYEY SAND WITH GRAVEL (SC-SM)** - medium dense, dry, brown (7.5YR 5/4), mostly fine to medium sands, little low plasticity fines, little fine gravel, trace organics, [LL=18, PL=14, PI=4, NMC=4.5%, %#200=24], AASHTO = A-2-4.		SS-1	5	7	6	7	13
	3.5	**SANDY FAT CLAY (CL)** - stiff, moist, red (10R 4/8), mostly high plasticity fines, some fine to medium sands.	2.0	SS-2	13	17	18	22	35
299.1		@ 2 feet - hard, [LL=69, PL=33, PI=36, NMC=25.6%, %#200=70], AASHTO = A-7-5 (26).	4.0	SS-3	9	14	18	19	32
		COASTAL PLAIN - CLAYEY SAND (SC) - dense, dry, light red (2.5YR 6/6), yellow (10YR 7/6), and white (10YR 8/1), mostly fine to medium sands, some high plasticity fines.	6.0	SS-4	7	12	12	13	24
		@ 4 feet - [LL=60, PL=23, PI=37, NMC=14.1%, %#200=39], AASHTO = A-7-6 (8).	8.0	SS-5	10	12	10	11	22
294.1		@ 6 feet - medium dense. ▽							
		@ 13.5 feet - loose.	13.5	SS-6	4	5	5		10
289.1									
		@ 18.5 feet - medium dense.	18.5	SS-7	5	6	7		13



LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	RW-43
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	NGS	**Boring Location:**	223+93.71	**Offset:**	R:137.088'	**Alignment:**	Proposed
Elev.:	304.1 ft	**Latitude:**	34.040407	**Longitude:**	-81.090298	**Date Started:**	4/4/2018
Total Depth:	50 ft	**Soil Depth:**	50 ft	**Core Depth:**	0 ft	**Date Completed:**	4/4/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 10.4 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	22.0	**PIEDMONT RESIDUUM - ELASTIC SILT WITH SAND (MH)** - firm, moist, dark reddish-gray (10R 3/1), mostly high plasticity fines, little fine sands.		23.5				
		@ 23.5 feet - [LL=80, PL=42, PI=38, NMC=60.7%, %#200=71], AASHTO = A-7-5 (30).			SS-8	2 3 3	6	● ▲
279.1								
		@ 28.5 feet - stiff.		28.5	SS-9	2 4 5	9	●
274.1	31.0	**SILT WITH SAND (ML)** - hard, moist, reddish-yellow (5YR 6/8) and very dark gray (5YR 3/1) mostly low plasticity fines, little fine to medium sands.		33.5	SS-10	7 16 17	33	●
269.1								
		@ 38.5 feet - stiff.		38.5	SS-11	2 5 6	11	●

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	RW-43
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	NGS	**Boring Location:**	223+93.71	**Offset:**	R:137.088'	**Alignment:**	Proposed
Elev.:	304.1 ft	**Latitude:**	34.040407	**Longitude:**	-81.090298	**Date Started:**	4/4/2018
Total Depth:	50 ft	**Soil Depth:**	50 ft	**Core Depth:**	0 ft	**Date Completed:**	4/4/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 10.4 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
		@ 43.5 feet - firm.		43.5	SS-12	5	4	4		8
259.1		@ 48.5 feet - very stiff.		48.5	SS-13	7	10	14		24
254.1	50.0	Boring Terminated at 50 feet. Obtained bulk sample from auger cuttings 0.1 to 10.1 feet.								
249.1										

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-18
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 24
Eng./Geo.:	NGS	**Boring Location:**	3144+03.93	**Offset:**	R:35.75'	**Alignment:**	Proposed
Elev.:	194.2 ft	**Latitude:**	34.035582	**Longitude:**	-81.116087	**Date Started:**	3/8/2018
Total Depth:	34.3 ft	**Soil Depth:**	22.6 ft	**Core Depth:**	11.7 ft	**Date Completed:**	3/8/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 9 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.4	**SURFACE MATERIALS** - 5 inches of ASPHALT.		0.4						
		ALLUVIUM - LEAN CLAY WITH SAND (CL) - stiff, moist, dark reddish-gray (5YR 4/2) and brown (7.5YR 4/3), mostly low plasticity fines, little fine to meduim sands, [LL=32, PL=18, PI=14, NMC=18.5%, %#200=78.6], AASHTO = A-6 (10).			SS-1	4	5	5	5	10
		@ 2.4 feet - firm, moist, yellowish-red (5YR 4/6), trace fine gravel, [LL=44, PL=26, PI=18, NMC=23.3%, %#200=81.3], AASHTO = A-7-6 (15).		2.4	SS-2	3	3	3	3	6
189.2	4.4	**SILTY CLAYEY SAND (SC-SM)** - loose, moist, black (5YR 2.5/1) and light brownish-gray (10YR 6/2), mostly fine to coarse sands, some low plasticity fines, trace wood organics, trace fine gravel, [LL=22, PL=17, PI=5, NMC=14.2%, %#200=46.5], AASHTO = A-4 (0).		4.4	SS-3	3	3	3	3	6
				6.4	SS-4	5	4	4	6	8
	8.4	**LEAN CLAY (CL)** - firm, moist, gray (GLEY 1 5/) and light olive (10Y4 5/4), mostly low plasticity fines, little fine to medium sands, [LL=27, PL=15, PI=12, NMC=18.5%, %#200=85.7], AASHTO = A-6 (8).		8.4	SS-5	2	2	3	4	5
184.2	10.0	**PIEDMONT RESIDUUM - SILT (ML)** - hard, moist, light gray (GLEY 1 7/) and yellowish-brown (10YR 5/6), mostly low plasticity fines, few fine sands, [LL=41, PL=29, PI=12, NMC=21.4%, %#200=89.5], AASHTO = A-7-6 (13).		13.5	SS-6	11	19	16		35
179.2	17.4	**PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM)** - very dense, moist, pale brown (2.5YR 5/1), mostly fine sands, some low plasticity fines.		18.5	SS-7	50/3"-	-			100

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-18
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 24
Eng./Geo.:	NGS	**Boring Location:**	3144+03.93	**Offset:**	R:35.75'	**Alignment:**	Proposed
Elev.:	194.2 ft	**Latitude:**	34.035582	**Longitude:**	-81.116087	**Date Started:**	3/8/2018
Total Depth:	34.3 ft	**Soil Depth:**	22.6 ft	**Core Depth:**	11.7 ft	**Date Completed:**	3/8/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 9 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	22.6	Tri-Cone Bit Refusal at 22.6 feet. Install NW Casing to 22.6 feet for NQ wireline coring.		22.6	~~SS-8~~	~~50/0"~~ - -	~~100~~	
		For discontinuity descriptors, see discontinuity worksheet.		22.6	RC-1			
169.2		**METAMORPHIC BEDROCK - PHYLITE** - light gray (GLEY 1 8/), fine grained to very fine grained, foliated, highly to moderately weathered, weak to medium strong rock.		24.3				
		RC-1: Rec= 88.2%, RQD= 0.0%, GSI= 10-20, RMR =			RC-2			
		Low to moderate recoveries likely due to seams of completely weathered rock or residual soil washed away by coring process.						
		@ 25.4 feet - moderately weathered.		29.3				
164.2		RC-2: Rec= 90.0%, RQD= 0.0%, GSI= 10-20.						
		@ 28.7 feet - highly weathered.						
		@ 28.9 feet - slightly weathered, strong rock.			RC-3			
		RC-3: Rec= 62.0%, RQD= 8.0%, GSI= 10-20.						
		@ 30.4 feet - moderately weathered, medium strong rock.						
	34.3	@ 34 feet - weak rock, moderate core recovery likely due to seams of completely weathered rock or residual soil not recovered in core run.						
159.2		Boring Terminated at 34.3 feet.						

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Miller
Logged By: Nat Shuff
Date: 3/8/2018

Boring Number: W-18
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 1

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
22.6	1	J	70	T	Su	Fe	Wa	S	
23.2	2	J	20	VN	Su	Fe	Pl	S	
23.4	3	J	20	VN	Pa	Fe/Cl	Ir	S	
24.3	4	J	70	T	Su	Fe	Wa	S	
25.2	5	J	60	VN	Su	Fe	Wa	SR	
25.6	6	J	60	N	Su	Fe/Cl	Wa/Ir	SR	
25.8	7	N/A	N/A	MW	Su	Fe/Cl	Ir	R	Fractured zone 25.8' - 26.2'
26.7	8	J	70	T	Su	Fe	Wa	S	
26.9	9	J	45	VN	Su	Fe	Wa	S	
27.1	10	J	50	VN	Su/Pa	Fe/Sd	Wa	S	
27.8	11	J	50	VN	Su/Pa	Fe/Sd	Ir	R	Fractured zone 27.8' - 28.1'
28.1	12	J	60	VN	Su	Fe	Ir	SR	Fractured zone 28.1' - 28.8'
29.1	13	J	40	VN	Su/Pa	Fe/Sd	Pl	SR	
29.6	14	J	60	VN	Su	Fe	Pl	S	
30.6	15	J	N/A	N	Su/Pa	Fe/Sd	Ir	R	Fractured zone 30.6' - 30.8'
30.9	16	J	70	T	Su	Fe	Wa	SR	
31.6	17	J	70	T	Su	Fe	Wa	SR	
32.4	18	N/A	N/A	N	Pa	Cl/Sd	Ir	SR	Fractured zone 32.4' - 33.1'
33.7	19	J	10	N	Pa	Cl/Sd	Ir	R	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-18UD
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 24
Eng./Geo.:	AKS	**Boring Location:**	3143+99.08	**Offset:**	R:34.55'	**Alignment:**	Proposed
Elev.:	194.3 ft	**Latitude:**	34.035578	**Longitude:**	-81.116103	**Date Started:**	3/27/2018
Total Depth:	12 ft	**Soil Depth:**	12 ft	**Core Depth:**	0 ft	**Date Completed:**	3/27/2018
Bore Hole Diameter (in):	4.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	T. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.3	**SURFACE MATERIALS** - 3.5 inches of ASPHALT.								
		Drilled without sampling to 2 feet.								
	2.0	**RIVEER TERRACE ALLUVIUM - LEAN CLAY WITH SAND (CL)** - dry to moist, reddish-brown (5YR 5/3), mostly low plasticity fines, little fine to coarse sands, [LL=49, PL=28, PI=21, %#200=83.3], AASHTO = A-7-6 (19).		2.0	UD-1					
189.3	6.0	**SILTY SAND (SM)** - loose, moist, gray (5YR 5/1), mostly fine sands, some low plasticity fines, trace fine gravel.		6.0	SS-1	4	5	5	8	10
	8.0	**CLAYEY SAND (SC)** - moist, reddish-brown (5YR 5/3), subangular, mostly fine to medium sands, little low plasticity fines.		8.0	UD-2					
184.3	9.0	**PIEDMONT RESIDUUM - SILTY SAND (SM)** - moist, white (GLEY 1 8/), mostly fine esands, some low plasticity fines, tracce fine gravel.		10.0	SS-2	5	6	13	21	19
		@ 10 feet - medium dense, absent gravel.								
179.3	12.0	Boring Terminated at 12 feet.								

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

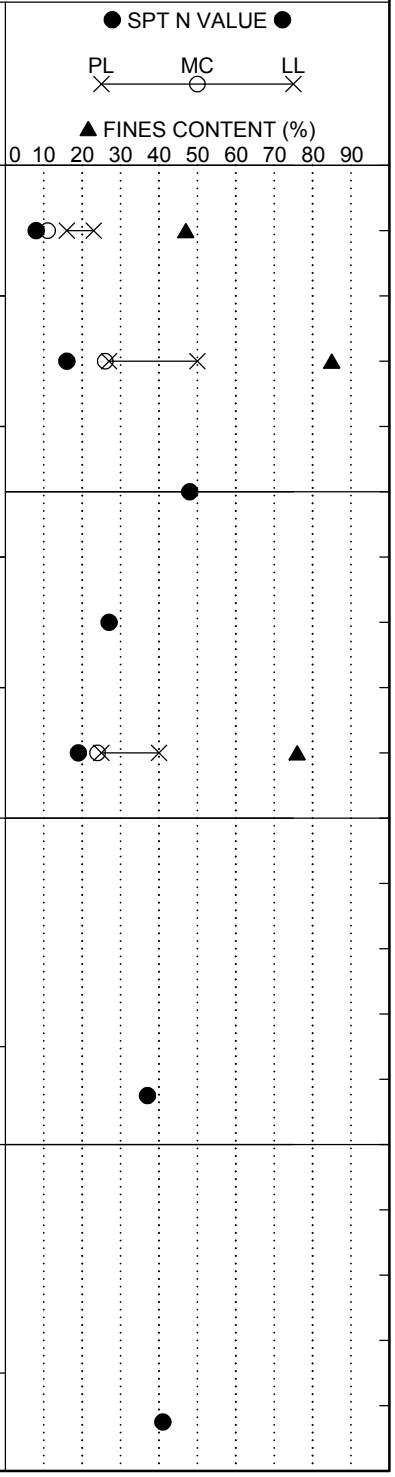
LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-19
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 21
Eng./Geo.:	NGS	**Boring Location:**	5148+29.97	**Offset:**	R:38.10'	**Alignment:**	Proposed
Elev.:	201.9 ft	**Latitude:**	34.034679	**Longitude:**	-81.114079	**Date Started:**	3/19/2018
Total Depth:	54.8 ft	**Soil Depth:**	44.1 ft	**Core Depth:**	10.7 ft	**Date Completed:**	3/20/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 5 ft	**24HR**	18 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**FILL - SILTY CLAYEY SAND (SC-SM)** - loose, moist, strong brown (7.5YR 5/8), mostly fine to medium sands, some low plasticity fines, [LL=23, PL=16, PI=7, NMC=11.3%, %#200=47.3], AASHTO = A-4 (0).		0.0	SS-1	5	4	4	3	8
	2.2	**COASTAL PLAIN FAT CLAY WITH SAND (CH)** - very stiff, moist, yellowish-brown (10YR 5/8), mostly high plasticity fines, little fine to medium sands, [LL=50, PL=27, PI=23, NMC=26.3%, %#200=84.7], AASHTO = A-7-6 (22).		2.0	SS-2	5	5	11	14	16
196.9		@ 4 feet - hard.		4.0	SS-3	18	24	24	29	48
		@ 6 feet - very stiff.		6.0	SS-4	15	14	13	11	27
	8.2	**PIEDMONT RESIDUUM - LEAN CLAY WITH SAND (CL)** - very stiff, moist, brownish-yellow (10YR 6/8) and white (10YR 8/1), mostly low plasticity fines, little fine sands, trace weathered rock fragments, [LL=40, PL=25, PI=15, NMC=23.9%, %#200=75.9], AASHTO = A-6 (11).		8.0	SS-5	10	9	10	12	19
191.9										
		@ 13.5 feet - hard.		13.5	SS-6	12	18	19		37
186.9										
	18.5	**SILT (ML)** - hard, moist, light ray (GLEY 1 7/), mostly low to medium plasticity fines, few fine sands.		18.5	SS-7	10	17	24		41



LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-19
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 21
Eng./Geo.:	NGS	**Boring Location:**	5148+29.97	**Offset:**	R:38.10'	**Alignment:**	Proposed
Elev.:	201.9 ft	**Latitude:**	34.034679	**Longitude:**	-81.114079	**Date Started:**	3/19/2018
Total Depth:	54.8 ft	**Soil Depth:**	44.1 ft	**Core Depth:**	10.7 ft	**Date Completed:**	3/20/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 5 ft	**24HR**	18 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				23.5				
		@ 23.5 feet - very stiff.			SS-8	17 15 12	27	●
176.9								
	27.0	**SANDY SILT (ML)** - hard, moist, reddish-yellow (7.5YR7/8), mostly lot to medium plasticity fines, some fine to medium sands.		28.5				
					SS-9	10 15 18	33	●
171.9								
	33.5	**PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM)** - very dense, moist, yellowish-brown (10YR 5/8), mostly fine sands, some low plasticity fines.		33.5	SS-10	34 50/5" -	100	●
166.9								
				38.5	SS-11	41 50/5" -	100	●

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-19
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 21
Eng./Geo.:	NGS	**Boring Location:**	5148+29.97	**Offset:**	R:38.10'	**Alignment:**	Proposed
Elev.:	201.9 ft	**Latitude:**	34.034679	**Longitude:**	-81.114079	**Date Started:**	3/19/2018
Total Depth:	54.8 ft	**Soil Depth:**	44.1 ft	**Core Depth:**	10.7 ft	**Date Completed:**	3/20/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 5 ft	**24HR**	18 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				43.5				
	44.1	Tri-Cone Bit Refusal at 44.1 feet. Install NW Casing to 44.1 feet for NQ wireline coring.		44.1	SS-12	43 50/1" -	100	
156.9		For discontinuity descriptors, see discontinuity worksheet.		44.8	RC-1			
		<u>METAMORPHIC BEDROCK</u> - PHYLLITE - yellowish-brown (10YR 5/6) and greenish-gray (GLEY 1 6/1), fine grained to very fine grained, foliated, highly weathered, weak rock.			RC-2			
		RC-1: Rec= 0.0%, RQD= 0.0%, GSI= 10-20.						
		@ 45.7 feet - completely weathered, extremely weak rock.		49.8				
151.9		@ 46.2 feet - highly weathered, weak rock.						
		@ 47.8 feet - moderately weathered, medium strong rock.			RC-3			
		RC-2: Rec= 70.0%, RQD= 15.0%, GSI= 10-20.						
		@ 50.4 feet - quartz vein.						
		@ 50.7 feet - weak rock.						
		@ 52 feet - medium strong rock.						
	54.8	RC-3: Rec= 96.0%, RQD= 50.0%, GSI= 10-20, RMR = 25.						
146.9		Boring Terminated at 54.8 feet.						

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Millwood
Logged By: Nat Shuff
Date: 3/20/2018

Boring Number: W-19
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 1

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
44.1	1	N/A	N/A	MW	Pa	Sd/Cl	Ir	R	Fractured zone 44.1' - 47.8'
46.4	2	J	10	N	Pa	Sd	Pl	R	
46.6	3	J	0	MW	Pa	Sd	Pl	R	
47.1	4	J	10	N	Pa	Sd	Ir	R	
47.5	5	J	20	N	Pa	Sd	St	R	
48	6	J	10	N	Sp	Sd	Ir	R	
48.2	7	J	0	N	Sp	Sd	Ir	R	
48.7	8	J	0	N	Sp	Sd/Fe	Ir	SR	
49.1	9	J	10	N	Su	Fe	Ir	R	
49.5	10	N/A	N/A	VN	Pa	Sd	Ir	R	Fractured zone 49.5' - 49.7'
50.4	11	N/A	N/A	N	Pa	Sd	Ir	R	Fractured zone 50.4' - 50.6'
50.8	12	J	15	N	Su	Sd/Fe	Ir	R	
51.1	13	J	45	VN	Su	Fe	Ir	R	
51.9	14	J	45	VN	Su	Sd/Fe	Ir	R	
52.3	15	J	10	N	Pa	Sd/Fe	Ir	R	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-22
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	ELF	**Boring Location:**	407+18.51	**Offset:**	L:77.239'	**Alignment:**	Proposed
Elev.:	185.9 ft	**Latitude:**	34.021085	**Longitude:**	-81.104590	**Date Started:**	2/7/2018
Total Depth:	79.1 ft	**Soil Depth:**	79.1 ft	**Core Depth:**	0 ft	**Date Completed:**	2/7/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 13 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0										
	0.3	**SURFACE MATERIALS** - 2 inches of TOPSOIL.		0.0	SS-1	2	3	3	2	6	
	2.0	**PIEDMONT RESIDUUM - SILTY CLAYEY SAND (SC-SM)** - loose, moist, very pale brown (10YR 7/3), subangular, mostly fine to medium sands, little low plasticity fines, [LL=20, PL=14, PI=6, NMC=14.8%, %#200=23.8], AASHTO = A-2-4.		2.0	SS-2	4	6	6	6	12	
180.9		**CLAYEY SAND (SC)** - medium dense, moist, gray to brown (10YR 5/1 to 5/3), subangular, mostly fine to coarse sands, some plastic fines, trace weathered rock fragments.		4.0	SS-3	4	5	5	5	10	
	6.0	@ 4 feet - loose, brownish yellow (10YR 6/6).		6.0	SS-4	3	3	3	4	6	
		SILTY SAND (SM) - loose, moist, reddish yellow (5YR 6/6), mostly fine to coarse sands, some low plasticity fines, [LL=36, PL=25, PI=11, NMC=20.4%, %#200=44.6], AASHTO = A-6 (2).		8.0	SS-5	3	5	4	4	9	
175.9											
	13.5			13.5	SS-6	14	11	7		18	
170.9	15.0	**SILTY CLAYEY SAND (SC-SM)** - medium dense, wet, reddish yellow (5YR 6/6), subangular, mostly fine to coarse sands, little low plasticity fines, few weathered rock fragments, [LL=30, PL=23, PI=7, NMC=22.7%, %#200=21.2], AASHTO = A-2-4. Tri-Cone Bit Refusal at 15 feet. Install NW Casing to 15 feet for NQ wireline coring.		15.0	RC-1						
				15.5	RC-2						
				16.5	RC-3						
	17.5	For discontinuity descriptors, see discontinuity worksheet.		18.5							
		POSSIBLE BOULDER - GRANITE - reddish-gray (5YR 5/2), coarse grained, massive, moderately weathered, strong			SS-7	7	10	14		24	

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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-22
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	ELF	**Boring Location:**	407+18.51	**Offset:**	L:77.239'	**Alignment:**	Proposed
Elev.:	185.9 ft	**Latitude:**	34.021085	**Longitude:**	-81.104590	**Date Started:**	2/7/2018
Total Depth:	79.1 ft	**Soil Depth:**	79.1 ft	**Core Depth:**	0 ft	**Date Completed:**	2/7/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 13 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		rock. RC-1: Rec= 80.0%, RQD= 0.0%, GSI= 75-85. @ 15.5 feet - completely weathered. RC-2: Rec= 20.0%, RQD= 0.0%, GSI= 75-85. @ 16.7 feet - slightly weathered, very strong rock. RC-3: Rec= 90.0%, RQD= 67.0%, GSI= 75-85, RMR = 62. Low to moderate recoveries likely due to seams of completely weathered rock or residual soil washed away by drilling process.		23.5	SS-8	13 13 12	25	
160.9		**SILTY SAND (SM)** - medium dense, moist, light gray (10YR 7/1), subangular, mostly fine to coarse sands, little non-plastic fines, few weathered rock fragments. @ 23.5 feet - pale brown (10YR 6/3), absent weathered rock fragments, [LL=NP, PL=NP, PI=NP, NMC=16.5%, %#200=20.6], AASHTO = A-2-4.		28.5	SS-9	14 20 22	42	
155.9		@ 28.5 feet - dense.		33.5	SS-10	33 44 50	94	
150.9		@ 33.5 feet - very dense, trace mica.						
	38.5	**PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM)** - very dense, moist, light yellowish brown (10YR 6/4), few non-plastic fines, moslty fine to coarse		38.5	SS-11	50/5" - -	100	

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-22
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	ELF	**Boring Location:**	407+18.51	**Offset:**	L:77.239'	**Alignment:**	Proposed
Elev.:	185.9 ft	**Latitude:**	34.021085	**Longitude:**	-81.104590	**Date Started:**	2/7/2018
Total Depth:	79.1 ft	**Soil Depth:**	79.1 ft	**Core Depth:**	0 ft	**Date Completed:**	2/7/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 13 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		sands.						
		@ 43.5 feet - yellowish brown (10YR 5/4).		43.5	SS-12	4 7 50/2" -	100	
140.9								
		@ 48.5 feet - very pale brown to brown (10YR 7/3 to 5/3).		48.5	SS-13	3 9 50/5" -	100	
135.9								
				53.5	SS-14	50/1" -	100	
130.9								
		@ 58.5 feet - no recovery.		58.5	SS-15	50/1" -	100	

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-22
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	ELF	**Boring Location:**	407+18.51	**Offset:**	L:77.239'	**Alignment:**	Proposed
Elev.:	185.9 ft	**Latitude:**	34.021085	**Longitude:**	-81.104590	**Date Started:**	2/7/2018
Total Depth:	79.1 ft	**Soil Depth:**	79.1 ft	**Core Depth:**	0 ft	**Date Completed:**	2/7/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 13 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
		@ 63.5 feet - no recovery.		63.5	SS-16	50/1"	-	-		100
120.9										
		@ 68.5 feet - no recovery.		68.5	SS-17	50/0"	-	-		100
115.9										
				73.5	SS-18	50/1"	-	-		100
110.9										
				78.5	SS-19	50/0"	-	-		100
	79.1	Boring Terminated at 79.1 feet due to Tri-Cone bit refusal.								

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Miller
Logged By: Lehe Fender
Date: 2/7/2018

Boring Number: W-22
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 1

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
14.6	1	J	5	W	No	N/A	Pl	SR	
16.2	2	J	20	W	No	N/A	Ir	SR	Fractured zone 16.2' to 16.3'

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-23
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 32
Eng./Geo.:	NGS	**Boring Location:**	6022+73.17	**Offset:**	L:53.37'	**Alignment:**	Proposed
Elev.:	185.6 ft	**Latitude:**	34.023770	**Longitude:**	-81.096544	**Date Started:**	3/5/2018
Total Depth:	28.6 ft	**Soil Depth:**	15.9 ft	**Core Depth:**	10.1 ft	**Date Completed:**	3/5/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 10.2 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.2	**SURFACE MATERIALS** - 2 inches of ASPHALT.		0.2						
		ALLUVIUM - CLAYEY SAND WITH GRAVEL (SC) - loose, moist, red (2.5YR 5/8), light gray (7.5YR 7/1) and reddish-yellow (7.5YR 6/6), mostly fine to medium sands, some low to medium plasticity fines, little fine gravel, [LL=29, PL=14, PI=15, NMC=17.2%, %#200=35.4], AASHTO = A-2-6 (1).			SS-1	2	2	3	2	5
		@ 2.2 feet - medium dense.		2.2						
					SS-2	7	8	12	15	20
				4.2						
180.6					SS-3	10	12	9	14	21
	6.2			6.2						
		FAT CLAY WITH SAND (CH) - sitff, moist, light green (GLEY 1 7/1) and strong brown (7.5YR 5/8), mostly high plasticity fines, little fine sands, [LL=60, PL=21, PI=39, NMC=26.2%, %#200=80.3], AASHTO = A-7-6 (32).			SS-4	4	6	7	7	13
				8.2						
					SS-5	5	6	9	9	15
175.6		▽								
	12.7			12.7						
		PARTIALLY WEATHERED ROCK (PWR) - no recovery.			SS-6	50/5"-		-		100
		@ 13.5 feet - quartz rock fragments.		13.5	SS-7	50/5"-		-		100
170.6										
	15.9									
		Reamed out borehole from 15.9 feet to 18.5 feet. Recovered 2.6 feet of granitic rock fragments.								
		Tri-Cone Bit Refusal at 18.5 feet. Install NW Casing to 18.5 feet for NQ wireline coring.		18.5	~~SS-8~~	~~50/0"-~~		~~-~~		~~100~~
	18.5			18.5	RC-1					
		For discontinuity descriptors, see discontinuity worksheet.		19.1						

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90

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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-23
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 32
Eng./Geo.:	NGS	**Boring Location:**	6022+73.17	**Offset:**	L:53.37'	**Alignment:**	Proposed
Elev.:	185.6 ft	**Latitude:**	34.023770	**Longitude:**	-81.096544	**Date Started:**	3/5/2018
Total Depth:	28.6 ft	**Soil Depth:**	15.9 ft	**Core Depth:**	10.1 ft	**Date Completed:**	3/5/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 10.2 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		IGNEOUS BEDROCK - GRANITE - pale red (7.5R), pinkish-gray (7.5R 7/1), and dark reddish-gray (7.5R 3/1), medium grained to coarse grained, slightly to moderately weathered, strong rock, trace pyrite.			RC-2			
		RC-1: Rec= 100%, RQD= 0%, GSI= 55-65.						
		@ 19.1 feet - fresh, very strong rock.						
		RC-2: Rec= 96.0%, RQD= 96.7%, GSI= 60-70, RMR = 34.		24.1				
160.6					RC-3			
	28.6	RC-3: Rec= 100%, RQD= 100%, GSI= 70-80.						
		Boring Terminated at 28.6 feet.						
155.6								
150.6								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Miller
Logged By: Nat Shuff
Date: 3/5/2018

Boring Number: W-23
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 1

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
16.9	1	J	30	N	Sp	Cl/Sd/Fe	Ir	R	
17.4	2	J	0	MW	Sp	Cl/Sd/Fe	Ir	R	
17.6	3	J	85	VN	Sp	Sd/Fe	Wa	SR	
18.7	4	N/A	N/A	MW	Sp	Sd	Ir	R	Fractured zone 17.7' - 19.1'
23.7	5	J	5	VN	Sp	Fe	Ir	R	
24.1	6	J	70	MW	Sp	Ca	Ir	SR	
24.2	7	J	0	VN	Sp	Fe	Pl	R	
24.8	8	J	0	N	Sp	Sd/Fe	Ir	SR	
26.1	9	J	30	N	Sp	Fe/Cl	Ir	SR	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-23UD
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	Site 32
Eng./Geo.:	AKS	**Boring Location:**	6022+77.81	**Offset:**	L:49.00'	**Alignment:**	Proposed
Elev.:	185.8 ft	**Latitude:**	34.023752	**Longitude:**	-81.096546	**Date Started:**	3/30/2018
Total Depth:	10.5 ft	**Soil Depth:**	10.5 ft	**Core Depth:**	0 ft	**Date Completed:**	3/30/2018
Bore Hole Diameter (in):	4.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	T. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0							
	0.3	**SURFACE MATERIALS** - 4 inches of ASPHALT.						
		Drilled without sampling to 6 feet.						
180.8	6.0	**RIVER TERRACE ALLUVIUM - FAT CLAY (CH)** - moist, yellowish-brown (10YR 4/4), mostly high plasticity fines, few fine sands.		6.0	UD-1			
		@ 8.5 feet - light gray (10YR 7/1) and brownish-yellow (10YR 6/6), [LL=59, PL=24, PI=35, %#200=90.8], AASHTO = A-7-6 (35).		8.5	UD-2			
175.8	10.5	Boring Terminated at 10.5 feet.						
170.8								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-24
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	NGS	**Boring Location:**	443+21.08	**Offset:**	L:119.722'	**Alignment:**	Proposed
Elev.:	277.3 ft	**Latitude:**	34.011868	**Longitude:**	-81.108948	**Date Started:**	3/9/2018
Total Depth:	39.2 ft	**Soil Depth:**	24.8 ft	**Core Depth:**	14.4 ft	**Date Completed:**	3/9/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 28.2 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.2	**SURFACE MATERIALS** - 2 inches of TOPSOIL.		0.0	SS-1	2	3	5	8	8
	2.0	**COASTAL PLAIN - SILTY CLAYEY SAND (SC-SM)** - loose, dry, brown (10YR 4/3), mostly fine to coarse sands, little low plasticity fines, few fine gravel, [LL=18, PL=14, PI=4, NMC=6.8%, %#200=21.5], AASHTO = A-2-4.		2.0	SS-2	6	5	3	6	8
272.3		**CLAYEY SAND (SC)** - loose, dry, red (10R 4/8) and strong brown (7.5YR 5/6), mostly fine to medium sands, some low plasticity fines, [LL=41, PL=22, PI=19, NMC=16.2%, %#200=45.5], AASHTO = A-7-6 (5). @ 4 feet - medium dense. @ 6 feet - dense.		4.0	SS-3	9	18	10	15	28
				6.0	SS-4	8	13	21	34	34
	8.0	**PIEDMONT RESIDUUM - SILTY SAND (SM)** - medium dense, moist, red (2.5YR 5/8), mostly fine to coarse sands, some low plasticity fines, [LL=40, PL=27, PI=13, NMC=23.4%, %#200=48.9], AASHTO = A-6 (4).		8.0	SS-5	12	11	12	12	23
267.3										
				13.5	SS-6	2	6	7		13
262.3										
				18.5						
		@ 18.5 feet - loose, reddish-yellow (7.5YR 8/8), black (7.5YR 2.5/1) and pinkish-white (7.5YR 8/2), [LL=42, PL=30, PI=12, NMC=30.8%, %#200=46.0], AASHTO =			SS-7	5	5	5		10

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-24
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	NGS	**Boring Location:**	443+21.08	**Offset:**	L:119.722'	**Alignment:**	Proposed
Elev.:	277.3 ft	**Latitude:**	34.011868	**Longitude:**	-81.108948	**Date Started:**	3/9/2018
Total Depth:	39.2 ft	**Soil Depth:**	24.8 ft	**Core Depth:**	14.4 ft	**Date Completed:**	3/9/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 28.2 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		A-7-5 (3).						
	23.5	**PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM)** - very dense, moist, reddish-yellow (7.5YR 8/8), black (7.5YR 2.5/1) and pinkish-white (7.5YR 8/2), mostly fine to medium sands, little low plasticity fines.		23.5	SS-8	35 50/5" -	100	
252.3	24.8	Tri-Cone Bit Refusal at 24.8 feet. Install NW Casing to 24.8 feet for NQ wireline coring.		24.8	RC-1			
		For discontinuity descriptors, see discontinuity worksheet.						
		IGNEOUS BEDROCK - GRANITE - gray (GLEY 1 5/) and black (GLEY 1 2.5/), coarse grained, fresh, very strong rock.		29.2				
247.3	30.1	RC-1: Rec= 100%, RQD= 92.8%, GSI= 60-70, RMR = 61.						
		@ 29.2 feet - fine grained to medium grained.			RC-2			
		@ 29.5 feet - completely weathered, extremely weak rock.						
		PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM) - very dense, moist, light yellowish-brown (10YR 8/4), mostly fine to medium sands, some low to medium plasticity fines.		34.2	SS-9	50/0"- -	100	
242.3		RC-2: Rec= 18.0%, RQD= 0.0%, GSI= 20-30.		34.2				
		Low recovery likely due to seams of completely weathered rock or residual soil washed away by coring process.			RC-3			
	36.6	**IGNEOUS BEDROCK - GRANITE** - gray (GLEY 1 5/) and black (GLEY 1 2.5/), coarse grained, fresh, very strong rock.						
	39.2	RC-3: Rec= 52.0%, RQD= 40.0%, GSI= 60-70.						

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-24
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	NGS	**Boring Location:**	443+21.08	**Offset:**	L:119.722'	**Alignment:**	Proposed
Elev.:	277.3 ft	**Latitude:**	34.011868	**Longitude:**	-81.108948	**Date Started:**	3/9/2018
Total Depth:	39.2 ft	**Soil Depth:**	24.8 ft	**Core Depth:**	14.4 ft	**Date Completed:**	3/9/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 28.2 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		Low recovery likely due to seams of completely weathered rock or residual soil washed away by coring process.						
		Boring Terminated at 39.2 feet.						
232.3								
227.3								
222.3								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Miller
Logged By: Nat Shuff
Date: 3/9/2018

Boring Number: W-24
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 1

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
24.8	1	J	35	MW	No	N/A	Ir	R	
25.2	2	J	0	MW	No	N/A	Pl	R	
26.6	3	J	60	VN	Pa	Cl/Sd	Ir	R	
29.2	4	J	15	N	Pa	Fe/Cl/Sd	Ir	R	
34.5	5	J	0	MW	Pa	Fe/Cl/Sd	Ir	R	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-25
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	ELF	**Boring Location:**	448+01.98	**Offset:**	R:158.081'	**Alignment:**	Proposed
Elev.:	275.7 ft	**Latitude:**	34.010945	**Longitude:**	-81.110409	**Date Started:**	2/6/2018
Total Depth:	36.2 ft	**Soil Depth:**	25.5 ft	**Core Depth:**	10.7 ft	**Date Completed:**	2/7/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	28 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.2	**SURFACE MATERIALS** - 2 inches of TOPSOIL.		0.0	SS-1	2	3	3	3	6
	2.0	**FILL - CLAYEY SAND (SC)** - loose, moist, reddish brown (5YR 5/4) and very pale brown (10YR 7/4), mostly fine to coarse sands, some high plasticity fines.		2.0	SS-2	4	6	8	12	14
	4.0	**PIEDMONT RESIDUUM - ELASTIC SILT WITH SAND (MH)** - stiff, moist, reddish brown (5YR 5/4) and very pale brown (10YR 7/4), mostly high plasticity fines, little fine to coarse sands., [LL=69, PL=39, PI=30, NMC=31.7%, %#200=74.9], AASHTO = A-7-5 (26).		4.0	SS-3	8	12	12	6	24
270.7		**SILTY SAND (SM)** - medium dense, moist, very pale brown to red (10YR 7/4 to 2.5YR 4/8), mostly fine to coarse sands, little low plasticity fines.		6.0	SS-4	3	4	5	9	9
		@ 6 feet - loose, yellowish red (5YR 4/6).		8.0	SS-5	7	7	4	4	11
		@ 8 feet - medium dense, reddish yellow (5YR 6/6), [LL=28, PL=24, PI=4, NMC=19.7%, %#200=22.5], AASHTO = A-1-b.								
265.7	13.5	**PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM)** - very dense, moist, dark gray to white (5YR 3/1 to 8/1), mostly fine to coarse sands, little non-plastic fines, trace gravel-sized rock fragments.		13.5	SS-6	50/5"	-	-		100
260.7										
	18.5	**PIEDMONT RESIDUUM - SILTY SAND (SM)** - medium dense, wet, light brown (7.5YR 6/4), subangular, mostly fine to coarse sands, little low plasticity fines.		18.5	SS-7	9	15	9		24

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-25
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-26
Eng./Geo.:	ELF	**Boring Location:**	448+01.98	**Offset:**	R:158.081'	**Alignment:**	Proposed
Elev.:	275.7 ft	**Latitude:**	34.010945	**Longitude:**	-81.110409	**Date Started:**	2/6/2018
Total Depth:	36.2 ft	**Soil Depth:**	25.5 ft	**Core Depth:**	10.7 ft	**Date Completed:**	2/7/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** N/A	**24HR**	28 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				23.5				
		@ 23.5 feet - [LL=32, PL=29, PI=3, NMC=27.1%, %#200=29.3], AASHTO = A-2-4.			SS-8	3 4 8	12	● ▲
250.7	25.5	Tri-Cone Bit Refusal at 25.5 feet. Install NW Casing to 25.5 feet for NQ wireline coring.		25.5				
		For discontinuity descriptors, see discontinuity worksheet.						
		IGENOUS BEDROCK - GRANITE - dark gray (10YR 4/1), coarse grained, massive, moderately weathered, strong rock.			RC-1			
		@ 26.5 feet - fresh, very strong rock.						
		RC-1: Rec= 95.1%, RQD= 75.2%, GSI= 80-90.		29.6				
245.7					RC-2			
		@ 32.3 to 33.8 feet - moderately weathered, medium strong rock.						
		RC-2: Rec= 82.5%, RQD= 78.3%, GSI= 80-90.		33.6				
		@ 33.8 feet - fresh, very strong rock.			RC-3			
240.7								
	36.2	RC-3: Rec= 100%, RQD= 100%, GSI= 80-90, RMR = 57.						
		Boring Terminated at 36.2 feet.						

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Miller
Logged By: Lehe Fender
Date: 2/6/2018

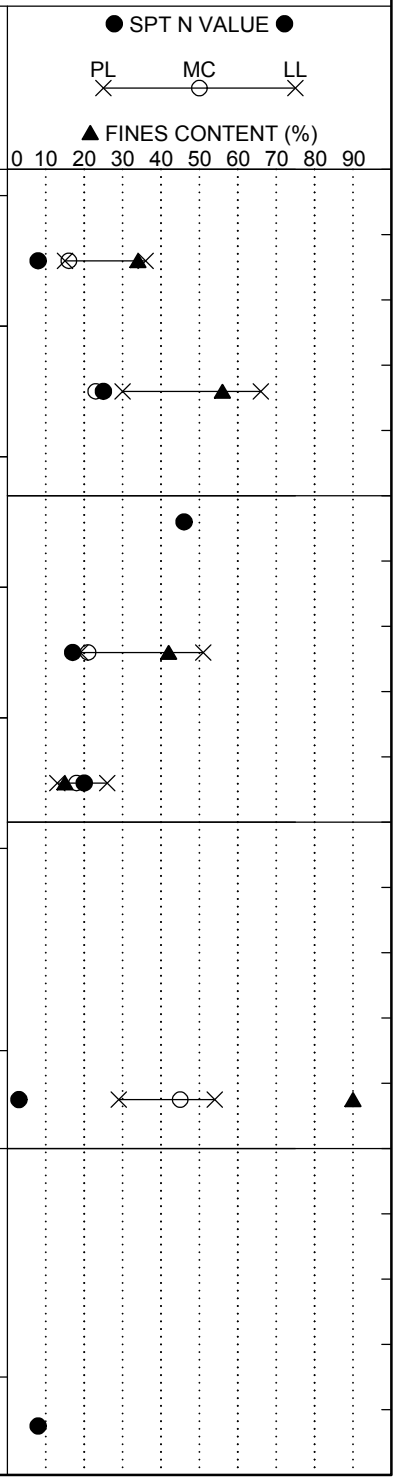
Boring Number: W-25
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 1

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
25.7	1	J	11	W	Su	Fe	Ir	R	
25.9	2	J	50	N	No	N/A	St	SR	Fractured zone 25.9' to 26.3'
28.9	3	J	31	VN	No	N/A	Pl	S	
32.1	4	J	15	N	No	N/A	Pl	S	
32.3	5	J	12	W	Su	Fe	Ir	S	Fractured zone 32.3' to 32.6'

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-27
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	NGS	**Boring Location:**	182+20.61	**Offset:**	R:133.688'	**Alignment:**	Proposed
Elev.:	275.3 ft	**Latitude:**	34.038030	**Longitude:**	-81.103686	**Date Started:**	3/23/2018
Total Depth:	74.1 ft	**Soil Depth:**	63.9 ft	**Core Depth:**	10.2 ft	**Date Completed:**	3/23/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 8 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.4	**SURFACE MATERIALS** - 5 inches of ASPHALT.		0.4						
		FILL - CLAYEY SAND (SC) - loose, moist, reddish-brown (5YR 5/4) and yellowish-red (5YR 5/6), mostly fine to medium sands, some low plasticity fines, [LL=36, PL=15, PI=21, NMC=16.1%, %#200=34], AASHTO = A-2-6.			SS-1	5	5	3	2	8
	2.4			2.4						
		COASTAL PLAIN - SANDY FAT CLAY (CL) - very stiff, moist, red (10R 4/8) and pinkish-gray (10YR 7/1), mostly high plasticity fines, some fine to medium sands, trace fine gravel, [LL=66, PL=30, PI=36, NMC=23.3%, %#200=56], AASHTO = A-7-5 (18).			SS-2	13	12	13	15	25
				4.4						
270.3					SS-3	23	21	25	18	46
	6.4	@ 4.4 feet - hard.		6.4						
		CLAYEY SAND (SC) - medium dense, moist, red (10R 4/8) and pinkish-gray (10YR 7/1), mostly fine to medium sands, some high plasticity fines, [LL=51, PL=19, PI=32, NMC=20.5%, %#200=42], AASHTO = A-7-6 (8).			SS-4	6	8	9	9	17
				8.4						
		@ 8.4 feet - little low plasticity fines, [LL=26, PL=13, PI=13, NMC=17.5%, %#200=15], AASHTO = A-2-4.			SS-5	8	12	8	9	20
265.3										
	13.5			13.5						
		FAT CLAY (CH) - very soft, moist, red (10R 4/8) and white (7.5YR 8/1), mostly high plasticity fines, few fine sands, [LL=54, PL=29, PI=25, NMC=45.4%, %#200=90], AASHTO = A-7-6 (26).			SS-6	2	1	2		3
260.3										
		@ 18.5 feet - firm.		18.5						
					SS-7	2	3	5		8



LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-27
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	NGS	**Boring Location:**	182+20.61	**Offset:**	R:133.688'	**Alignment:**	Proposed
Elev.:	275.3 ft	**Latitude:**	34.038030	**Longitude:**	-81.103686	**Date Started:**	3/23/2018
Total Depth:	74.1 ft	**Soil Depth:**	63.9 ft	**Core Depth:**	10.2 ft	**Date Completed:**	3/23/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 8 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
		@ 23.5 feet - stiff.		23.5	SS-8	2	4	6		10
250.3				28.5	SS-9	5	5	6		11
	29.5	**PIEDMONT RESIDUUM - ELASTIC SILT WITH SAND (ML)** - stiff, moist, white (10R 8/1) and brownish-yellow (10YR 6/8), mostly high plasticity fines, little fine to medium sands.								
245.3		@ 33.5 feet - very stiff, red (10R 4/8), relict rock structure, [LL=56, PL=36, PI=20, NMC=41.1%, %#200=72], AASHTO = A-7-5 (16).		33.5	SS-10	4	6	10		16
240.3				38.5	SS-11	3	5	7		12
		@ 38.5 feet - stiff.								

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-27
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	NGS	**Boring Location:**	182+20.61	**Offset:**	R:133.688'	**Alignment:**	Proposed
Elev.:	275.3 ft	**Latitude:**	34.038030	**Longitude:**	-81.103686	**Date Started:**	3/23/2018
Total Depth:	74.1 ft	**Soil Depth:**	63.9 ft	**Core Depth:**	10.2 ft	**Date Completed:**	3/23/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 8 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				43.5	SS-12	5 9 12	21	
230.3		@ 43.5 feet - very stiff.						
				48.5	SS-13	7 11 16	27	
225.3								
				53.5	SS-14	7 14 18	32	
		@ 53.5 feet - hard.						
220.3								
	56.0	**PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM)** - very dense, moist, white (GLEY 1 8/) and gray (GLEY 1 6/1), mostly fine to medium sands, some low plasticity fines.		58.5	SS-15	46 50/3" -	100	

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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-27
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	NGS	**Boring Location:**	182+20.61	**Offset:**	R:133.688'	**Alignment:**	Proposed
Elev.:	275.3 ft	**Latitude:**	34.038030	**Longitude:**	-81.103686	**Date Started:**	3/23/2018
Total Depth:	74.1 ft	**Soil Depth:**	63.9 ft	**Core Depth:**	10.2 ft	**Date Completed:**	3/23/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 8 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
		Tri-Cone Bit Refusal at 63.9 feet. Install NW Casing to 63.9 feet for NQ wireline coring.		63.5	SS-16	50/1"- -	100
	63.9			63.9			
		No recovery in core barrell.					
210.3		**SANDY SILT (ML)** - very hard, moist, light greenish-gray (GLEY 1 8/10Y), mostly low plasticity fines, some fine sands.			RC-1		
		RC-1: Rec= 0%, RQD= 0%.					
				68.9			
				69.2	SS-17	50/4"- -	100
205.3		RC-2: Rec= 0%, RQD= 0%.			RC-2		
				73.9			
	74.1				SS-18	50/2"- -	100
		Boring Terminated at 74.1 feet.					
200.3							

SPT N VALUE

PL MC LL

FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-27UD
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	AKS	**Boring Location:**	182+18.46	**Offset:**	R:137.491'	**Alignment:**	Proposed
Elev.:	275.2 ft	**Latitude:**	34.038019	**Longitude:**	-81.103692	**Date Started:**	3/29/2018
Total Depth:	27 ft	**Soil Depth:**	27 ft	**Core Depth:**	0 ft	**Date Completed:**	3/29/2018
Bore Hole Diameter (in):	4.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	T. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0							
	0.3	**SURFACE MATRIALS** - 3 inches of ASPHALT.						
270.2		Drilled without sampling to 13.5 feet.						
265.2								
	13.5	**COASTAL PLAIN - SANDY SILT (ML)** - wet, light red (7.5R 6/8), mostly low plasticity fines, some fine to coarse sands, few fine gravel, [LL=44, PL=29, PI=15, %#200=55.8], AASHTO = A-7-6 (7).		13.5	UD-1			
260.2		@ 15.5 feet - stiff, moist, yellow (2.5Y 7/8).		15.5	SS-1	4 6 9	15	●
	18.0	**POORLY GRADED SAND (SP)** - wet, pale rd (10R 7/40, subangular, mostly fine to coarse sands, trace fine gravel.		18.5	UD-2			
	19.5	**SILT (ML)** - moist, pinkish-white (7.5YR						

LEGEND

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SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-27UD
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	AKS	**Boring Location:**	182+18.46	**Offset:**	R:137.491'	**Alignment:**	Proposed
Elev.:	275.2 ft	**Latitude:**	34.038019	**Longitude:**	-81.103692	**Date Started:**	3/29/2018
Total Depth:	27 ft	**Soil Depth:**	27 ft	**Core Depth:**	0 ft	**Date Completed:**	3/29/2018
Bore Hole Diameter (in):	4.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	N/A	**Driller:**	T. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
		8/2), mostly low plasticity fines, trace fine to coarse sands.		20.5						
		@ 20.5 feet - stiff, pale brown (2.5Y 8/3), trace fine to medium sands.			SS-2	3	4	5		9
	23.0									
		CLAYEY SAND (SC) - moist, pinkish-white (7.5YR 8/2), subangular, mostly fine to coarse sands, little low plasticity fines, trace fine gravel.		23.5						
	24.5				UD-3					
250.2		**SANDY SILT (ML)** - moist, pinkish-white (7.5YR 8/2), mostly low plasticity fines, some fine to medium sands.		25.5						
	25.5				SS-3	4	5	7		12
		SILT (ML) - stiff, moist, white (7.5YR 8/1), mostly low plasticity fines, trace fine to medium sands.								
	27.0									
		Boring Terminated at 27 feet.								
245.2										
240.2										

● SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-28
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	NGS	**Boring Location:**	196+37.42	**Offset:**	R:79.032'	**Alignment:**	Proposed
Elev.:	319.9 ft	**Latitude:**	34.038228	**Longitude:**	-81.099057	**Date Started:**	2/21/2018
Total Depth:	69.8 ft	**Soil Depth:**	69.8 ft	**Core Depth:**	0 ft	**Date Completed:**	2/21/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 10 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.1	**SURFACE MATERIALS** - 1 inch of TOPSOIL.		0.0	SS-1	3	6	10	10	16
		FILL - CLAYEY SAND (SC) - medium dense, moist, red (10R 5/6), mostly fine to coarse sands, little low plasticity fines.		2.0	SS-2	12	15	14	15	29
		@ 2 feet - [LL=49, PL=25, PI=24, NMC=14.5%, %#200=27.8], AASHTO = A-2-7 (0).		4.0	SS-3	13	17	17	15	34
314.9		@ 4 feet - dense.								
	6.0	**SITLY SAND (SM)** - medium dense, moist, red (10R 5/6), mostly fine to medium sands, little non-plastic fines, few fine gravel.		6.0	SS-4	9	12	12	13	24
				8.0	SS-5	9	12	10	12	22
309.9	10.0 ▽	**COASTAL PLAIN - CLAYEY SAND (SC)** - medium dense, moist, light red (2.5YR 4/8), pinkish-gray (5YR 7/2), and reddish-yellow (7.5YR 7/6), mostly fine to medium sands, little low plasticity fines, [LL=48, PL=19, PI=29, NMC=18.4%, %#200=27.3], AASHTO = A-2-7 (0).		13.5	SS-6	5	9	6		15
304.9				18.5	SS-7	7	8	9		17

SPT N VALUE ● PL × MC ○ LL × ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90

LEGEND

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SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-28
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	NGS	**Boring Location:**	196+37.42	**Offset:**	R:79.032'	**Alignment:**	Proposed
Elev.:	319.9 ft	**Latitude:**	34.038228	**Longitude:**	-81.099057	**Date Started:**	2/21/2018
Total Depth:	69.8 ft	**Soil Depth:**	69.8 ft	**Core Depth:**	0 ft	**Date Completed:**	2/21/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 10 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
				23.5	SS-8	6	9	10		19
294.9		@ 23.5 feet - reddish-yellow (7.5YR 7/6), [LL=46, PL=20, PI=26, NMC=20.3%, %#200=16.5], AASHTO = A-2-7 (0).		28.5	SS-9	3	9	8		17
289.9				33.5	SS-10	3	2	1		3
284.9		@ 33.5 feet - very loose, wet, reddish-yellow (7.5YR 6/6), mostly fine to coarse sands, little high plasticity fines, trace fine gravel, [LL=56, PL=28, PI=28, NMC=27.7%, %#200=20.7], AASHTO = A-2-7 (0).		38.5	SS-11	4	4	5		9
		@ 38.5 feet - loose.								

SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-28
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	NGS	**Boring Location:**	196+37.42	**Offset:**	R:79.032'	**Alignment:**	Proposed
Elev.:	319.9 ft	**Latitude:**	34.038228	**Longitude:**	-81.099057	**Date Started:**	2/21/2018
Total Depth:	69.8 ft	**Soil Depth:**	69.8 ft	**Core Depth:**	0 ft	**Date Completed:**	2/21/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 10 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	43.5			43.5							
274.9		**PIEDMONT RESIDUUM - SILT WITH SAND (ML)** - stiff, moist, very pale brown (10YR 7/3) and reddish-yellow (7.5YR 7/6), mostly low plasticity fines, little fine sands, micaceous, [LL=48, PL=30, PI=18, NMC=33.0%, %#200=78.5], AASHTO = A-7-5 (16).			SS-12	3	5	7		12	
	48.5			48.5							
269.9		**SILT WITH SAND (ML)** - hard, moist, white (10YR 8/1) and very pale brown (10YR 7/4), mostly low plasticity fines, little fine sands.			SS-13	9	18	21		39	
		@ 53.5 feet - yellow (10YR 8/6).		53.5	SS-14	15	22	25		47	
264.9											
		@ 58.5 feet - brown (10YR 4/3) and very pale brown (10YR 8/2), micaceous.		58.5	SS-15	12	14	22		36	

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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-28
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	NGS	**Boring Location:**	196+37.42	**Offset:**	R:79.032'	**Alignment:**	Proposed
Elev.:	319.9 ft	**Latitude:**	34.038228	**Longitude:**	-81.099057	**Date Started:**	2/21/2018
Total Depth:	69.8 ft	**Soil Depth:**	69.8 ft	**Core Depth:**	0 ft	**Date Completed:**	2/21/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 10 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	63.5			63.5				
254.9		**SANDY SILT (ML)** - very hard, moist, brownish-yellow (10YR 6/6), mostly low plasticity fines, some fine sands, [LL=48, PL=29, PI=19, NMC=23.7%, %#200=68.5], AASHTO = A-7-6 (13).			SS-16	19 28 38	66	
	68.5			68.5				
249.9	69.8	**PARTIALLY WEATHERED ROCK (PWR) - WELL GRADED SAND WITH SILT (GW-GC)** - very dense, moist, brownish-yellow (10YR 6/6) and greenish-gray (GLEY 1 6/1), mostly fine to medium sands, few low plasticity fines.			SS-17	13 30 50/3"	100	
244.9		Boring Terminated at 69.8 feet.						

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-29
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	AKS	**Boring Location:**	205+83.54	**Offset:**	R:192.263'	**Alignment:**	Proposed
Elev.:	284.2 ft	**Latitude:**	34.038238	**Longitude:**	-81.095809	**Date Started:**	3/23/2018
Total Depth:	59.9 ft	**Soil Depth:**	49.3 ft	**Core Depth:**	10.6 ft	**Date Completed:**	3/26/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 10.1 ft	**24HR**	6.8 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0			0.0							
	0.3	**SURFACE MATERIALS** - 4 inches of TOPSOIL.									
		FILL - CLAYEY SAND (SC) - loose, moist, weak red (10R 4/4), subangular, mostly fine to coarse sands, little low plasticity fines.			SS-1	2	3	5	5	8	●
	2.0			2.0							
		COASTAL PLAIN - SILTY SAND WITH GRAVEL (SM) - medium dense, moist, olive brown (10YR 4/4), subangular, mostly fine to coarse sands, little non-plastic fines, little fine gravel, [LL=NP, PL=NP, PI=NP, NMC=7.4%, %#200=18.7], AASHTO = A-1-b.			SS-2	8	7	6	6	13	× ○ ● ▲
	4.0			4.0							
279.2					SS-3	7	7	8	6	15	●
	6.0	**CLAYEY SAND (SC)** - medium dense, moist, black (10YR 2.5/1), subangular, mostly fine to coarse sands, some low plasticity fines, trace fine gravel.		6.0							
		SILTY SAND (SM) - loose, moist, light brownish-gray (10YR 6/2), subangular, mostly fine to medium sands, little non-plastic fines, few fine gravel, [NMC=7.4%, %#200=12.2], AASHTO = A-1-b.			SS-4	4	4	6	3	10	● ▲
				8.0							
					SS-5	1	1	1	1	2	● × ○ ▲
274.2		@ 8 feet - very loose, moist to wet, yellow (10YR 7/6), mostly fine sands, little low plasticity fines, trace mica, absent gravel, [LL=33, PL=24, PI=9, NMC=31.0%, %#200=37.3], AASHTO = A-4 (0).									
				13.5							
		@ 13.5 feet - wet to saturated, mostly fine to coarse sands, few fine gravel, absent mica, [LL=44, PL=29, PI=15, NMC=24.4%, %#200=22.5], AASHTO = A-2-7 (0).			SS-6	WOH		1		1	● ▲ × ×
269.2											
				18.5							
		@ 18.5 feet - mostly fine to medium sands, absent gravel, [NMC=25.8%, %#200=21.8], AASHTO = A-1-b.			SS-7	W	O	H		0	● ▲ ○

LEGEND

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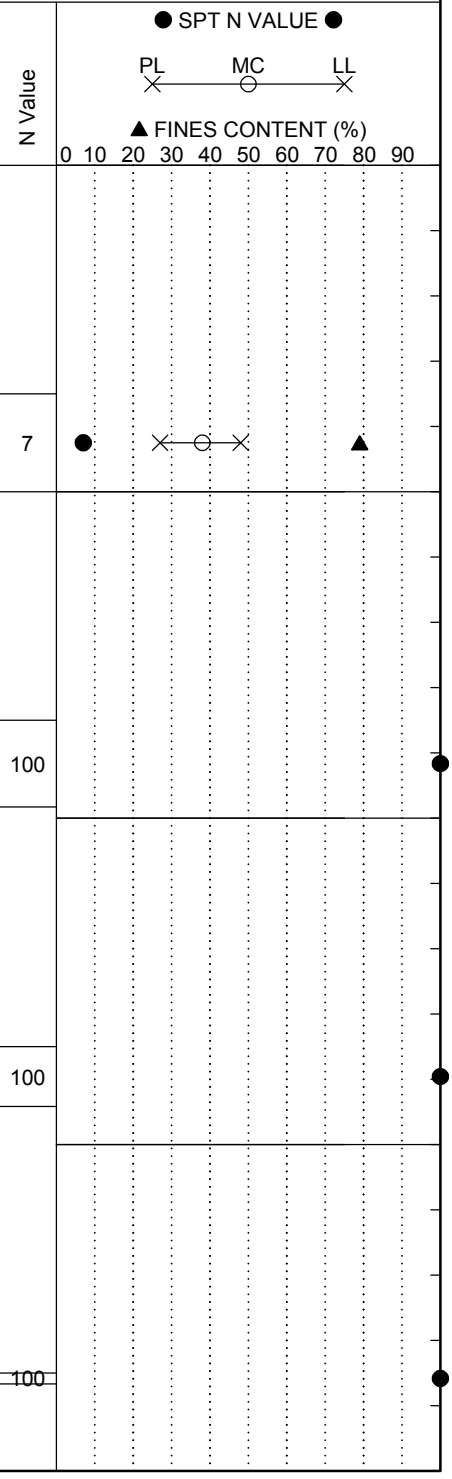
SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-29
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	AKS	**Boring Location:**	205+83.54	**Offset:**	R:192.263'	**Alignment:**	Proposed
Elev.:	284.2 ft	**Latitude:**	34.038238	**Longitude:**	-81.095809	**Date Started:**	3/23/2018
Total Depth:	59.9 ft	**Soil Depth:**	49.3 ft	**Core Depth:**	10.6 ft	**Date Completed:**	3/26/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 10.1 ft	**24HR**	6.8 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value
	23.5			23.5			
259.2		**PIEDMONT RESIDUUM - LEAN CLAY WITH SAND (CL)** - firm, moist, light yellowish-brown (10YR 6/3), mostly low plasticity fines, little fine sands, [LL=48, PL=27, PI=21, NMC=37.6%, %#200=78.6], AASHTO = A-7-6 (18).			SS-8	3 3 4	7
	28.5			28.5			
254.2		**PARTIALLY WEATHERED ROCK (PWR) - SILTY SAND (SM)** - very dense, moist, light yellowish-brown (10YR 6/3), subangular, mostly fine to medium sands, some low plasticity fines.			SS-9	21 47 50/4"	100
				33.5	SS-10	30 50/5" -	100
249.2							
				38.5	SS-11	50/2" - -	100



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SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-29
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	AKS	**Boring Location:**	205+83.54	**Offset:**	R:192.263'	**Alignment:**	Proposed
Elev.:	284.2 ft	**Latitude:**	34.038238	**Longitude:**	-81.095809	**Date Started:**	3/23/2018
Total Depth:	59.9 ft	**Soil Depth:**	49.3 ft	**Core Depth:**	10.6 ft	**Date Completed:**	3/26/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 10.1 ft	**24HR**	6.8 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				43.5	SS-12	50/4"- -	100	
239.2								
				48.5	~~SS-13~~	~~50/0"- -~~	~~100~~	
	49.3	Tri-Cone Bit Refusal at 49.3 feet. Install NW Casing to 49.3 feet for NQ wireline coring.		49.3				
234.2		For discontinuity descriptors, see discontinuity worksheet.			RC-1			
				50.6				
		METAMORPHIC BEDROCK - SCHIST - gray (GLEY 1 4/), coarse grained, foliated, moderately weathered, strong rock.			RC-2			
		RC-1: Rec= 100%, RQD= 0.0%, GSI= 50-60.						
		@ 52.6 feet - fine grained, slightly weathered.						
229.2		RC-2: Rec= 88.0%, RQD= 38.3%, GSI= 45-55.		55.6				
		@ 56.5 feet - moderately weathered.			RC-3			
		@ 57.2 TO 58.2 feet - residual soil.						
		RC-3: Rec= 100%, RQD= 13.5%, GSI= 40-50.						
	59.9							

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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-29
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	AKS	**Boring Location:**	205+83.54	**Offset:**	R:192.263'	**Alignment:**	Proposed
Elev.:	284.2 ft	**Latitude:**	34.038238	**Longitude:**	-81.095809	**Date Started:**	3/23/2018
Total Depth:	59.9 ft	**Soil Depth:**	49.3 ft	**Core Depth:**	10.6 ft	**Date Completed:**	3/26/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** 10.1 ft	**24HR**	6.8 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		Boring Terminated at 59.9 feet.						
219.2								
214.2								
209.2								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Millwood
Logged By: Austin Syms
Date: 3/26/2018

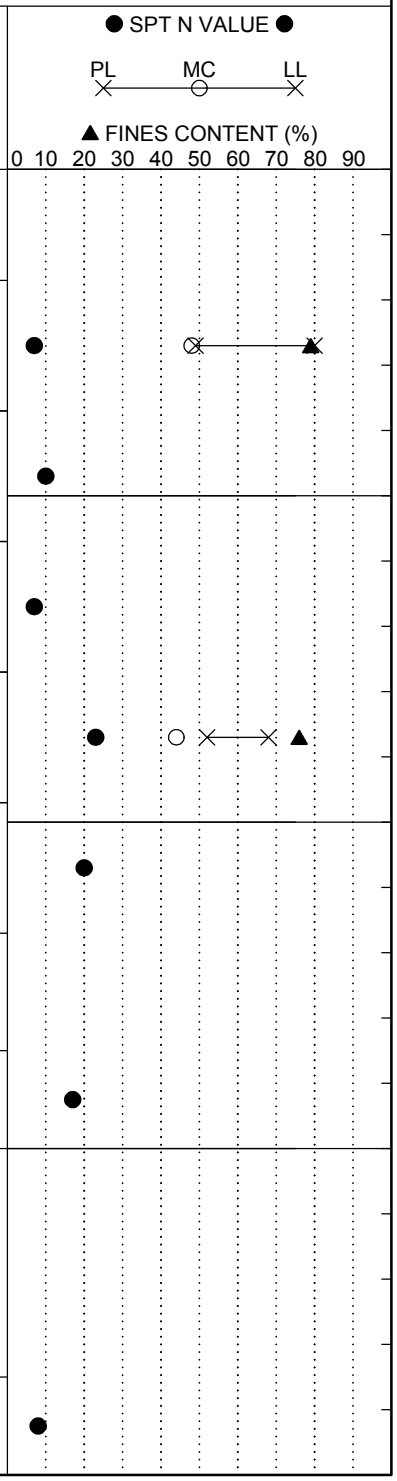
Boring Number: W-29
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 1

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
49.4	1	J	86	N	Pa	Fe	Pl	SR	
49.6	2	J	85	N	Pa	Fe	Pl	SR	
50.2	3	J	69	T	Pa	Fe	Ir	SR	
51	4	J	50	N	Pa	Fe	Ir	SR	
51.4	5	J	31	VN	Pa	Fe	Pl	SR	
52	6	J	22	N	Pa	Fe	Pl	SR	
53	7	J	24	VN	Pa	Fe	Pl	SR	
55	8	J	35	T	No	N/A	Pl	SR	
553	9	J	33	T	No	N/A	Pl	SR	
56.5	10	J	91	N	Pa	Fe	Pl	SR	
56.7	11	N/A	N/A	N/A	N/A	N/A	N/A	SR	Fractured zone 46.7' - 59.9'

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-30
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	NGS	**Boring Location:**	226+16.92	**Offset:**	L:110.400'	**Alignment:**	Proposed
Elev.:	292.4 ft	**Latitude:**	34.041290	**Longitude:**	-81.090007	**Date Started:**	2/22/2018
Total Depth:	64 ft	**Soil Depth:**	53.6 ft	**Core Depth:**	10.4 ft	**Date Completed:**	2/22/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 15 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0	**SURFACE MATERIALS** - 20 inches of ASPHALT.								
	1.7	**PIEDMONT RESIDUUM - ELASTIC SILT WITH SAND (MH)** - firm, moist, red (2.5YR 5/6), mostly high plasticity fines, little fine sands, [LL=80, PL=49, PI=31, NMC=47.7%, %#200=79.2], AASHTO = A-7-5 (31).		1.7	SS-1	2	3	4	5	7
		@ 3.7 feet - stiff, reddish-brown (2.5YR 4/4) and yellowish-brown (10YR 5/6), micaceous.		3.7	SS-2	4	5	5	6	10
287.4		@ 5.7 feet - firm.		5.7	SS-3	2	3	4	6	7
		@ 7.7 feet - very stiff, light yellowish-brown (10YR 6/4), [LL=68, PL=52, PI=16, NMC=44.3%, %#200=75.7], AASHTO = A-7-5 (17).		7.7	SS-4	7	12	11	12	23
282.4				9.7	SS-5	7	8	12	15	20
				13.5	SS-6	6	8	9		17
277.4		▽								
		@ 18.5 feet - firm, yellowish-brown (10YR 5/6) and weak red (10R 4/3).		18.5	SS-7	3	4	4		8



LEGEND

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SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-30
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	NGS	**Boring Location:**	226+16.92	**Offset:**	L:110.400'	**Alignment:**	Proposed
Elev.:	292.4 ft	**Latitude:**	34.041290	**Longitude:**	-81.090007	**Date Started:**	2/22/2018
Total Depth:	64 ft	**Soil Depth:**	53.6 ft	**Core Depth:**	10.4 ft	**Date Completed:**	2/22/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 15 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				23.5	SS-8	3 4 7	11	
267.4		@ 23.5 feet - stiff, greenish-gray (GLEY 1 5/1).						
				28.5	SS-9	9 12 15	27	
262.4		@ 28.5 feet - very stiff, [LL=72, PL=35, PI=37, NMC=35.7%, %#200=84.3], AASHTO = A-7-5 (36).						
	31.0	**FAT CLAY WITH SAND (CH)** - very stiff, moist, greenish-gray (GLEY 1 5/1), mostly high plasticity fines, little fine sands, micaceous.		33.5	SS-10	10 13 17	30	
257.4								
				38.5	SS-11	13 17 20	37	
		@ 38.5 feet - hard, [LL=65, PL=30, PI=35, NMC=31.6%, %#200=85.5], AASHTO = A-7-5 (34).						

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-30
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	NGS	**Boring Location:**	226+16.92	**Offset:**	L:110.400'	**Alignment:**	Proposed
Elev.:	292.4 ft	**Latitude:**	34.041290	**Longitude:**	-81.090007	**Date Started:**	2/22/2018
Total Depth:	64 ft	**Soil Depth:**	53.6 ft	**Core Depth:**	10.4 ft	**Date Completed:**	2/22/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 15 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
				43.5	SS-12	15 17 27	44	
247.4								
				48.5	SS-13	5 10 17	27	
		@ 48.5 feet - very stiff.						
242.4								
	53.5			53.5				
	53.7	**PARTIALLY WEATHERED ROCK (PWR) - SANDY SILT (ML)** - very hard, moist, greenish-gray (GLEY 1 5/1), mostly low plasticity fines, some fine sands, micaceous. Tri-cone bit refusal at 53.7 feet. Install NW casing to 53.7 for NQ wireline coring. For discontinuity descriptors, see discontinuity worksheet.		53.7	SS-14	50/2"- -	100	
					RC-1			
237.4				55.0				
					RC-2			
		METAMORPHIC BEDROCK - SCHIST - light greenish-gray (GLEY 1 7/1), very fine grained, foliated, highly weathered, extremely weak rock. RC-1: Rec= 30.8%, RQD= 0.0%, GSI=		60.0				

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LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-30
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	NGS	**Boring Location:**	226+16.92	**Offset:**	L:110.400'	**Alignment:**	Proposed
Elev.:	292.4 ft	**Latitude:**	34.041290	**Longitude:**	-81.090007	**Date Started:**	2/22/2018
Total Depth:	64 ft	**Soil Depth:**	53.6 ft	**Core Depth:**	10.4 ft	**Date Completed:**	2/22/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	NQ	**Driller:**	T. Miller	**Groundwater:**	**TOB** 15 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		10-20.						
		@ 58 feet - mixed quartzite.						
		RC-2: Rec= 52.0%, RQD= 0.0%, GSI= 10-20.			RC-3			
	64.0	RC-3: Rec= 10.0%, RQD= 0.0%, GSI= 10-20.						
227.4		Boring Terminated at 64 feet.						
222.4								
217.4								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Millwood
Logged By: Nat Shuff
Date: 2/22/2018

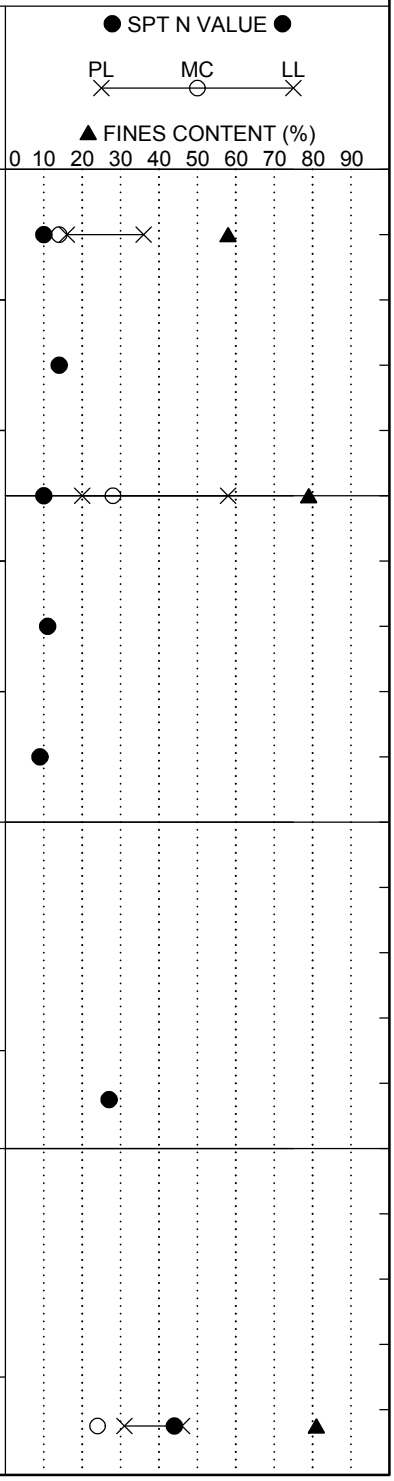
Boring Number: W-30
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 1

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
53.7	1	J	65	VN	Su	Fe	Wa	SR	
55	2	J	N/A	N/A	Su	Fe	Ir	SR	Fractured zone 55.0' - 64.0'

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-31
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	NGS	**Boring Location:**	240+69.16	**Offset:**	R:167.336'	**Alignment:**	Proposed
Elev.:	224.7 ft	**Latitude:**	34.042401	**Longitude:**	-81.085312	**Date Started:**	3/13/2018
Total Depth:	64.5 ft	**Soil Depth:**	64.5 ft	**Core Depth:**	0 ft	**Date Completed:**	3/14/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 10 ft	**24HR**	7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.1	**SURFACE MATERIALS** - 1 inch of TOPSOIL.		0.0	SS-1	5	4	6	7	10
		FILL - SANDY LEAN CLAY (CL) - loose, moist, reddish-brown (2.5YR 4/4), mostly low plasticity fines, some fine to medium sands, trace organics, trace fine gravel, [LL=36, PL=16, PI=20, NMC=14.0%, %#200=57.9], AASHTO = A-6 (8).		2.0	SS-2	8	8	6	6	14
		@ 2 feet - medium dense.								
	4.0			4.0						
219.7		**FAT CLAY WITH SAND (CH)** - stiff, moist, dark reddish-gray (2.5YR 3/1) and reddish-yellow (7.5YR 8/8), mostly high plasticity fines, little fine to medium sands, trace organics, [LL=58, PL=20, PI=38, NMC=28.0%, %#200=79.4], AASHTO = A-7-6 (31).			SS-3	6	4	6	7	10
				6.0	SS-4	5	7	4	4	11
	8.0			8.0						
214.7		**PIEDMONT RESIDUUM - SILT WITH SAND (ML)** - stiff, moist, reddish-yellow (5YR 5/6), black (5YR 2.5/1), and light brown (7.5YR 6/3), mostly low plasticity fines, little fine sands, trace organics, trace mica.			SS-5	3	3	6	10	9
				13.5						
		@ 13.5 feet - very stiff, absent organics, micaceous.			SS-6	11	11	16		27
209.7										
				18.5						
		@ 18.5 feet - hard, [LL=46, PL=31, PI=15, NMC=24.2%, %#200=80.5], AASHTO = A-7-5 (14).			SS-7	11	18	26		44



LEGEND

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SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-31
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	NGS	**Boring Location:**	240+69.16	**Offset:**	R:167.336'	**Alignment:**	Proposed
Elev.:	224.7 ft	**Latitude:**	34.042401	**Longitude:**	-81.085312	**Date Started:**	3/13/2018
Total Depth:	64.5 ft	**Soil Depth:**	64.5 ft	**Core Depth:**	0 ft	**Date Completed:**	3/14/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 10 ft	**24HR**	7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	23.5			23.5				
199.7		**PARTIALLY WEATHERED ROCK (PWR) - SANDY SILT (ML)** - very hard, moist, reddish-yellow (5YR 5/6), black (5YR 2.5/1), and light brown (7.5YR 6/3), mostly low to medium plasticity fines, some fine sands, micaceous.			SS-8	24 50/5" -	100	●
	28.5			28.5				
194.7		**PIEDMONT RESIDUUM - SILT WITH SAND (ML)** - very hard, moist, reddish-yellow (5YR 5/6) and gray (7.5YR 6/1), mostly low to medium plasticity fines, little fine sands, micaceous.			SS-9	21 25 40	65	●
	33.5			33.5				
189.7		**PARTIALLY WEATHERED ROCK (PWR) - SILT WITH SAND (ML)** - very hard, moist, reddish-yellow (5YR 5/6) and gray (7.5YR 6/1), mostly low to medium plasticity fines, some fine sands, micaceous.			SS-10	18 31 50/5"	100	●
	38.5			38.5				
		PIEDMONT RESIDUUM - SILT WITH SAND (ML) - very hard, moist, reddish-yellow (5YR 5/6) and gray (7.5YR 6/1), mostly low to medium plasticity fines,			SS-11	10 12 18	30	●

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-31
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	NGS	**Boring Location:**	240+69.16	**Offset:**	R:167.336'	**Alignment:**	Proposed
Elev.:	224.7 ft	**Latitude:**	34.042401	**Longitude:**	-81.085312	**Date Started:**	3/13/2018
Total Depth:	64.5 ft	**Soil Depth:**	64.5 ft	**Core Depth:**	0 ft	**Date Completed:**	3/14/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 10 ft	**24HR**	7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	SPT N VALUE / PL MC LL / FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		little fine sands, micaceous.						
	43.5			43.5				
179.7		**PARTIALLY WEATHERED ROCK (PWR) - CLAYEY SAND (SC)** - very dense, moist, yellowish-red (5YR 4/6) and dark reddish-brown (5YR 3/2), mostly medium to coarse sands, some low to medium plasticity fines, trace weathered rock fragments.			SS-12	27 36 50/5"	100	
				48.5	SS-13	17 50/5" -	100	
174.7								
				53.5	SS-14	50/5"- -	100	
169.7								
				58.5	SS-15	50/4"- -	100	

LEGEND

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SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-31
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	NGS	**Boring Location:**	240+69.16	**Offset:**	R:167.336'	**Alignment:**	Proposed
Elev.:	224.7 ft	**Latitude:**	34.042401	**Longitude:**	-81.085312	**Date Started:**	3/13/2018
Total Depth:	64.5 ft	**Soil Depth:**	64.5 ft	**Core Depth:**	0 ft	**Date Completed:**	3/14/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 10 ft	**24HR**	7 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
				63.5	SS-16	50/3"-		-		100
	64.5	Tri-Cone Bit Refusal at 64.5 feet. Attempted to install NW Casing to 64.5 feet for NQ wireline coring, but casing broke off in hole. Hole was abandoned with casing in-place, and rig offset to W-31A.								
159.7										
154.7										
149.7										

SPT N VALUE ●

PL MC LL

▲ FINES CONTENT (%)

0 10 20 30 40 50 60 70 80 90

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-31A
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	HGM	**Boring Location:**	240+67.18	**Offset:**	R:163.335'	**Alignment:**	Proposed
Elev.:	223.9 ft	**Latitude:**	34.042408	**Longitude:**	-81.085323	**Date Started:**	3/16/2018
Total Depth:	67.9 ft	**Soil Depth:**	67.9 ft	**Core Depth:**	0 ft	**Date Completed:**	3/17/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 8.5 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0							
	0.1	**SURFACE MATERIALS** - 1 inch of TOPSOIL.						
218.9		▽						
213.9		Drilled without sampling to 67.9 feet.						
208.9								

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-31A
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	HGM	**Boring Location:**	240+67.18	**Offset:**	R:163.335'	**Alignment:**	Proposed
Elev.:	223.9 ft	**Latitude:**	34.042408	**Longitude:**	-81.085323	**Date Started:**	3/16/2018
Total Depth:	67.9 ft	**Soil Depth:**	67.9 ft	**Core Depth:**	0 ft	**Date Completed:**	3/17/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 8.5 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
198.9								
193.9								
188.9								

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-31A
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	HGM	**Boring Location:**	240+67.18	**Offset:**	R:163.335'	**Alignment:**	Proposed
Elev.:	223.9 ft	**Latitude:**	34.042408	**Longitude:**	-81.085323	**Date Started:**	3/16/2018
Total Depth:	67.9 ft	**Soil Depth:**	67.9 ft	**Core Depth:**	0 ft	**Date Completed:**	3/17/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 8.5 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
178.9								
173.9								
168.9								

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-31A
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	HGM	**Boring Location:**	240+67.18	**Offset:**	R:163.335'	**Alignment:**	Proposed
Elev.:	223.9 ft	**Latitude:**	34.042408	**Longitude:**	-81.085323	**Date Started:**	3/16/2018
Total Depth:	67.9 ft	**Soil Depth:**	67.9 ft	**Core Depth:**	0 ft	**Date Completed:**	3/17/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 8.5 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
158.9								
	67.9	Tri-Cone Bit Refusal at 67.9 feet. Attempted to install NW Casing to 67.9 feet for NQ wireline coring, but casing broke off in hole. Hole was abandoned with casing in-place, and rig offset to W-31B.						
153.9								
148.9								

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-31B
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	NGS	**Boring Location:**	240+65.25	**Offset:**	R:166.494'	**Alignment:**	Proposed
Elev.:	224.2 ft	**Latitude:**	34.042398	**Longitude:**	-81.085324	**Date Started:**	3/21/2018
Total Depth:	64 ft	**Soil Depth:**	64 ft	**Core Depth:**	0 ft	**Date Completed:**	3/22/2018
Bore Hole Diameter (in):	7	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 6 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	0.0							
	0.1	**SURFACE MATERIALS** - 1 inch of TOPSOIL.						
219.2		▽						
214.2		Drilled without sampling to 64 feet.						
209.2								

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-31B
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	NGS	**Boring Location:**	240+65.25	**Offset:**	R:166.494'	**Alignment:**	Proposed
Elev.:	224.2 ft	**Latitude:**	34.042398	**Longitude:**	-81.085324	**Date Started:**	3/21/2018
Total Depth:	64 ft	**Soil Depth:**	64 ft	**Core Depth:**	0 ft	**Date Completed:**	3/22/2018
Bore Hole Diameter (in):	7	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 6 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
199.2								
194.2								
189.2								

LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-31B
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	NGS	**Boring Location:**	240+65.25	**Offset:**	R:166.494'	**Alignment:**	Proposed
Elev.:	224.2 ft	**Latitude:**	34.042398	**Longitude:**	-81.085324	**Date Started:**	3/21/2018
Total Depth:	64 ft	**Soil Depth:**	64 ft	**Core Depth:**	0 ft	**Date Completed:**	3/22/2018
Bore Hole Diameter (in):	7	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 6 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
179.2								
174.2								
169.2								

LEGEND

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SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-31B
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	NGS	**Boring Location:**	240+65.25	**Offset:**	R:166.494'	**Alignment:**	Proposed
Elev.:	224.2 ft	**Latitude:**	34.042398	**Longitude:**	-81.085324	**Date Started:**	3/21/2018
Total Depth:	64 ft	**Soil Depth:**	64 ft	**Core Depth:**	0 ft	**Date Completed:**	3/22/2018
Bore Hole Diameter (in):	7	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	CME 55	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	84.1%
Core Size:	N/A	**Driller:**	T. Miller	**Groundwater:**	**TOB** 6 ft	**24HR**	N/A

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
	64.0	Tri-Cone Bit Refusal at 64 feet. Attempted to install NW Casing to 64 feet for NQ wireline coring, but casing broke off in hole. Hole was abandoned.						
159.2								
154.2								
149.2								

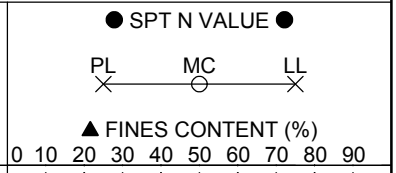
LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-32
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	AKS	**Boring Location:**	252+83.83	**Offset:**	L:60.487'	**Alignment:**	Proposed
Elev.:	189.8 ft	**Latitude:**	34.044459	**Longitude:**	-81.082066	**Date Started:**	2/5/2018
Total Depth:	54.7 ft	**Soil Depth:**	44.7 ft	**Core Depth:**	10 ft	**Date Completed:**	2/6/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	21.2 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6"	2nd 6"	3rd 6"	4th 6"	N Value
	0.0									
	0.2	**SURFACE MATERIALS** - 2 inches of TOPSOIL.		0.0	SS-1	3	2	2	6	4
		PIEDMONT RESIDUUM - SANDY SILT (ML) - soft, moist, reddish-yellow (7.5YR 6/6), mostly low plasticity fines, some fine to medium sands, relict rock structure.		2.0	SS-2	6	6	8	9	14
		@ 2 feet - stiff, [LL=33, PL=25, PI=8, NMC=17.5%, %#200=69.2], AASHTO = A-4 (5).		4.0	SS-3	3	6	6	5	12
184.8										
		@ 6 feet - dark red (2.5YR 3/6).		6.0	SS-4	4	5	5	6	10
	8.0			8.0						
		CLAYEY SAND (SC) - loose, moist, yellowish-brown (2.5YR 6/3), mostly fine to coarse sands, some low plasticity fines, few weathered rock fragments, [LL=29, PL=16, PI=13, NMC=15%, %#200=44.1], AASHTO = A-6 (2).			SS-5	2	3	5	8	8
179.8										
	13.5			13.5						
		SILTY SAND WITH GRAVEL (SM) - very dense, olive yellow (2.5YR 6/6), mostly fine to coarse sands, little low plasticity fines, little weathered rock fragments, [LL=24, PL=21, PI=3, NMC=7.6%, %#200=20.5], AASHTO = A-1-b.			SS-6	21	32	36		68
174.8										
		@ 18.5 feet - white (2.5YR 8/1).		18.5	SS-7	32	41	31		72



LEGEND

Continued Next Page

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-32
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	AKS	**Boring Location:**	252+83.83	**Offset:**	L:60.487'	**Alignment:**	Proposed
Elev.:	189.8 ft	**Latitude:**	34.044459	**Longitude:**	-81.082066	**Date Started:**	2/5/2018
Total Depth:	54.7 ft	**Soil Depth:**	44.7 ft	**Core Depth:**	10 ft	**Date Completed:**	2/6/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	21.2 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		▼						
	23.5	**SANDY SILT (ML)** - very hard, moist, yellowish-brown (10YR 5/4), mostly low plasticity fines, some fine to medium sands, relict rock structure.		23.5	SS-8	14 31 41	72	●
164.8								
	28.5	**PARTIALLY WEATHERED ROCK (PWR) - SANDY SILT (ML)** - very hard, moist, yellowish-brown (10YR 5/4), mostly low plasticity fines, some fine to medium sands, relict rock structure.		28.5	SS-9	47 50/5" -	100	●
159.8								
	33.5	**SANDY SILT (ML)** - very hard, moist, yellowish-brown (10YR 5/4), mostly low plasticity fines, some fine to medium sands, relict rock structure.		33.5	SS-10	13 21 30	51	●
154.8								
	38.5	**FAT CLAY WITH SAND (CH)** - very hard, moist, yellowish-brown (10YR 5/4), mostly high plasticity fines, little fine sands, [LL=53, PL=29, PI=24, NMC=24.3%,		38.5	SS-11	32 34 39	73	○×—× ● ▲

Continued Next Page

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

SC_DOT 1461-16-047_ALL BORINGS - HGM 7-16-18.GPJ SCDOT DATA TEMPLATE_01_30_2015.GDT 10/11/18

SCDOT Soil Test Log

Project ID:	P027662			**County:**	Lexington/Richland	**Boring No.:**	W-32
Site Description:	Carolina Crossroads I-20/26/126 Corridor Improvement Project					**Route:**	I-20
Eng./Geo.:	AKS	**Boring Location:**	252+83.83	**Offset:**	L:60.487'	**Alignment:**	Proposed
Elev.:	189.8 ft	**Latitude:**	34.044459	**Longitude:**	-81.082066	**Date Started:**	2/5/2018
Total Depth:	54.7 ft	**Soil Depth:**	44.7 ft	**Core Depth:**	10 ft	**Date Completed:**	2/6/2018
Bore Hole Diameter (in):	3.5	**Sampler Configuration**		**Liner Required:**	Y (N)	**Liner Used:**	Y (N)
Drill Machine:	D-50	**Drill Method:**	RW	**Hammer Type:**	Automatic	**Energy Ratio:**	86.5%
Core Size:	NQ	**Driller:**	J. Millwood	**Groundwater:**	**TOB** N/A	**24HR**	21.2 ft

Elevation (ft)	Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample Depth (ft)	Sample No./Type	1st 6" / 2nd 6" / 3rd 6" / 4th 6"	N Value	● SPT N VALUE ● PL MC LL ▲ FINES CONTENT (%) 0 10 20 30 40 50 60 70 80 90
		%#200=81.1], AASHTO = A-7-6 (21).						
	43.5			43.5				
		PARTIALLY WEATHERED ROCK (PWR) - SANDY SILT (ML) - very hard, moist, yellowish-brown (10YR 5/4), mostly low plasticity fines, some fine to medium sands, relict rock structure.			SS-12	27 50/5" -	100	●
144.8	44.7	Tri-Cone Bit Refusal at 44.7 feet. Install NW Casing to 44.7 feet for NQ wireline coring.		44.7				
		For discontinuity descriptors, see attached worksheet.			RC-1			
		METAMORPHIC BEDROCK - SCHIST - dark greenish-gray (GLEY 1 4/1), coarse grained, massive, subangular, moderately weathered, medium strong rock.		49.7				
139.8		@ 47 feet - highly weathered. RC-1: Rec= 92.0%, RQD= 36.7%, GSI= 10-20, RMR = 39. @ 49.7 feet - dark greenish-gray (GLEY 1 4/1). @ 51 feet - fine grained, laminated, completely weathered to residual soil, extremely weak rock.			RC-2			
134.8	54.7	RC-2: Rec= 82.0%, RQD= 0.0%, GSI= 10-20.						
		Boring Terminated at 54.7 feet.						

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
UD - Undisturbed Sample	CU - Cuttings	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	DC - Driving Casing	

Rock Core Discontinuity Worksheet

Project Name: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Project Number: 1461-16-047
Driller (Company/Name): S&ME/Millwood
Logged By: Austin Syms
Date: 2/5/2018

Boring Number: W-32
Core Barrel Type: NQ
Core Barrel Length: 5 ft
Coring Technique: Wireline
Number of Core Boxes: 1

Depth (ft)	Disc. No.	Disc. Type	Dip Angle (deg)	Disc. Width (mm)	Infill Amount	Infill Type	Surface Shape	Surface Roughness	Notes
44.7	1	J	N/A	N/A	No	N/A	Ir	SR	Fractured zone 44.7' to 46.5'
47	2	J	N/A	N/A	No	N/A	Ir	SR	
48.7	3	J	N/A	N/A	No	N/A	Ir	SR	Fractured zone 48.7' to 49.7'

Appendix IV – Rock Core Box Photographs

Boring B-29, Box 1 & 2

1	**Remarks:**	**Boring B-29, Box 1**

2	**Remarks:**	**Boring B-29, Box 2**

Boring B-31, Box 1 & 2

1	Remarks:	Boring B-31, Box 1

2	Remarks:	Boring B-31, Box 2

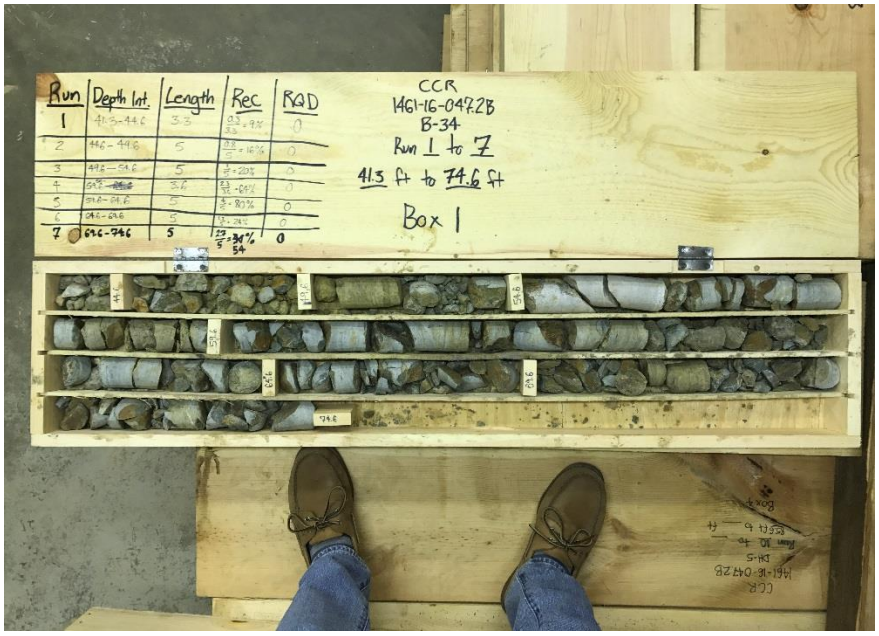
Boring B-32, Box 1

1	**Remarks:**	**Boring B-32, Box 1**

Boring B-33, Box 1

1	**Remarks:**	**Boring B-33, Box 1**

Boring B-34, Box 1



1	**Remarks:**	**Boring B-34, Box 1**

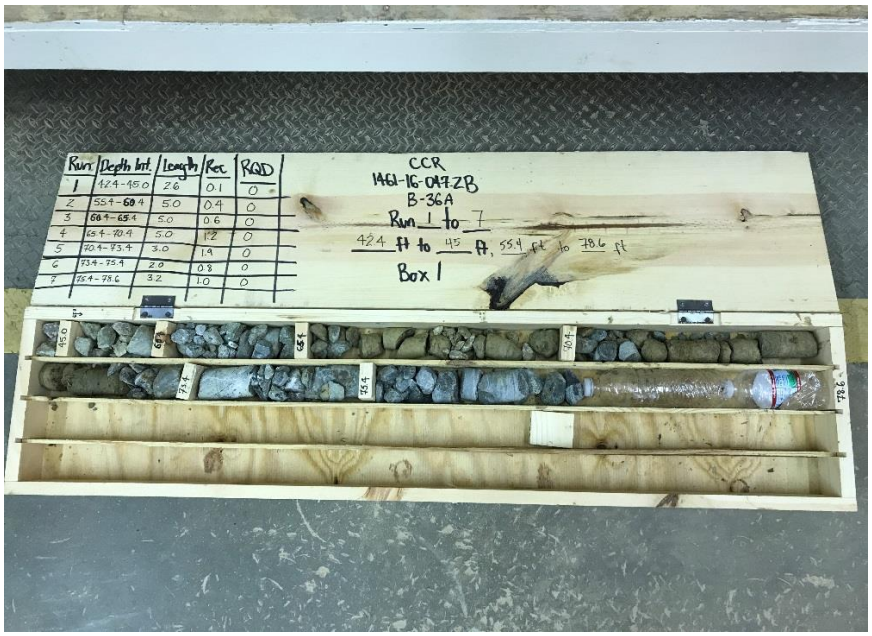
Boring B-35, Box 1

1	**Remarks:**	**Boring B-35, Box 1**

Boring B-36, Box 1

1	**Remarks:**	**Boring B-36, Box 1**

Boring B-36A, Box 1



1	**Remarks:**	**Boring B-36A, Box 1**

Boring B-37, Box 1 & 2

1	**Remarks:**	**Boring B-37, Box 1**

2	**Remarks:**	**Boring B-37, Box 2**

Boring B-38, Box 1 & 2

1	**Remarks:**	**Boring B-38, Box 1**

2	**Remarks:**	**Boring B-38, Box 2**

Boring B-39, Box 1 & 2

1	**Remarks:**	**Boring B-39, Box 1**

2	**Remarks:**	**Boring B-39, Box 2**

Boring B-40, Box 1 & 2

1	**Remarks:**	**Boring B-40, Box 1**

2	**Remarks:**	**Boring B-40, Box 2**

Boring B-41, Box 1

1	**Remarks:**	**Boring B-41, Box 1**

Boring B-42, Box 1 & 2

1	**Remarks:**	**Boring B-42, Box 1**

2	**Remarks:**	**Boring B-42, Box 2**

Boring B-43, Box 1 & 2

1	**Remarks:**	**Boring B-43, Box 1**

2	**Remarks:**	**Boring B-43, Box 2**

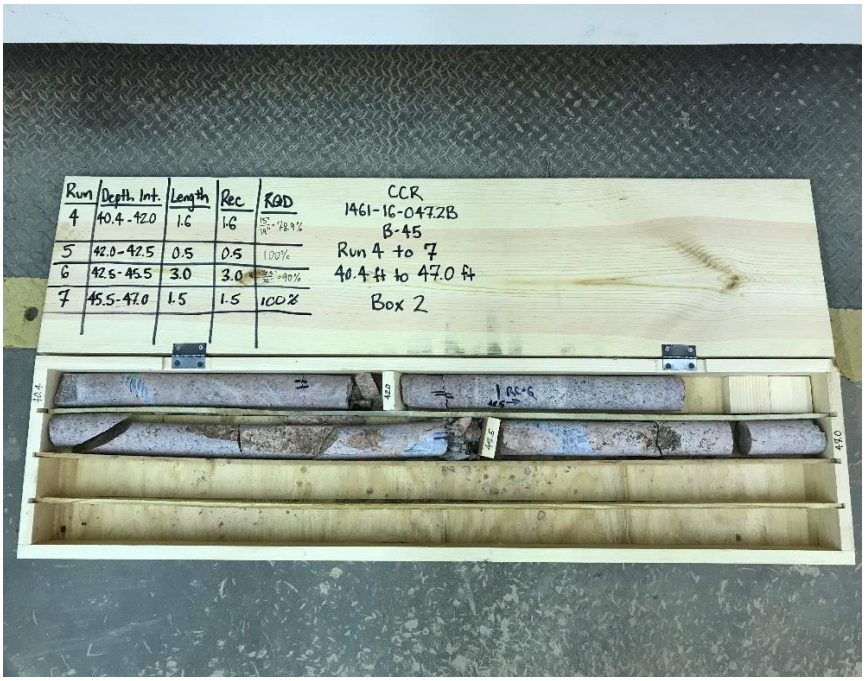
Boring B-44, Box 1 & 2

1	**Remarks:**	**Boring B-44, Box 1**

2	**Remarks:**	**Boring B-44, Box 2**

Boring B-45, Box 1 & 2

1	**Remarks:**	**Boring B-45, Box 1**



2	**Remarks:**	**Boring B-45, Box 2**

Boring B-46, Box 1 & 2

1	Remarks:	Boring B-46, Box 1

2	Remarks:	Boring B-46, Box 2

Boring B-47, Box 1 & 2

1	Remarks:	Boring B-47, Box 1

2	Remarks:	Boring B-47, Box 2

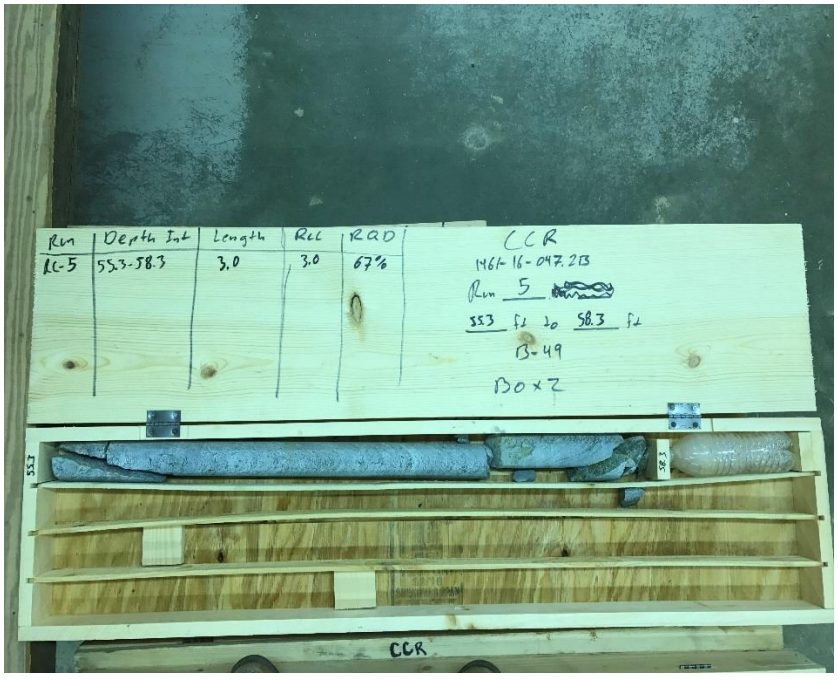
Boring B-48, Box 1 & 2

1	Remarks:	Boring B-48, Box 1

2	Remarks:	Boring B-48, Box 2

Boring B-49, Box 1 & 2

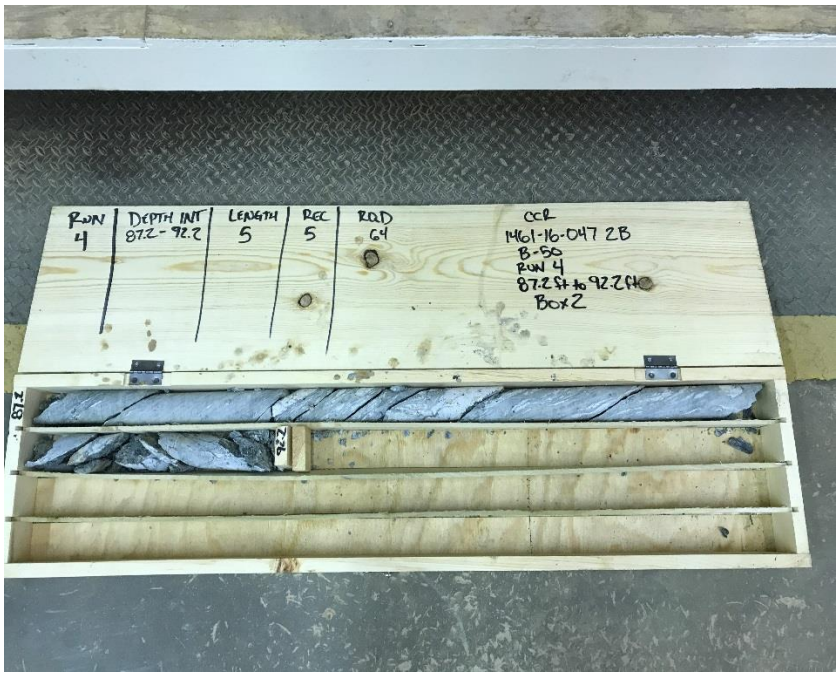
1	**Remarks:**	**Boring B-49, Box 1**



2	**Remarks:**	**Boring B-49, Box 2**

Boring B-50, Box 1 & 2

1	**Remarks:**	**Boring B-50, Box 1**



2	**Remarks:**	**Boring B-50, Box 2**

Boring B-51, Box 1

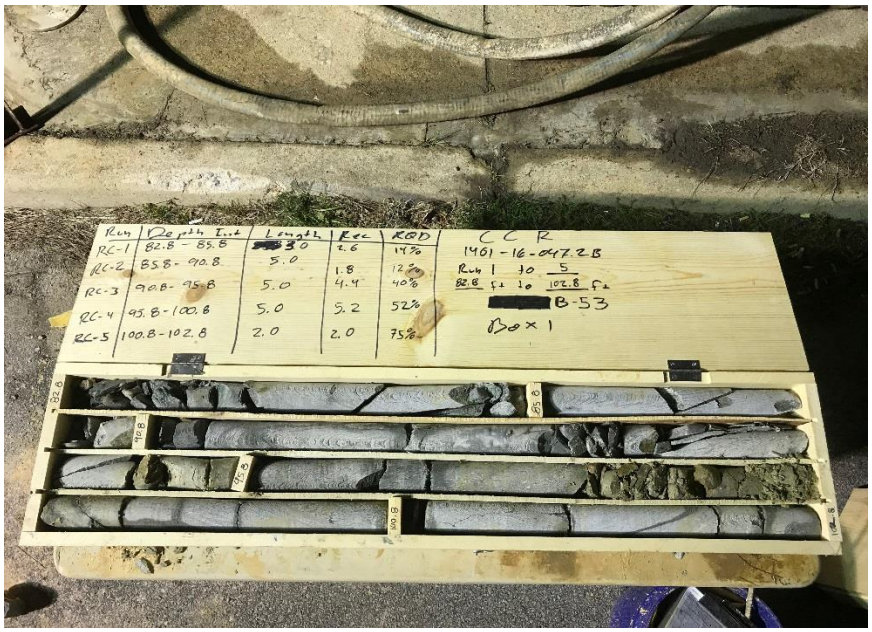
1	**Remarks:**	**Boring B-51, Box 1**

Boring B-52, Box 1 & 2

1	**Remarks:**	**Boring B-52, Box 1**

2	**Remarks:**	**Boring B-52, Box 2**

Boring B-53, Box 1



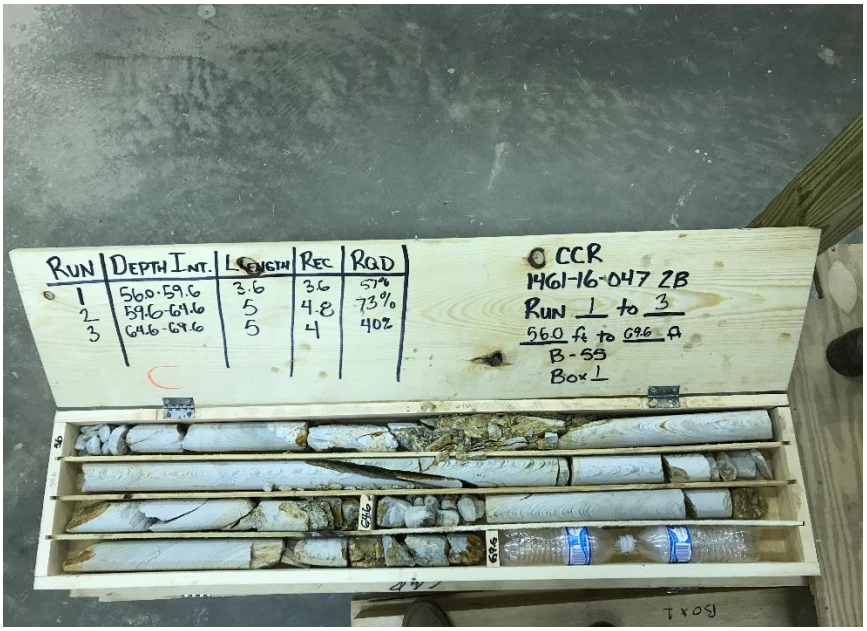
1	**Remarks:**	**Boring B-53, Box 1**

Boring B-54, Box 1 & 2

1	**Remarks:**	**Boring B-54, Box 1**

2	**Remarks:**	**Boring B-54, Box 2**

Boring B-55, Box 1 & 2



1	Remarks:	Boring B-55, Box 1

2	Remarks:	Boring B-55, Box 2

Boring B-56, Box 1 & 2

1	Remarks:	Boring B-56, Box 1

2	Remarks:	Boring B-56, Box 2

Boring B-57, Box 1

1	**Remarks:**	**Boring B-57, Box 1**

Boring B-59, Box 1

1	**Remarks:**	**Boring B-59, Box 1**

Boring B-60, Box 1 & 2

1	**Remarks:**	**Boring B-60, Box 1**

2	**Remarks:**	**Boring B-60, Box 2**

Boring B-61, Box 1

1	**Remarks:**	**Boring B-61, Box 1**

Boring B-62, Box 1

1	**Remarks:**	**Boring B-62, Box 1**

Boring DH-4, Box 1 & 2

1	**Remarks:**	**Boring DH-4, Box 1**

2	**Remarks:**	**Boring DH-4, Box 2**

Boring DH-4, Box 3 & 4

1	Remarks:	Boring DH-4, Box 3

2	Remarks:	Boring DH-4, Box 4

Boring DH-4, Box 5

1	**Remarks:**	**Boring DH-4, Box 5**

Boring DH-5, Box 1 & 2

1	**Remarks:**	**Boring DH-5, Box 1**

2	**Remarks:**	**Boring DH-5, Box 2**

Boring DH-5, Box 3 & 4

1	Remarks:	Boring DH-5, Box 3

2	Remarks:	Boring DH-5, Box 4

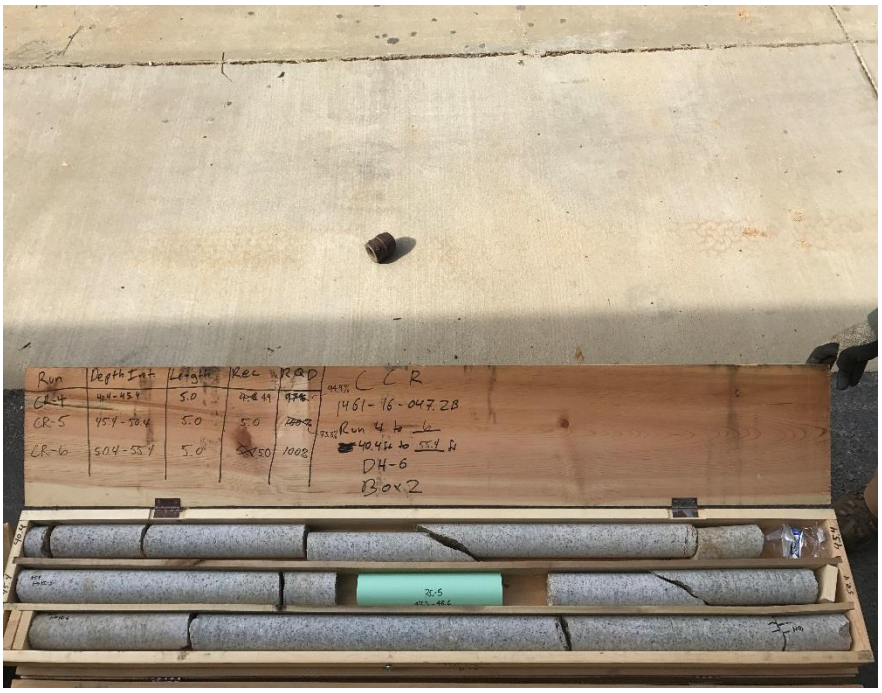
Boring DH-5, Box 5 & 6

1	**Remarks:**	**Boring DH-5, Box 5**

2	**Remarks:**	**Boring DH-5, Box 6**

Boring DH-6, Box 1 & 2

1	**Remarks:**	**Boring DH-6, Box 1**



2	**Remarks:**	**Boring DH-6, Box 2**

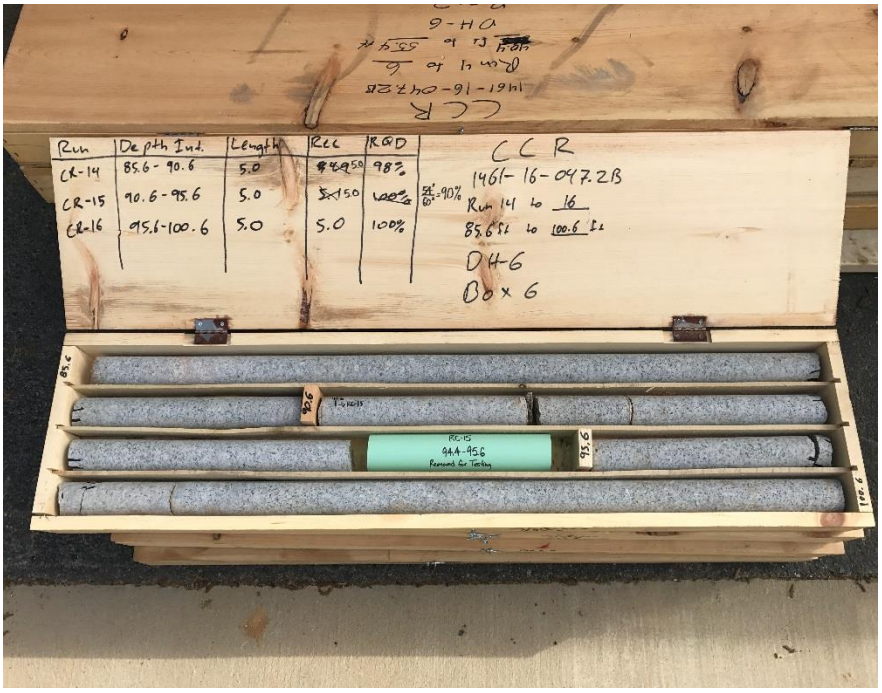
Boring DH-6, Box 3 & 4

1	Remarks:	Boring DH-6, Box 3

2	Remarks:	Boring DH-6, Box 4

Boring DH-6, Box 5 & 6

1	Remarks:	Boring DH-6, Box 5



2	Remarks:	Boring DH-6, Box 6

Boring DH-6, Box 7 & 8

1	Remarks:	Boring DH-6, Box 7

2	Remarks:	Boring DH-6, Box 8

Boring W-18, Box 1

1	**Remarks:**	**Boring W-18, Box 1**

Boring W-19, Box 1

1	**Remarks:**	**Boring W-19, Box 1**

Boring W-22, Box 1

1	**Remarks:**	**Boring W-22, Box 1**

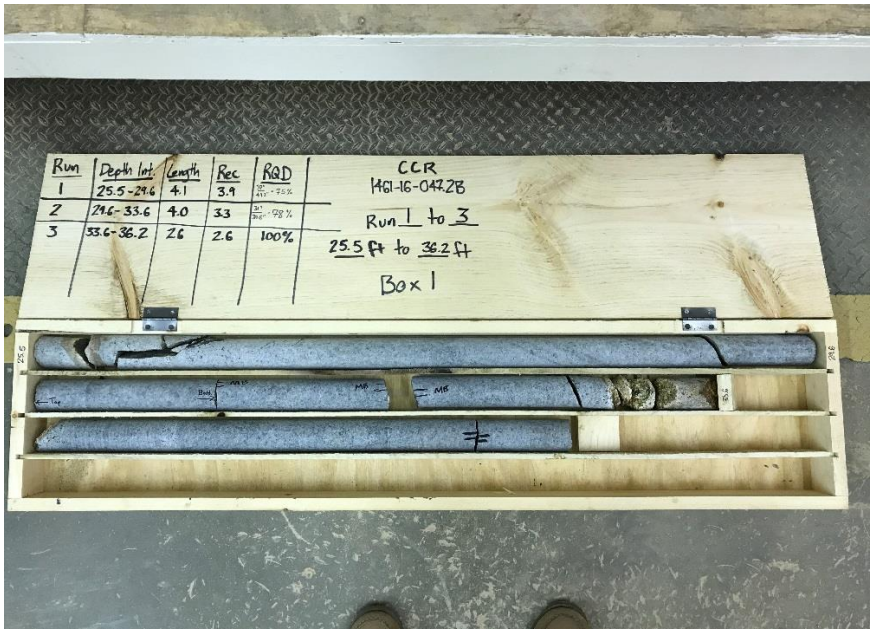
Boring W-23, Box 1

1	**Remarks:**	**Boring W-23, Box 1**

Boring W-24, Box 1

1	**Remarks:**	**Boring W-24, Box 1**

Boring W-25, Box 1



1	**Remarks:**	**Boring W-25, Box 1**

Boring W-29, Box 1

1	**Remarks:**	**Boring W-29, Box 1**

Boring W-30, Box 1

1	**Remarks:**	**Boring W-30, Box 1**

Boring W-32, Box 1

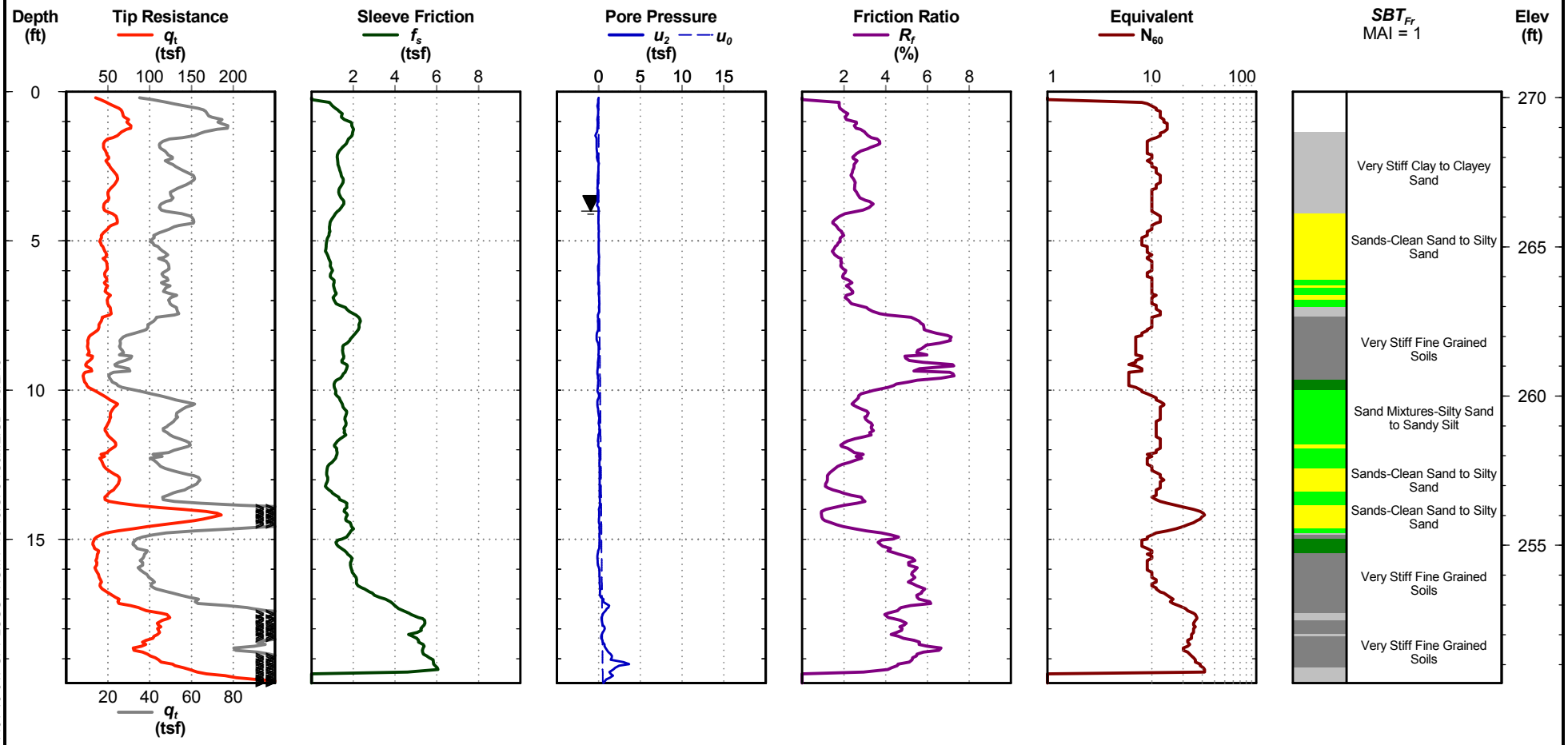
1	**Remarks:**	**Boring W-32, Box 1**

Appendix V – Cone Penetration Sounding Logs

CCR I-20/26/126 Improvement Project
Lexington/Richland
S&ME Project No: 1461-16-047

Sounding ID: CPT-B12

Latitude:	34.03532		
Longitude:	-81.109875		
Elevation:	270.2 ft MSL		
Date:	May. 22, 2018	**Total Depth:**	19.8 ft
Estimated Water Depth:	4 ft	**Termination Criteria:**	Maximum Reaction Force
Rig/Operator:	CPT Truck/D. Watson	**Cone Size:**	1.75



Cone Penetration Test

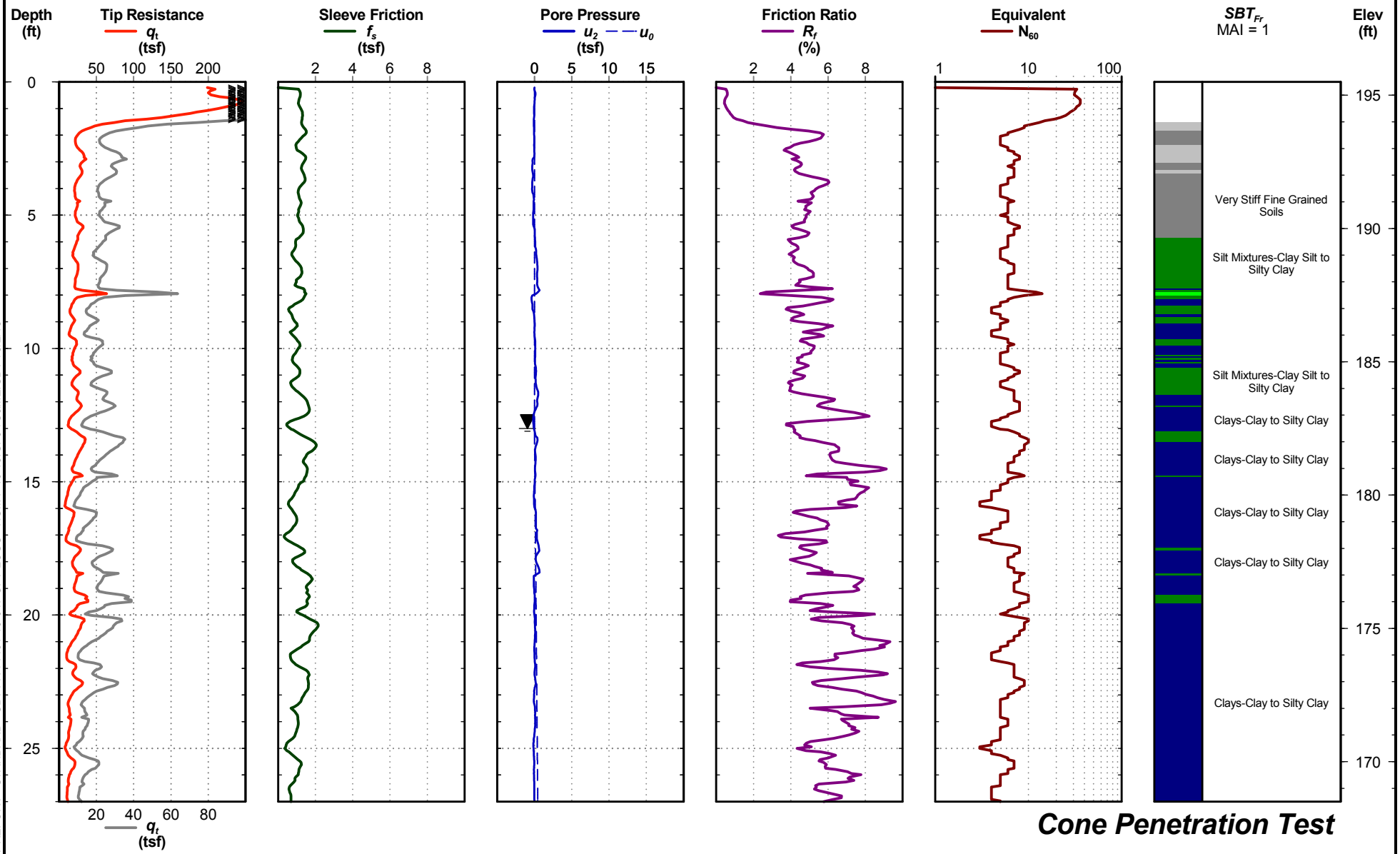
Electronic Filename: B-12(008)_PD.ECP

CPT REPORT - STANDARD - SBT FR \ 1461-16-047 CPT LOGS - HGM 7-16-18.GPJ \ S&ME.GDT \ 8/2/18

CCR I-20/26/126 Improvement Project
Lexington/Richland
S&ME Project No: 1461-16-047

Sounding ID: CPT-B34

Latitude:	34.025558		
Longitude:	-81.102365		
Elevation:	195.5 ft MSL		
Date:	Jun. 5, 2018	**Total Depth:**	39.6 ft
Estimated Water Depth:	13 ft	**Termination Criteria:**	Maximum Reaction Force
Rig/Operator:	CPT Truck/D. Watson	**Cone Size:**	1.75



Cone Penetration Test

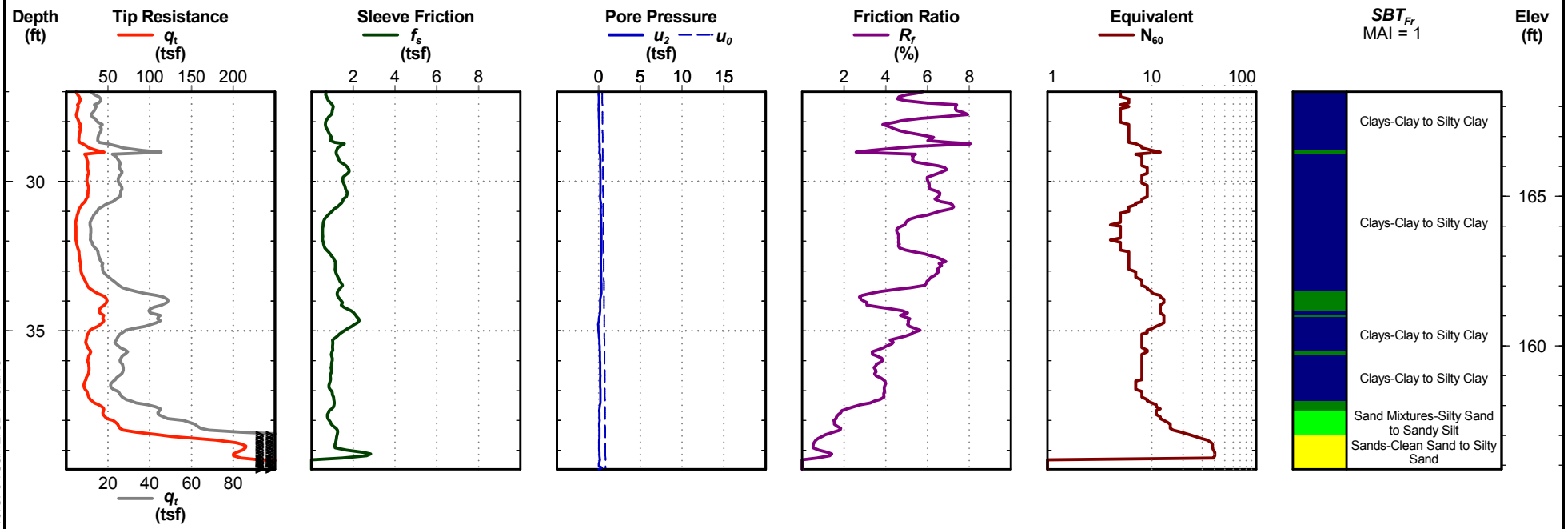
CPT REPORT - STANDARD - SBT FR \ 1461-16-047 CPT LOGS - HGM 7-16-18.GPJ \ S&ME.GDT \ 8/2/18

Electronic Filename: CPT-B34(001)_PD.ECP

CCR I-20/26/126 Improvement Project
Lexington/Richland
S&ME Project No: 1461-16-047

Sounding ID: CPT-B34

Latitude:	34.025558		
Longitude:	-81.102365		
Elevation:	195.5 ft MSL		
Date:	Jun. 5, 2018	**Total Depth:**	39.6 ft
Estimated Water Depth:	13 ft	**Termination Criteria:**	Maximum Reaction Force
Rig/Operator:	CPT Truck/D. Watson	**Cone Size:**	1.75



Cone Penetration Test

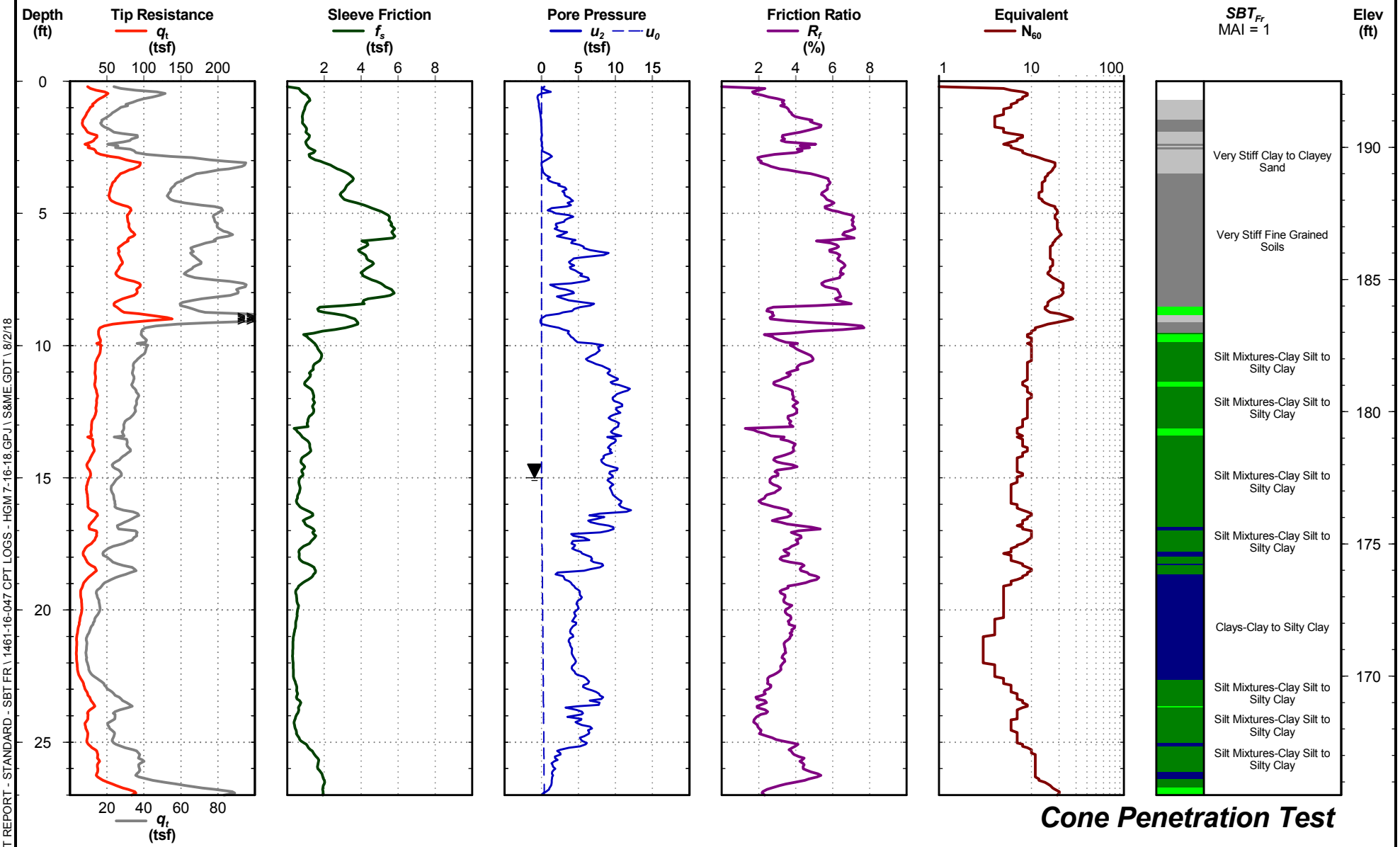
Electronic Filename: CPT-B34(001)_PD.ECP

CPT REPORT - STANDARD - SBT FR \ 1461-16-047 CPT LOGS - HGM 7-16-18.GPJ \ S&ME.GDT \ 8/2/18

CCR I-20/26/126 Improvement Project
Lexington/Richland
S&ME Project No: 1461-16-047

Sounding ID: CPT-B41

Latitude:	34.020917		
Longitude:	-81.094728		
Elevation:	192.5 ft MSL		
Date:	Jun. 4, 2018	**Total Depth:**	37.0 ft
Estimated Water Depth:	15 ft	**Termination Criteria:**	Maximum Reaction Force
Rig/Operator:	CPT Truck/D. Watson	**Cone Size:**	1.75



Cone Penetration Test

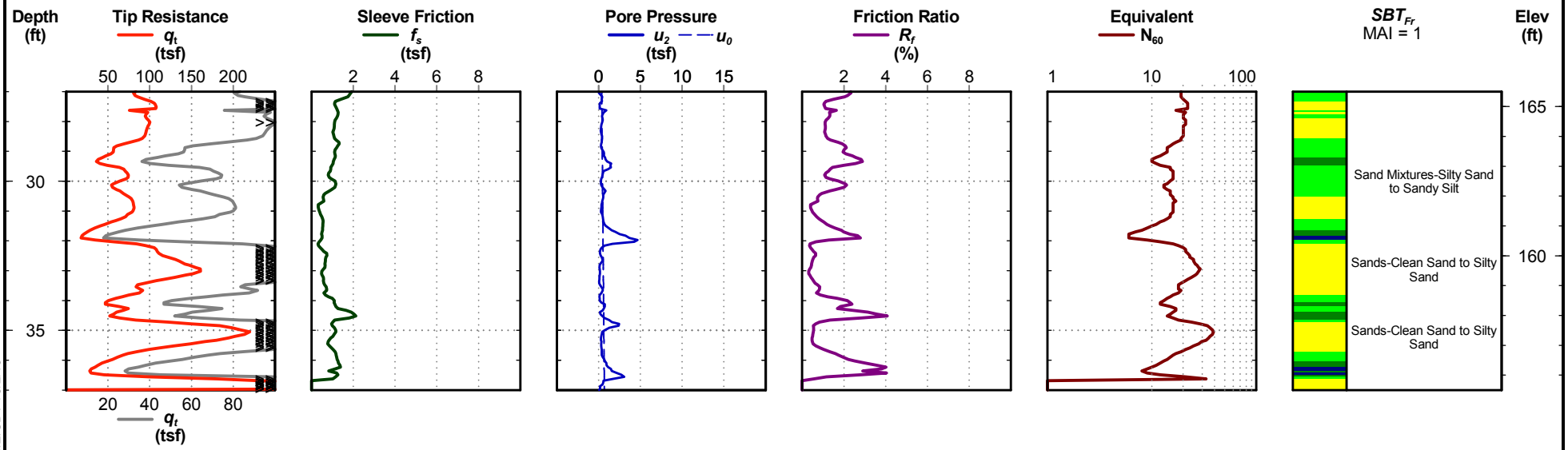
Electronic Filename: CPT-B41(001)_PD.ECP

CPT REPORT - STANDARD - SBT FR \ 1461-16-047 CPT LOGS - HGM 7-16-18.GPJ \ S&ME.GDT \ 8/2/18

CCR I-20/26/126 Improvement Project
Lexington/Richland
S&ME Project No: 1461-16-047

Sounding ID: CPT-B41

Latitude:	34.020917		
Longitude:	-81.094728		
Elevation:	192.5 ft MSL		
Date:	Jun. 4, 2018	**Total Depth:**	37.0 ft
Estimated Water Depth:	15 ft	**Termination Criteria:**	Maximum Reaction Force
Rig/Operator:	CPT Truck/D. Watson	**Cone Size:**	1.75



Cone Penetration Test

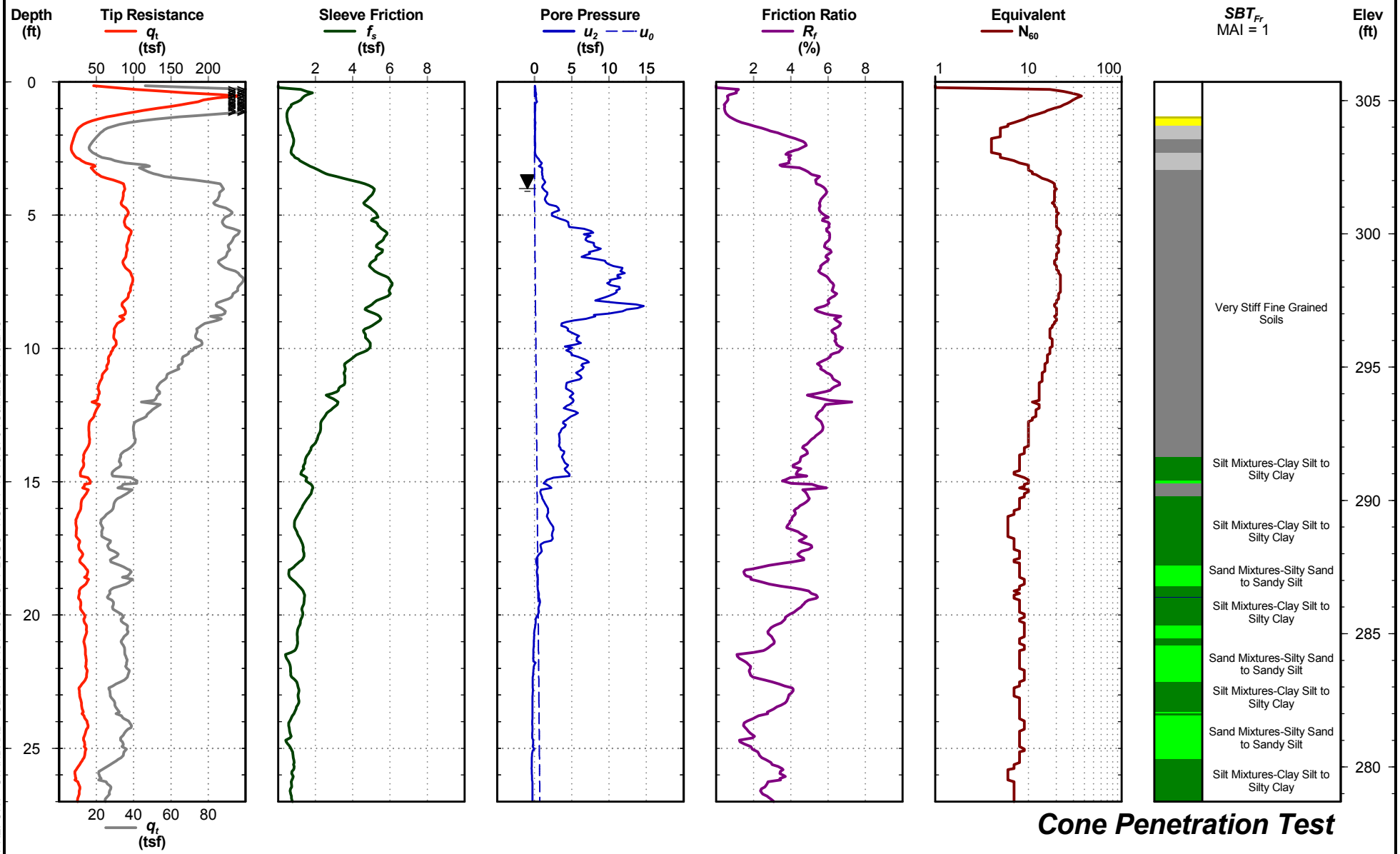
Electronic Filename: CPT-B41(001)_PD.ECP

CPT REPORT - STANDARD - SBT FR \ 1461-16-047 CPT LOGS - HGM 7-16-18.GPJ \ S&ME.GDT \ 8/2/18

CCR I-20/26/126 Improvement Project
Lexington/Richland
S&ME Project No: 1461-16-047

Sounding ID: CPT-B56

Latitude:	34.039592		
Longitude:	-81.094669		
Elevation:	305.7 ft MSL		
Date:	May. 22, 2018	**Total Depth:**	50.1 ft
Estimated Water Depth:	4 ft	**Termination Criteria:**	Target Depth
Rig/Operator:	CPT Truck/D. Watson	**Cone Size:**	1.75



Cone Penetration Test

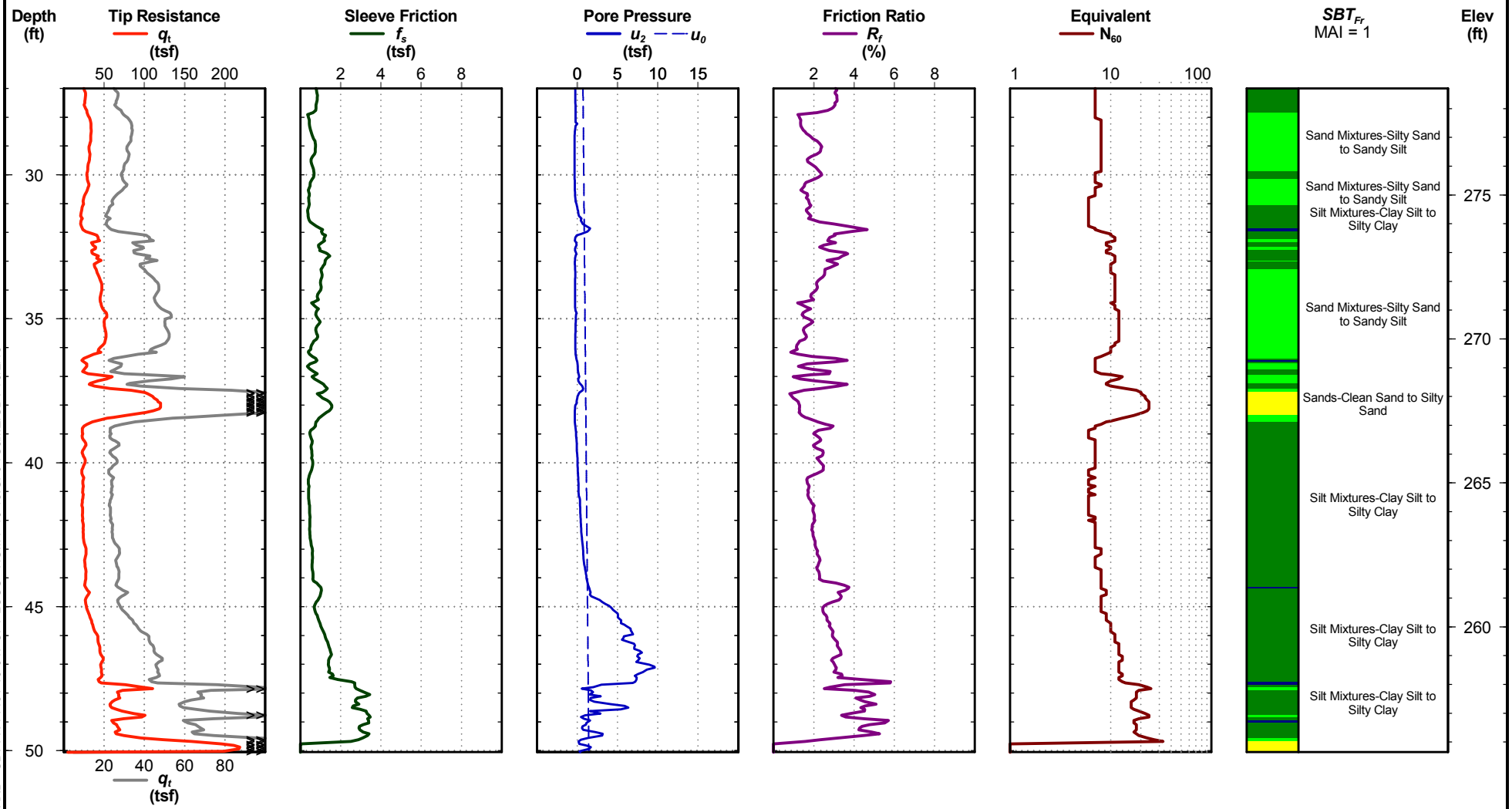
Electronic Filename: B-56(006)_PD.ECP

CPT REPORT - STANDARD - SBT FR \ 1461-16-047 CPT LOGS - HGM 7-16-18.GPJ \ S&ME.GDT \ 8/2/18

CCR I-20/26/126 Improvement Project
Lexington/Richland
S&ME Project No: 1461-16-047

Sounding ID: CPT-B56

Latitude:	34.039592		
Longitude:	-81.094669		
Elevation:	305.7 ft MSL		
Date:	May. 22, 2018	**Total Depth:**	50.1 ft
Estimated Water Depth:	4 ft	**Termination Criteria:**	Target Depth
Rig/Operator:	CPT Truck/D. Watson	**Cone Size:**	1.75



Cone Penetration Test

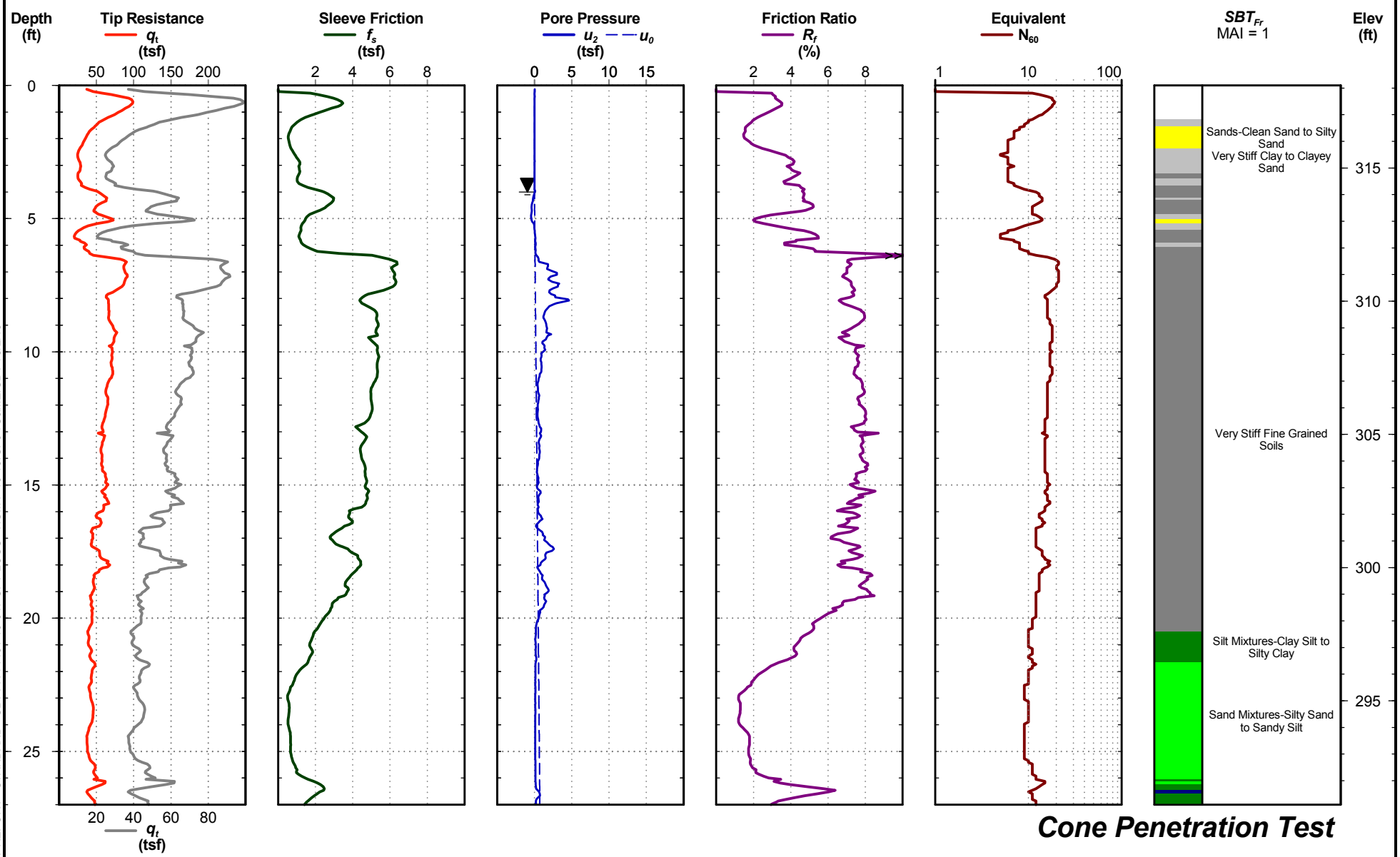
Electronic Filename: B-56(006)_PD.ECP

CPT REPORT - STANDARD - SBT FR \ 1461-16-047 CPT LOGS - HGM 7-16-18.GPJ \ S&ME.GDT \ 8/2/18

CCR I-20/26/126 Improvement Project
Lexington/Richland
S&ME Project No: 1461-16-047

Sounding ID: CPT-B58

Latitude:	34.039821		
Longitude:	-81.093666		
Elevation:	318.1 ft MSL		
Date:	May. 21, 2018	**Total Depth:**	50.0 ft
Estimated Water Depth:	4 ft	**Termination Criteria:**	Target Depth
Rig/Operator:	CPT Truck/D. Watson	**Cone Size:**	1.75



Cone Penetration Test

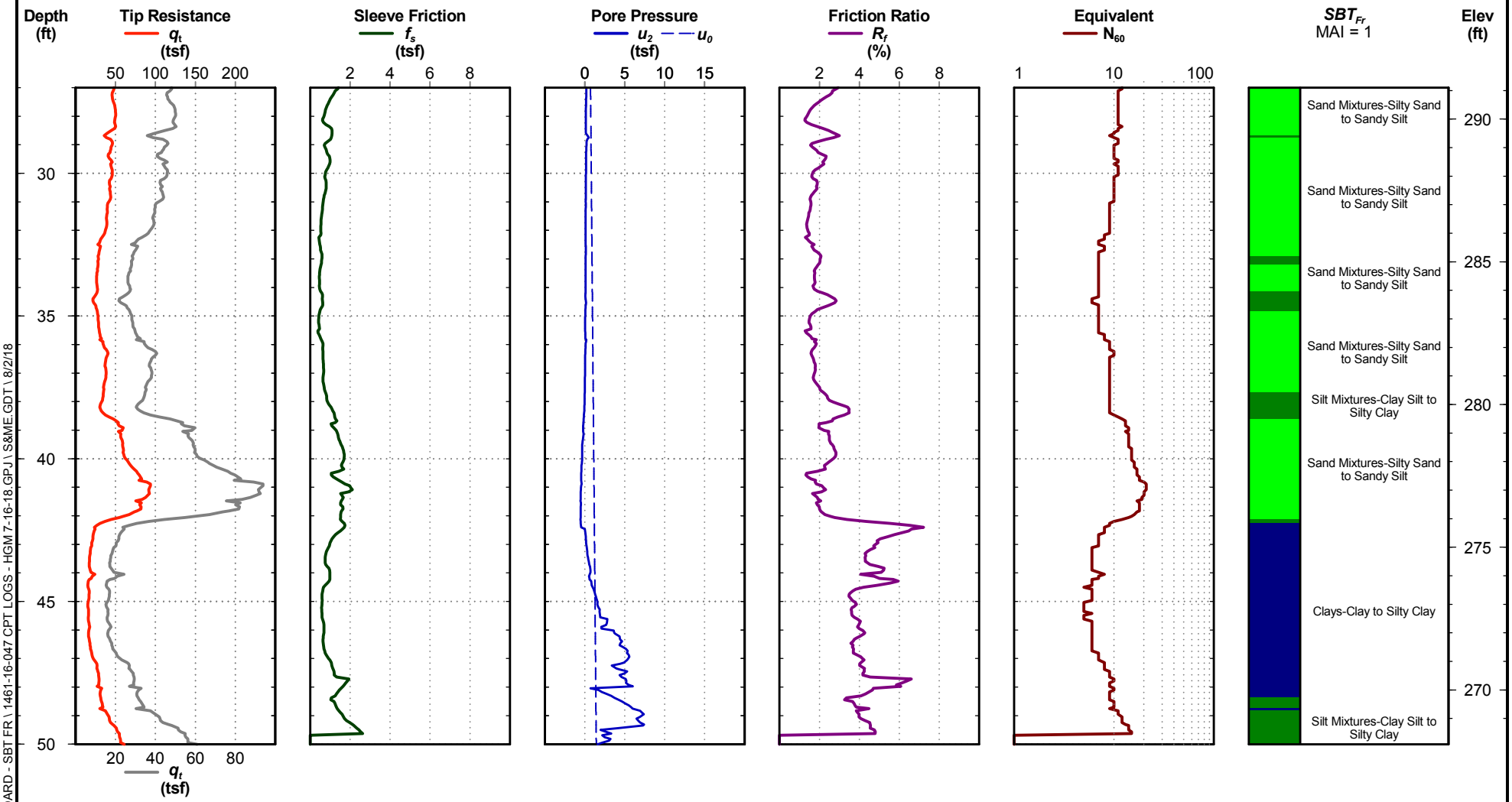
Electronic Filename: B-58A(005)_PD.ECP

CPT REPORT - STANDARD - SBT FR \ 1461-16-047 CPT LOGS - HGM 7-16-18.GPJ \ S&ME.GDT \ 8/2/18

CCR I-20/26/126 Improvement Project
Lexington/Richland
S&ME Project No: 1461-16-047

Sounding ID: CPT-B58

Latitude:	34.039821		
Longitude:	-81.093666		
Elevation:	318.1 ft MSL		
Date:	May. 21, 2018	**Total Depth:**	50.0 ft
Estimated Water Depth:	4 ft	**Termination Criteria:**	Target Depth
Rig/Operator:	CPT Truck/D. Watson	**Cone Size:**	1.75



Cone Penetration Test

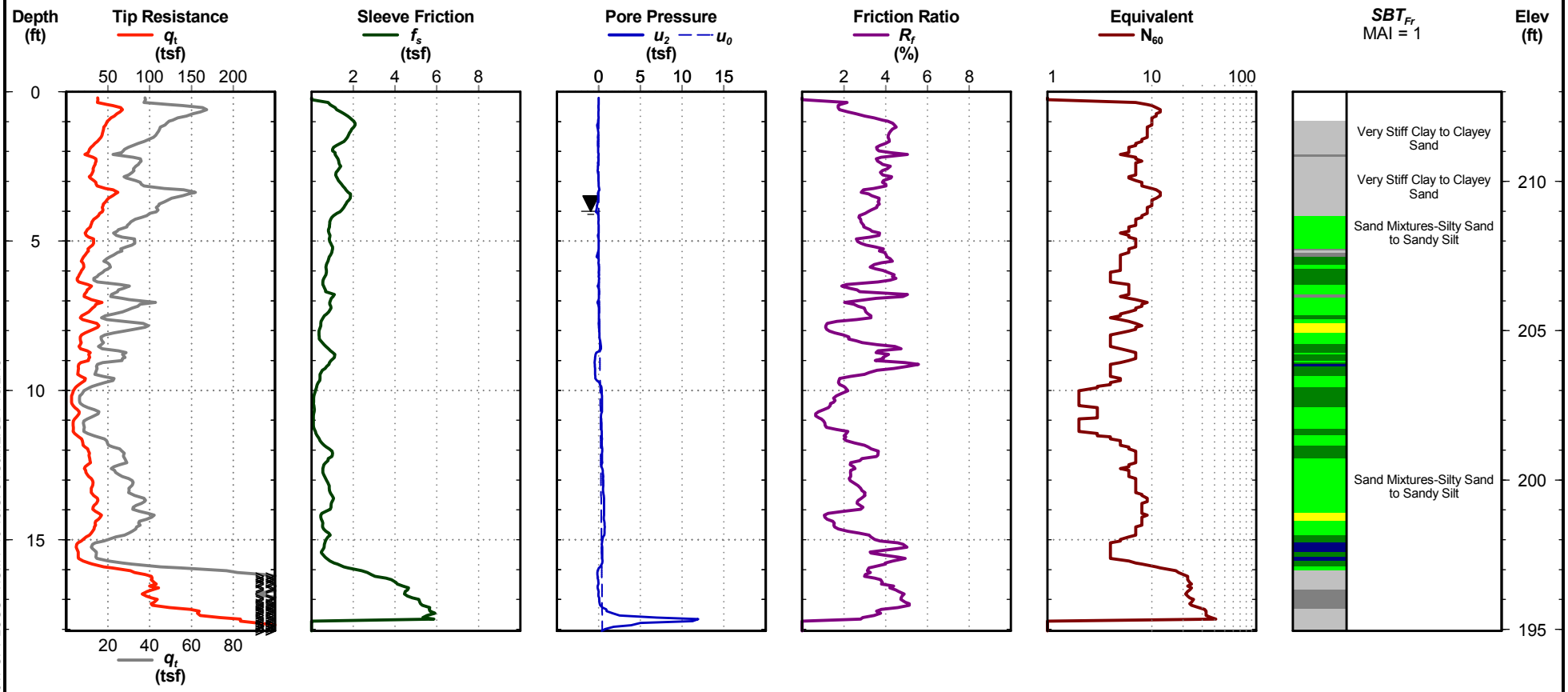
Electronic Filename: B-58A(005)_PD.ECP

CPT REPORT - STANDARD - SBT FR \ 1461-16-047 CPT LOGS - HGM 7-16-18.GPJ \ S&ME.GDT \ 8/2/18

CCR I-20/26/126 Improvement Project
Lexington/Richland
S&ME Project No: 1461-16-047

Sounding ID: CPT-RW17

Latitude:	34.045472		
Longitude:	-81.117945		
Elevation:	213 ft MSL		
Date:	May. 22, 2018	**Total Depth:**	18.1 ft
Estimated Water Depth:	4 ft	**Termination Criteria:**	Target Depth
Rig/Operator:	CPT Truck/D. Watson	**Cone Size:**	1.75



Cone Penetration Test

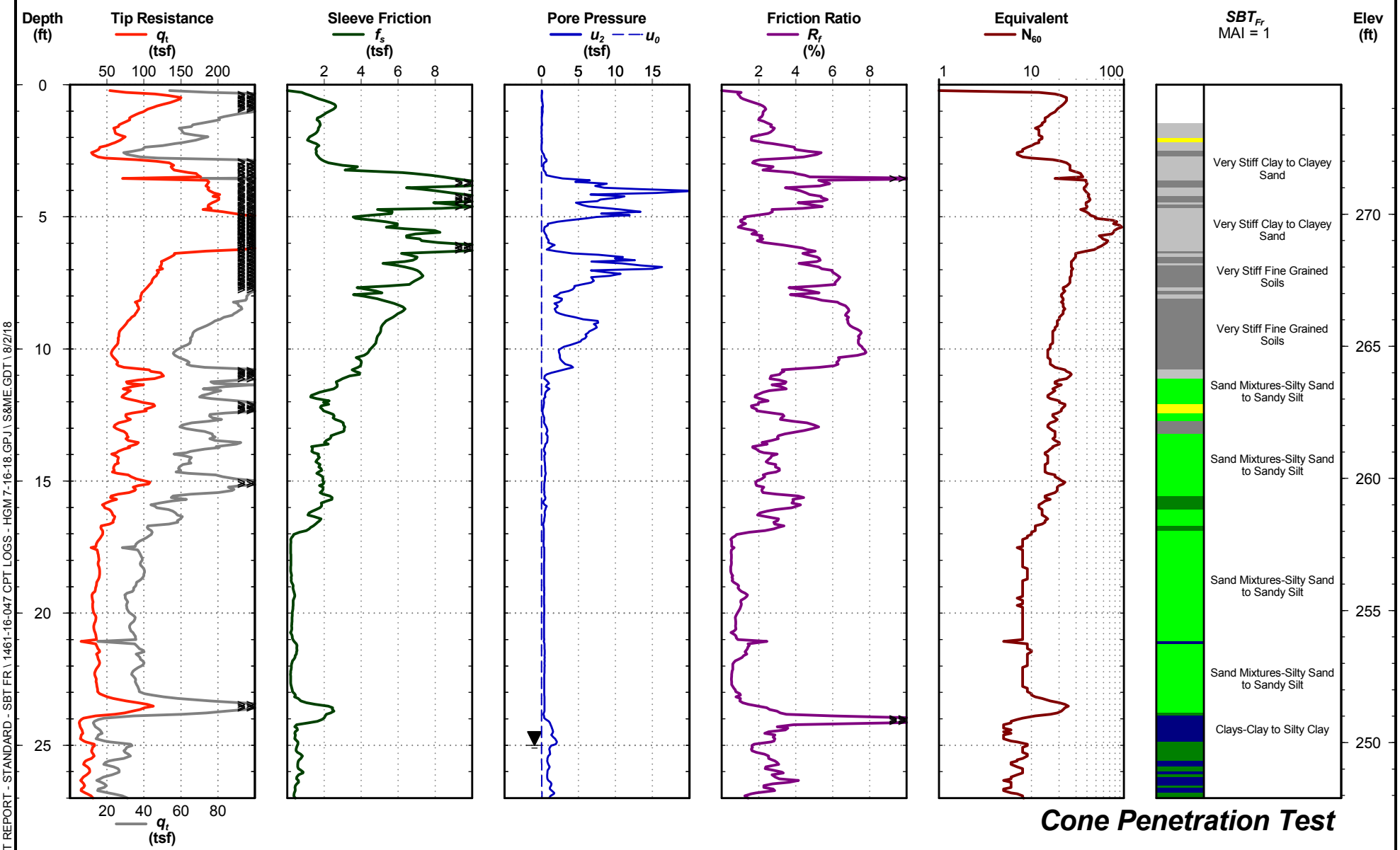
Electronic Filename: RW-17(007)_PD.ECP

CPT REPORT - STANDARD - SBT FR \ 1461-16-047 CPT LOGS - HGM 7-16-18.GPJ \ S&ME.GDT \ 8/2/18

CCR I-20/26/126 Improvement Project
Lexington/Richland
S&ME Project No: 1461-16-047

Sounding ID: CPT-RW24

Latitude:	34.037969		
Longitude:	-81.111446		
Elevation:	274.9 ft MSL		
Date:	Jun. 6, 2018	**Total Depth:**	30.0 ft
Estimated Water Depth:	25 ft	**Termination Criteria:**	Target Depth
Rig/Operator:	CPT Truck/D. Watson	**Cone Size:**	1.75



Cone Penetration Test

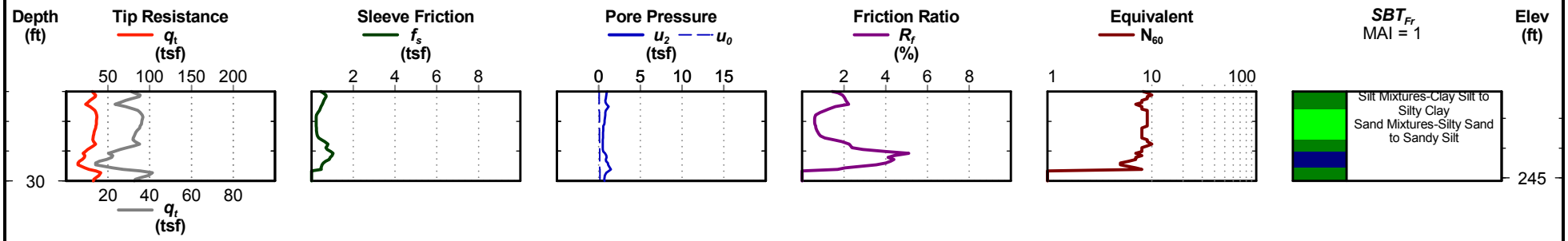
Electronic Filename: CPT-RW24(003)_PD.ECP

CPT REPORT - STANDARD - SBT FR \ 1461-16-047 CPT LOGS - HGM 7-16-18.GPJ \ S&ME.GDT \ 8/2/18

CCR I-20/26/126 Improvement Project
Lexington/Richland
S&ME Project No: 1461-16-047

Sounding ID: CPT-RW24

Latitude:	34.037969		
Longitude:	-81.111446		
Elevation:	274.9 ft MSL		
Date:	Jun. 6, 2018	**Total Depth:**	30.0 ft
Estimated Water Depth:	25 ft	**Termination Criteria:**	Target Depth
Rig/Operator:	CPT Truck/D. Watson	**Cone Size:**	1.75



Cone Penetration Test

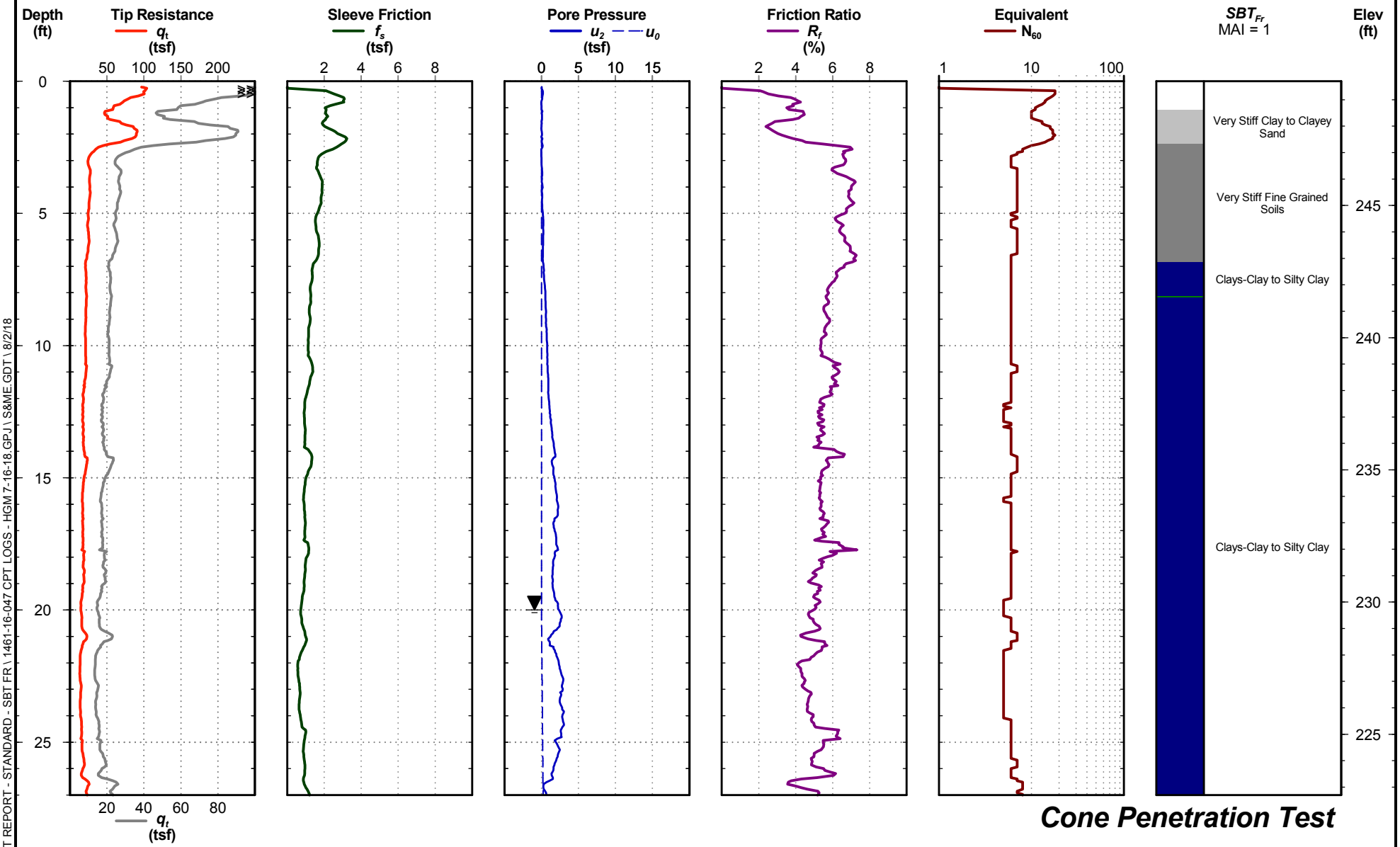
Electronic Filename: CPT-RW24(003)_PD.ECP

CPT REPORT - STANDARD - SBT FR \ 1461-16-047 CPT LOGS - HGM 7-16-18.GPJ \ S&ME.GDT \ 8/2/18

CCR I-20/26/126 Improvement Project
Lexington/Richland
S&ME Project No: 1461-16-047

Sounding ID: CPT-RW32

Latitude:	34.033375		
Longitude:	-81.107367		
Elevation:	249.7 ft MSL		
Date:	Jun. 6, 2018	**Total Depth:**	40.1 ft
Estimated Water Depth:	20 ft	**Termination Criteria:**	Target Depth
Rig/Operator:	CPT Truck/D. Watson	**Cone Size:**	1.75



Cone Penetration Test

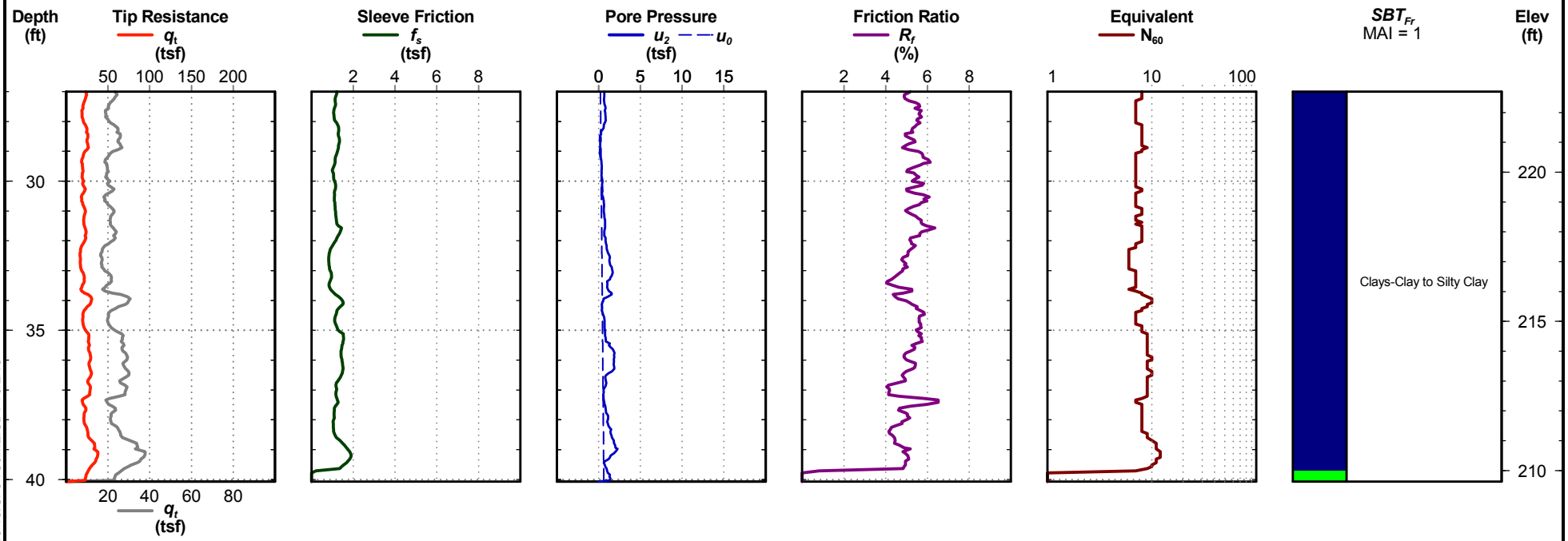
Electronic Filename: CPT-RW32(002)_PD.ECP

CPT REPORT - STANDARD - SBT FR \ 1461-16-047 CPT LOGS - HGM 7-16-18.GPJ \ S&ME.GDT \ 8/2/18

CCR I-20/26/126 Improvement Project
Lexington/Richland
S&ME Project No: 1461-16-047

Sounding ID: CPT-RW32

Latitude:	34.033375		
Longitude:	-81.107367		
Elevation:	249.7 ft MSL		
Date:	Jun. 6, 2018	**Total Depth:**	40.1 ft
Estimated Water Depth:	20 ft	**Termination Criteria:**	Target Depth
Rig/Operator:	CPT Truck/D. Watson	**Cone Size:**	1.75



Cone Penetration Test

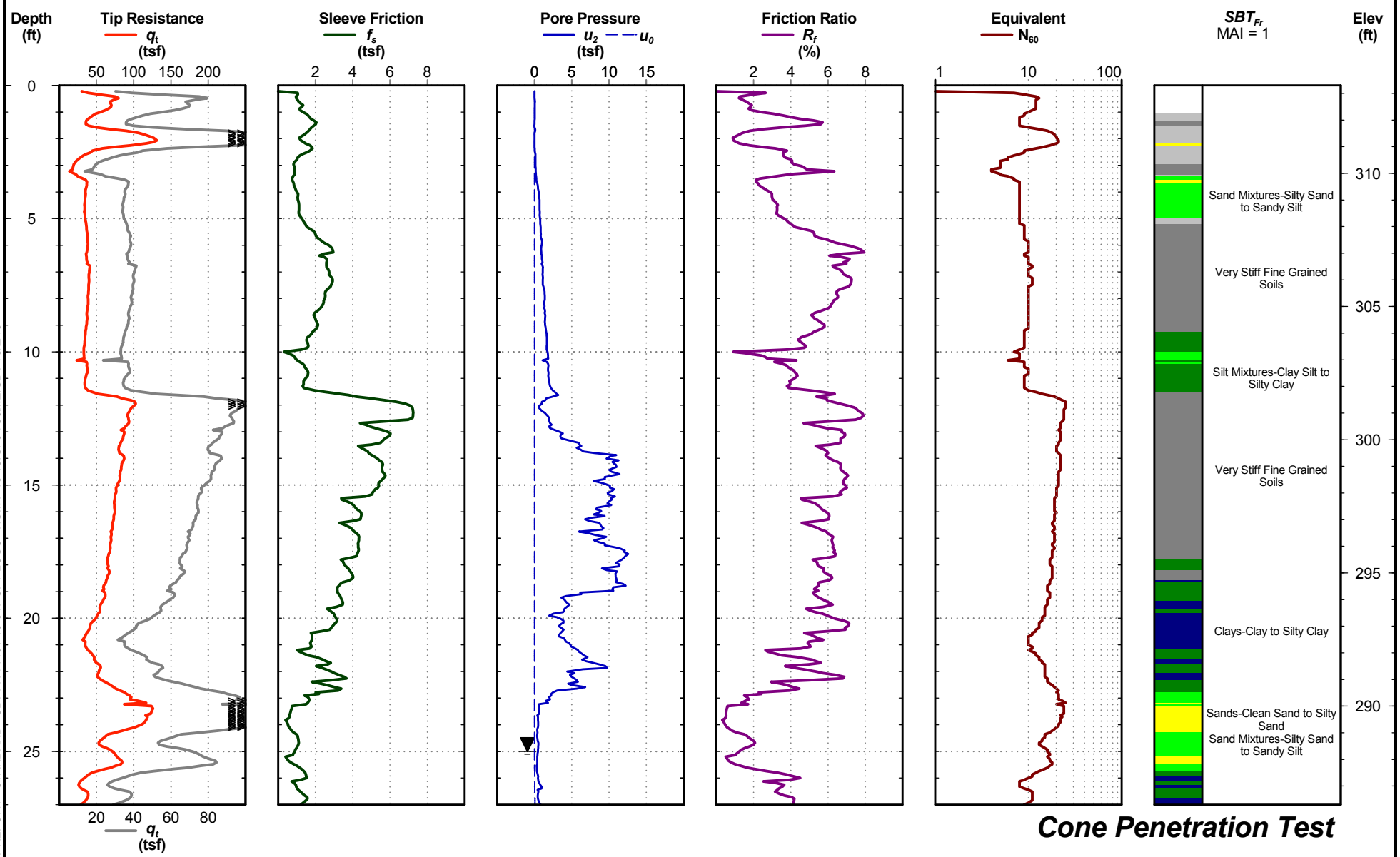
Electronic Filename: CPT-RW32(002)_PD.ECP

CPT REPORT - STANDARD - SBT FR \ 1461-16-047 CPT LOGS - HGM 7-16-18.GPJ \ S&ME.GDT \ 8/2/18

CCR I-20/26/126 Improvement Project
Lexington/Richland
S&ME Project No: 1461-16-047

Sounding ID: CPT-RW42

Latitude:	34.038721		
Longitude:	-81.098185		
Elevation:	313.3 ft MSL		
Date:	Jun. 5, 2018	**Total Depth:**	49.9 ft
Estimated Water Depth:	25 ft	**Termination Criteria:**	Target Depth
Rig/Operator:	CPT Truck/D. Watson	**Cone Size:**	1.75



Cone Penetration Test

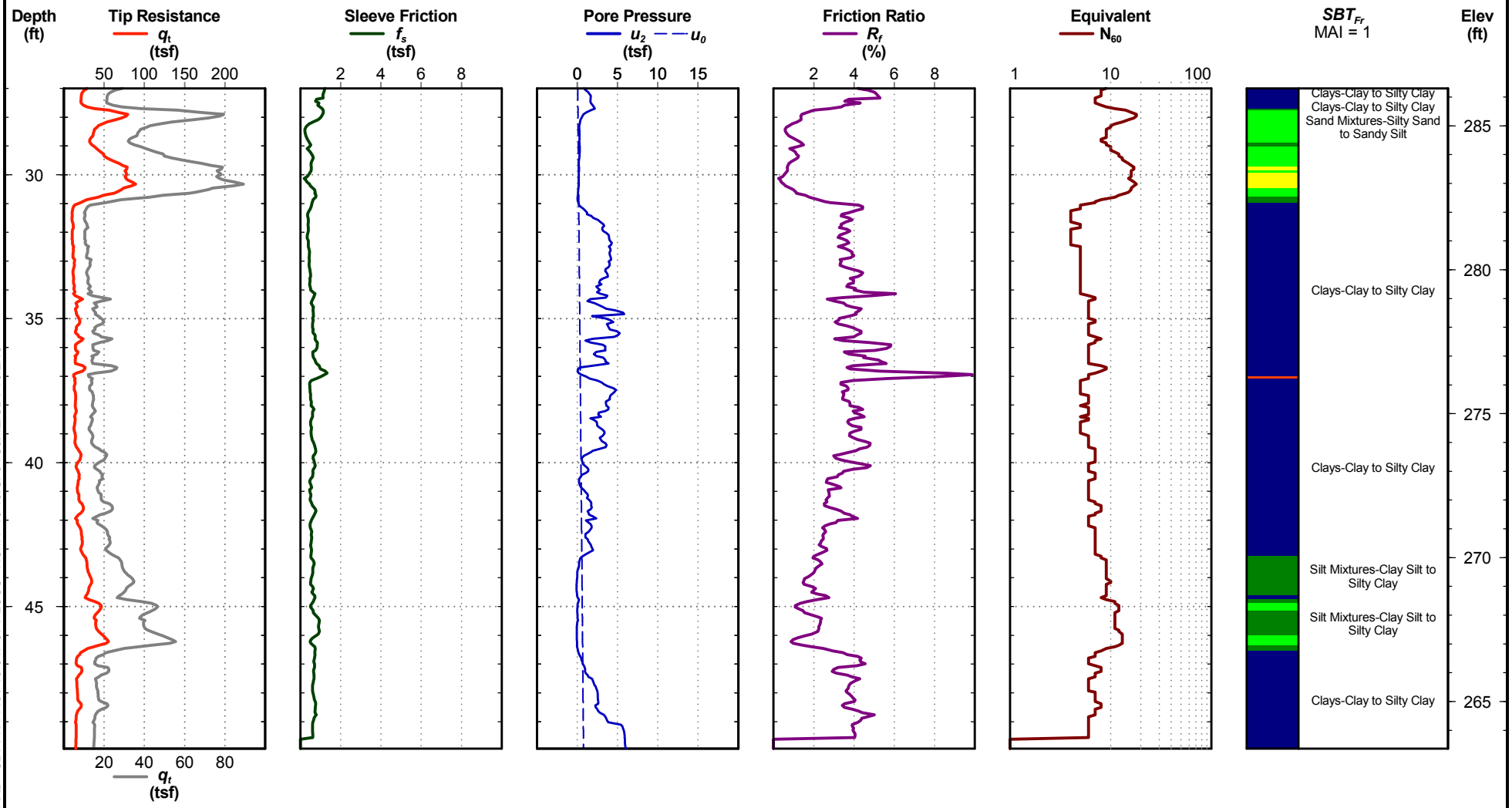
Electronic Filename: CPT-RW42(002)_PD.ECP

CPT REPORT - STANDARD - SBT FR \ 1461-16-047 CPT LOGS - HGM 7-16-18.GPJ \ S&ME.GDT \ 8/2/18

CCR I-20/26/126 Improvement Project
Lexington/Richland
S&ME Project No: 1461-16-047

Sounding ID: CPT-RW42

Latitude:	34.038721		
Longitude:	-81.098185		
Elevation:	313.3 ft MSL		
Date:	Jun. 5, 2018	**Total Depth:**	49.9 ft
Estimated Water Depth:	25 ft	**Termination Criteria:**	Target Depth
Rig/Operator:	CPT Truck/D. Watson	**Cone Size:**	1.75



Cone Penetration Test

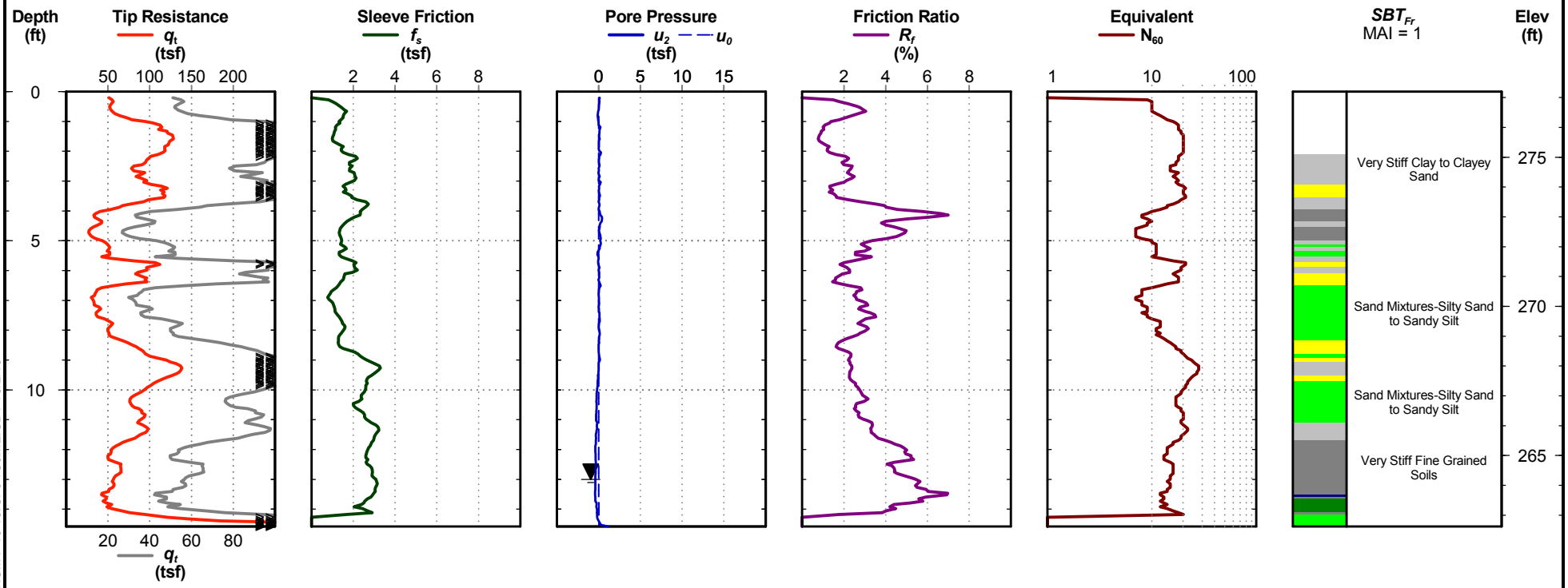
Electronic Filename: CPT-RW42(002)_PD.ECP

CPT REPORT - STANDARD - SBT FR \ 1461-16-047 CPT LOGS - HGM 7-16-18.GPJ \ S&ME.GDT \ 8/2/18

CCR I-20/26/126 Improvement Project
Lexington/Richland
S&ME Project No: 1461-16-047

Sounding ID: CPT-RW6

Latitude:	34.083726		
Longitude:	-81.158735		
Elevation:	277.2 ft MSL		
Date:	Jun. 6, 2018	**Total Depth:**	14.6 ft
Estimated Water Depth:	13 ft	**Termination Criteria:**	Maximum Reaction Force
Rig/Operator:	CPT Truck/D. Watson	**Cone Size:**	1.75



Cone Penetration Test

Electronic Filename: CPT-RW6(001)_PD.ECP

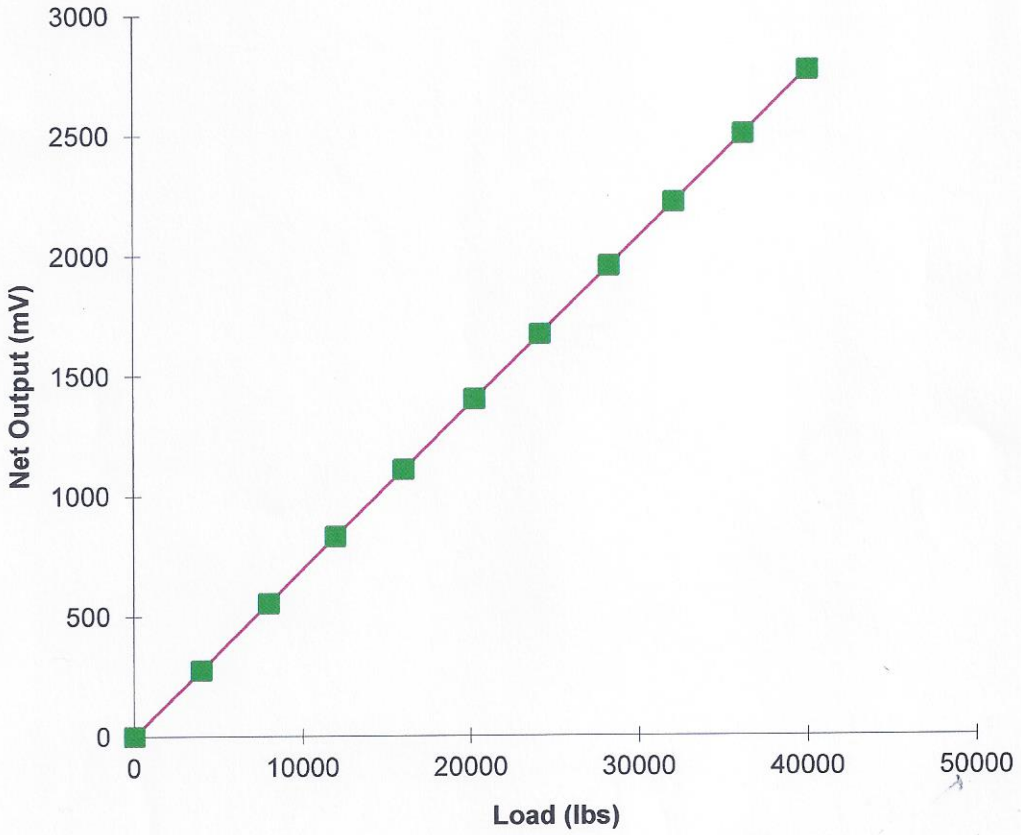
CPT REPORT - STANDARD - SBT FR \ 1461-16-047 CPT LOGS - HGM 7-16-18.GPJ \ S&ME.GDT \ 8/2/18

250 Beanville Road
Randolph, Vermont 05060
phone: (800)639-6315 fax: (802)728-9871

Cone Penetrometer Calibration
Digital Cone Tip

Cone Serial No.:	4444.177
Rated Range:	50000 lbs
Load Reference:	Ref LC-SN: 390752A
Ref. DVM:	MY47029221
Ref. Excitation:	9.887 V_{dc}

Date: 11-Apr-18
Calibrated By: L Smith
Approved By: T. Haas



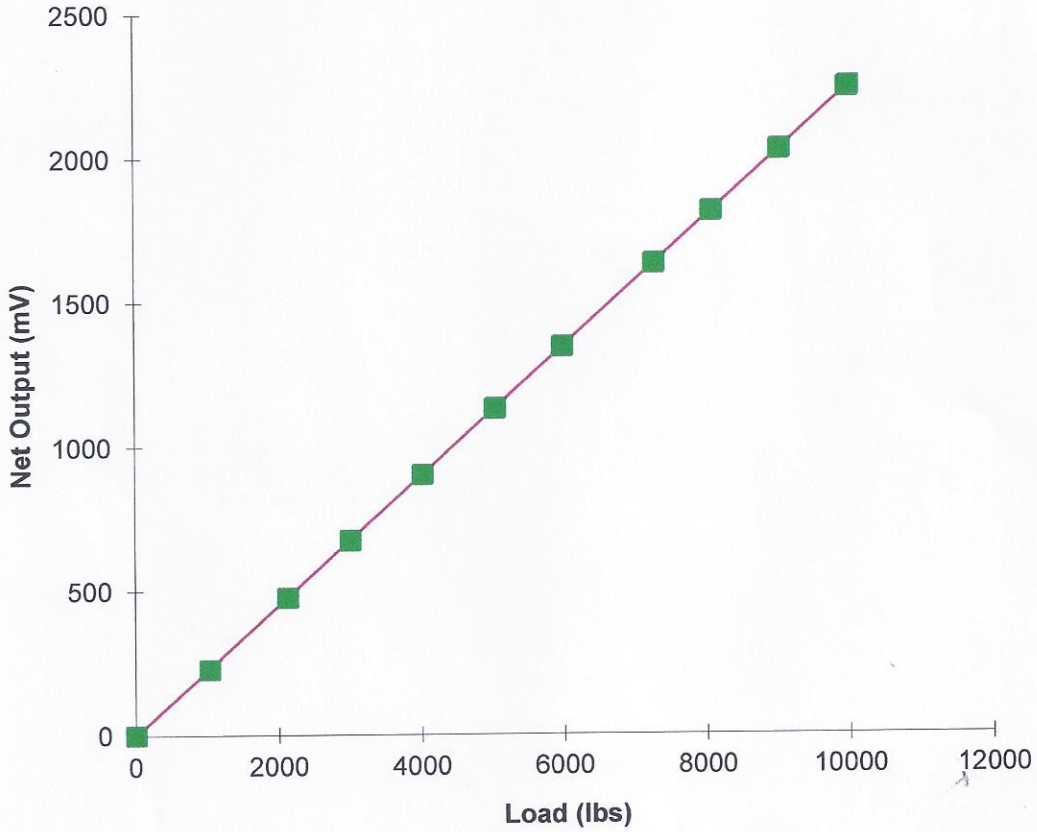
Cal Factor:	**69.097E-3 mV/lbs**	*52.000E-3 nominal*
R^2:	1.00000	
Nonlinearity:	0.13	
Zero Load Output:	259.938E-3 mV	

250 Beanville Road
Randolph, Vermont 05060
phone: (800)639-6315 fax: (802)728-9871

Cone Penetrometer Calibration
Digital Cone Sleeve

Cone Serial No.:	4444.177
Rated Range:	10000 lbs
Load Reference:	Ref LC-SN: 390752A
Ref. DVM:	MY47029221
Ref. Excitation:	9.888 V_{dc}

Date: 11-Apr-18
Calibrated By: L Smith
Approved By:



Cal Factor:	**224.791E-3 mV/lbs**	*212.000E-3 nominal*
R^2:	1.00000	
Nonlinearity:	0.10	
Zero Load Output:	347.762E-3 mV	

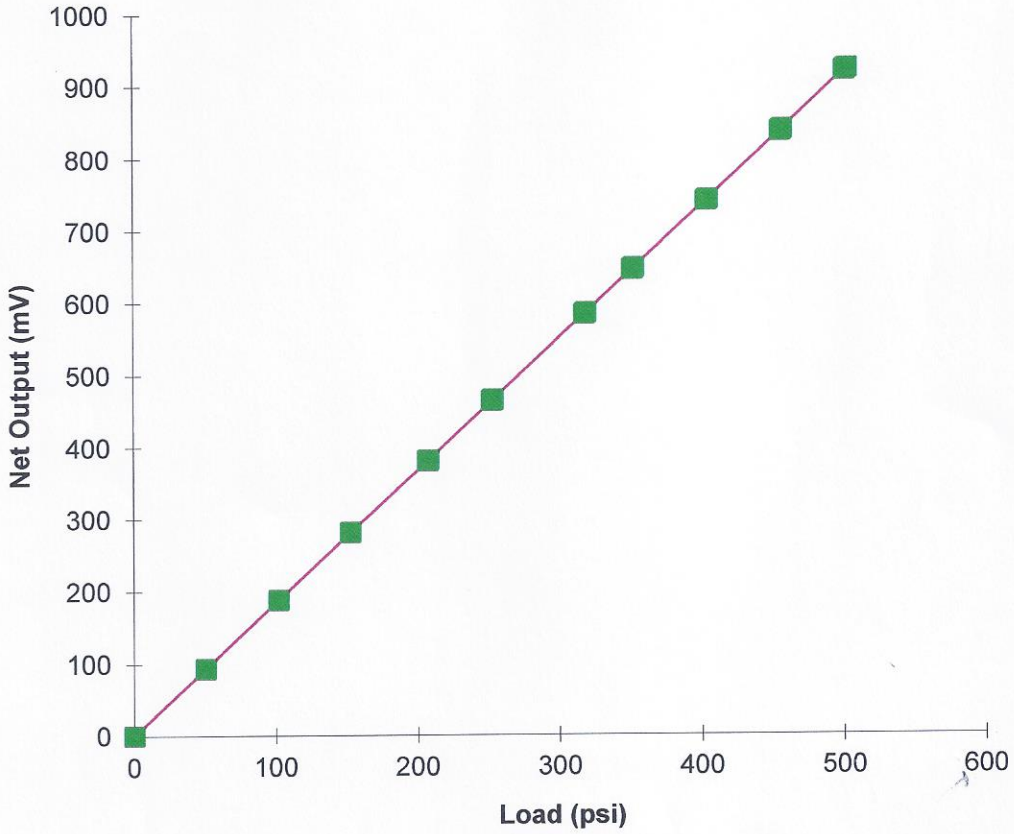
produced with Cone_Cal v 2003.02.04

250 Beanville Road
Randolph, Vermont 05060
phone: (800)639-6315 fax: (802)728-9871

Cone Penetrometer Calibration
Digital Cone Pore Pressure

Cone Serial No.: 4444.177
Rated Range: 1000 psi
Load Reference: Ref PT-13131-01G34P
Ref. DVM: MY47029221
Ref. Excitation: 5.034 V_{dc}

Date: 11-Apr-18
Calibrated By: L Smith
Approved By: J. Haas



Cal Factor: **1.836E+0 mV/psi** *2.500E+0 nominal*
R^2: 1.00000
Nonlinearity: 0.10
Zero Load Output: 198.302E-3 mV

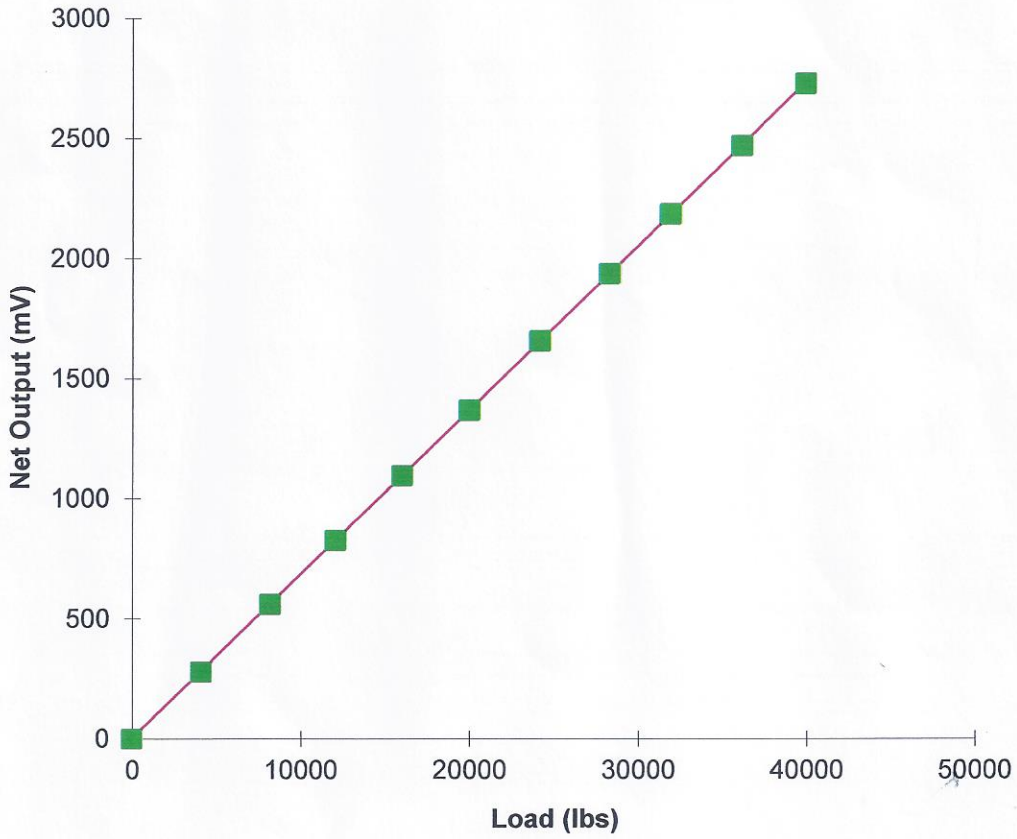
produced with Cone_Cal v 2003.02.04

250 Beanville Road
Randolph, Vermont 05060
phone: (800)639-6315 fax: (802)728-9871

Cone Penetrometer Calibration
Digital Cone Tip

Cone Serial No.:	4433.102
Rated Range:	50000 lbs
Load Reference:	Ref LC-SN: 390752A
Ref. DVM:	MY47029221
Ref. Excitation:	9.884 V_{dc}

Date: 7-Jul-17
Calibrated By: L Smith
Approved By: J. Haas



Cal Factor:	**68.217E-3 mV/lbs**	*65.000E-3 nominal*
R^2:	1.00000	
Nonlinearity:	0.14	
Zero Load Output:	258.769E-3 mV	

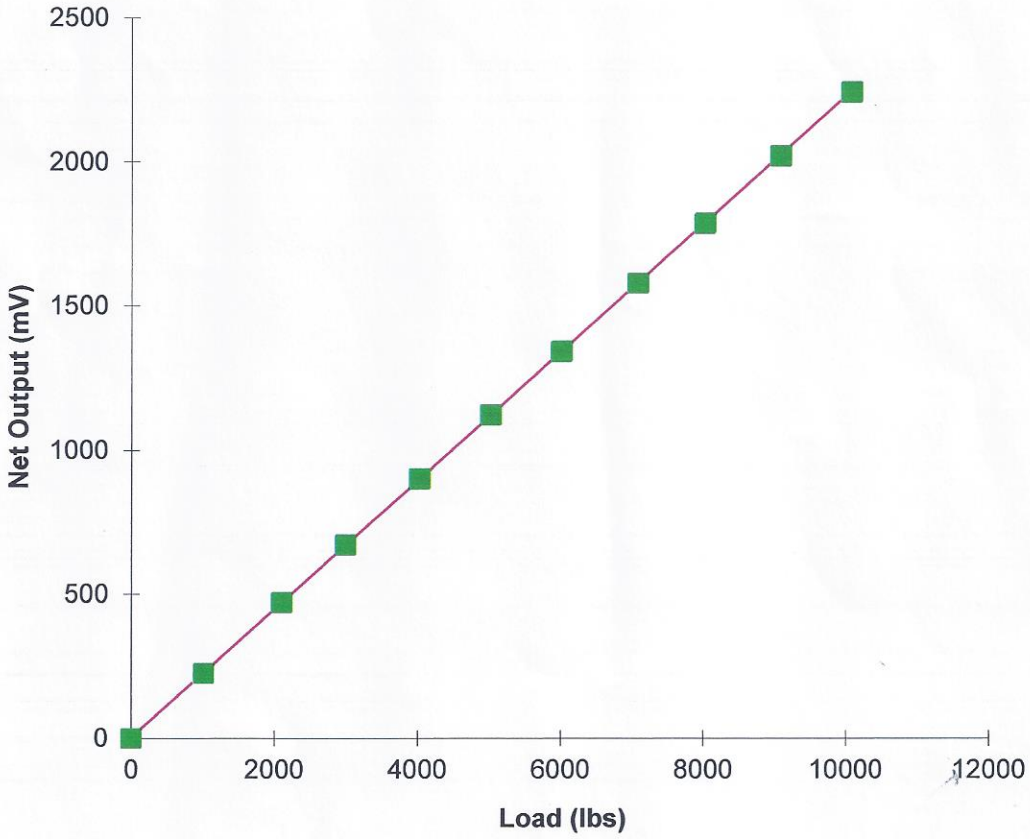
produced with Cone_Cal v 2003.02.04

250 Beanville Road
Randolph, Vermont 05060
phone: (800)639-6315 fax: (802)728-9871

Cone Penetrometer Calibration
Digital Cone Sleeve

Cone Serial No.:	4433.102
Rated Range:	10000 lbs
Load Reference:	Ref LC-SN: 390752A
Ref. DVM:	MY47029221
Ref. Excitation:	9.884 V_{dc}

Date: 7-Jul-17
Calibrated By: L Smith
Approved By: J. Haas



Cal Factor:	**222.315E-3 mV/lbs**	*212.000E-3 nominal*
R^2:	1.00000	
Nonlinearity:	0.16	
Zero Load Output:	288.896E-3 mV	

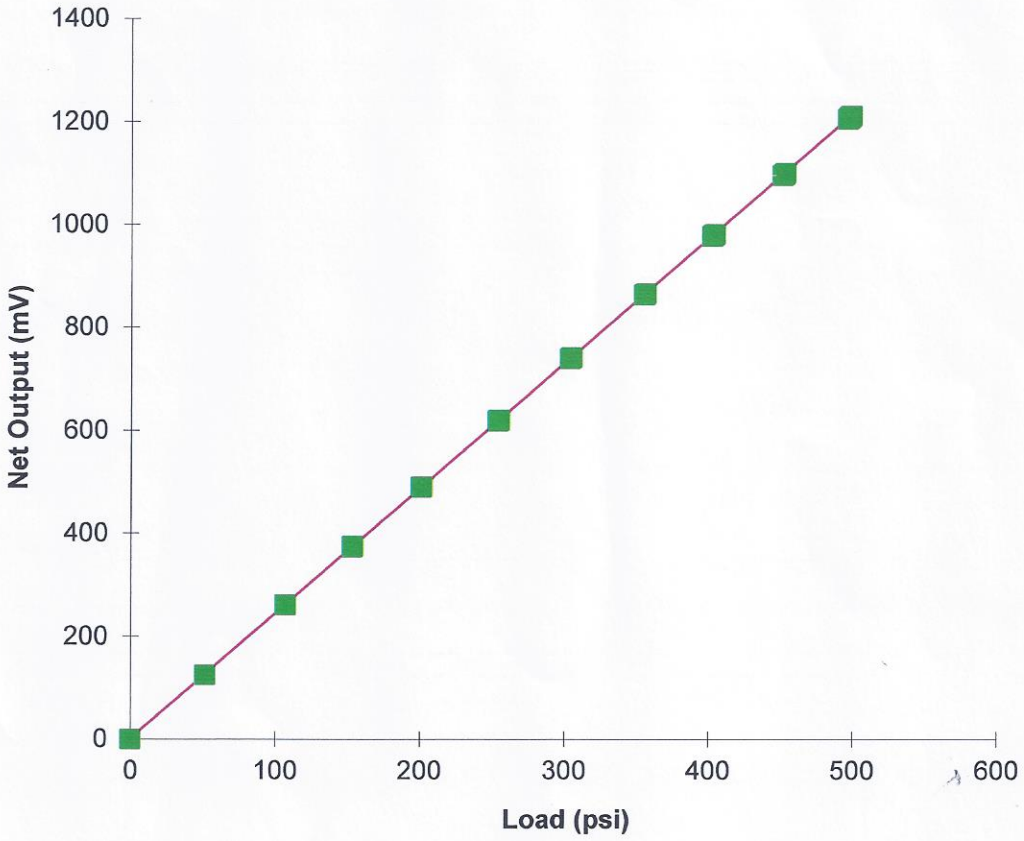
produced with Cone_Cal v 2003.02.04

250 Beanville Road
Randolph, Vermont 05060
phone: (800)639-6315 fax: (802)728-9871

Cone Penetrometer Calibration
Digital Cone Pore Pressure

Cone Serial No.:	4433.102
Rated Range:	1000 psi
Load Reference:	Ref PT-16244-01PDKV
Ref. DVM:	MY47029221
Ref. Excitation:	5.034 V_{dc}

Date: 7-Jul-17
Calibrated By: L Smith
Approved By: J. Haas



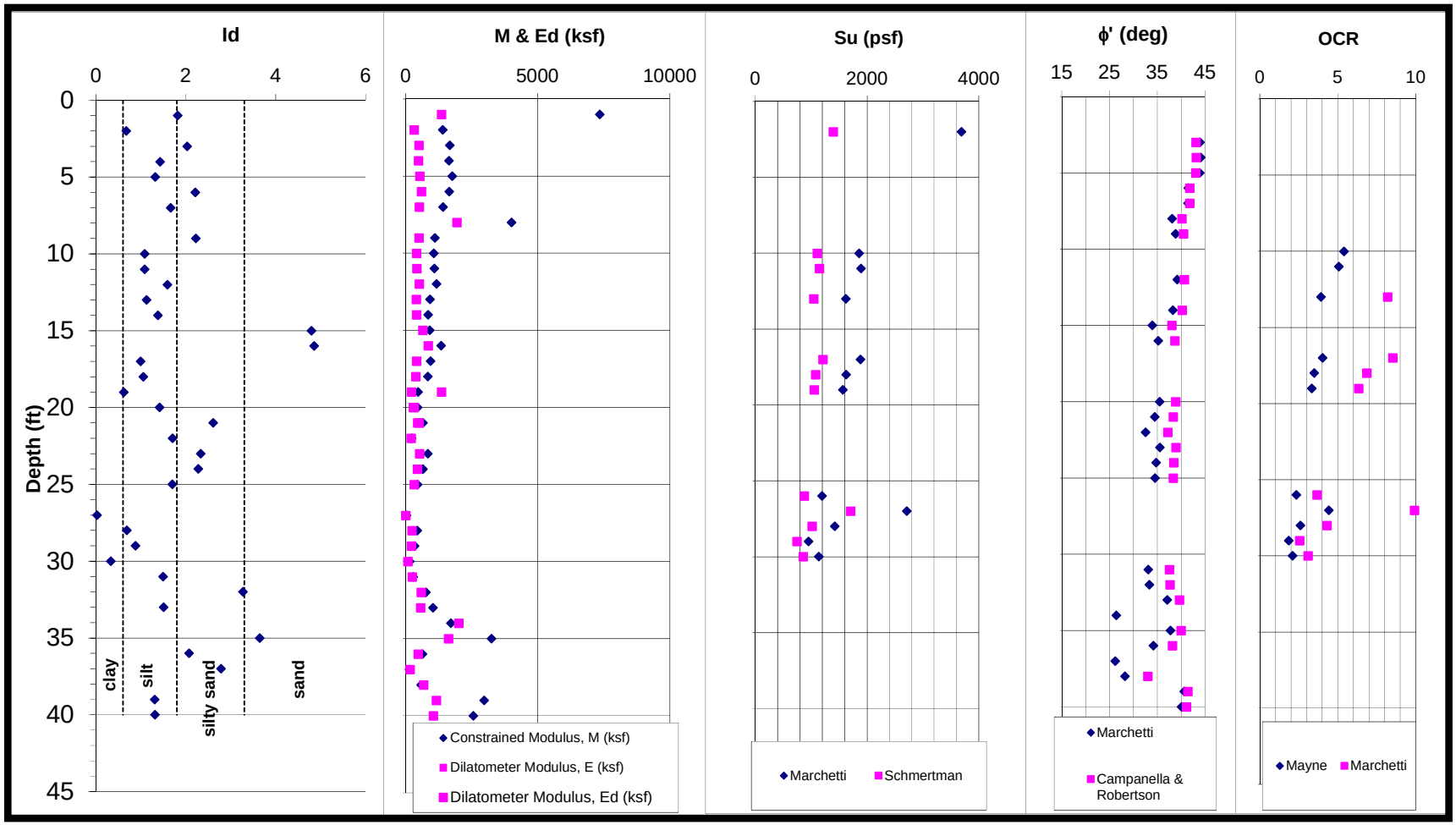
Cal Factor:	**2.427E+0 mV/psi**	*12.000E+0 nominal*
R^2:	1.00000	
Nonlinearity:	0.13	
Zero Load Output:	186.201E-3 mV	

produced with Cone_Cal v 2003.02.04

Appendix VI – Dilatometer Sounding Data

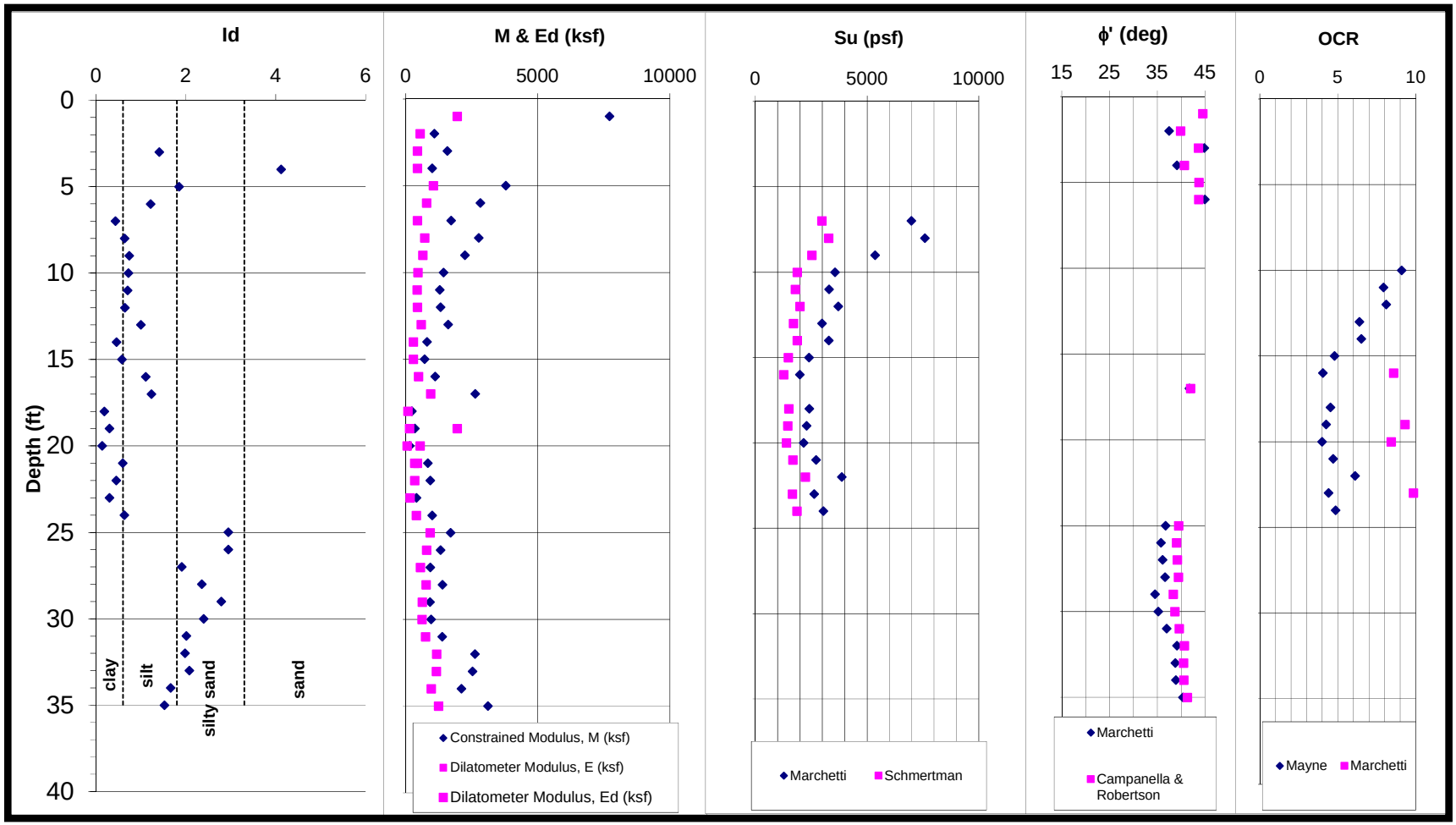
DILATOMETER TEST RESULTS

Test ID: DMT-B34
Site: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Location: Lexington and Richland Counties, South Carolina
Project No.: 1461-16-047



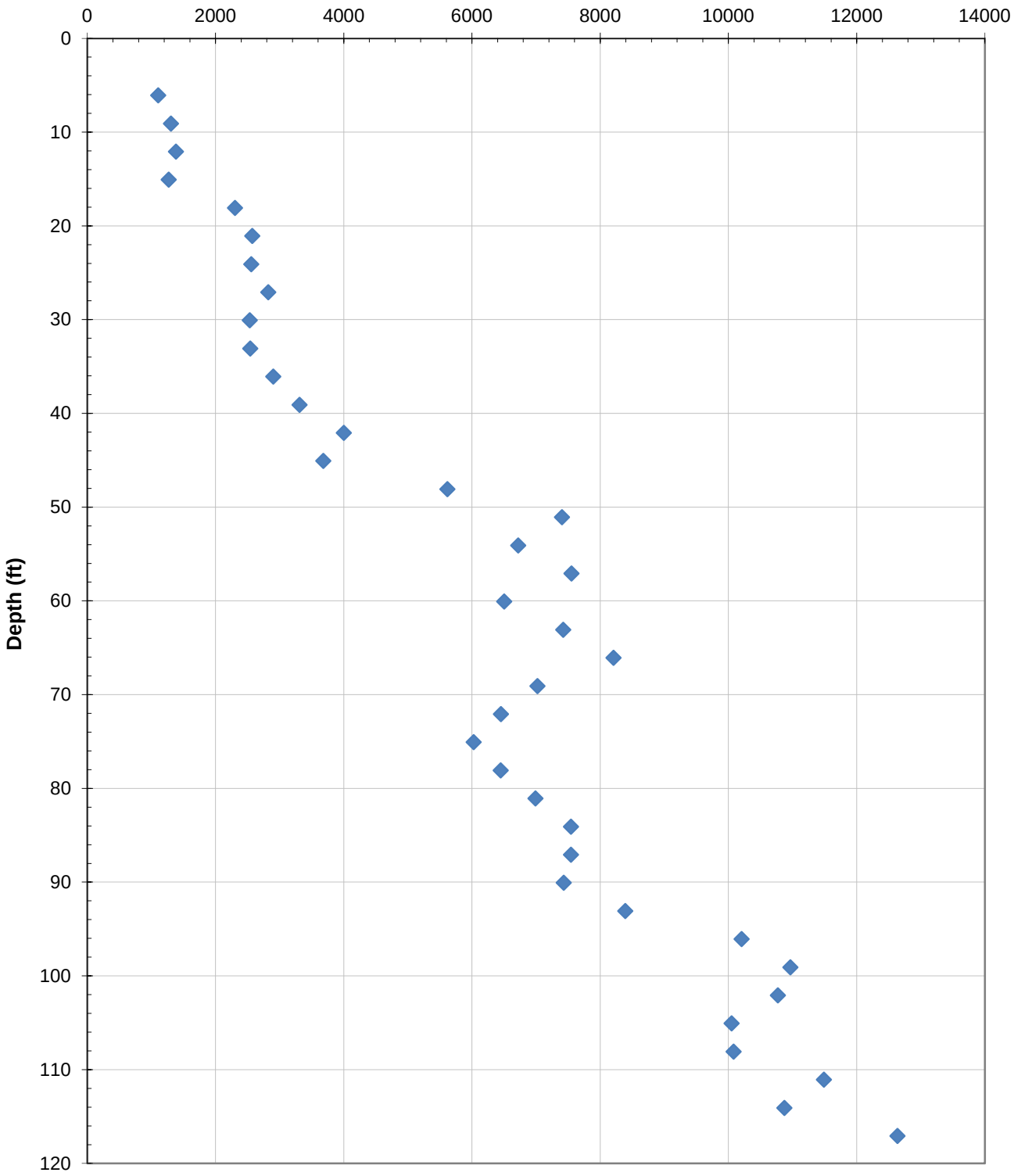
DILATOMETER TEST RESULTS

Test ID: DMT-B41
Site: Carolina Crossroads I-20/I-26/I-126 Improvement Project
Location: Lexington and Richland Counties, South Carolina
Project No.: 1461-16-047



Appendix VII – Downhole Seismic Data

Shear Wave Velocity Profile DH-4
I-20/26/126 Improvement Project
Lexington and Richland Counties, South Carolina
1461-16-047



Shear Wave Velocity Calculations

Carolina Crossroads I-20/26/126 Improvement Project

Lexington and Richland Counties, South Carolina

Sounding ID: **DH-4**

Project Number: **1461-16-047**

Geophone Offset: 0.00 Feet

Casing Stickup: 1.42 Feet

Source Offset: 6.00 Feet

Date: 17-Jan-17

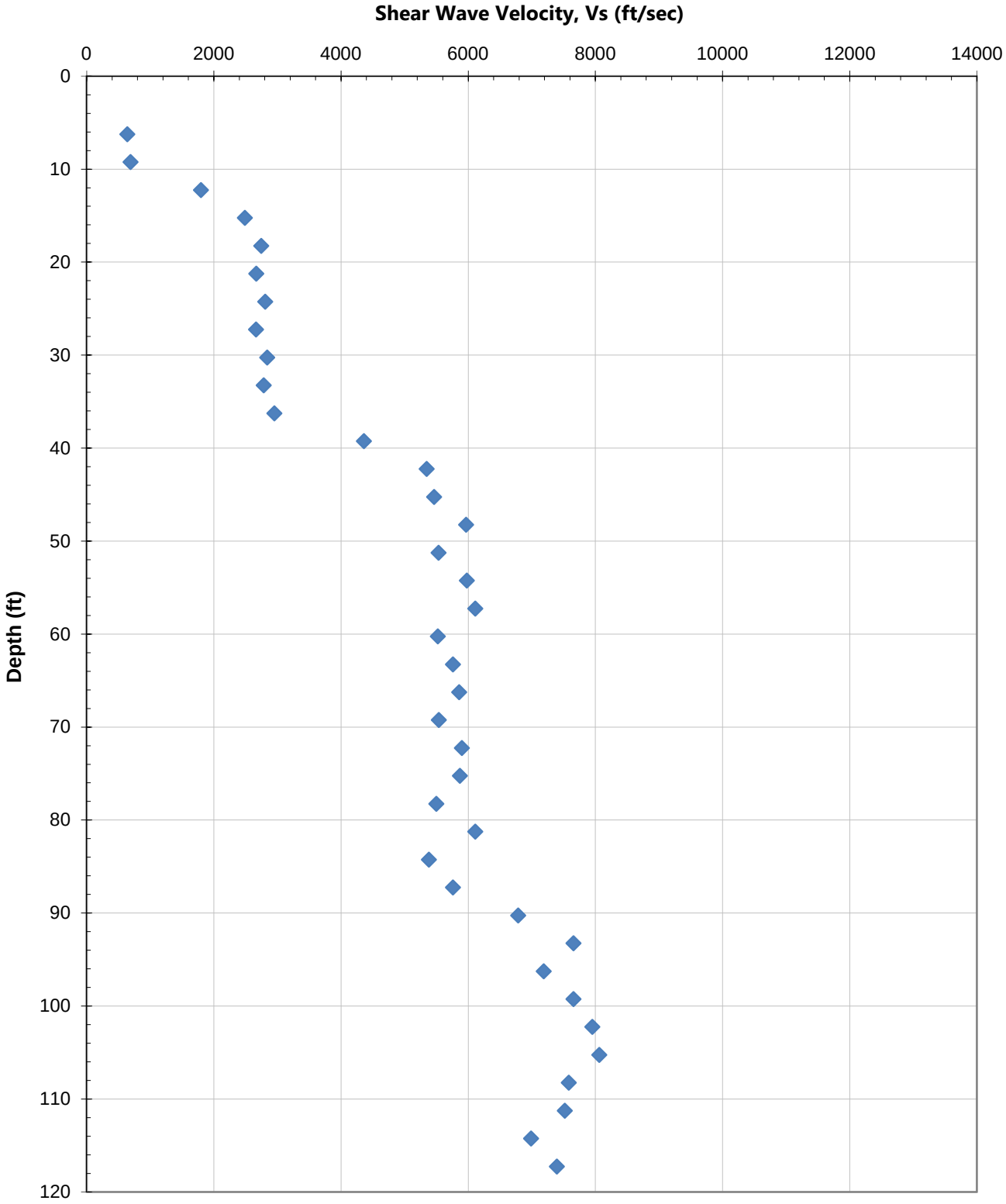
Rig: n/a

Test Depth (feet)	Geophone Depth (feet)	Waveform Ray Path (feet)	Incremental Distance (feet)	S-WAVE Characteristic Arrival Time (seconds)	S-WAVE Incremental Time Interval (seconds)	S-WAVE Interval Velocity (ft/s)	Interval Depth (feet)	d_i/v_{si}	Poissons
4.58	4.58	7.55	7.55	0.0075					
7.58	7.58	9.67	2.12	0.0094	0.0019	1102.7	6.08	0.00551	0.34
10.58	10.58	12.16	2.50	0.0113	0.0019	1302.6	9.08	0.00230	0.41
13.58	13.58	14.85	2.68	0.0133	0.0019	1380.2	12.08	0.00217	0.45
16.58	16.58	17.63	2.79	0.0155	0.0022	1266.7	15.08	0.00237	0.47
19.58	19.58	20.48	2.85	0.0167	0.0012	2303.5	18.08	0.00130	0.48
22.58	22.58	23.36	2.88	0.0178	0.0011	2570.4	21.08	0.00117	0.46
25.58	25.58	26.27	2.91	0.0190	0.0011	2554.7	24.08	0.00117	0.46
28.58	28.58	29.20	2.93	0.0200	0.0010	2823.4	27.08	0.00106	0.45
31.58	31.58	32.14	2.94	0.0212	0.0012	2531.7	30.08	0.00118	0.47
34.58	34.58	35.10	2.95	0.0223	0.0012	2540.2	33.08	0.00118	0.47
37.58	37.58	38.06	2.96	0.0233	0.0010	2900.4	36.08	0.00103	0.46
40.58	40.58	41.02	2.97	0.0242	0.0009	3310.9	39.08	0.00091	0.44
43.58	43.58	43.99	2.97	0.0250	0.0007	3999.6	42.08	0.00075	0.41
46.58	46.58	46.96	2.97	0.0258	0.0008	3681.6	45.08	0.00081	0.42
49.58	49.58	49.94	2.98	0.0263	0.0005	5616.9	48.08	0.00053	0.28
52.58	52.58	52.92	2.98	0.0267	0.0004	7403.3	51.08	0.00041	0.23
55.58	55.58	55.90	2.98	0.0272	0.0004	6718.6	54.08	0.00045	0.31
58.58	58.58	58.89	2.98	0.0276	0.0004	7551.0	57.08	0.00040	0.36
61.58	61.58	61.87	2.99	0.0280	0.0005	6501.6	60.08	0.00046	0.37
64.58	64.58	64.86	2.99	0.0284	0.0004	7420.8	63.08	0.00040	0.44
67.58	67.58	67.85	2.99	0.0288	0.0004	8207.1	66.08	0.00037	0.38
70.58	70.58	70.83	2.99	0.0292	0.0004	7019.9	69.08	0.00043	0.44
73.58	73.58	73.82	2.99	0.0297	0.0005	6449.5	72.08	0.00047	0.44
76.58	76.58	76.81	2.99	0.0302	0.0005	6025.6	75.08	0.00050	0.41
79.58	79.58	79.81	2.99	0.0306	0.0005	6448.5	78.08	0.00047	0.43
82.58	82.58	82.80	2.99	0.0311	0.0004	6990.9	81.08	0.00043	0.42
85.58	85.58	85.79	2.99	0.0315	0.0004	7541.6	84.08	0.00040	0.37
88.58	88.58	88.78	2.99	0.0319	0.0004	7542.9	87.08	0.00040	0.37
91.58	91.58	91.78	2.99	0.0323	0.0004	7431.8	90.08	0.00040	0.39
94.58	94.58	94.77	2.99	0.0326	0.0004	8391.0	93.08	0.00036	0.36
97.58	97.58	97.76	2.99	0.0329	0.0003	10204.3	96.08	0.00029	0.26
100.58	100.58	100.76	2.99	0.0332	0.0003	10965.0	99.08	0.00027	0.20
103.58	103.58	103.75	2.99	0.0335	0.0003	10770.2	102.08	0.00028	0.23
106.58	106.58	106.75	3.00	0.0338	0.0003	10048.3	105.08	0.00030	0.22
109.58	109.58	109.74	3.00	0.0341	0.0003	10081.9	108.08	0.00030	0.33
112.58	112.58	112.74	3.00	0.0343	0.0003	11488.9	111.08	0.00026	0.26
115.58	115.58	115.74	3.00	0.0346	0.0003	10872.6	114.08	0.00028	0.29
118.58	118.58	118.73	3.00	0.0348	0.0002	12634.3	117.08	0.00024	0.24

Weighted Average Soil Shear Wave Velocity, v_s 100 (ft/s): 3232 0.37

Note: The weighted average shear wave velocity reported above is for the interval from 6.08 to 105.08 feet.

Shear Wave Velocity Profile DH-5
I-20/26/126 Improvement Project
Lexington and Richland Counties, South Carolina
1461-16-047



Shear Wave Velocity Calculations

Carolina Crossroads I-20/26/126 Improvement Project

Lexington and Richland Counties, South Carolina

Sounding ID: **DH-5**

Project Number: **1461-16-047**

Geophone Offset: 0.00 Feet

Casing Stickup: 1.25 Feet

Source Offset: 6.00 Feet

Date: 17-Jan-17

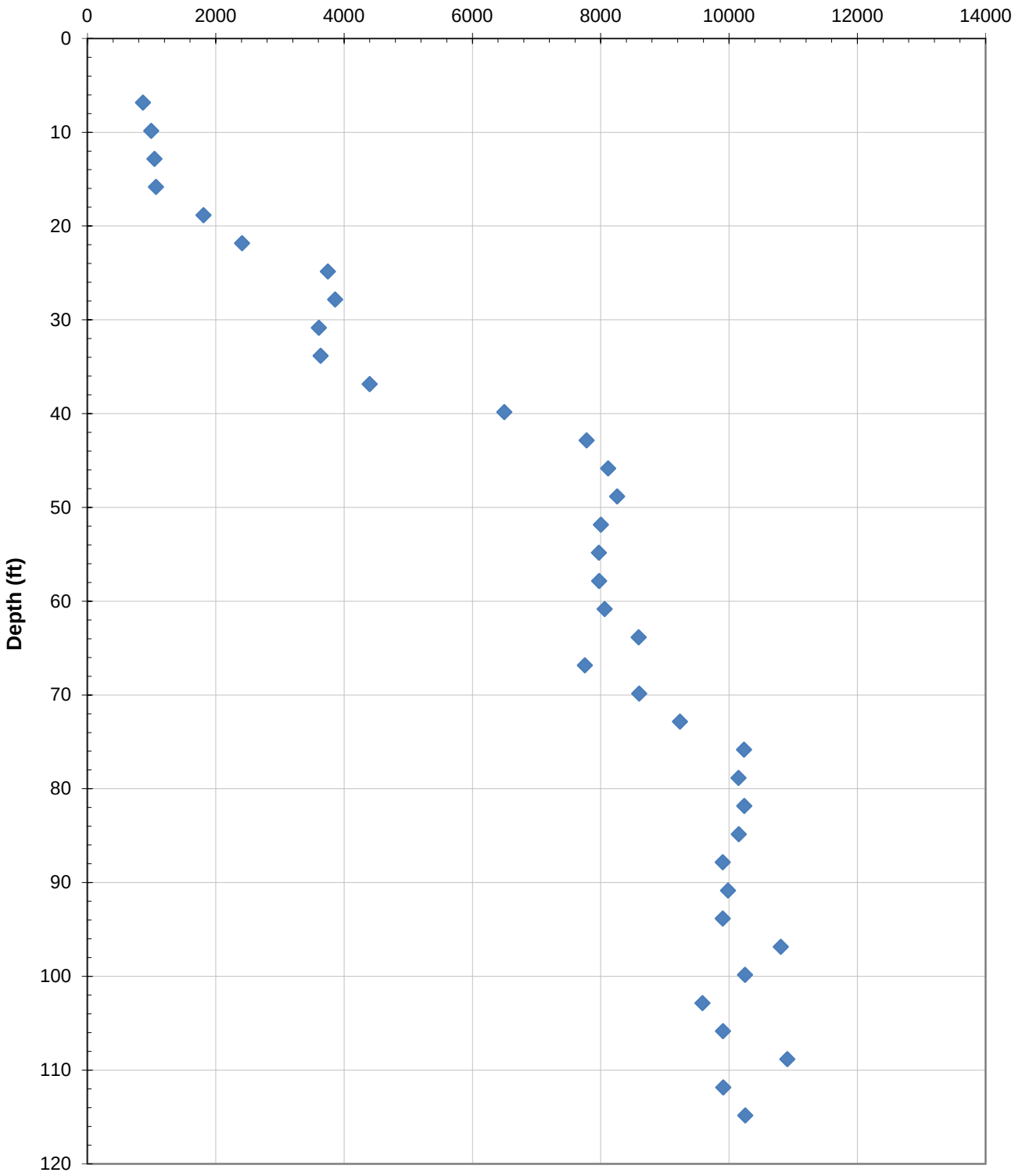
Rig: n/a

Test Depth (feet)	Geophone Depth (feet)	Waveform Ray Path (feet)	Incremental Distance (feet)	S-WAVE Characteristic Arrival Time (seconds)	S-WAVE Incremental Time Interval (seconds)	S-WAVE Interval Velocity (ft/s)	Interval Depth (feet)	d_i/v_{si}	Poissons
4.75	4.75	7.65	7.65	0.0105					
7.75	7.75	9.80	2.15	0.0139	0.0034	639.9	6.25	0.00977	0.50
10.75	10.75	12.31	2.51	0.0175	0.0036	688.8	9.25	0.00436	0.50
13.75	13.75	15.00	2.69	0.0190	0.0015	1798.3	12.25	0.00167	0.49
16.75	16.75	17.79	2.79	0.0201	0.0011	2486.0	15.25	0.00121	0.48
19.75	19.75	20.64	2.85	0.0212	0.0010	2746.6	18.25	0.00109	0.48
22.75	22.75	23.53	2.89	0.0222	0.0011	2666.2	21.25	0.00113	0.48
25.75	25.75	26.44	2.91	0.0233	0.0010	2807.1	24.25	0.00107	0.48
28.75	28.75	29.37	2.93	0.0244	0.0011	2664.1	27.25	0.00113	0.48
31.75	31.75	32.31	2.94	0.0254	0.0010	2836.7	30.25	0.00106	0.48
34.75	34.75	35.26	2.95	0.0265	0.0011	2785.2	33.25	0.00108	0.47
37.75	37.75	38.22	2.96	0.0275	0.0010	2949.9	36.25	0.00102	0.46
40.75	40.75	41.19	2.97	0.0282	0.0007	4359.7	39.25	0.00069	0.42
43.75	43.75	44.16	2.97	0.0287	0.0006	5346.8	42.25	0.00056	0.35
46.75	46.75	47.13	2.97	0.0293	0.0005	5465.2	45.25	0.00055	0.39
49.75	49.75	50.11	2.98	0.0298	0.0005	5968.2	48.25	0.00050	0.31
52.75	52.75	53.09	2.98	0.0303	0.0005	5533.3	51.25	0.00054	0.41
55.75	55.75	56.07	2.98	0.0308	0.0005	5977.8	54.25	0.00050	0.35
58.75	58.75	59.06	2.98	0.0313	0.0005	6110.6	57.25	0.00049	0.25
61.75	61.75	62.04	2.99	0.0318	0.0005	5521.5	60.25	0.00054	0.34
64.75	64.75	65.03	2.99	0.0323	0.0005	5759.7	63.25	0.00052	0.32
67.75	67.75	68.02	2.99	0.0329	0.0005	5856.6	66.25	0.00051	0.33
70.75	70.75	71.00	2.99	0.0334	0.0005	5538.3	69.25	0.00054	0.27
73.75	73.75	73.99	2.99	0.0339	0.0005	5900.7	72.25	0.00051	0.24
76.75	76.75	76.98	2.99	0.0344	0.0005	5867.9	75.25	0.00051	0.21
79.75	79.75	79.98	2.99	0.0350	0.0005	5496.9	78.25	0.00055	0.39
82.75	82.75	82.97	2.99	0.0354	0.0005	6109.7	81.25	0.00049	0.36
85.75	85.75	85.96	2.99	0.0360	0.0006	5380.8	84.25	0.00056	0.39
88.75	88.75	88.95	2.99	0.0365	0.0005	5760.1	87.25	0.00052	0.38
91.75	91.75	91.95	2.99	0.0370	0.0004	6784.9	90.25	0.00044	0.33
94.75	94.75	94.94	2.99	0.0374	0.0004	7654.5	93.25	0.00039	0.23
97.75	97.75	97.93	2.99	0.0378	0.0004	7186.7	96.25	0.00042	0.30
100.75	100.75	100.93	2.99	0.0382	0.0004	7656.4	99.25	0.00039	0.24
103.75	103.75	103.92	2.99	0.0385	0.0004	7951.9	102.25	0.00038	0.32
106.75	106.75	106.92	3.00	0.0389	0.0004	8060.1	105.25	0.00037	0.15
109.75	109.75	109.91	3.00	0.0393	0.0004	7580.9	108.25	0.00040	0.26
112.75	112.75	112.91	3.00	0.0397	0.0004	7518.3	111.25	0.00040	0.24
115.75	115.75	115.91	3.00	0.0401	0.0004	6988.9	114.25	0.00043	0.34
118.75	118.75	118.90	3.00	0.0405	0.0004	7393.8	117.25	0.00041	0.42

Weighted Average Soil Shear Wave Velocity, v_s 100 (ft/s): **2775** 0.36

Note: The weighted average shear wave velocity reported above is for the interval from 6.25 to 105.25 feet.

Shear Wave Velocity Profile DH-6
I-20/26/126 Improvement Project
Lexington and Richland Counties, South Carolina
1461-16-047



Shear Wave Velocity Calculations

Carolina Crossroads I-20/26/126 Improvement Project

Lexington and Richland Counties, South Carolina

Sounding ID: **DH-6** Project Number: **1461-16-047**

Geophone Offset: 0.00 Feet Date: 30-Jan-17

Casing Stickup: 0.66 Feet

Source Offset: 6.00 Feet Rig: n/a

Test Depth (feet)	Geophone Depth (feet)	Waveform Ray Path (feet)	Incremental Distance (feet)	S-WAVE Characteristic Arrival Time (seconds)	S-WAVE Incremental Time Interval (seconds)	S-WAVE Interval Velocity (ft/s)	Interval Depth (feet)	d_i/v_{si}	Poissons
5.34	5.34	8.03	8.03	0.0071					
8.34	8.34	10.27	2.24	0.0097	0.0026	866.1	6.84	0.00790	0.20
11.34	11.34	12.83	2.56	0.0123	0.0026	992.4	9.84	0.00302	0.25
14.34	14.34	15.54	2.72	0.0149	0.0026	1044.3	12.84	0.00287	0.23
17.34	17.34	18.35	2.80	0.0175	0.0026	1069.2	15.84	0.00281	0.22
20.34	20.34	21.21	2.86	0.0191	0.0016	1807.2	18.84	0.00166	0.20
23.34	23.34	24.10	2.89	0.0203	0.0012	2410.4	21.84	0.00124	0.33
26.34	26.34	27.01	2.92	0.0211	0.0008	3745.7	24.84	0.00080	0.35
29.34	29.34	29.95	2.93	0.0218	0.0008	3860.8	27.84	0.00078	0.33
32.34	32.34	32.89	2.94	0.0227	0.0008	3607.6	30.84	0.00083	0.35
35.34	35.34	35.85	2.95	0.0235	0.0008	3635.6	33.84	0.00083	0.41
38.34	38.34	38.81	2.96	0.0241	0.0007	4398.1	36.84	0.00068	0.42
41.34	41.34	41.77	2.97	0.0246	0.0005	6495.9	39.84	0.00046	0.35
44.34	44.34	44.74	2.97	0.0250	0.0004	7782.0	42.84	0.00039	0.24
47.34	47.34	47.72	2.97	0.0253	0.0004	8117.4	45.84	0.00037	0.20
50.34	50.34	50.70	2.98	0.0257	0.0004	8256.0	48.84	0.00036	0.21
53.34	53.34	53.68	2.98	0.0261	0.0004	8001.4	51.84	0.00037	0.21
56.34	56.34	56.66	2.98	0.0265	0.0004	7971.4	54.84	0.00038	0.20
59.34	59.34	59.64	2.98	0.0268	0.0004	7976.1	57.84	0.00038	0.20
62.34	62.34	62.63	2.99	0.0272	0.0004	8061.7	60.84	0.00037	0.21
65.34	65.34	65.61	2.99	0.0275	0.0003	8591.3	63.84	0.00035	0.20
68.34	68.34	68.60	2.99	0.0279	0.0004	7751.9	66.84	0.00039	0.23
71.34	71.34	71.59	2.99	0.0283	0.0003	8597.4	69.84	0.00035	0.24
74.34	74.34	74.58	2.99	0.0286	0.0003	9235.8	72.84	0.00032	0.25
77.34	77.34	77.57	2.99	0.0289	0.0003	10233.7	75.84	0.00029	0.28
80.34	80.34	80.56	2.99	0.0292	0.0003	10148.6	78.84	0.00030	0.29
83.34	83.34	83.56	2.99	0.0295	0.0003	10238.2	81.84	0.00029	0.21
86.34	86.34	86.55	2.99	0.0298	0.0003	10152.6	84.84	0.00030	0.32
89.34	89.34	89.54	2.99	0.0301	0.0003	9900.4	87.84	0.00030	0.36
92.34	92.34	92.53	2.99	0.0304	0.0003	9985.1	90.84	0.00030	0.35
95.34	95.34	95.53	2.99	0.0307	0.0003	9903.3	93.84	0.00030	0.30
98.34	98.34	98.52	2.99	0.0310	0.0003	10805.0	96.84	0.00028	0.22
101.34	101.34	101.52	2.99	0.0312	0.0003	10247.2	99.84	0.00029	0.34
104.34	104.34	104.51	2.99	0.0316	0.0003	9587.1	102.84	0.00031	0.33
107.34	107.34	107.51	3.00	0.0319	0.0003	9907.6	105.84	0.00030	0.23
110.34	110.34	110.50	3.00	0.0321	0.0003	10908.4	108.84	0.00028	0.28
113.34	113.34	113.50	3.00	0.0324	0.0003	9909.3	111.84	0.00030	0.31
116.34	116.34	116.49	3.00	0.0327	0.0003	10251.7	114.84	0.00029	0.25
119.34	119.34	119.49	3.00	0.0330	0.0003	10164.8	117.84	0.00030	0.42
						Weighted Average Soil Shear Wave Velocity, v_s100 (ft/s):		**3207**	0.28

Note: The weighted average shear wave velocity reported above is for the interval from 6.84 to 105.84 feet.

Appendix VIII – Laboratory Test Data Sheets – Split Spoon Samples

Form No: TR-D2216-T265-2
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Spartanburg: 301 Zima Park Drive, Spartanburg, SC 29301

Project #:	1461-16-047.2B	Report Date:	2/22/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/20 - 2/22/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sampled by:	S&ME	Sample Date(s):	1/29 - 2/14/18
Sampling Method:	Split-spoon	Drill Rig:	CME 55/Diedrich D-50

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 7536 Calibration Date: 1/31/18 Oven ID. 7621 Calibration Date: 7/28/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture
		ft.		grams	grams	grams	grams	%
B-29	SS-1	1.0 - 3.0	300	0.00	55.71	49.45	6.26	12.7%
B-29	SS-5	9.0 - 11.0	306	0.00	27.46	22.20	5.26	23.7%
B-29	SS-8	24.5 - 26.0	312	0.00	54.59	37.47	17.12	45.7%
B-29	SS-12	44.5 - 46.0	319	0.00	69.45	56.65	12.80	22.6%
B-34	SS-2	3.0 - 5.0	320	0.00	36.34	28.16	8.18	29.0%
B-34	SS-5	9.0 - 11.0	324	0.00	41.63	35.12	6.51	18.5%
B-34	SS-10	33.5 - 35.0	329	0.00	54.46	43.73	10.73	24.5%
B-34	SS-11	38.5 - 40.0	331	0.00	62.29	47.59	14.70	30.9%
B-40	SS-3	4.8 - 6.8	332	0.00	48.56	42.98	5.58	13.0%
B-40	SS-5	8.8 - 10.8	336	0.00	28.97	23.80	5.17	21.7%
B-40	SS-7	18.5 - 20.0	346	0.00	12.06	8.75	3.31	37.8%
B-40	SS-8	23.5 - 25.0	349	0.00	28.02	22.39	5.63	25.1%
B-45	SS-1	0.8 - 2.8	350	0.00	31.53	28.40	3.13	11.0%
B-47	SS-1	1.0 - 3.0	365	0.00	50.72	43.99	6.73	15.3%
B-47	SS-4	7.0 - 9.0	367	0.00	41.83	35.55	6.28	17.7%
B-47	SS-8	24.5 - 26.0	374	0.00	49.80	40.33	9.47	23.5%

Notes / Deviations / References Tare #'s were zeroed prior to recording Wet Weights

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Matt Jacobs	NICET Lab Level III / 118202	2/22/18
Technician Name	*Certification Type / No.*	*Date*
Matthew F. Cooke, P.G.	Project Manager	2/22/18
Technical Responsibility	*Position*	*Date*

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Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5/21/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/11-4/13/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample by:	S&ME	Sample Date(s):	Various
Sampling Method:	Split Spoon	Drill Rig :	N/A

Method: **A (1%)** ☑ **B (0.1%)** ☐ Balance ID. 25128 Calibration Date: 4/4/18 Oven ID. 31332 Calibration Date: 2/21/18

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft. or m.		grams	grams	grams	grams	%	
W-28	SS-6	13.5'-15'	TD-1	105.07	251.75	228.93	22.82	18.4%	
W-28	SS-2	2'-4'	J13	97.13	230.76	213.84	16.92	14.5%	
W-28	SS-8	23.5'-25'	NP3	107.07	234.31	212.85	21.46	20.3%	
W-28	SS-10	33.5'-35'	J11	98.19	327.14	277.53	49.61	27.7%	
W-28	SS-12	43.5'-45'	J7	90.51	223.96	190.88	33.08	33.0%	
W-28	SS-16	63.5'-65'	J9	89.84	224.77	198.94	25.83	23.7%	
W-30	SS-1	1.7'-3.7'	M-4	93.80	202.43	167.35	35.08	47.7%	
W-30	SS-4	7.7'-9.7'	J3	90.01	190.02	159.32	30.70	44.3%	
W-30	SS-9	28.5'-30'	J17	89.07	224.54	188.92	35.62	35.7%	
W-30	SS-11	38.5'-40'	J5	97.55	181.56	161.41	20.15	31.6%	
P-42	SS-1	0.8'-2.8'	NP2	107.05	258.64	235.96	22.68	17.6%	
P-44	SS-1	1.1'-3.1'	J2	90.23	218.73	189.03	29.70	30.1%	
P-45	SS-1	1'-3'	J12	95.74	285.64	262.85	22.79	13.6%	
P-47	SS-1	1.4'-3.4'	NP4	106.11	249.17	231.46	17.71	14.1%	
P-49	SS-1	1'-3'	J14	98.13	232.57	209.43	23.14	20.8%	
P-54	SS-1	0.7'-2.7'	G7	96.59	254.09	230.74	23.35	17.4%	

Notes / Deviations / References

Jimmy Hanson — *Technician Name* — 5/21/2018 — *Date*

Nathan Price — *Technical Responsibility* — *Signature* — Laboratory Manager — *Position* — 5/21/2018 — *Date*

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #: 1461-16-047.2B Report Date: 5/21/18

Project Name: Carolina Crossroads Project

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft. or m.		grams	grams	grams	grams	%	
P-56	SS-1	0.9'-2.9'	J88	98.65	228.18	210.10	18.08	16.2%	
P-58	SS-1	1.1'-3.1'	J16	91.97	224.95	207.28	17.67	15.3%	
P-60	SS-1	1'-3'	P100	91.28	191.91	165.74	26.17	35.1%	
P-62	SS-1	1.1'-3.1'	J15	97.70	214.70	194.67	20.03	20.7%	
B-30	SS-3	4'-6'	J1	91.54	310.68	280.66	30.02	15.9%	
B-36	SS-1	0'-2'	J4	97.73	279.64	262.77	16.87	10.2%	
B-36	SS-2	2'-4'	TD2	106.22	252.22	235.22	17.00	13.2%	
B-43	SS-2	16.8'-18.8'	5050	92.31	253.75	226.16	27.59	20.6%	
B-43	SS-6	28.3'-29.8'	5024	92.74	338.71	299.08	39.63	19.2%	
B-52	SS-9	28.5'-30'	5064	98.00	309.42	270.61	38.81	22.5%	
B-36	SS-8	23.5'-25'	5047	90.81	217.00	182.26	34.74	38.0%	
B-36	SS-10	33.5'-35'	5030	96.19	271.99	241.53	30.46	21.0%	
P-51	SS-1	2.6'-3.6'	G-4	96.99	237.25	215.30	21.95	18.6%	
B-52	SS-1	0'-2'	5044	90.44	214.92	199.67	15.25	14.0%	
B-52	SS-2	2'-4'	5062	96.34	281.16	261.55	19.61	11.9%	
B-30	SS-8	23.5'-25'	M5	96.09	249.94	206.54	43.40	39.3%	
B-30	SS-19	78.5'-80'	J6	96.85	322.28	287.36	34.92	18.3%	
B-53	SS-1	0'-2'	5036	98.68	296.90	277.65	19.25	10.8%	
B-53	SS-5	8'-10'	5012	93.52	281.48	247.10	34.38	22.4%	
B-43	SS-1	14.8'-16.8'	5013	95.80	335.77	298.21	37.56	18.6%	
B-36	SS-5	8'-10'	5059	96.55	246.08	222.43	23.65	18.8%	
B-30	SS-16	63.5'-65'	J88	90.57	239.13	214.02	25.11	20.3%	
P-64	SS-1	1.1'-3.1'	J18	98.01	228.28	208.12	20.16	18.3%	
B-52	SS-6	13.5'-15'	5004	96.54	289.09	254.03	35.06	22.3%	

Notes / Deviations / References

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/28 - 3/29/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sampled by:	S&ME	Sample Date(s):	3/01 - 3/08/18
Sampling Method:	Split-spoon		

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 13942 Calibration Date: 8/18/17 Oven ID. 13978 Calibration Date: 10/07/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
B-31	SS-1	0.0 - 2.0	262	0.00	54.53	43.52	11.01	25.3%	
B-31	SS-5	8.0 - 10.0	FU-24	0.00	53.27	41.67	11.60	27.8%	
B-33	SS-1	0.0 - 2.0	BC	0.00	53.75	45.93	7.82	17.0%	
B-33	SS-3	4.0 - 6.0	CT	0.00	52.42	43.41	9.01	20.8%	
B-33	SS-5	8.0 - 10.0	CL-4	0.00	55.23	39.20	16.03	40.9%	
B-35	SS-1	0.0 - 2.0	CL-3	0.00	54.31	44.30	10.01	22.6%	
B-35	SS-5	8.0 - 10.0	CL-6	0.00	53.55	45.65	7.90	17.3%	
B-37	SS-1	0.4 - 2.4	CL-5	0.00	56.59	47.61	8.98	18.9%	
B-37	SS-3	4.4 - 6.4	CL-1	0.00	52.74	39.68	13.06	32.9%	
B-37	SS-6	9.5 - 11.5	BK-2	0.00	149.05	116.44	32.61	28.0%	
B-37	SS-8	18.5 - 20.0	PC-1	0.00	53.94	46.57	7.37	15.8%	
B-42	SS-1	0.8 - 2.8	BK-1	0.00	55.65	47.46	8.19	17.3%	
B-42	SS-3	4.8 - 6.8	BK-11	0.00	52.07	42.01	10.06	23.9%	
B-42	SS-7	18.5 - 20.0	BK-5	0.00	54.46	42.84	11.62	27.1%	
B-42	SS-10	33.5 - 35.0	BK-9	0.00	52.25	41.57	10.68	25.7%	

Notes / Deviations / References

AASHTO T 265: Laboratory Determination of Moisture Content of Soils

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Benjamin Kovaleski	Benjamin J. Kovaleski	NICET Lab Level III/117226	4/27/18
Technician Name	*Signature*	*Certification Type / No.*	*Date*
Matthew F. Cooke, P.G.		Project Manager	4/27/18
Technical Responsibility		*Position*	*Date*

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/04/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/28 - 4/29/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sampled by:	S&ME	Sample Date(s):	3/13, 3/16 & 3/21/18
Sampling Method:	Split-spoon	Drill Rig:	CME 55/Diedrich D-50

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 13942 Calibration Date: 8/18/17 Oven ID. 13978 Calibration Date: 10/07/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
B-32	SS-1	0.0 - 2.0	D-3	0.00	50.42	39.91	10.51	26.3%	
B-32	SS-2	2.0 - 4.0	FU-24	0.00	52.09	46.96	5.13	10.9%	
B-32	SS-4	6.0 - 8.0	B-141	0.00	52.87	39.27	13.60	34.6%	
B-44	SS-1	0.0 - 2.0	262	0.00	55.29	47.40	7.89	16.6%	
B-56	SS-1	0.0 - 2.0	P	0.00	51.47	42.54	8.93	21.0%	
B-56	SS-2	2.0 - 4.0	D-27	0.00	53.36	44.74	8.62	19.3%	
B-56	SS-10	33.5 - 35.0	H	0.00	50.66	36.55	14.11	38.6%	

Notes / Deviations / References

AASHTO T 265: Laboratory Determination of Moisture Content of Soils

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Benjamin Kovaleski	Benjamin J. Kovaleski	NICET Lab Level III/117226	5/04/18
Technician Name	*Signature*	*Certification Type / No.*	*Date*
Matthew F. Cooke, P.G.		Project Manager	5/04/18
Technical Responsibility		*Position*	*Date*

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	2/14/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/12 - 2/13/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sampled by:	S&ME	Sample Date(s):	Varies
Sampling Method:	Split-spoon	Drill Rig:	CME 750/Diedrich D-50

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 13942 Calibration Date: 8/18/17 Oven ID. 13978 Calibration Date: 10/07/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
B-38	SS-2	2.0 - 4.0	D-14	0.00	74.23	63.80	10.43	16.3%	
B-38	SS-4	6.0 - 8.0	YM-9	0.00	73.49	60.19	13.30	22.1%	
B-38	SS-5	8.0 - 10.0	YM-3	0.00	70.18	55.23	14.95	27.1%	
B-41	SS-2	2.0 - 4.0	YM-2	0.00	73.78	63.39	10.39	16.4%	
B-41	SS-4	6.0 - 8.0	YM-4	0.00	73.43	60.19	13.24	22.0%	
B-41	SS-7	18.5 - 20.0	D-10	0.00	71.03	54.64	16.39	30.0%	
B-41	SS-9	28.5 - 30.0	D-19	0.00	71.98	57.82	14.16	24.5%	
B-57	SS-1	0.0 - 2.0	D-13	0.00	50.73	43.28	7.45	17.2%	
B-57	SS-6	13.5 - 15.0	YM-8	0.00	52.03	43.40	8.63	19.9%	
B-57	SS-11	38.5 - 40.0	YM-1	0.00	71.28	51.23	20.05	39.1%	
B-57	SS-15	58.5 - 60.0	D-4	0.00	51.69	43.09	8.60	20.0%	
B-59	SS-3	4.0 - 6.0	WX-1	0.00	73.13	63.72	9.41	14.8%	
B-59	SS-7	18.5 - 20.0	D-20	0.00	72.97	57.66	15.31	26.6%	
B-59	SS-10	33.5 - 35.0	CL-2	0.00	70.03	48.15	21.88	45.4%	
B-59	SS-14	53.5 - 55.0	CL-5	0.00	73.40	57.72	15.68	27.2%	

Notes / Deviations / References

AASHTO T 265: Laboratory Determination of Moisture Content of Soils

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Benjamin Kovaleski	Benjamin J. Kovaleski	NICET Lab Level III/117226	2/14/18
Technician Name	*Signature*	*Certification Type / No.*	*Date*
Brian Vaughan, P.E.	Brian Vaughan	Group Leader	2/14/18
Technical Responsibility	*Signature*	*Position*	*Date*

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/01 - 5/02/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sampled by:	S&ME	Sample Date(s):	4/09/18
Sampling Method:	Split-spoon	Drill Rig:	CME 55

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 13942 Calibration Date: 8/18/17 Oven ID. 13978 Calibration Date: 10/07/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
B-39	SS-1	0.0 - 2.0	JJ	0.00	71.48	62.57	8.91	14.2%	
B-39	SS-2	2.0 - 4.0	T-2	0.00	73.61	67.86	5.75	8.5%	
B-39	SS-3	6.0 - 8.0	D-15	0.00	267.15	226.02	41.13	18.2%	

Notes / Deviations / References

AASHTO T 265: Laboratory Determination of Moisture Content of Soils

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Benjamin Kovaleski	Benjamin J. Kovaleski	NICET Lab Level III/117226	5/11/18
Technician Name	*Signature*	*Certification Type / No.*	*Date*
Matthew F. Cooke, P.G.		Project Manager	5/11/18
Technical Responsibility		*Position*	*Date*

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

Quality Assurance *ASTM D 2216* ☑ *AASHTO T 265* ☐

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	4/24/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave. North Charleston, South Carolina		
Sampled by:	S&ME	Sample Date(s):	Various
Sampling Method:	Split Spoon	Log # :	43-2321

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 18435 Calibration Date: 4/10/2018 Oven ID. 12872 Calibration Date: 3/17/2018

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft		grams	grams	grams	grams	%	
B-46	SS-1	0.0 - 2.0	C-7	30.80	121.77	101.48	20.29	28.7%	
B-46	SS-2	2.0 - 4.0	C-11	30.37	120.71	105.22	15.49	20.7%	
B-48	SS-1	0.0 - 2.0	C-24	29.90	120.88	110.40	10.48	13.0%	
B-48	SS-2	2.0 - 4.0	C-51	31.32	120.76	100.47	20.29	29.3%	
B-48	SS-4	6.0 - 8.0	C-70	31.53	165.48	146.01	19.47	17.0%	
B-54	SS-1	0.4 - 2.4	C-8	30.37	121.74	105.07	16.67	22.3%	
B-54	SS-2	2.4 - 4.4	C-26	31.39	121.46	103.13	18.33	25.6%	
B-54	SS-10	33.9 - 35.4	C-37	31.01	122.65	99.40	23.25	34.0%	
B-58	SS-1	0.0 - 2.0	C-34	30.74	105.52	96.93	8.59	13.0%	
B-58	SS-6	13.5 - 15.0	C-30	31.29	116.75	102.01	14.74	20.8%	
B-58	SS-8	23.5 - 25.0	C-41	31.04	107.48	95.77	11.71	18.1%	
B-58	SS-10	33.5 - 35.0	C-72	31.97	110.24	96.06	14.18	22.1%	
B-58	SS-13	48.5 - 50.0	C-28	30.86	102.21	86.60	15.61	28.0%	
B-60	SS-1	0.0 - 2.0	C-69	30.75	103.91	92.11	11.80	19.2%	
B-60	SS-2	2.0 - 4.0	C-19	30.22	100.60	93.60	7.00	11.0%	
B-60	SS-3	4.0 - 6.0	C-35	30.86	102.05	91.63	10.42	17.1%	

Notes / Deviations / References

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Derek Baker — *Technician Name* — 4/24/2018 *Date*

Michael D. Kelso, E.I. — *Technical Responsibility* — *Signature* — Staff Professional — *Position* — 5/23/2018 *Date*

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Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

Quality Assurance *ASTM D 2216* ☑ *AASHTO T 265* ☐

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #: 1461-16-047.2B Report Date: 43243

Project Name: Carolina Crossroads Project

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft		grams	grams	grams	grams	%	
B-61	SS-1	0.0 - 2.0	C-32	31.08	101.15	92.16	8.99	14.7%	1
B-61	SS-6	13.5 - 15.0	C-38	31.26	101.03	87.06	13.97	25.0%	2
B-61	SS-7	18.5 - 20.0	C-49	31.24	100.30	90.25	10.05	17.0%	
B-62	SS-1	0.0 - 2.0	C-60	31.22	103.55	91.71	11.84	19.6%	
B-62	SS-2	2.0 - 4.0	C-25	31.77	101.59	94.58	7.01	11.2%	
B-62	SS-5	8.0 - 10.0	C-46	31.31	101.11	86.21	14.90	27.1%	

Notes / Deviations / References

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/16/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/15 - 3/16/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sampled by:	S&ME	Sample Date(s):	Varies
Sampling Method:	Split-spoon	Drill Rig:	CME 55/Diedrich D-50

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 13942 Calibration Date: 8/18/17 Oven ID. 13978 Calibration Date: 10/07/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
B-49	SS-1	24.5 - 26.5	H	0.00	53.61	43.24	10.37	24.0%	
B-49	SS-2	26.5 - 28.5	R	0.00	59.93	48.71	11.22	23.0%	
B-49	SS-4	30.5 - 32.5	F	0.00	59.59	40.00	19.59	49.0%	
B-49	SS-5	32.5 - 34.5	26	0.00	73.99	50.35	23.64	47.0%	
B-50	SS-4	7.0 - 9.0	D-13	0.00	60.88	53.18	7.70	14.5%	
B-50	SS-6	13.5 - 15.0	D-1	0.00	57.59	50.56	7.03	13.9%	
B-50	SS-8	23.5 - 25.0	T-2	0.00	63.48	53.49	9.99	18.7%	
B-50	SS-10	33.5 - 35.0	D-117	0.00	58.53	45.46	13.07	28.8%	
B-50	SS-14	53.5 - 55.0	JJ	0.00	74.06	57.86	16.20	28.0%	
B-55	SS-1	1.2 - 3.2	A-2	0.00	62.19	49.45	12.74	25.8%	
B-55	SS-5	9.2 - 11.2	D-3	0.00	53.41	45.84	7.57	16.5%	
B-55	SS-9	28.5 - 30.0	T-1	0.00	60.87	50.46	10.41	20.6%	

Notes / Deviations / References

AASHTO T 265: Laboratory Determination of Moisture Content of Soils

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Benjamin Kovaleski	Benjamin J. Kovaleski	NICET Lab Level III/117226	3/16/18
Technician Name	*Signature*	*Certification Type / No.*	*Date*
Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/16/18
Technical Responsibility	*Signature*	*Position*	*Date*

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/16/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/08 - 3/09/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sampled by:	S&ME	Sample Date(s):	2/08/18
Sampling Method:	Split-spoon	Drill Rig:	Diedrich D-50

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 13942 Calibration Date: 8/18/17 Oven ID. 13978 Calibration Date: 10/07/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
B-51	SS-1	0.0 - 2.0	PC-1	0.00	74.22	62.78	11.44	18.2%	
B-51	SS-6	13.5 - 15.0	BK-2	0.00	78.84	67.69	11.15	16.5%	
B-51	SS-9	28.5 - 30.0	G-4	0.00	73.26	59.36	13.90	23.4%	

Notes / Deviations / References

AASHTO T 265: Laboratory Determination of Moisture Content of Soils

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Benjamin Kovaleski	Benjamin J. Kovaleski	NICET Lab Level III/117226	3/16/18
Technician Name	*Signature*	*Certification Type / No.*	*Date*
Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/16/18
Technical Responsibility	*Signature*	*Position*	*Date*

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ *AASHTO T 89* ☐ *AASHTO T 90* ☐

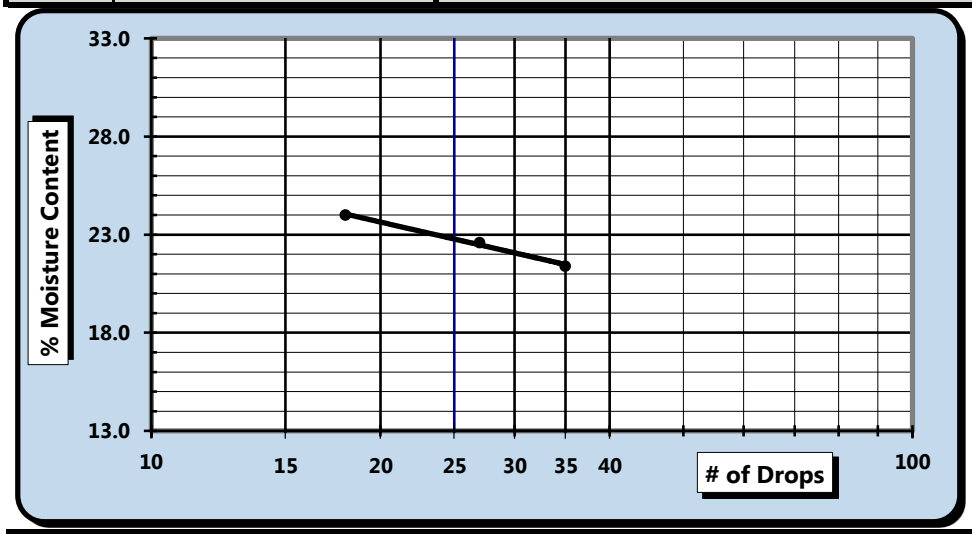
S&ME, Inc. - Spartanburg: 301 Zima Park Drive, Spartanburg, SC 29301

Project #:	1461-16-047.2B	Report Date:	3/14/18
Project Name:	Carolina Crossroads Project	Test Date:	3/13/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-29	Sample #:	SS-1	Sample Date:	2/14/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	1.0' - 3.0'
Sample Description:	Clayey Sand (SC, A-2-6(0))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	7537	1/31/2018	Grooving tool	14185	9/12/2017
LL Apparatus	13859	9/12/2017			
Oven	7313	7/28/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	P-1	P-2	P-3				1	2	
A	Tare Weight	16.36	15.26	16.52				12.11	12.16	
B	Wet Soil Weight + A	37.97	35.82	37.46				19.69	19.42	
C	Dry Soil Weight + A	34.16	32.03	33.41				18.86	18.63	
D	Water Weight (B-C)	3.81	3.79	4.05				0.83	0.79	
E	Dry Soil Weight (C-A)	17.80	16.77	16.89				6.75	6.47	
F	% Moisture (D/E)*100	21.4%	22.6%	24.0%				12.3%	12.2%	
N	# OF DROPS	35	27	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							12.3%		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**23**
Plastic Limit	**12**
Plastic Index	**11**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matt Jacobs	NICET 118202	Matthew F. Cooke, P.G.	3/14/18
Technician Name	*Certification#*	*Technical Responsibility*	*Date*

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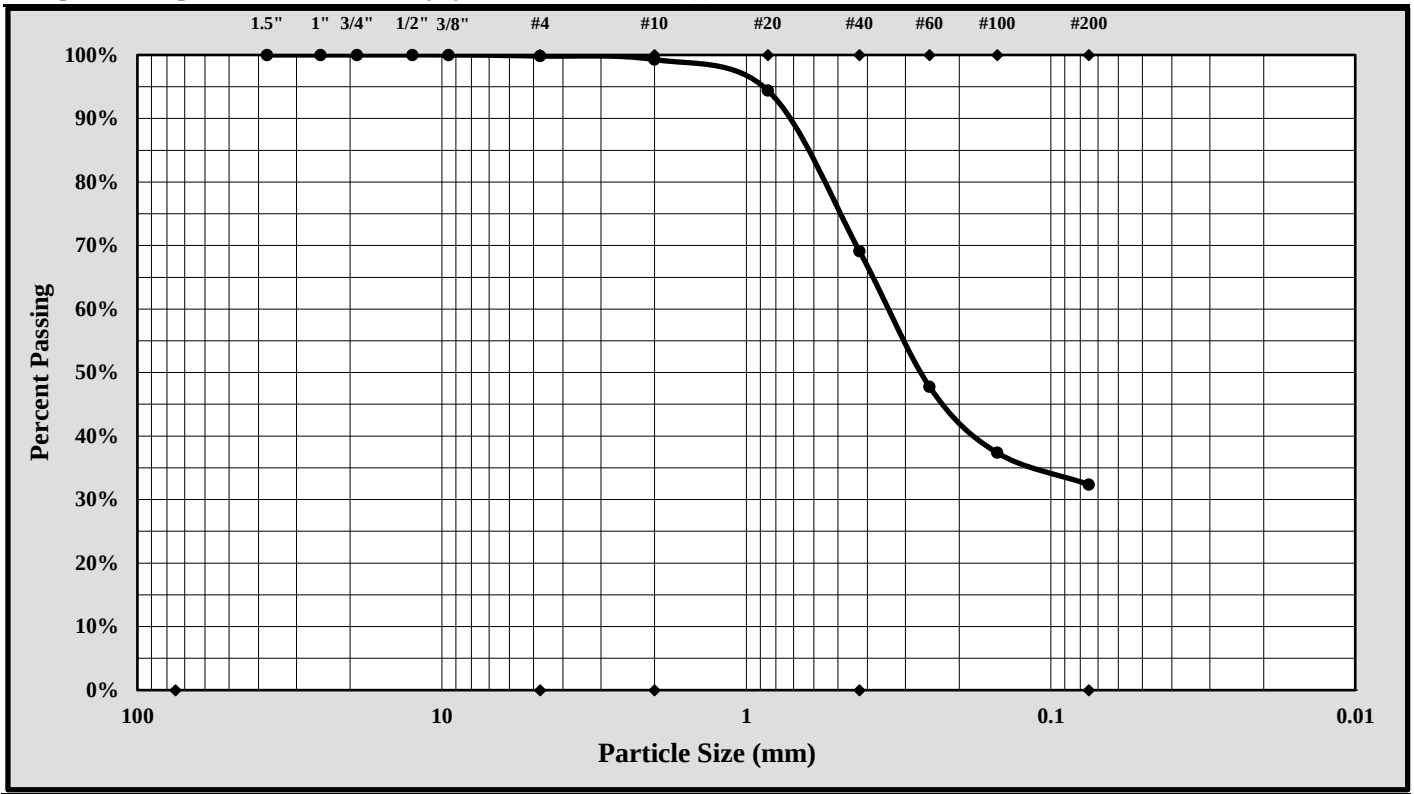
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. - Spartanburg 301 Zima Park Dr. Spartanburg, SC 29301

S&ME Project #:	1461-16-047.2B	Report Date:	3/14/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/20 - 2/23/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-29	Sample #: SS-1	Sample Date: 2/14/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 1.0' - 3.0'
Sample Description:	Clayey Sand (SC, A-2-6(0))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.2%
Silt & Clay (% Passing #200):	32.4%	Total Sand:	67.5%

Liquid Limit	23	Plastic Limit	12	Plastic Index	11
Coarse Sand:	0.6%	Medium Sand:	30.2%	Fine Sand:	36.7%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/14/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ *AASHTO T 89* ☐ *AASHTO T 90* ☐

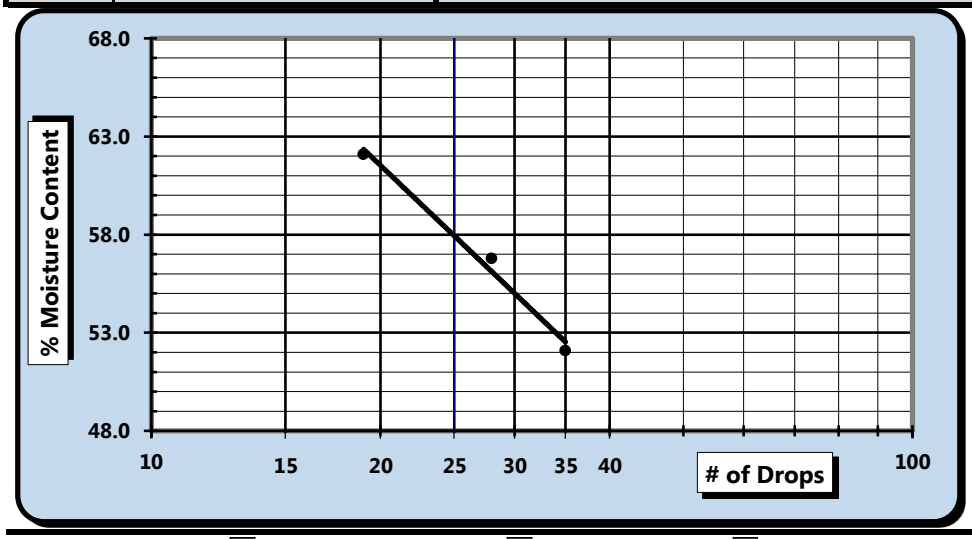
S&ME, Inc. - Spartanburg: 301 Zima Park Drive, Spartanburg, SC 29301

Project #:	1461-16-047.2B	Report Date:	3/14/18
Project Name:	Carolina Crossroads Project	Test Date:	3/13/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-29	Sample #:	SS-5	Sample Date:	2/14/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	9.0' - 11.0'
Sample Description:	Fat Clay with Sand (CH, A-7-6(25))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	7537	1/31/2018	Grooving tool	14185	9/12/2017
LL Apparatus	13859	9/12/2017			
Oven	7313	7/28/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	Q-1	Q-2	Q-3				3	4	
A	Tare Weight	16.69	16.63	15.72				11.59	12.27	
B	Wet Soil Weight + A	34.33	36.18	34.62				19.45	19.76	
C	Dry Soil Weight + A	28.29	29.10	27.38				17.87	18.27	
D	Water Weight (B-C)	6.04	7.08	7.24				1.58	1.49	
E	Dry Soil Weight (C-A)	11.60	12.47	11.66				6.28	6.00	
F	% Moisture (D/E)*100	52.1%	56.8%	62.1%				25.2%	24.8%	
N	# OF DROPS	35	28	19				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							25.0%		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**58**
Plastic Limit	**25**
Plastic Index	**33**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☑ Dry Preparation ☐ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matt Jacobs	NICET 118202	Matthew F. Cooke, P.G.	3/14/18
Technician Name	*Certification#*	*Technical Responsibility*	*Date*

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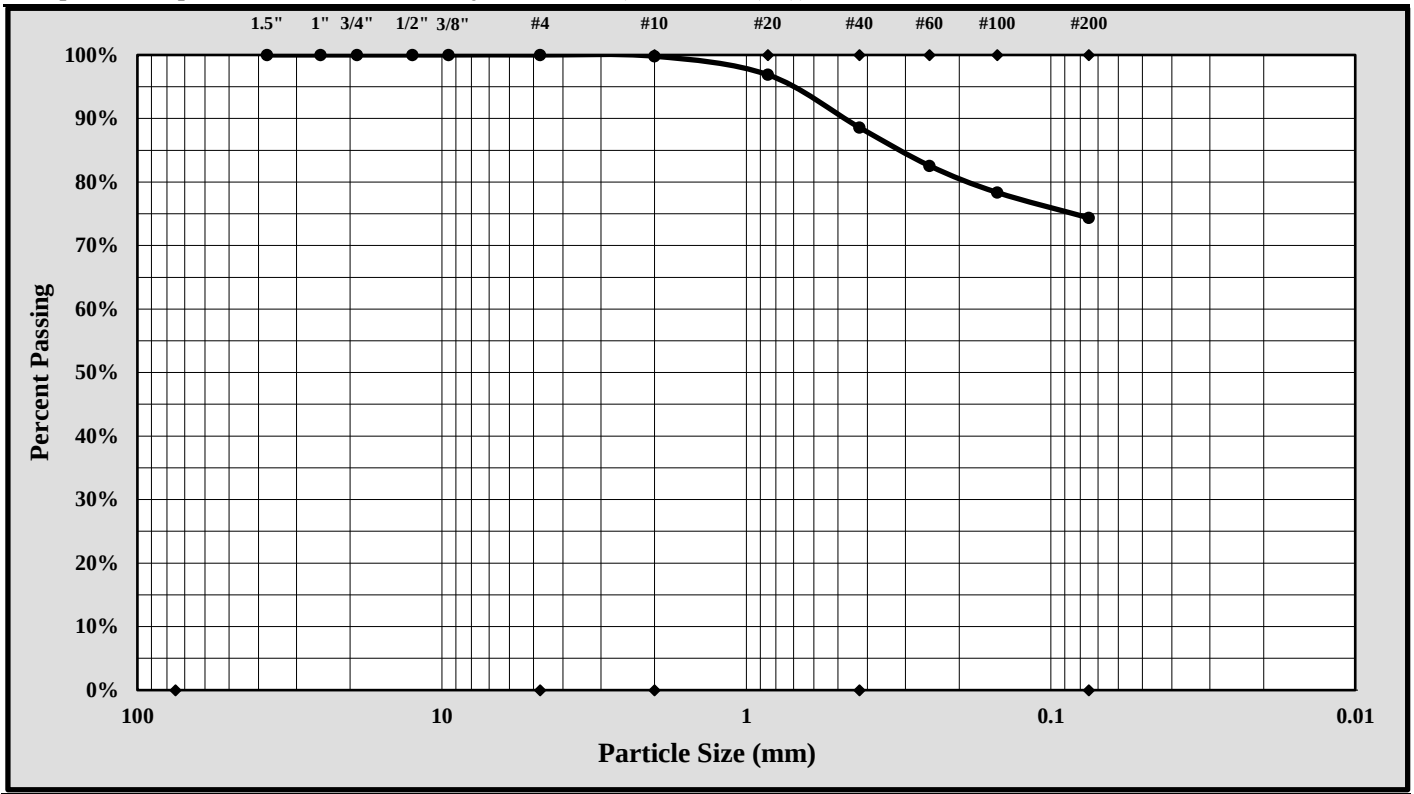
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. - Spartanburg 301 Zima Park Dr. Spartanburg, SC 29301

S&ME Project #:	1461-16-047.2B	Report Date:	3/14/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/20 - 2/23/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-29	Sample #: SS-5	Sample Date: 2/14/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 9.0' - 11.0'
Sample Description:	Fat Clay with Sand (CH, A-7-6(25))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	2.00 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	74.4%	Total Sand:	25.6%

Liquid Limit	58	Plastic Limit	25	Plastic Index	33
Coarse Sand:	0.2%	Medium Sand:	11.2%	Fine Sand:	14.2%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/14/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ *AASHTO T 89* ☐ *AASHTO T 90* ☐

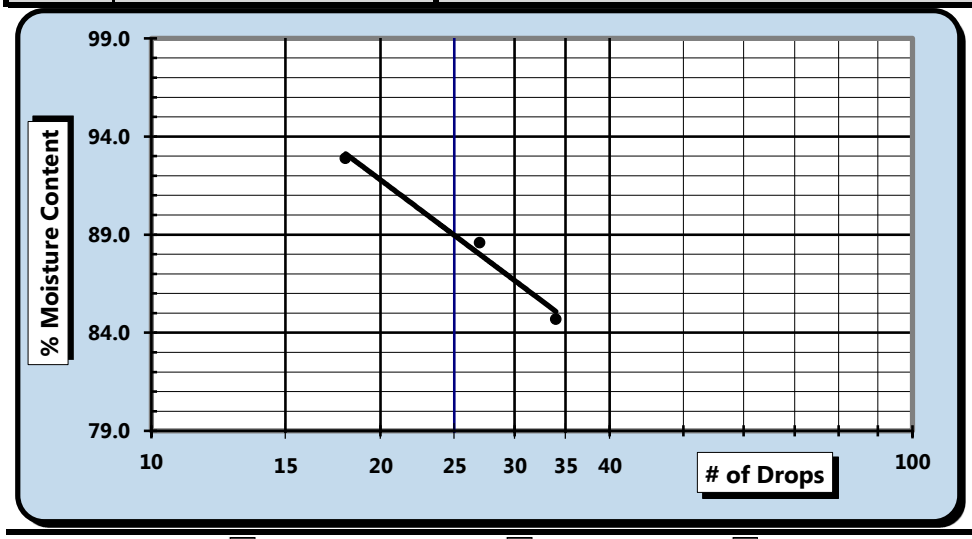
S&ME, Inc. - Spartanburg: 301 Zima Park Drive, Spartanburg, SC 29301

Project #:	1461-16-047.2B	Report Date:	3/14/18
Project Name:	Carolina Crossroads Project	Test Date:	3/13/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-29	Sample #:	SS-8	Sample Date:	2/14/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	24.5' - 26.0'
Sample Description:	Fat Clay (CH, A-7-5(67))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	7537	1/31/2018	Grooving tool	14185	9/12/2017
LL Apparatus	13859	9/12/2017			
Oven	7313	7/28/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	Y-1	Y-2	Y-3				5	6	
A	Tare Weight	16.43	16.47	16.99				12.10	12.29	
B	Wet Soil Weight + A	35.71	37.80	36.47				19.64	19.38	
C	Dry Soil Weight + A	26.87	27.78	27.09				17.83	17.70	
D	Water Weight (B-C)	8.84	10.02	9.38				1.81	1.68	
E	Dry Soil Weight (C-A)	10.44	11.31	10.10				5.73	5.41	
F	% Moisture (D/E)*100	84.7%	88.6%	92.9%				31.6%	31.1%	
N	# OF DROPS	34	27	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							31.4%		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**89**
Plastic Limit	**31**
Plastic Index	**58**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☑ Dry Preparation ☐ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matt Jacobs	NICET 118202	Matthew F. Cooke, P.G.	3/14/18
Technician Name	*Certification#*	*Technical Responsibility*	*Date*

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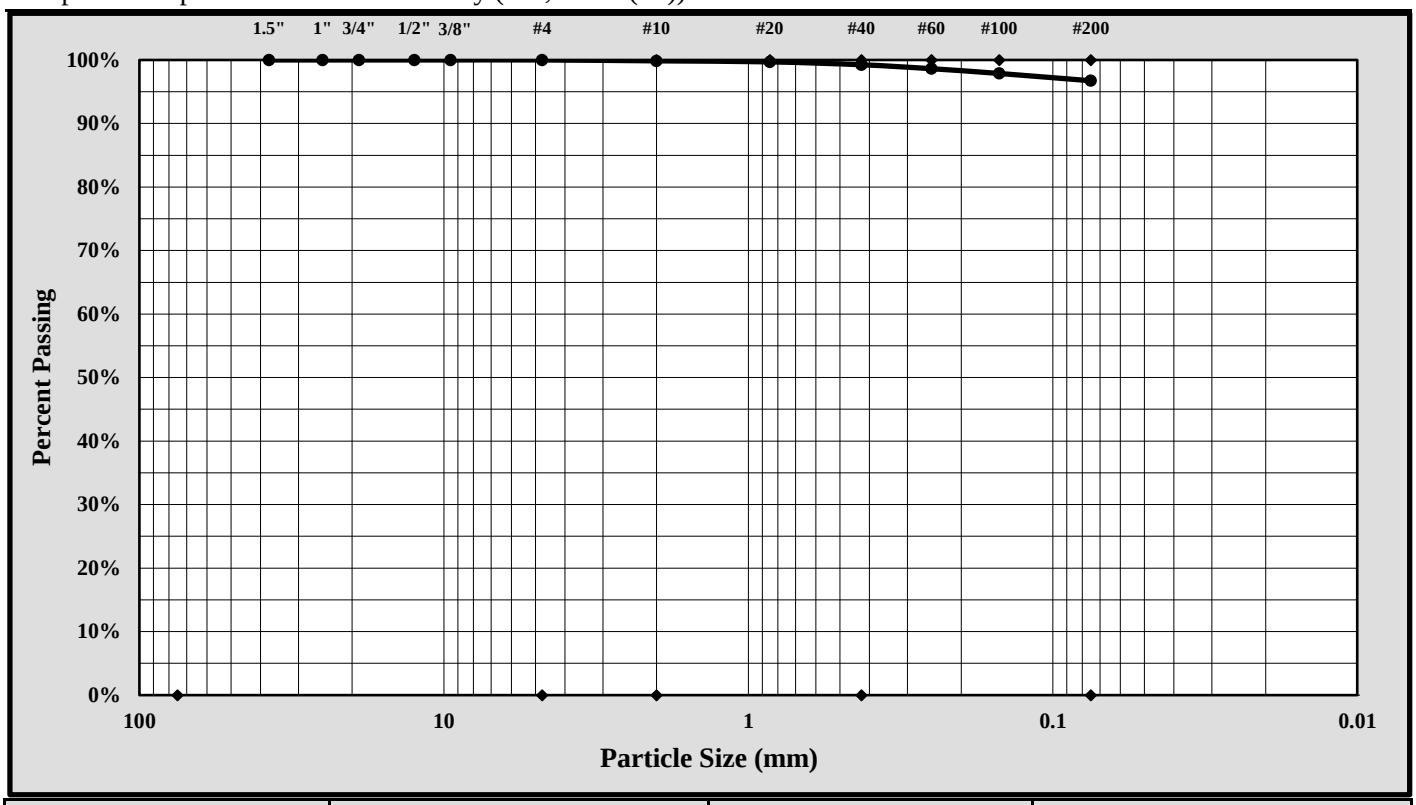
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. - Spartanburg 301 Zima Park Dr. Spartanburg, SC 29301

S&ME Project #:	1461-16-047.2B	Report Date:	3/14/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/20 - 2/23/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-29	Sample #: SS-8	Sample Date: 2/14/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 24.5' - 26.0'
Sample Description:	Fat Clay (CH, A-7-5(67))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	2.00 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	96.7%	Total Sand:	3.3%

Liquid Limit	89	Plastic Limit	31	Plastic Index	58
Coarse Sand:	0.1%	Medium Sand:	0.6%	Fine Sand:	2.5%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/14/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ *AASHTO T 89* ☐ *AASHTO T 90* ☐

S&ME, Inc. - Spartanburg: 301 Zima Park Drive, Spartanburg, SC 29301

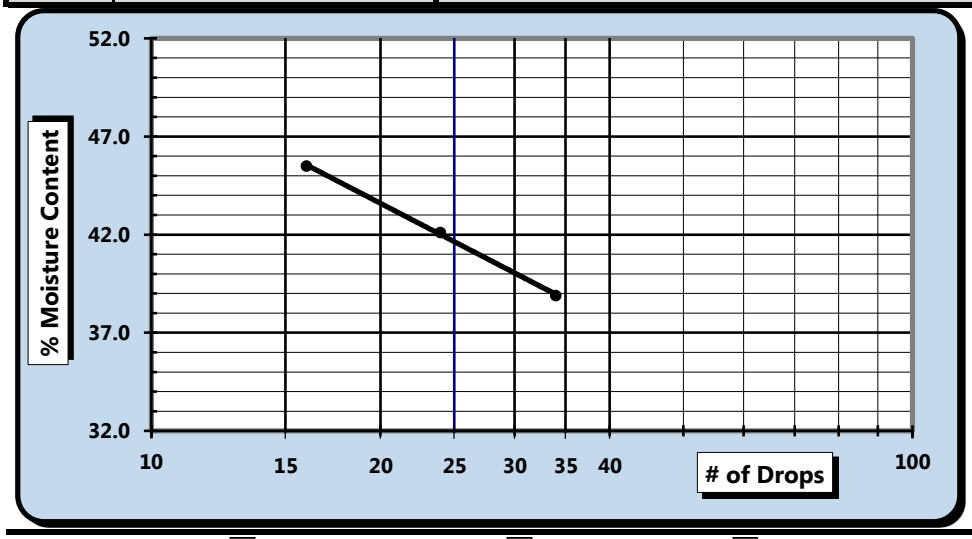
Project #:	1461-16-047.2B	Report Date:	3/14/18
Project Name:	Carolina Crossroads Project	Test Date:	3/13/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-29	Sample #:	SS-12	Sample Date:	2/14/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	44.5' - 46.0'

Sample Description: Silt (ML, A-7-6(15))

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	7537	1/31/2018	Grooving tool	14185	9/12/2017
LL Apparatus	13859	9/12/2017			
Oven	7313	7/28/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	Z-1	Z-2	Z-3				7	9	
A	Tare Weight	15.92	16.61	16.77				12.00	12.25	
B	Wet Soil Weight + A	36.18	36.51	36.73				19.89	19.61	
C	Dry Soil Weight + A	30.51	30.61	30.49				18.16	17.98	
D	Water Weight (B-C)	5.67	5.90	6.24				1.73	1.63	
E	Dry Soil Weight (C-A)	14.59	14.00	13.72				6.16	5.73	
F	% Moisture (D/E)*100	38.9%	42.1%	45.5%				28.1%	28.4%	
N	# OF DROPS	34	24	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							28.3%		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**42**
Plastic Limit	**28**
Plastic Index	**14**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matt Jacobs	NICET 118202	Matthew F. Cooke, P.G.	3/14/18
Technician Name	*Certification#*	*Technical Responsibility*	*Date*

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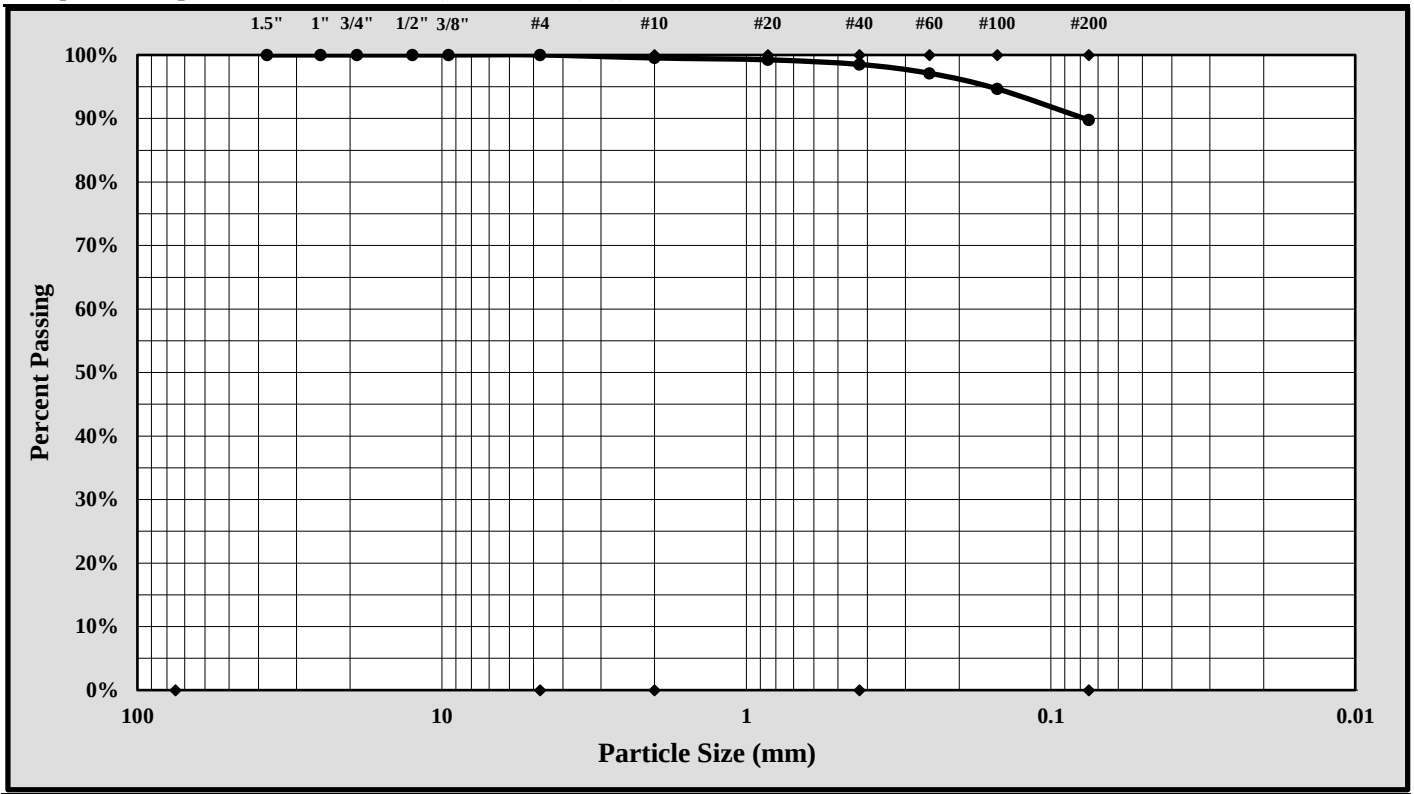
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. - Spartanburg 301 Zima Park Dr. Spartanburg, SC 29301

S&ME Project #:	1461-16-047.2B	Report Date:	3/14/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/20 - 2/23/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-29	Sample #: SS-12	Sample Date: 2/14/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 44.5' - 46.0'
Sample Description:	Silt (ML, A-7-6(15))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	2.00 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	89.8%	Total Sand:	10.2%

Liquid Limit	42	Plastic Limit	28	Plastic Index	14
Coarse Sand:	0.5%	Medium Sand:	1.0%	Fine Sand:	8.8%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/14/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

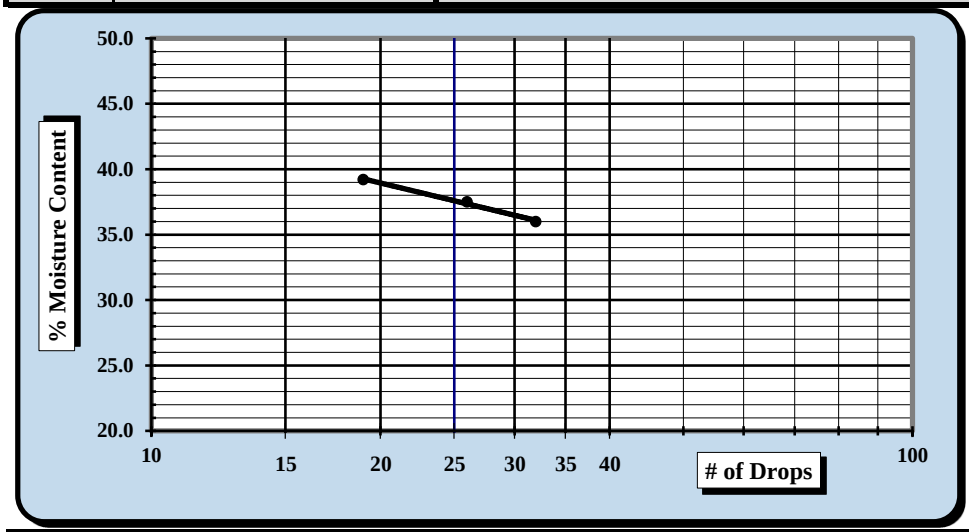
S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	4/30/18
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-30	Sample #: SS-3		Sample Date: Various	
Location:	Bridge Boring	Offset: N/A		Depth: 4.0' - 6.0'	
Sample Description:	Clayey Sand (SC, A-6 (5))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

		Liquid Limit						Plastic Limit		
Pan #	175									
	Tare #:	45	46	47				48	49	
A	Tare Weight	15.28	15.89	15.70				15.35	15.34	
B	Wet Soil Weight + A	27.75	26.38	26.57				22.76	22.54	
C	Dry Soil Weight + A	24.45	23.52	23.51				21.72	21.53	
D	Water Weight (B-C)	3.30	2.86	3.06				1.04	1.01	
E	Dry Soil Weight (C-A)	9.17	7.63	7.81				6.37	6.19	
F	% Moisture (D/E)*100	36.0%	37.5%	39.2%				16.3%	16.3%	
N	# OF DROPS	32	26	19				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**16.3%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**37**
Plastic Limit	**16**
Plastic Index	**21**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		4/30/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

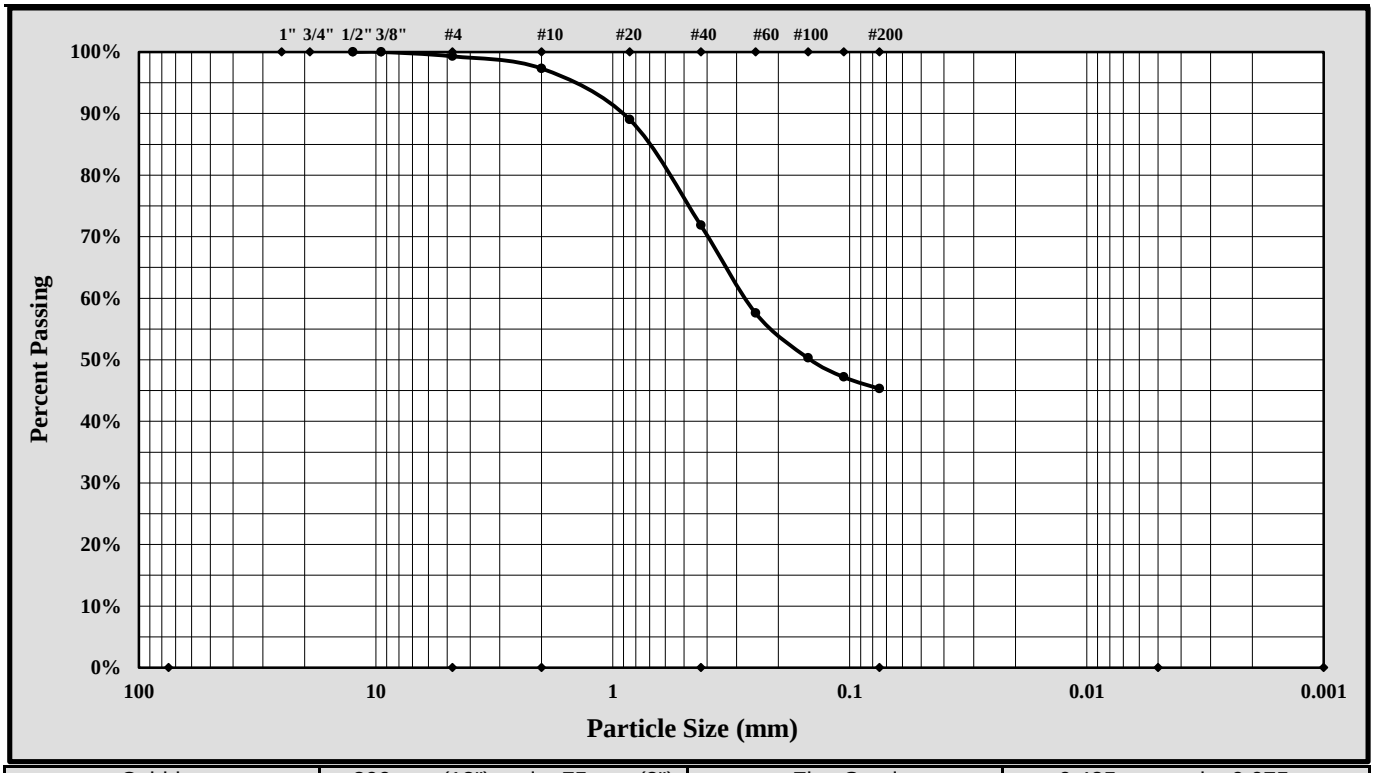
ASTM D6913/D7928

Quality Assurance

Sample Log No.:

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	B-30 Type: Split Spoon	Sample Date:	Various
Location:	Bridge Boring Sample No.: SS-3	Depth:	4.0' - 6.0'
Sample Description:	Clayey Sand (SC, A-6 (5))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	0.7%
Silt & Clay (% Passing #200):	45.3%	Total Sand:	54.0%
Assumed Specific Gravity:	2.65		
Liquid Limit	37	Plastic Limit	16
		Plastic Index	21

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded	☐	Angular	☒	Hard & Durable	☒	Soft	☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter				

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	5/7/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

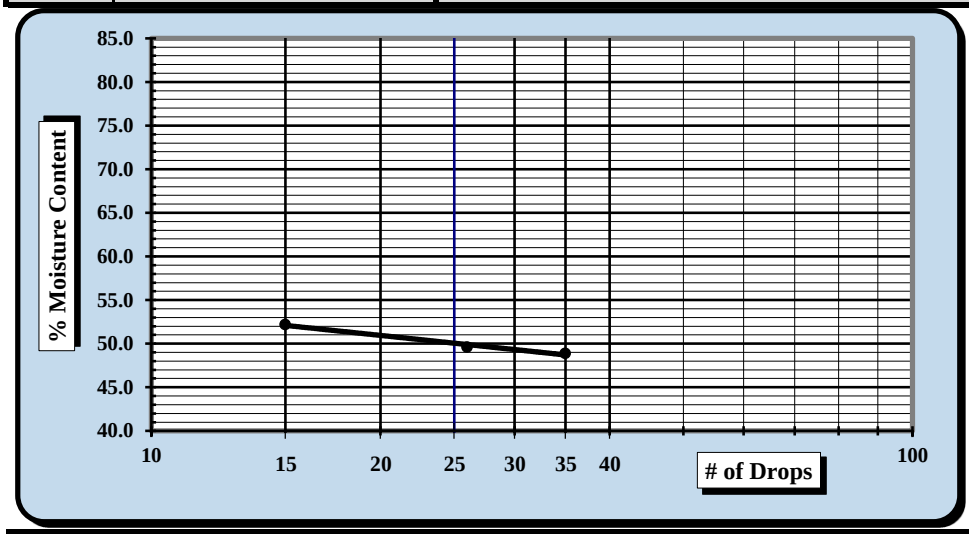
ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-3-18
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-30	Sample #: SS-8	Sample Date: Various
Location:	Bridge Boring	Offset: N/A	Depth: 23.5' - 25.0'
Sample Description:	Fat Clay (CH, A-7-6 (25))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 324		Liquid Limit						Plastic Limit		
	Tare #:	25	26	27				28	65	
A	Tare Weight	15.23	16.02	15.97				16.08	16.04	
B	Wet Soil Weight + A	27.41	29.47	29.20				22.15	22.57	
C	Dry Soil Weight + A	23.41	25.01	24.66				20.88	21.24	
D	Water Weight (B-C)	4.00	4.46	4.54				1.27	1.33	
E	Dry Soil Weight (C-A)	8.18	8.99	8.69				4.80	5.20	
F	% Moisture (D/E)*100	48.9%	49.6%	52.2%				26.5%	25.6%	
N	# OF DROPS	35	26	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**26.1%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**50**
Plastic Limit	**26**
Plastic Index	**24**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		5/4/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Particle Size Analysis of Soils

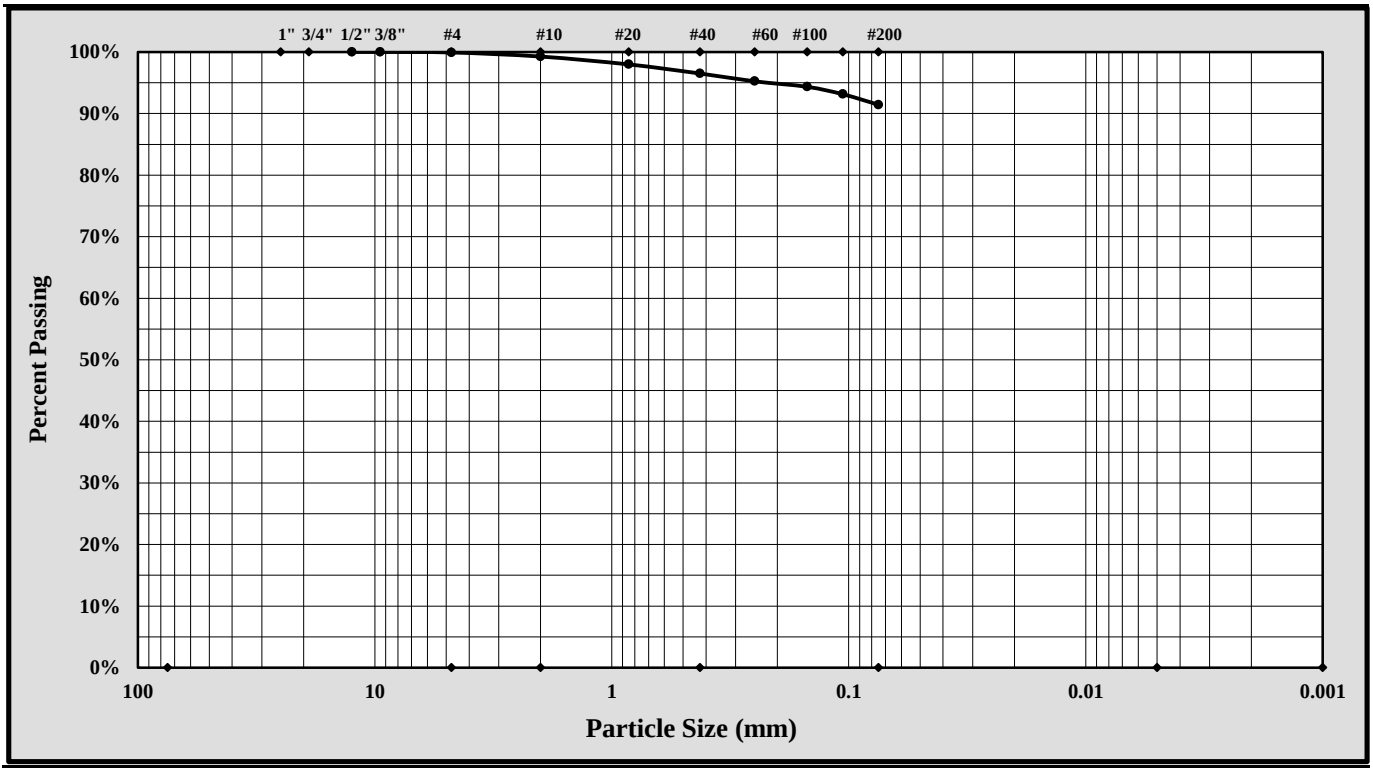
ASTM D6913/D7928

Sample Log No.:

Quality Assurance

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	B-30 Type: Split Spoon	Sample Date:	Various
Location:	Bridge Boring Sample No.: SS-8	Depth:	23.5' - 25.0'
Sample Description:	Fat Clay (CH, A-7-6 (25))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	0.1%
Silt & Clay (% Passing #200):	91.4%	Total Sand:	8.5%
Assumed Specific Gravity:	2.65		

Liquid Limit	50	Plastic Limit	26	Plastic Index	24

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	5/7/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

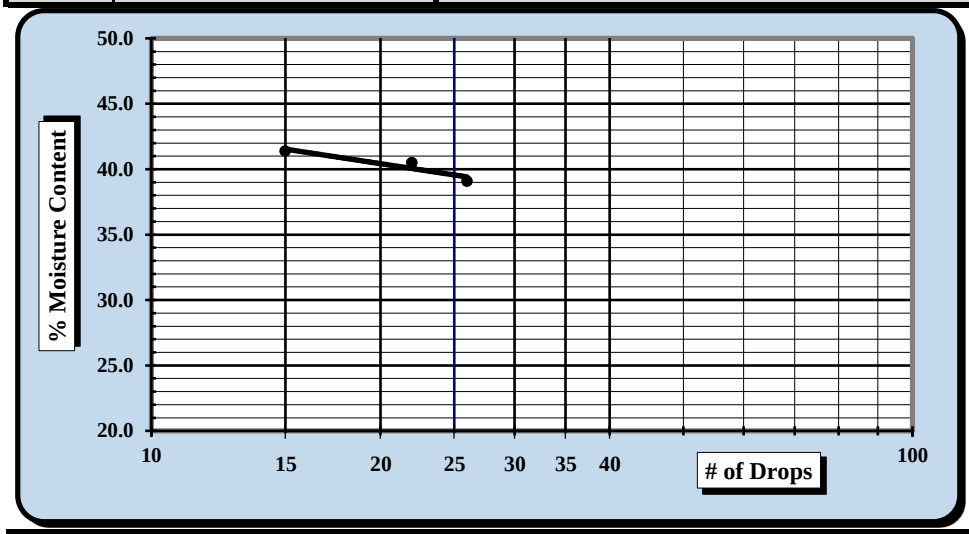
ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-4-18
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-30	Sample #: SS-19	Sample Date: Various
Location:	Bridge Boring	Offset: N/A	Depth: 63.5' - 65.0'
Sample Description:	Silt with Sand (ML, A-6 (9))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 384		Liquid Limit						Plastic Limit		
	Tare #:	30	31	32				35	36	
A	Tare Weight	15.20	15.99	15.13				15.48	15.12	
B	Wet Soil Weight + A	27.52	28.17	29.41				21.55	21.70	
C	Dry Soil Weight + A	24.06	24.66	25.23				20.20	20.27	
D	Water Weight (B-C)	3.46	3.51	4.18				1.35	1.43	
E	Dry Soil Weight (C-A)	8.86	8.67	10.10				4.72	5.15	
F	% Moisture (D/E)*100	39.1%	40.5%	41.4%				28.6%	27.8%	
N	# OF DROPS	26	22	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**28.2%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**39**
Plastic Limit	**28**
Plastic Index	**11**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		5/4/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

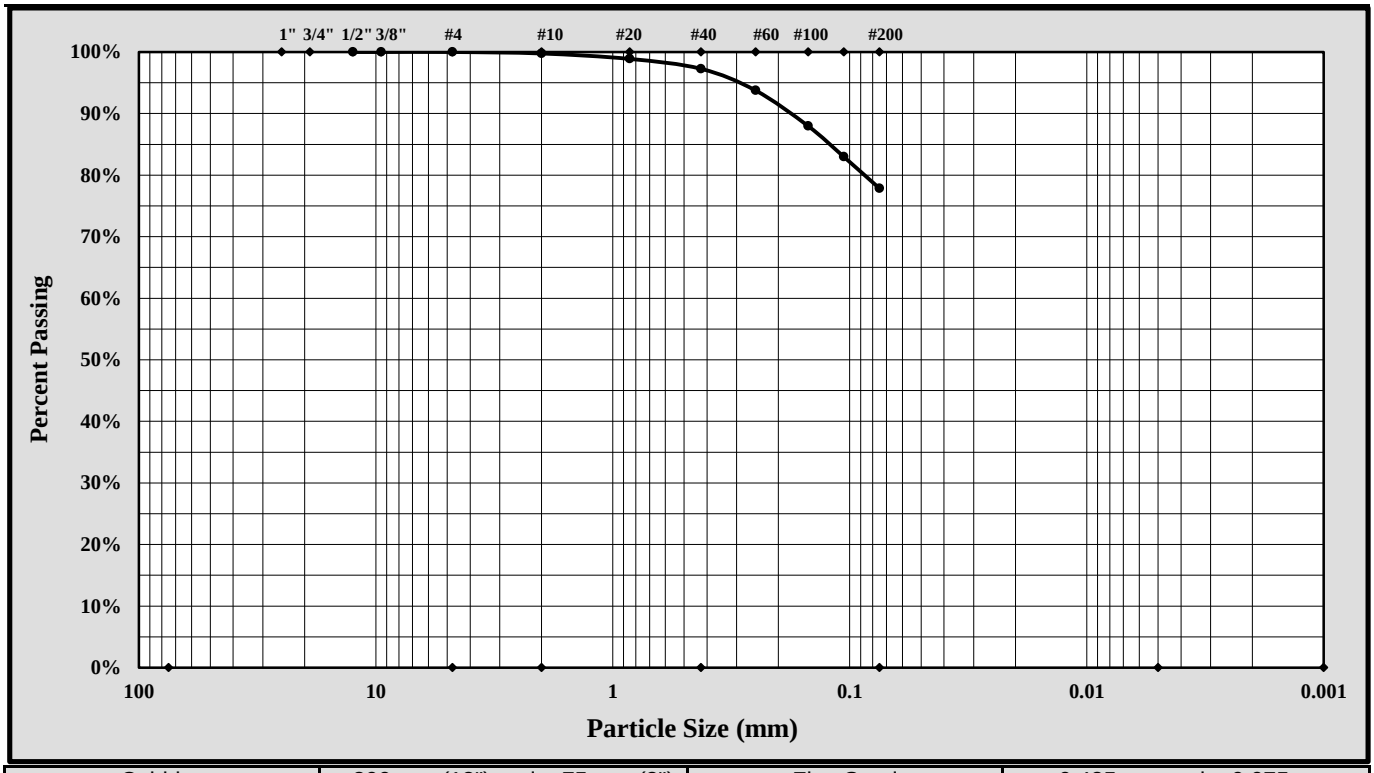
ASTM D6913/D7928

Quality Assurance

Sample Log No.:

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	B-30 Type: Split Spoon	Sample Date:	Various
Location:	Bridge Boring Sample No.: SS-16	Depth:	63.5' - 65.0'
Sample Description:	Silt with Sand (ML, A-6 (9))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	0.0%
Silt & Clay (% Passing #200):	77.9%	Total Sand:	22.1%
Assumed Specific Gravity:	2.65		

Liquid Limit	39	Plastic Limit	28	Plastic Index	11

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*

Project Manager — *Position*

6/7/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

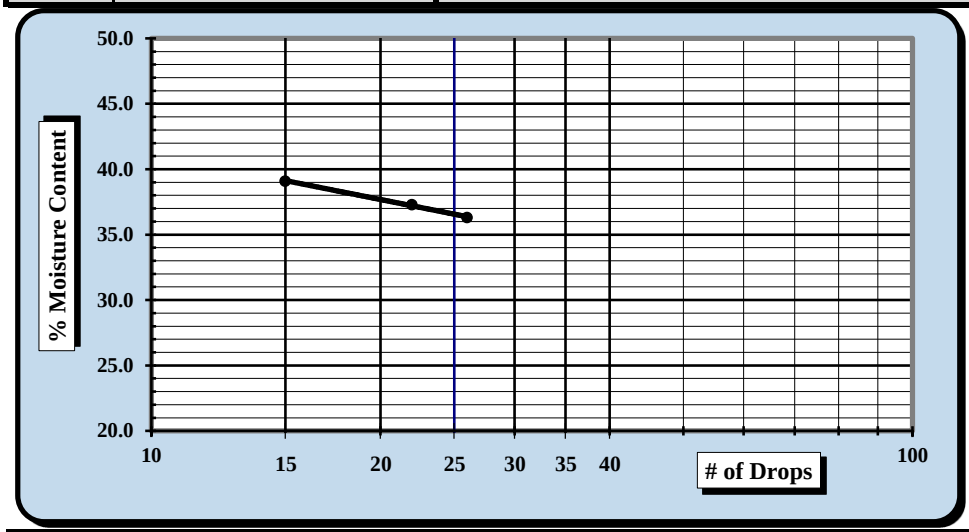
ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-4-18
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-30	Sample #: SS-19	Sample Date: Various
Location:	Bridge Boring	Offset: N/A	Depth: 78.5' - 80.0'
Sample Description:	Silt with Sand (ML, A-6 (8))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 384		Liquid Limit						Plastic Limit		
	Tare #:	30	31	32				35	36	
A	Tare Weight	15.35	15.45	15.18				15.98	15.10	
B	Wet Soil Weight + A	28.18	30.09	27.28				22.46	21.31	
C	Dry Soil Weight + A	24.76	26.11	23.88				21.14	20.08	
D	Water Weight (B-C)	3.42	3.98	3.40				1.32	1.23	
E	Dry Soil Weight (C-A)	9.41	10.66	8.70				5.16	4.98	
F	% Moisture (D/E)*100	36.3%	37.3%	39.1%				25.6%	24.7%	
N	# OF DROPS	26	22	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**25.2%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**36**
Plastic Limit	**25**
Plastic Index	**11**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		5/4/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

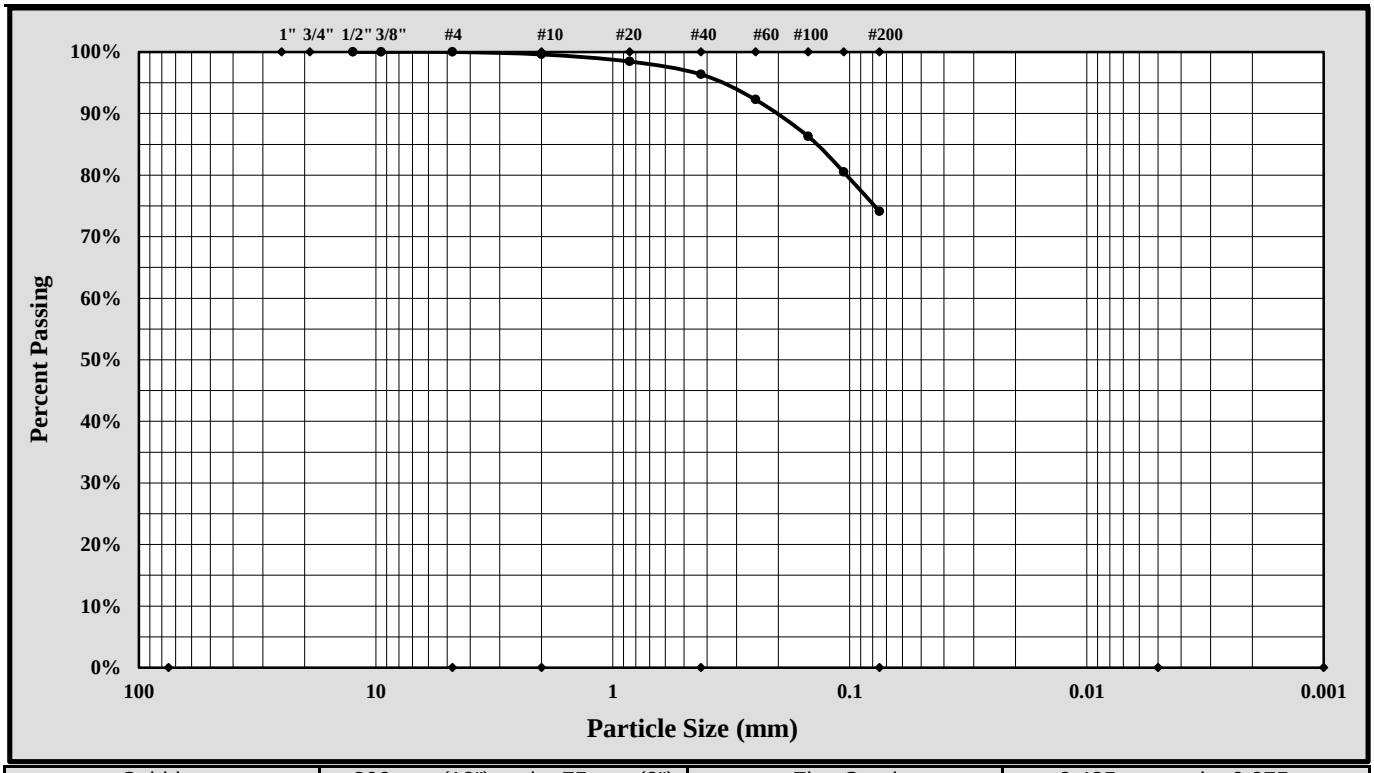
ASTM D6913/D7928

Quality Assurance

Sample Log No.:

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	B-30 Type: Split Spoon	Sample Date:	Various
Location:	Bridge Boring Sample No.: SS-19	Depth:	78.5' - 80.0'
Sample Description:	Silt with Sand (ML, A-6 (8))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	0.0%
Silt & Clay (% Passing #200):	74.1%	Total Sand:	25.9%
Assumed Specific Gravity:	2.65		

Liquid Limit	36	Plastic Limit	25	Plastic Index	11

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	5/7/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

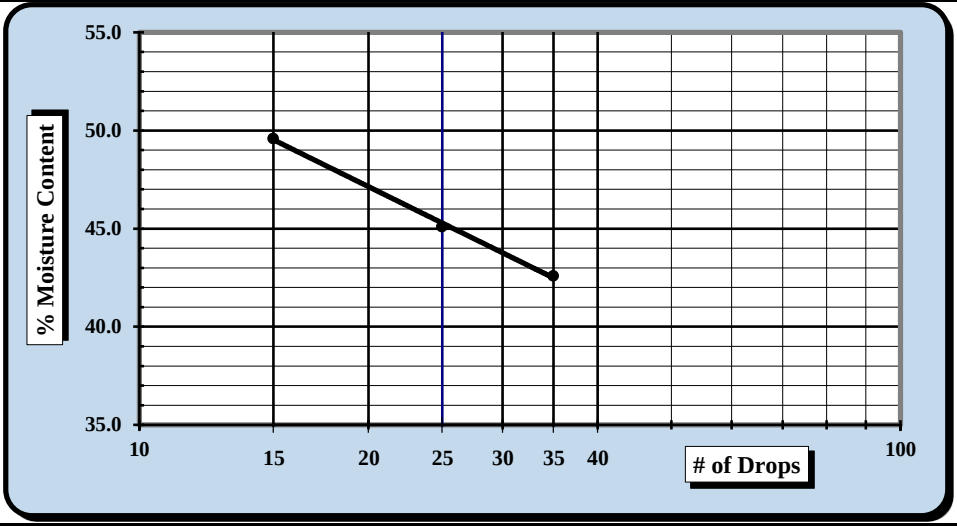
Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date:	4/24/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-31	Sample #:	SS-1	Sample Date:	3/05/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	0.0' - 2.0'

Sample Description: Silt with Sand (ML, A-7-6(13))

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	21	22	23				24	25	
A	Tare Weight	28.08	25.68	27.34				25.99	26.80	
B	Wet Soil Weight + A	42.14	38.99	42.57				33.46	34.67	
C	Dry Soil Weight + A	37.94	34.85	37.52				31.84	32.93	
D	Water Weight (B-C)	4.20	4.14	5.05				1.62	1.74	
E	Dry Soil Weight (C-A)	9.86	9.17	10.18				5.85	6.13	
F	% Moisture (D/E)*100	42.6%	45.1%	49.6%				27.7%	28.4%	
N	# OF DROPS	35	25	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**28.1%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**45**
Plastic Limit	**28**
Plastic Index	**17**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/27/18	Matthew F. Cooke, P.G.	4/27/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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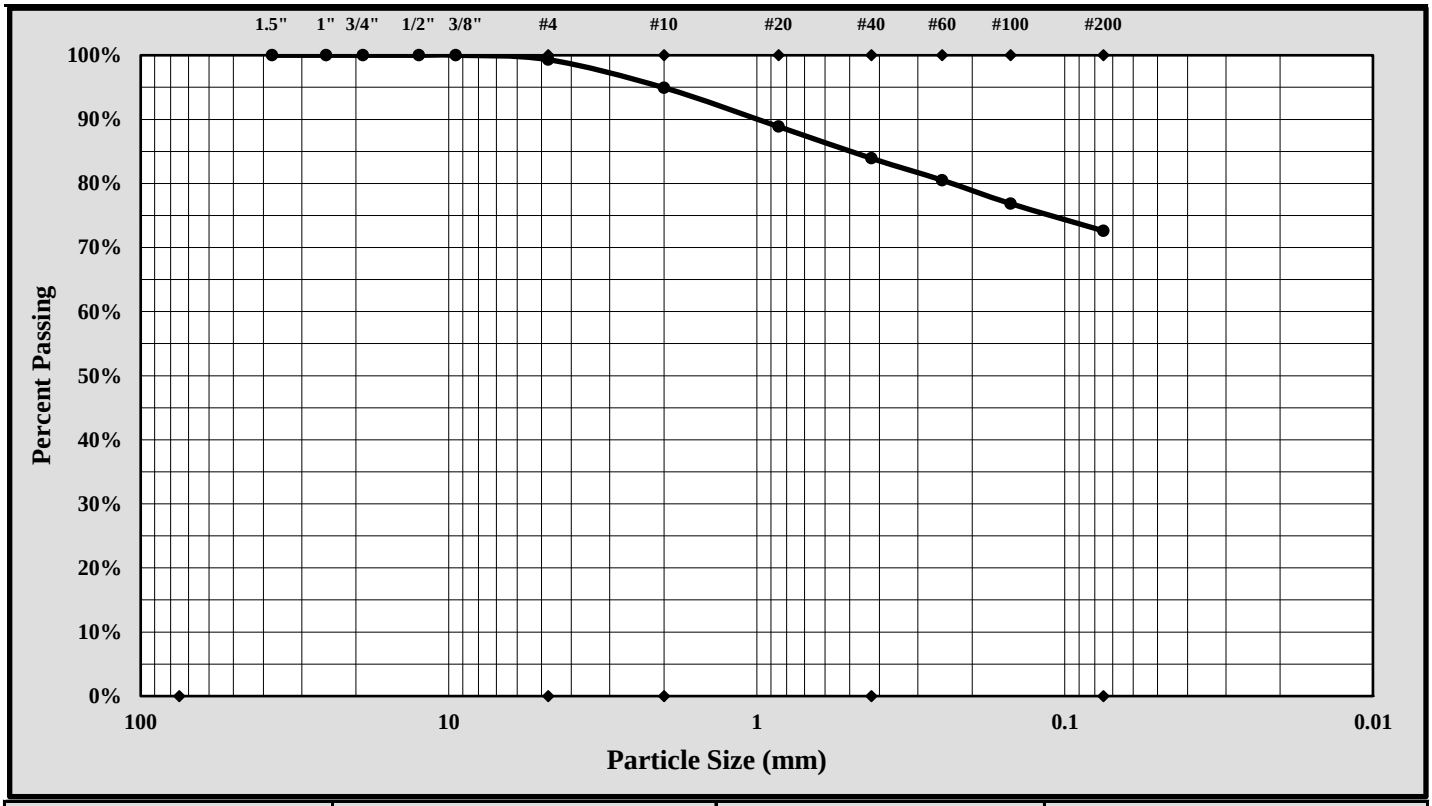
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/15 - 4/26/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-31 Sample #: SS-1	Sample Date:	3/05/18
Location:	Bridge Boring Type: Split-spoon	Depth:	0.0' - 2.0'
Sample Description:	Silt with Sand (ML, A-7-6(13))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.7%
Silt & Clay (% Passing #200):	72.6%	Total Sand:	26.7%

Liquid Limit	45	Plastic Limit	28	Plastic Index	17
Coarse Sand:	4.4%	Medium Sand:	11.0%	Fine Sand:	11.3%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

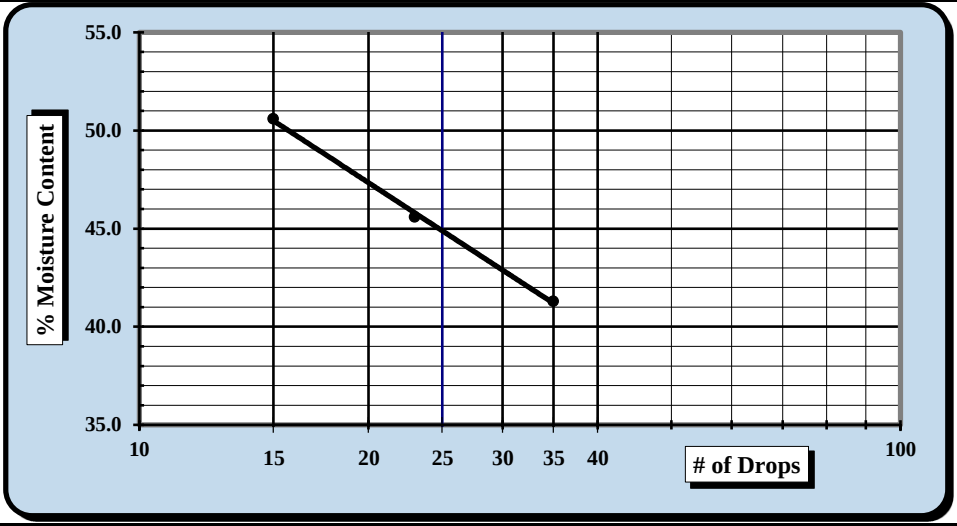
Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date:	4/24/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-31	Sample #:	SS-5	Sample Date:	3/05/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	8.0' - 10.0'

Sample Description: Silt with Sand (ML, A-7-5(13))

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	26	27	28				29	30	
A	Tare Weight	27.35	27.00	26.83				26.99	27.37	
B	Wet Soil Weight + A	43.75	44.31	40.34				32.99	34.43	
C	Dry Soil Weight + A	38.96	38.89	35.80				31.51	32.73	
D	Water Weight (B-C)	4.79	5.42	4.54				1.48	1.70	
E	Dry Soil Weight (C-A)	11.61	11.89	8.97				4.52	5.36	
F	% Moisture (D/E)*100	41.3%	45.6%	50.6%				32.7%	31.7%	
N	# OF DROPS	35	23	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**32.2%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**45**
Plastic Limit	**32**
Plastic Index	**13**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/27/18	Matthew F. Cooke, P.G.	4/27/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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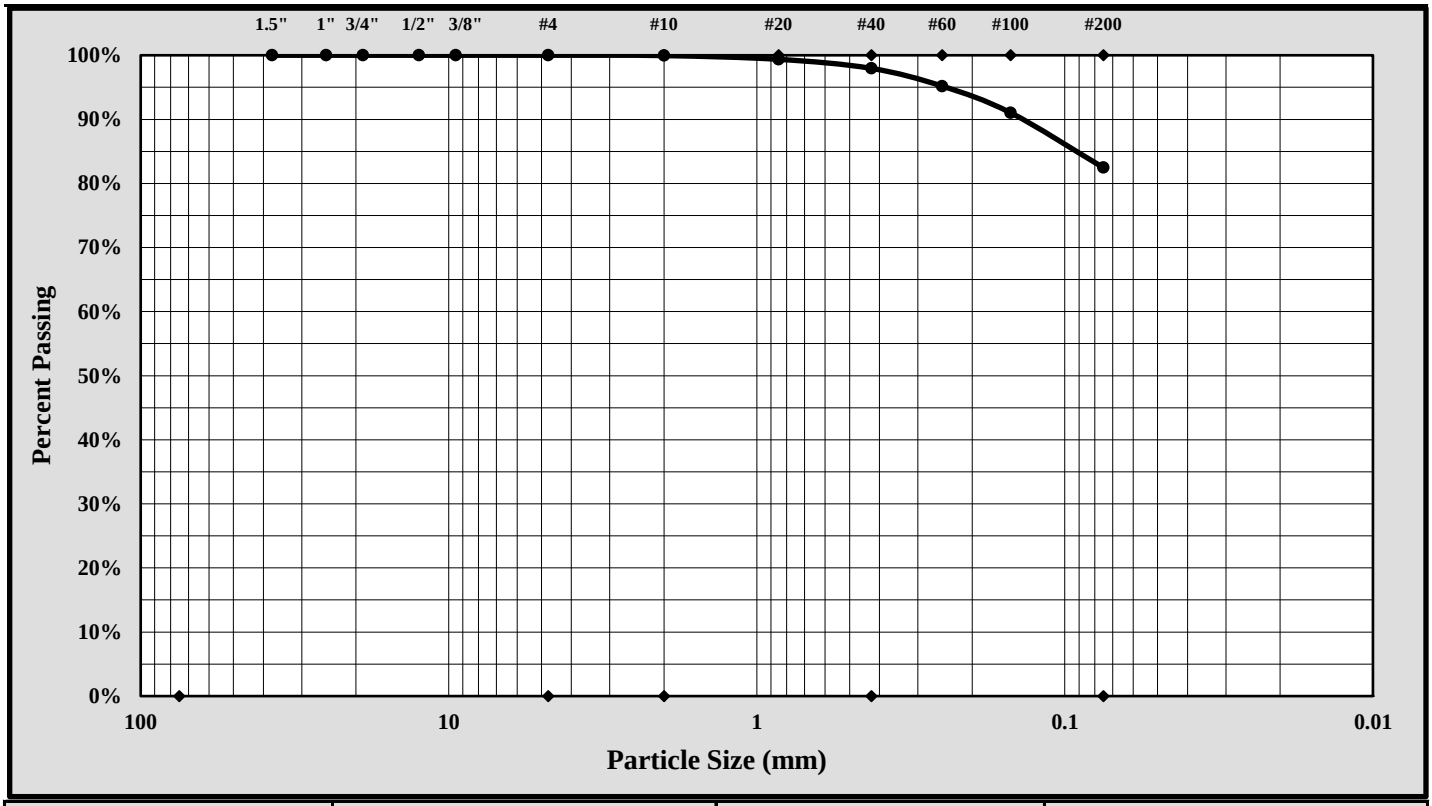
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/15 - 4/26/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-31	Sample #: SS-5	Sample Date: 3/05/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 8.0' - 10.0'
Sample Description:	Silt with Sand (ML, A-7-5(13))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	0.85 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	82.5%	Total Sand:	17.5%

Liquid Limit	45	Plastic Limit	32	Plastic Index	13
Coarse Sand:	0.1%	Medium Sand:	2.0%	Fine Sand:	15.5%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

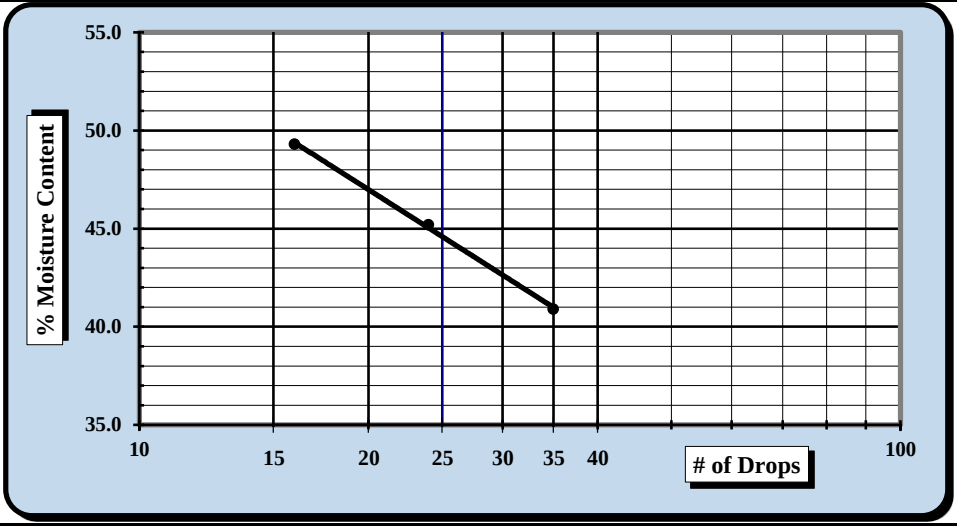
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/04/18
Project Name:	Carolina Crossroads Project	Test Date:	5/03/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-32	Sample #:	SS-1	Sample Date:	3/13/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	0.0' - 2.0'
Sample Description:	Clayey Sand with Gravel (SC, A-7-6(8))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	1	2	3				4	5	
A	Tare Weight	26.69	26.47	26.32				25.92	26.94	
B	Wet Soil Weight + A	40.60	39.16	38.92				32.09	33.16	
C	Dry Soil Weight + A	36.56	35.21	34.76				31.01	32.07	
D	Water Weight (B-C)	4.04	3.95	4.16				1.08	1.09	
E	Dry Soil Weight (C-A)	9.87	8.74	8.44				5.09	5.13	
F	% Moisture (D/E)*100	40.9%	45.2%	49.3%				21.2%	21.2%	
N	# OF DROPS	35	24	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**21.2%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**45**
Plastic Limit	**21**
Plastic Index	**24**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/04/18	Matthew F. Cooke, P.G.	5/04/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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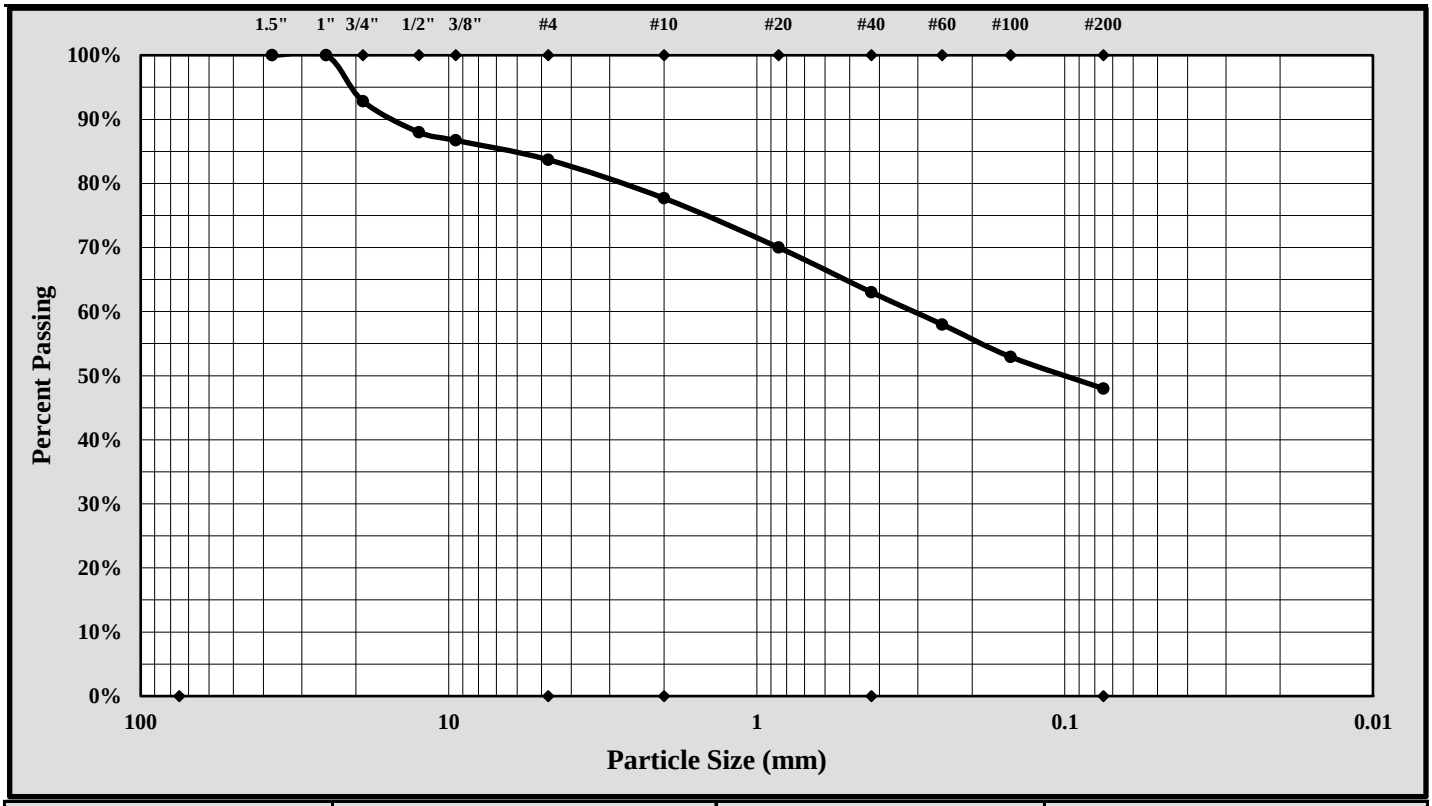
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/04/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/02 - 5/04/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-32	Sample #: SS-1	Sample Date: 3/13/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 0.0' - 2.0'
Sample Description:	Clayey Sand with Gravel (SC, A-7-6(8))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	25.0 mm	Gravel:	16.3%
Silt & Clay (% Passing #200):	48.0%	Total Sand:	35.7%

Liquid Limit	45	Plastic Limit	21	Plastic Index	24
Coarse Sand:	6.0%	Medium Sand:	14.7%	Fine Sand:	15.0%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/04/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

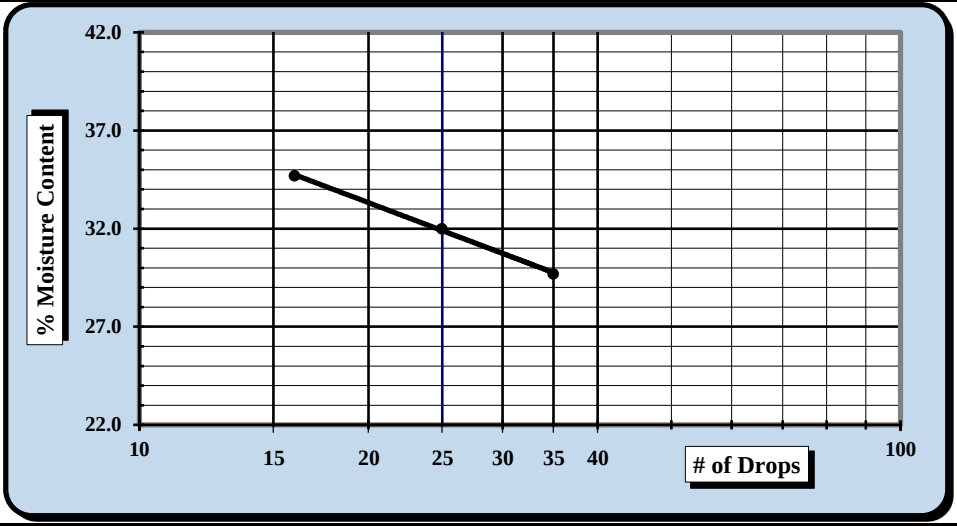
Project #:	1461-16-047.2B	Report Date:	5/04/18
Project Name:	Carolina Crossroads Project	Test Date:	5/03/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-32	Sample #:	SS-2	Sample Date:	3/13/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	2.0' - 4.0'

Sample Description: Clayey Gravel with Sand (GC, A-2-6(0))

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	6	7	8				9	10	
A	Tare Weight	27.76	26.31	27.31				26.83	26.74	
B	Wet Soil Weight + A	40.11	37.53	40.52				33.57	33.21	
C	Dry Soil Weight + A	37.28	34.81	37.12				32.62	32.27	
D	Water Weight (B-C)	2.83	2.72	3.40				0.95	0.94	
E	Dry Soil Weight (C-A)	9.52	8.50	9.81				5.79	5.53	
F	% Moisture (D/E)*100	29.7%	32.0%	34.7%				16.4%	17.0%	
N	# OF DROPS	35	25	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**16.7%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**32**
Plastic Limit	**17**
Plastic Index	**15**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/04/18	Matthew F. Cooke, P.G.	5/04/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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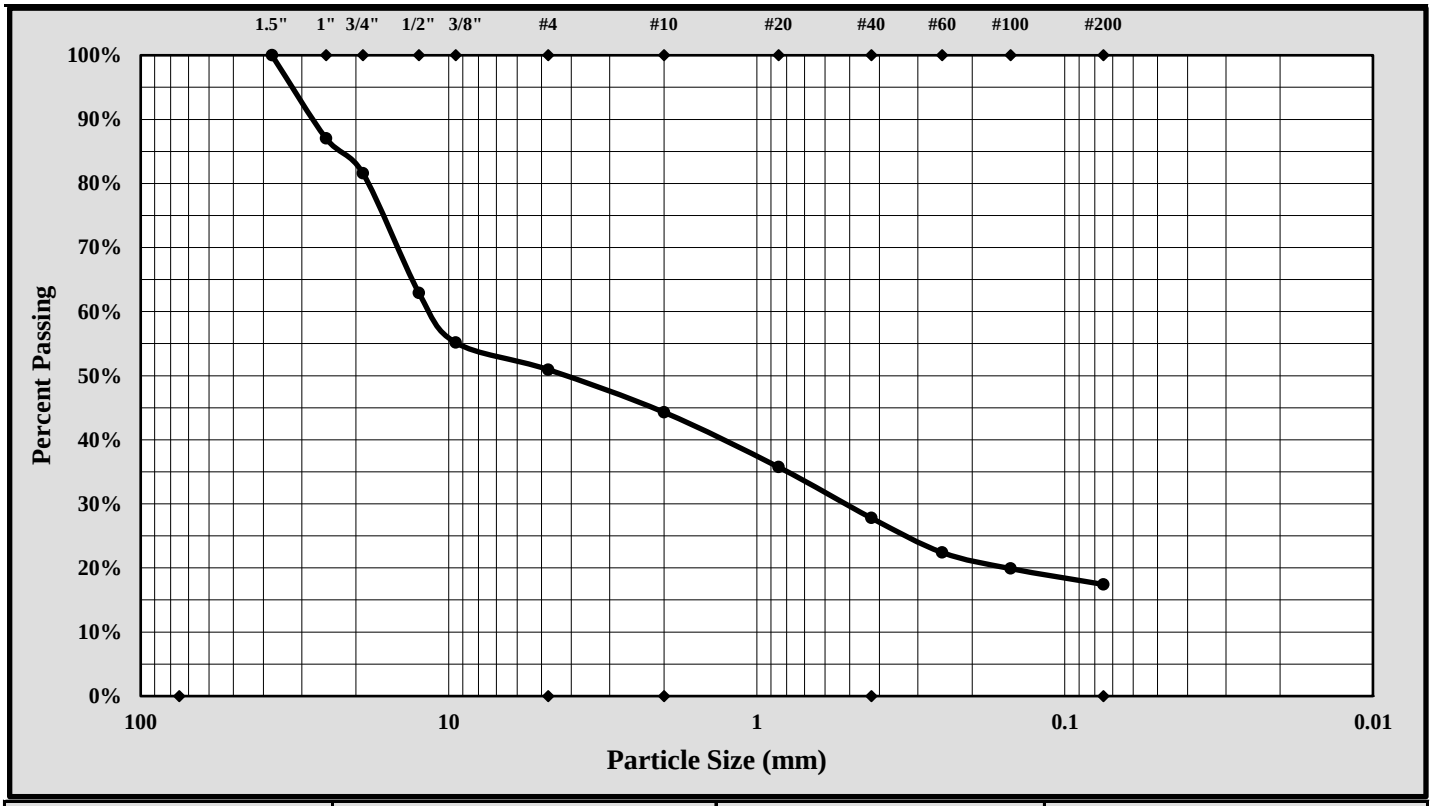
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/04/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/02 - 5/04/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-32 Sample #: SS-2	Sample Date:	3/13/18
Location:	Bridge Boring Type: Split-spoon	Depth:	2.0' - 4.0'
Sample Description:	Clayey Gravel with Sand (GC, A-2-6(0))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	37.5 mm	Gravel:	49.1%
Silt & Clay (% Passing #200):	17.4%	Total Sand:	33.5%

Liquid Limit	32	Plastic Limit	17	Plastic Index	15
Coarse Sand:	6.7%	Medium Sand:	16.5%	Fine Sand:	10.4%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/04/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

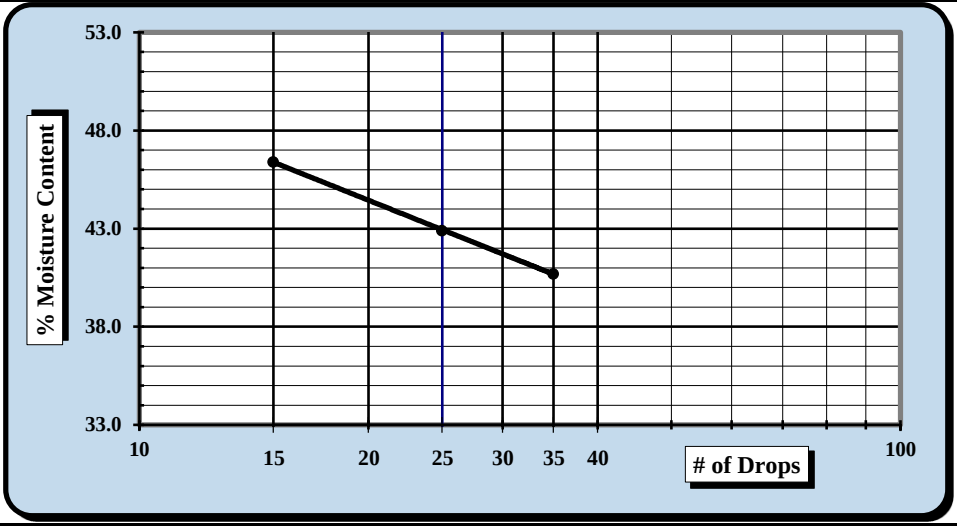
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/04/18
Project Name:	Carolina Crossroads Project	Test Date:	5/03/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-32	Sample #:	SS-4	Sample Date:	3/13/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	6.0' - 8.0'
Sample Description:	Silt with Sand (ML, A-7-5(8))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	11	12	13				14	15	
A	Tare Weight	26.68	26.65	26.77				26.65	27.59	
B	Wet Soil Weight + A	43.84	43.03	42.81				32.78	35.10	
C	Dry Soil Weight + A	38.88	38.11	37.73				31.29	33.30	
D	Water Weight (B-C)	4.96	4.92	5.08				1.49	1.80	
E	Dry Soil Weight (C-A)	12.20	11.46	10.96				4.64	5.71	
F	% Moisture (D/E)*100	40.7%	42.9%	46.4%				32.1%	31.5%	
N	# OF DROPS	35	25	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**31.8%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**43**
Plastic Limit	**32**
Plastic Index	**11**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/04/18	Matthew F. Cooke, P.G.	5/04/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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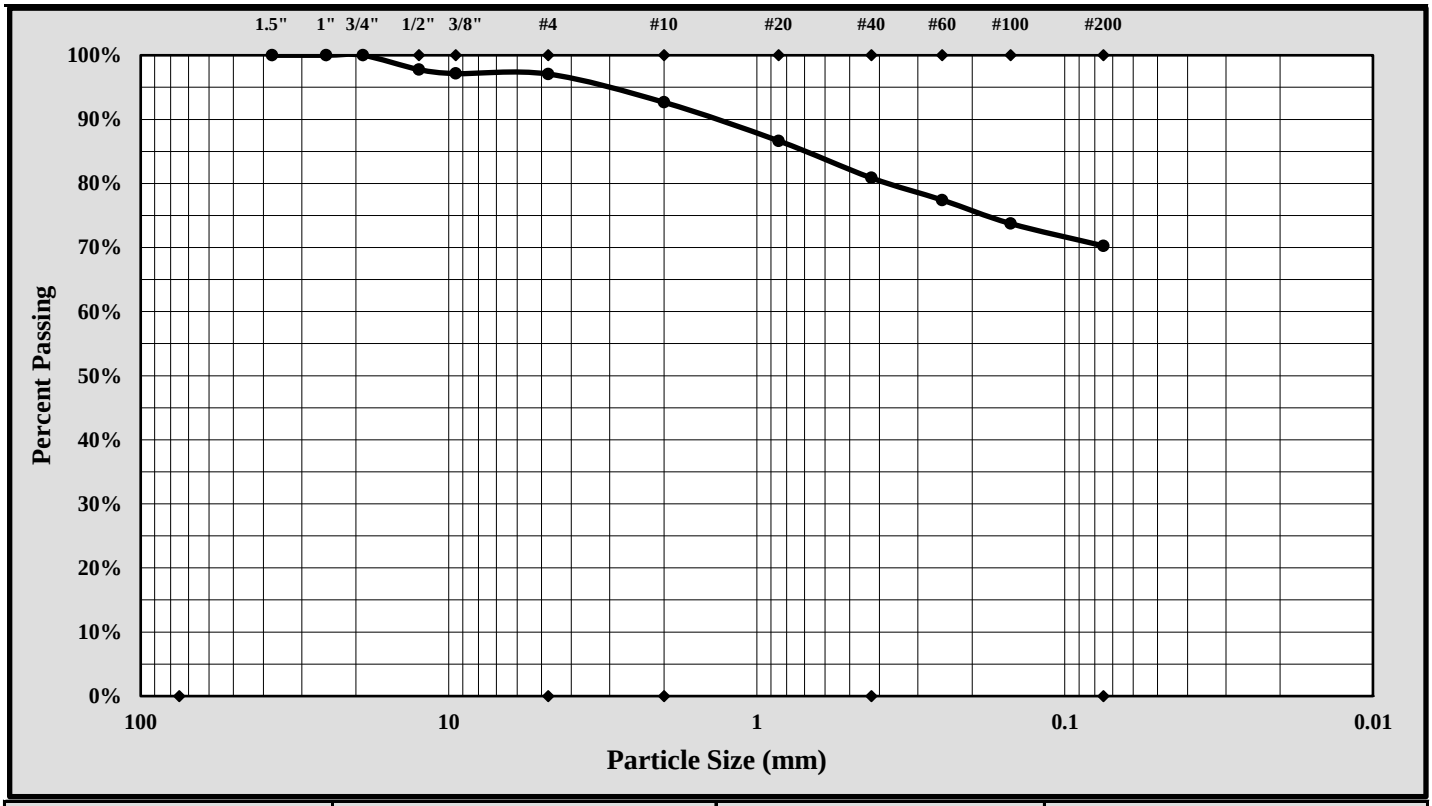
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/04/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/02 - 5/04/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-32 Sample #: SS-4	Sample Date:	3/13/18
Location:	Bridge Boring Type: Split-spoon	Depth:	6.0' - 8.0'
Sample Description:	Silt with Sand (ML, A-7-5(8))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	19.0 mm	Gravel:	2.9%
Silt & Clay (% Passing #200):	70.3%	Total Sand:	26.8%

Liquid Limit	43	Plastic Limit	32	Plastic Index	11
Coarse Sand:	4.4%	Medium Sand:	11.8%	Fine Sand:	10.6%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/04/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

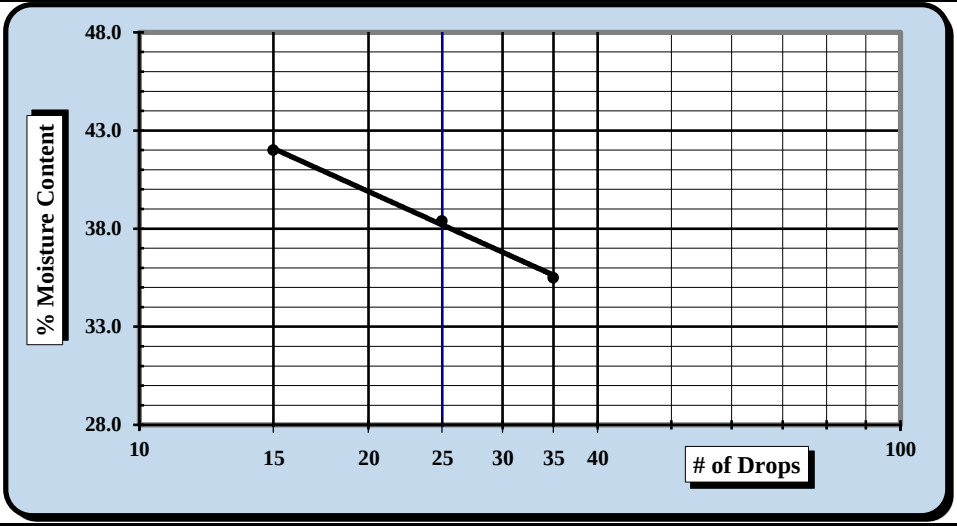
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date:	4/24/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-33	Sample #:	SS-1	Sample Date:	3/08/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	0.0' - 2.0'
Sample Description:	Lean Clay with Sand (CL, A-6(14))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	31	32	33				34	35	
A	Tare Weight	28.59	27.65	26.68				28.25	26.95	
B	Wet Soil Weight + A	41.38	43.63	42.22				34.37	34.44	
C	Dry Soil Weight + A	38.03	39.20	37.62				33.45	33.31	
D	Water Weight (B-C)	3.35	4.43	4.60				0.92	1.13	
E	Dry Soil Weight (C-A)	9.44	11.55	10.94				5.20	6.36	
F	% Moisture (D/E)*100	35.5%	38.4%	42.0%				17.7%	17.8%	
N	# OF DROPS	35	25	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**17.8%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**38**
Plastic Limit	**18**
Plastic Index	**20**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/27/18	Matthew F. Cooke, P.G.	4/27/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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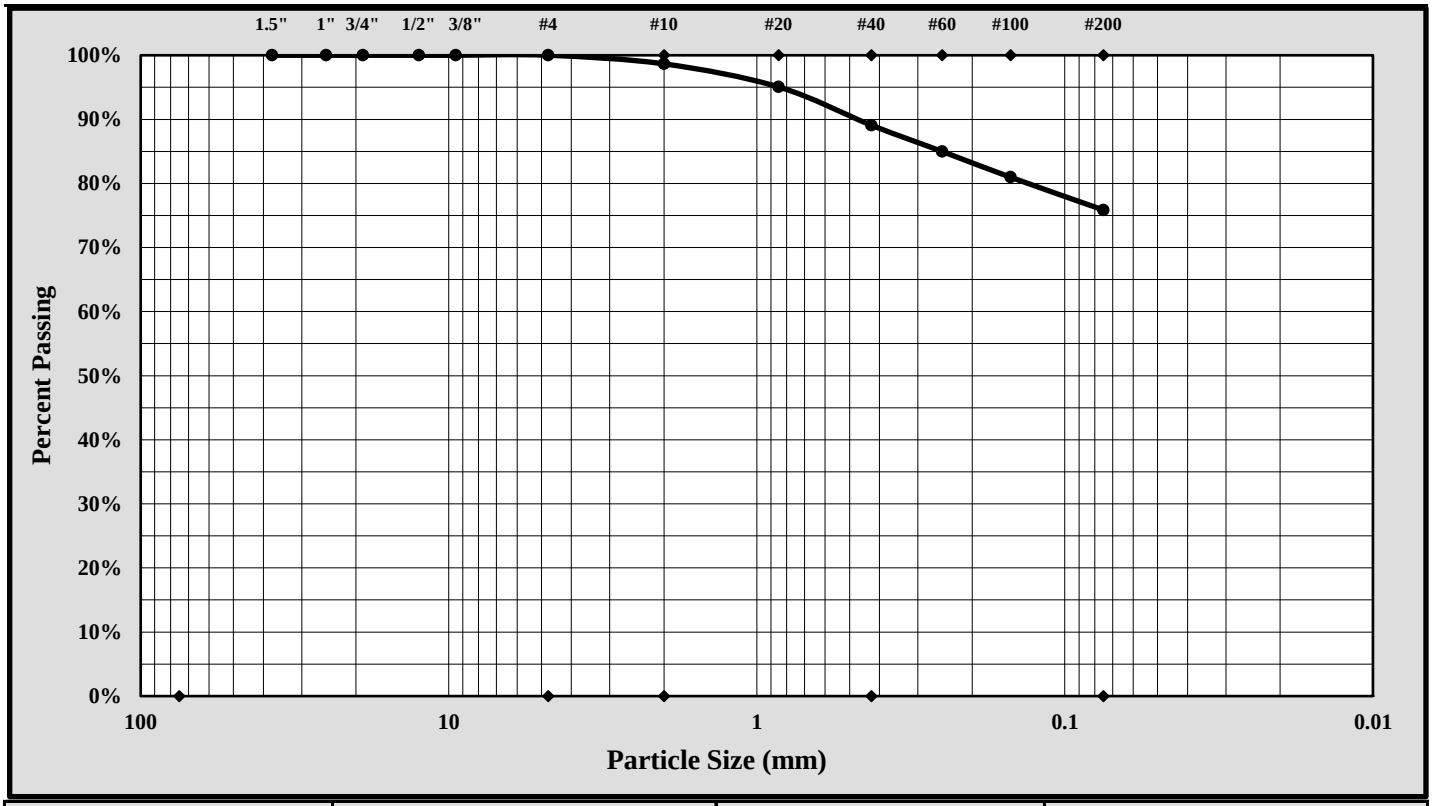
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/15 - 4/26/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-33	Sample #: SS-1	Sample Date: 3/08/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 0.0' - 2.0'
Sample Description:	Lean Clay with Sand (CL, A-6(14))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	75.9%	Total Sand:	24.1%

Liquid Limit	38	Plastic Limit	18	Plastic Index	20
Coarse Sand:	1.3%	Medium Sand:	9.6%	Fine Sand:	13.2%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

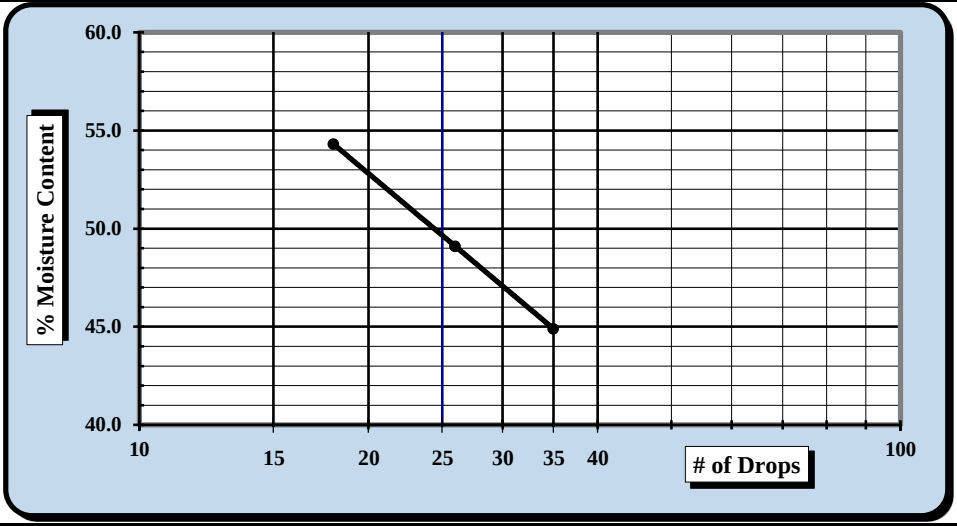
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date:	4/24/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-33	Sample #:	SS-3	Sample Date:	3/08/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	4.0' - 6.0'
Sample Description:	Sandy Elastic Silt [MH, A-7-6(14)]				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	36	37	38				39	40	
A	Tare Weight	25.68	26.21	26.29				25.88	26.27	
B	Wet Soil Weight + A	40.39	42.19	41.52				32.33	33.02	
C	Dry Soil Weight + A	35.83	36.93	36.16				30.88	31.51	
D	Water Weight (B-C)	4.56	5.26	5.36				1.45	1.51	
E	Dry Soil Weight (C-A)	10.15	10.72	9.87				5.00	5.24	
F	% Moisture (D/E)*100	44.9%	49.1%	54.3%				29.0%	28.8%	
N	# OF DROPS	35	26	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**28.9%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**50**
Plastic Limit	**29**
Plastic Index	**21**
Group Symbol	**MH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/27/18	Matthew F. Cooke, P.G.	4/27/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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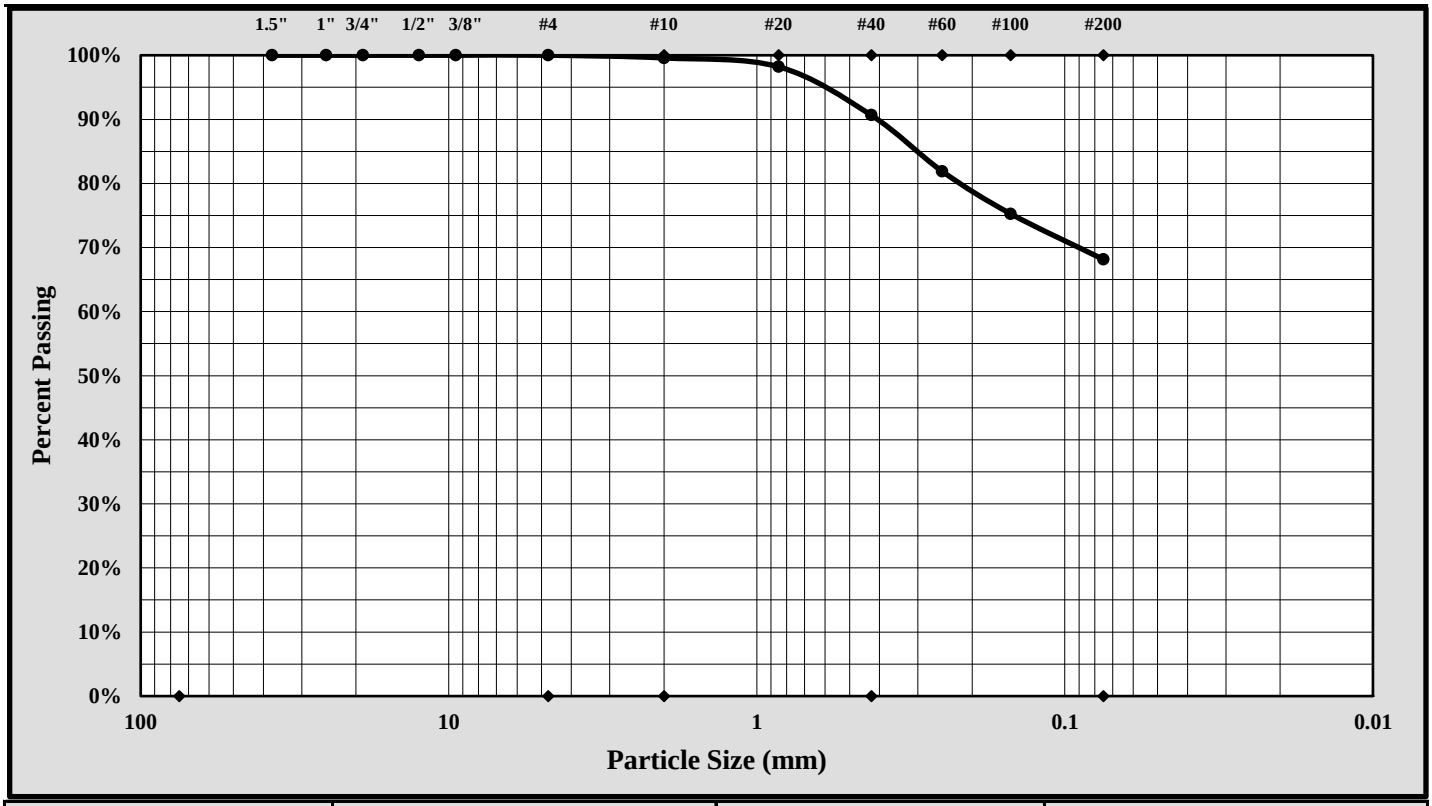
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/15 - 4/26/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-33	Sample #: SS-3	Sample Date: 3/08/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 4.0' - 6.0'
Sample Description:	Sandy Elastic Silt (MH, A-7-6(14))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	2.00 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	68.1%	Total Sand:	31.9%

Liquid Limit	50	Plastic Limit	29	Plastic Index	21
Coarse Sand:	0.4%	Medium Sand:	8.9%	Fine Sand:	22.5%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

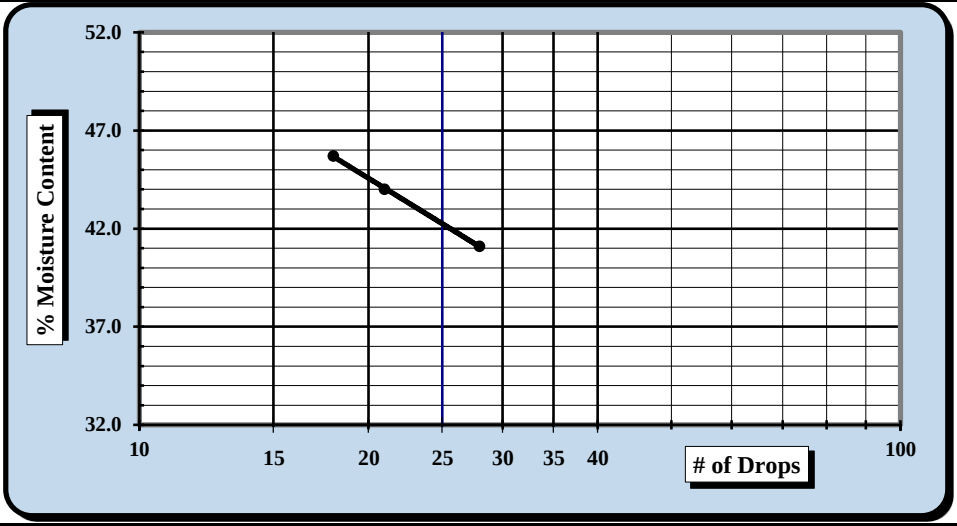
Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date:	4/24/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-33	Sample #:	SS-5	Sample Date:	3/08/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	8.0' - 10.0'

Sample Description: Silt (ML, A-7-5(13))

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	41	42	43				44	45	
A	Tare Weight	28.76	28.63	28.37				25.77	25.09	
B	Wet Soil Weight + A	48.60	46.59	45.75				32.20	31.84	
C	Dry Soil Weight + A	42.82	41.10	40.30				30.68	30.22	
D	Water Weight (B-C)	5.78	5.49	5.45				1.52	1.62	
E	Dry Soil Weight (C-A)	14.06	12.47	11.93				4.91	5.13	
F	% Moisture (D/E)*100	41.1%	44.0%	45.7%				31.0%	31.6%	
N	# OF DROPS	28	21	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**31.3%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**42**
Plastic Limit	**31**
Plastic Index	**11**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/27/18	Matthew F. Cooke, P.G.	4/27/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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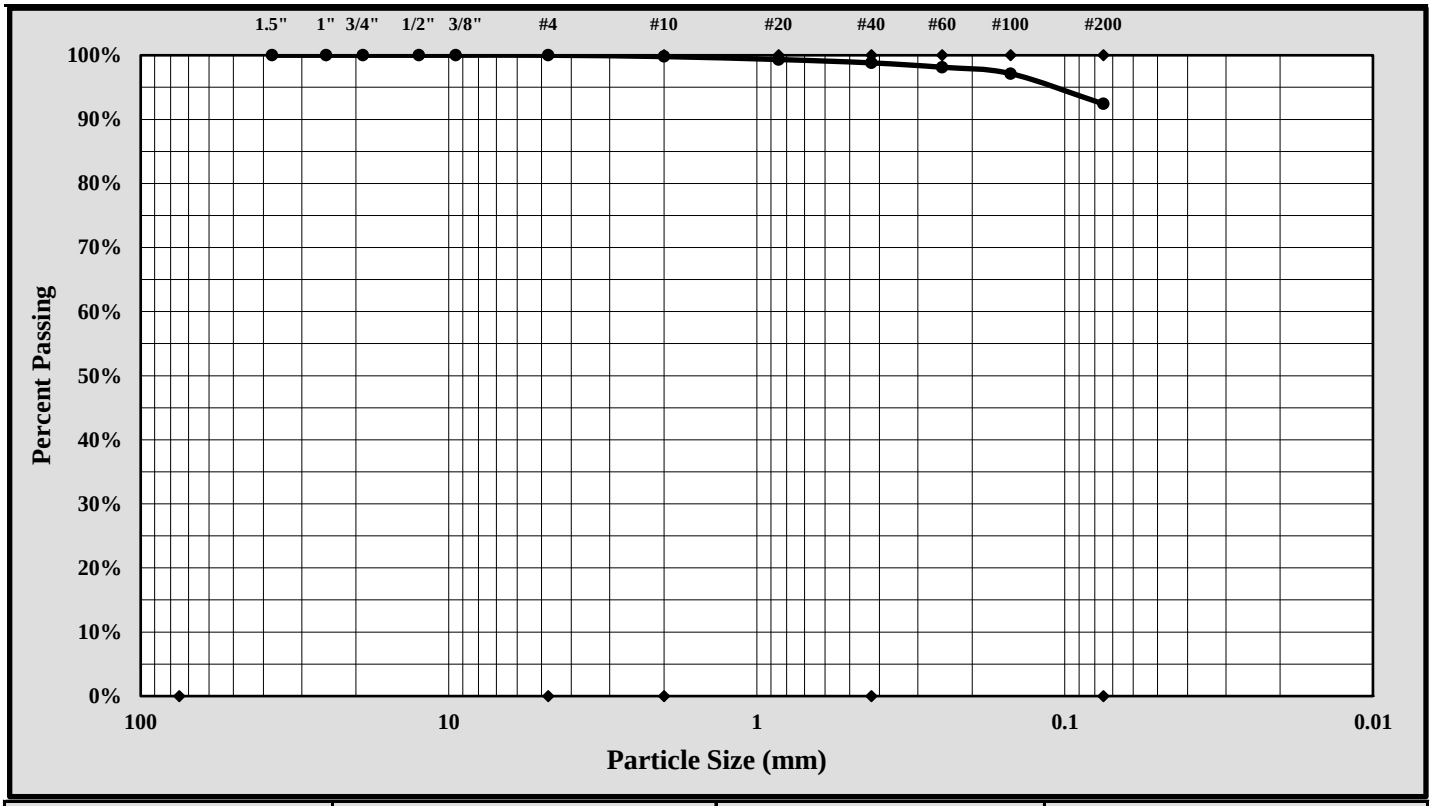
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/15 - 4/27/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-33	Sample #: SS-5	Sample Date: 3/08/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 8.0' - 10.0'
Sample Description:	Silt (ML, A-7-5(13))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	0.85 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	92.4%	Total Sand:	7.6%

Liquid Limit	42	Plastic Limit	31	Plastic Index	11
Coarse Sand:	0.2%	Medium Sand:	1.0%	Fine Sand:	6.4%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ *AASHTO T 89* ☐ *AASHTO T 90* ☐

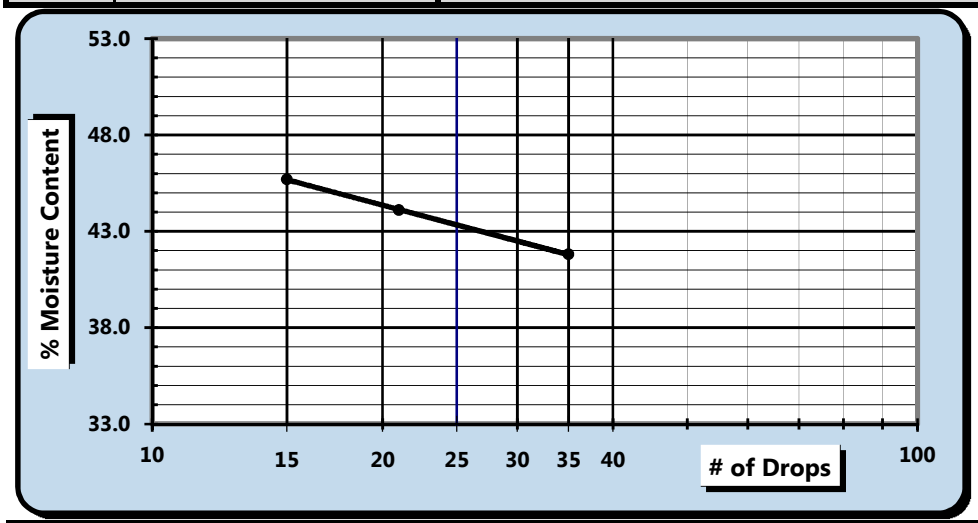
S&ME, Inc. - Spartanburg: 301 Zima Park Drive, Spartanburg, SC 29301

Project #:	1461-16-047.2B	Report Date:	3/15/18
Project Name:	Carolina Crossroads Project	Test Date:	3/14/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-34	Sample #:	SS-2	Sample Date:	2/5/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	3.0' - 5.0'
Sample Description:	Sandy Silt (ML, A-7-6(9))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	7537	1/31/2018	Grooving tool	14185	9/12/2017
LL Apparatus	13859	9/12/2017			
Oven	7313	7/28/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	P-4	P-5	P-6				12	13	
A	Tare Weight	16.62	16.61	15.97				11.16	12.11	
B	Wet Soil Weight + A	35.53	36.43	35.46				18.73	19.42	
C	Dry Soil Weight + A	29.96	30.36	29.35				17.11	17.87	
D	Water Weight (B-C)	5.57	6.07	6.11				1.62	1.55	
E	Dry Soil Weight (C-A)	13.34	13.75	13.38				5.95	5.76	
F	% Moisture (D/E)*100	41.8%	44.1%	45.7%				27.2%	26.9%	
N	# OF DROPS	35	21	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							27.1%		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**43**
Plastic Limit	**27**
Plastic Index	**16**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matt Jacobs	NICET 118202	Matthew F. Cooke, P.G.	3/15/18
Technician Name	*Certification#*	*Technical Responsibility*	*Date*

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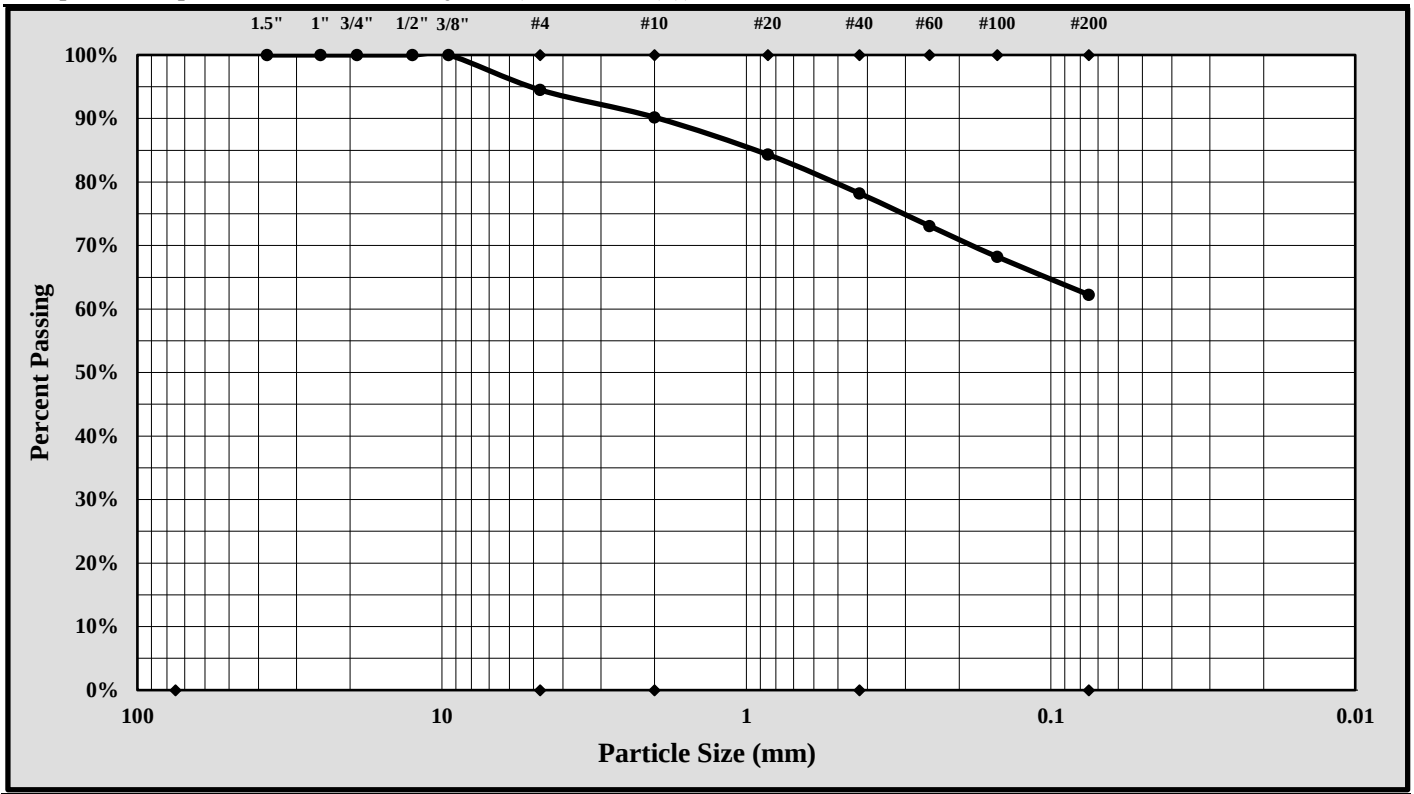
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. - Spartanburg 301 Zima Park Dr. Spartanburg, SC 29301

S&ME Project #:	1461-16-047.2B	Report Date:	3/15/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/20 - 2/23/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-34	Sample #: SS-2	Sample Date: 2/5/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 3.0' - 5.0'
Sample Description:	Sandy Silt (ML, A-7-6(9))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	9.50 mm	Gravel:	5.5%
Silt & Clay (% Passing #200):	62.2%	Total Sand:	32.2%

Liquid Limit	43	Plastic Limit	27	Plastic Index	16
Coarse Sand:	4.3%	Medium Sand:	12.0%	Fine Sand:	16.0%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/15/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ *AASHTO T 89* ☐ *AASHTO T 90* ☐

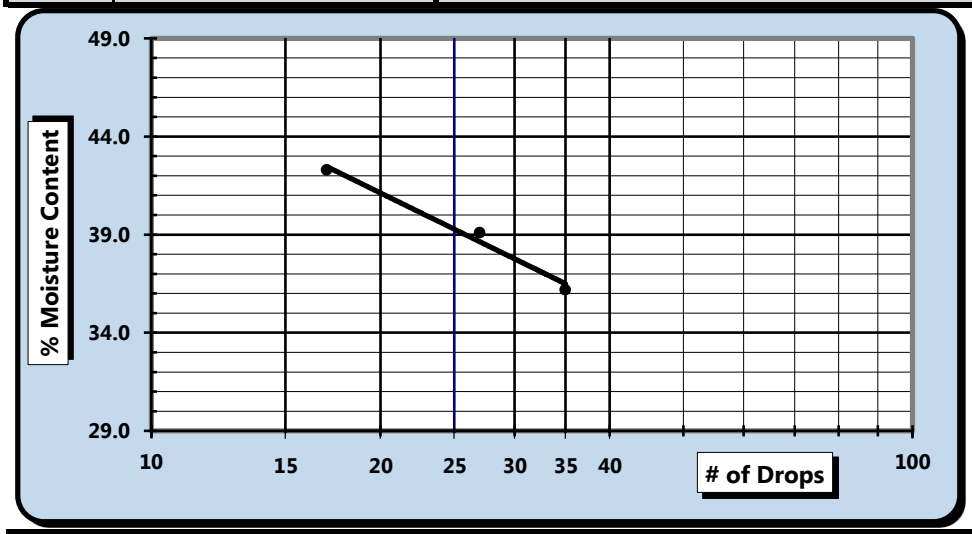
S&ME, Inc. - Spartanburg: 301 Zima Park Drive, Spartanburg, SC 29301

Project #:	1461-16-047.2B	Report Date:	3/15/18
Project Name:	Carolina Crossroads Project	Test Date:	3/14/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-34	Sample #:	SS-5	Sample Date:	2/5/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	9.0' - 11.0'
Sample Description:	Clayey Sand (SC, A-6(4))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	7537	1/31/2018	Grooving tool	14185	9/12/2017
LL Apparatus	13859	9/12/2017			
Oven	7313	7/28/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	Q-4	Q-5	Q-6				17	18	
A	Tare Weight	16.69	16.84	16.81				12.11	12.12	
B	Wet Soil Weight + A	35.74	36.72	36.48				19.44	19.20	
C	Dry Soil Weight + A	30.68	31.13	30.63				18.31	18.10	
D	Water Weight (B-C)	5.06	5.59	5.85				1.13	1.10	
E	Dry Soil Weight (C-A)	13.99	14.29	13.82				6.20	5.98	
F	% Moisture (D/E)*100	36.2%	39.1%	42.3%				18.2%	18.4%	
N	# OF DROPS	35	27	17				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							18.3%		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**39**
Plastic Limit	**18**
Plastic Index	**21**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matt Jacobs	NICET 118202	Matthew F. Cooke, P.G.	3/15/18
Technician Name	*Certification#*	*Technical Responsibility*	*Date*

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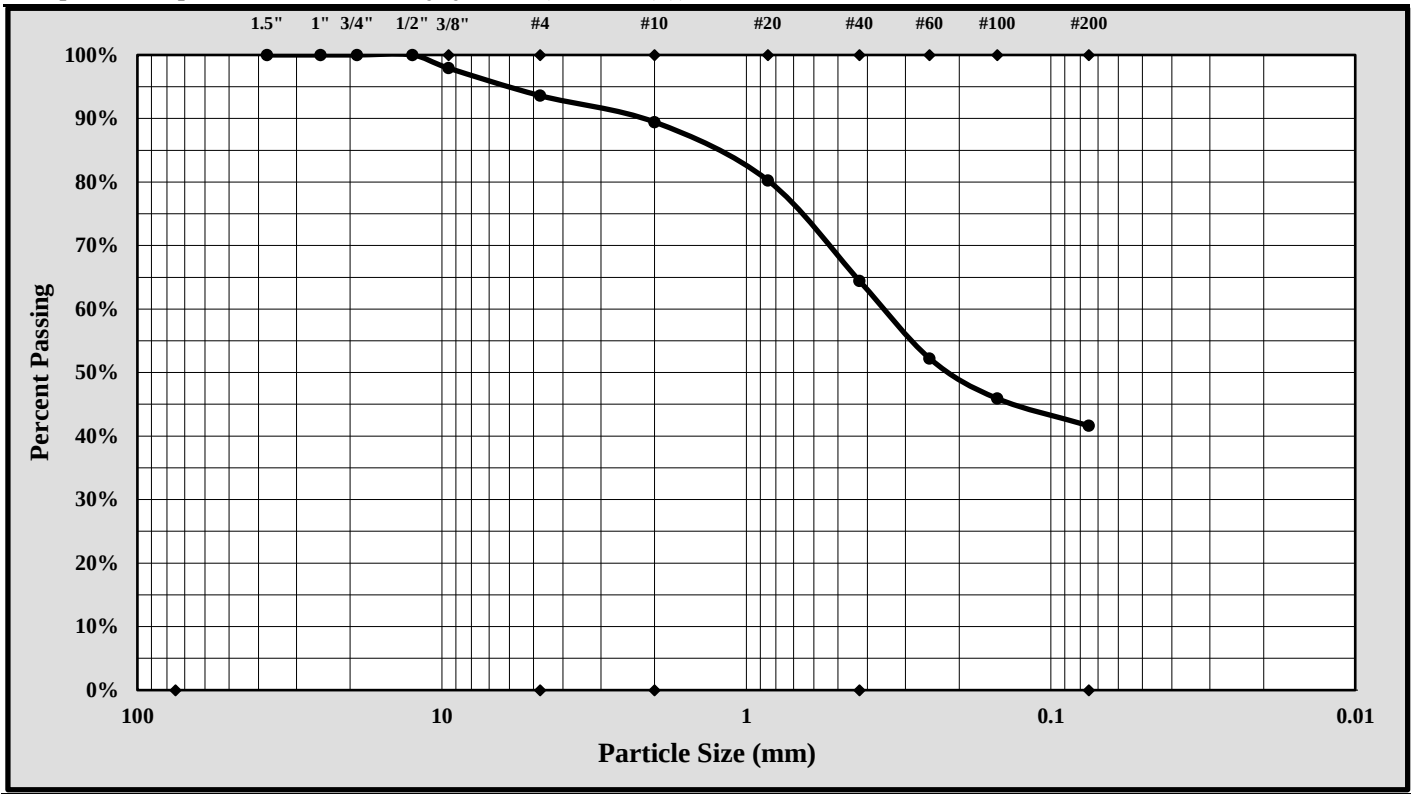
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. - Spartanburg 301 Zima Park Dr. Spartanburg, SC 29301

S&ME Project #:	1461-16-047.2B	Report Date:	3/15/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/20 - 2/23/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-34	Sample #: SS-5	Sample Date: 2/5/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 9.0' - 11.0'
Sample Description:	Clayey Sand (SC, A-6(4))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	12.50 mm	Gravel:	6.4%
Silt & Clay (% Passing #200):	41.6%	Total Sand:	52.0%

Liquid Limit	39	Plastic Limit	18	Plastic Index	21
Coarse Sand:	4.2%	Medium Sand:	25.0%	Fine Sand:	22.8%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/15/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ *AASHTO T 89* ☐ *AASHTO T 90* ☐

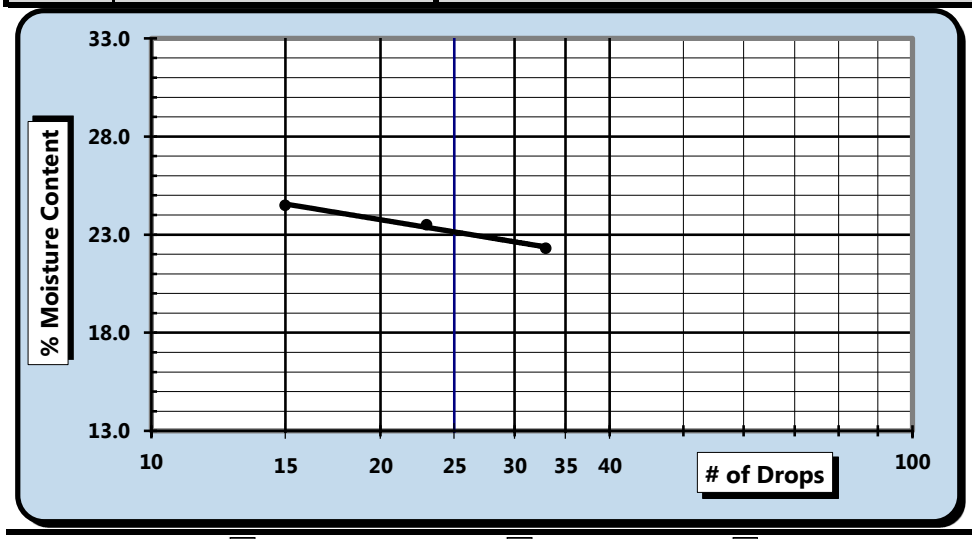
S&ME, Inc. - Spartanburg: 301 Zima Park Drive, Spartanburg, SC 29301

Project #:	1461-16-047.2B	Report Date:	3/15/18
Project Name:	Carolina Crossroads Project	Test Date:	3/14/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-34	Sample #:	SS-10	Sample Date:	2/5/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	33.5' - 35.0'
Sample Description:	Sandy Silty Clay (CL-ML, A-4(2))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	7537	1/31/2018	Grooving tool	14185	9/12/2017
LL Apparatus	13859	9/12/2017			
Oven	7313	7/28/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	Y-4	Y-5	Y-6				20	21	
A	Tare Weight	16.82	16.74	15.92				12.12	12.07	
B	Wet Soil Weight + A	37.17	38.39	36.70				19.83	19.59	
C	Dry Soil Weight + A	33.46	34.27	32.61				18.76	18.57	
D	Water Weight (B-C)	3.71	4.12	4.09				1.07	1.02	
E	Dry Soil Weight (C-A)	16.64	17.53	16.69				6.64	6.50	
F	% Moisture (D/E)*100	22.3%	23.5%	24.5%				16.1%	15.7%	
N	# OF DROPS	33	23	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							15.9%		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**23**
Plastic Limit	**16**
Plastic Index	**7**
Group Symbol	**CL-ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matt Jacobs	NICET 118202	Matthew F. Cooke, P.G.	3/15/18
Technician Name	*Certification#*	*Technical Responsibility*	*Date*

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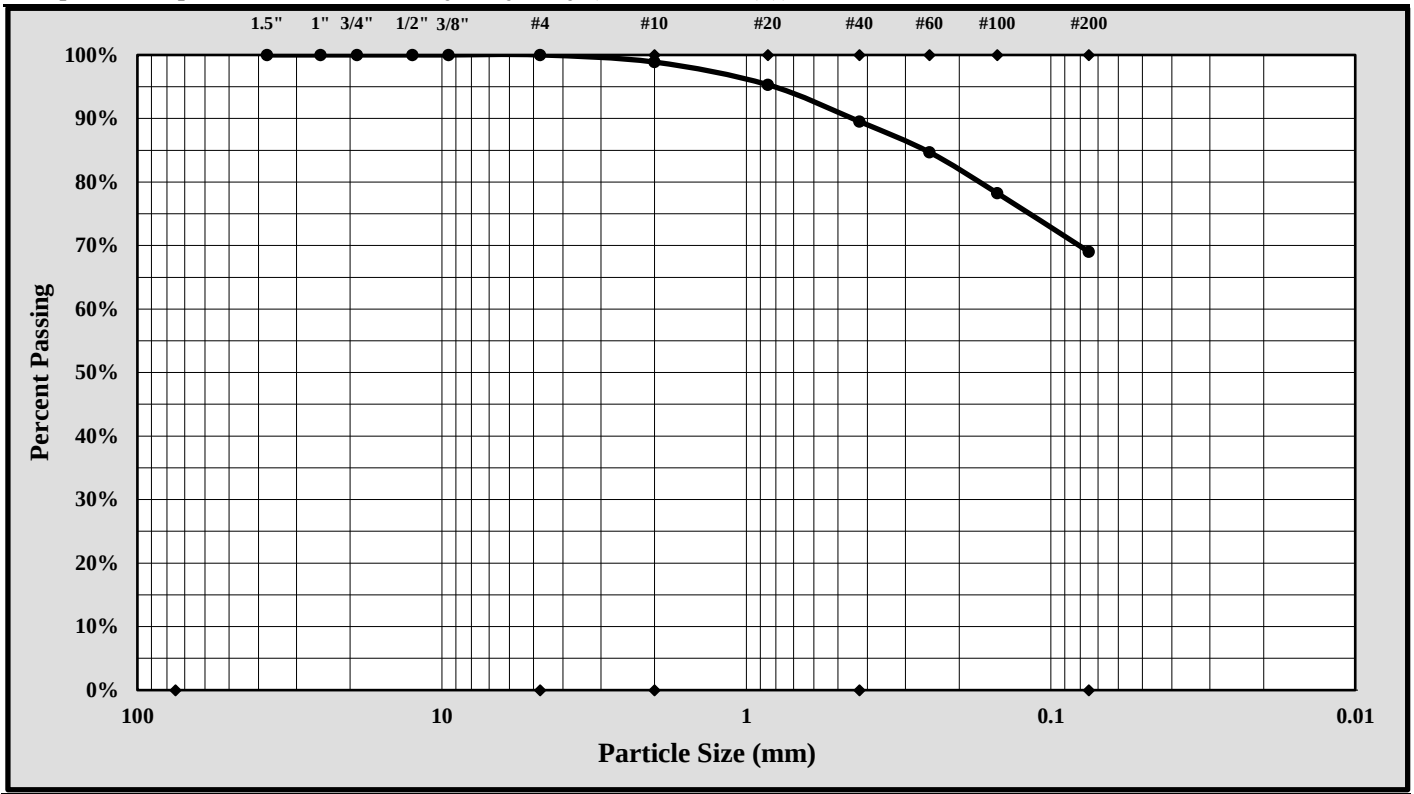
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. - Spartanburg 301 Zima Park Dr. Spartanburg, SC 29301

S&ME Project #:	1461-16-047.2B	Report Date:	3/15/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/20 - 2/23/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-34	Sample #: SS-10	Sample Date: 2/5/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 33.5' - 35.0'
Sample Description:	Sandy Silty Clay (CL-ML, A-4(2))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	69.0%	Total Sand:	31.0%

Liquid Limit	23	Plastic Limit	16	Plastic Index	7
Coarse Sand:	1.1%	Medium Sand:	9.4%	Fine Sand:	20.5%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/15/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ *AASHTO T 89* ☐ *AASHTO T 90* ☐

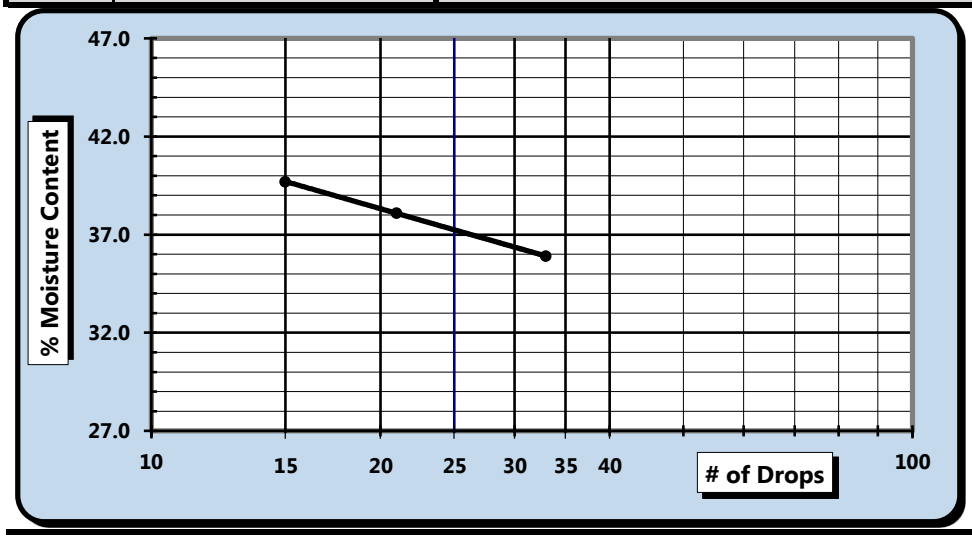
S&ME, Inc. - Spartanburg: 301 Zima Park Drive, Spartanburg, SC 29301

Project #:	1461-16-047.2B	Report Date:	3/16/18
Project Name:	Carolina Crossroads Project	Test Date:	3/15/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-34	Sample #:	SS-11	Sample Date:	2/5/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	38.5' - 40.0'
Sample Description:	Sandy Lean Clay (CL, A-6(8))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	7537	1/31/2018	Grooving tool	14185	9/12/2017
LL Apparatus	13859	9/12/2017			
Oven	7313	7/28/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	Z-4	Z-5	Z-6				22	23	
A	Tare Weight	15.76	15.57	16.91				11.92	12.07	
B	Wet Soil Weight + A	34.46	34.87	36.12				19.00	19.31	
C	Dry Soil Weight + A	29.52	29.55	30.66				17.68	17.98	
D	Water Weight (B-C)	4.94	5.32	5.46				1.32	1.33	
E	Dry Soil Weight (C-A)	13.76	13.98	13.75				5.76	5.91	
F	% Moisture (D/E)*100	35.9%	38.1%	39.7%				22.9%	22.5%	
N	# OF DROPS	33	21	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							22.7%		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**37**
Plastic Limit	**23**
Plastic Index	**14**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matt Jacobs	NICET 118202	Matthew F. Cooke, P.G.	3/16/18
Technician Name	*Certification#*	*Technical Responsibility*	*Date*

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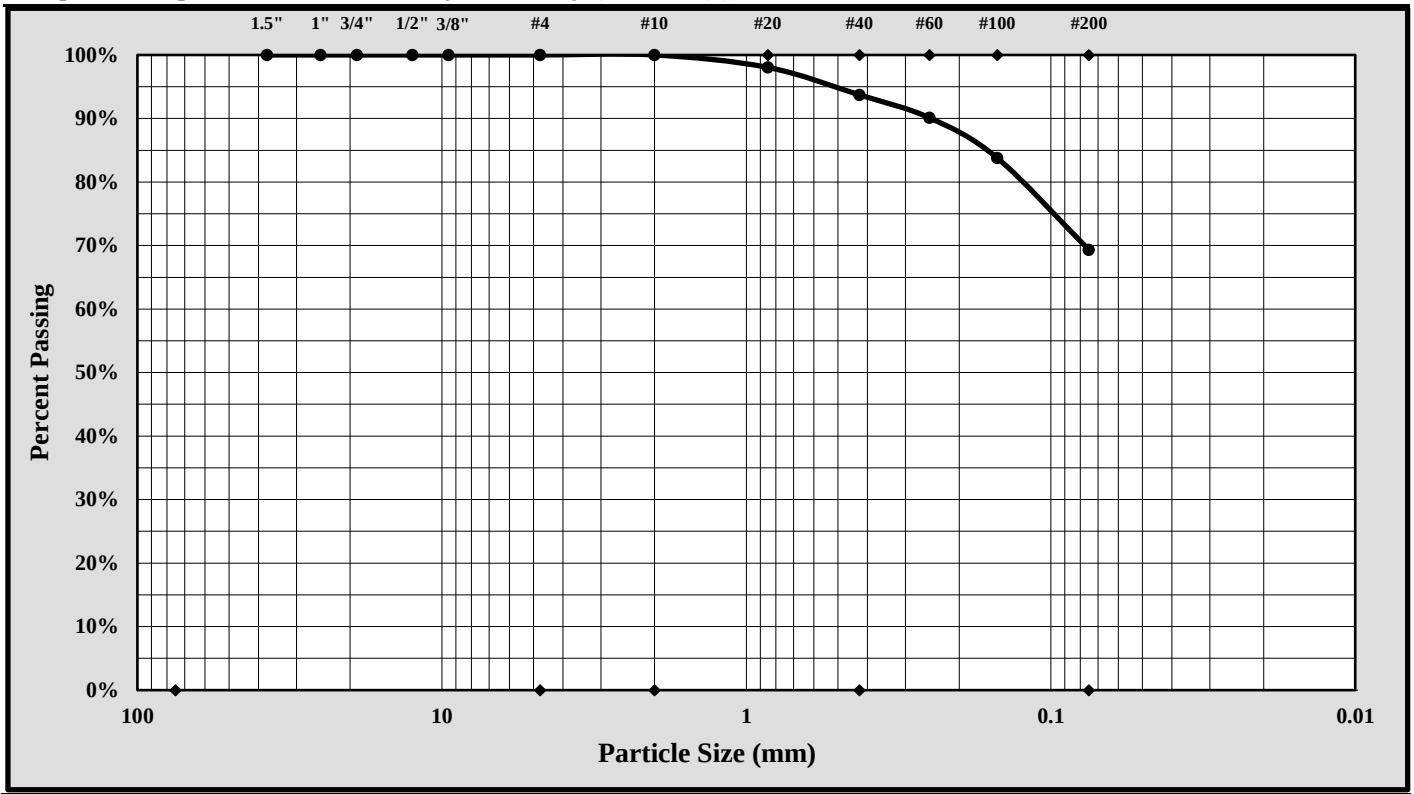
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. - Spartanburg 301 Zima Park Dr. Spartanburg, SC 29301

S&ME Project #:	1461-16-047.2B	Report Date:	3/16/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/20 - 2/23/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-34	Sample #: SS-11	Sample Date: 2/5/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 38.5' - 40.0'
Sample Description:	Sandy Lean Clay (CL, A-6(8))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	2.00 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	69.3%	Total Sand:	30.7%

Liquid Limit	37	Plastic Limit	23	Plastic Index	14
Coarse Sand:	0.0%	Medium Sand:	6.3%	Fine Sand:	24.4%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/16/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

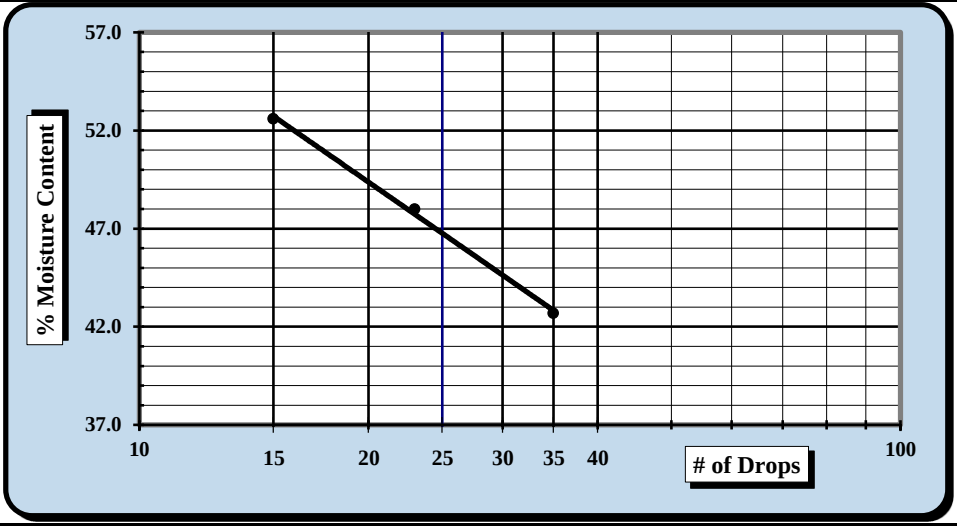
Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date:	4/24/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-35	Sample #:	SS-1	Sample Date:	3/02/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	0.0' - 2.0'

Sample Description: Silt with Sand (ML, A-7-6(15))

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	46	47	48				49	50	
A	Tare Weight	27.57	25.82	26.38				28.62	28.88	
B	Wet Soil Weight + A	43.91	42.04	43.56				36.61	36.60	
C	Dry Soil Weight + A	39.02	36.78	37.64				34.84	34.88	
D	Water Weight (B-C)	4.89	5.26	5.92				1.77	1.72	
E	Dry Soil Weight (C-A)	11.45	10.96	11.26				6.22	6.00	
F	% Moisture (D/E)*100	42.7%	48.0%	52.6%				28.5%	28.7%	
N	# OF DROPS	35	23	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**28.6%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**47**
Plastic Limit	**29**
Plastic Index	**18**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/27/18	Matthew F. Cooke, P.G.	4/27/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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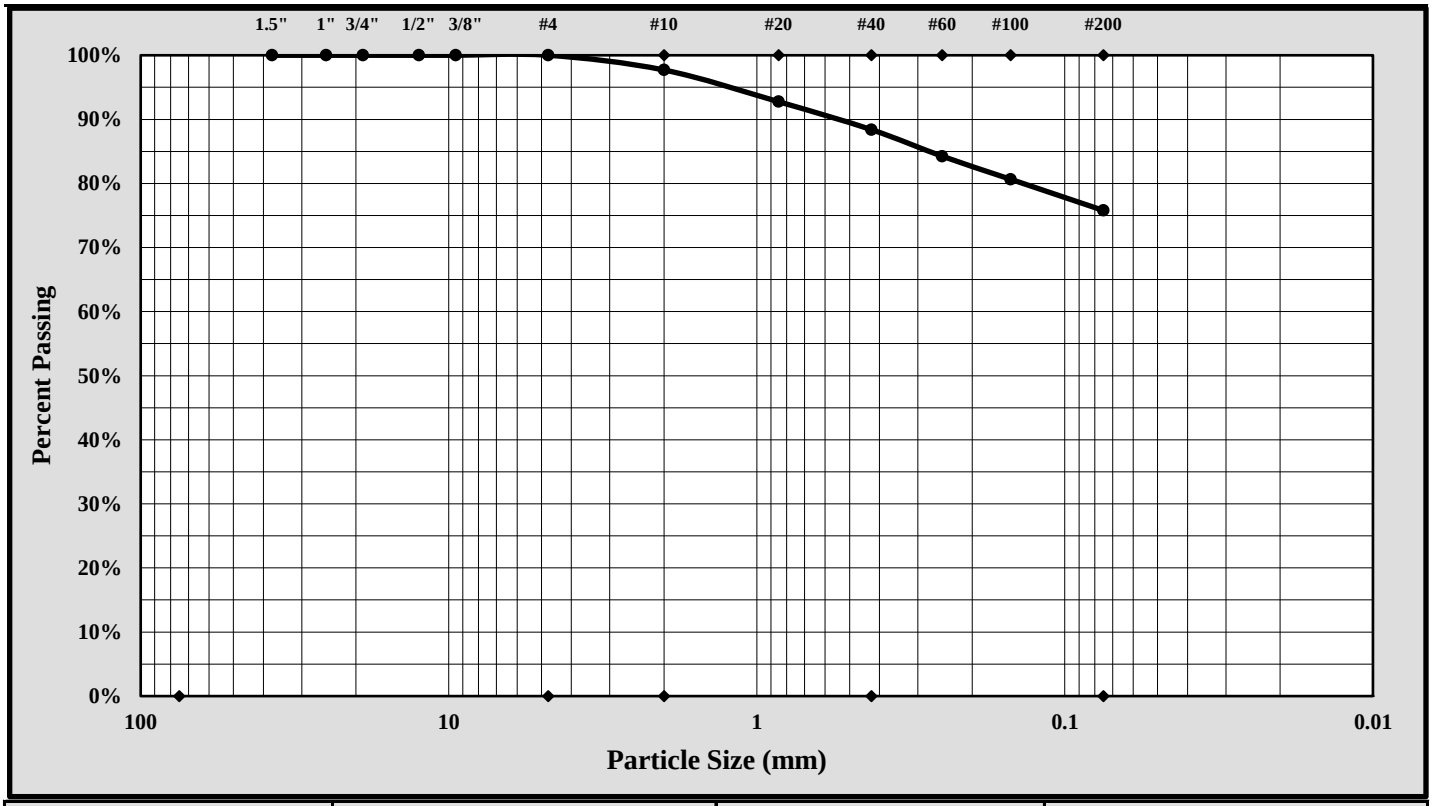
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/15 - 4/27/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-35	Sample #: SS-1	Sample Date: 3/02/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 0.0' - 2.0'
Sample Description:	Silt with Sand (ML, A-7-6(15))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	75.8%	Total Sand:	24.2%

Liquid Limit	47	Plastic Limit	29	Plastic Index	18
Coarse Sand:	2.3%	Medium Sand:	9.3%	Fine Sand:	12.6%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

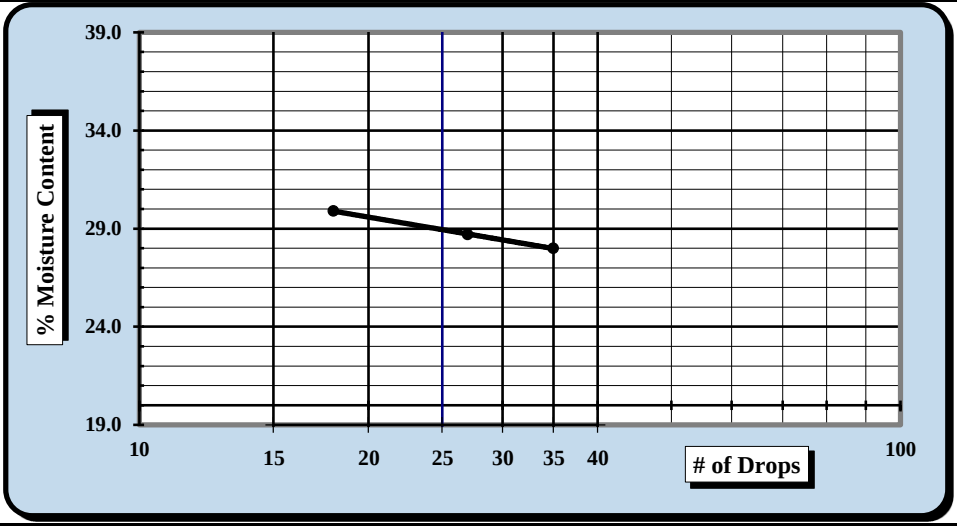
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date:	4/24/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-35	Sample #:	SS-5	Sample Date:	3/02/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	8.0' - 10.0'
Sample Description:	Lean Clay with Sand (CL, A-4(5))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	51	52	53				54	55	
A	Tare Weight	28.44	24.97	28.37				27.58	26.02	
B	Wet Soil Weight + A	50.31	46.07	47.78				34.13	34.53	
C	Dry Soil Weight + A	45.52	41.36	43.31				33.05	33.09	
D	Water Weight (B-C)	4.79	4.71	4.47				1.08	1.44	
E	Dry Soil Weight (C-A)	17.08	16.39	14.94				5.47	7.07	
F	% Moisture (D/E)*100	28.0%	28.7%	29.9%				19.7%	20.4%	
N	# OF DROPS	35	27	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**20.1%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**29**
Plastic Limit	**20**
Plastic Index	**9**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/27/18	Matthew F. Cooke, P.G.	4/27/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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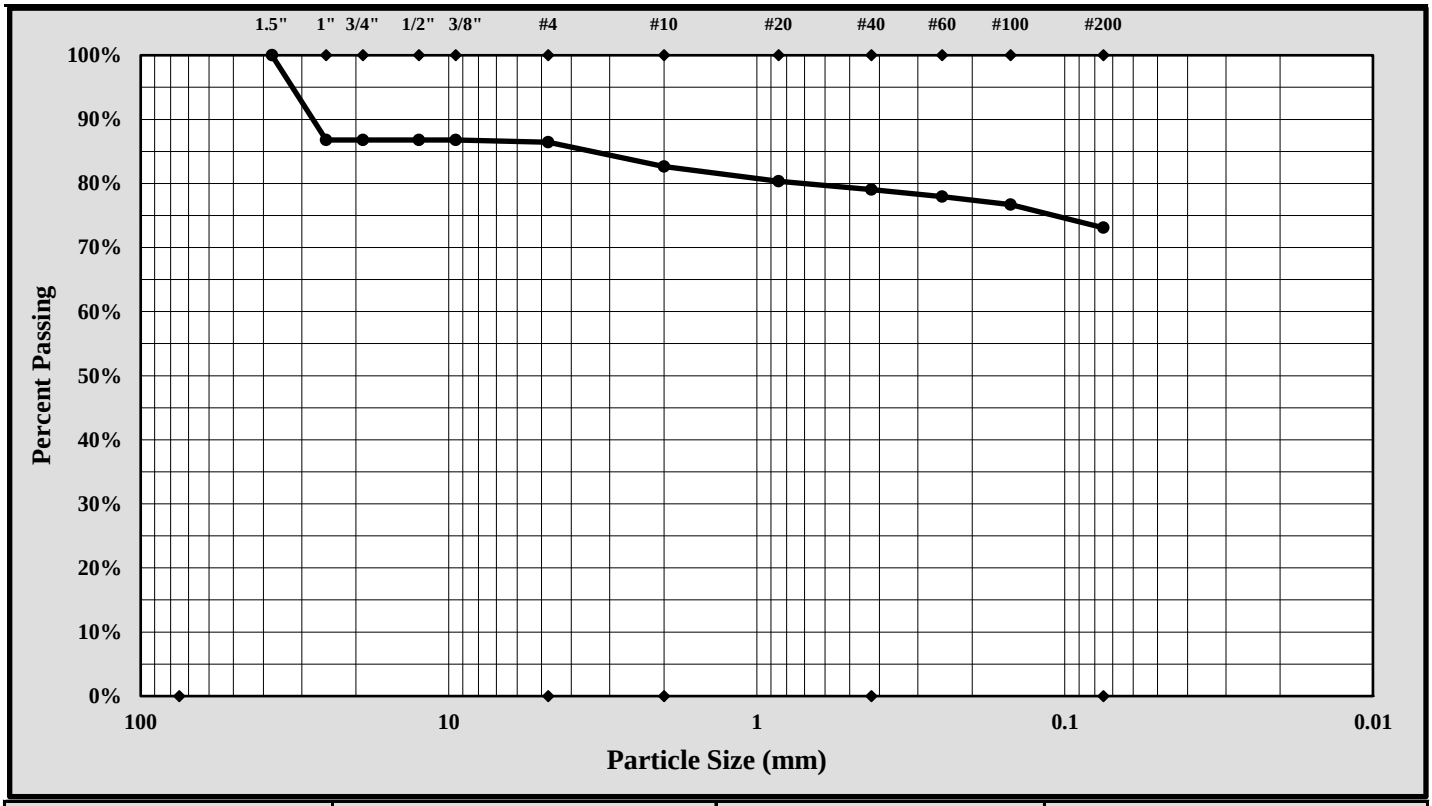
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/15 - 4/27/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-35	Sample #: SS-5	Sample Date: 3/02/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 8.0' - 10.0'
Sample Description:	Lean Clay with Sand (CL, A-4(5))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	37.5 mm	Gravel:	13.6%
Silt & Clay (% Passing #200):	73.1%	Total Sand:	13.4%

Liquid Limit	29	Plastic Limit	20	Plastic Index	9
Coarse Sand:	3.8%	Medium Sand:	3.6%	Fine Sand:	5.9%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

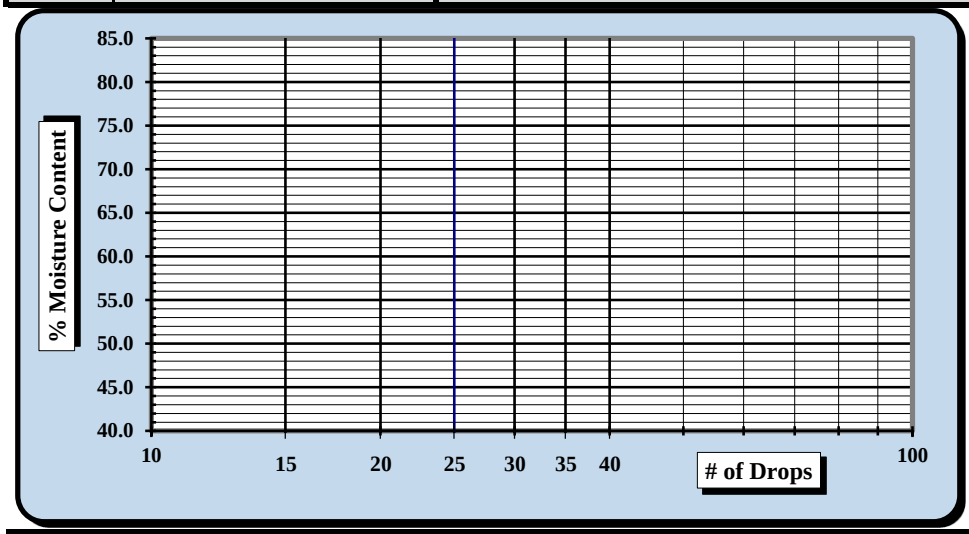
S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-4-18
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-36	Sample #: SS-1		Sample Date: Various	
Location:	Bridge Boring	Offset: N/A		Depth: 0.0' - 2.0'	
Sample Description:	Clayey Sand (SC, A-2-4)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 141		Liquid Limit						Plastic Limit		
	Tare #:	97						98	99	
A	Tare Weight	16.66						16.66	16.67	
B	Wet Soil Weight + A	29.29						25.07	25.00	
C	Dry Soil Weight + A	27.08						24.16	24.06	
D	Water Weight (B-C)	2.21						0.91	0.94	
E	Dry Soil Weight (C-A)	10.42						7.50	7.39	
F	% Moisture (D/E)*100	21.2%						12.1%	12.7%	
N	# OF DROPS	25						*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**12.4%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**21**
Plastic Limit	**12**
Plastic Index	**9**
Group Symbol	**CL**

Multipoint Method ☐
One-point Method ☑

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		5/4/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

ASTM D6913/D7928

Quality Assurance

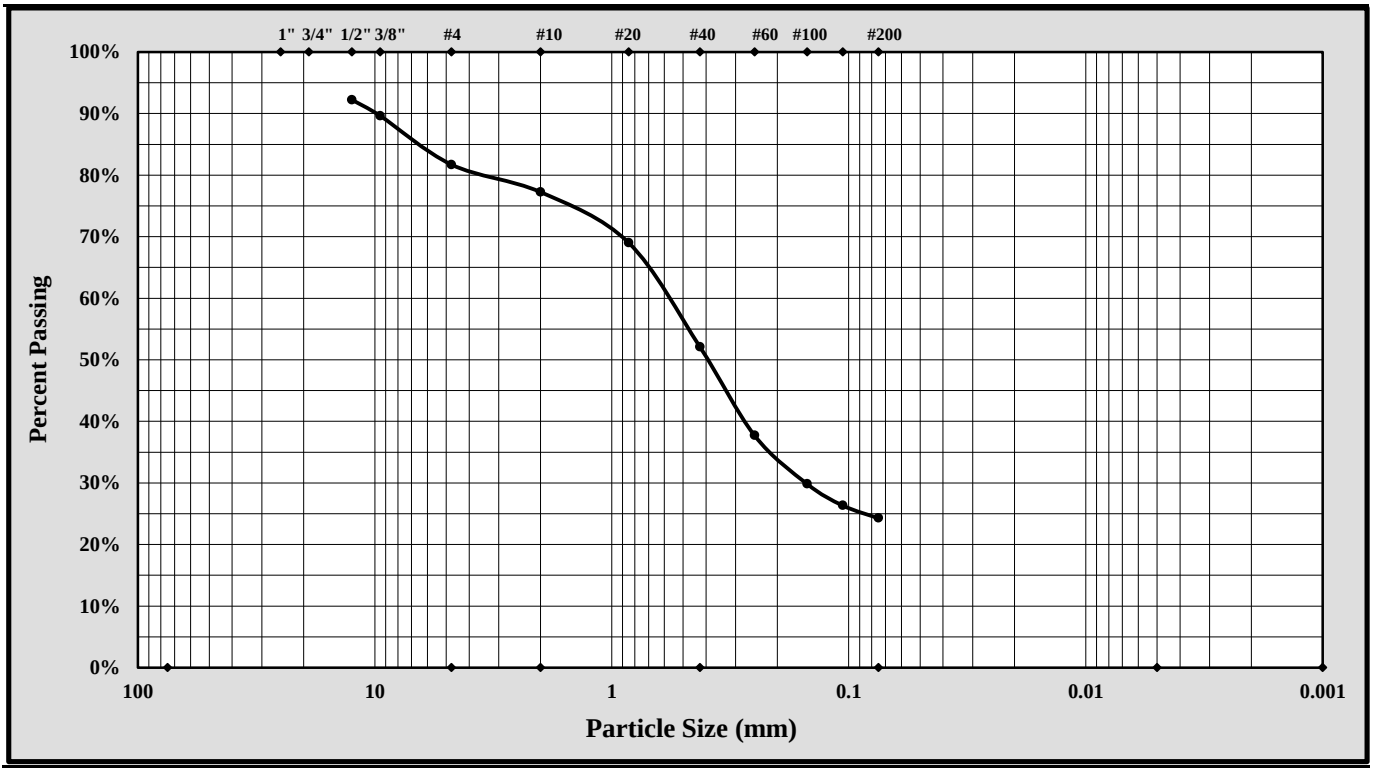
Sample Log No.:

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		

Sample ID:	B-36	Type:	Split Spoon	Sample Date:	Various
Location:	Bridge Boring	Sample No.:	SS-1	Depth:	0.0' - 2.0'

Sample Description: Clayey Sand (SC, A-2-4)



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	18.3%
Silt & Clay (% Passing #200):	24.3%	Total Sand:	57.4%
Assumed Specific Gravity:	2.65		

Liquid Limit	21	Plastic Limit	12	Plastic Index	9

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	5/7/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

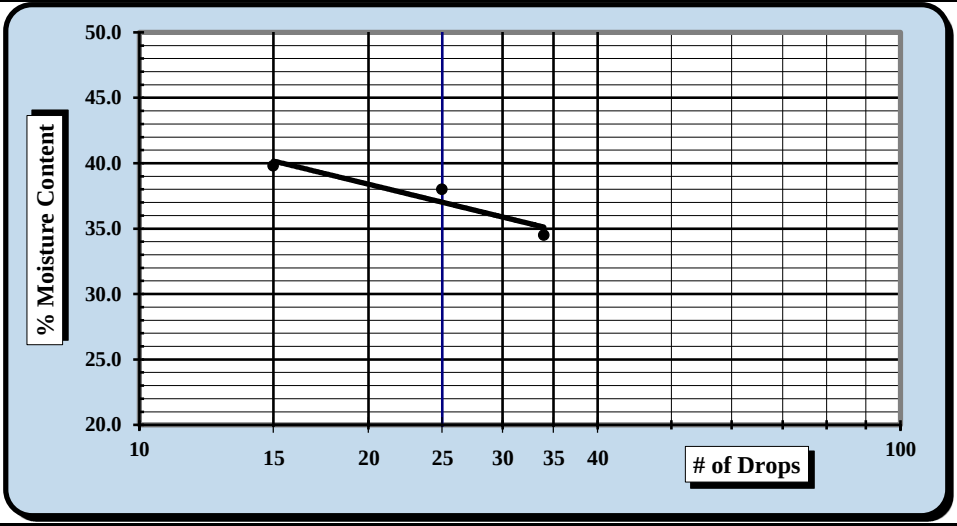
S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-4-18
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-36	Sample #: SS-2		Sample Date: Various	
Location:	Bridge Boring	Offset: N/A		Depth: 2.0' - 4.0'	
Sample Description:	Clayey Sand (SC, A-2-6)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

		Liquid Limit						Plastic Limit		
Pan #	182									
	Tare #:	67	68	69				70	72	
A	Tare Weight	26.12	29.34	29.07				29.40	26.31	
B	Wet Soil Weight + A	39.31	42.56	42.97				36.64	35.68	
C	Dry Soil Weight + A	35.93	38.92	39.01				35.72	34.50	
D	Water Weight (B-C)	3.38	3.64	3.96				0.92	1.18	
E	Dry Soil Weight (C-A)	9.81	9.58	9.94				6.32	8.19	
F	% Moisture (D/E)*100	34.5%	38.0%	39.8%				14.6%	14.4%	
N	# OF DROPS	34	25	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**14.5%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**37**
Plastic Limit	**15**
Plastic Index	**22**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		5/4/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

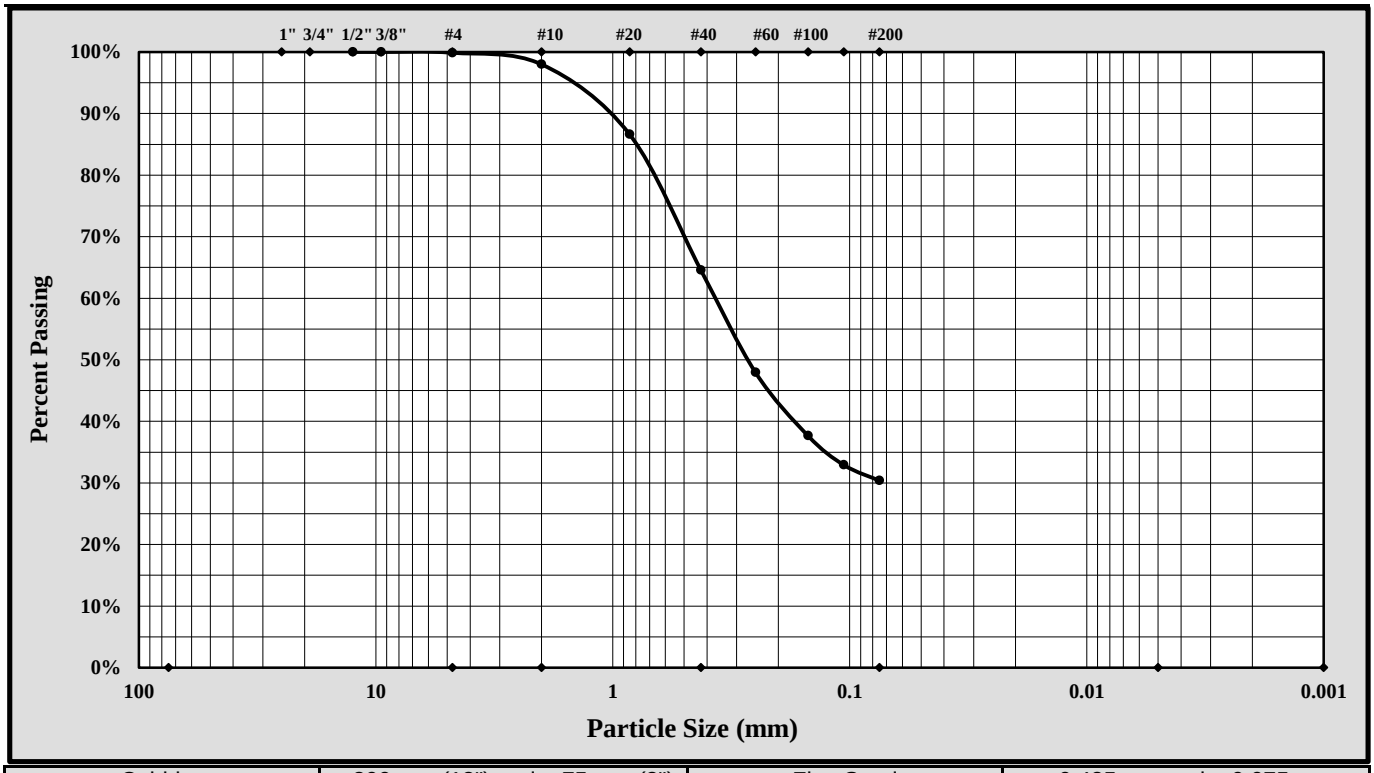
ASTM D6913/D7928

Quality Assurance

Sample Log No.:

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	B-36 Type: Split Spoon	Sample Date:	Various
Location:	Bridge Boring Sample No.: SS-2	Depth:	2.0' - 4.0'
Sample Description:	Clayey Sand (SC, A-2-6)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	0.1%
Silt & Clay (% Passing #200):	30.4%	Total Sand:	69.5%
Assumed Specific Gravity:	2.65		
Liquid Limit	37	Plastic Limit	15
		Plastic Index	22

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	5/7/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

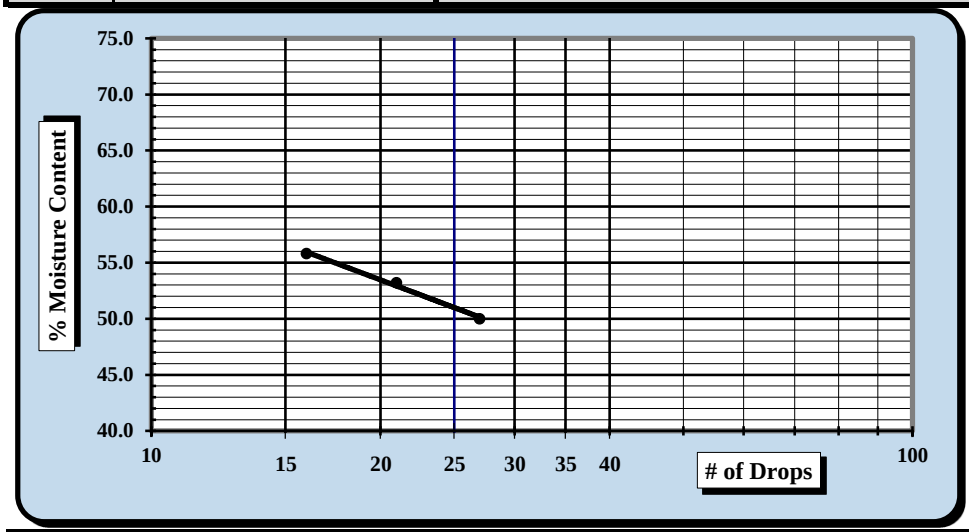
ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-1-2018
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-36	Sample #: SS-5	Sample Date: Various
Location:	Bridge Boring	Offset: N/A	Depth: 8.0' - 10.0'
Sample Description:	Clayey Sand (SC, A-7-6 (8))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 372		Liquid Limit						Plastic Limit		
	Tare #:	55	56	57				58	78	
A	Tare Weight	15.74	15.22	15.38				15.14	15.05	
B	Wet Soil Weight + A	25.85	26.79	26.32				22.72	21.57	
C	Dry Soil Weight + A	22.48	22.77	22.40				21.31	20.37	
D	Water Weight (B-C)	3.37	4.02	3.92				1.41	1.20	
E	Dry Soil Weight (C-A)	6.74	7.55	7.02				6.17	5.32	
F	% Moisture (D/E)*100	50.0%	53.2%	55.8%				22.9%	22.6%	
N	# OF DROPS	27	21	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**22.8%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**52**
Plastic Limit	**23**
Plastic Index	**29**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		4/30/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

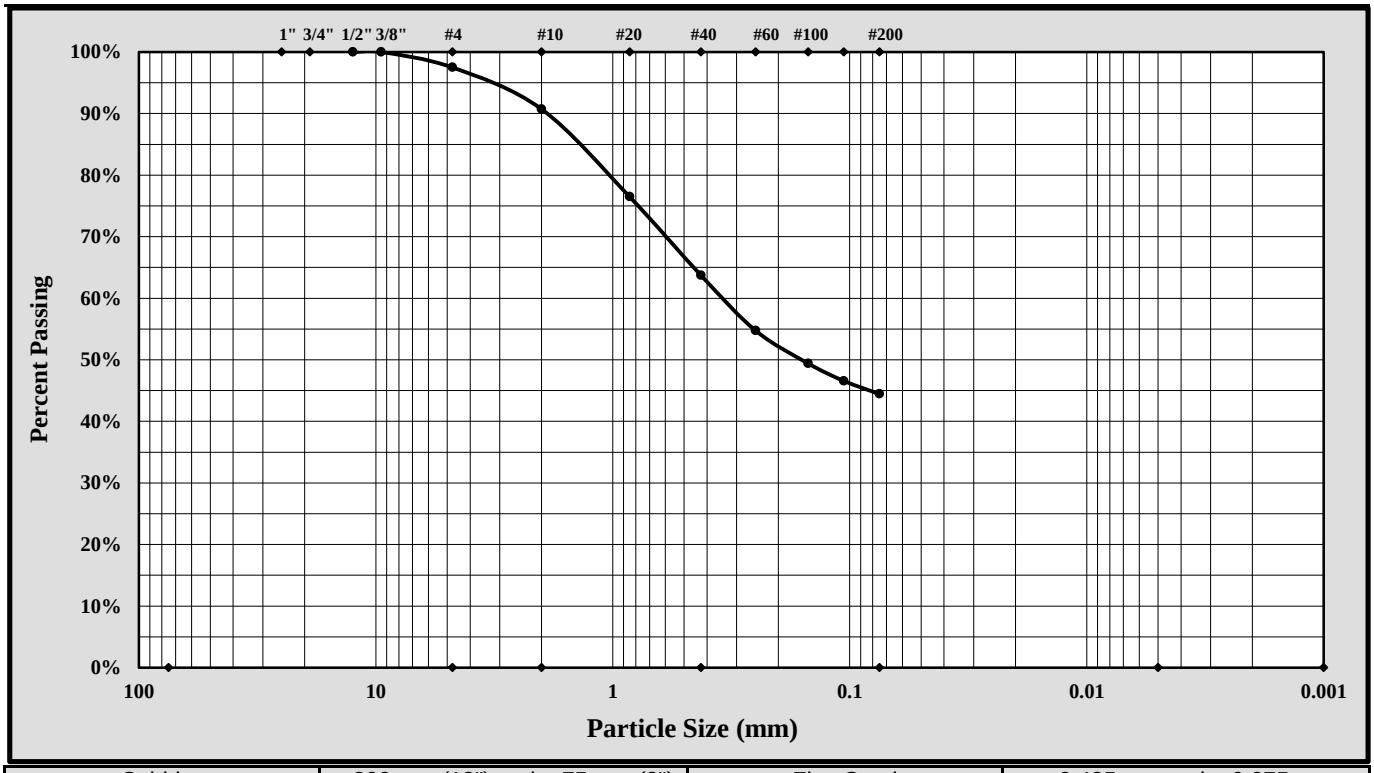
ASTM D6913/D7928

Quality Assurance

Sample Log No.:

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	B-36 Type: Split Spoon	Sample Date:	Various
Location:	Bridge Boring Sample No.: SS-5	Depth:	8.0' - 10.0'
Sample Description:	Clayey Sand (SC, A-7-6 (8))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	2.5%
Silt & Clay (% Passing #200):	44.5%	Total Sand:	53.0%
Assumed Specific Gravity:	2.65		
Liquid Limit	52	Plastic Limit	23
			Plastic Index 29

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel: Rounded ☐ Angular ☐ Hard & Durable ☐ Soft ☐ Weathered & Friable ☐

Sample Prep Method: Moist Prep | Dispersion Period: 1 min. | Dispersing Agent: Sodium Hexametaphosphate: 50 g./ Liter

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	5/7/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

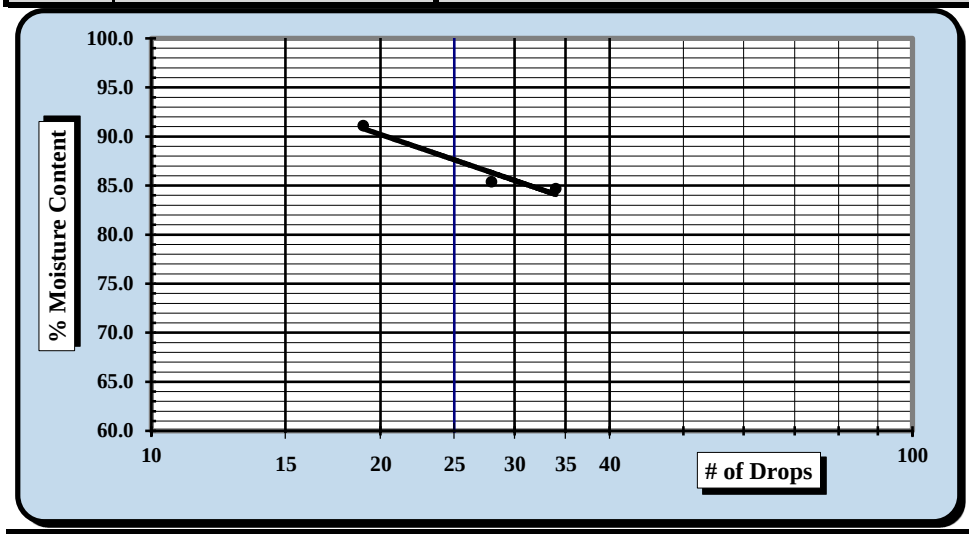
S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-4-18
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-36	Sample #: SS-8		Sample Date: Various	
Location:	Bridge Boring	Offset: N/A		Depth: 23.5' - 25.0'	
Sample Description:	Fat Clay with Sand (CH, A-7-5 (53))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 487		Liquid Limit						Plastic Limit		
	Tare #:	20	21	22				23	24	
A	Tare Weight	15.44	15.33	15.43				14.91	15.22	
B	Wet Soil Weight + A	26.32	27.27	27.66				22.02	22.08	
C	Dry Soil Weight + A	21.33	21.77	21.83				20.38	20.52	
D	Water Weight (B-C)	4.99	5.50	5.83				1.64	1.56	
E	Dry Soil Weight (C-A)	5.89	6.44	6.40				5.47	5.30	
F	% Moisture (D/E)*100	84.7%	85.4%	91.1%				30.0%	29.4%	
N	# OF DROPS	34	28	19				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**29.7%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**87**
Plastic Limit	**30**
Plastic Index	**57**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		5/4/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Sample Log No.:

Particle Size Analysis of Soils

ASTM D6913/D7928

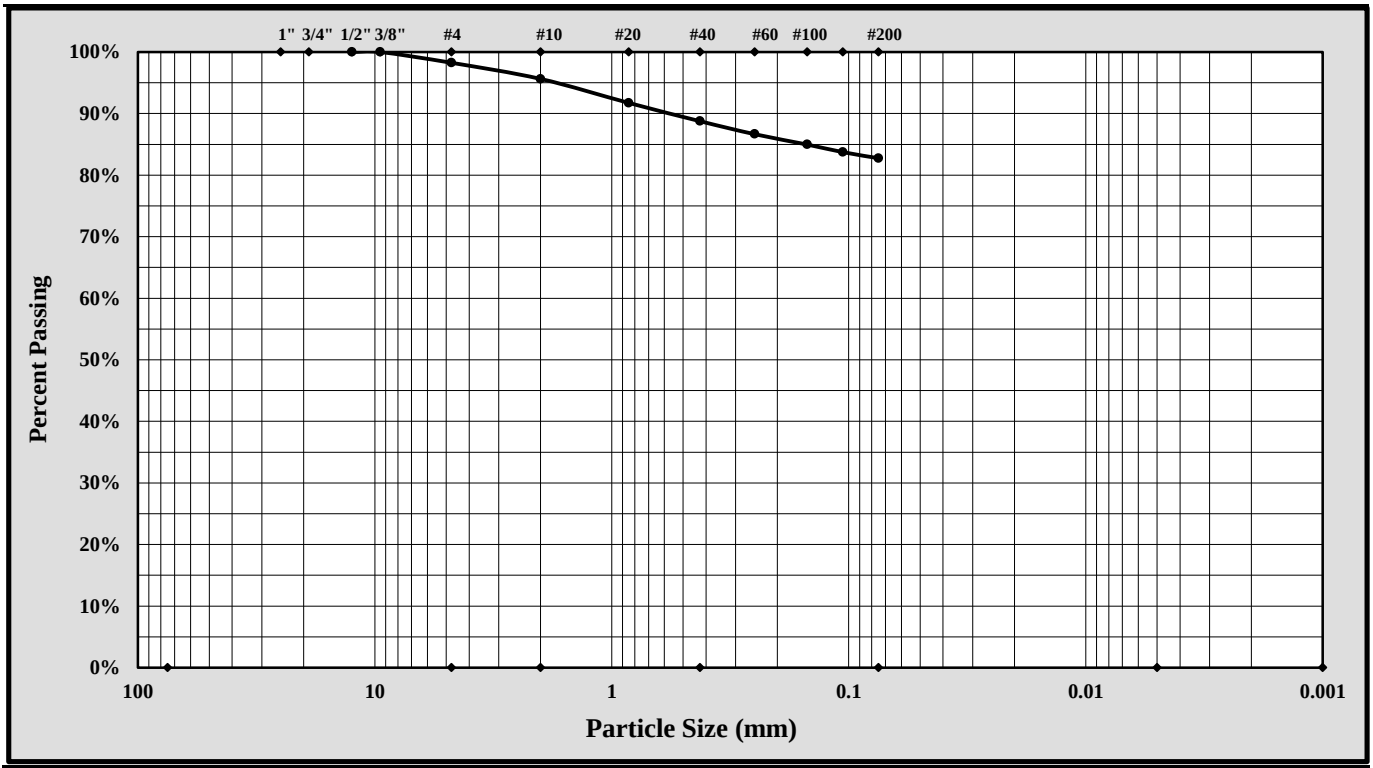
Quality Assurance

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		

Sample ID:	B-36	Type:	Split Spoon	Sample Date:	Various
Location:	Bridge Boring	Sample No.:	SS-8	Depth:	23.5' - 25.0'

Sample Description: Fat Clay with Sand (CH, A-7-5 (53))



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	1.7%
Silt & Clay (% Passing #200):	82.8%	Total Sand:	15.5%
Assumed Specific Gravity:	2.65		

Liquid Limit	87	Plastic Limit	30	Plastic Index	57

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*

Project Manager — *Position*

6/7/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

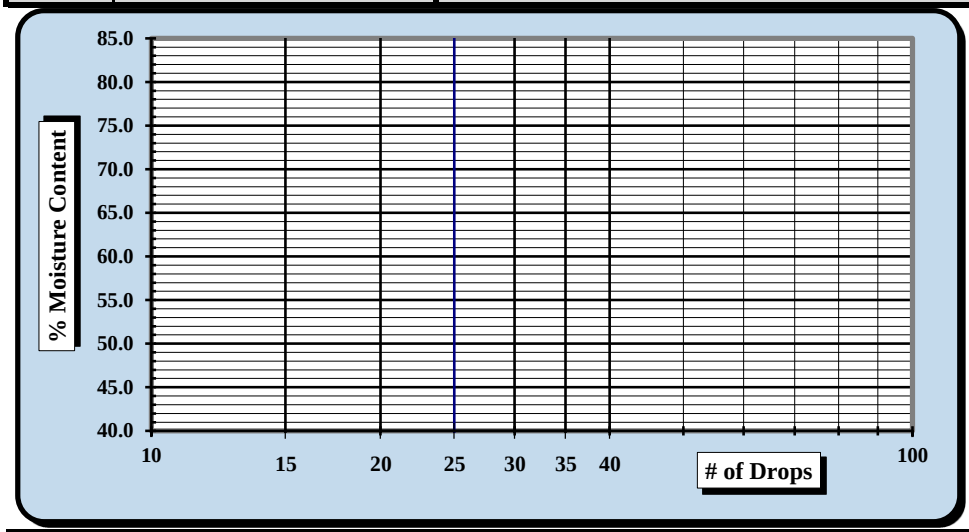
S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-4-18
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-36	Sample #: SS-10		Sample Date: Various	
Location:	Bridge Boring	Offset: N/A		Depth: 33.5' - 35.0'	
Sample Description:	Silt with Sand (ML, A-4 (0))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 489		Liquid Limit						Plastic Limit		
	Tare #:	10	11	12				13	14	
A	Tare Weight									
B	Wet Soil Weight + A									
C	Dry Soil Weight + A									
D	Water Weight (B-C)									
E	Dry Soil Weight (C-A)									
F	% Moisture (D/E)*100									
N	# OF DROPS							*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*									



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**NP**
Plastic Limit	**NP**
Plastic Index	**NP**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		5/4/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Sample Log No.:

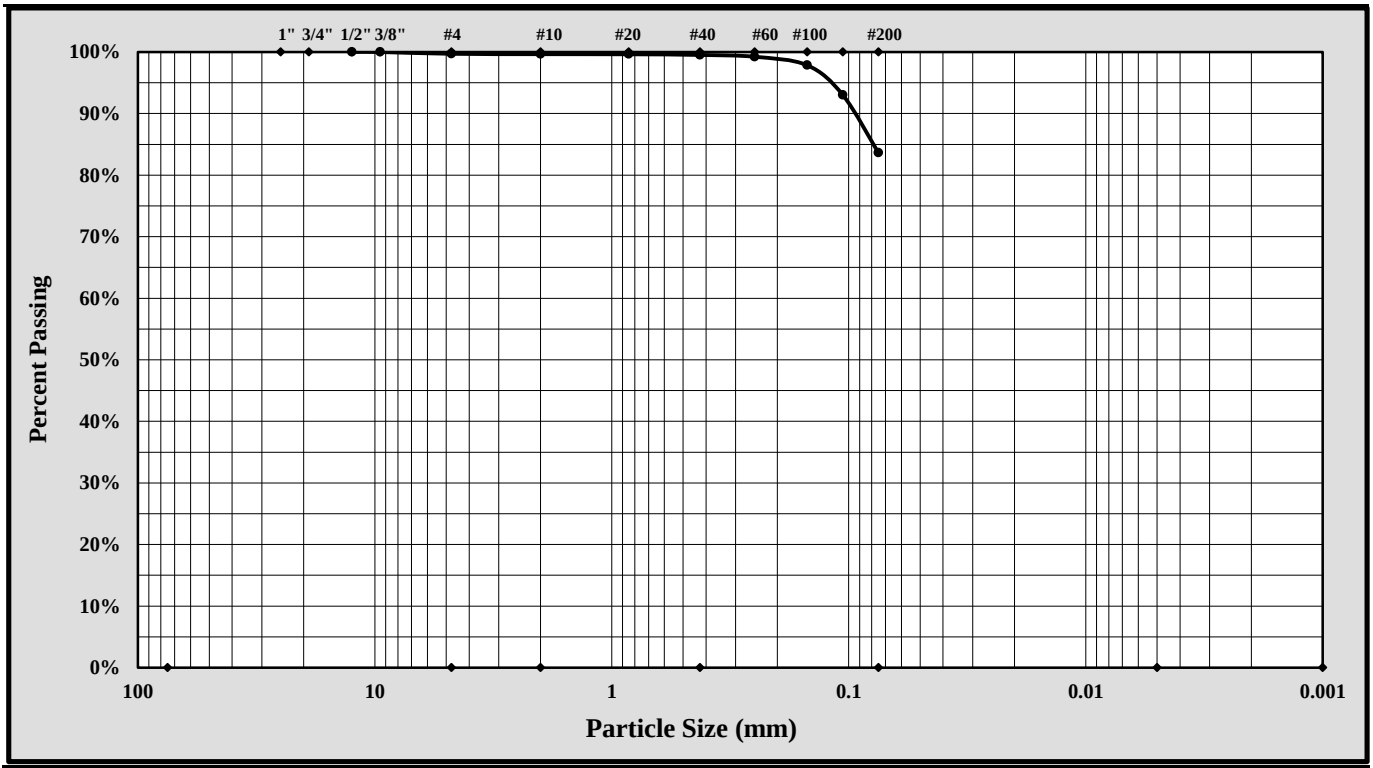
Particle Size Analysis of Soils

ASTM D6913/D7928

Quality Assurance

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	B-36 Type: Split Spoon	Sample Date:	Various
Location:	Bridge Boring Sample No.: SS-10	Depth:	33.5' - 35.0'
Sample Description:	Silt with Sand (ML, A-4 (0))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	0.3%
Silt & Clay (% Passing #200):	83.6%	Total Sand:	16.1%
Assumed Specific Gravity:	2.65		

Liquid Limit	NP	Plastic Limit	NP	Plastic Index	NP

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Nathan Price — *Technical Responsibility*

Laboratory Group Leader — *Position*

5/10/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

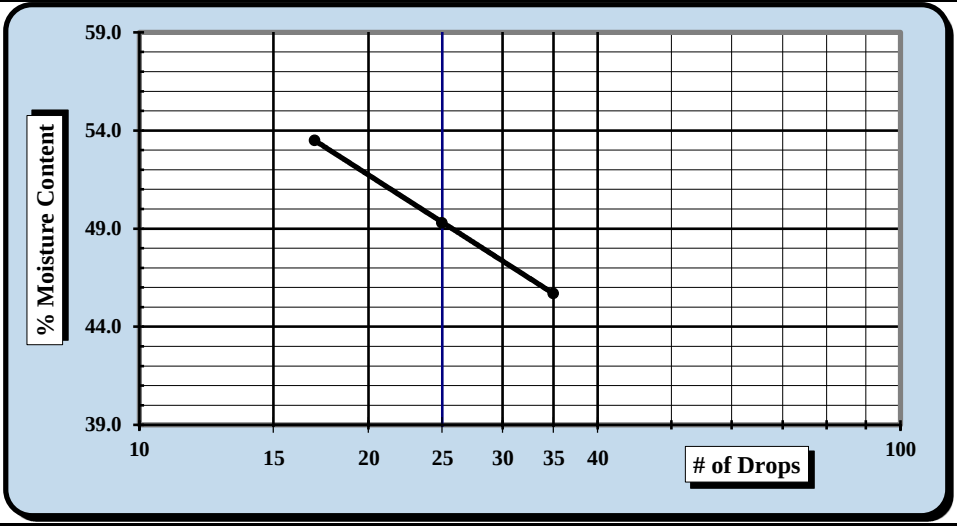
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date:	4/24/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-37	Sample #:	SS-1	Sample Date:	3/07/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	0.4' - 2.4'
Sample Description:	Sandy Lean Clay (CL, A-7-6(10))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	56	57	58				59	60	
A	Tare Weight	26.35	29.15	3.74				3.77	3.55	
B	Wet Soil Weight + A	38.88	44.51	19.23				10.95	9.92	
C	Dry Soil Weight + A	34.95	39.44	13.83				9.66	8.78	
D	Water Weight (B-C)	3.93	5.07	5.40				1.29	1.14	
E	Dry Soil Weight (C-A)	8.60	10.29	10.09				5.89	5.23	
F	% Moisture (D/E)*100	45.7%	49.3%	53.5%				21.9%	21.8%	
N	# OF DROPS	35	25	17				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**21.9%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**49**
Plastic Limit	**22**
Plastic Index	**27**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/27/18	Matthew F. Cooke, P.G.	4/27/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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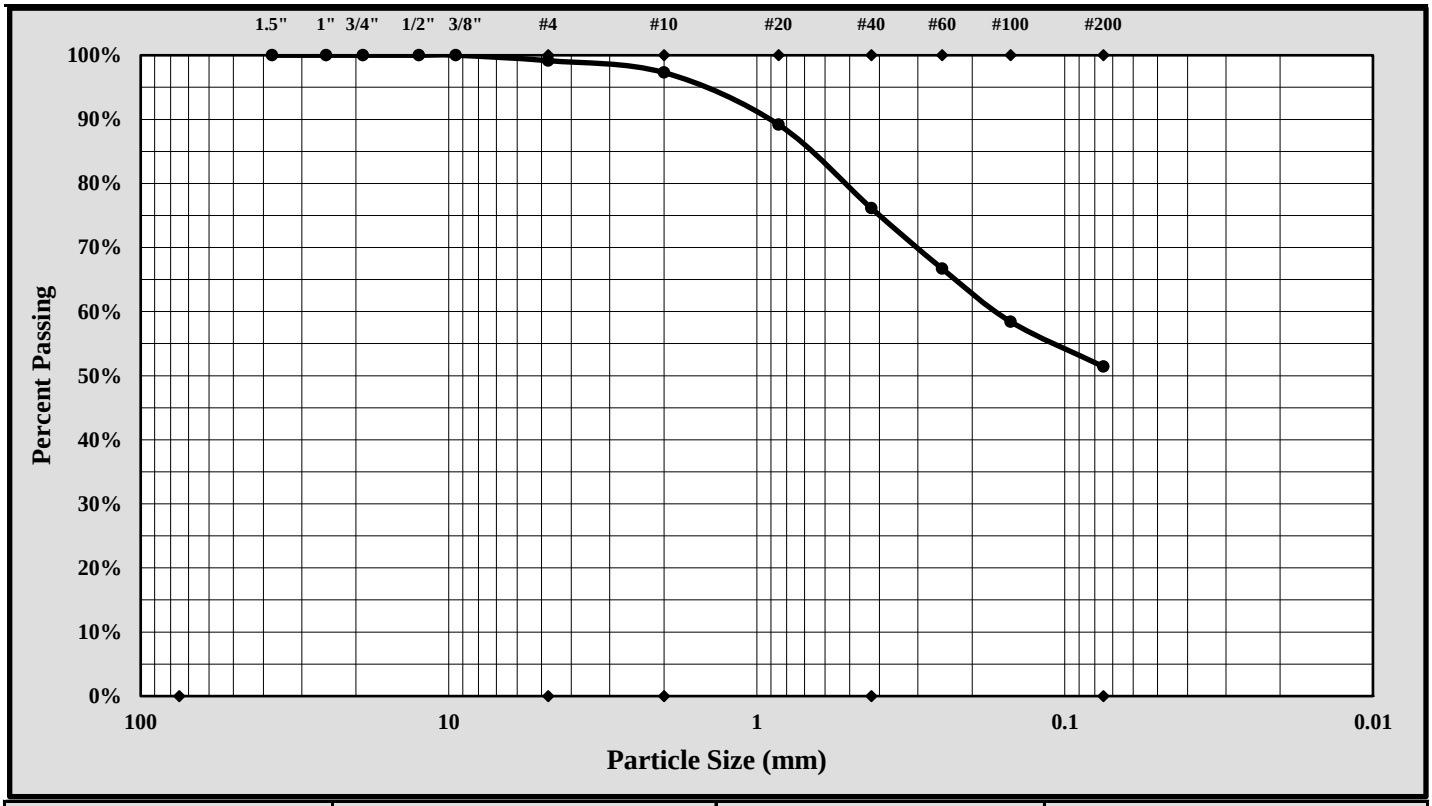
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/15 - 4/27/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-37 Sample #: SS-1	Sample Date:	3/07/18
Location:	Bridge Boring Type: Split-spoon	Depth:	0.4' - 2.4'
Sample Description:	Sandy Lean Clay (CL, A-7-6(10))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.8%
Silt & Clay (% Passing #200):	51.4%	Total Sand:	47.7%

Liquid Limit	49	Plastic Limit	22	Plastic Index	27
Coarse Sand:	1.9%	Medium Sand:	21.2%	Fine Sand:	24.7%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date:	4/24/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-37	Sample #:	SS-3	Sample Date:	3/07/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	4.4' - 6.4'
Sample Description:	Fat Clay (CH, A-7-6(51))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	1	2	3				4	5	
A	Tare Weight	26.70	26.47	26.33				25.93	26.94	
B	Wet Soil Weight + A	41.71	40.46	39.84				34.42	34.60	
C	Dry Soil Weight + A	35.54	34.50	33.67				32.85	33.15	
D	Water Weight (B-C)	6.17	5.96	6.17				1.57	1.45	
E	Dry Soil Weight (C-A)	8.84	8.03	7.34				6.92	6.21	
F	% Moisture (D/E)*100	69.8%	74.2%	84.1%				22.7%	23.3%	
N	# OF DROPS	35	28	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**23.0%**		

One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**77**
Plastic Limit	**23**
Plastic Index	**54**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/27/18	Matthew F. Cooke, P.G.	4/27/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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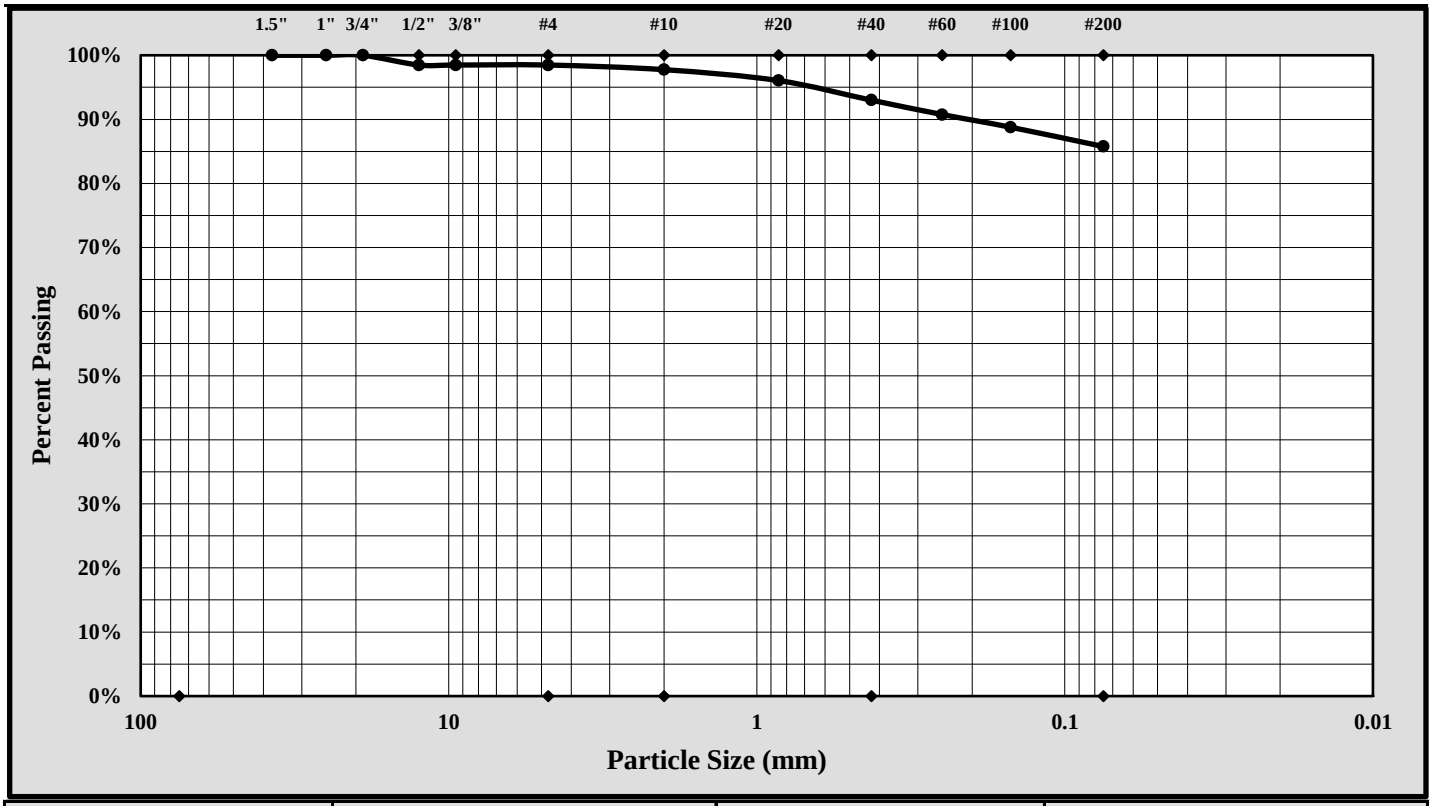
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/15 - 4/27/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-37	Sample #: SS-3	Sample Date: 3/07/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 4.4' - 6.4'
Sample Description:	Fat Clay (CH, A-7-6(51))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	19.0 mm	Gravel:	1.5%
Silt & Clay (% Passing #200):	85.8%	Total Sand:	12.7%

Liquid Limit	77	Plastic Limit	23	Plastic Index	54
Coarse Sand:	0.7%	Medium Sand:	4.8%	Fine Sand:	7.2%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/18 — *Date*

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Form No: TR-D1140-1
Revision No. 1
Revision Date: 8/2/17

MATERIAL FINER THAN THE #200 SIEVE

ASTM D1140

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/28 - 3/30/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sampled by:	S&ME	Sample Dates:	3/07/18
Sampling Method:	Split-spoon	Drill Rig:	CME 55
Method;	**A** ☐ **B** ☑	Soaked ☑	Soak Time 16 hrs.

Boring #	Sample #	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Tare Wt. + Dry Wt. after Wash	% Passing #200
		ft.		grams	grams	grams	grams	%
B-37	SS-6	9.5 - 11.5	BK-2	0.00	149.05	116.43	13.85	**88.1%**

Balance ID.: *13942* *Calibration Date:* *8/18/17* *#200 Sieve:* *23239* *Calibration Date:* *2/19/17*

Notes / Deviations / References: ASTM D1140: Amount of Material in Soil Finer Than the No. 200 (75-um)) Sieve

Benjamin Kovaleski	Benjamin J. Kovaleski	NICET Lab Level III/117226	4/27/18
Technician Name	*Signature*	*Certification Type/No.*	*Date*
Matthew F. Cooke, P.G.		Project Manager	4/27/18
Technical Responsibility		*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

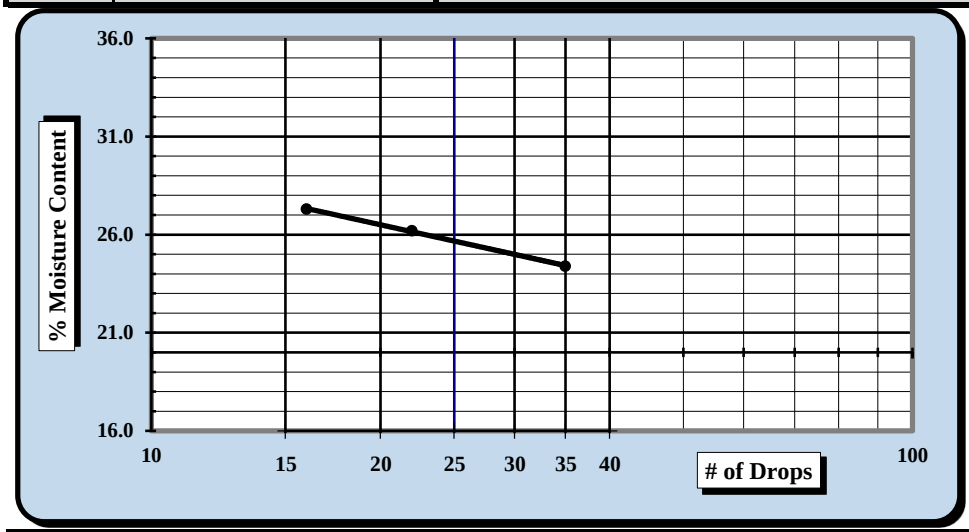
Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date:	4/25/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-37	Sample #:	SS-8	Sample Date:	3/07/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	18.5' - 20.0'

Sample Description: Silty Clayey Sand with Gravel (SC-SM, A-4(0))

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	6	7	8				9	10	
A	Tare Weight	27.76	26.31	27.31				26.85	26.75	
B	Wet Soil Weight + A	45.91	43.32	42.36				32.08	34.16	
C	Dry Soil Weight + A	42.35	39.79	39.13				31.25	33.02	
D	Water Weight (B-C)	3.56	3.53	3.23				0.83	1.14	
E	Dry Soil Weight (C-A)	14.59	13.48	11.82				4.40	6.27	
F	% Moisture (D/E)*100	24.4%	26.2%	27.3%				18.9%	18.2%	
N	# OF DROPS	35	22	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**18.6%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**26**
Plastic Limit	**19**
Plastic Index	**7**
Group Symbol	**CL-ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/27/18	Matthew F. Cooke, P.G.	4/27/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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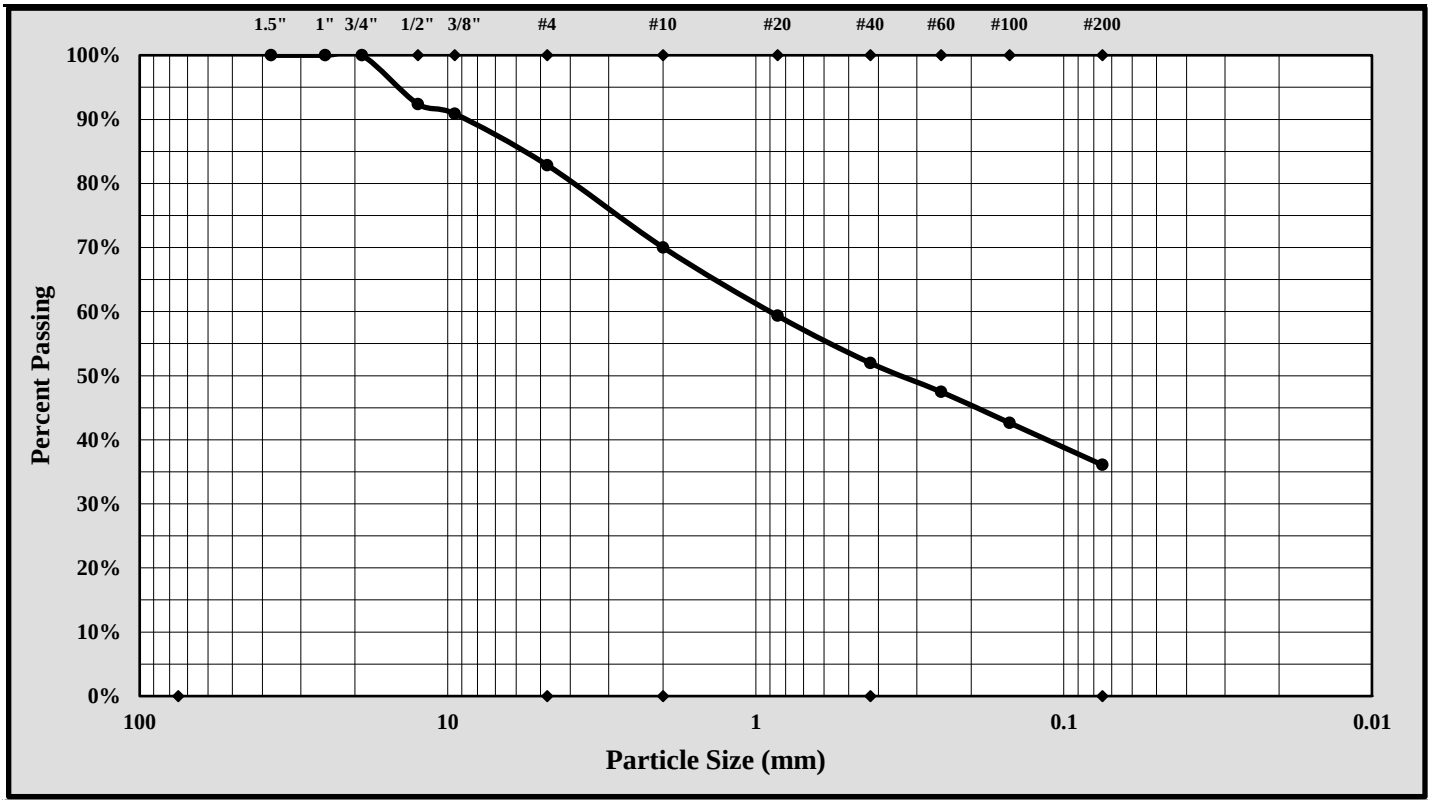
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/15 - 4/27/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-37	Sample #: SS-8	Sample Date: 3/07/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 18.5' - 20.0'
Sample Description:	Silty Clayey Sand with Gravel (SC-SM, A-4(0))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	19.0 mm	Gravel:	17.2%
Silt & Clay (% Passing #200):	36.1%	Total Sand:	46.8%

Liquid Limit	26	Plastic Limit	19	Plastic Index	7
Coarse Sand:	12.8%	Medium Sand:	18.0%	Fine Sand:	15.9%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

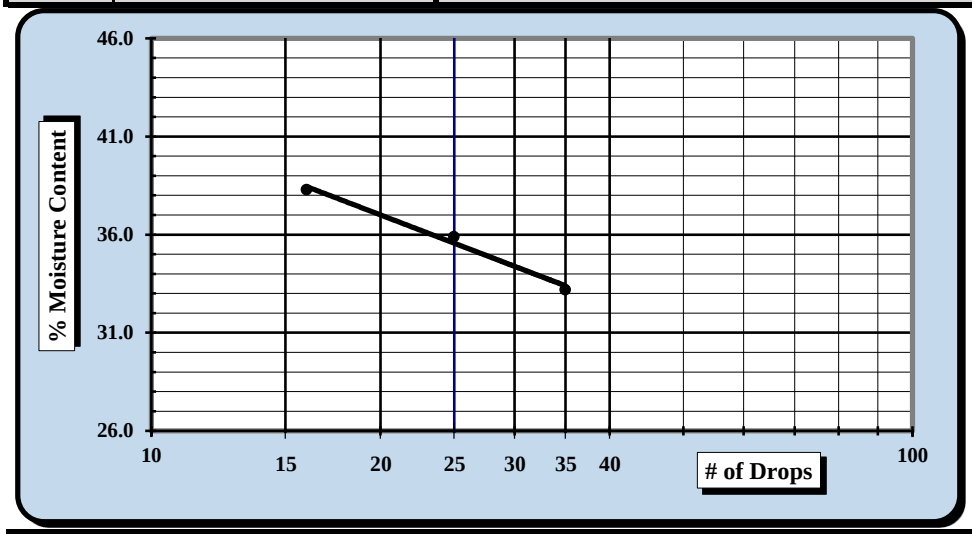
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/21/18
Project Name:	Carolina Crossroads Project	Test Date:	3/16/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-38	Sample #:	SS-2	Sample Date:	1/23/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	2.0' - 4.0'
Sample Description:	Clayey Sand (SC, A-6(5))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	1	2	3				4	5	
A	Tare Weight	26.69	26.47	26.35				25.93	26.95	
B	Wet Soil Weight + A	42.06	42.55	43.20				32.02	33.68	
C	Dry Soil Weight + A	38.23	38.30	38.53				31.13	32.67	
D	Water Weight (B-C)	3.83	4.25	4.67				0.89	1.01	
E	Dry Soil Weight (C-A)	11.54	11.83	12.18				5.20	5.72	
F	% Moisture (D/E)*100	33.2%	35.9%	38.3%				17.1%	17.7%	
N	# OF DROPS	35	25	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**17.4%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**36**
Plastic Limit	**17**
Plastic Index	**19**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 46.0%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	3/21/18	Brian Vaughn	3/21/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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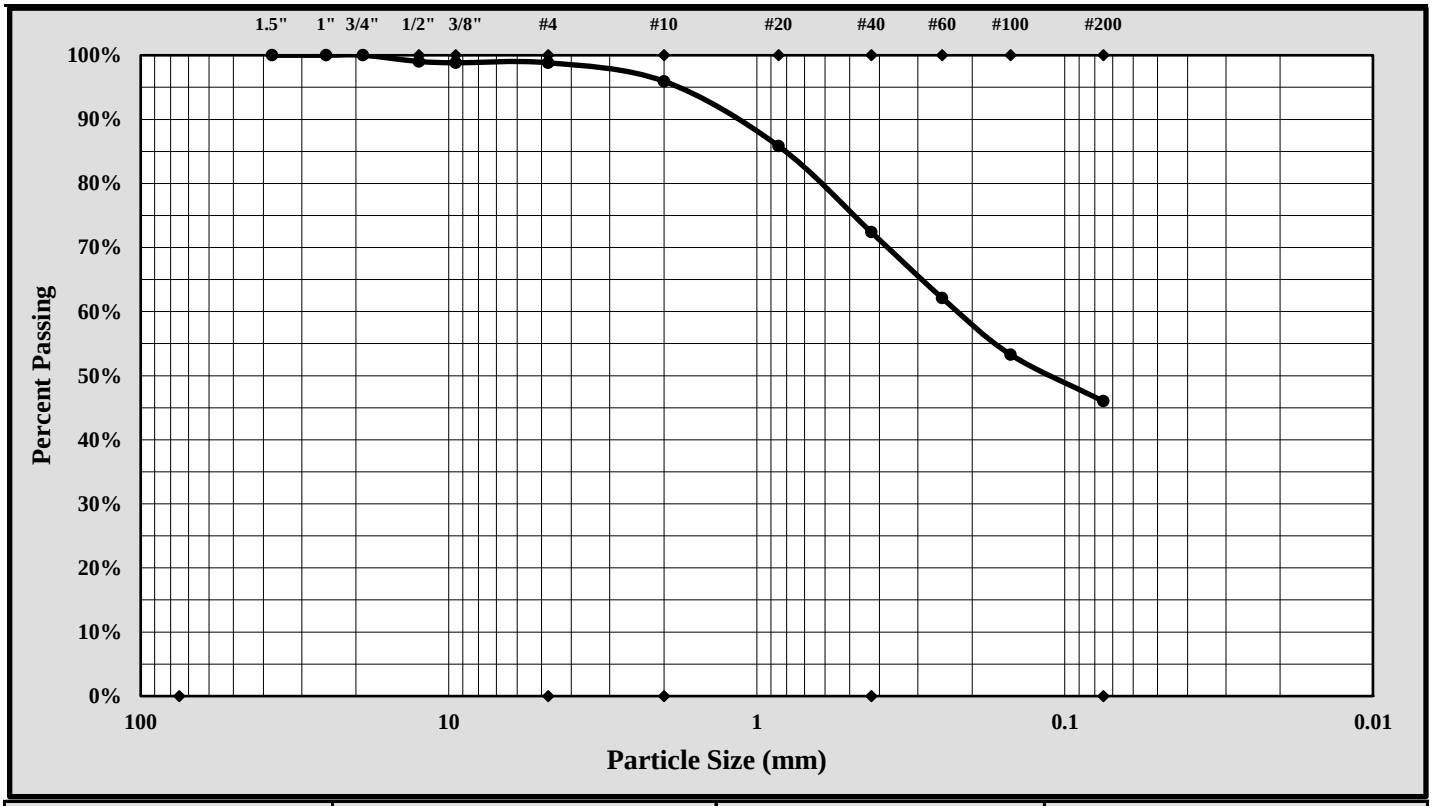
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/21/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/06 - 3/10/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-38 Sample #: SS-2	Sample Date:	1/23/18
Location:	Bridge Boring Type: Split-spoon	Depth:	2.0' - 4.0'
Sample Description:	Clayey Sand (SC, A-6(5))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	12.5 mm	Gravel:	1.2%
Silt & Clay (% Passing #200):	46.0%	Total Sand:	52.8%

Liquid Limit	36	Plastic Limit	17	Plastic Index	19
Coarse Sand:	2.9%	Medium Sand:	23.5%	Fine Sand:	26.4%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/21/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

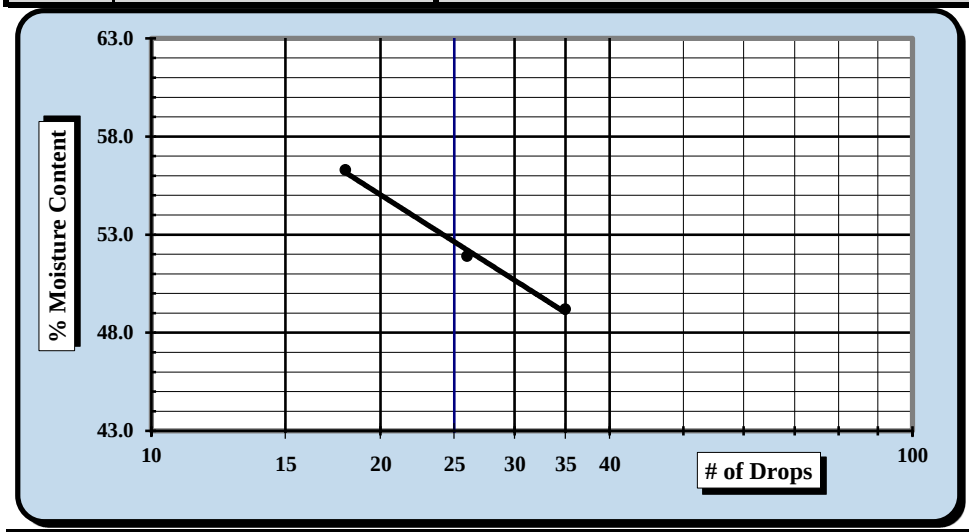
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/21/18
Project Name:	Carolina Crossroads Project	Test Date:	3/16/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-38	Sample #:	SS-4	Sample Date:	1/23/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	6.0' - 8.0'
Sample Description:	Sandy Fat Clay (CH, A-7-6(16))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	6	7	8				9	10	
A	Tare Weight	27.77	26.31	27.29				26.84	26.75	
B	Wet Soil Weight + A	42.99	41.70	43.80				33.81	33.93	
C	Dry Soil Weight + A	37.97	36.44	37.85				32.32	32.40	
D	Water Weight (B-C)	5.02	5.26	5.95				1.49	1.53	
E	Dry Soil Weight (C-A)	10.20	10.13	10.56				5.48	5.65	
F	% Moisture (D/E)*100	49.2%	51.9%	56.3%				27.2%	27.1%	
N	# OF DROPS	35	26	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**27.2%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**53**
Plastic Limit	**27**
Plastic Index	**26**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 66.4%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	3/21/18	Brian Vaughn	3/21/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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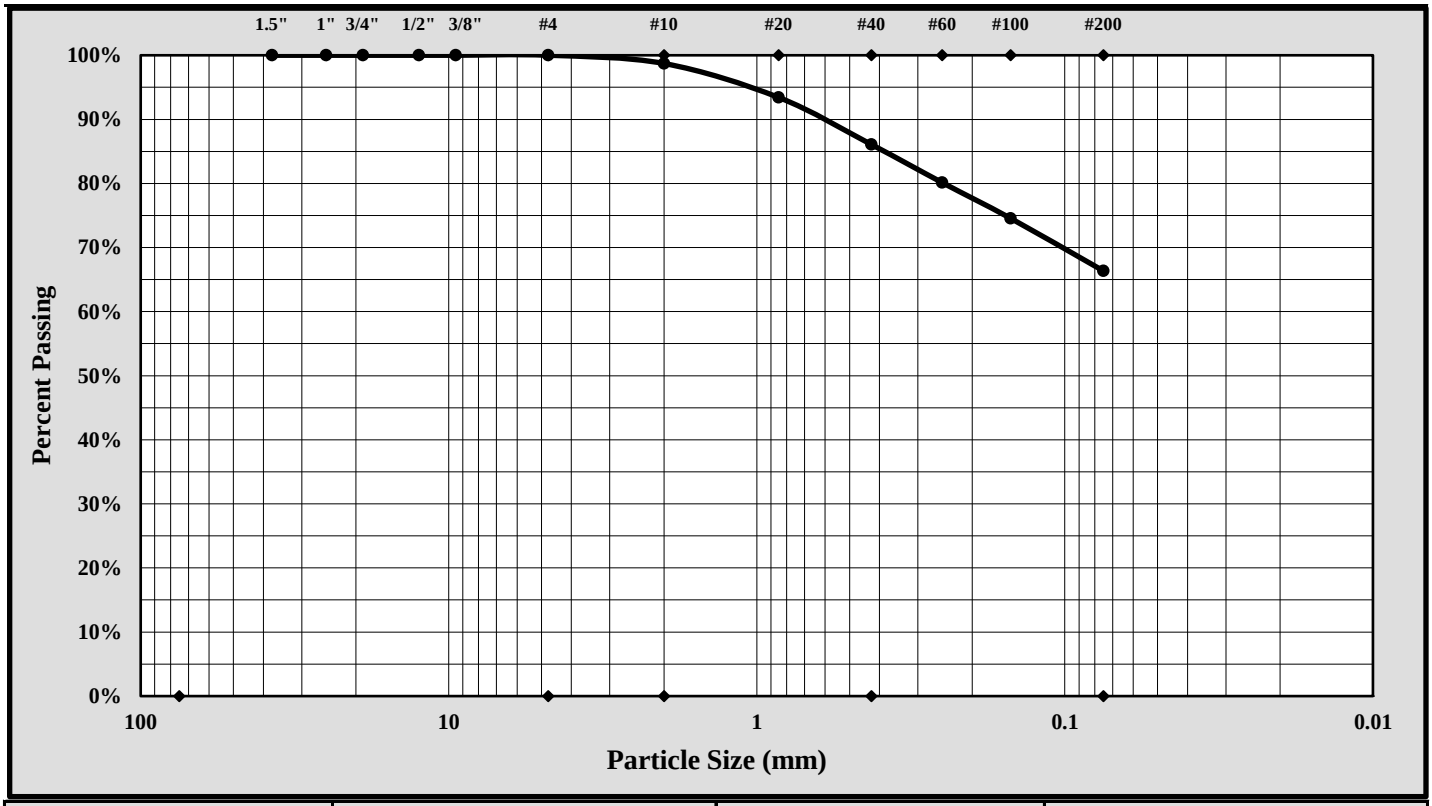
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/21/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/06 - 3/10/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-38 Sample #: SS-4	Sample Date:	1/23/18
Location:	Bridge Boring Type: Split-spoon	Depth:	6.0' - 8.0'
Sample Description:	Sandy Fat Clay (CH, A-7-6(16))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	66.4%	Total Sand:	33.6%

Liquid Limit	53	Plastic Limit	27	Plastic Index	26
Coarse Sand:	1.3%	Medium Sand:	12.6%	Fine Sand:	19.7%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/21/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

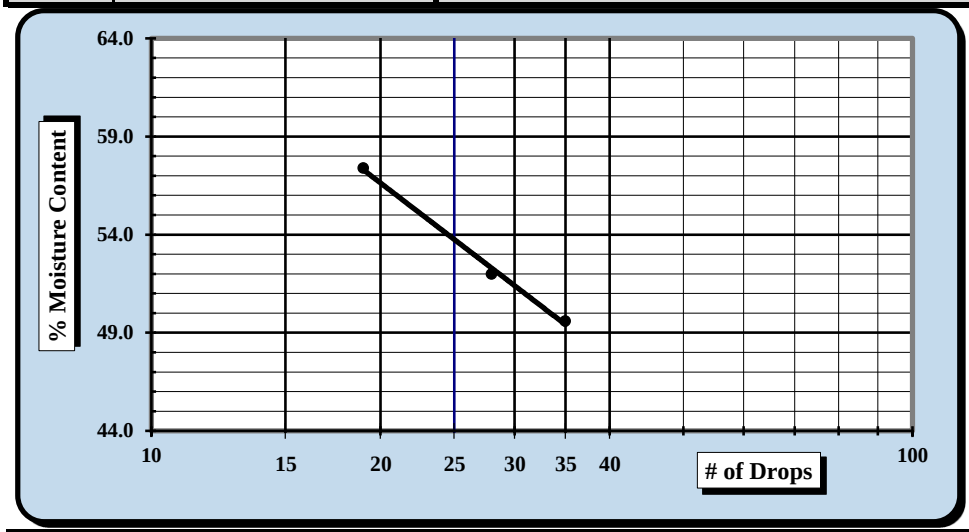
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/21/18
Project Name:	Carolina Crossroads Project	Test Date:	3/16/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-38	Sample #:	SS-5	Sample Date:	1/23/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	8.0' - 10.0'
Sample Description:	Clayey Sand (SC, A-7-6(8))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

	Pan #	Liquid Limit						Plastic Limit		
	Tare #:	11	12	13				14	15	
A	Tare Weight	26.64	26.67	26.78				26.66	27.60	
B	Wet Soil Weight + A	41.26	42.22	43.40				32.68	35.19	
C	Dry Soil Weight + A	36.41	36.90	37.34				31.54	33.76	
D	Water Weight (B-C)	4.85	5.32	6.06				1.14	1.43	
E	Dry Soil Weight (C-A)	9.77	10.23	10.56				4.88	6.16	
F	% Moisture (D/E)*100	49.6%	52.0%	57.4%				23.4%	23.2%	
N	# OF DROPS	35	28	19				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**23.3%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐
Liquid Limit **54**
Plastic Limit **23**
Plastic Index **31**
Group Symbol **CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 42.6%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski — *Technician Name*
3/21/18 — *Date*
Brian Vaughn — *Technical Responsibility*
3/21/18 — *Date*

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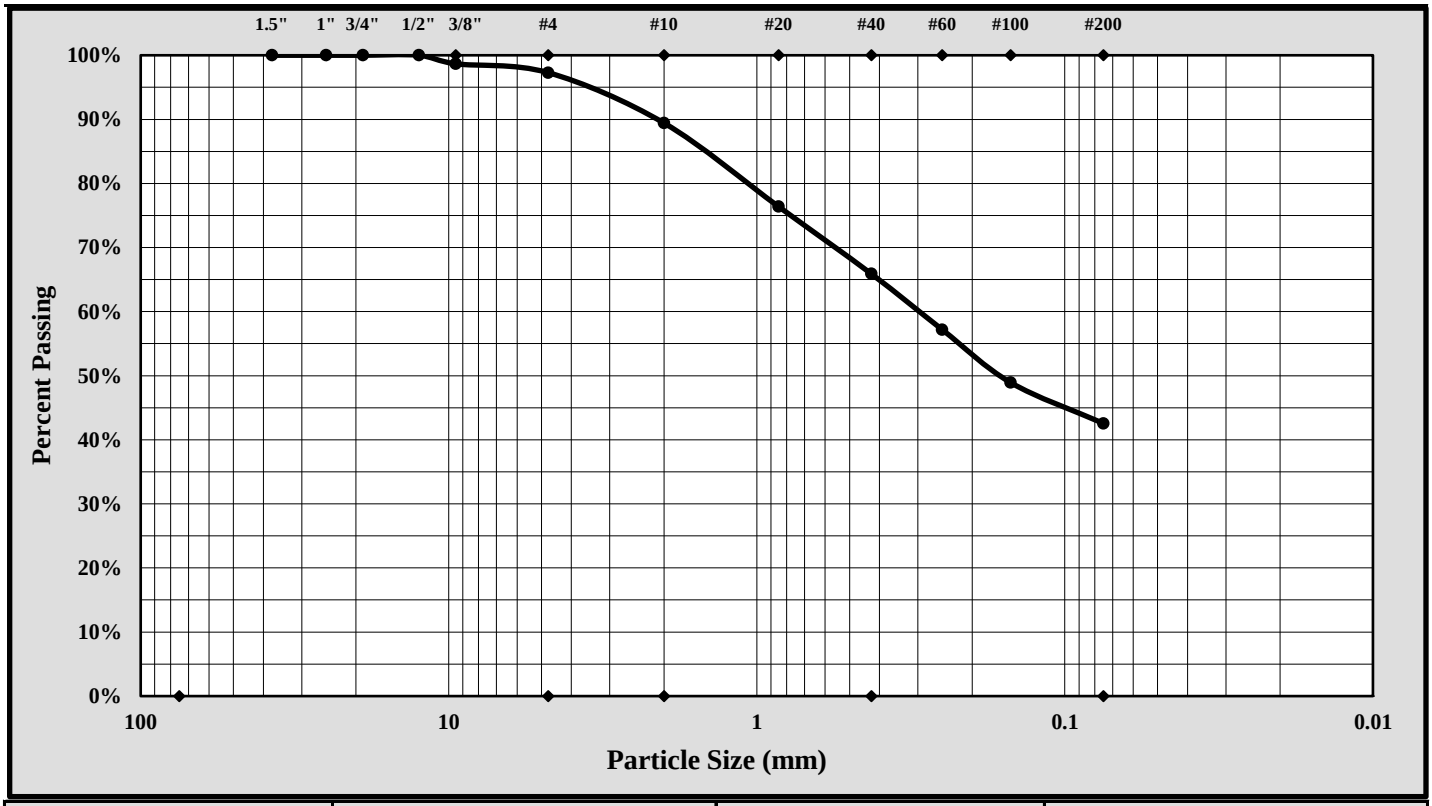
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/21/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/06 - 3/10/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-38 Sample #: SS-5	Sample Date:	1/23/18
Location:	Bridge Boring Type: Split-spoon	Depth:	8.0' - 10.0'
Sample Description:	Clayey Sand (SC, A-7-6(8))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	12.5 mm	Gravel:	2.7%
Silt & Clay (% Passing #200):	42.6%	Total Sand:	54.7%

Liquid Limit	54	Plastic Limit	23	Plastic Index	31
Coarse Sand:	7.9%	Medium Sand:	23.5%	Fine Sand:	23.3%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/21/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

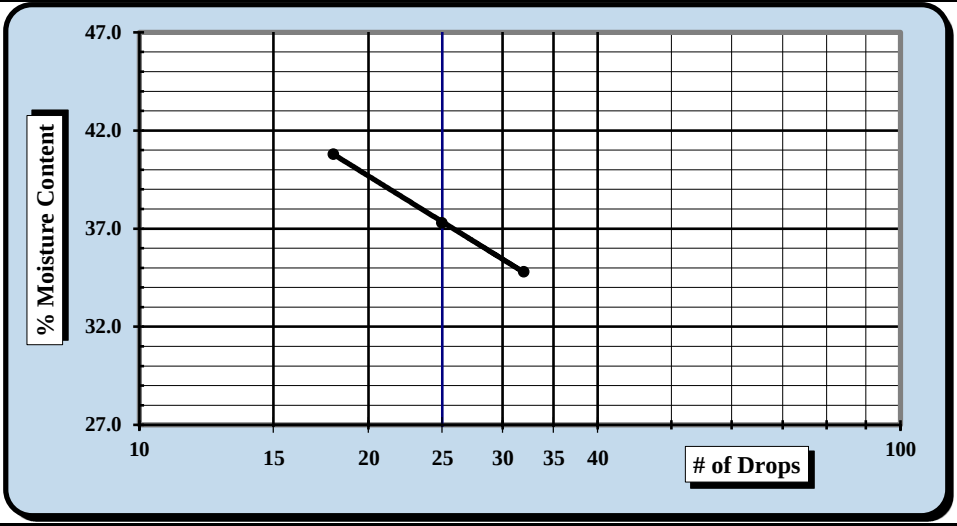
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date:	5/10/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-39	Sample #:	SS-1	Sample Date:	4/09/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	0.0' - 2.0'
Sample Description:	Clayey Sand (SC, A-6(5))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

	Pan #	Liquid Limit						Plastic Limit		
	Tare #:	46	47	48				49	50	
A	Tare Weight	27.57	25.82	26.36				28.63	28.88	
B	Wet Soil Weight + A	41.17	43.79	41.67				36.67	36.62	
C	Dry Soil Weight + A	37.66	38.91	37.23				35.34	35.32	
D	Water Weight (B-C)	3.51	4.88	4.44				1.33	1.30	
E	Dry Soil Weight (C-A)	10.09	13.09	10.87				6.71	6.44	
F	% Moisture (D/E)*100	34.8%	37.3%	40.8%				19.8%	20.2%	
N	# OF DROPS	32	25	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**20.0%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐
Liquid Limit **37**
Plastic Limit **20**
Plastic Index **17**
Group Symbol **CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/11/18	Matthew F. Cooke, P.G.	5/11/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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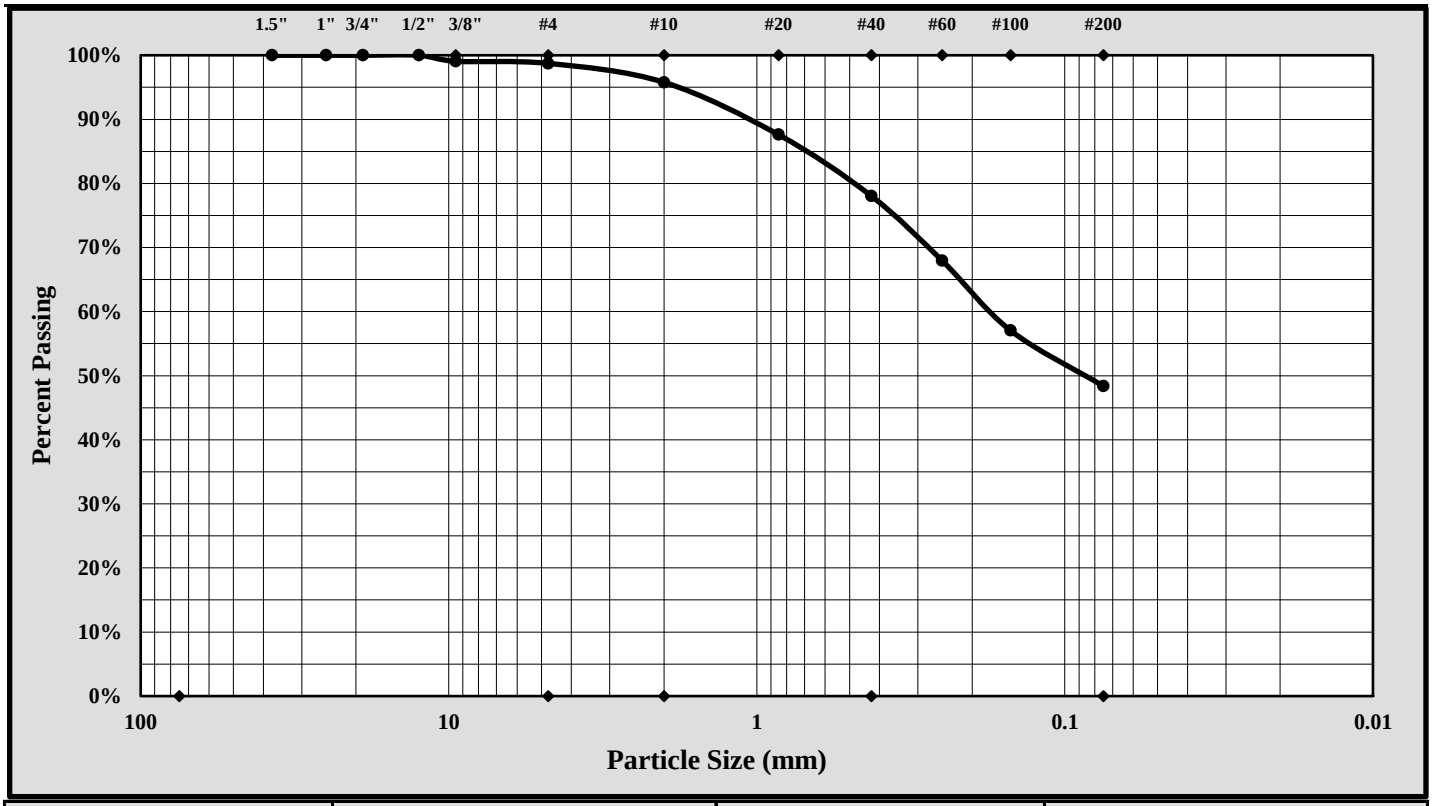
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/08 - 5/10/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-39 Sample #: SS-1	Sample Date:	4/09/18
Location:	Bridge Boring Type: Split-spoon	Depth:	0.0' - 2.0'
Sample Description:	Clayey Sand (SC, A-6(5))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	9.50 mm	Gravel:	1.3%
Silt & Clay (% Passing #200):	48.4%	Total Sand:	50.3%

Liquid Limit	37	Plastic Limit	20	Plastic Index	17
Coarse Sand:	3.0%	Medium Sand:	17.7%	Fine Sand:	29.7%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/11/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

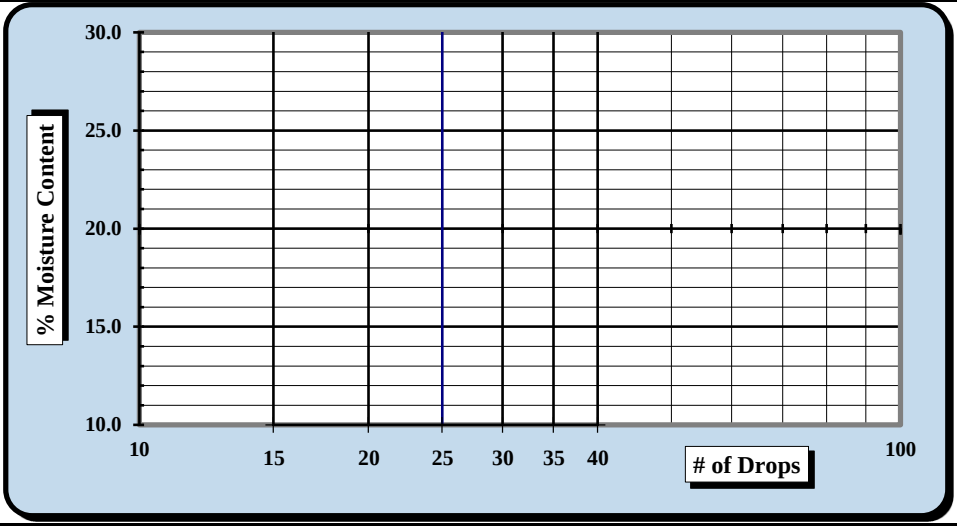
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date:	5/10/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-39	Sample #:	SS-2	Sample Date:	4/09/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	2.0' - 4.0'
Sample Description:	Silty Sand (SM, A-2-4)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:									
A	Tare Weight									
B	Wet Soil Weight + A									
C	Dry Soil Weight + A									
D	Water Weight (B-C)									
E	Dry Soil Weight (C-A)									
F	% Moisture (D/E)*100									
N	# OF DROPS							*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*									



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☒

Liquid Limit	---
Plastic Limit	**NP**
Plastic Index	**NP**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/11/18	Matthew F. Cooke, P.G.	5/11/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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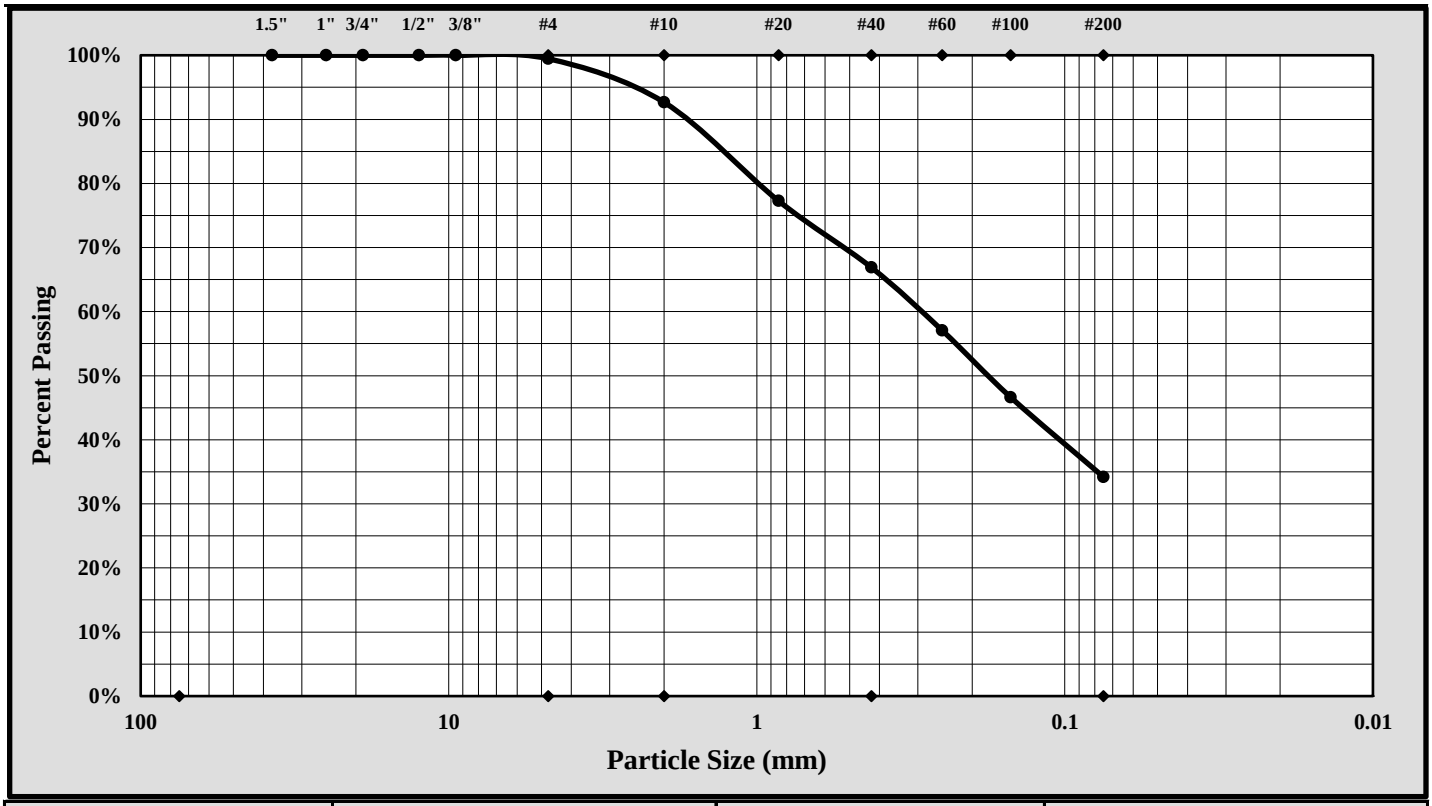
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/08 - 5/10/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-39	Sample #: SS-2	Sample Date: 4/09/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 2.0' - 4.0'
Sample Description:	Silty Sand (SM, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.5%
Silt & Clay (% Passing #200):	34.2%	Total Sand:	65.2%

Liquid Limit	---	Plastic Limit	NP	Plastic Index	NP
Coarse Sand:	6.8%	Medium Sand:	25.8%	Fine Sand:	32.7%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/11/18 — *Date*

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Form No: TR-D1140-1
Revision No. 1
Revision Date: 8/2/17

MATERIAL FINER THAN THE #200 SIEVE

ASTM D1140

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/01 - 5/03/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sampled by:	S&ME	Sample Dates:	4/09/18
Sampling Method:	Split-spoon		

Method; A ☐ **B** ☑ Soaked ☑ Soak Time 16 hrs.

Boring #	Sample #	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Tare Wt. + Dry Wt. after Wash	% Passing #200
		ft.		grams	grams	grams	grams	%
B-39	SS-3	6.0 - 8.0	D-15	0.00	N/A	175.79	83.09	**52.7%**

Balance ID.: *13942* *Calibration Date:* *8/18/17* *#200 Sieve:* *23239* *Calibration Date:* *2/19/18*

Notes / Deviations / References: ASTM D1140: Amount of Material in Soil Finer Than the No. 200 (75-um)) Sieve

Benjamin Kovaleski	Benjamin J. Kovaleski	NICET Lab Level III/117226	5/11/18
Technician Name	*Signature*	*Certification Type/No.*	*Date*
Matthew F. Cooke, P.G.		Project Manager	5/11/18
Technical Responsibility		*Position*	*Date*

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Form No: TR-D2974-1
Revision No. 1
Revision Date: 08/26/17

MOISTURE, ASH, AND ORGANIC MATTER

ASTM D-2974

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/05/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-39	Sample #: SS-3	Sample Date: 4/09/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 6.0' - 8.0'
Sample Description:	Sandy Lean Clay (CL)		

Equipment: *Balance: 0.01 g.Readability, 500g. Minimum Capaccity*
Balance: *S&ME ID #:* *13942* *Cal. Date:* *8/19/17* *Due:* *8/19/18*

Method A: Moisture Content Determination *Required Oven Temperature: 105 ± 5 °C*

Oven Temperature: 105 °C		*Tare #*	
t	Tare Weight *(Dish plus Aluminum Foil Cover)*	*grams*	
a	Mass of *As-Received* Specimen + Tare Wt.	*grams*	
b	Mass of Oven Dry Specimen + Tare Wt.	*grams*	
w	Water Weight	*(a-b)*	
A	Mass of As-Received Specimen	*(a-t)*	
B	Mass of Oven Dry Specimen	*(b-t)*	
	% Moisture Content as a % of As Received or Total Mass	*(w/A)*100*	
	% Moisture Content as a % of Oven-dried Mass	*(w/B)*100*	

Oven *S&ME ID #:* *Cal. Date:* *Due:*

Method C (440 ° C) or D (750 ° C): Ash Content and Organic Matter Determination

Muffle Furnace: 440 °C		*Tare #*	B
t	Tare Weight *(Dish plus Aluminum Foil Cover)*	*grams*	56.80
b	Mass of Oven Dry Specimen + Tare Wt.	*grams*	107.11
c	Ash Weight + Tare Wt.	*grams*	106.44
C	Ash Weight	*c-t*	49.64
B	Mass of Oven Dry Specimen	*(b-t)*	50.31
D	***% Ash Content***	*(C/B)*100*	**98.7%**
	% Organic Matter	*100-D*	**1.3%**

Muffle Furnace: *S&ME ID #:* *23123* *Cal. Date:* *N/A* *Due:* *N/A*

Notes / Deviations / References: ASTM D2974: Moisture, Ash, and Organic Matter of Peat and Other Organic Soils

Benjamin Kovaleski	Benjamin J. Kovaleski	NICET Level III/117226	5/11/18
Technician Name	*Signature*	*Level/Certification*	*Date*
Matthew F. Cooke, P.G.		Project Manager	5/11/18
Technical Responsibility		*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ *AASHTO T 89* ☐ *AASHTO T 90* ☐

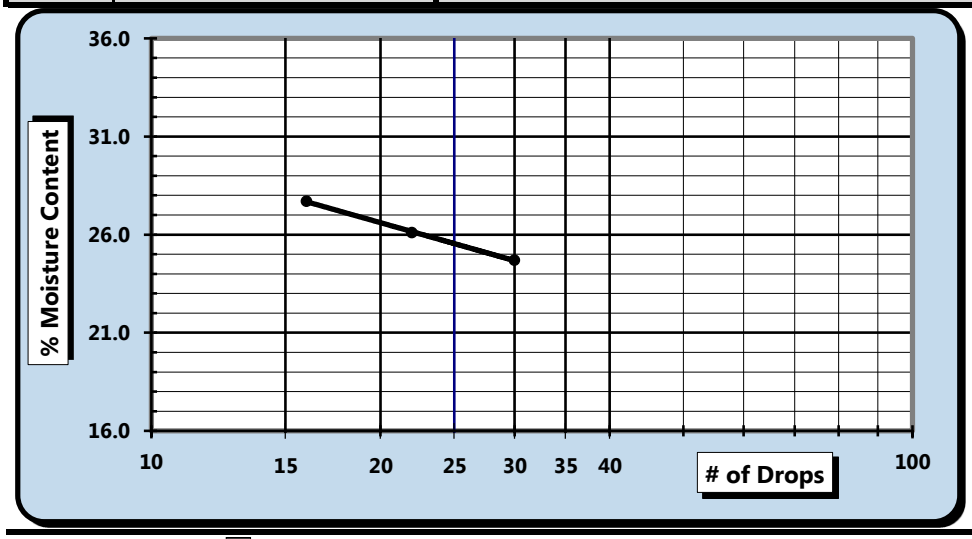
S&ME, Inc. - Spartanburg: 301 Zima Park Drive, Spartanburg, SC 29301

Project #:	1461-16-047.2B	Report Date:	3/16/18
Project Name:	Carolina Crossroads Project	Test Date:	3/15/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-40	Sample #:	SS-3	Sample Date:	1/29/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	4.8' - 6.8'
Sample Description:	Clayey Sand (SC, A-4(0))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	7537	1/31/2018	Grooving tool	14185	9/12/2017
LL Apparatus	13859	9/12/2017			
Oven	7313	7/28/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	P-7	P-8	P-9				25	26	
A	Tare Weight	15.79	15.66	15.94				11.67	11.53	
B	Wet Soil Weight + A	39.47	39.86	39.63				19.47	19.18	
C	Dry Soil Weight + A	34.78	34.85	34.49				18.36	18.08	
D	Water Weight (B-C)	4.69	5.01	5.14				1.11	1.10	
E	Dry Soil Weight (C-A)	18.99	19.19	18.55				6.69	6.55	
F	% Moisture (D/E)*100	24.7%	26.1%	27.7%				16.6%	16.8%	
N	# OF DROPS	30	22	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							16.7%		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**26**
Plastic Limit	**17**
Plastic Index	**9**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matt Jacobs	NICET 118202	Matthew F. Cooke, P.G.	3/16/18
Technician Name	*Certification#*	*Technical Responsibility*	*Date*

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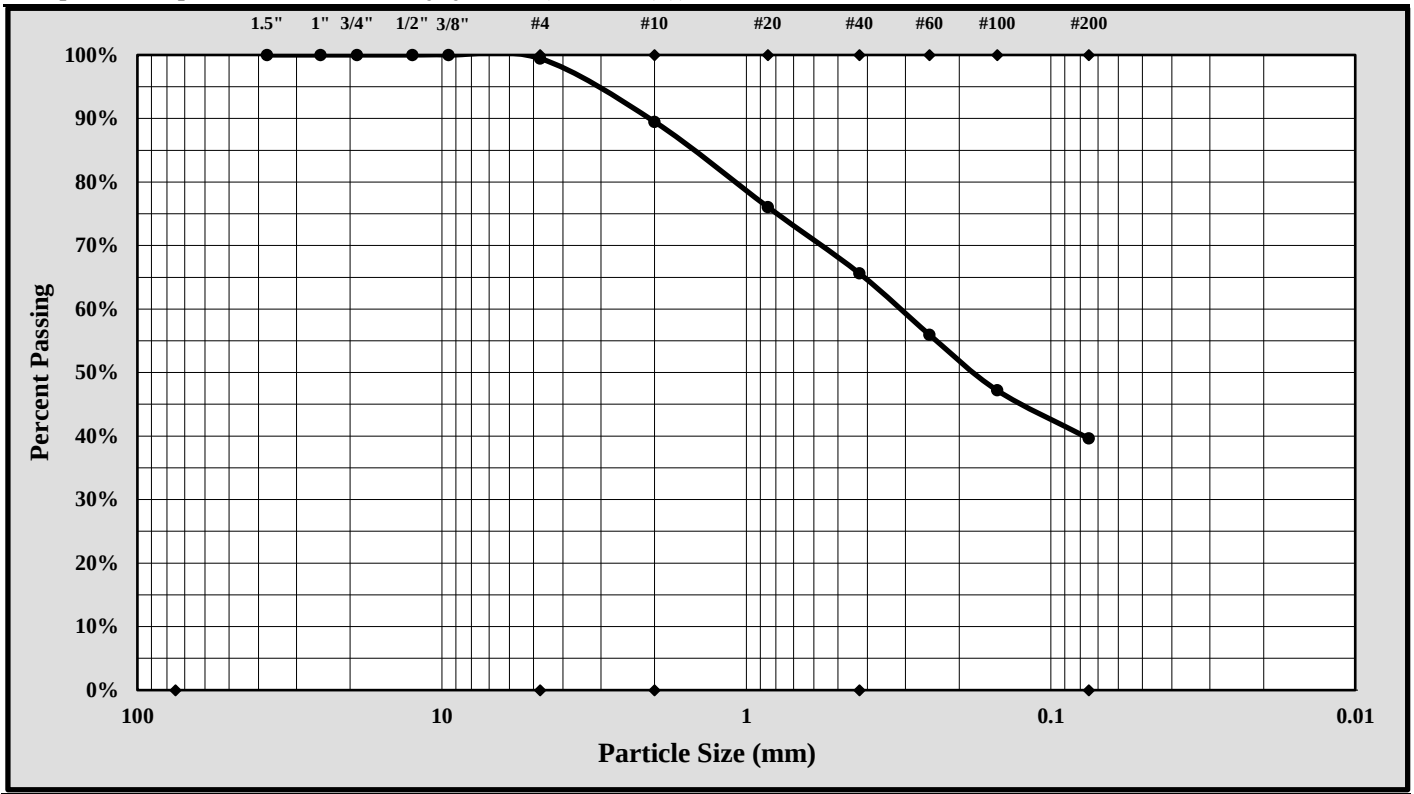
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. - Spartanburg 301 Zima Park Dr. Spartanburg, SC 29301

S&ME Project #:	1461-16-047.2B	Report Date:	3/16/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/21 - 2/26/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-40	Sample #: SS-3	Sample Date: 1/29/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 4.8' - 6.8'
Sample Description:	Clayey Sand (SC, A-4(0))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.6%
Silt & Clay (% Passing #200):	39.6%	Total Sand:	59.8%

Liquid Limit	26	Plastic Limit	17	Plastic Index	9
Coarse Sand:	10.0%	Medium Sand:	23.9%	Fine Sand:	26.0%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/16/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ *AASHTO T 89* ☐ *AASHTO T 90* ☐

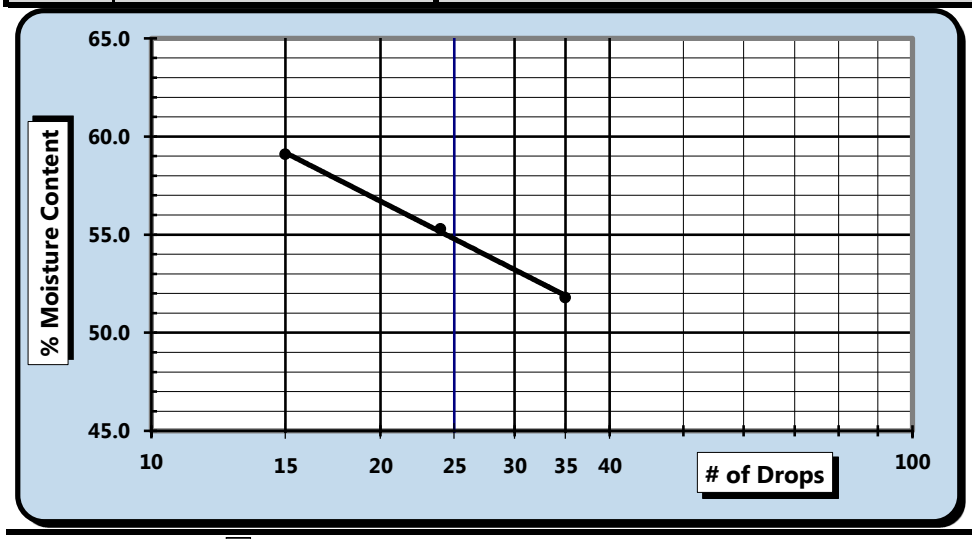
S&ME, Inc. - Spartanburg: 301 Zima Park Drive, Spartanburg, SC 29301

Project #:	1461-16-047.2B	Report Date:	5/9/18
Project Name:	Carolina Crossroads Project	Test Date:	5/8/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-40	Sample #:	SS-5	Sample Date:	1/29/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	8.8' - 10.8'
Sample Description:	Sandy Fat Clay (CH, A-7-6(15))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	7537	1/31/2018	Grooving tool	14185	9/12/2017
LL Apparatus	13859	9/12/2017			
Oven	7313	7/28/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	Q-7	Q-8	Q-9				27	28	
A	Tare Weight	16.90	16.92	16.79				11.48	11.47	
B	Wet Soil Weight + A	36.80	35.51	35.88				18.57	18.73	
C	Dry Soil Weight + A	30.01	28.89	28.79				17.16	17.30	
D	Water Weight (B-C)	6.79	6.62	7.09				1.41	1.43	
E	Dry Soil Weight (C-A)	13.11	11.97	12.00				5.68	5.83	
F	% Moisture (D/E)*100	51.8%	55.3%	59.1%				24.8%	24.5%	
N	# OF DROPS	35	24	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							24.7%		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**55**
Plastic Limit	**25**
Plastic Index	**30**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☑ Dry Preparation ☐ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matt Jacobs	NICET 118202	Matthew F. Cooke, P.G.	5/9/18
Technician Name	*Certification#*	*Technical Responsibility*	*Date*

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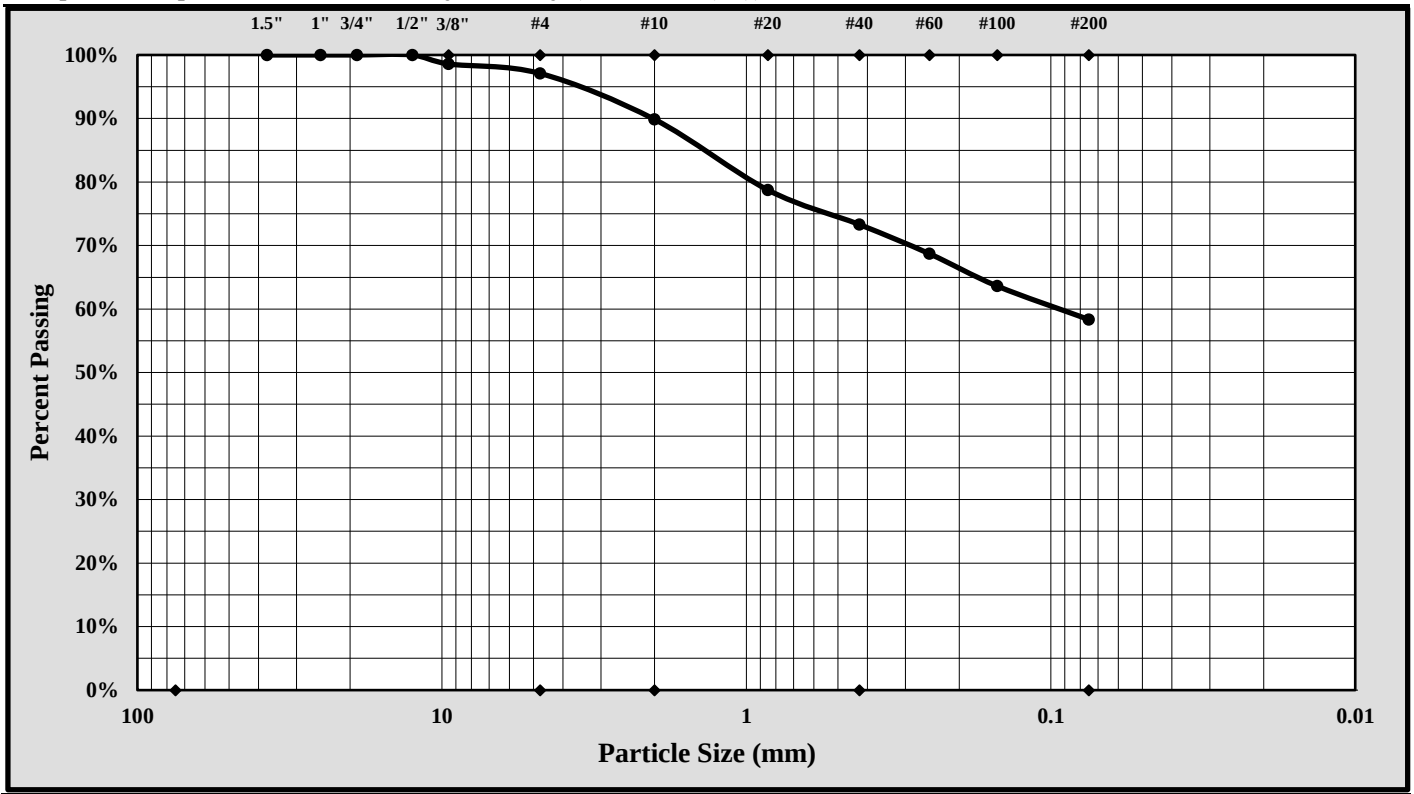
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. - Spartanburg 301 Zima Park Dr. Spartanburg, SC 29301

S&ME Project #:	1461-16-047.2B	Report Date:	5/9/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/21 - 2/26/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-40	Sample #: SS-5	Sample Date: 1/29/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 8.8' - 10.8'
Sample Description:	Sandy Fat Clay (CH, A-7-6(15))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	12.50 mm	Gravel:	2.9%
Silt & Clay (% Passing #200):	58.3%	Total Sand:	38.7%

Liquid Limit	55	Plastic Limit	25	Plastic Index	30
Coarse Sand:	7.2%	Medium Sand:	16.5%	Fine Sand:	14.9%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/9/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ *AASHTO T 89* ☐ *AASHTO T 90* ☐

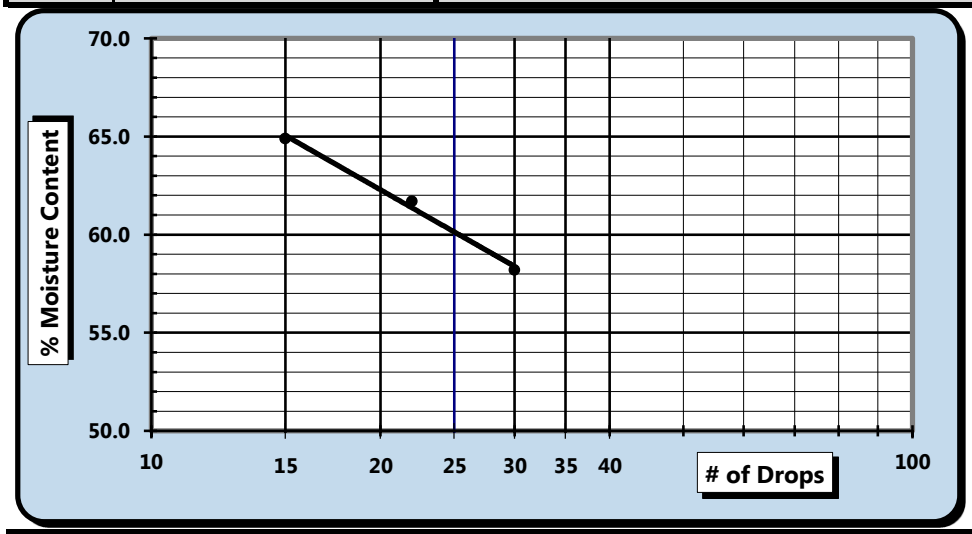
S&ME, Inc. - Spartanburg: 301 Zima Park Drive, Spartanburg, SC 29301

Project #:	1461-16-047.2B	Report Date:	5/9/18
Project Name:	Carolina Crossroads Project	Test Date:	5/8/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-40	Sample #:	SS-7	Sample Date:	1/29/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	18.5' - 20.0'
Sample Description:	Elastic Silt (MH, A-7-5(32))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	7537	1/31/2018	Grooving tool	14185	9/12/2017
LL Apparatus	13859	9/12/2017			
Oven	7313	7/28/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	Z-7	Z-8	Z-9				29	31	
A	Tare Weight	16.74	15.72	16.71				11.59	11.54	
B	Wet Soil Weight + A	36.24	34.45	35.99				18.88	18.61	
C	Dry Soil Weight + A	29.07	27.30	28.40				17.07	16.87	
D	Water Weight (B-C)	7.17	7.15	7.59				1.81	1.74	
E	Dry Soil Weight (C-A)	12.33	11.58	11.69				5.48	5.33	
F	% Moisture (D/E)*100	58.2%	61.7%	64.9%				33.0%	32.6%	
N	# OF DROPS	30	22	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							32.8%		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**60**
Plastic Limit	**33**
Plastic Index	**27**
Group Symbol	**MH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☑ Dry Preparation ☐ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matt Jacobs	NICET 118202	Matthew F. Cooke, P.G.	5/9/18
Technician Name	*Certification#*	*Technical Responsibility*	*Date*

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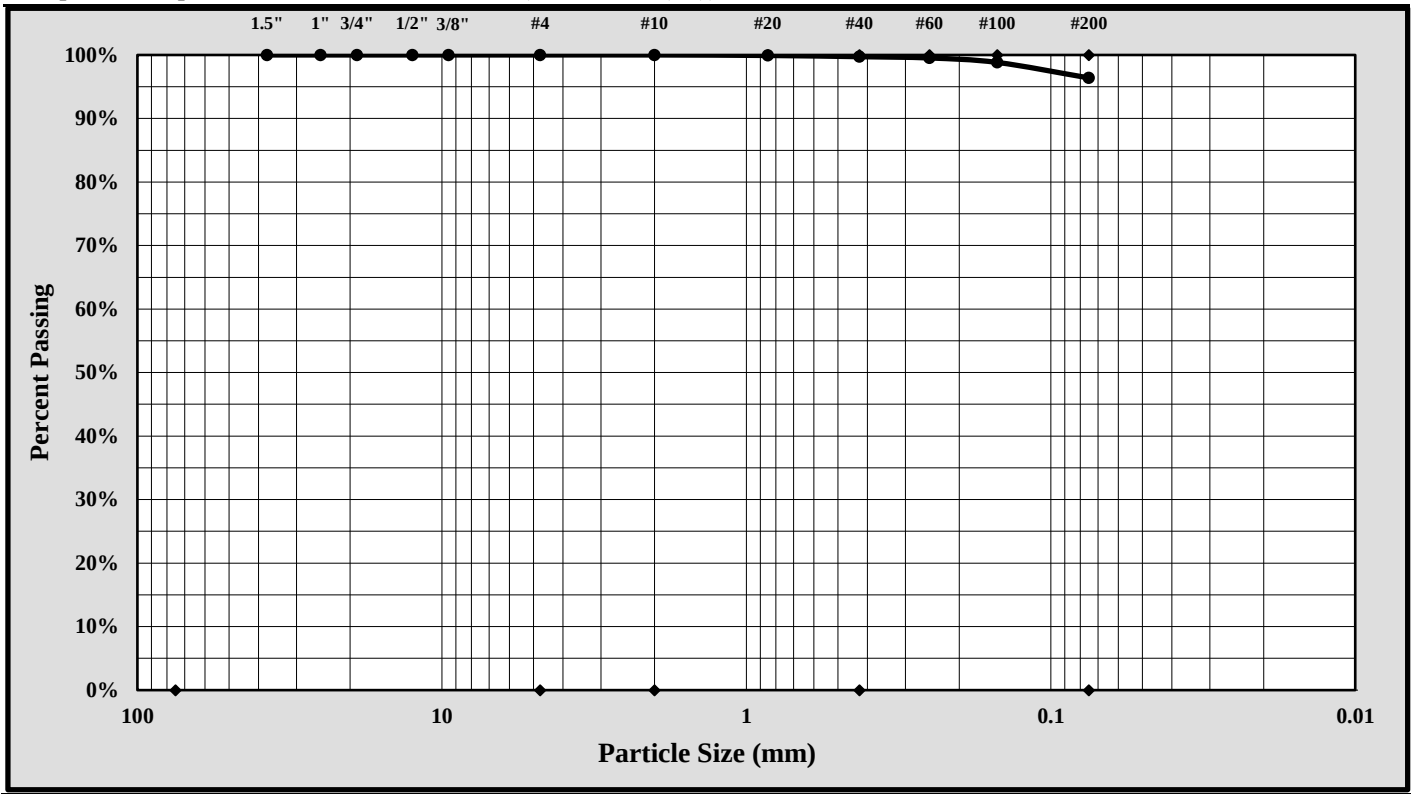
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. - Spartanburg 301 Zima Park Dr. Spartanburg, SC 29301

S&ME Project #:	1461-16-047.2B	Report Date:	5/9/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/21 - 2/26/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-40	Sample #: SS-7	Sample Date: 1/29/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 18.5' - 20.0'
Sample Description:	Elastic Silt (MH, A-7-5(32))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	0.85 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	96.4%	Total Sand:	3.6%

Liquid Limit	60	Plastic Limit	33	Plastic Index	27
Coarse Sand:	0.0%	Medium Sand:	0.3%	Fine Sand:	3.3%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/9/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ *AASHTO T 89* ☐ *AASHTO T 90* ☐

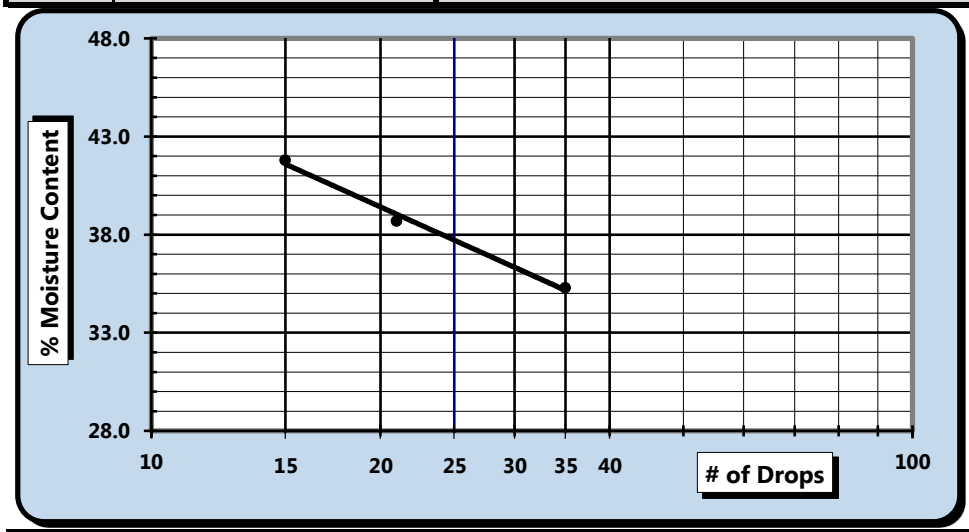
S&ME, Inc. - Spartanburg: 301 Zima Park Drive, Spartanburg, SC 29301

Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date:	5/10/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-40	Sample #:	SS-8	Sample Date:	1/29/18
Location:	Bridge borings	Type:	Split-spoon	Depth:	23.5 - 25.0'
Sample Description:	Sandy Lean Clay (CL, A-6(8))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	7537	1/31/2018	Grooving tool	14185	9/12/2017
LL Apparatus	13859	9/12/2017			
Oven	7313	7/28/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	P-1	P-2	P-3				1	2	
A	Tare Weight	16.36	15.25	16.53				12.11	12.16	
B	Wet Soil Weight + A	34.56	36.26	35.81				19.91	19.68	
C	Dry Soil Weight + A	29.81	30.40	30.13				18.62	18.42	
D	Water Weight (B-C)	4.75	5.86	5.68				1.29	1.26	
E	Dry Soil Weight (C-A)	13.45	15.15	13.60				6.51	6.26	
F	% Moisture (D/E)*100	35.3%	38.7%	41.8%				19.8%	20.1%	
N	# OF DROPS	35	21	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							20.0%		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**38**
Plastic Limit	**20**
Plastic Index	**18**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matt Jacobs	NICET 118202	Matthew F. Cooke, P.G.	5/11/18
Technician Name	*Certification#*	*Technical Responsibility*	*Date*

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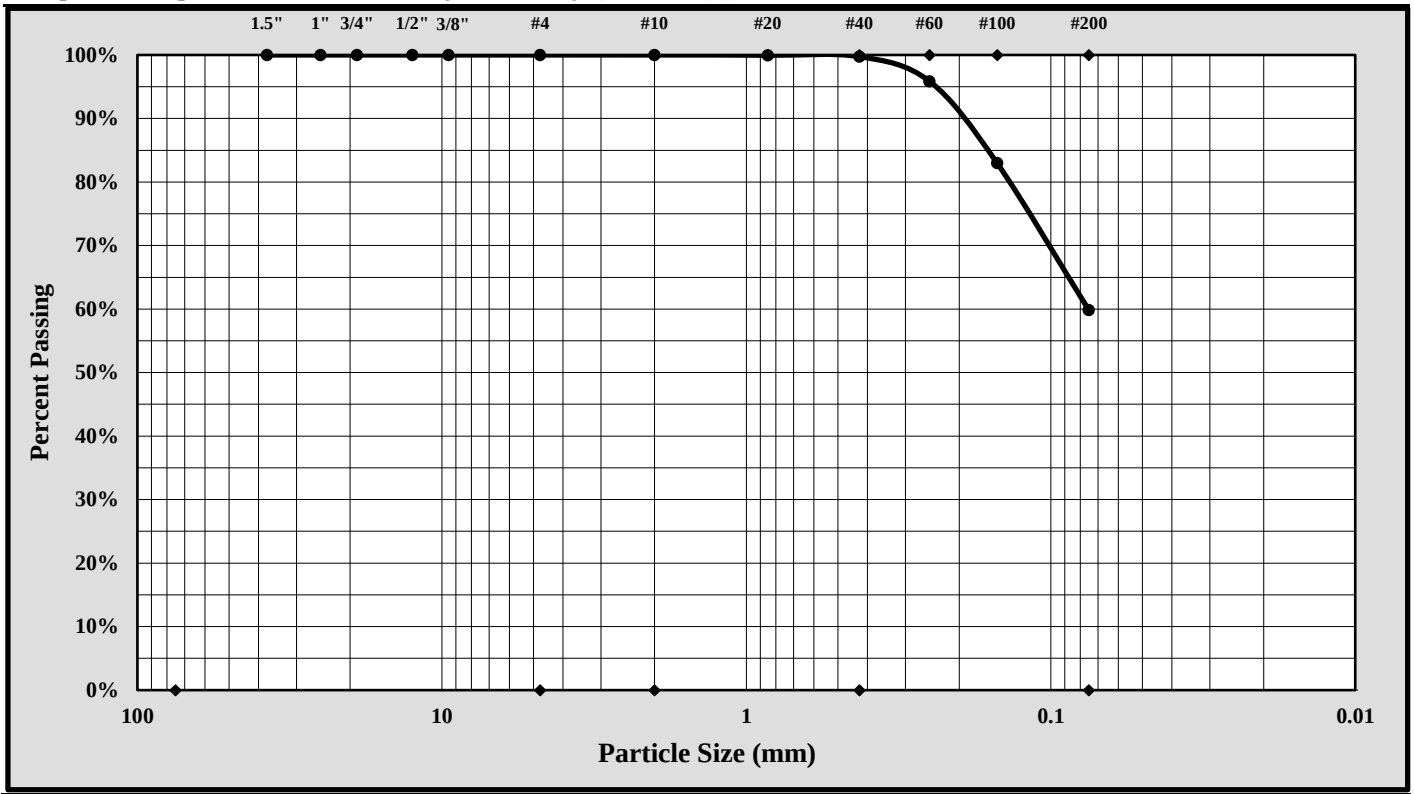
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. - Spartanburg 301 Zima Park Dr. Spartanburg, SC 29301

S&ME Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/21 - 2/27/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-40	Sample #: SS-8	Sample Date: 1/29/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 23.5' - 25.0'
Sample Description:	Sandy Lean Clay (CL, A-6(8))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	0.85 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	59.8%	Total Sand:	40.2%

Liquid Limit	38	Plastic Limit	20	Plastic Index	18
Coarse Sand:	0.0%	Medium Sand:	0.3%	Fine Sand:	39.9%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/11/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

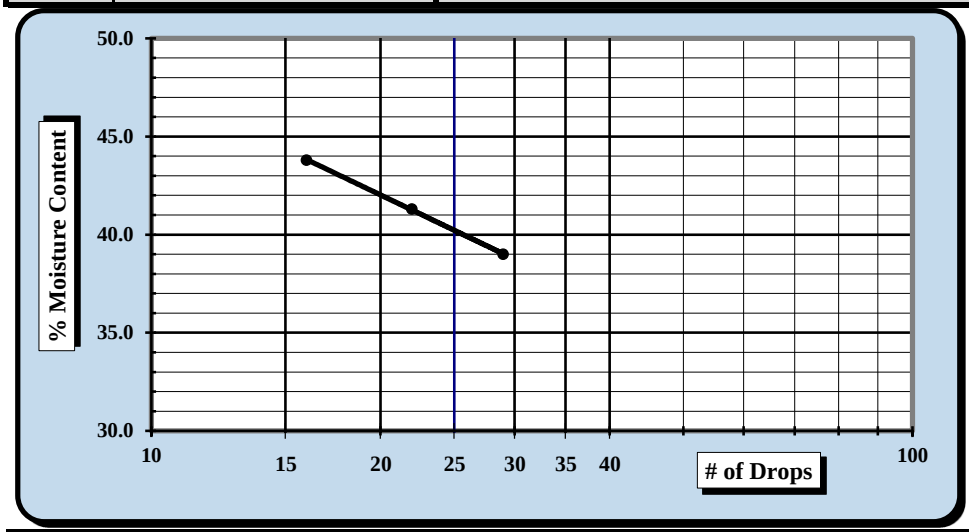
Project #:	1461-16-047.2B	Report Date:	3/21/18
Project Name:	Carolina Crossroads Project	Test Date:	3/16/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-41	Sample #:	SS-2	Sample Date:	1/21/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	2.8' - 4.8'

Sample Description: Lean Clay with Sand (CL, A-6(13))

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

	Pan #	Liquid Limit						Plastic Limit		
	Tare #:	16	17	18				19	20	
A	Tare Weight	26.54	26.62	26.78				26.68	26.83	
B	Wet Soil Weight + A	41.94	44.45	45.19				34.21	34.40	
C	Dry Soil Weight + A	37.62	39.24	39.58				32.87	33.05	
D	Water Weight (B-C)	4.32	5.21	5.61				1.34	1.35	
E	Dry Soil Weight (C-A)	11.08	12.62	12.80				6.19	6.22	
F	% Moisture (D/E)*100	39.0%	41.3%	43.8%				21.6%	21.7%	
N	# OF DROPS	29	22	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**21.7%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**40**
Plastic Limit	**22**
Plastic Index	**18**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 74.5%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	3/21/18	Brian Vaughn	3/21/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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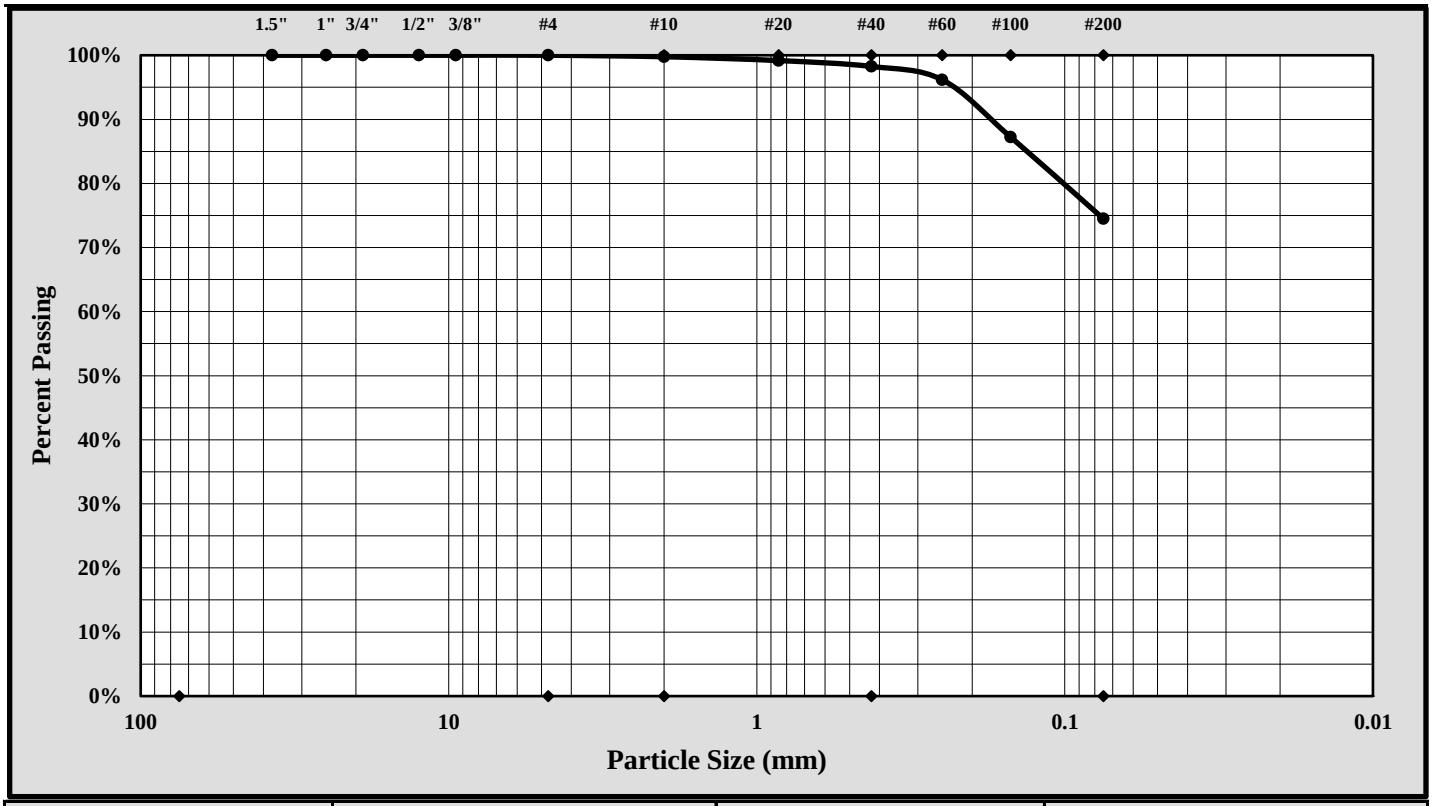
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/21/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/06 - 3/10/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-41 Sample #: SS-2	Sample Date:	1/21/18
Location:	Bridge Boring Type: Split-spoon	Depth:	2.8' - 4.8'
Sample Description:	Lean Clay with Sand (CL, A-6(13))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	.85 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	74.5%	Total Sand:	25.5%

Liquid Limit	40	Plastic Limit	22	Plastic Index	18
Coarse Sand:	0.2%	Medium Sand:	1.5%	Fine Sand:	23.8%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/21/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

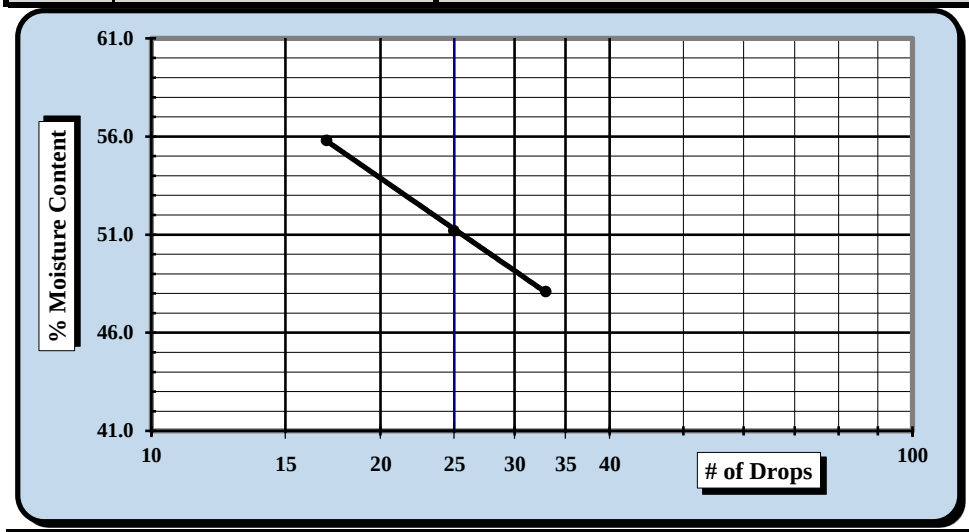
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/21/18
Project Name:	Carolina Crossroads Project	Test Date:	3/17/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-41	Sample #:	SS-4	Sample Date:	1/21/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	6.8' - 8.8'
Sample Description:	Sandy Fat Clay (CH, A-7-6(10))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	21	22	23				24	25	
A	Tare Weight	28.09	25.70	27.21				25.99	26.82	
B	Wet Soil Weight + A	43.18	42.36	43.34				33.49	33.88	
C	Dry Soil Weight + A	38.28	36.72	37.56				31.99	32.47	
D	Water Weight (B-C)	4.90	5.64	5.78				1.50	1.41	
E	Dry Soil Weight (C-A)	10.19	11.02	10.35				6.00	5.65	
F	% Moisture (D/E)*100	48.1%	51.2%	55.8%				25.0%	25.0%	
N	# OF DROPS	33	25	17				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**25.0%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**51**
Plastic Limit	**25**
Plastic Index	**26**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 52.1%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski — *Technician Name*
3/21/18 — *Date*
Brian Vaughn — *Technical Responsibility*
3/21/18 — *Date*

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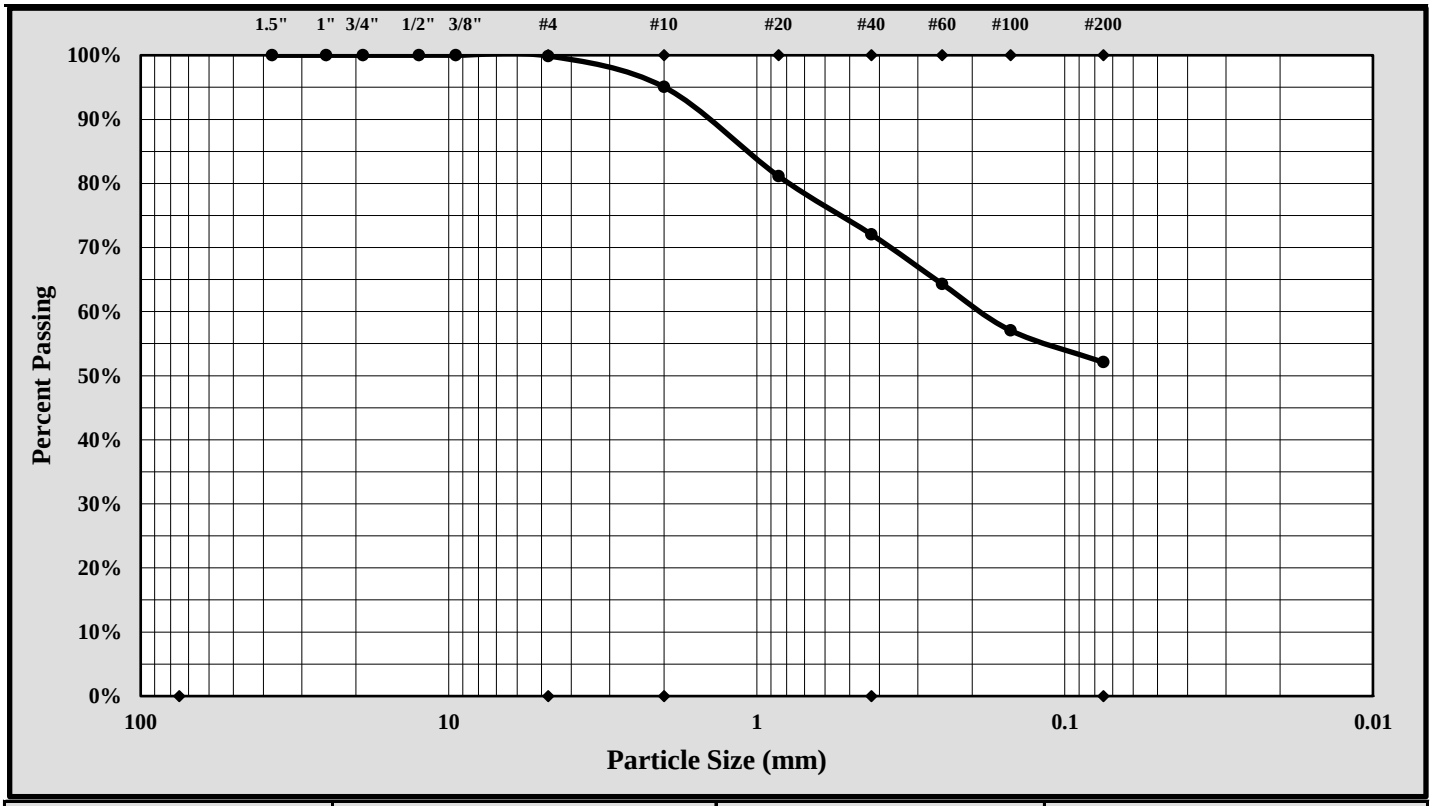
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/21/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/06 - 3/10/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-41 Sample #: SS-4	Sample Date:	1/21/18
Location:	Bridge Boring Type: Split-spoon	Depth:	6.8' - 8.8'
Sample Description:	Sandy Fat Clay (CH, A-7-6(10))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.1%
Silt & Clay (% Passing #200):	52.1%	Total Sand:	47.8%

Liquid Limit	51	Plastic Limit	25	Plastic Index	26
Coarse Sand:	4.8%	Medium Sand:	23.0%	Fine Sand:	20.0%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/21/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/21/18
Project Name:	Carolina Crossroads Project	Test Date:	3/17/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-41	Sample #:	SS-7	Sample Date:	1/21/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	18.5' - 20.0'

Sample Description: Fat Clay with Sand (CH, A-7-6(24))

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	26	27	28				29	30	
A	Tare Weight	27.32	27.02	26.83				27.02	27.39	
B	Wet Soil Weight + A	46.02	44.91	42.57				33.99	35.70	
C	Dry Soil Weight + A	40.20	39.08	37.13				32.77	34.24	
D	Water Weight (B-C)	5.82	5.83	5.44				1.22	1.46	
E	Dry Soil Weight (C-A)	12.88	12.06	10.30				5.75	6.85	
F	% Moisture (D/E)*100	45.2%	48.3%	52.8%				21.2%	21.3%	
N	# OF DROPS	35	28	20				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**21.3%**		

One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**50**
Plastic Limit	**21**
Plastic Index	**29**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 80.1%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	3/21/18		3/21/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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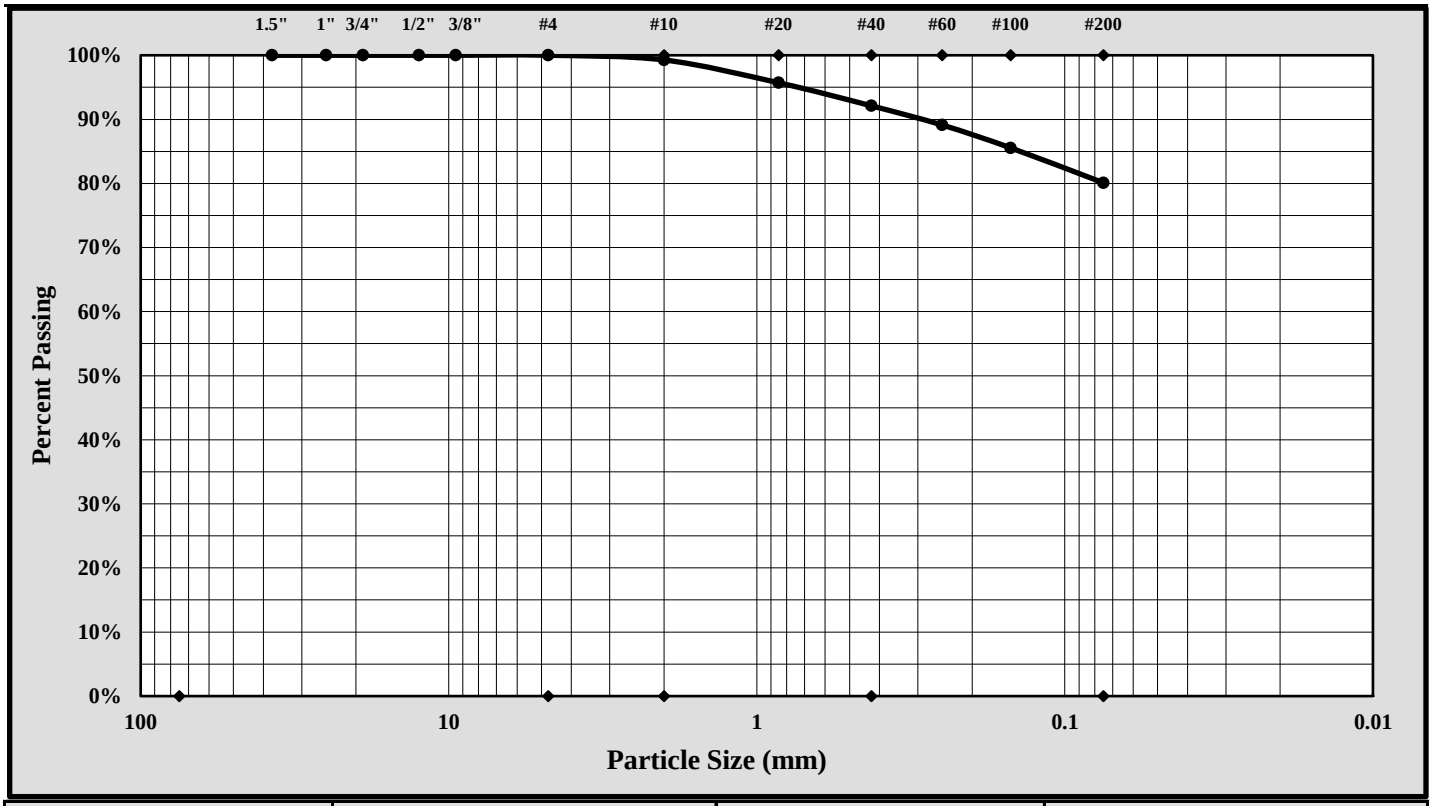
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/21/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/07 - 3/12/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-41	Sample #: SS-7	Sample Date: 1/21/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 18.5' - 20.0'
Sample Description:	Fat Clay with Sand (CH, A-7-6(24))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	2.00 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	80.1%	Total Sand:	19.9%

Liquid Limit	50	Plastic Limit	21	Plastic Index	29
Coarse Sand:	0.7%	Medium Sand:	7.2%	Fine Sand:	12.0%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/21/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

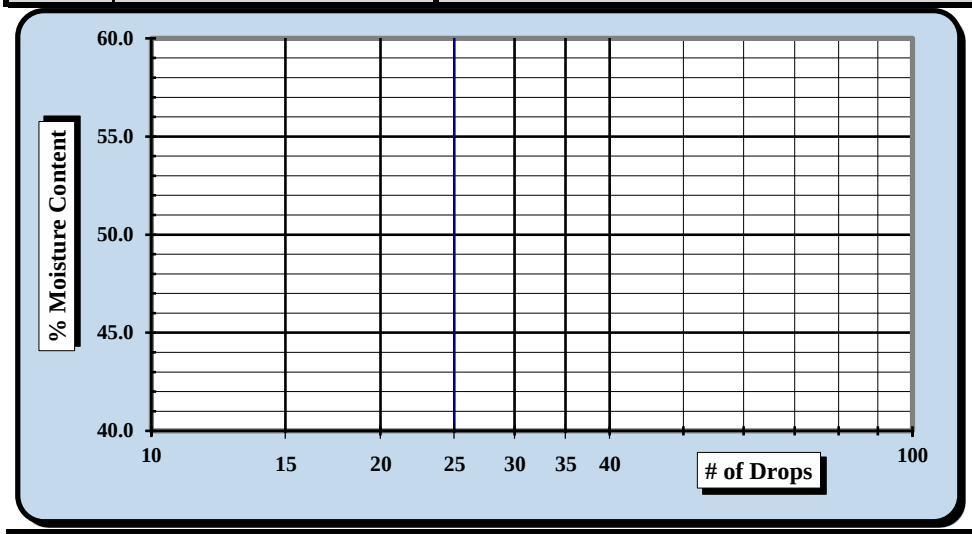
Project #:	1461-16-047.2B	Report Date:	3/21/18
Project Name:	Carolina Crossroads Project	Test Date:	3/17/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-41	Sample #:	SS-9	Sample Date:	1/21/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	28.5' - 30.0'

Sample Description: Silty Sand (SM, A-2-4)

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:									
A	Tare Weight									
B	Wet Soil Weight + A									
C	Dry Soil Weight + A									
D	Water Weight (B-C)									
E	Dry Soil Weight (C-A)									
F	% Moisture (D/E)*100									
N	# OF DROPS							*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*									



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☒

Liquid Limit	**NP**
Plastic Limit	**NP**
Plastic Index	**NP**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 12.9%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	3/21/18	Brian Vaughn	3/21/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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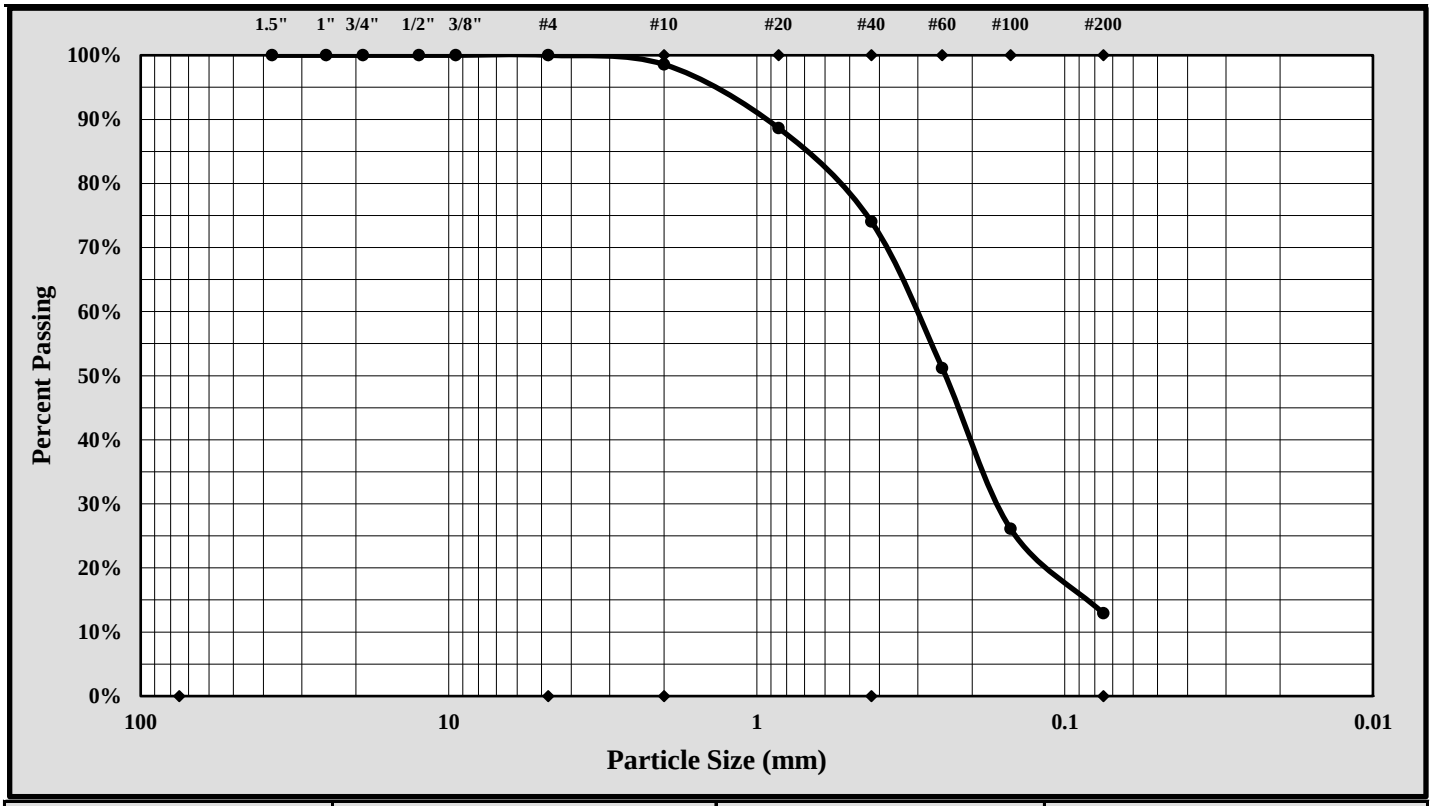
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/21/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/07 - 3/12/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-41	Sample #: SS-9	Sample Date: 1/21/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 28.5' - 30.0'
Sample Description:	Silty Sand (SM, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	12.9%	Total Sand:	87.1%

Liquid Limit	---	Plastic Limit	NP	Plastic Index	NP
Coarse Sand:	1.4%	Medium Sand:	24.5%	Fine Sand:	61.1%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/21/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

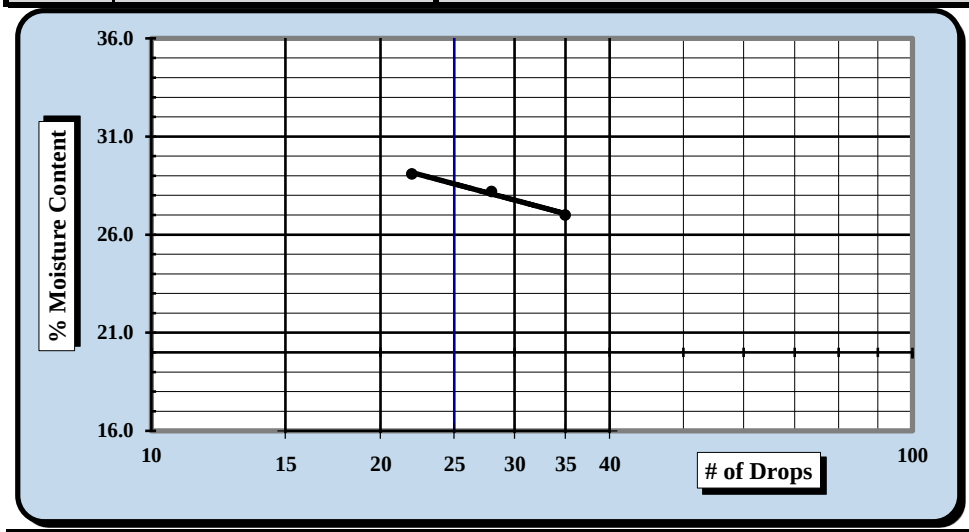
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date:	4/25/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-42	Sample #:	SS-1	Sample Date:	3/01/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	0.8' - 2.8'
Sample Description:	Clayey Sand (SC, A-6(2))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	11	12	13				14	15	
A	Tare Weight	26.67	26.66	26.76				26.65	27.60	
B	Wet Soil Weight + A	42.23	39.17	40.19				33.51	34.58	
C	Dry Soil Weight + A	38.92	36.42	37.16				32.53	33.60	
D	Water Weight (B-C)	3.31	2.75	3.03				0.98	0.98	
E	Dry Soil Weight (C-A)	12.25	9.76	10.40				5.88	6.00	
F	% Moisture (D/E)*100	27.0%	28.2%	29.1%				16.7%	16.3%	
N	# OF DROPS	35	28	22				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**16.5%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**29**
Plastic Limit	**17**
Plastic Index	**12**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/27/18	Matthew F. Cooke, P.G.	4/27/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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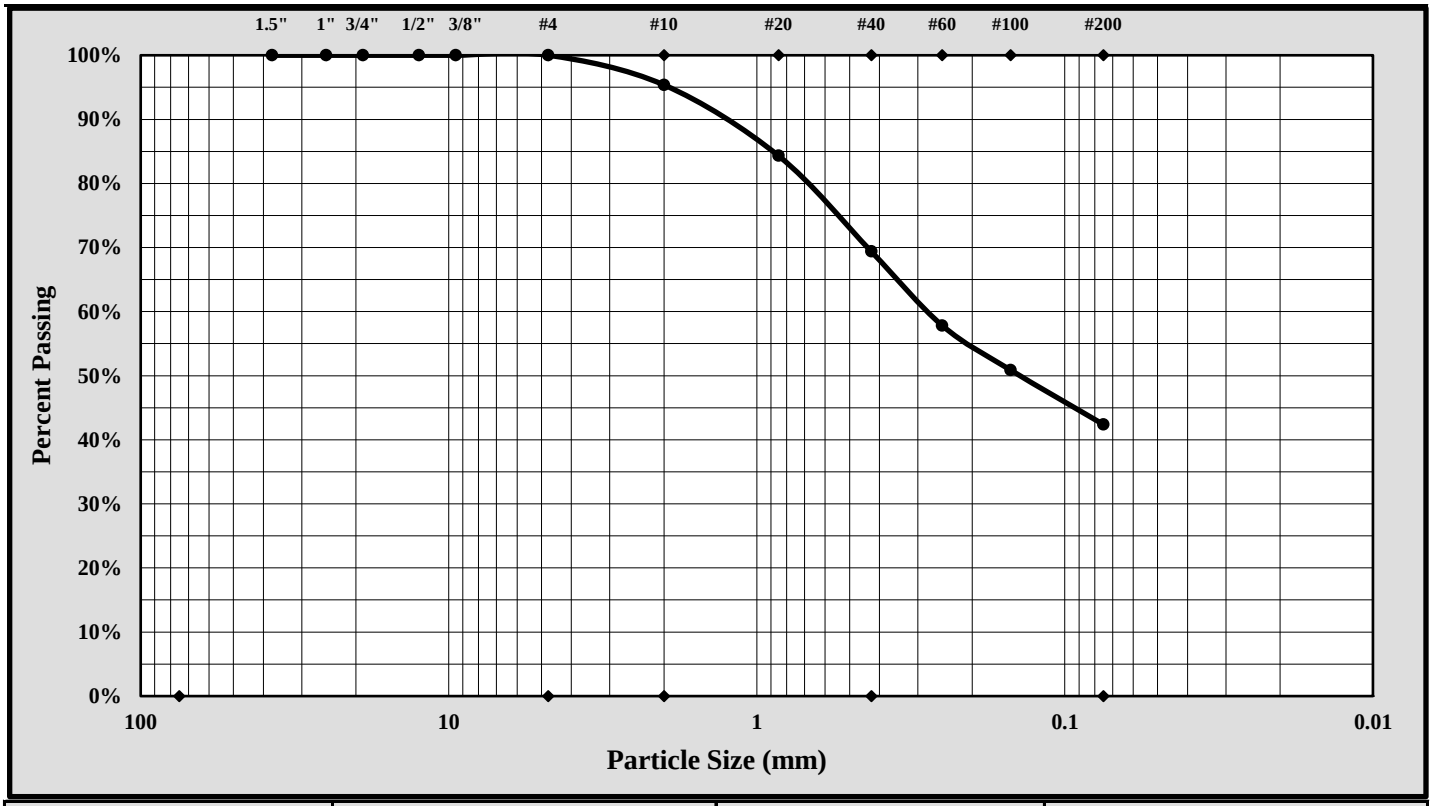
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/16 - 4/27/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-42 Sample #: SS-1	Sample Date:	3/01/18
Location:	Bridge Boring Type: Split-spoon	Depth:	0.8' - 2.8'
Sample Description:	Clayey Sand (SC, A-6(2))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	42.4%	Total Sand:	57.6%

Liquid Limit	29	Plastic Limit	17	Plastic Index	12
Coarse Sand:	4.6%	Medium Sand:	26.0%	Fine Sand:	27.0%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

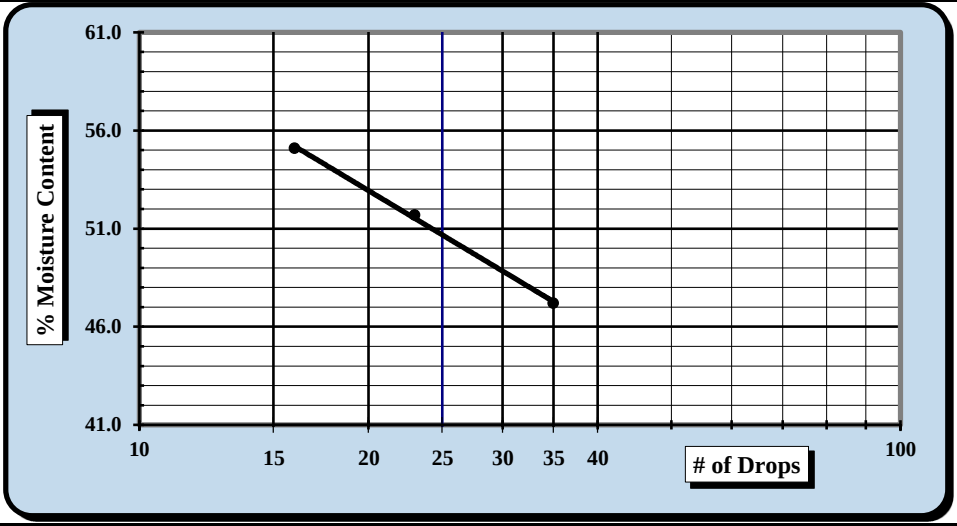
Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date:	4/25/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-42	Sample #:	SS-3	Sample Date:	3/01/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	4.8' - 6.8'

Sample Description: Sandy Elastic Silt (MH, A-7-6(12))

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	16	17	18				19	20	
A	Tare Weight	26.57	26.63	26.78				26.66	26.83	
B	Wet Soil Weight + A	36.45	38.40	41.98				32.78	34.23	
C	Dry Soil Weight + A	33.28	34.39	36.58				31.40	32.57	
D	Water Weight (B-C)	3.17	4.01	5.40				1.38	1.66	
E	Dry Soil Weight (C-A)	6.71	7.76	9.80				4.74	5.74	
F	% Moisture (D/E)*100	47.2%	51.7%	55.1%				29.1%	28.9%	
N	# OF DROPS	35	23	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**29.0%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**51**
Plastic Limit	**29**
Plastic Index	**22**
Group Symbol	**MH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/27/18	Matthew F. Cooke, P.G.	4/27/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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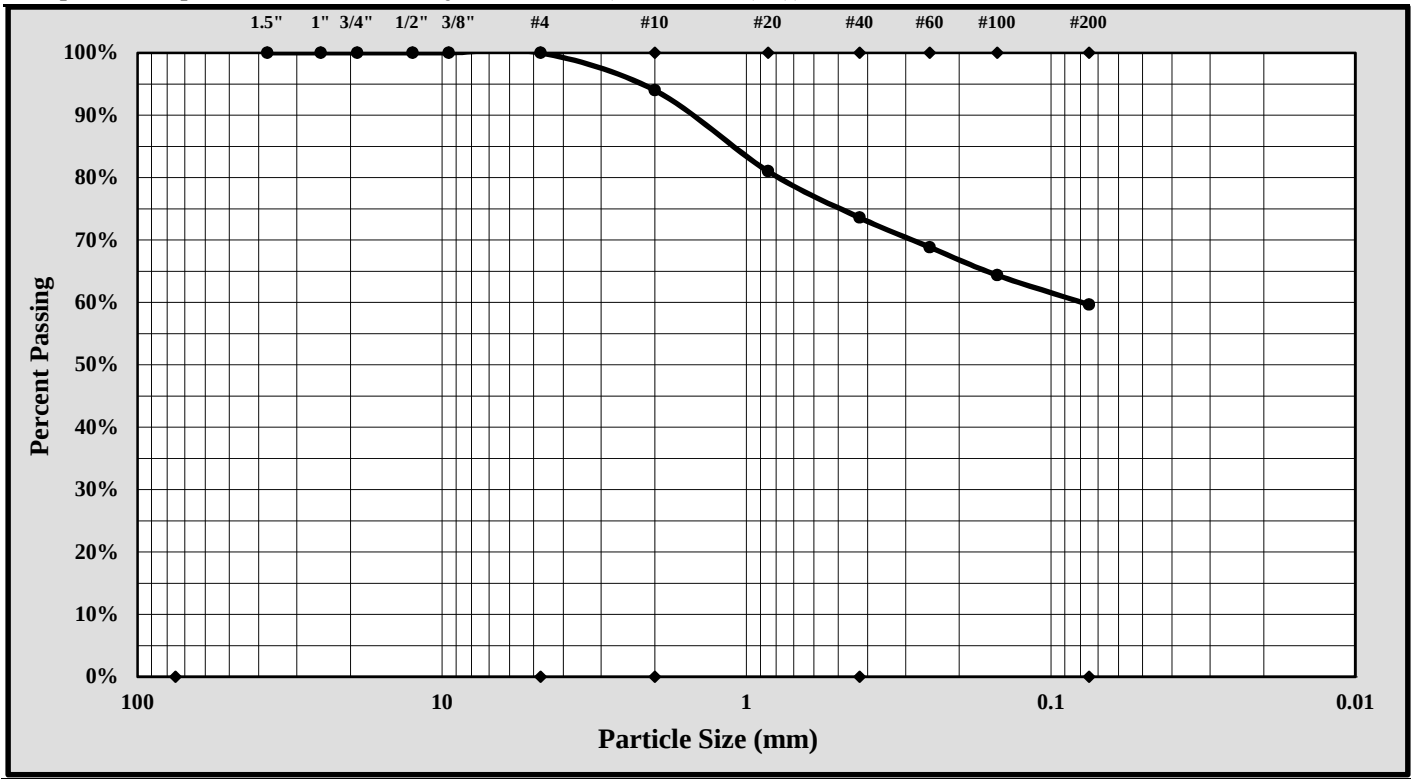
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/16 - 4/27/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-42 Sample #: SS-3	Sample Date:	3/01/18
Location:	Bridge Boring Type: Split-spoon	Depth:	4.8' - 6.8'
Sample Description:	Sandy Elastic Silt (MH, A-7-6(12))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	59.7%	Total Sand:	40.3%

Liquid Limit	51	Plastic Limit	29	Plastic Index	22
Coarse Sand:	6.0%	Medium Sand:	20.4%	Fine Sand:	13.9%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

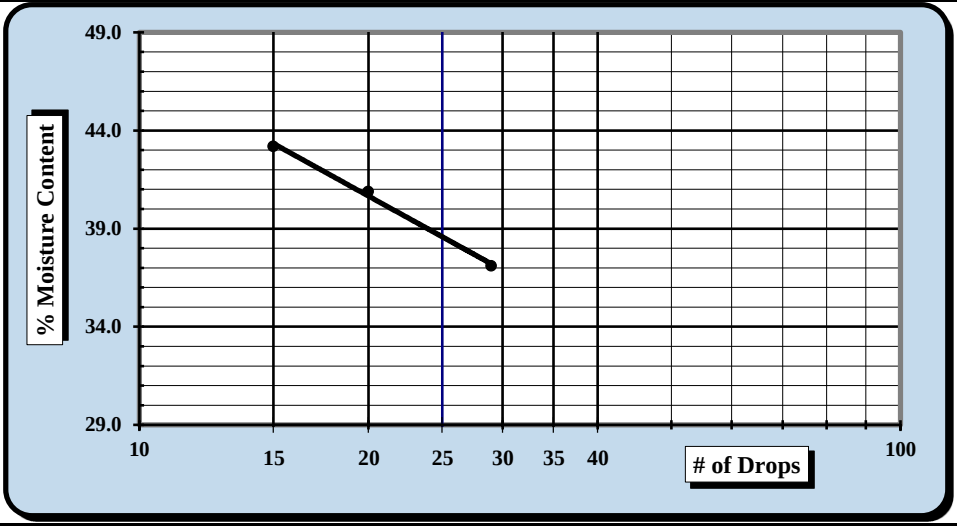
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date:	4/25/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-42	Sample #:	SS-7	Sample Date:	3/01/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	18.5' - 20.0'
Sample Description:	Silty Sand (SM, A-6(1))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	21	22	23				24	25	
A	Tare Weight	28.08	25.67	27.29				25.98	26.79	
B	Wet Soil Weight + A	42.21	41.85	38.59				32.18	33.04	
C	Dry Soil Weight + A	38.39	37.15	35.18				30.83	31.66	
D	Water Weight (B-C)	3.82	4.70	3.41				1.35	1.38	
E	Dry Soil Weight (C-A)	10.31	11.48	7.89				4.85	4.87	
F	% Moisture (D/E)*100	37.1%	40.9%	43.2%				27.8%	28.3%	
N	# OF DROPS	29	20	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**28.1%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**39**
Plastic Limit	**28**
Plastic Index	**11**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/27/18	Matthew F. Cooke, P.G.	4/27/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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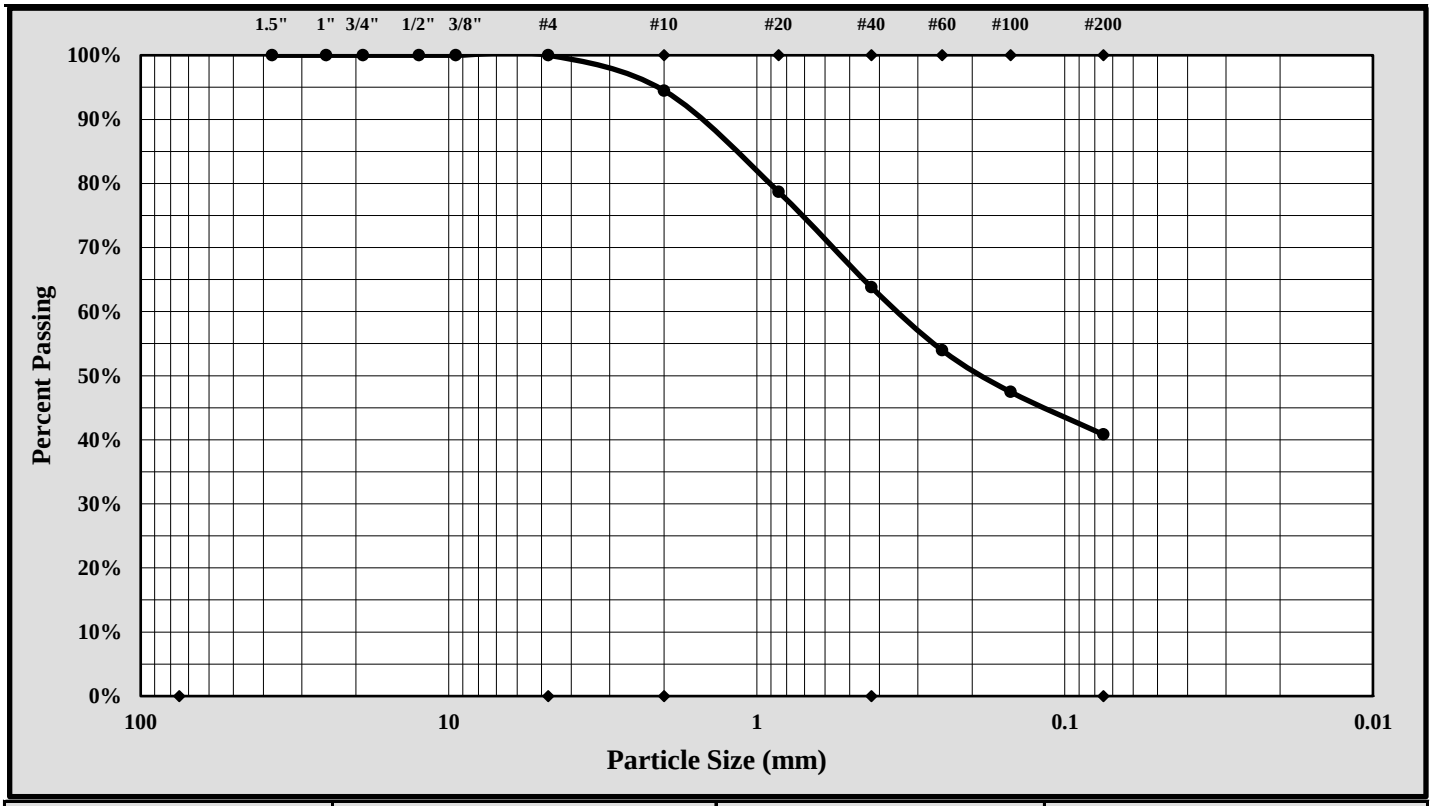
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/16 - 4/27/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-42 Sample #: SS-7	Sample Date:	3/01/18
Location:	Bridge Boring Type: Split-spoon	Depth:	18.5' - 20.0'
Sample Description:	Silty Sand (SM, A-6(1))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	40.8%	Total Sand:	59.2%

Liquid Limit	39	Plastic Limit	28	Plastic Index	11
Coarse Sand:	5.5%	Medium Sand:	30.7%	Fine Sand:	23.0%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

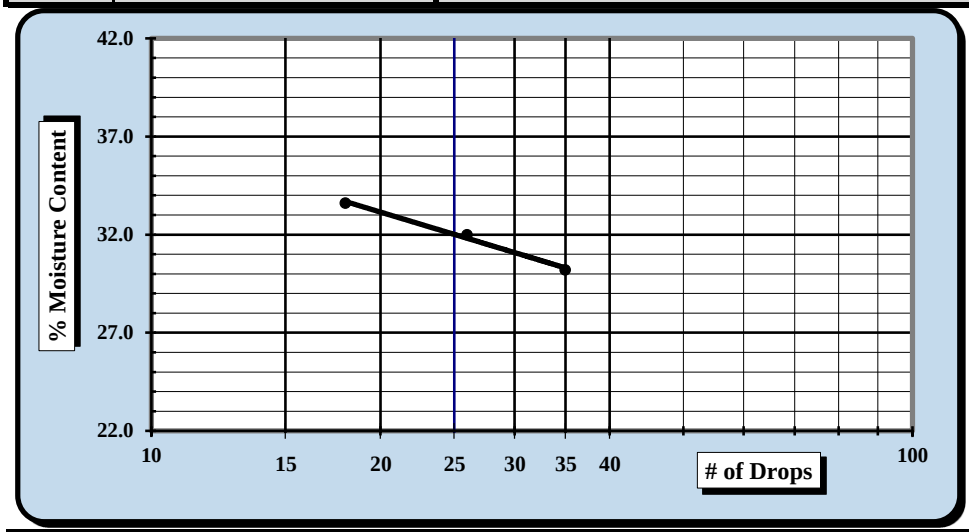
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date:	4/25/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-42	Sample #:	SS-10	Sample Date:	3/01/18
Location:	Bridge boring	Type:	Split-spoon	Depth:	33.5 - 35.0'
Sample Description:	Silty Sand [SM, A-4(0)]				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	26	27	28				29	30	
A	Tare Weight	27.33	27.00	26.83				26.99	27.36	
B	Wet Soil Weight + A	42.47	38.87	41.04				33.44	33.48	
C	Dry Soil Weight + A	38.96	35.99	37.47				32.00	32.13	
D	Water Weight (B-C)	3.51	2.88	3.57				1.44	1.35	
E	Dry Soil Weight (C-A)	11.63	8.99	10.64				5.01	4.77	
F	% Moisture (D/E)*100	30.2%	32.0%	33.6%				28.7%	28.3%	
N	# OF DROPS	35	26	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**28.5%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐
Liquid Limit **32**
Plastic Limit **29**
Plastic Index **3**
Group Symbol **ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/27/18	Matthew F. Cooke, P.G.	4/27/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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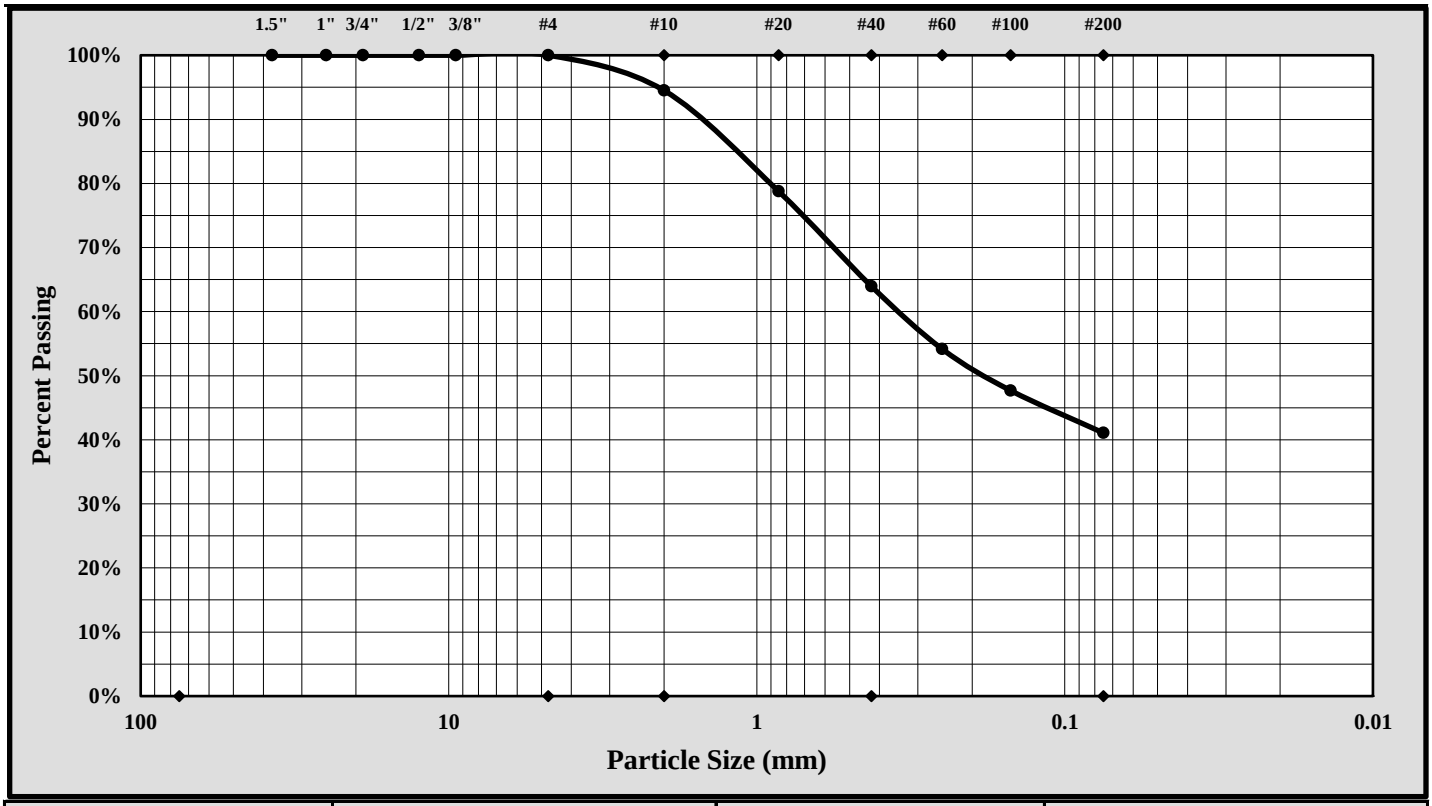
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/27/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/16 - 4/27/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-42 Sample #: SS-10	Sample Date:	3/01/18
Location:	Bridge Boring Type: Split-spoon	Depth:	33.5' - 35.0'
Sample Description:	Silty Sand (SM, A-4(0))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	41.1%	Total Sand:	58.9%

Liquid Limit	32	Plastic Limit	29	Plastic Index	3
Coarse Sand:	5.5%	Medium Sand:	30.5%	Fine Sand:	22.9%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

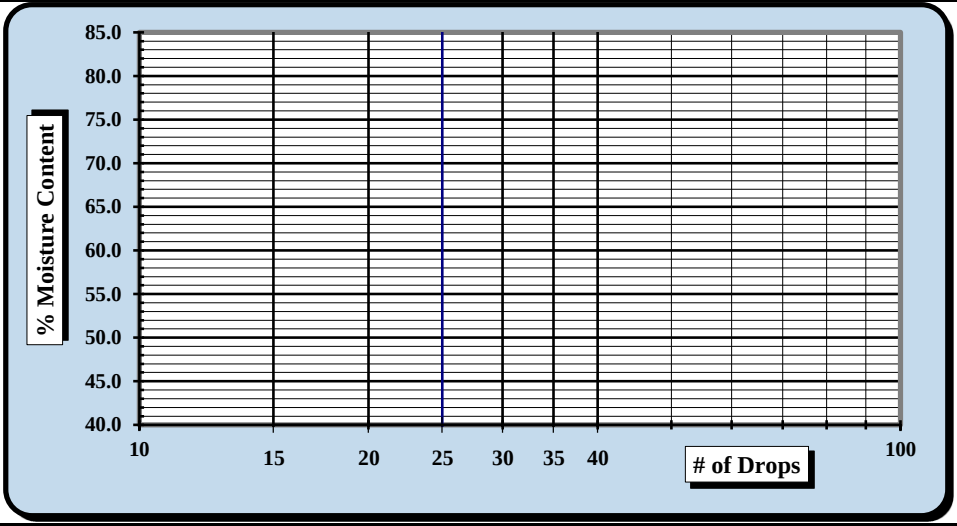
S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-1-2018
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-43	Sample #: SS-1		Sample Date: Various	
Location:	Bridge Boring	Offset: N/A		Depth: 14.8' - 16.8'	
Sample Description:	Silty Sand (SM, A-2-4)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

		Liquid Limit						Plastic Limit		
Pan #	337									
	Tare #:									
A	Tare Weight									
B	Wet Soil Weight + A									
C	Dry Soil Weight + A									
D	Water Weight (B-C)									
E	Dry Soil Weight (C-A)									
F	% Moisture (D/E)*100									
N	# OF DROPS							*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*									



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☒

Liquid Limit	**NP**
Plastic Limit	**NP**
Plastic Index	**NP**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		5/1/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

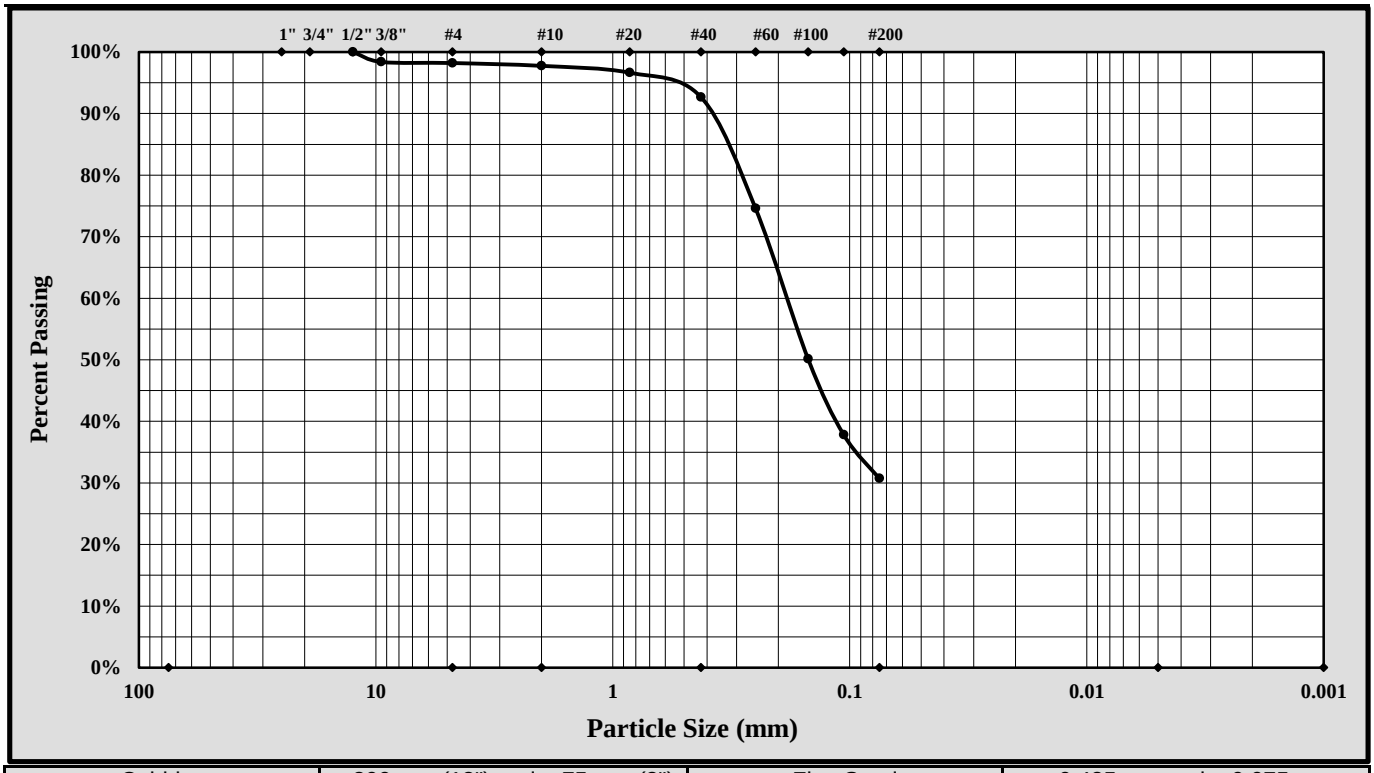
ASTM D6913/D7928

Quality Assurance

Sample Log No.:

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	B-43 Type: Split Spoon	Sample Date:	Various
Location:	Bridge Boring Sample No.: SS-1	Depth:	14.8' - 16.8'
Sample Description:	Silty Sand (SM, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	1.8%
Silt & Clay (% Passing #200):	30.7%	Total Sand:	67.5%
Assumed Specific Gravity:	2.65		

Liquid Limit	NP	Plastic Limit	NP	Plastic Index	NP

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	5/10/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

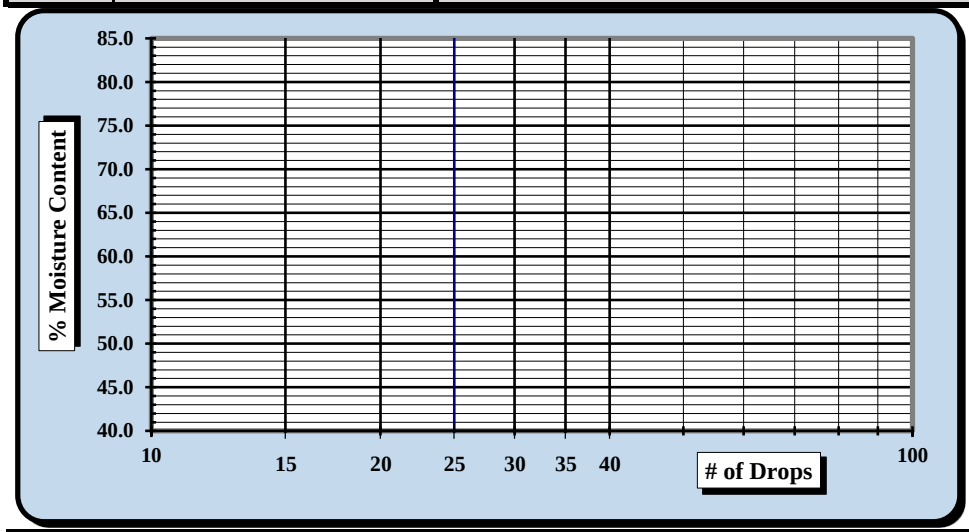
S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	4/30/18
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-43	Sample #: SS-2		Sample Date: Various	
Location:	Bridge Boring	Offset: N/A		Depth: 16.8' - 18.8'	
Sample Description:	Sandy Lean Clay (CL, A-6 (8))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 423		Liquid Limit						Plastic Limit		
	Tare #:	60	61	62				63	64	
A	Tare Weight	16.00	15.05	15.54				15.09	15.86	
B	Wet Soil Weight + A	29.61	27.81	28.44				22.93	23.71	
C	Dry Soil Weight + A	26.25	24.61	25.14				21.69	22.46	
D	Water Weight (B-C)	3.36	3.20	3.30				1.24	1.25	
E	Dry Soil Weight (C-A)	10.25	9.56	9.60				6.60	6.60	
F	% Moisture (D/E)*100	32.8%	33.5%	34.4%				18.8%	18.9%	
N	# OF DROPS	30	25	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**18.9%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**34**
Plastic Limit	**19**
Plastic Index	**15**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		4/30/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

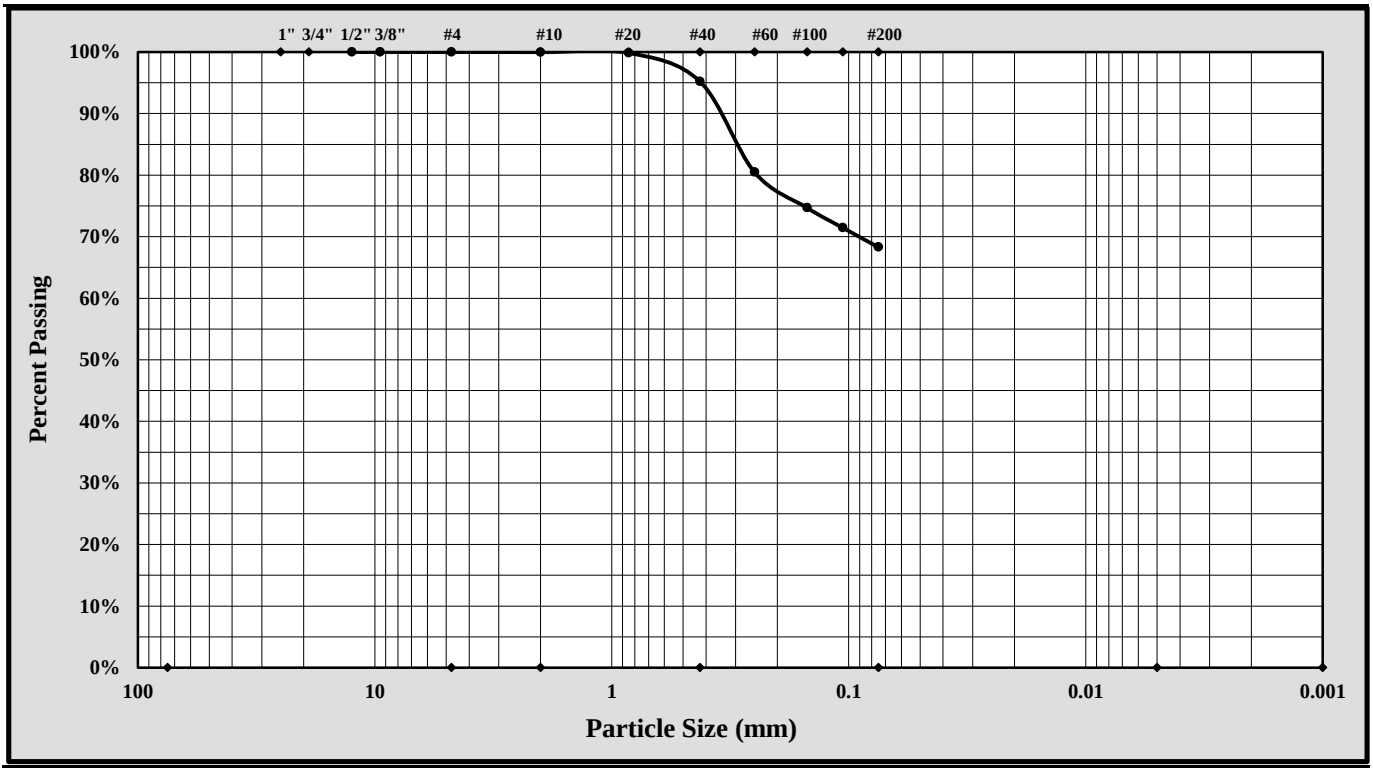
ASTM D6913/D7928

Quality Assurance

Sample Log No.:

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	B-43 Type: Split Spoon	Sample Date:	Various
Location:	Bridge Boring Sample No.: SS-2	Depth:	16.8' - 18.8'
Sample Description:	Sandy Lean Clay (CL, A-6 (8))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	0.0%
Silt & Clay (% Passing #200):	68.3%	Total Sand:	31.7%
Assumed Specific Gravity:	2.65		

Liquid Limit	34	Plastic Limit	19	Plastic Index	15

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Matthew F. Cooke, P.G.	Project Manager	6/7/2018
Technical Responsibility	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

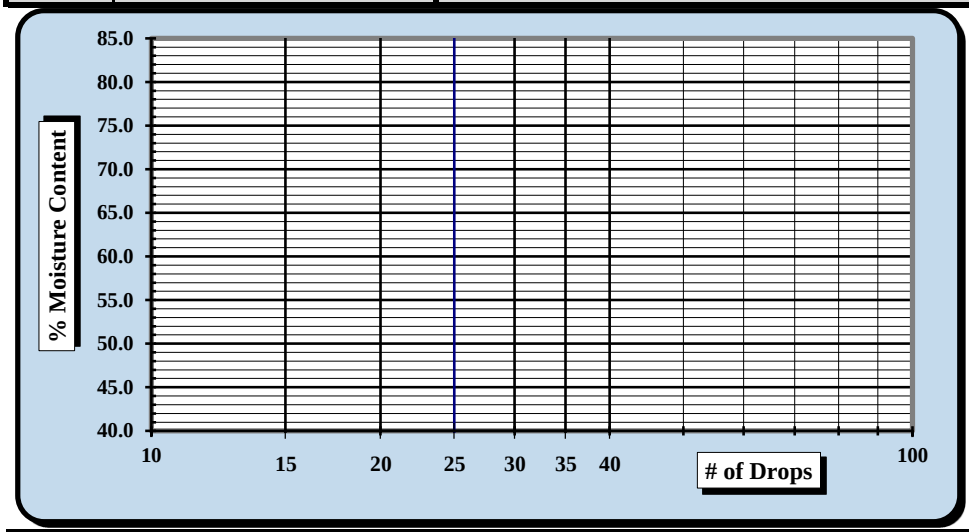
S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-2-2018
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-43	Sample #: SS-6		Sample Date: Various	
Location:	Bridge Boring	Offset: N/A		Depth: 28.3' - 29.8'	
Sample Description:	Silty Sand with Gravel (SM, A-2-4)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 407		Liquid Limit						Plastic Limit		
	Tare #:	1	4	5				6	7	
A	Tare Weight									
B	Wet Soil Weight + A									
C	Dry Soil Weight + A									
D	Water Weight (B-C)									
E	Dry Soil Weight (C-A)									
F	% Moisture (D/E)*100									
N	# OF DROPS							*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*									



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☒

Liquid Limit	**NP**
Plastic Limit	**NP**
Plastic Index	**NP**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		5/2/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

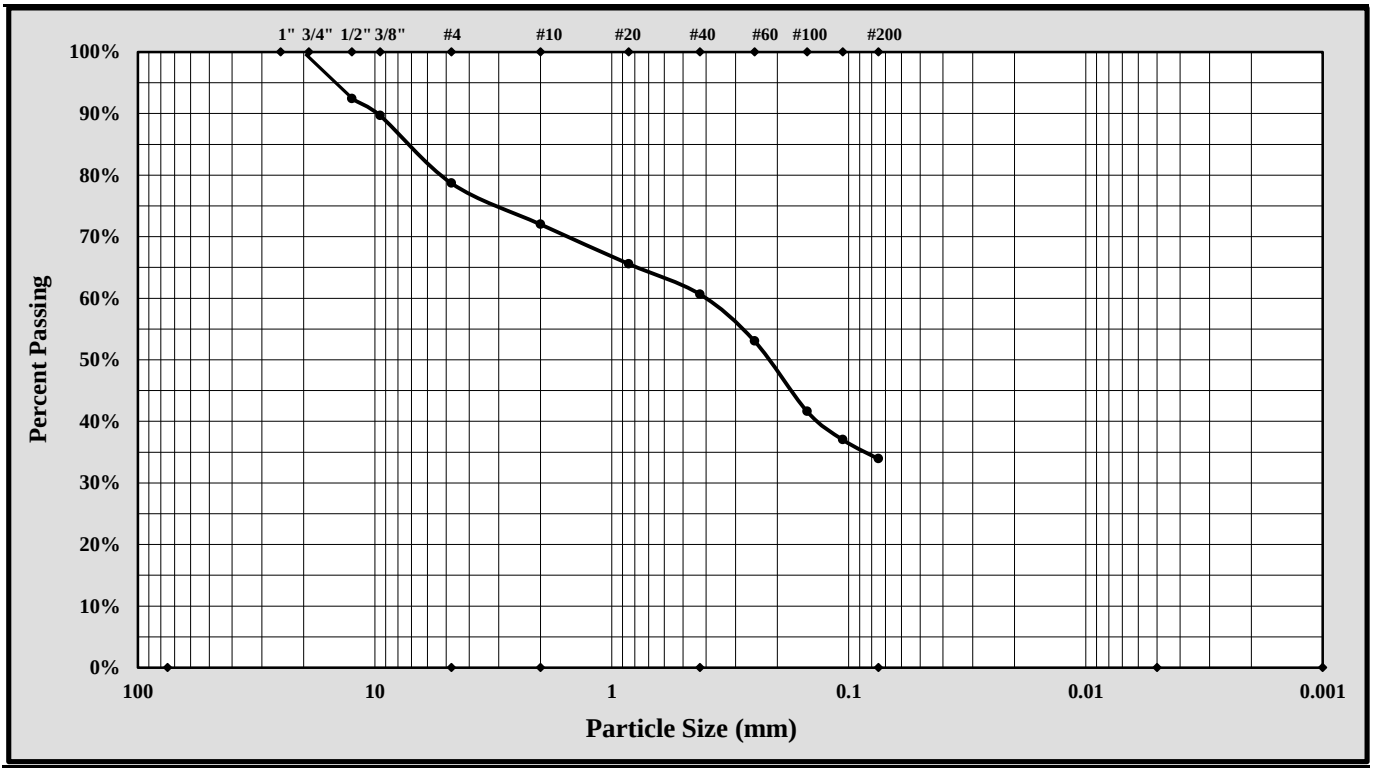
ASTM D6913/D7928

Quality Assurance

Sample Log No.:

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	B-43 Type: Split Spoon	Sample Date:	Various
Location:	Bridge Boring Sample No.: SS-6	Depth:	28.3' - 29.8'
Sample Description:	Silty Sand with Gravel (SM, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	21.3%
Silt & Clay (% Passing #200):	33.9%	Total Sand:	44.8%
Assumed Specific Gravity:	2.65		

Liquid Limit	NP	Plastic Limit	NP	Plastic Index	NP

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	5/2/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

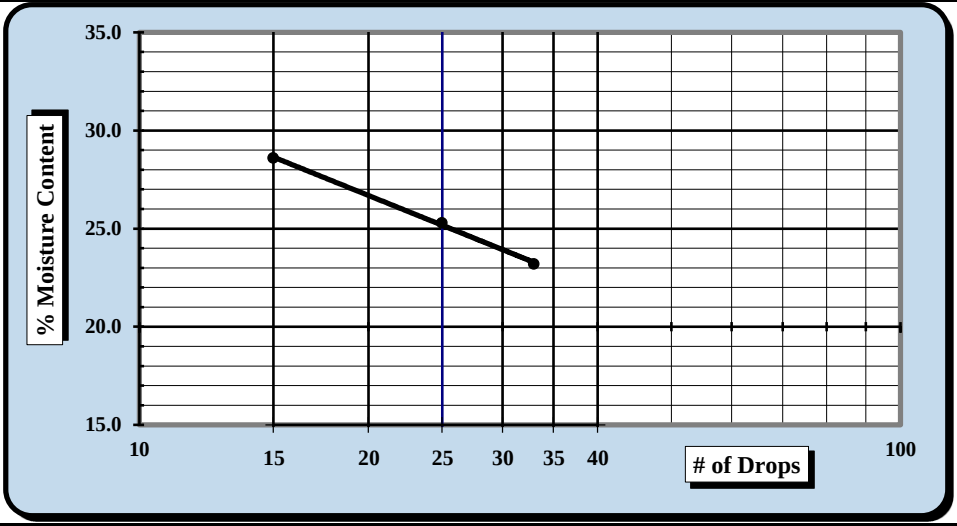
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/04/18
Project Name:	Carolina Crossroads Project	Test Date:	5/03/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-44	Sample #:	SS-1	Sample Date:	3/21/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	0.0' - 2.0'
Sample Description:	Sandy Silty Clay (CL-ML, A-4(1))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	16	17	18				19	20	
A	Tare Weight	26.61	26.64	26.77				26.66	26.82	
B	Wet Soil Weight + A	47.31	43.28	42.09				33.18	33.89	
C	Dry Soil Weight + A	43.41	39.92	38.68				32.15	32.77	
D	Water Weight (B-C)	3.90	3.36	3.41				1.03	1.12	
E	Dry Soil Weight (C-A)	16.80	13.28	11.91				5.49	5.95	
F	% Moisture (D/E)*100	23.2%	25.3%	28.6%				18.8%	18.8%	
N	# OF DROPS	33	25	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**18.8%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**25**
Plastic Limit	**19**
Plastic Index	**6**
Group Symbol	**CL-ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/04/18	Matthew F. Cooke, P.G.	5/04/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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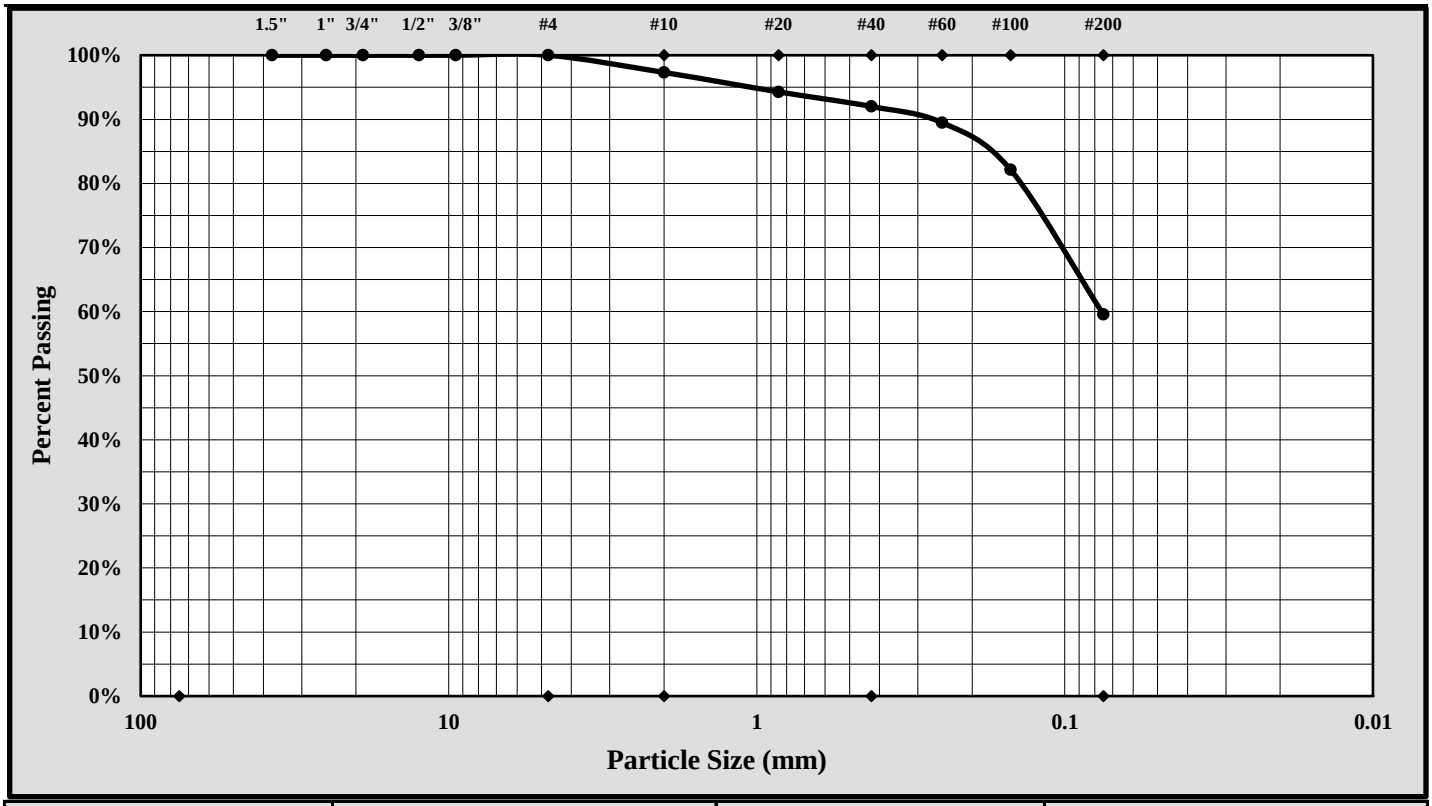
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/04/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/02 - 5/04/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-44 Sample #: SS-1	Sample Date:	3/21/18
Location:	Bridge Boring Type: Split-spoon	Depth:	0.0' - 2.0'
Sample Description:	Sandy Silty Clay (CL-ML, A-4(1))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	59.6%	Total Sand:	40.4%

Liquid Limit	25	Plastic Limit	19	Plastic Index	6
Coarse Sand:	2.7%	Medium Sand:	5.3%	Fine Sand:	32.5%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/04/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ *AASHTO T 89* ☐ *AASHTO T 90* ☐

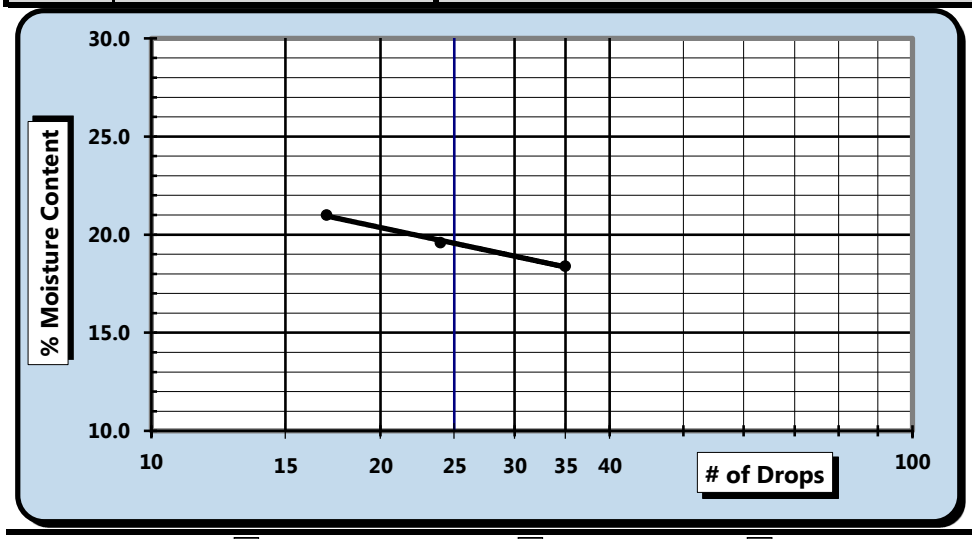
S&ME, Inc. - Spartanburg: 301 Zima Park Drive, Spartanburg, SC 29301

Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date:	5/10/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-45	Sample #:	SS-1	Sample Date:	2/8/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	0.8' - 2.8'
Sample Description:	Silty Clayey Sand (SC-SM, A-2-4)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	7537	1/31/2018	Grooving tool	14185	9/12/2017
LL Apparatus	13859	9/12/2017			
Oven	7313	7/28/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	Q-1	Q-2	Q-3				3	4	
A	Tare Weight	16.69	16.63	15.72				11.59	12.27	
B	Wet Soil Weight + A	38.29	39.44	38.50				18.97	19.49	
C	Dry Soil Weight + A	34.94	35.70	34.55				17.94	18.51	
D	Water Weight (B-C)	3.35	3.74	3.95				1.03	0.98	
E	Dry Soil Weight (C-A)	18.25	19.07	18.83				6.35	6.24	
F	% Moisture (D/E)*100	18.4%	19.6%	21.0%				16.2%	15.7%	
N	# OF DROPS	35	24	17				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							16.0%		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**20**
Plastic Limit	**16**
Plastic Index	**4**
Group Symbol	**CL-ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matt Jacobs	NICET 118202	Matthew F. Cooke, P.G.	5/11/18
Technician Name	*Certification#*	*Technical Responsibility*	*Date*

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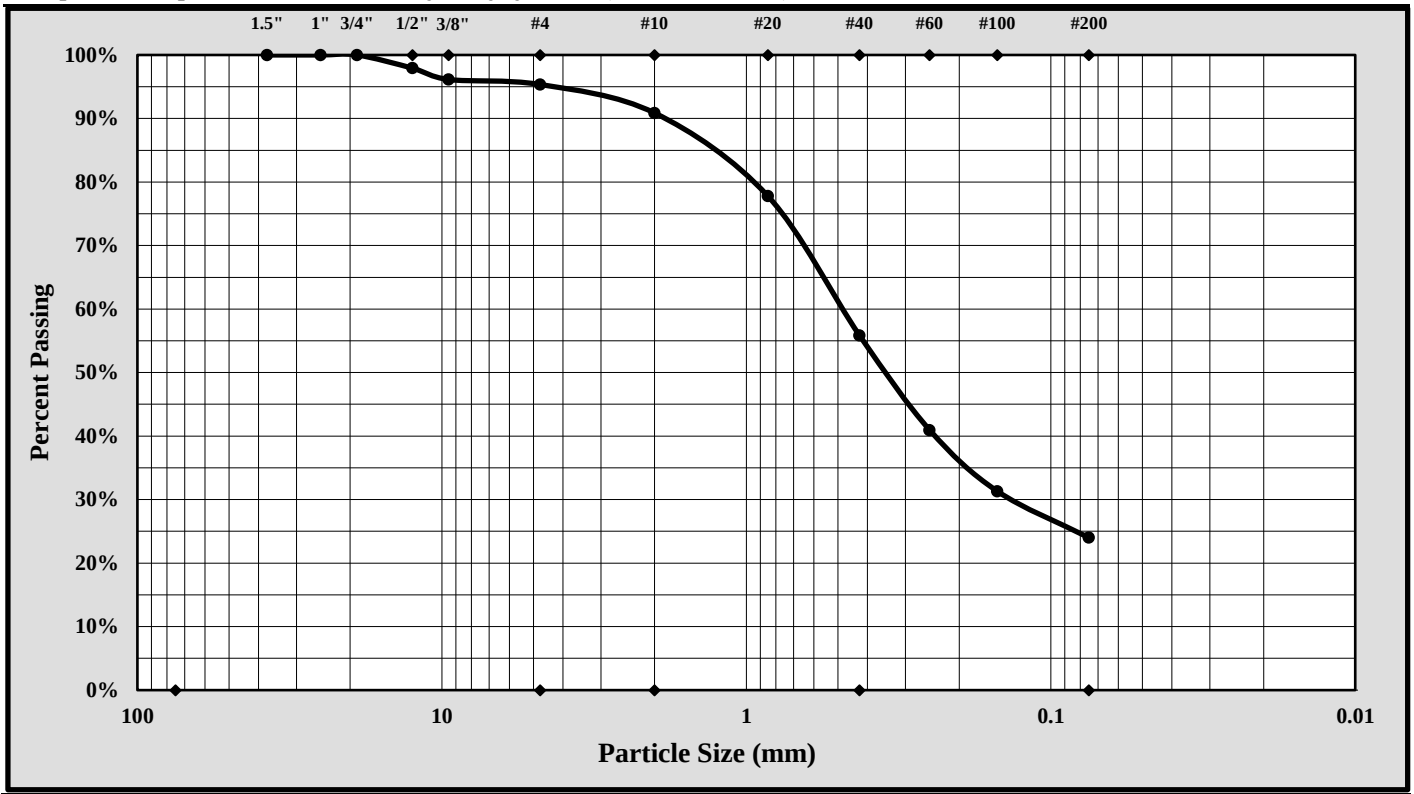
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. - Spartanburg 301 Zima Park Dr. Spartanburg, SC 29301

S&ME Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/21 - 2/27/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-45	Sample #: SS-1	Sample Date: 2/8/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 0.8' - 2.8'
Sample Description:	Silty Clayey Sand (SC-SM, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	19.00 mm	Gravel:	4.7%
Silt & Clay (% Passing #200):	24.0%	Total Sand:	71.3%

Liquid Limit	20	Plastic Limit	16	Plastic Index	4
Coarse Sand:	4.5%	Medium Sand:	35.0%	Fine Sand:	31.8%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/11/18 — *Date*

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Form No. TR-D4318-T89-90
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LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	4/30/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-46	Sample #: SS-1	Sample Date: Various
Log #:	43-2321		Depth: 0.0' - 2.0'
Sample Description:	Lean clay with sand (CL, A-6 (8))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	17	12	10				14	19	
A	Tare Weight	15.49	15.57	15.41				15.46	15.42	
B	Wet Soil Weight + A	27.87	28.60	29.90				24.48	25.40	
C	Dry Soil Weight + A	24.76	25.42	26.44				22.91	23.66	
D	Water Weight (B-C)	3.11	3.18	3.46				1.57	1.74	
E	Dry Soil Weight (C-A)	9.27	9.85	11.03				7.45	8.24	
F	% Moisture (D/E)*100	33.5%	32.3%	31.4%				21.1%	21.1%	
N	# OF DROPS	18	25	35				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**21.1%**		

One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**32**
Plastic Limit	**21**
Plastic Index	**11**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	4/30/2018	Michael D. Kelso, E.I.	5/23/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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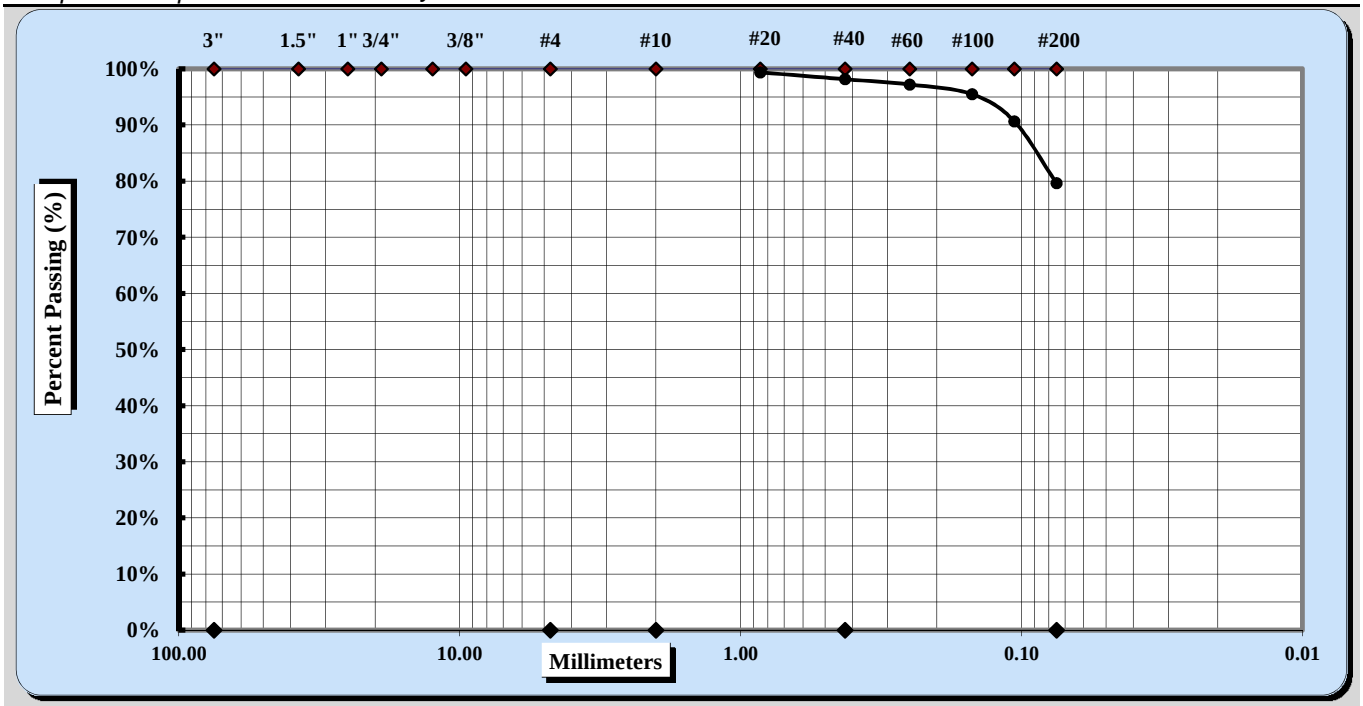
Sieve Analysis of Soils

Quality Assurance | *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/5/18 - 5/22/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID: B-46	Type: Split Spoon	Sample Date:	Various
Sample Log No.: 43-2321	Sample: 1	Depth:	0.0' - 2.0'
Sample Description:	Lean clay with sand (CL, A-6 (8))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	No. 20	Coarse Sand	0%	Fine Sand	19%
Gravel	0%	Medium Sand	2%	Silt & Clay	80%
Liquid Limit	32	Plastic Limit	21	Plastic Index	11

Coarse Sand	0%	Medium Sand	2%	Fine Sand	19%

Description of Sand & Gravel Particles: Rounded ☒ Angular ☒
Hard & Durable ☒ Soft ☒ Weathered & Friable ☒

Notes / Deviations / References:

Michael D. Kelso, E.I.		Staff Professional	5/23/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
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LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	4/30/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-46	Sample #: SS-2	Sample Date: Various
Log #:	43-2321		Depth: 2.0' - 4.0'
Sample Description:	Lean clay with sand (CL, A-6 (8))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	11	13	8				24	7	
A	Tare Weight	15.43	15.39	15.52				15.43	15.40	
B	Wet Soil Weight + A	27.62	28.38	29.88				24.67	24.81	
C	Dry Soil Weight + A	24.52	25.28	26.58				23.19	23.33	
D	Water Weight (B-C)	3.10	3.10	3.30				1.48	1.48	
E	Dry Soil Weight (C-A)	9.09	9.89	11.06				7.76	7.93	
F	% Moisture (D/E)*100	34.1%	31.3%	29.8%				19.1%	18.7%	
N	# OF DROPS	18	28	35				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**18.9%**		

One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**32**
Plastic Limit	**19**
Plastic Index	**13**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	4/30/2018	Michael D. Kelso, E.I.	5/23/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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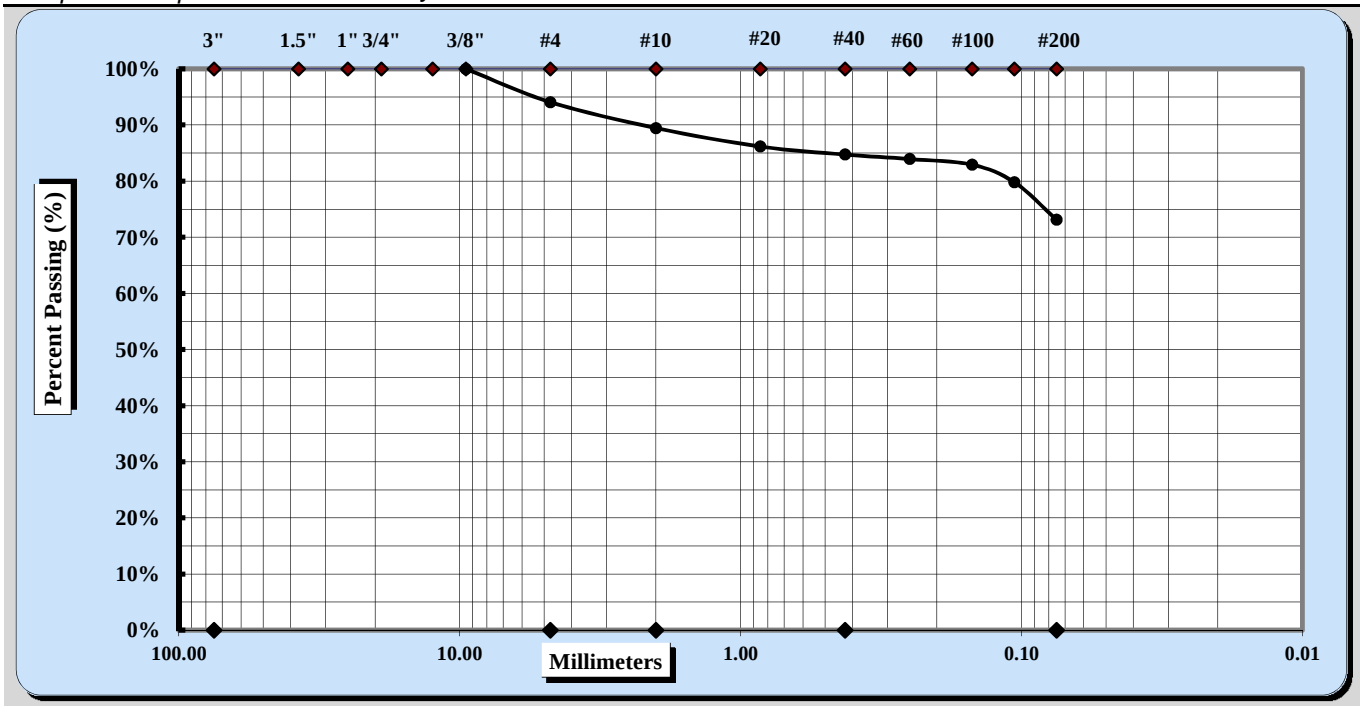
Sieve Analysis of Soils

Quality Assurance | *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/5/18 - 5/22/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID: B-46	Type: Split Spoon	Sample Date:	Various
Sample Log No.: 43-2321	Sample: 2	Depth:	2.0' - 4.0'

Sample Description: Lean clay with sand (CL, A-6 (8))



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	3/8"	Coarse Sand	5%	Fine Sand	12%
Gravel	6%	Medium Sand	5%	Silt & Clay	73%
Liquid Limit	32	Plastic Limit	19	Plastic Index	13

Coarse Sand	5%	Medium Sand	5%	Fine Sand	12%

Description of Sand & Gravel Particles: Rounded ☒ Angular ☒
Hard & Durable ☒ Soft ☒ Weathered & Friable ☐

Notes / Deviations / References:

Michael D. Kelso, E.I. — *Technical Responsibility*
Signature
Staff Professional — *Position*
5/23/2018 — *Date*

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Form No. TR-D4318-T89-90
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LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ *AASHTO T 89* ☐ *AASHTO T 90* ☐

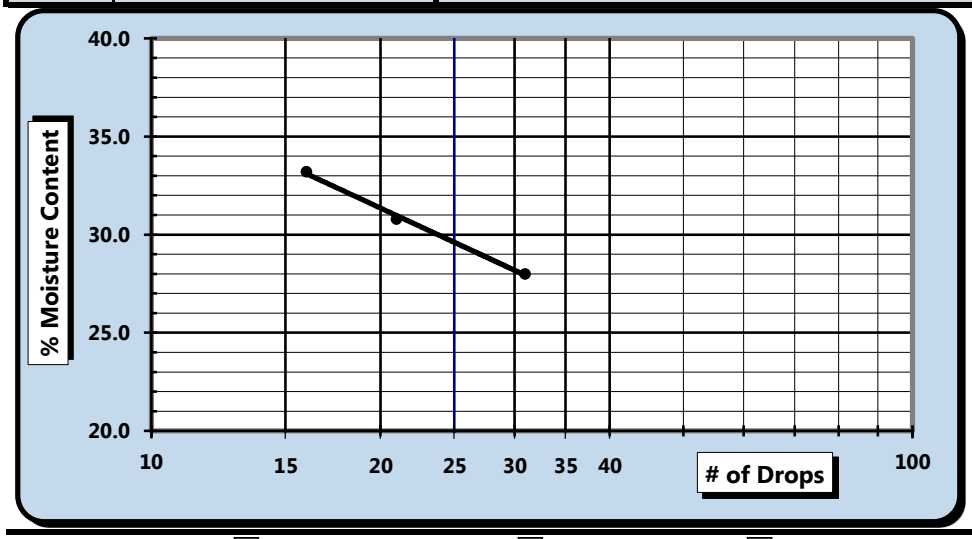
S&ME, Inc. - Spartanburg: 301 Zima Park Drive, Spartanburg, SC 29301

Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date:	5/10/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-47	Sample #:	SS-1	Sample Date:	2/12/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	1.0' - 3.0'
Sample Description:	Sandy Lean Clay (CL, A-6(5))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	7537	1/31/2018	Grooving tool	14185	9/12/2017
LL Apparatus	13859	9/12/2017			
Oven	7313	7/28/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	Y-1	Y-2	Y-3				5	6	
A	Tare Weight	16.43	16.47	17.00				12.10	12.29	
B	Wet Soil Weight + A	39.04	39.03	38.42				19.27	19.11	
C	Dry Soil Weight + A	34.10	33.72	33.08				18.21	18.12	
D	Water Weight (B-C)	4.94	5.31	5.34				1.06	0.99	
E	Dry Soil Weight (C-A)	17.67	17.25	16.08				6.11	5.83	
F	% Moisture (D/E)*100	28.0%	30.8%	33.2%				17.3%	17.0%	
N	# OF DROPS	31	21	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							17.2%		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**30**
Plastic Limit	**17**
Plastic Index	**13**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matt Jacobs	NICET 118202	Matthew F. Cooke, P.G.	5/11/18
Technician Name	*Certification#*	*Technical Responsibility*	*Date*

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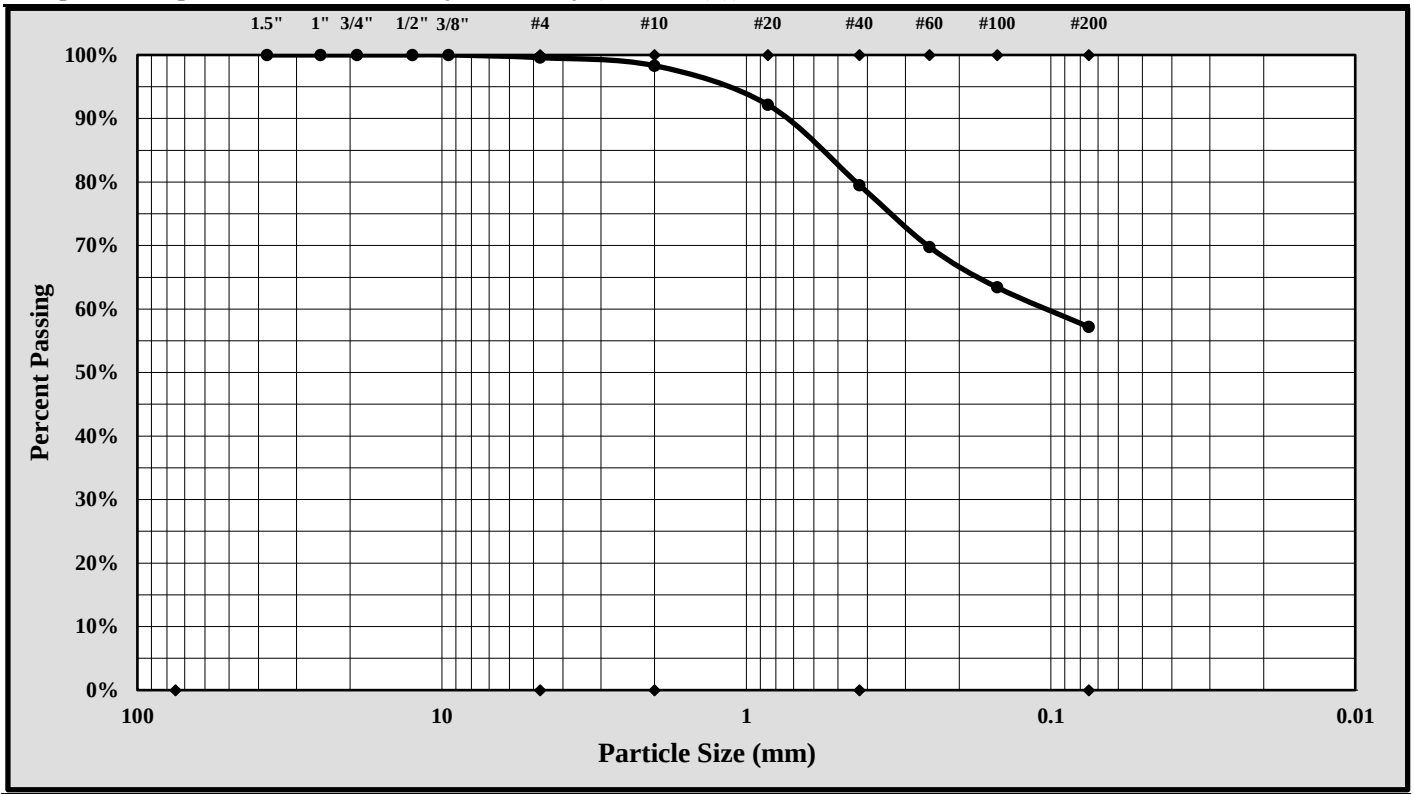
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. - Spartanburg 301 Zima Park Dr. Spartanburg, SC 29301

S&ME Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/21 - 2/28/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-47	Sample #: SS-1	Sample Date: 2/12/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 1.0' - 3.0'
Sample Description:	Sandy Lean Clay (CL, A-6(5))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.4%
Silt & Clay (% Passing #200):	57.2%	Total Sand:	42.4%

Liquid Limit	30	Plastic Limit	17	Plastic Index	13
Coarse Sand:	1.3%	Medium Sand:	18.8%	Fine Sand:	22.3%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/11/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ *AASHTO T 89* ☐ *AASHTO T 90* ☐

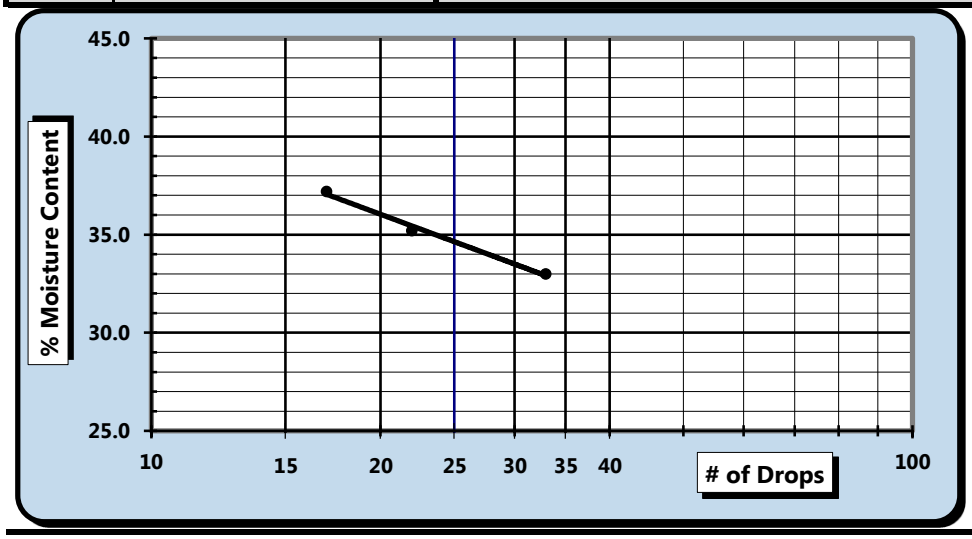
S&ME, Inc. - Spartanburg: 301 Zima Park Drive, Spartanburg, SC 29301

Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date:	5/10/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-47	Sample #:	SS-4	Sample Date:	2/12/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	7.0' - 9.0'
Sample Description:	Silt With Sand (ML, A-4(6))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	7537	1/31/2018	Grooving tool	14185	9/12/2017
LL Apparatus	13859	9/12/2017			
Oven	7313	7/28/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	Z-1	Z-2	Z-3				7	9	
A	Tare Weight	15.92	16.62	16.77				12.00	12.24	
B	Wet Soil Weight + A	39.27	38.76	39.03				18.53	18.89	
C	Dry Soil Weight + A	33.48	33.00	32.99				17.18	17.53	
D	Water Weight (B-C)	5.79	5.76	6.04				1.35	1.36	
E	Dry Soil Weight (C-A)	17.56	16.38	16.22				5.18	5.29	
F	% Moisture (D/E)*100	33.0%	35.2%	37.2%				26.1%	25.7%	
N	# OF DROPS	33	22	17				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							25.9%		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**35**
Plastic Limit	**26**
Plastic Index	**9**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matt Jacobs	NICET 118202	Matthew F. Cooke, P.G.	5/11/18
Technician Name	*Certification#*	*Technical Responsibility*	*Date*

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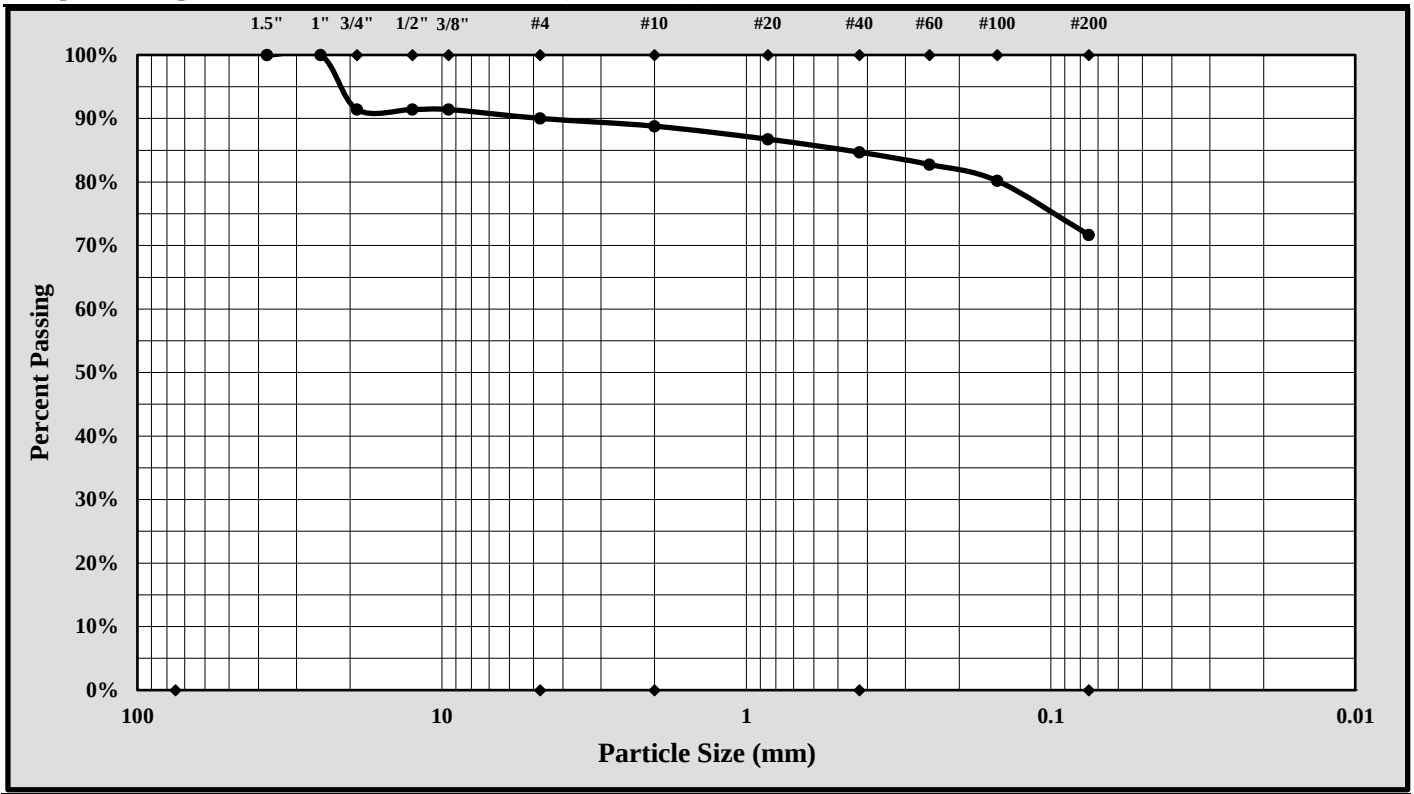
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. - Spartanburg 301 Zima Park Dr. Spartanburg, SC 29301

S&ME Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/21 - 2/28/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-47	Sample #: SS-4	Sample Date: 2/12/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 7.0' - 9.0'
Sample Description:	Silt with Sand (ML, A-4(6))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	25.00 mm	Gravel:	10.0%
Silt & Clay (% Passing #200):	71.7%	Total Sand:	18.3%

Liquid Limit	35	Plastic Limit	26	Plastic Index	9
Coarse Sand:	1.2%	Medium Sand:	4.1%	Fine Sand:	13.0%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/11/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ *AASHTO T 89* ☐ *AASHTO T 90* ☐

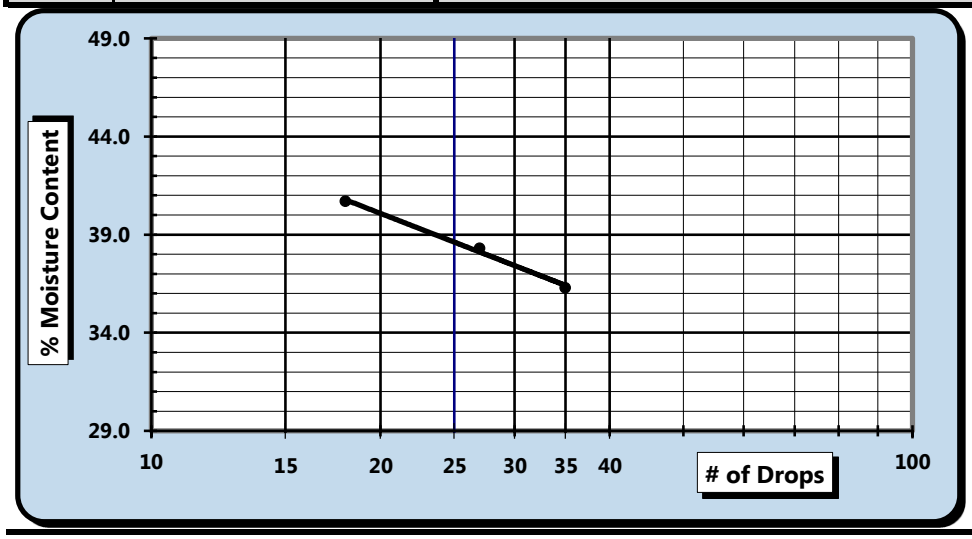
S&ME, Inc. - Spartanburg: 301 Zima Park Drive, Spartanburg, SC 29301

Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date:	5/10/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-47	Sample #:	SS-8	Sample Date:	2/12/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	24.5' - 26.0'
Sample Description:	Clayey Sand With Gravel (SC, A-6(2))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	7537	1/31/2018	Grooving tool	14185	9/12/2017
LL Apparatus	13859	9/12/2017			
Oven	7313	7/28/2017			

	Pan #	Liquid Limit						Plastic Limit		
	Tare #:	P-4	P-5	P-6				12	13	
A	Tare Weight	16.62	16.61	15.95				11.16	12.11	
B	Wet Soil Weight + A	39.30	37.89	37.56				18.12	19.24	
C	Dry Soil Weight + A	33.26	32.00	31.31				16.75	17.83	
D	Water Weight (B-C)	6.04	5.89	6.25				1.37	1.41	
E	Dry Soil Weight (C-A)	16.64	15.39	15.36				5.59	5.72	
F	% Moisture (D/E)*100	36.3%	38.3%	40.7%				24.5%	24.7%	
N	# OF DROPS	35	27	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							24.6%		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**39**
Plastic Limit	**25**
Plastic Index	**14**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matt Jacobs	NICET 118202	Matthew F. Cooke, P.G.	5/11/18
Technician Name	*Certification#*	*Technical Responsibility*	*Date*

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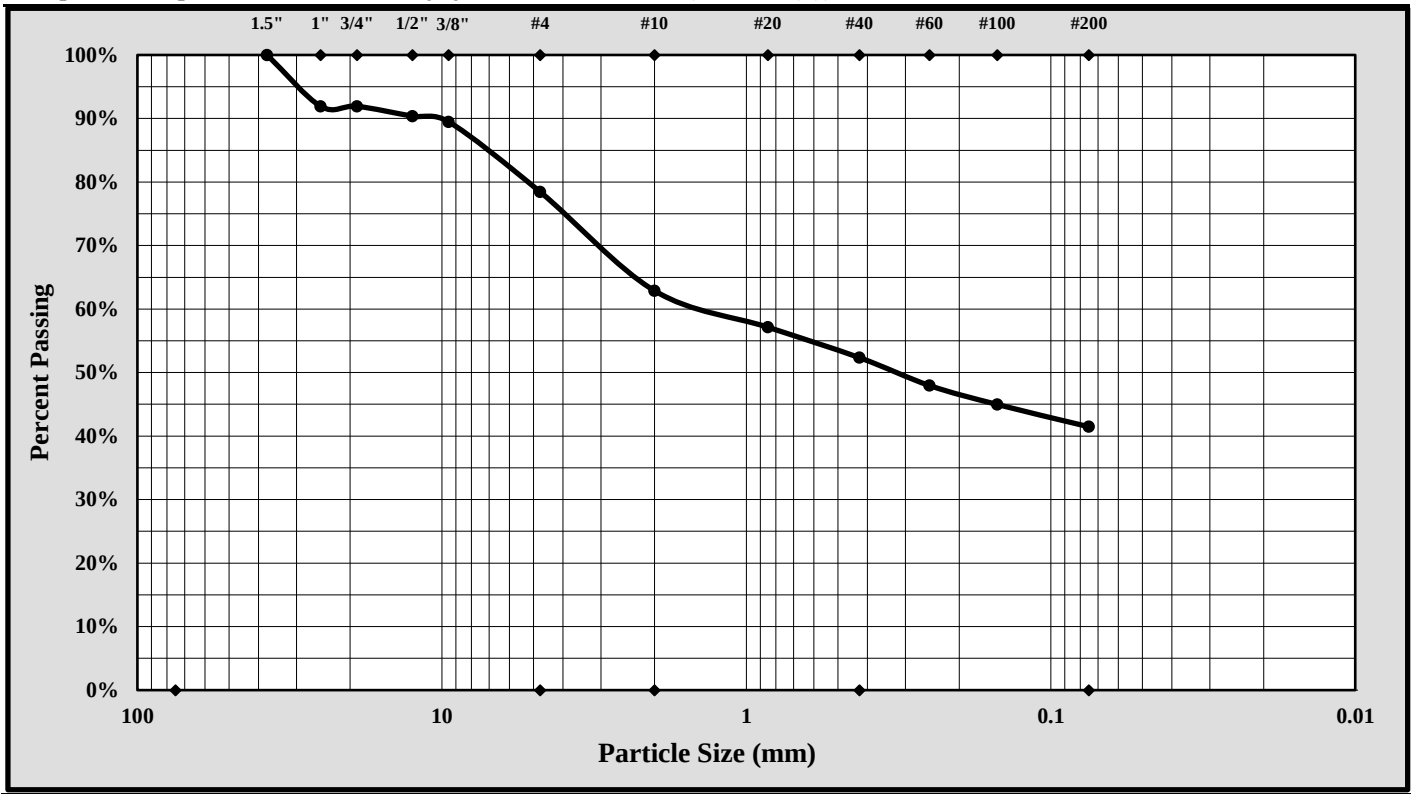
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. - Spartanburg 301 Zima Park Dr. Spartanburg, SC 29301

S&ME Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/21 - 2/28/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-47	Sample #: SS-8	Sample Date: 2/12/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 24.5'- 26.0'
Sample Description:	Clayey Sand with Gravel (SC, A-6(2))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	31.25 mm	Gravel:	21.6%
Silt & Clay (% Passing #200):	41.5%	Total Sand:	37.0%

Liquid Limit	39	Plastic Limit	25	Plastic Index	14
Coarse Sand:	15.6%	Medium Sand:	10.5%	Fine Sand:	10.9%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/11/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

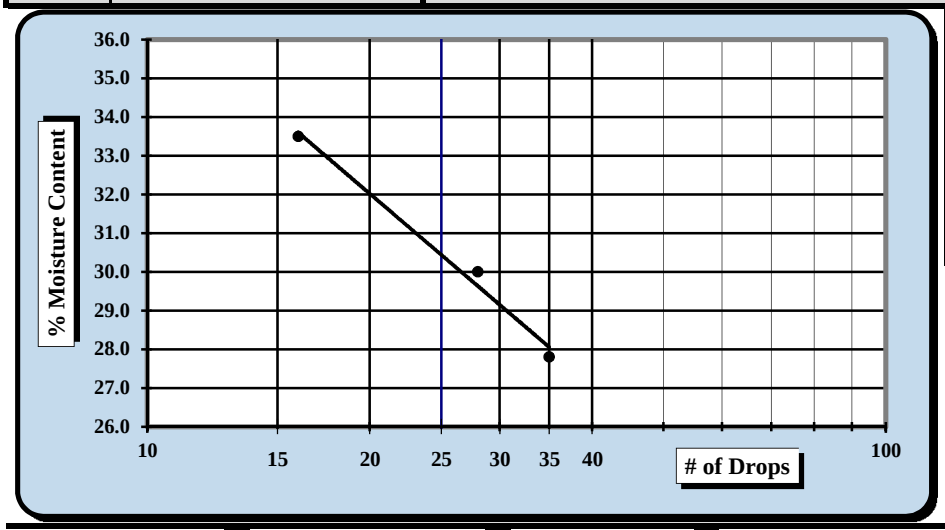
Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	4/30/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-48	Sample #: SS-1	Sample Date: Various
Log #:	43-2321		Depth: 0.0' - 2.0'
Sample Description:	Sandy lean clay (CL, A-6 (4))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	1	6	18				15	16	
A	Tare Weight	15.34	15.45	15.42				15.32	15.64	
B	Wet Soil Weight + A	25.71	26.40	27.57				25.45	24.27	
C	Dry Soil Weight + A	23.11	23.87	24.93				23.93	22.98	
D	Water Weight (B-C)	2.60	2.53	2.64				1.52	1.29	
E	Dry Soil Weight (C-A)	7.77	8.42	9.51				8.61	7.34	
F	% Moisture (D/E)*100	33.5%	30.0%	27.8%				17.7%	17.6%	
N	# OF DROPS	16	28	35				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**17.7%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**30**
Plastic Limit	**18**
Plastic Index	**12**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	4/30/2018	Michael D. Kelso, E.I.	5/23/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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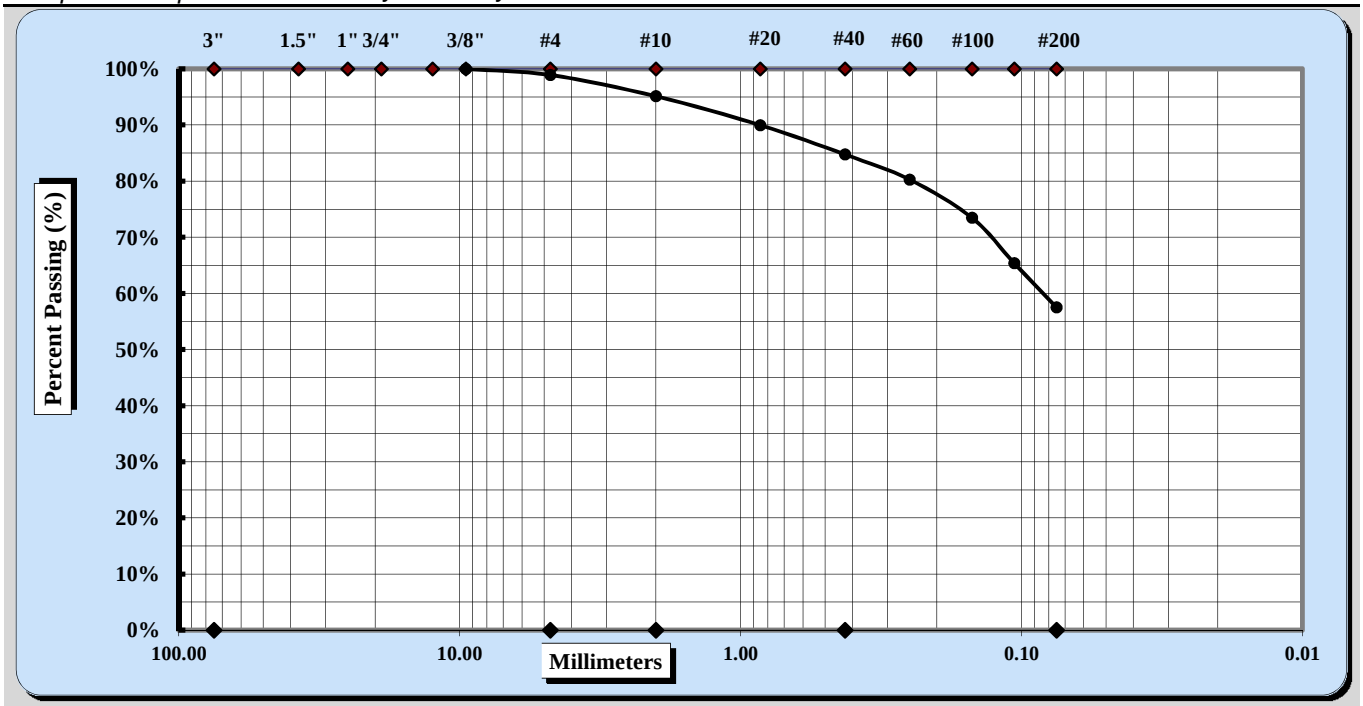
Sieve Analysis of Soils

Quality Assurance | *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/21/18 - 5/22/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID: B-48	Type: Split Spoon	Sample Date:	Various
Sample Log No.: 43-2321	Sample: 1	Depth:	0.0' - 2.0'
Sample Description:	Sandy lean clay (CL, A-6 (4))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	3/8"	Coarse Sand	4%	Fine Sand	27%
Gravel	1%	Medium Sand	10%	Silt & Clay	57%
Liquid Limit	30	Plastic Limit	18	Plastic Index	12

Coarse Sand	4%	Medium Sand	10%	Fine Sand	27%

Description of Sand & Gravel Particles: Rounded ☒ Angular ☒
Hard & Durable ☒ Soft ☐ Weathered & Friable ☒

Notes / Deviations / References:

Michael D. Kelso, E.I.		Staff Professional	5/23/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	4/30/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-48	Sample #: SS-2	Sample Date: Various
Log #:	43-2321		Depth: 2.0' - 4.0'
Sample Description:	Lean clay with sand (CL, A-6 (14))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	5	20	2				3	21	
A	Tare Weight	15.39	15.46	15.55				15.49	15.51	
B	Wet Soil Weight + A	26.68	27.65	28.14				24.75	24.55	
C	Dry Soil Weight + A	23.32	24.18	24.69				22.94	22.77	
D	Water Weight (B-C)	3.36	3.47	3.45				1.81	1.78	
E	Dry Soil Weight (C-A)	7.93	8.72	9.14				7.45	7.26	
F	% Moisture (D/E)*100	42.4%	39.8%	37.7%				24.3%	24.5%	
N	# OF DROPS	16	25	35				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**24.4%**		

One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**40**
Plastic Limit	**24**
Plastic Index	**16**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	4/30/2018	Michael D. Kelso, E.I.	5/23/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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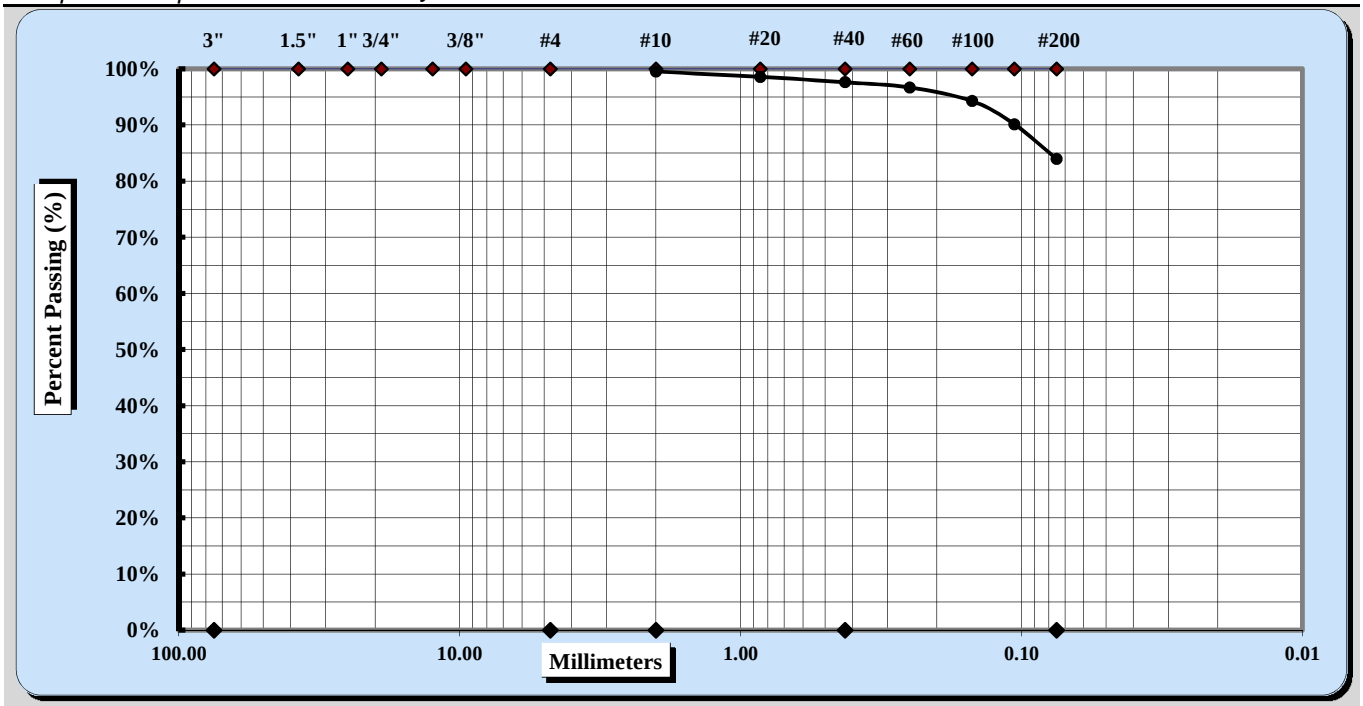
Sieve Analysis of Soils

Quality Assurance | *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/21/18 - 5/22/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID: B-48	Type: Split Spoon	Sample Date:	Various
Sample Log No.: 43-2321	Sample: 2	Depth:	2.0' - 4.0'
Sample Description:	Lean clay with sand (CL, A-6 (14))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	No. 10	Coarse Sand	0%	Fine Sand	14%
Gravel	0%	Medium Sand	2%	Silt & Clay	84%
Liquid Limit	40	Plastic Limit	24	Plastic Index	16

Coarse Sand	0%	Medium Sand	2%	Fine Sand	14%
Description of Sand & Gravel Particles:		Rounded	☒	Angular	☒
Hard & Durable	☒	Soft	☐	Weathered & Friable	☒

Notes / Deviations / References:

Michael D. Kelso, E.I.		Staff Professional	5/23/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	4/30/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-48	Sample #: SS-4	Sample Date: Various
Log #:	43-2321		Elevation: 6.0' - 8.0'
Sample Description:	Silty sand (SM, A-4 (0))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	9	22	23				4	28-B	
A	Tare Weight	15.42	15.39	15.44				15.44	17.69	
B	Wet Soil Weight + A	25.74	26.50	27.77				25.14	26.97	
C	Dry Soil Weight + A	23.11	23.81	24.88				23.31	25.22	
D	Water Weight (B-C)	2.63	2.69	2.89				1.83	1.75	
E	Dry Soil Weight (C-A)	7.69	8.42	9.44				7.87	7.53	
F	% Moisture (D/E)*100	34.2%	31.9%	30.6%				23.3%	23.2%	
N	# OF DROPS	16	26	35				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**23.3%**		

One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**32**
Plastic Limit	**23**
Plastic Index	**9**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	4/30/2018	Michael D. Kelso, E.I.	5/23/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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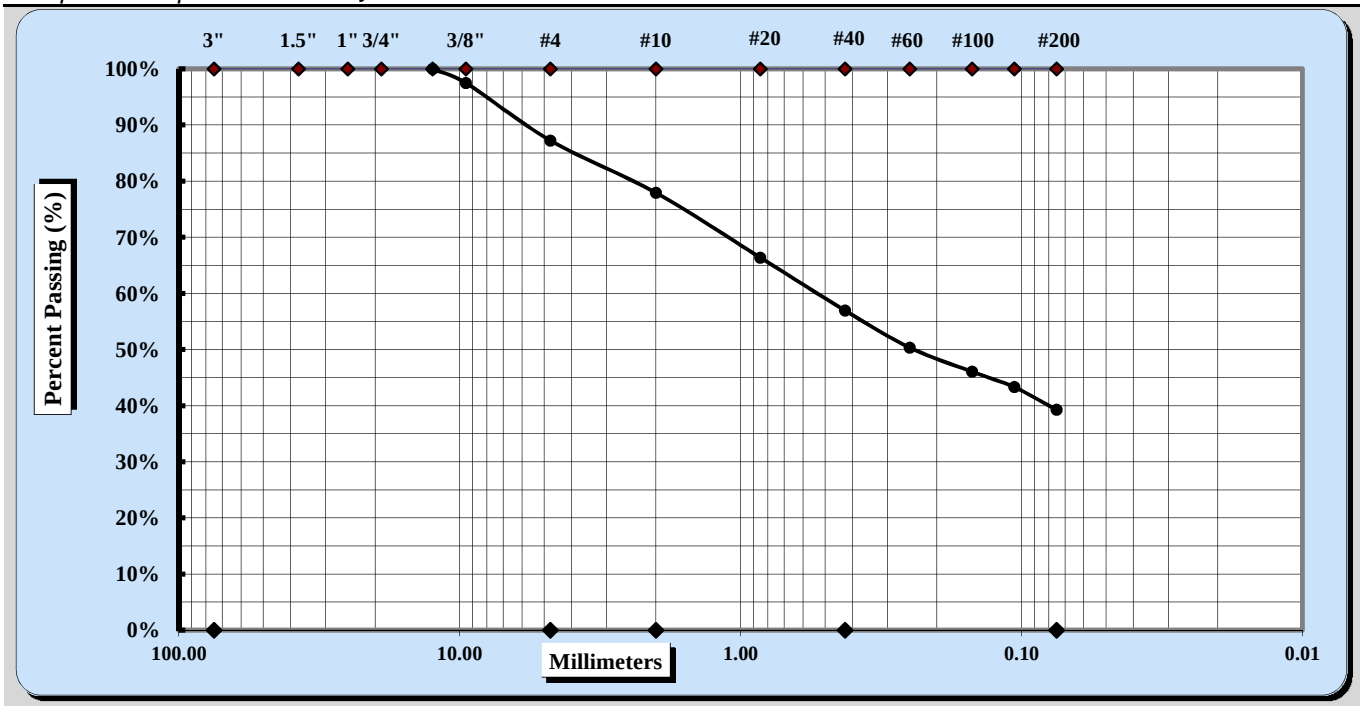
Sieve Analysis of Soils

Quality Assurance *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/21/18 - 5/22/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID: B-48	Type: Split Spoon	Sample Date:	Various
Sample Log No.: 43-2321	Sample: 4	Depth:	6.0' - 8.0'
Sample Description:	Silty sand (SM, A-4 (0))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	1/2"	Coarse Sand	9%	Fine Sand	18%
Gravel	13%	Medium Sand	21%	Silt & Clay	39%
Liquid Limit	32	Plastic Limit	23	Plastic Index	9

Coarse Sand	9%	Medium Sand	21%	Fine Sand	18%
Description of Sand & Gravel Particles:		Rounded	☒	Angular	☒
Hard & Durable	☒	Soft	☐	Weathered & Friable	☒

Notes / Deviations / References:

Michael D. Kelso, E.I.		Staff Professional	5/23/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

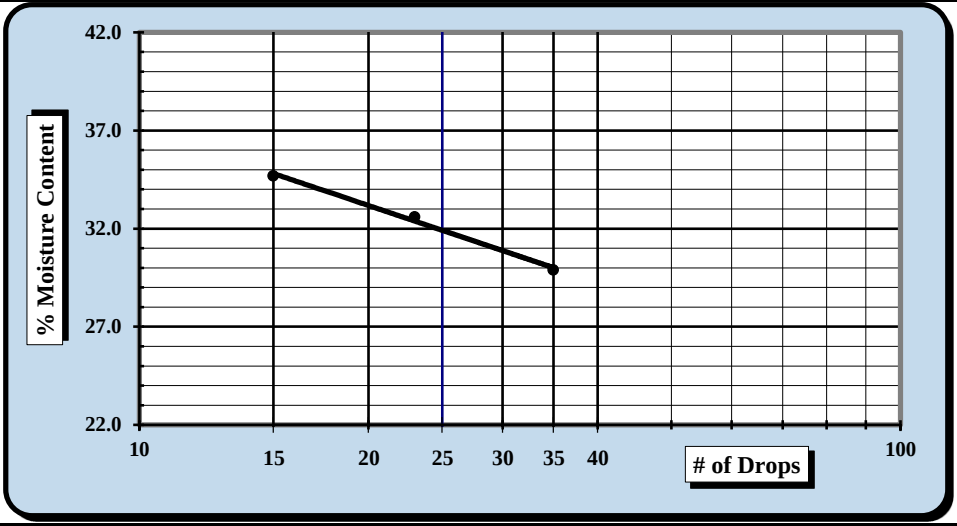
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/10/18
Project Name:	Carolina Crossroads Project	Test Date:	4/09/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-49	Sample #:	SS-1	Sample Date:	2/22/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	24.5' - 26.5'
Sample Description:	Clayey Sand with Gravel (SC, A-2-4)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	1	2	3				4	5	
A	Tare Weight	26.70	26.48	26.32				25.93	26.94	
B	Wet Soil Weight + A	41.95	44.54	41.93				33.05	33.65	
C	Dry Soil Weight + A	38.44	40.10	37.91				31.73	32.39	
D	Water Weight (B-C)	3.51	4.44	4.02				1.32	1.26	
E	Dry Soil Weight (C-A)	11.74	13.62	11.59				5.80	5.45	
F	% Moisture (D/E)*100	29.9%	32.6%	34.7%				22.8%	23.1%	
N	# OF DROPS	35	23	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**23.0%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**32**
Plastic Limit	**23**
Plastic Index	**9**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/10/18	Matthew F. Cooke, P.G.	4/10/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Form No: TR-D2974-1
Revision No. 1
Revision Date: 08/26/17

MOISTURE, ASH, AND ORGANIC MATTER

ASTM D-2974

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/10/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/09/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-49	Sample #: SS-1	Sample Date: 2/22/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 24.5' - 26.5'
Sample Description:	Clayey Sand with Gravel (SC, A-2-4)		

Equipment: *Balance: 0.01 g.Readability, 500g. Minimum Capaccity*

Balance: *S&ME ID #:* *13942* *Cal. Date:* *8/19/17* *Due:* *8/19/18*

Method A: Moisture Content Determination *Required Oven Temperature: 105 ± 5 °C*

	Oven Temperature: 105 °C	*Tare #*	
t	Tare Weight *(Dish plus Aluminum Foil Cover)*	*grams*	
a	Mass of *As-Received* Specimen + Tare Wt.	*grams*	
b	Mass of Oven Dry Specimen + Tare Wt.	*grams*	
w	Water Weight	*(a-b)*	
A	Mass of As-Received Specimen	*(a-t)*	
B	Mass of Oven Dry Specimen	*(b-t)*	
	% Moisture Content as a % of As Received or Total Mass	*(w/A)*100*	
	% Moisture Content as a % of Oven-dried Mass	*(w/B)*100*	

Oven *S&ME ID #:* *Cal. Date:* *Due:*

Method C (440 ° C) or D (750 ° C): Ash Content and Organic Matter Determination

	Muffle Furnace: 440 °C	*Tare #*	B
t	Tare Weight *(Dish plus Aluminum Foil Cover)*	*grams*	56.78
b	Mass of Oven Dry Specimen + Tare Wt.	*grams*	87.83
c	Ash Weight + Tare Wt.	*grams*	86.89
C	Ash Weight	*c-t*	30.11
B	Mass of Oven Dry Specimen	*(b-t)*	31.05
D	***% Ash Content***	*(C/B)*100*	**97.0%**
	% Organic Matter	*100-D*	**3.0%**

Muffle Furnace: *S&ME ID #:* *23123* *Cal. Date:* *N/A* *Due:* *N/A*

Notes / Deviations / References: ASTM D2974: Moisture, Ash, and Organic Matter of Peat and Other Organic Soils

Benjamin Kovaleski	Benjamin J. Kovaleski	NICET Level III/117226	4/10/18
Technician Name	*Signature*	*Level/Certification*	*Date*
Matthew F. Cooke, P.G.		Project Manager	4/10/18
Technical Responsibility		*Position*	*Date*

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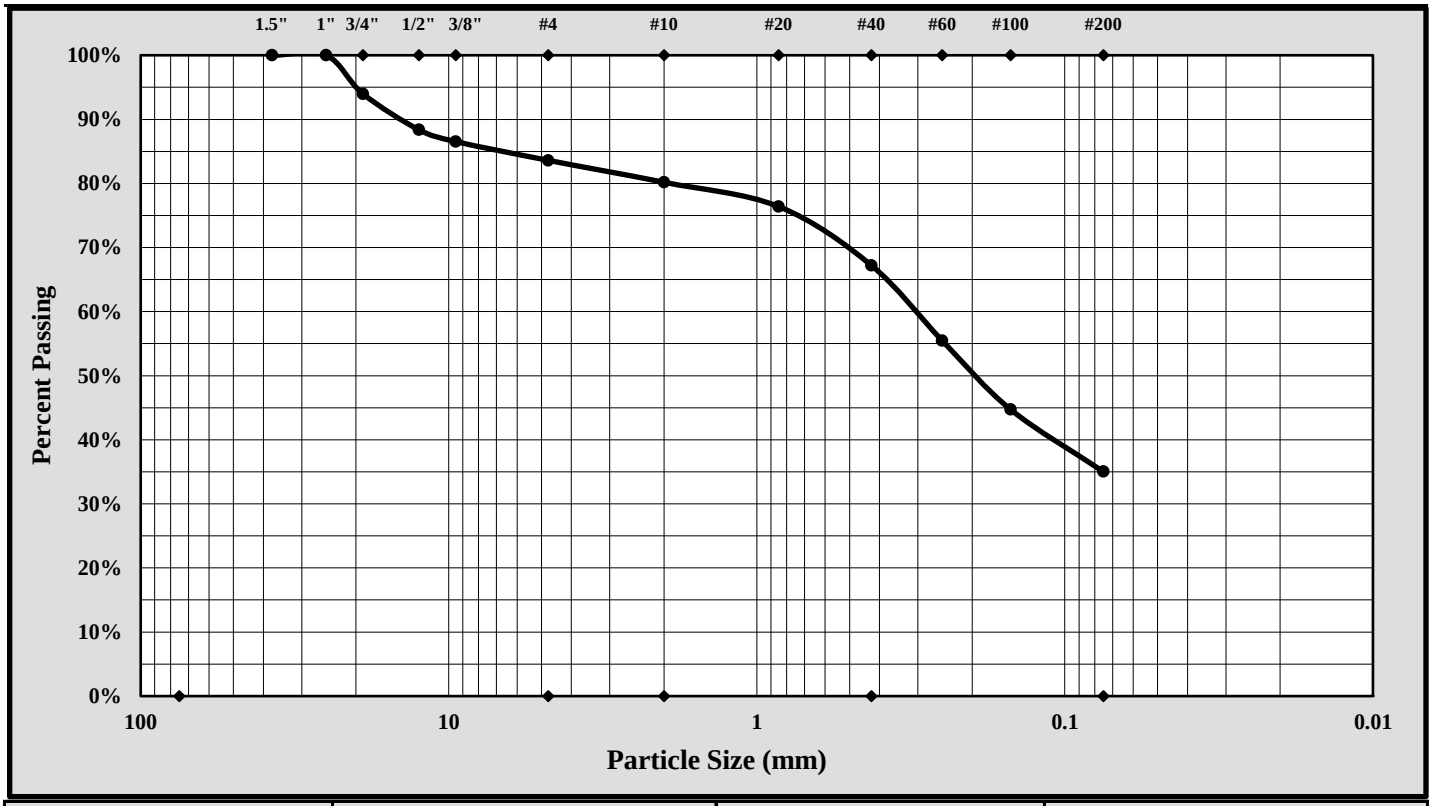
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/10/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/27 - 4/09/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-49	Sample #: SS-1	Sample Date: 2/22/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 24.5' - 26.5'
Sample Description:	Clayey Sand with Gravel (SC, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	25.0 mm	Gravel:	16.4%
Silt & Clay (% Passing #200):	35.0%	Total Sand:	48.6%

Liquid Limit	32	Plastic Limit	23	Plastic Index	9
Coarse Sand:	3.4%	Medium Sand:	13.0%	Fine Sand:	32.2%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/10/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

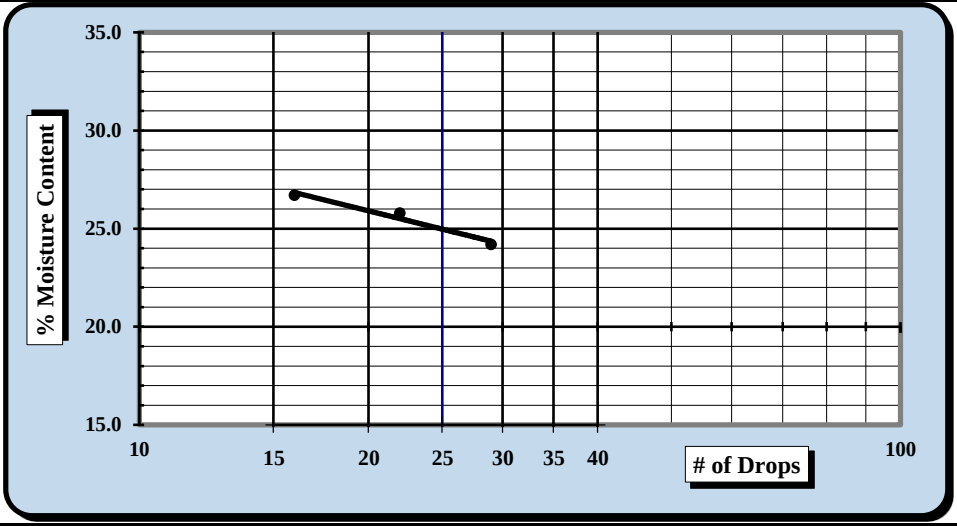
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/10/18
Project Name:	Carolina Crossroads Project	Test Date:	4/09/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-49	Sample #:	SS-2	Sample Date:	2/22/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	26.5' - 28.5'
Sample Description:	Clayey Sand (SC, A-4(0))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	6	7	8				9	10	
A	Tare Weight	27.76	26.32	27.30				26.85	26.75	
B	Wet Soil Weight + A	47.64	45.50	46.48				34.55	33.87	
C	Dry Soil Weight + A	43.77	41.57	42.44				33.40	32.82	
D	Water Weight (B-C)	3.87	3.93	4.04				1.15	1.05	
E	Dry Soil Weight (C-A)	16.01	15.25	15.14				6.55	6.07	
F	% Moisture (D/E)*100	24.2%	25.8%	26.7%				17.6%	17.3%	
N	# OF DROPS	29	22	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**17.5%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**25**
Plastic Limit	**17**
Plastic Index	**8**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/10/18	Matthew F. Cooke, P.G.	4/10/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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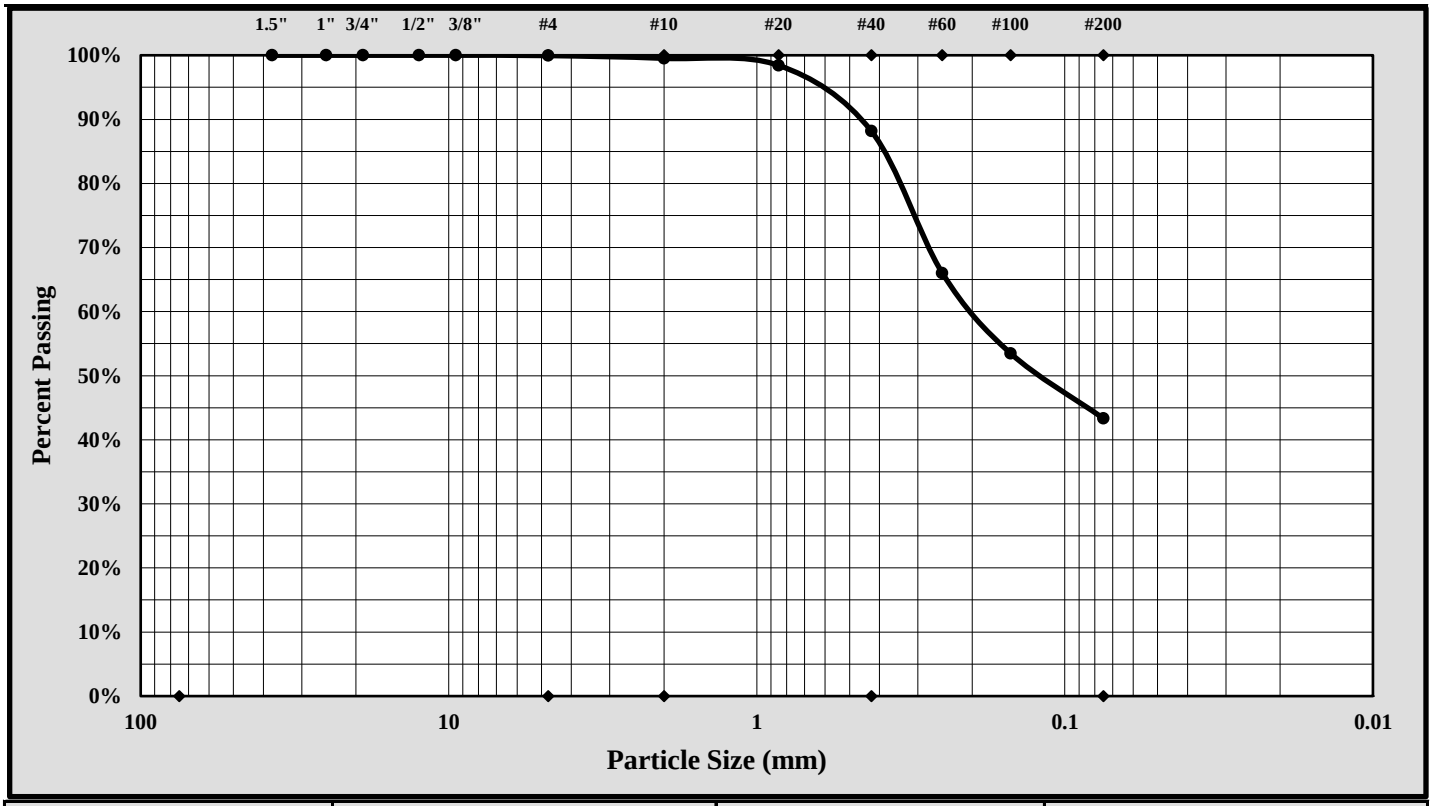
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/10/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/27 - 4/09/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-49 Sample #: SS-2	Sample Date:	2/22/18
Location:	Bridge Boring Type: Split-spoon	Depth:	26.5' - 28.5'
Sample Description:	Clayey Sand (SC, A-4(0))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	2.00 mm	Gravel:	0.1%
Silt & Clay (% Passing #200):	43.3%	Total Sand:	56.6%

Liquid Limit	25	Plastic Limit	17	Plastic Index	8
Coarse Sand:	0.4%	Medium Sand:	11.3%	Fine Sand:	44.8%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/10/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/10/18
Project Name:	Carolina Crossroads Project	Test Date:	4/09/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-49	Sample #:	SS-4	Sample Date:	2/22/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	30.5' - 32.5'
Sample Description:	Lean Clay with Sand ([CL, A-6(10))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	11	12	13				14	15	
A	Tare Weight	26.66	26.65	26.75				26.65	27.60	
B	Wet Soil Weight + A	47.52	45.76	43.28				33.12	35.54	
C	Dry Soil Weight + A	41.94	40.39	38.31				31.80	33.94	
D	Water Weight (B-C)	5.58	5.37	4.97				1.32	1.60	
E	Dry Soil Weight (C-A)	15.28	13.74	11.56				5.15	6.34	
F	% Moisture (D/E)*100	36.5%	39.1%	43.0%				25.6%	25.2%	
N	# OF DROPS	35	25	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**25.4%**		

One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐
Liquid Limit **39**
Plastic Limit **25**
Plastic Index **14**
Group Symbol **CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/10/18	Matthew F. Cooke, P.G.	4/10/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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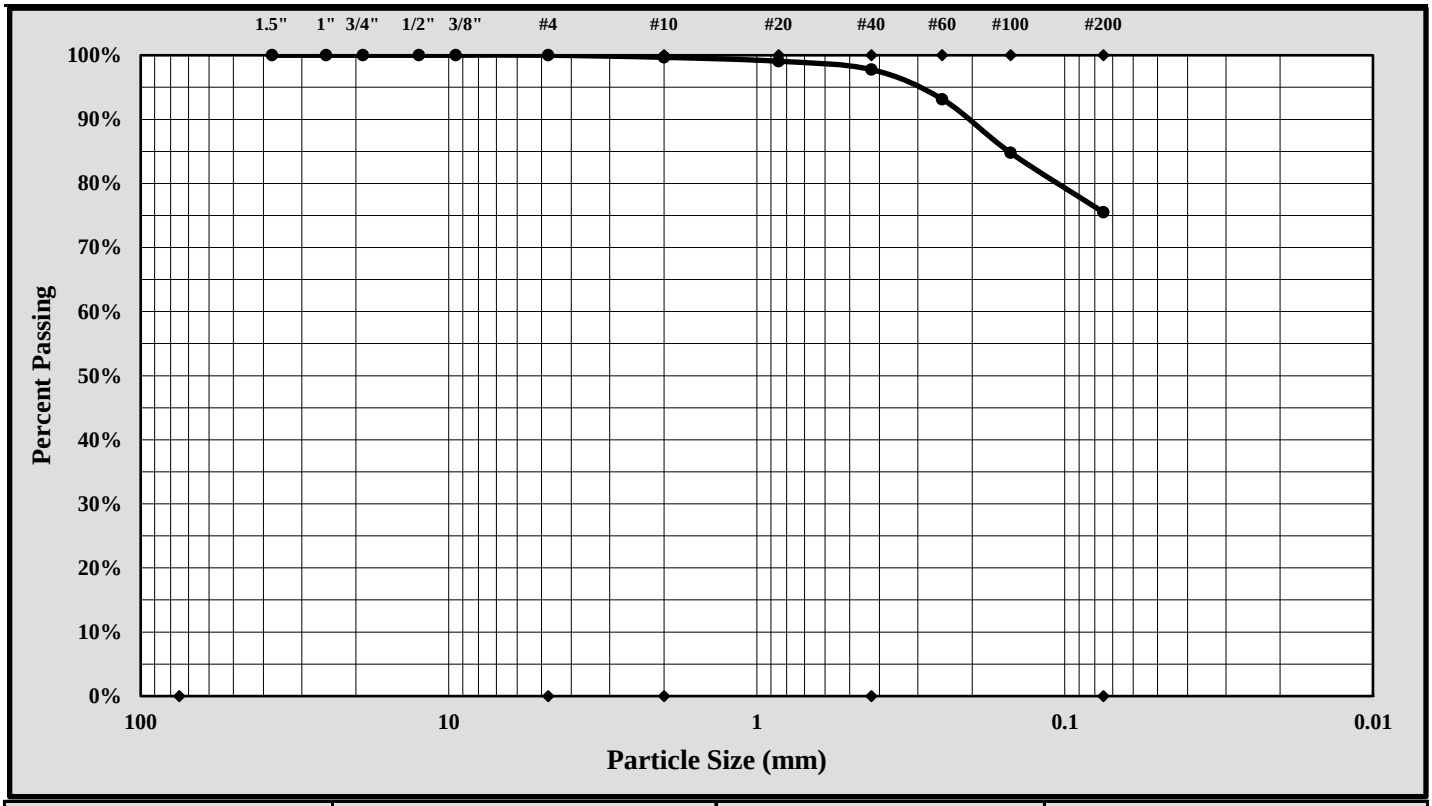
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/10/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/27 - 4/09/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-49	Sample #: SS-4	Sample Date: 2/22/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 30.5' - 32.5'
Sample Description:	Lean Clay with Sand (CL, A-6(10))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	0.85 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	75.5%	Total Sand:	24.5%

Liquid Limit	39	Plastic Limit	25	Plastic Index	14
Coarse Sand:	0.3%	Medium Sand:	1.9%	Fine Sand:	22.3%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/10/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/10/18
Project Name:	Carolina Crossroads Project	Test Date:	4/09/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

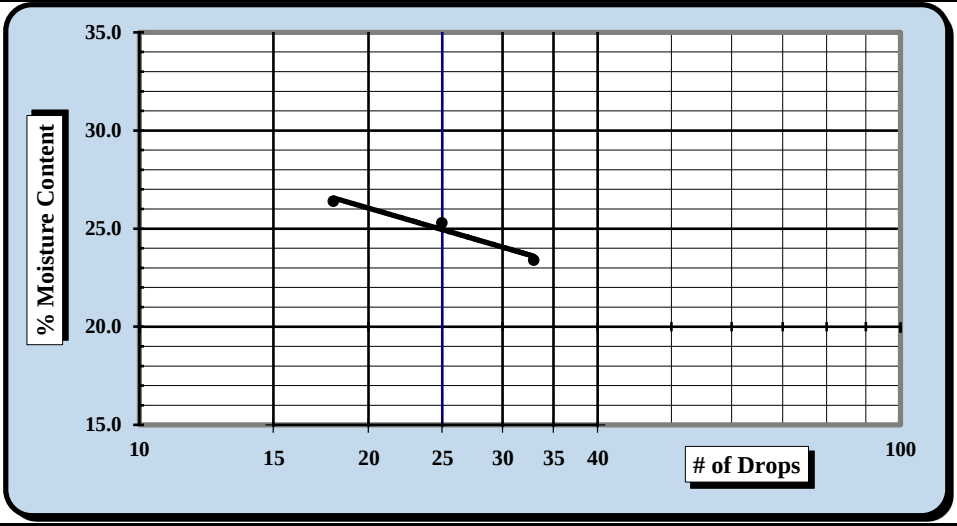
Boring #:	B-49	Sample #:	SS-5	Sample Date:	2/22/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	32.5' - 34.5'

Sample Description: Silty Sand (SM, A-4(0))

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	16	17	18						
A	Tare Weight	26.58	26.64	26.82						
B	Wet Soil Weight + A	45.29	44.81	46.11						
C	Dry Soil Weight + A	41.74	41.14	42.08						
D	Water Weight (B-C)	3.55	3.67	4.03						
E	Dry Soil Weight (C-A)	15.16	14.50	15.26						
F	% Moisture (D/E)*100	23.4%	25.3%	26.4%						
N	# OF DROPS	33	25	18						
LL	LL = **F** * FACTOR									
Ave.	*Average*									

Moisture Contents determined by ASTM D 2216



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☒

Liquid Limit	**25**
Plastic Limit	**NP**
Plastic Index	**NP**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/10/18	Matthew F. Cooke, P.G.	4/10/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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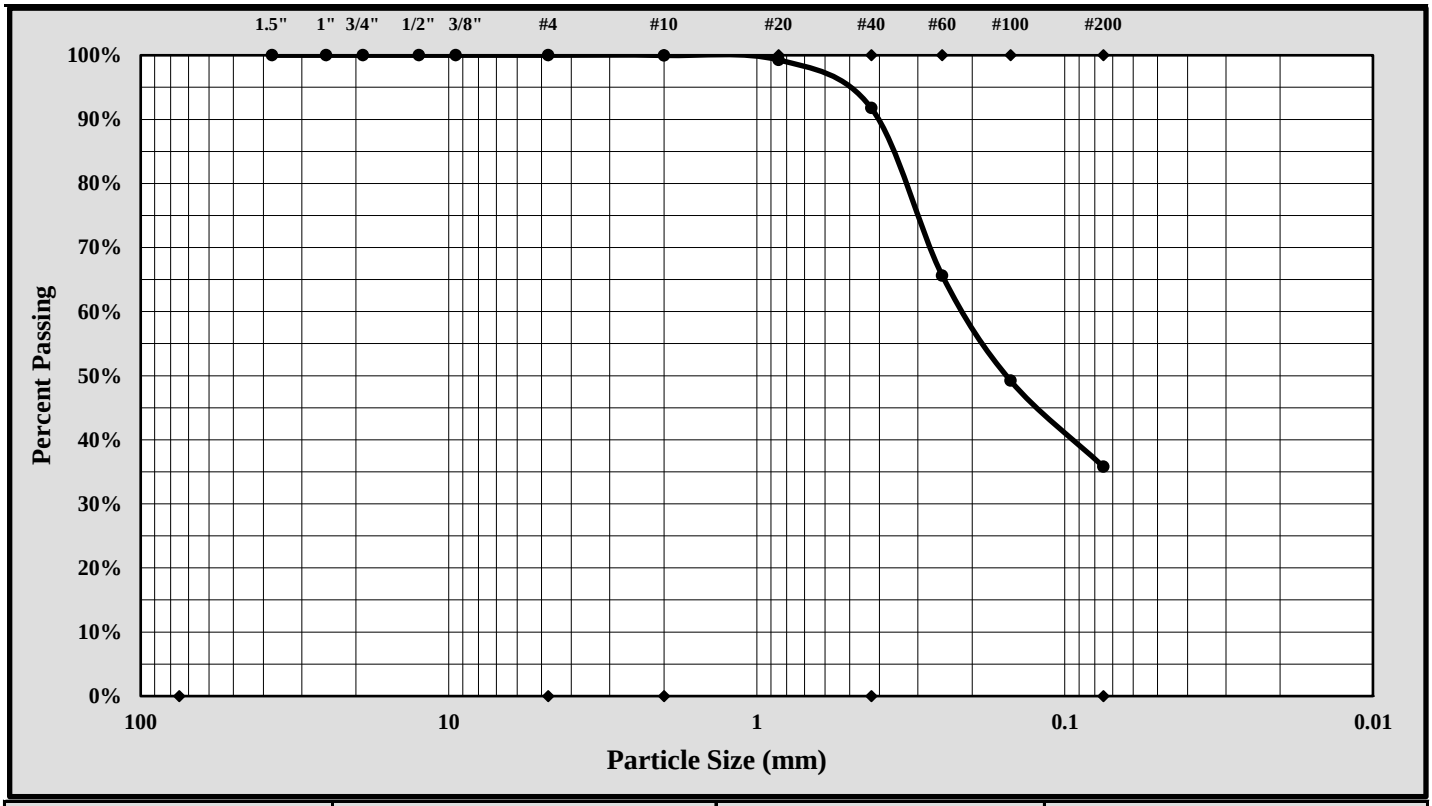
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/10/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/27 - 4/09/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-49 Sample #: SS-5	Sample Date:	2/22/18
Location:	Bridge Boring Type: Split-spoon	Depth:	32.5' - 34.5'
Sample Description:	Silty Sand (SM, A-4(0))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	0.85 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	35.8%	Total Sand:	64.2%

Liquid Limit	25	Plastic Limit	NP	Plastic Index	NP
Coarse Sand:	0.0%	Medium Sand:	8.2%	Fine Sand:	56.0%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/10/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

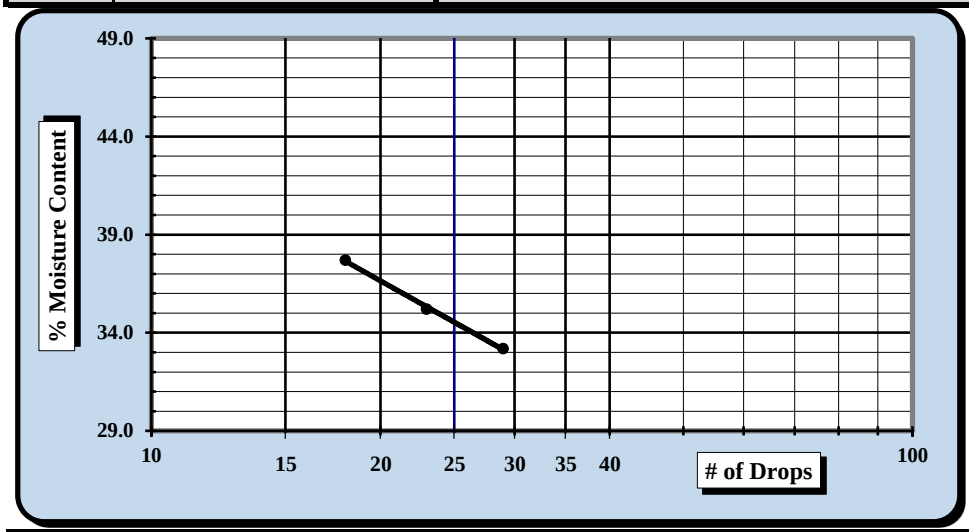
Project #:	1461-16-047.2B	Report Date:	4/10/18
Project Name:	Carolina Crossroads Project	Test Date:	4/09/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-50	Sample #:	SS-4	Sample Date:	2/18/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	7.0' - 9.0'

Sample Description: Silt with Sand (ML, A-4(6))

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	21	22	23				24	25	
A	Tare Weight	28.08	25.67	27.24				25.99	26.80	
B	Wet Soil Weight + A	46.33	43.32	44.30				32.06	34.40	
C	Dry Soil Weight + A	41.78	38.72	39.63				30.74	32.77	
D	Water Weight (B-C)	4.55	4.60	4.67				1.32	1.63	
E	Dry Soil Weight (C-A)	13.70	13.05	12.39				4.75	5.97	
F	% Moisture (D/E)*100	33.2%	35.2%	37.7%				27.8%	27.3%	
N	# OF DROPS	29	23	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**27.6%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**35**
Plastic Limit	**28**
Plastic Index	**7**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/10/18	Matthew F. Cooke, P.G.	4/10/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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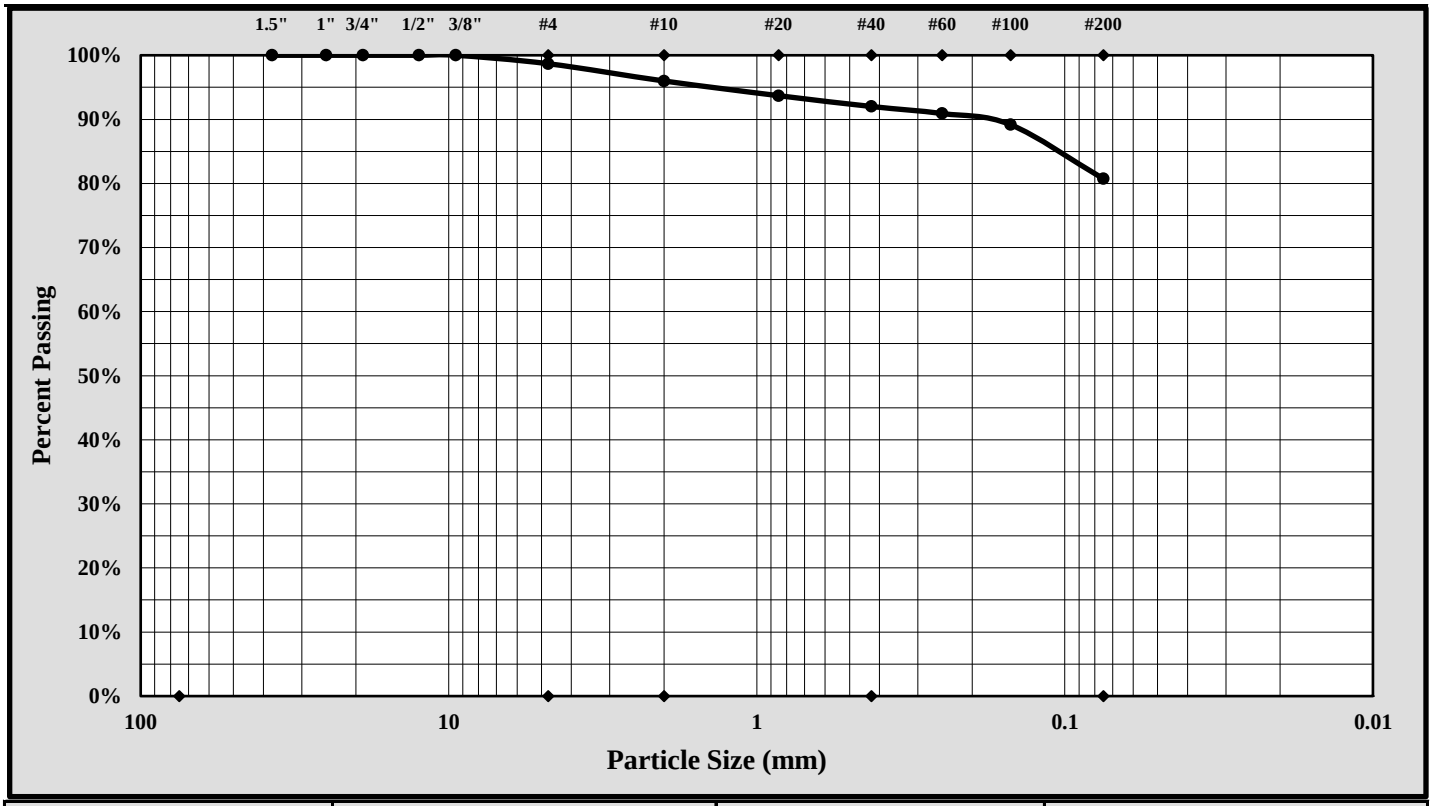
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/10/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/27 - 4/09/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-50 Sample #: SS-4	Sample Date:	2/22/18
Location:	Bridge Boring Type: Split-spoon	Depth:	7.0' - 9.0'
Sample Description:	Silt with Sand (ML, A-4(6))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	9.50 mm	Gravel:	1.3%
Silt & Clay (% Passing #200):	80.7%	Total Sand:	18.0%

Liquid Limit	35	Plastic Limit	28	Plastic Index	7
Coarse Sand:	2.7%	Medium Sand:	4.0%	Fine Sand:	11.3%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/10/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

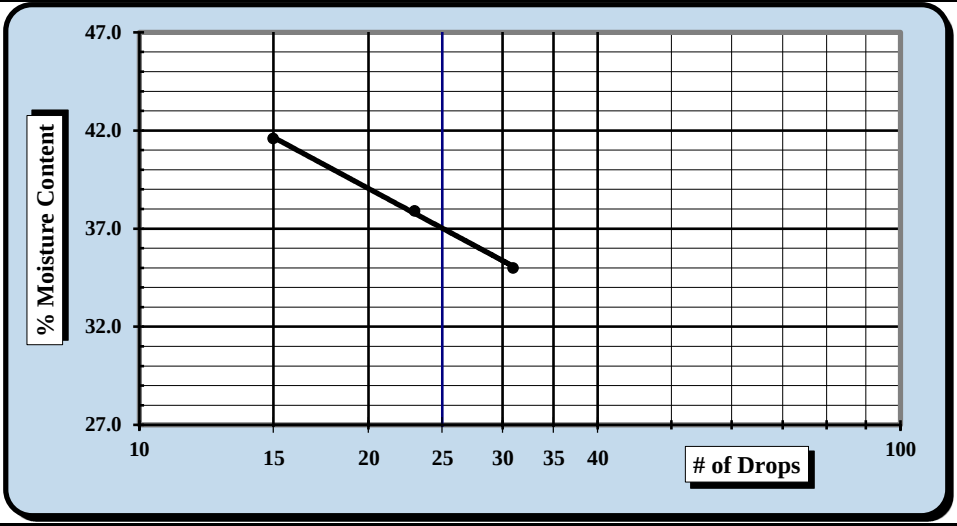
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/10/18
Project Name:	Carolina Crossroads Project	Test Date:	4/09/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-50	Sample #:	SS-6	Sample Date:	2/18/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	13.5' - 15.0'
Sample Description:	Sandy Lean Clay (CL, A-6(8))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	26	27	28				29	30	
A	Tare Weight	27.34	27.01	26.81				27.00	27.38	
B	Wet Soil Weight + A	44.85	42.59	42.30				34.98	34.55	
C	Dry Soil Weight + A	40.31	38.31	37.75				33.48	33.20	
D	Water Weight (B-C)	4.54	4.28	4.55				1.50	1.35	
E	Dry Soil Weight (C-A)	12.97	11.30	10.94				6.48	5.82	
F	% Moisture (D/E)*100	35.0%	37.9%	41.6%				23.1%	23.2%	
N	# OF DROPS	31	23	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**23.2%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐
Liquid Limit **37**
Plastic Limit **23**
Plastic Index **14**
Group Symbol **CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/10/18	Matthew F. Cooke, P.G.	4/10/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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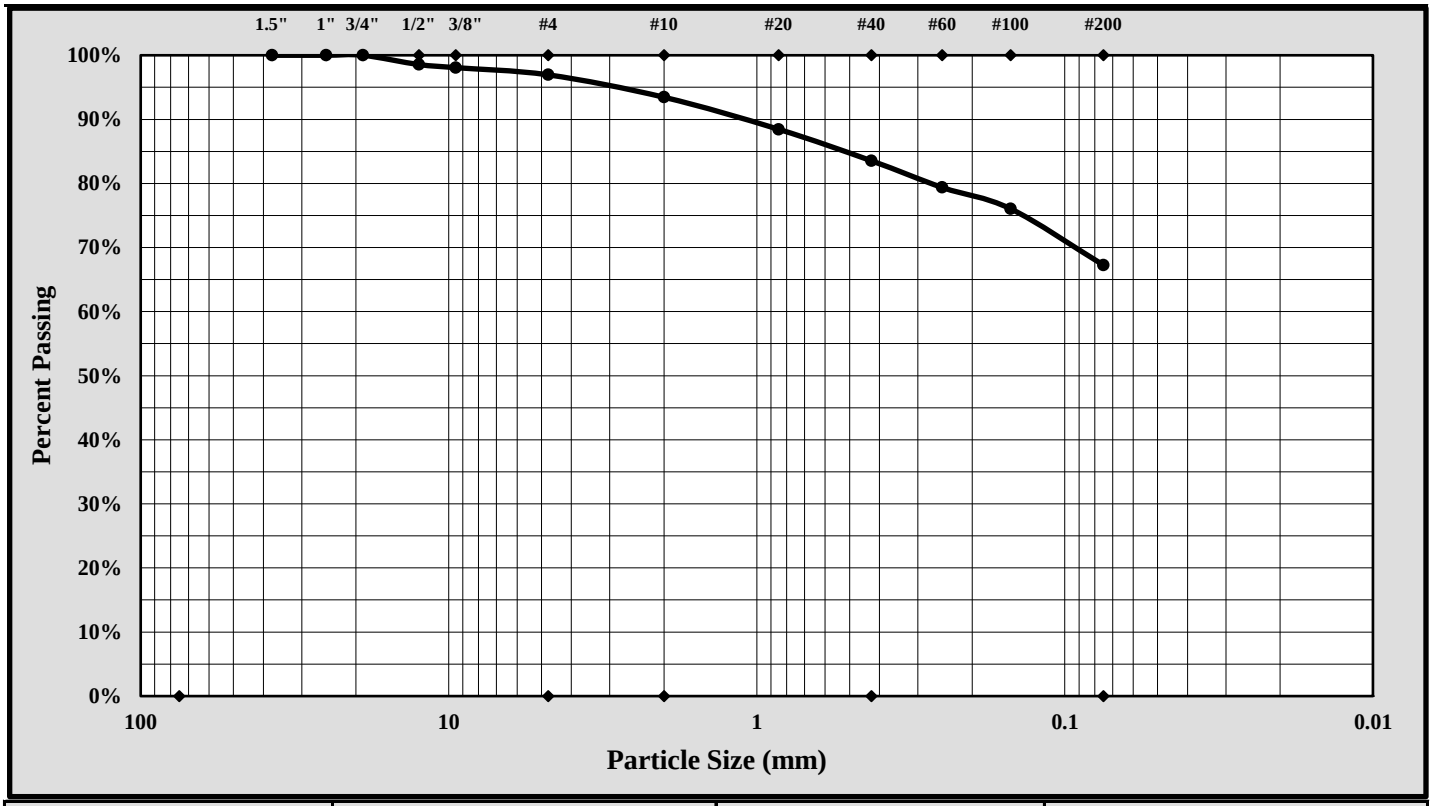
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/10/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/27 - 4/09/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-50	Sample #: SS-6	Sample Date: 2/18/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 13.5' - 15.0'
Sample Description:	Sandy Lean Clay (CL, A-6(8))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	19.0 mm	Gravel:	3.1%
Silt & Clay (% Passing #200):	67.3%	Total Sand:	29.7%

Liquid Limit	37	Plastic Limit	23	Plastic Index	14
Coarse Sand:	3.5%	Medium Sand:	9.9%	Fine Sand:	16.3%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/10/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

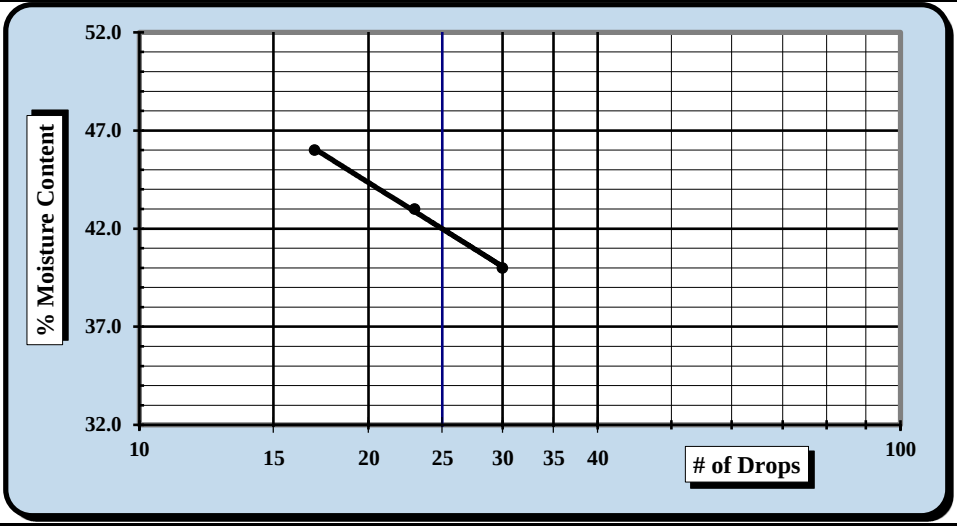
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/10/18
Project Name:	Carolina Crossroads Project	Test Date:	4/09/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-50	Sample #:	SS-8	Sample Date:	2/18/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	23.5' - 25.0'
Sample Description:	Sandy Silt (ML, A-7-6(8))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	31	32	33				34	35	
A	Tare Weight	28.61	27.65	26.68				28.25	26.95	
B	Wet Soil Weight + A	45.73	41.38	42.80				34.98	34.41	
C	Dry Soil Weight + A	40.84	37.25	37.72				33.48	32.77	
D	Water Weight (B-C)	4.89	4.13	5.08				1.50	1.64	
E	Dry Soil Weight (C-A)	12.23	9.60	11.04				5.23	5.82	
F	% Moisture (D/E)*100	40.0%	43.0%	46.0%				28.7%	28.2%	
N	# OF DROPS	30	23	17				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**28.5%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**42**
Plastic Limit	**28**
Plastic Index	**14**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/10/18	Matthew F. Cooke, P.G.	4/10/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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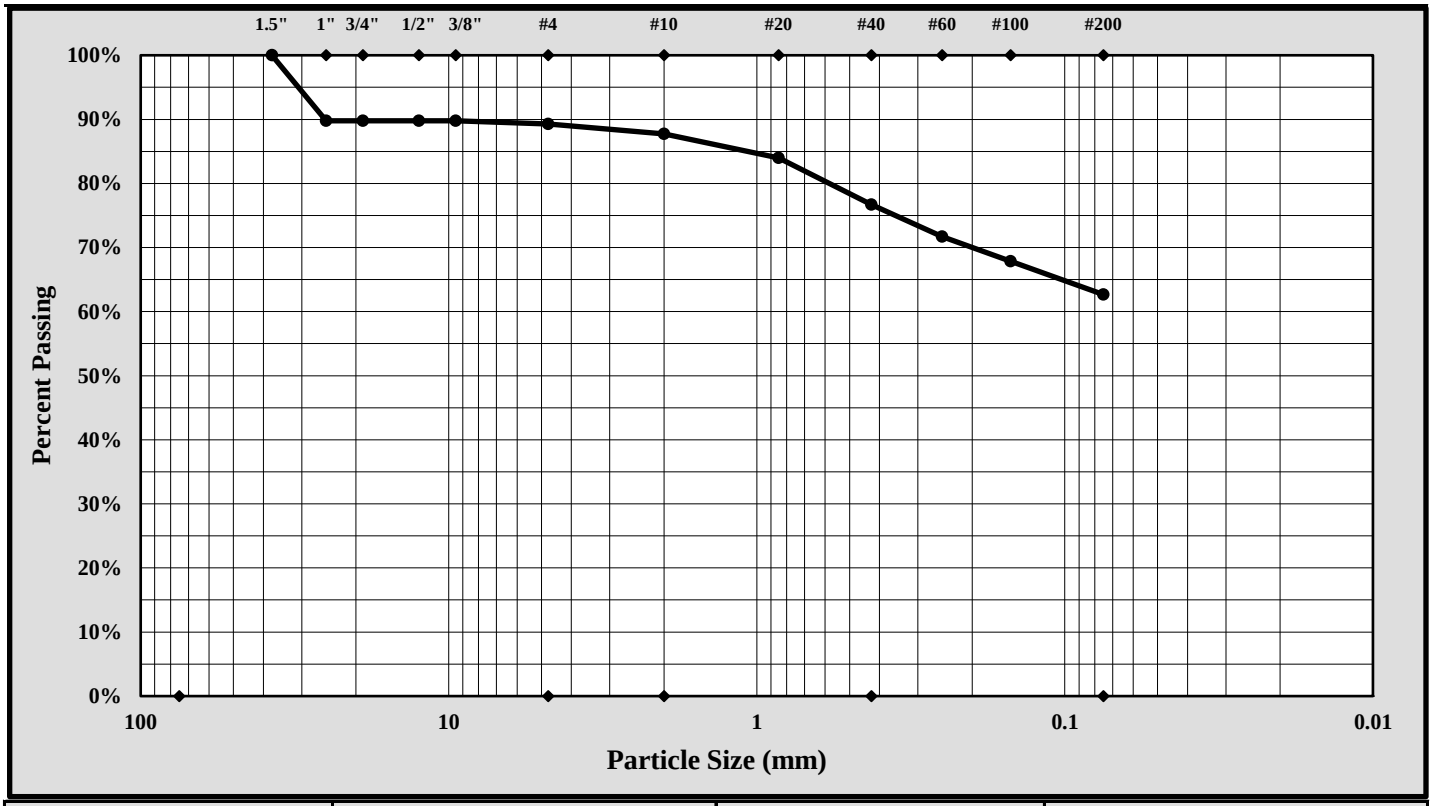
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/10/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/27 - 4/09/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-50	Sample #: SS-8	Sample Date: 2/18/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 23.5' - 25.0'
Sample Description:	Sandy Silt (ML, A-7-6(8))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	37.5 mm	Gravel:	10.7%
Silt & Clay (% Passing #200):	62.7%	Total Sand:	26.6%

Liquid Limit	42	Plastic Limit	28	Plastic Index	14
Coarse Sand:	1.5%	Medium Sand:	11.0%	Fine Sand:	14.0%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/10/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/10/18
Project Name:	Carolina Crossroads Project	Test Date:	4/09/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-50	Sample #:	SS-10	Sample Date:	2/18/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	33.5' - 35.0'

Sample Description: Elastic Silt with Sand (MH, A-7-5(16))

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	36	37	38				39	40	
A	Tare Weight	25.68	26.21	26.29				25.90	26.28	
B	Wet Soil Weight + A	36.47	37.93	39.46				32.77	34.17	
C	Dry Soil Weight + A	33.02	34.00	34.89				31.07	32.26	
D	Water Weight (B-C)	3.45	3.93	4.57				1.70	1.91	
E	Dry Soil Weight (C-A)	7.34	7.79	8.60				5.17	5.98	
F	% Moisture (D/E)*100	47.0%	50.4%	53.1%				32.9%	31.9%	
N	# OF DROPS	35	26	20				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**32.4%**		

One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐
Liquid Limit **51**
Plastic Limit **32**
Plastic Index **19**
Group Symbol **MH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/10/18	Matthew F. Cooke, P.G.	4/10/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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MOISTURE, ASH, AND ORGANIC MATTER

ASTM D-2974

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/10/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/09/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-50	Sample #: SS-10	Sample Date: 2/18/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 33.5' - 35.0'
Sample Description:	Elastic Silt with Sand (MH, A-7-5(6))		

Equipment: *Balance: 0.01 g.Readability, 500g. Minimum Capaccity*
Balance: *S&ME ID #:* *13942* *Cal. Date:* *8/19/17* *Due:* *8/19/18*

Method A: Moisture Content Determination *Required Oven Temperature: 105 ± 5 °C*

Oven Temperature: 105 °C		*Tare #*	
t	Tare Weight *(Dish plus Aluminum Foil Cover)*	*grams*	
a	Mass of *As-Received* Specimen + Tare Wt.	*grams*	
b	Mass of Oven Dry Specimen + Tare Wt.	*grams*	
w	Water Weight	*(a-b)*	
A	Mass of As-Received Specimen	*(a-t)*	
B	Mass of Oven Dry Specimen	*(b-t)*	
	% Moisture Content as a % of As Received or Total Mass	*(w/A)*100*	
	% Moisture Content as a % of Oven-dried Mass	*(w/B)*100*	

Oven *S&ME ID #:* *Cal. Date:* *Due:*

Method C (440 ° C) or D (750 ° C): Ash Content and Organic Matter Determination

Muffle Furnace: 440 °C		*Tare #*	D
t	Tare Weight *(Dish plus Aluminum Foil Cover)*	*grams*	55.72
b	Mass of Oven Dry Specimen + Tare Wt.	*grams*	75.96
c	Ash Weight + Tare Wt.	*grams*	75.54
C	Ash Weight	*c-t*	19.82
B	Mass of Oven Dry Specimen	*(b-t)*	20.24
D	***% Ash Content***	*(C/B)*100*	**97.9%**
	% Organic Matter	*100-D*	**2.1%**

Muffle Furnace: *S&ME ID #:* *23123* *Cal. Date:* *N/A* *Due:* *N/A*

Notes / Deviations / References: ASTM D2974: Moisture, Ash, and Organic Matter of Peat and Other Organic Soils

Benjamin Kovaleski	Benjamin J. Kovaleski	NICET Level III/117226	4/10/18
Technician Name	*Signature*	*Level/Certification*	*Date*
Matthew F. Cooke, P.G.		Project Manager	4/10/18
Technical Responsibility		*Position*	*Date*

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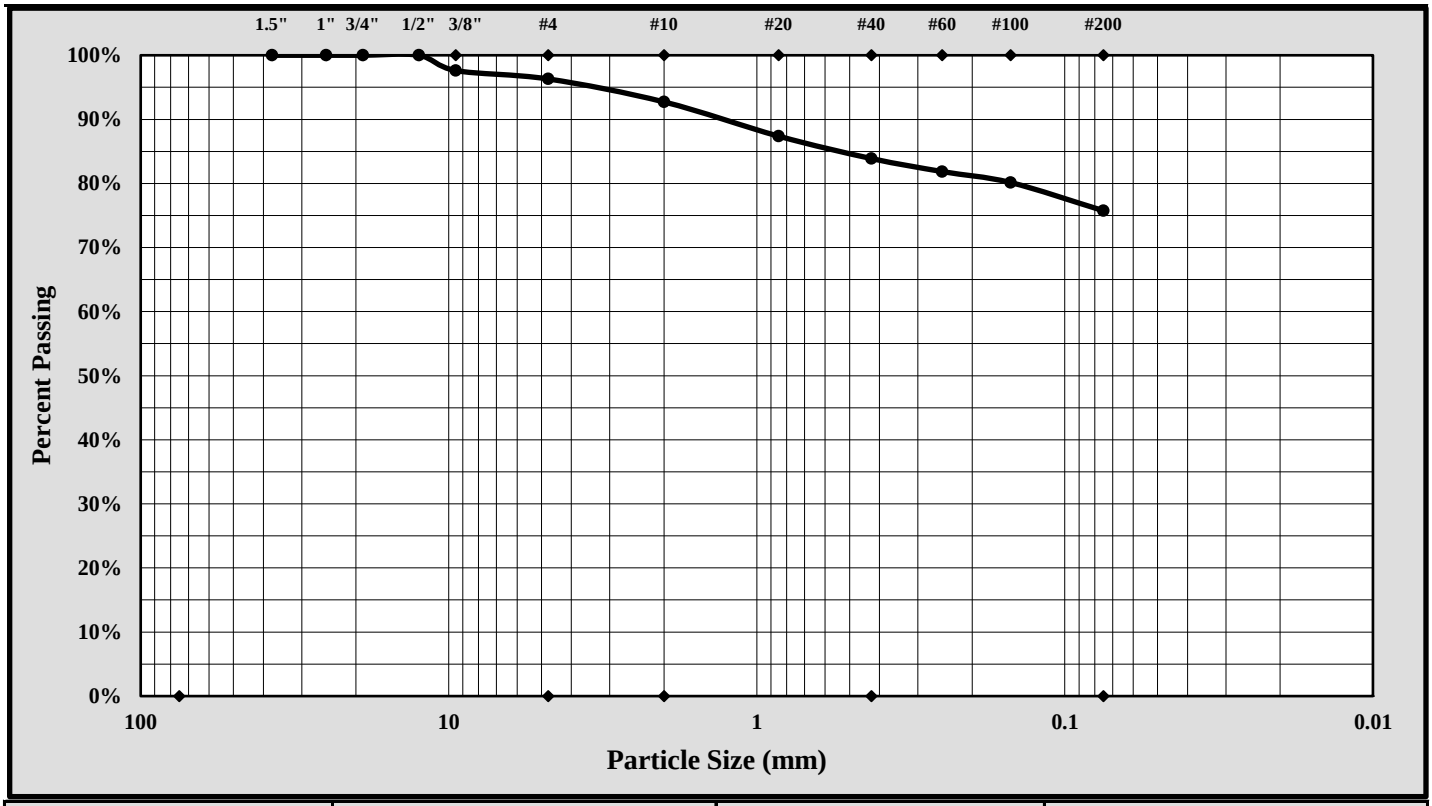
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/10/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/27 - 4/09/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-50	Sample #: SS-10	Sample Date: 2/18/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 33.5' - 35.0'
Sample Description:	Elastic Silt with Sand (MH, A-7-5(16))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	12.5 mm	Gravel:	3.7%
Silt & Clay (% Passing #200):	75.8%	Total Sand:	20.6%

Liquid Limit	51	Plastic Limit	32	Plastic Index	19
Coarse Sand:	3.6%	Medium Sand:	8.8%	Fine Sand:	8.1%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/10/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

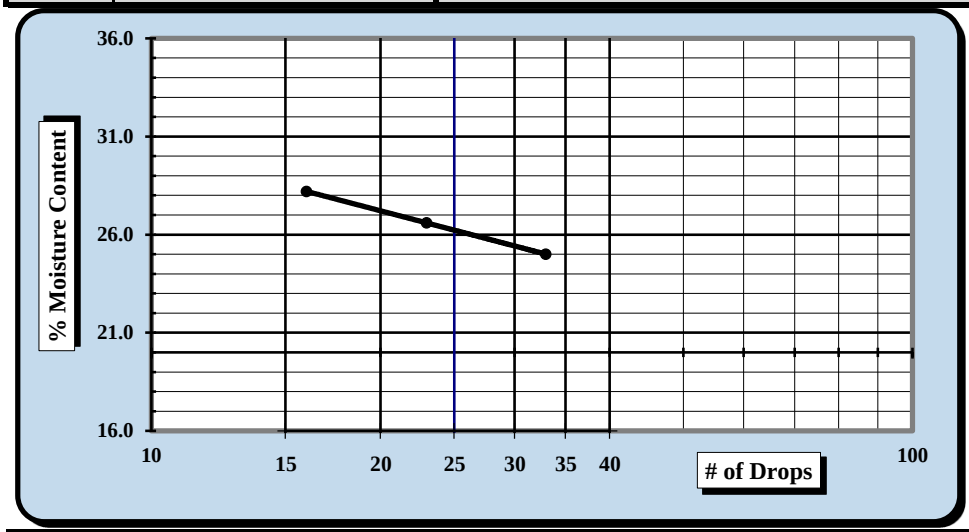
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/10/18
Project Name:	Carolina Crossroads Project	Test Date:	4/09/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-50	Sample #:	SS-14	Sample Date:	2/18/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	53.5' - 55.0'
Sample Description:	Silty Clayey Sand (SC-SM, A-2-4)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	41	42	43				44	45	
A	Tare Weight	28.74	28.64	28.38				25.78	25.10	
B	Wet Soil Weight + A	46.75	47.37	48.68				32.03	31.90	
C	Dry Soil Weight + A	43.15	43.44	44.22				30.89	30.67	
D	Water Weight (B-C)	3.60	3.93	4.46				1.14	1.23	
E	Dry Soil Weight (C-A)	14.41	14.80	15.84				5.11	5.57	
F	% Moisture (D/E)*100	25.0%	26.6%	28.2%				22.3%	22.1%	
N	# OF DROPS	33	23	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**22.2%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**26**
Plastic Limit	**22**
Plastic Index	**4**
Group Symbol	**CL-ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/10/18	Matthew F. Cooke, P.G.	4/10/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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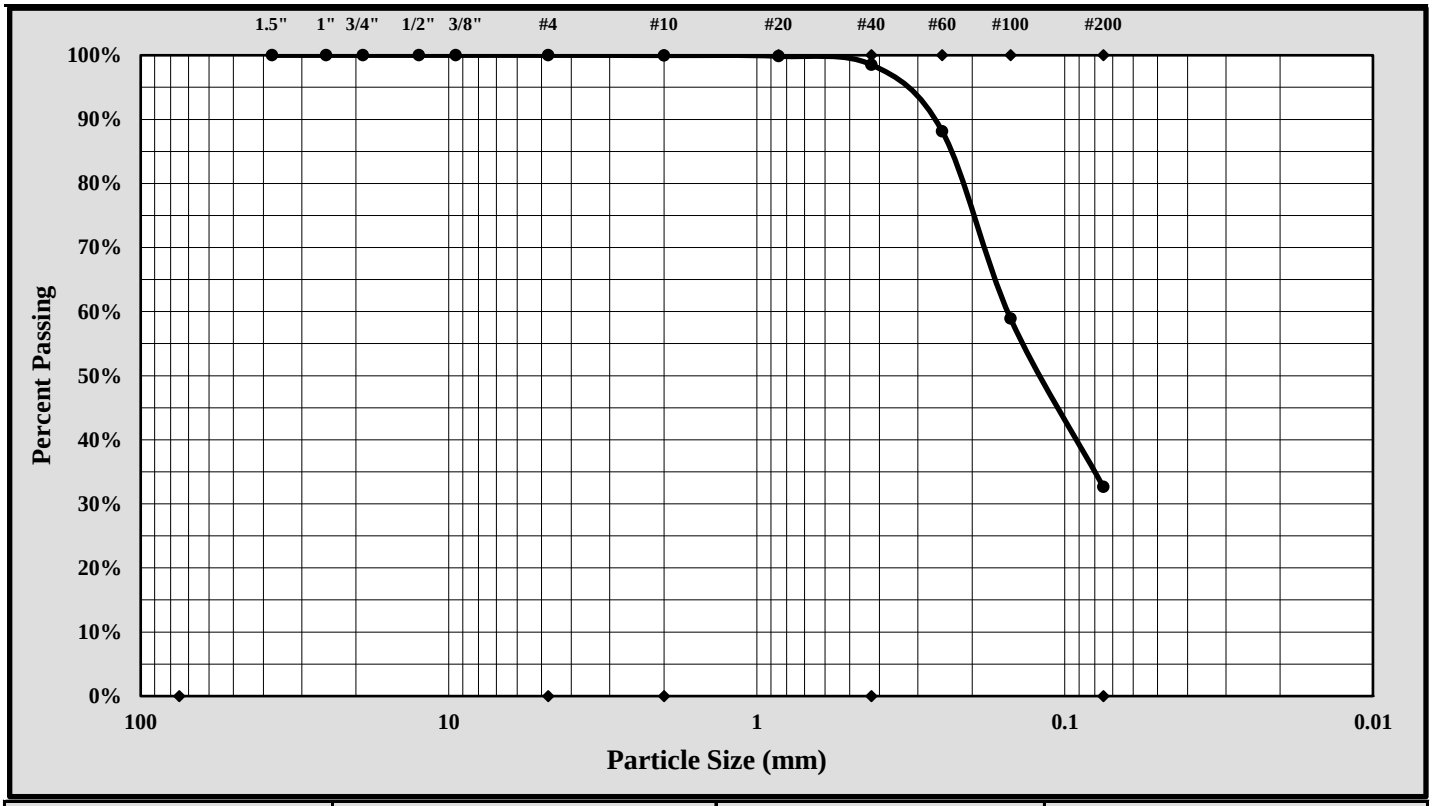
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/10/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/27 - 4/09/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-50 Sample #: SS-14	Sample Date:	2/18/18
Location:	Bridge Boring Type: Split-spoon	Depth:	53.5' - 55.0'
Sample Description:	Silty Clayey Sand (SC-SM, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	0.85 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	32.6%	Total Sand:	67.4%

Liquid Limit	26	Plastic Limit	22	Plastic Index	4
Coarse Sand:	0.0%	Medium Sand:	1.4%	Fine Sand:	65.9%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/10/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

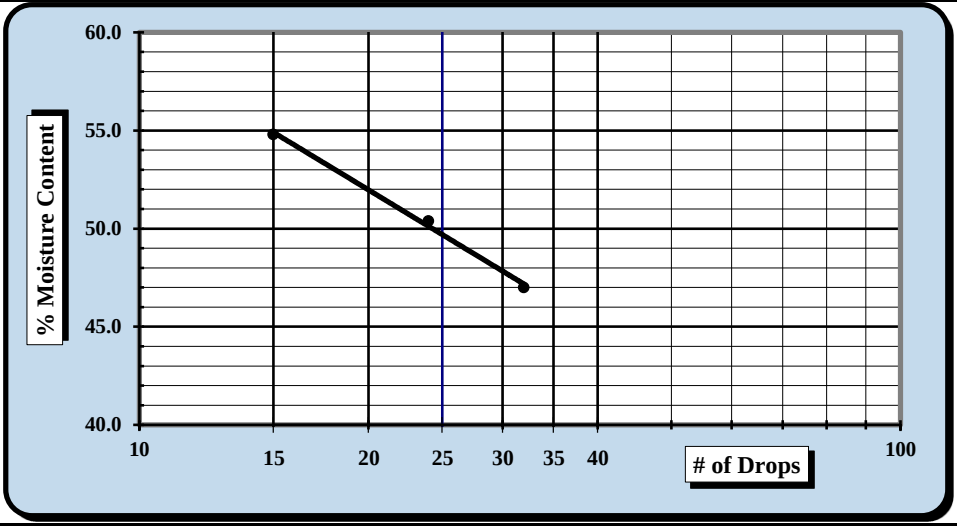
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/03/18
Project Name:	Carolina Crossroads Project	Test Date:	4/02/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-51	Sample #:	SS-1	Sample Date:	2/08/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	0.0' - 2.0'
Sample Description:	Clayey Sand (SC, A-7-6(7))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	26	27	28				29	30	
A	Tare Weight	27.37	27.00	26.80				27.00	27.36	
B	Wet Soil Weight + A	41.85	41.23	41.71				33.57	35.09	
C	Dry Soil Weight + A	37.22	36.46	36.43				32.22	33.47	
D	Water Weight (B-C)	4.63	4.77	5.28				1.35	1.62	
E	Dry Soil Weight (C-A)	9.85	9.46	9.63				5.22	6.11	
F	% Moisture (D/E)*100	47.0%	50.4%	54.8%				25.9%	26.5%	
N	# OF DROPS	32	24	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**26.2%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**50**
Plastic Limit	**26**
Plastic Index	**24**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/03/18	Matthew F. Cooke, P.G.	4/03/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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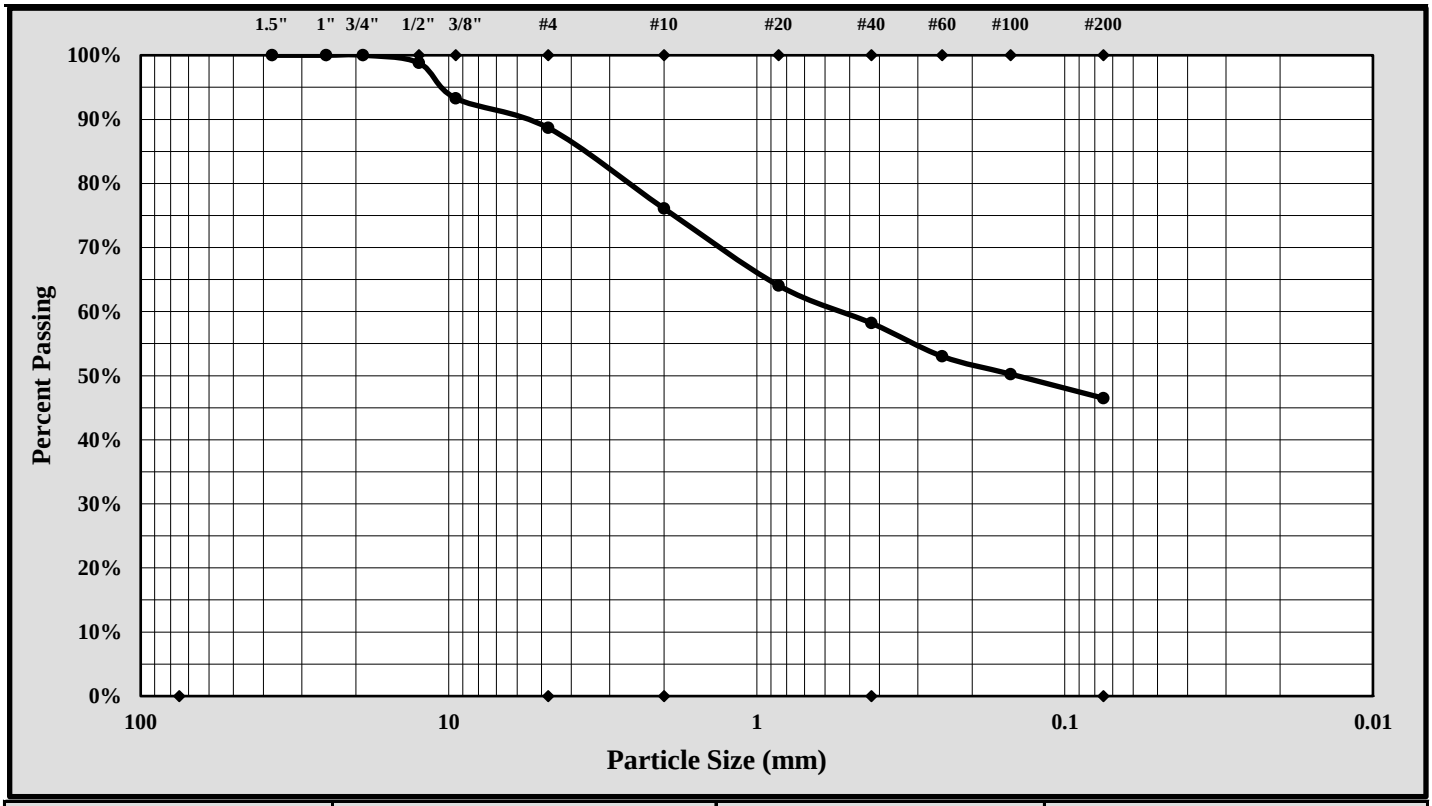
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/03/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/23 - 4/02/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-51 Sample #: SS-1	Sample Date:	2/08/18
Location:	Bridge Boring Type: Split-spoon	Depth:	0.0' - 2.0'
Sample Description:	Clayey Sand (SC, A-7-6(7))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	19.0 mm	Gravel:	11.3%
Silt & Clay (% Passing #200):	46.5%	Total Sand:	42.2%

Liquid Limit	50	Plastic Limit	26	Plastic Index	24
Coarse Sand:	12.6%	Medium Sand:	17.9%	Fine Sand:	11.7%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/03/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

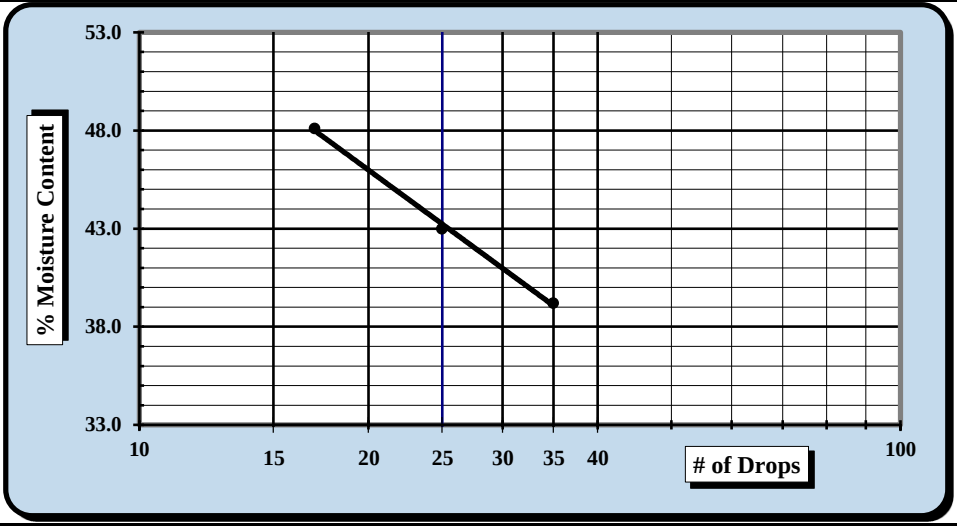
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/03/18
Project Name:	Carolina Crossroads Project	Test Date:	4/02/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-51	Sample #:	SS-6	Sample Date:	2/08/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	13.5' - 15.0'
Sample Description:	Silty Gravel with Sand (GM, A-7-6(4))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	31	32	33				34	35	
A	Tare Weight	28.62	27.70	26.70				28.25	26.96	
B	Wet Soil Weight + A	44.46	44.50	41.98				34.52	33.98	
C	Dry Soil Weight + A	40.00	39.45	37.02				33.17	32.45	
D	Water Weight (B-C)	4.46	5.05	4.96				1.35	1.53	
E	Dry Soil Weight (C-A)	11.38	11.75	10.32				4.92	5.49	
F	% Moisture (D/E)*100	39.2%	43.0%	48.1%				27.4%	27.9%	
N	# OF DROPS	35	25	17				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**27.7%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**43**
Plastic Limit	**28**
Plastic Index	**15**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/03/18	Matthew F. Cooke, P.G.	4/03/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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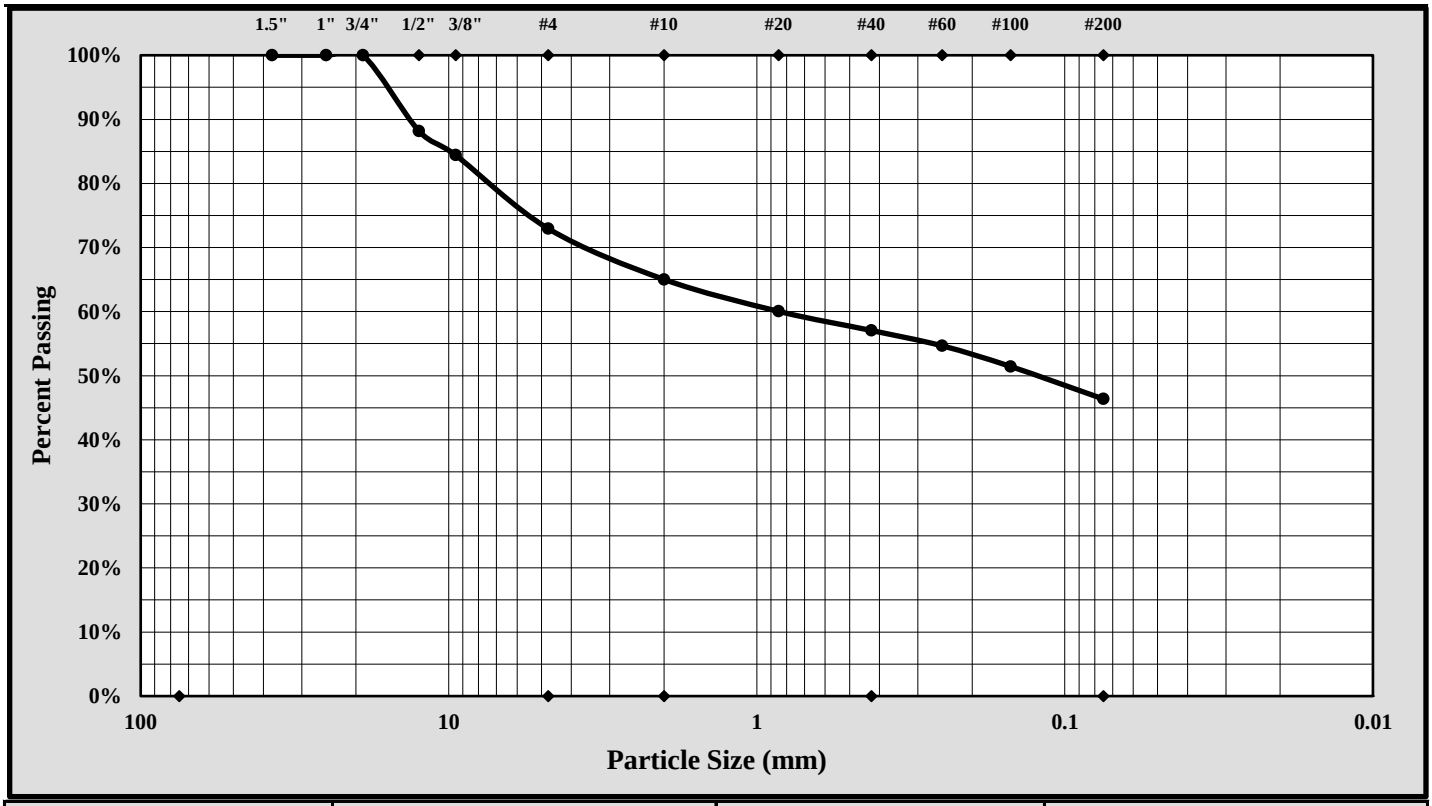
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/03/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/23 - 4/02/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-51	Sample #: SS-6	Sample Date: 2/08/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 13.5' - 15.0'
Sample Description:	Silty Gravel with Sand (GM, A-7-6(4))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	19.0 mm	Gravel:	27.1%
Silt & Clay (% Passing #200):	46.4%	Total Sand:	26.6%

Liquid Limit	43	Plastic Limit	28	Plastic Index	15
Coarse Sand:	7.9%	Medium Sand:	8.0%	Fine Sand:	10.7%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/03/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

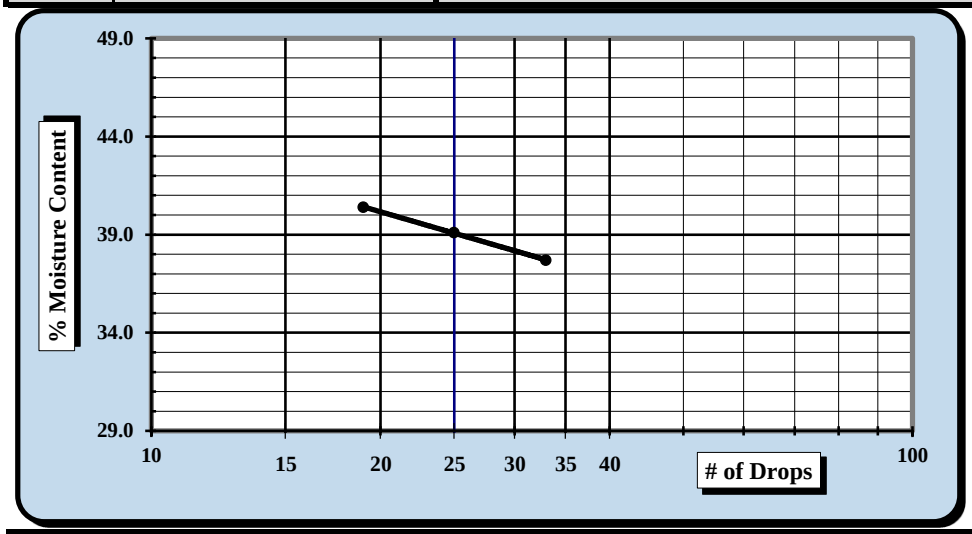
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/03/18
Project Name:	Carolina Crossroads Project	Test Date:	4/02/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-51	Sample #:	SS-9	Sample Date:	2/08/18
Location:	Bridge boring	Type:	Split-spoon	Depth:	28.5' - 30.0'
Sample Description:	Silt with Sand (ML, A-6(11))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	36	37	38				39	40	
A	Tare Weight	25.69	26.19	26.28				25.90	26.27	
B	Wet Soil Weight + A	42.35	43.26	43.90				32.87	33.20	
C	Dry Soil Weight + A	37.79	38.46	38.83				31.41	31.78	
D	Water Weight (B-C)	4.56	4.80	5.07				1.46	1.42	
E	Dry Soil Weight (C-A)	12.10	12.27	12.55				5.51	5.51	
F	% Moisture (D/E)*100	37.7%	39.1%	40.4%				26.5%	25.8%	
N	# OF DROPS	33	25	19				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**26.2%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐
Liquid Limit **39**
Plastic Limit **26**
Plastic Index **13**
Group Symbol **ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/03/18	Matthew F. Cooke, P.G.	4/03/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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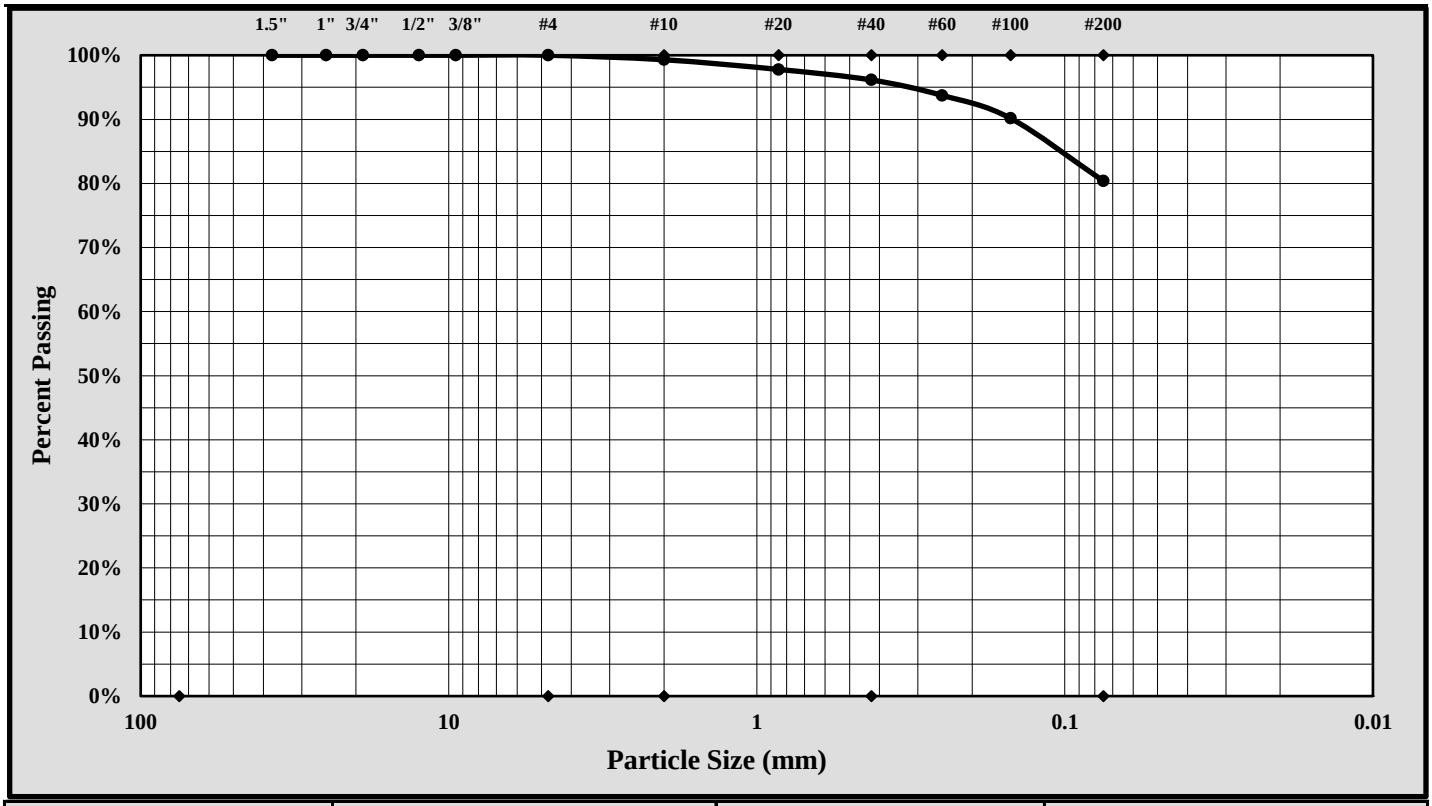
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/03/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/23 - 4/02/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-51 Sample #: SS-9	Sample Date:	2/08/18
Location:	Bridge boring Type: Split-spoon	Depth:	28.5 - 30.0'
Sample Description:	Silt with Sand (ML, A-6(11))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	2.00 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	80.4%	Total Sand:	19.6%

Liquid Limit	39	Plastic Limit	26	Plastic Index	13
Coarse Sand:	0.7%	Medium Sand:	3.2%	Fine Sand:	15.8%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/03/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

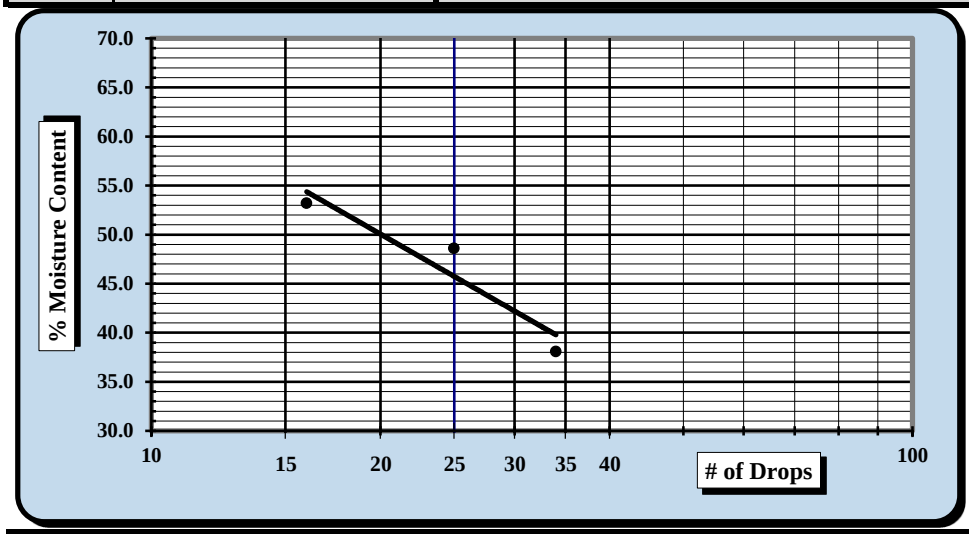
ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-2-2018
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-52	Sample #: SS-1	Sample Date: Various
Location:	Bridge Boring	Offset: N/A	Depth: 0.0' - 2.0'
Sample Description:	Clayey Sand (SC, A-7-6 (6))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

	Pan # 305	Liquid Limit						Plastic Limit		
	Tare #:	91	92	93				94	95	
A	Tare Weight	15.15	15.11	15.06				15.04	15.06	
B	Wet Soil Weight + A	25.00	25.44	25.86				22.88	21.88	
C	Dry Soil Weight + A	22.28	22.06	22.11				21.49	20.70	
D	Water Weight (B-C)	2.72	3.38	3.75				1.39	1.18	
E	Dry Soil Weight (C-A)	7.13	6.95	7.05				6.45	5.64	
F	% Moisture (D/E)*100	38.1%	48.6%	53.2%				21.6%	20.9%	
N	# OF DROPS	34	25	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**21.3%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**46**
Plastic Limit	**21**
Plastic Index	**25**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		5/2/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

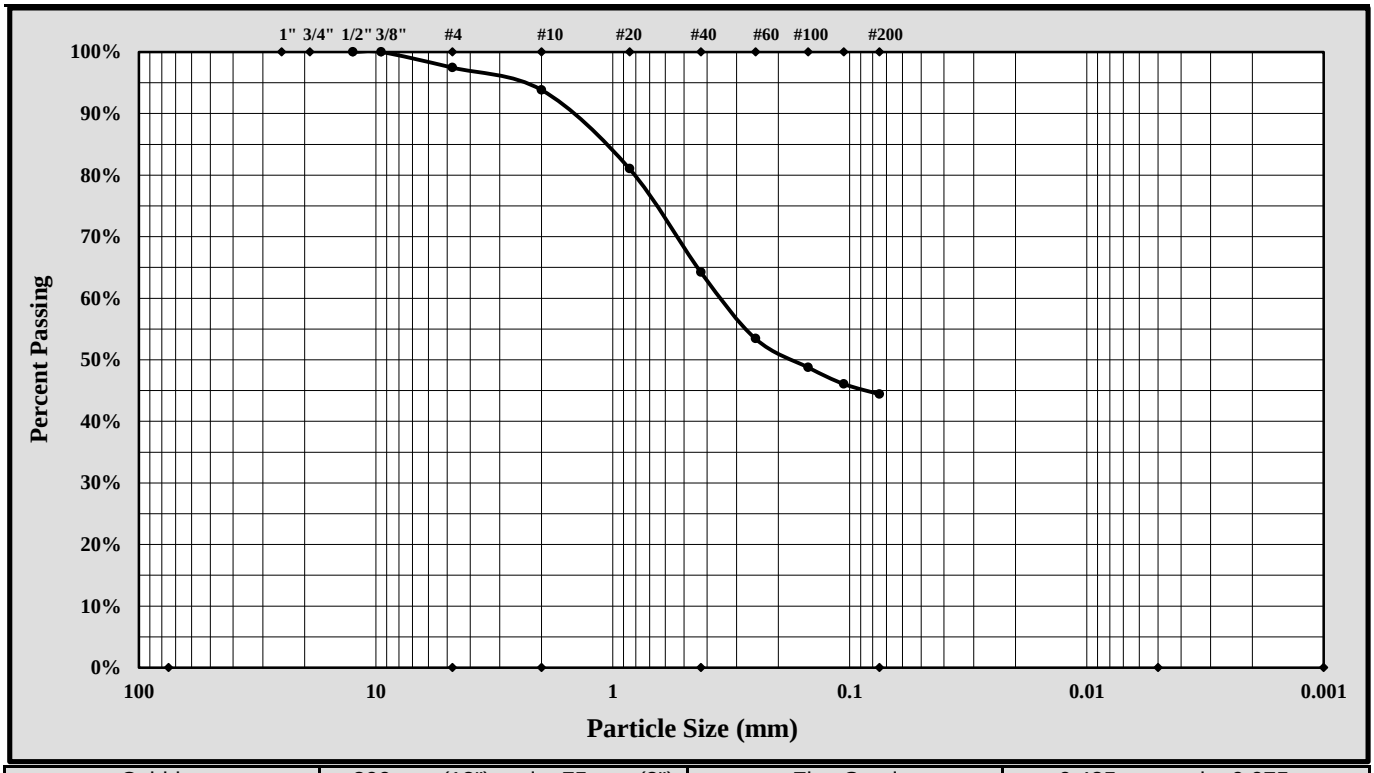
ASTM D6913/D7928

Quality Assurance

Sample Log No.:

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	B-52 Type: Split Spoon	Sample Date:	Various
Location:	Bridge Boring Sample No.: SS-1	Depth:	0.0' - 2.0'
Sample Description:	Clayey Sand (SC, A-7-6 (6))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	2.5%
Silt & Clay (% Passing #200):	44.4%	Total Sand:	53.0%
Assumed Specific Gravity:	2.65		
Liquid Limit	46	Plastic Limit	21
		Plastic Index	24

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	5/2/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

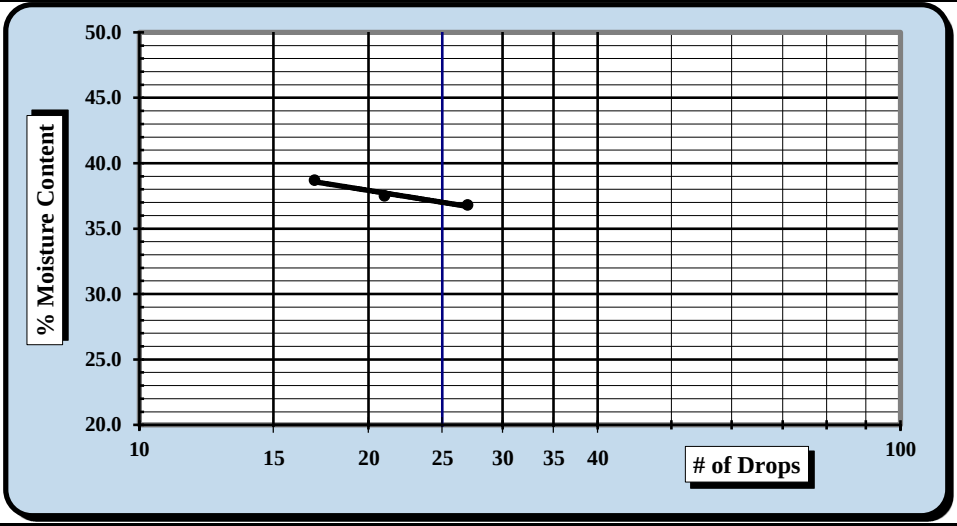
S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-4-18
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-52	Sample #: SS-2		Sample Date: Various	
Location:	Bridge Boring	Offset: N/A		Depth: 2.0' - 4.0'	
Sample Description:	Silt with Sand (ML, A-4 (7))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 415		Liquid Limit						Plastic Limit		
	Tare #:	1	4	5				6	7	
A	Tare Weight	15.00	15.00	15.31				15.55	15.97	
B	Wet Soil Weight + A	25.27	26.84	27.86				22.60	23.59	
C	Dry Soil Weight + A	22.51	23.61	24.36				21.07	21.96	
D	Water Weight (B-C)	2.76	3.23	3.50				1.53	1.63	
E	Dry Soil Weight (C-A)	7.51	8.61	9.05				5.52	5.99	
F	% Moisture (D/E)*100	36.8%	37.5%	38.7%				27.7%	27.2%	
N	# OF DROPS	27	21	17				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**27.5%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**36**
Plastic Limit	**27**
Plastic Index	**9**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		5/4/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

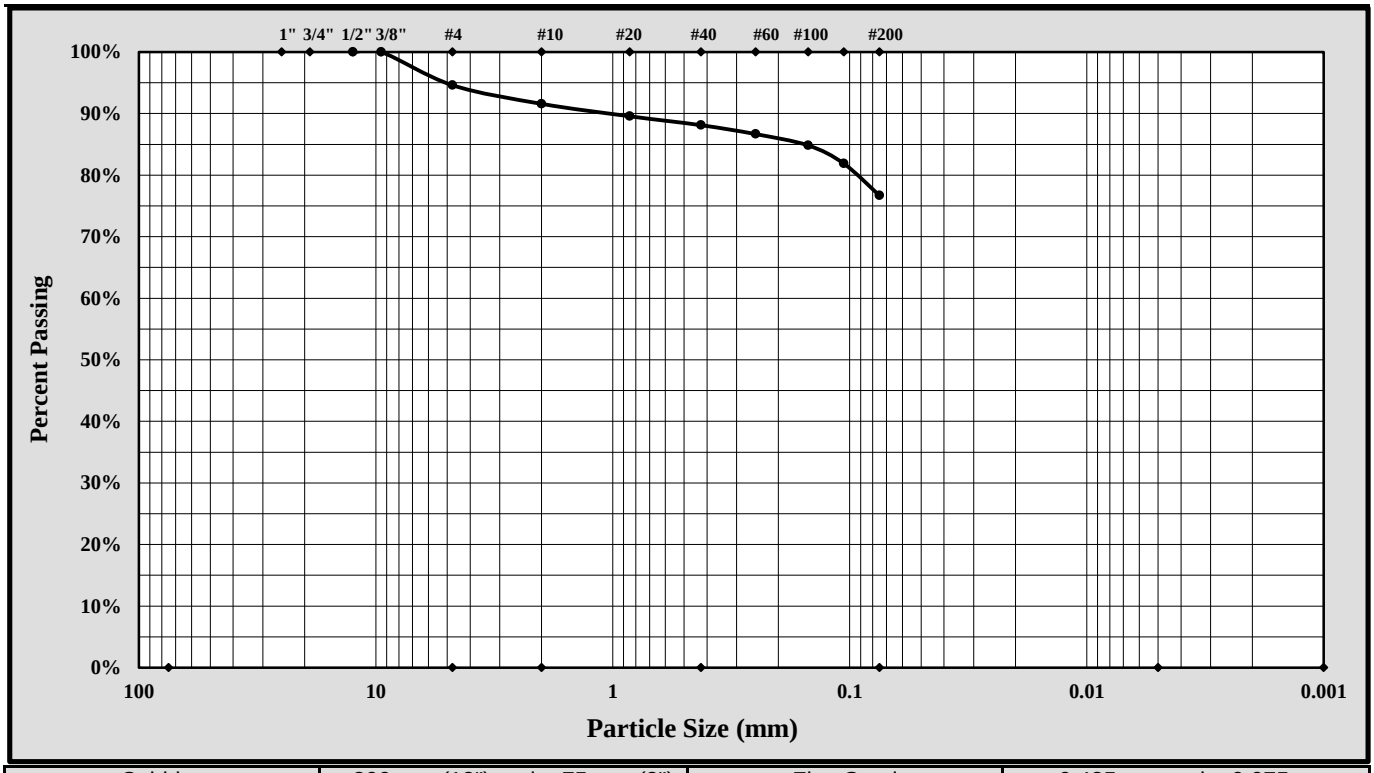
ASTM D6913/D7928

Quality Assurance

Sample Log No.:

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	B-52 Type: Split Spoon	Sample Date:	Various
Location:	Bridge Boring Sample No.: SS-2	Depth:	2.0' - 4.0'
Sample Description:	Silt with Sand (ML, A-4 (7))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	5.4%
Silt & Clay (% Passing #200):	76.7%	Total Sand:	17.9%
Assumed Specific Gravity:	2.65		
Liquid Limit	36	Plastic Limit 27	Plastic Index 9

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel: Rounded ☐ Angular ☐ Hard & Durable ☐ Soft ☐ Weathered & Friable ☐

Sample Prep Method: Moist Prep | Dispersion Period: 1 min. | Dispersing Agent: Sodium Hexametaphosphate: 50 g./ Liter

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	5/4/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

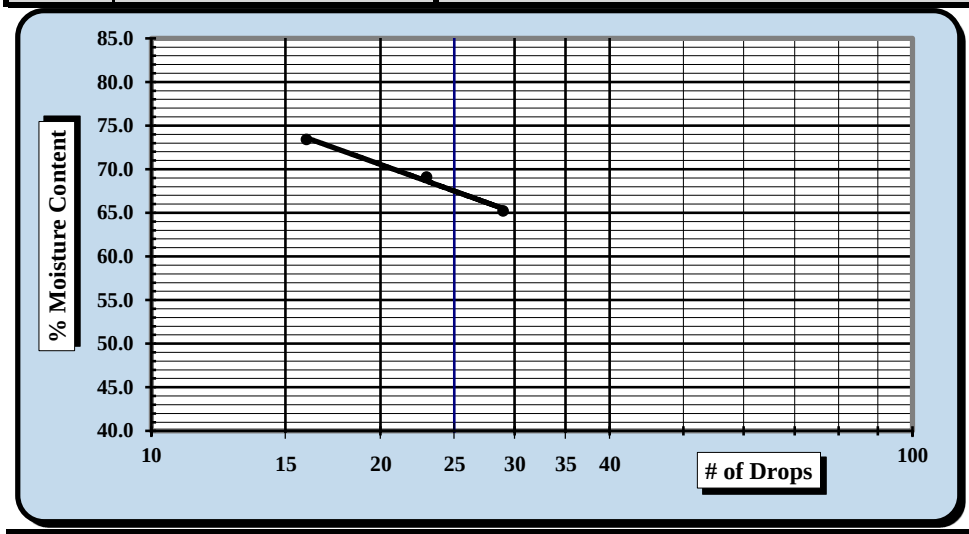
S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-1-2018
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-52	Sample #: SS-6		Sample Date: Various	
Location:	Bridge Boring	Offset: N/A		Depth: 13.5' - 15.0'	
Sample Description:	Sandy Fat Clay (CH, A-7-5 (17))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 330		Liquid Limit						Plastic Limit		
	Tare #:	15	16	17				18	19	
A	Tare Weight	15.99	15.08	15.52				15.27	15.08	
B	Wet Soil Weight + A	26.00	25.36	27.45				22.09	20.96	
C	Dry Soil Weight + A	22.05	21.16	22.40				20.51	19.62	
D	Water Weight (B-C)	3.95	4.20	5.05				1.58	1.34	
E	Dry Soil Weight (C-A)	6.06	6.08	6.88				5.24	4.54	
F	% Moisture (D/E)*100	65.2%	69.1%	73.4%				30.2%	29.5%	
N	# OF DROPS	29	23	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**29.9%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**67**
Plastic Limit	**30**
Plastic Index	**37**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		5/1/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

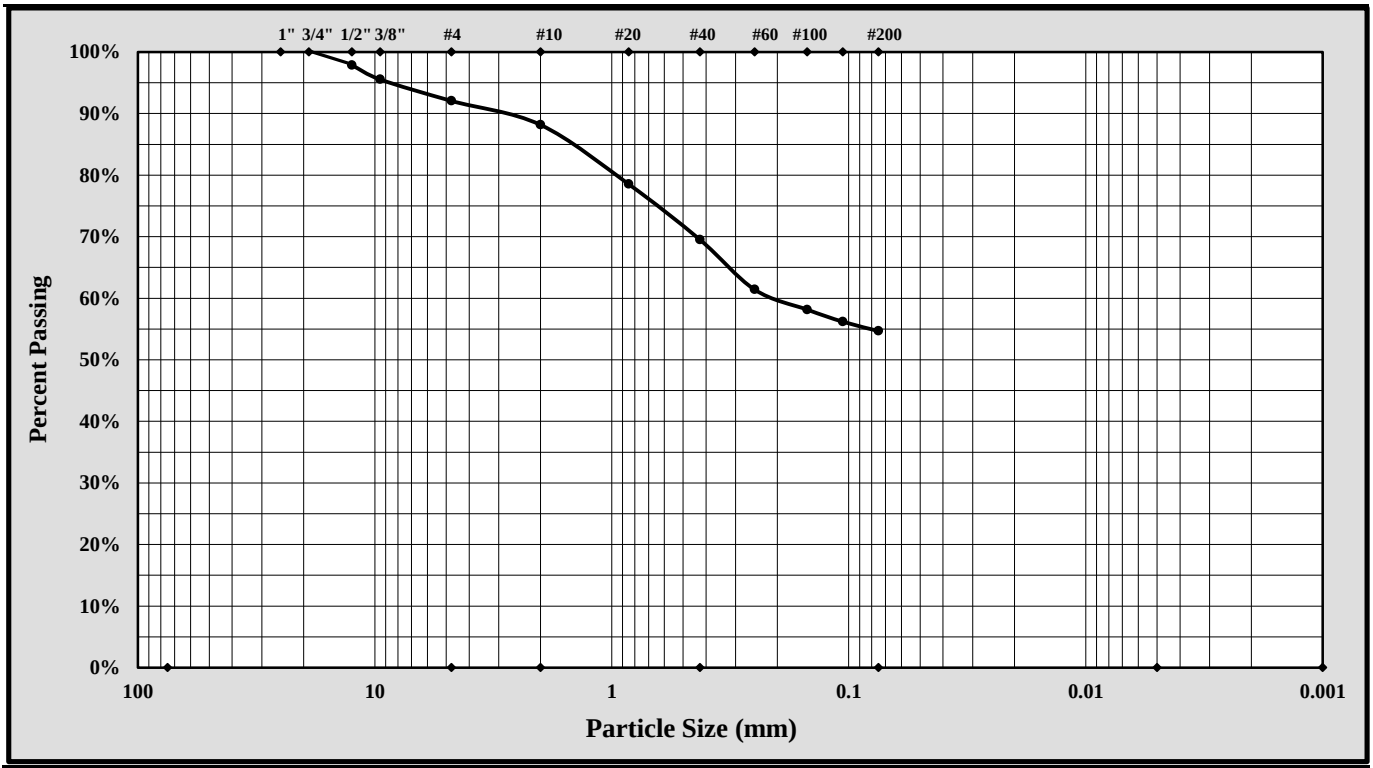
ASTM D6913/D7928

Quality Assurance

Sample Log No.:

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	B-52 Type: Split Spoon	Sample Date:	Various
Location:	Bridge Boring Sample No.: SS-6	Depth:	13.5' - 15.0'
Sample Description:	Sandy Fat Clay (CH, A-7-5 (17))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	7.9%
Silt & Clay (% Passing #200):	54.7%	Total Sand:	37.4%
Assumed Specific Gravity:	2.65		
Liquid Limit	67	Plastic Limit	30
		Plastic Index	37

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel: Rounded ☐ Angular ☐ Hard & Durable ☐ Soft ☐ Weathered & Friable ☐

Sample Prep Method: Moist Prep | Dispersion Period: 1 min. | Dispersing Agent: Sodium Hexametaphosphate: 50 g./ Liter

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	5/2/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

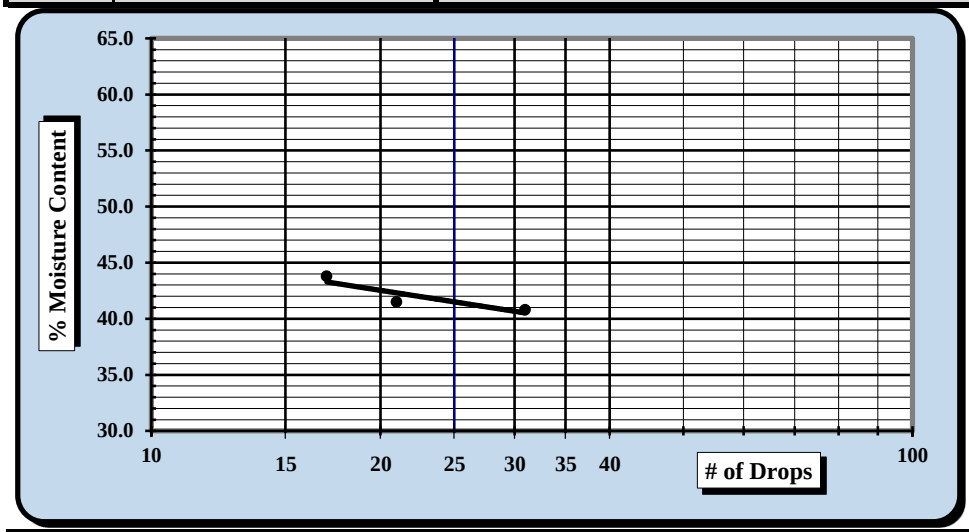
S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-2-2018
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-52	Sample #: SS-9		Sample Date: Various	
Location:	Bridge Boring	Offset: N/A		Depth: 28.5' - 30.0'	
Sample Description:	Silt with Sand (ML, A-5 (8))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 426		Liquid Limit						Plastic Limit		
	Tare #:	35	36	37				38	39	
A	Tare Weight	15.99	15.10	15.69				15.27	16.02	
B	Wet Soil Weight + A	26.53	27.52	26.59				21.39	23.59	
C	Dry Soil Weight + A	23.32	23.88	23.43				19.87	21.68	
D	Water Weight (B-C)	3.21	3.64	3.16				1.52	1.91	
E	Dry Soil Weight (C-A)	7.33	8.78	7.74				4.60	5.66	
F	% Moisture (D/E)*100	43.8%	41.5%	40.8%				33.0%	33.7%	
N	# OF DROPS	17	21	31				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**33.4%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**41**
Plastic Limit	**33**
Plastic Index	**8**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		5/2/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

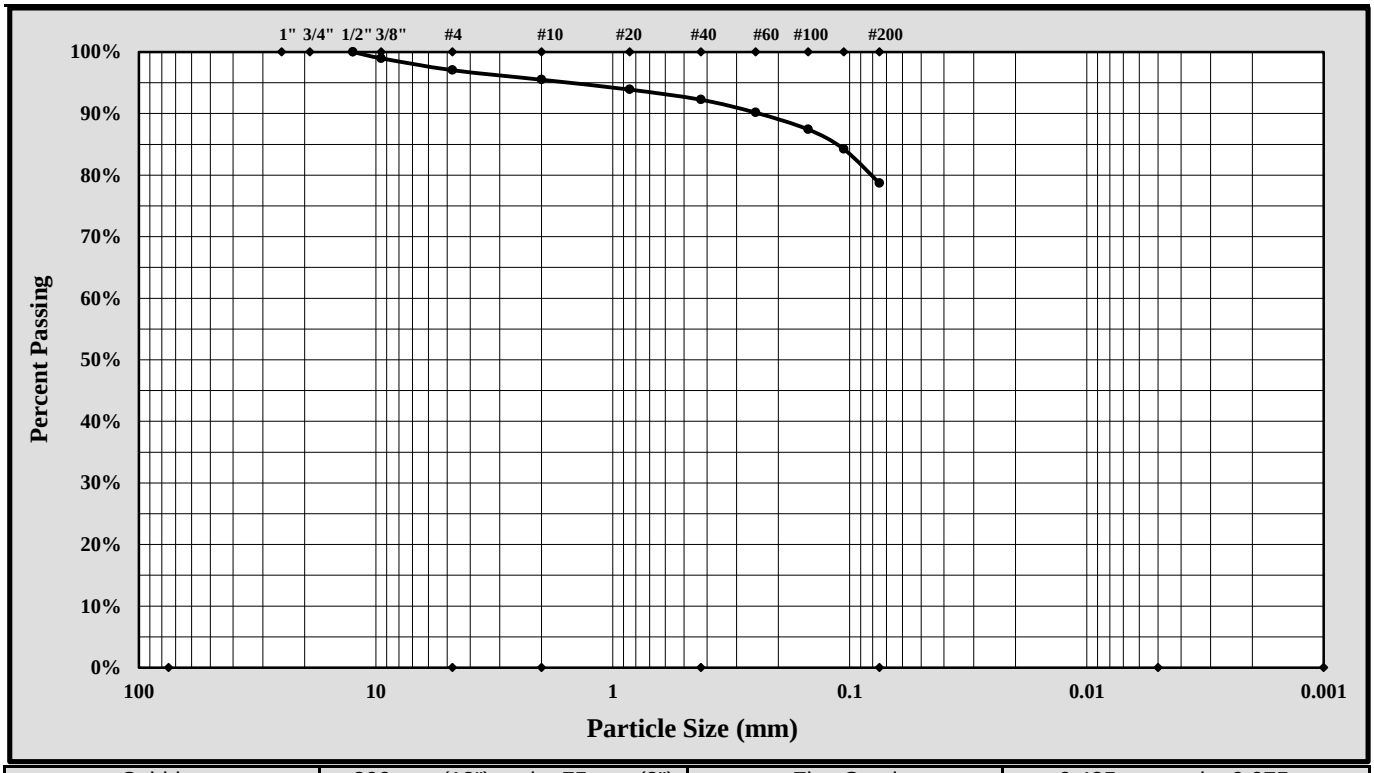
ASTM D6913/D7928

Quality Assurance

Sample Log No.:

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	B-52 Type: Split Spoon	Sample Date:	Various
Location:	Bridge Boring Sample No.: SS-9	Depth:	28.5' - 30.0'
Sample Description:	Silt with Sand (ML, A-5 (8))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	2.9%
Silt & Clay (% Passing #200):	78.7%	Total Sand:	18.4%
Assumed Specific Gravity:	2.65		
Liquid Limit	41	Plastic Limit 33	Plastic Index 8

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel: Rounded ☐ Angular ☐ Hard & Durable ☐ Soft ☐ Weathered & Friable ☐

Sample Prep Method: Moist Prep | Dispersion Period: 1 min. | Dispersing Agent: Sodium Hexametaphosphate: 50 g./ Liter

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	5/2/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

ASTM D6913/D7928

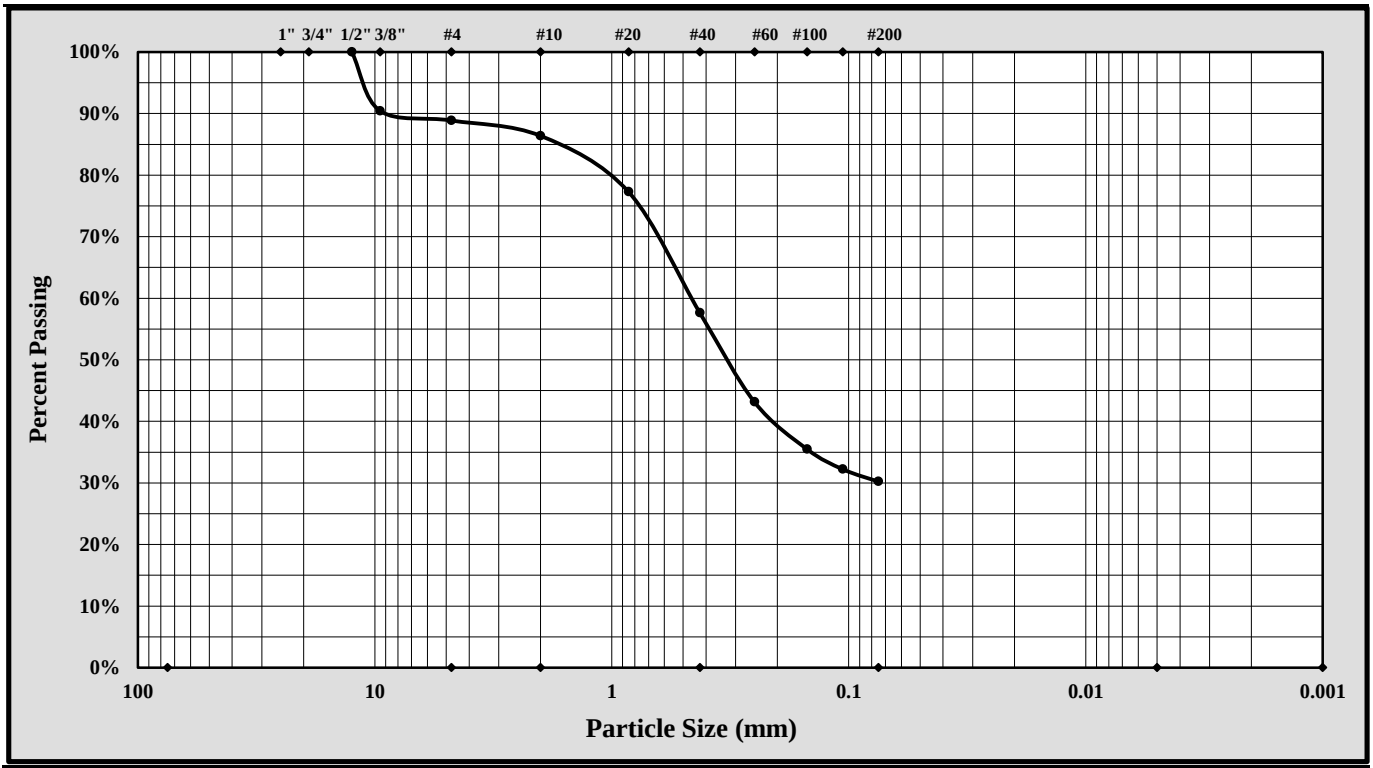
Quality Assurance

Sample Log No.:

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		

Sample ID:	B-53	Type:	Split Spoon	Sample Date:	Various
Location:	Bridge Boring	Sample No.:	SS-1	Depth:	0.0' - 2.0'
Sample Description:	Silty Sand (SM, A-2-4)				



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	11.1%
Silt & Clay (% Passing #200):	30.2%	Total Sand:	58.6%
Assumed Specific Gravity:	2.65		

Liquid Limit	Plastic Limit	Plastic Index

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	5/2/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

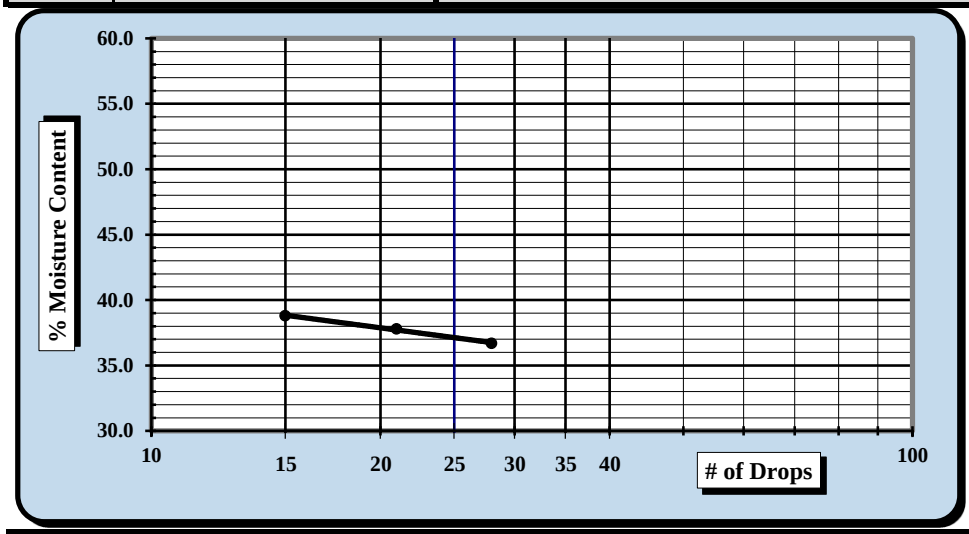
S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-4-18
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-53	Sample #: SS-5		Sample Date: Various	
Location:	Bridge Boring	Offset: N/A		Depth: 8.0' - 10.0'	
Sample Description:	Silt with Sand (ML, A-4 (6))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 418		Liquid Limit						Plastic Limit		
	Tare #:	30	31	32				33	34	
A	Tare Weight	15.36	15.47	15.17				15.57	15.26	
B	Wet Soil Weight + A	26.87	27.93	27.65				22.57	22.41	
C	Dry Soil Weight + A	23.78	24.51	24.16				21.05	20.82	
D	Water Weight (B-C)	3.09	3.42	3.49				1.52	1.59	
E	Dry Soil Weight (C-A)	8.42	9.04	8.99				5.48	5.56	
F	% Moisture (D/E)*100	36.7%	37.8%	38.8%				27.7%	28.6%	
N	# OF DROPS	28	21	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**28.2%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**37**
Plastic Limit	**28**
Plastic Index	**9**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		5/4/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

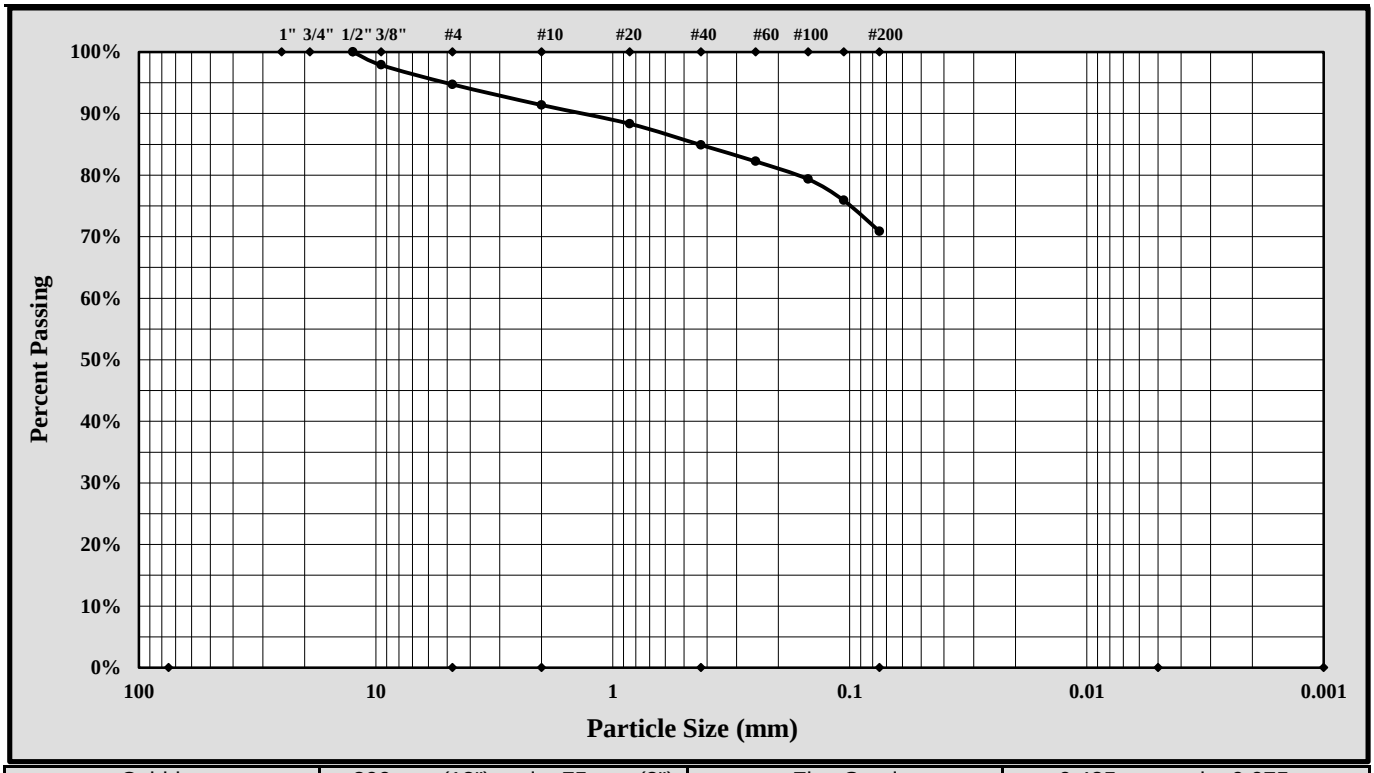
ASTM D6913/D7928

Quality Assurance

Sample Log No.:

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	B-53 Type: Split Spoon	Sample Date:	Various
Location:	Bridge Boring Sample No.: SS-5	Depth:	8.0' - 10.0'
Sample Description:	Silt with Sand (ML, A-4 (6))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	5.3%
Silt & Clay (% Passing #200):	70.9%	Total Sand:	23.9%
Assumed Specific Gravity:	2.65		
Liquid Limit	37	Plastic Limit 28	Plastic Index 8

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel: Rounded ☐ Angular ☐ Hard & Durable ☐ Soft ☐ Weathered & Friable ☐

Sample Prep Method: Moist Prep | Dispersion Period: 1 min. | Dispersing Agent: Sodium Hexametaphosphate: 50 g./ Liter

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	5/4/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

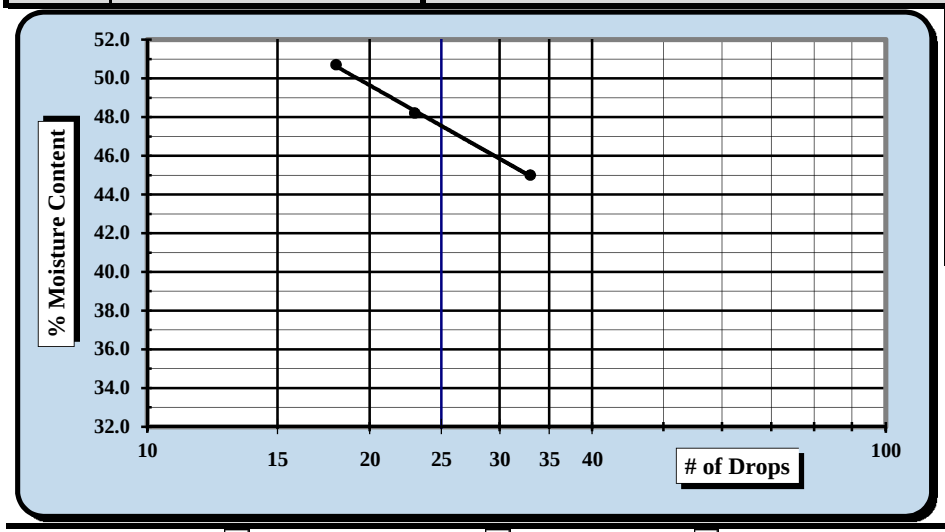
S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	4/30/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-54	Sample #: SS-1	Sample Date: Various
Log #:	43-2321		Elevation: 0.4' - 2.4'
Sample Description:	Lean clay with sand (CL, A-7-6 (20))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	C-78	C-76	32-B				29	30	
A	Tare Weight	15.56	22.58	17.83				17.79	17.81	
B	Wet Soil Weight + A	28.55	29.62	30.78				26.68	26.20	
C	Dry Soil Weight + A	24.18	27.33	26.76				24.86	24.48	
D	Water Weight (B-C)	4.37	2.29	4.02				1.82	1.72	
E	Dry Soil Weight (C-A)	8.62	4.75	8.93				7.07	6.67	
F	% Moisture (D/E)*100	50.7%	48.2%	45.0%				25.7%	25.8%	
N	# OF DROPS	18	23	33				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**25.8%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**48**
Plastic Limit	**26**
Plastic Index	**22**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	4/30/2018	Michael D. Kelso, E.I.	5/23/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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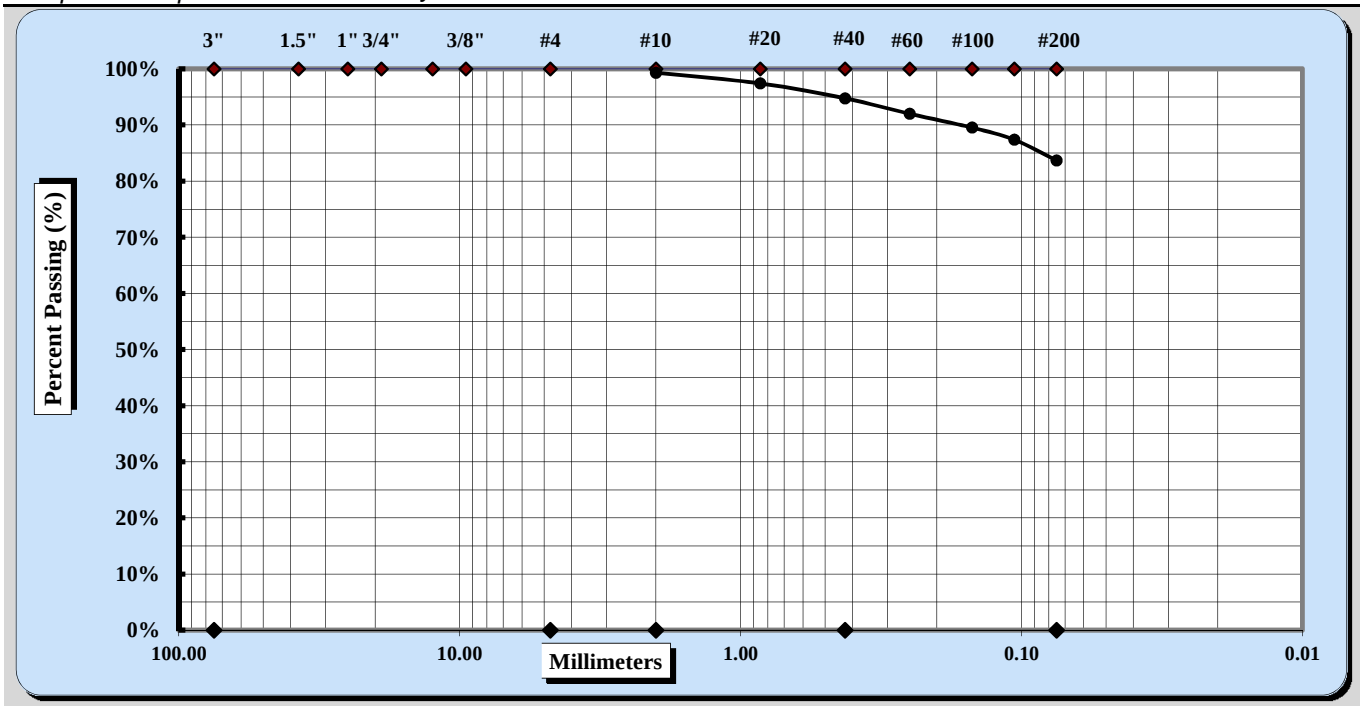
Sieve Analysis of Soils

Quality Assurance | *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/5/18 - 5/22/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID: B-54	Type: Split Spoon	Sample Date:	Various
Sample Log No.: 43-2321	Sample: 1	Depth:	0.4' - 2.4'

Sample Description: Lean clay with sand (CL, A-7-6 (20))



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	No. 10	Coarse Sand	1%	Fine Sand	11%
Gravel	0%	Medium Sand	5%	Silt & Clay	84%
Liquid Limit	48	Plastic Limit	26	Plastic Index	22

Coarse Sand	1%	Medium Sand	5%	Fine Sand	11%

Description of Sand & Gravel Particles: Rounded ☒ Angular ☒
Hard & Durable ☒ Soft ☒ Weathered & Friable ☐

Notes / Deviations / References:

Michael D. Kelso, E.I. — *Technical Responsibility*
Signature
Staff Professional — *Position*
5/23/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

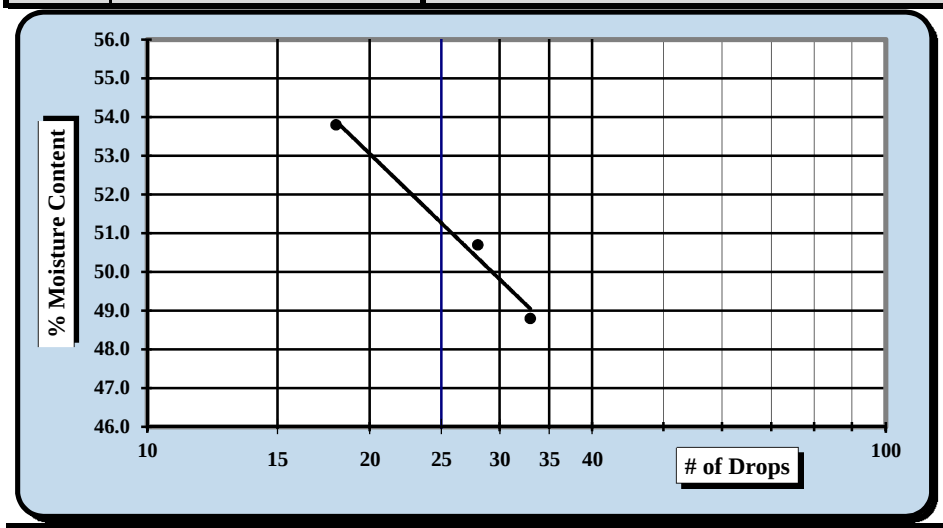
S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	5/17/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-54	Sample #: SS-2	Sample Date: Various
Log #:	43-2321		Elevation: 2.4' - 4.4'
Sample Description:	Elastic silt (MH, A-7-5 (21))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	15	17	8				10	13	
A	Tare Weight	15.33	15.49	15.52				15.41	15.39	
B	Wet Soil Weight + A	24.73	25.21	26.10				23.50	24.43	
C	Dry Soil Weight + A	21.44	21.94	22.63				21.56	22.27	
D	Water Weight (B-C)	3.29	3.27	3.47				1.94	2.16	
E	Dry Soil Weight (C-A)	6.11	6.45	7.11				6.15	6.88	
F	% Moisture (D/E)*100	53.8%	50.7%	48.8%				31.5%	31.4%	
N	# OF DROPS	18	28	33				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**31.5%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**51**
Plastic Limit	**32**
Plastic Index	**19**
Group Symbol	**MH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	5/17/2018	Michael D. Kelso, E.I.	5/23/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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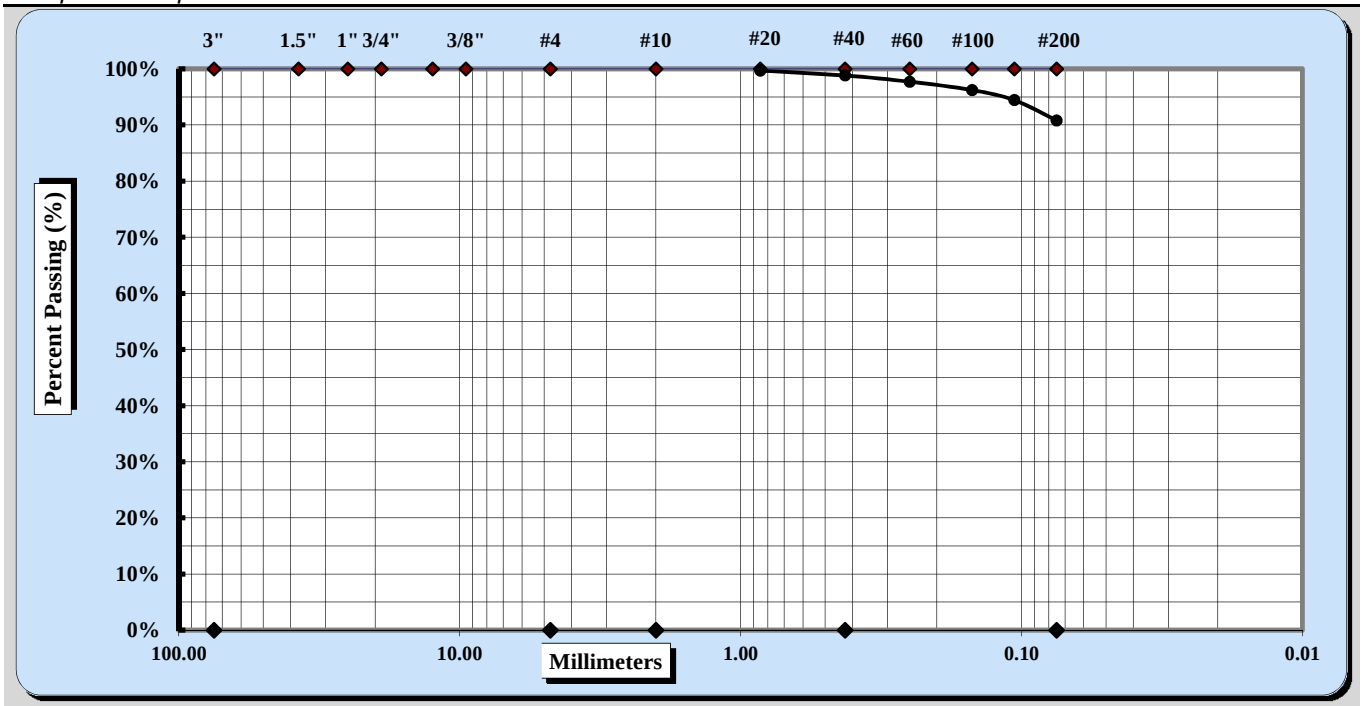
Sieve Analysis of Soils

Quality Assurance | *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/5/18 - 5/22/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID: B-54	Type: Split Spoon	Sample Date:	Various
Sample Log No.: 43-2321	Sample: 2	Depth:	2.4' - 4.4'
Sample Description:	Elastic silt (MH, A-7-5 (21))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	No. 20	Coarse Sand	0%	Fine Sand	8%
Gravel	0%	Medium Sand	1%	Silt & Clay	91%
Liquid Limit	51	Plastic Limit	32	Plastic Index	19

Coarse Sand	0%	Medium Sand	1%	Fine Sand	8%

Description of Sand & Gravel Particles: Rounded ☒ Angular ☒
Hard & Durable ☒ Soft ☒ Weathered & Friable ☐

Notes / Deviations / References:

Michael D. Kelso, E.I. — *Technical Responsibility*
Signature
Staff Professional — *Position*
5/23/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

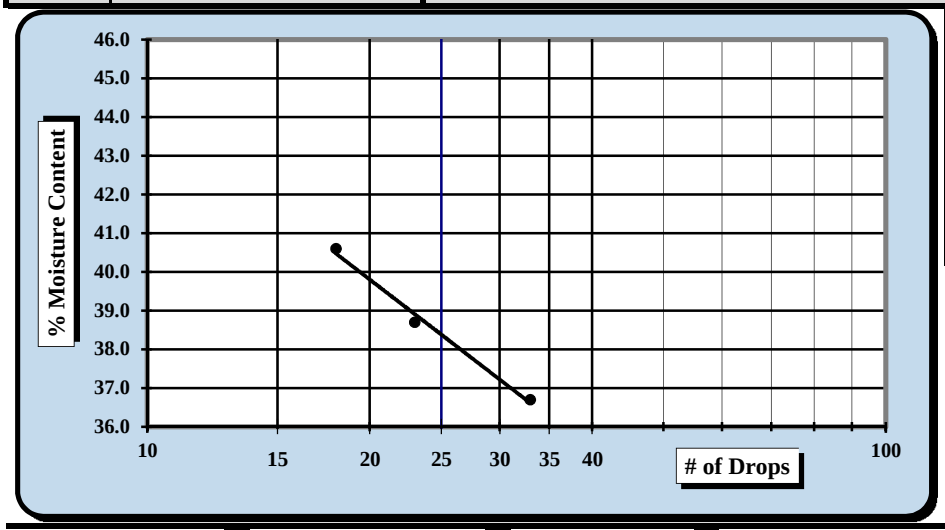
Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	5/17/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-54	Sample #: SS-10	Sample Date: Various
Log #:	43-2321		Depth: 33.9' - 35.4'
Sample Description:	Silt with sand (ML, A-6 (10))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	9	12	3				19	28-B	
A	Tare Weight	15.43	15.56	15.48				15.42	17.69	
B	Wet Soil Weight + A	24.36	25.53	26.51				24.22	27.26	
C	Dry Soil Weight + A	21.78	22.75	23.55				22.40	25.26	
D	Water Weight (B-C)	2.58	2.78	2.96				1.82	2.00	
E	Dry Soil Weight (C-A)	6.35	7.19	8.07				6.98	7.57	
F	% Moisture (D/E)*100	40.6%	38.7%	36.7%				26.1%	26.4%	
N	# OF DROPS	18	23	33				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**26.3%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**38**
Plastic Limit	**26**
Plastic Index	**12**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	5/17/2018	Michael D. Kelso, E.I.	5/23/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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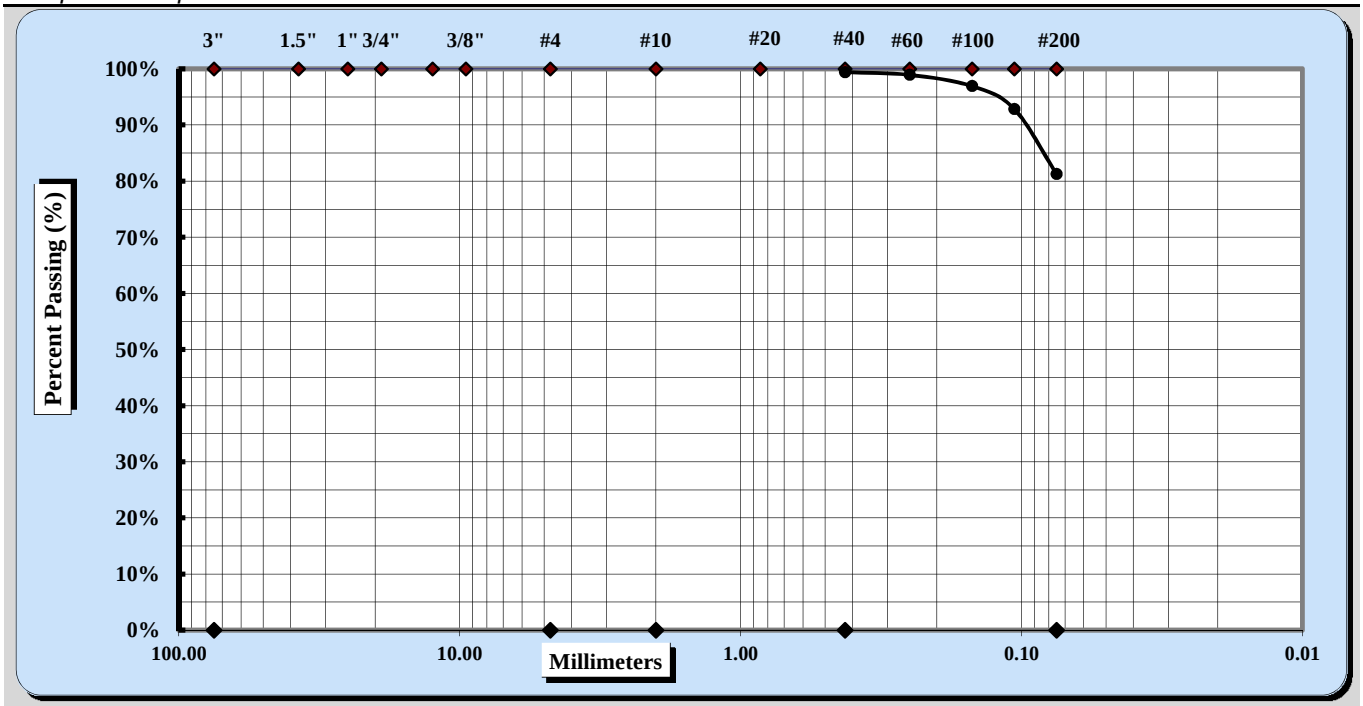
Sieve Analysis of Soils

Quality Assurance | *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/5/18 - 5/22/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID: B-54	Type: Split Spoon	Sample Date:	Various
Sample Log No.: 43-2321	Sample: 10	Depth:	33.9' - 35.4'
Sample Description:	Silt with sand (ML, A-6 (10))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	No. 40	Coarse Sand	0%	Fine Sand	18%
Gravel	0%	Medium Sand	1%	Silt & Clay	81%
Liquid Limit	38	Plastic Limit	26	Plastic Index	12

Coarse Sand	0%	Medium Sand	1%	Fine Sand	18%

Description of Sand & Gravel Particles: Rounded ☒ Angular ☒
Hard & Durable ☒ Soft ☒ Weathered & Friable ☐

Notes / Deviations / References:

Michael D. Kelso, E.I. — *Technical Responsibility*
Signature
Staff Professional — *Position*
5/23/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

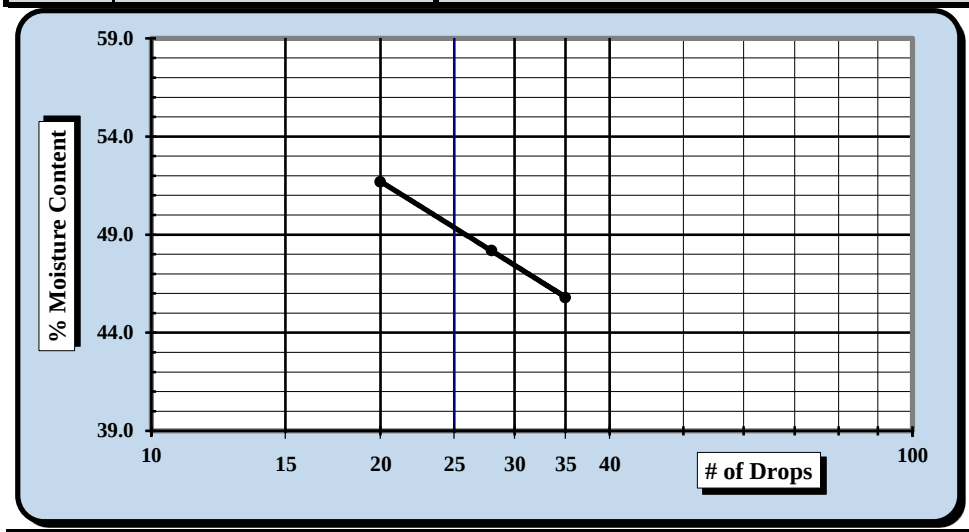
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/12/18
Project Name:	Carolina Crossroads Project	Test Date:	4/11/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-55	Sample #:	SS-1	Sample Date:	2/19/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	1.2' - 3.2'
Sample Description:	Silt (ML, A-7-5(19))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	1	2	3				4	5	
A	Tare Weight	26.70	26.47	26.32				25.93	26.95	
B	Wet Soil Weight + A	42.27	40.21	42.93				32.28	34.31	
C	Dry Soil Weight + A	37.38	35.74	37.27				30.79	32.62	
D	Water Weight (B-C)	4.89	4.47	5.66				1.49	1.69	
E	Dry Soil Weight (C-A)	10.68	9.27	10.95				4.86	5.67	
F	% Moisture (D/E)*100	45.8%	48.2%	51.7%				30.7%	29.8%	
N	# OF DROPS	35	28	20				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**30.3%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**49**
Plastic Limit	**30**
Plastic Index	**19**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/12/18	Matthew F. Cooke, P.G.	4/12/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Form No: TR-D2974-1
Revision No. 1
Revision Date: 08/26/17

MOISTURE, ASH, AND ORGANIC MATTER

ASTM D-2974

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/12/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/09/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-55 Sample #: SS-1	Sample Date:	2/19/18
Location:	Bridge Boring Type: Split-spoon	Depth:	1.2' - 3.2'
Sample Description:	Silt (ML, A-7-5(19))		

Equipment: *Balance: 0.01 g.Readability, 500g. Minimum Capaccity*
Balance: *S&ME ID #:* *13942* *Cal. Date:* *8/19/17* *Due:* *8/19/18*

Method A: Moisture Content Determination *Required Oven Temperature: 105 ± 5 °C*

	Oven Temperature: 105 °C	*Tare #*	
t	Tare Weight *(Dish plus Aluminum Foil Cover)*	*grams*	
a	Mass of *As-Received* Specimen + Tare Wt.	*grams*	
b	Mass of Oven Dry Specimen + Tare Wt.	*grams*	
w	Water Weight	*(a-b)*	
A	Mass of As-Received Specimen	*(a-t)*	
B	Mass of Oven Dry Specimen	*(b-t)*	
	% Moisture Content as a % of As Received or Total Mass	*(w/A)*100*	
	% Moisture Content as a % of Oven-dried Mass	*(w/B)*100*	

Oven *S&ME ID #:* *Cal. Date:* *Due:*

Method C (440 ° C) or D (750 ° C): Ash Content and Organic Matter Determination

	Muffle Furnace: 440 °C	*Tare #*	H
t	Tare Weight *(Dish plus Aluminum Foil Cover)*	*grams*	56.25
b	Mass of Oven Dry Specimen + Tare Wt.	*grams*	79.70
c	Ash Weight + Tare Wt.	*grams*	79.16
C	Ash Weight	*c-t*	22.91
B	Mass of Oven Dry Specimen	*(b-t)*	23.45
D	***% Ash Content***	*(C/B)*100*	**97.7%**
	% Organic Matter	*100-D*	**2.3%**

Muffle Furnace: *S&ME ID #:* *23123* *Cal. Date:* *N/A* *Due:* *N/A*

Notes / Deviations / References: ASTM D2974: Moisture, Ash, and Organic Matter of Peat and Other Organic Soils

Benjamin Kovaleski	Benjamin J. Kovaleski	NICET Level III/117226	4/12/18
Technician Name	*Signature*	*Level/Certification*	*Date*
Matthew F. Cooke, P.G.		Project Manager	4/12/18
Technical Responsibility		*Position*	*Date*

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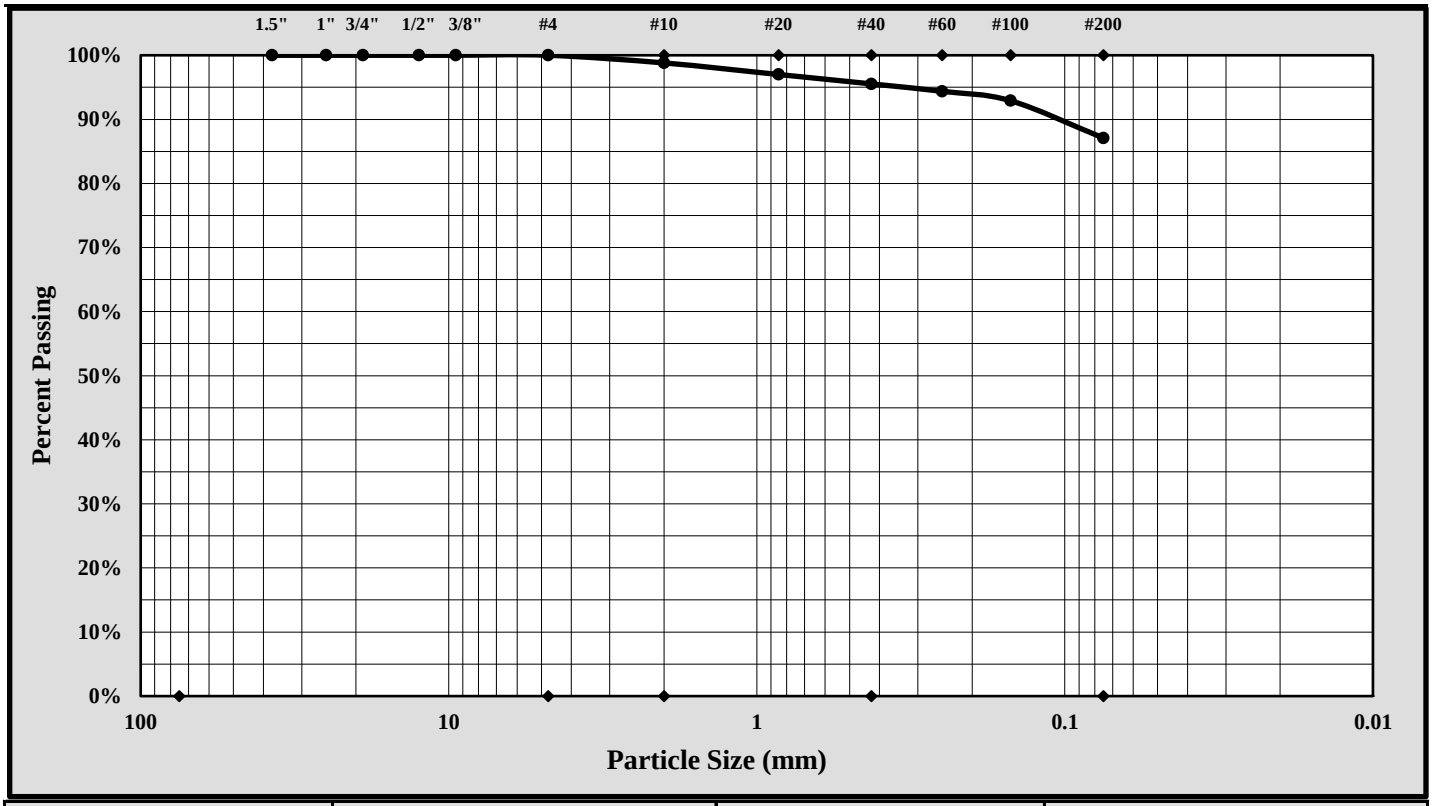
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/12/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/27 - 4/10/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-55 Sample #: SS-1	Sample Date:	2/19/18
Location:	Bridge Boring Type: Split-spoon	Depth:	1.2' - 3.2'
Sample Description:	Silt (ML, A-7-5(19))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	87.1%	Total Sand:	12.9%

Liquid Limit	49	Plastic Limit	30	Plastic Index	19
Coarse Sand:	1.2%	Medium Sand:	3.3%	Fine Sand:	8.4%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/12/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

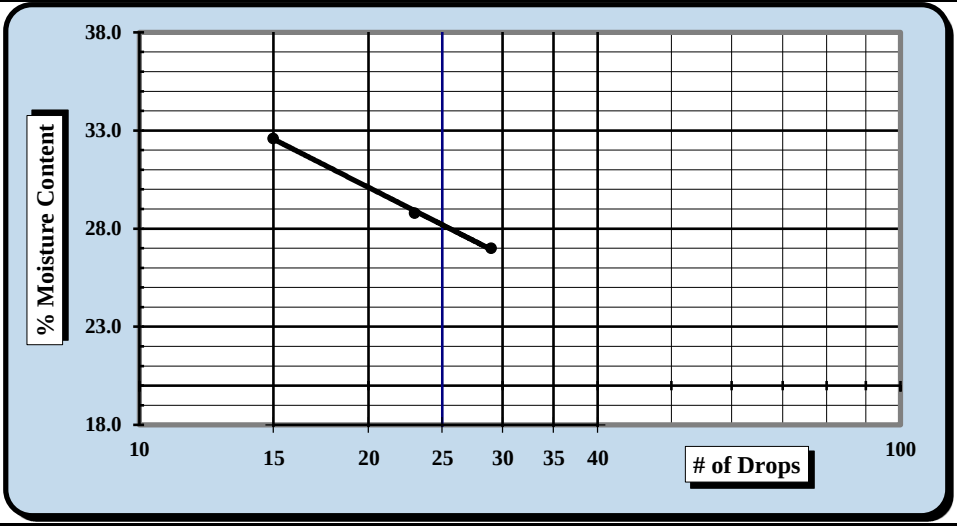
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/12/18
Project Name:	Carolina Crossroads Project	Test Date:	4/11/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-55	Sample #:	SS-5	Sample Date:	2/19/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	9.2' - 11.2'
Sample Description:	Sandy Silt (ML, A-4(2))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	6	7	8				9	10	
A	Tare Weight	27.76	26.30	27.31				26.84	26.75	
B	Wet Soil Weight + A	45.81	45.89	43.62				34.60	33.06	
C	Dry Soil Weight + A	41.97	41.51	39.61				33.15	31.87	
D	Water Weight (B-C)	3.84	4.38	4.01				1.45	1.19	
E	Dry Soil Weight (C-A)	14.21	15.21	12.30				6.31	5.12	
F	% Moisture (D/E)*100	27.0%	28.8%	32.6%				23.0%	23.2%	
N	# OF DROPS	29	23	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**23.1%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**28**
Plastic Limit	**23**
Plastic Index	**5**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/12/18	Matthew F. Cooke, P.G.	4/12/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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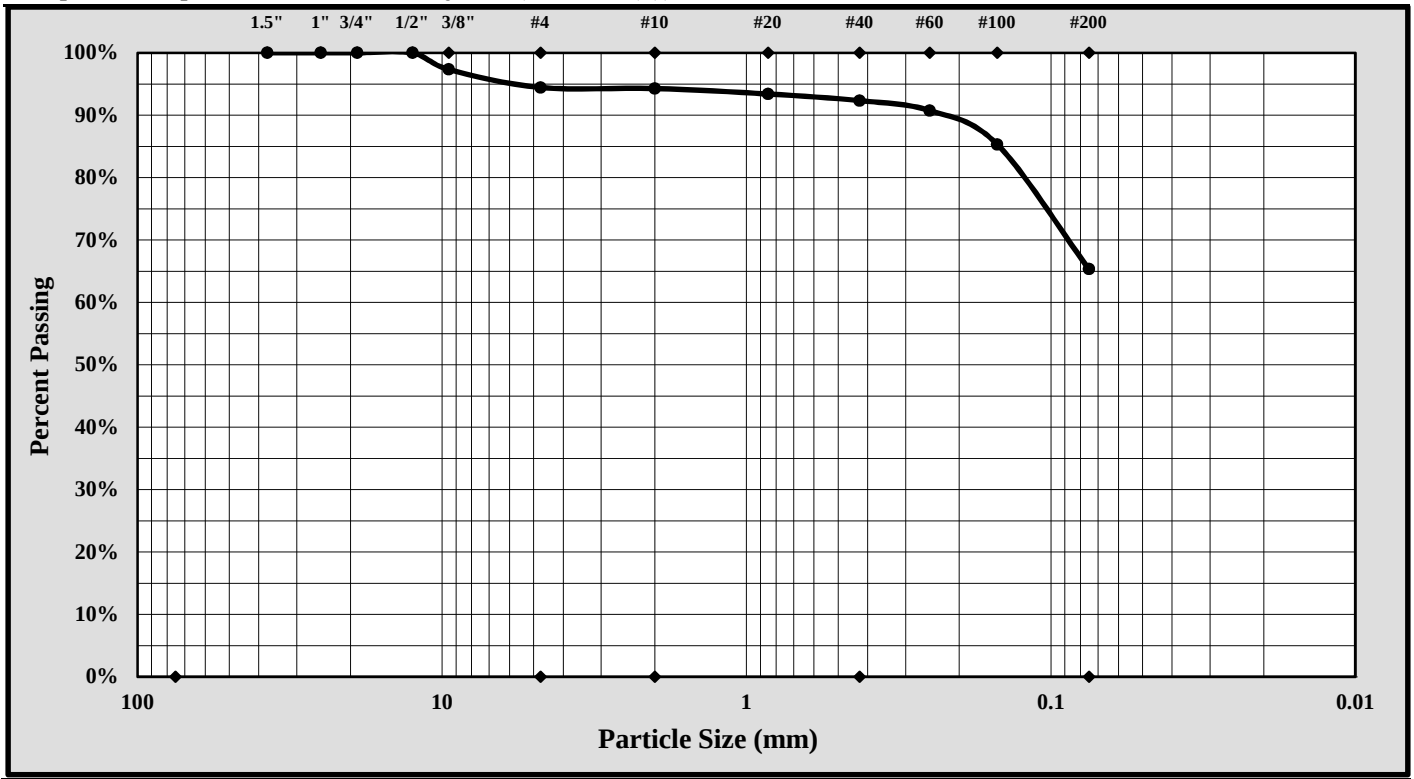
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/12/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/27 - 4/10/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-55 Sample #: SS-5	Sample Date:	2/19/18
Location:	Bridge Boring Type: Split-spoon	Depth:	9.2' - 11.2'
Sample Description:	Sandy Silt (ML, A-4(2))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	12.5 mm	Gravel:	5.5%
Silt & Clay (% Passing #200):	65.3%	Total Sand:	29.1%

Liquid Limit	28	Plastic Limit	23	Plastic Index	5
Coarse Sand:	0.2%	Medium Sand:	1.9%	Fine Sand:	27.0%

Description of Sand and Gravel Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/12/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

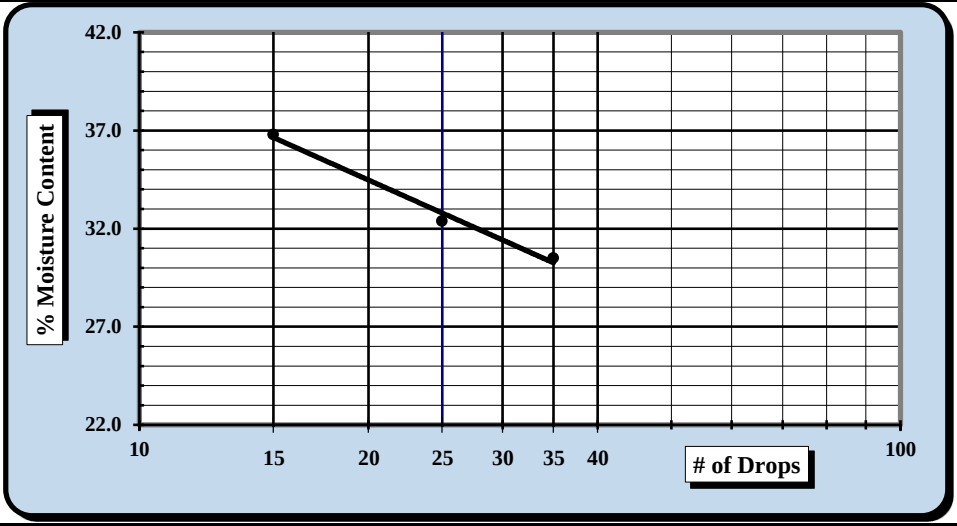
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/12/18
Project Name:	Carolina Crossroads Project	Test Date:	4/11/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-55	Sample #:	SS-9	Sample Date:	2/19/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	28.5' - 30.0'
Sample Description:	Silt with Sand (ML, A-4(5))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	11	12	13				14	15	
A	Tare Weight	26.68	26.65	26.76				26.65	27.60	
B	Wet Soil Weight + A	44.42	44.61	41.86				33.18	34.29	
C	Dry Soil Weight + A	40.27	40.21	37.80				31.83	32.90	
D	Water Weight (B-C)	4.15	4.40	4.06				1.35	1.39	
E	Dry Soil Weight (C-A)	13.59	13.56	11.04				5.18	5.30	
F	% Moisture (D/E)*100	30.5%	32.4%	36.8%				26.1%	26.2%	
N	# OF DROPS	35	25	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**26.2%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**32**
Plastic Limit	**26**
Plastic Index	**6**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/12/18	Matthew F. Cooke, P.G.	4/12/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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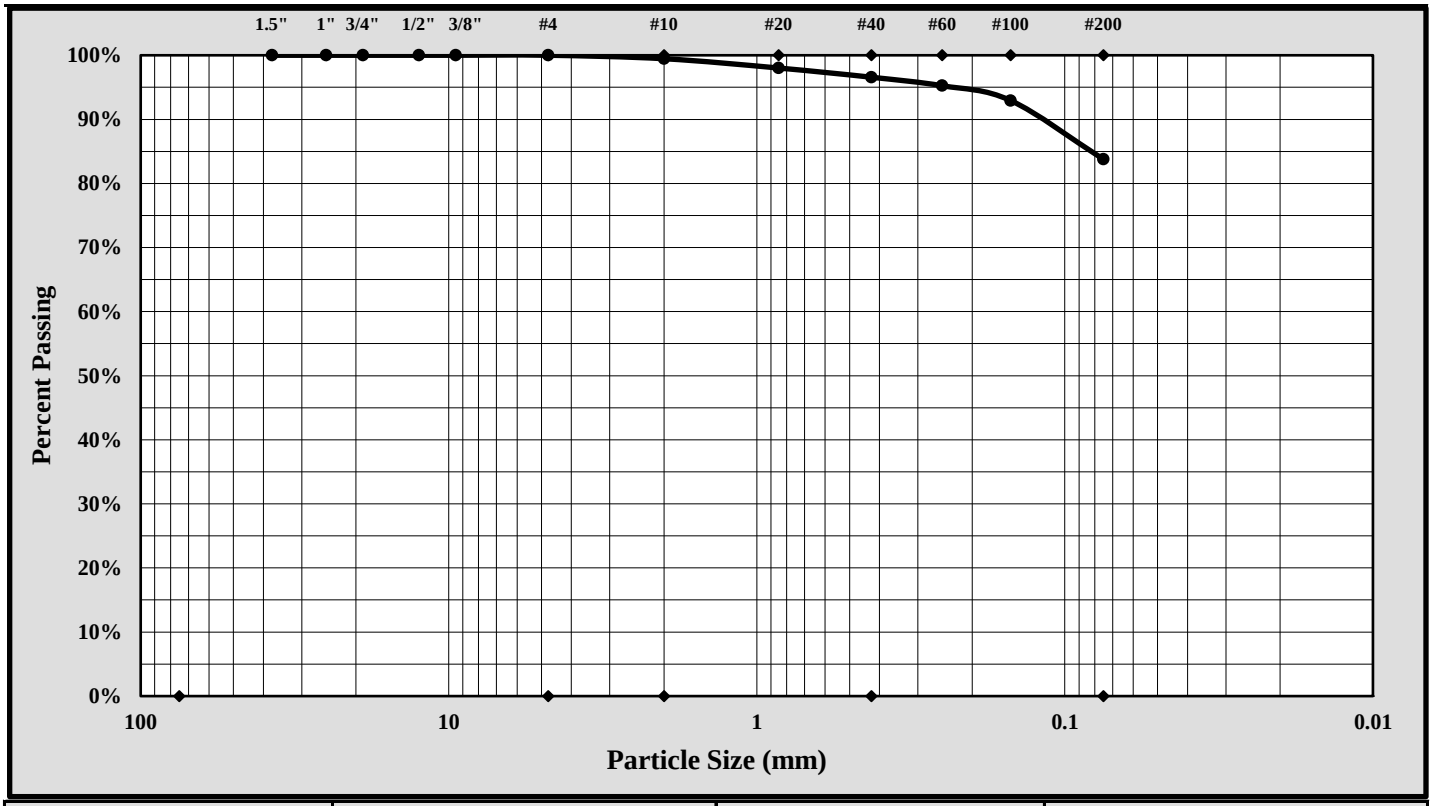
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/12/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/27 - 4/10/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-55	Sample #: SS-9	Sample Date: 2/19/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 28.5' - 30.0'
Sample Description:	Silt with Sand (ML, A-4(5))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	2.00 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	83.8%	Total Sand:	16.2%

Liquid Limit	32	Plastic Limit	26	Plastic Index	6
Coarse Sand:	0.5%	Medium Sand:	2.9%	Fine Sand:	12.8%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/12/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/04/18
Project Name:	Carolina Crossroads Project	Test Date:	5/03/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-56	Sample #:	SS-1	Sample Date:	3/16/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	0.0' - 2.0'
Sample Description:	Sandy Lean Clay (CL, A-7-6(11))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	21	22	23				24	25	
A	Tare Weight	28.07	25.68	27.29				25.98	26.78	
B	Wet Soil Weight + A	43.35	39.77	43.92				32.47	33.32	
C	Dry Soil Weight + A	38.95	35.48	38.61				31.28	32.10	
D	Water Weight (B-C)	4.40	4.29	5.31				1.19	1.22	
E	Dry Soil Weight (C-A)	10.88	9.80	11.32				5.30	5.32	
F	% Moisture (D/E)*100	40.4%	43.8%	46.9%				22.5%	22.9%	
N	# OF DROPS	35	25	17				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**22.7%**		

One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**44**
Plastic Limit	**23**
Plastic Index	**21**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/04/18	Matthew F. Cooke, P.G.	5/04/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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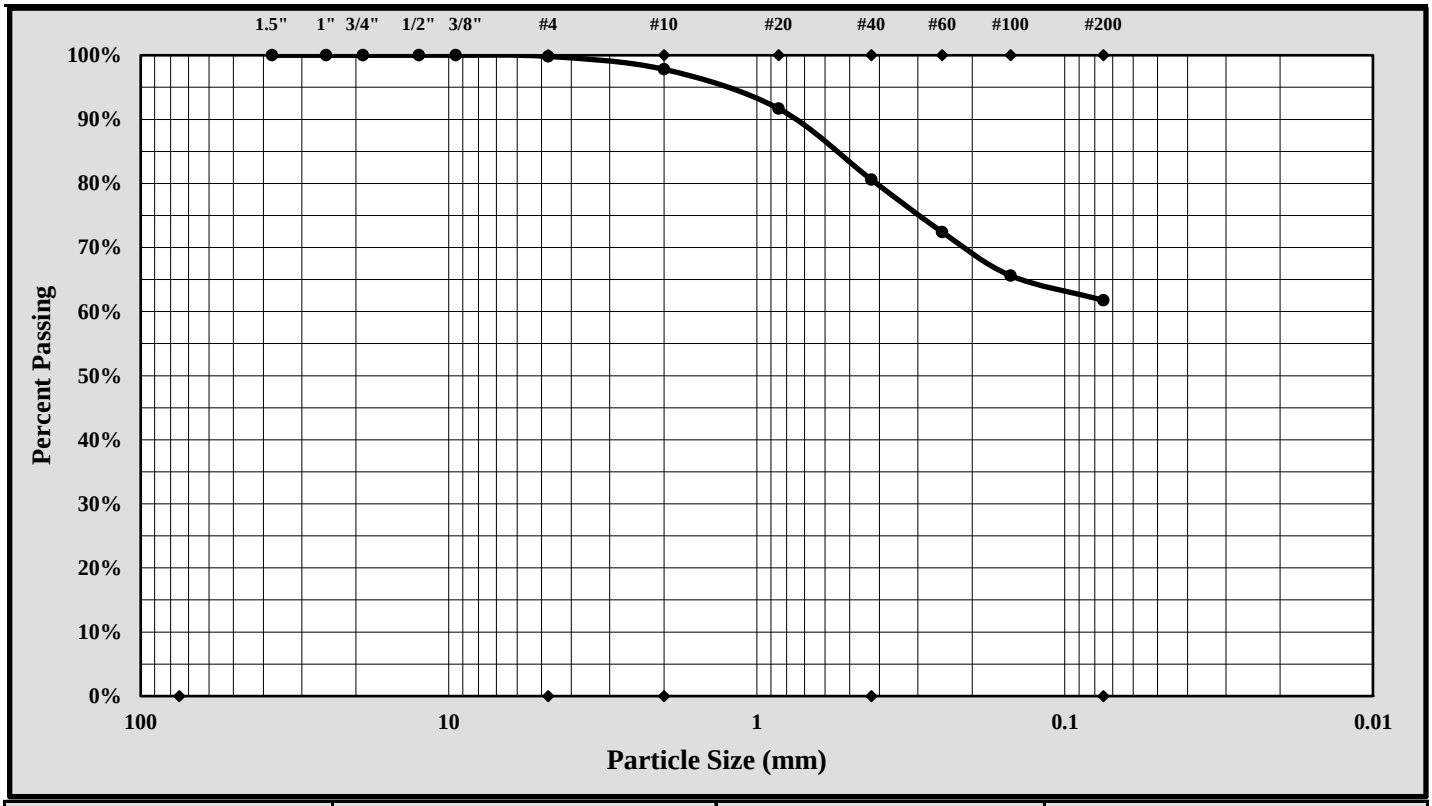
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/04/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/02 - 5/04/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-56 Sample #: SS-1	Sample Date:	3/16/18
Location:	Bridge Boring Type: Split-spoon	Depth:	0.0' - 2.0'
Sample Description:	Sandy Lean Clay (CL, A-7-6(11))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.2%
Silt & Clay (% Passing #200):	61.8%	Total Sand:	38.0%

Liquid Limit	44	Plastic Limit	23	Plastic Index	21
Coarse Sand:	2.0%	Medium Sand:	17.2%	Fine Sand:	18.8%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/04/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/04/18
Project Name:	Carolina Crossroads Project	Test Date:	5/03/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-56	Sample #:	SS-2	Sample Date:	3/16/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	2.0' - 4.0'
Sample Description:	Sandy Fat Clay (CL, A-7-6(16))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

	Pan #	Liquid Limit						Plastic Limit		
	Tare #:	26	27	28				29	30	
A	Tare Weight	27.34	26.99	26.83				26.99	27.37	
B	Wet Soil Weight + A	44.01	41.24	40.02				33.59	34.36	
C	Dry Soil Weight + A	38.27	36.11	35.09				32.09	32.79	
D	Water Weight (B-C)	5.74	5.13	4.93				1.50	1.57	
E	Dry Soil Weight (C-A)	10.93	9.12	8.26				5.10	5.42	
F	% Moisture (D/E)*100	52.5%	56.3%	59.7%				29.4%	29.0%	
N	# OF DROPS	35	26	20				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**29.2%**		

One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**57**
Plastic Limit	**29**
Plastic Index	**28**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/04/18	Matthew F. Cooke, P.G.	5/04/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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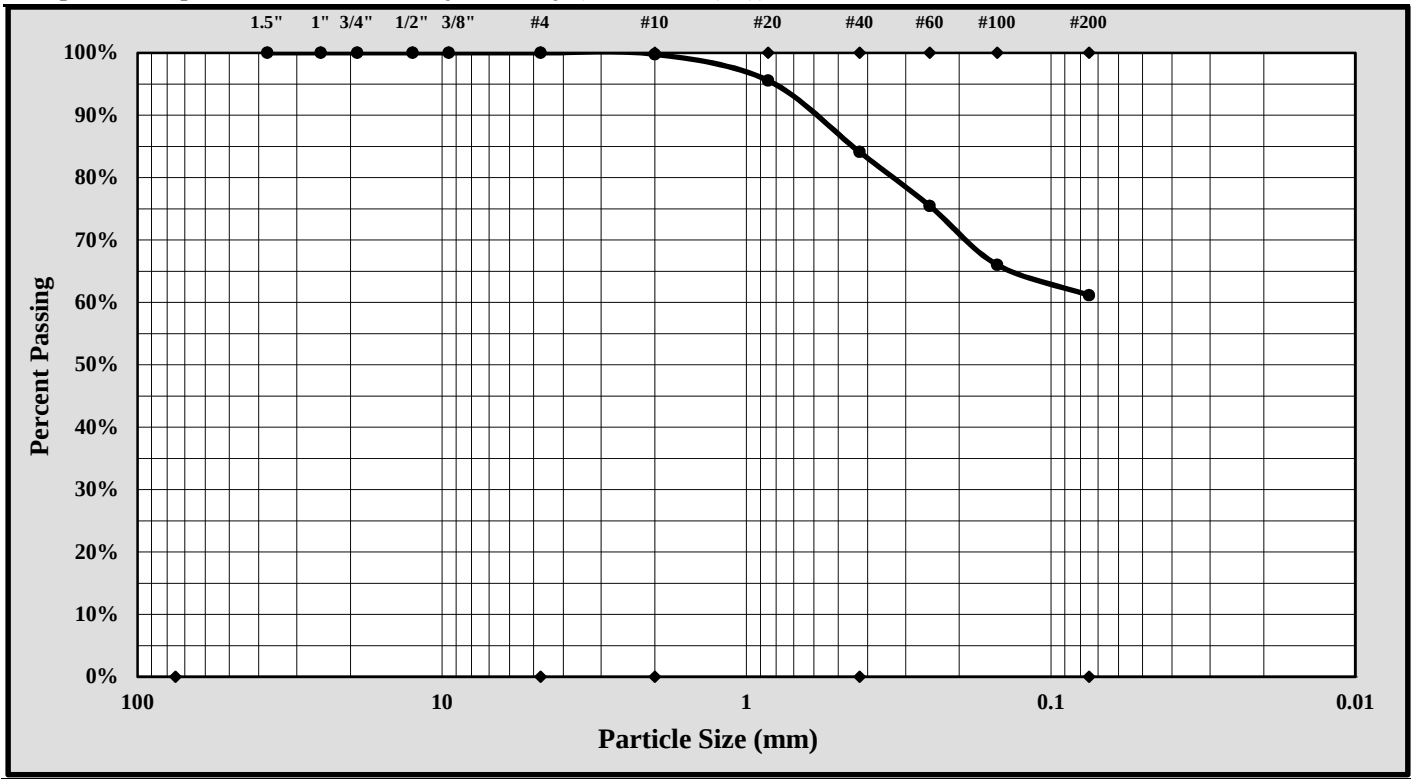
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/04/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/02 - 5/04/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-56 Sample #: SS-2	Sample Date:	3/16/18
Location:	Bridge Boring Type: Split-spoon	Depth:	2.0' - 4.0'
Sample Description:	Sandy Fat Clay (CH, A-7-6(16))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	2.00 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	61.2%	Total Sand:	38.8%

Liquid Limit	57	Plastic Limit	29	Plastic Index	28
Coarse Sand:	0.2%	Medium Sand:	15.7%	Fine Sand:	22.9%

Description of Sand and Gravel Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/04/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

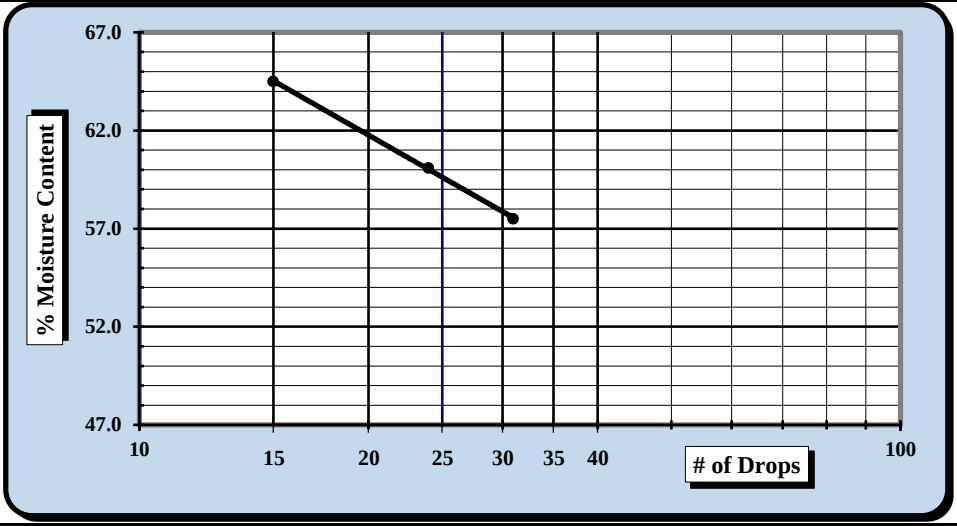
Project #:	1461-16-047.2B	Report Date:	5/04/18
Project Name:	Carolina Crossroads Project	Test Date:	5/03/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-56	Sample #:	SS-10	Sample Date:	3/16/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	33.5' - 35.0'

Sample Description: Elastic Silt with Sand (MH, A-7-5(21))

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	31	32	33				34	35	
A	Tare Weight	28.62	27.64	26.69				28.25	26.95	
B	Wet Soil Weight + A	43.13	41.97	42.76				35.68	33.24	
C	Dry Soil Weight + A	37.83	36.59	36.46				33.73	31.59	
D	Water Weight (B-C)	5.30	5.38	6.30				1.95	1.65	
E	Dry Soil Weight (C-A)	9.21	8.95	9.77				5.48	4.64	
F	% Moisture (D/E)*100	57.5%	60.1%	64.5%				35.6%	35.6%	
N	# OF DROPS	31	24	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**35.6%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**60**
Plastic Limit	**36**
Plastic Index	**24**
Group Symbol	**MH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/04/18	Matthew F. Cooke, P.G.	5/04/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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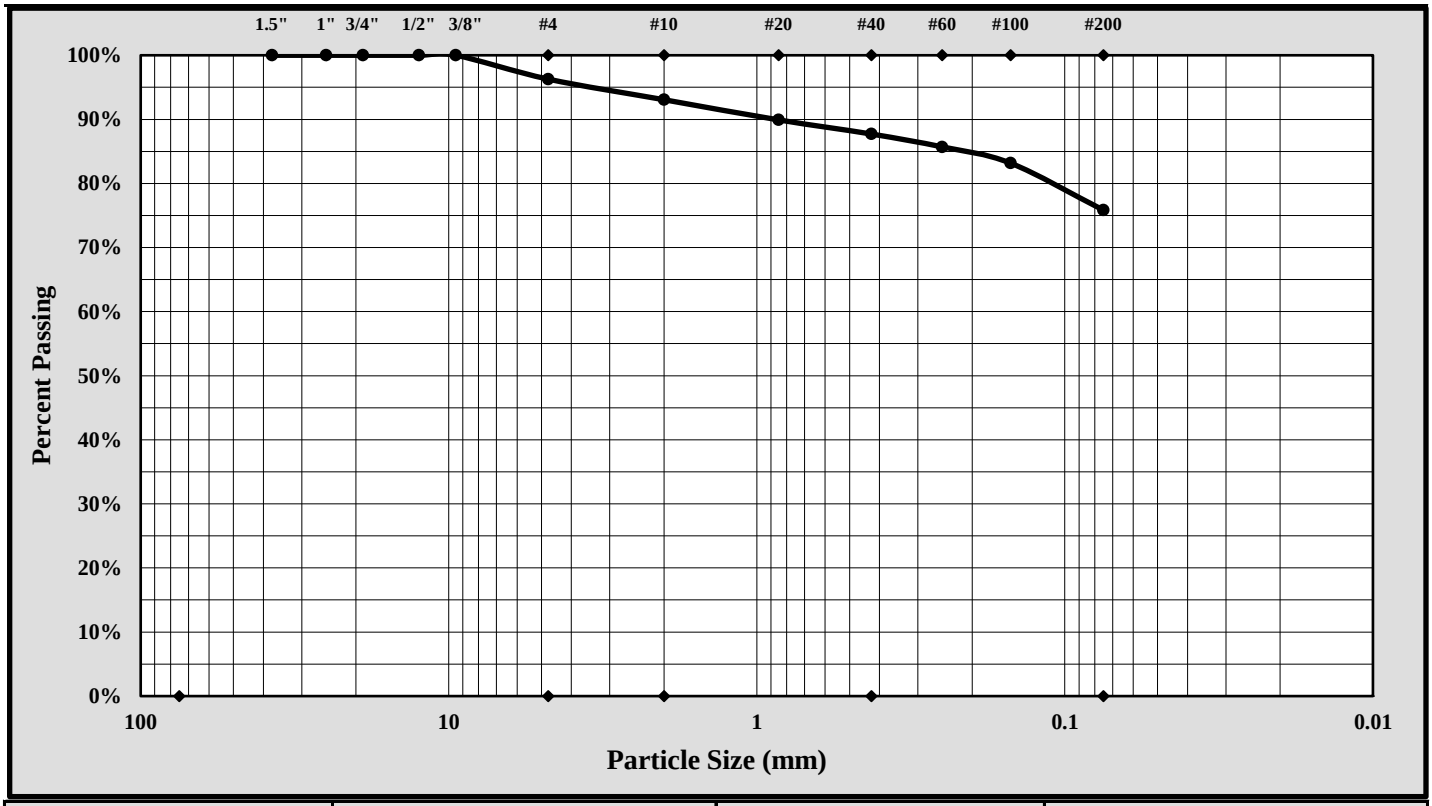
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/04/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/02 - 5/04/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-56	Sample #: SS-10	Sample Date: 3/16/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 33.5' - 35.0'
Sample Description:	Elastic Silt with Sand (MH, A-7-5(21))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	9.50 mm	Gravel:	3.7%
Silt & Clay (% Passing #200):	75.8%	Total Sand:	20.4%

Liquid Limit	60	Plastic Limit	36	Plastic Index	24
Coarse Sand:	3.2%	Medium Sand:	5.4%	Fine Sand:	11.9%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/04/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

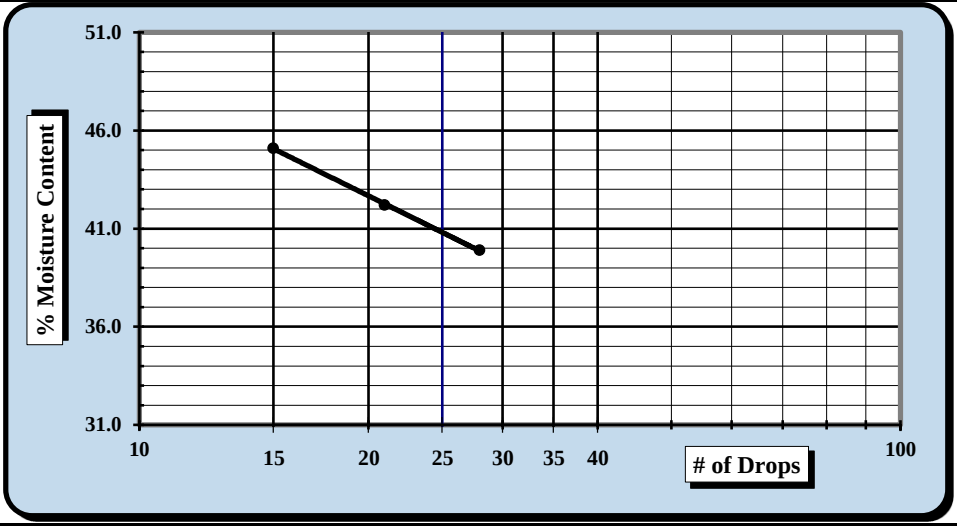
Project #:	1461-16-047.2B	Report Date:	3/21/18
Project Name:	Carolina Crossroads Project	Test Date:	3/19/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-57	Sample #:	SS-1	Sample Date:	1/09/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	0.0' - 2.0'

Sample Description: Gravelly Silt with Sand (ML, A-5(8))

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	31	32	33				34	35	
A	Tare Weight	28.62	27.62	26.69				28.28	26.97	
B	Wet Soil Weight + A	47.94	46.34	42.32				34.58	33.86	
C	Dry Soil Weight + A	42.43	40.78	37.46				33.02	32.16	
D	Water Weight (B-C)	5.51	5.56	4.86				1.56	1.70	
E	Dry Soil Weight (C-A)	13.81	13.16	10.77				4.74	5.19	
F	% Moisture (D/E)*100	39.9%	42.2%	45.1%				32.9%	32.8%	
N	# OF DROPS	28	21	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**32.9%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**41**
Plastic Limit	**33**
Plastic Index	**8**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 65.5%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	3/21/18	Brian Vaughn	3/21/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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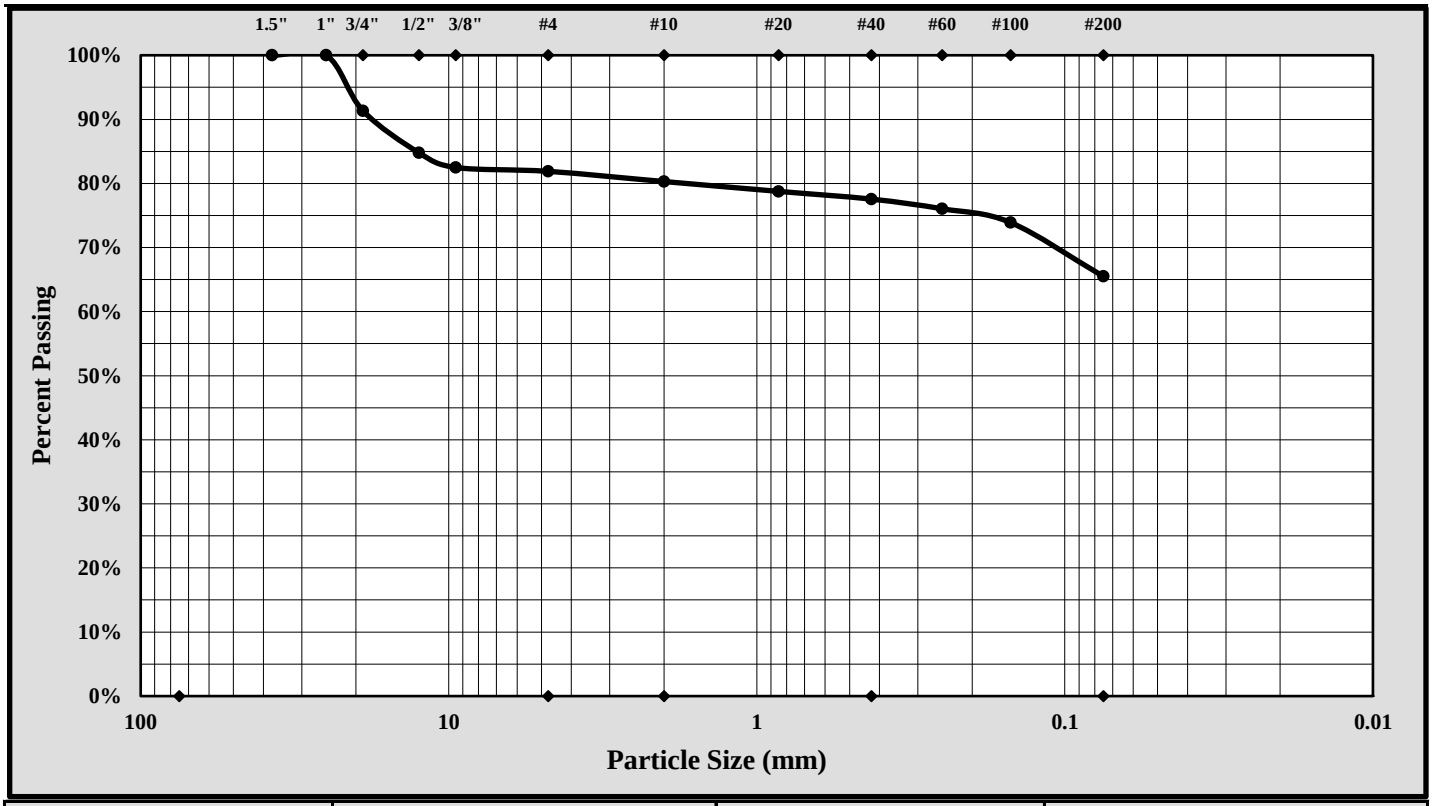
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/21/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/07 - 3/12/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-57 Sample #: SS-1	Sample Date:	1/09/18
Location:	Bridge Boring Type: Split-spoon	Depth:	0.0' - 2.0'
Sample Description:	Gravelly Silt with Sand (ML, A-5(8))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	25.0 mm	Gravel:	18.1%
Silt & Clay (% Passing #200):	65.5%	Total Sand:	16.4%

Liquid Limit	41	Plastic Limit	33	Plastic Index	8
Coarse Sand:	1.6%	Medium Sand:	2.7%	Fine Sand:	12.1%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/21/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

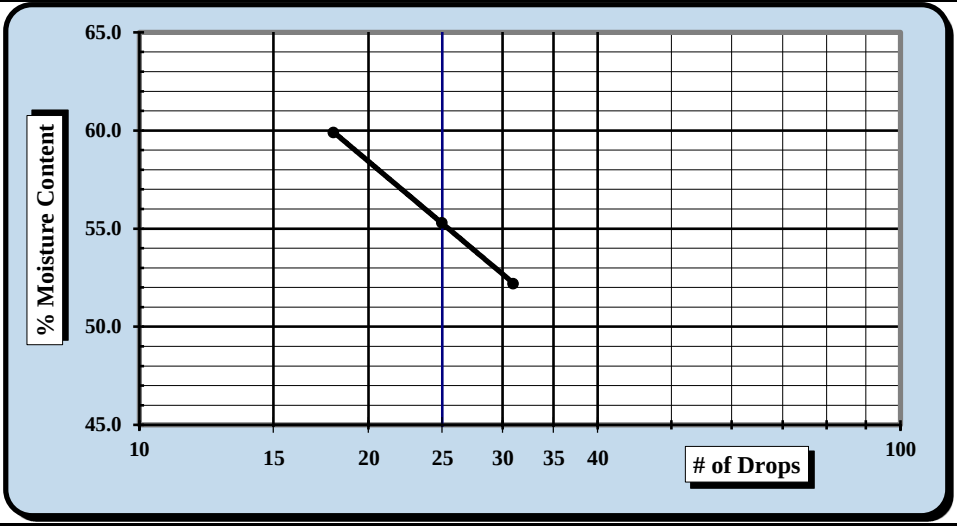
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/21/18
Project Name:	Carolina Crossroads Project	Test Date:	3/19/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-57	Sample #:	SS-6	Sample Date:	1/09/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	13.5' - 15.0'
Sample Description:	Clayey Sand (SC, A-2-7(3))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

	Pan #	Liquid Limit						Plastic Limit		
	Tare #:	36	37	38				39	40	
A	Tare Weight	25.72	26.20	26.30				25.87	26.28	
B	Wet Soil Weight + A	33.21	35.52	38.61				33.75	33.59	
C	Dry Soil Weight + A	30.64	32.20	34.00				31.98	31.95	
D	Water Weight (B-C)	2.57	3.32	4.61				1.77	1.64	
E	Dry Soil Weight (C-A)	4.92	6.00	7.70				6.11	5.67	
F	% Moisture (D/E)*100	52.2%	55.3%	59.9%				29.0%	28.9%	
N	# OF DROPS	31	25	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**29.0%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**55**
Plastic Limit	**29**
Plastic Index	**26**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 34.8%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	3/21/18	Brian Vaughn	3/21/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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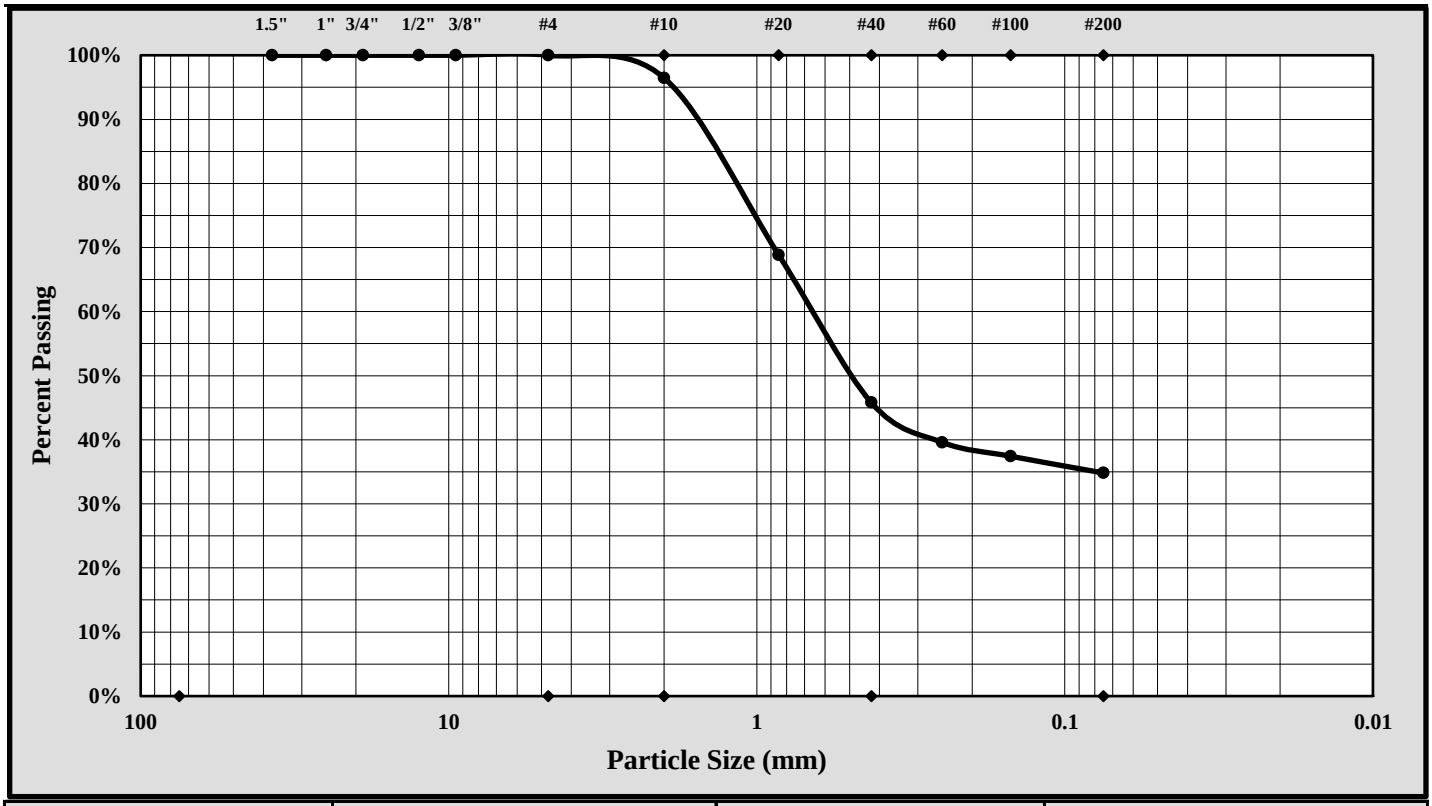
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/21/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/07 - 3/12/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-57	Sample #: SS-6	Sample Date: 1/09/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 13.5' - 15.0'
Sample Description:	Clayey Sand (SC, A-2-7(3))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	34.8%	Total Sand:	65.2%

Liquid Limit	55	Plastic Limit	29	Plastic Index	26
Coarse Sand:	3.5%	Medium Sand:	50.7%	Fine Sand:	11.0%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/21/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

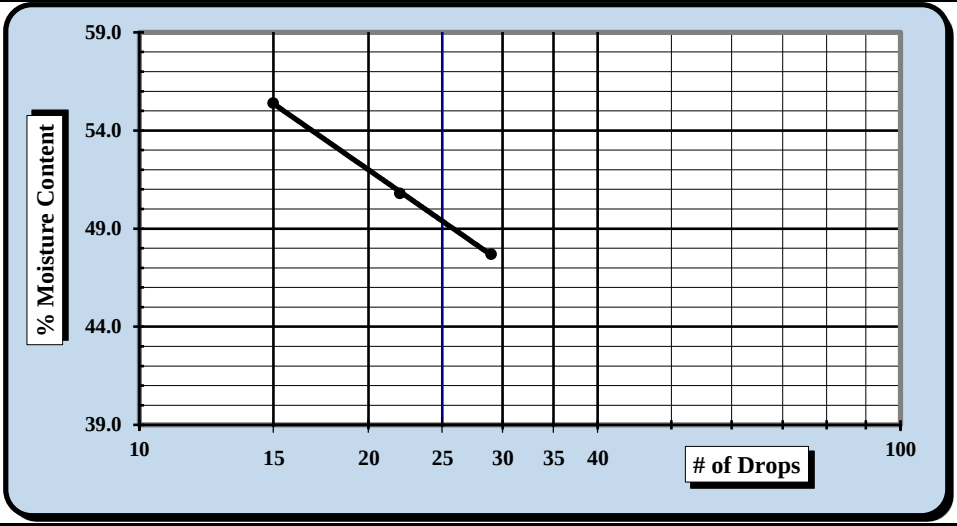
Project #:	1461-16-047.2B	Report Date:	3/22/18
Project Name:	Carolina Crossroads Project	Test Date:	3/21/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-57	Sample #:	SS-11	Sample Date:	1/10/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	38.5' - 40.0'

Sample Description: Silt with Sand (ML, A-7-5(18))

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	1	2	3				4	5	
A	Tare Weight	26.69	26.47	26.34				25.94	26.96	
B	Wet Soil Weight + A	39.58	43.72	43.20				33.45	34.60	
C	Dry Soil Weight + A	35.42	37.91	37.19				31.71	32.83	
D	Water Weight (B-C)	4.16	5.81	6.01				1.74	1.77	
E	Dry Soil Weight (C-A)	8.73	11.44	10.85				5.77	5.87	
F	% Moisture (D/E)*100	47.7%	50.8%	55.4%				30.2%	30.2%	
N	# OF DROPS	29	22	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**30.2%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**49**
Plastic Limit	**30**
Plastic Index	**19**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 82.6%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	3/22/18	Brian Vaughn	3/22/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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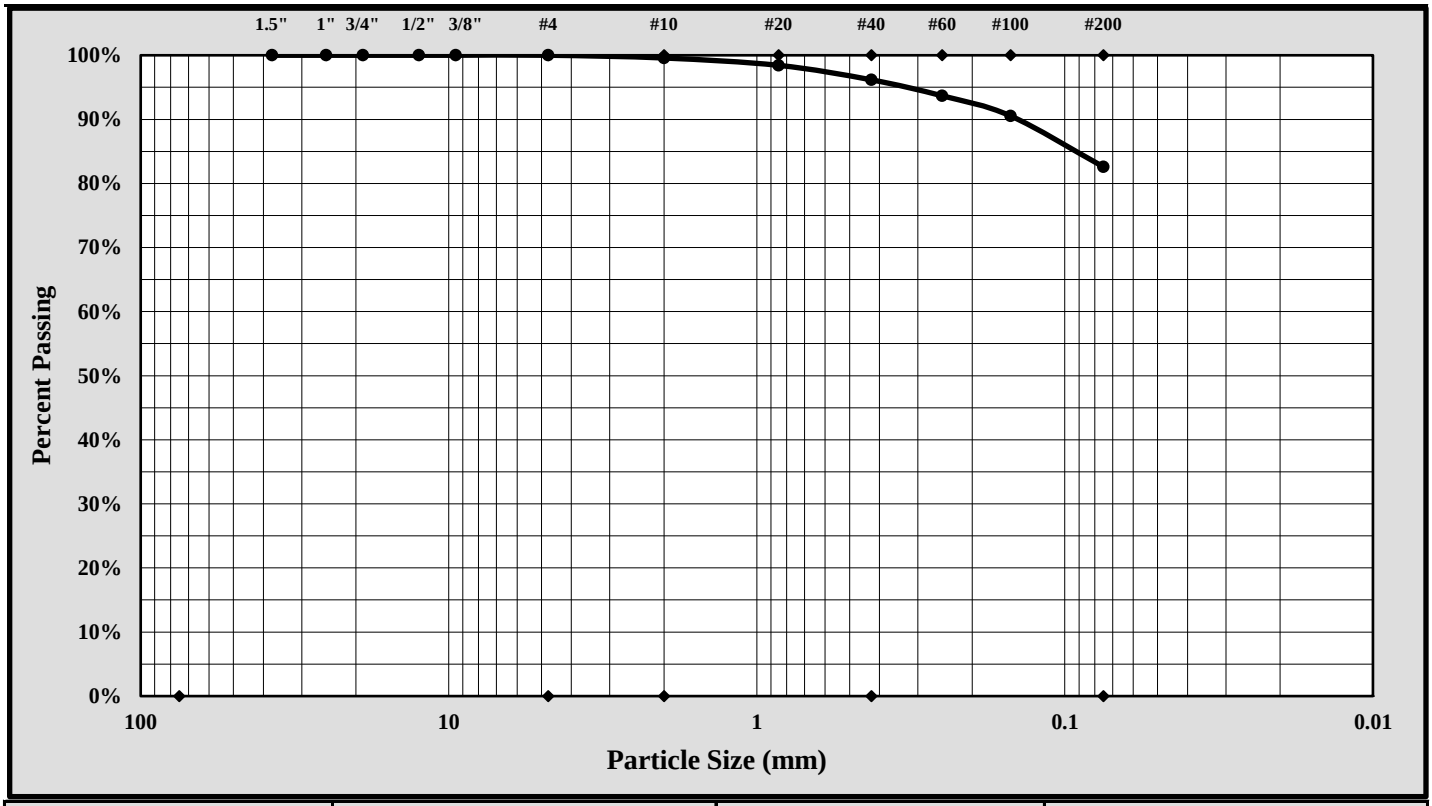
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/21/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/07 - 3/13/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-57	Sample #: SS-11	Sample Date: 1/10/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 38.5' - 40.0'
Sample Description:	Silt with Sand (ML, A-7-5(18))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	2.00 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	82.6%	Total Sand:	17.4%

Liquid Limit	49	Plastic Limit	30	Plastic Index	19
Coarse Sand:	0.4%	Medium Sand:	3.4%	Fine Sand:	13.6%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/21/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

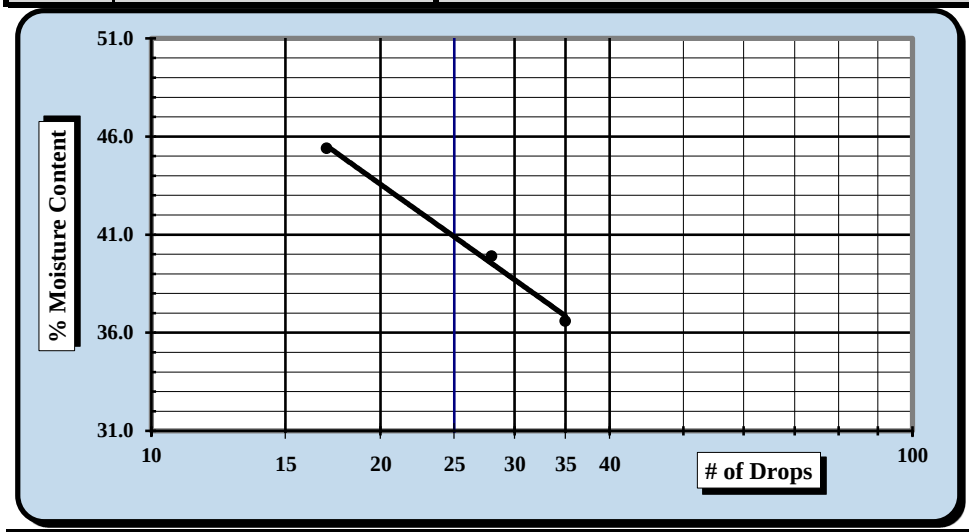
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/22/18
Project Name:	Carolina Crossroads Project	Test Date:	3/21/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-57	Sample #:	SS-15	Sample Date:	1/10/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	58.5' - 60.0'
Sample Description:	Sandy Silt (ML, A-7-6(8))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	6	7	8				9	10	
A	Tare Weight	27.77	26.30	27.32				26.85	26.76	
B	Wet Soil Weight + A	47.55	44.94	44.53				33.32	34.70	
C	Dry Soil Weight + A	42.25	39.62	39.16				31.95	33.02	
D	Water Weight (B-C)	5.30	5.32	5.37				1.37	1.68	
E	Dry Soil Weight (C-A)	14.48	13.32	11.84				5.10	6.26	
F	% Moisture (D/E)*100	36.6%	39.9%	45.4%				26.9%	26.8%	
N	# OF DROPS	35	28	17				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**26.9%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐
Liquid Limit **41**
Plastic Limit **27**
Plastic Index **14**
Group Symbol **ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 66.4%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski — *Technician Name*
3/22/18 — *Date*
Technical Responsibility
3/22/18 — *Date*

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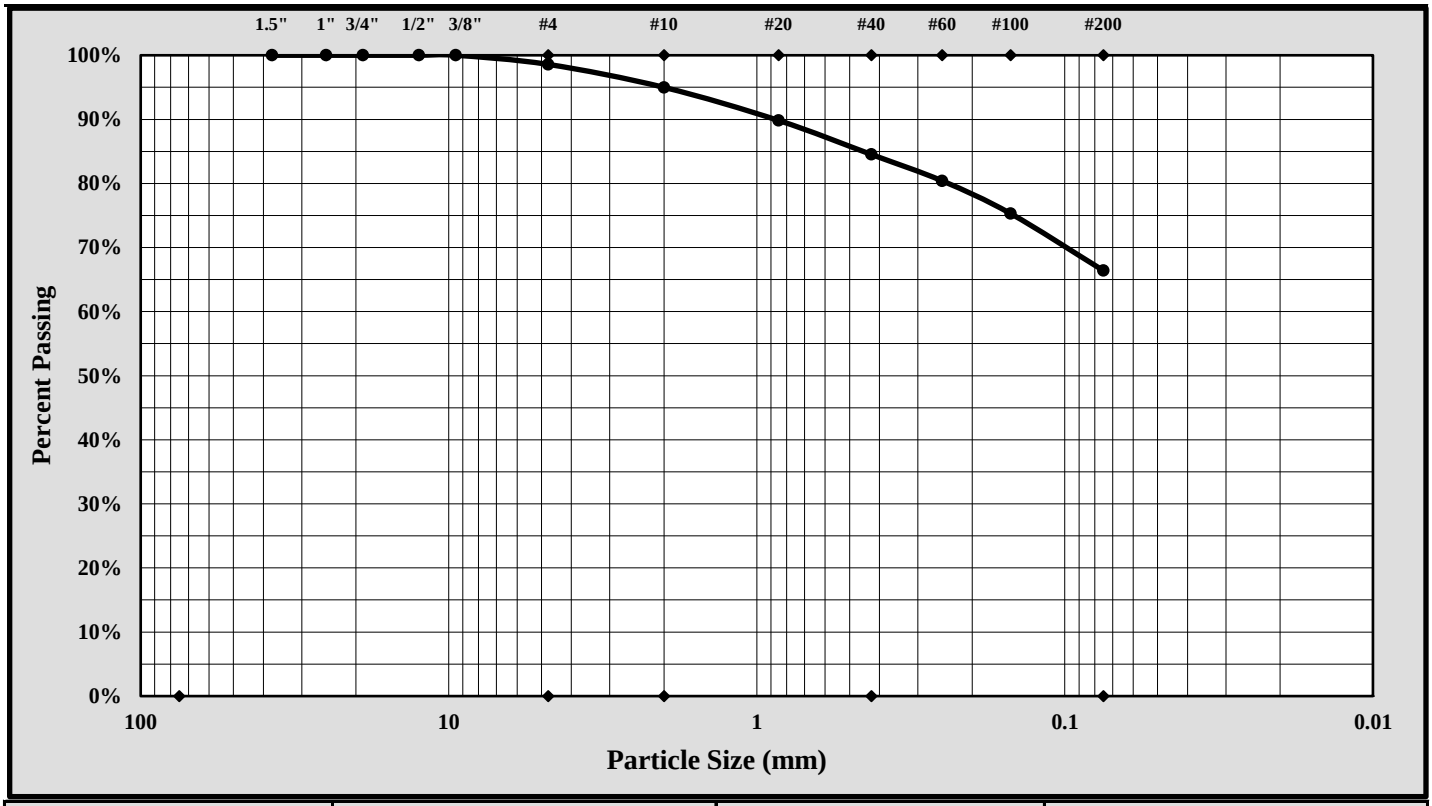
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/21/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/07 - 3/13/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-57	Sample #: SS-15	Sample Date: 1/10/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 58.5' - 60.0'
Sample Description:	Sandy Silt (ML, A-7-6(8))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	9.50 mm	Gravel:	1.4%
Silt & Clay (% Passing #200):	66.4%	Total Sand:	32.2%

Liquid Limit	41	Plastic Limit	27	Plastic Index	14
Coarse Sand:	3.6%	Medium Sand:	10.5%	Fine Sand:	18.1%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/21/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	5/17/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-58	Sample #: SS-1	Sample Date: Various
Log #:	43-2321		Depth: 0.0' - 2.0'
Sample Description:	Clayey sand (SC, A-7-6 (13))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	C-76	C-78	32-B				30	29	
A	Tare Weight	22.58	15.56	17.84				17.81	17.80	
B	Wet Soil Weight + A	30.51	26.53	27.75				25.27	26.35	
C	Dry Soil Weight + A	27.24	22.16	23.92				23.79	24.67	
D	Water Weight (B-C)	3.27	4.37	3.83				1.48	1.68	
E	Dry Soil Weight (C-A)	4.66	6.60	6.08				5.98	6.87	
F	% Moisture (D/E)*100	70.2%	66.2%	63.0%				24.7%	24.5%	
N	# OF DROPS	15	25	35				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**24.6%**		

One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**66**
Plastic Limit	**25**
Plastic Index	**41**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	5/17/2018	Michael D. Kelso, E.I.	5/23/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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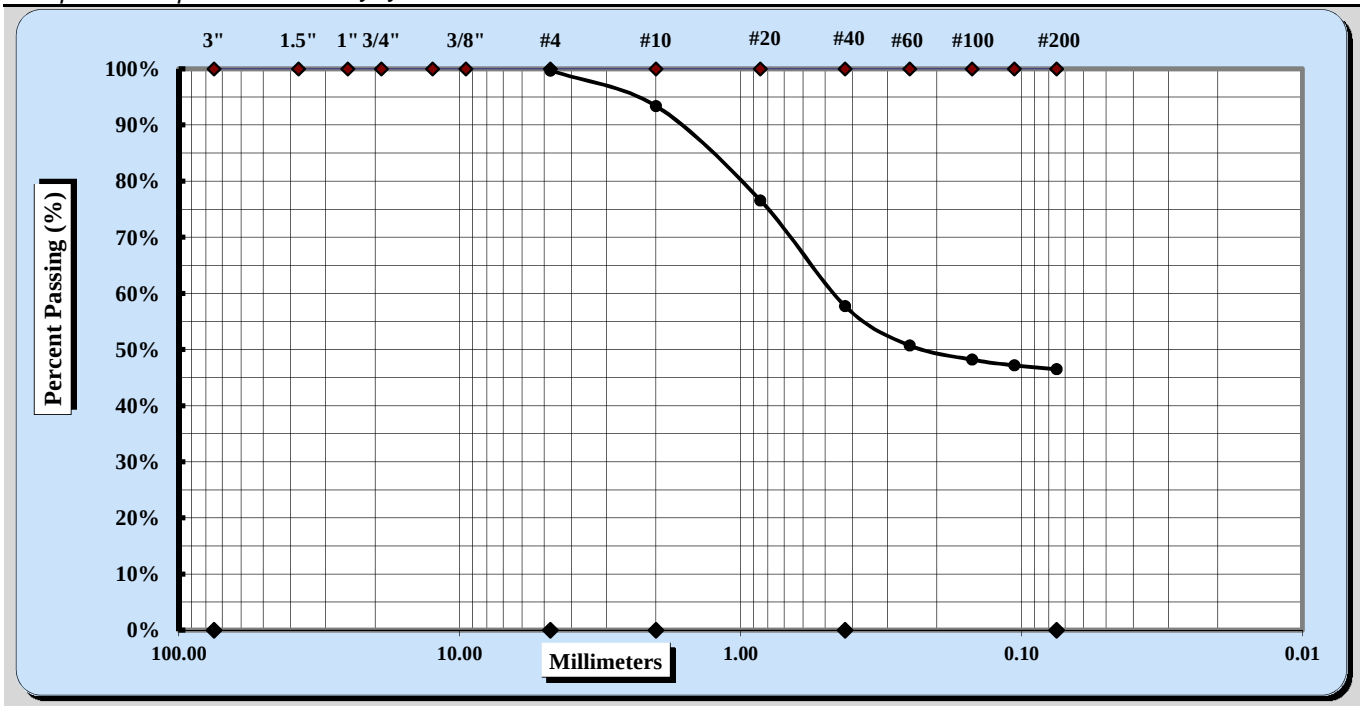
Sieve Analysis of Soils

Quality Assurance | *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/5/18 - 5/22/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID: B-58	Type: Split Spoon	Sample Date:	Various
Sample Log No.: 43-2321	Sample: 1	Depth:	0.0' - 2.0'
Sample Description:	Clayey sand (SC, A-7-6 (13))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	No. 4	Coarse Sand	6%	Fine Sand	11%
Gravel	0%	Medium Sand	36%	Silt & Clay	46%
Liquid Limit	66	Plastic Limit	25	Plastic Index	41

Coarse Sand	6%	Medium Sand	36%	Fine Sand	11%

Description of Sand & Gravel Particles: Rounded ☒ Angular ☒
Hard & Durable ☒ Soft ☒ Weathered & Friable ☐

Notes / Deviations / References:

Michael D. Kelso, E.I. — *Technical Responsibility*
Signature
Staff Professional — *Position*
5/23/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

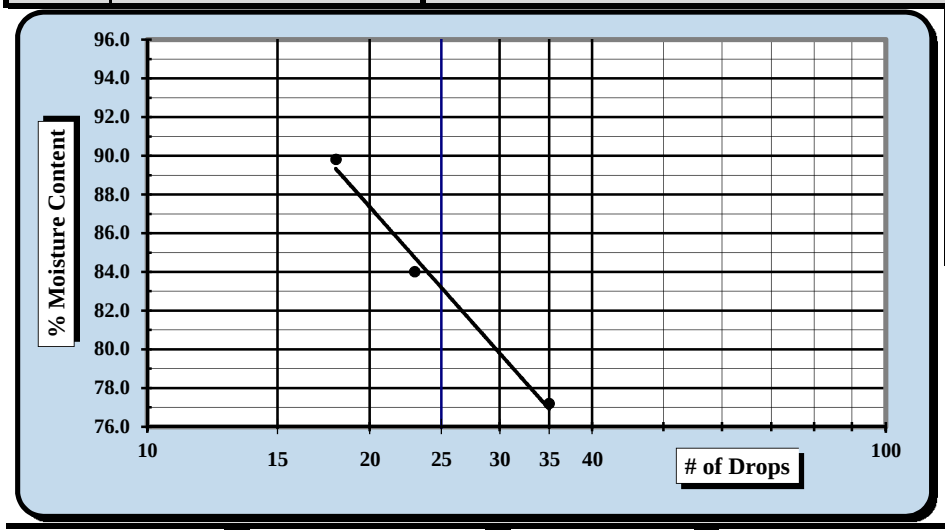
Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	5/17/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-58	Sample #: SS-6	Sample Date: Various
Log #:	43-2321		Depth: 13.5' - 15.0'
Sample Description:	Clayey sand (SC, A-7-5 (15))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	18	20	1				2	7	
A	Tare Weight	15.42	15.46	15.34				15.55	15.40	
B	Wet Soil Weight + A	22.50	23.41	24.29				22.95	22.78	
C	Dry Soil Weight + A	19.15	19.78	20.39				21.15	21.00	
D	Water Weight (B-C)	3.35	3.63	3.90				1.80	1.78	
E	Dry Soil Weight (C-A)	3.73	4.32	5.05				5.60	5.60	
F	% Moisture (D/E)*100	89.8%	84.0%	77.2%				32.1%	31.8%	
N	# OF DROPS	18	23	35				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**32.0%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**83**
Plastic Limit	**32**
Plastic Index	**51**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	5/17/2018	Michael D. Kelso, E.I.	5/23/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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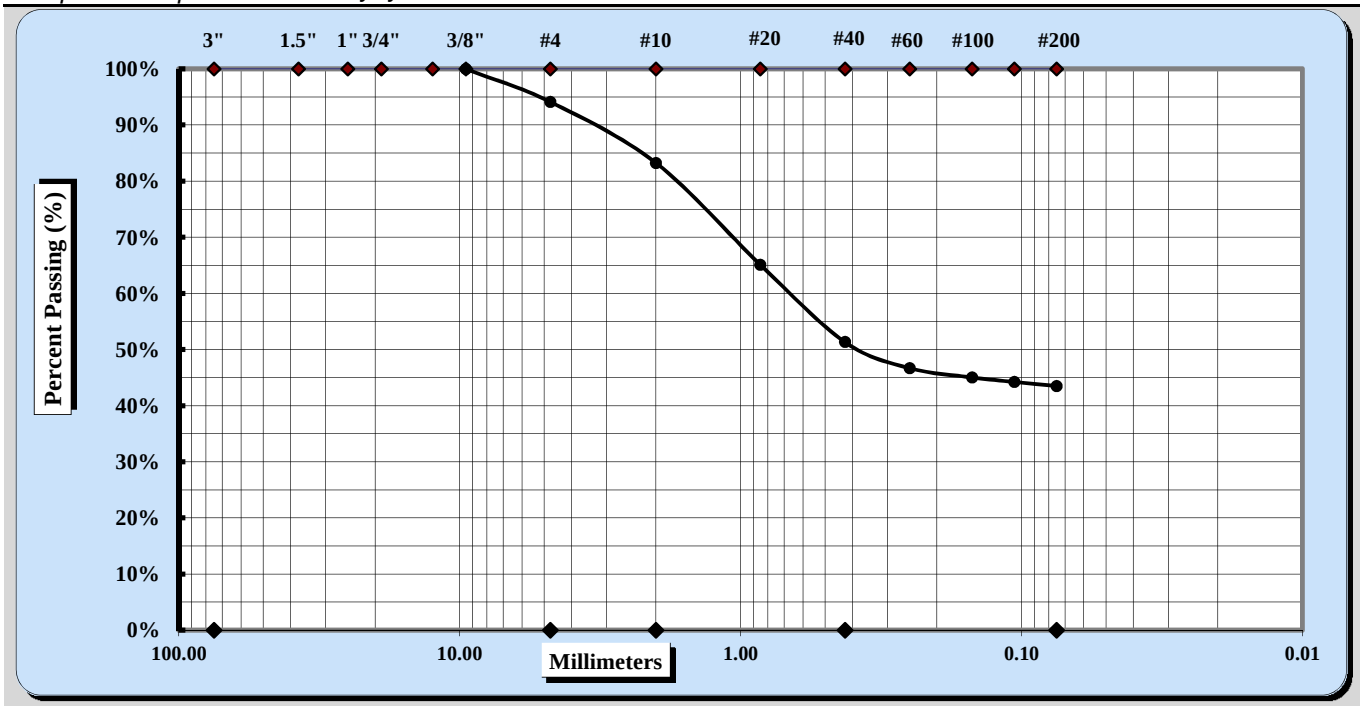
Sieve Analysis of Soils

Quality Assurance | *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/5/18 - 5/22/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID: B-58	Type: Split Spoon	Sample Date:	Various
Sample Log No.: 43-2321	Sample: 6	Depth:	13.5' - 15.0'
Sample Description:	Clayey sand (SC, A-7-5 (15))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	3/8"	Coarse Sand	11%	Fine Sand	8%
Gravel	6%	Medium Sand	32%	Silt & Clay	43%
Liquid Limit	83	Plastic Limit	32	Plastic Index	51

Coarse Sand	11%	Medium Sand	32%	Fine Sand	8%

Description of Sand & Gravel Particles: Rounded ☒ Angular ☒
Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

Notes / Deviations / References:

Michael D. Kelso, E.I. — *Technical Responsibility*
Signature
Staff Professional — *Position*
5/23/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

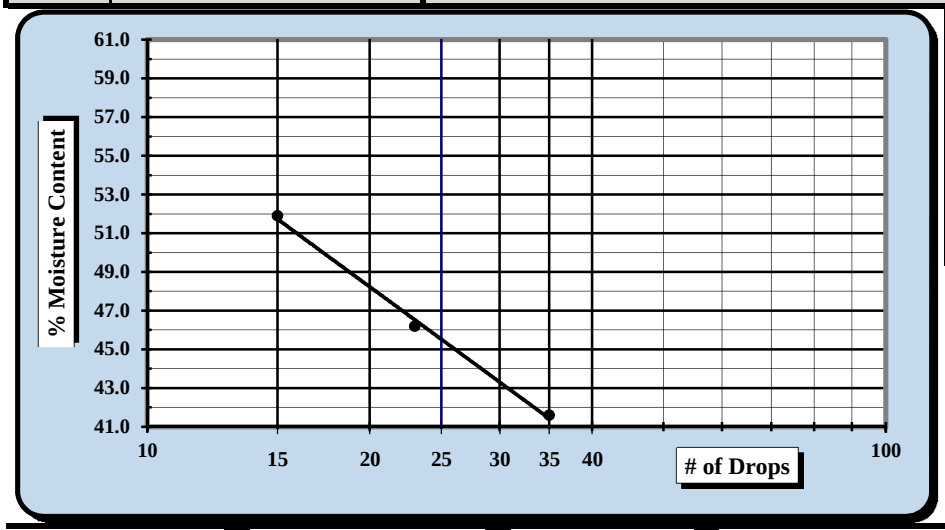
Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	5/17/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-58	Sample #: SS-8	Sample Date: Various
Log #:	43-2321		Depth: 23.5' - 25.0'
Sample Description:	Clayey sand (SC, A-2-7 (0))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	6	11	14				24	4	
A	Tare Weight	15.45	15.42	15.46				15.43	15.44	
B	Wet Soil Weight + A	21.48	22.16	23.12				24.06	23.85	
C	Dry Soil Weight + A	19.42	20.03	20.87				22.45	22.27	
D	Water Weight (B-C)	2.06	2.13	2.25				1.61	1.58	
E	Dry Soil Weight (C-A)	3.97	4.61	5.41				7.02	6.83	
F	% Moisture (D/E)*100	51.9%	46.2%	41.6%				22.9%	23.1%	
N	# OF DROPS	15	23	35				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**23.0%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**45**
Plastic Limit	**23**
Plastic Index	**22**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	5/17/2018	Michael D. Kelso, E.I.	5/23/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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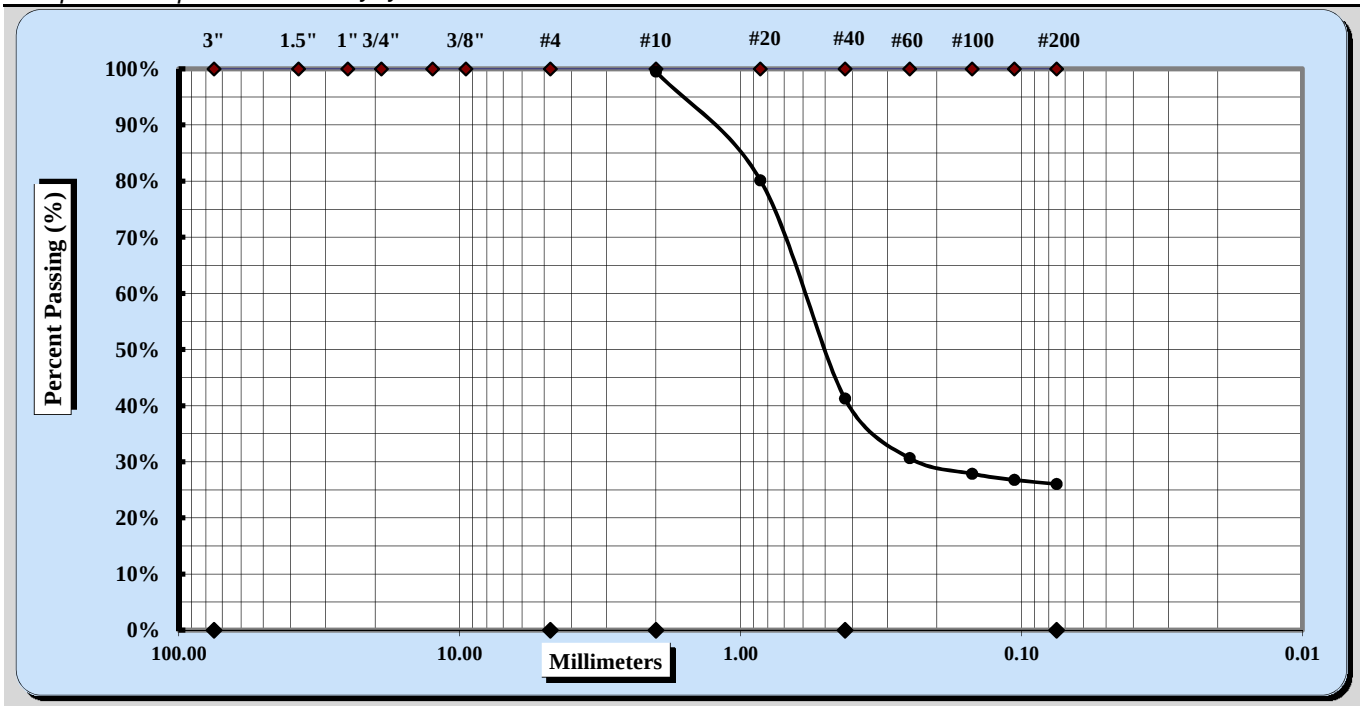
Sieve Analysis of Soils

Quality Assurance | *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/5/18 - 5/22/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID: B-58	Type: Split Spoon	Sample Date:	Various
Sample Log No.: 43-2321	Sample: 8	Depth:	23.5' - 25.0'
Sample Description:	Clayey sand (SC, A-2-7 (0))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	No. 10	Coarse Sand	0%	Fine Sand	15%
Gravel	0%	Medium Sand	58%	Silt & Clay	26%
Liquid Limit	45	Plastic Limit	23	Plastic Index	22

Coarse Sand	0%	Medium Sand	58%	Fine Sand	15%

Description of Sand & Gravel Particles: Rounded ☒ Angular ☒
Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

Notes / Deviations / References:

Michael D. Kelso, E.I.		Staff Professional	5/23/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

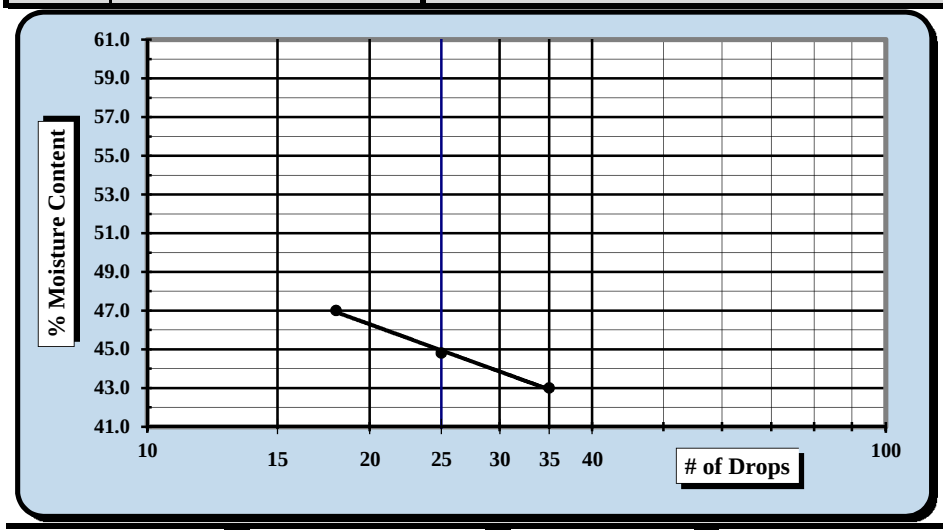
Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	5/17/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-58	Sample #: SS-10	Sample Date: Various
Log #:	43-2321		Depth: 33.5' - 35.0'
Sample Description:	Silty sand (SM, A-2-7 (0))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	22	16	23				5	21	
A	Tare Weight	15.38	15.63	15.44				15.39	15.51	
B	Wet Soil Weight + A	23.39	24.55	25.25				24.91	23.88	
C	Dry Soil Weight + A	20.83	21.79	22.30				22.91	22.12	
D	Water Weight (B-C)	2.56	2.76	2.95				2.00	1.76	
E	Dry Soil Weight (C-A)	5.45	6.16	6.86				7.52	6.61	
F	% Moisture (D/E)*100	47.0%	44.8%	43.0%				26.6%	26.6%	
N	# OF DROPS	18	25	35				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**26.6%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**45**
Plastic Limit	**27**
Plastic Index	**18**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	5/17/2018	Michael D. Kelso, E.I.	5/23/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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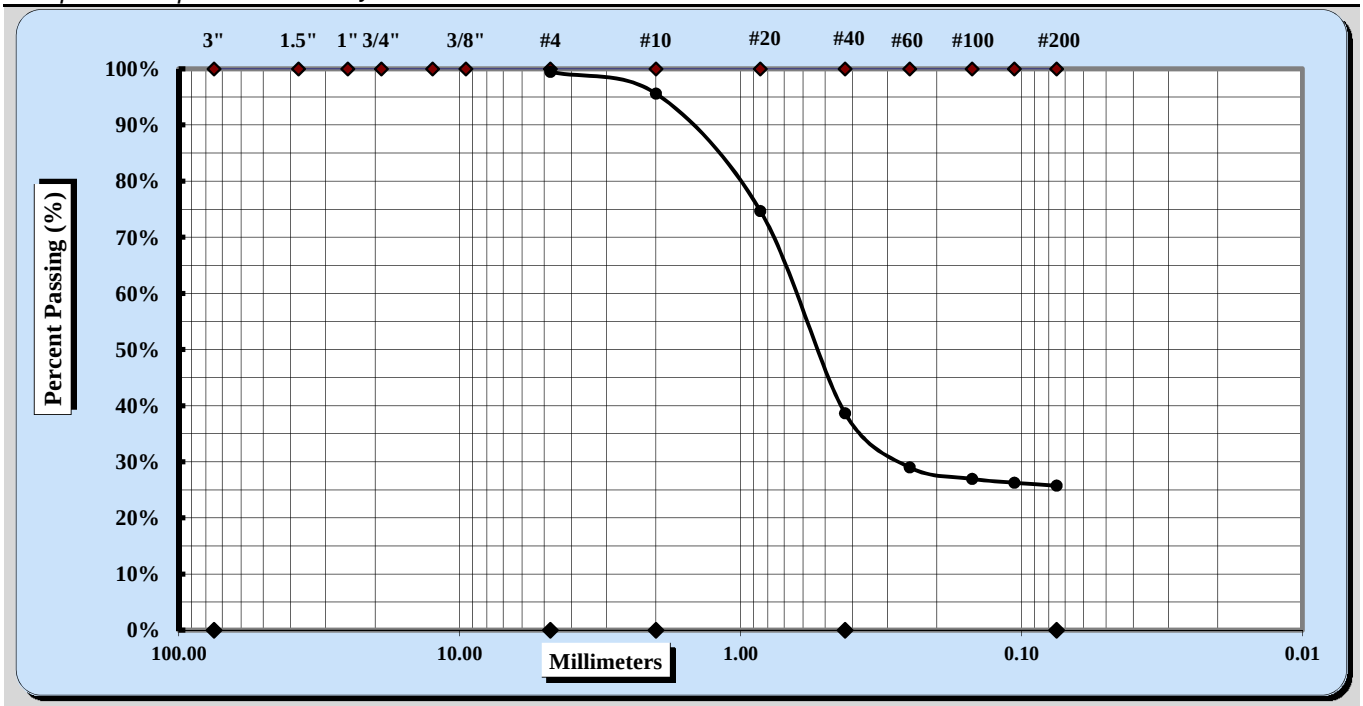
Sieve Analysis of Soils

Quality Assurance | *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/5/18 - 5/22/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID: B-58	Type: Split Spoon	Sample Date:	Various
Sample Log No.: 43-2321	Sample: 10	Depth:	33.5' - 35.0'
Sample Description:	Silty sand (SM, A-2-7 (0))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	No. 4	Coarse Sand	4%	Fine Sand	13%
Gravel	0%	Medium Sand	57%	Silt & Clay	26%
Liquid Limit	45	Plastic Limit	27	Plastic Index	18

Coarse Sand	4%	Medium Sand	57%	Fine Sand	13%

Description of Sand & Gravel Particles: Rounded ☒ Angular ☒
Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

Notes / Deviations / References:

Michael D. Kelso, E.I. — *Technical Responsibility*
Signature
Staff Professional — *Position*
5/23/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

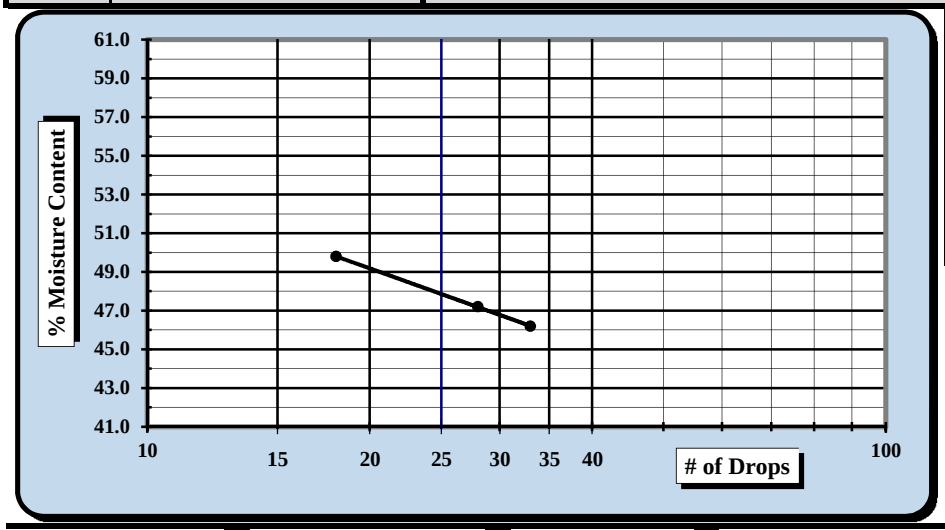
Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	5/18/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-58	Sample #: SS-13	Sample Date: Various
Log #:	43-2321		Depth: 48.5' - 50.0'
Sample Description:	Silt with sand (ML, A-7-5 (15))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	18	20	7				2	11	
A	Tare Weight	15.41	15.46	15.41				15.55	15.43	
B	Wet Soil Weight + A	25.46	26.53	27.78				24.88	24.11	
C	Dry Soil Weight + A	22.12	22.98	23.87				22.71	22.10	
D	Water Weight (B-C)	3.34	3.55	3.91				2.17	2.01	
E	Dry Soil Weight (C-A)	6.71	7.52	8.46				7.16	6.67	
F	% Moisture (D/E)*100	49.8%	47.2%	46.2%				30.3%	30.1%	
N	# OF DROPS	18	28	33				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**30.2%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**48**
Plastic Limit	**30**
Plastic Index	**18**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	5/18/2018	Michael D. Kelso, E.I.	5/23/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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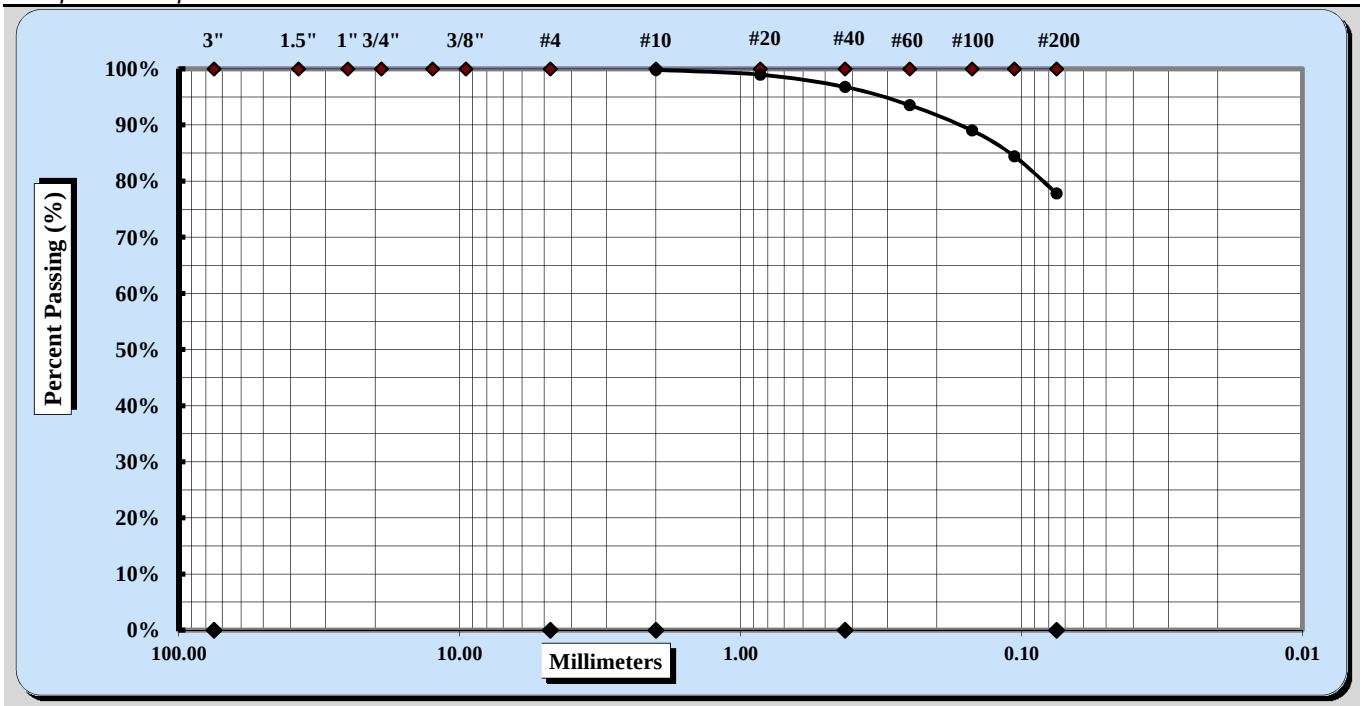
Sieve Analysis of Soils

Quality Assurance | *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/21/18 - 5/22/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID: B-58	Type: Split Spoon	Sample Date:	Various
Sample Log No.: 43-2321	Sample: 13	Depth:	48.5' - 50.0'
Sample Description:	Silt with sand (ML, A-7-5 (15))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	No. 10	Coarse Sand	0%	Fine Sand	19%
Gravel	0%	Medium Sand	3%	Silt & Clay	78%
Liquid Limit	48	Plastic Limit	30	Plastic Index	18

Coarse Sand	0%	Medium Sand	3%	Fine Sand	19%

Description of Sand & Gravel Particles: Rounded ☒ Angular ☒
Hard & Durable ☒ Soft ☐ Weathered & Friable ☒

Notes / Deviations / References:

Michael D. Kelso, E.I. — *Technical Responsibility*
Signature
Staff Professional — *Position*
5/23/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

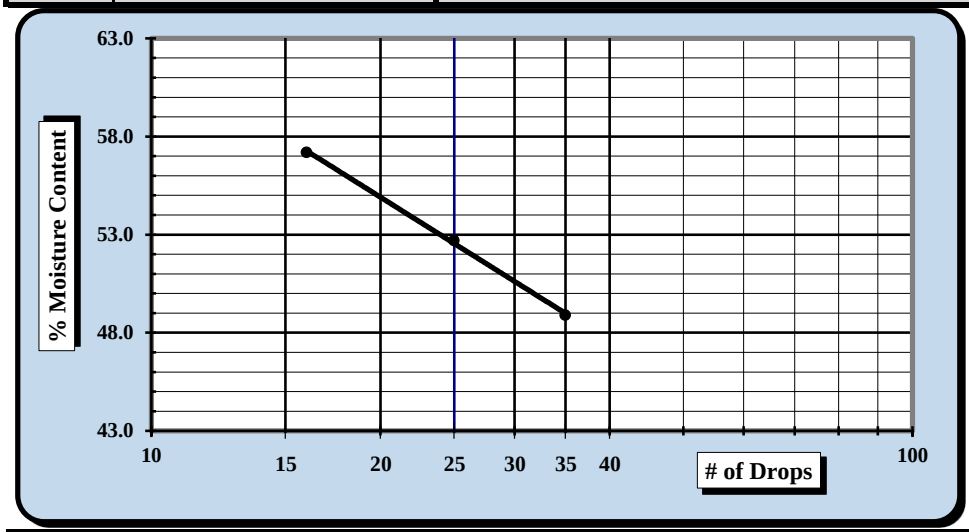
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/22/18
Project Name:	Carolina Crossroads Project	Test Date:	3/21/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-59	Sample #:	SS-3	Sample Date:	1/15/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	4.0' - 6.0'
Sample Description:	Clayey Sand (SC, A-2-7(3))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	11	12	13				14	15	
A	Tare Weight	26.67	26.66	26.78				26.66	27.61	
B	Wet Soil Weight + A	41.22	41.15	41.82				33.64	33.92	
C	Dry Soil Weight + A	36.44	36.15	36.35				32.17	32.60	
D	Water Weight (B-C)	4.78	5.00	5.47				1.47	1.32	
E	Dry Soil Weight (C-A)	9.77	9.49	9.57				5.51	4.99	
F	% Moisture (D/E)*100	48.9%	52.7%	57.2%				26.7%	26.5%	
N	# OF DROPS	35	25	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**26.6%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**53**
Plastic Limit	**27**
Plastic Index	**26**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 35.3%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski — *Technician Name*
3/22/18 — *Date*
Brian Vaughn — *Technical Responsibility*
3/22/18 — *Date*

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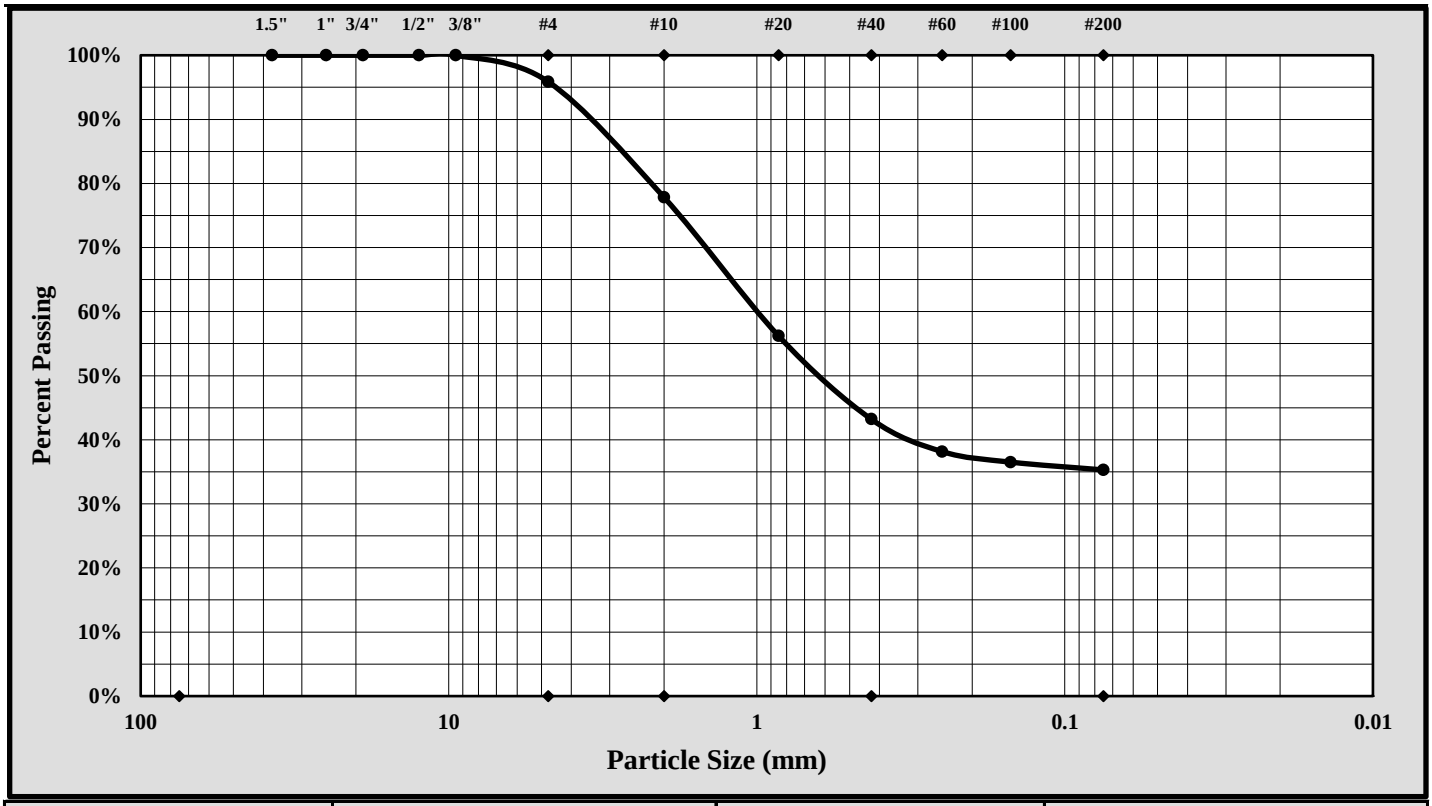
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/21/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/07 - 3/13/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-59	Sample #: SS-3	Sample Date: 1/15/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 4.0' - 6.0'
Sample Description:	Clayey Sand (SC, A-2-7(3))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	9.50 mm	Gravel:	4.1%
Silt & Clay (% Passing #200):	35.3%	Total Sand:	60.6%

Liquid Limit	53	Plastic Limit	27	Plastic Index	26
Coarse Sand:	18.0%	Medium Sand:	34.6%	Fine Sand:	7.9%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/21/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/22/18
Project Name:	Carolina Crossroads Project	Test Date:	3/21/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-59	Sample #:	SS-7	Sample Date:	1/16/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	18.5' - 20.0'

Sample Description: Sandy Elastic Silt (MH, A-7-5(17))

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	16	17	18				19	20	
A	Tare Weight	26.58	26.64	26.80				26.68	26.85	
B	Wet Soil Weight + A	41.64	43.55	42.70				34.07	34.60	
C	Dry Soil Weight + A	36.31	37.39	36.64				32.25	32.70	
D	Water Weight (B-C)	5.33	6.16	6.06				1.82	1.90	
E	Dry Soil Weight (C-A)	9.73	10.75	9.84				5.57	5.85	
F	% Moisture (D/E)*100	54.8%	57.3%	61.6%				32.7%	32.5%	
N	# OF DROPS	35	26	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**32.6%**		

One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**58**
Plastic Limit	**33**
Plastic Index	**25**
Group Symbol	**MH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 66.1%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski — *Technician Name*
3/22/18 — *Date*
Brian Vaughn — *Technical Responsibility*
3/22/18 — *Date*

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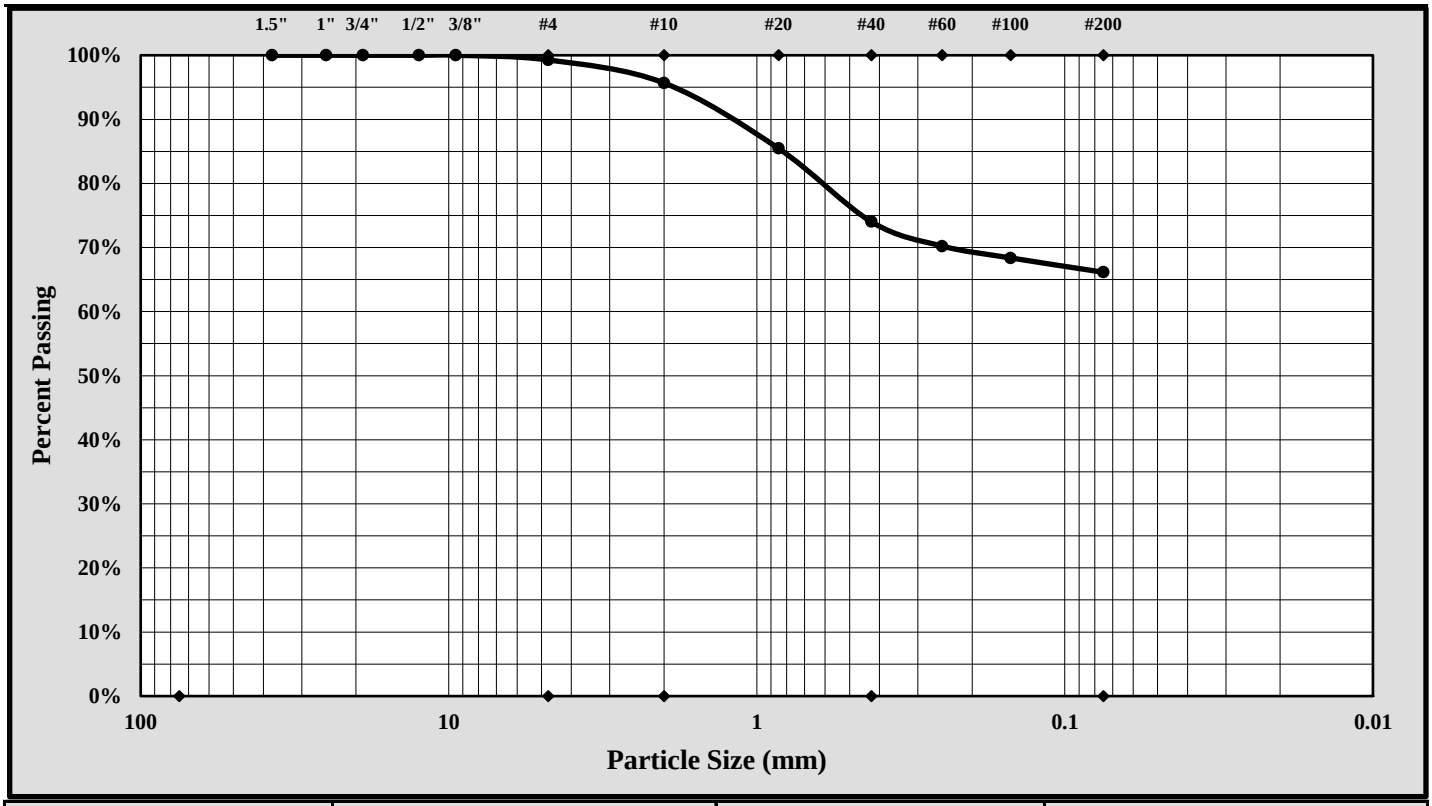
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/21/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/07 - 3/13/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-59	Sample #: SS-7	Sample Date: 1/16/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 18.5' - 20.0'
Sample Description:	Sandy Elastic Silt (MH, A-7-5(17))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.7%
Silt & Clay (% Passing #200):	66.1%	Total Sand:	33.1%

Liquid Limit	58	Plastic Limit	33	Plastic Index	25
Coarse Sand:	3.6%	Medium Sand:	21.6%	Fine Sand:	7.9%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/21/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

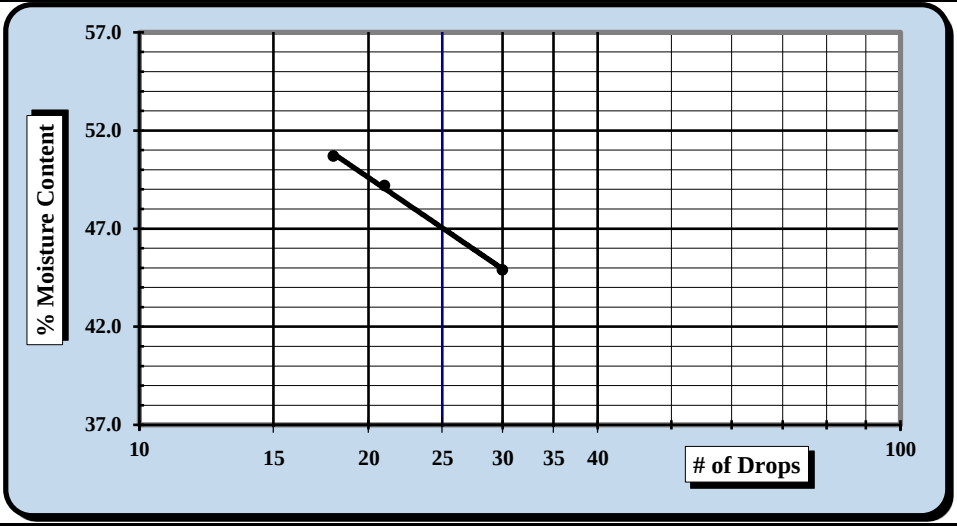
Project #:	1461-16-047.2B	Report Date:	3/22/18
Project Name:	Carolina Crossroads Project	Test Date:	3/21/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-59	Sample #:	SS-10	Sample Date:	1/16/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	33.5' - 35.0'

Sample Description: Silt (ML, A-7-5(16))

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	21	22	23				24	25	
A	Tare Weight	28.09	25.68	27.23				25.99	26.81	
B	Wet Soil Weight + A	45.58	43.57	43.25				32.07	33.93	
C	Dry Soil Weight + A	40.16	37.67	37.86				30.52	32.13	
D	Water Weight (B-C)	5.42	5.90	5.39				1.55	1.80	
E	Dry Soil Weight (C-A)	12.07	11.99	10.63				4.53	5.32	
F	% Moisture (D/E)*100	44.9%	49.2%	50.7%				34.2%	33.8%	
N	# OF DROPS	30	21	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**34.0%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**47**
Plastic Limit	**34**
Plastic Index	**13**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 92.9%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski — *Technician Name*
3/22/18 — *Date*
Brian Vaughn — *Technical Responsibility*
3/22/18 — *Date*

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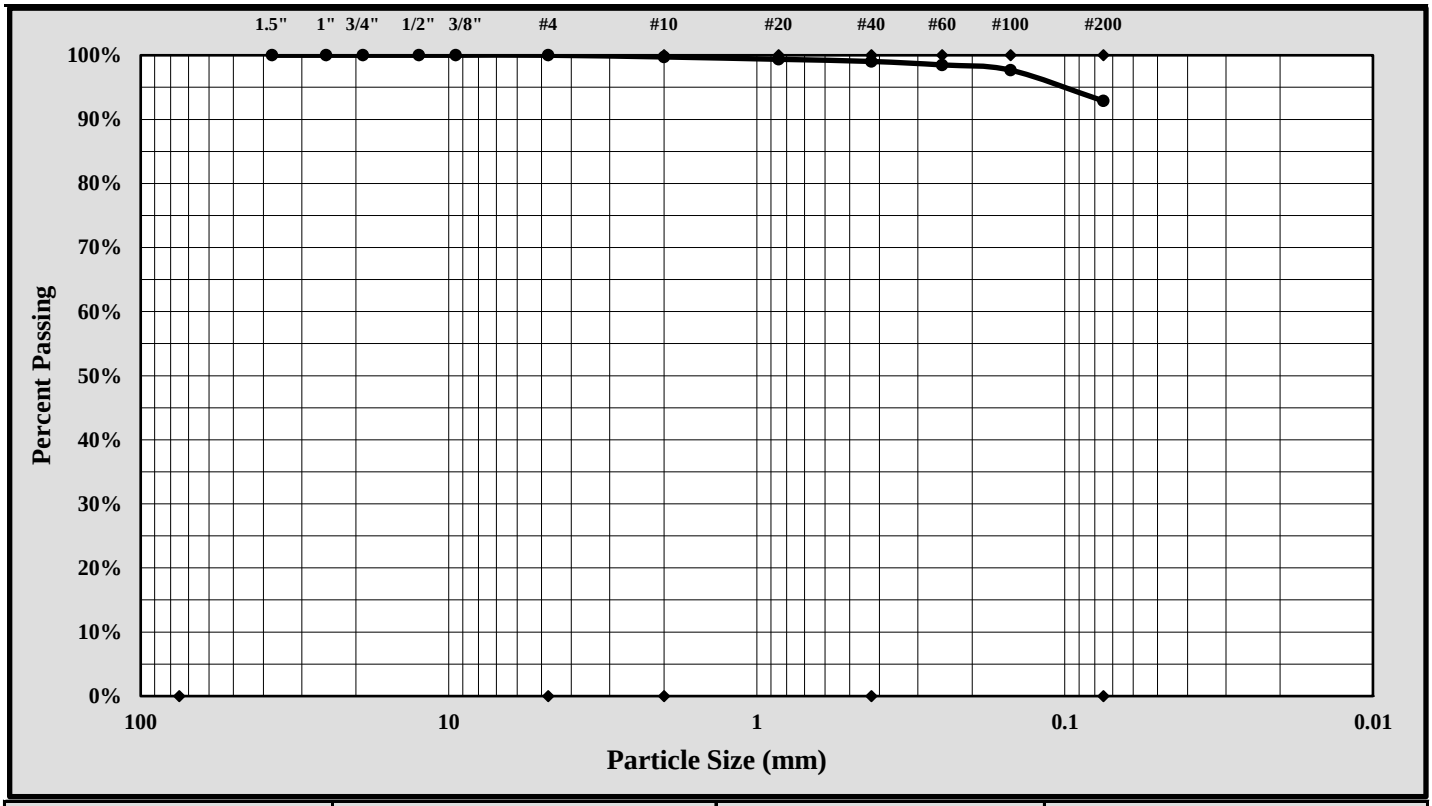
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/21/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/07 - 3/13/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-59	Sample #: SS-10	Sample Date: 1/16/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 33.5' - 35.0'
Sample Description:	Silt (ML, A-7-5(16))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	.425 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	92.9%	Total Sand:	7.1%

Liquid Limit	47	Plastic Limit	34	Plastic Index	13
Coarse Sand:	0.3%	Medium Sand:	0.7%	Fine Sand:	6.2%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/21/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

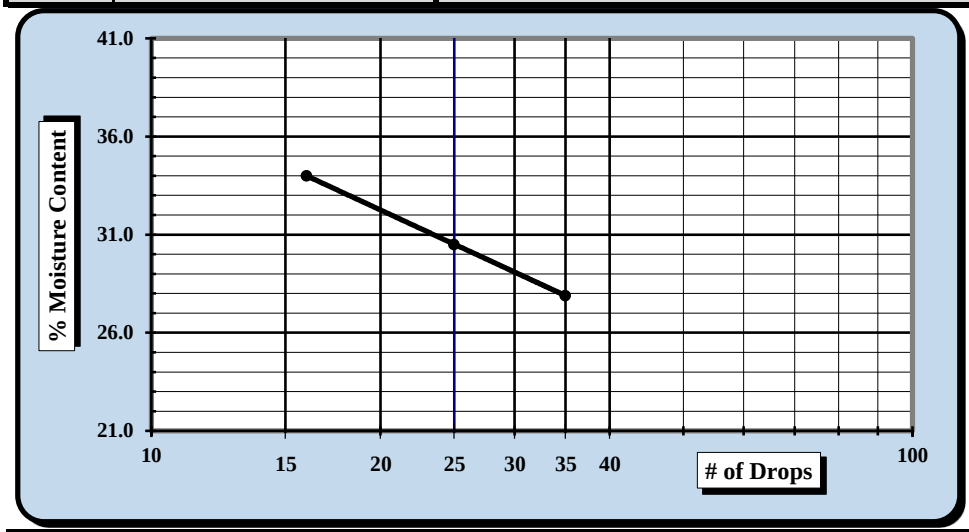
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/22/18
Project Name:	Carolina Crossroads Project	Test Date:	3/21/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-59	Sample #:	SS-14	Sample Date:	1/16/18
Location:	Bridge Boring	Type:	Split-spoon	Depth:	53.5' - 55.0'
Sample Description:	Lean Clay (CL, A-4(7))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	26	27	28				29	30	
A	Tare Weight	27.34	27.03	26.82				27.03	27.39	
B	Wet Soil Weight + A	42.02	42.79	43.02				34.09	33.48	
C	Dry Soil Weight + A	38.82	39.11	38.91				32.78	32.36	
D	Water Weight (B-C)	3.20	3.68	4.11				1.31	1.12	
E	Dry Soil Weight (C-A)	11.48	12.08	12.09				5.75	4.97	
F	% Moisture (D/E)*100	27.9%	30.5%	34.0%				22.8%	22.5%	
N	# OF DROPS	35	25	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**22.7%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**31**
Plastic Limit	**23**
Plastic Index	**8**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 90.3%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	3/22/18	Brian Vaughn	3/22/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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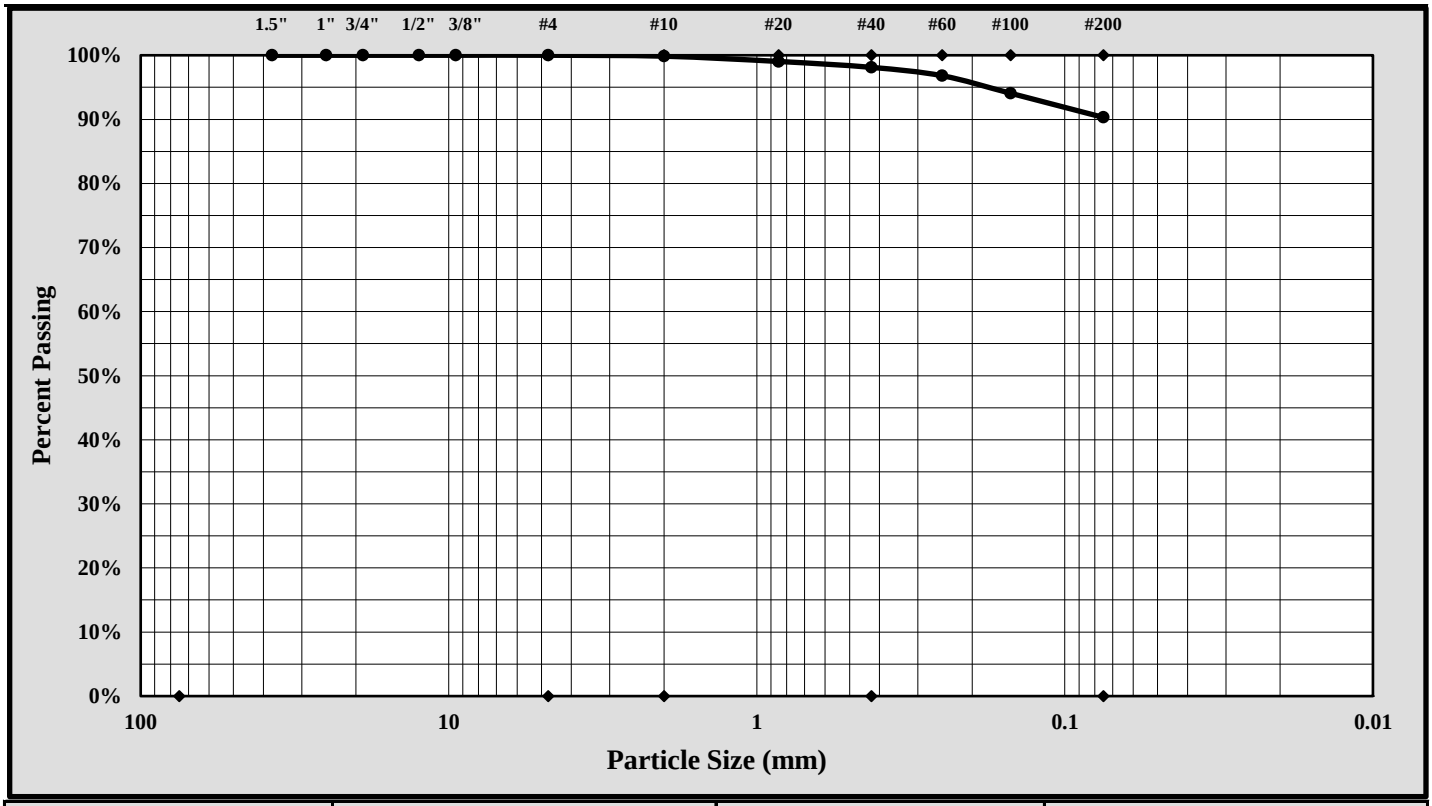
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/21/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/07 - 3/13/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-59	Sample #: SS-14	Sample Date: 1/16/18
Location:	Bridge Boring	Type: Split-spoon	Depth: 53.5' - 55.0'
Sample Description:	Lean Clay (CL, A-4(7))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	0.85 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	90.3%	Total Sand:	9.7%

Liquid Limit	31	Plastic Limit	23	Plastic Index	8
Coarse Sand:	0.1%	Medium Sand:	1.7%	Fine Sand:	7.8%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/21/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	5/18/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-60	Sample #: SS-1	Sample Date: Various
Log #:	43-2321		Depth: 0.0' - 2.0'
Sample Description:	Sandy fat clay (CH, A-7-6 (12))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	16	22	10				23	17	
A	Tare Weight	15.63	15.38	15.41				15.44	15.50	
B	Wet Soil Weight + A	24.74	25.52	26.56				23.29	24.27	
C	Dry Soil Weight + A	21.56	22.14	23.00				21.75	22.58	
D	Water Weight (B-C)	3.18	3.38	3.56				1.54	1.69	
E	Dry Soil Weight (C-A)	5.93	6.76	7.59				6.31	7.08	
F	% Moisture (D/E)*100	53.6%	50.0%	46.9%				24.4%	23.9%	
N	# OF DROPS	18	28	35				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**24.2%**		

One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**51**
Plastic Limit	**24**
Plastic Index	**27**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	5/18/2018	Michael D. Kelso, E.I.	5/23/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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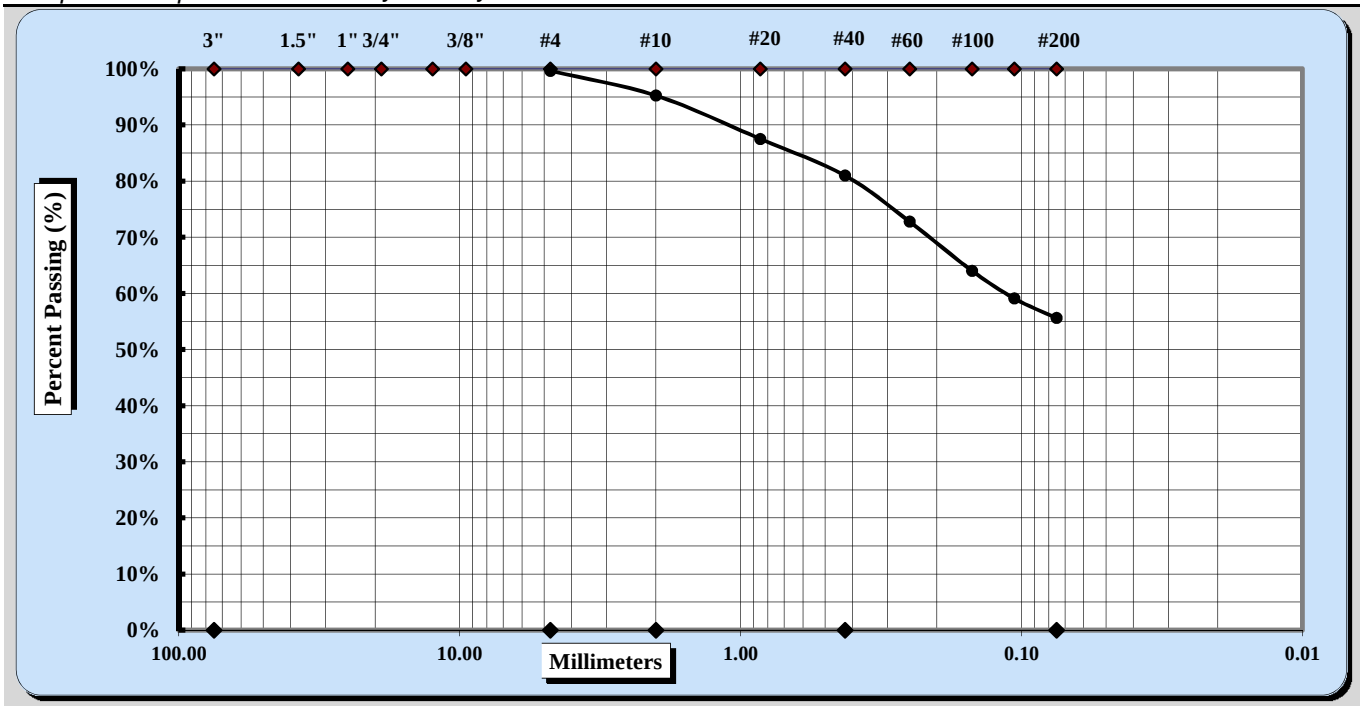
Sieve Analysis of Soils

Quality Assurance | *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/21/18 - 5/22/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID: B-60	Type: Split Spoon	Sample Date:	Various
Sample Log No.: 43-2321	Sample: 1	Depth:	0.0' - 2.0'
Sample Description:	Sandy fat clay (CH, A-7-6 (12))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	No. 4	Coarse Sand	4%	Fine Sand	25%
Gravel	0%	Medium Sand	14%	Silt & Clay	56%
Liquid Limit	51	Plastic Limit	24	Plastic Index	27

Coarse Sand	4%	Medium Sand	14%	Fine Sand	25%

Description of Sand & Gravel Particles: Rounded ☒ Angular ☒
Hard & Durable ☒ Soft ☐ Weathered & Friable ☒

Notes / Deviations / References:

Michael D. Kelso, E.I.		Staff Professional	5/23/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

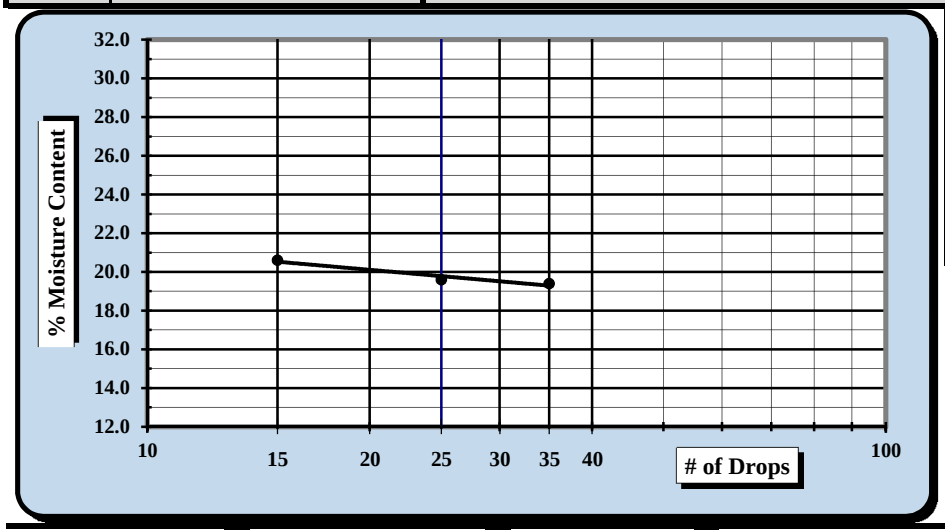
Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	5/18/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-60	Sample #: SS-2	Sample Date: Various
Log #:	43-2321		Depth: 2.0' - 4.0'
Sample Description:	Silty, clayey sand (SC-SM, A-2-4)		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	6	24	13				4	14	
A	Tare Weight	15.45	15.43	15.39				15.44	15.46	
B	Wet Soil Weight + A	28.54	29.52	30.18				25.27	25.06	
C	Dry Soil Weight + A	26.30	27.21	27.78				24.14	23.95	
D	Water Weight (B-C)	2.24	2.31	2.40				1.13	1.11	
E	Dry Soil Weight (C-A)	10.85	11.78	12.39				8.70	8.49	
F	% Moisture (D/E)*100	20.6%	19.6%	19.4%				13.0%	13.1%	
N	# OF DROPS	15	25	35				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**13.1%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**20**
Plastic Limit	**13**
Plastic Index	**7**
Group Symbol	**CL-ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	5/18/2018	Michael D. Kelso, E.I.	5/23/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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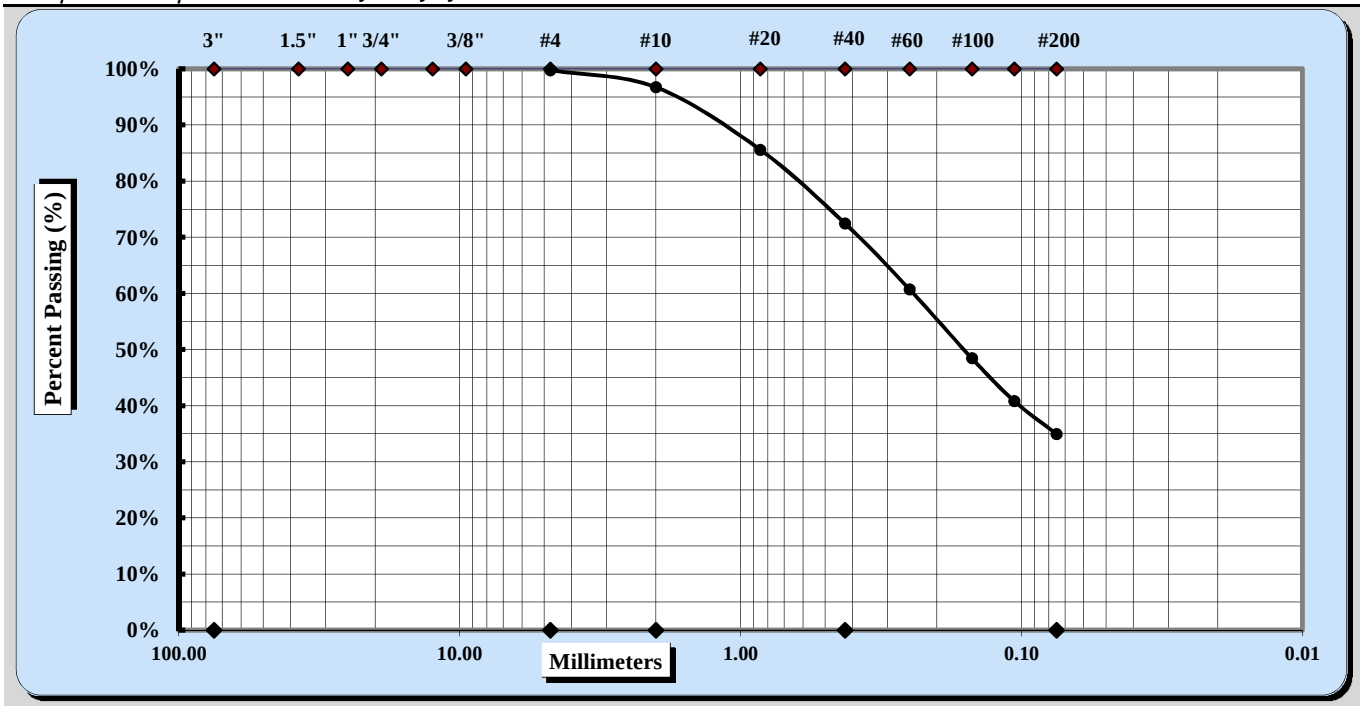
Sieve Analysis of Soils

Quality Assurance | *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/5/18 - 5/22/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID: B-60	Type: Split Spoon	Sample Date:	Various
Sample Log No.: 43-2321	Sample: 2	Depth:	2.0' - 4.0'
Sample Description:	Silty, clayey sand (SC-SM, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	No. 4	Coarse Sand	3%	Fine Sand	38%
Gravel	0%	Medium Sand	24%	Silt & Clay	35%
Liquid Limit	20	Plastic Limit	13	Plastic Index	7

Coarse Sand	3%	Medium Sand	24%	Fine Sand	38%

Description of Sand & Gravel Particles: Rounded ☒ Angular ☒
Hard & Durable ☒ Soft ☒ Weathered & Friable ☐

Notes / Deviations / References:

Michael D. Kelso, E.I. — *Technical Responsibility*
Signature
Staff Professional — *Position*
5/23/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

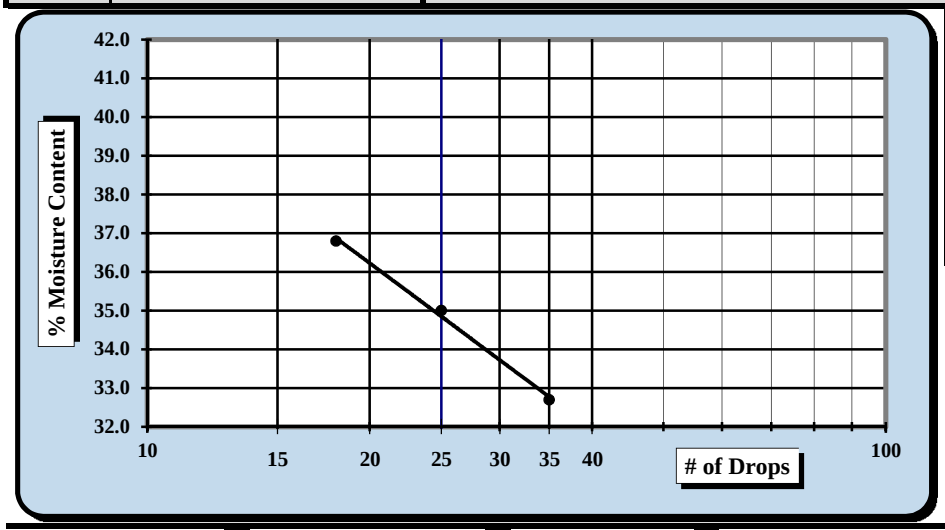
Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	5/18/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-60	Sample #: SS-3	Sample Date: Various
Log #:	43-2321		Depth: 4.0' - 6.0'
Sample Description:	Clayey sand (SC, A-2-6)		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	1	8	15				3	12	
A	Tare Weight	15.34	15.52	15.32				15.48	15.56	
B	Wet Soil Weight + A	25.79	26.67	27.94				24.83	24.68	
C	Dry Soil Weight + A	22.98	23.78	24.83				23.27	23.16	
D	Water Weight (B-C)	2.81	2.89	3.11				1.56	1.52	
E	Dry Soil Weight (C-A)	7.64	8.26	9.51				7.79	7.60	
F	% Moisture (D/E)*100	36.8%	35.0%	32.7%				20.0%	20.0%	
N	# OF DROPS	18	25	35				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**20.0%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**35**
Plastic Limit	**20**
Plastic Index	**15**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	5/18/2018	Michael D. Kelso, E.I.	5/23/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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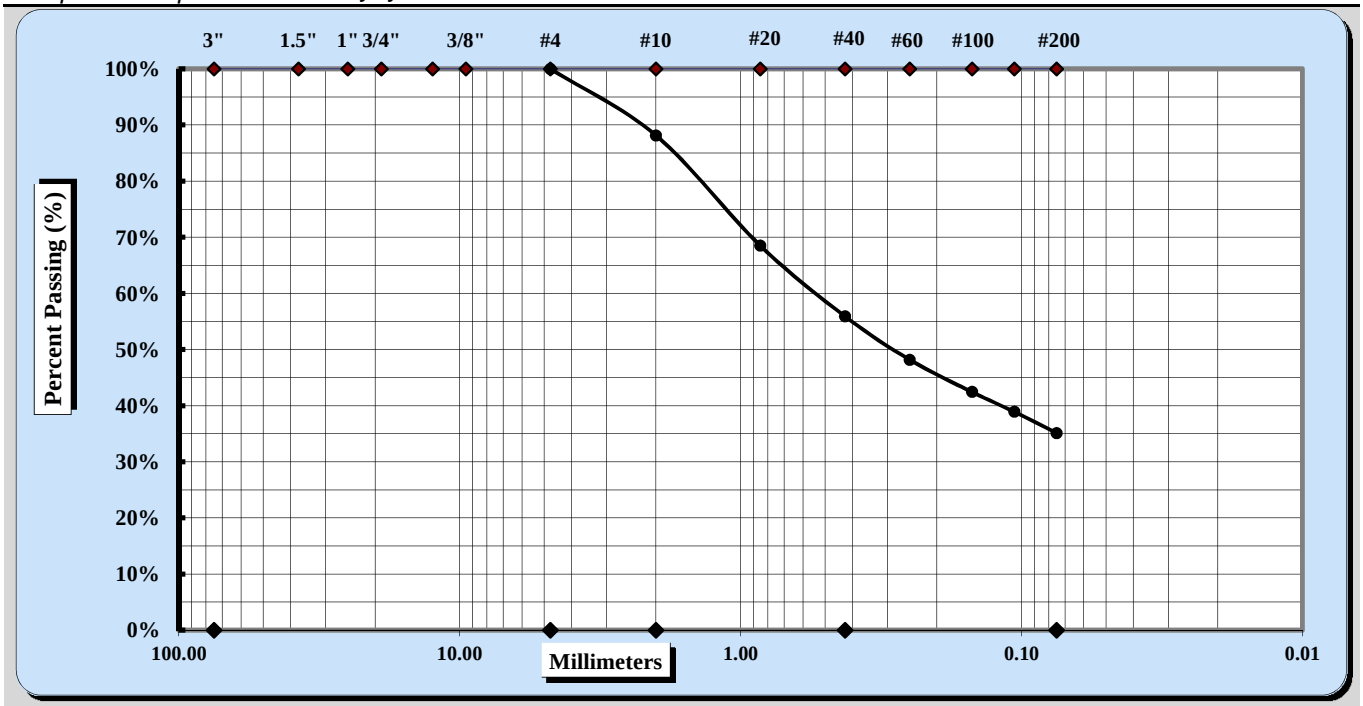
Sieve Analysis of Soils

Quality Assurance *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/5/18 - 5/22/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID: B-60	Type: Split Spoon	Sample Date:	Various
Sample Log No.: 43-2321	Sample: 3	Depth:	4.0' - 6.0'
Sample Description:	Clayey sand (SC, A-2-6)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	No. 4	Coarse Sand	12%	Fine Sand	21%
Gravel	0%	Medium Sand	32%	Silt & Clay	35%
Liquid Limit	35	Plastic Limit	20	Plastic Index	15

Coarse Sand	12%	Medium Sand	32%	Fine Sand	21%
Description of Sand & Gravel Particles:		Rounded	☒	Angular	☒
Hard & Durable	☒	Soft	☐	Weathered & Friable	☒

Notes / Deviations / References:

Michael D. Kelso, E.I.		Staff Professional	5/23/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

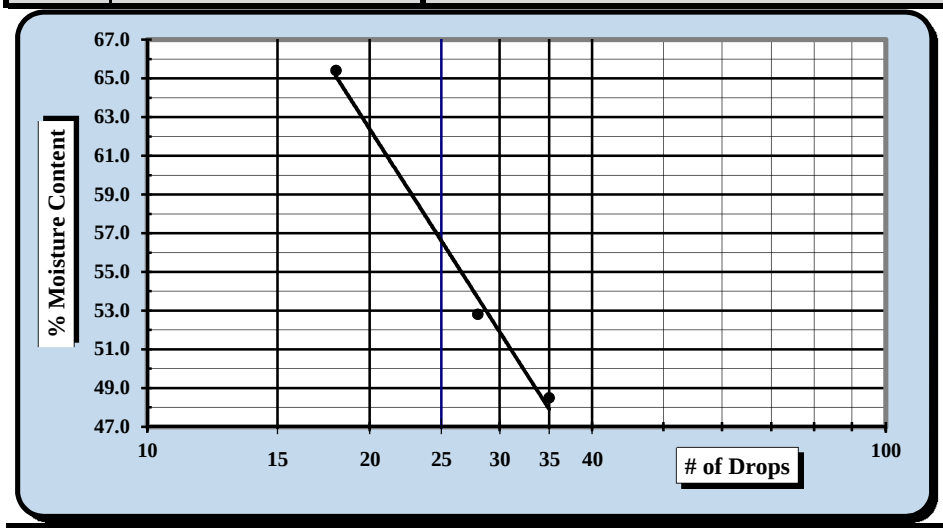
Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	5/18/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-61	Sample #: SS-1	Sample Date: Various
Log #:	43-2321		Depth: 0.0' - 2.0'
Sample Description:	Clayey sand (SC, A-7-6 (8))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	21	5	9				19	30	
A	Tare Weight	15.51	15.39	15.43				15.42	17.81	
B	Wet Soil Weight + A	25.17	26.71	27.16				23.69	25.46	
C	Dry Soil Weight + A	21.35	22.80	23.33				21.92	23.83	
D	Water Weight (B-C)	3.82	3.91	3.83				1.77	1.63	
E	Dry Soil Weight (C-A)	5.84	7.41	7.90				6.50	6.02	
F	% Moisture (D/E)*100	65.4%	52.8%	48.5%				27.2%	27.1%	
N	# OF DROPS	18	28	35				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**27.2%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**56**
Plastic Limit	**27**
Plastic Index	**29**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	5/18/2018	Michael D. Kelso, E.I.	5/23/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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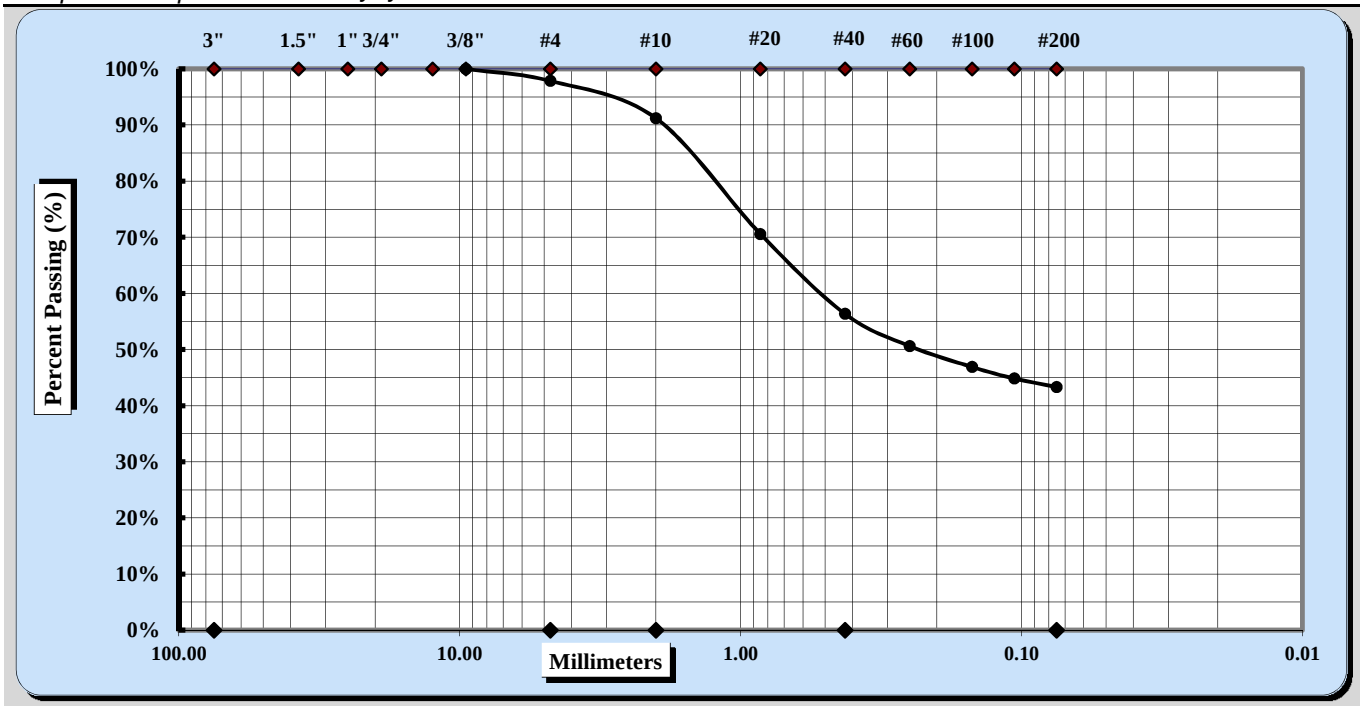
Sieve Analysis of Soils

Quality Assurance | *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/5/18 - 5/22/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID: B-61	Type: Split Spoon	Sample Date:	Various
Sample Log No.: 43-2321	Sample: 1	Depth:	0.0' - 2.0'
Sample Description:	Clayey sand (SC, A-7-6 (8))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	3/8"	Coarse Sand	7%	Fine Sand	13%
Gravel	2%	Medium Sand	35%	Silt & Clay	43%
Liquid Limit	56	Plastic Limit	27	Plastic Index	29

Coarse Sand	7%	Medium Sand	35%	Fine Sand	13%

Description of Sand & Gravel Particles: Rounded ☒ Angular ☒
Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

Notes / Deviations / References:

Michael D. Kelso, E.I.		Staff Professional	5/23/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

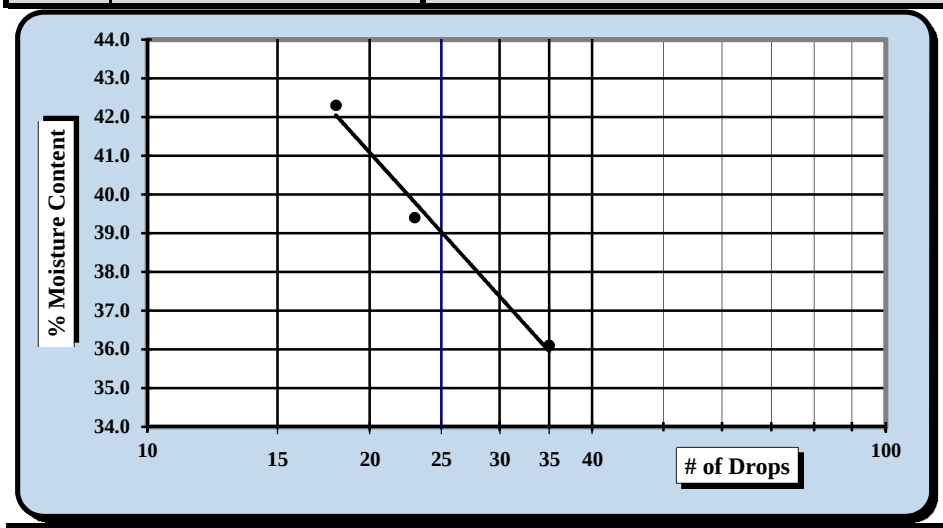
Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	5/18/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-61	Sample #: SS-6	Sample Date: Various
Log #:	43-2321		Depth: 13.5' - 15.0'
Sample Description:	Sandy lean clay (CL, A-6 (7))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	C-76	C-78	32-B				29	28-B	
A	Tare Weight	22.59	15.57	17.84				17.80	17.69	
B	Wet Soil Weight + A	26.12	25.73	26.39				25.82	26.78	
C	Dry Soil Weight + A	25.07	22.86	24.12				24.68	25.48	
D	Water Weight (B-C)	1.05	2.87	2.27				1.14	1.30	
E	Dry Soil Weight (C-A)	2.48	7.29	6.28				6.88	7.79	
F	% Moisture (D/E)*100	42.3%	39.4%	36.1%				16.6%	16.7%	
N	# OF DROPS	18	23	35				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**16.7%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**39**
Plastic Limit	**17**
Plastic Index	**22**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	5/18/2018	Michael D. Kelso, E.I.	5/23/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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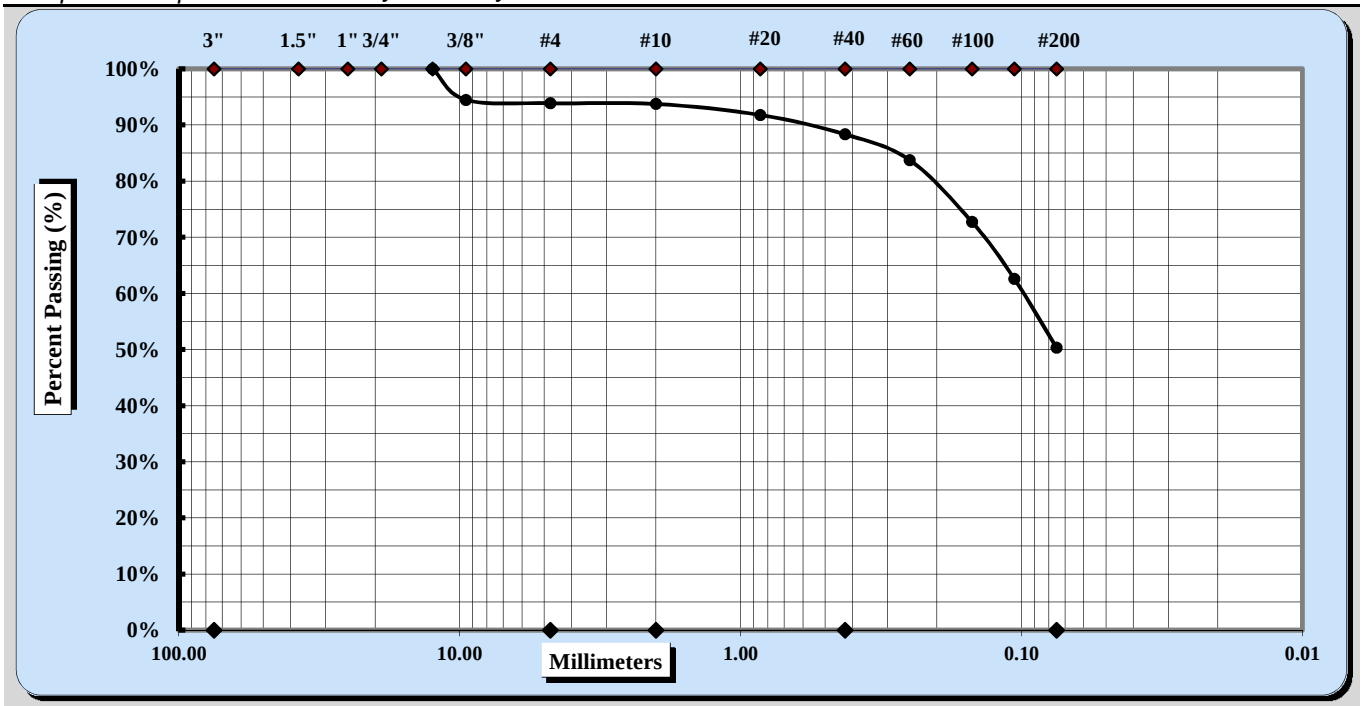
Sieve Analysis of Soils

Quality Assurance | *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/5/18 - 5/22/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID: B-61	Type: Split Spoon	Sample Date:	Various
Sample Log No.: 43-2321	Sample: 6	Depth:	13.5' - 15.0'
Sample Description:	Sandy lean clay (CL, A-6 (7))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	1/2"	Coarse Sand	0%	Fine Sand	38%
Gravel	6%	Medium Sand	5%	Silt & Clay	50%
Liquid Limit	39	Plastic Limit	17	Plastic Index	22

Coarse Sand	0%	Medium Sand	5%	Fine Sand	38%
Description of Sand & Gravel Particles:		Rounded	☒	Angular	☒
Hard & Durable	☒	Soft	☐	Weathered & Friable	☒

Notes / Deviations / References:

Michael D. Kelso, E.I.		Staff Professional	5/23/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

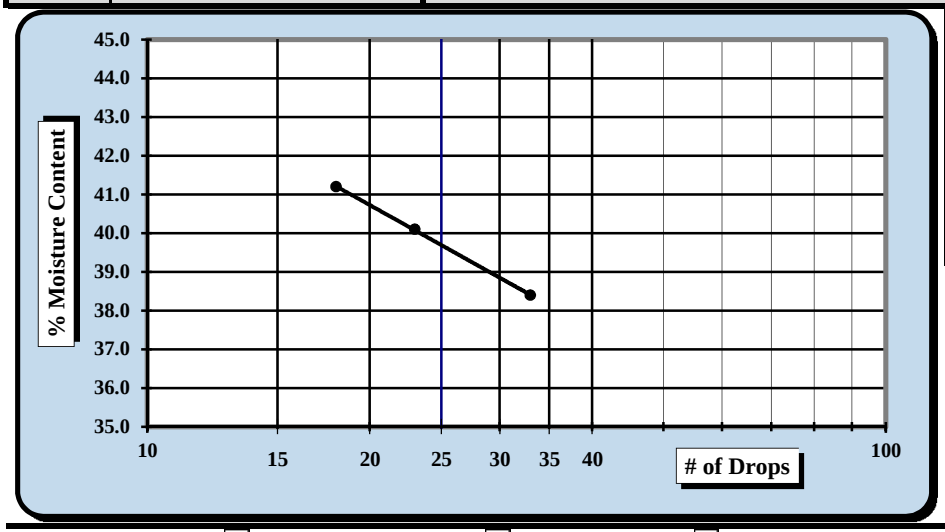
Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	5/19/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-61	Sample #: SS-7	Sample Date: Various
Log #:	43-2321		Depth: 18.5' - 20.0'
Sample Description:	Silty sand (SM, A-6 (3))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	22	5	9				7	3	
A	Tare Weight	15.37	15.39	15.42				15.40	15.48	
B	Wet Soil Weight + A	23.46	24.61	25.29				25.66	23.74	
C	Dry Soil Weight + A	21.10	21.97	22.55				23.43	21.96	
D	Water Weight (B-C)	2.36	2.64	2.74				2.23	1.78	
E	Dry Soil Weight (C-A)	5.73	6.58	7.13				8.03	6.48	
F	% Moisture (D/E)*100	41.2%	40.1%	38.4%				27.8%	27.5%	
N	# OF DROPS	18	23	33				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**27.7%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**40**
Plastic Limit	**28**
Plastic Index	**12**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	5/19/2018	Michael D. Kelso, E.I.	5/23/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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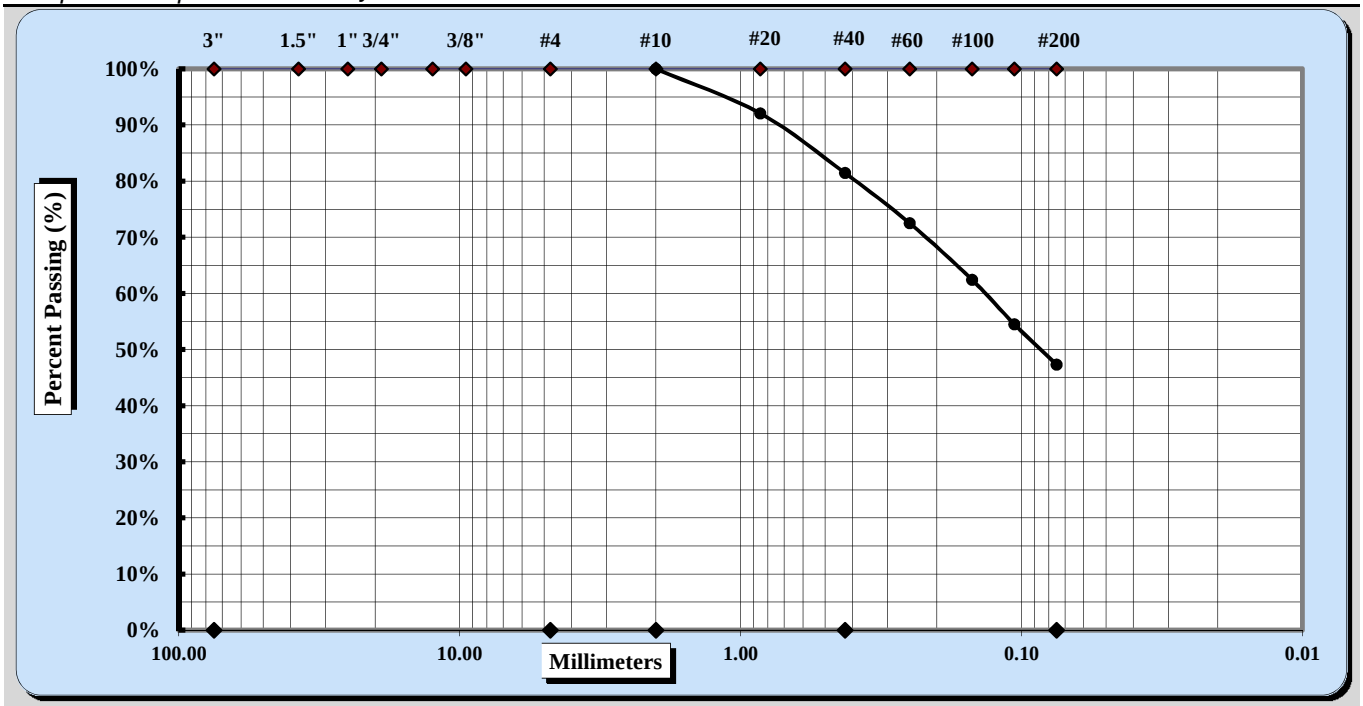
Sieve Analysis of Soils

Quality Assurance | *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/5/18 - 5/22/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID: B-61	Type: Split Spoon	Sample Date:	Various
Sample Log No.: 43-2321	Sample: 7	Depth:	18.5' - 20.0'
Sample Description:	Silty sand (SM, A-6 (3))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	No. 10	Coarse Sand	0%	Fine Sand	34%
Gravel	0%	Medium Sand	19%	Silt & Clay	47%
Liquid Limit	40	Plastic Limit	28	Plastic Index	12

Coarse Sand	0%	Medium Sand	19%	Fine Sand	34%
Description of Sand & Gravel Particles:		Rounded	☒	Angular	☒
Hard & Durable	☒	Soft	☒	Weathered & Friable	☒

Notes / Deviations / References:

Michael D. Kelso, E.I.		Staff Professional	5/23/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	5/19/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-62	Sample #: SS-1	Sample Date: Various
Log #:	43-2321		Elevation: 0.0' - 2.0'
Sample Description:	Sandy lean clay (CL, A-4 (2))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	17	21	16				4	10	
A	Tare Weight	15.50	15.51	15.64				15.44	15.40	
B	Wet Soil Weight + A	25.46	26.47	27.05				24.47	25.07	
C	Dry Soil Weight + A	23.36	24.24	24.84				23.26	23.78	
D	Water Weight (B-C)	2.10	2.23	2.21				1.21	1.29	
E	Dry Soil Weight (C-A)	7.86	8.73	9.20				7.82	8.38	
F	% Moisture (D/E)*100	26.7%	25.5%	24.0%				15.5%	15.4%	
N	# OF DROPS	18	23	35				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**15.5%**		

One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**25**
Plastic Limit	**16**
Plastic Index	**9**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	5/19/2018	Michael D. Kelso, E.I.	5/23/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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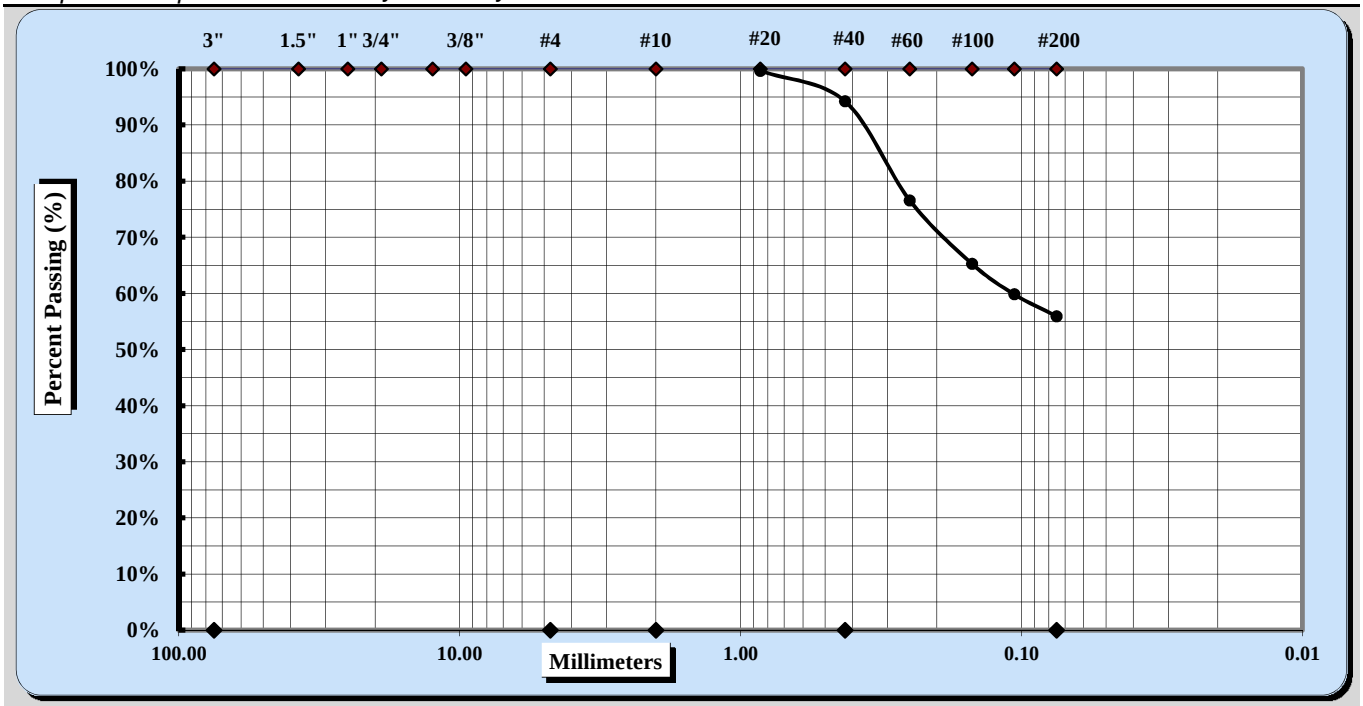
Sieve Analysis of Soils

Quality Assurance *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/5/18 - 5/22/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID: B-62	Type: Split Spoon	Sample Date:	Various
Sample Log No.: 43-2321	Sample: 1	Depth:	0.0' - 2.0'
Sample Description:	Sandy lean clay (CL, A-4 (2))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	No. 20	Coarse Sand	0%	Fine Sand	38%
Gravel	0%	Medium Sand	6%	Silt & Clay	56%
Liquid Limit	25	Plastic Limit	16	Plastic Index	9

Coarse Sand	0%	Medium Sand	6%	Fine Sand	38%
Description of Sand & Gravel Particles:		Rounded	☒	Angular	☒
Hard & Durable	☒	Soft	☐	Weathered & Friable	☐

Notes / Deviations / References:

Michael D. Kelso, E.I.		Staff Professional	5/23/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

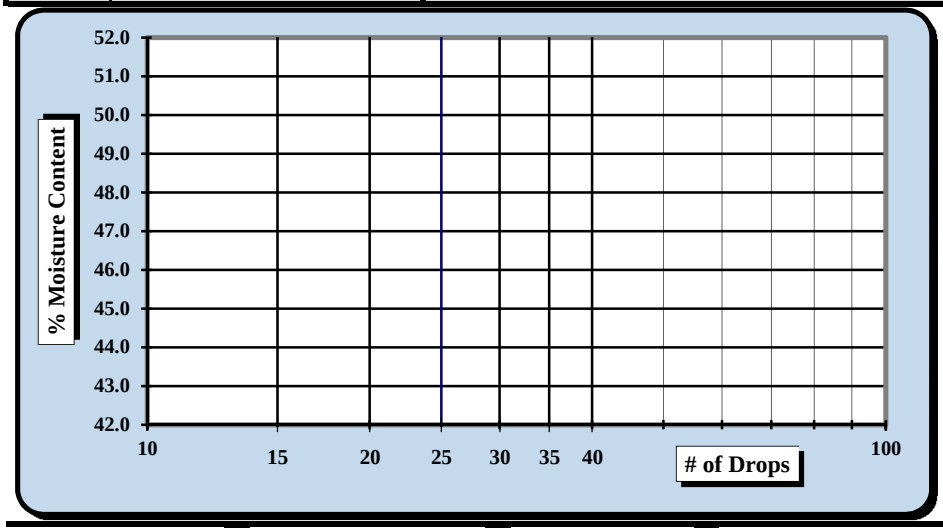
Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	5/19/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-62	Sample #: SS-2	Sample Date: Various
Log #:	43-2321		Depth: 2.0' - 4.0'
Sample Description:	Silty sand (SM, A-2-4)		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:									
A	Tare Weight									
B	Wet Soil Weight + A									
C	Dry Soil Weight + A									
D	Water Weight (B-C)									
E	Dry Soil Weight (C-A)									
F	% Moisture (D/E)*100									
N	# OF DROPS							*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*									



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☒

Liquid Limit	**NP**
Plastic Limit	**NP**
Plastic Index	**NP**
Group Symbol	**NP**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	5/19/2018	Michael D. Kelso, E.I.	5/23/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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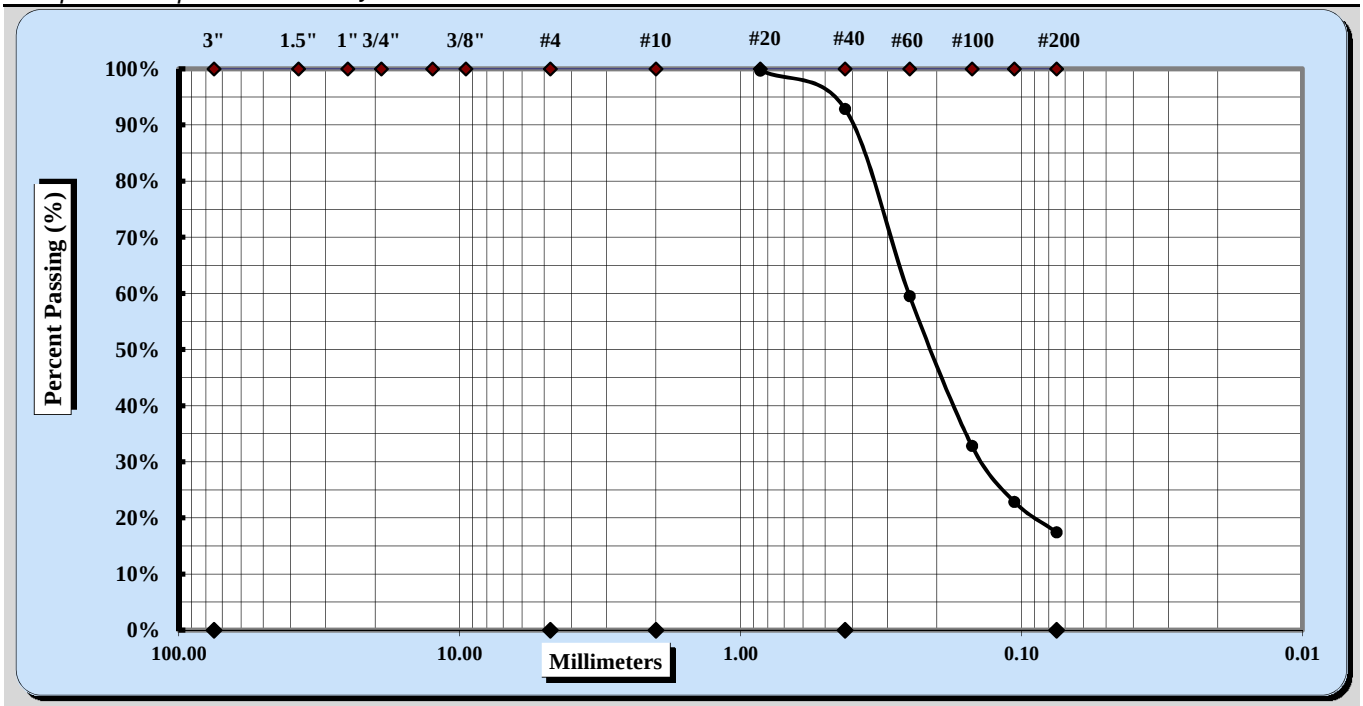
Sieve Analysis of Soils

Quality Assurance | *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/5/18 - 5/22/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID: B-62	Type: Split Spoon	Sample Date:	Various
Sample Log No.: 43-2321	Sample: 2	Depth:	2.0' - 4.0'
Sample Description:	Silty sand (SM, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	No. 20	Coarse Sand	0%	Fine Sand	75%
Gravel	0%	Medium Sand	7%	Silt & Clay	17%

Coarse Sand	0%	Medium Sand	7%	Fine Sand	75%
Description of Sand & Gravel Particles:		Rounded	☒	Angular	☐
Hard & Durable	☒	Soft	☒	Weathered & Friable	☐

Notes / Deviations / References:

Michael D. Kelso, E.I.		Staff Professional	5/23/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

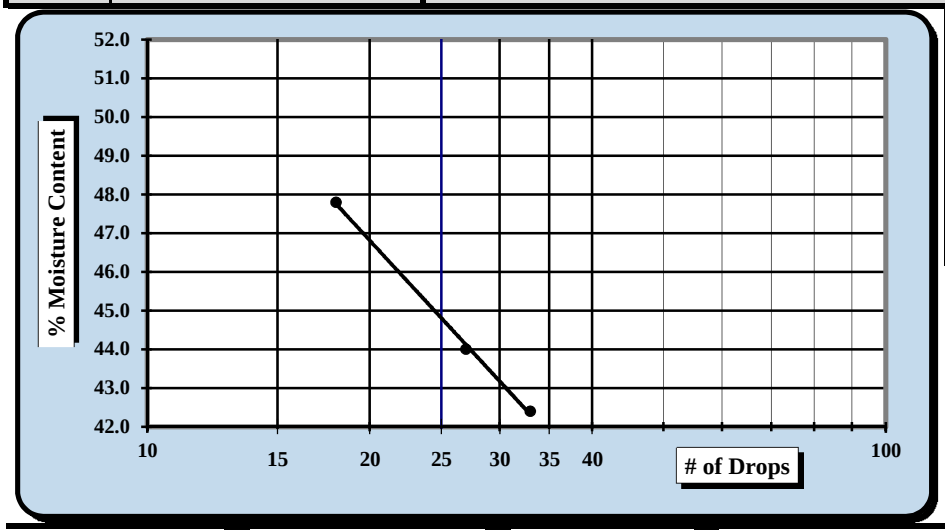
Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	5/19/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-62	Sample #: SS-5	Sample Date: Various
Log #:	43-2321		Depth: 8.0' - 10.0'
Sample Description:	Silt with sand (ML, A-7-5 (14))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	8	15	6				18	11	
A	Tare Weight	15.52	15.32	15.45				15.42	15.43	
B	Wet Soil Weight + A	23.62	24.49	25.49				23.89	24.71	
C	Dry Soil Weight + A	21.00	21.69	22.50				21.96	22.58	
D	Water Weight (B-C)	2.62	2.80	2.99				1.93	2.13	
E	Dry Soil Weight (C-A)	5.48	6.37	7.05				6.54	7.15	
F	% Moisture (D/E)*100	47.8%	44.0%	42.4%				29.5%	29.8%	
N	# OF DROPS	18	27	33				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**29.7%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**45**
Plastic Limit	**30**
Plastic Index	**15**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	5/19/2018	Michael D. Kelso, E.I.	5/23/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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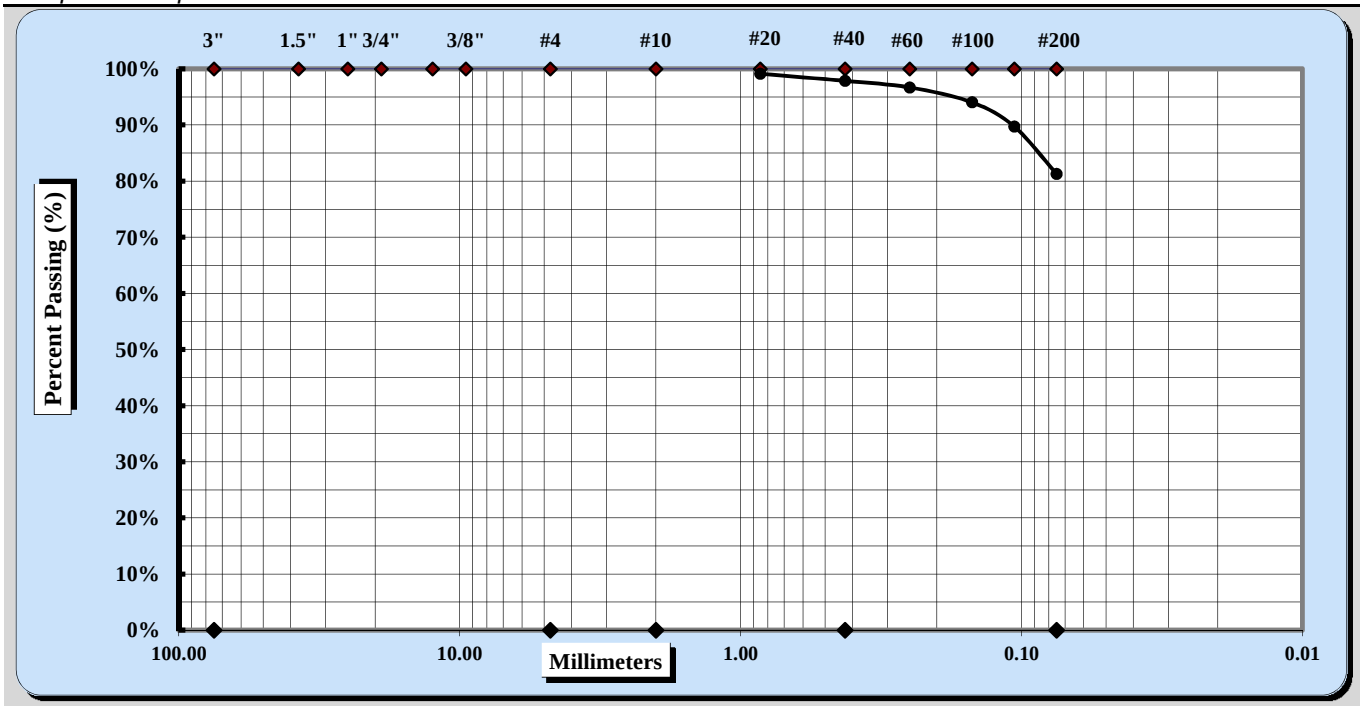
Sieve Analysis of Soils

Quality Assurance | *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/23/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/5/18 - 5/22/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID: B-62	Type: Split Spoon	Sample Date:	Various
Sample Log No.: 43-2321	Sample: 5	Depth:	8.0' - 10.0'
Sample Description:	Silt with sand (ML, A-7-5 (14))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	No. 20	Coarse Sand	0%	Fine Sand	17%
Gravel	0%	Medium Sand	2%	Silt & Clay	81%
Liquid Limit	45	Plastic Limit	30	Plastic Index	15

Coarse Sand	0%	Medium Sand	2%	Fine Sand	17%
Description of Sand & Gravel Particles:			Rounded ☒	Angular ☒	
Hard & Durable ☒		Soft ☒		Weathered & Friable ☒	

Notes / Deviations / References:

Michael D. Kelso, E.I.		Staff Professional	5/23/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	2/14/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/12 - 2/13/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sampled by:	S&ME	Sample Date(s):	Varies
Sampling Method:	Split-spoon	Drill Rig:	CME 750/Diedrich D-50

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 13942 Calibration Date: 8/18/17 Oven ID. 13978 Calibration Date: 10/07/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
DH-4	SS-1	0.0 - 2.0	WX-Z	0.00	71.20	64.42	6.78	10.5%	
DH-4	SS-2	2.0 - 4.0	D-5	0.00	50.95	43.48	7.47	17.2%	
DH-4	SS-4	6.0 - 8.0	YM-5	0.00	52.42	44.92	7.50	16.7%	
DH-4	SS-6	13.5 - 15.0	D-12	0.00	54.02	41.18	12.84	31.2%	
DH-5	SS-1	0.0 - 2.0	D-22	0.00	72.35	63.67	8.68	13.6%	
DH-5	SS-2	2.0 - 4.0	YM-7	0.00	73.44	58.17	15.27	26.3%	
DH-5	SS-3	4.0 - 6.0	YM-6	0.00	73.42	61.16	12.26	20.0%	
DH-5	SS-4	6.0 - 8.0	D-21	0.00	72.14	63.77	8.37	13.1%	
DH-6	SS-1	0.0 - 2.0	D-7	0.00	70.54	59.07	11.47	19.4%	
DH-6	SS-2	2.0 - 4.0	D-9	0.00	71.96	61.42	10.54	17.2%	
DH-6	SS-3	4.0 - 6.0	D-3A	0.00	73.49	60.80	12.69	20.9%	

Notes / Deviations / References

AASHTO T 265: Laboratory Determination of Moisture Content of Soils

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Benjamin Kovaleski	Benjamin J. Kovaleski	NICET Lab Level III/117226	2/14/18
Technician Name	*Signature*	*Certification Type / No.*	*Date*
Brian Vaughan, P.E.	Brian Vaughan	Group Leader	2/14/18
Technical Responsibility	*Signature*	*Position*	*Date*

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

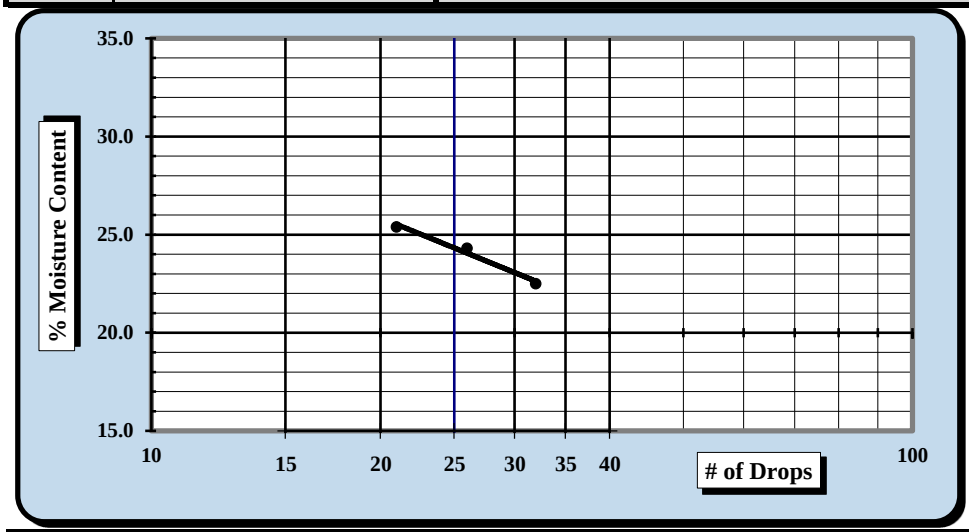
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/14/18
Project Name:	Carolina Crossroads Project	Test Date:	3/13/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	DH-4	Sample #:	SS-1	Sample Date:	1/04/18
Location:	Seismic Boring	Type:	Split-spoon	Depth:	0.0' - 2.0'
Sample Description:	Clayey Sand (SC, A-2-4)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	1	2	3				4	5	
A	Tare Weight	26.99	26.46	26.37				25.93	26.95	
B	Wet Soil Weight + A	46.06	43.64	43.43				31.95	33.15	
C	Dry Soil Weight + A	42.56	40.28	39.97				31.21	32.38	
D	Water Weight (B-C)	3.50	3.36	3.46				0.74	0.77	
E	Dry Soil Weight (C-A)	15.57	13.82	13.60				5.28	5.43	
F	% Moisture (D/E)*100	22.5%	24.3%	25.4%				14.0%	14.2%	
N	# OF DROPS	32	26	21				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**14.1%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**24**
Plastic Limit	**14**
Plastic Index	**10**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 28.4%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	3/14/18	Brian Vaughn	3/14/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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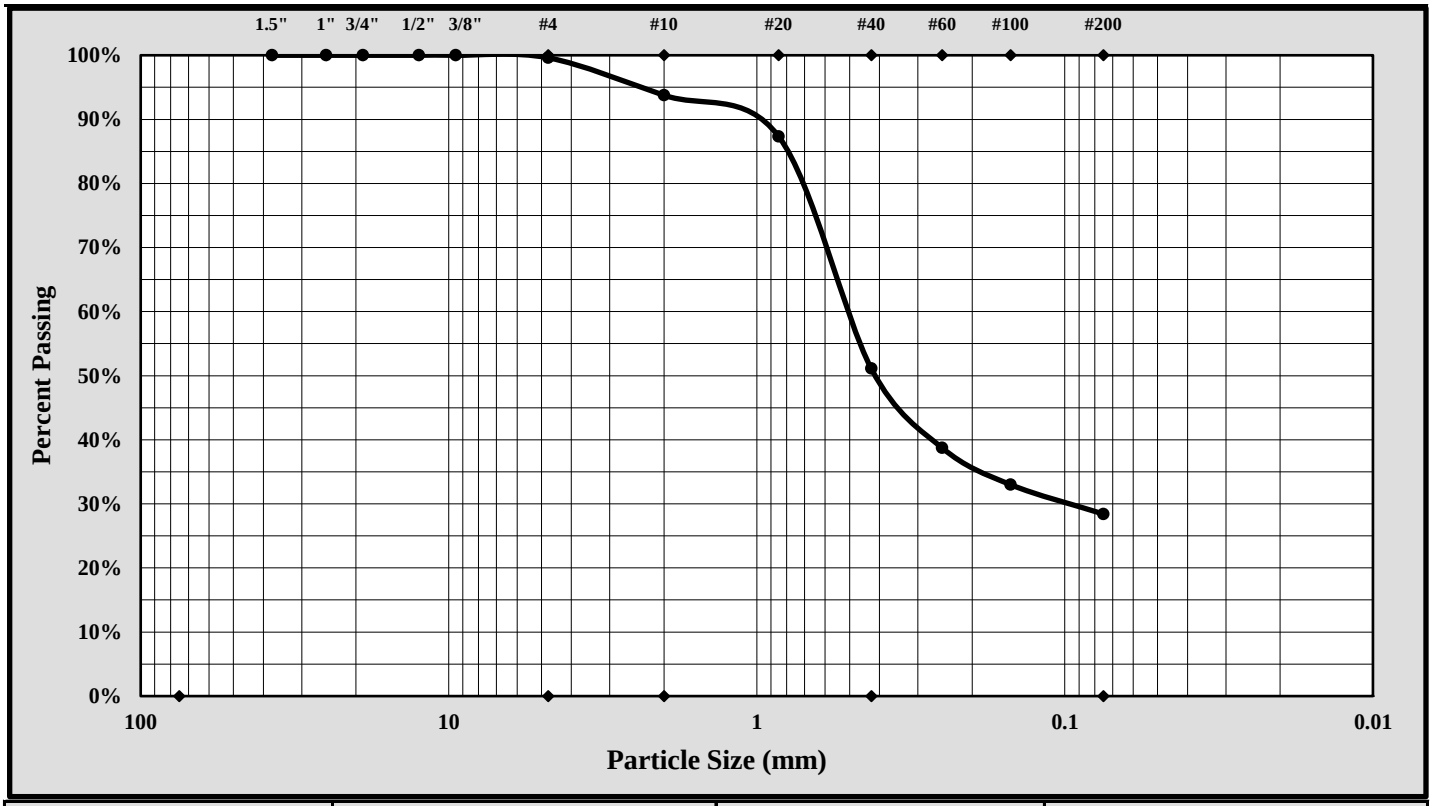
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/13/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/01 - 3/09/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	DH-4	Sample #: SS-1	Sample Date: 1/04/18
Location:	Seismic Boring	Type: Split-spoon	Depth: 0.0' - 2.0'
Sample Description:	Clayey Sand (SC, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.4%
Silt & Clay (% Passing #200):	28.4%	Total Sand:	71.2%

Liquid Limit	24	Plastic Limit	14	Plastic Index	10
Coarse Sand:	5.8%	Medium Sand:	42.6%	Fine Sand:	22.7%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/13/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

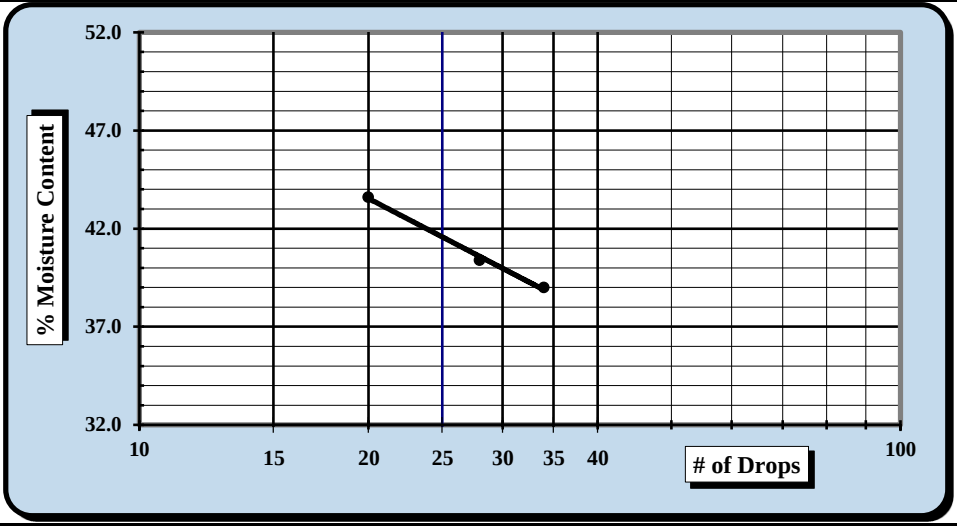
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/14/18
Project Name:	Carolina Crossroads Project	Test Date:	3/13/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	DH-4	Sample #:	SS-2	Sample Date:	1/04/18
Location:	Seismic Boring	Type:	Split-spoon	Depth:	2.0' - 4.0'
Sample Description:	Sandy Lean Clay (CL, A-7-6(11))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	6	7	8				9	10	
A	Tare Weight	27.76	26.30	27.32				26.86	26.76	
B	Wet Soil Weight + A	42.69	40.66	42.21				33.55	34.84	
C	Dry Soil Weight + A	38.50	36.53	37.69				32.28	33.32	
D	Water Weight (B-C)	4.19	4.13	4.52				1.27	1.52	
E	Dry Soil Weight (C-A)	10.74	10.23	10.37				5.42	6.56	
F	% Moisture (D/E)*100	39.0%	40.4%	43.6%				23.4%	23.2%	
N	# OF DROPS	34	28	20				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**23.3%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐
Liquid Limit **42**
Plastic Limit **23**
Plastic Index **19**
Group Symbol **CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 65.6%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski — *Technician Name*
3/14/18 — *Date*
Brian Vaughn — *Technical Responsibility*
3/14/18 — *Date*

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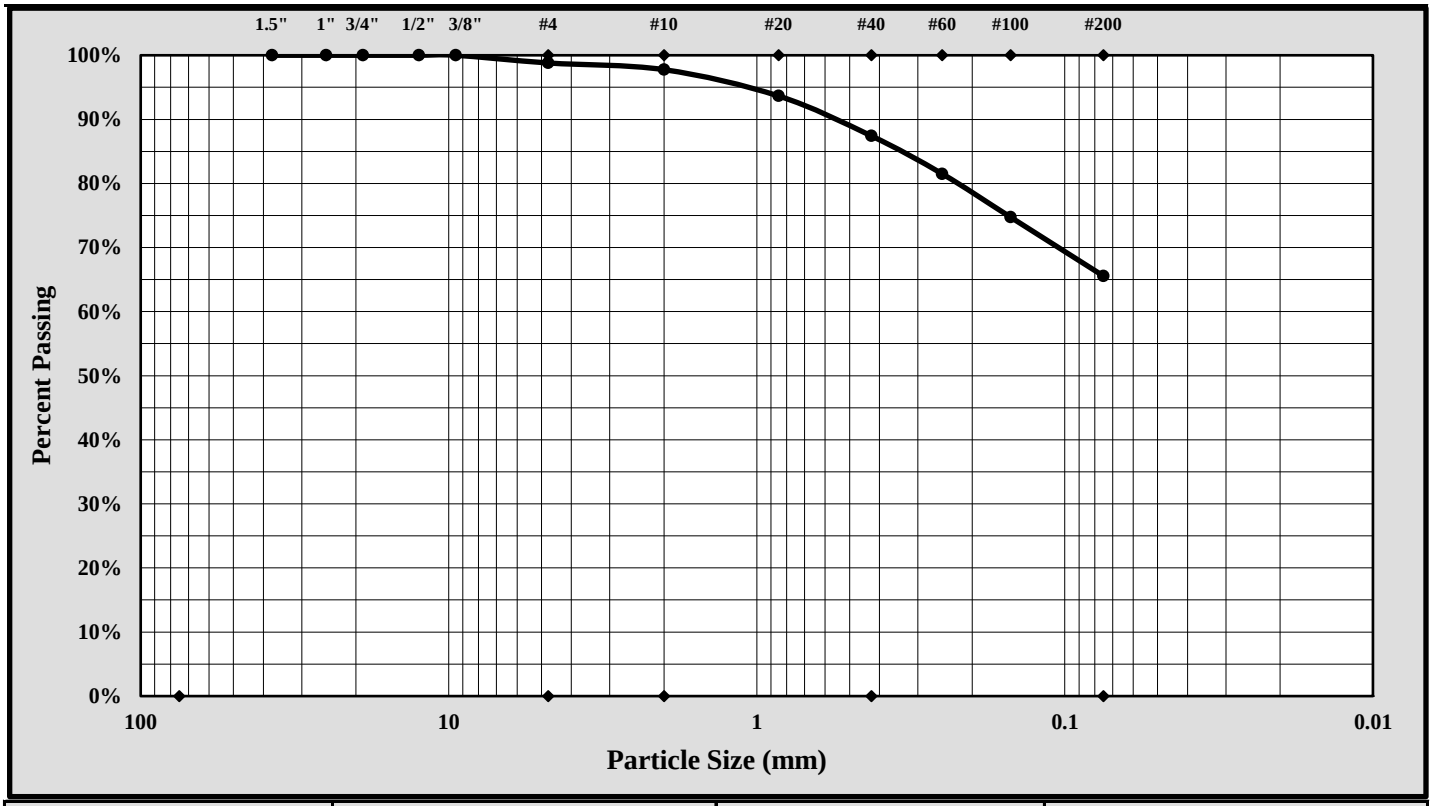
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/13/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/01 - 3/09/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	DH-4	Sample #: SS-2	Sample Date: 1/04/18
Location:	Seismic Boring	Type: Split-spoon	Depth: 2.0' - 4.0'
Sample Description:	Sandy Lean Clay (CL, A-7-6(11))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	9.50 mm	Gravel:	1.2%
Silt & Clay (% Passing #200):	65.6%	Total Sand:	33.2%

Liquid Limit	42	Plastic Limit	23	Plastic Index	19
Coarse Sand:	1.0%	Medium Sand:	10.3%	Fine Sand:	21.9%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/13/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

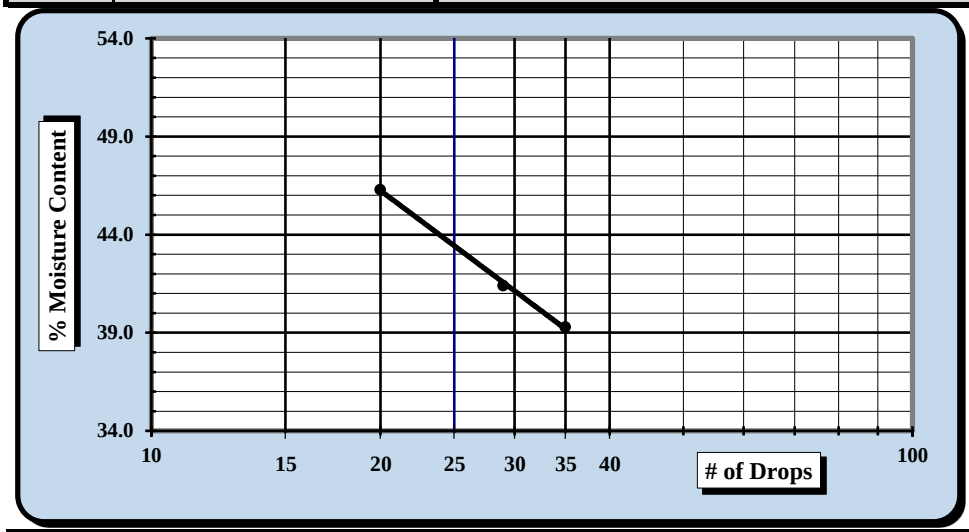
Project #:	1461-16-047.2B	Report Date:	3/14/18
Project Name:	Carolina Crossroads Project	Test Date:	3/13/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	DH-4	Sample #:	SS-4	Sample Date:	1/04/18
Location:	Seismic Boring	Type:	Split-spoon	Depth:	6.0' - 8.0'

Sample Description: Clayey Sand with Gravel (SC, A-2-7(2))

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	11	12	13				14	15	
A	Tare Weight	26.67	26.66	26.79				26.66	27.61	
B	Wet Soil Weight + A	41.14	43.58	42.47				32.66	33.61	
C	Dry Soil Weight + A	37.06	38.63	37.51				31.62	32.59	
D	Water Weight (B-C)	4.08	4.95	4.96				1.04	1.02	
E	Dry Soil Weight (C-A)	10.39	11.97	10.72				4.96	4.98	
F	% Moisture (D/E)*100	39.3%	41.4%	46.3%				21.0%	20.5%	
N	# OF DROPS	35	29	20				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**20.8%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐
Liquid Limit **44**
Plastic Limit **21**
Plastic Index **23**
Group Symbol **CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 27.1%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski — *Technician Name*
3/14/18 — *Date*
Brian Vaughn — *Technical Responsibility*
3/14/18 — *Date*

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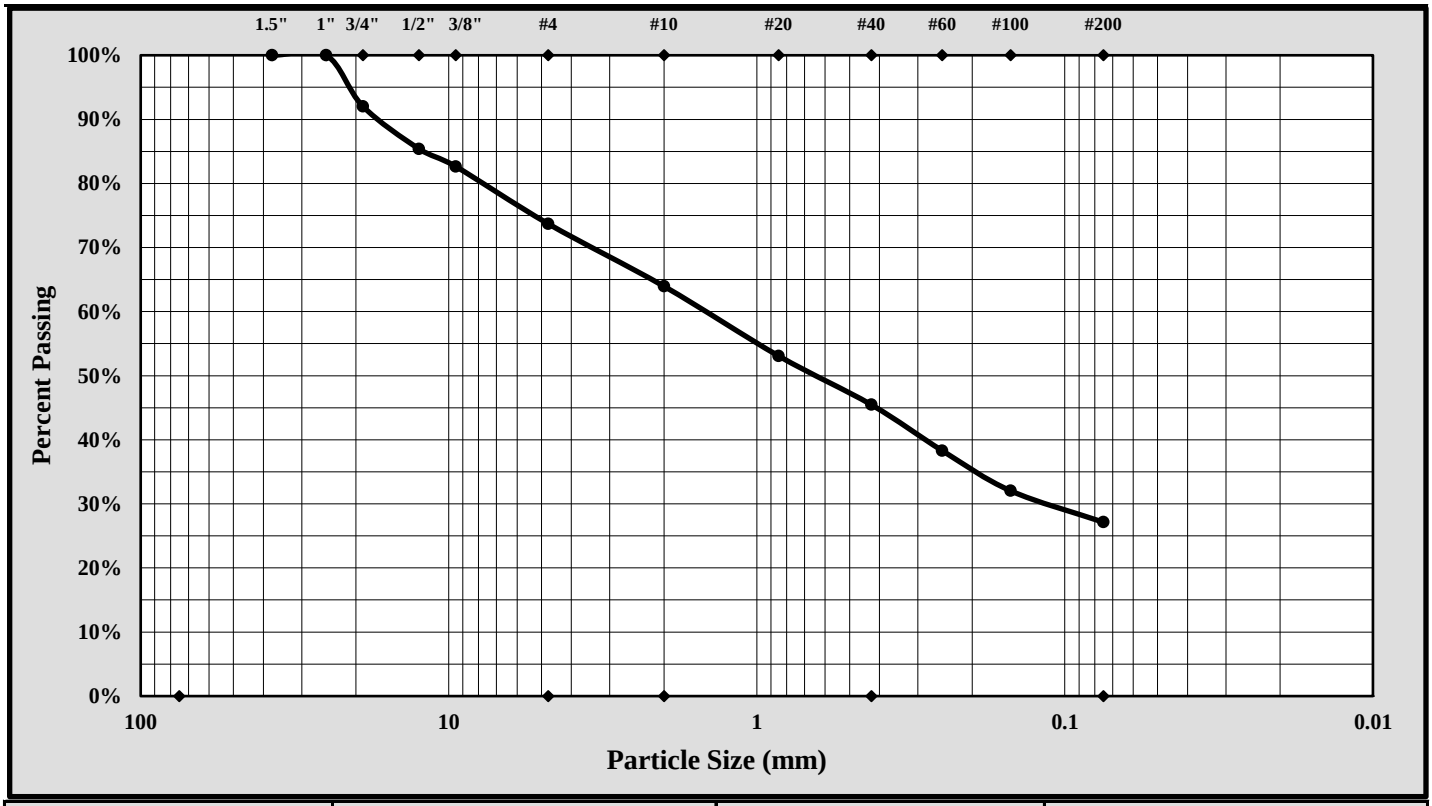
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/13/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/01 - 3/09/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	DH-4	Sample #: SS-4	Sample Date: 1/04/18
Location:	Seismic Boring	Type: Split-spoon	Depth: 6.0' - 8.0'
Sample Description:	Clayey Sand with Gravel (SC, A-2-7(2))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	25.00 mm	Gravel:	26.3%
Silt & Clay (% Passing #200):	27.1%	Total Sand:	46.6%

Liquid Limit	44	Plastic Limit	21	Plastic Index	23
Coarse Sand:	9.7%	Medium Sand:	18.5%	Fine Sand:	18.3%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/13/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

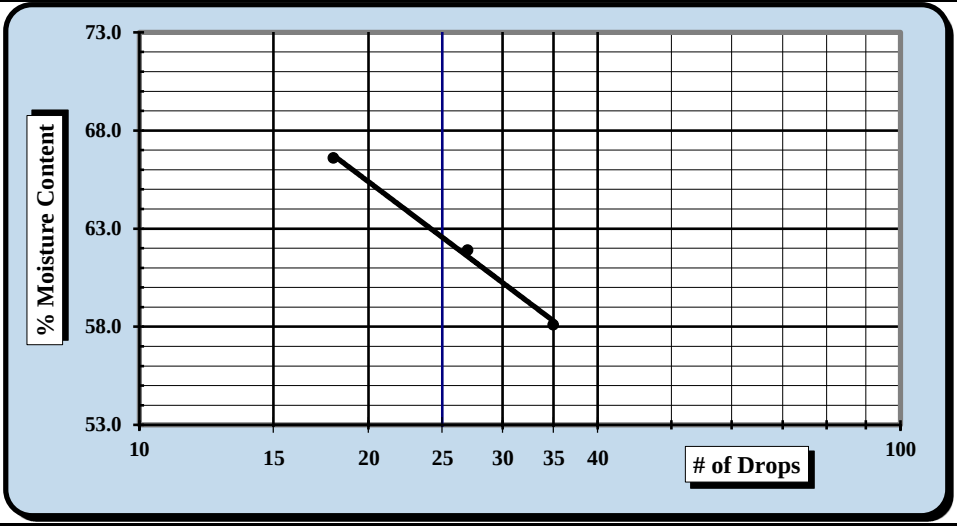
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/14/18
Project Name:	Carolina Crossroads Project	Test Date:	3/13/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	DH-4	Sample #:	SS-6	Sample Date:	1/04/18
Location:	Seismic Boring	Type:	Split-spoon	Depth:	13.5' - 15.0'
Sample Description:	Elastic Silt with Sand (MH, A-7-5(24))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	16	17	18				19	20	
A	Tare Weight	26.57	26.63	26.79				26.68	26.83	
B	Wet Soil Weight + A	43.80	39.66	41.32				32.68	33.13	
C	Dry Soil Weight + A	37.47	34.68	35.51				31.02	31.40	
D	Water Weight (B-C)	6.33	4.98	5.81				1.66	1.73	
E	Dry Soil Weight (C-A)	10.90	8.05	8.72				4.34	4.57	
F	% Moisture (D/E)*100	58.1%	61.9%	66.6%				38.2%	37.9%	
N	# OF DROPS	35	27	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**38.1%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**63**
Plastic Limit	**38**
Plastic Index	**25**
Group Symbol	**MH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 80.9%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	3/14/18	Brian Vaughn	3/14/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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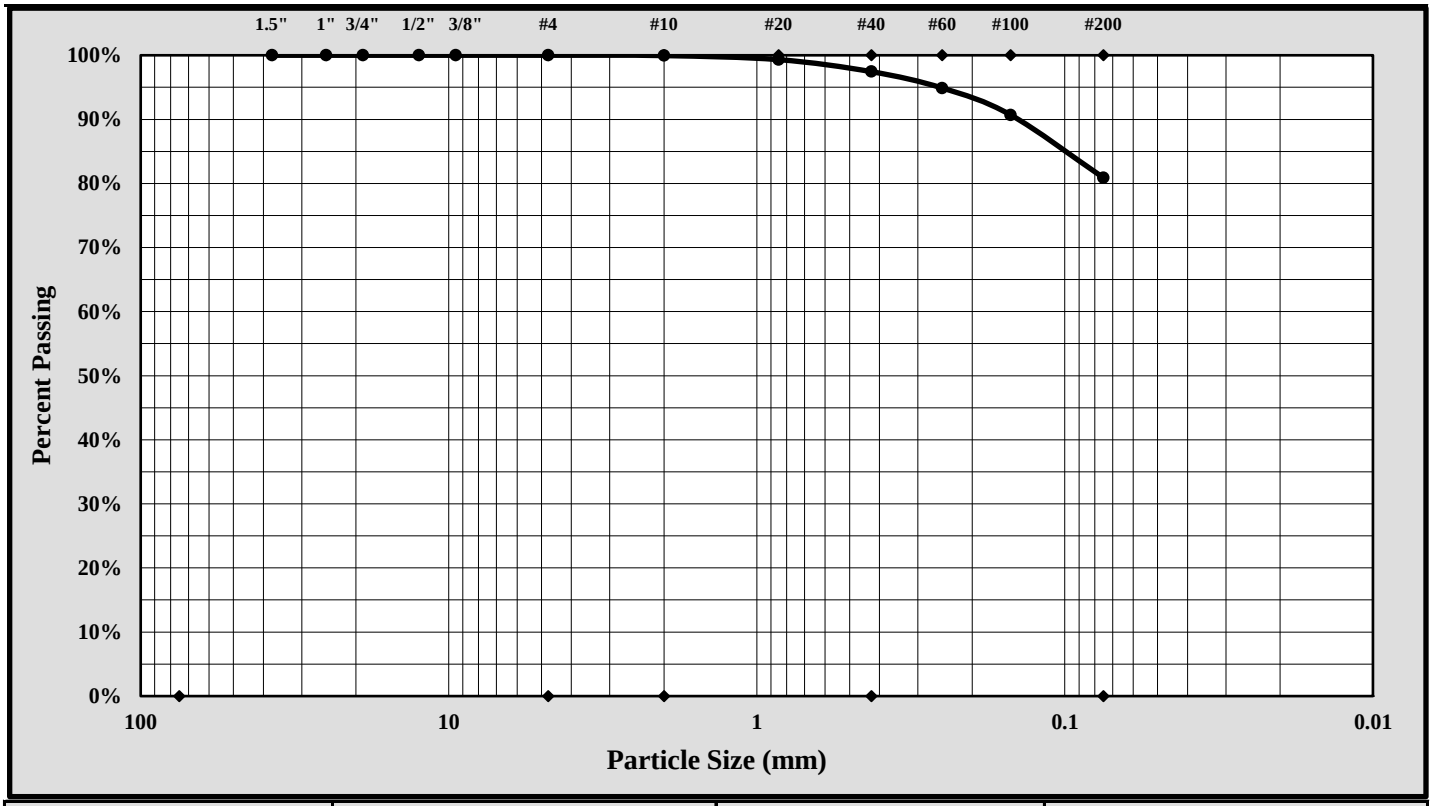
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/13/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/02 - 3/09/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	DH-4	Sample #: SS-6	Sample Date: 1/04/18
Location:	Seismic Boring	Type: Split-spoon	Depth: 13.5' - 15.0'
Sample Description:	Elastic Silt with Sand (MH, A-7-5(24))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	.85 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	80.9%	Total Sand:	19.1%

Liquid Limit	63	Plastic Limit	38	Plastic Index	25
Coarse Sand:	0.1%	Medium Sand:	2.5%	Fine Sand:	16.5%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/13/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

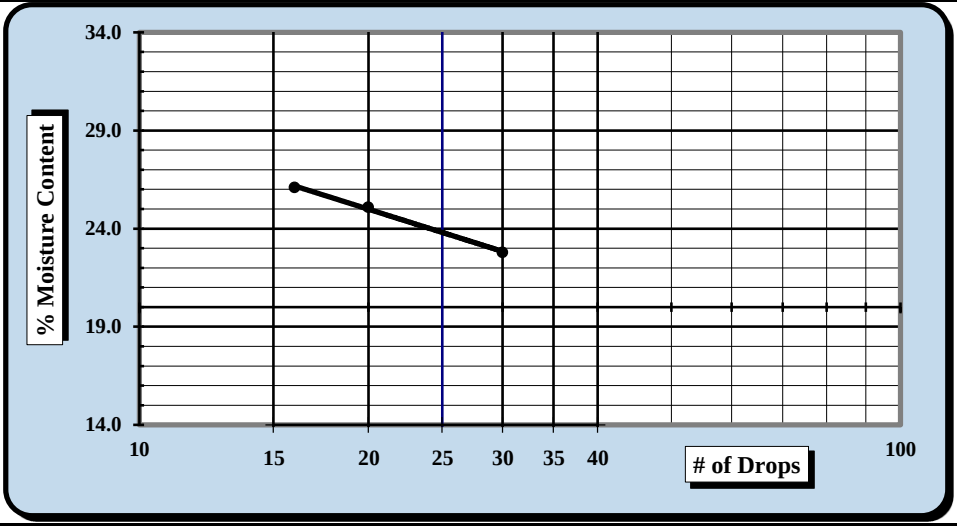
Project #:	1461-16-047.2B	Report Date:	3/14/18
Project Name:	Carolina Crossroads Project	Test Date:	3/13/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	DH-5	Sample #:	SS-1	Sample Date:	1/04/18
Location:	Seismic Boring	Type:	Split-spoon	Depth:	0.0' - 2.0'

Sample Description: Silty Clay with Sand (CL-ML, A-4(3))

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	21	22	23				24	25	
A	Tare Weight	28.09	25.68	27.23				26.01	26.83	
B	Wet Soil Weight + A	48.70	45.87	43.86				32.82	35.54	
C	Dry Soil Weight + A	44.87	41.82	40.42				31.82	34.27	
D	Water Weight (B-C)	3.83	4.05	3.44				1.00	1.27	
E	Dry Soil Weight (C-A)	16.78	16.14	13.19				5.81	7.44	
F	% Moisture (D/E)*100	22.8%	25.1%	26.1%				17.2%	17.1%	
N	# OF DROPS	30	20	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**17.2%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**24**
Plastic Limit	**17**
Plastic Index	**7**
Group Symbol	**CL-ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 70.8%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	3/14/18	Brian Vaughn	3/14/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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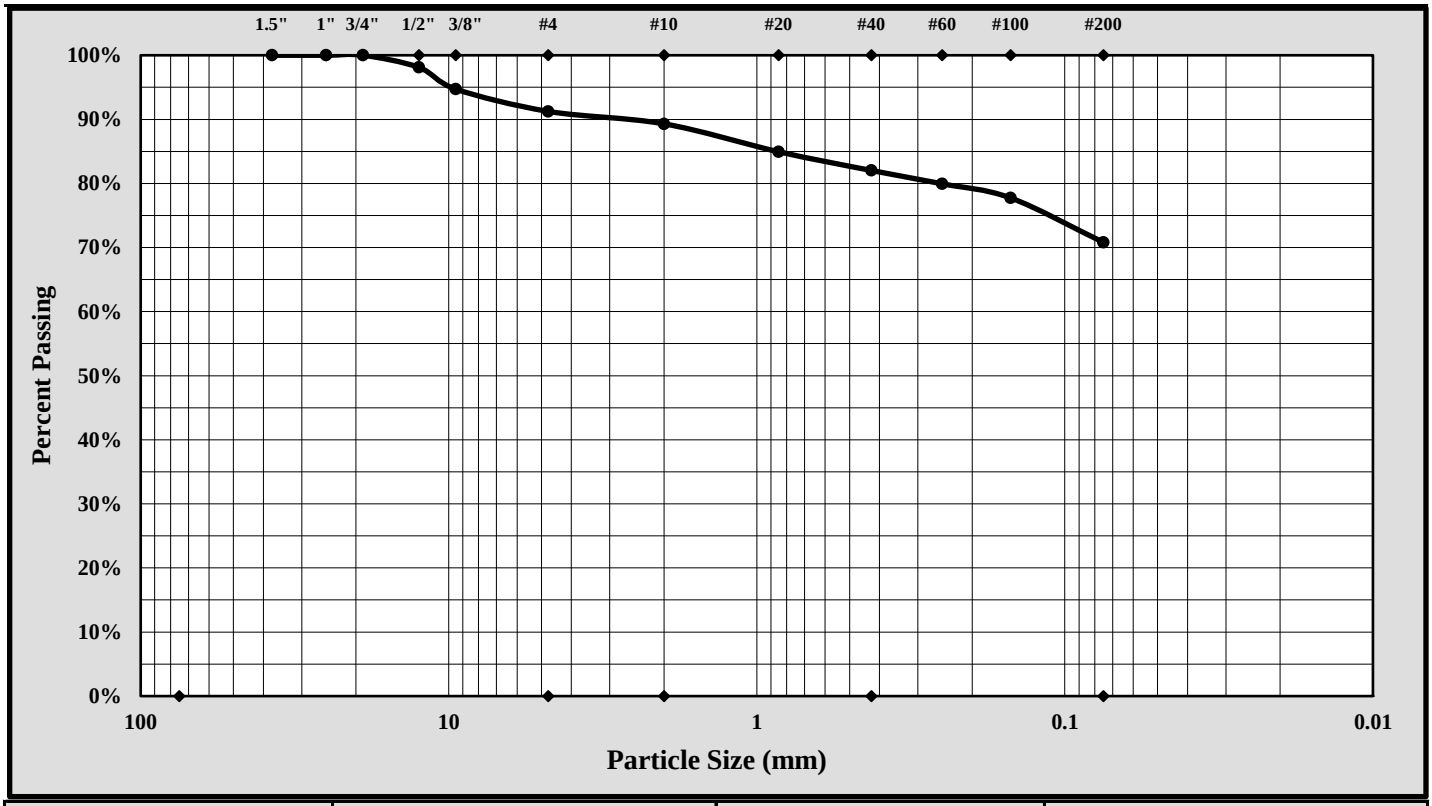
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/13/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/05 - 3/09/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	DH-5	Sample #: SS-1	Sample Date: 1/04/18
Location:	Seismic Boring	Type: Split-spoon	Depth: 0.0' - 2.0'
Sample Description:	Silty Clay with Sand (CL-ML, A-4(3))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	19.00 mm	Gravel:	8.8%
Silt & Clay (% Passing #200):	70.8%	Total Sand:	20.4%

Liquid Limit	24	Plastic Limit	17	Plastic Index	7
Coarse Sand:	1.9%	Medium Sand:	7.3%	Fine Sand:	11.2%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/13/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

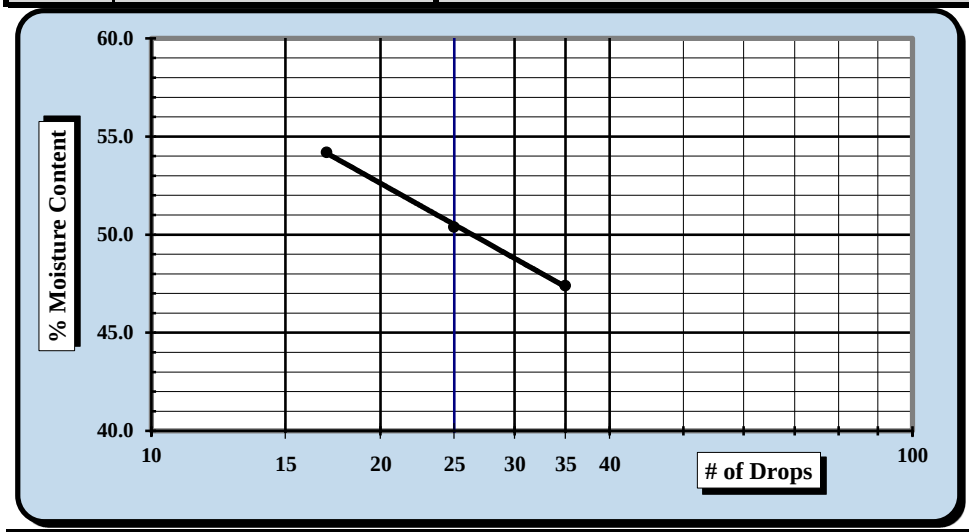
Project #:	1461-16-047.2B	Report Date:	3/14/18
Project Name:	Carolina Crossroads Project	Test Date:	3/13/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	DH-5	Sample #:	SS-2	Sample Date:	1/04/18
Location:	Seismic Boring	Type:	Split-spoon	Depth:	2.0' - 4.0'

Sample Description: Fat Clay with Sand (CH, A-7-6(23))

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	26	27	28				29	30	
A	Tare Weight	27.33	27.03	26.83				27.03	27.39	
B	Wet Soil Weight + A	39.95	43.23	38.58				33.51	35.02	
C	Dry Soil Weight + A	35.89	37.80	34.45				32.36	33.66	
D	Water Weight (B-C)	4.06	5.43	4.13				1.15	1.36	
E	Dry Soil Weight (C-A)	8.56	10.77	7.62				5.33	6.27	
F	% Moisture (D/E)*100	47.4%	50.4%	54.2%				21.6%	21.7%	
N	# OF DROPS	35	25	17				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**21.7%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**50**
Plastic Limit	**22**
Plastic Index	**28**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 79.5%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	3/14/18	Brian Vaughn	3/14/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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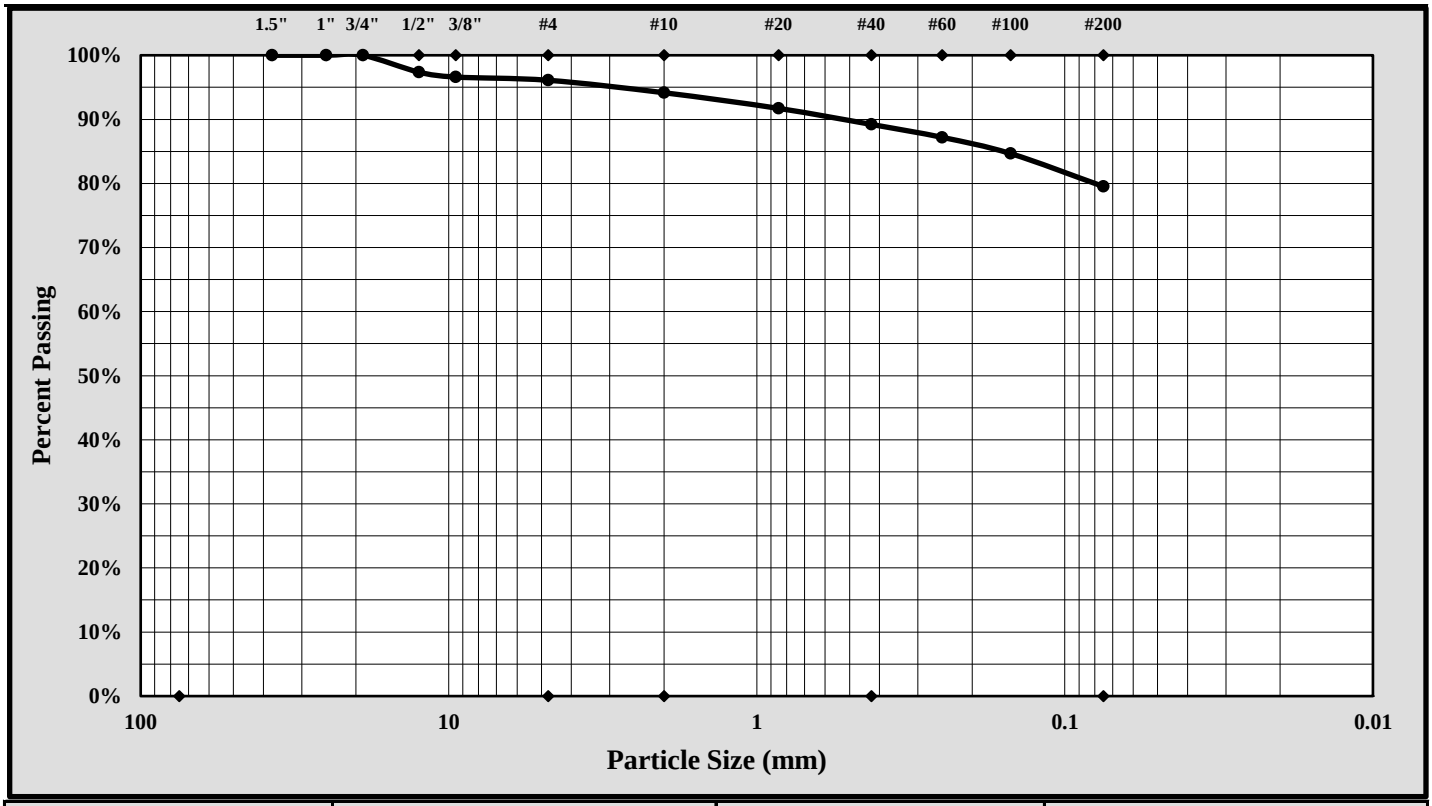
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/13/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/02 - 3/09/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	DH-5	Sample #: SS-2	Sample Date: 1/04/18
Location:	Seismic Boring	Type: Split-spoon	Depth: 2.0' - 4.0'
Sample Description:	Fat Clay with Sand (CH, A-7-6(23))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	19.00 mm	Gravel:	3.9%
Silt & Clay (% Passing #200):	79.5%	Total Sand:	16.6%

Liquid Limit	50	Plastic Limit	22	Plastic Index	28
Coarse Sand:	1.9%	Medium Sand:	4.9%	Fine Sand:	9.7%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/13/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

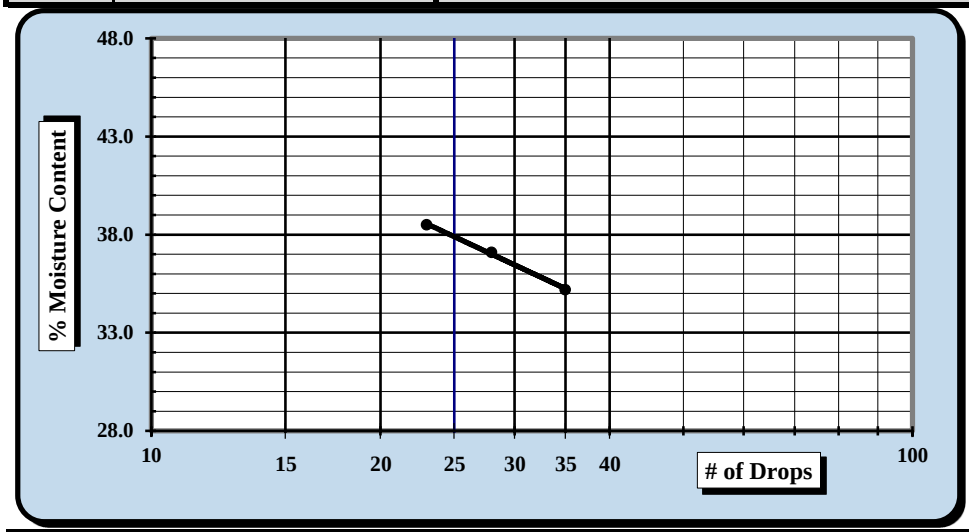
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/15/18
Project Name:	Carolina Crossroads Project	Test Date:	3/14/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	DH-5	Sample #:	SS-3	Sample Date:	1/04/18
Location:	Seismic Boring	Type:	Split-spoon	Depth:	4.0' - 6.0'
Sample Description:	Gravelly Lean Clay with Sand (CL, A-6(8))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	1	2	3				4	5	
A	Tare Weight	26.69	26.47	26.35				25.92	26.95	
B	Wet Soil Weight + A	49.56	47.44	42.79				33.13	34.70	
C	Dry Soil Weight + A	43.60	41.77	38.22				31.74	33.22	
D	Water Weight (B-C)	5.96	5.67	4.57				1.39	1.48	
E	Dry Soil Weight (C-A)	16.91	15.30	11.87				5.82	6.27	
F	% Moisture (D/E)*100	35.2%	37.1%	38.5%				23.9%	23.6%	
N	# OF DROPS	35	28	23				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**23.8%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐
Liquid Limit **38**
Plastic Limit **24**
Plastic Index **14**
Group Symbol **CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 66.6%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski — *Technician Name*
3/15/18 — *Date*
Brian Vaughn — *Technical Responsibility*
3/15/18 — *Date*

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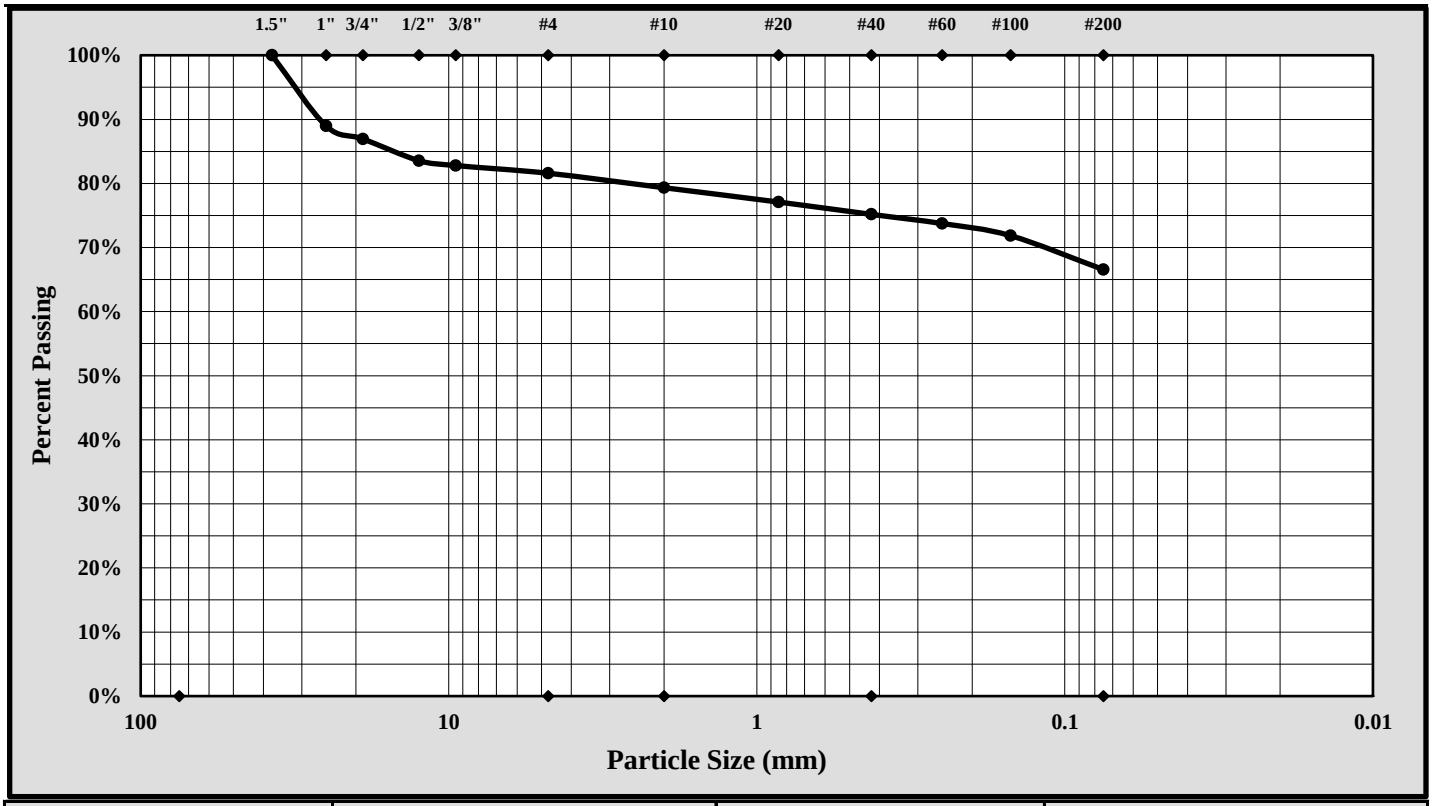
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/15/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/02 - 3/10/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	DH-5	Sample #: SS-3	Sample Date: 1/04/18
Location:	Seismic Boring	Type: Split-spoon	Depth: 4.0' - 6.0'
Sample Description:	Gravelly Lean Clay with Sand (CL, A-6(8))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	38.1 mm	Gravel:	18.4%
Silt & Clay (% Passing #200):	66.6%	Total Sand:	15.0%

Liquid Limit	38	Plastic Limit	24	Plastic Index	14
Coarse Sand:	2.3%	Medium Sand:	4.2%	Fine Sand:	8.6%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Brian Vaughan, P.E. — *Technical Responsibility*
Brian Vaughan — *Signature*
Group Leader — *Position*
3/15/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

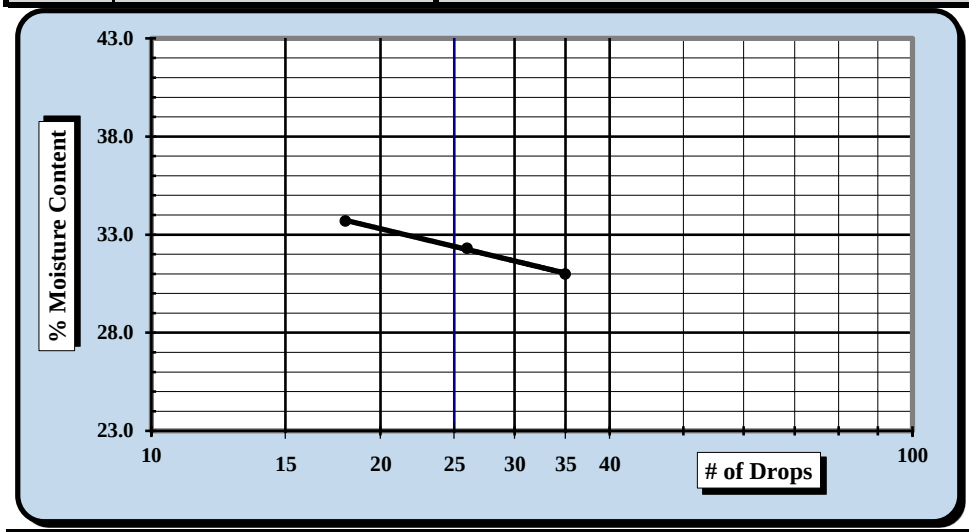
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/15/18
Project Name:	Carolina Crossroads Project	Test Date:	3/14/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	DH-5	Sample #:	SS-4	Sample Date:	1/04/18
Location:	Seismic Boring	Type:	Split-spoon	Depth:	6.0' - 8.0'
Sample Description:	Silty Sand (SM, A-4(1))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	6	7	8				9	10	
A	Tare Weight	27.76	26.30	27.32				26.85	26.75	
B	Wet Soil Weight + A	48.30	47.22	50.60				33.84	33.66	
C	Dry Soil Weight + A	43.44	42.11	44.73				32.44	32.27	
D	Water Weight (B-C)	4.86	5.11	5.87				1.40	1.39	
E	Dry Soil Weight (C-A)	15.68	15.81	17.41				5.59	5.52	
F	% Moisture (D/E)*100	31.0%	32.3%	33.7%				25.0%	25.2%	
N	# OF DROPS	35	26	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**25.1%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐
Liquid Limit **32**
Plastic Limit **25**
Plastic Index **7**
Group Symbol **ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 49.5%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski — *Technician Name*
3/15/18 — *Date*
Brian Vaughn — *Technical Responsibility*
3/15/18 — *Date*

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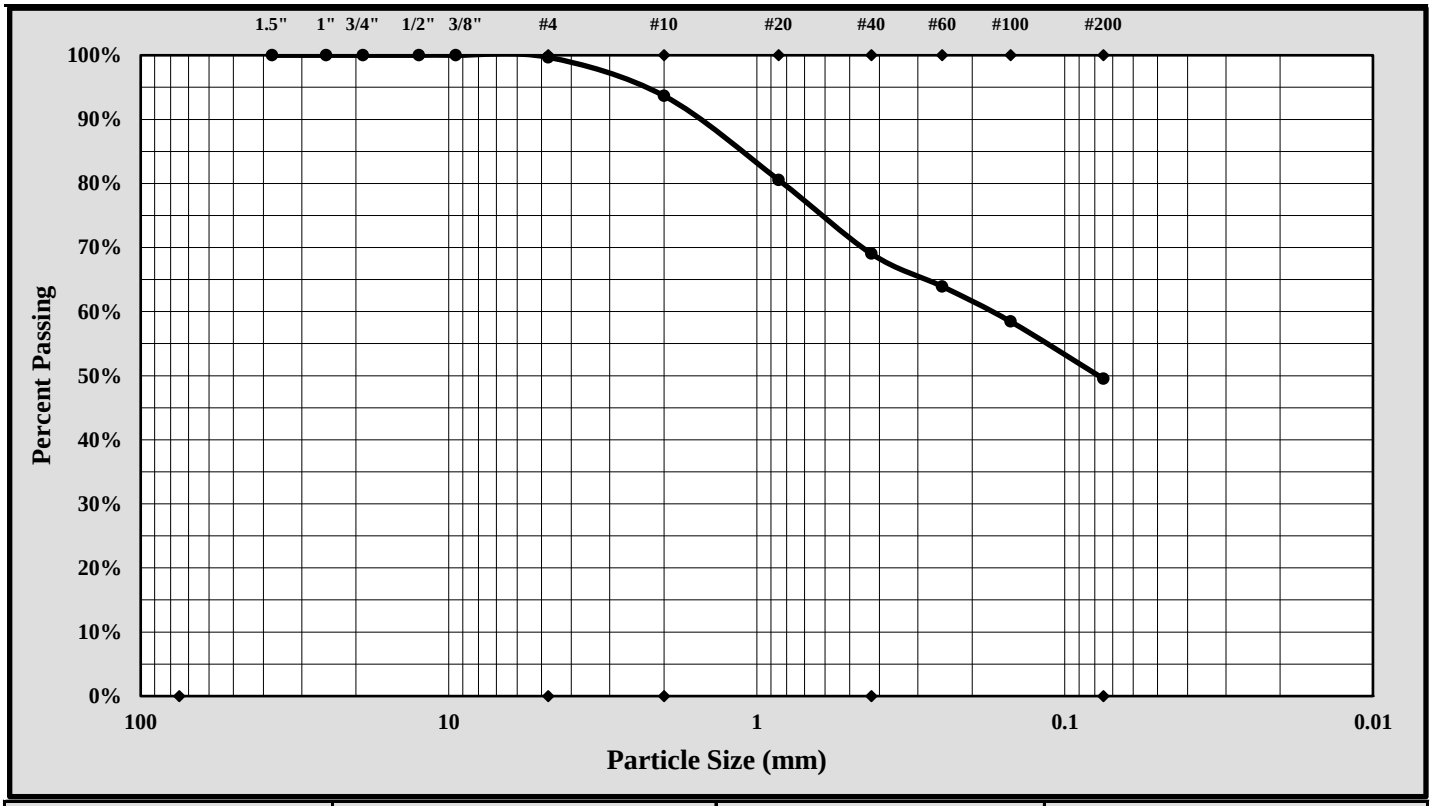
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/15/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/05 - 3/10/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	DH-5	Sample #: SS-4	Sample Date: 1/04/18
Location:	Seismic Boring	Type: Split-spoon	Depth: 6.0' - 8.0'
Sample Description:	Silty Sand (SM, A-4(1))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.3%
Silt & Clay (% Passing #200):	49.5%	Total Sand:	50.1%

Liquid Limit	32	Plastic Limit	25	Plastic Index	7
Coarse Sand:	6.0%	Medium Sand:	24.6%	Fine Sand:	19.5%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/15/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

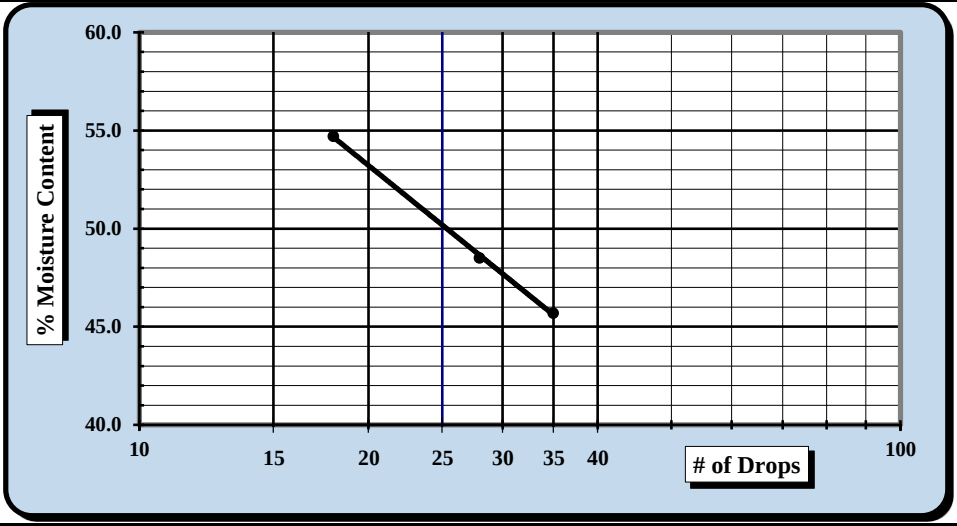
Project #:	1461-16-047.2B	Report Date:	3/15/18
Project Name:	Carolina Crossroads Project	Test Date:	3/14/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	DH-6	Sample #:	SS-1	Sample Date:	1/10/18
Location:	Seismic Boring	Type:	Split-spoon	Depth:	0.0' - 2.0'

Sample Description: Sandy Fat Clay (CH, A-7-6(11))

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	11	12	13				14	15	
A	Tare Weight	26.66	26.66	26.78				26.65	27.60	
B	Wet Soil Weight + A	39.16	42.36	39.85				33.51	35.23	
C	Dry Soil Weight + A	35.24	37.23	35.23				32.21	33.79	
D	Water Weight (B-C)	3.92	5.13	4.62				1.30	1.44	
E	Dry Soil Weight (C-A)	8.58	10.57	8.45				5.56	6.19	
F	% Moisture (D/E)*100	45.7%	48.5%	54.7%				23.4%	23.3%	
N	# OF DROPS	35	28	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**23.4%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**50**
Plastic Limit	**23**
Plastic Index	**27**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 52.1%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	3/15/18		3/15/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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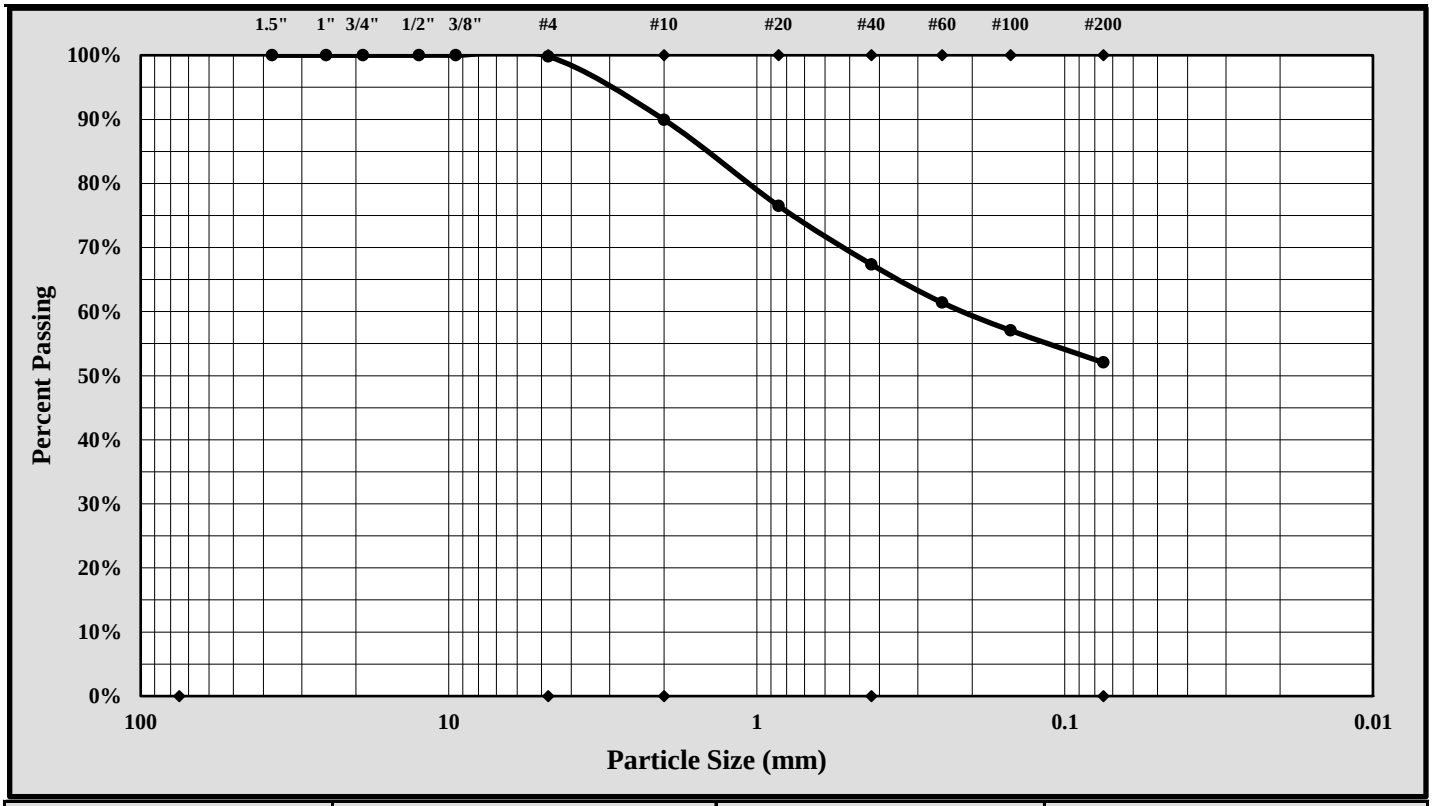
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/15/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/05 - 3/10/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	DH-6	Sample #: SS-1	Sample Date: 1/10/18
Location:	Seismic Boring	Type: Split-spoon	Depth: 0.0' - 2.0'
Sample Description:	Sandy Fat Clay (CH, A-7-6(11))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.2%
Silt & Clay (% Passing #200):	52.1%	Total Sand:	47.8%

Liquid Limit	50	Plastic Limit	23	Plastic Index	27
Coarse Sand:	9.9%	Medium Sand:	22.6%	Fine Sand:	15.3%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/15/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

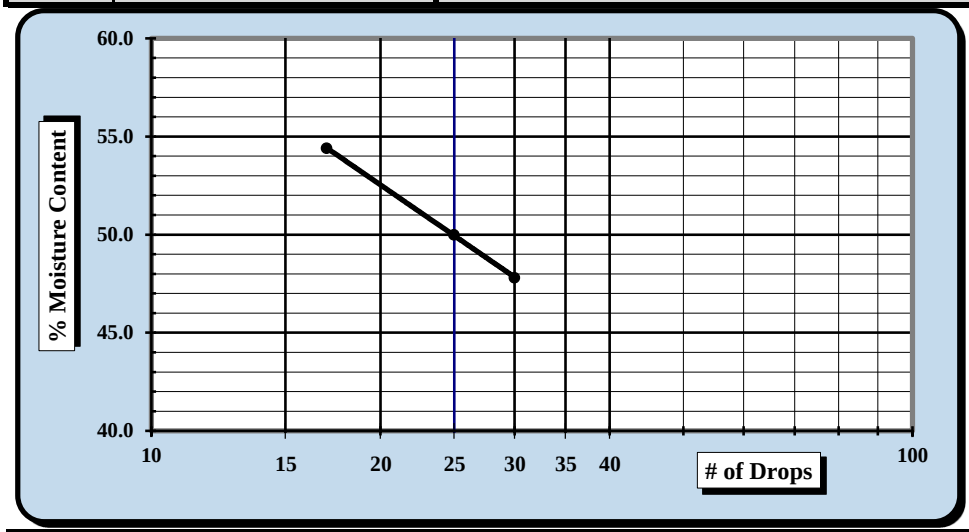
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/15/18
Project Name:	Carolina Crossroads Project	Test Date:	3/14/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	DH-6	Sample #:	SS-2	Sample Date:	1/10/18
Location:	Seismic Boring	Type:	Split-spoon	Depth:	2.0' - 4.0'
Sample Description:	Clayey Sand (SC, A-7-6(7))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	16	17	18				19	20	
A	Tare Weight	26.57	26.62	26.81				26.67	26.83	
B	Wet Soil Weight + A	44.32	42.15	43.49				35.30	34.19	
C	Dry Soil Weight + A	38.58	36.97	37.61				33.52	32.63	
D	Water Weight (B-C)	5.74	5.18	5.88				1.78	1.56	
E	Dry Soil Weight (C-A)	12.01	10.35	10.80				6.85	5.80	
F	% Moisture (D/E)*100	47.8%	50.0%	54.4%				26.0%	26.9%	
N	# OF DROPS	30	25	17				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**26.5%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**50**
Plastic Limit	**26**
Plastic Index	**24**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 46.9%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	3/15/18	Brian Vaughn	3/15/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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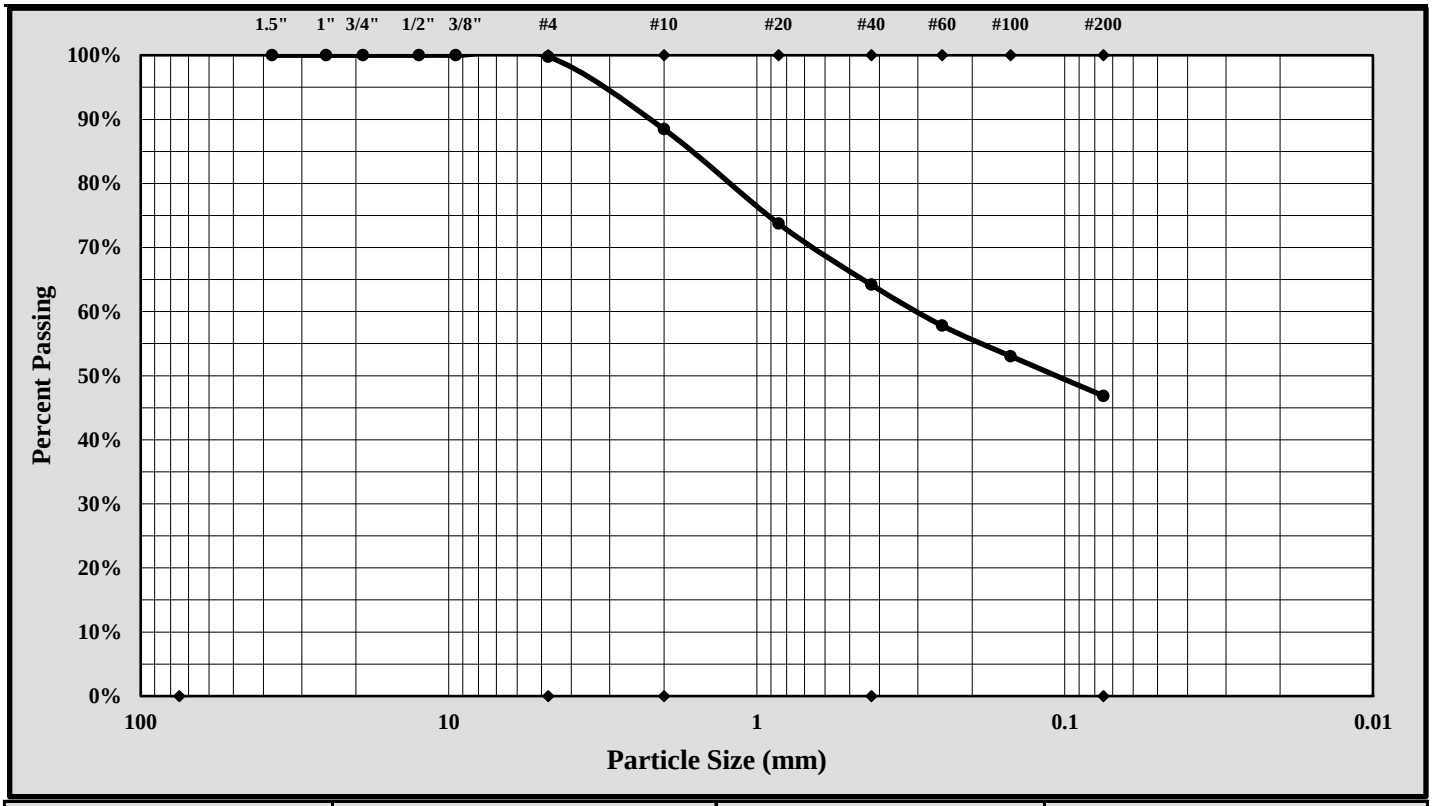
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/15/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/02 - 3/10/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	DH-6	Sample #: SS-2	Sample Date: 1/10/18
Location:	Seismic Boring	Type: Split-spoon	Depth: 2.0' - 4.0'
Sample Description:	Clayey Sand (SC, A-7-6(7))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.2%
Silt & Clay (% Passing #200):	46.9%	Total Sand:	52.9%

Liquid Limit	50	Plastic Limit	26	Plastic Index	24
Coarse Sand:	11.3%	Medium Sand:	24.3%	Fine Sand:	17.3%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/15/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

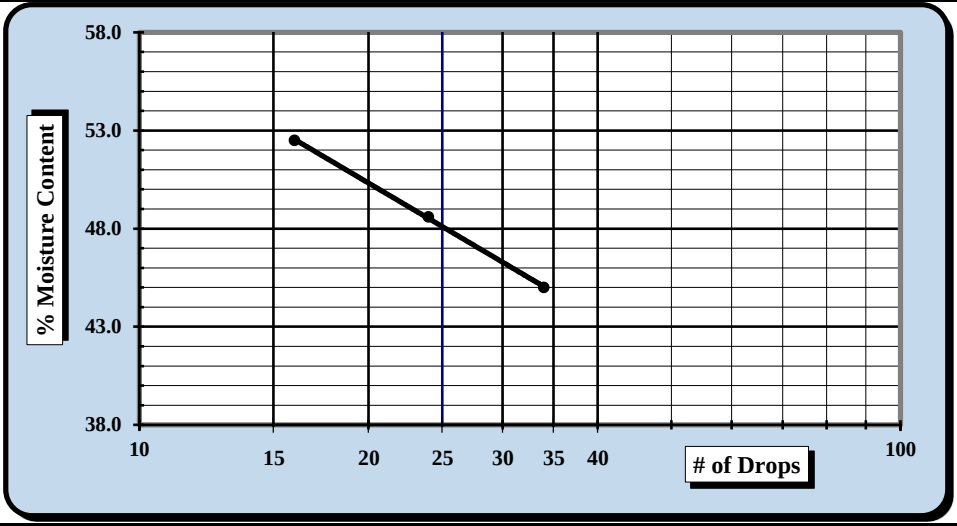
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/15/18
Project Name:	Carolina Crossroads Project	Test Date:	3/14/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	DH-6	Sample #:	SS-3	Sample Date:	1/10/18
Location:	Seismic Boring	Type:	Split-spoon	Depth:	4.0' - 6.0'
Sample Description:	Clayey Sand (SC, A-7-6(7))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	21	22	23				24	25	
A	Tare Weight	28.08	25.69	27.26				26.00	26.82	
B	Wet Soil Weight + A	45.10	42.44	44.19				33.92	34.44	
C	Dry Soil Weight + A	39.82	36.96	38.36				32.35	32.95	
D	Water Weight (B-C)	5.28	5.48	5.83				1.57	1.49	
E	Dry Soil Weight (C-A)	11.74	11.27	11.10				6.35	6.13	
F	% Moisture (D/E)*100	45.0%	48.6%	52.5%				24.7%	24.3%	
N	# OF DROPS	34	24	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**24.5%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**48**
Plastic Limit	**25**
Plastic Index	**23**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 46.3%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	3/15/18	Brian Vaughn	3/15/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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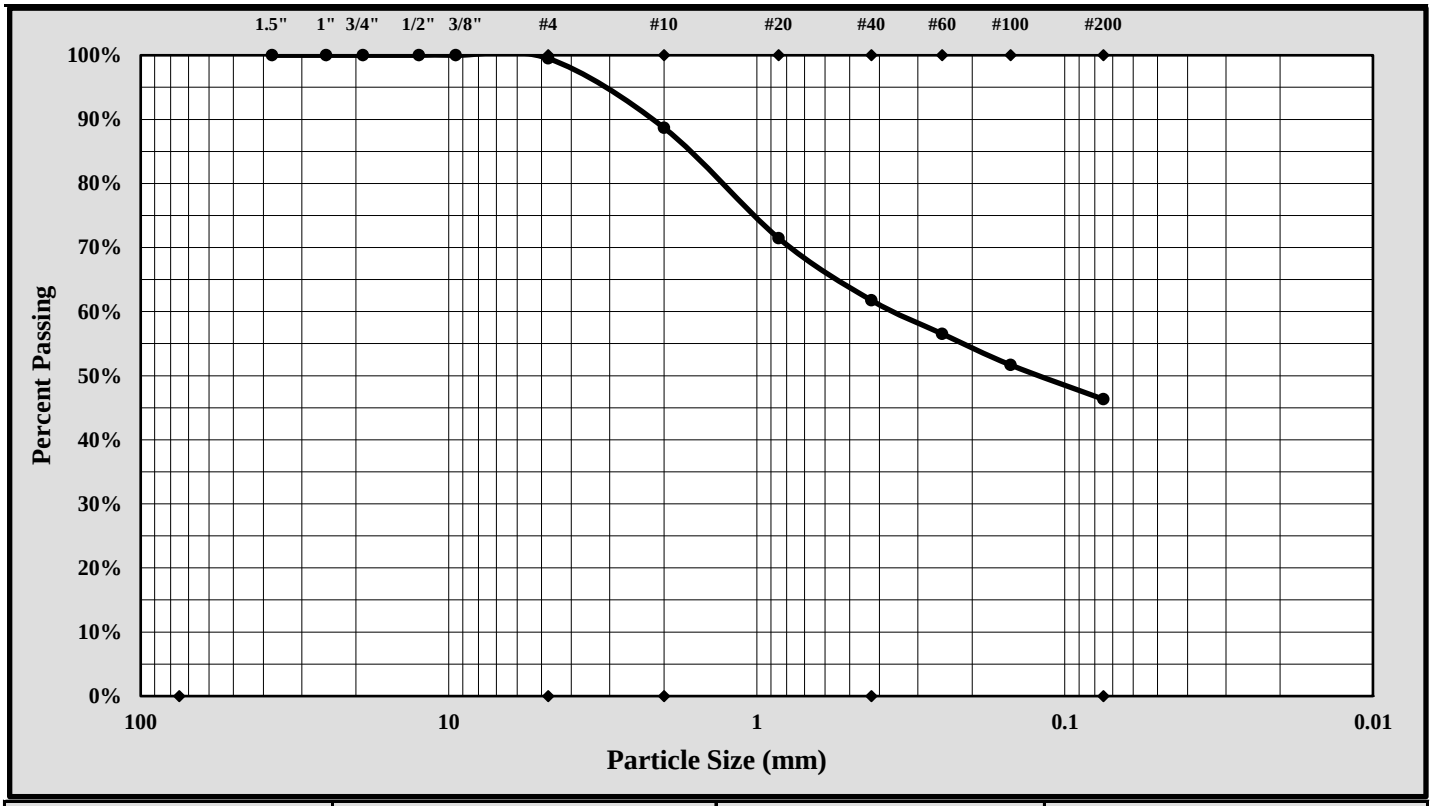
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/15/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/05 - 3/10/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	DH-6	Sample #: SS-3	Sample Date: 1/10/18
Location:	Seismic Boring	Type: Split-spoon	Depth: 4.0' - 6.0'
Sample Description:	Clayey Sand (SC, A-7-6(7))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.5%
Silt & Clay (% Passing #200):	46.3%	Total Sand:	53.2%

Liquid Limit	48	Plastic Limit	25	Plastic Index	23
Coarse Sand:	10.8%	Medium Sand:	26.9%	Fine Sand:	15.5%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/15/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/2-2/6/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sampled by:	S&ME	Sample Date(s):	Varies
Sampling Method:	Split Spoon	Drill Rig :	CME 55/Diedrich D-50

Method: **A (1%)** ☑ **B (0.1%)** ☐ Balance ID. 25711 Calibration Date: 8/30/17 Oven ID. 25722 Calibration Date: 8/18/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
P-1	SS-1	.5-2.5	19	20.52	51.40	47.22	4.18	16%	
P-3	SS-1	.9-2.9	40	20.81	50.20	44.85	5.35	22%	
P-5	SS-1	.4-2.4	243	20.74	43.09	39.23	3.86	21%	
P-7	SS-1	1-3	30	20.80	49.79	45.23	4.56	19%	
P-9	SS-1	.7-2.7	244	20.76	59.16	56.21	2.95	8%	
P-11	SS-1	1.5-3.5	46	20.72	56.15	49.59	6.56	23%	
P-13	SS-1	1.5-3.5	19	20.52	41.45	38.74	2.71	15%	
P-15	SS-1	1-3	40	20.84	45.31	43.33	1.98	9%	
P-17	SS-1	1.7-3.7	243	20.75	41.93	39.19	2.74	15%	
P-19	SS-1	13-3.3	30	20.81	41.41	39.48	1.93	10%	
P-21	SS-1	1.4-4.4	244	20.76	42.43	37.64	4.79	28%	
P-23	SS-1	.9-2.9	210	20.97	44.67	42.64	2.03	9%	
P-25	SS-1	1-3	46	20.72	43.07	40.55	2.52	13%	
P-27	SS-1	1.1-3.1	212	20.84	41.57	38.27	3.30	19%	
P-29	SS-1	1.2-3.2	10	20.77	43.42	41.57	1.85	9%	
P-31	SS-1	1.2-3.2	227	20.83	44.97	42.64	2.33	11%	

Notes / Deviations / References

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Matthew Wolfe
Technician Name

NICET 123218
Certification Type / No.

Matthew F. Cooke, P.G.
Technical Responsibility

Project Manager
Position

3/8/2018
Date

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #: 1461-16-047.2B Report Date: 2/21/2018

Project Name: Carolina Crossroads Project

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
P-32	SS-1	.9-2.9	211	20.83	42.46	38.48	3.98	23%	
P-33	SS-1	1.3-3.3	201	20.87	41.71	38.30	3.41	20%	
P-34	SS-1	.7-2.7	45	20.76	47.08	42.98	4.10	19%	
P-35	SS-1	.9-2.9	209	21.08	42.99	38.58	4.41	25%	
P-36	SS-1	.9-2.9	1	20.64	42.12	39.82	2.30	12%	
P-37	SS-1	2-4	31	20.81	42.08	35.61	6.47	44%	
P-39	SS-1	.8-2.8	200	20.86	42.22	40.12	2.10	11%	
P-40	SS-1	.9-2.9	7	20.80	40.62	38.19	2.43	14%	
P-41	SS-1	2-4	207	20.93	42.12	38.15	3.97	23%	
P-43	SS-1	.2-2.2	8	20.60	41.71	38.35	3.36	19%	
P-65	SS-1	.8-2.8	100	20.56	41.00	36.52	4.48	28%	

Notes / Deviations / References

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/22-2/23/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample by:	S&ME	Sample Date(s):	Various
Sampling Method:	Split-spoon	Drill Rig :	CME 55/Diedrich D-50

Method: **A (1%)** ☑ **B (0.1%)** ☐ Balance ID. 25711 Calibration Date: 8/30/17 Oven ID. 25722 Calibration Date: 8/18/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
P-2	SS-1	1.0 - 3.0	16	20.69	42.06	39.26	2.80	15%	
P-4	SS-1	0.8 - 2.8	240	20.77	41.25	40.44	0.81	4%	
P-6	SS-1	1.1 - 3.1	201	20.86	43.15	36.55	6.60	42%	
P-8	SS-1	0.8 - 2.8	46	20.74	41.15	36.33	4.82	31%	
P-10	SS-1	1.6 - 3.6	44	20.77	41.92	39.94	1.98	10%	
P-12	SS-1	1.2 - 3.2	123	20.56	40.57	39.52	1.05	6%	
P-14	SS-1	0.7 - 2.7	210	20.97	41.42	37.20	4.22	26%	
P-16	SS-1	0.8 - 2.8	211	20.84	41.02	39.19	1.83	10%	
P-18	SS-1	1.3 - 3.3	32	20.45	42.11	38.51	3.60	20%	
P-20	SS-1	1.5 - 3.5	146	20.55	41.46	37.62	3.84	22%	
P-22	SS-1	1.4 - 3.4	1	20.67	41.49	39.63	1.86	10%	
P-24	SS-1	0.7 - 2.7	195	20.55	42.02	40.32	1.70	9%	
P-26	SS-1	0.6 - 2.6	235	20.76	41.16	35.51	5.65	38%	
P-28	SS-1	0.7 - 2.7	9	20.80	42.92	40.83	2.09	10%	
P-30	SS-1	0.7 - 2.7	45	20.75	41.08	38.07	3.01	17%	
P-38	SS-1	0.8 - 2.8	222	20.85	41.99	39.32	2.67	14%	

Notes / Deviations / References

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Matthew Wolfe
Technician Name

NICET 123218
Certification Type / No.

Matthew F. Cooke, P.G.
Technical Responsibility

Project Manager
Position

5/3/2018
Date

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #: 1461-16-047.2B Report Date: 4/25/2018

Project Name: Carolina Crossroads Project

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
P-48	SS-1	1.0 - 3.0	3	20.80	41.06	37.80	3.26	19%	
P-50	SS-1	1.0 - 3.0	229	20.74	40.90	36.83	4.07	25%	
P-52	SS-1	1.2 - 3.2	36	20.94	42.37	39.10	3.27	18%	
P-53	SS-1	0.6 - 2.6	30	20.82	41.93	37.61	4.32	26%	
P-55	SS-1	0.9 - 2.9	4	20.53	43.24	39.54	3.70	19%	
P-57	SS-1	1.1 - 3.1	217	20.90	41.48	38.60	2.88	16%	
P-59	SS-1	1.4 - 3.4	19	20.57	44.50	40.57	3.93	20%	
P-61	SS-1	1.4 - 3.4	116	20.63	43.66	39.44	4.22	22%	
P-63	SS-1	1.3 - 3.3	39	20.81	41.75	39.68	2.07	11%	
P-67	SS-1	0.6 - 2.6	25	20.62	42.32	38.47	3.85	22%	
P-68	SS-1	1.1 - 3.1	6	20.58	44.94	43.09	1.85	8%	
P-69	SS-1	1.0 - 3.0	214	20.84	43.02	39.42	3.60	19%	
P-70	SS-1	0.6 - 2.6	7	20.82	43.32	39.96	3.36	18%	
P-71	SS-1	1.3 - 3.3	29	20.80	43.18	41.34	1.84	9%	

Notes / Deviations / References

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

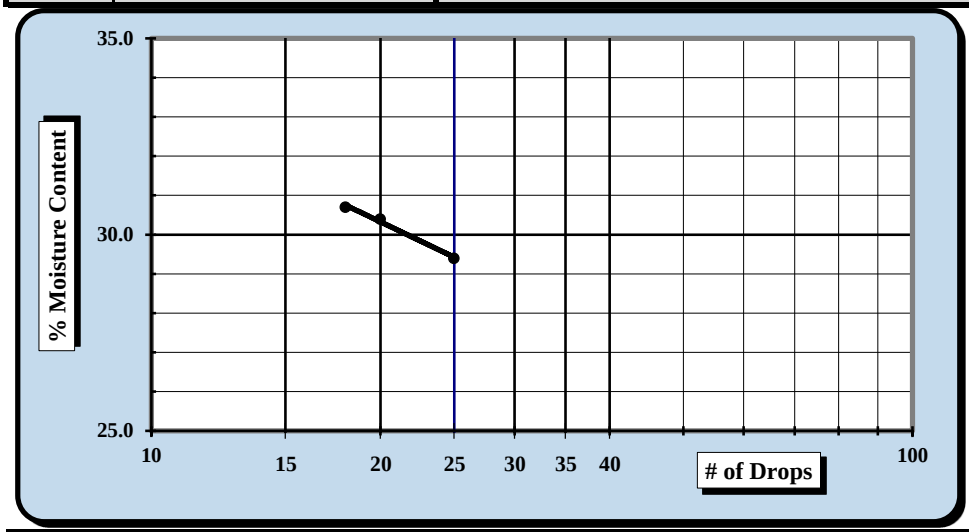
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/2-2/9/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-1	Sample #: SS-1		Sample Date: 1/21/2018	
Location:	Pavement Boring	Offset: N/A		Depth: 0.5' - 2.5'	
Sample Description:	Sandy Lean Clay (CL, A-4(2))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28573	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

Pan # 611		Liquid Limit						Plastic Limit		
	Tare #:	24	116	207				209	244	
A	Tare Weight	20.76	20.56	20.93				21.12	20.76	
B	Wet Soil Weight + A	31.37	30.61	32.29				27.44	27.38	
C	Dry Soil Weight + A	28.96	28.27	29.62				26.31	26.20	
D	Water Weight (B-C)	2.41	2.34	2.67				1.13	1.18	
E	Dry Soil Weight (C-A)	8.20	7.71	8.69				5.19	5.44	
F	% Moisture (D/E)*100	29.4%	30.4%	30.7%				21.8%	21.7%	
N	# OF DROPS	25	20	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**21.8%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**30**
Plastic Limit	**22**
Plastic Index	**8**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	3/8/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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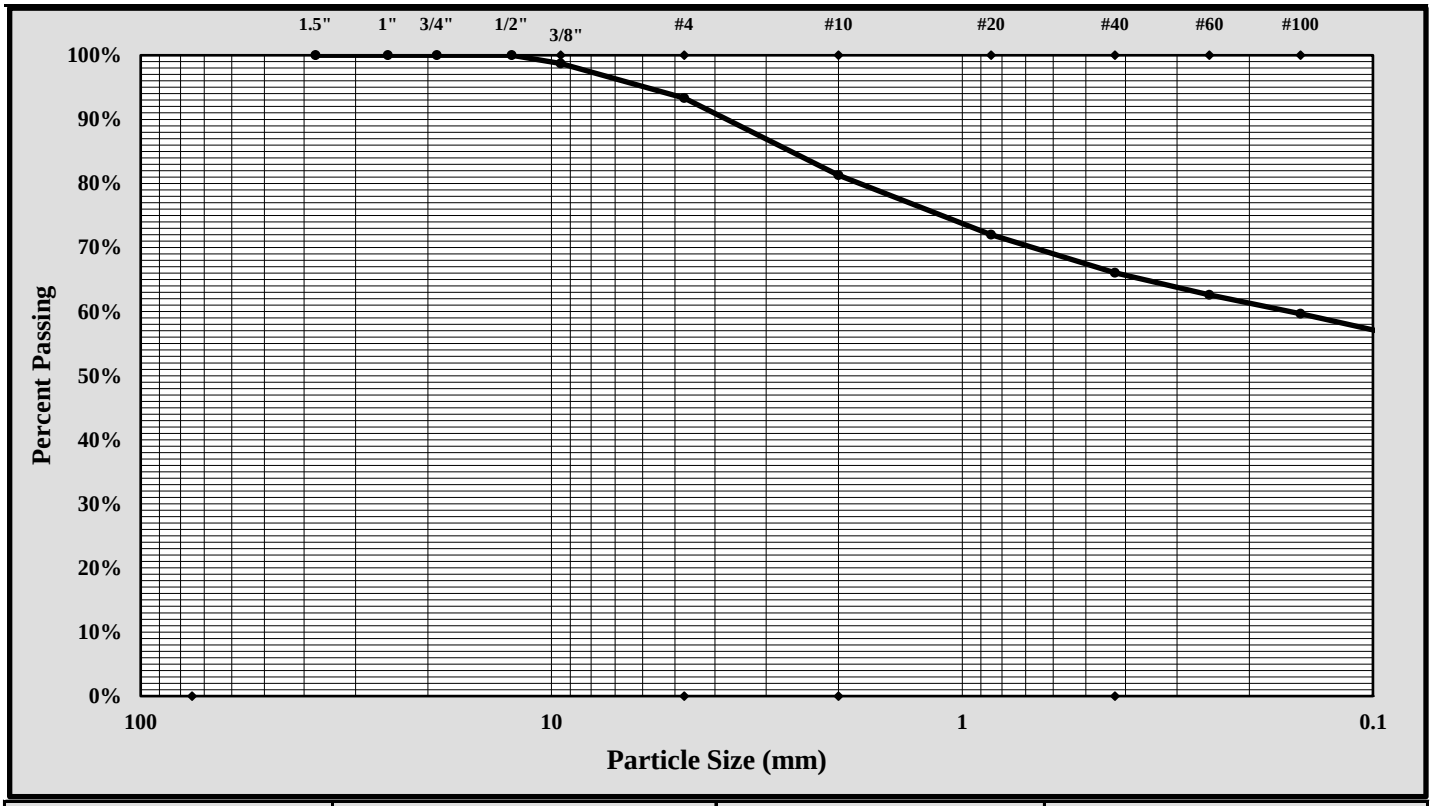
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/5-2/7/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-1 Sample #: SS-1	Sample Date:	1/21/2018
Location:	Pavement Boring Offset: N/A	Depth:	0.5' - 2.5'
Sample Description:	Sandy Lean Clay (CL, A-4(2))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	3/8-inch	Gravel:	7%
Silt & Clay (% Passing #200):	55%	Total Sand:	38%

Liquid Limit	30	Plastic Limit	22	Plastic Index	8
Coarse Sand:	12%	Medium Sand:	15%	Fine Sand:	11%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/8/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

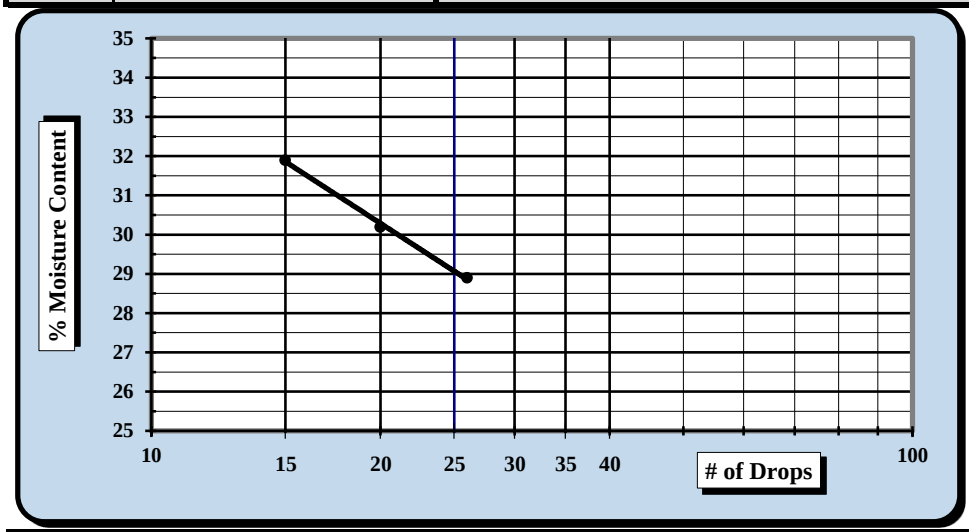
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	3/1-3/6/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-2	Sample #: SS-1		Sample Date: 1/31/18	
Location:	Pavement Boring	Offset: N/A		Depth: 1.0' - 3.0'	
Sample Description:	Clayey Sand (SC, A-6(1))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28574	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

	Pan # 608	Liquid Limit						Plastic Limit		
	Tare #:	9	44	1				212	226	
A	Tare Weight	20.79	20.74	20.64				20.85	20.92	
B	Wet Soil Weight + A	29.27	30.17	29.98				27.86	26.79	
C	Dry Soil Weight + A	27.37	27.98	27.72				26.81	25.90	
D	Water Weight (B-C)	1.90	2.19	2.26				1.05	0.89	
E	Dry Soil Weight (C-A)	6.58	7.24	7.08				5.96	4.98	
F	% Moisture (D/E)*100	28.9%	30.2%	31.9%				17.6%	17.9%	
N	# OF DROPS	26	20	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**17.8%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**29**
Plastic Limit	**18**
Plastic Index	**11**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group Symbol for minus No. 40 sieve portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	5/3/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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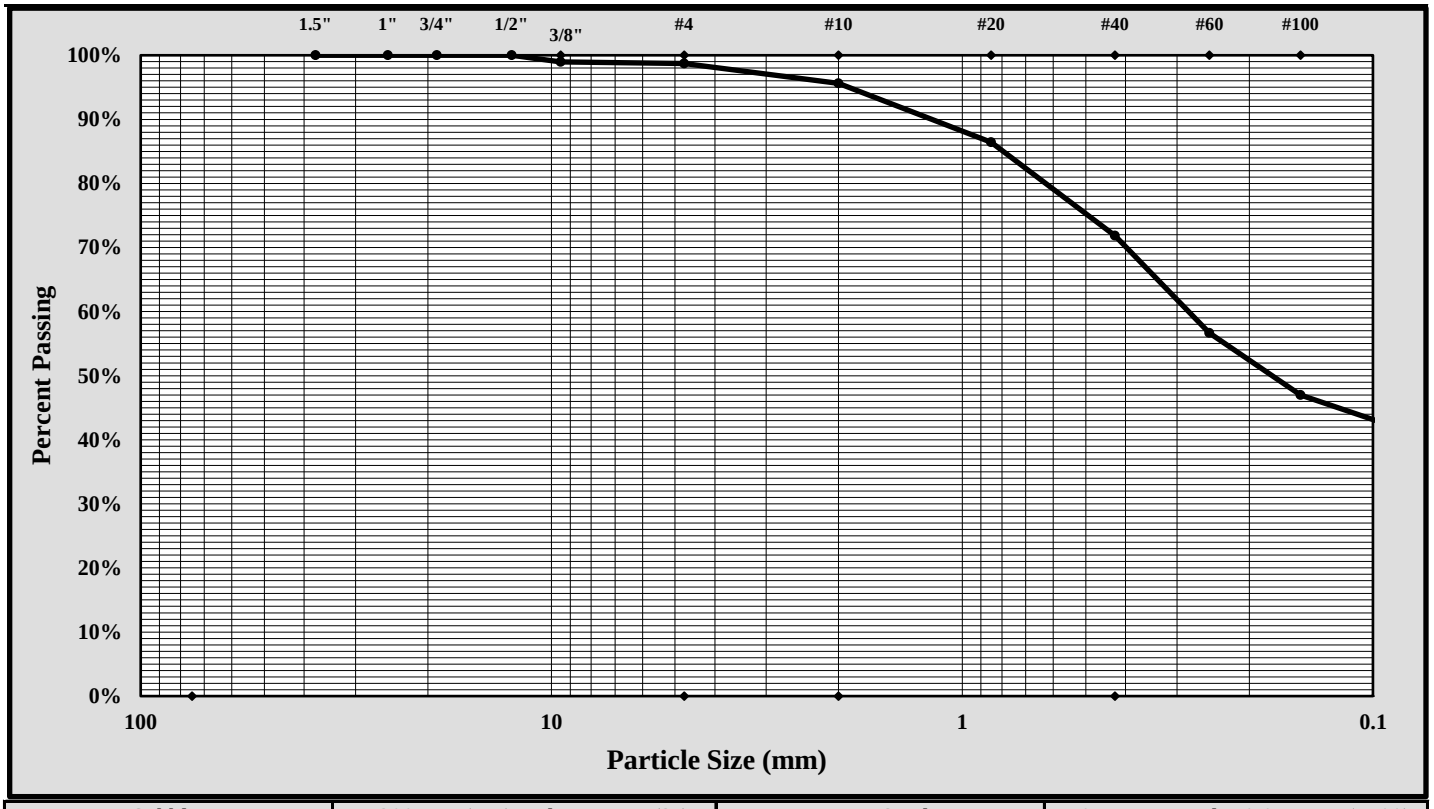
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	3/1-3/7/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-2 Sample #: SS-1	Sample Date:	1/31/2018
Location:	Pavement Boring Offset: N/A	Depth:	1.0' - 3.0'
Sample Description:	Clayey Sand (SC, A-6(1))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	3/8-inch	Gravel:	1.3%
Silt & Clay (% Passing #200):	40.5%	Total Sand:	58.2%

Liquid Limit	29	Plastic Limit	18	Plastic Index	11
Coarse Sand:	3.1%	Medium Sand:	23.8%	Fine Sand:	31.4%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☒

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/3/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/2-2/9/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-3	Sample #: SS-1		Sample Date: 1/21/2018	
Location:	Pavement Boring	Offset: N/A		Depth: 0.9' - 2.9'	
Sample Description:	Clayey Sand (SC, A-4(1))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28573	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

	Pan # 600	Liquid Limit						Plastic Limit		
	Tare #:	43	100	229				17	25	
A	Tare Weight	20.83	20.57	20.71				20.62	20.61	
B	Wet Soil Weight + A	33.06	32.46	31.55				27.19	27.58	
C	Dry Soil Weight + A	30.52	29.89	29.14				26.15	26.48	
D	Water Weight (B-C)	2.54	2.57	2.41				1.04	1.10	
E	Dry Soil Weight (C-A)	9.69	9.32	8.43				5.53	5.87	
F	% Moisture (D/E)*100	26.2%	27.6%	28.6%				18.8%	18.7%	
N	# OF DROPS	29	20	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**18.8%**		

One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**27**
Plastic Limit	**19**
Plastic Index	**8**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	3/8/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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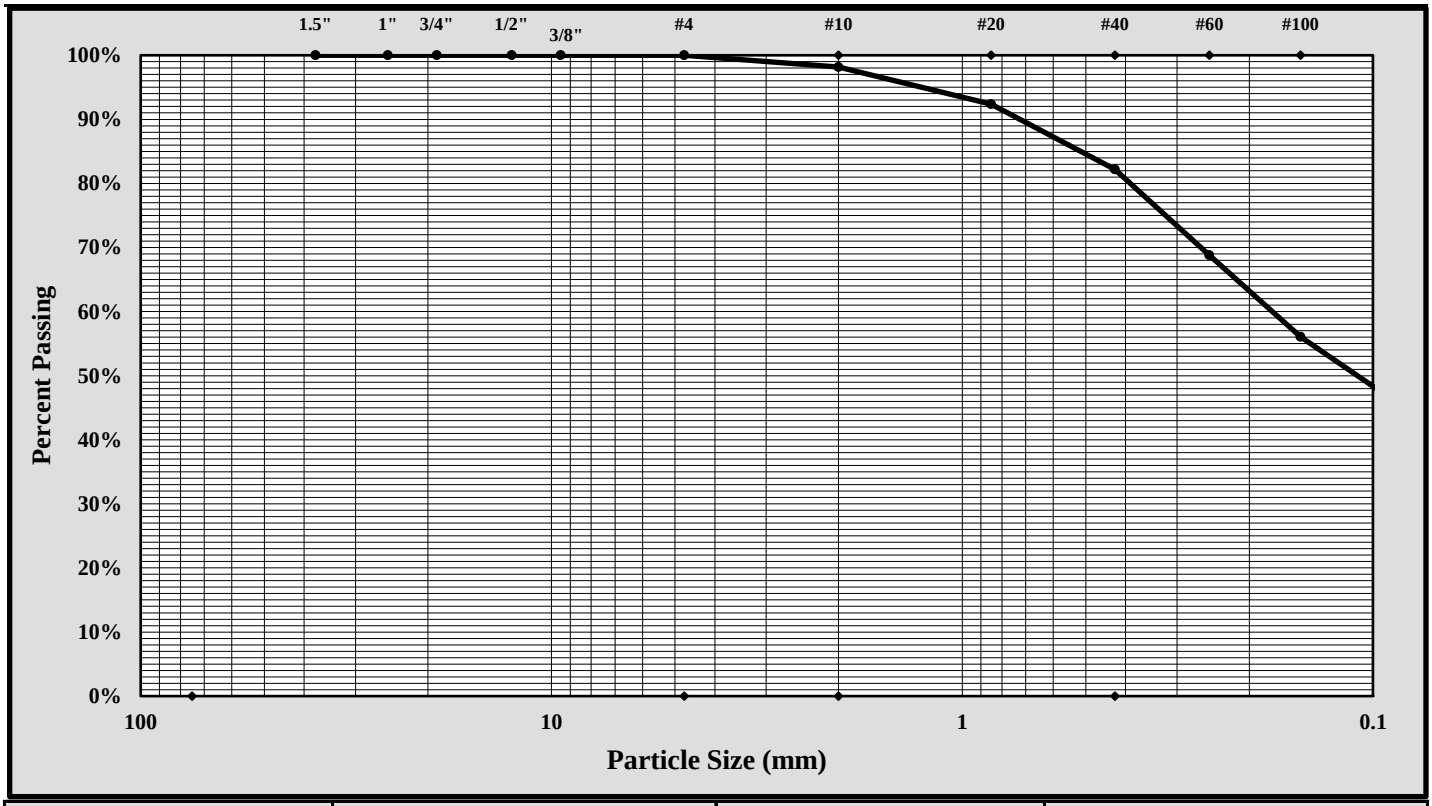
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/5-2/7/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-3 Sample #: SS-1	Sample Date:	1/21/2018
Location:	Pavement Boring Offset: N/A	Depth:	0.9' - 2.9'
Sample Description:	Clayey Sand (SC, A-4(1))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	#10	Gravel:	0%
Silt & Clay (% Passing #200):	43%	Total Sand:	57%

Liquid Limit	27	Plastic Limit	19	Plastic Index	8
Coarse Sand:	2%	Medium Sand:	16%	Fine Sand:	39%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☒

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/8/2018 — *Date*

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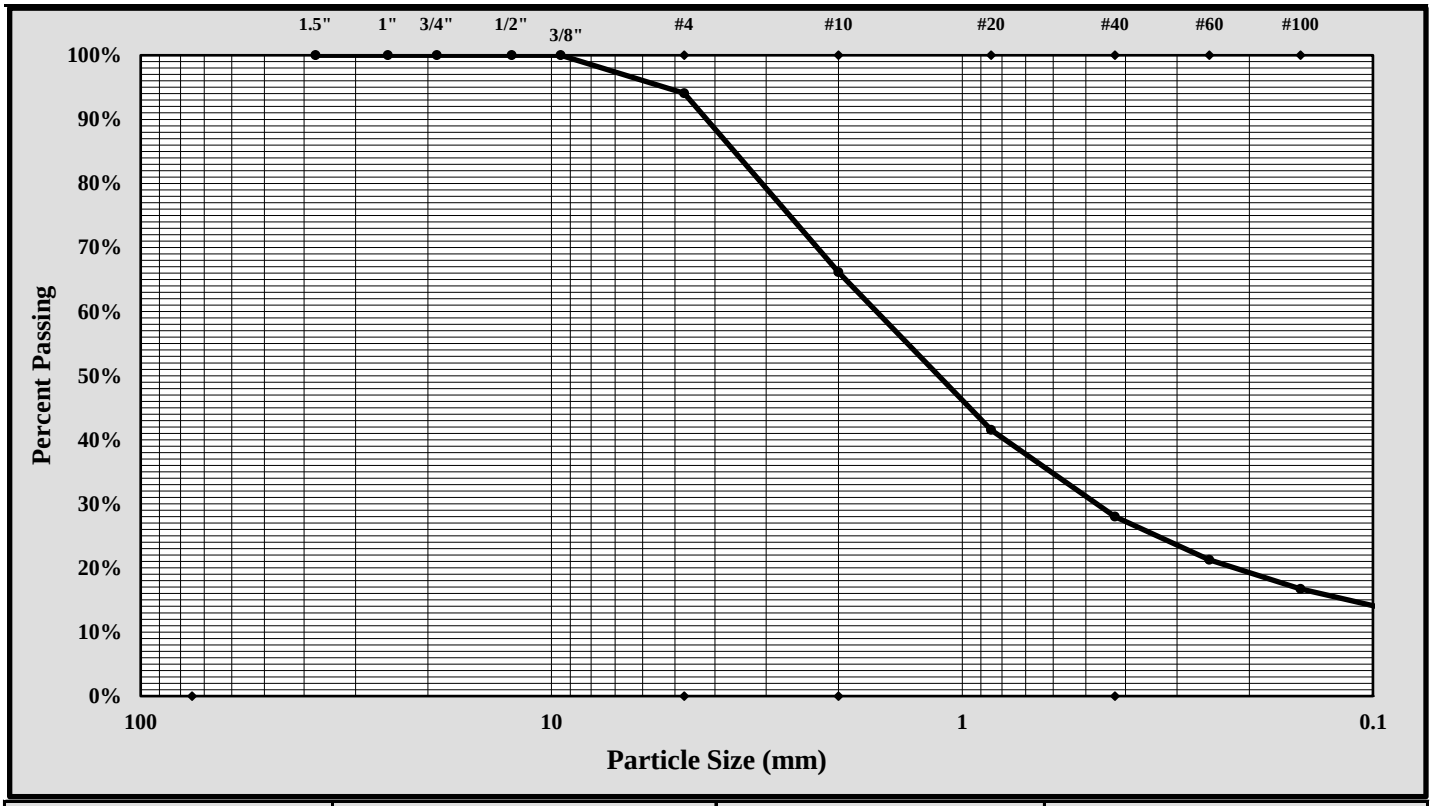
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	3/1-3/7/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-4 Sample #: SS-1	Sample Date:	1/31/2018
Location:	Pavement Boring Offset: N/A	Depth:	0.8' - 2.8'
Sample Description:	Silty Sand (SM, A-1-b)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	#4	Gravel:	6.0%
Silt & Clay (% Passing #200):	12.3%	Total Sand:	81.8%

Liquid Limit	*	Plastic Limit	*	Plastic Index	*
Coarse Sand:	27.9%	Medium Sand:	38.1%	Fine Sand:	15.8%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/3/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/2-2/9/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-5	Sample #: SS-1	Sample Date: 1/21/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.4' - 2.4'
Sample Description:	Clayey Sand (SC, A-6(4))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28573	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

Pan # 609		Liquid Limit						Plastic Limit		
	Tare #:	9	222	35				147	6	
A	Tare Weight	20.80	20.83	20.76				20.78	20.57	
B	Wet Soil Weight + A	30.96	28.74	30.56				27.63	26.93	
C	Dry Soil Weight + A	28.25	26.60	27.82				26.37	25.77	
D	Water Weight (B-C)	2.71	2.14	2.74				1.26	1.16	
E	Dry Soil Weight (C-A)	7.45	5.77	7.06				5.59	5.20	
F	% Moisture (D/E)*100	36.4%	37.1%	38.8%				22.5%	22.3%	
N	# OF DROPS	32	27	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**22.4%**		

One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**37**
Plastic Limit	**22**
Plastic Index	**15**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	3/8/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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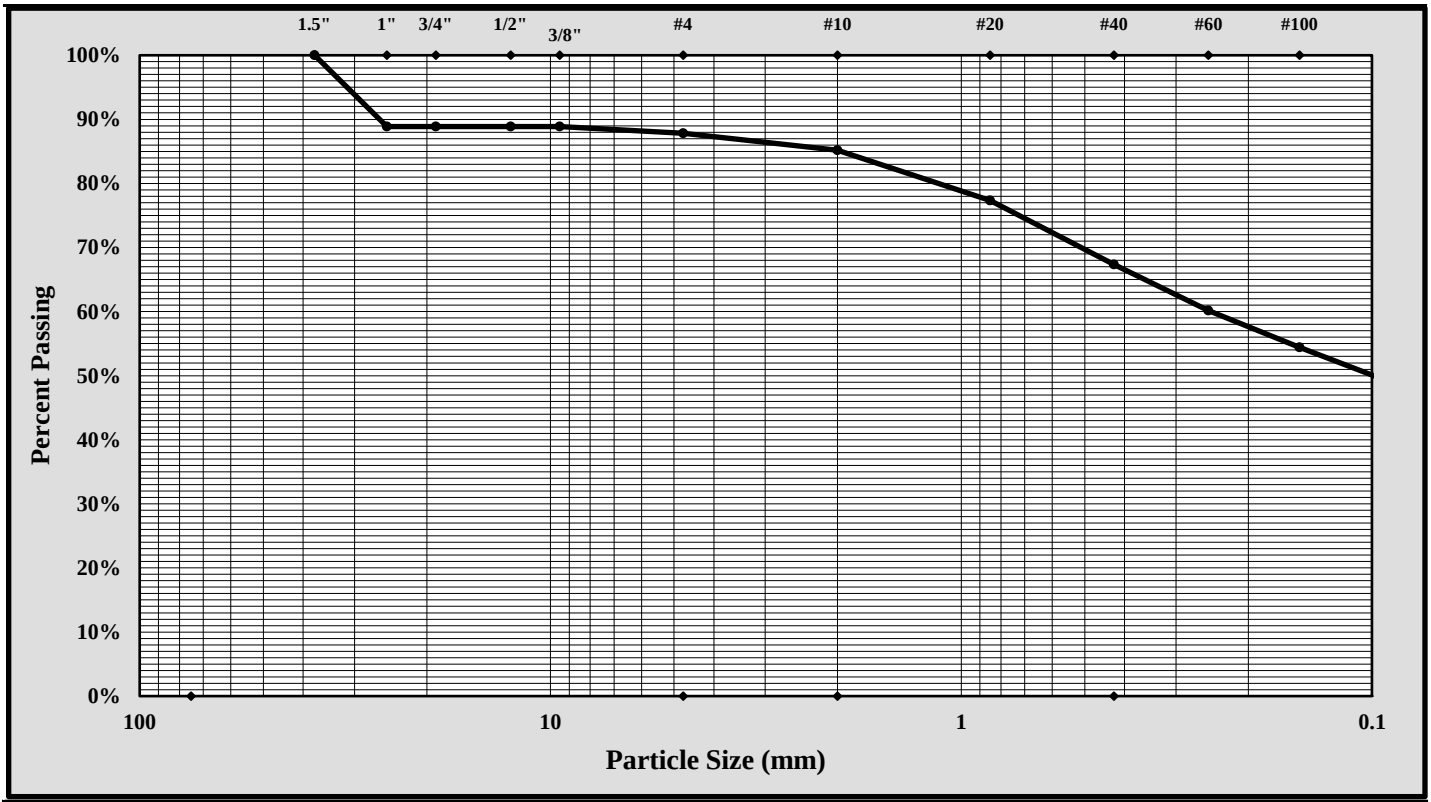
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/5-2/7/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-5 Sample #: SS-1	Sample Date:	1/21/2018
Location:	Pavement Boring Offset: N/A	Depth:	0.4' - 2.4'
Sample Description:	Clayey Sand (SC, A-6(4))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	1-inch	Gravel:	12%
Silt & Clay (% Passing #200):	47%	Total Sand:	41%

Liquid Limit	37	Plastic Limit	22	Plastic Index	15
Coarse Sand:	3%	Medium Sand:	18%	Fine Sand:	20%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☒

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/8/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

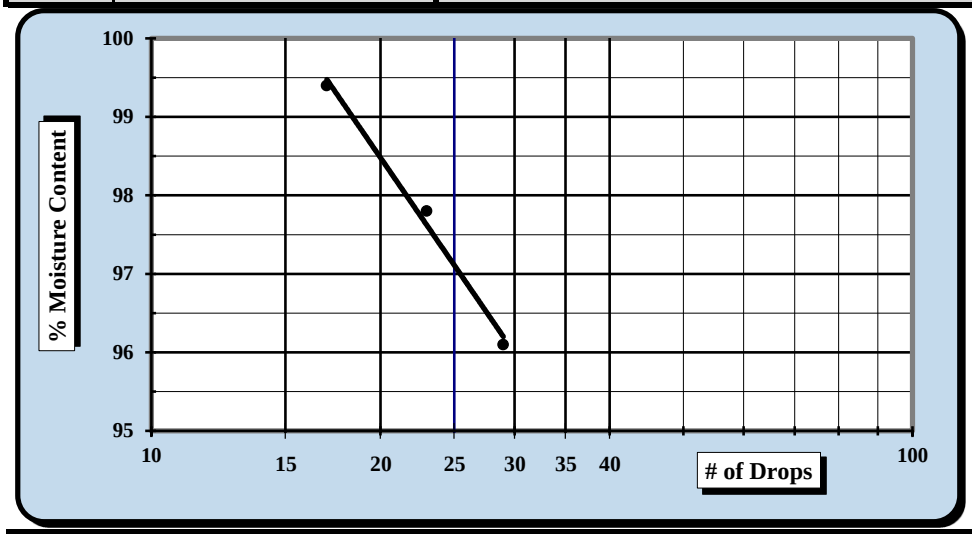
ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	3/1-3/6/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-6	Sample #: SS-1	Sample Date: 1/31/18
Location:	Pavement Boring	Offset: N/A	Depth: 1.1' - 3.1'
Sample Description:	Fat Clay (CH, A-7-5(67))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28574	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

	Pan # 601	Liquid Limit						Plastic Limit		
	Tare #:	10	24	235				6	36	
A	Tare Weight	20.80	20.77	20.76				20.56	20.96	
B	Wet Soil Weight + A	28.31	27.12	27.98				27.14	26.88	
C	Dry Soil Weight + A	24.63	23.98	24.38				25.36	25.27	
D	Water Weight (B-C)	3.68	3.14	3.60				1.78	1.61	
E	Dry Soil Weight (C-A)	3.83	3.21	3.62				4.80	4.31	
F	% Moisture (D/E)*100	96.1%	97.8%	99.4%				37.1%	37.4%	
N	# OF DROPS	29	23	17				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**37.3%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**97**
Plastic Limit	**37**
Plastic Index	**60**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group Symbol for minus No. 40 sieve portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	5/3/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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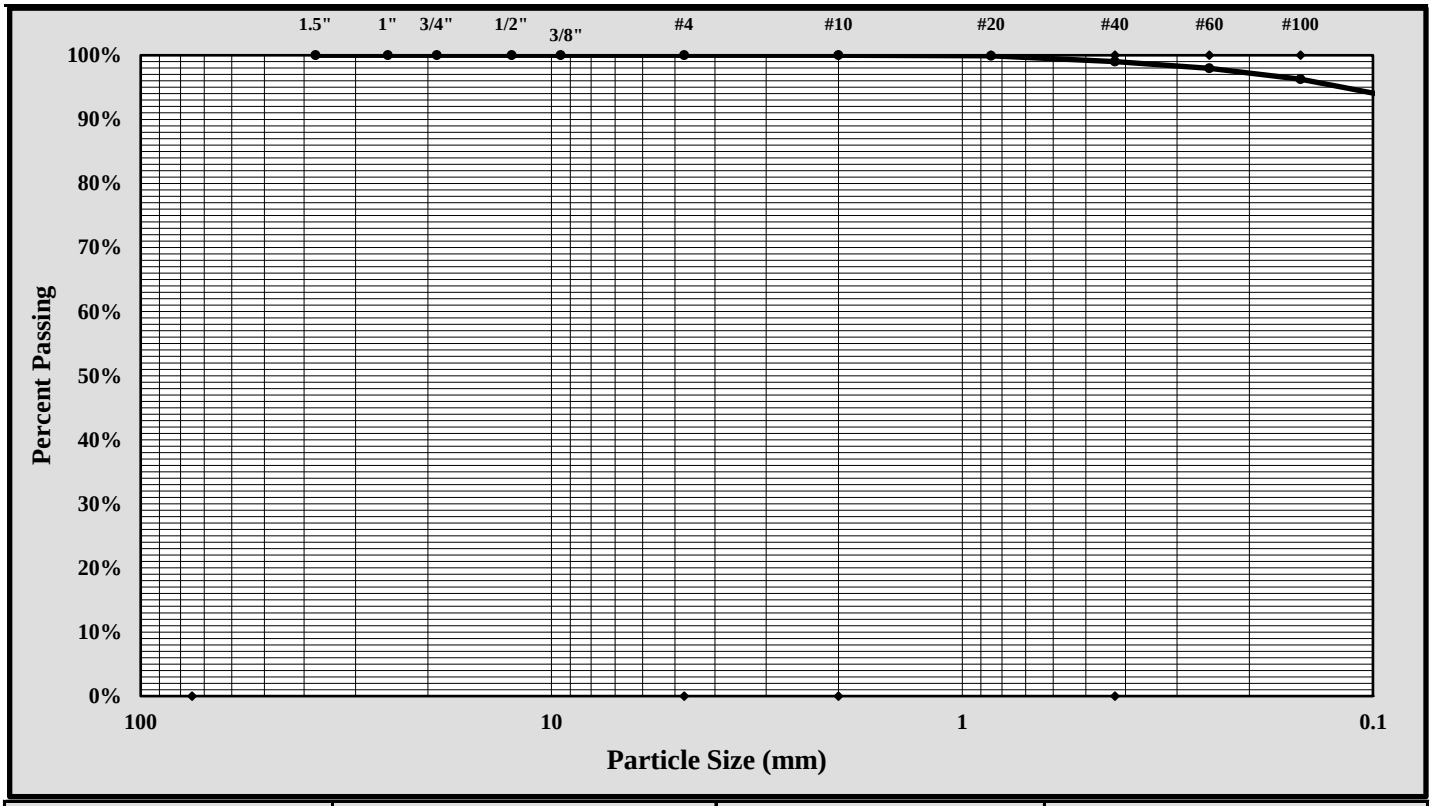
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	3/1-3/7/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-6 Sample #: SS-1	Sample Date:	1/31/2018
Location:	Pavement Boring Offset: N/A	Depth:	1.1' - 3.1'
Sample Description:	Fat Clay (CH, A-7-5(67))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	#20	Gravel:	0.0%
Silt & Clay (% Passing #200):	92.6%	Total Sand:	7.4%

Liquid Limit	97	Plastic Limit	37	Plastic Index	60
Coarse Sand:	0.0%	Medium Sand:	1.0%	Fine Sand:	6.4%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☒

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/3/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

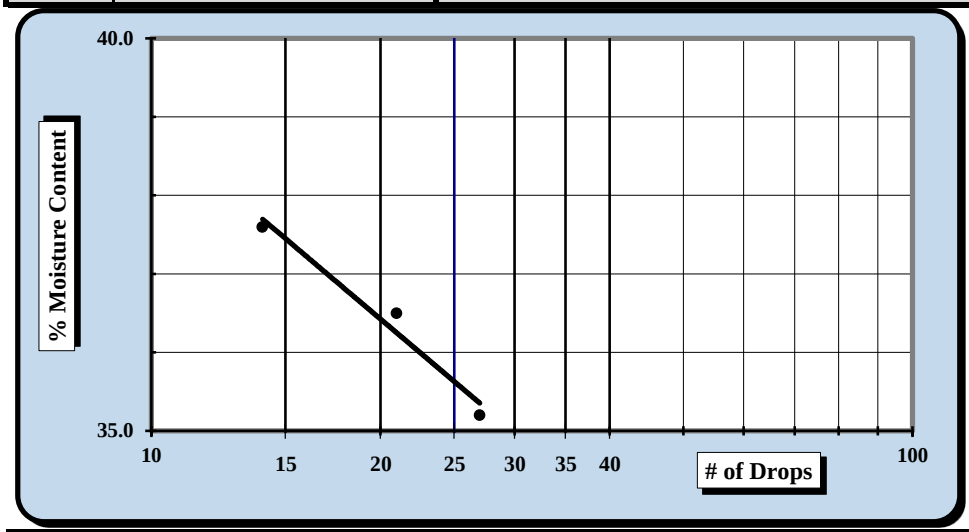
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/2-2/9/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-7	Sample #: SS-1		Sample Date: 1/21/2018	
Location:	Pavement Boring	Offset: N/A		Depth: 1.0' - 3.0'	
Sample Description:	Sandy Lean Clay (CL, A-6(7))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28573	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

Pan # 601		Liquid Limit						Plastic Limit		
	Tare #:	245	235	200				204	31	
A	Tare Weight	20.76	20.76	20.86				20.86	20.82	
B	Wet Soil Weight + A	31.91	30.81	32.34				28.52	28.14	
C	Dry Soil Weight + A	29.01	28.12	29.20				27.05	26.76	
D	Water Weight (B-C)	2.90	2.69	3.14				1.47	1.38	
E	Dry Soil Weight (C-A)	8.25	7.36	8.34				6.19	5.94	
F	% Moisture (D/E)*100	35.2%	36.5%	37.6%				23.7%	23.2%	
N	# OF DROPS	27	21	14				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**23.5%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**36**
Plastic Limit	**24**
Plastic Index	**12**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	3/8/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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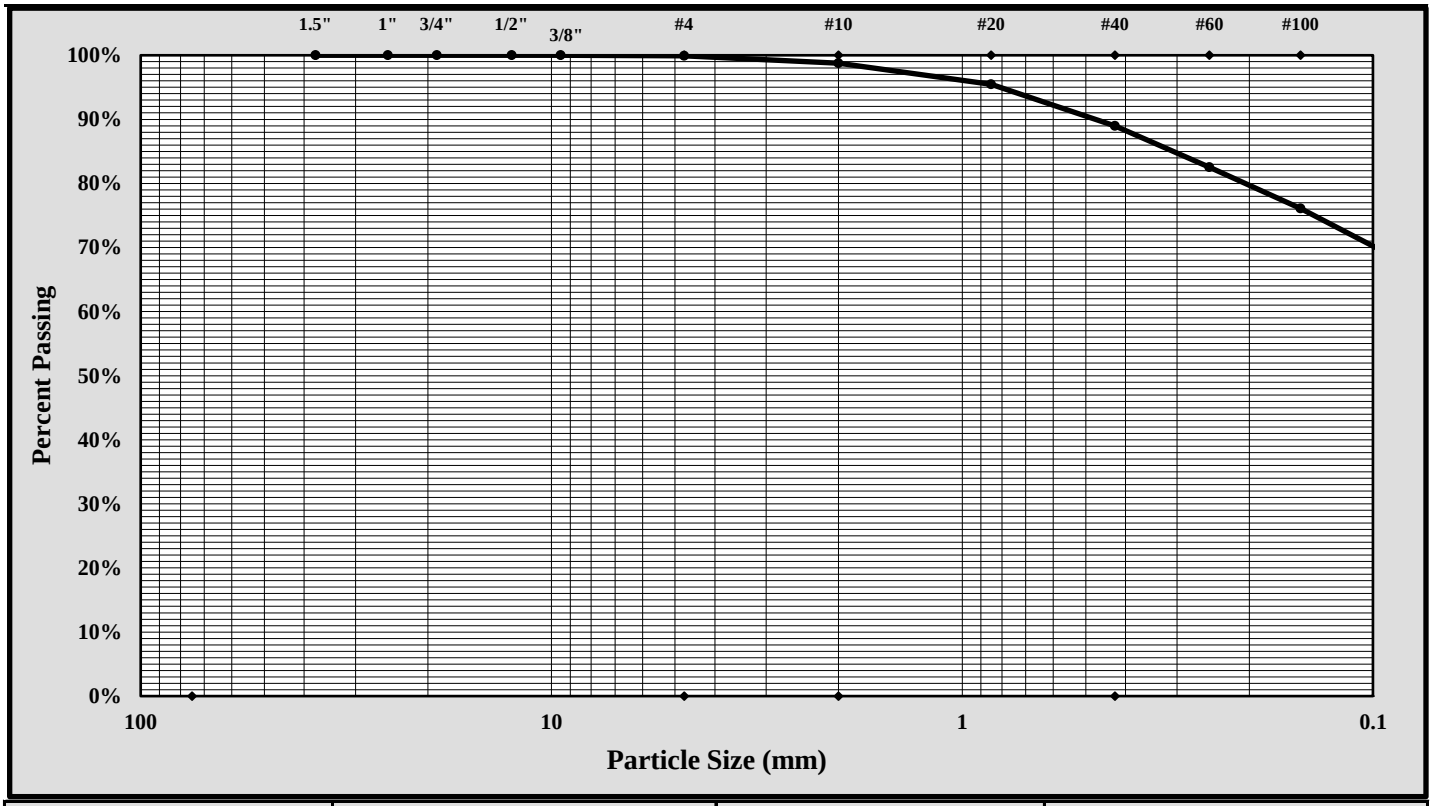
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/5-2/7/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-7 Sample #: SS-1	Sample Date:	1/21/2018
Location:	Pavement Boring Offset: N/A	Depth:	1.0' - 3.0'
Sample Description:	Sandy Lean Clay (CL, A-6(7))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	#4	Gravel:	0%
Silt & Clay (% Passing #200):	66%	Total Sand:	34%

Liquid Limit	36	Plastic Limit	24	Plastic Index	12
Coarse Sand:	1%	Medium Sand:	10%	Fine Sand:	23%

Description of Sand and Gravel	Rounded	Angular	Hard & Durable	Soft	Weathered & Friable
	☐	☒	☒	☐	☒

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/8/2018 — *Date*

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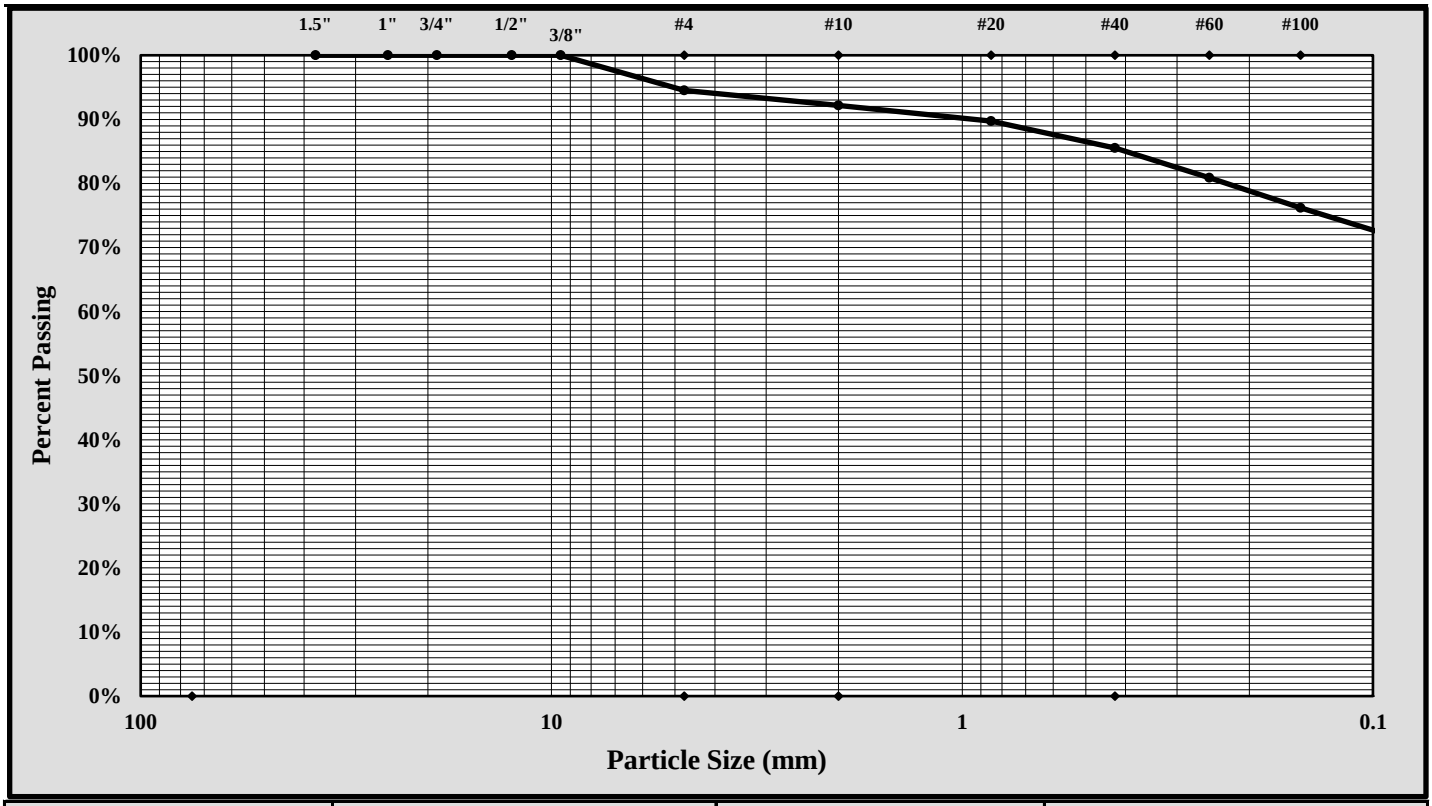
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	3/1-3/7/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-8 Sample #: SS-1	Sample Date:	1/31/2018
Location:	Pavement Boring Offset: N/A	Depth:	0.8' - 2.2'
Sample Description:	Silt with Sand (ML, A-4 (0))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	#4	Gravel:	5.5%
Silt & Clay (% Passing #200):	70.3%	Total Sand:	24.3%

Liquid Limit	*	Plastic Limit	*	Plastic Index	*
Coarse Sand:	2.3%	Medium Sand:	6.6%	Fine Sand:	15.3%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/3/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

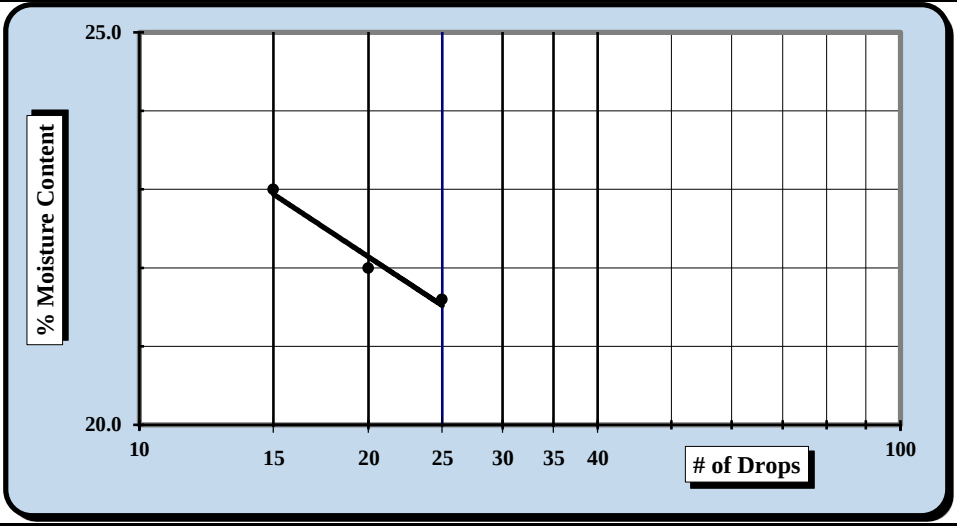
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/2-2/9/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-9	Sample #: SS-1		Sample Date: 1/21/2018	
Location:	Pavement Boring	Offset: N/A		Depth: 0.7' - 2.7'	
Sample Description:	Silty, Clayey Sand (SC-SM, A-2-4)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28573	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

Pan # 608		Liquid Limit						Plastic Limit		
	Tare #:	1	10	4				227	3	
A	Tare Weight	20.64	20.55	20.54				20.83	20.80	
B	Wet Soil Weight + A	31.13	29.65	30.81				27.66	29.89	
C	Dry Soil Weight + A	29.27	28.01	28.89				26.79	28.72	
D	Water Weight (B-C)	1.86	1.64	1.92				0.87	1.17	
E	Dry Soil Weight (C-A)	8.63	7.46	8.35				5.96	7.92	
F	% Moisture (D/E)*100	21.6%	22.0%	23.0%				14.6%	14.8%	
N	# OF DROPS	25	20	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**14.7%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**22**
Plastic Limit	**15**
Plastic Index	**7**
Group Symbol	**CL-ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	3/8/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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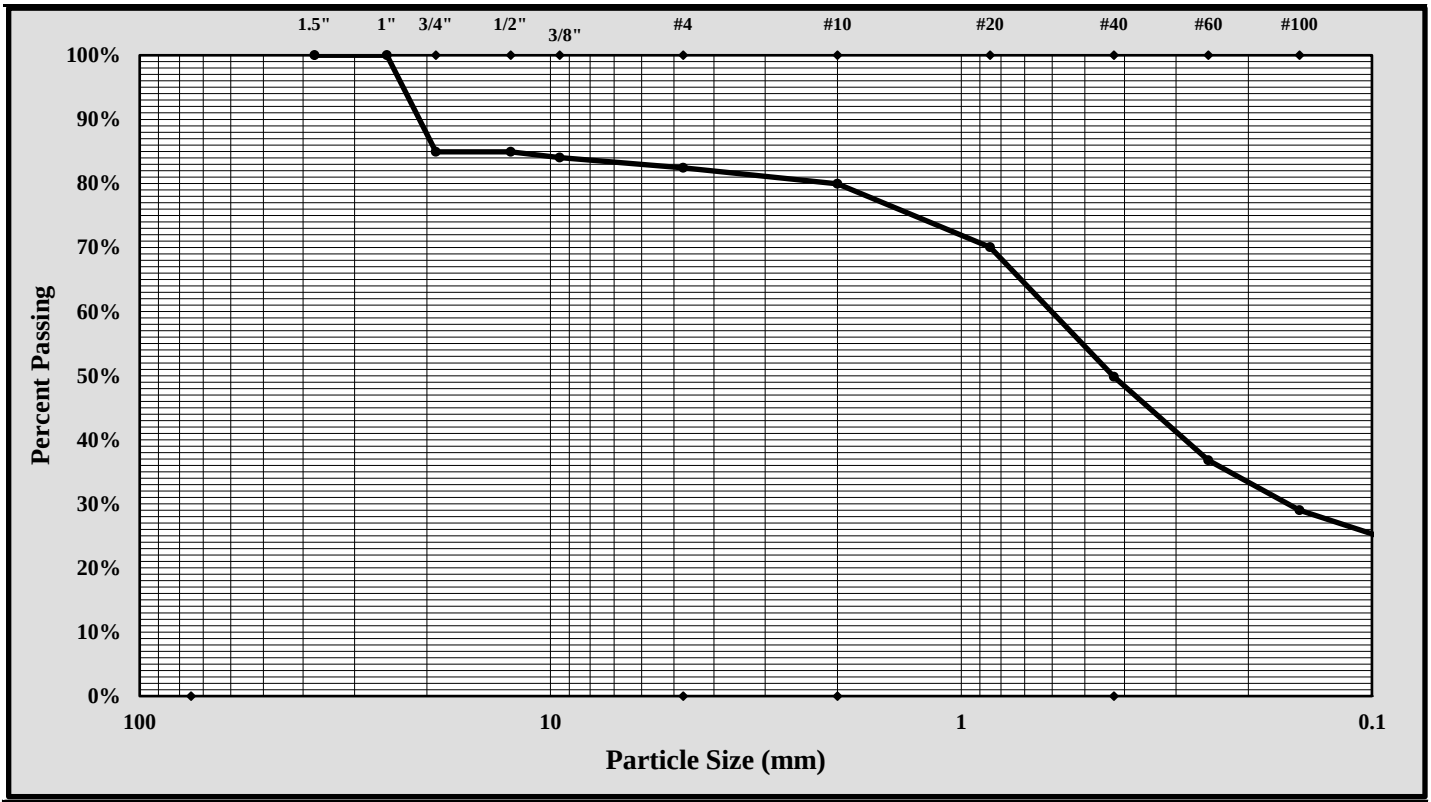
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/5-2/7/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-9 Sample #: SS-1	Sample Date:	1/21/2018
Location:	Pavement Boring Offset: N/A	Depth:	0.7' - 2.7'
Sample Description:	Silty, Clayey Sand (SC-SM, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	3/4-inch	Gravel:	18%
Silt & Clay (% Passing #200):	23%	Total Sand:	60%

Liquid Limit	22	Plastic Limit	15	Plastic Index	7
Coarse Sand:	2%	Medium Sand:	30%	Fine Sand:	27%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☒

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/8/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

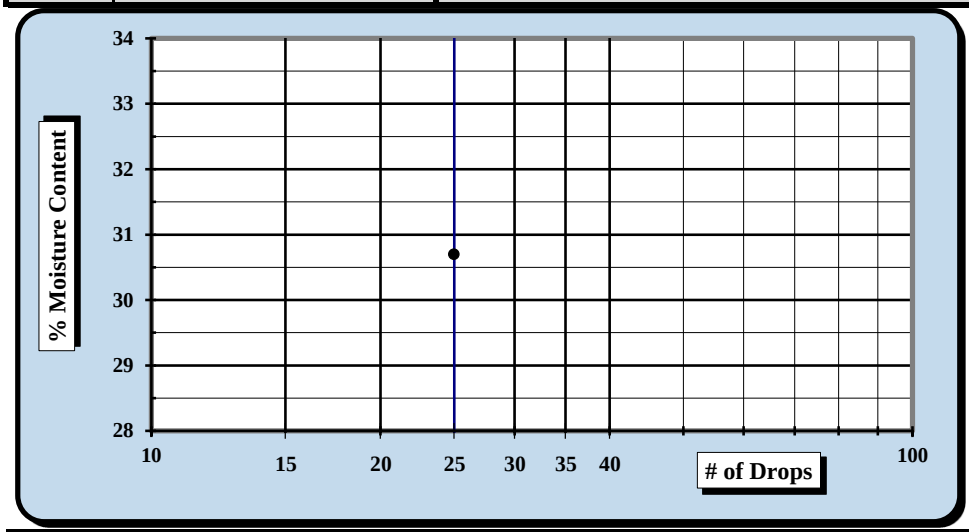
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	3/1-3/6/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-10	Sample #: SS-1		Sample Date: 1/31/18	
Location:	Pavement Boring	Offset: N/A		Depth: 1.2' - 3.0'	
Sample Description:	Silty Sand with Gravel (SM, A-2-4)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28574	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

Pan # 603		Liquid Limit						Plastic Limit		
	Tare #:	211	45					147	31	
A	Tare Weight	20.82	20.76					20.76	20.81	
B	Wet Soil Weight + A	27.32	28.16					28.79	27.12	
C	Dry Soil Weight + A	25.79	26.43					27.29	25.96	
D	Water Weight (B-C)	1.53	1.73					1.50	1.16	
E	Dry Soil Weight (C-A)	4.97	5.67					6.53	5.15	
F	% Moisture (D/E)*100	30.8%	30.5%					23.0%	22.5%	
N	# OF DROPS	25	25					*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR	30.8%	30.5%							
Ave.	*Average*	**30.7%**						**22.8%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**31**
Plastic Limit	**23**
Plastic Index	**8**
Group Symbol	**ML**

Multipoint Method ☐
One-point Method ☑

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group Symbol for minus No. 40 sieve portion only.
Limited minus No. 40 material available.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	5/3/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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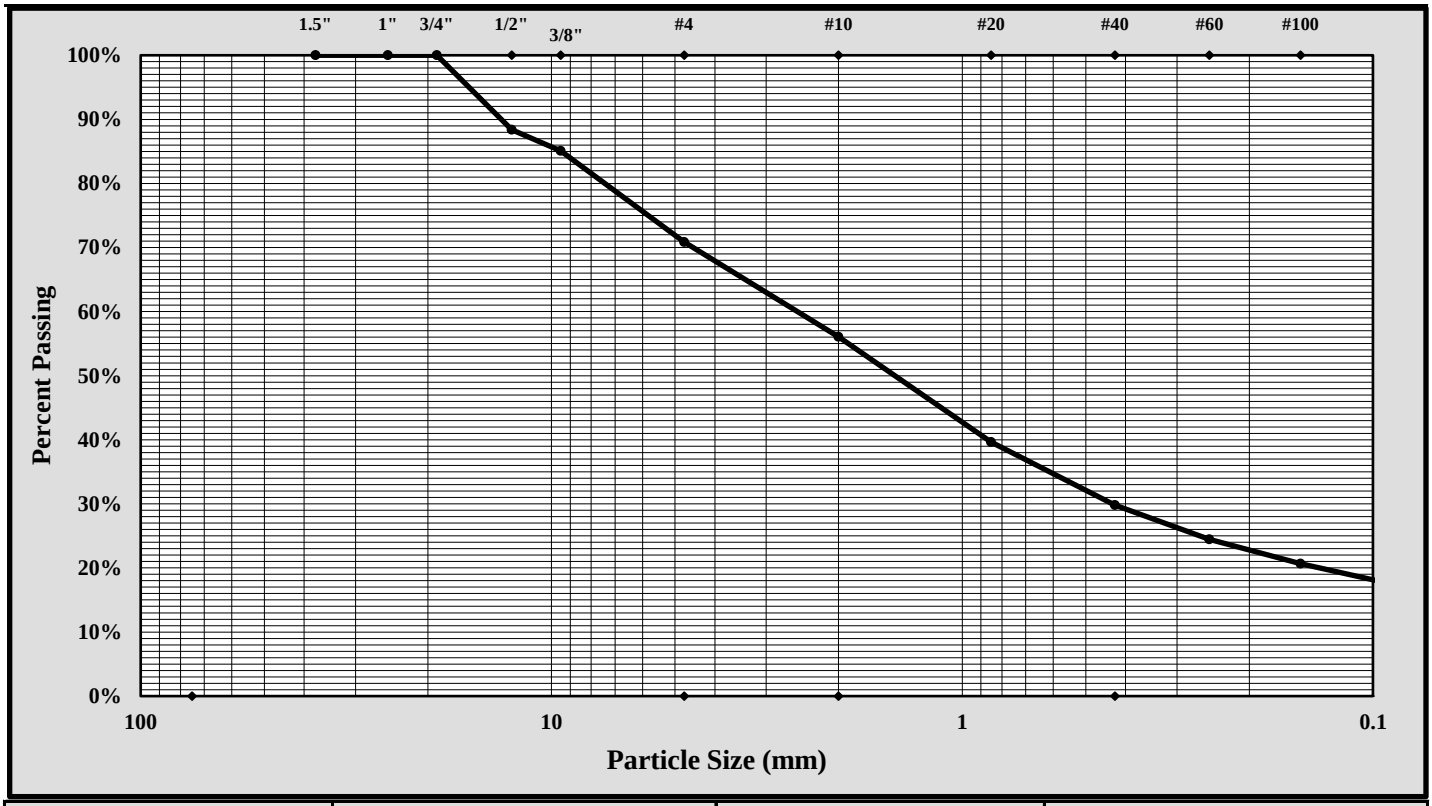
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	3/1-3/7/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-10 Sample #: SS-1	Sample Date:	1/31/2018
Location:	Pavement Boring Offset: N/A	Depth:	1.2' - 3.0'
Sample Description:	Silty Sand with Gravel (SM, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	1/2-inch	Gravel:	29.2%
Silt & Clay (% Passing #200):	16.4%	Total Sand:	54.5%

Liquid Limit	31	Plastic Limit	23	Plastic Index	8
Coarse Sand:	14.8%	Medium Sand:	26.3%	Fine Sand:	13.4%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Matthew F. Cooke, P.G.	Project Manager	5/3/2018
Technical Responsibility	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

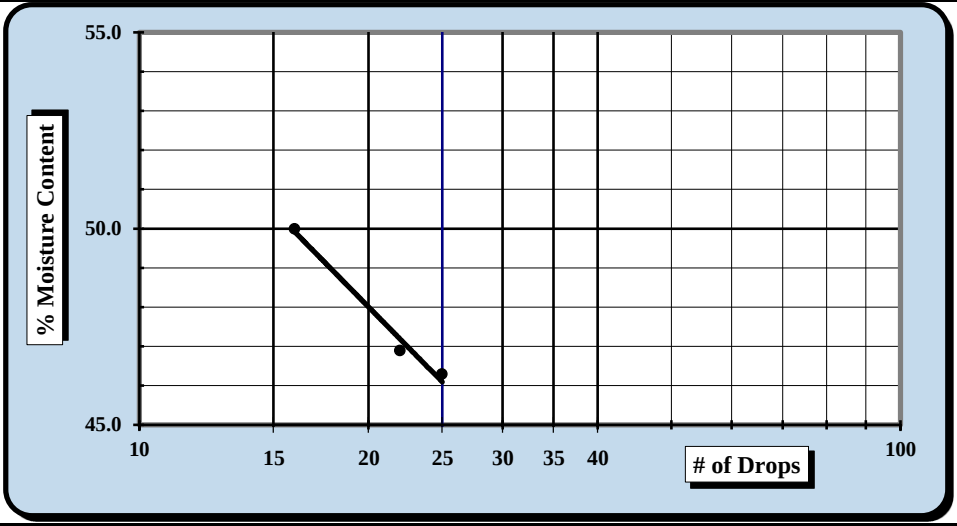
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/2-2/9/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-11	Sample #: SS-1		Sample Date: 1/21/2018	
Location:	Pavement Boring	Offset: N/A		Depth: 1.5' - 3.5'	
Sample Description:	Sandy Lean Clay (CL, A-7-6(14))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28573	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

	Pan # 605	Liquid Limit						Plastic Limit		
	Tare #:	44	29	7				146	214	
A	Tare Weight	20.75	20.81	20.79				20.55	20.84	
B	Wet Soil Weight + A	29.92	30.49	28.41				27.37	27.04	
C	Dry Soil Weight + A	27.02	27.40	25.87				26.00	25.79	
D	Water Weight (B-C)	2.90	3.09	2.54				1.37	1.25	
E	Dry Soil Weight (C-A)	6.27	6.59	5.08				5.45	4.95	
F	% Moisture (D/E)*100	46.3%	46.9%	50.0%				25.1%	25.3%	
N	# OF DROPS	25	22	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**25.2%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**46**
Plastic Limit	**25**
Plastic Index	**21**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	3/8/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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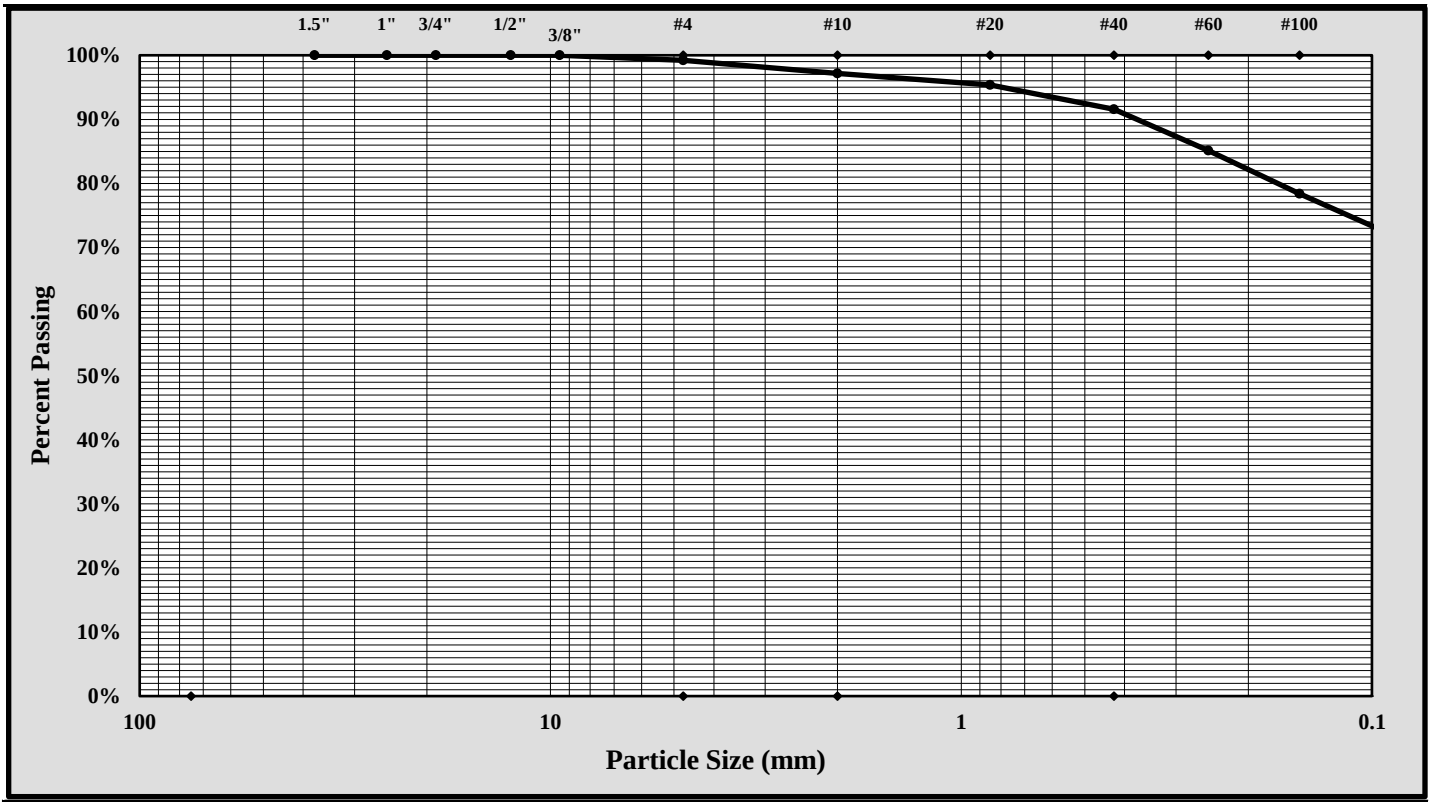
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/5-2/7/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-11 Sample #: SS-1	Sample Date:	1/22/2018
Location:	Pavement Boring Offset: N/A	Depth:	1.5' - 3.5'
Sample Description:	Sandy Lean Clay (CL, A-7-6(14))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	#4	Gravel:	1%
Silt & Clay (% Passing #200):	70%	Total Sand:	29%

Liquid Limit	46	Plastic Limit	25	Plastic Index	21
Coarse Sand:	2%	Medium Sand:	6%	Fine Sand:	22%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☒

References / Comments / Deviations:

Matthew F. Cooke, P.G.	Project Manager	3/8/2018
Technical Responsibility	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	3/1-3/6/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-12	Sample #: SS-1		Sample Date: 1/30/18	
Location:	Pavement Boring	Offset: N/A		Depth: 1.3' - 2.7'	
Sample Description:	Silty, Clayey Sand (SC-SM, A-1-b)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28574	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

	Pan # 606	Liquid Limit						Plastic Limit		
	Tare #:	29	7	39				25	195	
A	Tare Weight	20.81	20.79	20.80				20.60	20.53	
B	Wet Soil Weight + A	31.40	29.45	29.90				27.14	31.23	
C	Dry Soil Weight + A	29.17	27.58	27.82				26.02	29.42	
D	Water Weight (B-C)	2.23	1.87	2.08				1.12	1.81	
E	Dry Soil Weight (C-A)	8.36	6.79	7.02				5.42	8.89	
F	% Moisture (D/E)*100	26.7%	27.5%	29.6%				20.7%	20.4%	
N	# OF DROPS	34	22	12				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**20.6%**		

One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**27**
Plastic Limit	**21**
Plastic Index	**6**
Group Symbol	**CL-ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group Symbol for minus No. 40 sieve portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	5/3/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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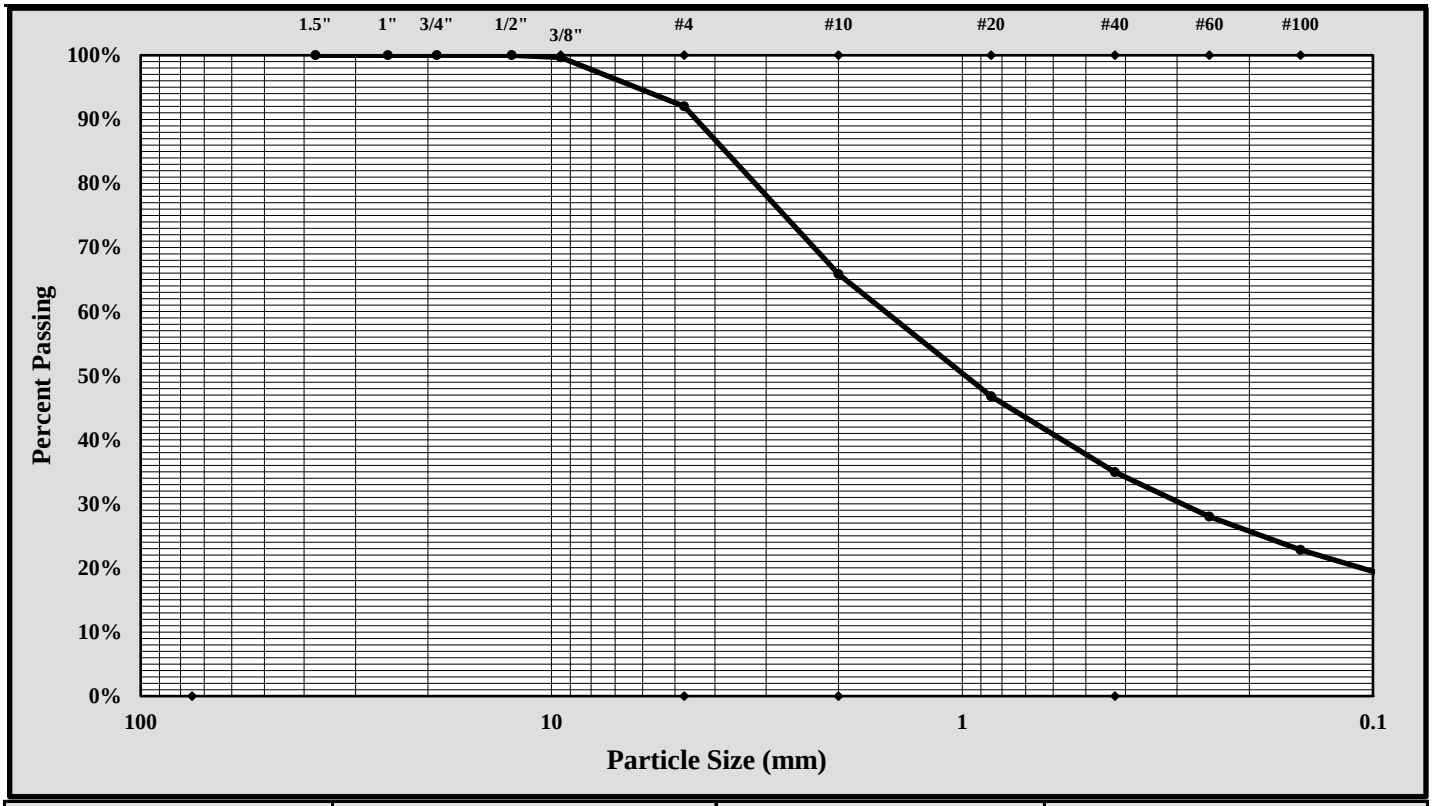
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	3/1-3/7/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-12 Sample #: SS-1	Sample Date:	1/30/18
Location:	Pavement Boring Offset: N/A	Depth:	1.3' - 2.7'
Sample Description:	Silty, Clayey Sand (SC-SM, A-1-b)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	3/8-inch	Gravel:	8.0%
Silt & Clay (% Passing #200):	17.1%	Total Sand:	75.0%

Liquid Limit	27	Plastic Limit	21	Plastic Index	6
Coarse Sand:	26.2%	Medium Sand:	30.9%	Fine Sand:	17.9%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/3/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

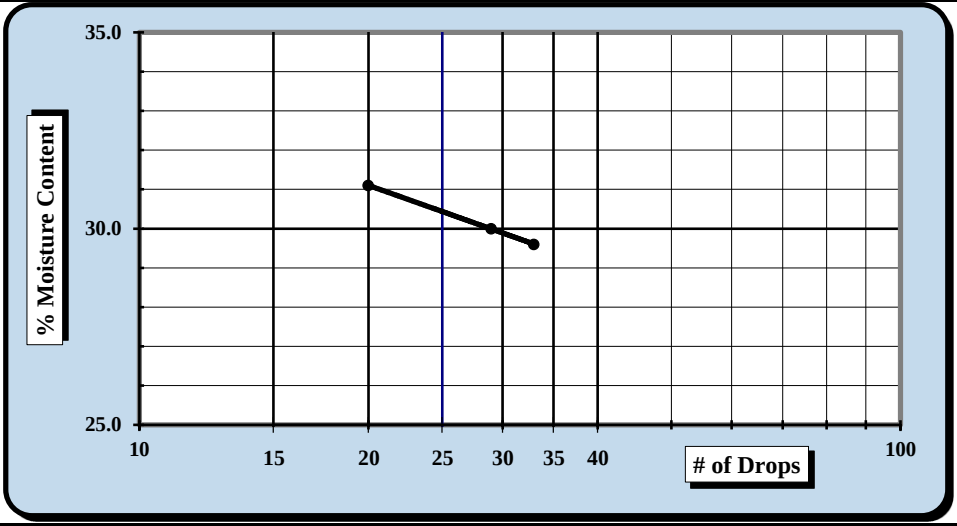
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/7-2/15/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-13	Sample #: SS-1	Sample Date: 1/22/2018
Location:	Pavement Boring	Offset: N/A	Depth: 1.5' - 3.5'
Sample Description:	Sandy Lean Clay (CL, A-4(3))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28573	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

		Liquid Limit						Plastic Limit		
Pan #	604									
	Tare #:	209	244	207				116	24	
A	Tare Weight	21.12	20.77	20.93				20.57	20.77	
B	Wet Soil Weight + A	29.44	30.57	29.90				27.62	28.22	
C	Dry Soil Weight + A	27.54	28.31	27.77				26.40	26.94	
D	Water Weight (B-C)	1.90	2.26	2.13				1.22	1.28	
E	Dry Soil Weight (C-A)	6.42	7.54	6.84				5.83	6.17	
F	% Moisture (D/E)*100	29.6%	30.0%	31.1%				20.9%	20.7%	
N	# OF DROPS	33	29	20				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**20.8%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**31**
Plastic Limit	**21**
Plastic Index	**10**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	3/8/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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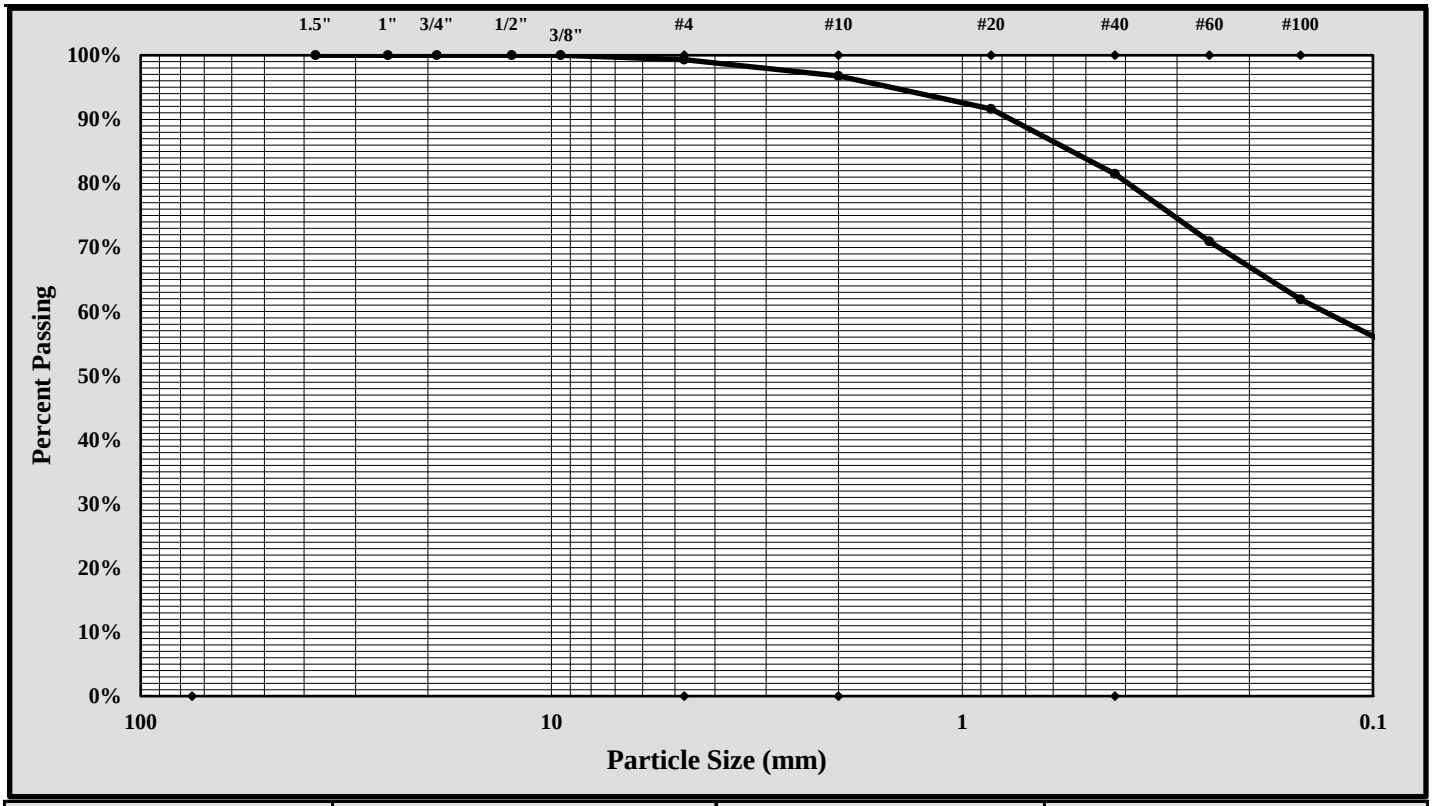
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/5-2/7/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-13 Sample #: SS-1	Sample Date:	1/22/2018
Location:	Pavement Boring Offset: N/A	Depth:	1.5' - 3.5'
Sample Description:	Sandy Lean Clay (CL, A-4(3))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	#4	Gravel:	1%
Silt & Clay (% Passing #200):	52%	Total Sand:	47%

Liquid Limit	31	Plastic Limit	21	Plastic Index	10
Coarse Sand:	3%	Medium Sand:	15%	Fine Sand:	29%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/8/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	3/1-3/6/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-14	Sample #: SS-1		Sample Date: 1/30/18	
Location:	Pavement Boring	Offset: N/A		Depth: 0.7' - 2.7'	
Sample Description:	Sandy Fat Clay (CH, A-7-6(16))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28574	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

Pan # 600		Liquid Limit						Plastic Limit		
	Tare #:	217	123	46				116	201	
A	Tare Weight	20.86	20.55	20.72				20.57	20.87	
B	Wet Soil Weight + A	28.72	29.86	27.62				27.29	27.09	
C	Dry Soil Weight + A	26.18	26.74	25.25				25.96	25.85	
D	Water Weight (B-C)	2.54	3.12	2.37				1.33	1.24	
E	Dry Soil Weight (C-A)	5.32	6.19	4.53				5.39	4.98	
F	% Moisture (D/E)*100	47.7%	50.4%	52.3%				24.7%	24.9%	
N	# OF DROPS	35	24	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**24.8%**		

One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**51**
Plastic Limit	**25**
Plastic Index	**26**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group Symbol for minus No. 40 sieve portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	5/3/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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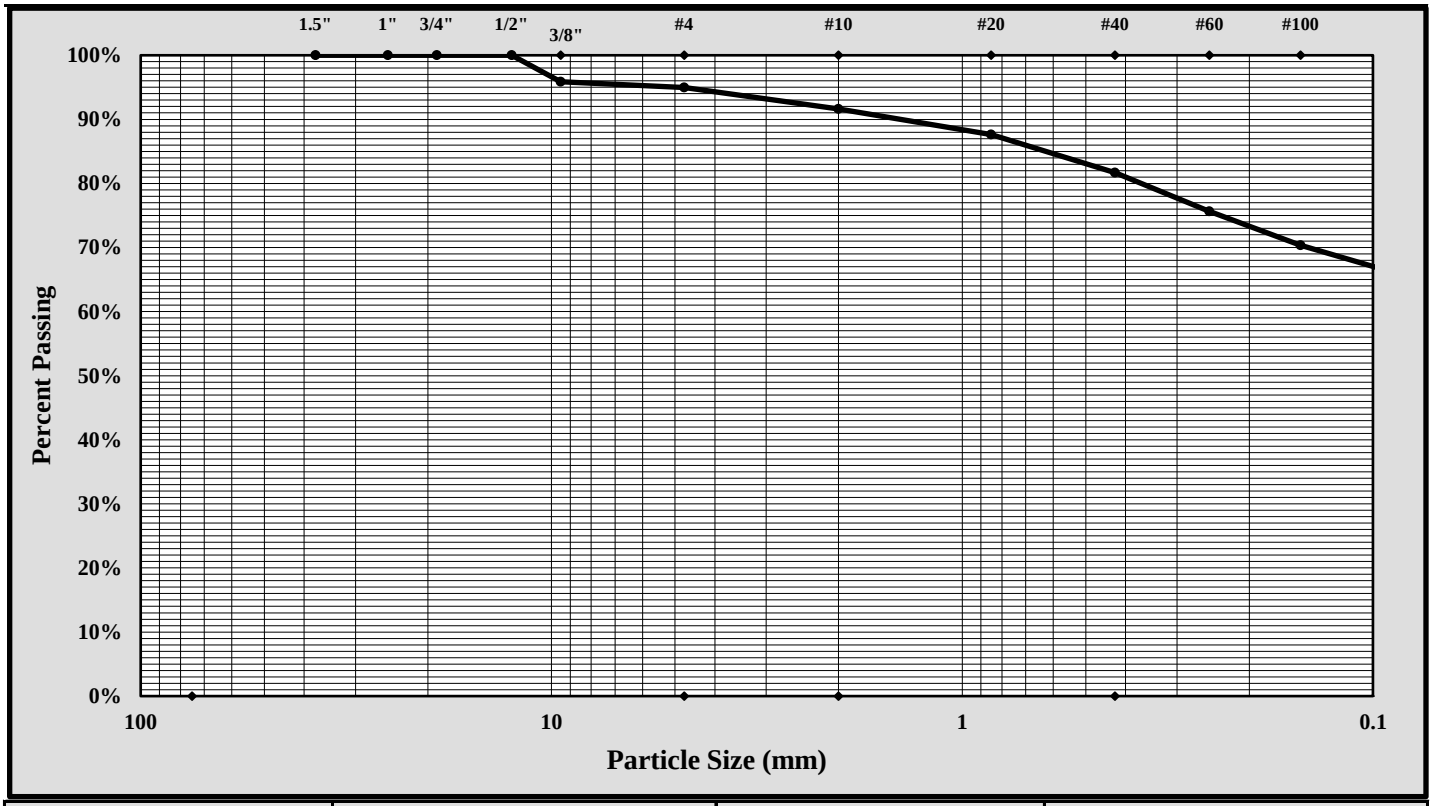
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	3/1-3/7/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-14 Sample #: SS-1	Sample Date:	1/30/18
Location:	Pavement Boring Offset: N/A	Depth:	0.7' - 2.7'
Sample Description:	Sandy Fat Clay (CH, A-7-6(16))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	3/8-inch	Gravel:	5.1%
Silt & Clay (% Passing #200):	64.7%	Total Sand:	30.2%

Liquid Limit	51	Plastic Limit	25	Plastic Index	26
Coarse Sand:	3.3%	Medium Sand:	10.0%	Fine Sand:	17.0%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/3/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

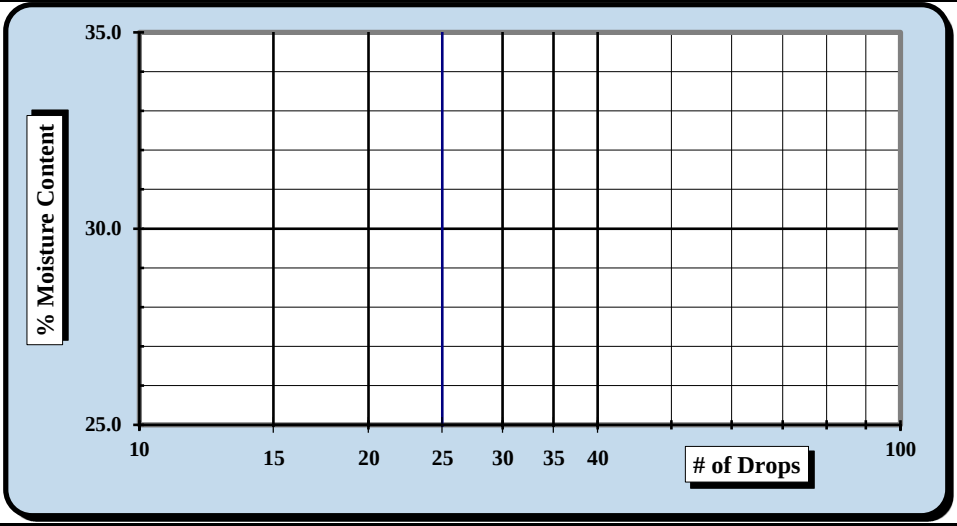
ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/7-2/15/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-15	Sample #: SS-1	Sample Date: 1/22/2018
Location:	Pavement Boring	Offset: N/A	Depth: 1.0' - 3.0'
Sample Description:	Silty Sand (SM, A-2-4)		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28573	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

		Liquid Limit						Plastic Limit		
Pan #	603									
	Tare #:									
A	Tare Weight									
B	Wet Soil Weight + A									
C	Dry Soil Weight + A									
D	Water Weight (B-C)									
E	Dry Soil Weight (C-A)									
F	% Moisture (D/E)*100									
N	# OF DROPS							*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*									



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☒

Liquid Limit	**NP**
Plastic Limit	**NP**
Plastic Index	**NP**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	3/8/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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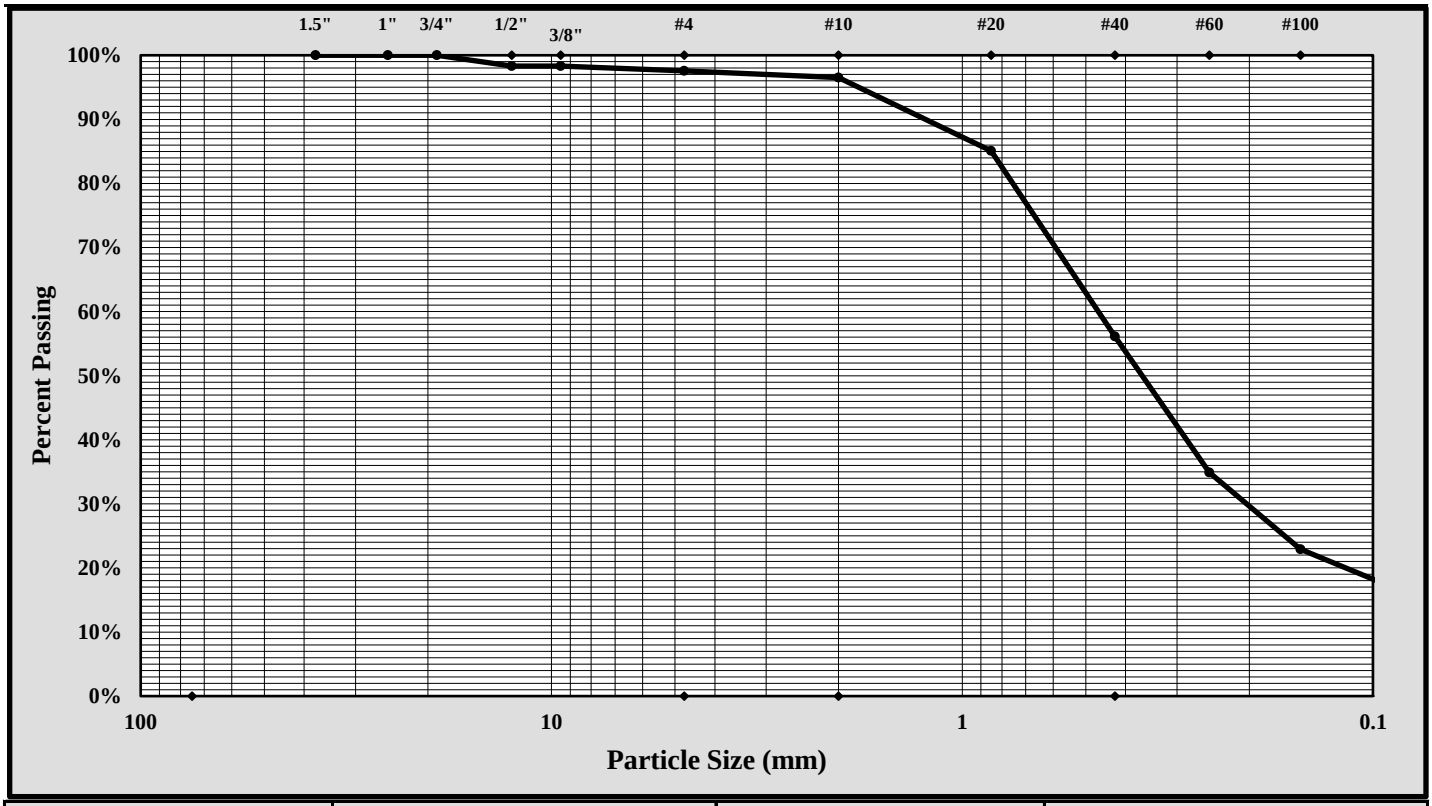
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/5-2/15/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-15 Sample #: SS-1	Sample Date:	1/22/2018
Location:	Pavement Boring Offset: N/A	Depth:	1.0' - 3.0'
Sample Description:	Silty Sand (SM, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	1/2-inch	Gravel:	2%
Silt & Clay (% Passing #200):	15%	Total Sand:	83%

Liquid Limit	NP	Plastic Limit	NP	Plastic Index	NP
Coarse Sand:	1%	Medium Sand:	40%	Fine Sand:	41%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/8/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

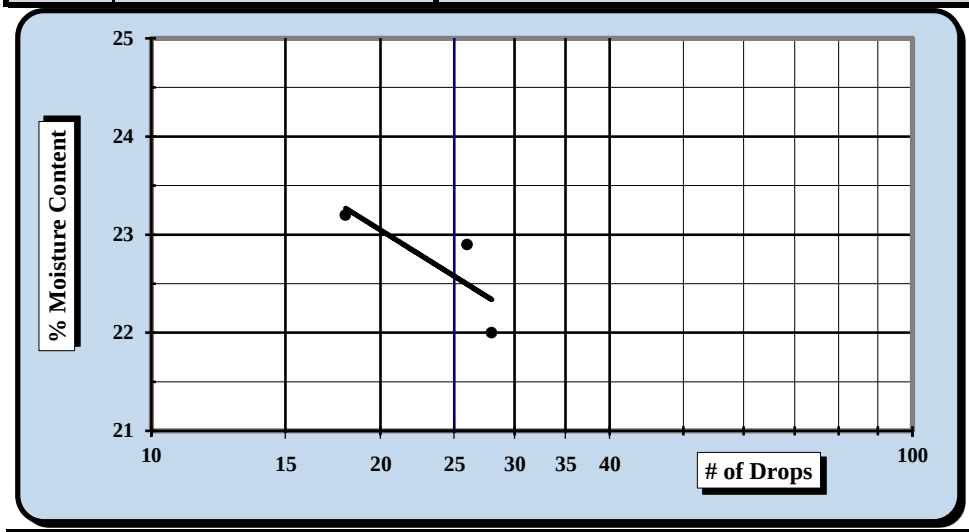
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	3/1-3/6/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-16	Sample #: SS-1		Sample Date: 1/30/18	
Location:	Pavement Boring	Offset: N/A		Depth: 0.8' - 2.8'	
Sample Description:	Clayey Sand (SC, A-2-4)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28574	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

		Pan # 609	Liquid Limit						Plastic Limit		
		Tare #:	19	210	30				3	209	
A	Tare Weight		20.51	20.97	20.80				20.80	21.08	
B	Wet Soil Weight + A		31.20	29.94	30.67				29.75	28.72	
C	Dry Soil Weight + A		29.27	28.27	28.81				28.63	27.70	
D	Water Weight (B-C)		1.93	1.67	1.86				1.12	1.02	
E	Dry Soil Weight (C-A)		8.76	7.30	8.01				7.83	6.62	
F	% Moisture (D/E)*100		22.0%	22.9%	23.2%				14.3%	15.4%	
N	# OF DROPS		28	26	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR										
Ave.	*Average*								**14.9%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**23**
Plastic Limit	**15**
Plastic Index	**8**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group Symbol for minus No. 40 sieve portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	5/3/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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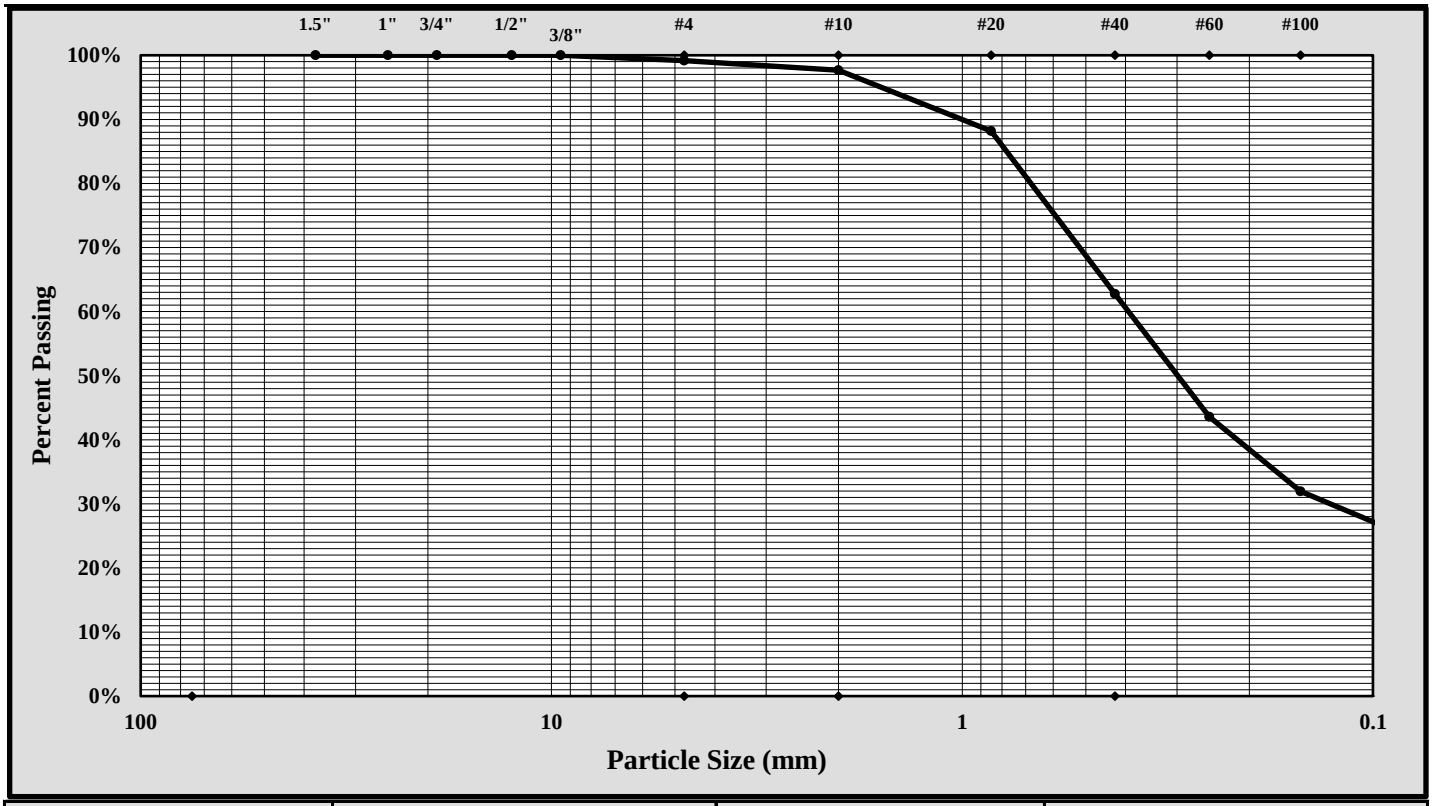
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	3/1-3/7/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-16 Sample #: SS-1	Sample Date:	1/30/18
Location:	Pavement Boring Offset: N/A	Depth:	0.8' - 2.8'
Sample Description:	Clayey Sand (SC, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	#4	Gravel:	0.9%
Silt & Clay (% Passing #200):	23.9%	Total Sand:	75.3%

Liquid Limit	23	Plastic Limit	15	Plastic Index	8
Coarse Sand:	1.5%	Medium Sand:	34.9%	Fine Sand:	38.9%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☒

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/3/2018 — *Date*

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Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/7-2/15/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-17	Sample #: SS-1		Sample Date: 1/22/2018	
Location:	Pavement Boring	Offset: N/A		Depth: 0.7' - 2.7'	
Sample Description:	Sandy Lean Clay (CL, A-6(8))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28573	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

Pan # 602		Liquid Limit						Plastic Limit		
	Tare #:	17	25	229				1	4	
A	Tare Weight	20.61	20.62	20.70				20.64	20.55	
B	Wet Soil Weight + A	29.34	28.18	28.48				27.20	26.56	
C	Dry Soil Weight + A	27.05	26.15	26.31				26.17	25.60	
D	Water Weight (B-C)	2.29	2.03	2.17				1.03	0.96	
E	Dry Soil Weight (C-A)	6.44	5.53	5.61				5.53	5.05	
F	% Moisture (D/E)*100	35.6%	36.7%	38.7%				18.6%	19.0%	
N	# OF DROPS	34	24	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**18.8%**		

One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**37**
Plastic Limit	**19**
Plastic Index	**18**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	3/8/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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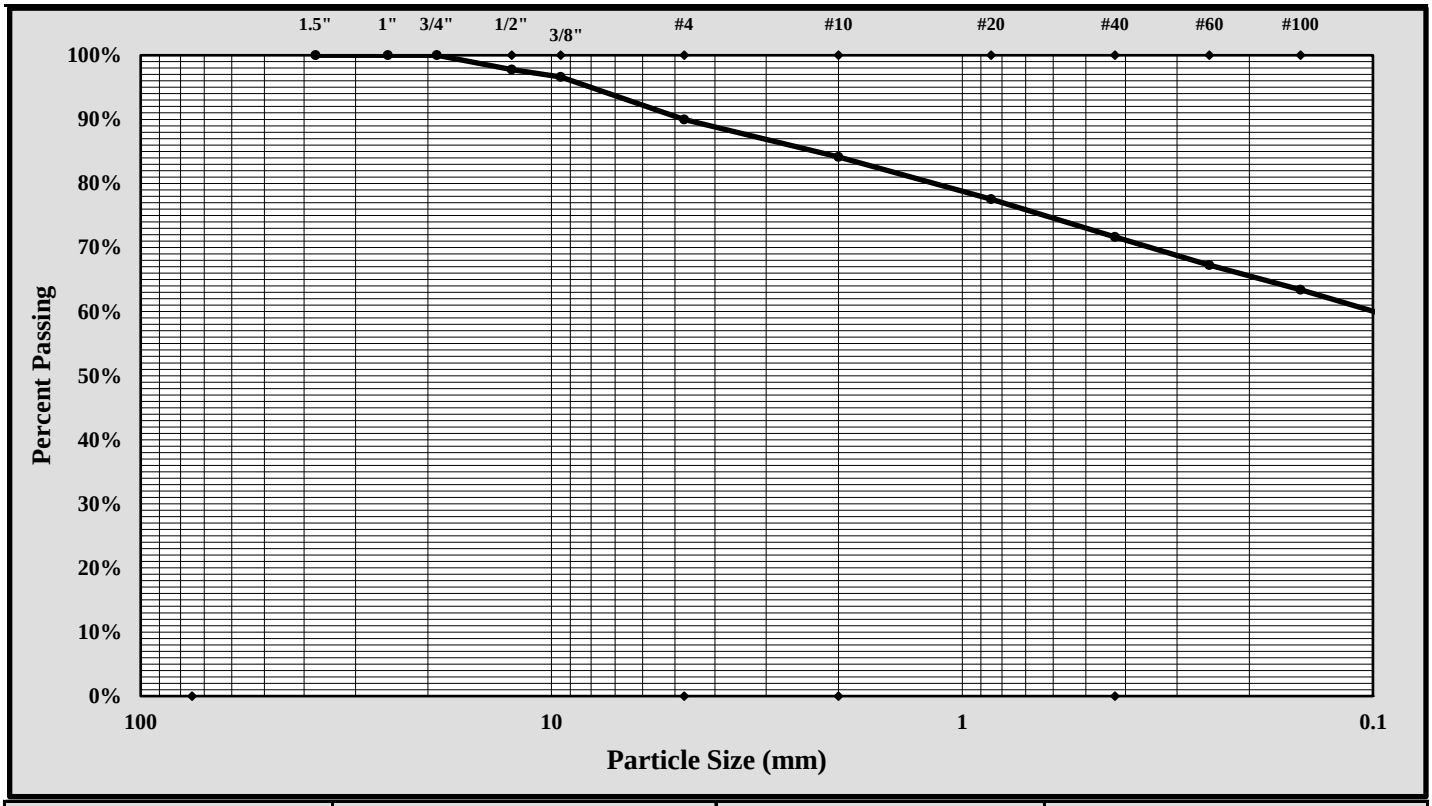
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/5-2/15/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., N. Charleston, SC		
Boring #:	P-17 Sample #: SS-1	Sample Date:	1/22/2018
Location:	Pavement Boring Offset: N/A	Depth:	0.7' - 2.7'
Sample Description:	Sandy Lean Clay (CL, A-6(8))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	1/2-inch	Gravel:	10%
Silt & Clay (% Passing #200):	58%	Total Sand:	32%

Liquid Limit	37	Plastic Limit	19	Plastic Index	18
Coarse Sand:	6%	Medium Sand:	13%	Fine Sand:	14%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☒

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/8/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

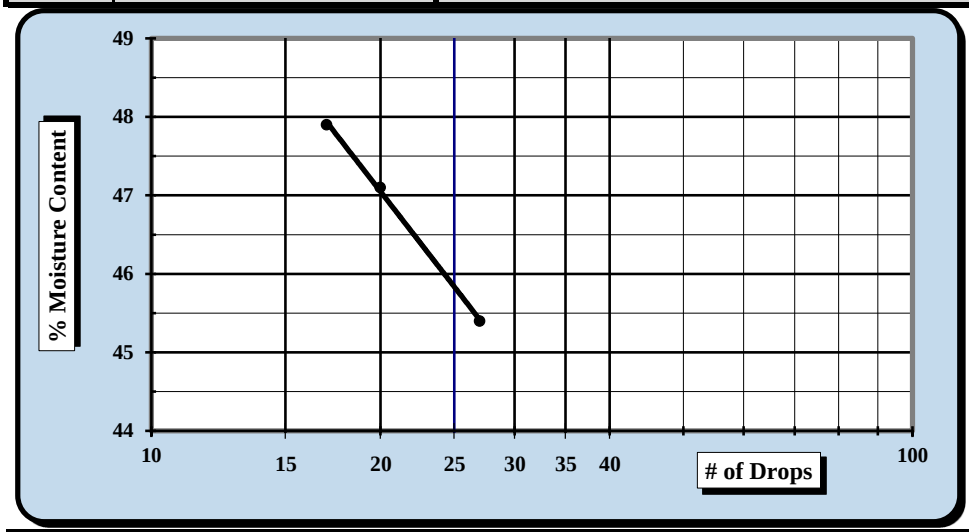
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	3/1-3/6/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-18	Sample #: SS-1	Sample Date: 1/30/18
Location:	Pavement Boring	Offset: N/A	Depth: 1.3' - 3.3'
Sample Description:	Sandy Silt (ML, A-7-5(7))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28574	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

	Pan # 484	Liquid Limit						Plastic Limit		
	Tare #:	4	240	32				229	16	
A	Tare Weight	20.54	20.76	20.42				20.70	20.71	
B	Wet Soil Weight + A	28.42	27.57	27.68				27.95	27.11	
C	Dry Soil Weight + A	25.96	25.39	25.33				26.21	25.60	
D	Water Weight (B-C)	2.46	2.18	2.35				1.74	1.51	
E	Dry Soil Weight (C-A)	5.42	4.63	4.91				5.51	4.89	
F	% Moisture (D/E)*100	45.4%	47.1%	47.9%				31.6%	30.9%	
N	# OF DROPS	27	20	17				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**31.3%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**46**
Plastic Limit	**31**
Plastic Index	**15**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group Symbol for minus No. 40 sieve portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	5/3/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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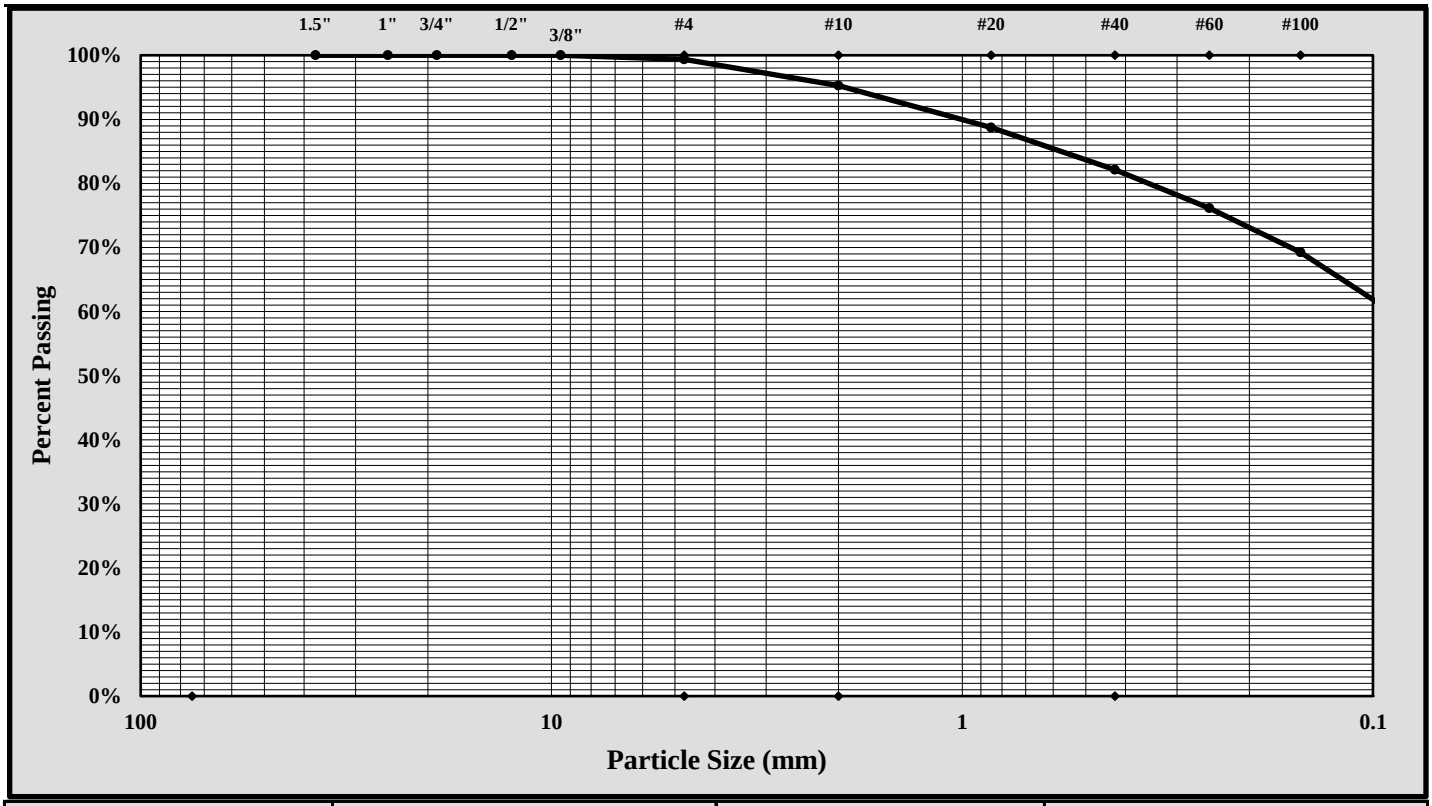
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	3/1-3/7/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-18 Sample #: SS-1	Sample Date:	1/30/18
Location:	Pavement Boring Offset: N/A	Depth:	1.3' - 3.3'
Sample Description:	Sandy Silt (ML, A-7-5(7))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	#4	Gravel:	0.7%
Silt & Clay (% Passing #200):	56.7%	Total Sand:	42.7%

Liquid Limit	46	Plastic Limit	31	Plastic Index	15
Coarse Sand:	4.1%	Medium Sand:	13.1%	Fine Sand:	25.5%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Matthew F. Cooke, P.G.	Project Manager	5/3/2018
Technical Responsibility	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

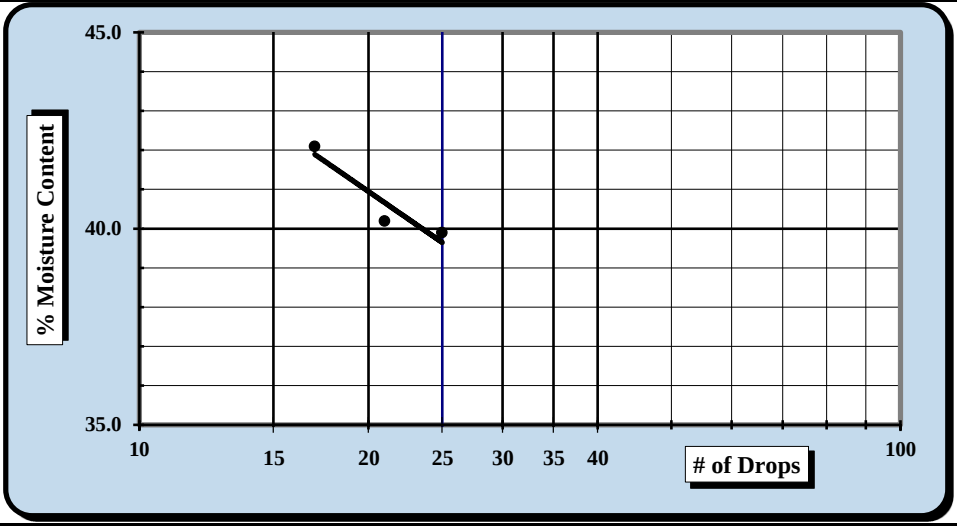
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/7-2/15/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-19	Sample #: SS-1	Sample Date: 1/22/2018
Location:	Pavement Boring	Offset: N/A	Depth: 1.3' - 2.7'
Sample Description:	Sandy Silt (ML, A-6(8))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28573	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

	Pan # 606	Liquid Limit						Plastic Limit		
	Tare #:	44	40	246				147	43	
A	Tare Weight	20.75	20.84	20.68				20.77	20.82	
B	Wet Soil Weight + A	29.73	29.98	28.91				26.77	27.45	
C	Dry Soil Weight + A	27.17	27.36	26.47				25.56	26.07	
D	Water Weight (B-C)	2.56	2.62	2.44				1.21	1.38	
E	Dry Soil Weight (C-A)	6.42	6.52	5.79				4.79	5.25	
F	% Moisture (D/E)*100	39.9%	40.2%	42.1%				25.3%	26.3%	
N	# OF DROPS	25	21	17				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**25.8%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**40**
Plastic Limit	**26**
Plastic Index	**14**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	3/8/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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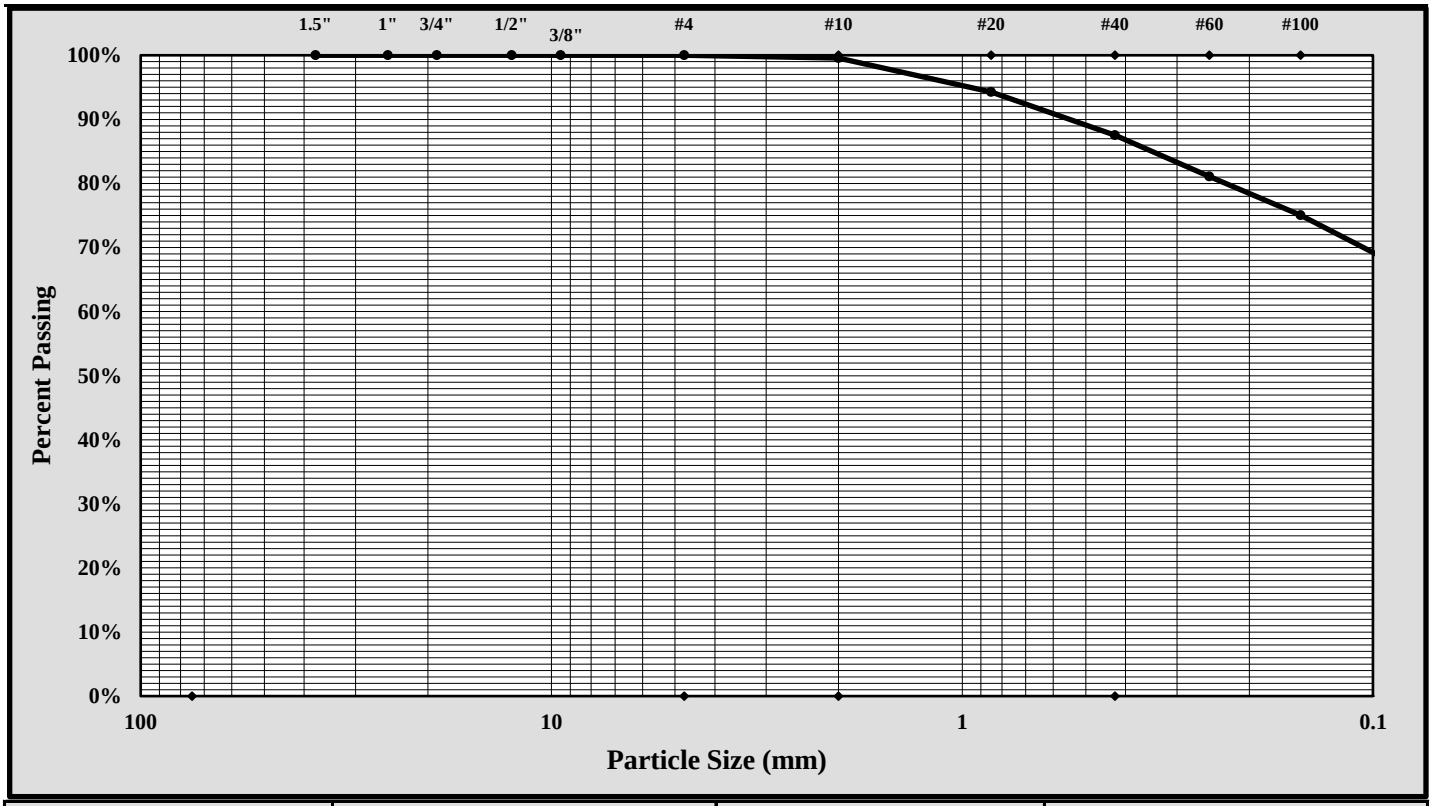
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/5-2/15/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-19 Sample #: SS-1	Sample Date:	1/22/2018
Location:	Pavement Boring Offset: N/A	Depth:	1.3' - 2.7'
Sample Description:	Sandy Silt (ML, A-6(8))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	#10	Gravel:	0%
Silt & Clay (% Passing #200):	65%	Total Sand:	35%

Liquid Limit	40	Plastic Limit	26	Plastic Index	14
Coarse Sand:	0%	Medium Sand:	12%	Fine Sand:	22%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/8/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	3/7-3/26/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-20	Sample #: SS-1		Sample Date: 1/30/18	
Location:	Pavement Boring	Offset: N/A		Depth: 1.5' - 3.5'	
Sample Description:	Clayey Sand (SC, A-2-6)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28574	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

Pan # 610		Liquid Limit						Plastic Limit		
	Tare #:	214	10	211				16	229	
A	Tare Weight	20.84	20.79	20.84				20.67	20.70	
B	Wet Soil Weight + A	30.19	28.85	28.84				26.89	27.08	
C	Dry Soil Weight + A	28.12	26.95	26.87				26.01	26.16	
D	Water Weight (B-C)	2.07	1.90	1.97				0.88	0.92	
E	Dry Soil Weight (C-A)	7.28	6.16	6.03				5.34	5.46	
F	% Moisture (D/E)*100	28.4%	30.8%	32.7%				16.5%	16.8%	
N	# OF DROPS	32	20	12				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**16.7%**		

One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**30**
Plastic Limit	**17**
Plastic Index	**13**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group Symbol for minus No. 40 sieve portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	5/3/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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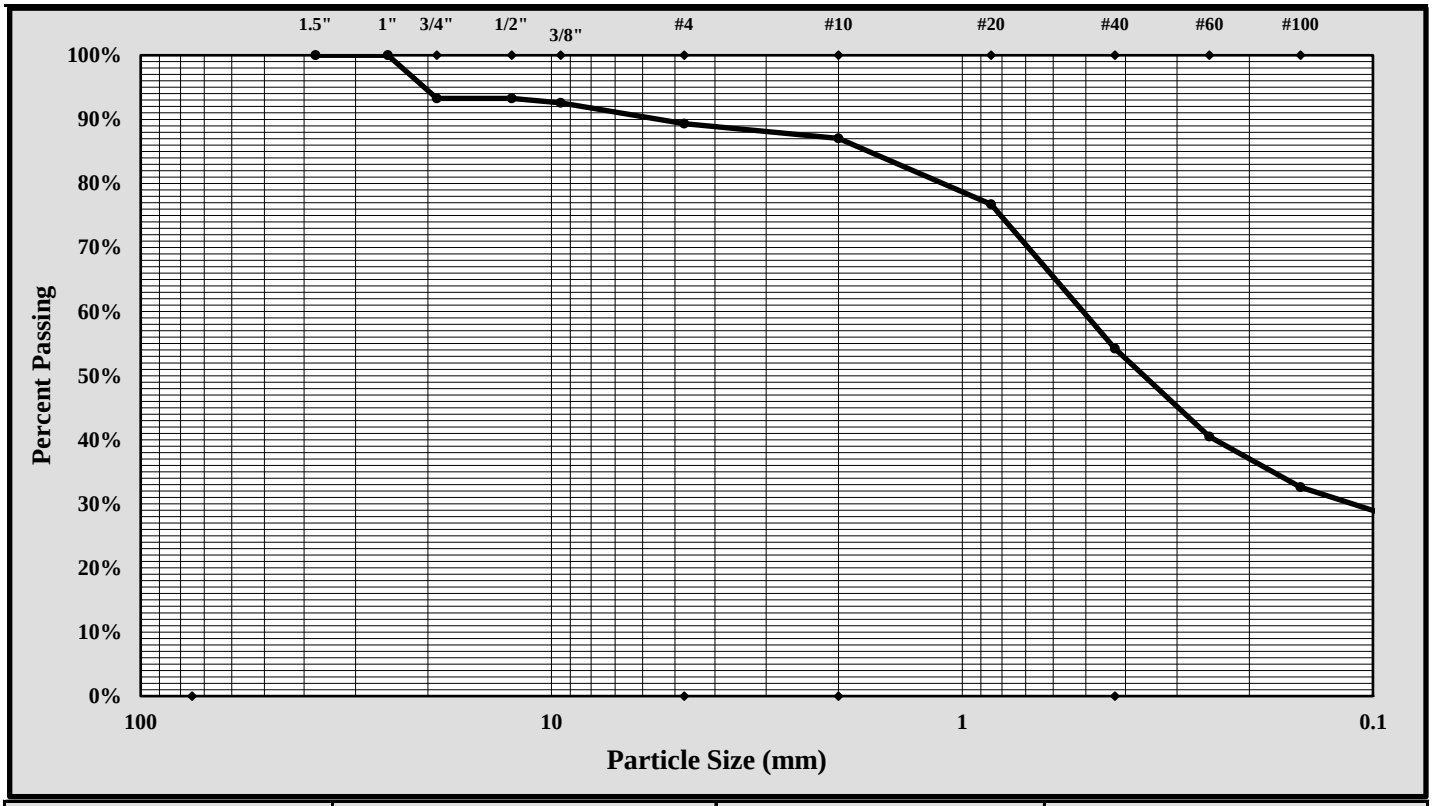
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	3/1-3/7/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-20 Sample #: SS-1	Sample Date:	1/30/18
Location:	Pavement Boring Offset: N/A	Depth:	1.5' - 3.5'
Sample Description:	Clayey Sand (SC, A-2-6)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	3/4-inch	Gravel:	10.7%
Silt & Clay (% Passing #200):	26.4%	Total Sand:	62.9%

Liquid Limit	30	Plastic Limit	17	Plastic Index	13
Coarse Sand:	2.3%	Medium Sand:	32.8%	Fine Sand:	27.8%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/3/2018 — *Date*

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Form No. TR-D4318-T89-90
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LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

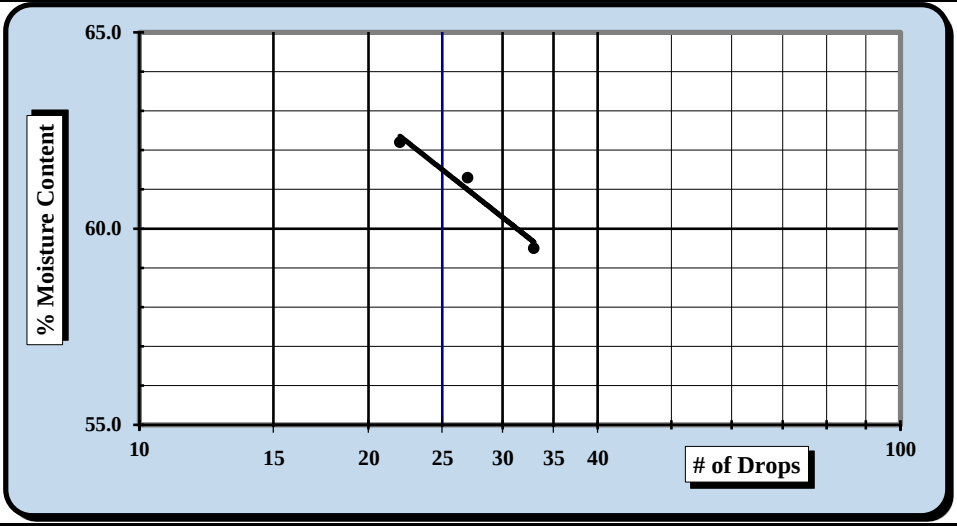
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/7-2/15/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-21	Sample #: SS-1		Sample Date: 1/23/2018	
Location:	Pavement Boring	Offset: N/A		Depth: 1.4' - 3.4'	
Sample Description:	Fat Clay with Sand (CH, A-7-5(26))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28573	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

Pan # 610		Liquid Limit						Plastic Limit		
	Tare #:	100	29	9				3	227	
A	Tare Weight	20.57	20.81	20.81				20.79	20.83	
B	Wet Soil Weight + A	28.45	27.89	27.98				26.95	27.24	
C	Dry Soil Weight + A	25.51	25.20	25.23				25.47	25.72	
D	Water Weight (B-C)	2.94	2.69	2.75				1.48	1.52	
E	Dry Soil Weight (C-A)	4.94	4.39	4.42				4.68	4.89	
F	% Moisture (D/E)*100	59.5%	61.3%	62.2%				31.6%	31.1%	
N	# OF DROPS	33	27	22				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**31.4%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**62**
Plastic Limit	**31**
Plastic Index	**31**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	3/8/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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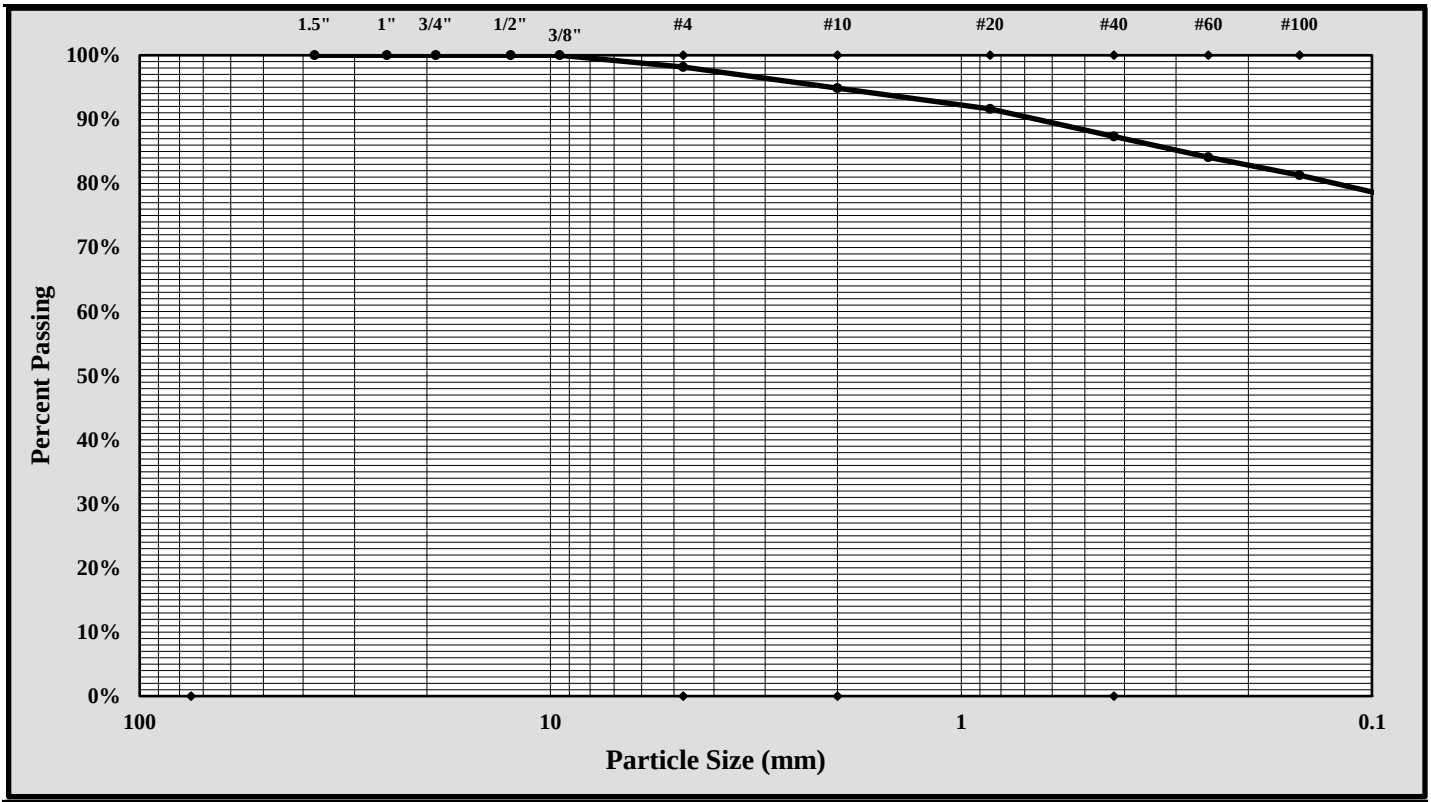
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/5-2/15/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-21 Sample #: SS-1	Sample Date:	1/23/2018
Location:	Pavement Boring Offset: N/A	Depth:	1.4' - 3.4'
Sample Description:	Fat Clay with Sand (CH, A-7-5(26))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	#4	Gravel:	2%
Silt & Clay (% Passing #200):	77%	Total Sand:	21%

Liquid Limit	62	Plastic Limit	31	Plastic Index	31
Coarse Sand:	3%	Medium Sand:	8%	Fine Sand:	11%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☒

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/8/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

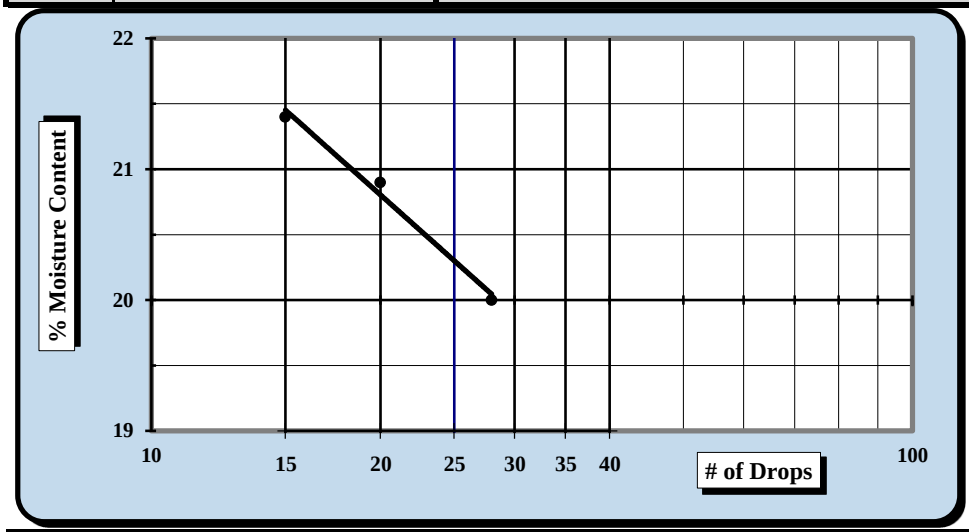
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	3/7-3/26/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-22	Sample #: SS-1	Sample Date: 1/29/18
Location:	Pavement Boring	Offset: N/A	Depth: 0.8' - 2.8'
Sample Description:	Silty, Clayey Sand (SC-SM, A-2-4)		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28574	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

Pan # 611		Liquid Limit						Plastic Limit		
	Tare #:	123	212	19				240	36	
A	Tare Weight	20.55	20.85	20.52				20.76	20.94	
B	Wet Soil Weight + A	33.98	30.97	31.88				30.94	28.62	
C	Dry Soil Weight + A	31.74	29.22	29.88				29.59	27.60	
D	Water Weight (B-C)	2.24	1.75	2.00				1.35	1.02	
E	Dry Soil Weight (C-A)	11.19	8.37	9.36				8.83	6.66	
F	% Moisture (D/E)*100	20.0%	20.9%	21.4%				15.3%	15.3%	
N	# OF DROPS	28	20	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**15.3%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**20**
Plastic Limit	**15**
Plastic Index	**5**
Group Symbol	**CL-ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group Symbol for minus No. 40 sieve portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	5/3/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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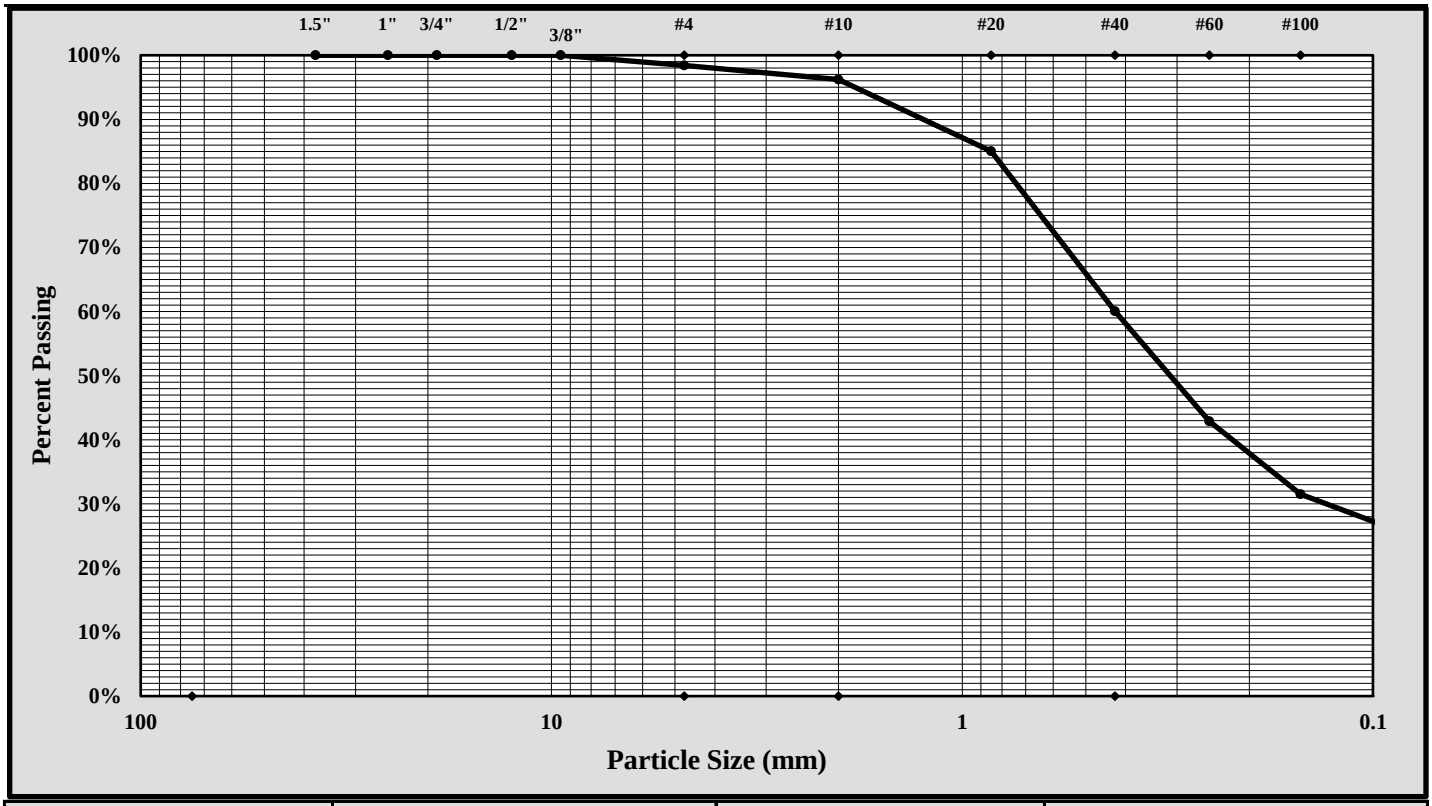
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	3/1-3/7/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-22	Sample #: SS-1	Sample Date: 1/29/18
Location:	Pavement Boring	Offset: N/A	Depth: 0.8' - 2.8'
Sample Description:	Silty, Clayey Sand (SC-SM, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	#4	Gravel:	1.6%
Silt & Clay (% Passing #200):	24.3%	Total Sand:	74.1%

Liquid Limit	20	Plastic Limit	15	Plastic Index	5
Coarse Sand:	2.2%	Medium Sand:	36.2%	Fine Sand:	35.8%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/3/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

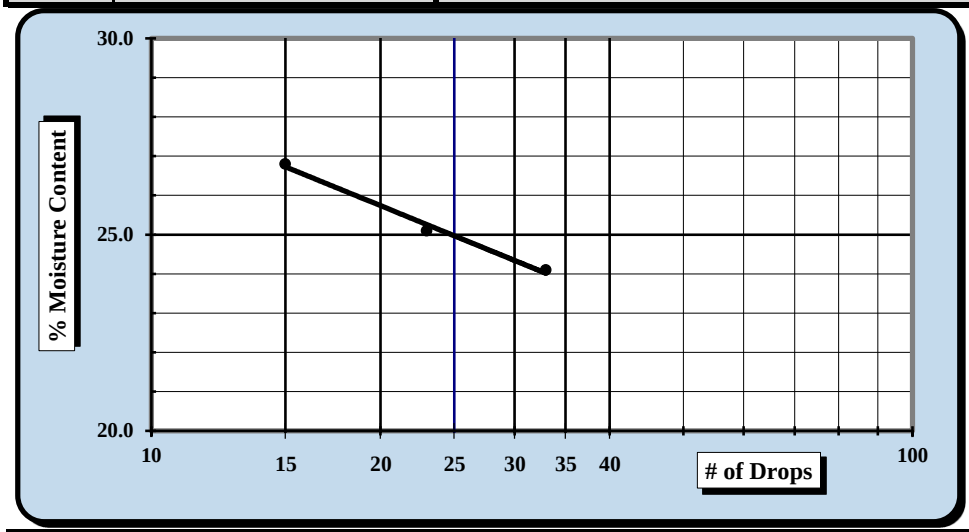
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/8-2/13/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-23	Sample #: SS-1	Sample Date: 1/23/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.9' - 2.9'
Sample Description:	Silty, Clayey Sand (SC-SM, A-2-4)		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28573	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

	Pan # 607	Liquid Limit						Plastic Limit		
	Tare #:	222	35	10				6	45	
A	Tare Weight	20.83	20.79	20.79				20.57	20.76	
B	Wet Soil Weight + A	34.44	31.76	30.92				27.22	27.05	
C	Dry Soil Weight + A	31.80	29.56	28.78				26.15	26.05	
D	Water Weight (B-C)	2.64	2.20	2.14				1.07	1.00	
E	Dry Soil Weight (C-A)	10.97	8.77	7.99				5.58	5.29	
F	% Moisture (D/E)*100	24.1%	25.1%	26.8%				19.2%	18.9%	
N	# OF DROPS	33	23	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**19.1%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**25**
Plastic Limit	**19**
Plastic Index	**6**
Group Symbol	**CL-ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	3/8/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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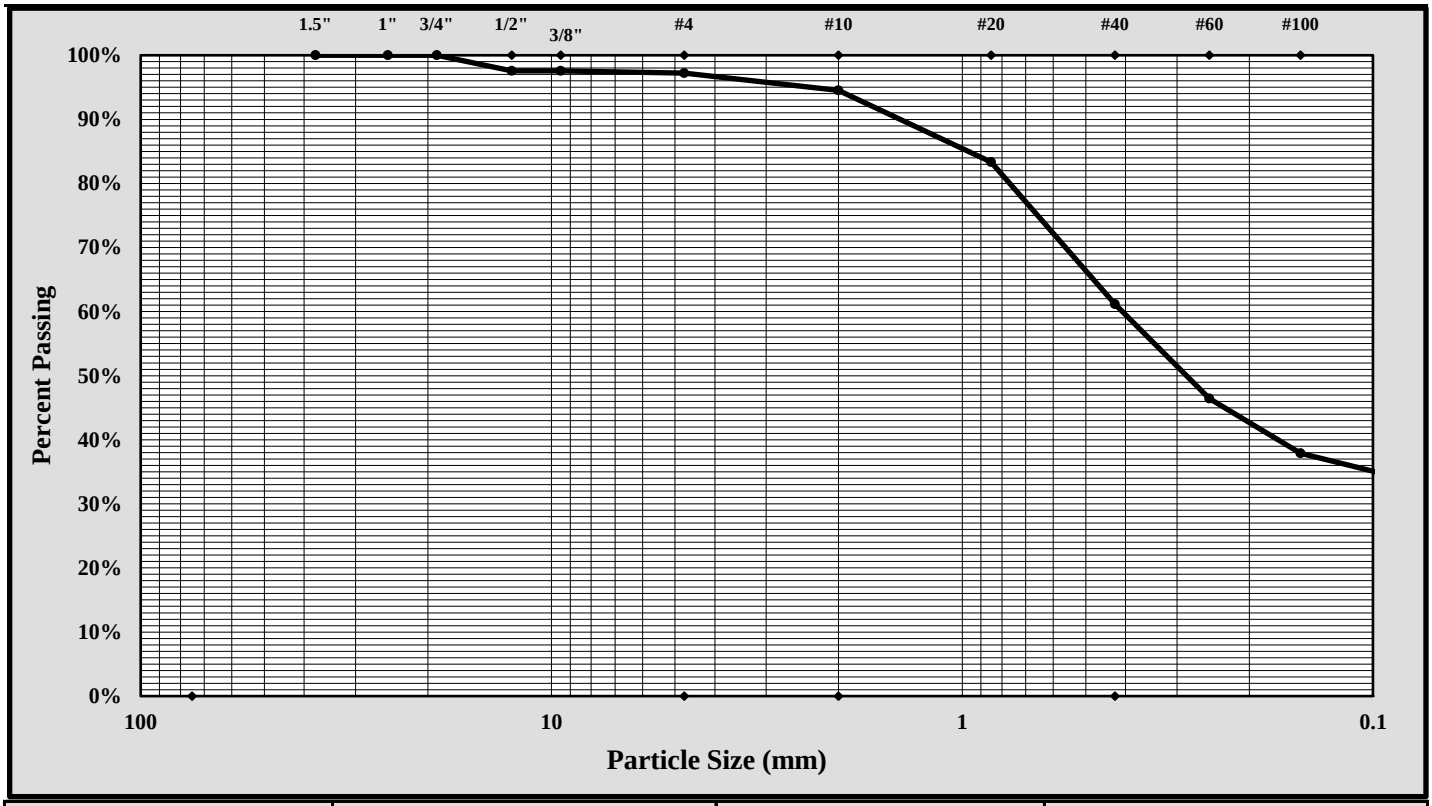
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/5-2/15/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-23 Sample #: SS-1	Sample Date:	1/23/2018
Location:	Pavement Boring Offset: N/A	Depth:	0.9' - 2.9'
Sample Description:	Silty, Clayey Sand (SC-SM, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	1/2-inch	Gravel:	3%
Silt & Clay (% Passing #200):	33%	Total Sand:	64%

Liquid Limit	25	Plastic Limit	19	Plastic Index	6
Coarse Sand:	3%	Medium Sand:	33%	Fine Sand:	28%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☒

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/8/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	3/7-3/26/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-24	Sample #: SS-1		Sample Date: 1/29/18	
Location:	Pavement Boring	Offset: N/A		Depth: 0.7' - 2.7'	
Sample Description:	Silty Sand (SM, A-2-4)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28574	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

Pan # 609		Liquid Limit						Plastic Limit		
	Tare #:	210	200	217				229	1	
A	Tare Weight	20.93	20.87	20.87				20.70	20.64	
B	Wet Soil Weight + A	29.61	28.80	31.63				27.53	26.95	
C	Dry Soil Weight + A	27.47	26.79	28.80				26.07	25.60	
D	Water Weight (B-C)	2.14	2.01	2.83				1.46	1.35	
E	Dry Soil Weight (C-A)	6.54	5.92	7.93				5.37	4.96	
F	% Moisture (D/E)*100	32.7%	34.0%	35.7%				27.2%	27.2%	
N	# OF DROPS	29	21	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**27.2%**		

One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**33**
Plastic Limit	**27**
Plastic Index	**6**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group Symbol for minus No. 40 sieve portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	5/3/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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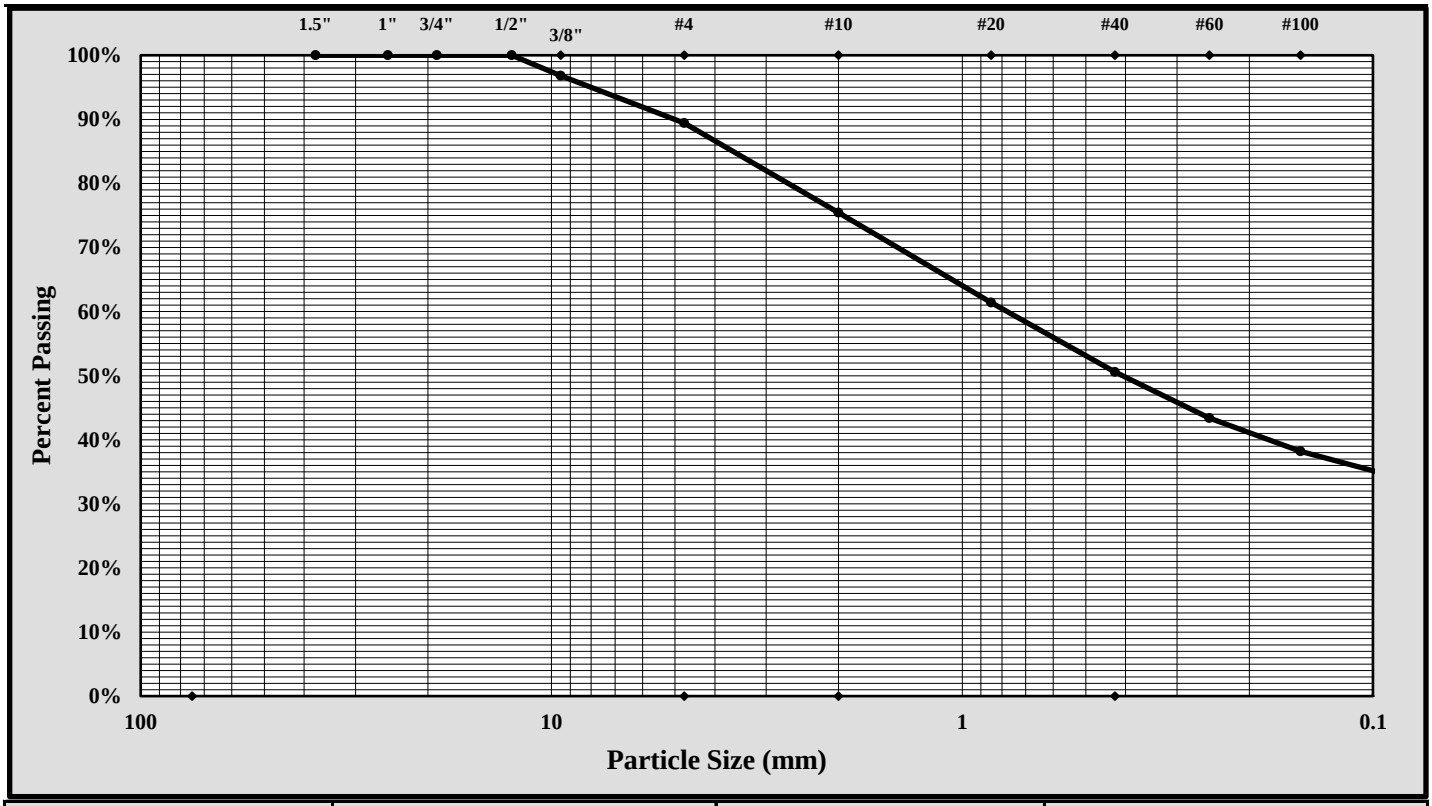
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	3/1-3/7/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-24 Sample #: SS-1	Sample Date:	1/29/18
Location:	Pavement Boring Offset: N/A	Depth:	0.7' - 2.7'
Sample Description:	Silty Sand (SM, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	3/8-inch	Gravel:	10.6%
Silt & Clay (% Passing #200):	33.0%	Total Sand:	56.4%

Liquid Limit	33	Plastic Limit	27	Plastic Index	6
Coarse Sand:	14.0%	Medium Sand:	24.9%	Fine Sand:	17.5%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Matthew F. Cooke, P.G.	Project Manager	5/3/2018
Technical Responsibility	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/8-2/15/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-25	Sample #: SS-1	Sample Date: 1/23/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.9' - 2.9'
Sample Description:	Clayey Sand (SC, A-2-6)		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28573	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

Pan # 600		Liquid Limit						Plastic Limit		
	Tare #:	240	19	8				212	206	
A	Tare Weight	20.78	20.52	20.60				20.87	20.91	
B	Wet Soil Weight + A	30.34	30.56	30.87				28.79	27.75	
C	Dry Soil Weight + A	28.64	28.45	28.28				27.67	26.79	
D	Water Weight (B-C)	1.70	2.11	2.59				1.12	0.96	
E	Dry Soil Weight (C-A)	7.86	7.93	7.68				6.80	5.88	
F	% Moisture (D/E)*100	21.6%	26.6%	33.7%				16.5%	16.3%	
N	# OF DROPS	32	27	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**16.4%**		

One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**28**
Plastic Limit	**16**
Plastic Index	**12**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	3/8/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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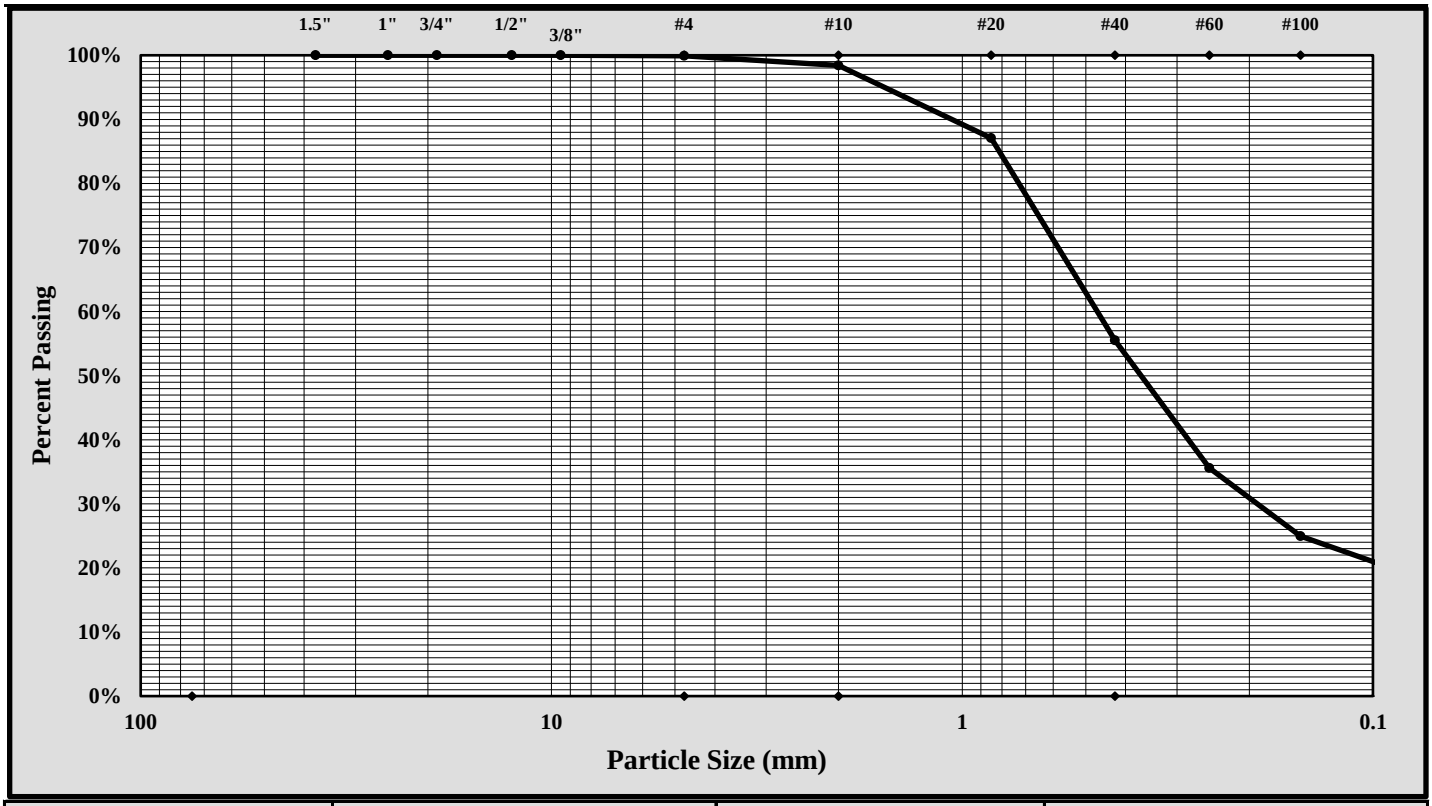
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/5-2/15/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-25 Sample #: SS-1	Sample Date:	1/23/2018
Location:	Pavement Boring Offset: N/A	Depth:	0.9' - 2.9'
Sample Description:	Clayey Sand (SC, A-2-6)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	#4	Gravel:	0%
Silt & Clay (% Passing #200):	18%	Total Sand:	82%

Liquid Limit	28	Plastic Limit	16	Plastic Index	12
Coarse Sand:	1%	Medium Sand:	43%	Fine Sand:	37%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☒

References / Comments / Deviations:

Matthew F. Cooke, P.G.	Project Manager	3/8/2018
Technical Responsibility	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	3/7-4/2/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-26	Sample #: SS-1		Sample Date: 1/29/18	
Location:	Pavement Boring	Offset: N/A		Depth: 0.6' - 2.6'	
Sample Description:	Elastic Silt (MH (A-7-5(22))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28574	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

Pan # 604		Liquid Limit						Plastic Limit		
	Tare #:	211	216	4				227	123	
A	Tare Weight	20.86	20.68	20.54				20.82	20.56	
B	Wet Soil Weight + A	28.93	27.42	29.30				27.05	27.92	
C	Dry Soil Weight + A	26.12	25.03	26.11				25.33	25.89	
D	Water Weight (B-C)	2.81	2.39	3.19				1.72	2.03	
E	Dry Soil Weight (C-A)	5.26	4.35	5.57				4.51	5.33	
F	% Moisture (D/E)*100	53.4%	54.9%	57.3%				38.1%	38.1%	
N	# OF DROPS	31	24	14				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**38.1%**		

One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**55**
Plastic Limit	**38**
Plastic Index	**17**
Group Symbol	**MH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group Symbol for minus No. 40 sieve portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	5/3/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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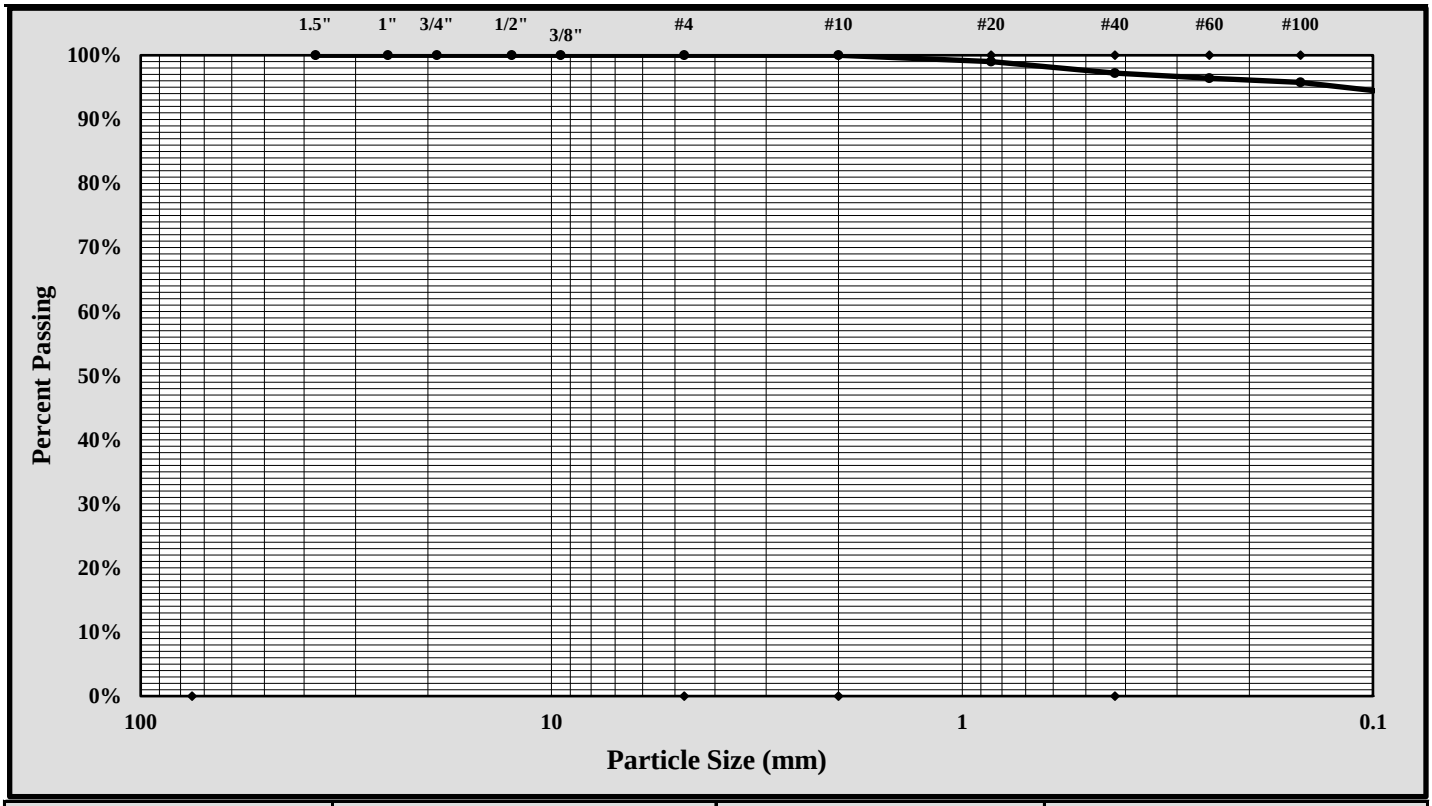
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	3/1-3/7/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-26 Sample #: SS-1	Sample Date:	1/29/18
Location:	Pavement Boring Offset: N/A	Depth:	0.6' - 2.6'
Sample Description:	Elastic Silt (MH, A-7-5(22))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	#20	Gravel:	0.0%
Silt & Clay (% Passing #200):	93.6%	Total Sand:	6.4%

Liquid Limit	55	Plastic Limit	38	Plastic Index	17
Coarse Sand:	0.0%	Medium Sand:	2.8%	Fine Sand:	3.6%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/3/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

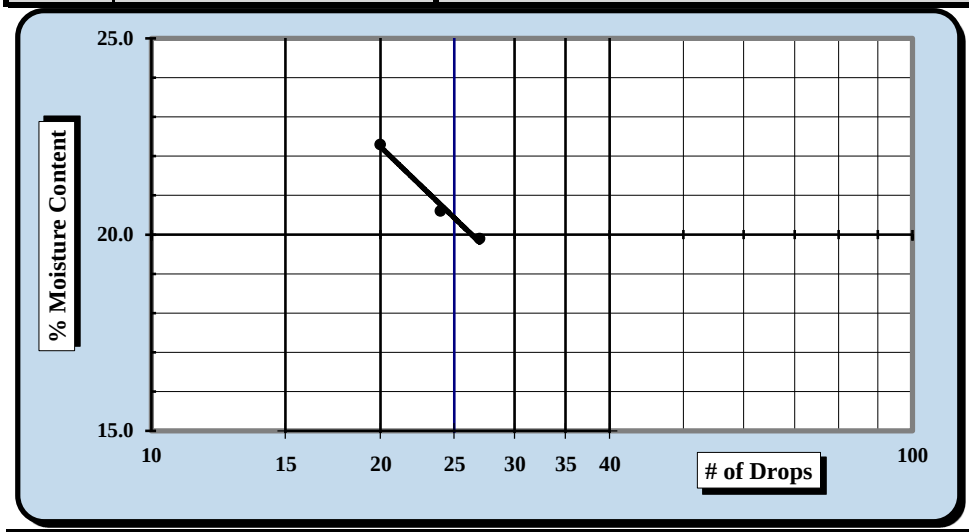
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/8-2/15/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-27	Sample #: SS-1		Sample Date: 1/23/2018	
Location:	Pavement Boring	Offset: N/A		Depth: 1.1' - 3.1'	
Sample Description:	Silty, Clayey Sand (SC-SM, A-2-4)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28573	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

	Pan # 611	Liquid Limit						Plastic Limit		
	Tare #:	235	245	200				31	204	
A	Tare Weight	20.76	20.76	20.87				20.83	20.88	
B	Wet Soil Weight + A	34.13	34.09	32.56				28.36	28.43	
C	Dry Soil Weight + A	31.91	31.81	30.43				27.30	27.35	
D	Water Weight (B-C)	2.22	2.28	2.13				1.06	1.08	
E	Dry Soil Weight (C-A)	11.15	11.05	9.56				6.47	6.47	
F	% Moisture (D/E)*100	19.9%	20.6%	22.3%				16.4%	16.7%	
N	# OF DROPS	27	24	20				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**16.6%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**21**
Plastic Limit	**17**
Plastic Index	**4**
Group Symbol	**CL-ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	3/8/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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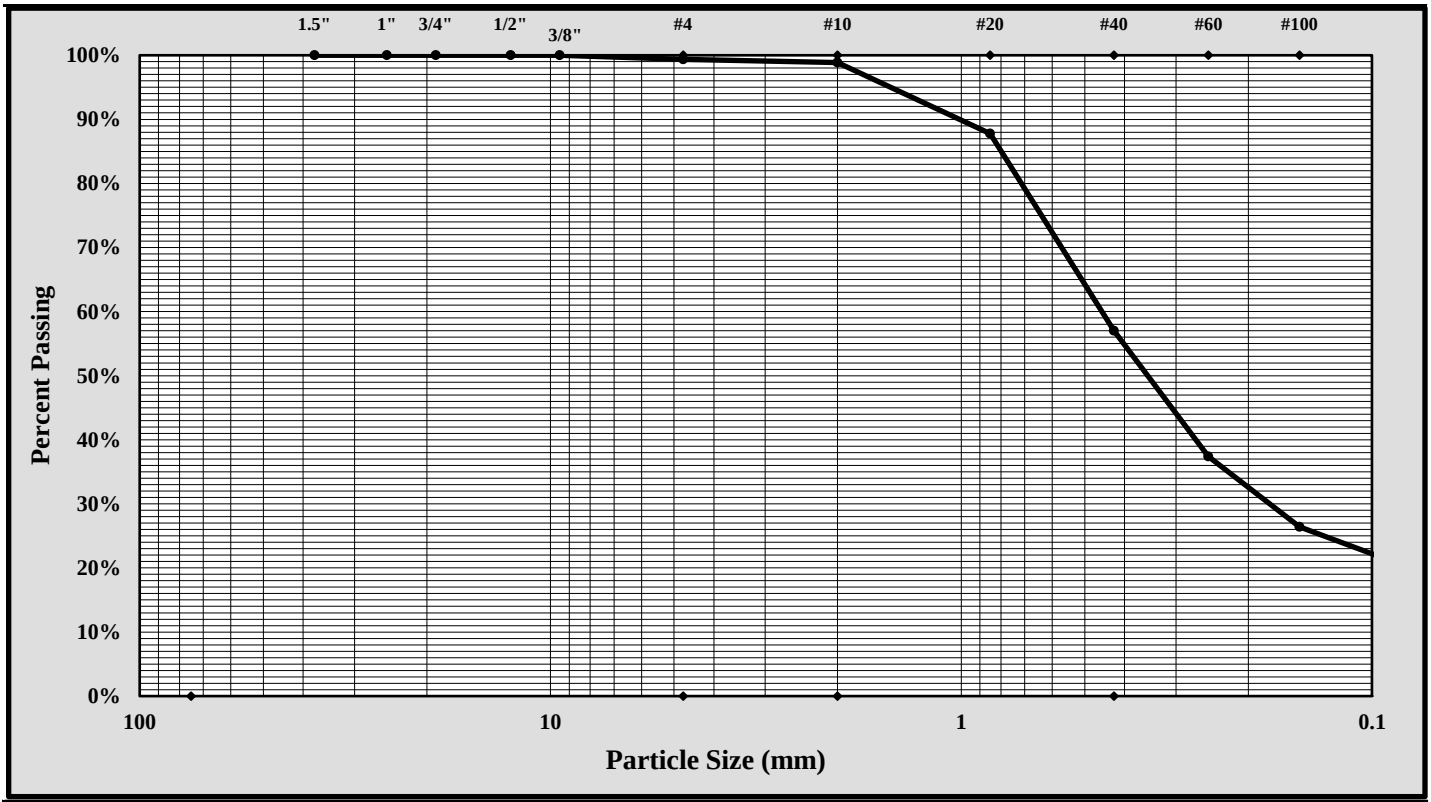
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/5-2/15/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-27 Sample #: SS-1	Sample Date:	1/23/2018
Location:	Pavement Boring Offset: N/A	Depth:	1.1' - 3.1'
Sample Description:	Silty, Clayey Sand (SC-SM, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	#4	Gravel:	1%
Silt & Clay (% Passing #200):	19%	Total Sand:	80%

Liquid Limit	21	Plastic Limit	17	Plastic Index	4
Coarse Sand:	1%	Medium Sand:	42%	Fine Sand:	38%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☒

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/8/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	3/7-4/2/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-28	Sample #: SS-1	Sample Date: 1/29/18
Location:	Pavement Boring	Offset: N/A	Depth: 0.7' - 2.7'
Sample Description:	Silty Sand (SM, A-2-4)		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28574	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

Pan # 606		Liquid Limit						Plastic Limit		
	Tare #:	10	226	214				36	19	
A	Tare Weight	20.79	20.92	20.83				20.94	20.52	
B	Wet Soil Weight + A	33.91	32.38	33.58				27.33	27.46	
C	Dry Soil Weight + A	31.88	30.52	31.40				26.46	26.52	
D	Water Weight (B-C)	2.03	1.86	2.18				0.87	0.94	
E	Dry Soil Weight (C-A)	11.09	9.60	10.57				5.52	6.00	
F	% Moisture (D/E)*100	18.3%	19.4%	20.6%				15.8%	15.7%	
N	# OF DROPS	32	20	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**15.8%**		

One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**19**
Plastic Limit	**16**
Plastic Index	**3**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group Symbol for minus No. 40 sieve portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	5/3/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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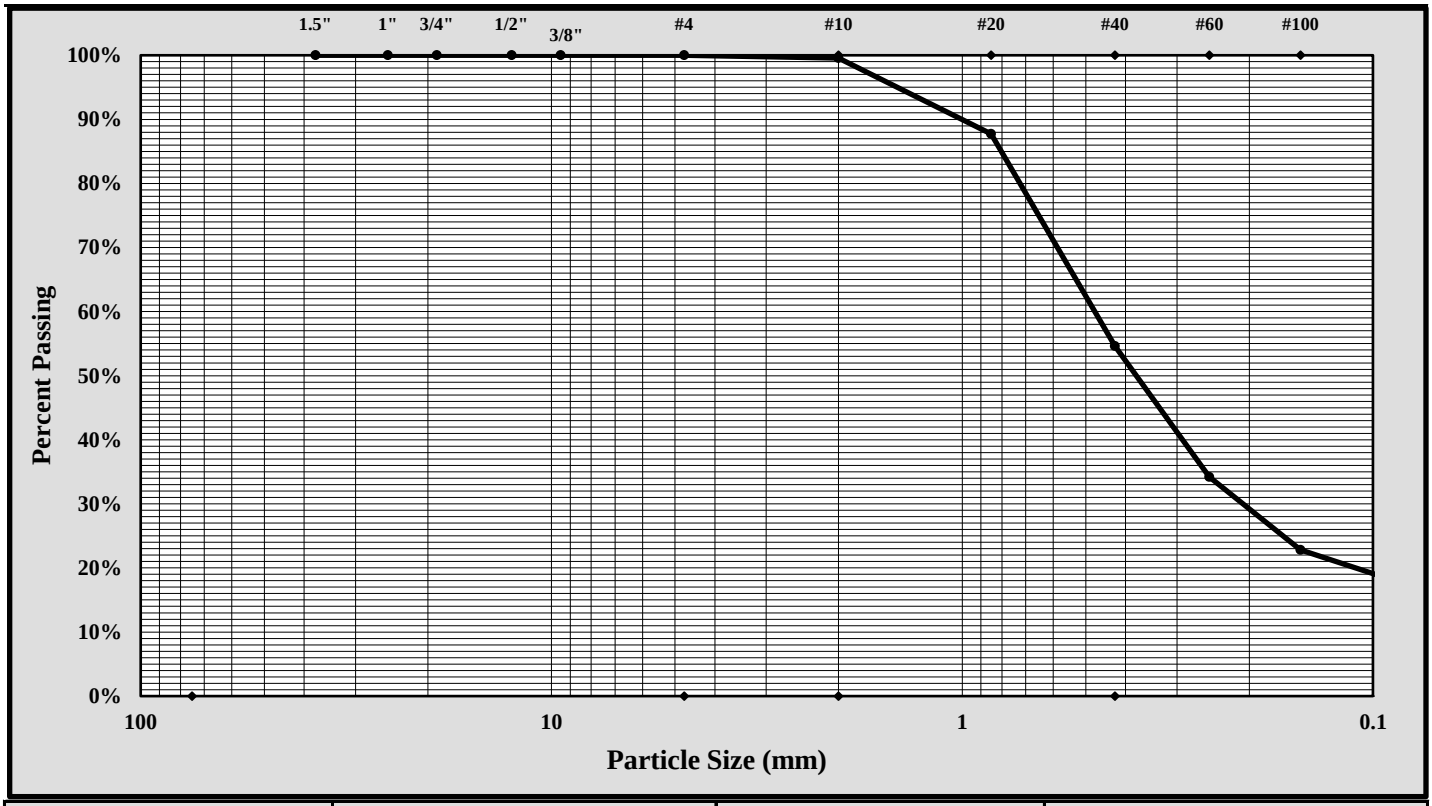
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	3/1-3/7/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-28 Sample #: SS-1	Sample Date:	1/29/18
Location:	Pavement Boring Offset: N/A	Depth:	0.7' - 2.7'
Sample Description:	Silty Sand (SM, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	#10	Gravel:	0.0%
Silt & Clay (% Passing #200):	16.5%	Total Sand:	83.5%

Liquid Limit	19	Plastic Limit	16	Plastic Index	3
Coarse Sand:	0.4%	Medium Sand:	44.9%	Fine Sand:	38.1%

Description of Sand and Gravel	Rounded	Angular	Hard & Durable	Soft	Weathered & Friable
	☐	☒	☒	☐	☒

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/3/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

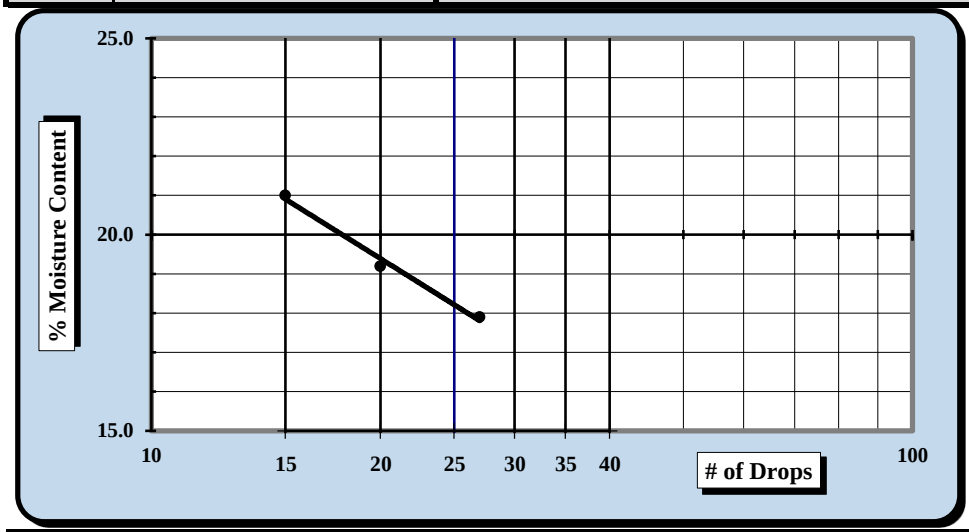
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/8-2/15/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-29	Sample #: SS-1		Sample Date: 1/23/2018	
Location:	Pavement Boring	Offset: N/A		Depth: 1.3' - 3.3'	
Sample Description:	Silty Sand (SM, A-2-4)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28573	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

	Pan # 608	Liquid Limit						Plastic Limit		
	Tare #:	7	214	39				217	146	
A	Tare Weight	20.80	20.84	20.81				20.91	20.55	
B	Wet Soil Weight + A	31.26	32.00	33.04				29.00	30.85	
C	Dry Soil Weight + A	29.67	30.20	30.92				27.90	29.46	
D	Water Weight (B-C)	1.59	1.80	2.12				1.10	1.39	
E	Dry Soil Weight (C-A)	8.87	9.36	10.11				6.99	8.91	
F	% Moisture (D/E)*100	17.9%	19.2%	21.0%				15.7%	15.6%	
N	# OF DROPS	27	20	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**15.7%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**18**
Plastic Limit	**16**
Plastic Index	**2**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	3/8/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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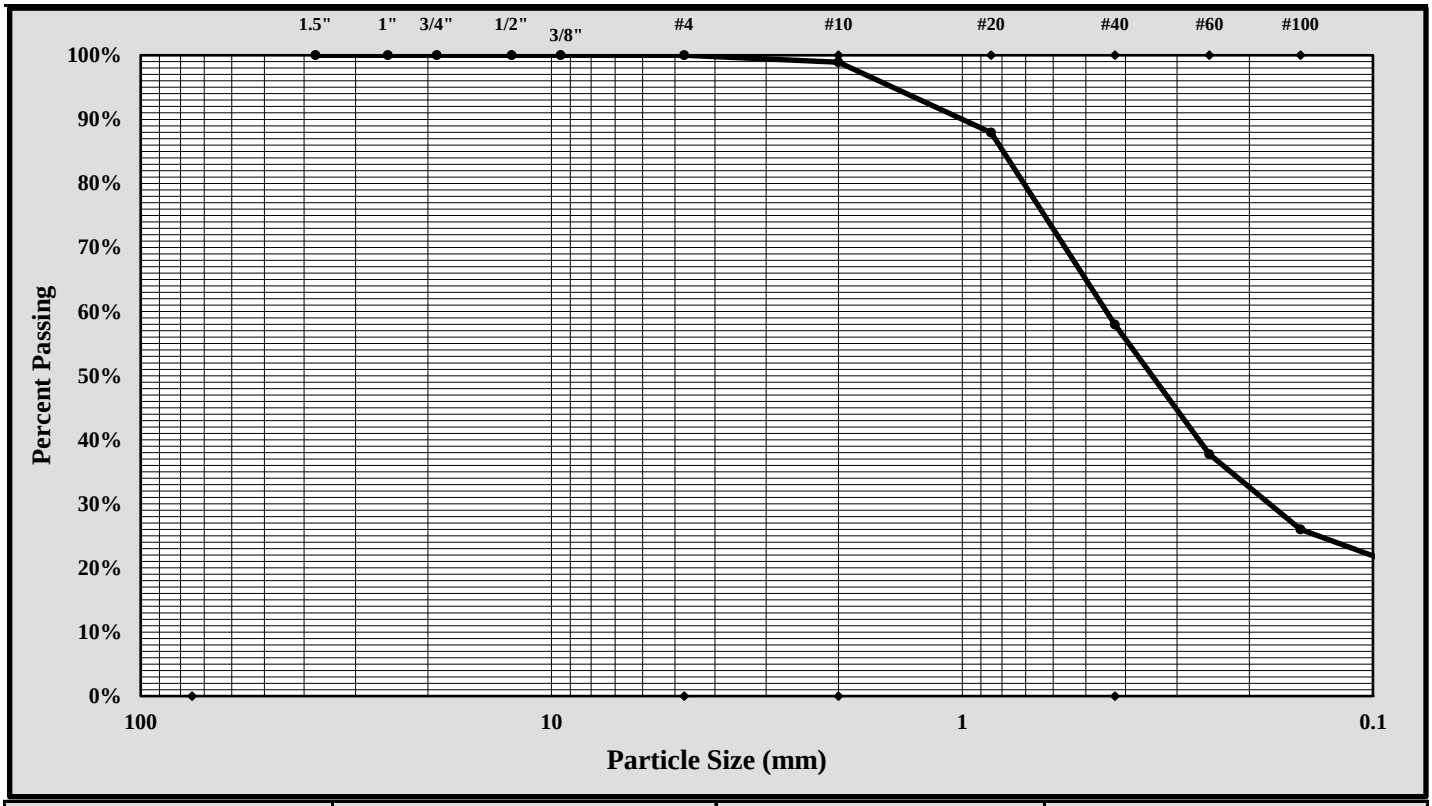
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/5-2/15/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-29 Sample #: SS-1	Sample Date:	1/23/2018
Location:	Pavement Boring Offset: N/A	Depth:	1.3' - 3.3'
Sample Description:	Silty Sand (SM, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	#10	Gravel:	0%
Silt & Clay (% Passing #200):	19%	Total Sand:	81%

Liquid Limit	18	Plastic Limit	16	Plastic Index	2
Coarse Sand:	1%	Medium Sand:	41%	Fine Sand:	39%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☒

References / Comments / Deviations:

Matthew F. Cooke, P.G.	Project Manager	3/8/2018
Technical Responsibility	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

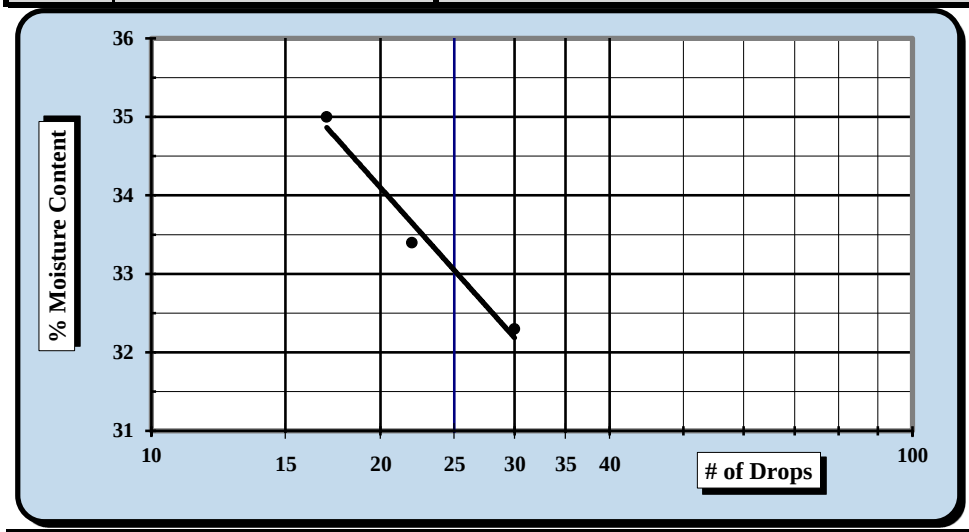
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	3/7-4/2/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-30	Sample #: SS-1		Sample Date: 1/29/18	
Location:	Pavement Boring	Offset: N/A		Depth: 0.7' - 2.7'	
Sample Description:	Clayey Sand (SC, A-6(1))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28574	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

Pan # 600		Liquid Limit						Plastic Limit		
	Tare #:	211	10	16				226	4	
A	Tare Weight	20.85	20.77	20.67				20.91	20.55	
B	Wet Soil Weight + A	32.82	31.48	29.07				26.94	27.85	
C	Dry Soil Weight + A	29.90	28.80	26.89				25.91	26.65	
D	Water Weight (B-C)	2.92	2.68	2.18				1.03	1.20	
E	Dry Soil Weight (C-A)	9.05	8.03	6.22				5.00	6.10	
F	% Moisture (D/E)*100	32.3%	33.4%	35.0%				20.6%	19.7%	
N	# OF DROPS	30	22	17				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**20.2%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**33**
Plastic Limit	**20**
Plastic Index	**13**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group Symbol for minus No. 40 sieve portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	5/3/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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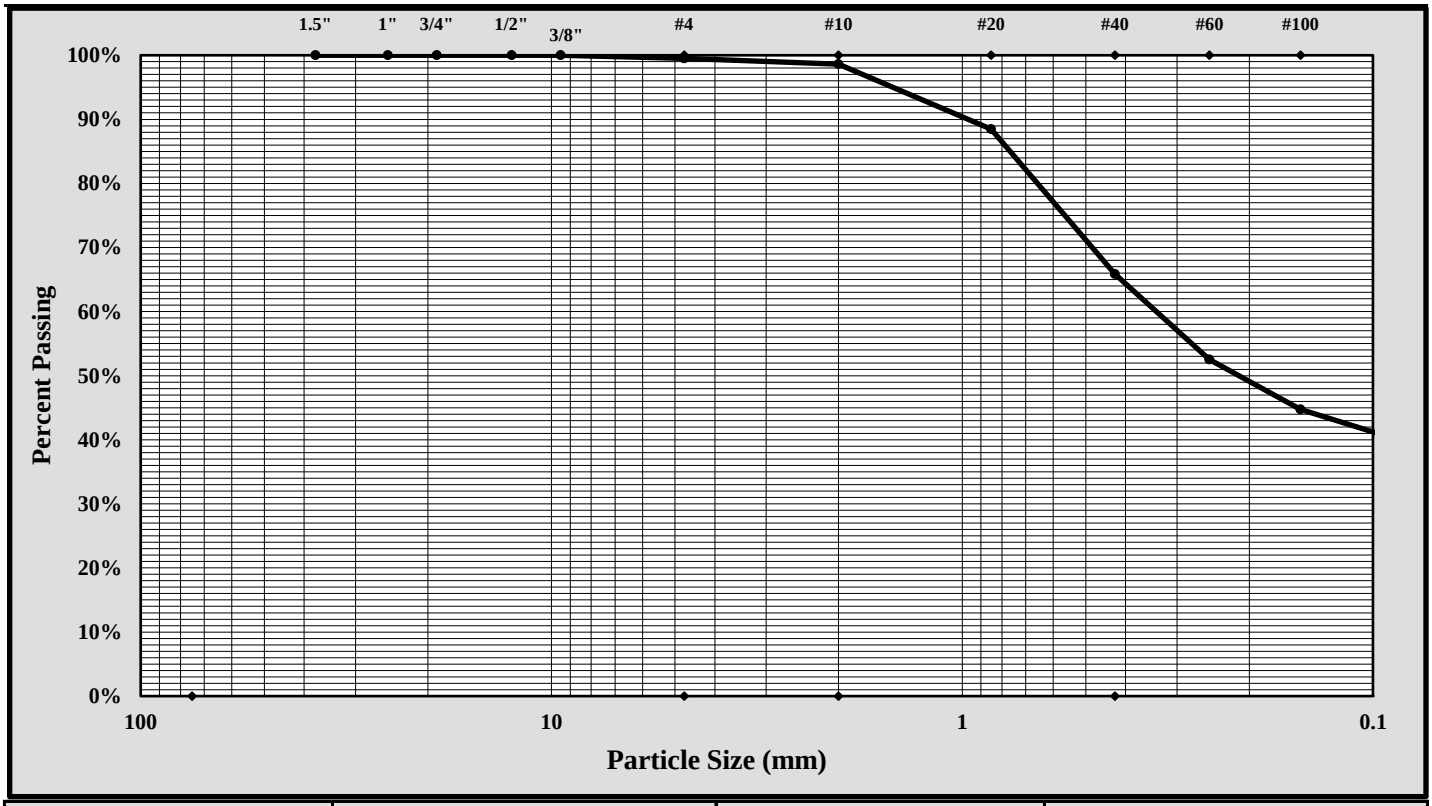
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	3/1-3/7/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-30 Sample #: SS-1	Sample Date:	1/29/18
Location:	Pavement Boring Offset: N/A	Depth:	0.7' - 2.7'
Sample Description:	Clayey Sand (SC, A-6(1))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	#4	Gravel:	0.5%
Silt & Clay (% Passing #200):	38.7%	Total Sand:	60.8%

Liquid Limit	33	Plastic Limit	20	Plastic Index	13
Coarse Sand:	0.9%	Medium Sand:	32.8%	Fine Sand:	27.1%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☒

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/3/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

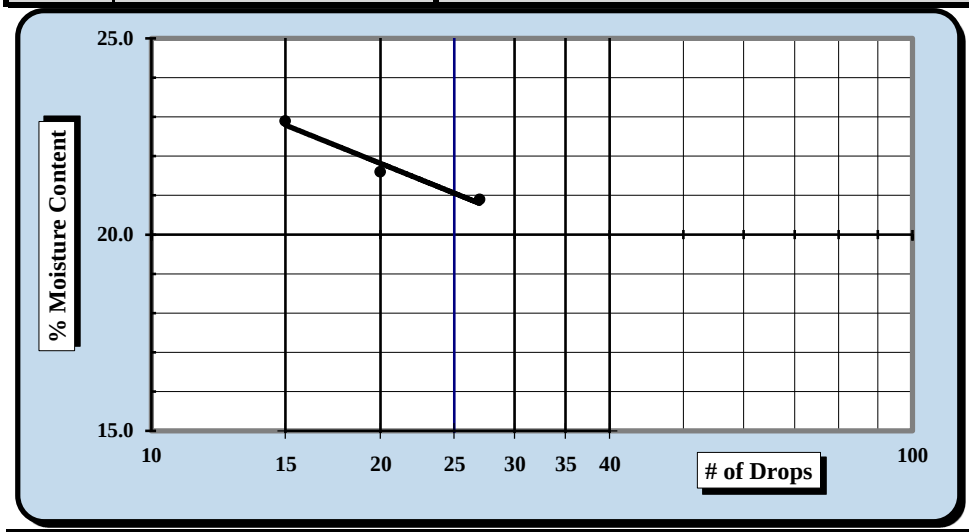
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/8-2/15/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-31	Sample #: SS-1		Sample Date: 1/24/2018	
Location:	Pavement Boring	Offset: N/A		Depth: 1.2' - 3.2'	
Sample Description:	Silty, Clayey Sand (SC-SM, A-2-4)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28573	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

	Pan # 609	Liquid Limit						Plastic Limit		
	Tare #:	226	211	195				243	32	
A	Tare Weight	20.93	20.83	20.54				20.76	20.42	
B	Wet Soil Weight + A	31.97	31.98	31.33				28.34	29.77	
C	Dry Soil Weight + A	30.06	30.00	29.32				27.26	28.53	
D	Water Weight (B-C)	1.91	1.98	2.01				1.08	1.24	
E	Dry Soil Weight (C-A)	9.13	9.17	8.78				6.50	8.11	
F	% Moisture (D/E)*100	20.9%	21.6%	22.9%				16.6%	15.3%	
N	# OF DROPS	27	20	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**16.0%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**21**
Plastic Limit	**16**
Plastic Index	**5**
Group Symbol	**CL-ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	3/8/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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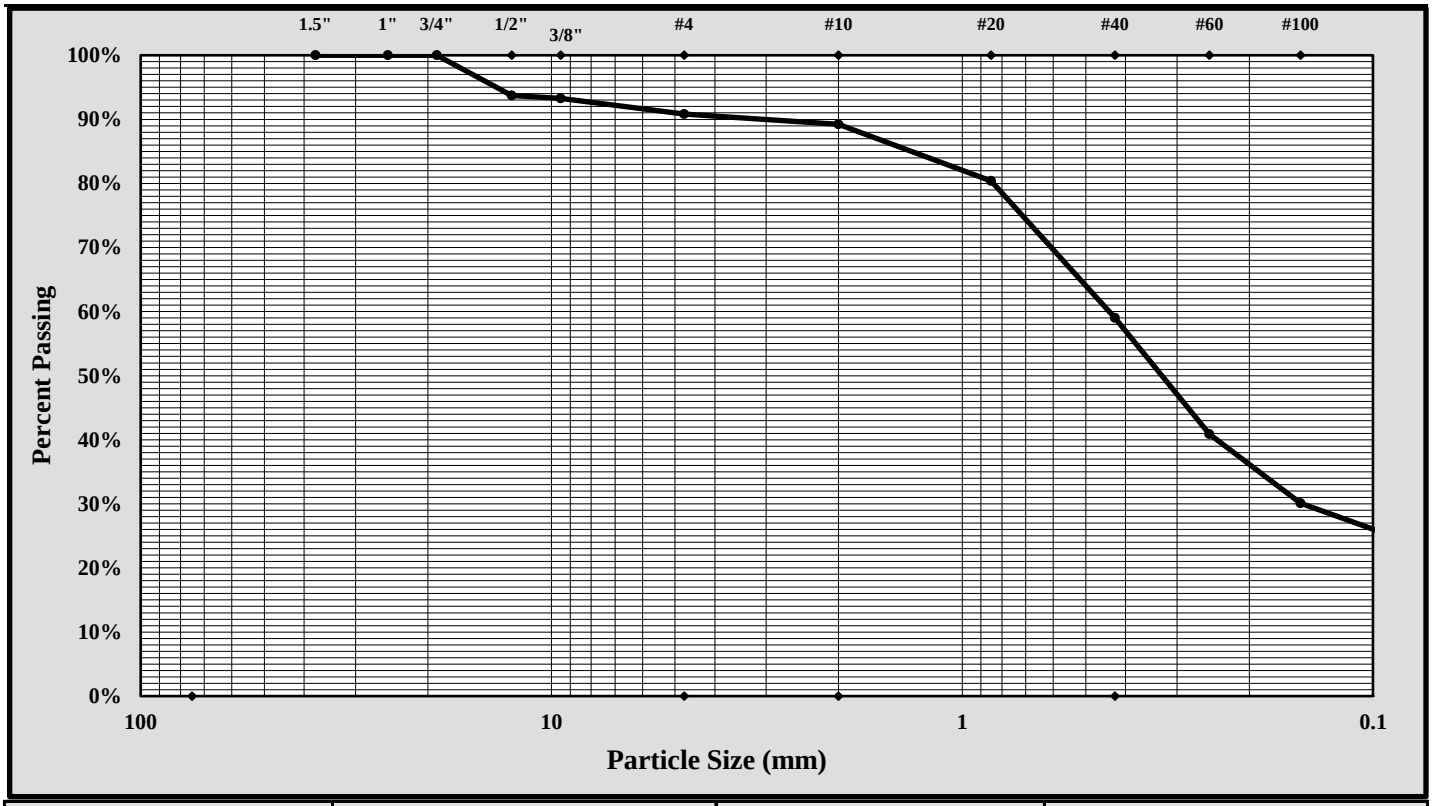
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/5-2/15/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-31 Sample #: SS-1	Sample Date:	1/24/2018
Location:	Pavement Boring Offset: N/A	Depth:	1.2' - 3.2'
Sample Description:	Silty, Clayey Sand (SC-SM, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	1/2-inch	Gravel:	9%
Silt & Clay (% Passing #200):	23%	Total Sand:	68%

Liquid Limit	21	Plastic Limit	16	Plastic Index	5
Coarse Sand:	2%	Medium Sand:	30%	Fine Sand:	36%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☒

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/8/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

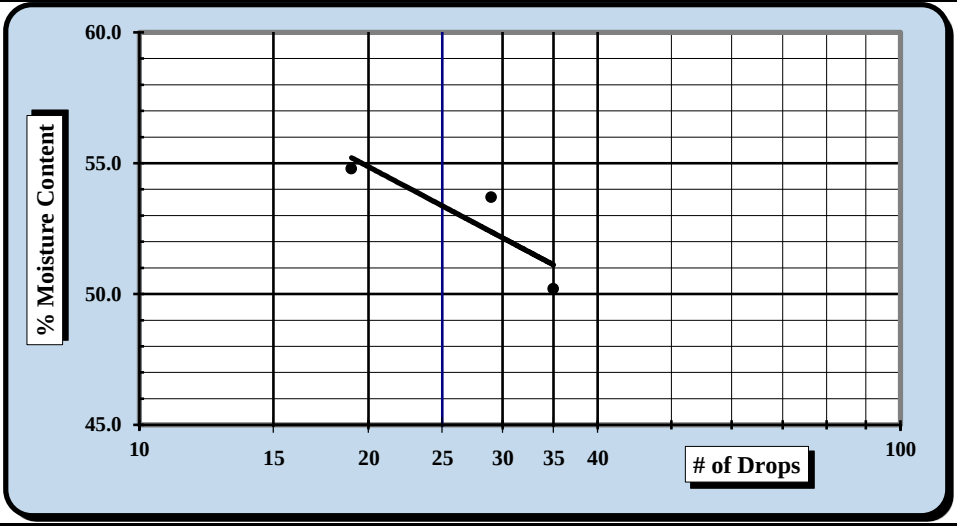
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/15-2/20/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-32	Sample #: SS-1	Sample Date: 1/25/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.9' - 2.9'
Sample Description:	Sandy Elastic Silt (MH, A-7-5(17))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28573	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

Pan # 611		Liquid Limit						Plastic Limit		
	Tare #:	25	116	229				4	1	
A	Tare Weight	20.61	20.58	20.71				20.55	20.66	
B	Wet Soil Weight + A	29.82	28.02	29.24				27.37	26.74	
C	Dry Soil Weight + A	26.74	25.42	26.22				25.80	25.31	
D	Water Weight (B-C)	3.08	2.60	3.02				1.57	1.43	
E	Dry Soil Weight (C-A)	6.13	4.84	5.51				5.25	4.65	
F	% Moisture (D/E)*100	50.2%	53.7%	54.8%				29.9%	30.8%	
N	# OF DROPS	35	29	19				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**30.4%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**54**
Plastic Limit	**30**
Plastic Index	**24**
Group Symbol	**MH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	3/8/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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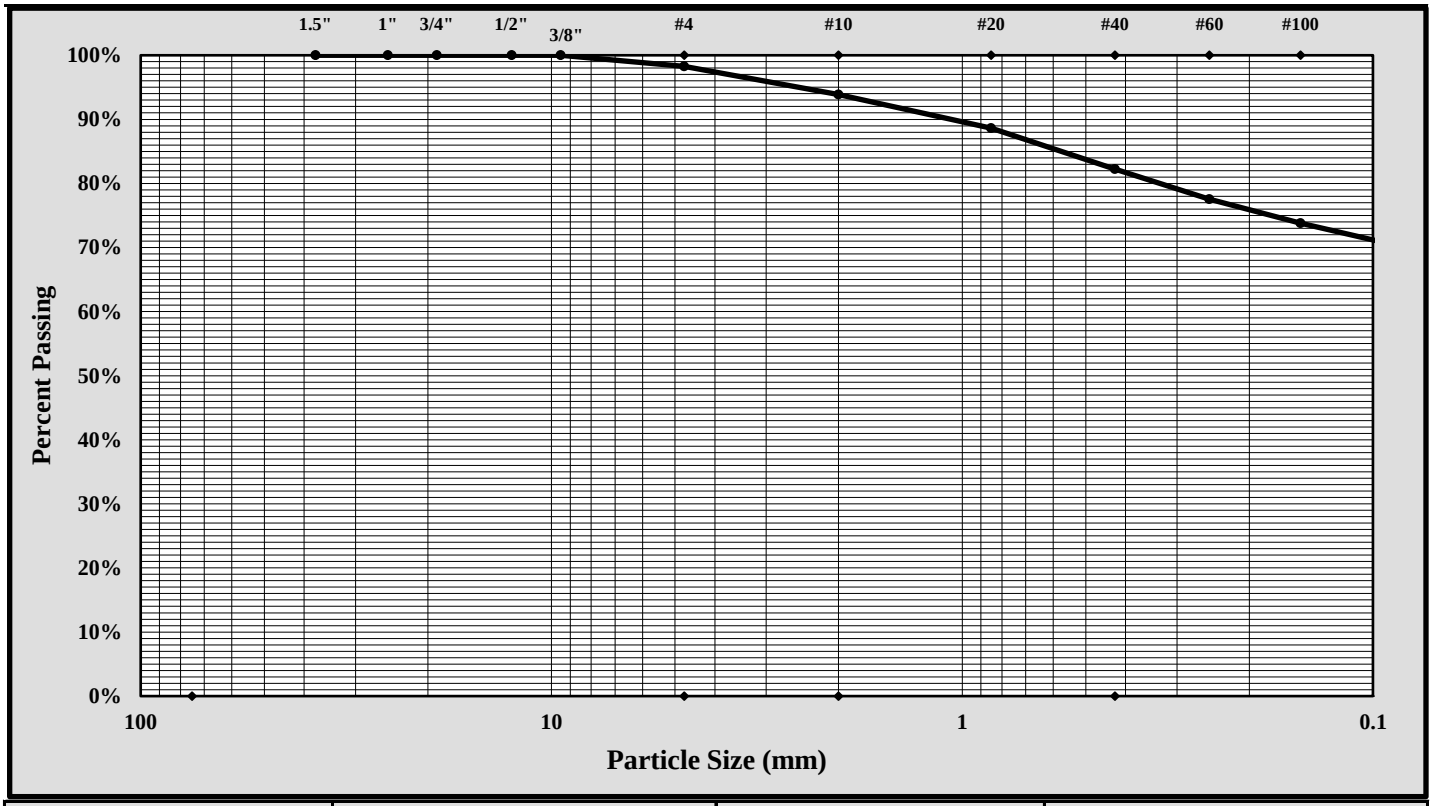
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/5-2/20/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-32 Sample #: SS-1	Sample Date:	1/25/2018
Location:	Pavement Boring Offset: N/A	Depth:	0.9' - 2.9'
Sample Description:	Sandy Elastic Silt (MH, A-7-5(17))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	#4	Gravel:	2%
Silt & Clay (% Passing #200):	69%	Total Sand:	29%

Liquid Limit	54	Plastic Limit	30	Plastic Index	24
Coarse Sand:	4%	Medium Sand:	12%	Fine Sand:	13%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☒

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/8/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

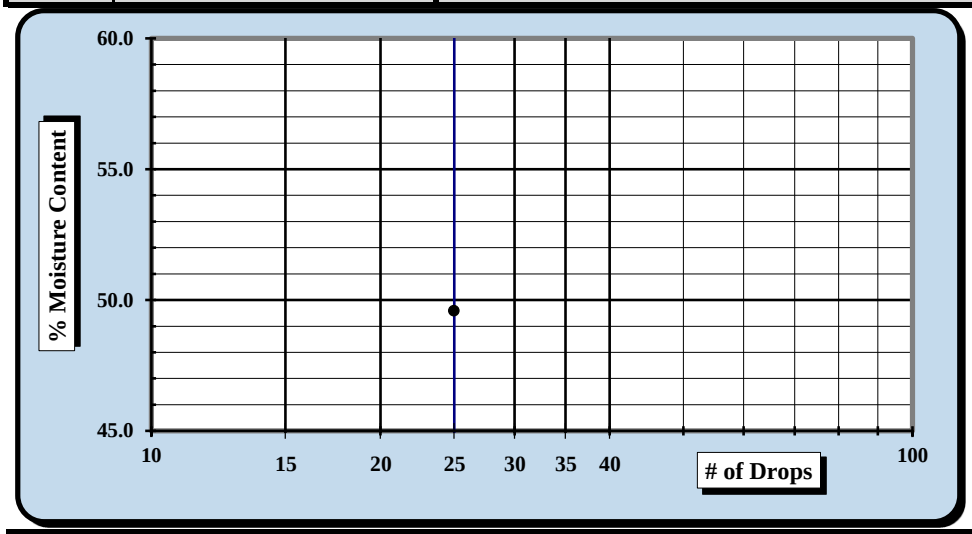
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/15-2/20/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-33	Sample #: SS-1	Sample Date: 1/24/2018
Location:	Pavement Boring	Offset: N/A	Depth: 1.3' - 3.3'
Sample Description:	Sandy Fat Clay (CH, A-7-6(10))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28573	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

	Pan # 608	Liquid Limit						Plastic Limit		
	Tare #:	44	147					40	246	
A	Tare Weight	20.77	20.78					20.84	20.68	
B	Wet Soil Weight + A	28.31	28.13					27.21	26.91	
C	Dry Soil Weight + A	25.80	25.71					25.96	25.69	
D	Water Weight (B-C)	2.51	2.42					1.25	1.22	
E	Dry Soil Weight (C-A)	5.03	4.93					5.12	5.01	
F	% Moisture (D/E)*100	49.9%	49.1%					24.4%	24.4%	
N	# OF DROPS	25	26					*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR	**49.9%**	49.3%							
Ave.	*Average*	**49.6%**						**24.4%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**50**
Plastic Limit	**24**
Plastic Index	**26**
Group Symbol	**CH**

Multipoint Method ☐
One-point Method ☑

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: The one-point method was used due to limited material. Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	3/8/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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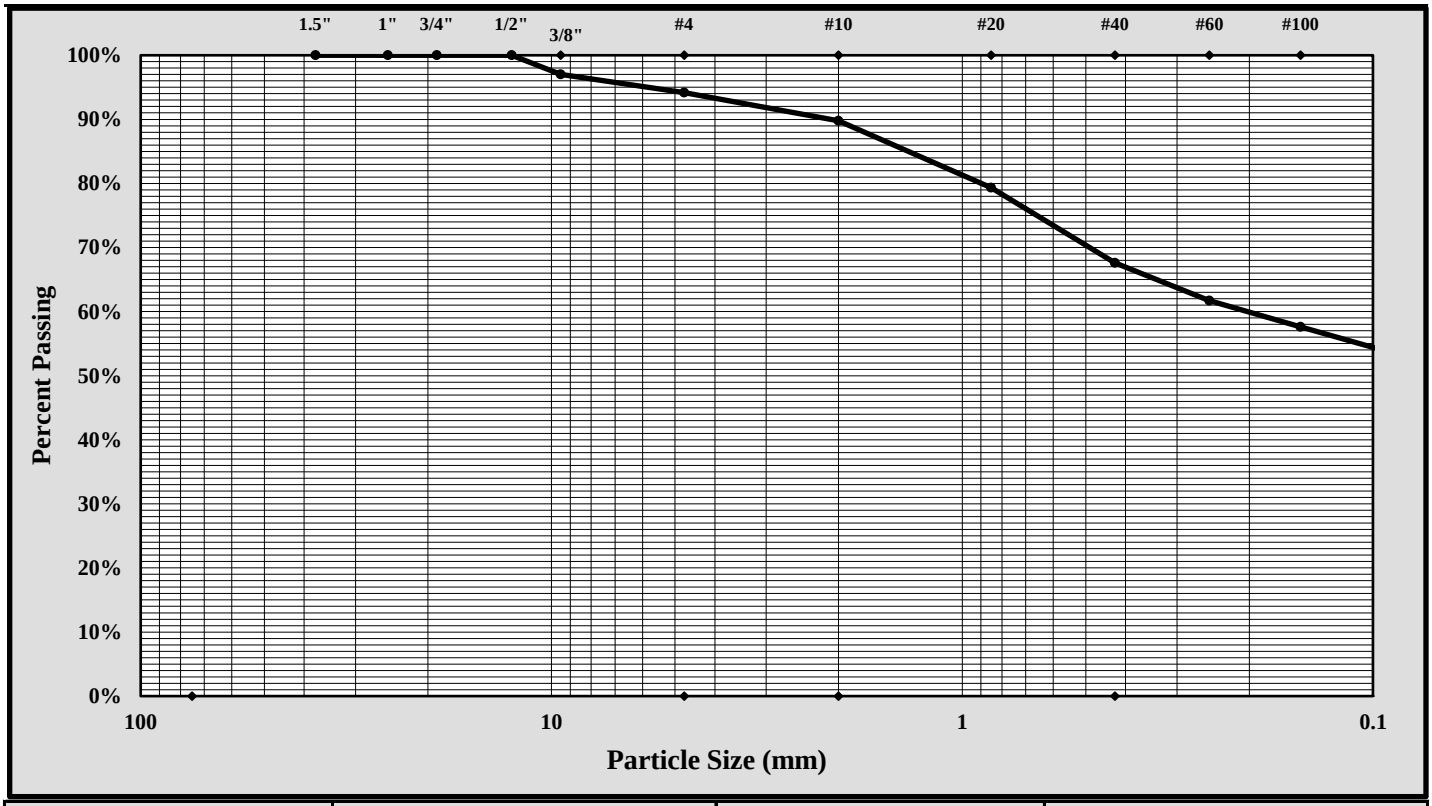
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/5-2/20/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-33 Sample #: SS-1	Sample Date:	1/24/2018
Location:	Pavement Boring Offset: N/A	Depth:	1.3' - 3.3'
Sample Description:	Sandy Fat Clay (CH, A-7-6(10))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	3/8-inch	Gravel:	6%
Silt & Clay (% Passing #200):	52%	Total Sand:	42%

Liquid Limit	50	Plastic Limit	24	Plastic Index	26
Coarse Sand:	4%	Medium Sand:	22%	Fine Sand:	15%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/8/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/15-2/20/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-34	Sample #: SS-1	Sample Date: 1/24/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.7' - 2.7'
Sample Description:	Sandy Lean Clay (CL, A-6(9))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28573	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

Pan # 609		Liquid Limit						Plastic Limit		
	Tare #:	100	43	10				200	35	
A	Tare Weight	20.59	20.82	20.80				20.87	20.80	
B	Wet Soil Weight + A	29.68	29.44	28.43				28.69	27.40	
C	Dry Soil Weight + A	27.40	27.21	26.39				27.57	26.45	
D	Water Weight (B-C)	2.28	2.23	2.04				1.12	0.95	
E	Dry Soil Weight (C-A)	6.81	6.39	5.59				6.70	5.65	
F	% Moisture (D/E)*100	33.5%	34.9%	36.5%				16.7%	16.8%	
N	# OF DROPS	31	20	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**16.8%**		

One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**34**
Plastic Limit	**17**
Plastic Index	**17**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	3/8/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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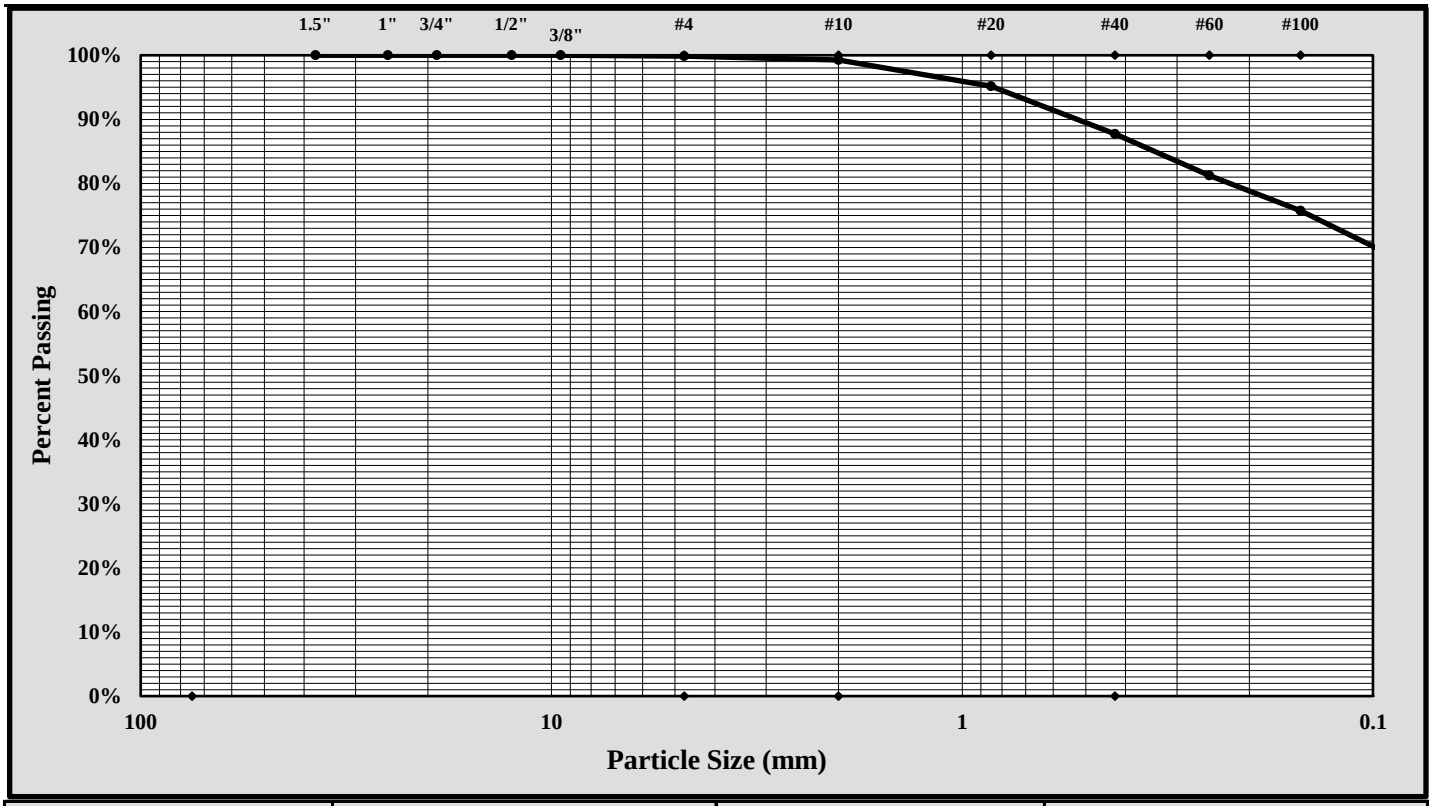
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/5-2/20/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-34 Sample #: SS-1	Sample Date:	1/24/2018
Location:	Pavement Boring Offset: N/A	Depth:	0.7' - 2.7'
Sample Description:	Sandy Lean Clay (CL, A-6(9))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	#4	Gravel:	0%
Silt & Clay (% Passing #200):	66%	Total Sand:	34%

Liquid Limit	34	Plastic Limit	17	Plastic Index	17
Coarse Sand:	1%	Medium Sand:	12%	Fine Sand:	21%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☒

References / Comments / Deviations:

Matthew F. Cooke, PG — *Technical Responsibility*
Project Manager — *Position*
3/8/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

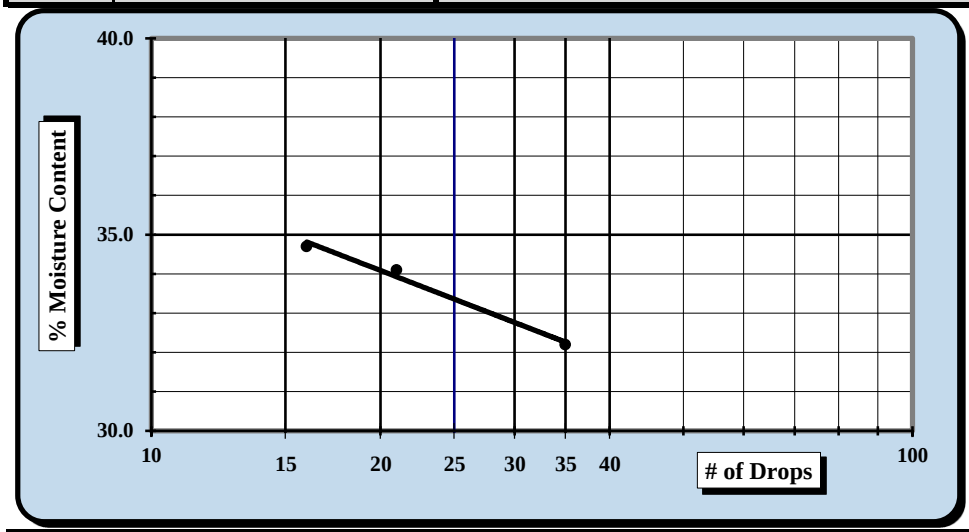
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/15-2/20/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-35	Sample #: SS-1	Sample Date: 1/25/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.8' - 2.8'
Sample Description:	Clayey Sand (SC, A-6(3))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28573	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

Pan # 600		Liquid Limit						Plastic Limit		
	Tare #:	204	31	29				39	7	
A	Tare Weight	20.87	20.81	20.83				20.81	20.81	
B	Wet Soil Weight + A	30.22	29.30	28.44				30.04	27.15	
C	Dry Soil Weight + A	27.94	27.14	26.48				28.55	26.12	
D	Water Weight (B-C)	2.28	2.16	1.96				1.49	1.03	
E	Dry Soil Weight (C-A)	7.07	6.33	5.65				7.74	5.31	
F	% Moisture (D/E)*100	32.2%	34.1%	34.7%				19.3%	19.4%	
N	# OF DROPS	35	21	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**19.4%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**33**
Plastic Limit	**19**
Plastic Index	**14**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	3/8/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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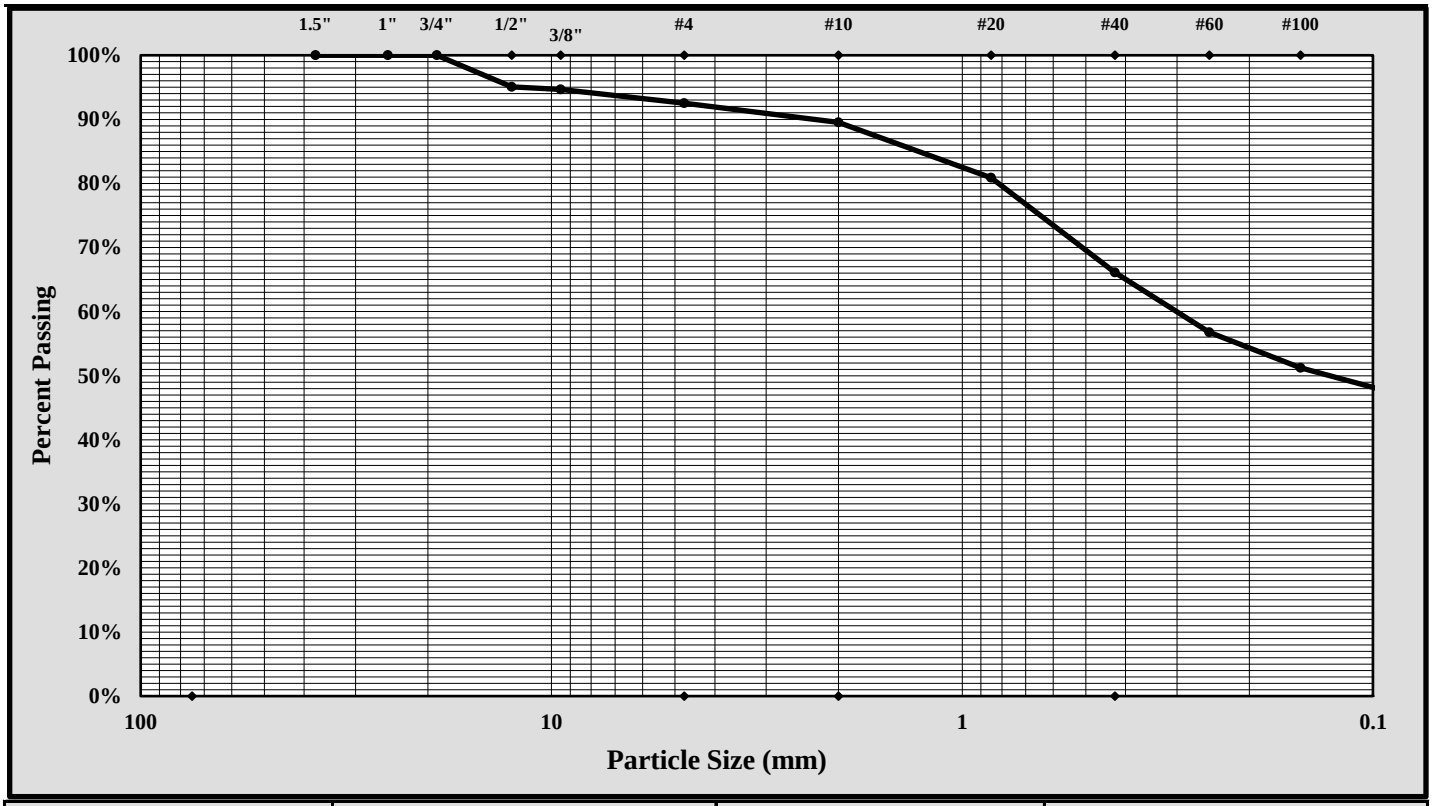
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/5-2/19/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-35 Sample #: SS-1	Sample Date:	1/25/2018
Location:	Pavement Boring Offset: N/A	Depth:	0.8' - 2.8'
Sample Description:	Clayey Sand (SC, A-6(3))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	1/2-inch	Gravel:	7%
Silt & Clay (% Passing #200):	46%	Total Sand:	47%

Liquid Limit	33	Plastic Limit	19	Plastic Index	14
Coarse Sand:	3%	Medium Sand:	23%	Fine Sand:	20%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☒

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/8/2018 — *Date*

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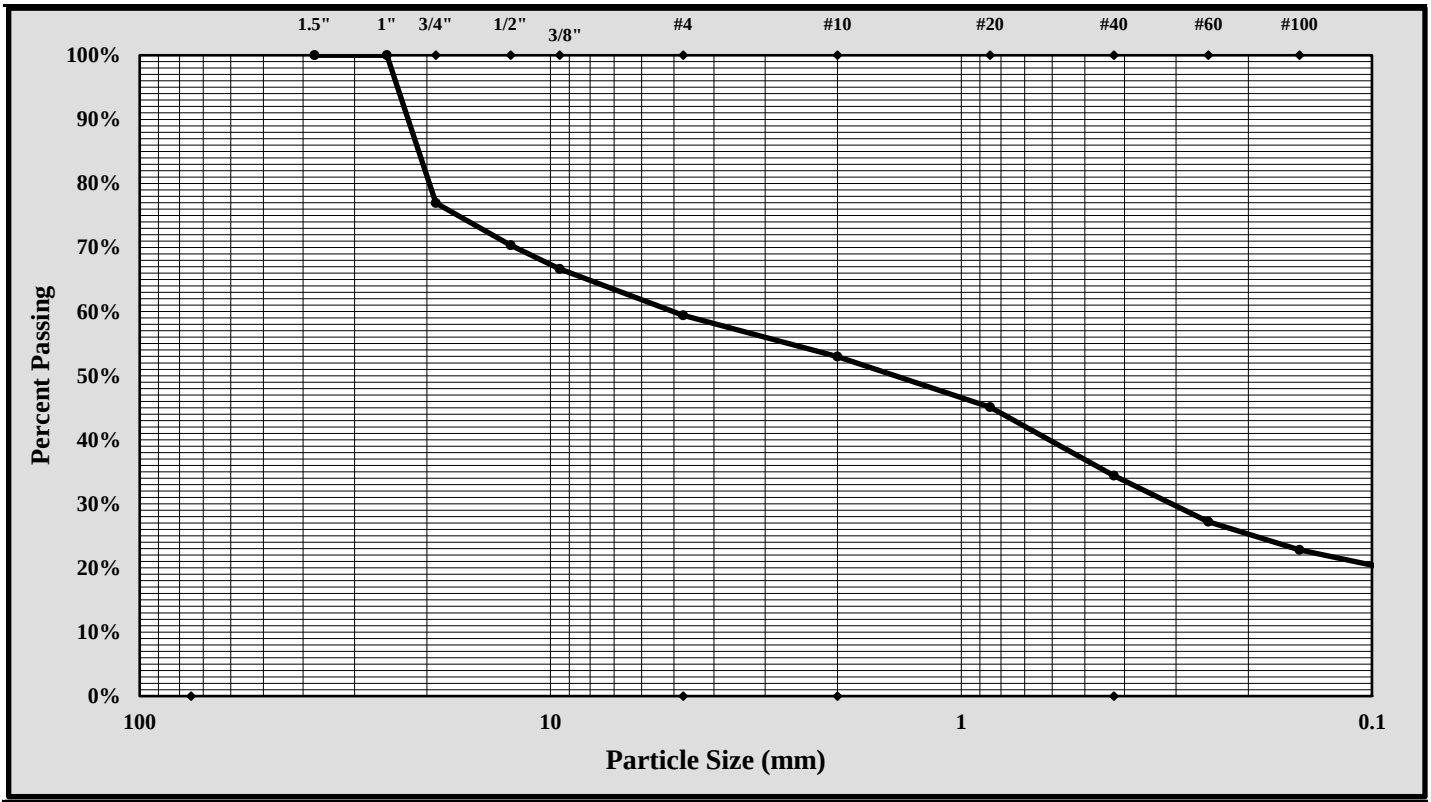
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/5-2/19/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-36 Sample #: SS-1	Sample Date:	1/24/2018
Location:	Pavement Boring Offset: N/A	Depth:	0.9' - 2.9'
Sample Description:	Silty Sand with Gravel (SM, A-1-b)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	3/4-inch	Gravel:	41%
Silt & Clay (% Passing #200):	19%	Total Sand:	41%

Liquid Limit	*	Plastic Limit	*	Plastic Index	*
Coarse Sand:	6%	Medium Sand:	19%	Fine Sand:	16%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

*Not enough fine material available for testing. Material assumed to be non-plastic.

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/8/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

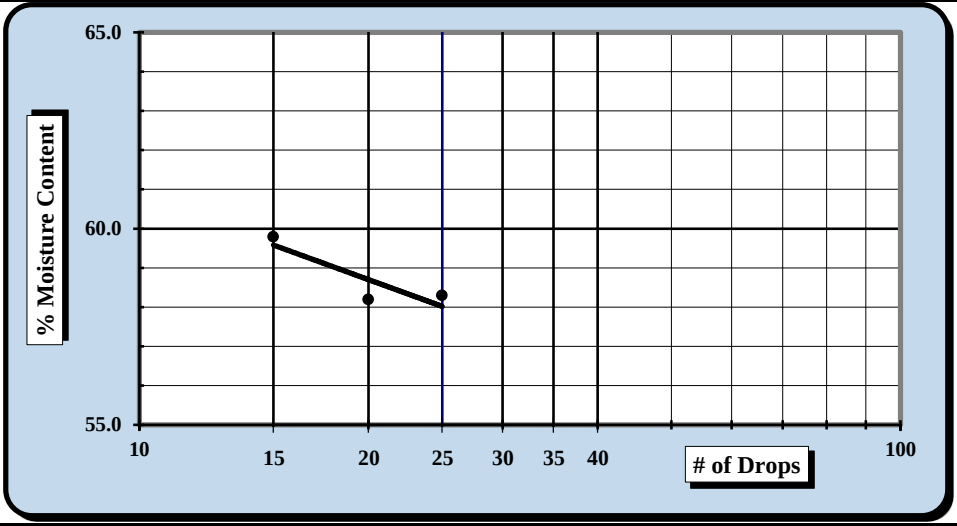
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/15-2/20/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-37	Sample #: SS-1	Sample Date: 1/24/2018
Location:	Pavement Boring	Offset: N/A	Depth: 1.7' - 3.7'
Sample Description:	Sandy Elastic Silt (MH, A-7-5(14))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28573	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

	Pan # 604	Liquid Limit						Plastic Limit		
	Tare #:	214	6	217				9	19	
A	Tare Weight	20.84	20.57	20.91				20.82	20.53	
B	Wet Soil Weight + A	28.50	27.83	28.87				28.61	27.42	
C	Dry Soil Weight + A	25.68	25.16	25.89				26.43	25.47	
D	Water Weight (B-C)	2.82	2.67	2.98				2.18	1.95	
E	Dry Soil Weight (C-A)	4.84	4.59	4.98				5.61	4.94	
F	% Moisture (D/E)*100	58.3%	58.2%	59.8%				38.9%	39.5%	
N	# OF DROPS	25	20	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**39.2%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**58**
Plastic Limit	**39**
Plastic Index	**19**
Group Symbol	**MH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	3/8/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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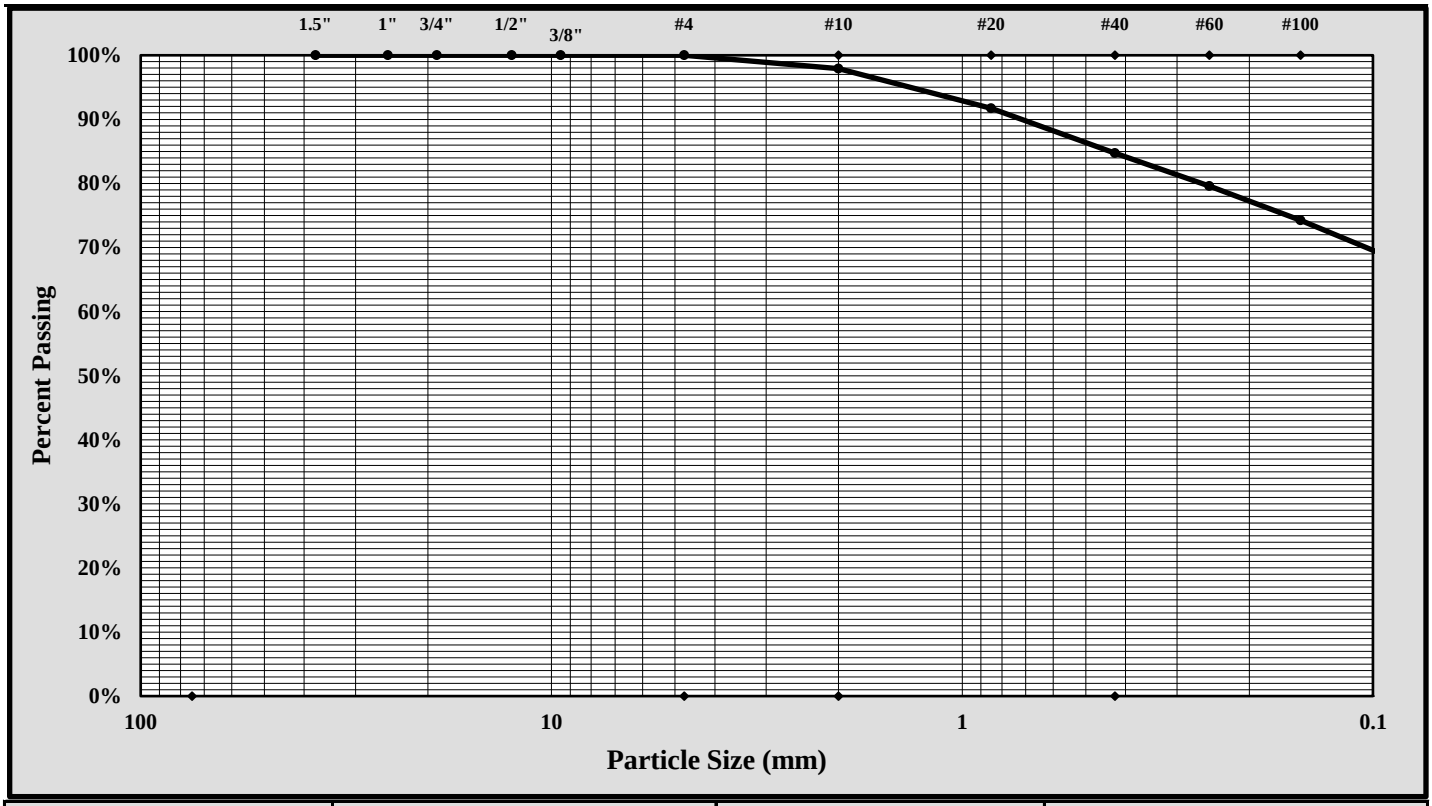
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/5-2/19/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-37 Sample #: SS-1	Sample Date:	1/24/2018
Location:	Pavement Boring Offset: N/A	Depth:	1.7' - 3.7'
Sample Description:	Sandy Elastic Silt (MH, A-7-5(14))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	#10	Gravel:	0%
Silt & Clay (% Passing #200):	66%	Total Sand:	34%

Liquid Limit	58	Plastic Limit	39	Plastic Index	19
Coarse Sand:	2%	Medium Sand:	13%	Fine Sand:	18%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/8/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

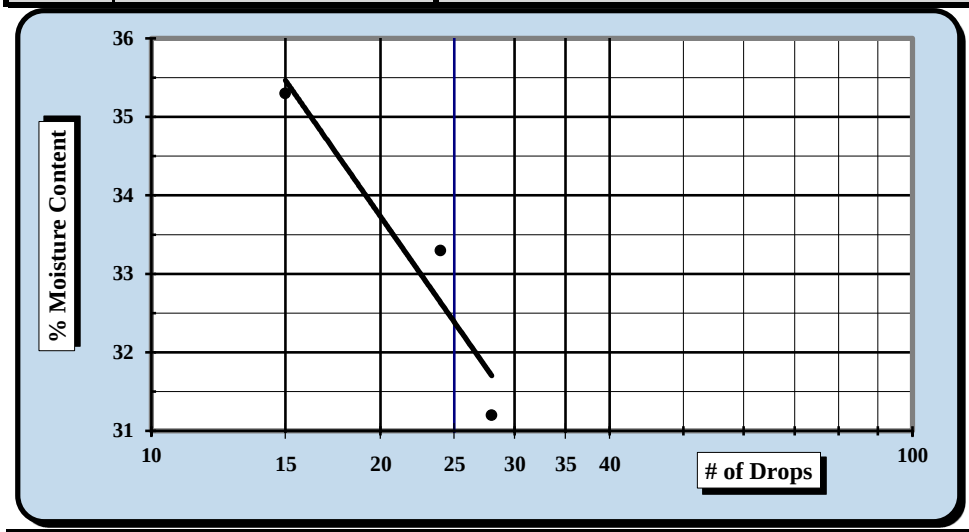
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	3/7-4/2/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-38	Sample #: SS-1		Sample Date: 1/29/18	
Location:	Pavement Boring	Offset: N/A		Depth: 0.8' - 2.8'	
Sample Description:	Clayey Sand (SC, A-2-6)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28574	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

Pan # 601		Liquid Limit						Plastic Limit		
	Tare #:	36	214	227				123	19	
A	Tare Weight	20.95	20.83	20.81				20.56	20.52	
B	Wet Soil Weight + A	29.37	28.04	27.37				27.10	26.54	
C	Dry Soil Weight + A	27.37	26.24	25.66				26.28	25.80	
D	Water Weight (B-C)	2.00	1.80	1.71				0.82	0.74	
E	Dry Soil Weight (C-A)	6.42	5.41	4.85				5.72	5.28	
F	% Moisture (D/E)*100	31.2%	33.3%	35.3%				14.3%	14.0%	
N	# OF DROPS	28	24	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**14.2%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**32**
Plastic Limit	**14**
Plastic Index	**18**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group Symbol for minus No. 40 sieve portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	5/3/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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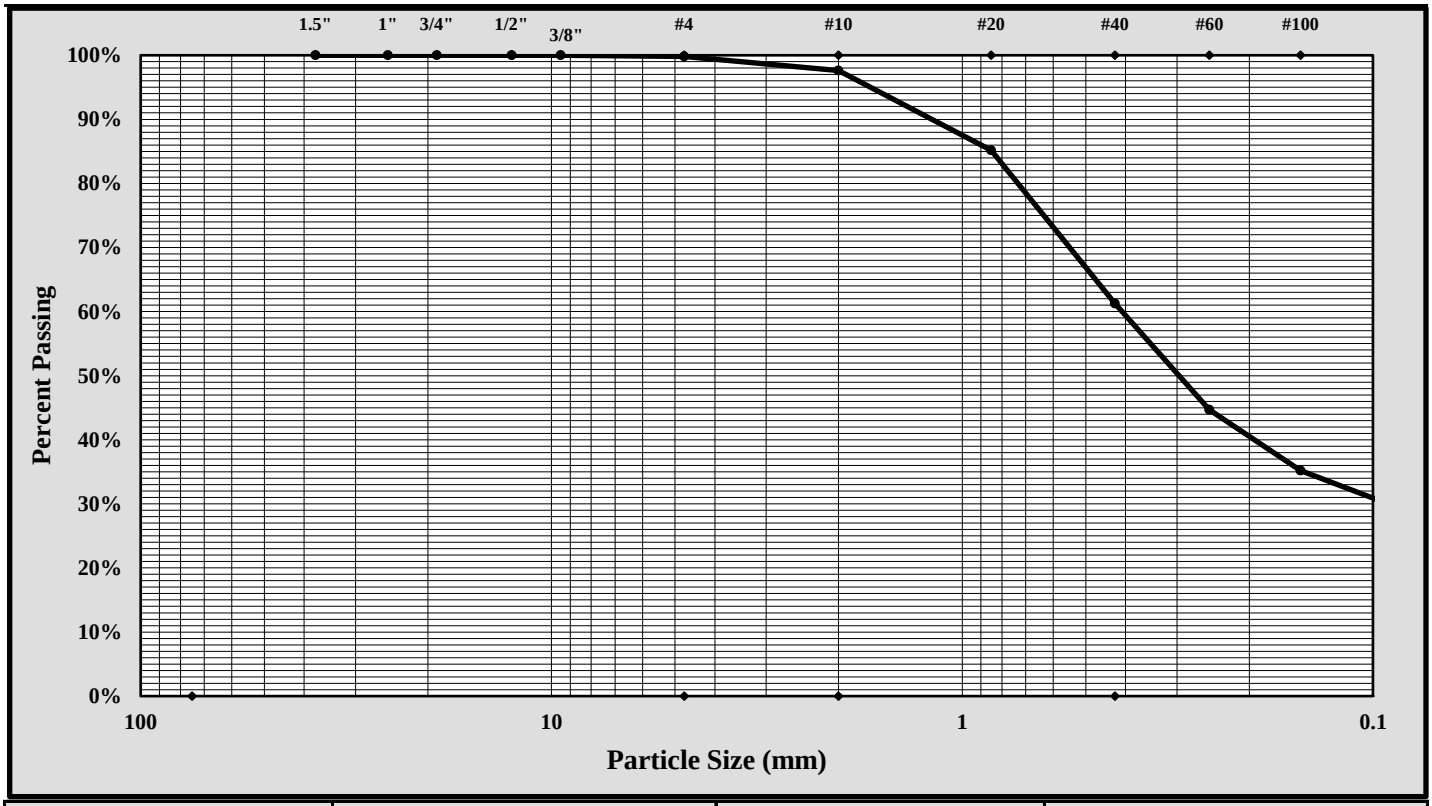
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	3/1-3/7/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-38 Sample #: SS-1	Sample Date:	1/29/18
Location:	Pavement Boring Offset: N/A	Depth:	0.8' - 2.8'
Sample Description:	Clayey Sand (SC, A-2-6)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	#4	Gravel:	0.2%
Silt & Clay (% Passing #200):	27.9%	Total Sand:	71.9%

Liquid Limit	32	Plastic Limit	14	Plastic Index	18		
Coarse Sand:	2.2%	Medium Sand:	36.3%	Fine Sand:	33.4%		
Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/3/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/15-2/20/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-39	Sample #: SS-1	Sample Date: 1/24/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.8' - 2.8'
Sample Description:	Clayey Sand (SC, A-6(2))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28573	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

	Pan # 606	Liquid Limit						Plastic Limit		
	Tare #:	240	32	123				206	245	
A	Tare Weight	20.78	20.41	20.57				20.92	20.77	
B	Wet Soil Weight + A	30.72	29.69	29.53				29.88	27.47	
C	Dry Soil Weight + A	28.37	27.43	27.29				28.68	26.59	
D	Water Weight (B-C)	2.35	2.26	2.24				1.20	0.88	
E	Dry Soil Weight (C-A)	7.59	7.02	6.72				7.76	5.82	
F	% Moisture (D/E)*100	31.0%	32.2%	33.3%				15.5%	15.1%	
N	# OF DROPS	35	24	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**15.3%**		

One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**32**
Plastic Limit	**15**
Plastic Index	**17**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	3/8/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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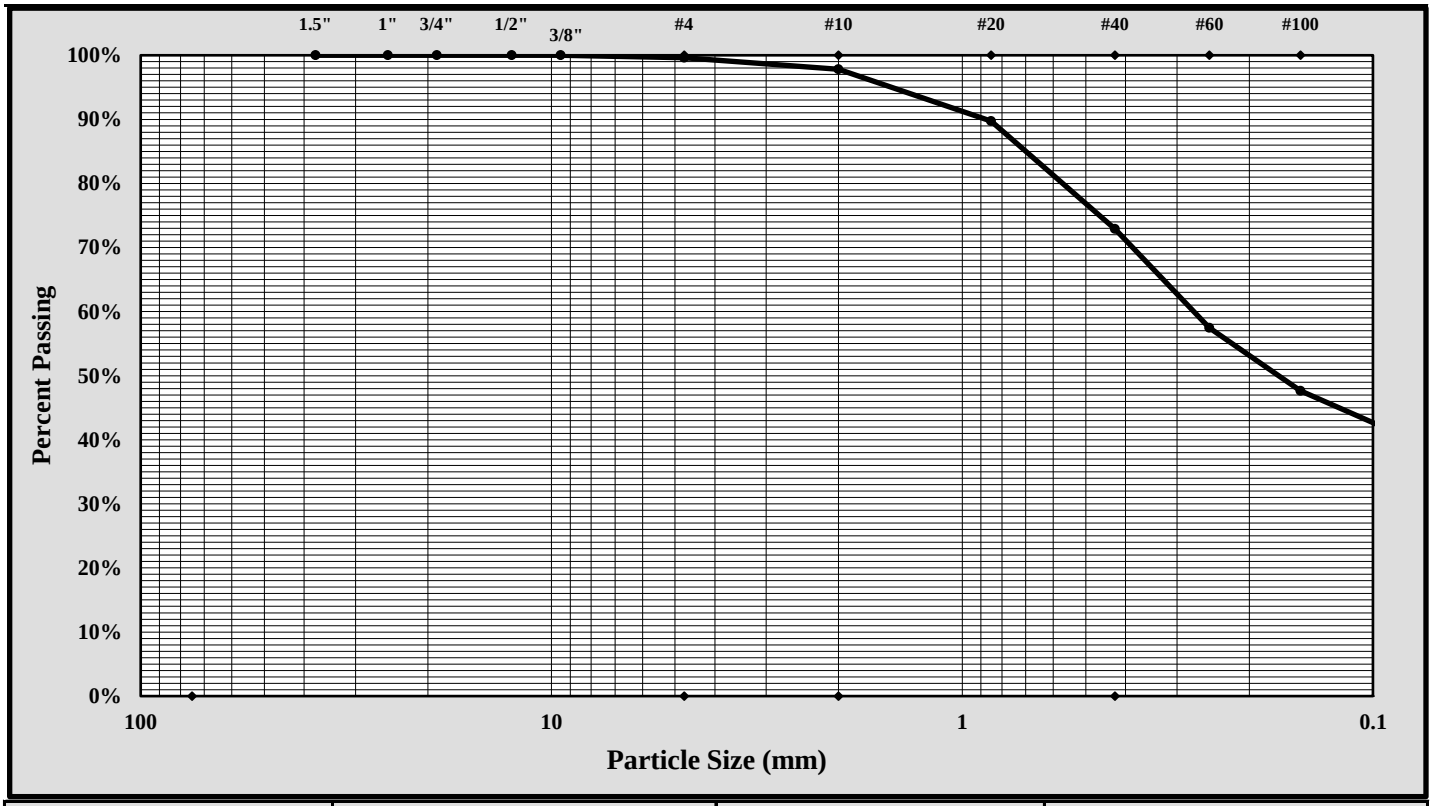
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/5-2/19/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-39 Sample #: SS-1	Sample Date:	1/24/2018
Location:	Pavement Boring Offset: N/A	Depth:	0.8' - 2.8'
Sample Description:	Clayey Sand (SC, A-6(2))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	#4	Gravel:	0%
Silt & Clay (% Passing #200):	39%	Total Sand:	60%

Liquid Limit	32	Plastic Limit	15	Plastic Index	17
Coarse Sand:	2%	Medium Sand:	25%	Fine Sand:	34%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☒

References / Comments / Deviations:

Matthew F. Cooke, P.G.	Project Manager	3/8/2018
Technical Responsibility	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

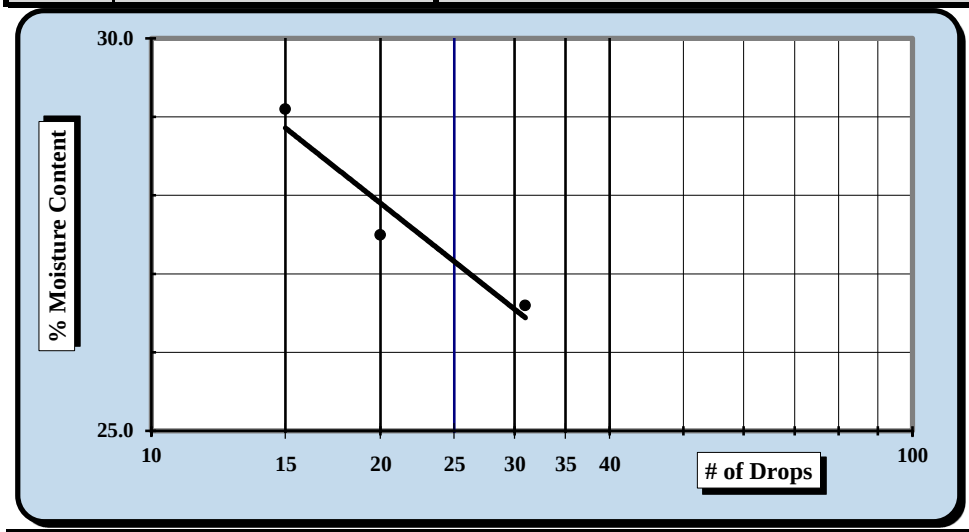
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/15-2/20/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-40	Sample #: SS-1		Sample Date: 1/25/2018	
Location:	Pavement Boring	Offset: N/A		Depth: 0.9' - 2.9'	
Sample Description:	Clayey Sand (SC, A-2-4)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28573	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

	Pan # 603	Liquid Limit						Plastic Limit		
	Tare #:	146	211	195				227	243	
A	Tare Weight	20.55	20.82	20.53				20.82	20.75	
B	Wet Soil Weight + A	29.27	30.15	31.18				30.63	28.59	
C	Dry Soil Weight + A	27.44	28.14	28.78				29.12	27.41	
D	Water Weight (B-C)	1.83	2.01	2.40				1.51	1.18	
E	Dry Soil Weight (C-A)	6.89	7.32	8.25				8.30	6.66	
F	% Moisture (D/E)*100	26.6%	27.5%	29.1%				18.2%	17.7%	
N	# OF DROPS	31	20	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**18.0%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**27**
Plastic Limit	**18**
Plastic Index	**9**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	3/8/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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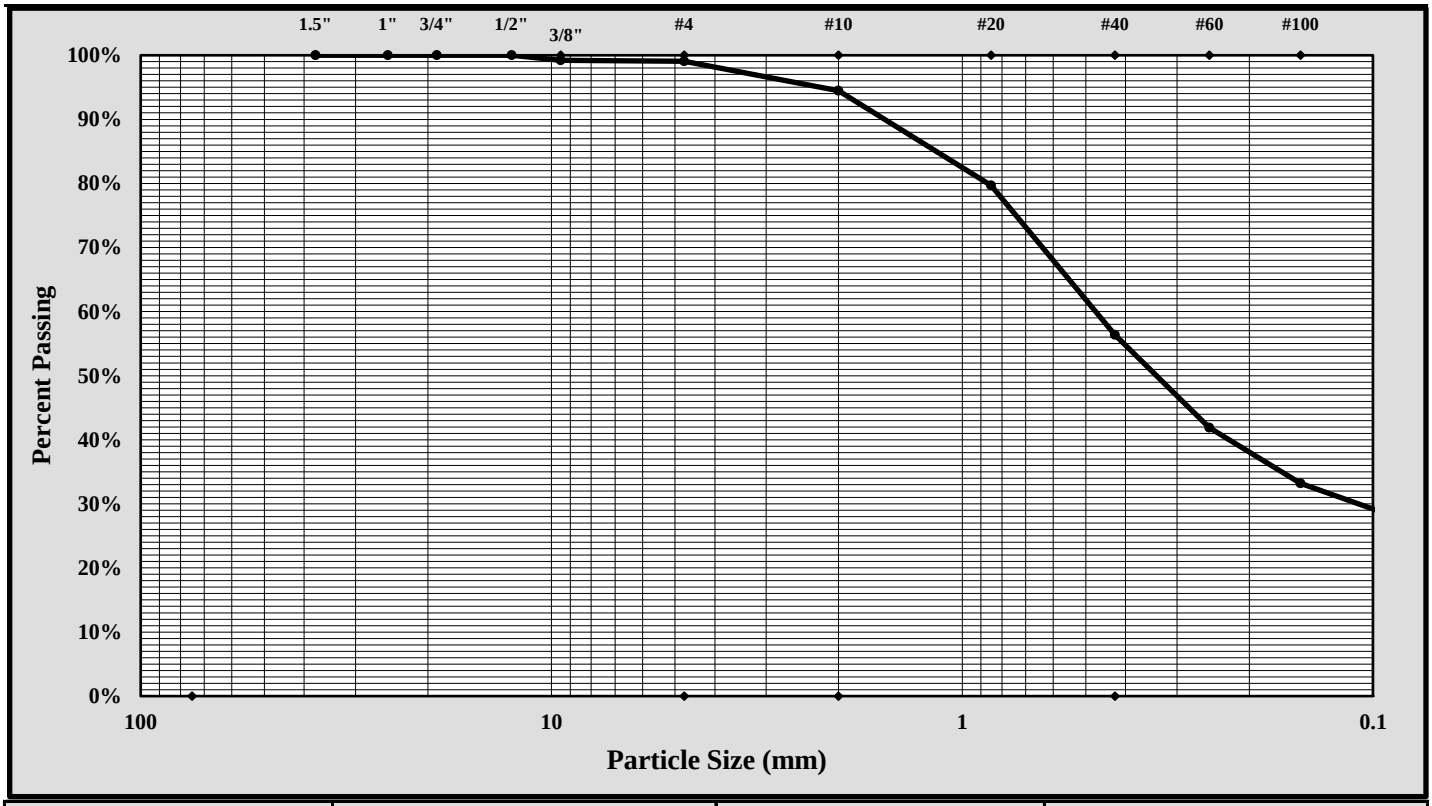
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/5-2/19/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-40 Sample #: SS-1	Sample Date:	1/25/2018
Location:	Pavement Boring Offset: N/A	Depth:	0.9' - 2.9'
Sample Description:	Clayey Sand (SC, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	3/8-inch	Gravel:	1%
Silt & Clay (% Passing #200):	26%	Total Sand:	73%

Liquid Limit	27	Plastic Limit	18	Plastic Index	9
Coarse Sand:	5%	Medium Sand:	38%	Fine Sand:	30%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☒

References / Comments / Deviations:

Matthew F. Cooke, P.G.	Project Manager	3/8/2018
Technical Responsibility	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

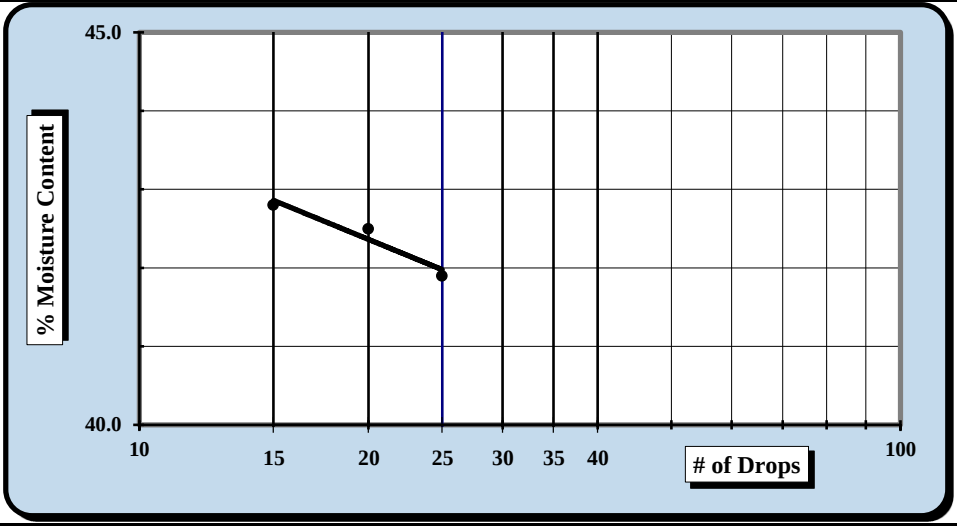
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/15-2/20/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-41	Sample #: SS-1		Sample Date: 1/24/2018	
Location:	Pavement Boring	Offset: N/A		Depth: 2.0' - 4.0'	
Sample Description:	Silty Sand (SM, A-2-5)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28573	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

Pan # 610		Liquid Limit						Plastic Limit		
	Tare #:	8	212	3				36	30	
A	Tare Weight	20.61	20.87	20.80				20.98	20.82	
B	Wet Soil Weight + A	29.49	30.15	30.24				29.37	28.87	
C	Dry Soil Weight + A	26.87	27.38	27.41				27.33	26.96	
D	Water Weight (B-C)	2.62	2.77	2.83				2.04	1.91	
E	Dry Soil Weight (C-A)	6.26	6.51	6.61				6.35	6.14	
F	% Moisture (D/E)*100	41.9%	42.5%	42.8%				32.1%	31.1%	
N	# OF DROPS	25	20	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**31.6%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**42**
Plastic Limit	**32**
Plastic Index	**10**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	3/8/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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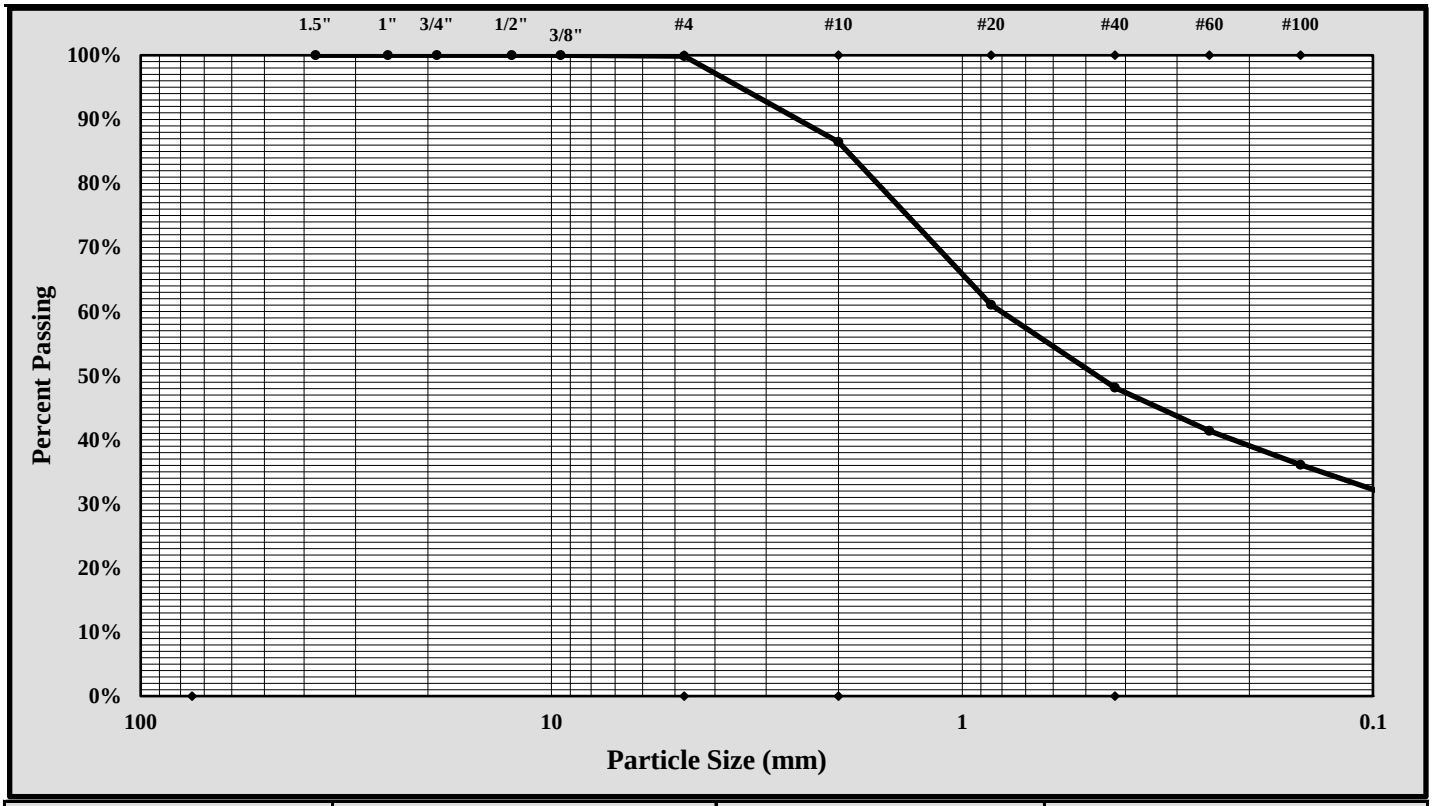
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/5-2/19/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-41 Sample #: SS-1	Sample Date:	1/24/2018
Location:	Pavement Boring Offset: N/A	Depth:	2.0' - 4.0'
Sample Description:	Silty Sand (SM, A-2-5)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	#4	Gravel:	0%
Silt & Clay (% Passing #200):	30%	Total Sand:	70%

Liquid Limit	42	Plastic Limit	32	Plastic Index	10
Coarse Sand:	13%	Medium Sand:	38%	Fine Sand:	19%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☒

References / Comments / Deviations:

Matthew F. Cooke, P.G.	Project Manager	3/8/2018
Technical Responsibility	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-1-2018
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-42	Sample #: SS-1	Sample Date: Various
Location:	Pavement Boring	Offset: N/A	Depth: 0.8' - 2.8'
Sample Description:	Clayey Sand (SC, A-7-6 (8))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 340		Liquid Limit						Plastic Limit		
	Tare #:	35	36	37				38	39	
A	Tare Weight	15.99	15.09	15.69				15.26	16.02	
B	Wet Soil Weight + A	28.18	27.49	27.73				21.26	22.07	
C	Dry Soil Weight + A	24.53	23.70	23.84				20.32	21.12	
D	Water Weight (B-C)	3.65	3.79	3.89				0.94	0.95	
E	Dry Soil Weight (C-A)	8.54	8.61	8.15				5.06	5.10	
F	% Moisture (D/E)*100	42.7%	44.0%	47.7%				18.6%	18.6%	
N	# OF DROPS	30	21	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**18.6%**		

One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**44**
Plastic Limit	**19**
Plastic Index	**25**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		4/30/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

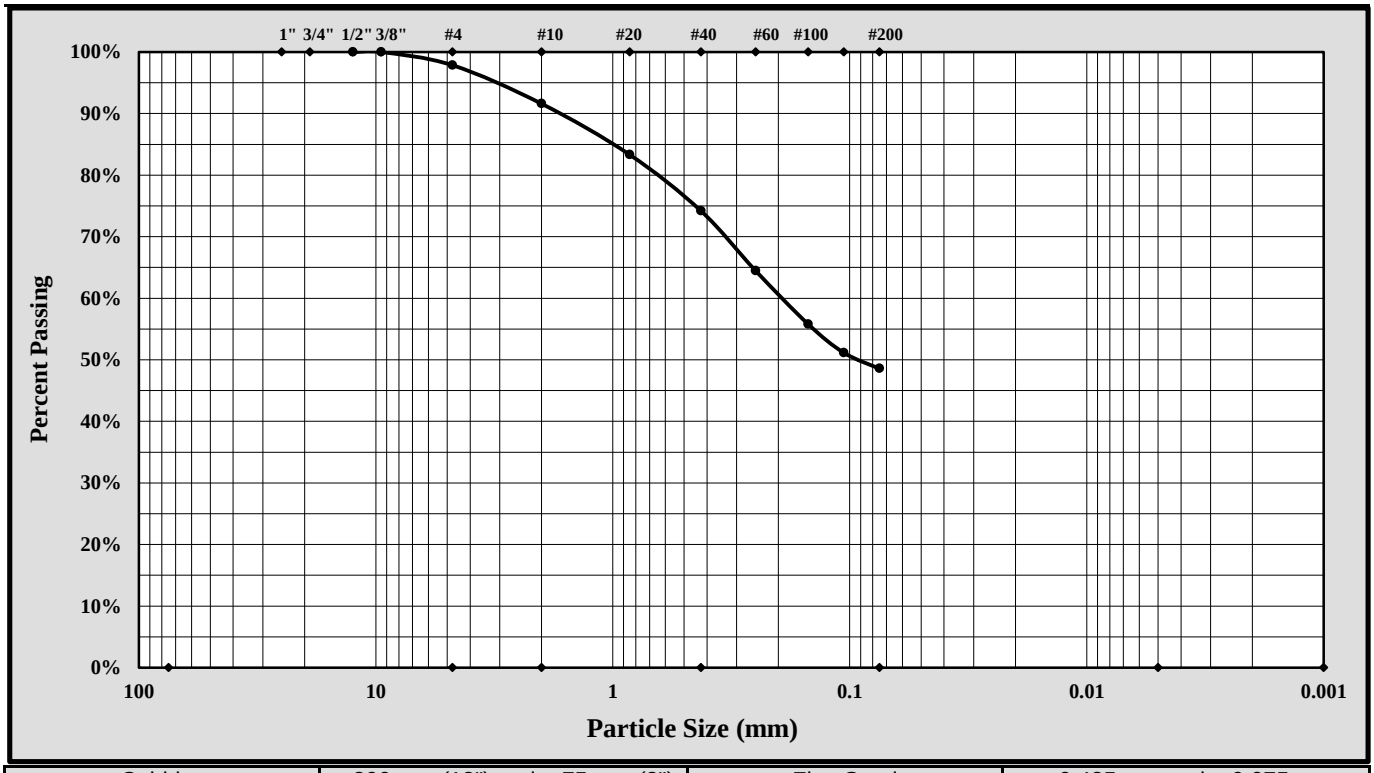
ASTM D6913/D7928

Quality Assurance

Sample Log No.:

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	P-42 Type: Split Spoon	Sample Date:	Various
Location:	Pavement Boring Sample No.: SS-1	Depth:	0.8' - 2.8'
Sample Description:	Clayey Sand (SC, A-7-6 (8))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	2.1%
Silt & Clay (% Passing #200):	48.6%	Total Sand:	49.3%
Assumed Specific Gravity:	2.65		

Liquid Limit	44	Plastic Limit	19	Plastic Index	25

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	5/1/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

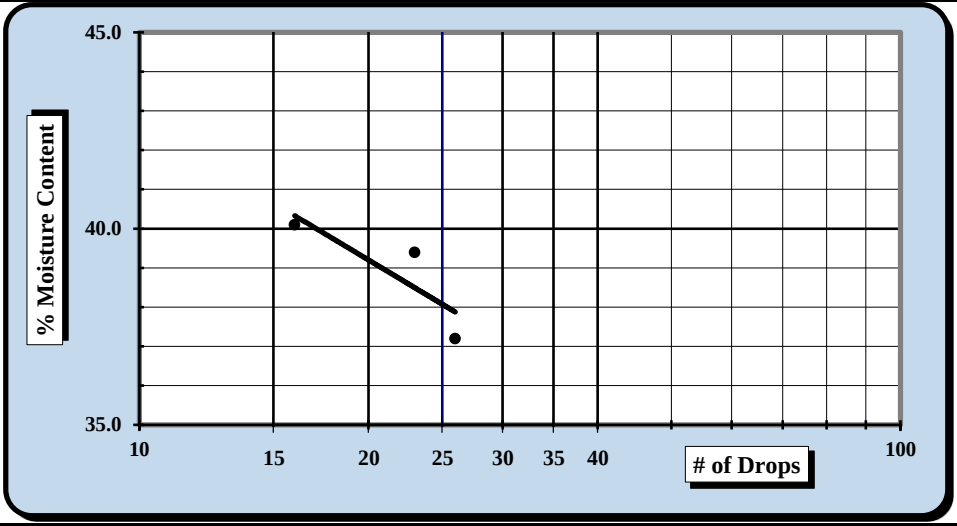
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/15-2/20/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-43	Sample #: SS-1		Sample Date: 1/24/2018	
Location:	Pavement Boring	Offset: N/A		Depth: 0.5' - 2.5'	
Sample Description:	Clayey Sand with Gravel (SC, A-6(3))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28573	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

		Liquid Limit						Plastic Limit		
Pan #	602									
	Tare #:	45	235	16				226	222	
A	Tare Weight	20.77	20.76	20.68				20.94	20.84	
B	Wet Soil Weight + A	29.21	27.84	29.24				27.74	27.59	
C	Dry Soil Weight + A	26.92	25.84	26.79				26.60	26.50	
D	Water Weight (B-C)	2.29	2.00	2.45				1.14	1.09	
E	Dry Soil Weight (C-A)	6.15	5.08	6.11				5.66	5.66	
F	% Moisture (D/E)*100	37.2%	39.4%	40.1%				20.1%	19.3%	
N	# OF DROPS	26	23	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**19.7%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**38**
Plastic Limit	**20**
Plastic Index	**18**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	3/8/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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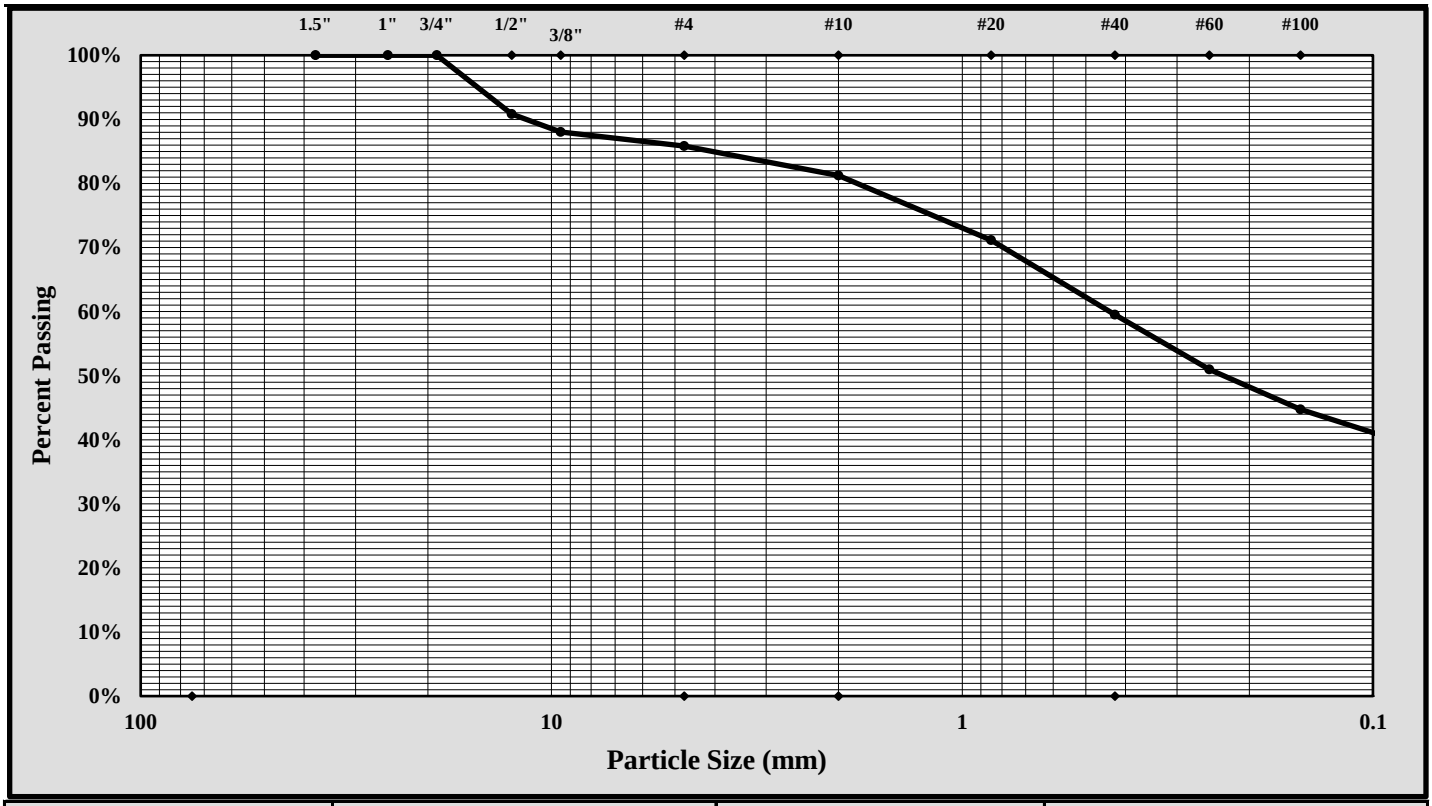
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/5-2/19/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-43 Sample #: SS-1	Sample Date:	1/24/2018
Location:	Pavement Boring Offset: N/A	Depth:	0.5' - 2.5'
Sample Description:	Clayey Sand with Gravel (SC, A-6(3))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	1/2-inch	Gravel:	14%
Silt & Clay (% Passing #200):	39%	Total Sand:	47%

Liquid Limit	38	Plastic Limit	20	Plastic Index	18
Coarse Sand:	5%	Medium Sand:	22%	Fine Sand:	21%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/8/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

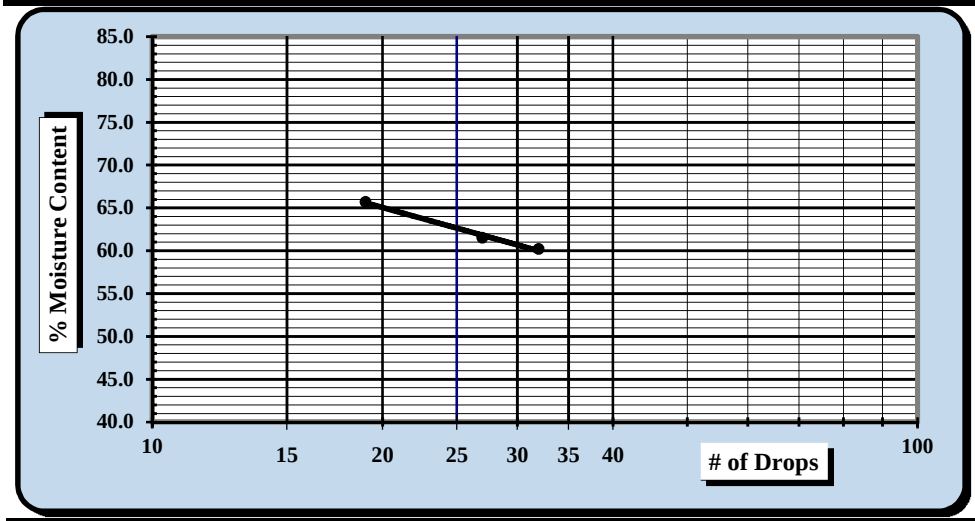
S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	4/30/18
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-44	Sample #: SS-1		Sample Date: Various	
Location:	Pavement Boring	Offset: N/A		Depth: 1.1' - 3.1'	
Sample Description:	Fat Clay with Sand (CH, A-7-6 (34))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 327		Liquid Limit						Plastic Limit		
	Tare #:	60	61	62				63	64	
A	Tare Weight	16.01	15.07	15.56				15.10	15.88	
B	Wet Soil Weight + A	27.98	27.12	27.19				22.25	22.67	
C	Dry Soil Weight + A	23.48	22.53	22.58				20.82	21.30	
D	Water Weight (B-C)	4.50	4.59	4.61				1.43	1.37	
E	Dry Soil Weight (C-A)	7.47	7.46	7.02				5.72	5.42	
F	% Moisture (D/E)*100	60.2%	61.5%	65.7%				25.0%	25.3%	
N	# OF DROPS	32	27	19				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**25.2%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**62**
Plastic Limit	**25**
Plastic Index	**37**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		4/30/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

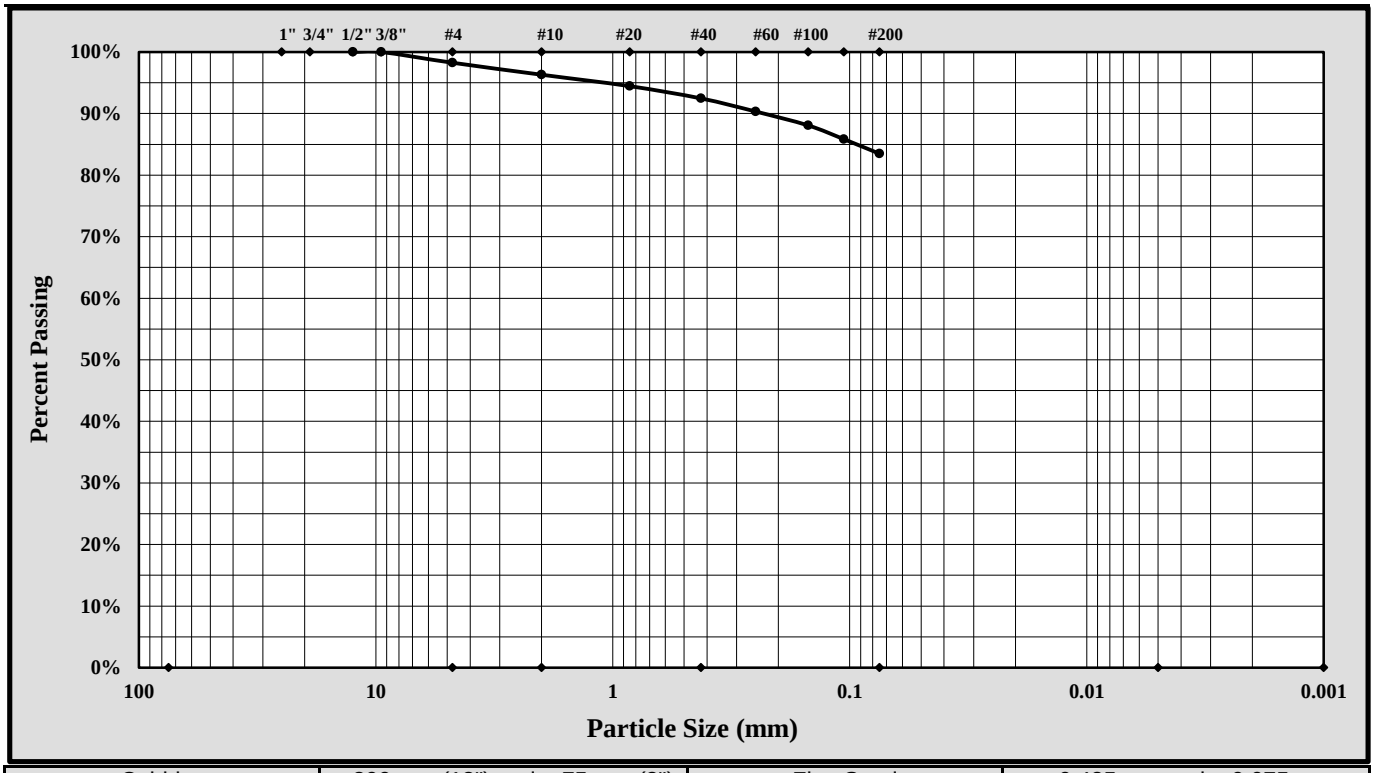
ASTM D6913/D7928

Sample Log No.:

Quality Assurance

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	P-44 Type: Split Spoon	Sample Date:	Various
Location:	Pavement Boring Sample No.: SS-1	Depth:	1.1' - 3.1'
Sample Description:	Fat Clay with Sand (CH, A-7-6 (34))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	1.7%
Silt & Clay (% Passing #200):	83.5%	Total Sand:	14.8%
Assumed Specific Gravity:	2.65		

Liquid Limit	62	Plastic Limit	25	Plastic Index	37

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	4/30/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

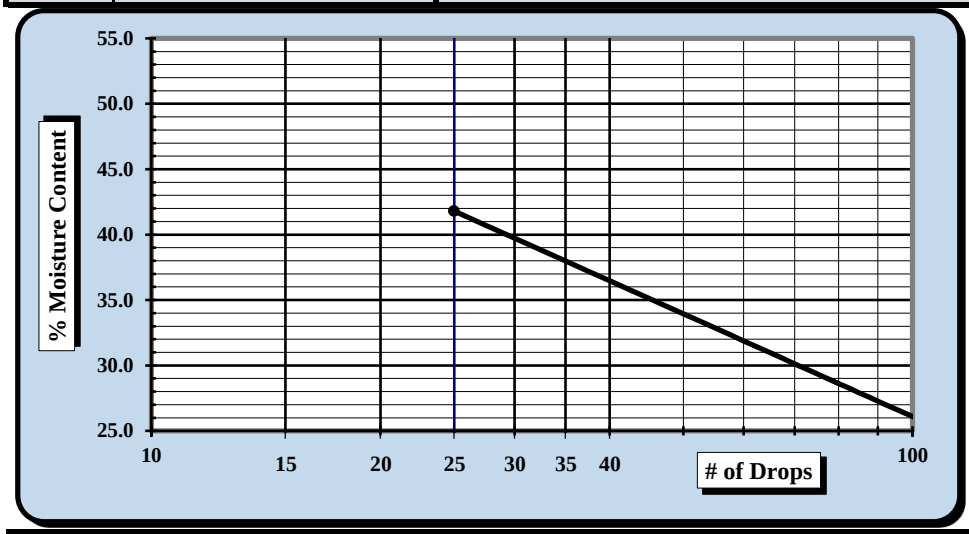
S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-4-18
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-45	Sample #: SS-1	Sample Date: Various
Location:	Pavement Boring	Offset: N/A	Depth: 1.0' - 3.0'
Sample Description:	Clayey Sand with Gravel (SC, A-2-7 (2))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 189		Liquid Limit						Plastic Limit		
	Tare #:	66						77	79	
A	Tare Weight	26.68						29.17	29.31	
B	Wet Soil Weight + A	39.78						36.57	38.12	
C	Dry Soil Weight + A	35.92						35.37	36.69	
D	Water Weight (B-C)	3.86						1.20	1.43	
E	Dry Soil Weight (C-A)	9.24						6.20	7.38	
F	% Moisture (D/E)*100	41.8%						19.4%	19.4%	
N	# OF DROPS	25						*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**19.4%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**42**
Plastic Limit	**19**
Plastic Index	**23**
Group Symbol	**CL**

Multipoint Method ☐
One-point Method ☑

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		4/30/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

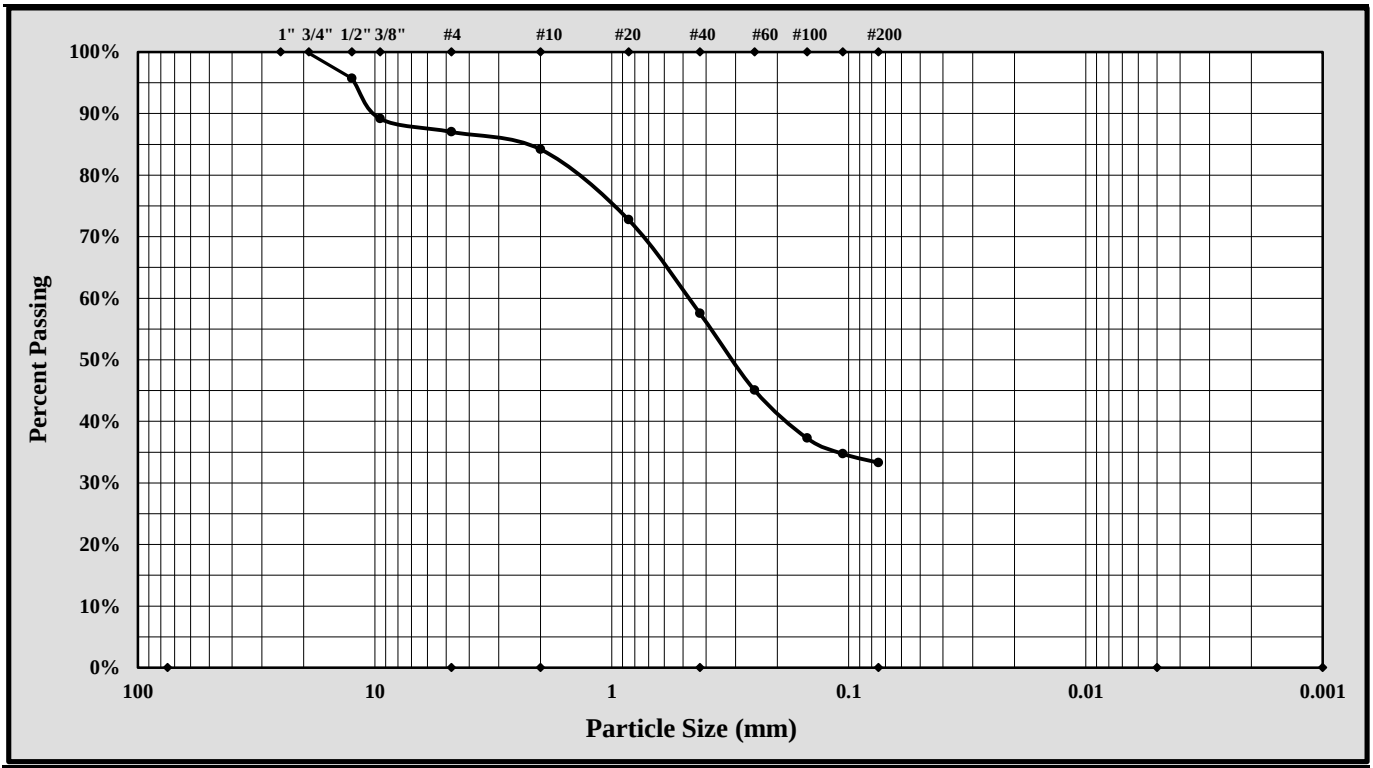
ASTM D6913/D7928

Sample Log No.:

Quality Assurance

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	P-45 Type: Split Spoon	Sample Date:	Various
Location:	Pavement Boring Sample No.: SS-1	Depth:	1.0' - 3.0'
Sample Description:	Clayey Sand with Gravel (SC, A-2-7 (2))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	13.0%
Silt & Clay (% Passing #200):	33.3%	Total Sand:	53.7%
Assumed Specific Gravity:	2.65		

Liquid Limit	42	Plastic Limit	19	Plastic Index	23

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	5/4/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

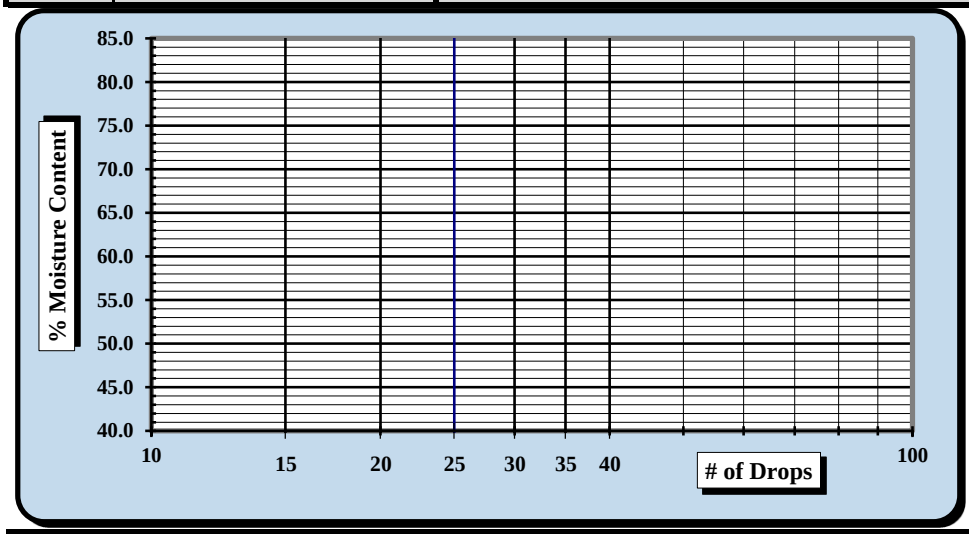
S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-2-2018
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-47	Sample #: SS-1	Sample Date: Various
Location:	Pavement Boring	Offset: N/A	Depth: 1.4' - 3.4'
Sample Description:	Sandy Lean Clay (CL, A-6 (8))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 468		Liquid Limit						Plastic Limit		
	Tare #:	82						88	89	
A	Tare Weight	16.98						17.08	17.27	
B	Wet Soil Weight + A	27.80						23.58	23.45	
C	Dry Soil Weight + A	24.94						22.82	22.72	
D	Water Weight (B-C)	2.86						0.76	0.73	
E	Dry Soil Weight (C-A)	7.96						5.74	5.45	
F	% Moisture (D/E)*100	35.9%						13.2%	13.4%	
N	# OF DROPS	26						*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**13.3%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**36**
Plastic Limit	**13**
Plastic Index	**23**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		5/2/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

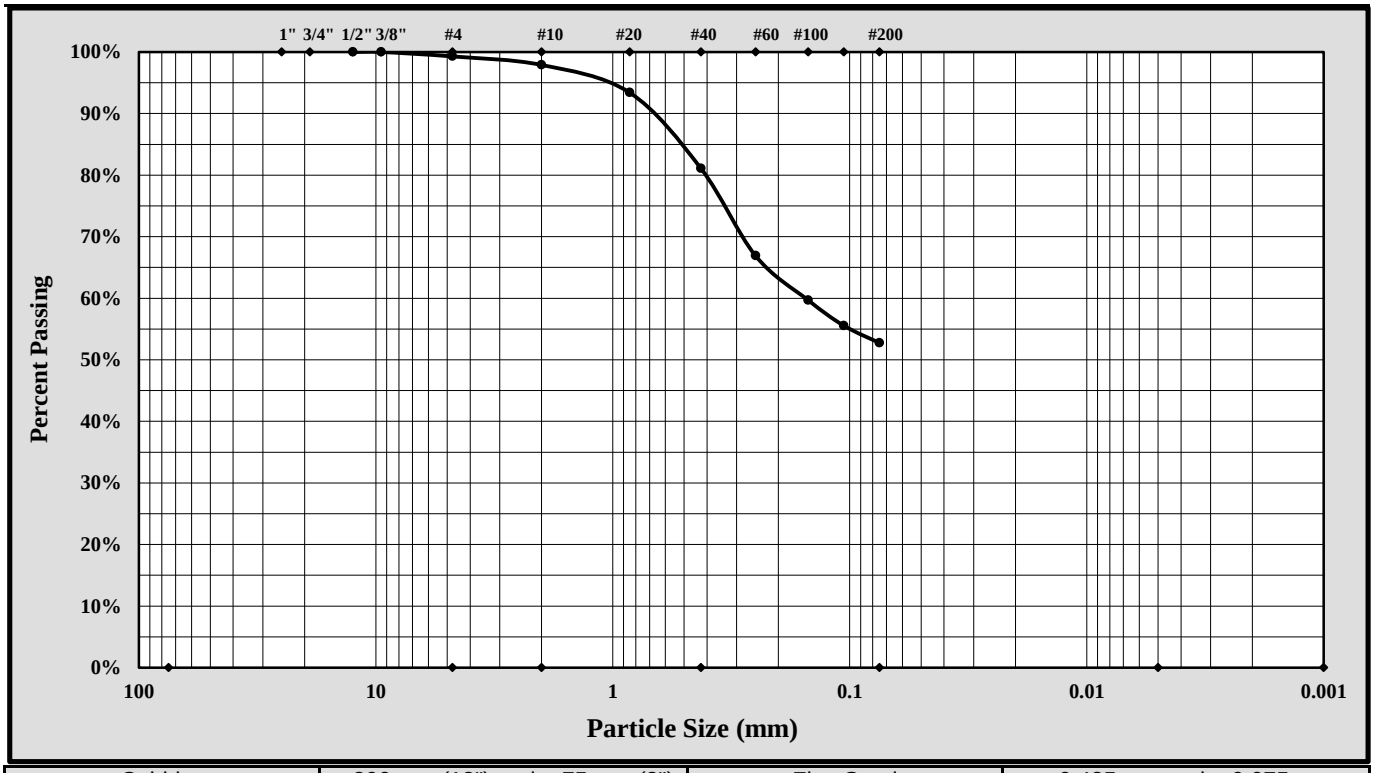
ASTM D6913/D7928

Quality Assurance

Sample Log No.:

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	P-47 Type: Split Spoon	Sample Date:	Various
Location:	Pavement Boring Sample No.: SS-1	Depth:	1.4' - 3.4'
Sample Description:	Sandy Lean Clay (CL, A-6 (8))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	0.7%
Silt & Clay (% Passing #200):	52.8%	Total Sand:	46.5%
Assumed Specific Gravity:	2.65		
Liquid Limit	36	Plastic Limit	13
		Plastic Index	23

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel: Rounded ☐ Angular ☐ Hard & Durable ☐ Soft ☐ Weathered & Friable ☐

Sample Prep Method: Moist Prep | Dispersion Period: 1 min. | Dispersing Agent: Sodium Hexametaphosphate: 50 g./ Liter

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	5/2/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

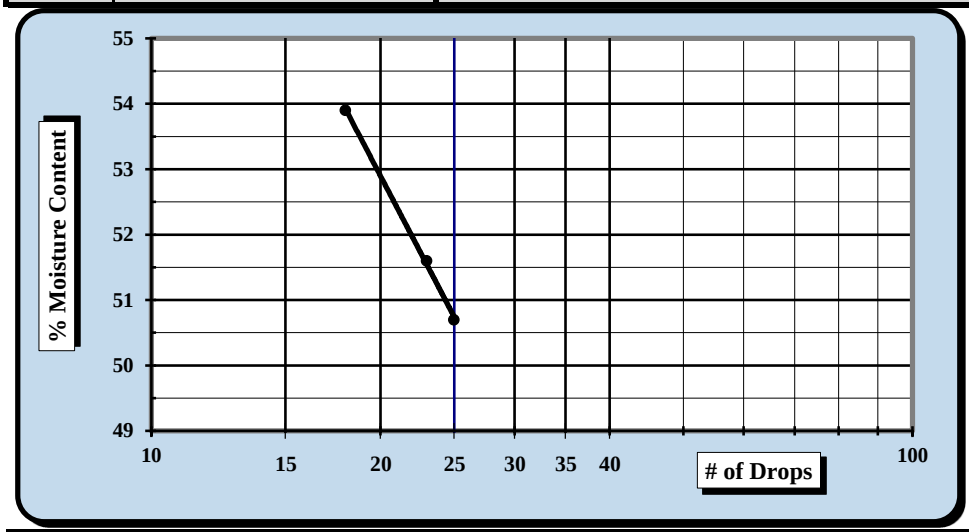
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	3/7-3/26/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-48	Sample #: SS-1		Sample Date: 2/7/18	
Location:	Pavement Boring	Offset: N/A		Depth: 1.0' - 3.0'	
Sample Description:	Sandy Elastic Silt (MH, A-7-5(8))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28574	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

Pan # 602		Liquid Limit						Plastic Limit		
	Tare #:	6	235	31				210	227	
A	Tare Weight	20.56	20.76	20.81				20.92	20.81	
B	Wet Soil Weight + A	29.36	28.16	29.26				28.82	27.28	
C	Dry Soil Weight + A	26.40	25.64	26.30				26.99	25.80	
D	Water Weight (B-C)	2.96	2.52	2.96				1.83	1.48	
E	Dry Soil Weight (C-A)	5.84	4.88	5.49				6.07	4.99	
F	% Moisture (D/E)*100	50.7%	51.6%	53.9%				30.1%	29.7%	
N	# OF DROPS	25	23	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**29.9%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**51**
Plastic Limit	**30**
Plastic Index	**21**
Group Symbol	**MH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group Symbol for minus No. 40 sieve portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	5/3/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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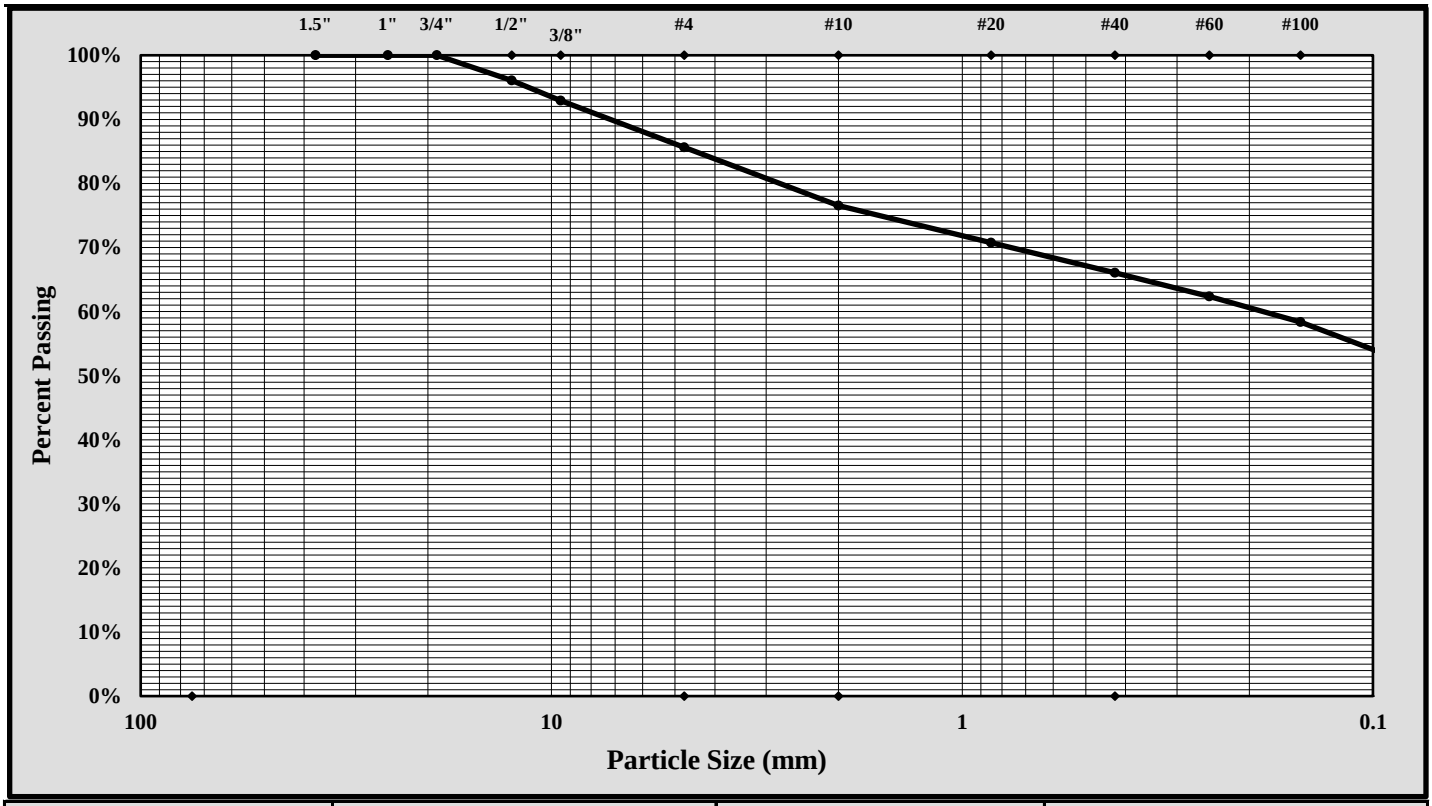
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	3/1-3/7/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-48 Sample #: SS-1	Sample Date:	2/7/18
Location:	Pavement Boring Offset: N/A	Depth:	1.0' - 3.0'
Sample Description:	Sandy Elastic Silt (MH, A-7-5(8))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	1/2-inch	Gravel:	14.4%
Silt & Clay (% Passing #200):	51.1%	Total Sand:	34.6%

Liquid Limit	51	Plastic Limit	30	Plastic Index	21
Coarse Sand:	9.1%	Medium Sand:	10.5%	Fine Sand:	15.0%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Matthew F. Cooke, P.G.	Project Manager	5/3/2018
Technical Responsibility	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

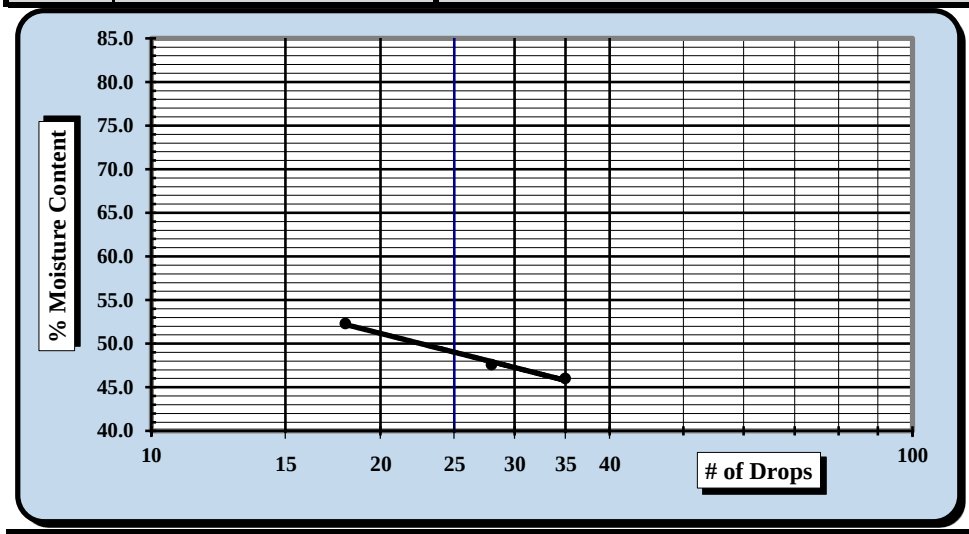
ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-1-2018
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-49	Sample #: SS-1	Sample Date: Various
Location:	Pavement Boring	Offset: N/A	Depth: 1.0' - 3.0'
Sample Description:	Sandy Lean Clay (CL, A-7-6 (9))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 170		Liquid Limit						Plastic Limit		
	Tare #:	20	21	22				23	24	
A	Tare Weight	15.46	15.34	15.43				14.90	15.23	
B	Wet Soil Weight + A	27.40	26.00	26.70				21.91	21.57	
C	Dry Soil Weight + A	23.64	22.56	22.83				20.65	20.42	
D	Water Weight (B-C)	3.76	3.44	3.87				1.26	1.15	
E	Dry Soil Weight (C-A)	8.18	7.22	7.40				5.75	5.19	
F	% Moisture (D/E)*100	46.0%	47.6%	52.3%				21.9%	22.2%	
N	# OF DROPS	35	28	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**22.1%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**48**
Plastic Limit	**22**
Plastic Index	**26**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		5/1/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

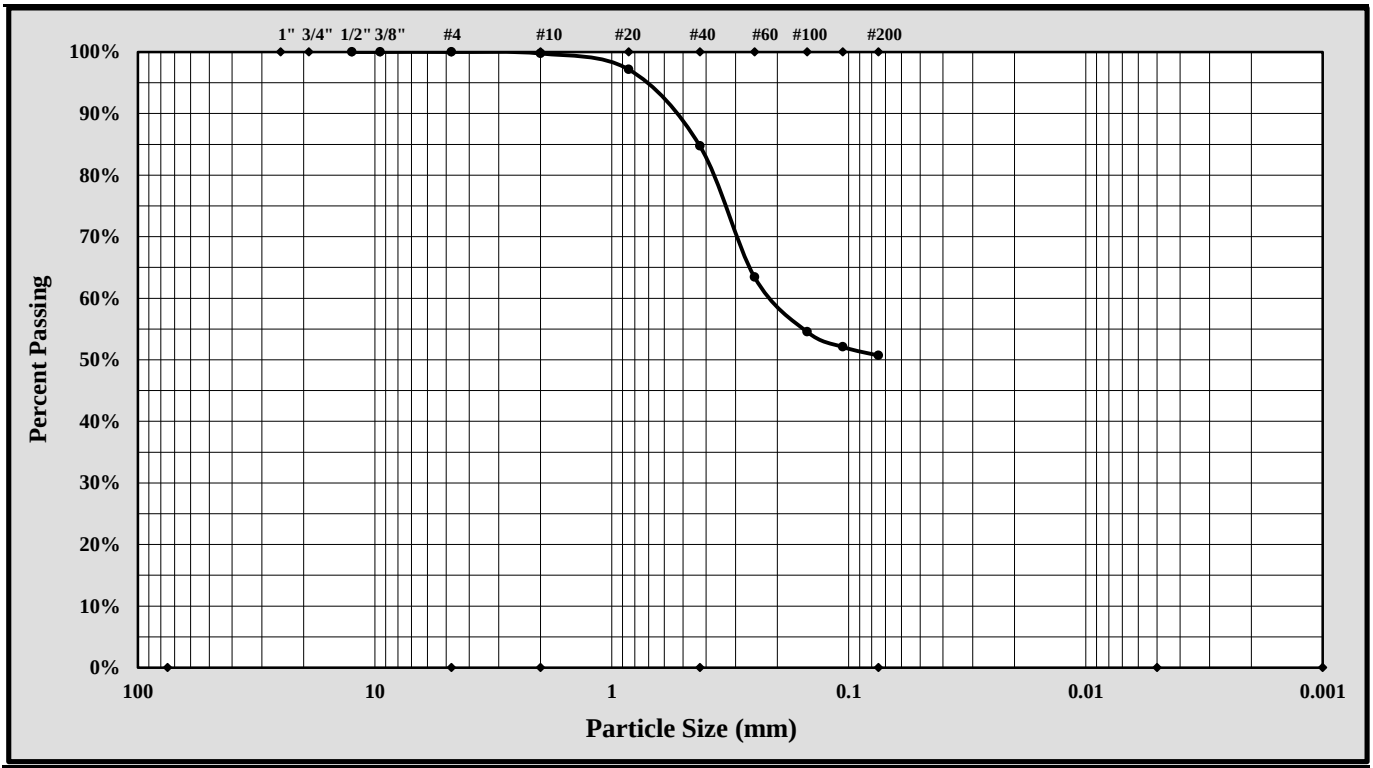
ASTM D6913/D7928

Quality Assurance

Sample Log No.:

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	P-49 Type: Split Spoon	Sample Date:	Various
Location:	Pavement Boring Sample No.: SS-1	Depth:	1.0' - 3.0'
Sample Description:	Sandy Lean Clay (CL, A-7-6 (9))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	0.0%
Silt & Clay (% Passing #200):	50.7%	Total Sand:	49.3%
Assumed Specific Gravity:	2.65		

Liquid Limit	48	Plastic Limit	22	Plastic Index	26

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	5/1/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

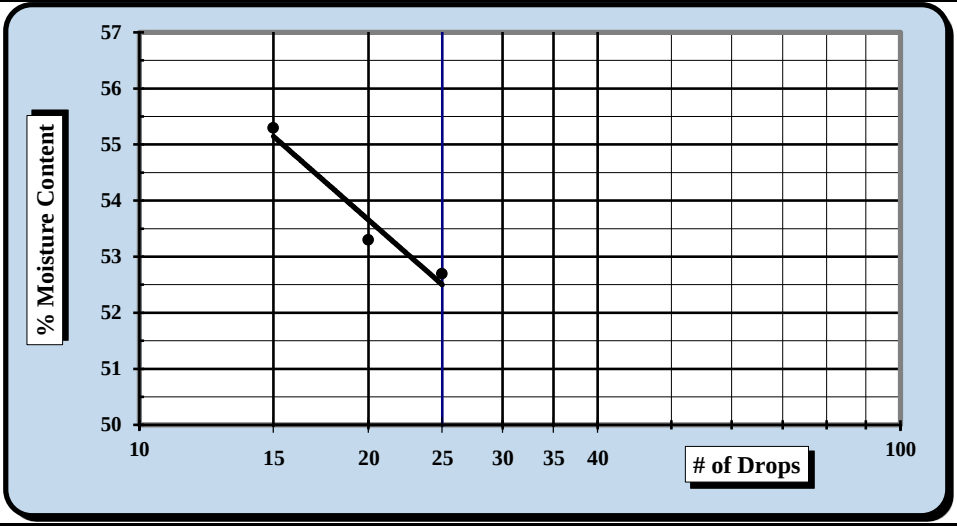
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	3/7-3/16/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-50	Sample #: SS-1		Sample Date: 2/7/18	
Location:	Pavement Boring	Offset: N/A		Depth: 1.0' - 3.0'	
Sample Description:	Elastic Silt (MH, A-7-5(23))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28574	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

Pan # 603		Liquid Limit						Plastic Limit		
	Tare #:	211	45	227				226	16	
A	Tare Weight	20.82	20.76	20.81				20.91	20.67	
B	Wet Soil Weight + A	27.54	27.98	27.97				26.92	27.06	
C	Dry Soil Weight + A	25.22	25.47	25.42				25.44	25.48	
D	Water Weight (B-C)	2.32	2.51	2.55				1.48	1.58	
E	Dry Soil Weight (C-A)	4.40	4.71	4.61				4.53	4.81	
F	% Moisture (D/E)*100	52.7%	53.3%	55.3%				32.7%	32.8%	
N	# OF DROPS	25	20	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**32.8%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**53**
Plastic Limit	**33**
Plastic Index	**20**
Group Symbol	**MH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group Symbol for minus No. 40 sieve portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	5/3/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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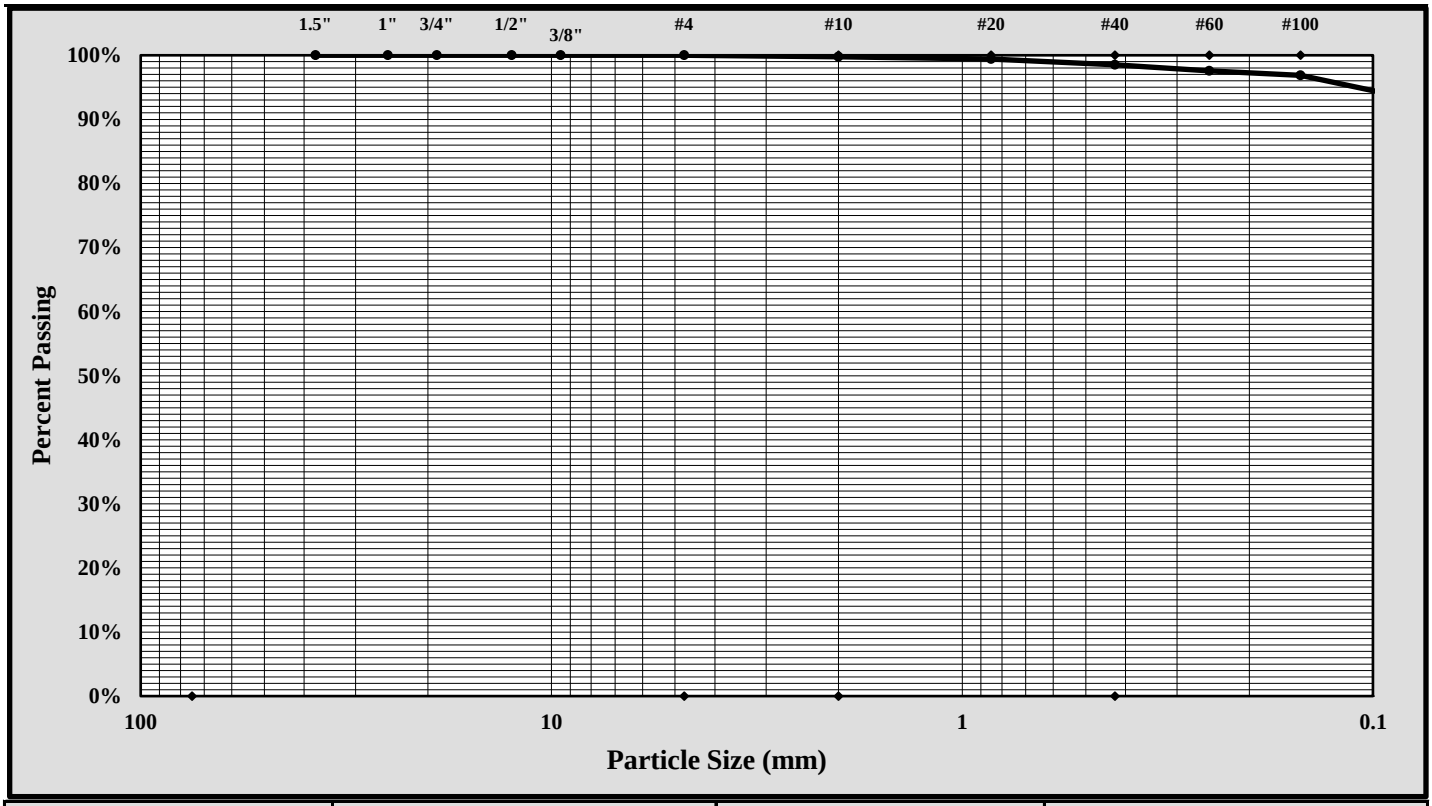
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	3/1-3/7/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-50 Sample #: SS-1	Sample Date:	2/7/18
Location:	Pavement Boring Offset: N/A	Depth:	1.0' - 3.0'
Sample Description:	Elastic Silt (MH, A-7-5(23))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	#10	Gravel:	0.0%
Silt & Clay (% Passing #200):	92.8%	Total Sand:	7.2%

Liquid Limit	53	Plastic Limit	33	Plastic Index	20
Coarse Sand:	0.2%	Medium Sand:	1.2%	Fine Sand:	5.7%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☒

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/3/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

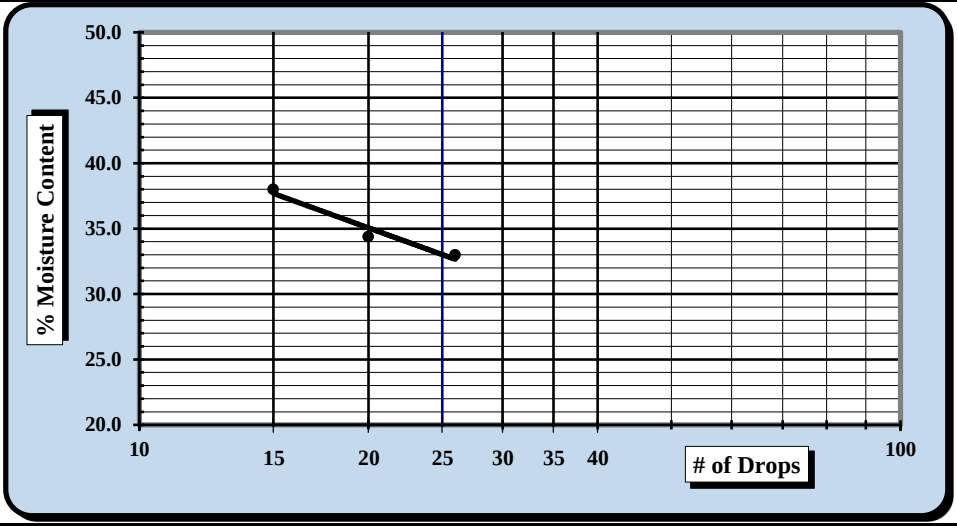
S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	4/30/18
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-51	Sample #: SS-1		Sample Date: Various	
Location:	Pavement Boring	Offset: N/A		Depth: 2.6' - 3.6'	
Sample Description:	Sandy Silt (ML, A-4 (3))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 441		Liquid Limit						Plastic Limit		
	Tare #:	40	41	42				43	44	
A	Tare Weight	14.86	15.09	15.01				14.93	15.07	
B	Wet Soil Weight + A	28.36	27.47	26.70				24.11	25.00	
C	Dry Soil Weight + A	25.01	24.30	23.48				22.14	22.85	
D	Water Weight (B-C)	3.35	3.17	3.22				1.97	2.15	
E	Dry Soil Weight (C-A)	10.15	9.21	8.47				7.21	7.78	
F	% Moisture (D/E)*100	33.0%	34.4%	38.0%				27.3%	27.6%	
N	# OF DROPS	26	20	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**27.5%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**33**
Plastic Limit	**27**
Plastic Index	**6**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		4/30/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

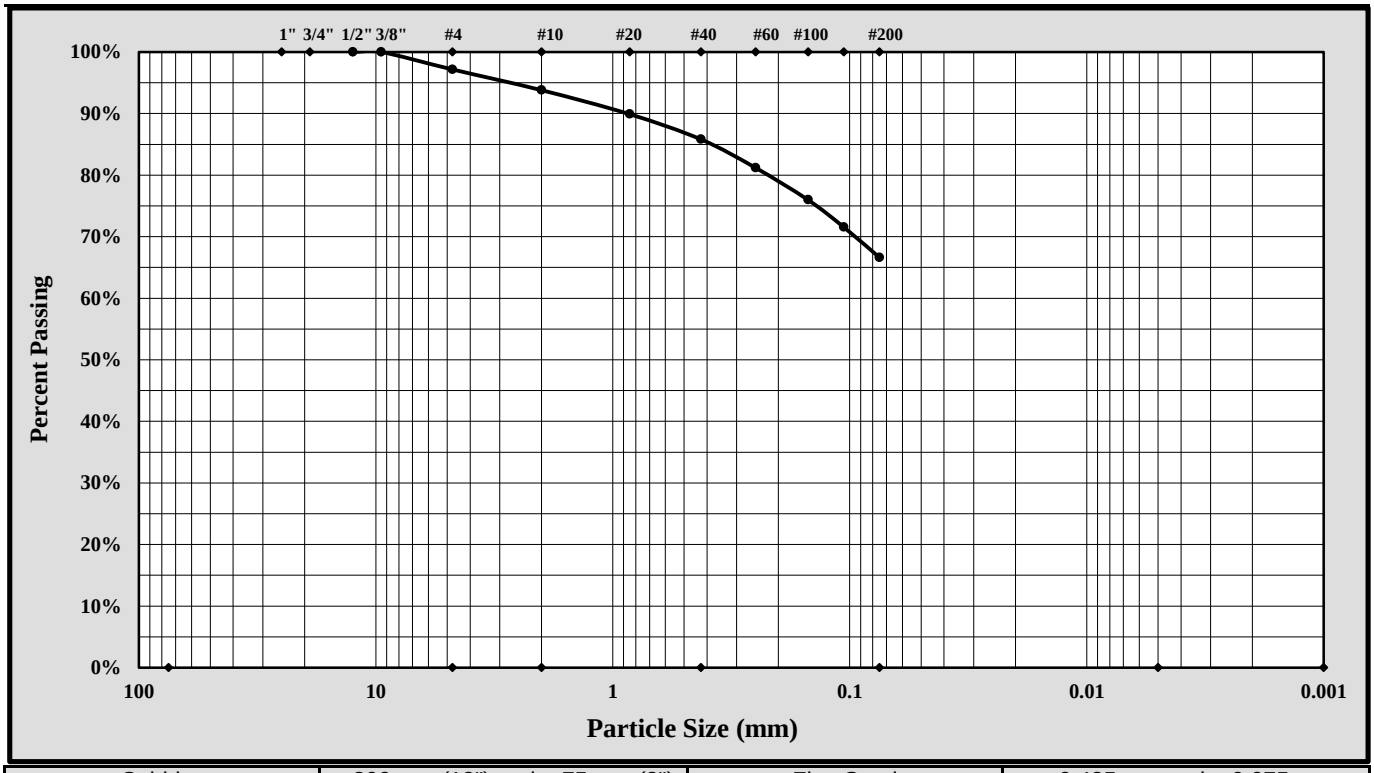
ASTM D6913/D7928

Quality Assurance

Sample Log No.:

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	P-51 Type: Split Spoon	Sample Date:	Various
Location:	Pavement Boring Sample No.: SS-1	Depth:	2.6' - 4.6'
Sample Description:	Sandy Silt (ML, A-4 (3))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	2.8%
Silt & Clay (% Passing #200):	66.6%	Total Sand:	30.5%
Assumed Specific Gravity:	2.65		

Liquid Limit	33	Plastic Limit	27	Plastic Index	6

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	430/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	3/7-3/26/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-52	Sample #: SS-1		Sample Date: 2/7/18	
Location:	Pavement Boring	Offset: N/A		Depth: 1.2' - 3.2'	
Sample Description:	Silt with Sand (ML, A-7-5(12))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28574	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

Pan # 607		Liquid Limit						Plastic Limit		
	Tare #:	200	116	146				217	226	
A	Tare Weight	20.86	20.55	20.56				20.85	20.91	
B	Wet Soil Weight + A	29.05	29.76	27.40				27.36	27.38	
C	Dry Soil Weight + A	26.45	26.76	25.09				25.68	25.70	
D	Water Weight (B-C)	2.60	3.00	2.31				1.68	1.68	
E	Dry Soil Weight (C-A)	5.59	6.21	4.53				4.83	4.79	
F	% Moisture (D/E)*100	46.5%	48.3%	51.0%				34.8%	35.1%	
N	# OF DROPS	30	25	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**35.0%**		

One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**48**
Plastic Limit	**35**
Plastic Index	**13**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group Symbol for minus No. 40 sieve portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	5/3/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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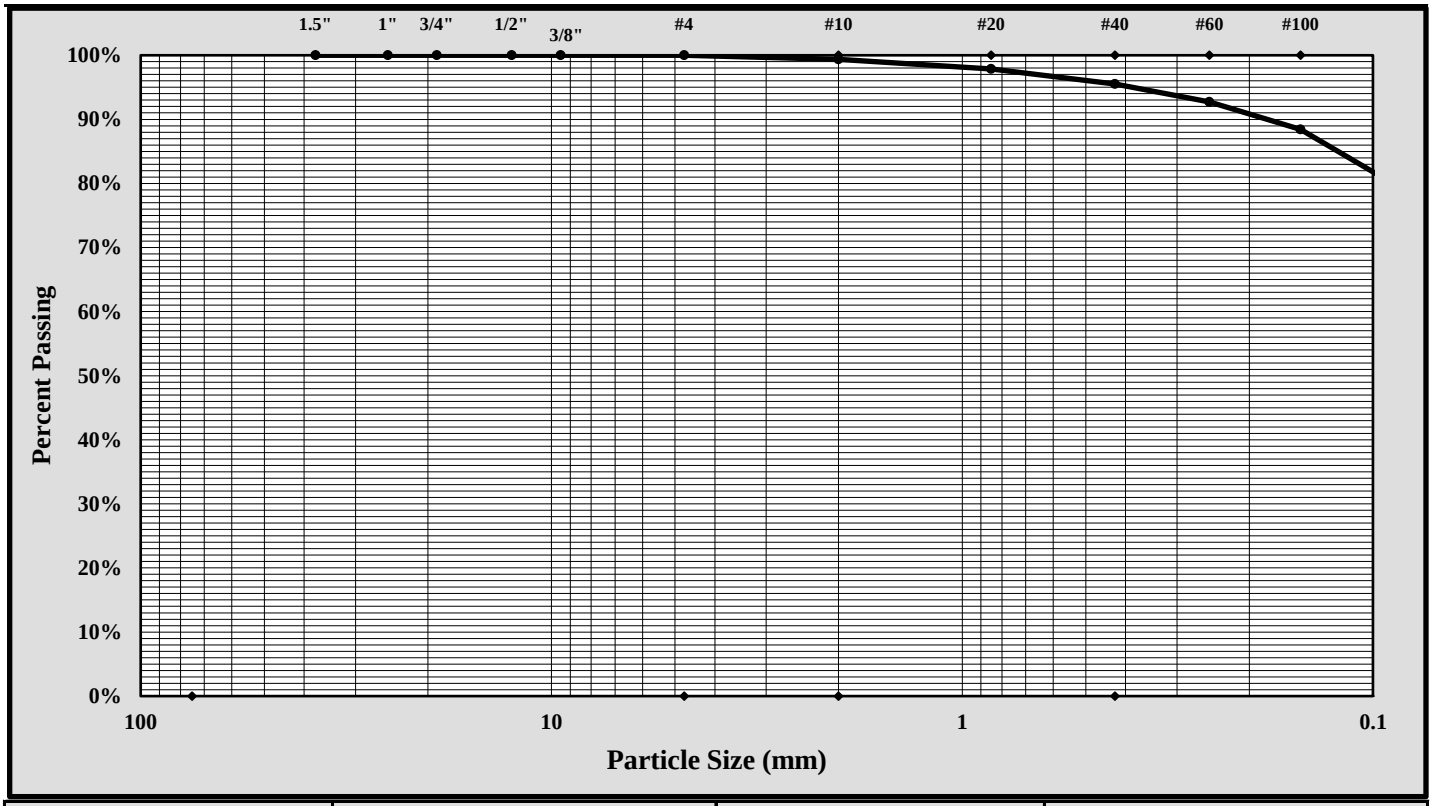
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	3/1-3/7/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-52 Sample #: SS-1	Sample Date:	2/7/18
Location:	Pavement Boring Offset: N/A	Depth:	1.2' - 3.2'
Sample Description:	Silt with Sand (ML, A-7-5(12))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	#10	Gravel:	0.0%
Silt & Clay (% Passing #200):	77.1%	Total Sand:	22.9%

Liquid Limit	48	Plastic Limit	35	Plastic Index	13
Coarse Sand:	0.6%	Medium Sand:	3.9%	Fine Sand:	18.4%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Matthew F. Cooke, P.G.	Project Manager	5/3/2018
Technical Responsibility	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	3/7-3/26/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-53	Sample #: SS-1		Sample Date: 2/7/18	
Location:	Pavement Boring	Offset: N/A		Depth: 0.6' - 2.6'	
Sample Description:	Clayey Sand (SC, A-7-6(11))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28574	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

	Pan # 608	Liquid Limit						Plastic Limit		
	Tare #:	44	209	9	1			4	45	
A	Tare Weight	20.73	21.09	20.80	20.66			20.55	20.77	
B	Wet Soil Weight + A	28.09	27.56	27.15	26.97			26.96	27.12	
C	Dry Soil Weight + A	25.35	25.11	24.72	24.52			25.65	25.85	
D	Water Weight (B-C)	2.74	2.45	2.43	2.45			1.31	1.27	
E	Dry Soil Weight (C-A)	4.62	4.02	3.92	3.86			5.10	5.08	
F	% Moisture (D/E)*100	59.3%	60.9%	62.0%	63.5%			25.7%	25.0%	
N	# OF DROPS	30	26	24	21			*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**25.4%**		

One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**61**
Plastic Limit	**25**
Plastic Index	**36**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group Symbol for minus No. 40 sieve portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	5/3/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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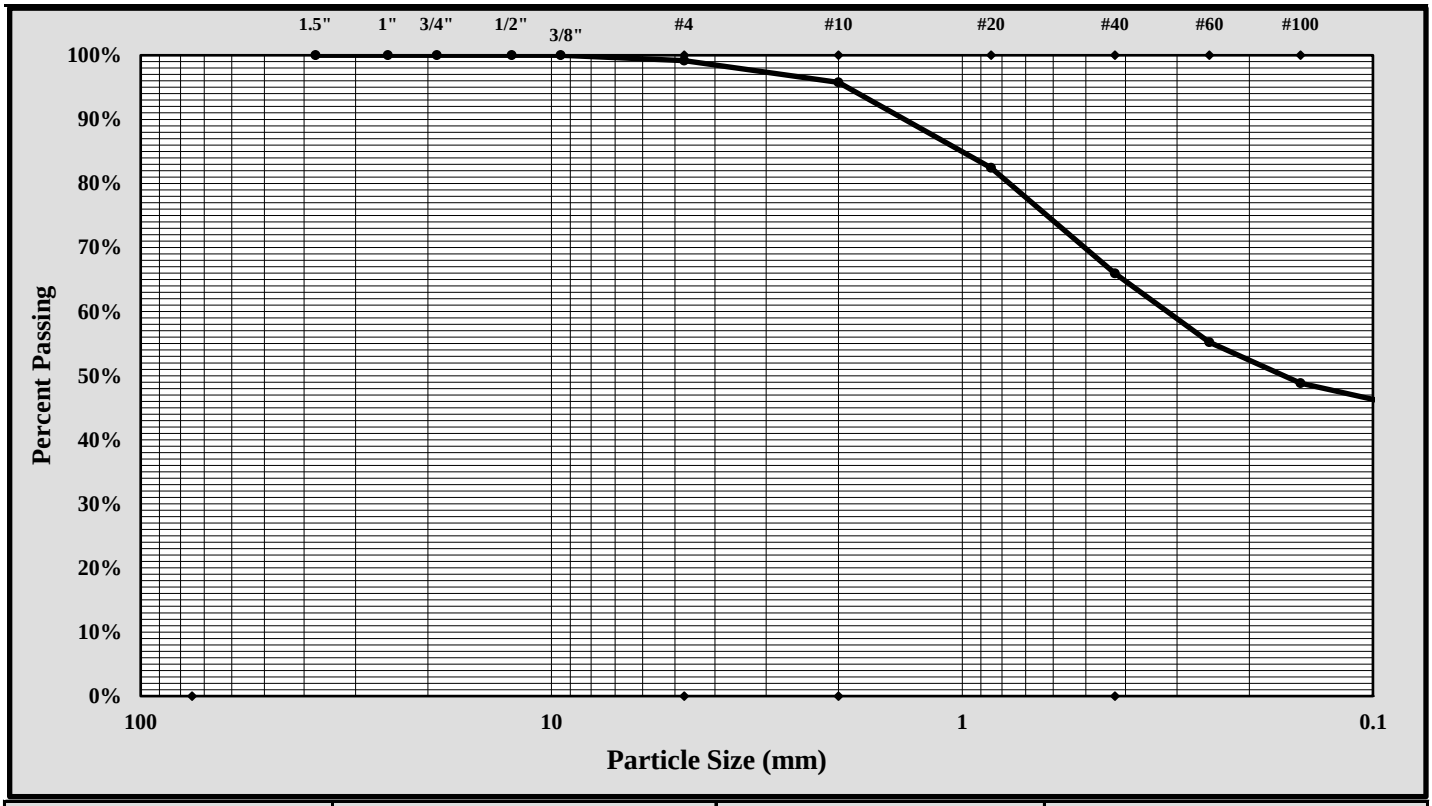
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	3/1-3/7/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-53 Sample #: SS-1	Sample Date:	2/7/18
Location:	Pavement Boring Offset: N/A	Depth:	0.6' - 2.6'
Sample Description:	Clayey Sand (SC, A-7-6(11))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	#4	Gravel:	0.8%
Silt & Clay (% Passing #200):	44.5%	Total Sand:	54.6%

Liquid Limit	61	Plastic Limit	25	Plastic Index	36
Coarse Sand:	3.4%	Medium Sand:	29.8%	Fine Sand:	21.4%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☒

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/3/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

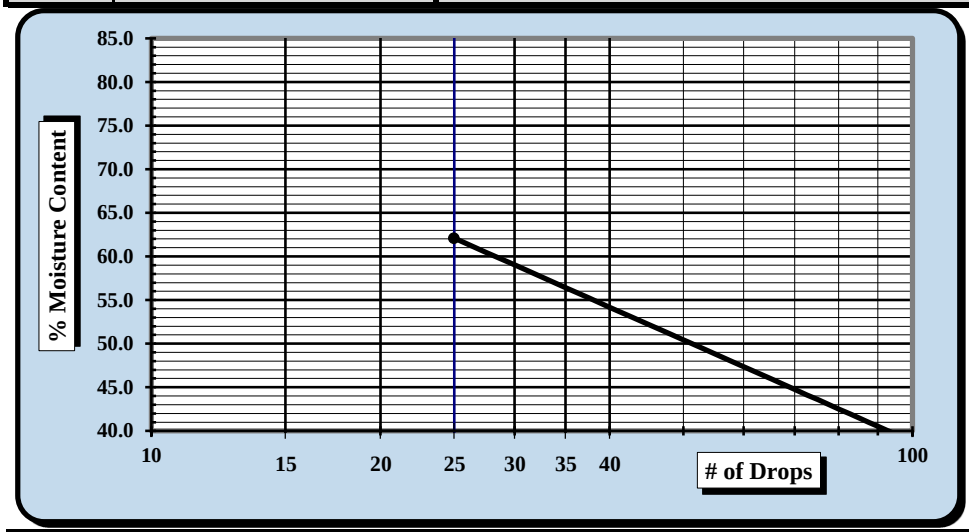
S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	4/30/18
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-54	Sample #: SS-1	Sample Date: Various
Location:	Pavement Boring	Offset: N/A	Depth: 0.7' - 2.7'
Sample Description:	Clayey Sand (SC, A-2-7 (2))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 484		Liquid Limit						Plastic Limit		
	Tare #:	8						29	59	
A	Tare Weight	17.00						17.04	17.30	
B	Wet Soil Weight + A	29.64						24.85	24.64	
C	Dry Soil Weight + A	24.80						23.32	23.21	
D	Water Weight (B-C)	4.84						1.53	1.43	
E	Dry Soil Weight (C-A)	7.80						6.28	5.91	
F	% Moisture (D/E)*100	62.1%						24.4%	24.2%	
N	# OF DROPS	25						*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**24.3%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**62**
Plastic Limit	**24**
Plastic Index	**38**
Group Symbol	**CH**

Multipoint Method ☐
One-point Method ☑

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		4/30/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

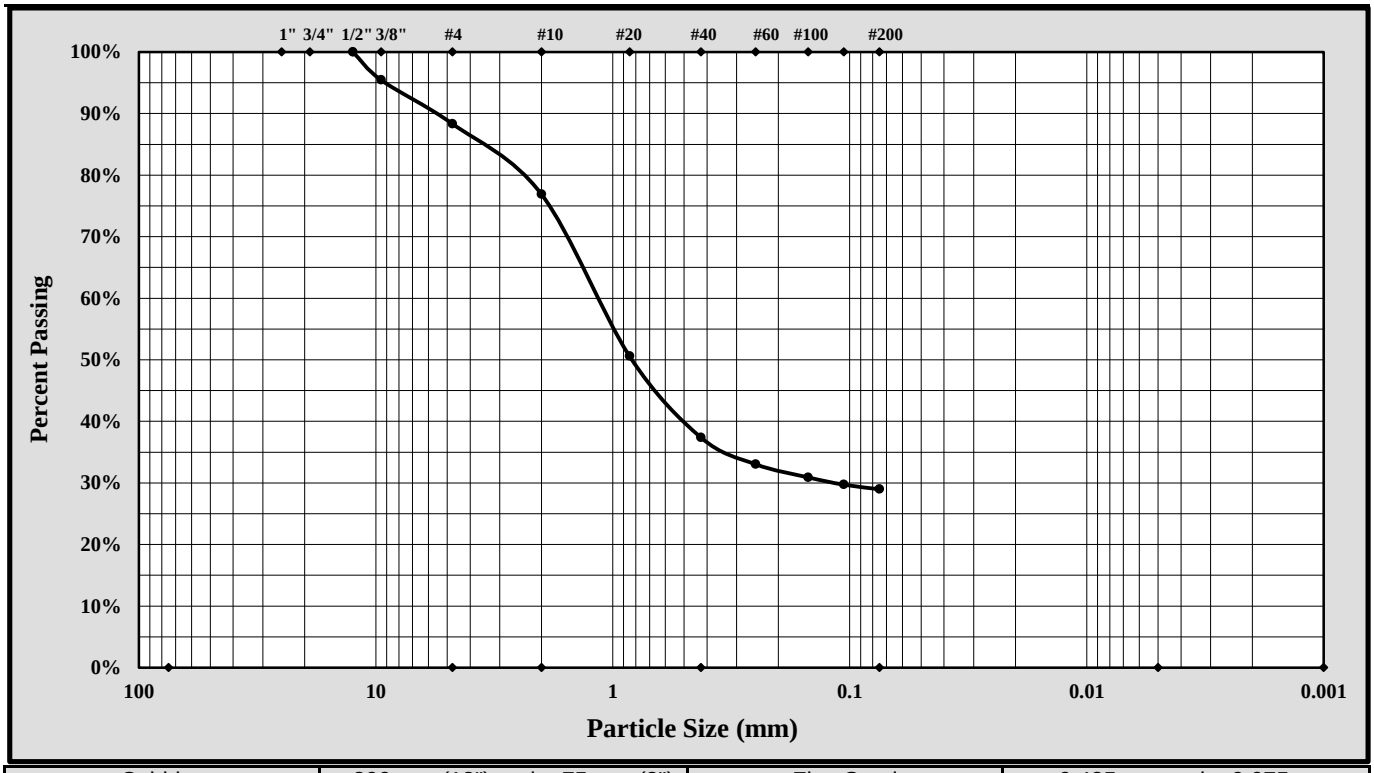
ASTM D6913/D7928

Quality Assurance

Sample Log No.:

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	P-54 Type: Split Spoon	Sample Date:	Various
Location:	Pavement Boring Sample No.: SS-1	Depth:	0.7' - 2.7'
Sample Description:	Clayey Sand (SC, A-2-7 (2))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	11.7%
Silt & Clay (% Passing #200):	29.0%	Total Sand:	59.3%
Assumed Specific Gravity:	2.65		

Liquid Limit 62 Plastic Limit 24 Plastic Index 38

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel Rounded ☐ Angular ☐ Hard & Durable ☐ Soft ☐ Weathered & Friable ☐

Sample Prep Method: Moist Prep Dispersion Period: 1 min. Dispersing Agent: Sodium Hexametaphosphate: 50 g./ Liter

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	4/30/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

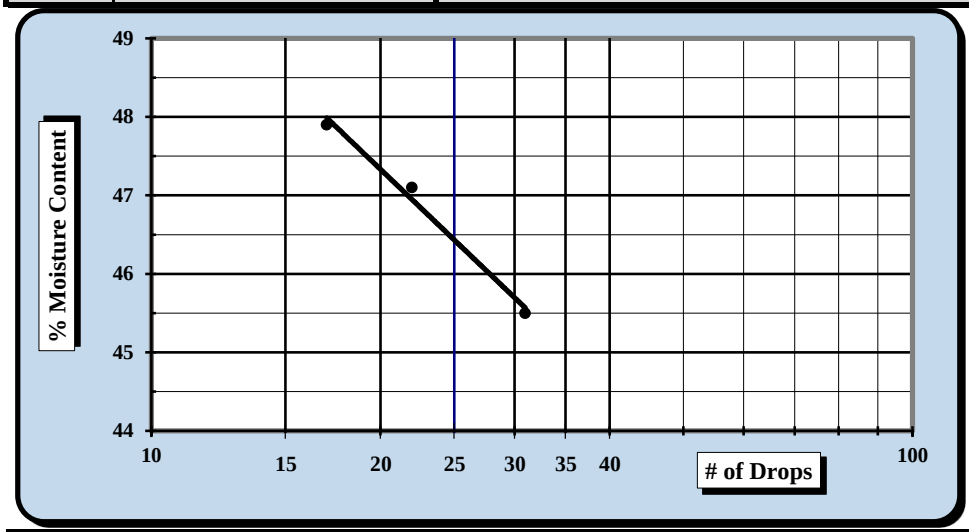
ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	3/7-4/2/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-55	Sample #: SS-1	Sample Date: 2/6/18
Location:	Pavement Boring	Offset: N/A	Depth: 0.9' - 2.9'
Sample Description:	Clayey Sand (SC, A-7-6(8))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28574	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

Pan # 605		Liquid Limit						Plastic Limit		
	Tare #:	210	217	200				1	240	
A	Tare Weight	20.93	20.87	20.86				20.63	20.76	
B	Wet Soil Weight + A	28.35	27.87	27.68				27.11	27.10	
C	Dry Soil Weight + A	26.03	25.63	25.47				26.04	26.06	
D	Water Weight (B-C)	2.32	2.24	2.21				1.07	1.04	
E	Dry Soil Weight (C-A)	5.10	4.76	4.61				5.41	5.30	
F	% Moisture (D/E)*100	45.5%	47.1%	47.9%				19.8%	19.6%	
N	# OF DROPS	31	22	17				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**19.7%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**46**
Plastic Limit	**20**
Plastic Index	**26**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group Symbol for minus No. 40 sieve portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	5/3/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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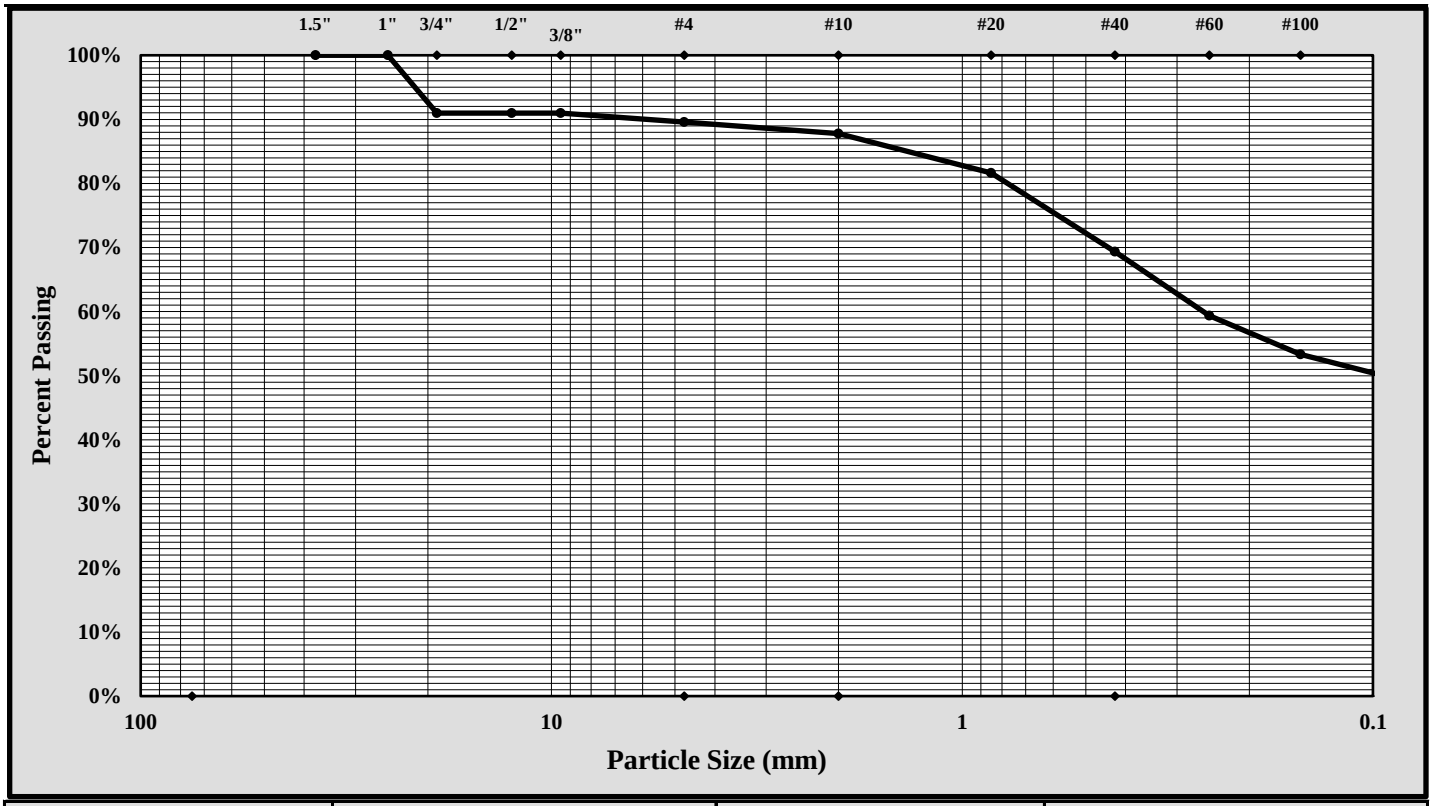
Form No. 61-D422-3
Revision No. 0
Revision Date: 05/05/2017

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	3/7-3/8/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-55 Sample #: SS-1	Sample Date:	2/6/18
Location:	Pavement Boring Offset: N/A	Depth:	0.9' - 2.9'
Sample Description:	Clayey Sand (SC, A-7-6(8))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	3/4-inch	Gravel:	10.4%
Silt & Clay (% Passing #200):	48.4%	Total Sand:	41.2%

Liquid Limit	46	Plastic Limit	20	Plastic Index	26
Coarse Sand:	1.8%	Medium Sand:	18.4%	Fine Sand:	21.0%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/3/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

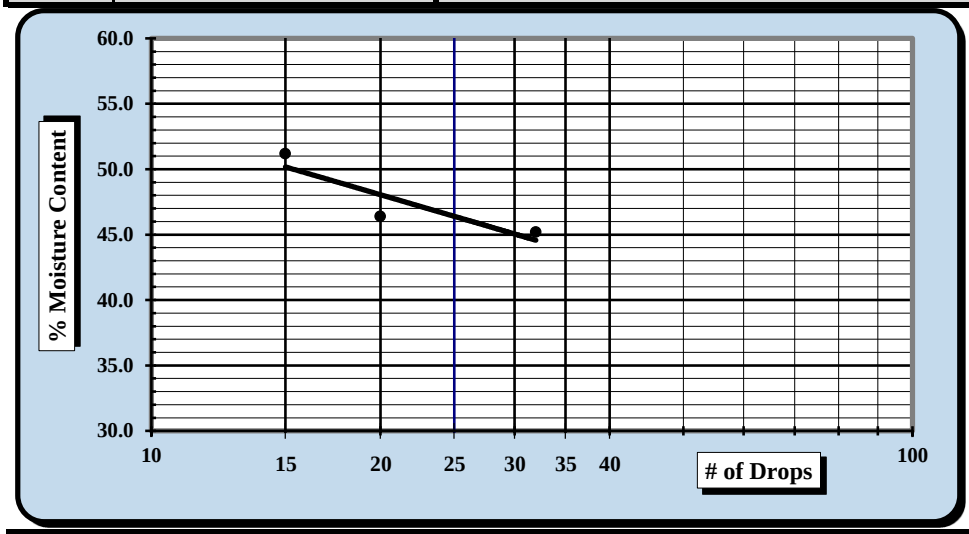
ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-1-2018
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-56	Sample #: SS-1	Sample Date: Various
Location:	Pavement Boring	Offset: N/A	Depth: 0.9' - 2.9'
Sample Description:	Clayey Sand (SC, A-7-6 (6))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 111		Liquid Limit						Plastic Limit		
	Tare #:	1	4	5				6	7	
A	Tare Weight	15.04	15.03	15.34				15.57	16.01	
B	Wet Soil Weight + A	26.50	28.12	28.13				22.50	23.29	
C	Dry Soil Weight + A	22.93	23.97	23.80				21.22	21.96	
D	Water Weight (B-C)	3.57	4.15	4.33				1.28	1.33	
E	Dry Soil Weight (C-A)	7.89	8.94	8.46				5.65	5.95	
F	% Moisture (D/E)*100	45.2%	46.4%	51.2%				22.7%	22.4%	
N	# OF DROPS	32	20	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**22.6%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**46**
Plastic Limit	**23**
Plastic Index	**23**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		5/1/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Particle Size Analysis of Soils

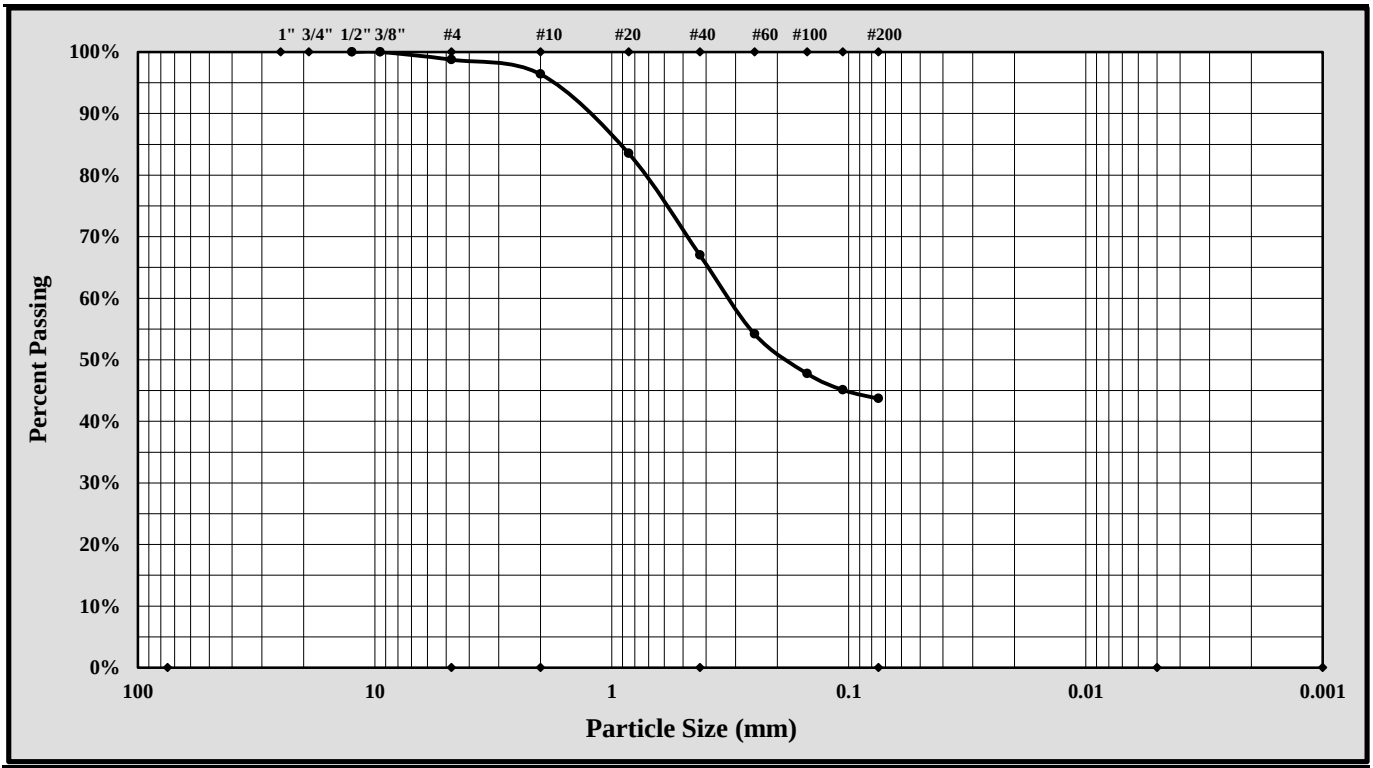
ASTM D6913/D7928

Quality Assurance

Sample Log No.:

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	P-56 Type: Split Spoon	Sample Date:	Various
Location:	Pavement Boring Sample No.: SS-1	Depth:	0.9' - 2.9'
Sample Description:	Clayey Sand (SC, A-7-6 (6))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	1.2%
Silt & Clay (% Passing #200):	43.7%	Total Sand:	55.1%
Assumed Specific Gravity:	2.65		

Liquid Limit	Plastic Limit	Plastic Index
46	23	23

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	5/1/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	4/2-4/24/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-57	Sample #: SS-1		Sample Date: 2/6/18	
Location:	Pavement Boring	Offset: N/A		Depth: 1.1' - 3.1'	
Sample Description:	Clayey Sand (SC, A-7-6(5))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28574	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

	Pan # 602	Liquid Limit						Plastic Limit		
	Tare #:	235	204	10				123	209	
A	Tare Weight	20.77	20.87	20.79				20.55	21.09	
B	Wet Soil Weight + A	27.69	27.69	27.92				26.55	28.22	
C	Dry Soil Weight + A	25.33	25.26	25.29				25.38	26.85	
D	Water Weight (B-C)	2.36	2.43	2.63				1.17	1.37	
E	Dry Soil Weight (C-A)	4.56	4.39	4.50				4.83	5.76	
F	% Moisture (D/E)*100	51.8%	55.4%	58.4%				24.2%	23.8%	
N	# OF DROPS	35	27	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**24.0%**		

One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**55**
Plastic Limit	**24**
Plastic Index	**31**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group Symbol for minus No. 40 sieve portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	5/3/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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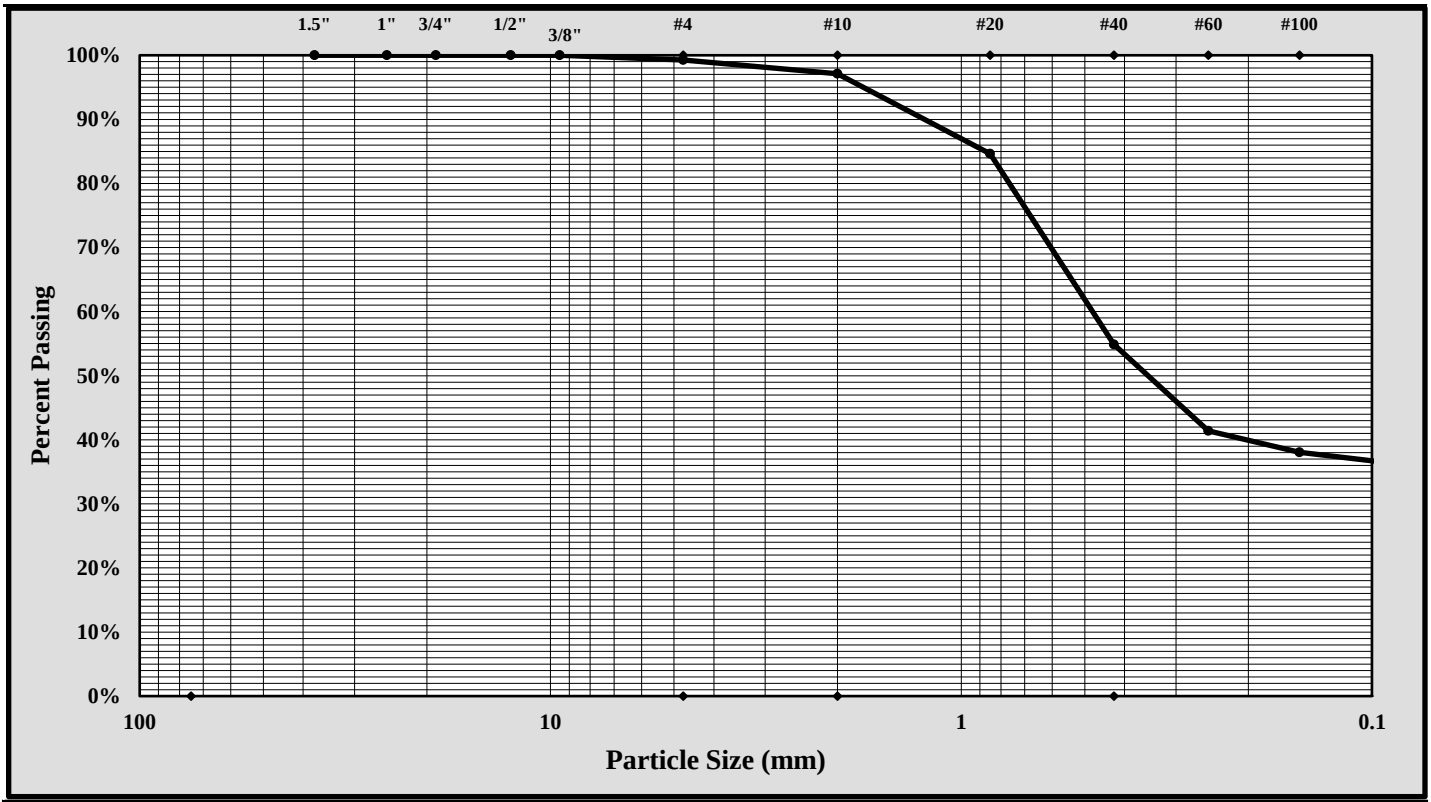
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	4/2-4/25/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-57	Sample #: SS-1	Sample Date: 2/6/18
Location:	Pavement Boring	Offset: N/A	Depth: 1.1' - 3.1'
Sample Description:	Clayey Sand (SC, A-7-6(5))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	#4	Gravel:	0.8%
Silt & Clay (% Passing #200):	35.8%	Total Sand:	63.5%

Liquid Limit	55	Plastic Limit	24	Plastic Index	31
Coarse Sand:	2.1%	Medium Sand:	42.2%	Fine Sand:	19.1%

Description of Sand and Gravel	Rounded	Angular	Hard & Durable	Soft	Weathered & Friable
	☐	☒	☒	☐	☒

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/3/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

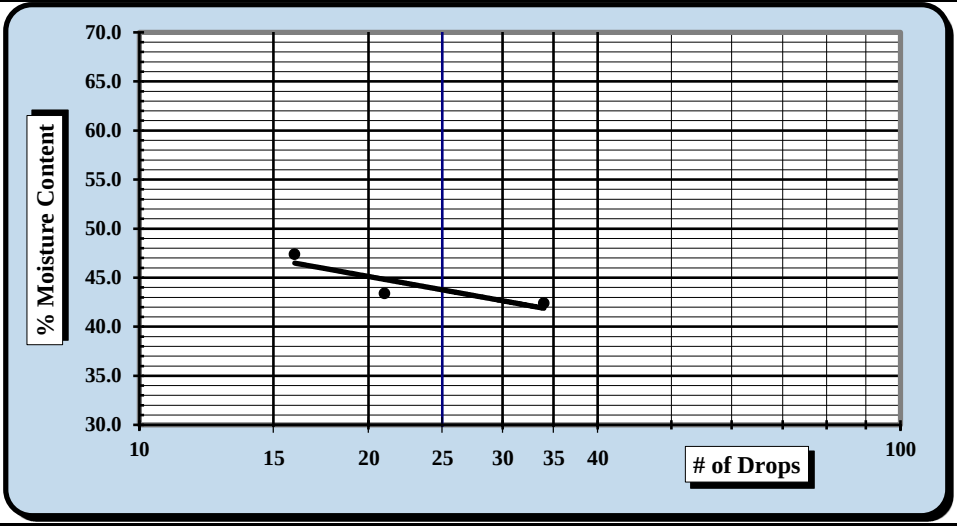
ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-1-2018
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-58	Sample #: SS-1	Sample Date: Various
Location:	Pavement Boring	Offset: N/A	Depth: 1.1' - 3.1'
Sample Description:	Clayey Sand (SC, A-7-6 (6))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 500		Liquid Limit						Plastic Limit		
	Tare #:	40	41	42				43	44	
A	Tare Weight	14.85	15.10	15.03				14.96	15.10	
B	Wet Soil Weight + A	26.71	26.14	27.34				22.92	22.89	
C	Dry Soil Weight + A	23.18	22.80	23.38				21.67	21.67	
D	Water Weight (B-C)	3.53	3.34	3.96				1.25	1.22	
E	Dry Soil Weight (C-A)	8.33	7.70	8.35				6.71	6.57	
F	% Moisture (D/E)*100	42.4%	43.4%	47.4%				18.6%	18.6%	
N	# OF DROPS	34	21	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**18.6%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**43**
Plastic Limit	**19**
Plastic Index	**24**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		5/1/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

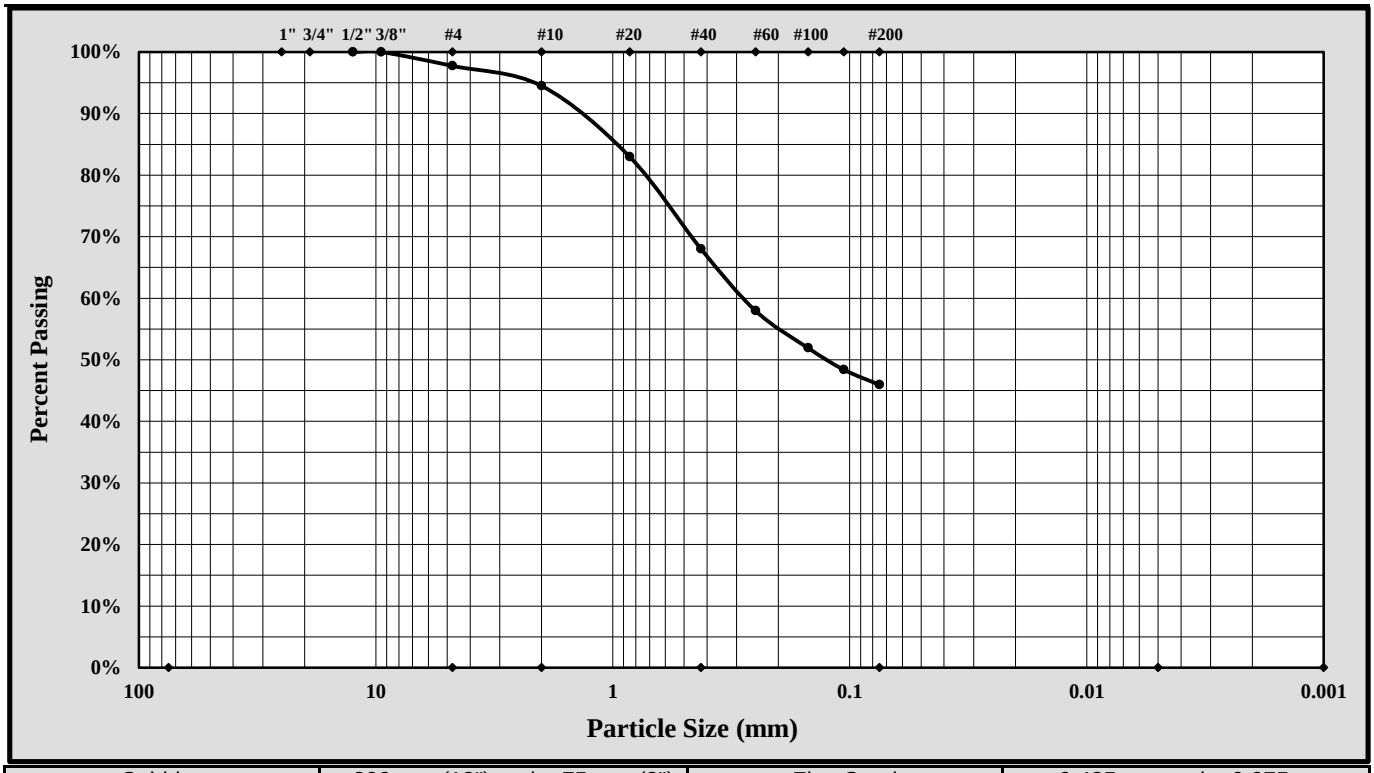
ASTM D6913/D7928

Sample Log No.:

Quality Assurance

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	P-58 Type: Split Spoon	Sample Date:	Various
Location:	Pavement Boring Sample No.: SS-1	Depth:	1.1' - 3.1'
Sample Description:	Clayey Sand (SC, A-7-6 (6))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	2.3%
Silt & Clay (% Passing #200):	46.0%	Total Sand:	51.8%
Assumed Specific Gravity:	2.65		

Liquid Limit	43	Plastic Limit	19	Plastic Index	24

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	5/2/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	4/2-4/24/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-59	Sample #: SS-1	Sample Date: 2/6/18
Location:	Pavement Boring	Offset: N/A	Depth: 1.4' - 3.4'
Sample Description:	Clayey Sand (SC, A-7-6(8))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28574	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

Pan # 611		Liquid Limit						Plastic Limit		
	Tare #:	240	6	29				19	46	
A	Tare Weight	20.78	20.58	20.82				20.55	20.74	
B	Wet Soil Weight + A	27.65	26.67	27.04				26.30	27.28	
C	Dry Soil Weight + A	25.13	24.40	24.60				25.16	26.01	
D	Water Weight (B-C)	2.52	2.27	2.44				1.14	1.27	
E	Dry Soil Weight (C-A)	4.35	3.82	3.78				4.61	5.27	
F	% Moisture (D/E)*100	57.9%	59.4%	64.6%				24.7%	24.1%	
N	# OF DROPS	32	28	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**24.4%**		

One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**60**
Plastic Limit	**24**
Plastic Index	**36**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group Symbol for minus No. 40 sieve portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	5/3/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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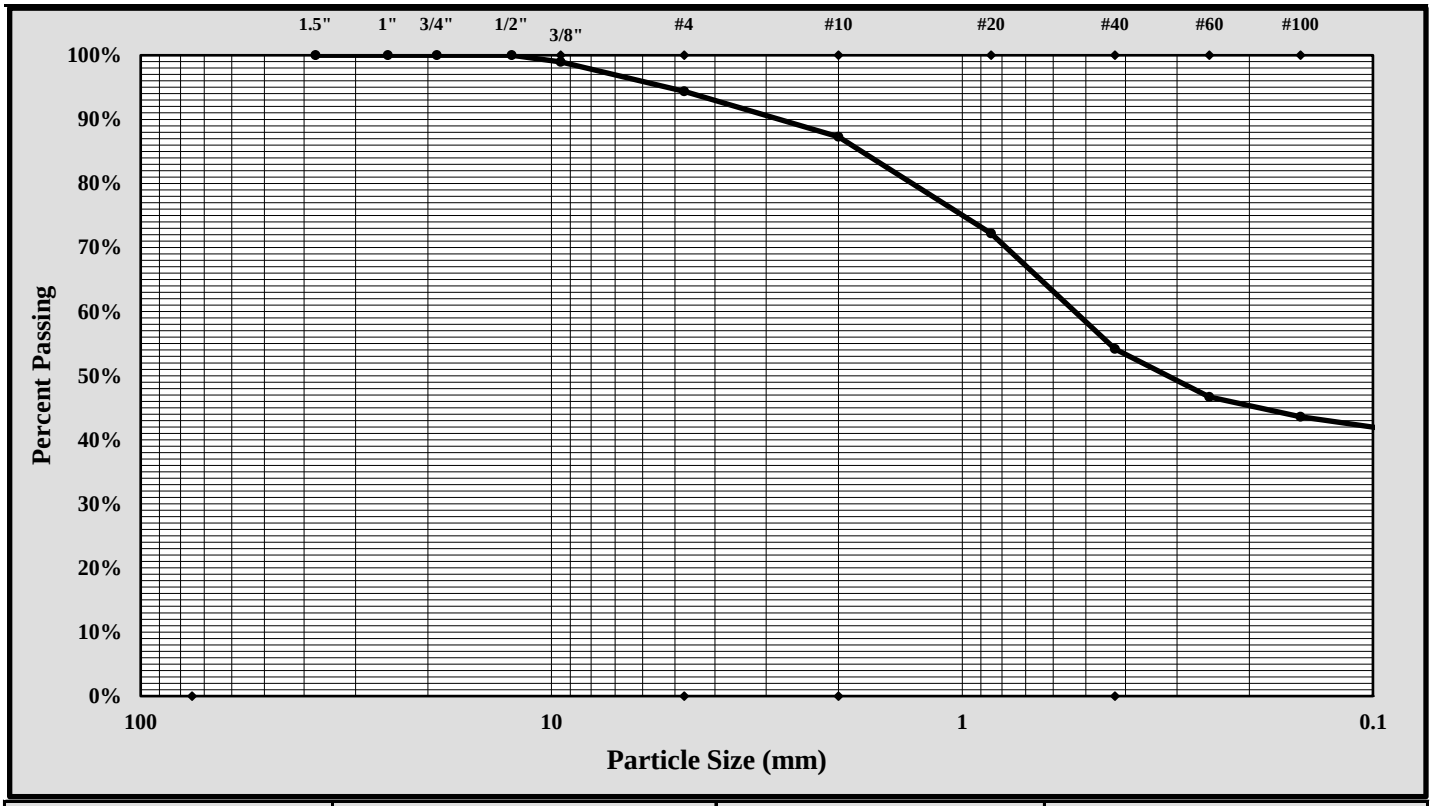
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	4/2-4/25/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-59 Sample #: SS-1	Sample Date:	2/6/18
Location:	Pavement Boring Offset: N/A	Depth:	1.4' - 3.4'
Sample Description:	Clayey Sand (SC, A-7-6(8))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	3/8-inch	Gravel:	5.6%
Silt & Clay (% Passing #200):	40.8%	Total Sand:	53.6%

Liquid Limit	60	Plastic Limit	24	Plastic Index	36
Coarse Sand:	7.1%	Medium Sand:	33.1%	Fine Sand:	13.3%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Matthew F. Cooke, P.G.	Project Manager	5/3/2018
Technical Responsibility	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

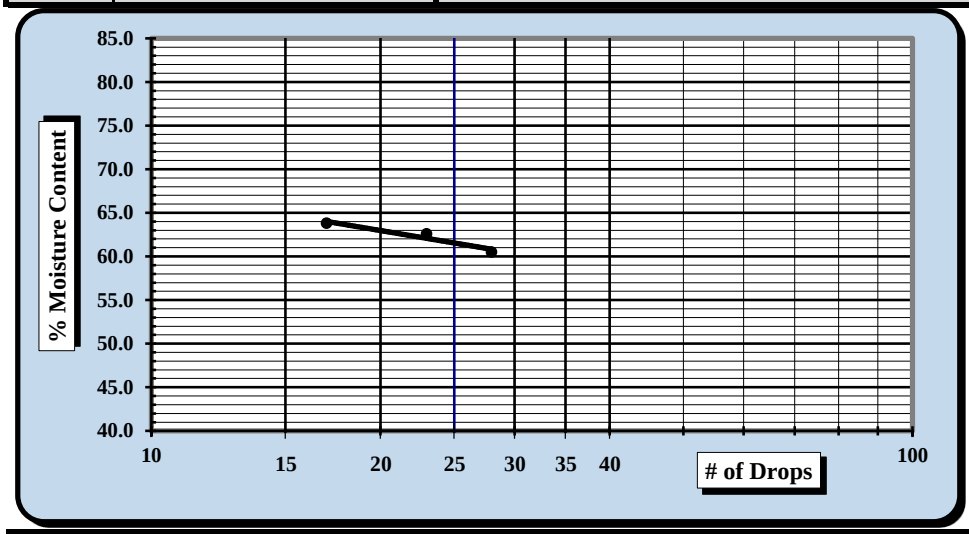
ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-1-2018
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-60	Sample #: SS-1	Sample Date: Various
Location:	Pavement Boring	Offset: N/A	Depth: 1.0' - 3.0'
Sample Description:	Elastic Silt (MH, A-7-5 (28))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 463		Liquid Limit						Plastic Limit		
	Tare #:	10	11	12				13	14	
A	Tare Weight	15.64	14.95	15.20				15.42	15.70	
B	Wet Soil Weight + A	27.66	25.83	27.99				22.15	23.78	
C	Dry Soil Weight + A	23.13	21.64	23.01				20.21	21.45	
D	Water Weight (B-C)	4.53	4.19	4.98				1.94	2.33	
E	Dry Soil Weight (C-A)	7.49	6.69	7.81				4.79	5.75	
F	% Moisture (D/E)*100	60.5%	62.6%	63.8%				40.5%	40.5%	
N	# OF DROPS	28	23	17				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**40.5%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**62**
Plastic Limit	**41**
Plastic Index	**21**
Group Symbol	**MH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		5/1/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

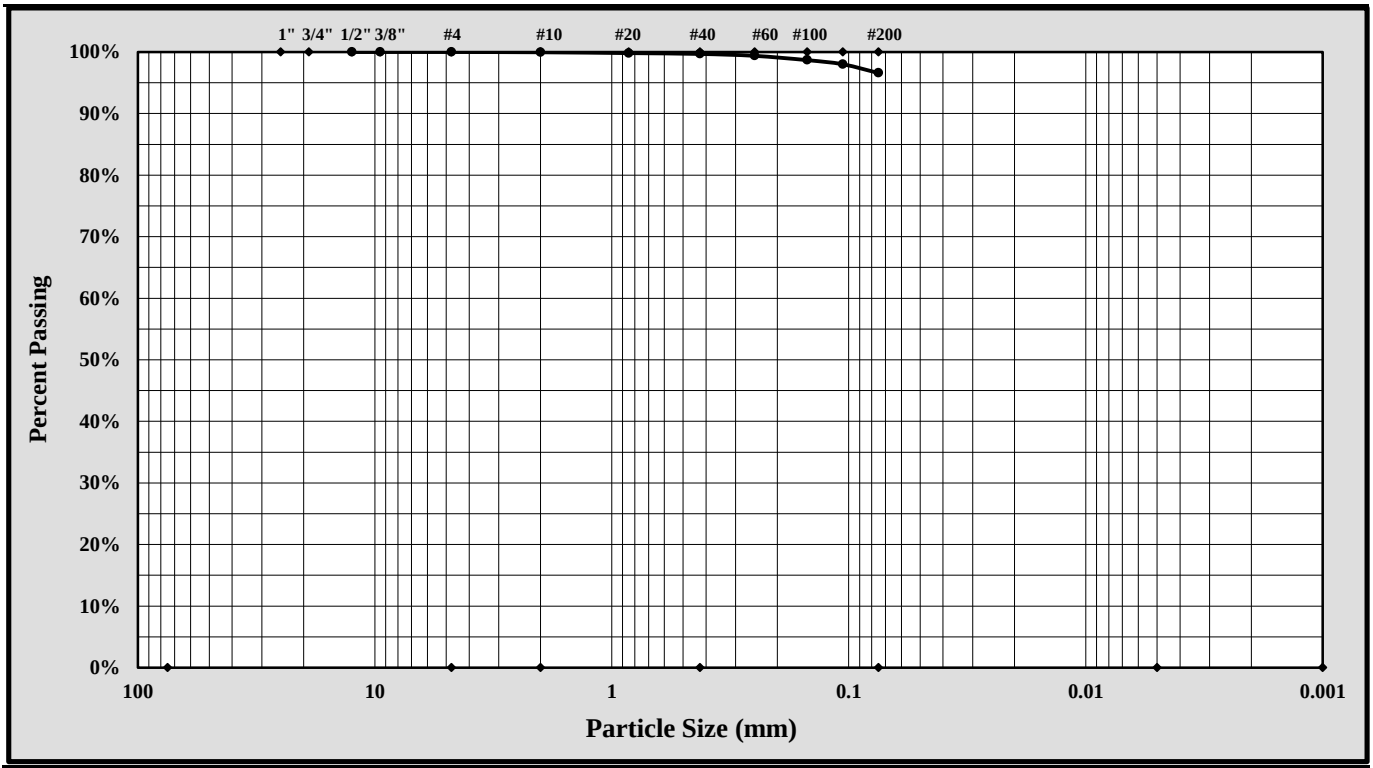
ASTM D6913/D7928

Quality Assurance

Sample Log No.:

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	P-60 Type: Split Spoon	Sample Date:	Various
Location:	Pavement Boring Sample No.: SS-1	Depth:	1.0' - 3.0'
Sample Description:	Elastic Silt (MH, A-7-5 (28))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	0.0%
Silt & Clay (% Passing #200):	96.6%	Total Sand:	3.4%
Assumed Specific Gravity:	2.65		

Liquid Limit	62	Plastic Limit	41	Plastic Index	21

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	5/2/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

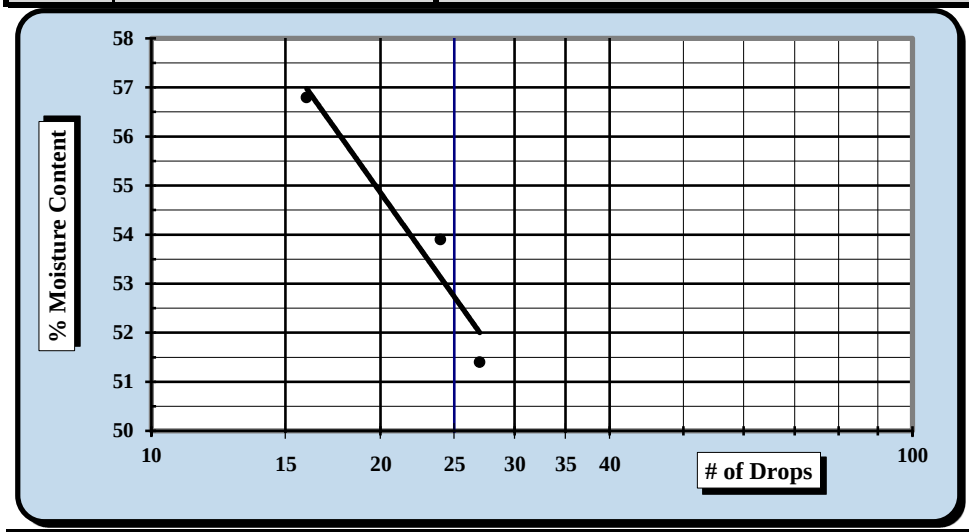
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	4/2-4/24/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-61	Sample #: SS-1		Sample Date: 2/6/18	
Location:	Pavement Boring	Offset: N/A		Depth: 1.4' - 3.4'	
Sample Description:	Sandy Fat Clay (CH, A-7-6(14))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28574	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

		Pan # 610	Liquid Limit						Plastic Limit		
		Tare #:	40	31	207				146	243	
A	Tare Weight		20.85	20.82	20.94				20.58	20.76	
B	Wet Soil Weight + A		27.01	27.84	27.84				28.14	27.71	
C	Dry Soil Weight + A		24.92	25.38	25.34				26.54	26.25	
D	Water Weight (B-C)		2.09	2.46	2.50				1.60	1.46	
E	Dry Soil Weight (C-A)		4.07	4.56	4.40				5.96	5.49	
F	% Moisture (D/E)*100		51.4%	53.9%	56.8%				26.8%	26.6%	
N	# OF DROPS		27	24	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR										
Ave.	*Average*								**26.7%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**53**
Plastic Limit	**27**
Plastic Index	**26**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group Symbol for minus No. 40 sieve portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	5/3/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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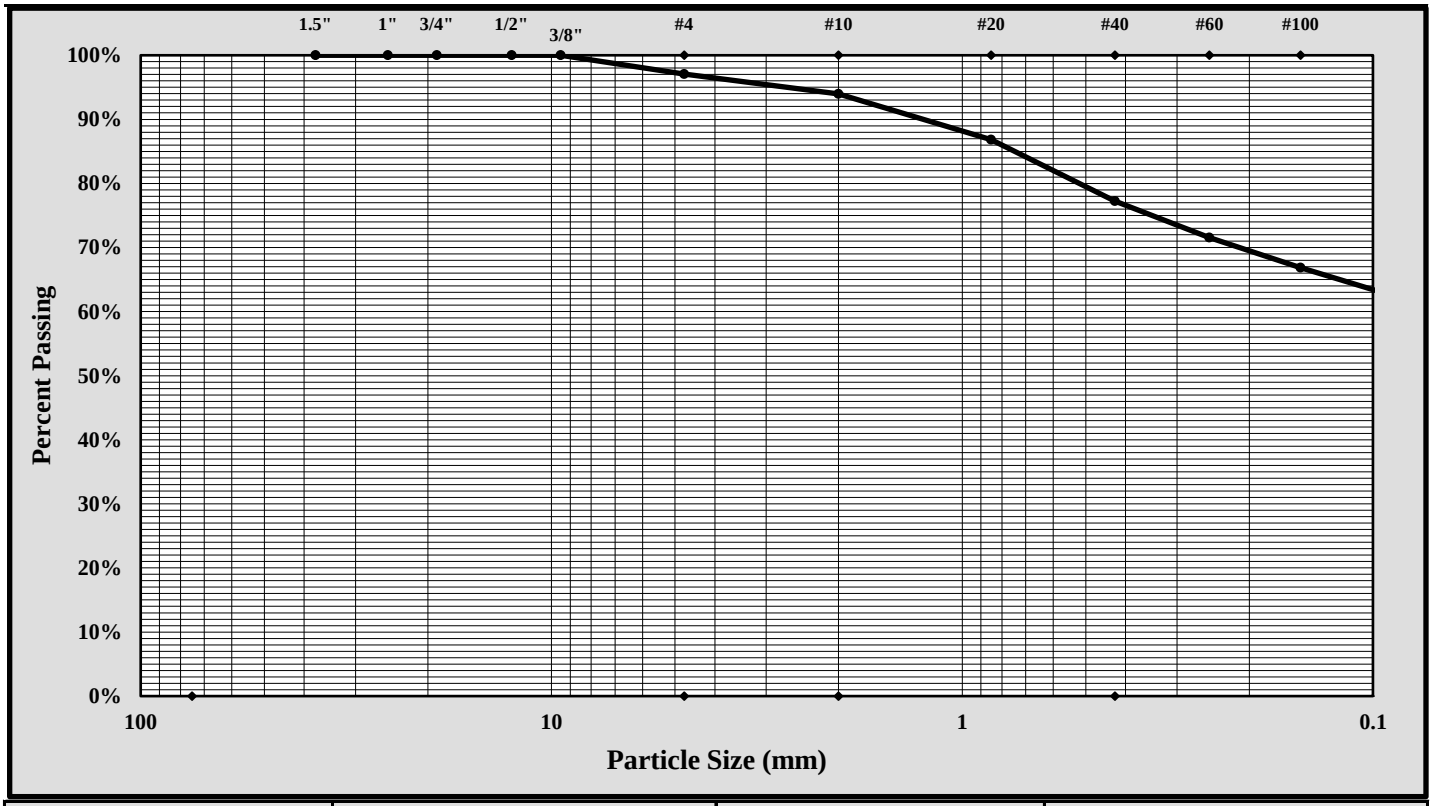
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	4/2-4/25/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-61 Sample #: SS-1	Sample Date:	2/6/18
Location:	Pavement Boring Offset: N/A	Depth:	1.4' - 3.4'
Sample Description:	Sandy Fat Clay (CH, A-7-6(14))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	#4	Gravel:	2.9%
Silt & Clay (% Passing #200):	61.0%	Total Sand:	36.1%

Liquid Limit	53	Plastic Limit	27	Plastic Index	26
Coarse Sand:	3.1%	Medium Sand:	16.7%	Fine Sand:	16.2%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Matthew F. Cooke, P.G.	Project Manager	5/3/2018
Technical Responsibility	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

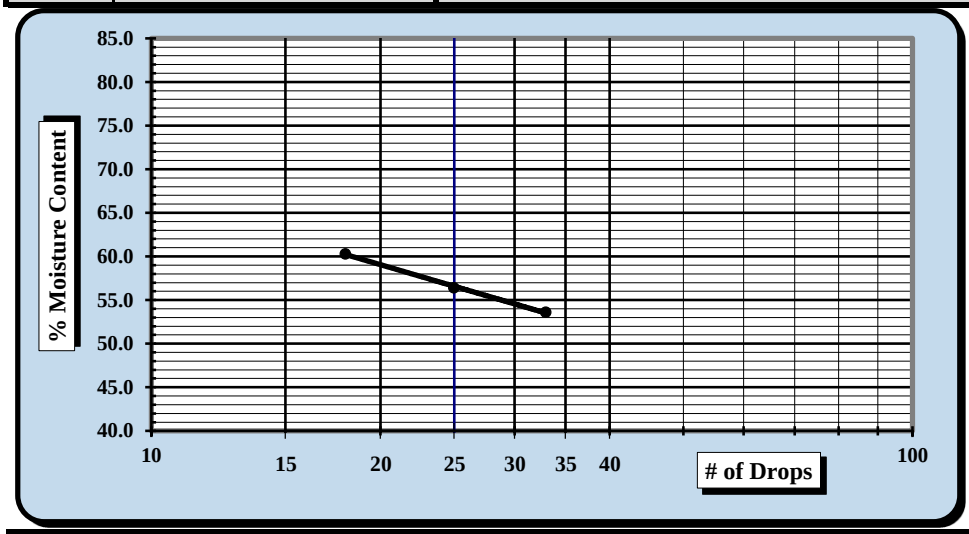
S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-1-2018
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-62	Sample #: SS-1	Sample Date: Various
Location:	Pavement Boring	Offset: N/A	Depth: 1.1' - 3.1'
Sample Description:	Sandy Fat Clay (CH, A-7-6 (16))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 131		Liquid Limit						Plastic Limit		
	Tare #:	30	31	32				33	34	
A	Tare Weight	15.36	15.46	15.18				15.57	15.28	
B	Wet Soil Weight + A	25.48	26.33	27.97				22.87	22.18	
C	Dry Soil Weight + A	21.95	22.41	23.16				21.38	20.72	
D	Water Weight (B-C)	3.53	3.92	4.81				1.49	1.46	
E	Dry Soil Weight (C-A)	6.59	6.95	7.98				5.81	5.44	
F	% Moisture (D/E)*100	53.6%	56.4%	60.3%				25.6%	26.8%	
N	# OF DROPS	33	25	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**26.2%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**56**
Plastic Limit	**26**
Plastic Index	**30**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		5/1/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

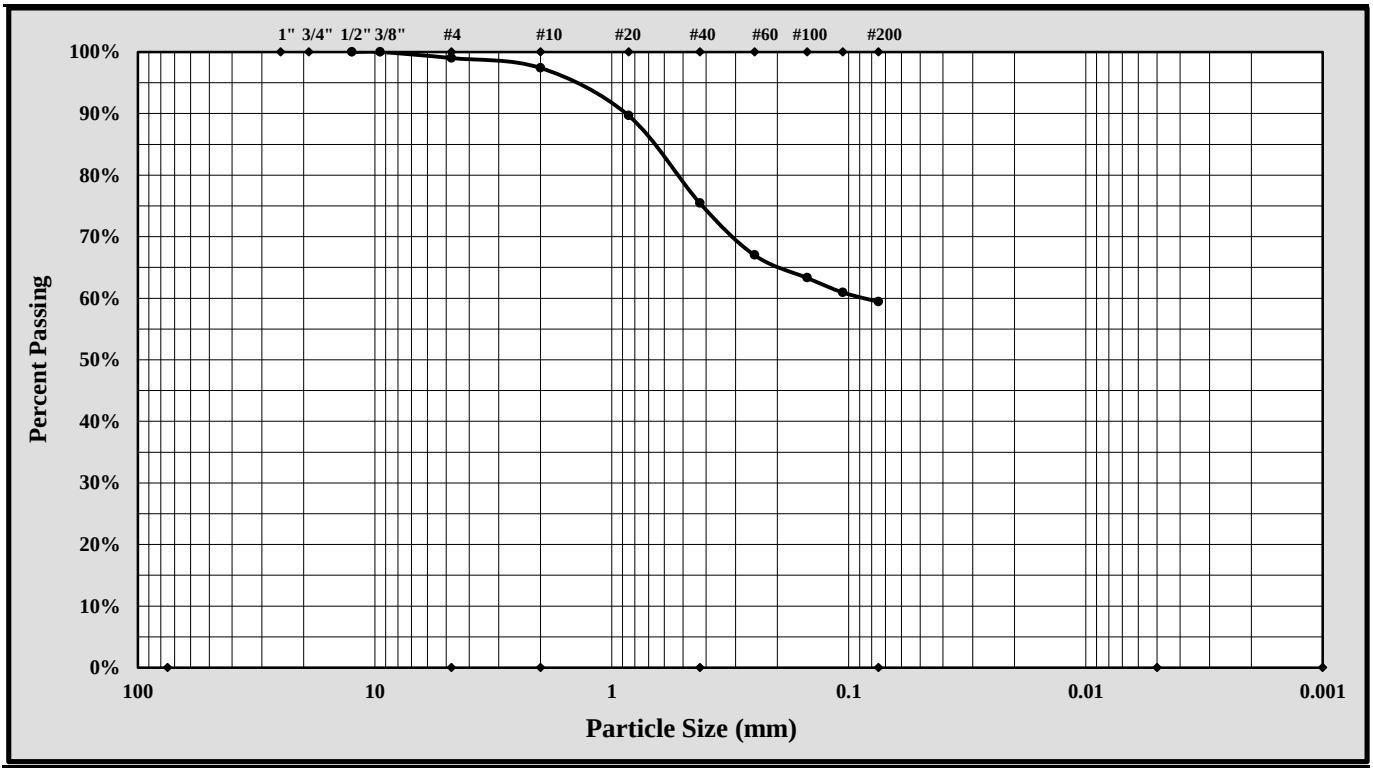
ASTM D6913/D7928

Quality Assurance

Sample Log No.:

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	P-62 Type: Split Spoon	Sample Date:	Various
Location:	Pavement Boring Sample No.: SS-1	Depth:	1.1' - 3.1'
Sample Description:	Sandy Fat Clay (CH, A-7-6 (16))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	1.0%
Silt & Clay (% Passing #200):	59.4%	Total Sand:	39.6%
Assumed Specific Gravity:	2.65		

Liquid Limit	Plastic Limit	Plastic Index
56	26	30

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	5/1/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

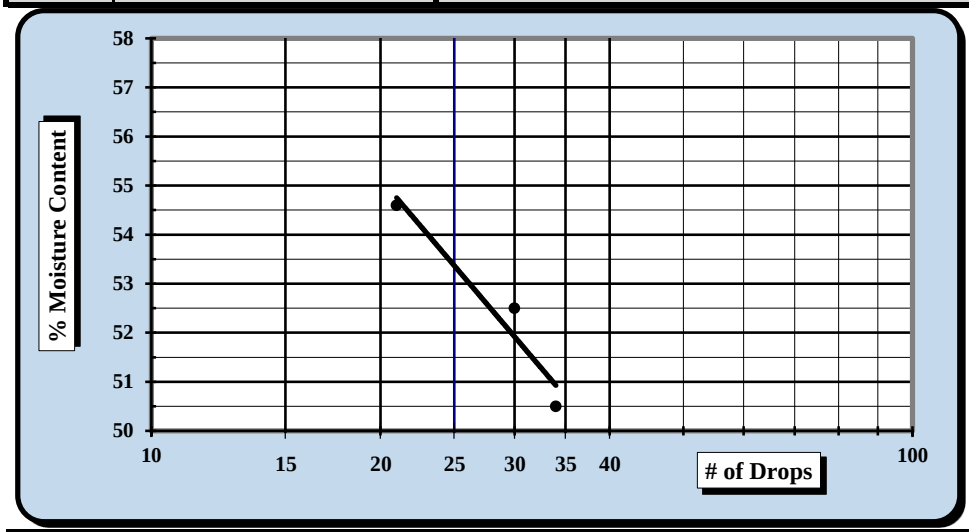
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	4/2-4/24/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-63	Sample #: SS-1		Sample Date: 2/6/18	
Location:	Pavement Boring	Offset: N/A		Depth: 1.3' - 3.3'	
Sample Description:	Clayey Sand (SC, A-7-6(10))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28574	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

Pan # 603		Liquid Limit						Plastic Limit		
	Tare #:	200	44	1				36	3	
A	Tare Weight	20.86	20.75	20.66				20.97	20.80	
B	Wet Soil Weight + A	27.71	26.97	28.11				27.16	26.90	
C	Dry Soil Weight + A	25.41	24.83	25.48				26.03	25.80	
D	Water Weight (B-C)	2.30	2.14	2.63				1.13	1.10	
E	Dry Soil Weight (C-A)	4.55	4.08	4.82				5.06	5.00	
F	% Moisture (D/E)*100	50.5%	52.5%	54.6%				22.3%	22.0%	
N	# OF DROPS	34	30	21				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**22.2%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**53**
Plastic Limit	**22**
Plastic Index	**31**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group Symbol for minus No. 40 sieve portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	5/3/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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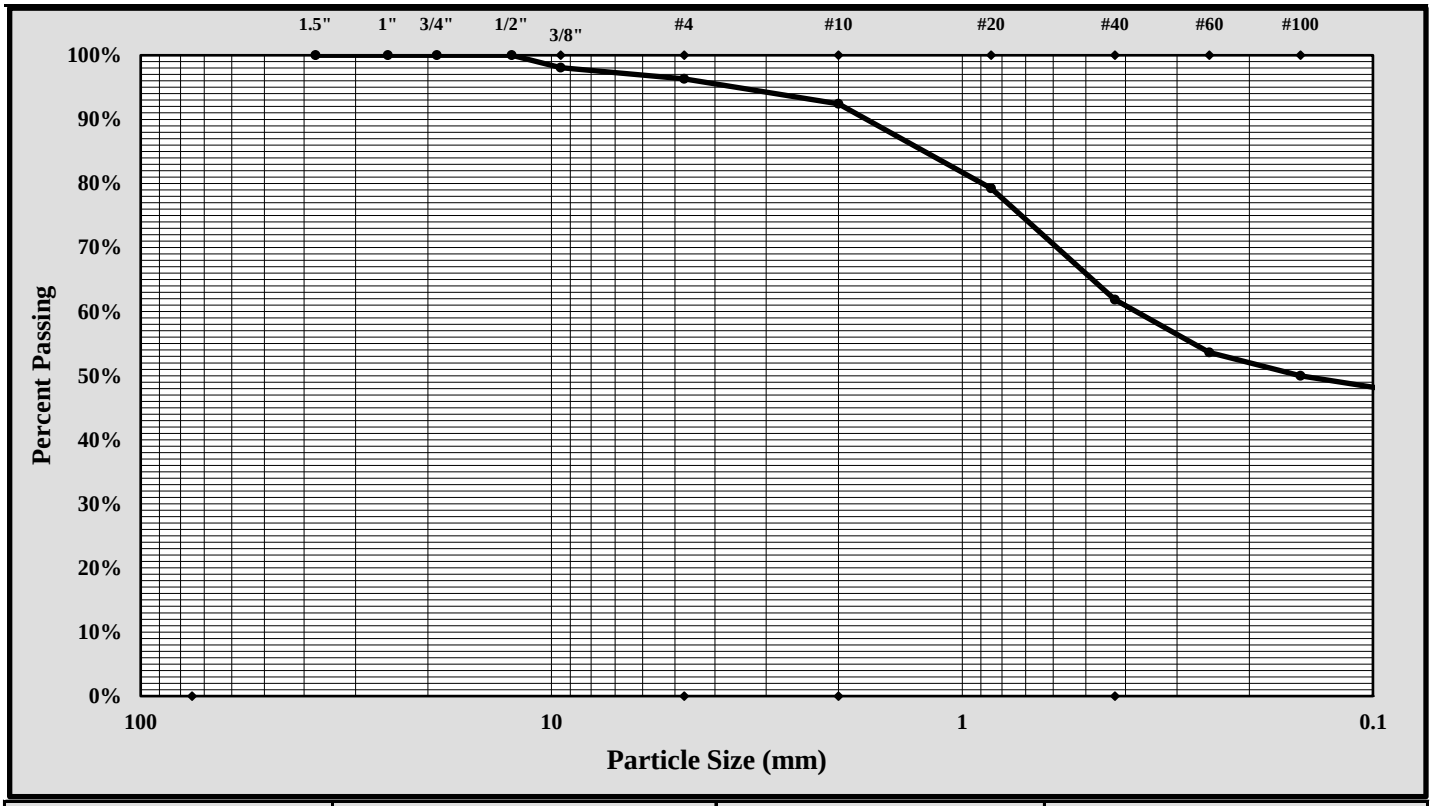
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	4/2-4/25/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-63 Sample #: SS-1	Sample Date:	2/6/18
Location:	Pavement Boring Offset: N/A	Depth:	1.3' - 3.3'
Sample Description:	Clayey Sand (SC, A-7-6(10))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	3/8-inch	Gravel:	3.7%
Silt & Clay (% Passing #200):	46.9%	Total Sand:	49.4%

Liquid Limit	53	Plastic Limit	22	Plastic Index	31
Coarse Sand:	3.9%	Medium Sand:	30.6%	Fine Sand:	14.9%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☒

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/3/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

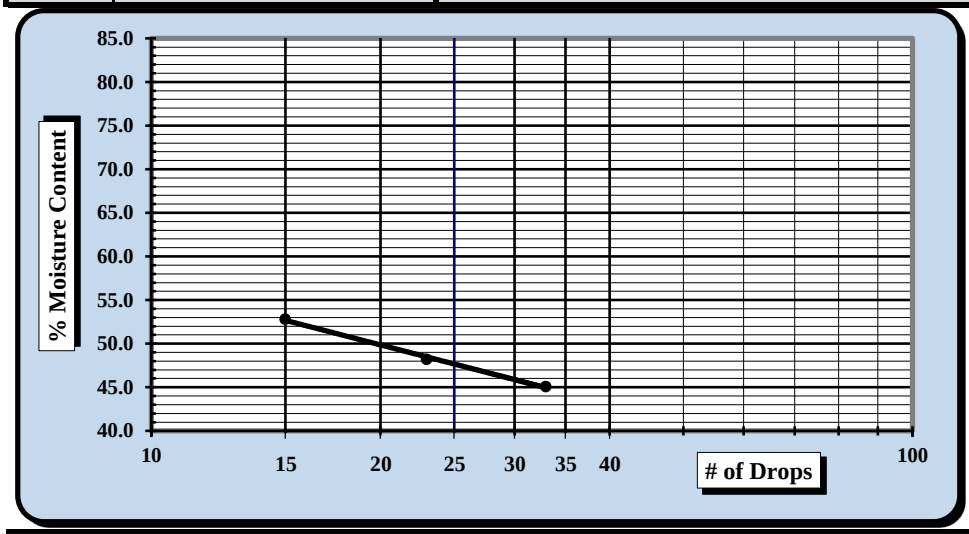
S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-4-18
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-64	Sample #: SS-1		Sample Date: Various	
Location:	Pavement Boring	Offset: N/A		Depth: 1.1' - 3.1'	
Sample Description:	Sandy Fat Clay (CH, A-7-6 (14))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 156		Liquid Limit						Plastic Limit		
	Tare #:	20	21	22				23	24	
A	Tare Weight	15.42	15.34	15.42				14.90	15.21	
B	Wet Soil Weight + A	26.61	26.23	29.74				21.30	21.65	
C	Dry Soil Weight + A	23.13	22.69	24.79				20.16	20.49	
D	Water Weight (B-C)	3.48	3.54	4.95				1.14	1.16	
E	Dry Soil Weight (C-A)	7.71	7.35	9.37				5.26	5.28	
F	% Moisture (D/E)*100	45.1%	48.2%	52.8%				21.7%	22.0%	
N	# OF DROPS	33	23	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**21.9%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**62**
Plastic Limit	**25**
Plastic Index	**37**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		4/30/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

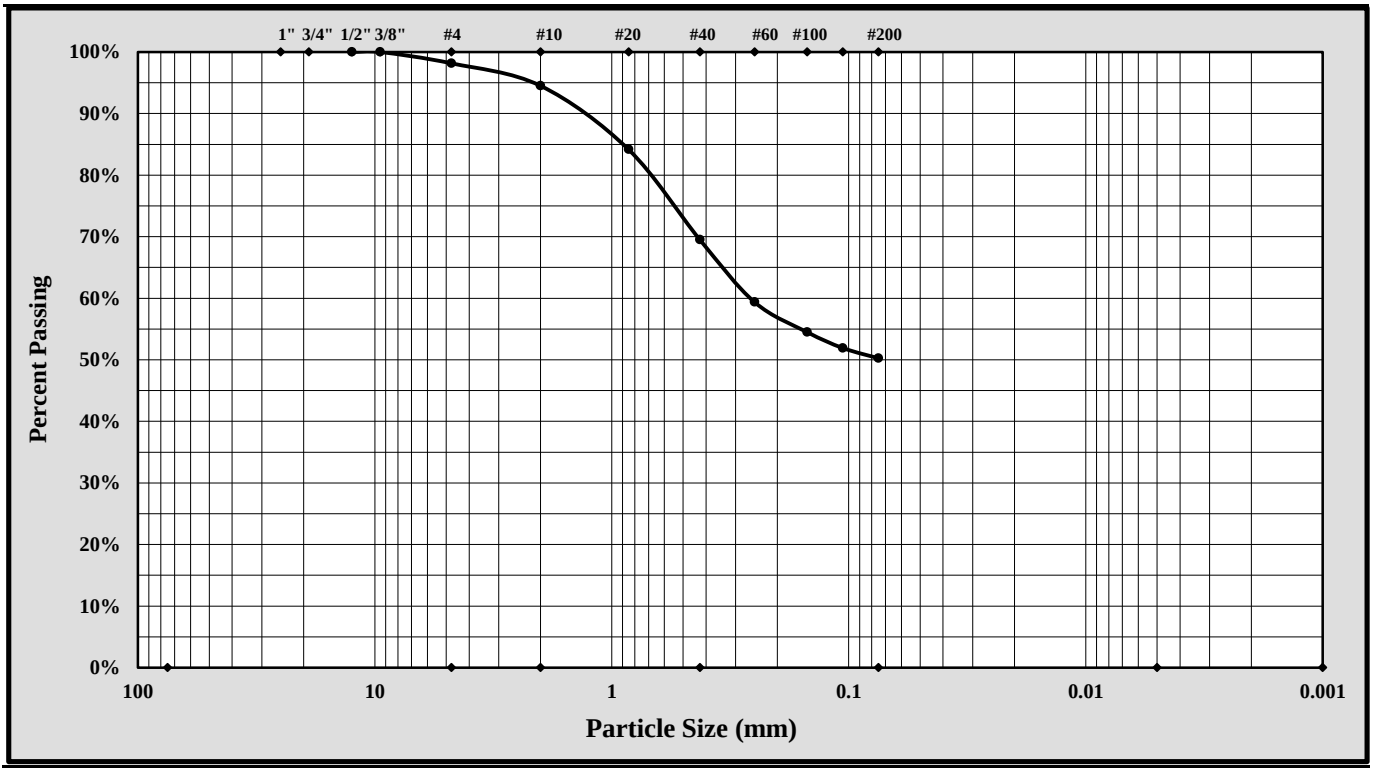
ASTM D6913/D7928

Quality Assurance

Sample Log No.:

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	P-64 Type: Split Spoon	Sample Date:	Various
Location:	Pavement Boring Sample No.: SS-1	Depth:	1.1' - 3.1'
Sample Description:	Sandy Fat Clay (CH, A-7-6 (14))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	1.8%
Silt & Clay (% Passing #200):	50.3%	Total Sand:	47.9%
Assumed Specific Gravity:	2.65		

Liquid Limit	62	Plastic Limit	25	Plastic Index	37

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*

Project Manager — *Position*

6/7/2018 — *Date*

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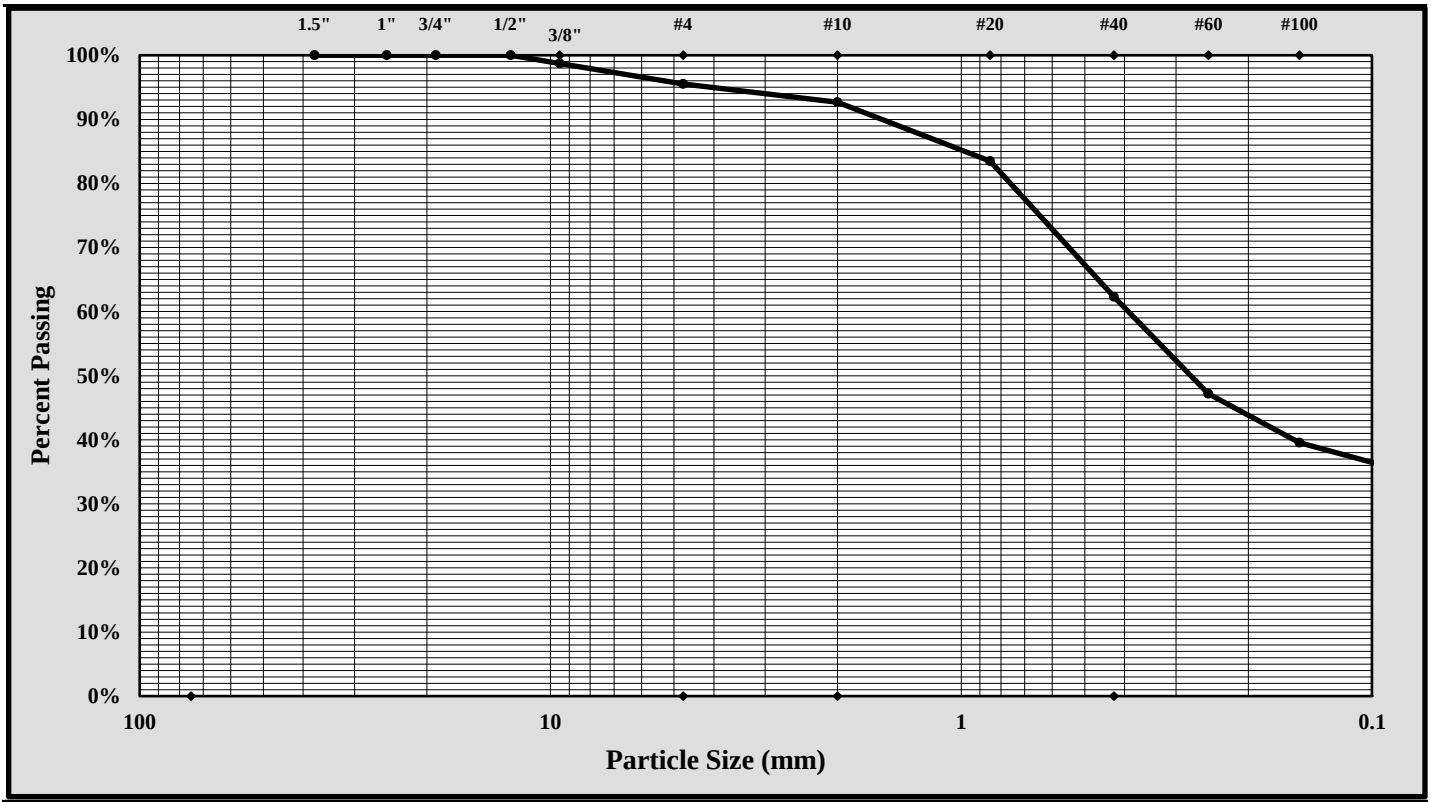
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/5-2/19/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-65 Sample #: SS-1	Sample Date:	1/24/2018
Location:	Pavement Boring Offset: N/A	Depth:	0.8' - 2.8'
Sample Description:	Silty Sand (SM, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	3/8-inch	Gravel:	5%
Silt & Clay (% Passing #200):	34%	Total Sand:	61%

Liquid Limit	*	Plastic Limit	*	Plastic Index	*
Coarse Sand:	3%	Medium Sand:	30%	Fine Sand:	28%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

*Not enough fine material available for testing. Material assumed to be non-plastic.

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/8/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

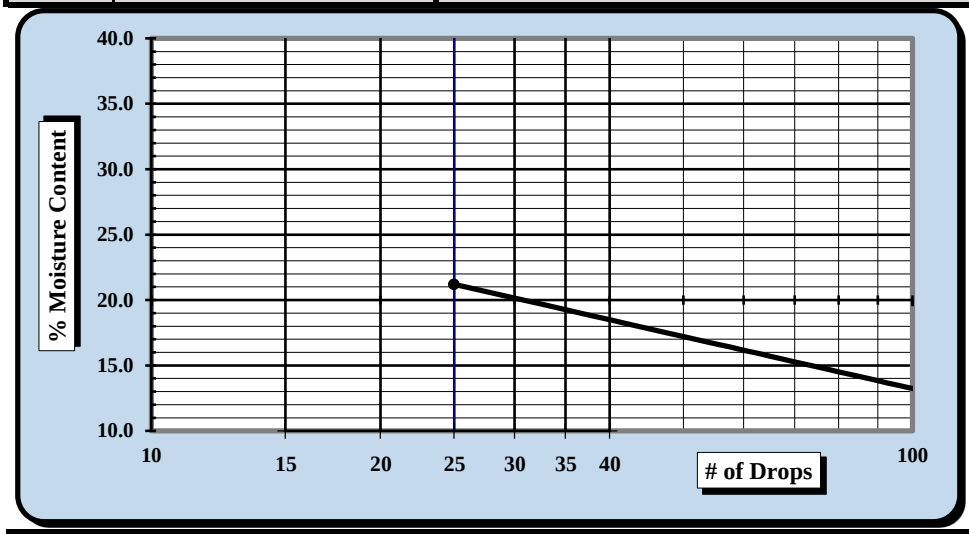
ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-2-18
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-66	Sample #: SS-1	Sample Date: Various
Location:	Pavement Boring	Offset: N/A	Depth: 0.8' - 2.8'
Sample Description:	Clayey Sand (SC, A-2-4))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

	Pan # 328	Liquid Limit						Plastic Limit		
	Tare #:	74						75	76	
A	Tare Weight	27.24						29.34	29.09	
B	Wet Soil Weight + A	43.41						38.34	37.41	
C	Dry Soil Weight + A	40.58						37.35	36.50	
D	Water Weight (B-C)	2.83						0.99	0.91	
E	Dry Soil Weight (C-A)	13.34						8.01	7.41	
F	% Moisture (D/E)*100	21.2%						12.4%	12.3%	
N	# OF DROPS	25						*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**12.4%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**21**
Plastic Limit	**12**
Plastic Index	**9**
Group Symbol	**CL**

Multipoint Method ☐
One-point Method ☑

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		5/2/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

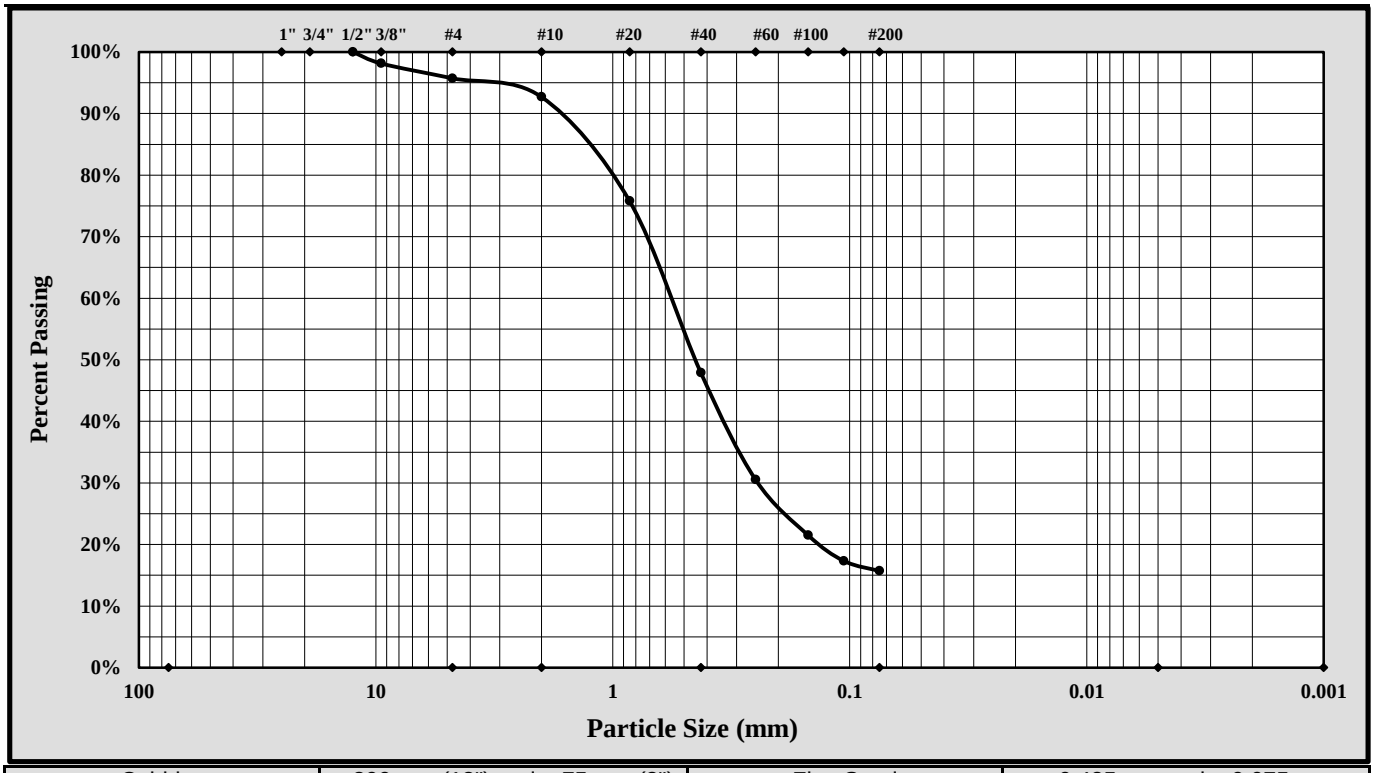
ASTM D6913/D7928

Quality Assurance

Sample Log No.:

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	P-66 Type: Split Spoon	Sample Date:	Various
Location:	Pavement Boring Sample No.: SS-1	Depth:	0.8' - 2.8'
Sample Description:	Clayey Sand (SC, A-2-4))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	4.3%
Silt & Clay (% Passing #200):	15.7%	Total Sand:	80.0%
Assumed Specific Gravity:	2.65		
Liquid Limit	21	Plastic Limit	12
		Plastic Index	9

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Nathan Price		Labortory Group Leader	5/2/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

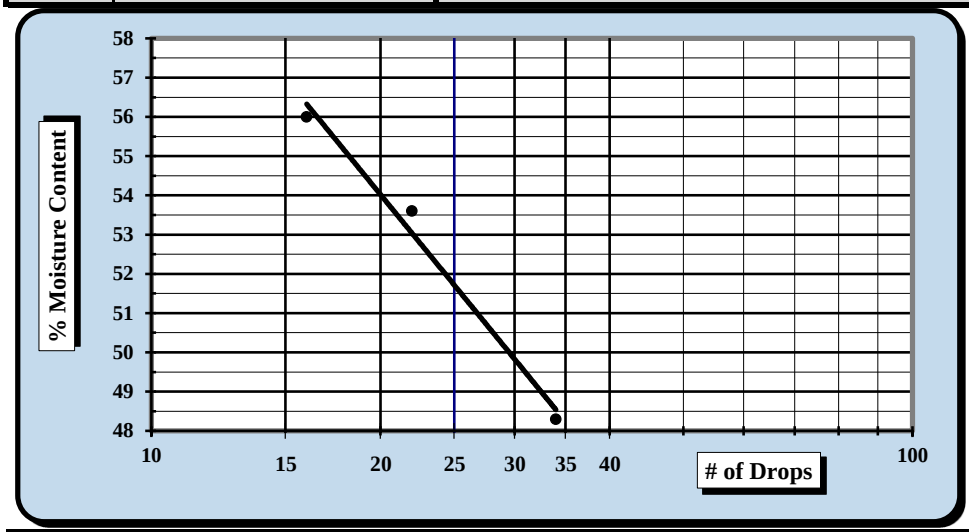
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	4/2-4/24/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-67	Sample #: SS-1		Sample Date: 1/31/18	
Location:	Pavement Boring	Offset: N/A		Depth: 0.6' - 2.6'	
Sample Description:	Sandy Fat Clay (CH, A-7-6(16))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28574	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

	Pan # 608	Liquid Limit						Plastic Limit		
	Tare #:	39	24	25				7	195	
A	Tare Weight	20.81	20.77	20.61				20.80	20.54	
B	Wet Soil Weight + A	28.49	27.65	27.35				26.94	27.74	
C	Dry Soil Weight + A	25.99	25.25	24.93				25.81	26.41	
D	Water Weight (B-C)	2.50	2.40	2.42				1.13	1.33	
E	Dry Soil Weight (C-A)	5.18	4.48	4.32				5.01	5.87	
F	% Moisture (D/E)*100	48.3%	53.6%	56.0%				22.6%	22.7%	
N	# OF DROPS	34	22	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**22.7%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**52**
Plastic Limit	**23**
Plastic Index	**29**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group Symbol for minus No. 40 sieve portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	5/3/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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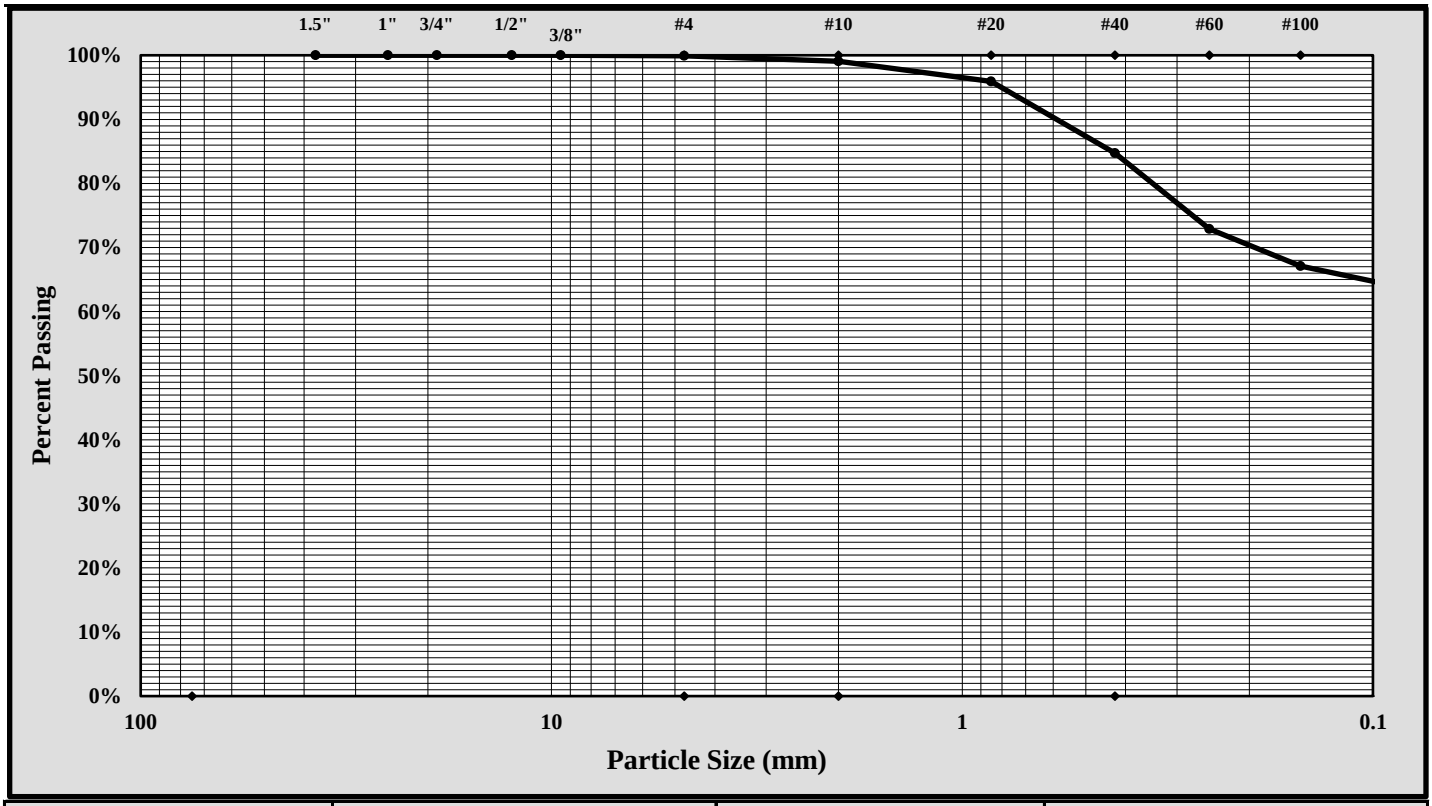
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	4/2-4/25/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-67 Sample #: SS-1	Sample Date:	1/31/18
Location:	Pavement Boring Offset: N/A	Depth:	0.6' - 2.6'
Sample Description:	Sandy Fat Clay (CH, A-7-6(16))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	#4	Gravel:	0.1%
Silt & Clay (% Passing #200):	63.1%	Total Sand:	36.9%

Liquid Limit	52	Plastic Limit	23	Plastic Index	29
Coarse Sand:	0.9%	Medium Sand:	14.3%	Fine Sand:	21.7%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/3/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

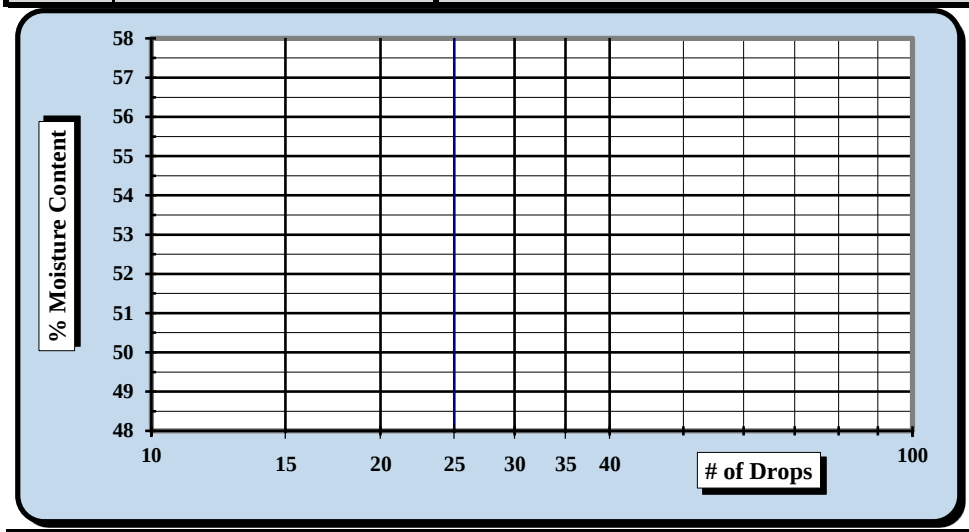
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	4/3-4/23/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-68	Sample #: SS-1		Sample Date: 1/31/18	
Location:	Pavement Boring	Offset: N/A		Depth: 1.1' - 3.1'	
Sample Description:	Silty Sand (SM, A-2-4)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28574	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

		Liquid Limit						Plastic Limit		
Pan #	811									
	Tare #:									
A	Tare Weight									
B	Wet Soil Weight + A									
C	Dry Soil Weight + A									
D	Water Weight (B-C)									
E	Dry Soil Weight (C-A)									
F	% Moisture (D/E)*100									
N	# OF DROPS							*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*									



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☒

Liquid Limit	**NP**
Plastic Limit	**NP**
Plastic Index	**NP**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group Symbol for minus No. 40 sieve portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	5/3/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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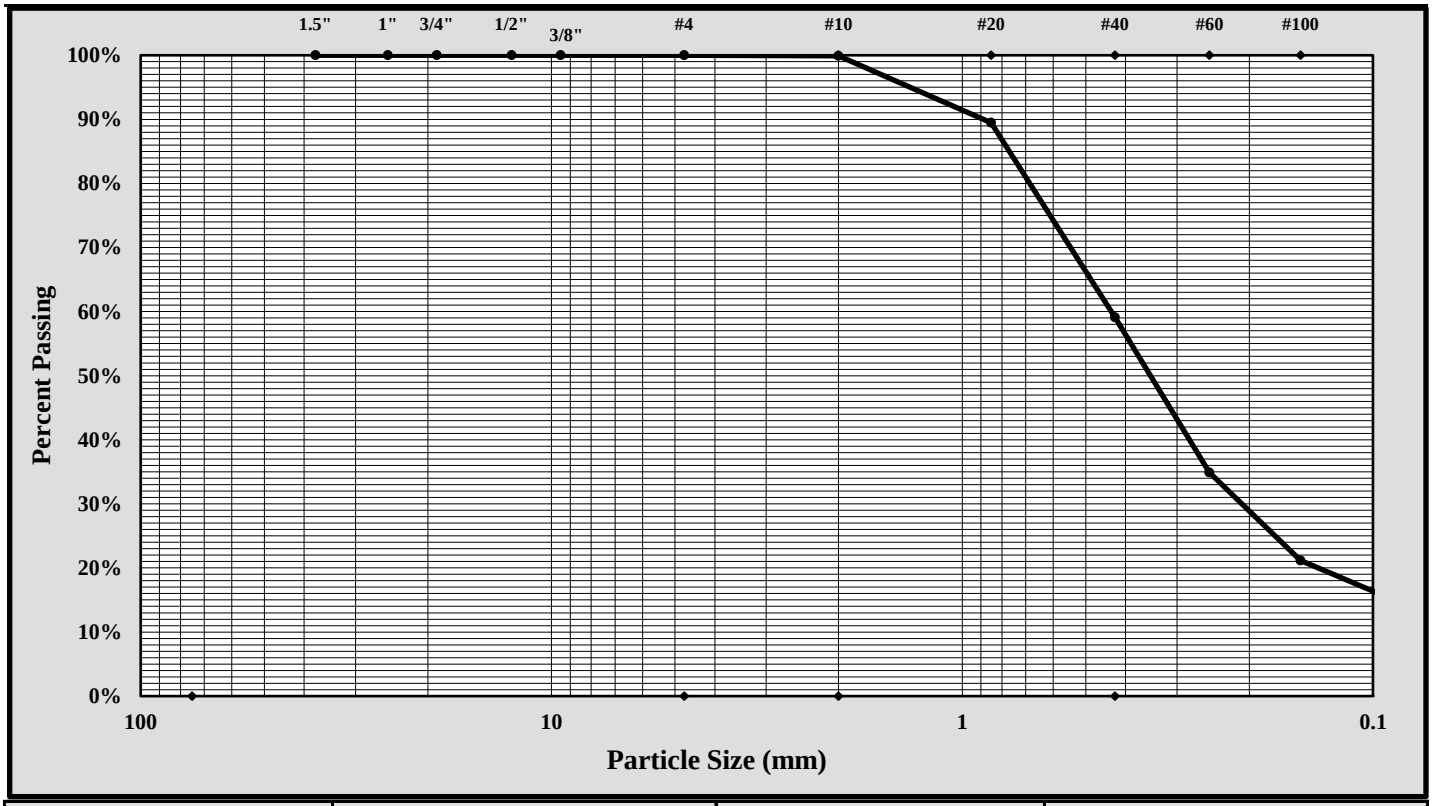
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	4/2-4/25/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-68 Sample #: SS-1	Sample Date:	1/31/18
Location:	Pavement Boring Offset: N/A	Depth:	1.1' - 3.1'
Sample Description:	Silty Sand (SM, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	#10	Gravel:	0.0%
Silt & Clay (% Passing #200):	13.0%	Total Sand:	87.0%

Liquid Limit	NP	Plastic Limit	NP	Plastic Index	NP		
Coarse Sand:	0.1%	Medium Sand:	40.8%	Fine Sand:	46.1%		
Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/3/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	4/24-4/25/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-69	Sample #: SS-1	Sample Date: 1/31/18
Location:	Pavement Boring	Offset: N/A	Depth: 1.0' - 3.0'
Sample Description:	Silty Sand (SM, A-6(2))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28574	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

Pan # 1		Liquid Limit						Plastic Limit		
	Tare #:	25	235	204				207	229	
A	Tare Weight	20.60	20.76	20.86				20.94	20.71	
B	Wet Soil Weight + A	28.62	28.59	29.60				28.14	27.42	
C	Dry Soil Weight + A	26.44	26.41	27.08				26.63	26.03	
D	Water Weight (B-C)	2.18	2.18	2.52				1.51	1.39	
E	Dry Soil Weight (C-A)	5.84	5.65	6.22				5.69	5.32	
F	% Moisture (D/E)*100	37.3%	38.6%	40.5%				26.5%	26.1%	
N	# OF DROPS	33	25	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**26.3%**		

One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**39**
Plastic Limit	**26**
Plastic Index	**13**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group Symbol for minus No. 40 sieve portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	5/3/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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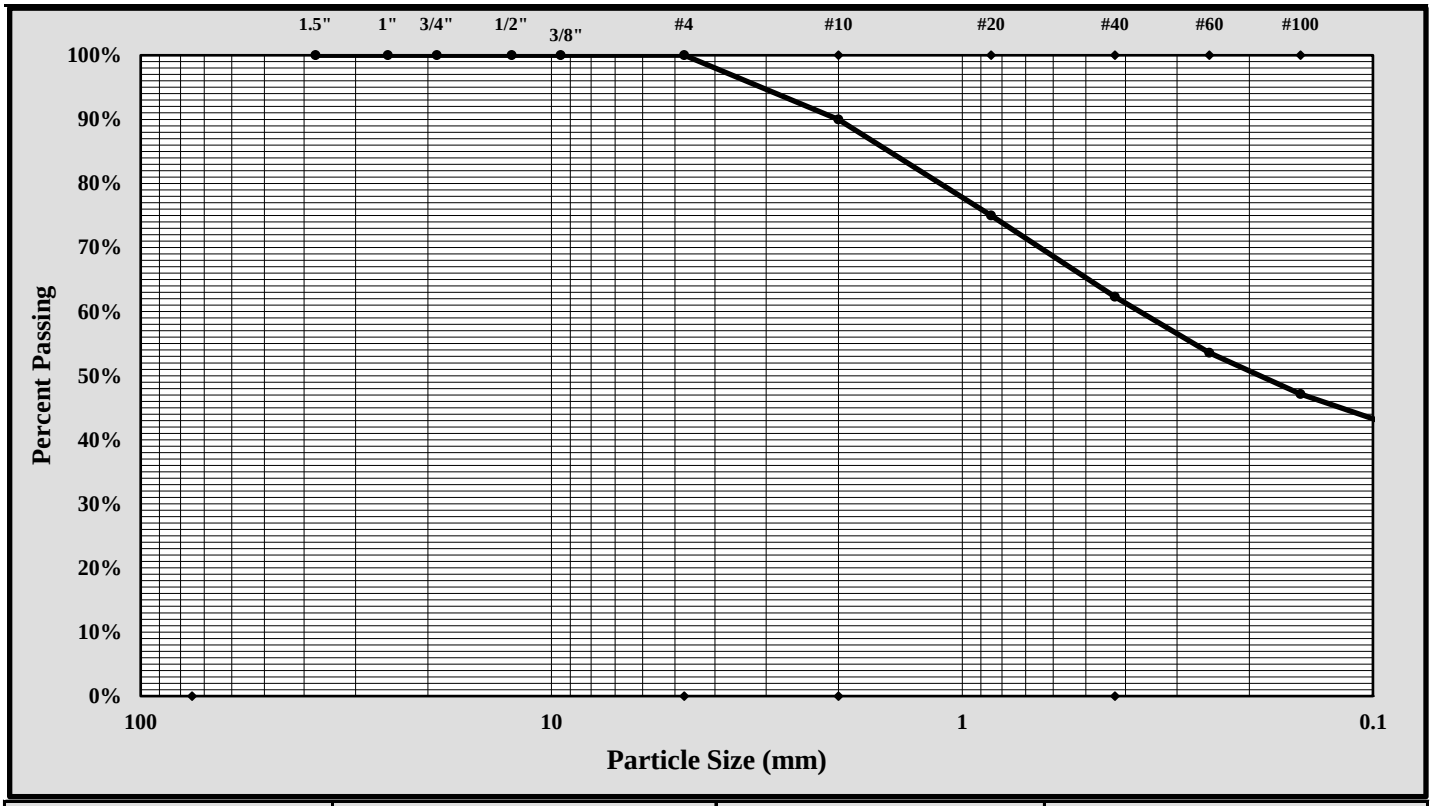
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	4/24-4/25/218
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-69 Sample #: SS-1	Sample Date:	1/31/18
Location:	Pavement Boring Offset: N/A	Depth:	1.0' - 3.0'
Sample Description:	Silty Sand (SM, A-6(2))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	#10	Gravel:	0.0%
Silt & Clay (% Passing #200):	40.6%	Total Sand:	59.4%

Liquid Limit	39	Plastic Limit	26	Plastic Index	13
Coarse Sand:	10.0%	Medium Sand:	27.7%	Fine Sand:	21.8%

Description of Sand and Gravel	Rounded	Angular	Hard & Durable	Soft	Weathered & Friable
	☐	☒	☒	☐	☒

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/3/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	4/24-4/25/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-70	Sample #: SS-1	Sample Date: 2/1/18
Location:	Pavement Boring	Offset: N/A	Depth: 0.6' - 2.6'
Sample Description:	Sandy Fat Clay (CH, A-7-6(12))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28574	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

	Pan # 7	Liquid Limit						Plastic Limit		
	Tare #:	10	31	209				39	40	
A	Tare Weight	20.79	20.82	21.08				20.80	20.85	
B	Wet Soil Weight + A	28.27	28.14	27.55				28.55	27.41	
C	Dry Soil Weight + A	25.79	25.65	25.29				26.90	26.01	
D	Water Weight (B-C)	2.48	2.49	2.26				1.65	1.40	
E	Dry Soil Weight (C-A)	5.00	4.83	4.21				6.10	5.16	
F	% Moisture (D/E)*100	49.6%	51.6%	53.7%				27.0%	27.1%	
N	# OF DROPS	25	20	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**27.1%**		

One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**50**
Plastic Limit	**27**
Plastic Index	**23**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group Symbol for minus No. 40 sieve portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	5/3/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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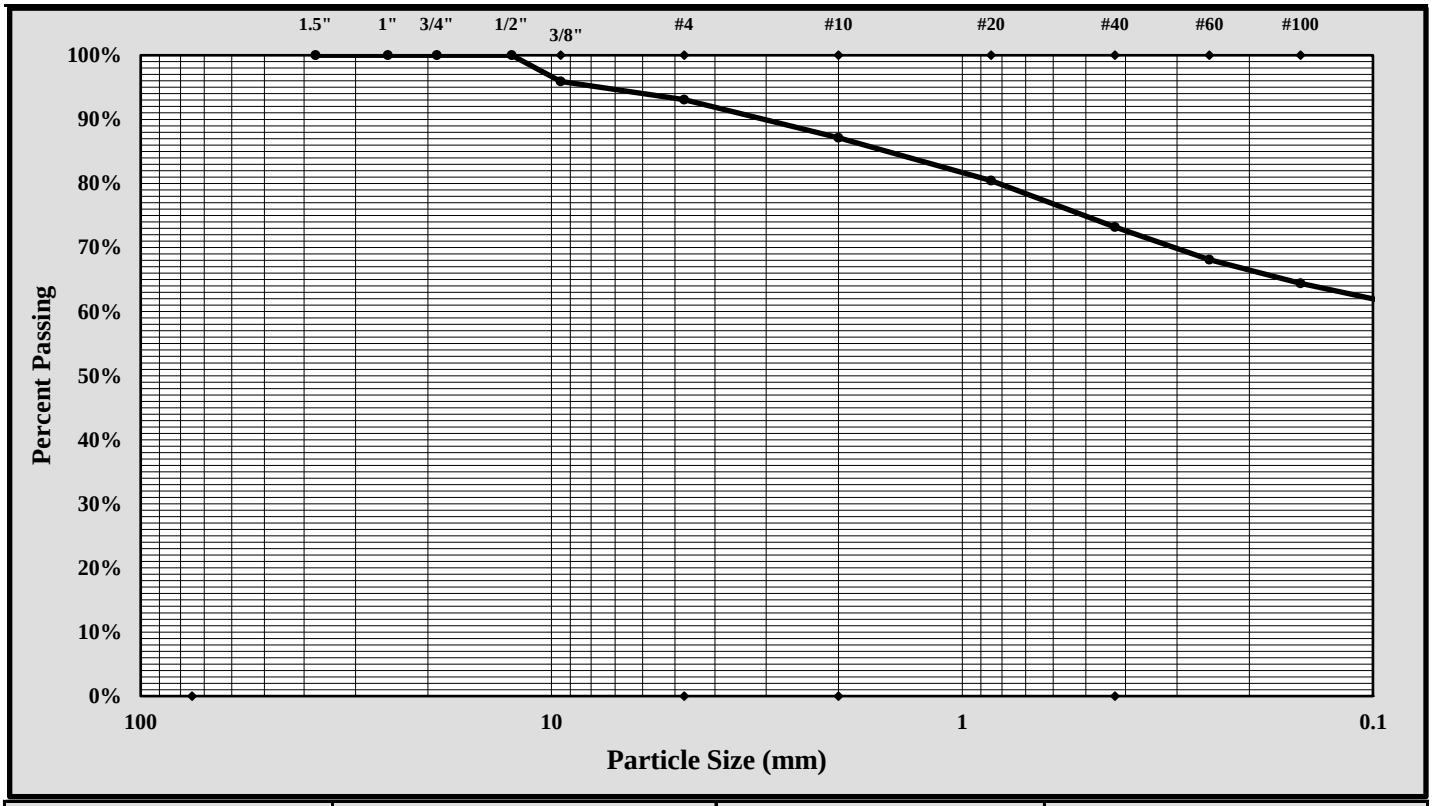
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	4/24-4/25/218
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-70 Sample #: SS-1	Sample Date:	2/1/18
Location:	Pavement Boring Offset: N/A	Depth:	0.6' - 2.6'
Sample Description:	Sandy Fat Clay (CH, A-7-6(12))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	3/8-inch	Gravel:	6.9%
Silt & Clay (% Passing #200):	60.3%	Total Sand:	32.8%

Liquid Limit	50	Plastic Limit	27	Plastic Index	23
Coarse Sand:	6.0%	Medium Sand:	13.9%	Fine Sand:	12.9%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☒

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/3/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

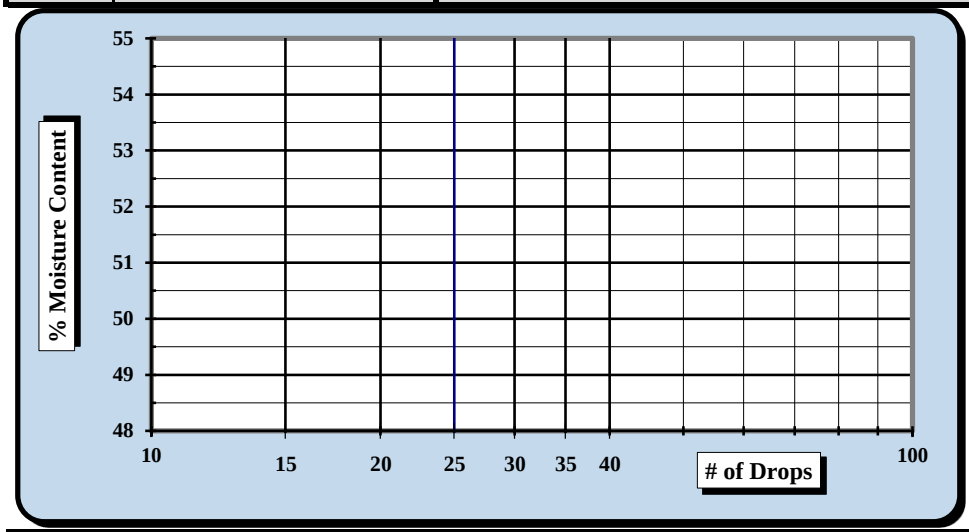
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	4/24-4/25/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-71	Sample #: SS-1	Sample Date: 2/1/18
Location:	Pavement Boring	Offset: N/A	Depth: 1.3' - 3.3'
Sample Description:	Silty Sand (SM, A-2-4)		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28574	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

		Liquid Limit						Plastic Limit		
Pan #	5									
	Tare #:									
A	Tare Weight									
B	Wet Soil Weight + A									
C	Dry Soil Weight + A									
D	Water Weight (B-C)									
E	Dry Soil Weight (C-A)									
F	% Moisture (D/E)*100									
N	# OF DROPS							*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*									



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☒

Liquid Limit	**NP**
Plastic Limit	**NP**
Plastic Index	**NP**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group Symbol for minus No. 40 sieve portion only.
The liquid limit could not be determined.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	5/3/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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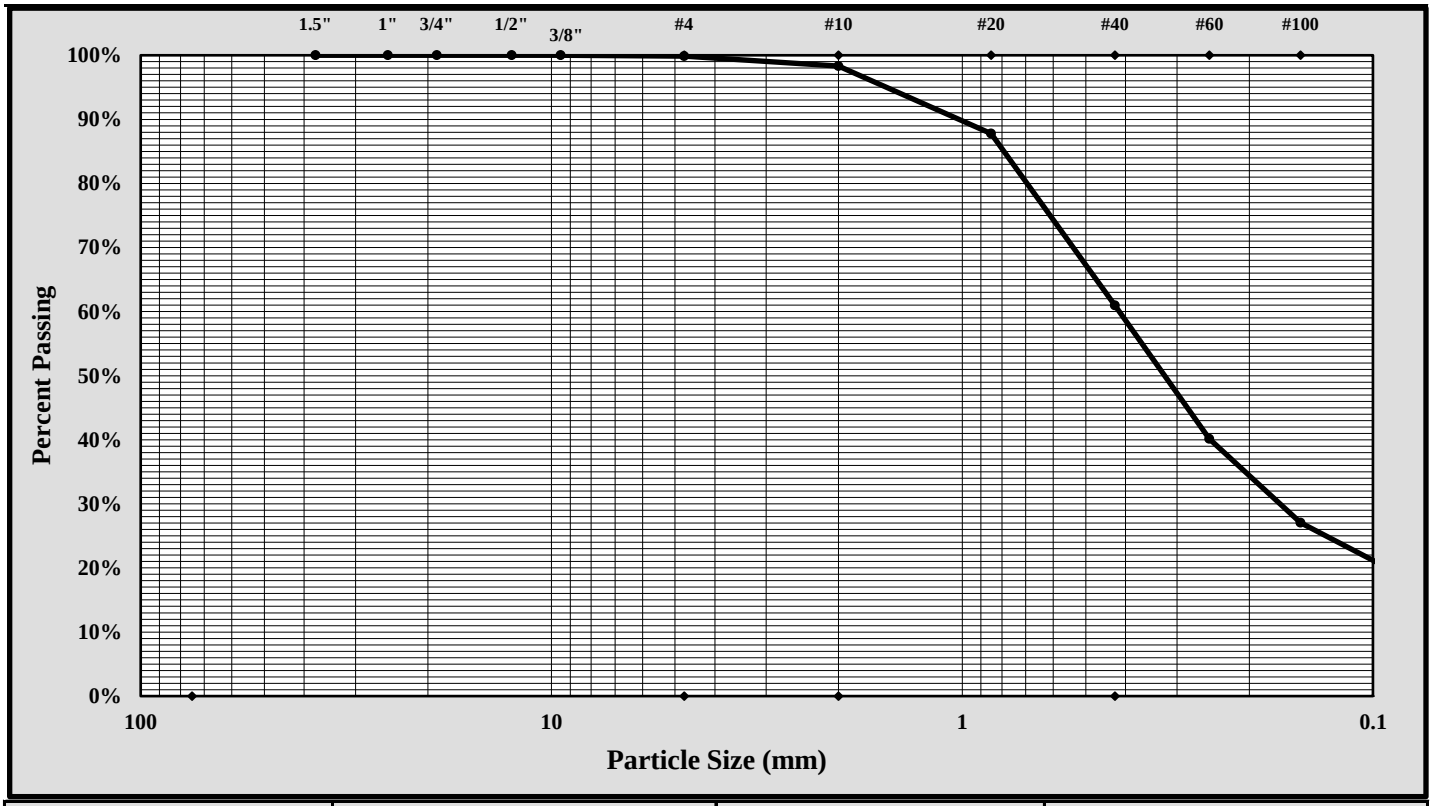
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	4/24-4/25/218
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-71 Sample #: SS-1	Sample Date:	2/1/18
Location:	Pavement Boring Offset: N/A	Depth:	1.3' - 3.3'
Sample Description:	Silty Sand (SM, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	#4	Gravel:	0.1%
Silt & Clay (% Passing #200):	17.0%	Total Sand:	82.8%

Liquid Limit	NP	Plastic Limit	NP	Plastic Index	NP		
Coarse Sand:	1.6%	Medium Sand:	37.3%	Fine Sand:	43.9%		
Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/3/2018 — *Date*

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Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	2/14/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/12 - 2/13/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sampled by:	S&ME	Sample Date(s):	1/24 - 1/25/18
Sampling Method:	Split-spoon	Drill Rig:	CME 55

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 13942 Calibration Date: 8/18/17 Oven ID. 13978 Calibration Date: 10/07/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
RW-37	SS-3	4.0 - 6.0	D-16	0.00	70.96	62.07	8.89	14.3%	
RW-37	SS-6	13.5 - 15.0	D-17	0.00	70.92	56.09	14.83	26.4%	
RW-37	SS-8	23.5 - 25.0	D-18	0.00	73.37	61.58	11.79	19.1%	
RW-35	SS-3	4.0 - 6.0	D-8	0.00	73.49	53.36	20.13	37.7%	
RW-35	SS-5	8.0 - 10.0	D-6	0.00	70.63	60.51	10.12	16.7%	
RW-35	SS-8	23.5 - 25.0	D-15	0.00	73.81	60.45	13.36	22.1%	

Notes / Deviations / References

AASHTO T 265: Laboratory Determination of Moisture Content of Soils

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Benjamin Kovaleski	Benjamin J. Kovaleski	NICET Lab Level III/117226	2/14/18
Technician Name	*Signature*	*Certification Type / No.*	*Date*
Brian Vaughan, P.E.	Brian Vaughan	Group Leader	2/14/18
Technical Responsibility	*Signature*	*Position*	*Date*

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/26/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/28 - 3/29/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sampled by:	S&ME	Sample Date(s):	3/01/18
Sampling Method:	Split-spoon	Drill Rig:	Diedrich D-50

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 13942 Calibration Date: 8/18/17 Oven ID. 13978 Calibration Date: 10/07/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
RW-36	SS-1	0.0 - 2.0	A-2	0.00	54.72	43.70	11.02	25.2%	
RW-36	SS-4	6.0 - 8.0	T-2	0.00	53.26	46.28	6.98	15.1%	

Notes / Deviations / References

AASHTO T 265: Laboratory Determination of Moisture Content of Soils

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Benjamin Kovaleski	Benjamin J. Kovaleski	NICET Lab Level III/117226	4/26/18
Technician Name	*Signature*	*Certification Type / No.*	*Date*
Matthew F. Cooke, P.G.		Project Manager	4/26/18
Technical Responsibility		*Position*	*Date*

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

Quality Assurance *ASTM D 2216* ☑ *AASHTO T 265* ☐

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/31/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	4/25/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave. North Charleston, South Carolina		
Sampled by:	S&ME	Sample Date(s):	Various
Sampling Method:	Split Spoon	Log # :	43-2321

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 18435 Calibration Date: 4/10/2018 Oven ID. 12872 Calibration Date: 3/17/2018

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft		grams	grams	grams	grams	%	
RW-38	SS-1A	0.0 - 1.0	C-66	30.88	182.93	171.51	11.42	8.1%	
RW-38	SS-2	2.0 - 4.0	C-15	30.86	80.60	71.21	9.39	23.3%	
RW-38	SS-4	6.0 - 8.0	C-33	30.36	83.49	72.57	10.92	25.9%	
RW-43	SS-1A	0.0 - 1.0	C-62	31.39	88.65	86.17	2.48	4.5%	
RW-43	SS-2	2.0 - 4.0	C-45	31.34	79.71	69.86	9.85	25.6%	
RW-43	SS-3	4.0 - 6.0	C-5	29.82	80.68	74.41	6.27	14.1%	
RW-43	SS-8	23.5 - 25.0	C-29	31.54	88.59	67.03	21.56	60.7%	

Notes / Deviations / References

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Derek Baker — *Technician Name* — 4/25/2018 *Date*

Michael D. Kelso, E.I. — *Technical Responsibility* — Signature — Staff Professional — *Position* — 5/31/2018 *Date*

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Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/16/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/08 - 3/09/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sampled by:	S&ME	Sample Date(s):	2/01 & 2/13/18
Sampling Method:	Split-spoon	Drill Rig:	CME 55/Diedrich D-50

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 13942 Calibration Date: 8/18/17 Oven ID. 13978 Calibration Date: 10/07/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
RW-39	SS-2	2.0 - 4.0	BK-5	0.00	63.81	56.43	7.38	13.1%	
RW-39	SS-11	6.0 - 8.0	BK-9	0.00	71.93	61.33	10.60	17.3%	
RW-39	SS-7	18.5 - 20.0	BK-1	0.00	74.21	60.78	13.43	22.1%	
RW-40	SS-2	2.0 - 4.0	BK-11	0.00	73.51	56.18	17.33	30.8%	

Notes / Deviations / References

AASHTO T 265: Laboratory Determination of Moisture Content of Soils

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Benjamin Kovaleski	Benjamin J. Kovaleski	NICET Lab Level III/117226	3/16/18
Technician Name	*Signature*	*Certification Type / No.*	*Date*
Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/16/18
Technical Responsibility	*Signature*	*Position*	*Date*

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/08/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/28 - 4/29/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sampled by:	S&ME	Sample Date(s):	3/14 - 3/15/18
Sampling Method:	Split-spoon	Drill Rig:	CME 55/Diedrich D-50

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 13942 Calibration Date: 8/18/17 Oven ID. 13978 Calibration Date: 10/07/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
RW-41	SS-1	0.0 - 2.0	26	0.00	52.83	47.97	4.86	10.1%	
RW-41	SS-2	2.0 - 4.0	F	0.00	55.65	48.83	6.82	14.0%	
RW-41	SS-4	6.0 - 8.0	R	0.00	51.54	41.71	9.83	23.6%	
RW-42	SS-1	0.0 - 2.0	E	0.00	50.50	45.71	4.79	10.5%	
RW-42	SS-4	6.0 - 8.0	D-13	0.00	51.18	41.31	9.87	23.9%	
RW-42	SS-7	18.5 - 20.0	D-117	0.00	53.14	44.50	8.64	19.4%	
RW-42	SS-10	33.5 - 35.0	D-1	0.00	54.65	42.12	12.53	29.7%	
RW-42	SS-12	43.5 - 45.0	A-2	0.00	54.98	42.86	12.12	28.3%	

Notes / Deviations / References

AASHTO T 265: Laboratory Determination of Moisture Content of Soils

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Benjamin Kovaleski	Benjamin J. Kovaleski	NICET Lab Level III/117226	5/08/18
Technician Name	*Signature*	*Certification Type / No.*	*Date*
Matthew F. Cooke, P.G.		Project Manager	5/08/18
Technical Responsibility		*Position*	*Date*

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/09/18
Project Name:	Carolina Crossroads Project	Test Date:	3/08/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-35	Sample #:	SS-3	Sample Date:	1/24/18
Location:	Embankment Boring	Type:	Split-spoon	Depth:	4.0' - 6.0'
Sample Description:	Sandy Silt (ML, A-7-5 (11))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	11	12	13				14	15	
A	Tare Weight	26.67	26.66	26.78				26.66	27.61	
B	Wet Soil Weight + A	44.06	41.88	42.03				34.26	34.53	
C	Dry Soil Weight + A	38.59	36.98	36.89				32.46	32.88	
D	Water Weight (B-C)	5.47	4.90	5.14				1.80	1.65	
E	Dry Soil Weight (C-A)	11.92	10.32	10.11				5.80	5.27	
F	% Moisture (D/E)*100	45.9%	47.5%	50.8%				31.0%	31.3%	
N	# OF DROPS	35	28	20				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**31.2%**		

One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐
Liquid Limit **49**
Plastic Limit **31**
Plastic Index **18**
Group Symbol **ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 64.2%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	3/09/18		3/09/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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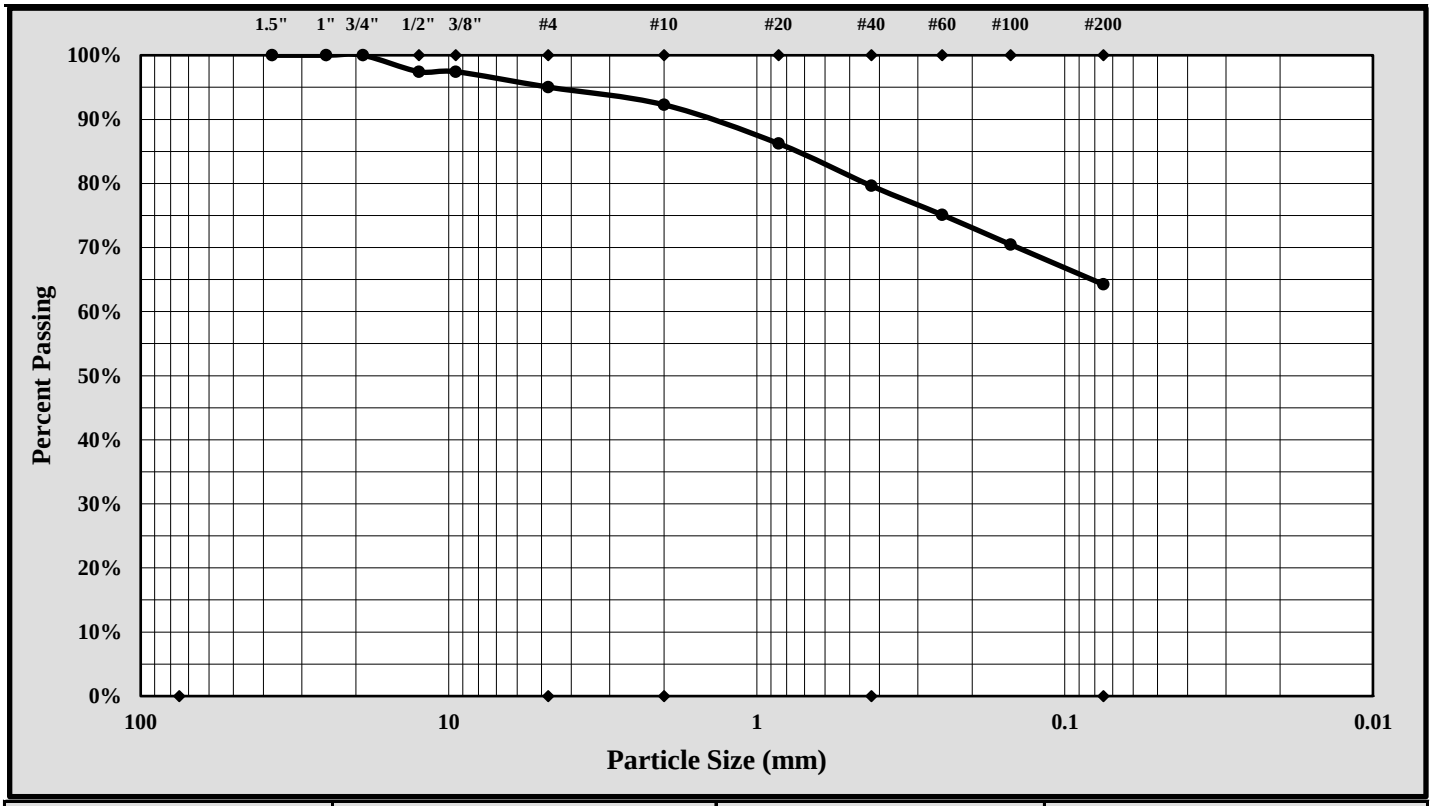
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/09/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/28 - 3/09/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	RW-35 Sample #: SS-3	Sample Date:	1/24/18
Location:	Embankment Boring Type: Split-spoon	Depth:	4.0' - 6.0'
Sample Description:	Sandy Silt (ML, A-7-5 (11))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	19.0 mm	Gravel:	5.0%
Silt & Clay (% Passing #200):	64.2%	Total Sand:	30.8%

Liquid Limit	49	Plastic Limit	31	Plastic Index	18
Coarse Sand:	2.8%	Medium Sand:	12.6%	Fine Sand:	15.4%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/09/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/09/18
Project Name:	Carolina Crossroads Project	Test Date:	3/08/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-35	Sample #:	SS-5	Sample Date:	1/24/18
Location:	Embankment Boring	Type:	Split-spoon	Depth:	8.0' - 10.0'
Sample Description:	Lean Clay (CL, A-4(7))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	16	17	18				19	20	
A	Tare Weight	26.57	26.63	26.77				26.68	26.83	
B	Wet Soil Weight + A	47.62	48.50	46.73				33.75	33.63	
C	Dry Soil Weight + A	43.07	43.55	42.02				32.45	32.39	
D	Water Weight (B-C)	4.55	4.95	4.71				1.30	1.24	
E	Dry Soil Weight (C-A)	16.50	16.92	15.25				5.77	5.56	
F	% Moisture (D/E)*100	27.6%	29.3%	30.9%				22.5%	22.3%	
N	# OF DROPS	35	27	20				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**22.4%**		

One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐
Liquid Limit **30**
Plastic Limit **22**
Plastic Index **8**
Group Symbol **CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 92.8%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	3/09/18	Brian Vaughn	3/09/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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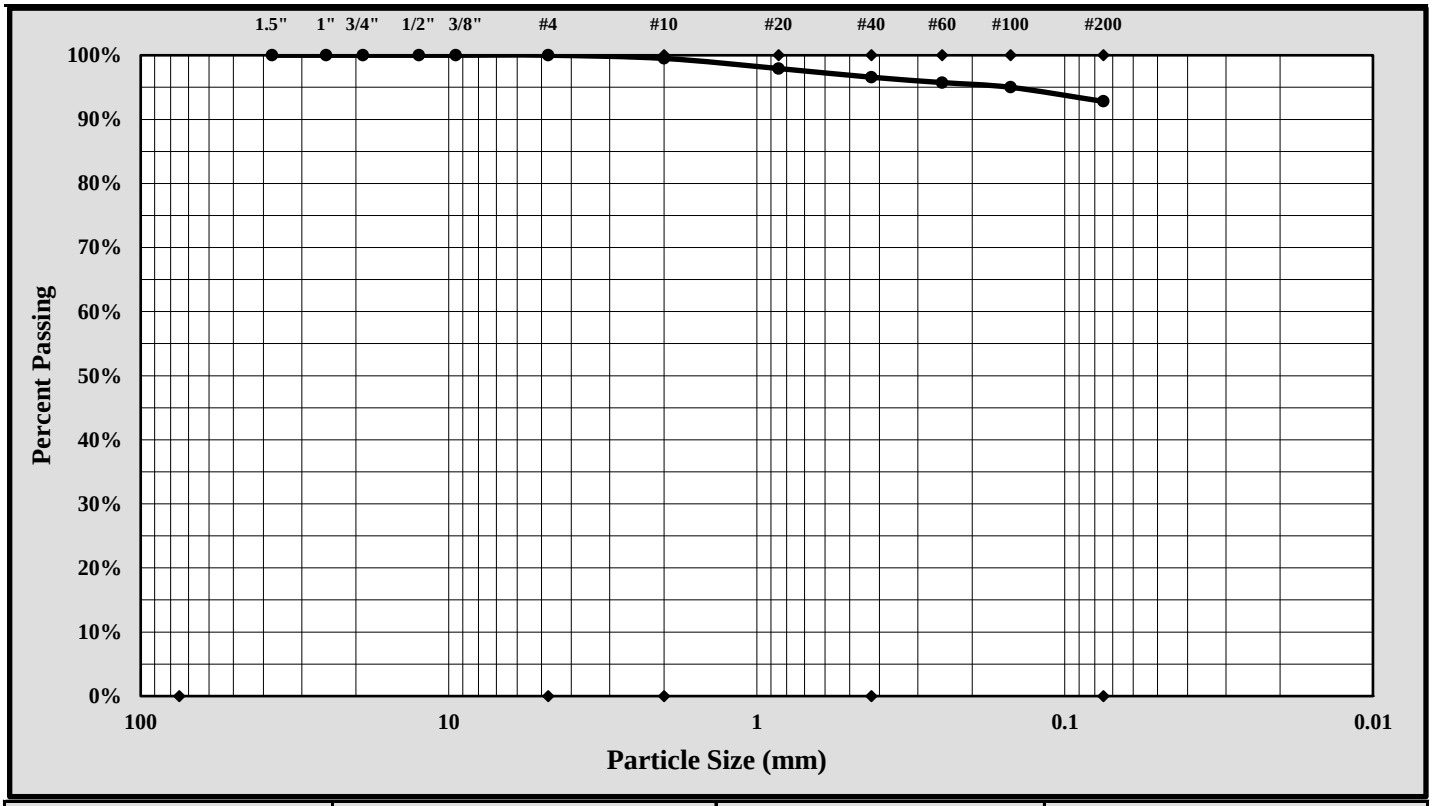
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/09/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/28 - 3/09/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	RW-35 Sample #: SS-5	Sample Date:	1/24/18
Location:	Embankment Boring Type: Split-spoon	Depth:	8.0' - 10.0'
Sample Description:	Lean Clay (CL, A-4(7))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	2.00 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	92.8%	Total Sand:	7.2%

Liquid Limit	30	Plastic Limit	22	Plastic Index	8
Coarse Sand:	0.5%	Medium Sand:	2.9%	Fine Sand:	3.8%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/09/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

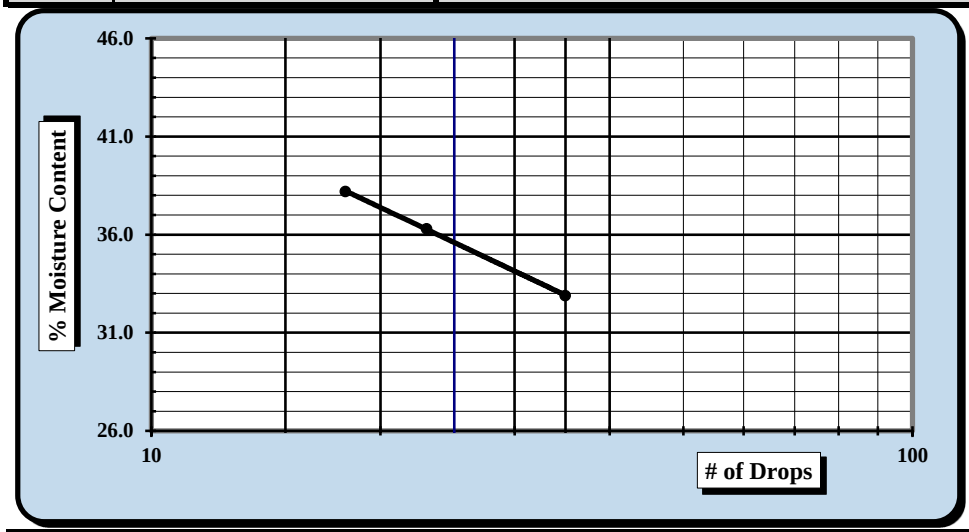
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/09/18
Project Name:	Carolina Crossroads Project	Test Date:	3/08/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-35	Sample #:	SS-8	Sample Date:	1/24/18
Location:	Embankment Boring	Type:	Split-spoon	Depth:	23.5' - 25.0'
Sample Description:	Silt with Sand (ML, A-4(6))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	21	22	23				24	25	
A	Tare Weight	28.09	25.69	27.22				26.00	26.83	
B	Wet Soil Weight + A	45.65	43.50	47.62				32.83	33.29	
C	Dry Soil Weight + A	41.30	38.76	41.98				31.42	31.94	
D	Water Weight (B-C)	4.35	4.74	5.64				1.41	1.35	
E	Dry Soil Weight (C-A)	13.21	13.07	14.76				5.42	5.11	
F	% Moisture (D/E)*100	32.9%	36.3%	38.2%				26.0%	26.4%	
N	# OF DROPS	35	23	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**26.2%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**36**
Plastic Limit	**26**
Plastic Index	**10**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 70.3%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	3/09/18	Brian Vaughn	3/09/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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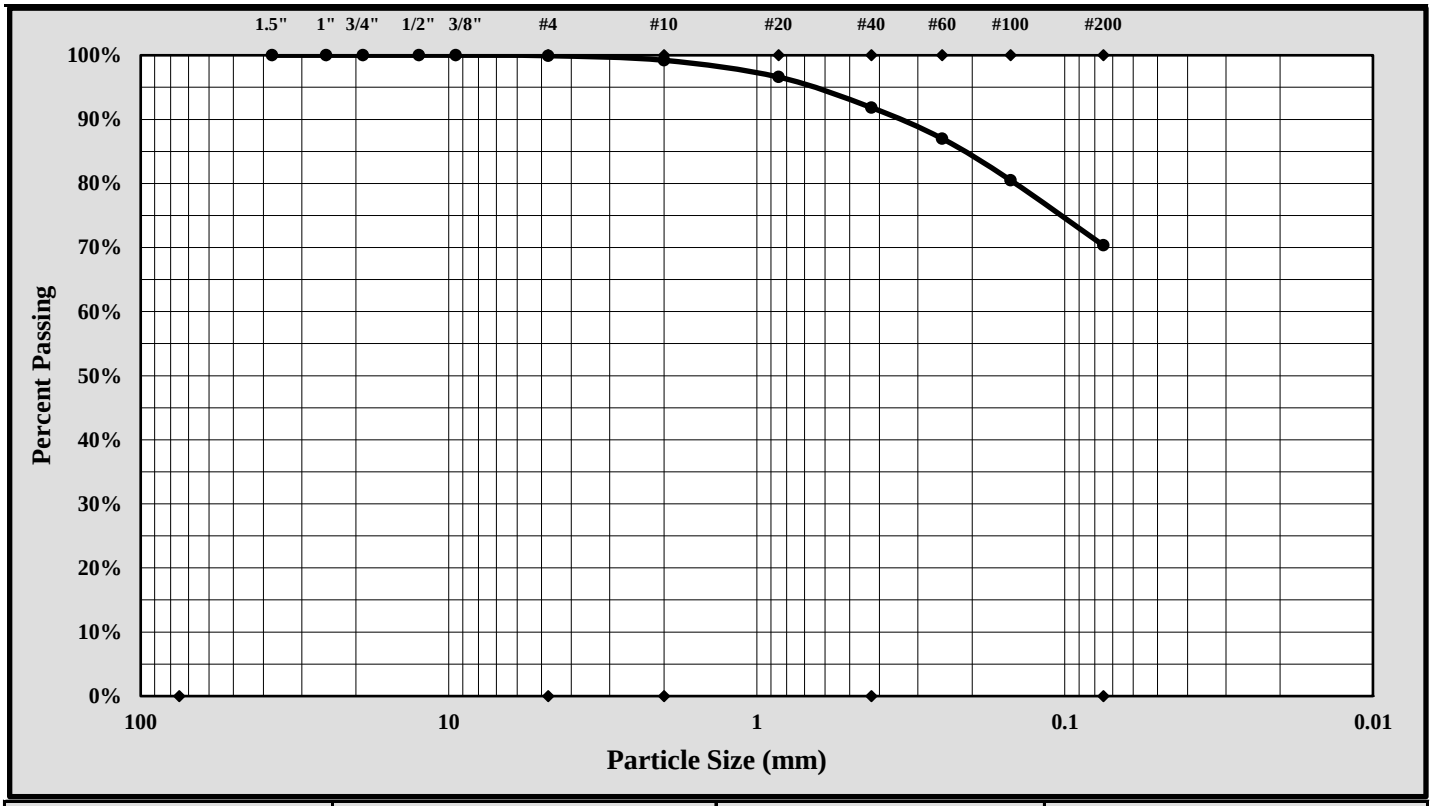
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/09/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/28 - 3/09/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	RW-35 Sample #: SS-8	Sample Date:	1/24/18
Location:	Embankment Boring Type: Split-spoon	Depth:	23.5' - 25.0'
Sample Description:	Silt with Sand (ML, A-4(6))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	2.00 mm	Gravel:	0.1%
Silt & Clay (% Passing #200):	70.3%	Total Sand:	29.6%

Liquid Limit	36	Plastic Limit	26	Plastic Index	10
Coarse Sand:	0.7%	Medium Sand:	7.4%	Fine Sand:	21.5%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/09/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

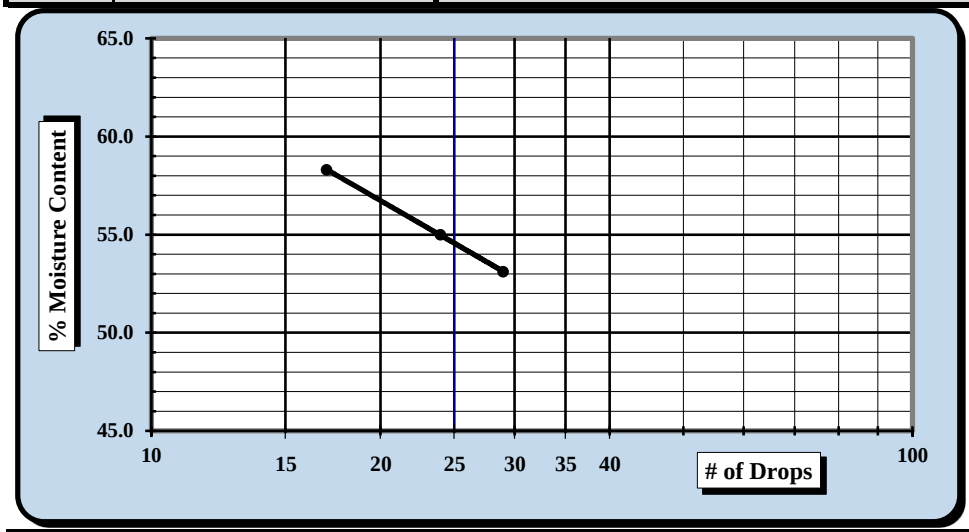
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/26/18
Project Name:	Carolina Crossroads Project	Test Date:	4/21/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-36	Sample #:	SS-1	Sample Date:	3/01/18
Location:	Embankment Boring	Type:	Split-spoon	Depth:	0.0' - 2.0'
Sample Description:	Fat Clay with Sand (CH, A-7-6(23))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	11	12	13				14	15	
A	Tare Weight	26.68	26.66	26.78				26.65	27.61	
B	Wet Soil Weight + A	43.69	39.73	41.72				33.48	34.88	
C	Dry Soil Weight + A	37.79	35.09	36.22				32.12	33.43	
D	Water Weight (B-C)	5.90	4.64	5.50				1.36	1.45	
E	Dry Soil Weight (C-A)	11.11	8.43	9.44				5.47	5.82	
F	% Moisture (D/E)*100	53.1%	55.0%	58.3%				24.9%	24.9%	
N	# OF DROPS	29	24	17				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**24.9%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**55**
Plastic Limit	**25**
Plastic Index	**30**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/26/18	Matthew F. Cooke, P.G.	4/26/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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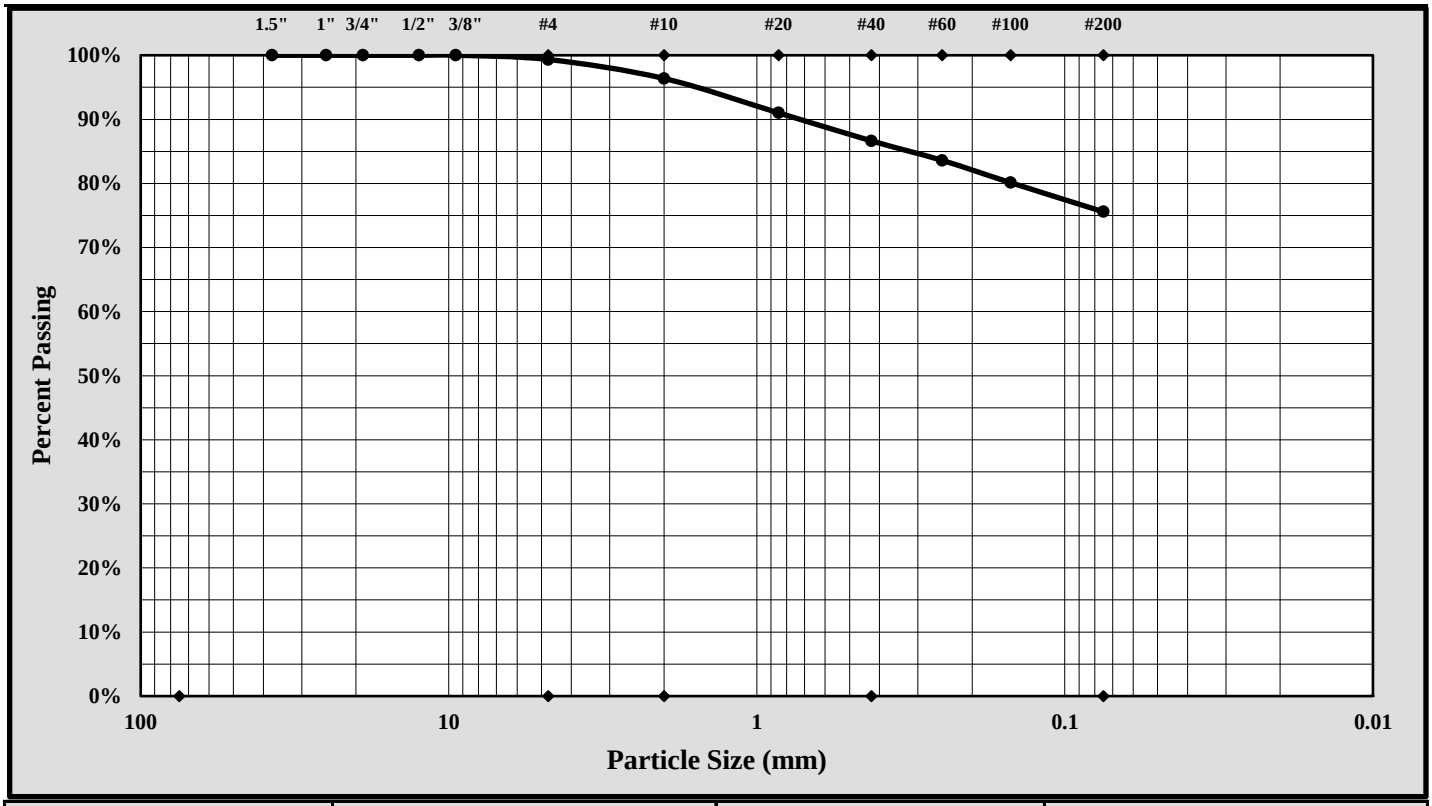
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/26/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/11 - 4/25/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	RW-36 Sample #: SS-1	Sample Date:	3/01/18
Location:	Embankment Boring Type: Split-spoon	Depth:	0.0' - 2.0'
Sample Description:	Fat Clay with Sand (CH, A-7-6(23))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.7%
Silt & Clay (% Passing #200):	75.6%	Total Sand:	23.8%

Liquid Limit	55	Plastic Limit	25	Plastic Index	30
Coarse Sand:	3.0%	Medium Sand:	9.7%	Fine Sand:	11.1%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☐		

References / Comments / Deviations:

Matthew F. Cooke, P.G.	Project Manager	4/26/18
Technical Responsibility	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

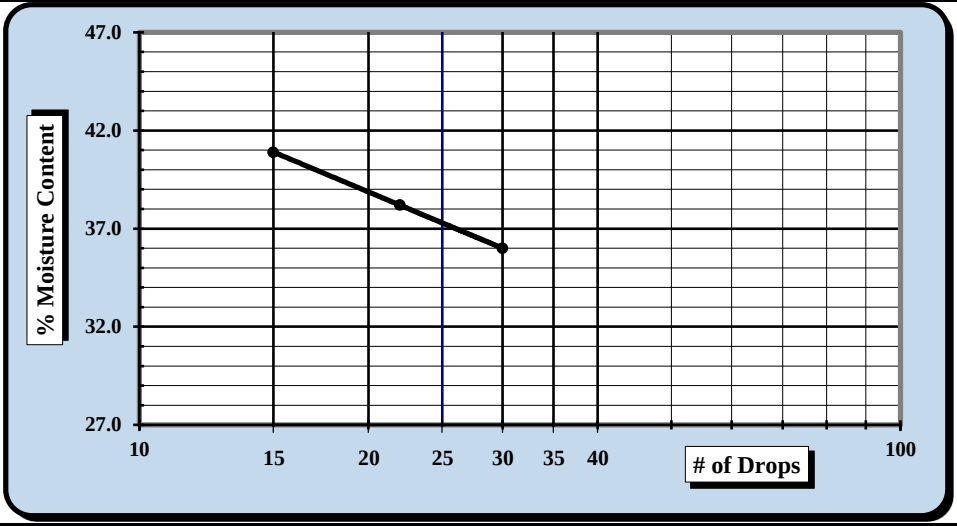
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/26/18
Project Name:	Carolina Crossroads Project	Test Date:	4/21/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-36	Sample #:	SS-4	Sample Date:	3/01/18
Location:	Embankment Boring	Type:	Split-spoon	Depth:	6.0' - 8.0'
Sample Description:	Lean Clay with Sand (CL, A-6(11))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	16	17	18				19	20	
A	Tare Weight	26.57	26.63	26.84				26.66	26.85	
B	Wet Soil Weight + A	44.50	43.95	42.65				33.19	34.88	
C	Dry Soil Weight + A	39.75	39.16	38.06				31.97	33.35	
D	Water Weight (B-C)	4.75	4.79	4.59				1.22	1.53	
E	Dry Soil Weight (C-A)	13.18	12.53	11.22				5.31	6.50	
F	% Moisture (D/E)*100	36.0%	38.2%	40.9%				23.0%	23.5%	
N	# OF DROPS	30	22	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**23.3%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐
Liquid Limit **37**
Plastic Limit **23**
Plastic Index **14**
Group Symbol **CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/26/18	Matthew F. Cooke, P.G.	4/26/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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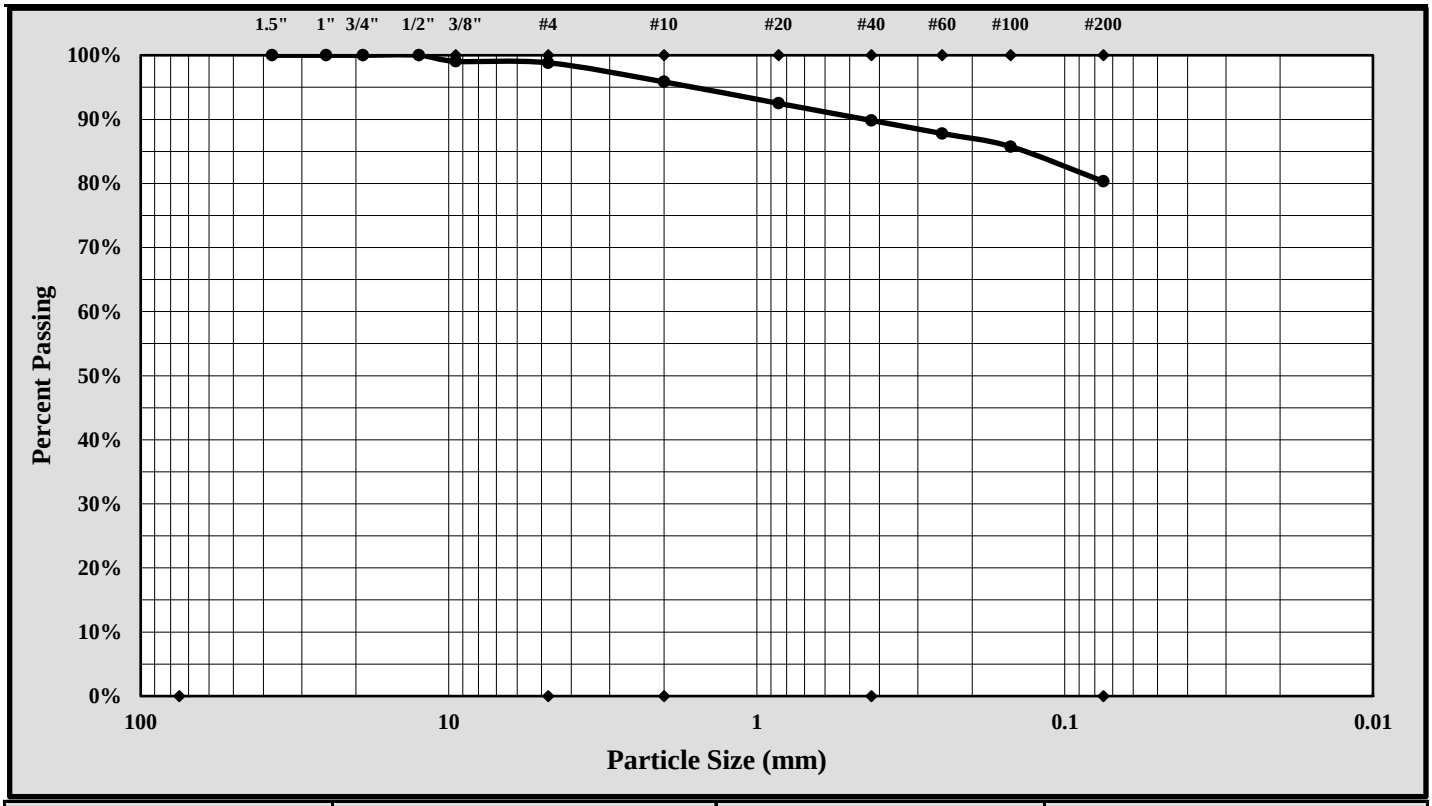
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/26/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/11 - 4/25/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	RW-36 Sample #: SS-4	Sample Date:	3/01/18
Location:	Embankment Boring Type: Split-spoon	Depth:	6.0' - 8.0'
Sample Description:	Lean Clay with Sand (CL, A-6(11))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	9.50 mm	Gravel:	1.2%
Silt & Clay (% Passing #200):	80.3%	Total Sand:	18.5%

Liquid Limit	37	Plastic Limit	23	Plastic Index	14
Coarse Sand:	3.0%	Medium Sand:	6.0%	Fine Sand:	9.5%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/26/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

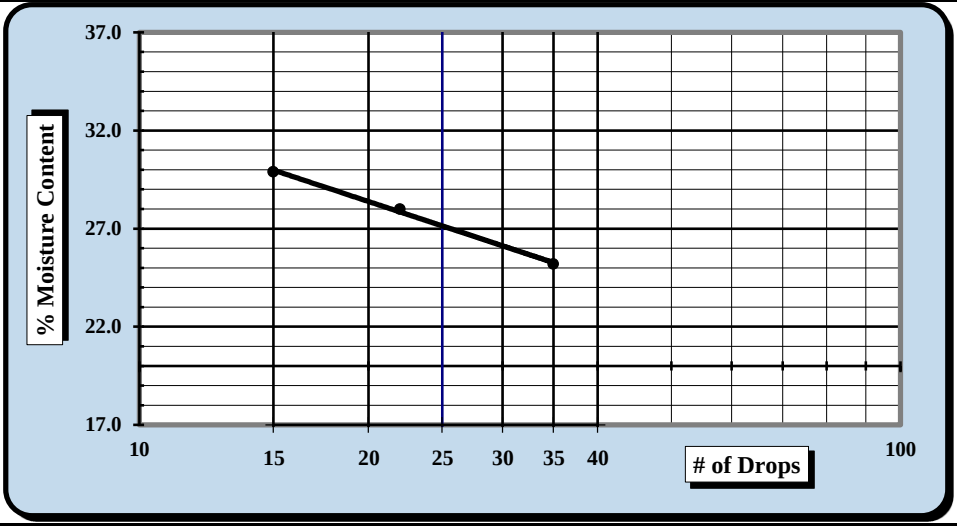
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/09/18
Project Name:	Carolina Crossroads Project	Test Date:	3/08/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-37	Sample #:	SS-3	Sample Date:	1/25/18
Location:	Embankment Boring	Type:	Split-spoon	Depth:	4.0' - 6.0'
Sample Description:	Clayey Sand (SC, A-2-4)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	1	2	3				4	5	
A	Tare Weight	26.69	26.47	26.36				25.94	26.95	
B	Wet Soil Weight + A	46.99	44.49	44.89				33.21	33.82	
C	Dry Soil Weight + A	42.90	40.55	40.63				32.13	32.79	
D	Water Weight (B-C)	4.09	3.94	4.26				1.08	1.03	
E	Dry Soil Weight (C-A)	16.21	14.08	14.27				6.19	5.84	
F	% Moisture (D/E)*100	25.2%	28.0%	29.9%				17.4%	17.6%	
N	# OF DROPS	35	22	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**17.5%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**27**
Plastic Limit	**18**
Plastic Index	**9**
Group Symbol	**SC**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 34.8%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	3/09/18	Brian Vaughn	3/09/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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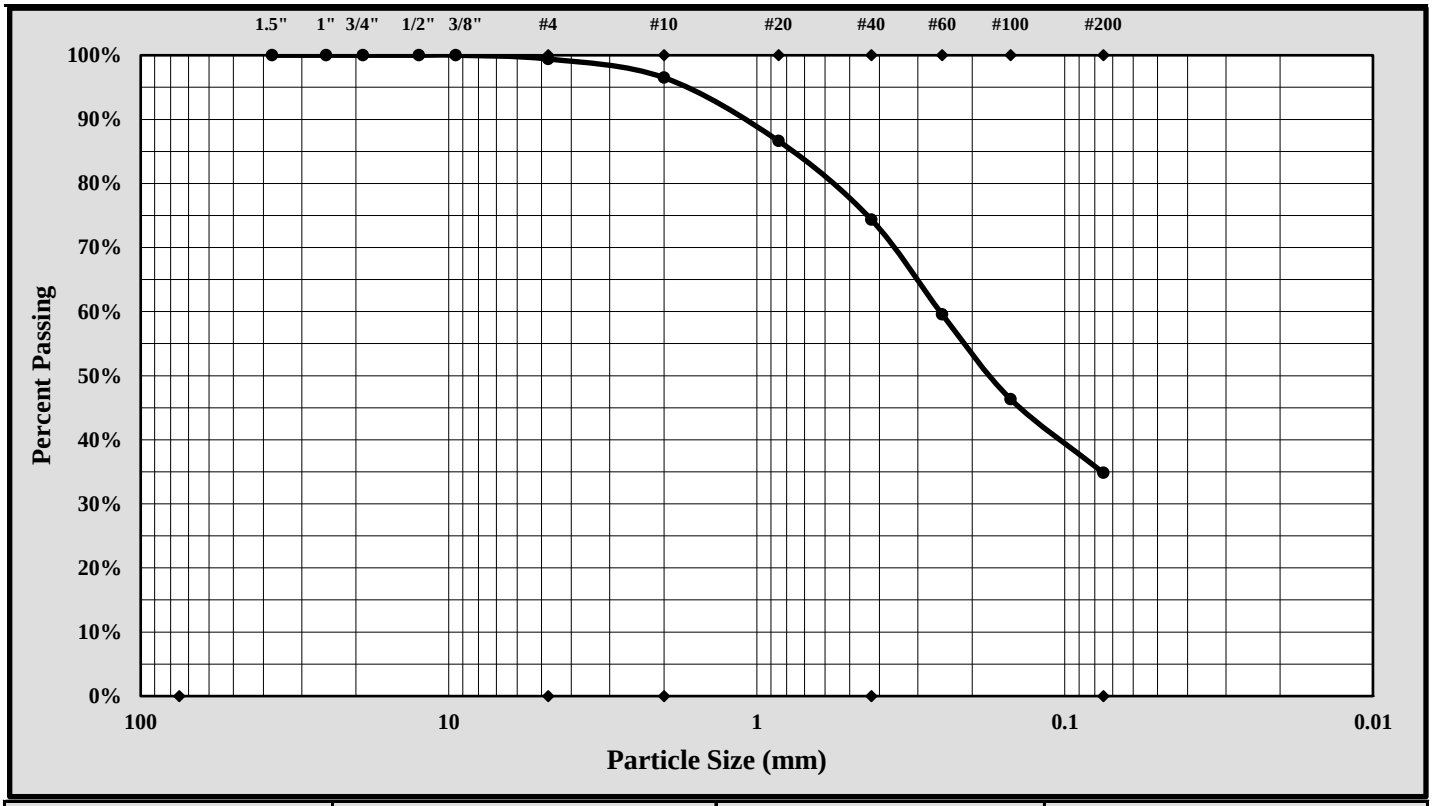
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/09/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/01 - 3/09/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	RW-37 Sample #: SS-3	Sample Date:	1/25/18
Location:	Embankment Boring Type: Split-spoon	Depth:	4.0' - 6.0'
Sample Description:	Clayey Sand (SC, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.6%
Silt & Clay (% Passing #200):	34.8%	Total Sand:	64.6%

Liquid Limit	27	Plastic Limit	18	Plastic Index	9
Coarse Sand:	2.9%	Medium Sand:	22.1%	Fine Sand:	39.5%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/09/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

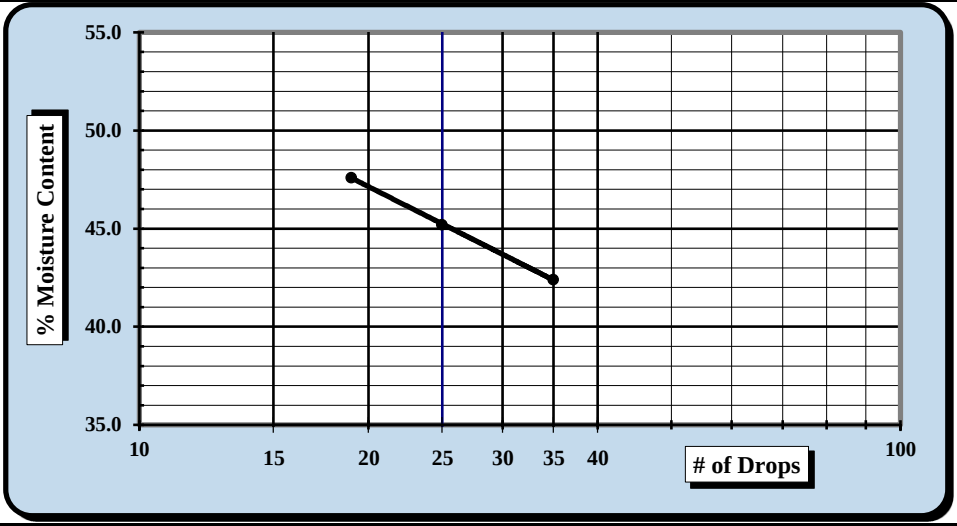
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/09/18
Project Name:	Carolina Crossroads Project	Test Date:	3/08/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-37	Sample #:	SS-6	Sample Date:	1/25/18
Location:	Embankment Boring	Type:	Split-spoon	Depth:	13.5' - 15.0'
Sample Description:	Silty Sand (SM, A-2-7(1))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	6	7	8				9	10	
A	Tare Weight	27.77	26.31	27.32				26.85	26.76	
B	Wet Soil Weight + A	45.22	42.17	43.84				33.63	33.75	
C	Dry Soil Weight + A	40.02	37.23	38.51				32.07	32.13	
D	Water Weight (B-C)	5.20	4.94	5.33				1.56	1.62	
E	Dry Soil Weight (C-A)	12.25	10.92	11.19				5.22	5.37	
F	% Moisture (D/E)*100	42.4%	45.2%	47.6%				29.9%	30.2%	
N	# OF DROPS	35	25	19				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**30.1%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐
Liquid Limit **45**
Plastic Limit **30**
Plastic Index **15**
Group Symbol **SM**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 33.3%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	3/09/18		3/09/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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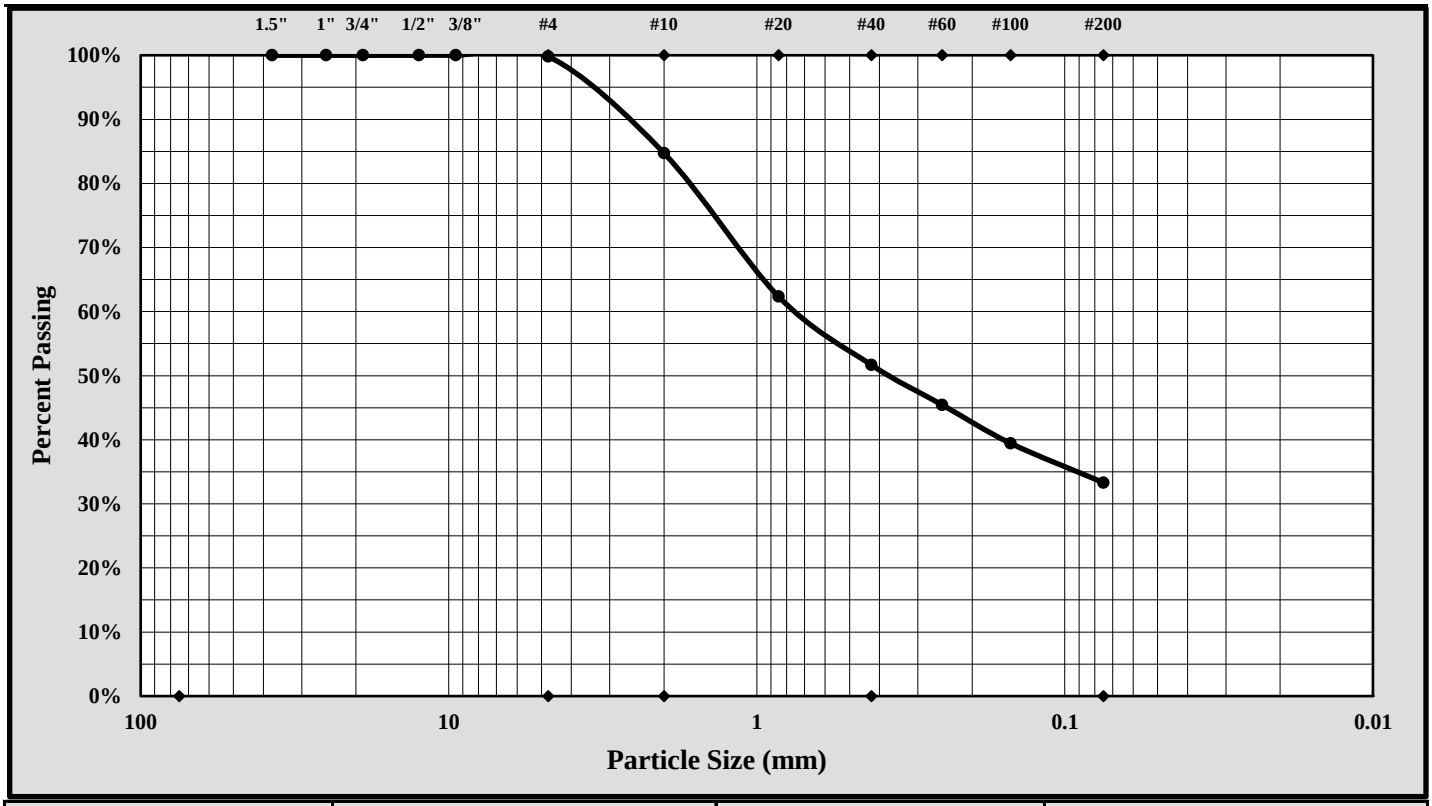
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/09/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/01 - 3/09/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	RW-37 Sample #: SS-6	Sample Date:	1/25/18
Location:	Embankment Boring Type: Split-spoon	Depth:	13.5' - 15.0'
Sample Description:	Silty Sand (SM, A-2-7(1))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.2%
Silt & Clay (% Passing #200):	33.3%	Total Sand:	66.5%

Liquid Limit	45	Plastic Limit	30	Plastic Index	15
Coarse Sand:	15.1%	Medium Sand:	33.0%	Fine Sand:	18.4%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/09/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

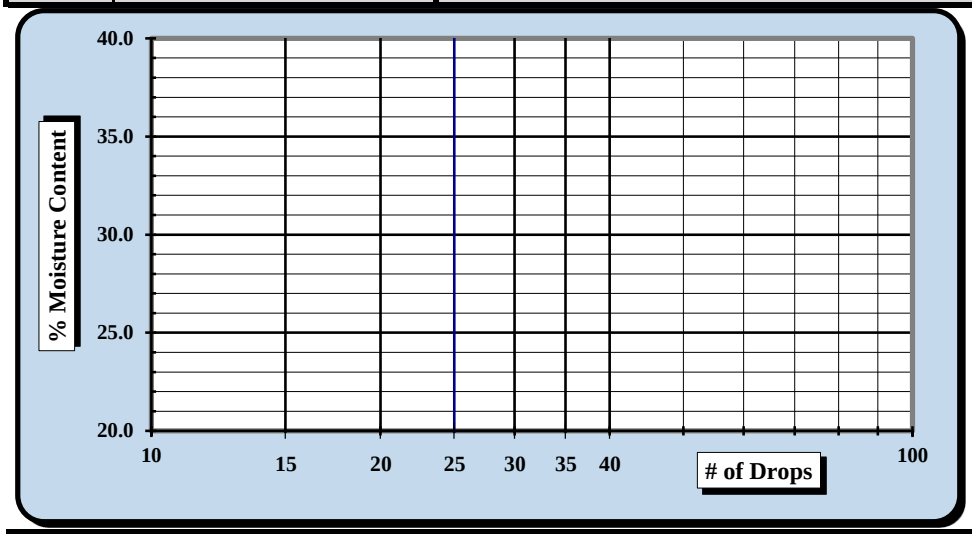
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/09/18
Project Name:	Carolina Crossroads Project	Test Date:	3/08/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-37	Sample #:	SS-8	Sample Date:	1/25/18
Location:	Embankment Boring	Type:	Split-spoon	Depth:	23.5' - 25.0'
Sample Description:	Silty Sand (SM, A-2-4)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:									
A	Tare Weight									
B	Wet Soil Weight + A									
C	Dry Soil Weight + A									
D	Water Weight (B-C)									
E	Dry Soil Weight (C-A)									
F	% Moisture (D/E)*100									
N	# OF DROPS							*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*									



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☒

Liquid Limit	**NP**
Plastic Limit	**NP**
Plastic Index	**NP**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 24.4%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	3/09/18	Brian Vaughn	3/09/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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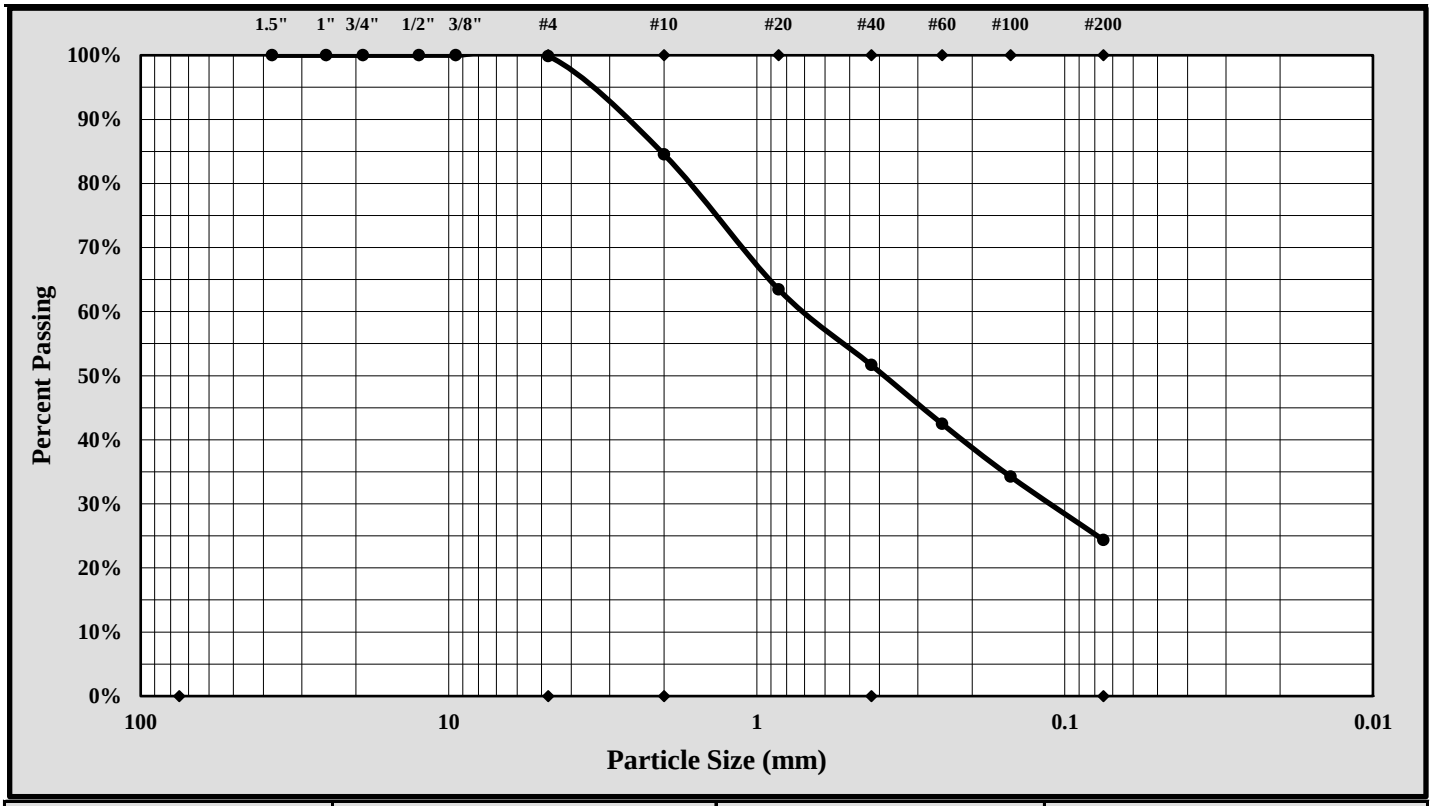
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/09/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/01 - 3/09/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	RW-37	Sample #: SS-8	Sample Date: 1/25/18
Location:	Embankment Boring	Type: Split-spoon	Depth: 23.5' - 25.0'
Sample Description:	Silty Sand (SM, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.1%
Silt & Clay (% Passing #200):	24.4%	Total Sand:	75.5%

Liquid Limit	---	Plastic Limit	NP	Plastic Index	NP
Coarse Sand:	15.4%	Medium Sand:	32.9%	Fine Sand:	27.3%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Brian Vaughan, P.E. — *Technical Responsibility*
Signature — *Signature*
Group Leader — *Position*
3/09/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

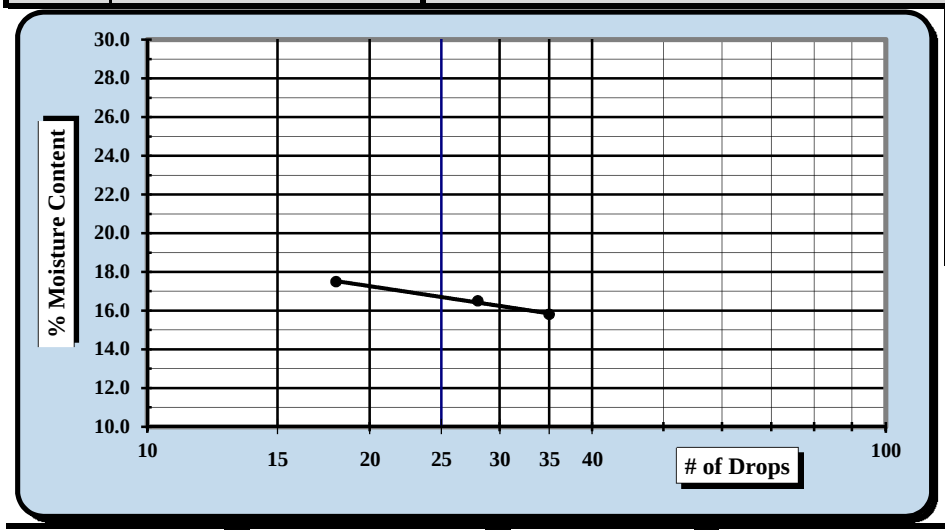
S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/31/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	5/30/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-38	Sample #: SS-1A	Sample Date: Various
Log #:	43-2321		Depth: 0.0' - 1.0'
Sample Description:	Silty, clayey sand (SC-SM, A-2-4)		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	14	17	1				18	16	
A	Tare Weight	15.47	15.49	15.34				15.41	15.64	
B	Wet Soil Weight + A	24.69	25.71	26.77				25.58	24.47	
C	Dry Soil Weight + A	23.32	24.26	25.21				24.50	23.54	
D	Water Weight (B-C)	1.37	1.45	1.56				1.08	0.93	
E	Dry Soil Weight (C-A)	7.85	8.77	9.87				9.09	7.90	
F	% Moisture (D/E)*100	17.5%	16.5%	15.8%				11.9%	11.8%	
N	# OF DROPS	18	28	35				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**11.9%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**17**
Plastic Limit	**12**
Plastic Index	**5**
Group Symbol	**CL-ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	5/30/2018	Michael D. Kelso, E.I.	5/31/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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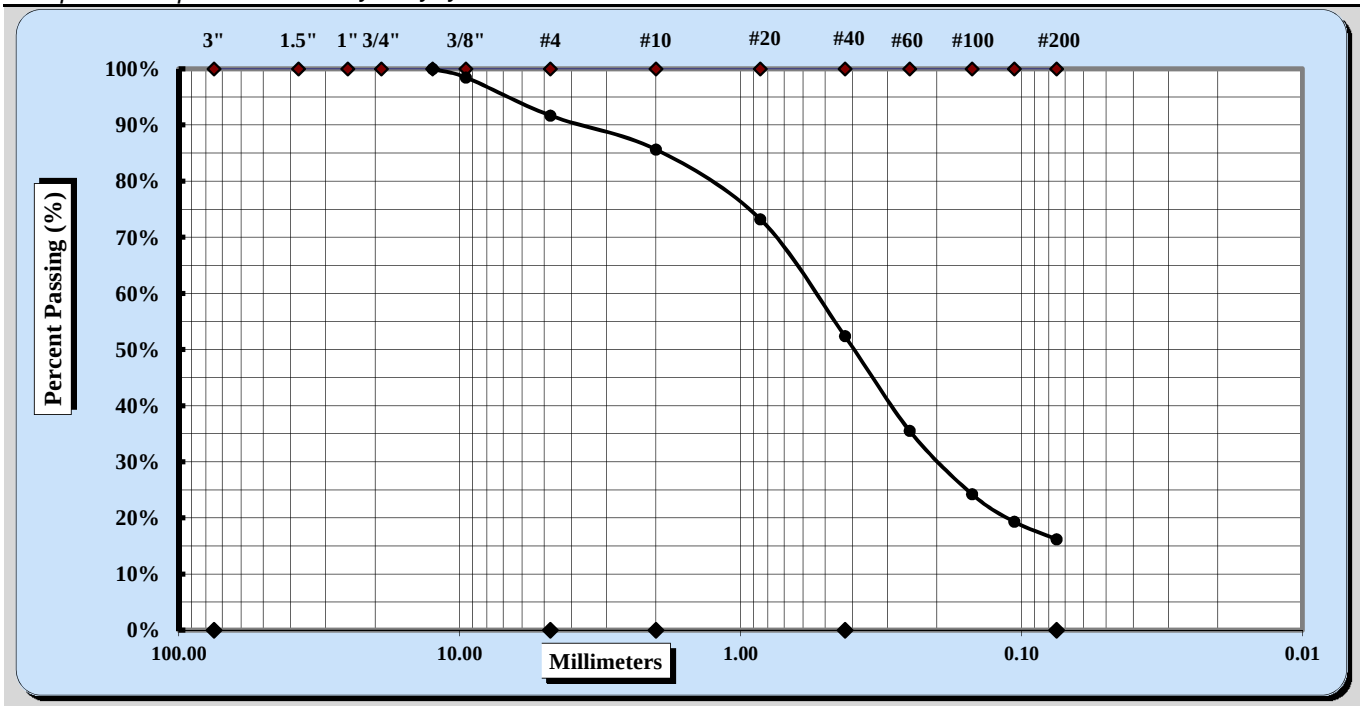
Sieve Analysis of Soils

Quality Assurance *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/31/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/25/18 - 5/29/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	RW-38	Type: Split Spoon	Sample Date: Various
Sample Log No.:	43-2321	Sample: 1A	Depth: 0.0' - 1.0'
Sample Description:	Silty, clayey sand (SC-SM, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	1/2"	Coarse Sand	6%	Fine Sand	36%
Gravel	8%	Medium Sand	33%	Silt & Clay	16%
Liquid Limit	17	Plastic Limit	12	Plastic Index	5

Coarse Sand	6%	Medium Sand	33%	Fine Sand	36%

Description of Sand & Gravel Particles: Rounded ☐ Angular ☒
Hard & Durable ☒ Soft ☒ Weathered & Friable ☒

Notes / Deviations / References:

Michael D. Kelso, E.I. — *Technical Responsibility*
Signature
Staff Professional — *Position*
5/31/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

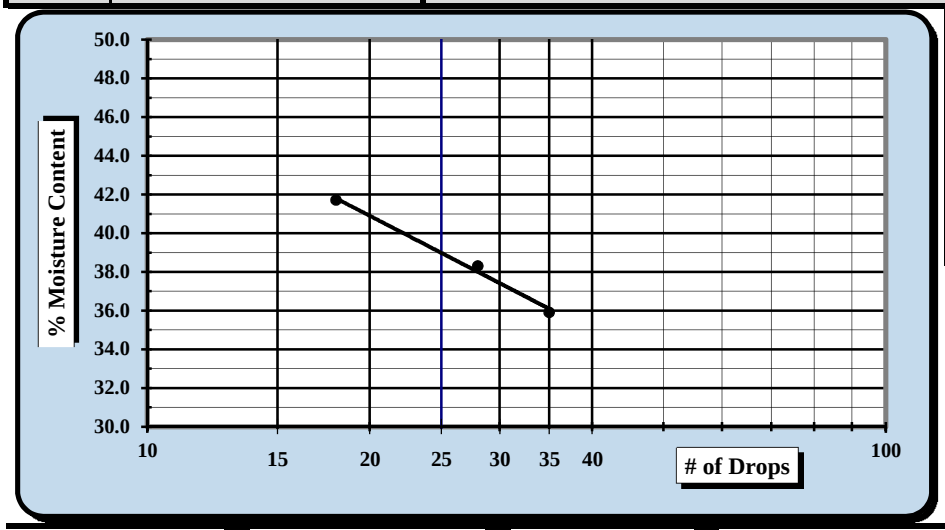
S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/31/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	5/30/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-38	Sample #: SS-2	Sample Date: Various
Log #:	43-2321		Depth: 2.0' - 4.0'
Sample Description:	Lean clay with sand (CL, A-6 (13))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	23	8	6				21	20	
A	Tare Weight	15.44	15.51	15.45				15.51	15.46	
B	Wet Soil Weight + A	28.52	29.56	30.34				23.97	24.75	
C	Dry Soil Weight + A	24.67	25.67	26.41				22.53	23.17	
D	Water Weight (B-C)	3.85	3.89	3.93				1.44	1.58	
E	Dry Soil Weight (C-A)	9.23	10.16	10.96				7.02	7.71	
F	% Moisture (D/E)*100	41.7%	38.3%	35.9%				20.5%	20.5%	
N	# OF DROPS	18	28	35				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**20.5%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**39**
Plastic Limit	**21**
Plastic Index	**18**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	5/30/2018	Michael D. Kelso, E.I.	5/31/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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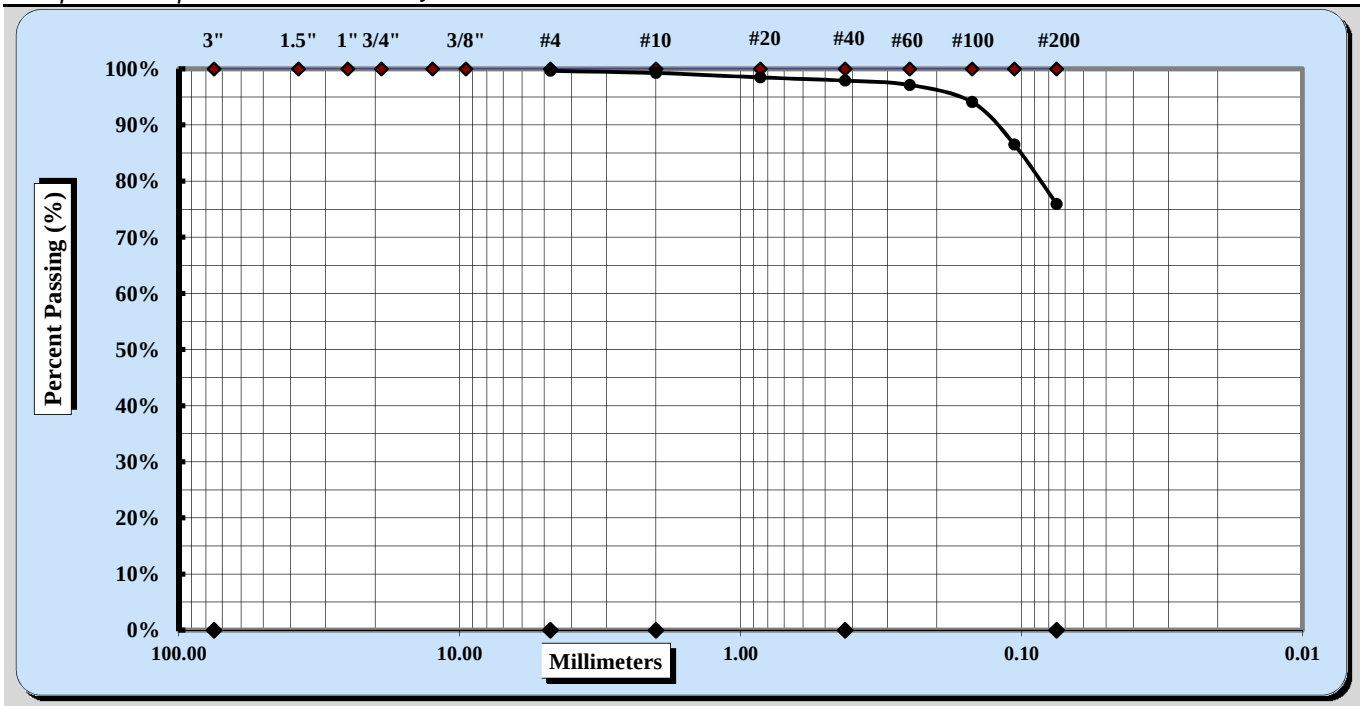
Sieve Analysis of Soils

Quality Assurance *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/31/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/25/18 - 5/29/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	RW-38	Type: Split Spoon	Sample Date: Various
Sample Log No.:	43-2321	Sample: 2	Depth: 2.0' - 4.0'
Sample Description:	Lean clay with sand (CL, A-6 (13))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	No. 4	Coarse Sand	0%	Fine Sand	22%
Gravel	0%	Medium Sand	1%	Silt & Clay	76%
Liquid Limit	39	Plastic Limit	21	Plastic Index	18

Coarse Sand	0%	Medium Sand	1%	Fine Sand	22%
Description of Sand & Gravel Particles:		Rounded	☐	Angular	☒
Hard & Durable	☒	Soft	☒	Weathered & Friable	☒

Notes / Deviations / References:

Michael D. Kelso, E.I.		Staff Professional	5/31/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

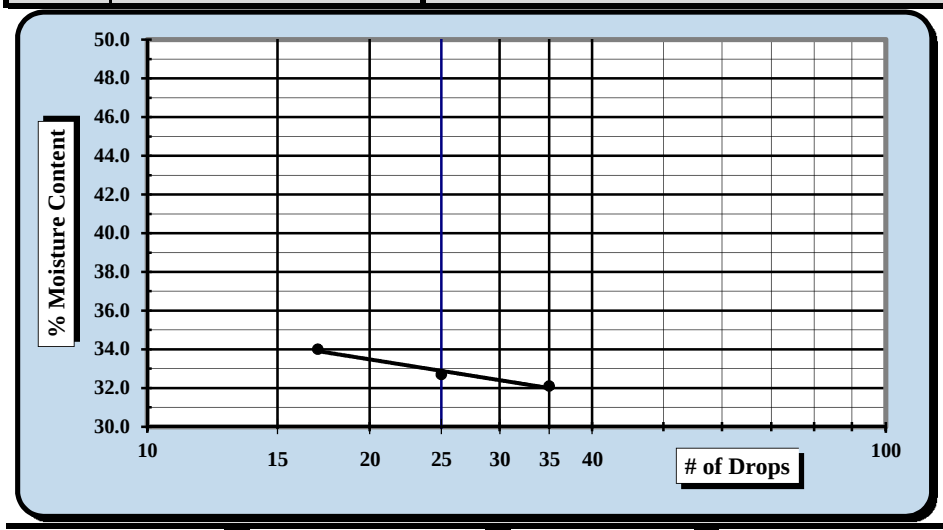
S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/31/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	5/29/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-38	Sample #: SS-4	Sample Date: Various
Log #:	43-2321		Depth: 6.0' - 8.0'
Sample Description:	Lean clay with sand (CL, A-6 (11))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	19	15	16				22	7	
A	Tare Weight	15.42	15.32	15.64				15.38	15.41	
B	Wet Soil Weight + A	27.27	28.43	29.15				24.17	24.86	
C	Dry Soil Weight + A	24.26	25.20	25.87				22.75	23.33	
D	Water Weight (B-C)	3.01	3.23	3.28				1.42	1.53	
E	Dry Soil Weight (C-A)	8.84	9.88	10.23				7.37	7.92	
F	% Moisture (D/E)*100	34.0%	32.7%	32.1%				19.3%	19.3%	
N	# OF DROPS	17	25	35				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**19.3%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**33**
Plastic Limit	**19**
Plastic Index	**14**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	5/29/2018	Michael D. Kelso, E.I.	5/31/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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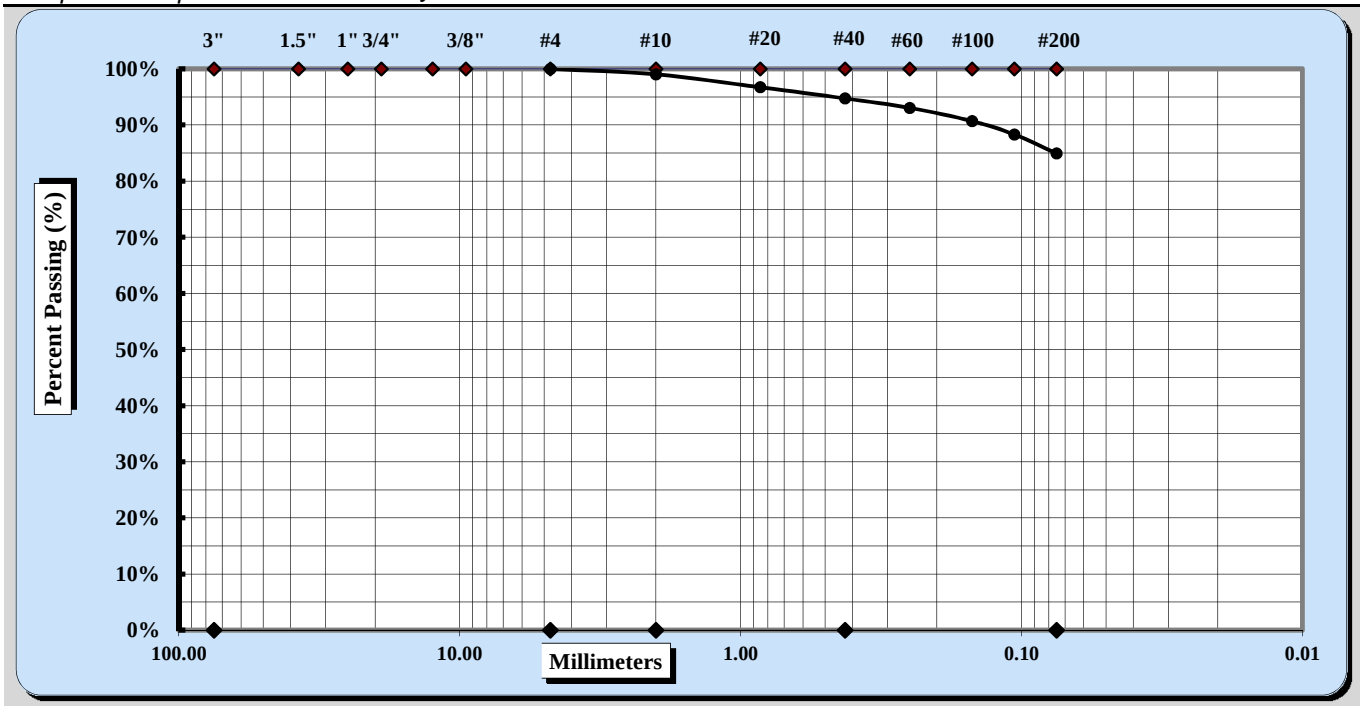
Sieve Analysis of Soils

Quality Assurance *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/31/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/25/18 - 5/29/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	RW-38	Type: Split Spoon	Sample Date: Various
Sample Log No.:	43-2321	Sample: 4	Depth: 6.0' - 8.0'
Sample Description:	Lean clay with sand (CL, A-6 (11))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	No. 4	Coarse Sand	1%	Fine Sand	10%
Gravel	0%	Medium Sand	4%	Silt & Clay	85%
Liquid Limit	33	Plastic Limit	19	Plastic Index	14

Coarse Sand	1%	Medium Sand	4%	Fine Sand	10%

Description of Sand & Gravel Particles: Rounded ☐ Angular ☒
Hard & Durable ☒ Soft ☒ Weathered & Friable ☒

Notes / Deviations / References:

Michael D. Kelso, E.I. — *Technical Responsibility*
Signature
Staff Professional — *Position*
5/31/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

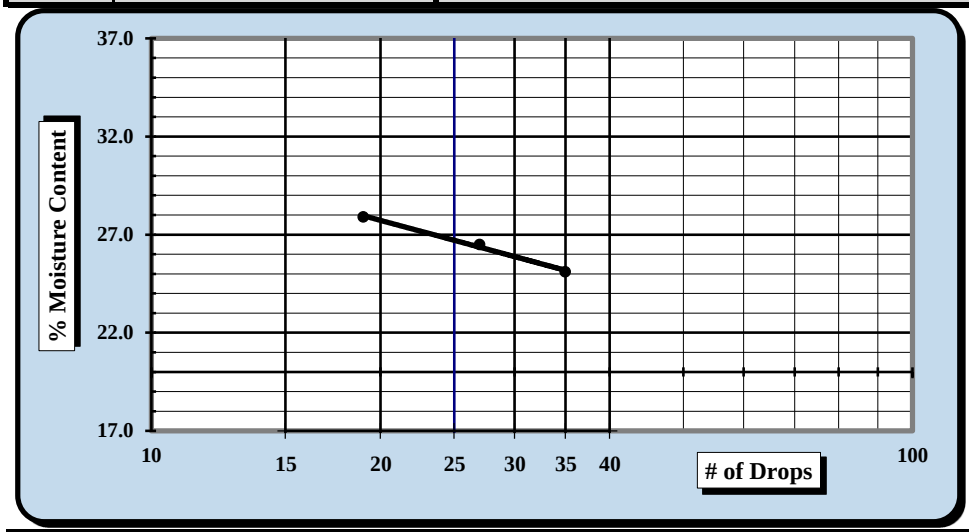
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/03/18
Project Name:	Carolina Crossroads Project	Test Date:	4/02/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-39	Sample #:	SS-2	Sample Date:	2/01/18
Location:	Embankment boring	Type:	Split-spoon	Depth:	2.0 - 4.0'
Sample Description:	Clayey Sand (SC, A-4(1))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

	Pan #	Liquid Limit						Plastic Limit		
	Tare #:	6	7	8				9	10	
A	Tare Weight	27.78	26.31	27.35				26.86	26.77	
B	Wet Soil Weight + A	44.05	40.33	40.56				32.93	33.03	
C	Dry Soil Weight + A	40.79	37.39	37.68				32.02	32.09	
D	Water Weight (B-C)	3.26	2.94	2.88				0.91	0.94	
E	Dry Soil Weight (C-A)	13.01	11.08	10.33				5.16	5.32	
F	% Moisture (D/E)*100	25.1%	26.5%	27.9%				17.6%	17.7%	
N	# OF DROPS	35	27	19				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**17.7%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**27**
Plastic Limit	**18**
Plastic Index	**9**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/03/18	Matthew F. Cooke, P.G.	4/03/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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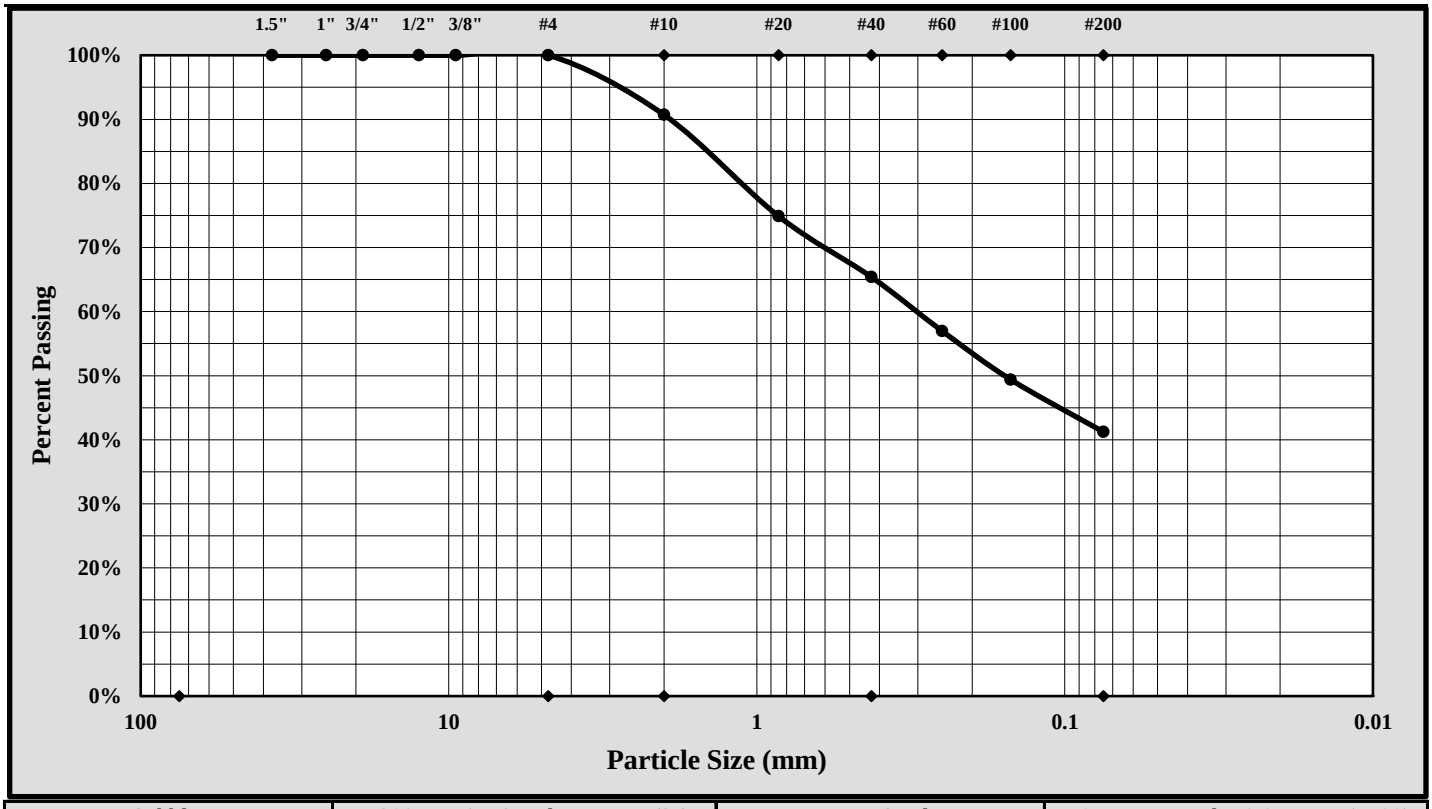
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/03/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/23 - 4/02/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	RW-39 Sample #: SS-2	Sample Date:	2/01/18
Location:	Embankment boring Type: Split-spoon	Depth:	2.0' - 4.0'
Sample Description:	Clayey Sand (SC, A-4(1))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	41.2%	Total Sand:	58.8%

Liquid Limit	27	Plastic Limit	18	Plastic Index	9
Coarse Sand:	9.3%	Medium Sand:	25.3%	Fine Sand:	24.2%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/03/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

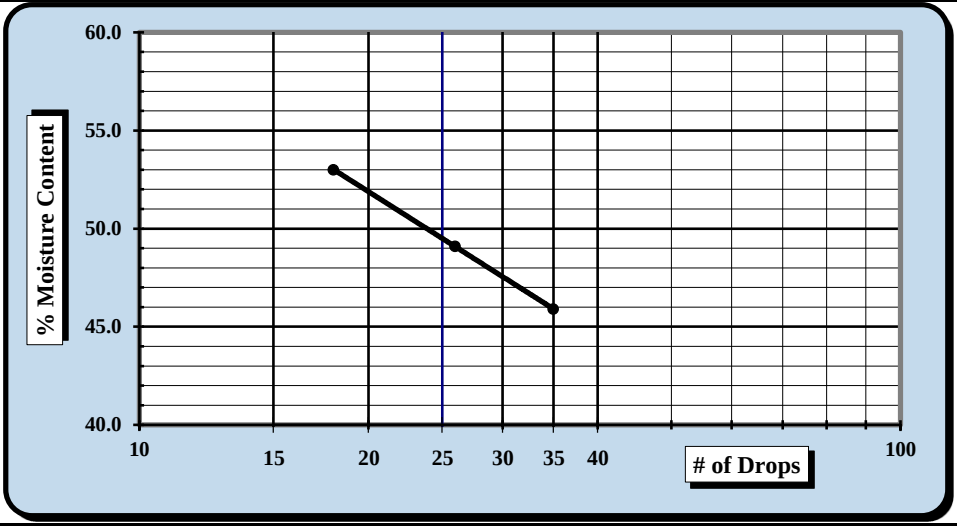
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/03/18
Project Name:	Carolina Crossroads Project	Test Date:	4/02/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-39	Sample #:	SS-4	Sample Date:	2/01/18
Location:	Embankment Boring	Type:	Split-spoon	Depth:	6.0' - 8.0'
Sample Description:	Sandy Fat Clay (CH, A-7-6(13))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	11	12	13				14	15	
A	Tare Weight	26.68	26.67	26.80				26.65	27.60	
B	Wet Soil Weight + A	41.98	39.09	40.74				34.40	35.94	
C	Dry Soil Weight + A	37.17	35.00	35.91				32.90	34.35	
D	Water Weight (B-C)	4.81	4.09	4.83				1.50	1.59	
E	Dry Soil Weight (C-A)	10.49	8.33	9.11				6.25	6.75	
F	% Moisture (D/E)*100	45.9%	49.1%	53.0%				24.0%	23.6%	
N	# OF DROPS	35	26	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**23.8%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**50**
Plastic Limit	**24**
Plastic Index	**26**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/03/18	Matthew F. Cooke, P.G.	4/03/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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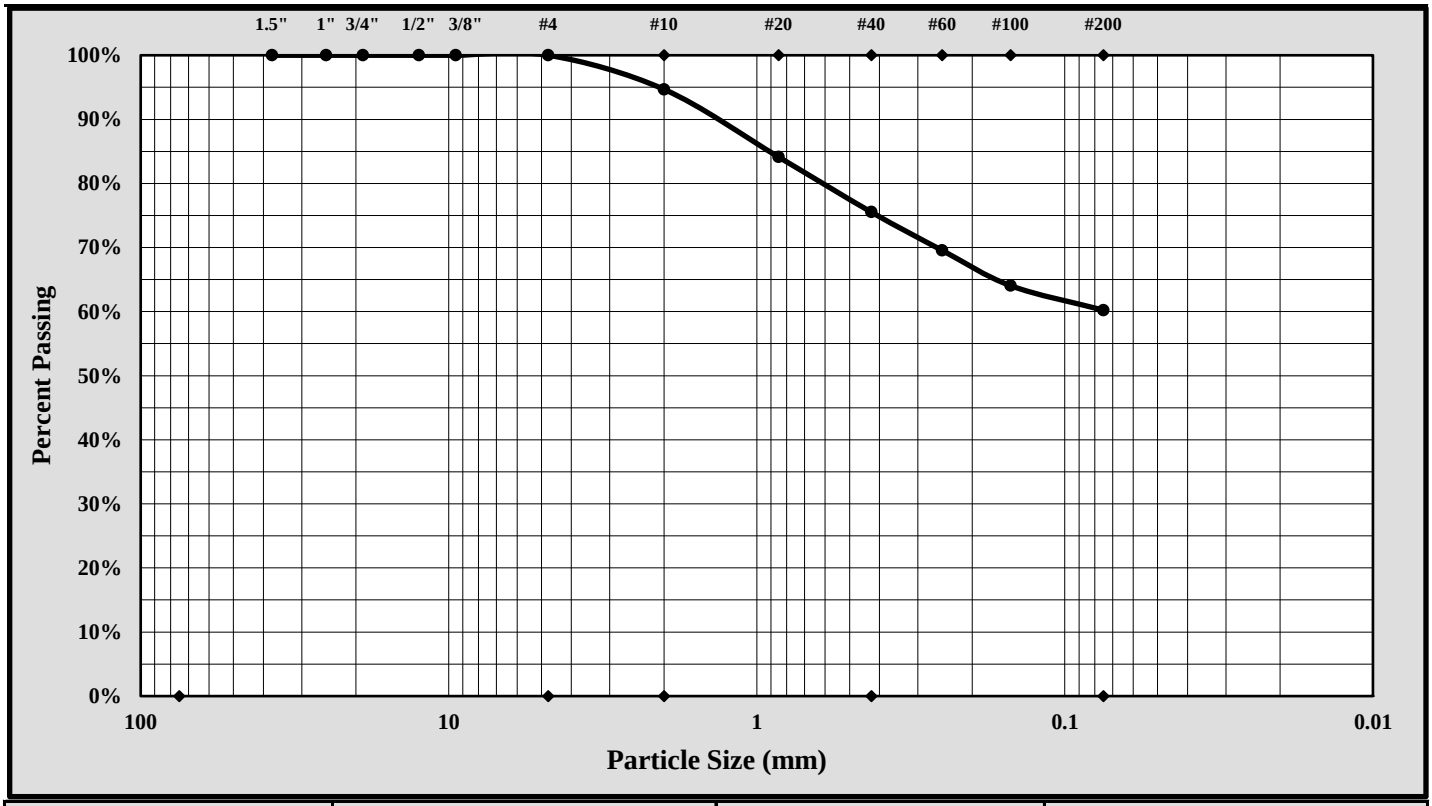
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/03/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/23 - 4/02/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	RW-39 Sample #: SS-4	Sample Date:	2/01/18
Location:	Embankment Boring Type: Split-spoon	Depth:	6.0' - 8.0'
Sample Description:	Sandy Fat Clay (CH, A-7-6(13))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	60.2%	Total Sand:	39.8%

Liquid Limit	50	Plastic Limit	24	Plastic Index	26
Coarse Sand:	5.3%	Medium Sand:	19.1%	Fine Sand:	15.3%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/03/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

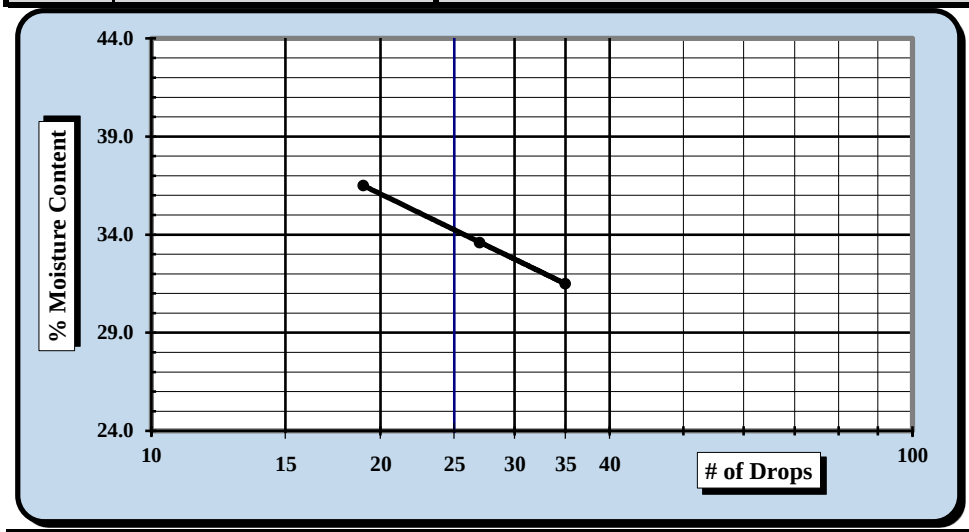
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/03/18
Project Name:	Carolina Crossroads Project	Test Date:	4/02/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-39	Sample #:	SS-7	Sample Date:	2/01/18
Location:	Embankment Boring	Type:	Split-spoon	Depth:	18.5' - 20.0'
Sample Description:	Silty Sand (SM, A-4(0))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	16	17	18				19	20	
A	Tare Weight	26.58	26.62	26.80				26.68	26.83	
B	Wet Soil Weight + A	40.73	42.44	44.96				33.30	32.99	
C	Dry Soil Weight + A	37.34	38.46	40.10				31.88	31.65	
D	Water Weight (B-C)	3.39	3.98	4.86				1.42	1.34	
E	Dry Soil Weight (C-A)	10.76	11.84	13.30				5.20	4.82	
F	% Moisture (D/E)*100	31.5%	33.6%	36.5%				27.3%	27.8%	
N	# OF DROPS	35	27	19				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**27.6%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐
Liquid Limit **34**
Plastic Limit **28**
Plastic Index **6**
Group Symbol **ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/03/18	Matthew F. Cooke, P.G.	4/03/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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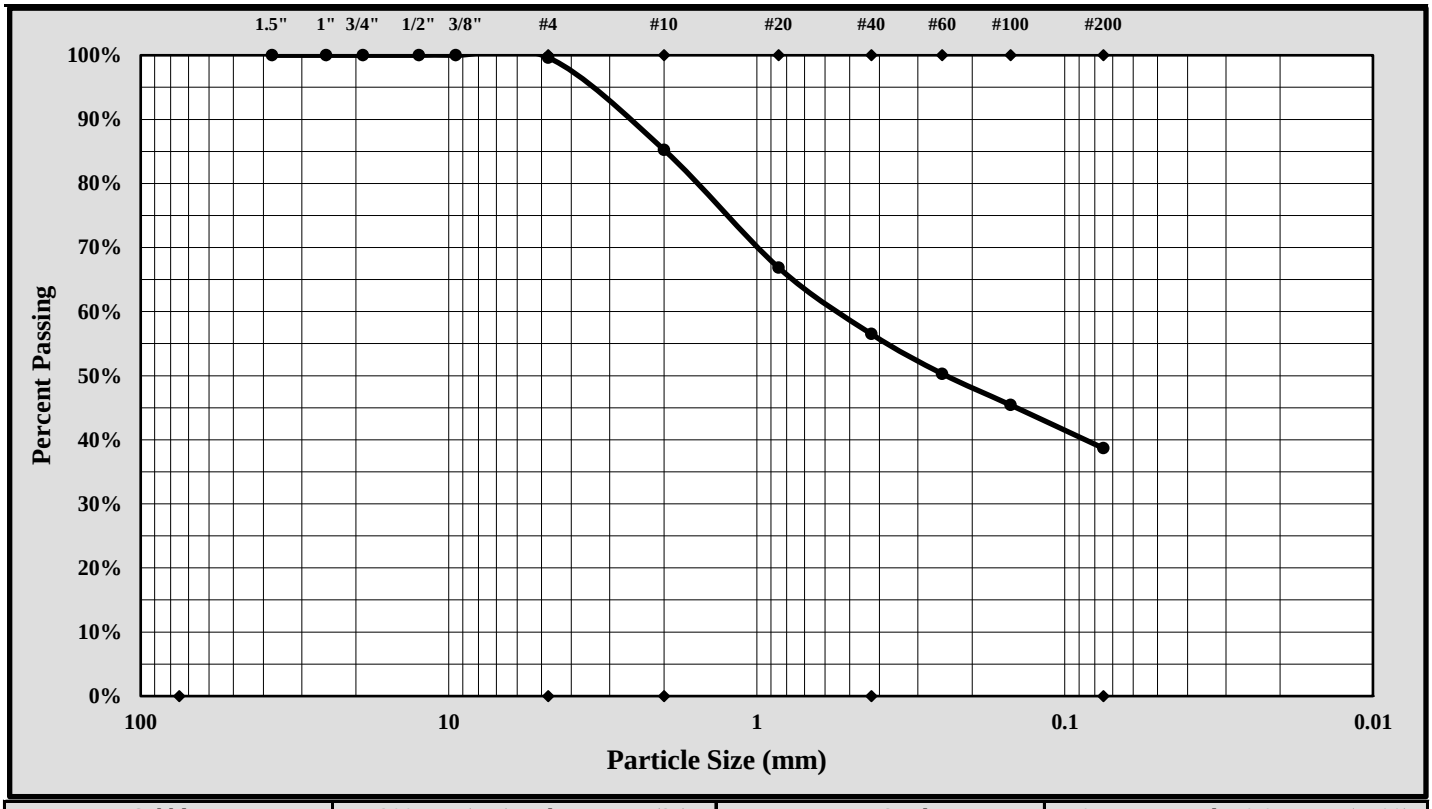
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/03/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/23 - 4/02/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	RW-39	Sample #: SS-7	Sample Date: 2/01/18
Location:	Embankment Boring	Type: Split-spoon	Depth: 18.5' - 20.0'
Sample Description:	Silty Sand (SM, A-4(0))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.4%
Silt & Clay (% Passing #200):	38.7%	Total Sand:	61.0%

Liquid Limit	34	Plastic Limit	28	Plastic Index	6
Coarse Sand:	14.4%	Medium Sand:	28.7%	Fine Sand:	17.8%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/03/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/03/18
Project Name:	Carolina Crossroads Project	Test Date:	4/02/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-40	Sample #:	SS-2	Sample Date:	2/13/18
Location:	Embankment Boring	Type:	Split-spoon	Depth:	2.0' - 4.0'
Sample Description:	Silt with Sand (ML, A-7-5(11))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	21	22	23				24	25	
A	Tare Weight	28.09	25.67	27.24				25.99	26.81	
B	Wet Soil Weight + A	45.32	39.01	45.44				33.70	33.91	
C	Dry Soil Weight + A	40.37	34.96	39.61				31.84	32.18	
D	Water Weight (B-C)	4.95	4.05	5.83				1.86	1.73	
E	Dry Soil Weight (C-A)	12.28	9.29	12.37				5.85	5.37	
F	% Moisture (D/E)*100	40.3%	43.6%	47.1%				31.8%	32.2%	
N	# OF DROPS	35	23	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**32.0%**		

One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**43**
Plastic Limit	**32**
Plastic Index	**11**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/03/18	Matthew F. Cooke, P.G.	4/03/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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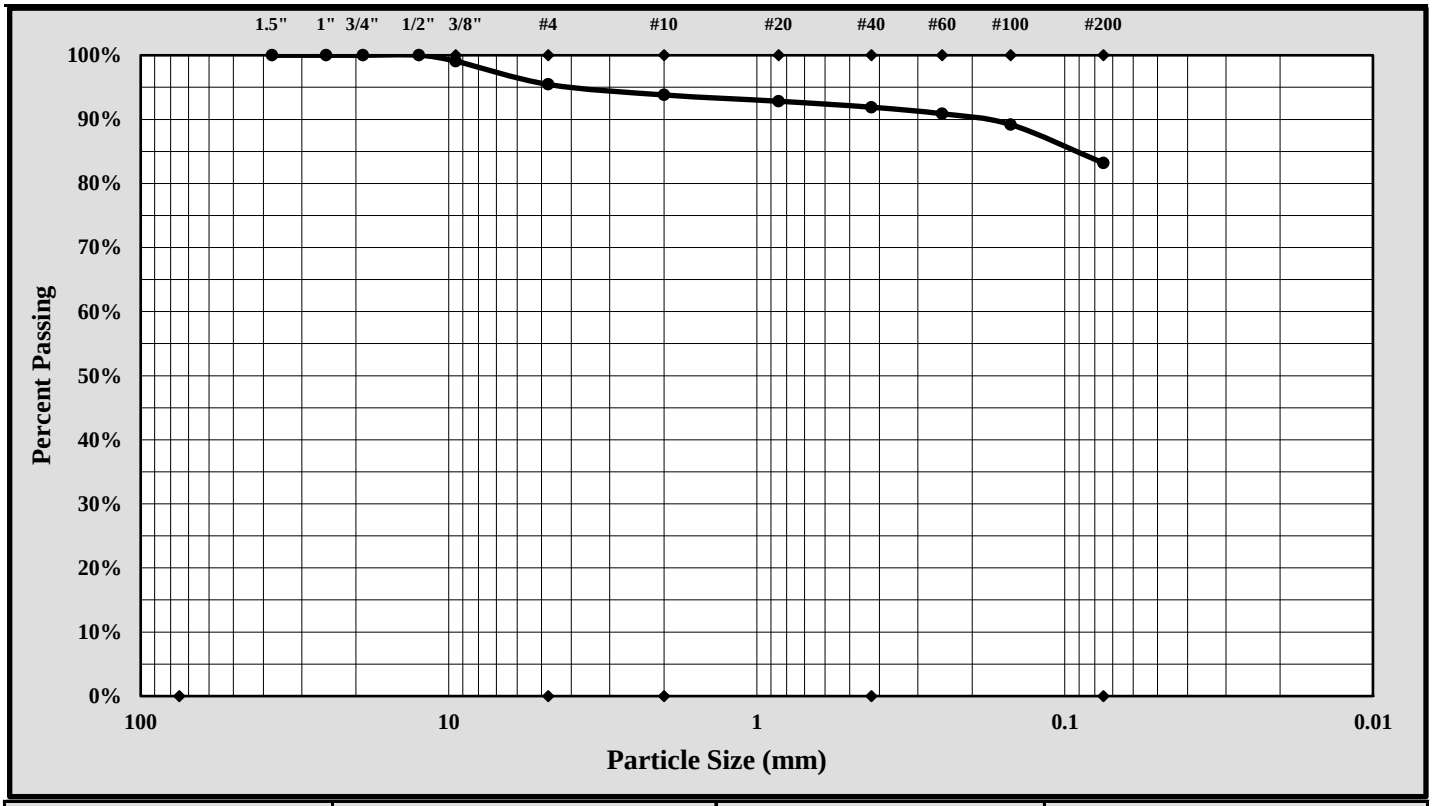
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/03/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/23 - 4/02/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	RW-40 Sample #: SS-2	Sample Date:	2/13/18
Location:	Embankment Boring Type: Split-spoon	Depth:	2.0' - 4.0'
Sample Description:	Silt with Sand (ML, A-7-5(11))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	9.50 mm	Gravel:	4.6%
Silt & Clay (% Passing #200):	83.2%	Total Sand:	12.3%

Liquid Limit	43	Plastic Limit	32	Plastic Index	11
Coarse Sand:	1.6%	Medium Sand:	1.9%	Fine Sand:	8.7%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/03/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

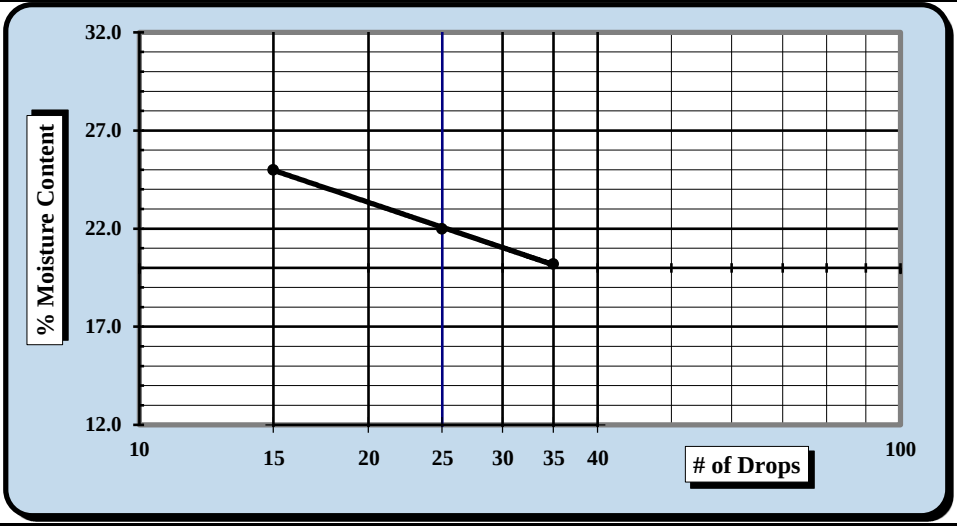
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/08/18
Project Name:	Carolina Crossroads Project	Test Date:	5/07/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-41	Sample #:	SS-1	Sample Date:	3/14/18
Location:	Embankment Boring	Type:	Split-spoon	Depth:	0.0' - 2.0'
Sample Description:	Silty Clayey Sand (SC-SM, A-4(0))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	1	2	3				4	5	
A	Tare Weight	26.70	26.48	26.32				25.93	26.94	
B	Wet Soil Weight + A	42.21	44.00	40.36				32.99	34.43	
C	Dry Soil Weight + A	39.60	40.84	37.55				32.04	33.43	
D	Water Weight (B-C)	2.61	3.16	2.81				0.95	1.00	
E	Dry Soil Weight (C-A)	12.90	14.36	11.23				6.11	6.49	
F	% Moisture (D/E)*100	20.2%	22.0%	25.0%				15.5%	15.4%	
N	# OF DROPS	35	25	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**15.5%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**22**
Plastic Limit	**15**
Plastic Index	**7**
Group Symbol	**CL-ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/08/18	Matthew F. Cooke, P.G.	5/08/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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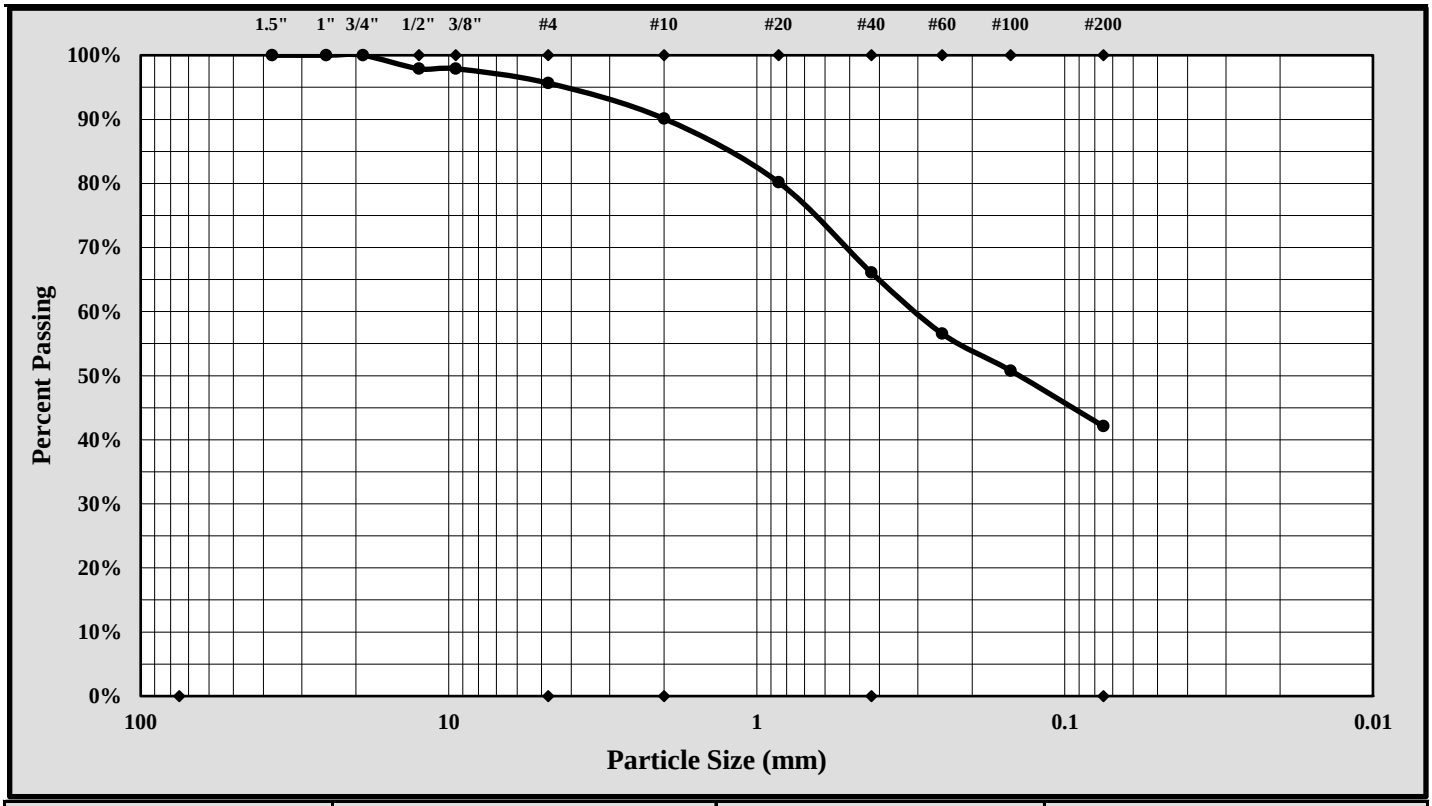
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/08/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/05 - 5/08/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	RW-41 Sample #: SS-1	Sample Date:	3/14/18
Location:	Embankment Boring Type: Split-spoon	Depth:	0.0' - 2.0'
Sample Description:	Silty Clayey Sand (SC-SM, A-4(0))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	19.0 mm	Gravel:	4.4%
Silt & Clay (% Passing #200):	42.1%	Total Sand:	53.5%

Liquid Limit	22	Plastic Limit	15	Plastic Index	7
Coarse Sand:	5.5%	Medium Sand:	24.0%	Fine Sand:	24.0%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/08/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

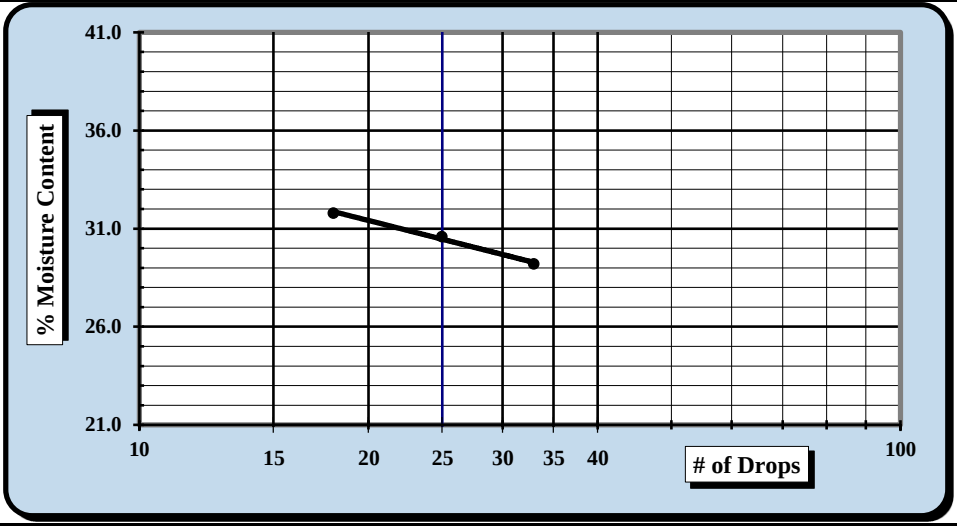
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/08/18
Project Name:	Carolina Crossroads Project	Test Date:	5/07/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-41	Sample #:	SS-2	Sample Date:	3/14/18
Location:	Embankment Boring	Type:	Split-spoon	Depth:	2.0' - 4.0'
Sample Description:	Sandy Lean Clay (CL, A-6(5))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	6	7	8				9	10	
A	Tare Weight	27.75	26.31	27.30				26.84	26.74	
B	Wet Soil Weight + A	47.19	42.52	40.93				33.56	34.53	
C	Dry Soil Weight + A	42.80	38.72	37.64				32.56	33.38	
D	Water Weight (B-C)	4.39	3.80	3.29				1.00	1.15	
E	Dry Soil Weight (C-A)	15.05	12.41	10.34				5.72	6.64	
F	% Moisture (D/E)*100	29.2%	30.6%	31.8%				17.5%	17.3%	
N	# OF DROPS	33	25	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**17.4%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**31**
Plastic Limit	**17**
Plastic Index	**14**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/08/18	Matthew F. Cooke, P.G.	5/08/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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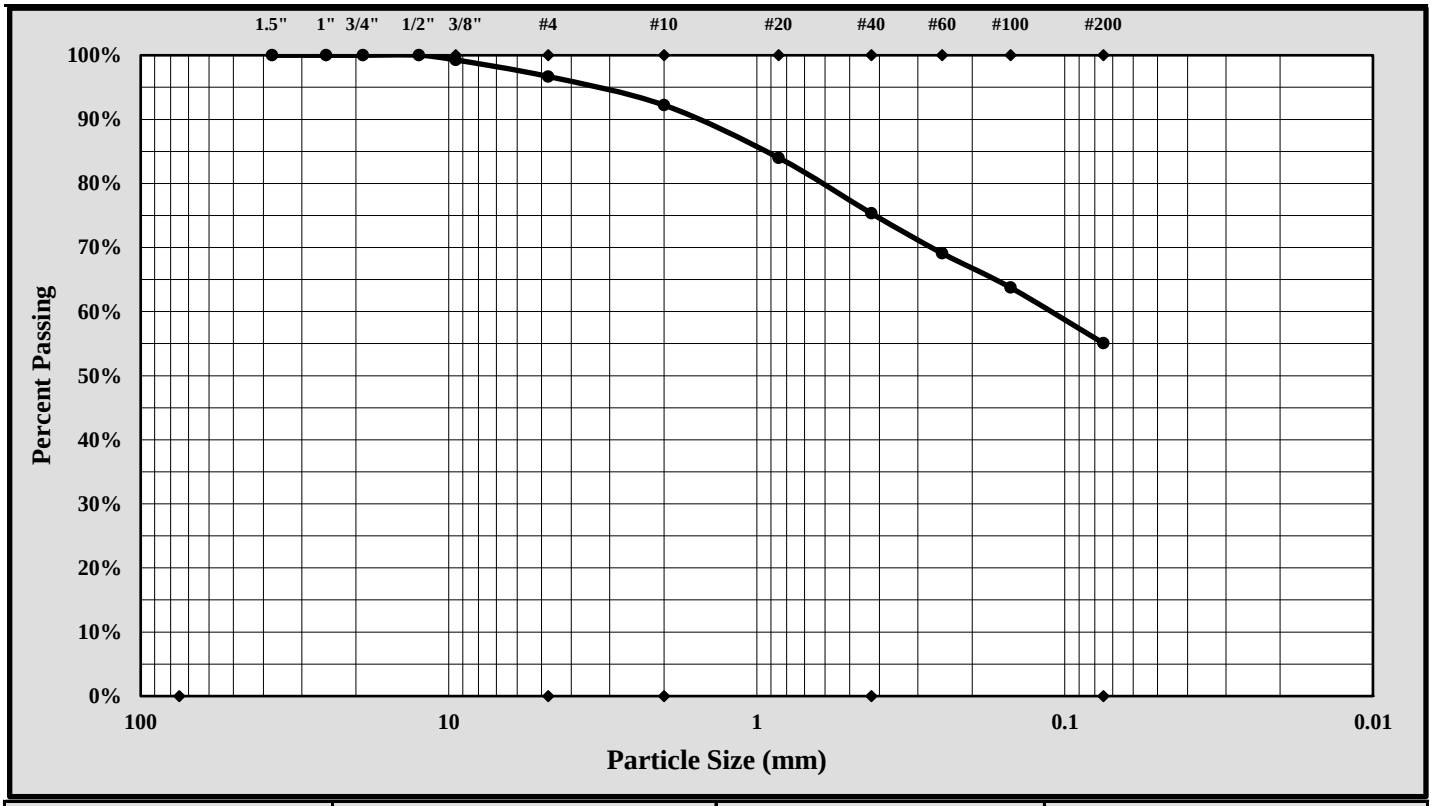
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/08/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/05 - 5/08/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	RW-41 Sample #: SS-2	Sample Date:	3/14/18
Location:	Embankment Boring Type: Split-spoon	Depth:	2.0' - 4.0'
Sample Description:	Sandy Lean Clay (CL, A-6(5))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	9.50 mm	Gravel:	3.3%
Silt & Clay (% Passing #200):	55.1%	Total Sand:	41.6%

Liquid Limit	31	Plastic Limit	17	Plastic Index	14
Coarse Sand:	4.5%	Medium Sand:	16.9%	Fine Sand:	20.3%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/08/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

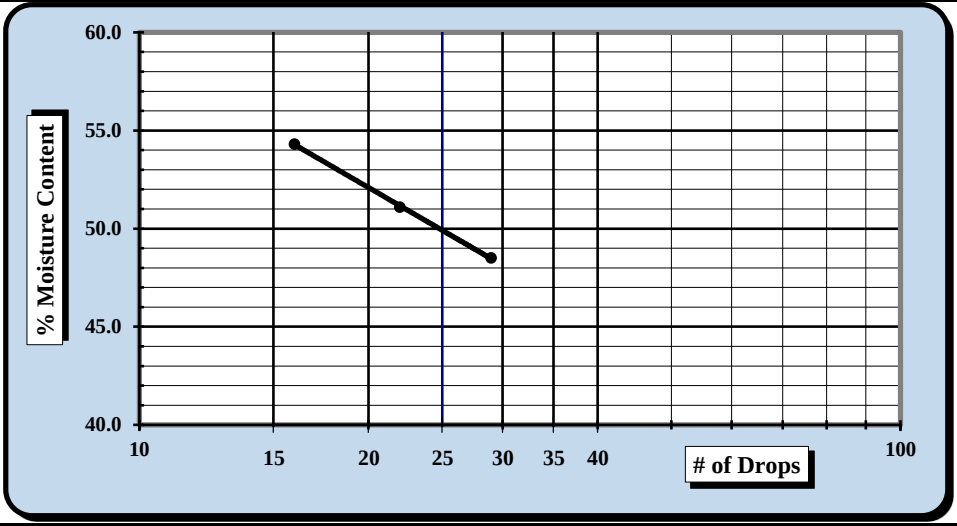
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/08/18
Project Name:	Carolina Crossroads Project	Test Date:	5/07/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-41	Sample #:	SS-4	Sample Date:	3/14/18
Location:	Embankment Boring	Type:	Split-spoon	Depth:	6.0' - 8.0'
Sample Description:	Elastic Silt with Sand (MH, A-7-5(19))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	11	12	13				14	15	
A	Tare Weight	26.68	26.66	26.76				26.64	27.60	
B	Wet Soil Weight + A	41.72	40.32	42.48				34.14	34.84	
C	Dry Soil Weight + A	36.81	35.70	36.95				32.39	33.15	
D	Water Weight (B-C)	4.91	4.62	5.53				1.75	1.69	
E	Dry Soil Weight (C-A)	10.13	9.04	10.19				5.75	5.55	
F	% Moisture (D/E)*100	48.5%	51.1%	54.3%				30.4%	30.5%	
N	# OF DROPS	29	22	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**30.5%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**50**
Plastic Limit	**30**
Plastic Index	**20**
Group Symbol	**MH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/08/18	Matthew F. Cooke, P.G.	5/08/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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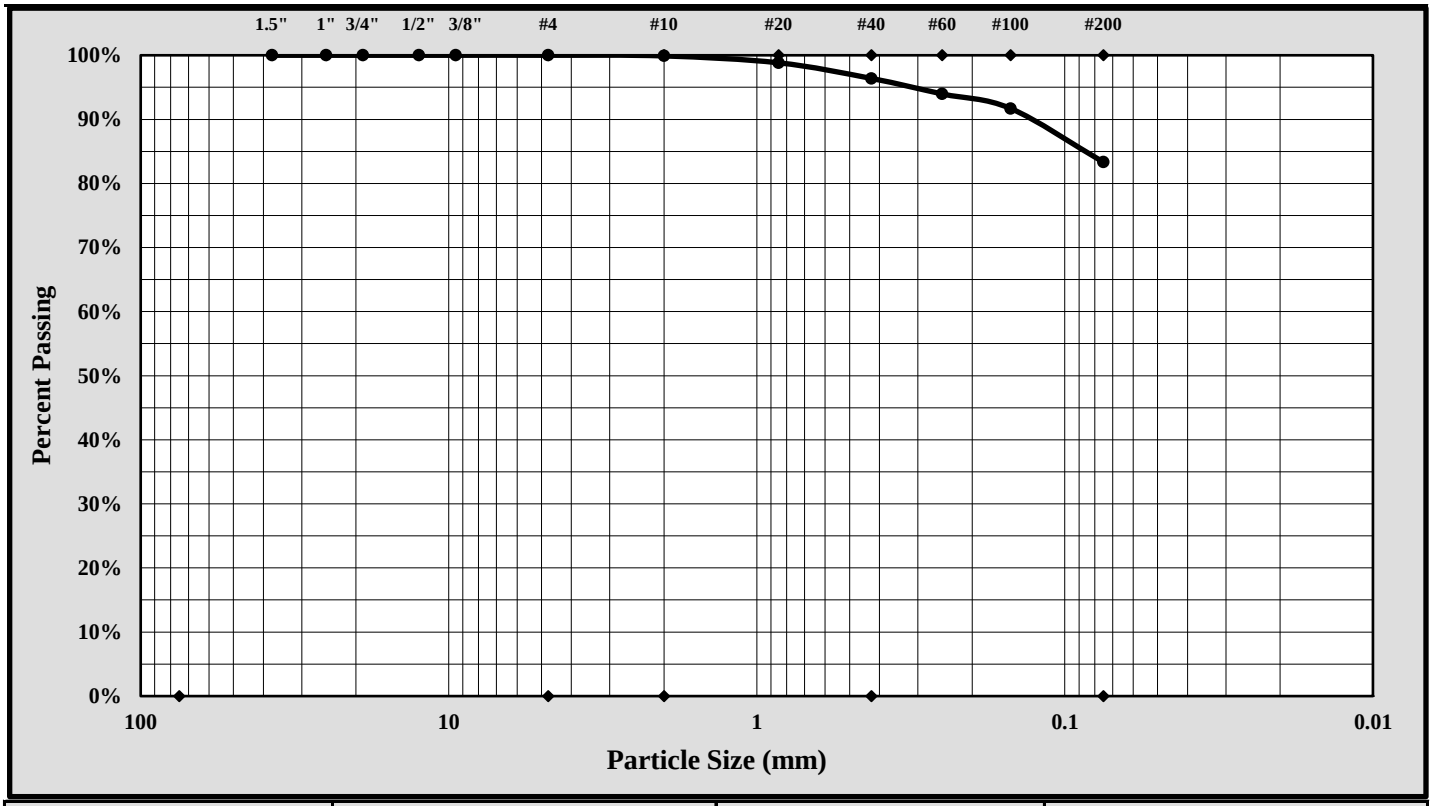
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/08/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/05 - 5/08/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	RW-41 Sample #: SS-4	Sample Date:	3/14/18
Location:	Embankment Boring Type: Split-spoon	Depth:	6.0' - 8.0'
Sample Description:	Elastic Silt with Sand (MH, A-7-5(19))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	2.00 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	83.3%	Total Sand:	16.7%

Liquid Limit	50	Plastic Limit	30	Plastic Index	20
Coarse Sand:	0.1%	Medium Sand:	3.5%	Fine Sand:	13.1%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/08/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

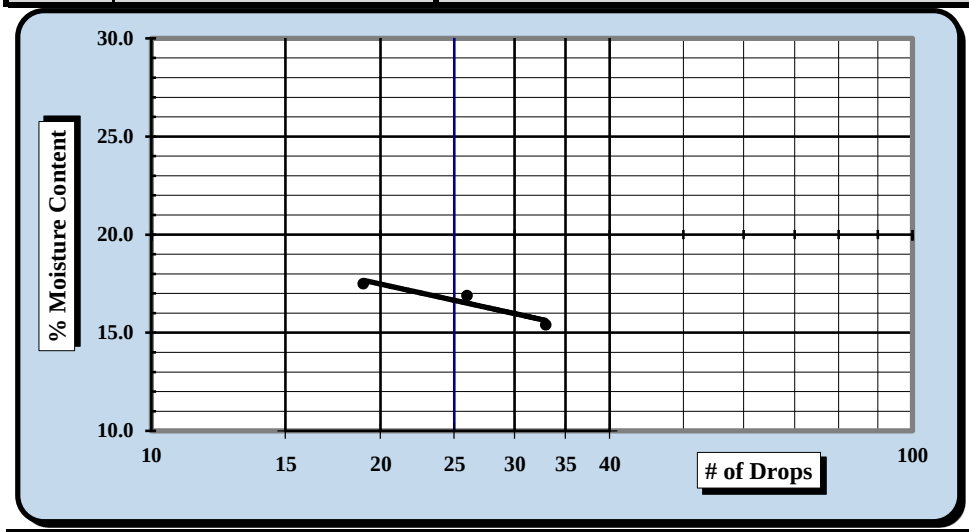
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/08/18
Project Name:	Carolina Crossroads Project	Test Date:	5/07/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-42	Sample #:	SS-1	Sample Date:	3/15/18
Location:	Embankment Boring	Type:	Split-spoon	Depth:	0.0' - 2.0'
Sample Description:	Silty Clayey Sand (SC-SM, A-4(0))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	16	17	18				19	20	
A	Tare Weight	26.60	26.62	26.78				26.67	26.84	
B	Wet Soil Weight + A	48.61	45.62	45.56				33.50	33.59	
C	Dry Soil Weight + A	45.68	42.87	42.76				32.86	32.94	
D	Water Weight (B-C)	2.93	2.75	2.80				0.64	0.65	
E	Dry Soil Weight (C-A)	19.08	16.25	15.98				6.19	6.10	
F	% Moisture (D/E)*100	15.4%	16.9%	17.5%				10.3%	10.7%	
N	# OF DROPS	33	26	19				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**10.5%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐
Liquid Limit **17**
Plastic Limit **11**
Plastic Index **6**
Group Symbol **CL-ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/08/18	Matthew F. Cooke, P.G.	5/08/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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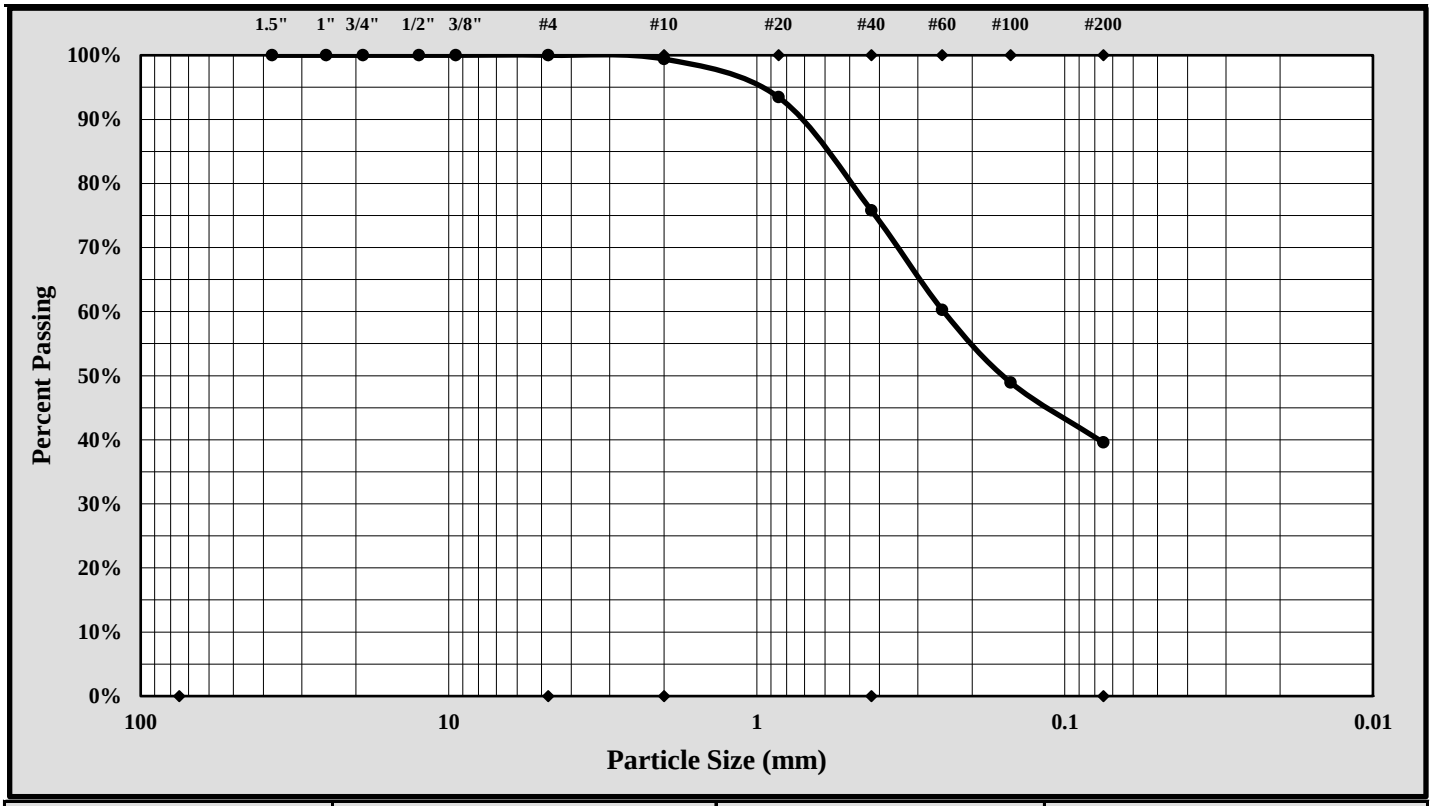
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/08/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/05 - 5/08/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	RW-42 Sample #: SS-1	Sample Date:	3/15/18
Location:	Embankment Boring Type: Split-spoon	Depth:	0.0' - 2.0'
Sample Description:	Silty Clayey Sand (SC-SM, A-4(0))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	2.00 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	39.6%	Total Sand:	60.4%

Liquid Limit	17	Plastic Limit	11	Plastic Index	6
Coarse Sand:	0.6%	Medium Sand:	23.6%	Fine Sand:	36.2%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/08/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

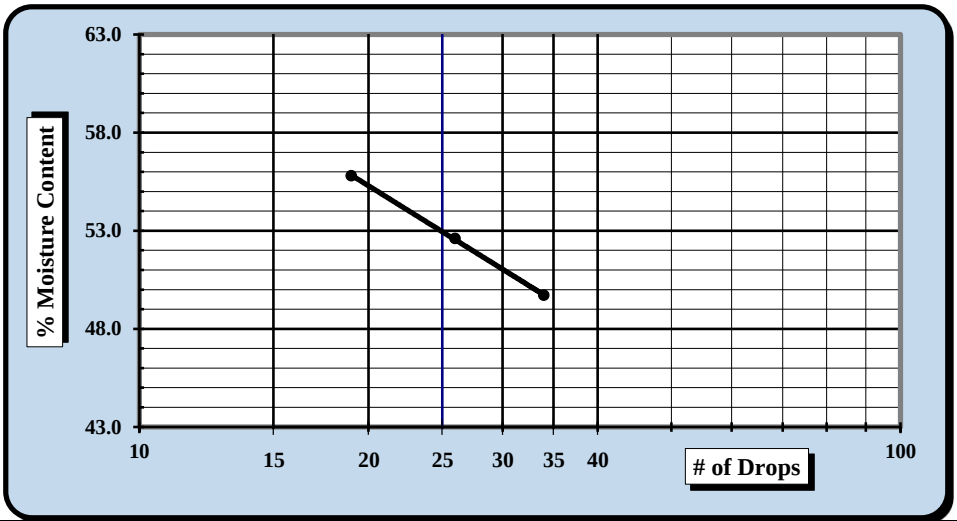
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/08/18
Project Name:	Carolina Crossroads Project	Test Date:	5/07/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-42	Sample #:	SS-4	Sample Date:	3/15/18
Location:	Embankment Boring	Type:	Split-spoon	Depth:	6.0' - 8.0'
Sample Description:	Sandy Elastic Silt (MH, A-7-5(15))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	21	22	23				24	25	
A	Tare Weight	28.08	25.68	27.29				25.99	26.78	
B	Wet Soil Weight + A	43.56	41.38	41.95				34.17	34.30	
C	Dry Soil Weight + A	38.42	35.97	36.70				32.22	32.51	
D	Water Weight (B-C)	5.14	5.41	5.25				1.95	1.79	
E	Dry Soil Weight (C-A)	10.34	10.29	9.41				6.23	5.73	
F	% Moisture (D/E)*100	49.7%	52.6%	55.8%				31.3%	31.2%	
N	# OF DROPS	34	26	19				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**31.3%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**53**
Plastic Limit	**31**
Plastic Index	**22**
Group Symbol	**MH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/08/18	Matthew F. Cooke, P.G.	5/08/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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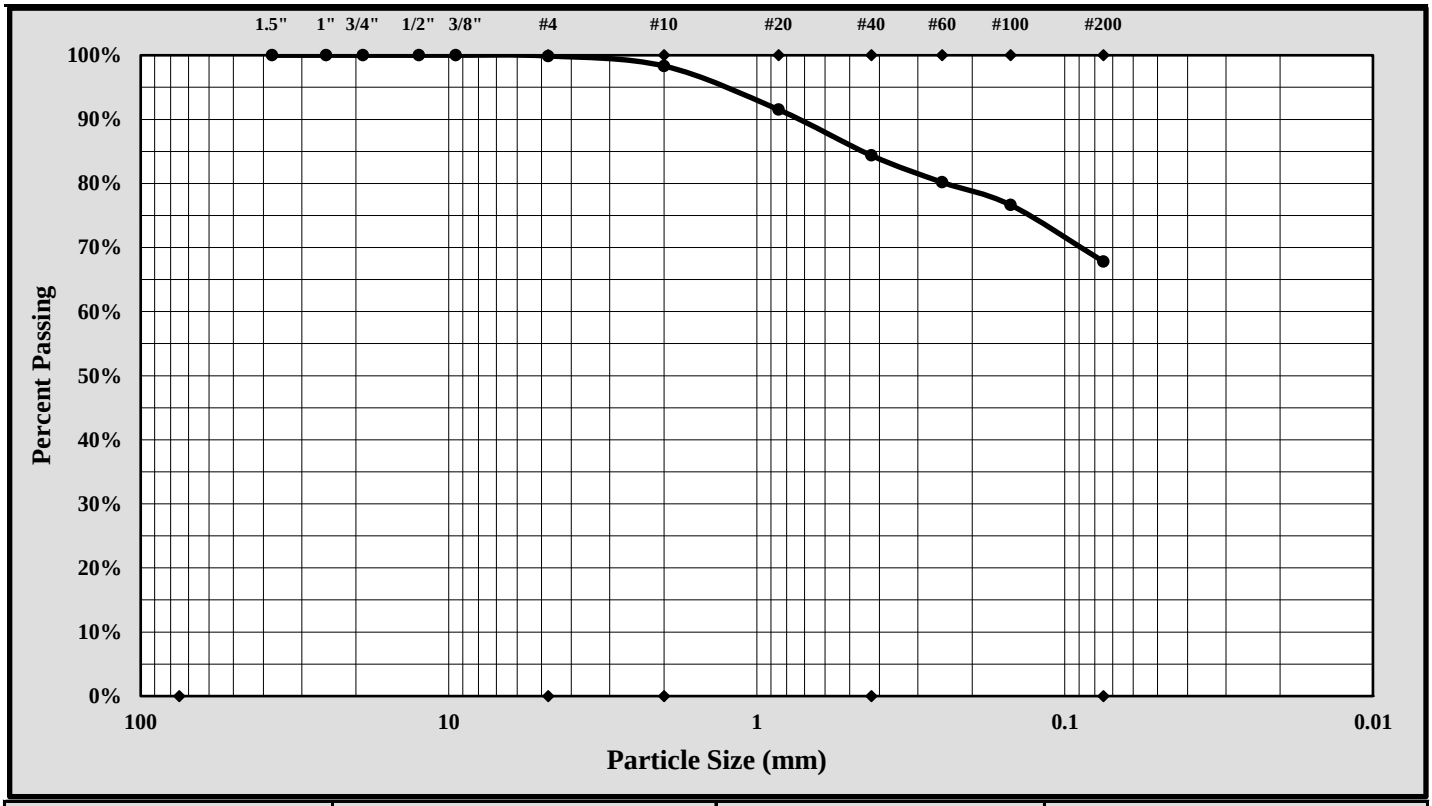
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/08/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/05 - 5/08/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	RW-42 Sample #: SS-4	Sample Date:	3/15/18
Location:	Embankment Boring Type: Split-spoon	Depth:	6.0' - 8.0'
Sample Description:	Sandy Elastic Silt (MH, A-7-5(15))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.1%
Silt & Clay (% Passing #200):	67.8%	Total Sand:	32.1%

Liquid Limit	53	Plastic Limit	31	Plastic Index	22
Coarse Sand:	1.6%	Medium Sand:	14.0%	Fine Sand:	16.5%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/08/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

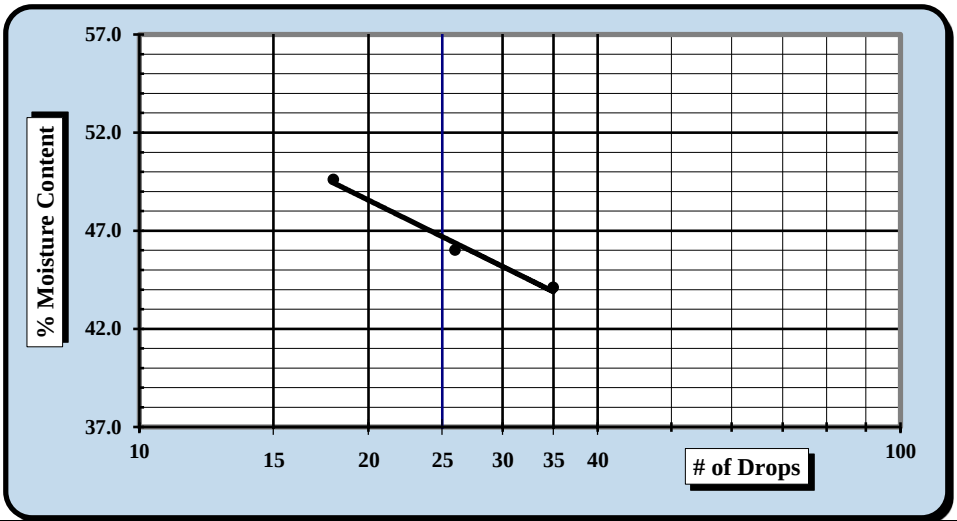
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/08/18
Project Name:	Carolina Crossroads Project	Test Date:	5/07/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-42	Sample #:	SS-7	Sample Date:	3/15/18
Location:	Embankment Boring	Type:	Split-spoon	Depth:	18.5' - 20.0'
Sample Description:	Sandy Lean Clay (CL, A-7-6(16))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

	Pan #	Liquid Limit						Plastic Limit		
	Tare #:	26	27	28				29	30	
A	Tare Weight	27.34	26.97	26.83				26.99	27.37	
B	Wet Soil Weight + A	42.59	41.26	41.88				36.06	34.87	
C	Dry Soil Weight + A	37.92	36.76	36.89				34.64	33.70	
D	Water Weight (B-C)	4.67	4.50	4.99				1.42	1.17	
E	Dry Soil Weight (C-A)	10.58	9.79	10.06				7.65	6.33	
F	% Moisture (D/E)*100	44.1%	46.0%	49.6%				18.6%	18.5%	
N	# OF DROPS	35	26	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**18.6%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**47**
Plastic Limit	**19**
Plastic Index	**28**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/08/18	Matthew F. Cooke, P.G.	5/08/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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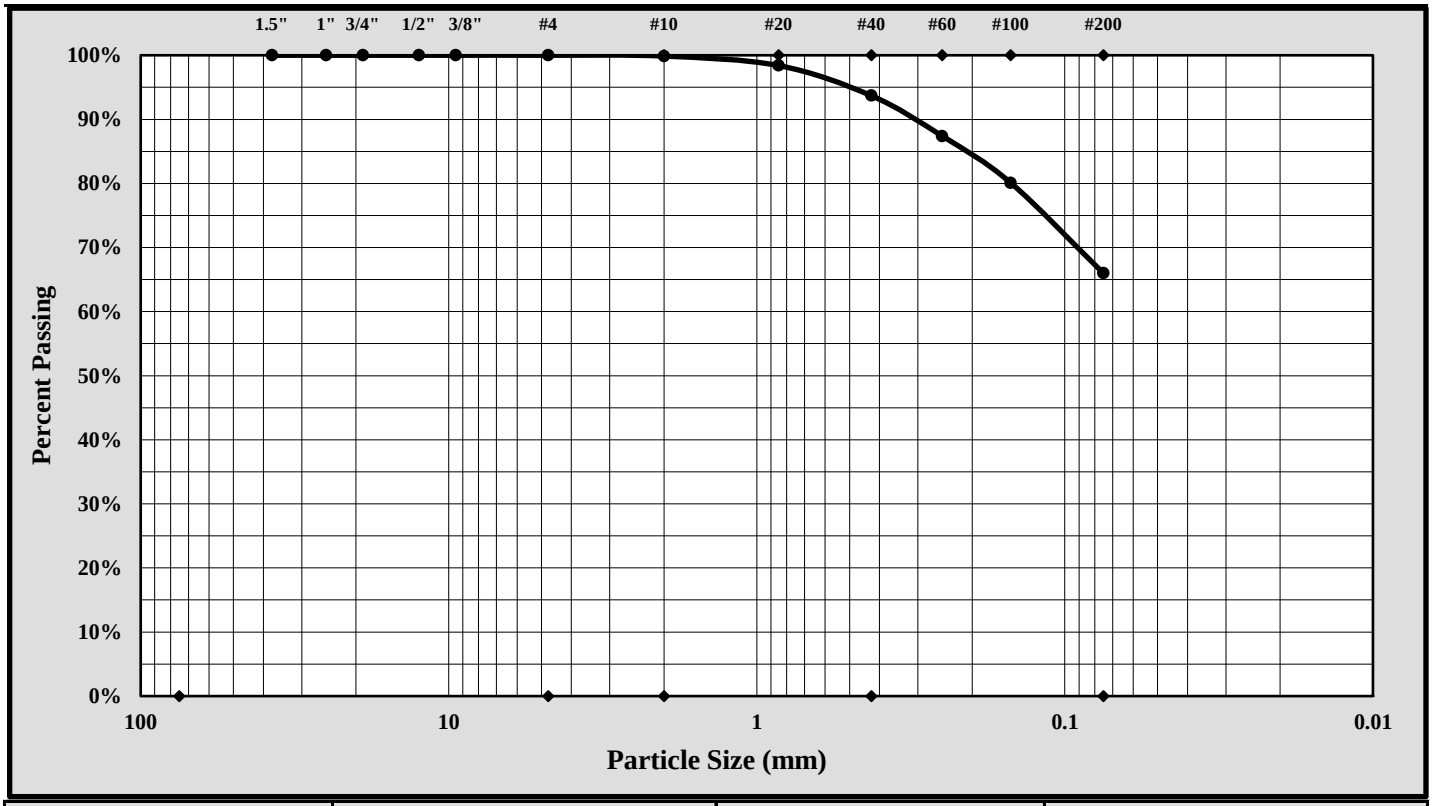
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/08/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/05 - 5/08/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	RW-42 Sample #: SS-7	Sample Date:	3/15/18
Location:	Embankment Boring Type: Split-spoon	Depth:	18.5' - 20.0'
Sample Description:	Sandy Lean Clay (CL, A-7-6(16))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	2.00 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	66.0%	Total Sand:	34.0%

Liquid Limit	47	Plastic Limit	19	Plastic Index	28
Coarse Sand:	0.1%	Medium Sand:	6.2%	Fine Sand:	27.7%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/08/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

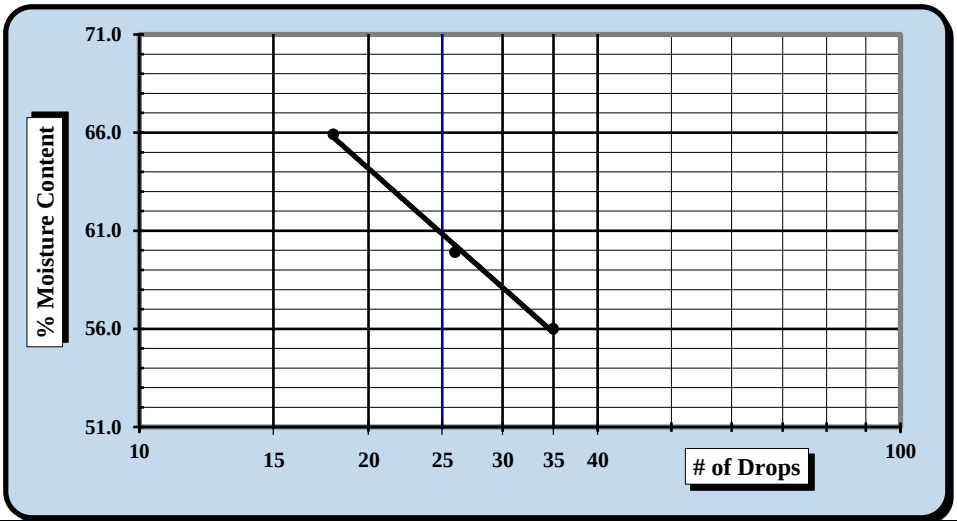
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/08/18
Project Name:	Carolina Crossroads Project	Test Date:	5/07/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-42	Sample #:	SS-10	Sample Date:	3/15/18
Location:	Embankment Boring	Type:	Split-spoon	Depth:	33.5' - 35.0'
Sample Description:	Clayey Sand (SC, A-2-7(3))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	31	32	33				34	35	
A	Tare Weight	28.63	27.64	26.69				28.25	26.95	
B	Wet Soil Weight + A	40.72	40.29	41.89				36.42	34.23	
C	Dry Soil Weight + A	36.38	35.55	35.85				34.55	32.58	
D	Water Weight (B-C)	4.34	4.74	6.04				1.87	1.65	
E	Dry Soil Weight (C-A)	7.75	7.91	9.16				6.30	5.63	
F	% Moisture (D/E)*100	56.0%	59.9%	65.9%				29.7%	29.3%	
N	# OF DROPS	35	26	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**29.5%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**61**
Plastic Limit	**30**
Plastic Index	**31**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/08/18	Matthew F. Cooke, P.G.	5/08/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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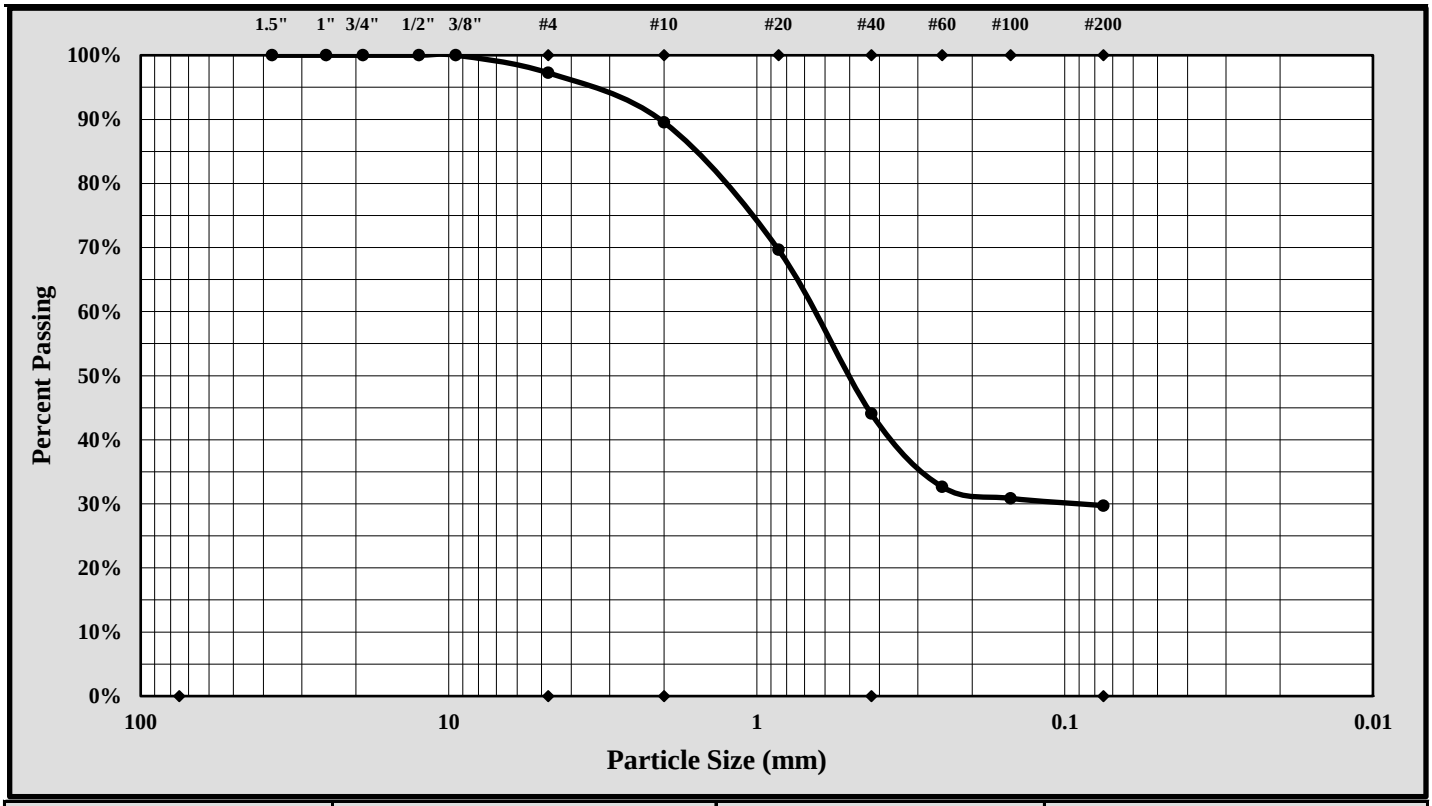
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/08/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/05 - 5/08/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	RW-42 Sample #: SS-10	Sample Date:	3/15/18
Location:	Embankment Boring Type: Split-spoon	Depth:	33.5' - 35.0'
Sample Description:	Clayey Sand (SC, A-2-7(3))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	9.50 mm	Gravel:	2.8%
Silt & Clay (% Passing #200):	29.7%	Total Sand:	67.5%

Liquid Limit	61	Plastic Limit	30	Plastic Index	31
Coarse Sand:	7.7%	Medium Sand:	45.4%	Fine Sand:	14.4%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/08/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

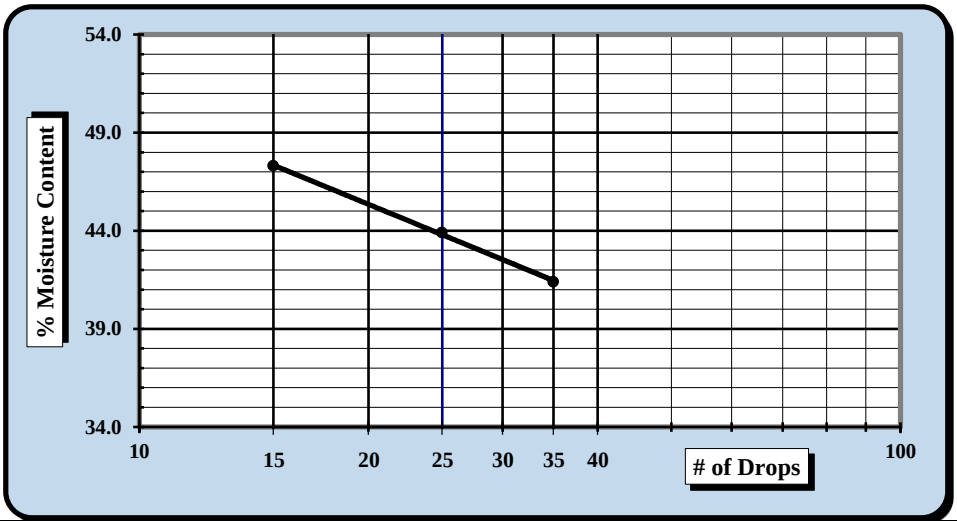
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/08/18
Project Name:	Carolina Crossroads Project	Test Date:	5/07/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-42	Sample #:	SS-12	Sample Date:	3/15/18
Location:	Embankment Boring	Type:	Split-spoon	Depth:	43.5' - 45.0'
Sample Description:	Clayey Sand (SC, A-2-7(0))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	36	37	38				39	40	
A	Tare Weight	25.68	26.22	26.29				25.88	26.27	
B	Wet Soil Weight + A	41.11	42.95	41.46				32.60	34.80	
C	Dry Soil Weight + A	36.59	37.85	36.59				31.20	33.01	
D	Water Weight (B-C)	4.52	5.10	4.87				1.40	1.79	
E	Dry Soil Weight (C-A)	10.91	11.63	10.30				5.32	6.74	
F	% Moisture (D/E)*100	41.4%	43.9%	47.3%				26.3%	26.6%	
N	# OF DROPS	35	25	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**26.5%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**44**
Plastic Limit	**26**
Plastic Index	**18**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/08/18	Matthew F. Cooke, P.G.	5/08/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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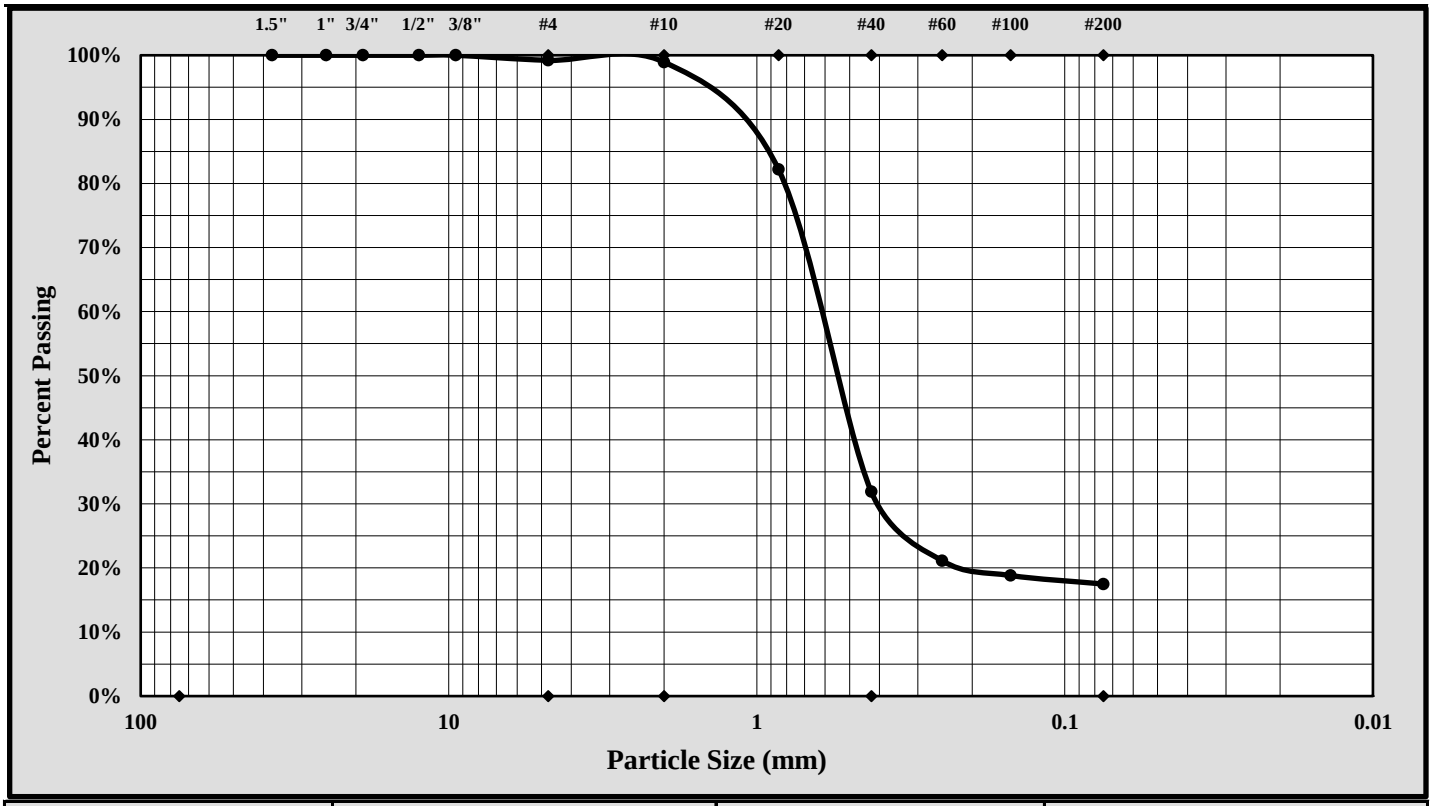
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/08/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/05 - 5/08/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	RW-42 Sample #: SS-12	Sample Date:	3/15/18
Location:	Embankment Boring Type: Split-spoon	Depth:	43.5' - 45.0'
Sample Description:	Clayey Sand (SC, A-2-7(0))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.8%
Silt & Clay (% Passing #200):	17.5%	Total Sand:	81.7%

Liquid Limit	44	Plastic Limit	26	Plastic Index	18
Coarse Sand:	0.3%	Medium Sand:	67.1%	Fine Sand:	14.4%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/08/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

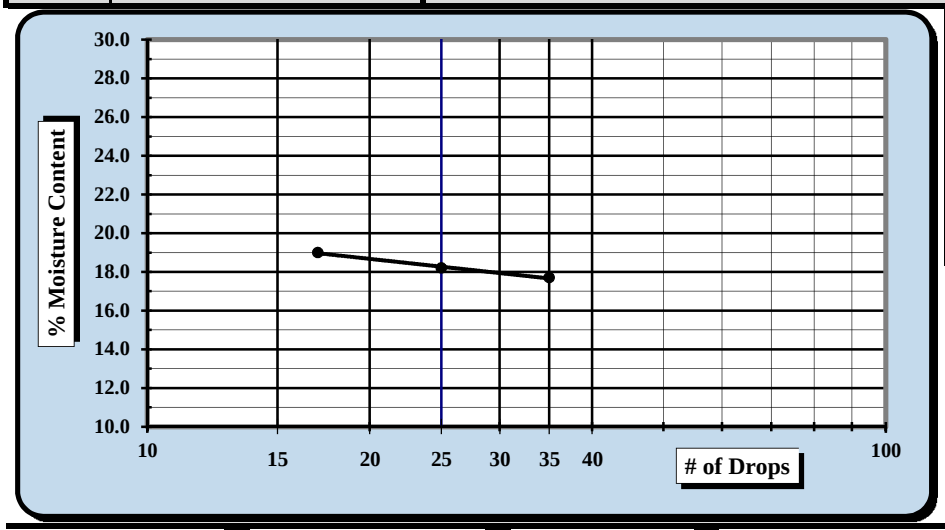
S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/31/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	5/29/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-43	Sample #: SS-1A	Sample Date: Various
Log #:	43-2321		Depth: 0.0' - 1.0'
Sample Description:	Silty, clayey sand with gravel (SC-SM, A-2-4)		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	18	6	3				11	12	
A	Tare Weight	15.41	15.44	15.48				15.43	15.56	
B	Wet Soil Weight + A	26.24	27.19	29.11				24.92	25.76	
C	Dry Soil Weight + A	24.51	25.38	27.06				23.80	24.55	
D	Water Weight (B-C)	1.73	1.81	2.05				1.12	1.21	
E	Dry Soil Weight (C-A)	9.10	9.94	11.58				8.37	8.99	
F	% Moisture (D/E)*100	19.0%	18.2%	17.7%				13.4%	13.5%	
N	# OF DROPS	17	25	35				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**13.5%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**18**
Plastic Limit	**14**
Plastic Index	**4**
Group Symbol	**CL-ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	5/29/2018	Michael D. Kelso, E.I.	5/31/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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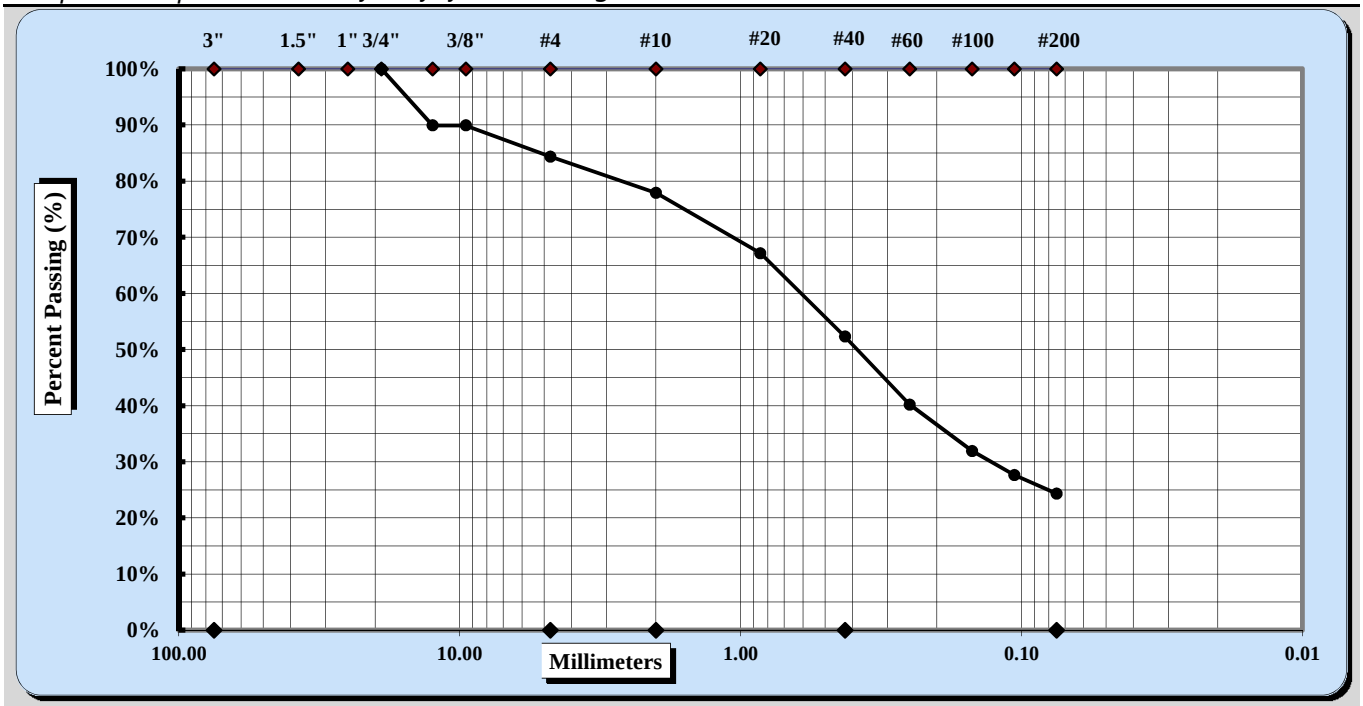
Sieve Analysis of Soils

Quality Assurance | *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/31/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/25/18 - 5/29/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	RW-43	Type: Split Spoon	Sample Date: Various
Sample Log No.:	43-2321	Sample: 1A	Depth: 0.0' - 1.0'
Sample Description:	Silty, clayey sand with gravel (SC-SM, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	3/4"	Coarse Sand	6%	Fine Sand	28%
Gravel	16%	Medium Sand	26%	Silt & Clay	24%
Liquid Limit	18	Plastic Limit	14	Plastic Index	4

Coarse Sand	6%	Medium Sand	26%	Fine Sand	28%
Description of Sand & Gravel Particles:		Rounded	☐	Angular	☒
Hard & Durable	☒	Soft	☐	Weathered & Friable	☒

Notes / Deviations / References:

Michael D. Kelso, E.I.		Staff Professional	5/31/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

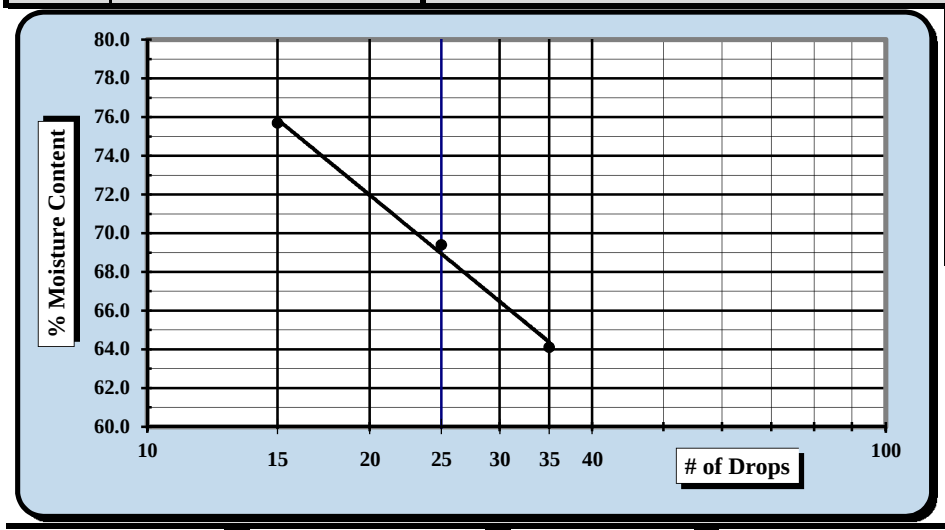
S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/31/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	5/29/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-43	Sample #: SS-2	Sample Date: Various
Log #:	43-2321		Elevation: 2.0' - 4.0'
Sample Description:	Sandy fat clay (CH, A-7-5 (26))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	13	8	17				9	21	
A	Tare Weight	15.39	15.51	15.49				15.42	15.51	
B	Wet Soil Weight + A	24.23	25.27	26.45				24.46	23.19	
C	Dry Soil Weight + A	20.42	21.27	22.17				22.24	21.28	
D	Water Weight (B-C)	3.81	4.00	4.28				2.22	1.91	
E	Dry Soil Weight (C-A)	5.03	5.76	6.68				6.82	5.77	
F	% Moisture (D/E)*100	75.7%	69.4%	64.1%				32.6%	33.1%	
N	# OF DROPS	15	25	35				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**32.9%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**69**
Plastic Limit	**33**
Plastic Index	**36**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	5/29/2018	Michael D. Kelso, E.I.	5/31/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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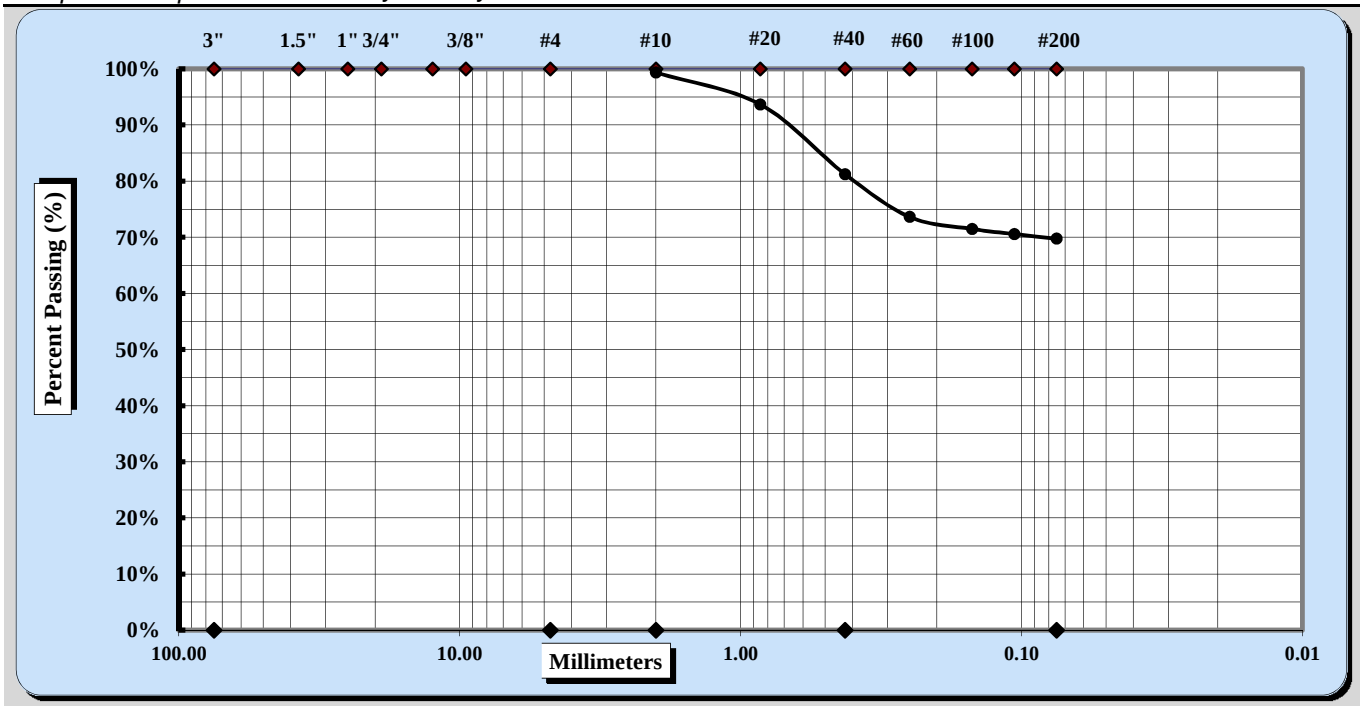
Sieve Analysis of Soils

Quality Assurance | *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/31/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/25/18 - 5/29/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	RW-43	Type: Split Spoon	Sample Date: Various
Sample Log No.:	43-2321	Sample: 2	Depth: 2.0' - 4.0'
Sample Description:	Sandy fat clay (CH, A-7-5 (26))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	No. 10	Coarse Sand	1%	Fine Sand	12%
Gravel	0%	Medium Sand	18%	Silt & Clay	70%
Liquid Limit	69	Plastic Limit	33	Plastic Index	36

Coarse Sand	1%	Medium Sand	18%	Fine Sand	12%
Description of Sand & Gravel Particles:			Rounded ☐	Angular ☒	
Hard & Durable ☐		Soft ☒		Weathered & Friable ☒	

Notes / Deviations / References:

Michael D. Kelso, E.I.		Staff Professional	5/31/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

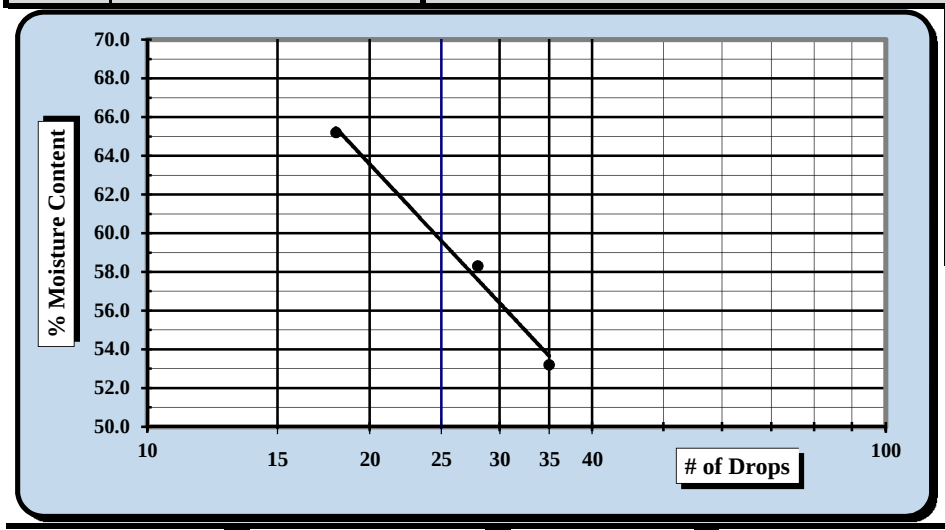
S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/31/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	5/29/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-43	Sample #: SS-3	Sample Date: Various
Log #:	43-2321		Elevation: 4.0' - 6.0'
Sample Description:	Clayey sand (SC, A-7-6 (8))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	1	5	23				4	14	
A	Tare Weight	15.34	15.39	15.44				15.44	15.47	
B	Wet Soil Weight + A	24.51	25.27	26.38				23.61	23.09	
C	Dry Soil Weight + A	20.89	21.63	22.58				22.11	21.69	
D	Water Weight (B-C)	3.62	3.64	3.80				1.50	1.40	
E	Dry Soil Weight (C-A)	5.55	6.24	7.14				6.67	6.22	
F	% Moisture (D/E)*100	65.2%	58.3%	53.2%				22.5%	22.5%	
N	# OF DROPS	18	28	35				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**22.5%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**60**
Plastic Limit	**23**
Plastic Index	**37**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	5/29/2018	Michael D. Kelso, E.I.	5/31/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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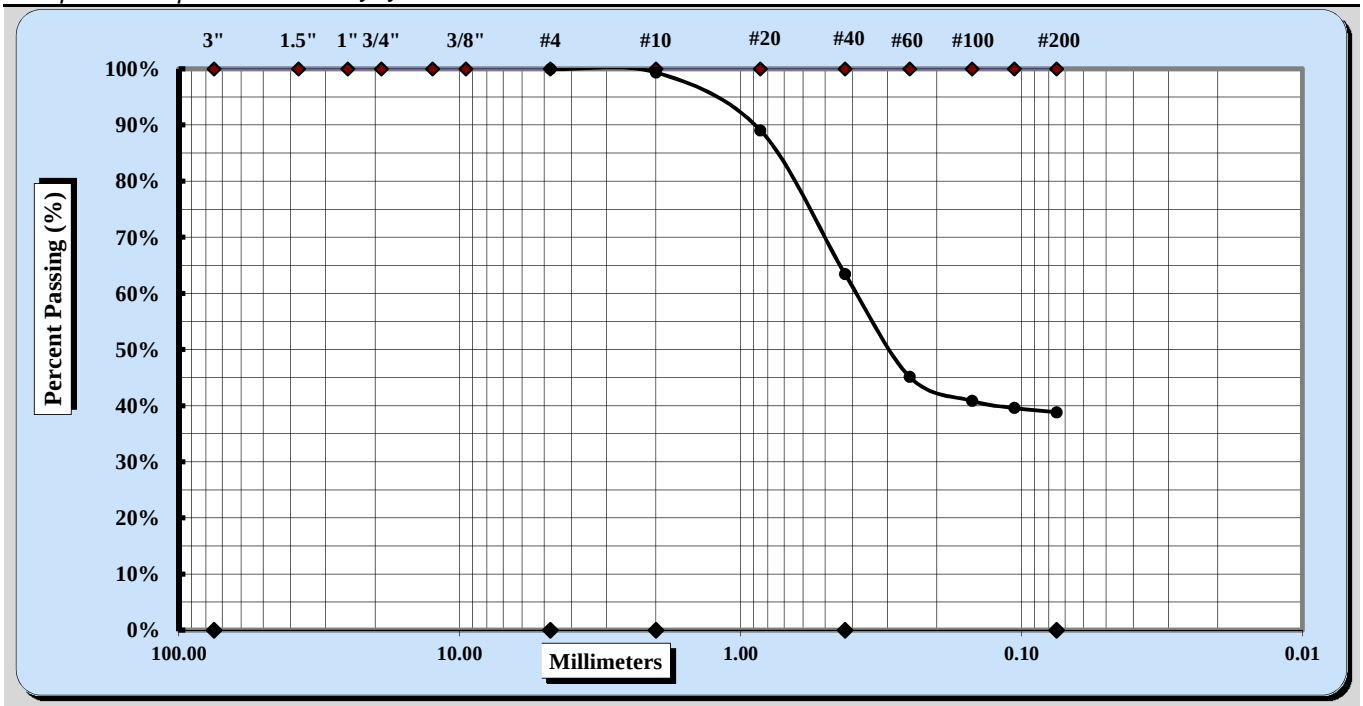
Sieve Analysis of Soils

Quality Assurance | *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/31/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/25/18 - 5/29/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	RW-43	Type: Split Spoon	Sample Date: Various
Sample Log No.:	43-2321	Sample: 3	Depth: 4.0' - 6.0'
Sample Description:	Clayey sand (SC, A-7-6 (8))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	No. 10	Coarse Sand	1%	Fine Sand	25%
Gravel	0%	Medium Sand	36%	Silt & Clay	39%
Liquid Limit	60	Plastic Limit	23	Plastic Index	37

Coarse Sand	1%	Medium Sand	36%	Fine Sand	25%

Description of Sand & Gravel Particles: Rounded ☐ Angular ☒
Hard & Durable ☐ Soft ☒ Weathered & Friable ☒

Notes / Deviations / References:

Michael D. Kelso, E.I.		Staff Professional	5/31/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

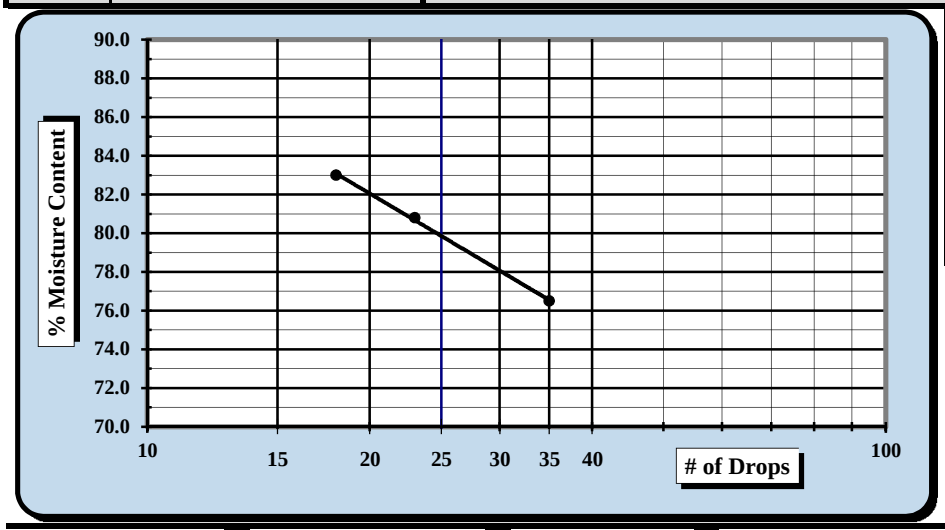
S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/31/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	5/30/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-43	Sample #: SS-8	Sample Date: Various
Log #:	43-2321		Elevation: 23.5' - 25.0'
Sample Description:	Elastic silt with sand (MH, A-7-5 (30))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	13	2	24				10	30	
A	Tare Weight	15.39	15.55	15.43				15.40	17.82	
B	Wet Soil Weight + A	25.73	26.20	27.24				22.82	25.79	
C	Dry Soil Weight + A	21.04	21.44	22.12				20.62	23.43	
D	Water Weight (B-C)	4.69	4.76	5.12				2.20	2.36	
E	Dry Soil Weight (C-A)	5.65	5.89	6.69				5.22	5.61	
F	% Moisture (D/E)*100	83.0%	80.8%	76.5%				42.1%	42.1%	
N	# OF DROPS	18	23	35				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**42.1%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**80**
Plastic Limit	**42**
Plastic Index	**38**
Group Symbol	**MH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	5/30/2018	Michael D. Kelso, E.I.	5/31/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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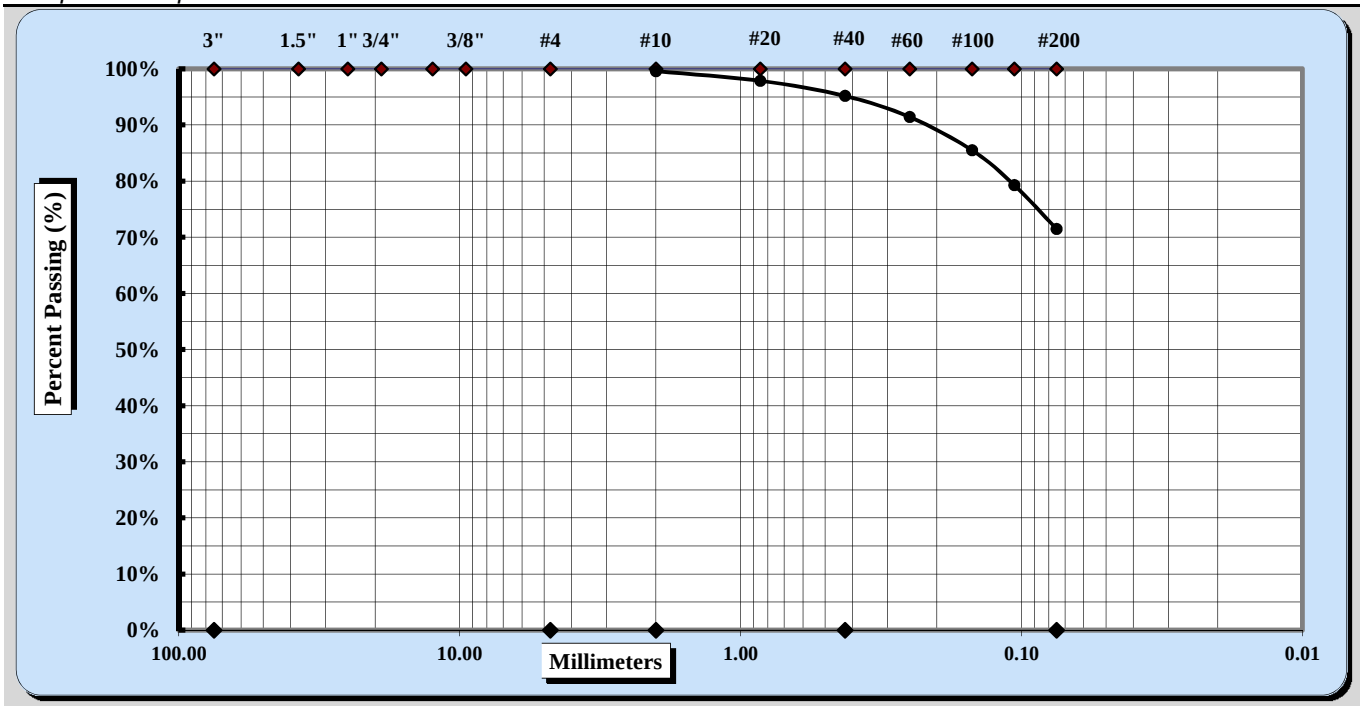
Sieve Analysis of Soils

Quality Assurance *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/31/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/25/18 - 5/29/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	RW-43	Type: Split Spoon	Sample Date: Various
Sample Log No.:	43-2321	Sample: 8	Depth: 23.5' - 25.0'
Sample Description:	Elastic silt with sand (MH, A-7-5 (30))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	No. 10	Coarse Sand	0%	Fine Sand	24%
Gravel	0%	Medium Sand	4%	Silt & Clay	71%
Liquid Limit	80	Plastic Limit	42	Plastic Index	38

Coarse Sand	0%	Medium Sand	4%	Fine Sand	24%
Description of Sand & Gravel Particles:		Rounded	☐	Angular	☒
Hard & Durable	☐	Soft	☒	Weathered & Friable	☒

Notes / Deviations / References:

Michael D. Kelso, E.I.		Staff Professional	5/31/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/26/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/28 - 3/29/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sampled by:	S&ME	Sample Date(s):	3/05, 3/08 & 3/09/18
Sampling Method:	Split-spoon	Drill Rig:	CME 55

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 13942 Calibration Date: 8/18/17 Oven ID. 13978 Calibration Date: 10/07/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
W-18	SS-1	0.4 - 2.4	D-117	0.00	54.56	46.03	8.53	18.5%	
W-18	SS-2	2.4 - 4.4	D-13	0.00	53.06	43.04	10.02	23.3%	
W-18	SS-3	4.4 - 6.4	D-1	0.00	53.65	46.97	6.68	14.2%	
W-18	SS-5	8.4 - 10.4	F	0.00	52.82	44.57	8.25	18.5%	
W-18	SS-6	13.5 - 15.0	26	0.00	52.22	43.00	9.22	21.4%	
W-23	SS-1	0.2 - 2.2	H	0.00	53.92	46.00	7.92	17.2%	
W-23	SS-4	6.2 - 8.2	R	0.00	53.41	42.32	11.09	26.2%	
W-24	SS-1	0.0 - 2.0	E	0.00	52.01	48.70	3.31	6.8%	
W-24	SS-2	2.0 - 4.0	P	0.00	53.26	45.83	7.43	16.2%	
W-24	SS-5	8.0 - 10.0	B-141	0.00	53.38	43.26	10.12	23.4%	
W-24	SS-7	18.5 - 20.0	D-27	0.00	52.56	40.18	12.38	30.8%	

Notes / Deviations / References

AASHTO T 265: Laboratory Determination of Moisture Content of Soils

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Benjamin Kovaleski	Benjamin J. Kovaleski	NICET Lab Level III/117226	4/26/18
Technician Name	*Signature*	*Certification Type / No.*	*Date*
Matthew F. Cooke, P.G.		Project Manager	4/26/18
Technical Responsibility		*Position*	*Date*

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/28 - 4/29/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sampled by:	S&ME	Sample Date(s):	3/13, 3/19 & 3/23
Sampling Method:	Split-spoon	Drill Rig:	CME 55/Diedrich D-50

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 13942 Calibration Date: 8/18/17 Oven ID. 13978 Calibration Date: 10/07/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
W-19	SS-1	0.0 - 2.0	T-2	0.00	53.29	47.86	5.43	11.3%	
W-19	SS-2	2.0 - 4.0	JJ	0.00	50.89	40.38	10.51	26.0%	
W-19	SS-5	8.0 - 10.0	T-1	0.00	51.91	41.88	10.03	23.9%	
W-29	SS-2	2.0 - 4.0	P-11	0.00	51.30	47.77	3.53	7.4%	
W-29	SS-4	6.0 - 8.0	S-14	0.00	52.69	47.09	5.60	11.9%	
W-29	SS-5	8.0 - 10.0	S-17	0.00	52.80	40.30	12.50	31.0%	
W-29	SS-6	13.5 - 15.0	P-2	0.00	54.05	43.44	10.61	24.4%	
W-29	SS-7	18.5 - 20.0	P-5	0.00	53.40	42.45	10.95	25.8%	
W-29	SS-8	23.5 - 25.0	S-13	0.00	52.66	38.27	14.39	37.6%	
W-31	SS-1	0.0 - 2.0	S-18	0.00	52.57	46.11	6.46	14.0%	
W-31	SS-3	4.0 - 6.0	S-4	0.00	51.74	40.43	11.31	28.0%	
W-31	SS-7	18.5 - 20.0	P-10	0.00	54.44	43.84	10.60	24.2%	

Notes / Deviations / References

AASHTO T 265: Laboratory Determination of Moisture Content of Soils

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Benjamin Kovaleski	Benjamin J. Kovaleski	NICET Lab Level III/117226	5/11/18
Technician Name	*Signature*	*Certification Type / No.*	*Date*
Matthew F. Cooke, P.G.		Project Manager	5/11/18
Technical Responsibility		*Position*	*Date*

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/16/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/08 - 3/09/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sampled by:	S&ME	Sample Date(s):	2/05 - 2/07/18
Sampling Method:	Split-spoon	Drill Rig:	CME 55/Diedrich D-50

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 13942 Calibration Date: 8/18/17 Oven ID. 13978 Calibration Date: 10/07/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
W-22	SS-1	0.0 - 2.0	262	0.00	75.19	65.48	9.71	14.8%	
W-22	SS-4	6.0 - 8.0	D-27	0.00	75.61	62.78	12.83	20.4%	
W-22	SS-6	13.5 - 15.0	P	0.00	84.59	68.94	15.65	22.7%	
W-22	SS-8	23.5 - 25.0	B-141	0.00	71.19	61.13	10.06	16.5%	
W-25	SS-2	2.0 - 4.0	E	0.00	73.25	55.63	17.62	31.7%	
W-25	SS-5	8.0 - 10.0	T-1	0.00	70.02	58.51	11.51	19.7%	
W-25	SS-8	23.5 - 25.0	A-2	0.00	73.30	57.65	15.65	27.1%	
W-32	SS-2	2.0 - 4.0	D-3	0.00	74.58	63.48	11.10	17.5%	
W-32	SS-5	8.0 - 10.0	D-117	0.00	78.52	68.27	10.25	15.0%	
W-32	SS-6	13.5 - 15.0	JJ	0.00	76.83	71.42	5.41	7.6%	
W-32	SS-11	38.5 - 40.0	T-2	0.00	73.60	59.22	14.38	24.3%	

Notes / Deviations / References

AASHTO T 265: Laboratory Determination of Moisture Content of Soils

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Benjamin Kovaleski	Benjamin J. Kovaleski	NICET Lab Level III/117226	3/16/18
Technician Name	*Signature*	*Certification Type / No.*	*Date*
Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/16/18
Technical Responsibility	*Signature*	*Position*	*Date*

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

Quality Assurance *ASTM D 2216* ☑ *AASHTO T 265* ☐

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/31/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	4/25/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave. North Charleston, South Carolina		
Sampled by:	S&ME	Sample Date(s):	Various
Sampling Method:	Split Spoon	Log # :	43-2321

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 18435 Calibration Date: 4/10/2018 Oven ID. 12872 Calibration Date: 3/17/2018

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft		grams	grams	grams	grams	%	
W-27	1	0.4 - 2.4	C-65	30.48	82.27	75.09	7.18	16.1%	
W-27	2	2.4 - 4.0	C-64	31.50	84.81	74.72	10.09	23.3%	
W-27	4	6.4 - 8.4	C-6	30.54	82.56	73.72	8.84	20.5%	
W-27	5	8.4 - 10.4	C-39	30.87	99.45	89.26	10.19	17.5%	
W-27	6	13.5 - 15.0	C-1	30.36	97.47	76.51	20.96	45.4%	
W-27	10	33.5 - 35.0	C-12	30.14	88.68	71.64	17.04	41.1%	

Notes / Deviations / References

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Derek Baker — *Technician Name* — 4/25/2018 *Date*

Michael D. Kelso, E.I. — *Technical Responsibility* — Signature — Staff Professional — *Position* — 5/31/2018 *Date*

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Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5/21/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/11-4/13/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample by:	S&ME	Sample Date(s):	Various
Sampling Method:	Split Spoon	Drill Rig :	N/A

Method: **A (1%)** ☑ **B (0.1%)** ☐ Balance ID. 25128 Calibration Date: 4/4/18 Oven ID. 31332 Calibration Date: 2/21/18

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft. or m.		grams	grams	grams	grams	%	
W-28	SS-6	13.5'-15'	TD-1	105.07	251.75	228.93	22.82	18.4%	
W-28	SS-2	2'-4'	J13	97.13	230.76	213.84	16.92	14.5%	
W-28	SS-8	23.5'-25'	NP3	107.07	234.31	212.85	21.46	20.3%	
W-28	SS-10	33.5'-35'	J11	98.19	327.14	277.53	49.61	27.7%	
W-28	SS-12	43.5'-45'	J7	90.51	223.96	190.88	33.08	33.0%	
W-28	SS-16	63.5'-65'	J9	89.84	224.77	198.94	25.83	23.7%	
W-30	SS-1	1.7'-3.7'	M-4	93.80	202.43	167.35	35.08	47.7%	
W-30	SS-4	7.7'-9.7'	J3	90.01	190.02	159.32	30.70	44.3%	
W-30	SS-9	28.5'-30'	J17	89.07	224.54	188.92	35.62	35.7%	
W-30	SS-11	38.5'-40'	J5	97.55	181.56	161.41	20.15	31.6%	
P-42	SS-1	0.8'-2.8'	NP2	107.05	258.64	235.96	22.68	17.6%	
P-44	SS-1	1.1'-3.1'	J2	90.23	218.73	189.03	29.70	30.1%	
P-45	SS-1	1'-3'	J12	95.74	285.64	262.85	22.79	13.6%	
P-47	SS-1	1.4'-3.4'	NP4	106.11	249.17	231.46	17.71	14.1%	
P-49	SS-1	1'-3'	J14	98.13	232.57	209.43	23.14	20.8%	
P-54	SS-1	0.7'-2.7'	G7	96.59	254.09	230.74	23.35	17.4%	

Notes / Deviations / References

Jimmy Hanson — *Technician Name* — 5/21/2018 — *Date*

Nathan Price — *Technical Responsibility* — *Signature* — Laboratory Manager — *Position* — 5/21/2018 — *Date*

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/26/18
Project Name:	Carolina Crossroads Project	Test Date:	4/23/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-18	Sample #:	SS-1	Sample Date:	3/08/18
Location:	Wall Boring	Type:	Split-spoon	Depth:	0.4' - 2.4'
Sample Description:	Lean Clay with Sand (CL, A-6(10))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

	Pan #	Liquid Limit						Plastic Limit		
	Tare #:	21	22	23				24	25	
A	Tare Weight	28.07	25.67	27.24				25.99	26.78	
B	Wet Soil Weight + A	45.22	43.48	45.95				34.10	34.80	
C	Dry Soil Weight + A	41.21	39.17	41.30				32.86	33.55	
D	Water Weight (B-C)	4.01	4.31	4.65				1.24	1.25	
E	Dry Soil Weight (C-A)	13.14	13.50	14.06				6.87	6.77	
F	% Moisture (D/E)*100	30.5%	31.9%	33.1%				18.0%	18.5%	
N	# OF DROPS	34	27	20				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**18.3%**		

One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**32**
Plastic Limit	**18**
Plastic Index	**14**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/26/18	Matthew F. Cooke, P.G.	4/26/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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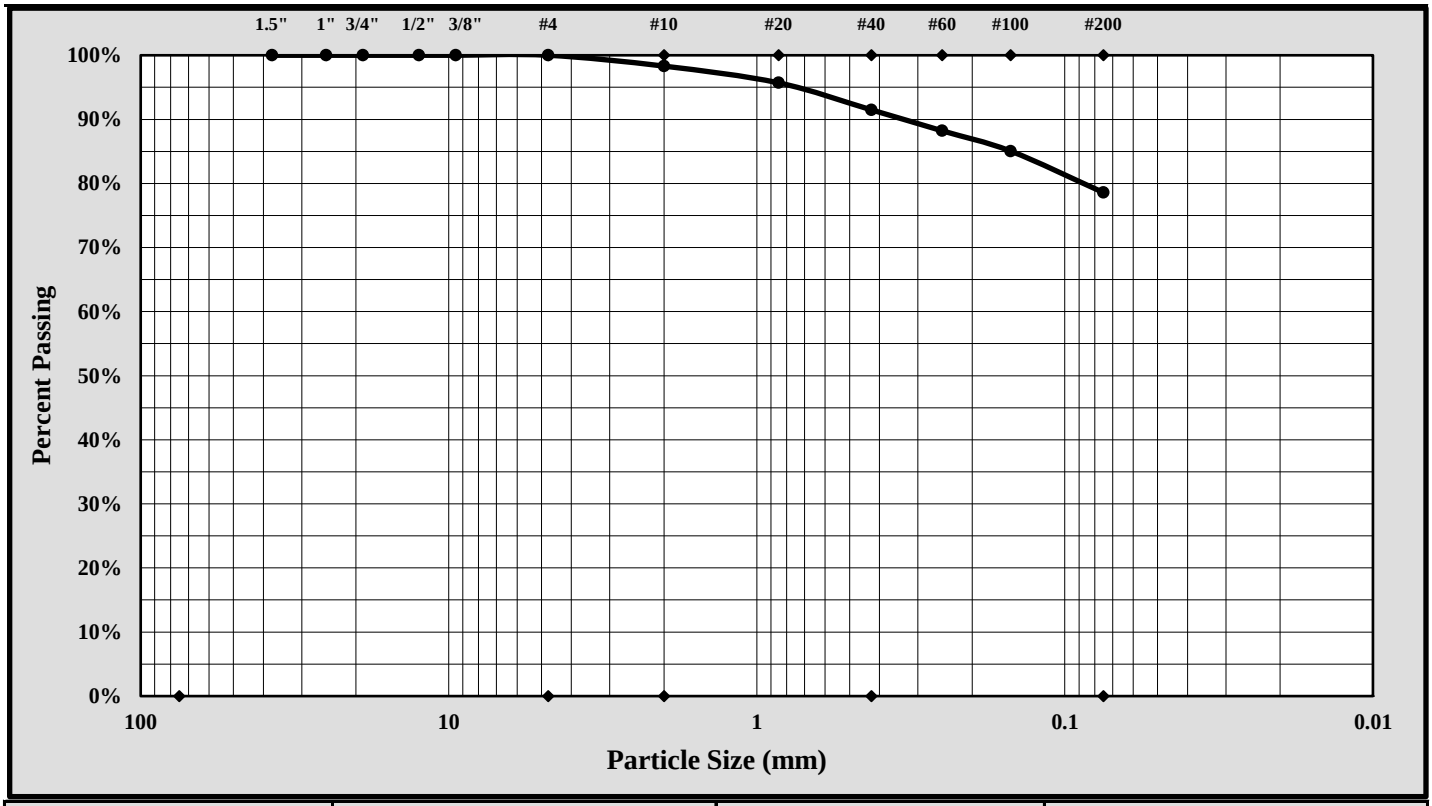
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/26/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/12 - 4/25/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-18	Sample #: SS-1	Sample Date: 3/08/18
Location:	Wall Boring	Type: Split-spoon	Depth: 0.4' - 2.4'
Sample Description:	Lean Clay with Sand (CL, A-6(10))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	78.6%	Total Sand:	21.4%

Liquid Limit	32	Plastic Limit	18	Plastic Index	14
Coarse Sand:	1.7%	Medium Sand:	6.8%	Fine Sand:	12.9%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/26/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

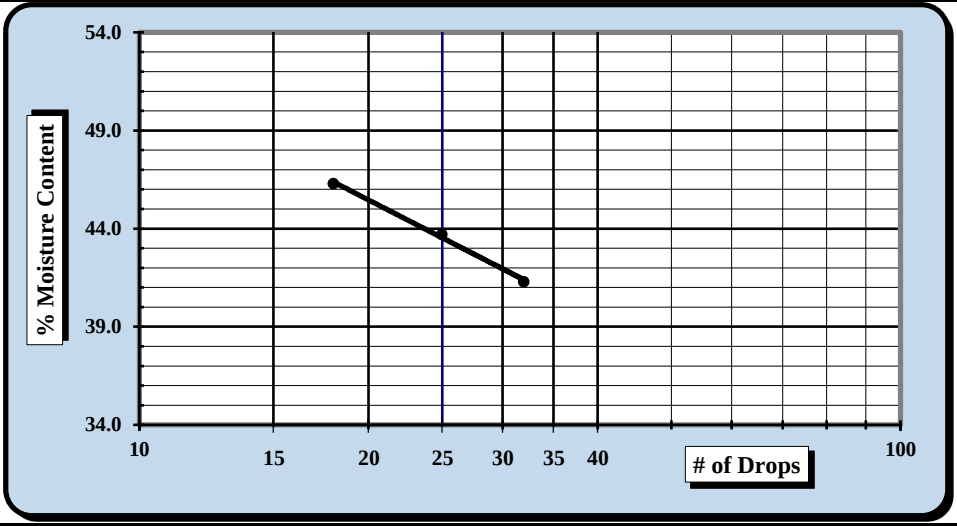
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/26/18
Project Name:	Carolina Crossroads Project	Test Date:	4/23/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-18	Sample #:	SS-2	Sample Date:	3/08/18
Location:	Wall Boring	Type:	Split-spoon	Depth:	2.4' - 4.4'
Sample Description:	Lean Clay with Sand (CL, A-7-6(15))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	26	27	28				29	30	
A	Tare Weight	27.32	27.01	26.81				27.00	27.38	
B	Wet Soil Weight + A	44.85	44.45	45.24				33.76	34.12	
C	Dry Soil Weight + A	39.73	39.15	39.41				32.35	32.72	
D	Water Weight (B-C)	5.12	5.30	5.83				1.41	1.40	
E	Dry Soil Weight (C-A)	12.41	12.14	12.60				5.35	5.34	
F	% Moisture (D/E)*100	41.3%	43.7%	46.3%				26.4%	26.2%	
N	# OF DROPS	32	25	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**26.3%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**44**
Plastic Limit	**26**
Plastic Index	**18**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/26/18	Matthew F. Cooke, P.G.	4/26/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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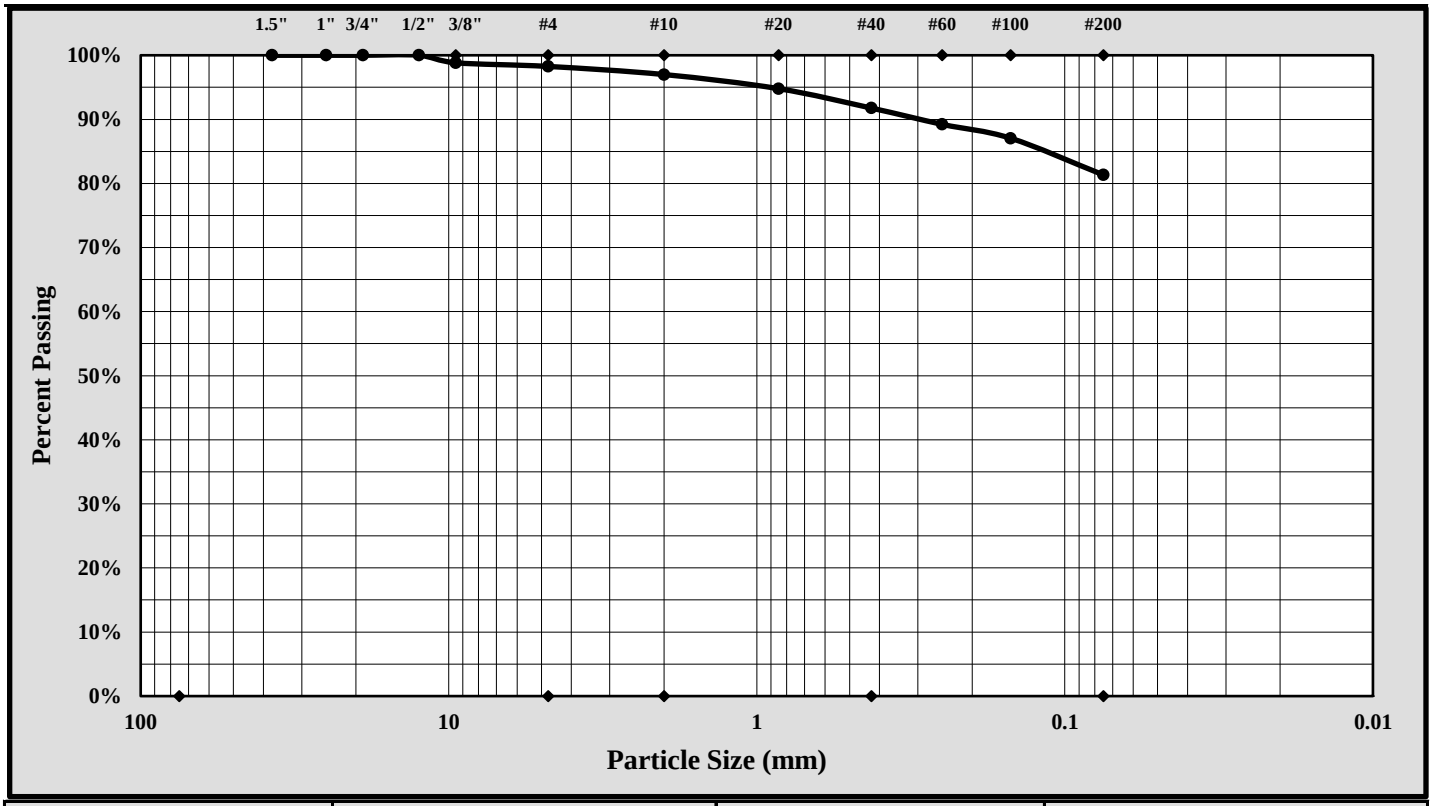
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/26/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/12 - 4/25/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-18	Sample #: SS-2	Sample Date: 3/08/18
Location:	Wall Boring	Type: Split-spoon	Depth: 2.4' - 4.4'
Sample Description:	Lean Clay with Sand (CL, A-7-6(15))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	12.5 mm	Gravel:	1.7%
Silt & Clay (% Passing #200):	81.3%	Total Sand:	16.9%

Liquid Limit	44	Plastic Limit	26	Plastic Index	18
Coarse Sand:	1.3%	Medium Sand:	5.2%	Fine Sand:	10.4%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/26/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

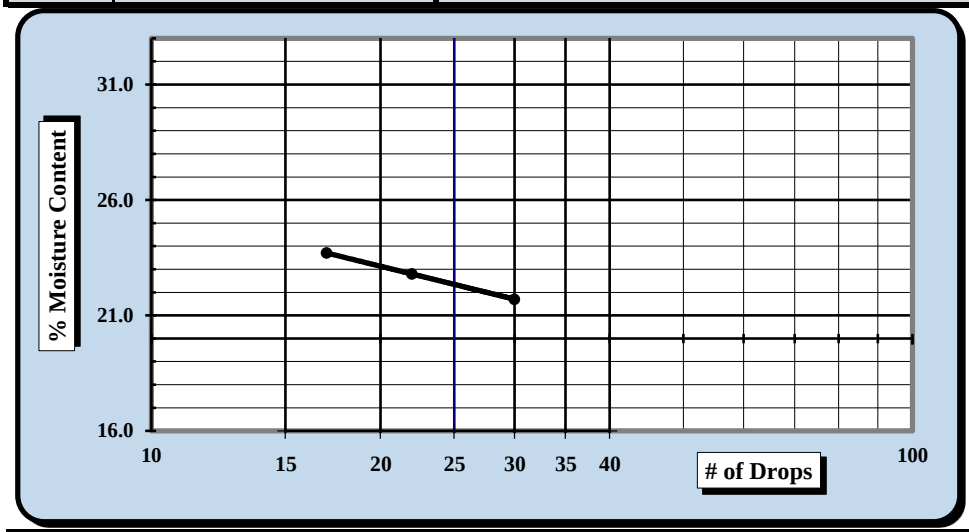
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/26/18
Project Name:	Carolina Crossroads Project	Test Date:	4/23/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-18	Sample #:	SS-3	Sample Date:	3/08/18
Location:	Wall Boring	Type:	Split-spoon	Depth:	4.4' - 6.4'
Sample Description:	Silty Clayey Sand (SC-SM, A-4(0))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	31	32	33				34	35	
A	Tare Weight	28.61	27.64	26.68				28.26	26.96	
B	Wet Soil Weight + A	49.61	42.57	44.32				35.11	35.02	
C	Dry Soil Weight + A	45.86	39.80	40.94				34.13	33.87	
D	Water Weight (B-C)	3.75	2.77	3.38				0.98	1.15	
E	Dry Soil Weight (C-A)	17.25	12.16	14.26				5.87	6.91	
F	% Moisture (D/E)*100	21.7%	22.8%	23.7%				16.7%	16.6%	
N	# OF DROPS	30	22	17				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**16.7%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**22**
Plastic Limit	**17**
Plastic Index	**5**
Group Symbol	**CL-ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/26/18	Matthew F. Cooke, P.G.	4/26/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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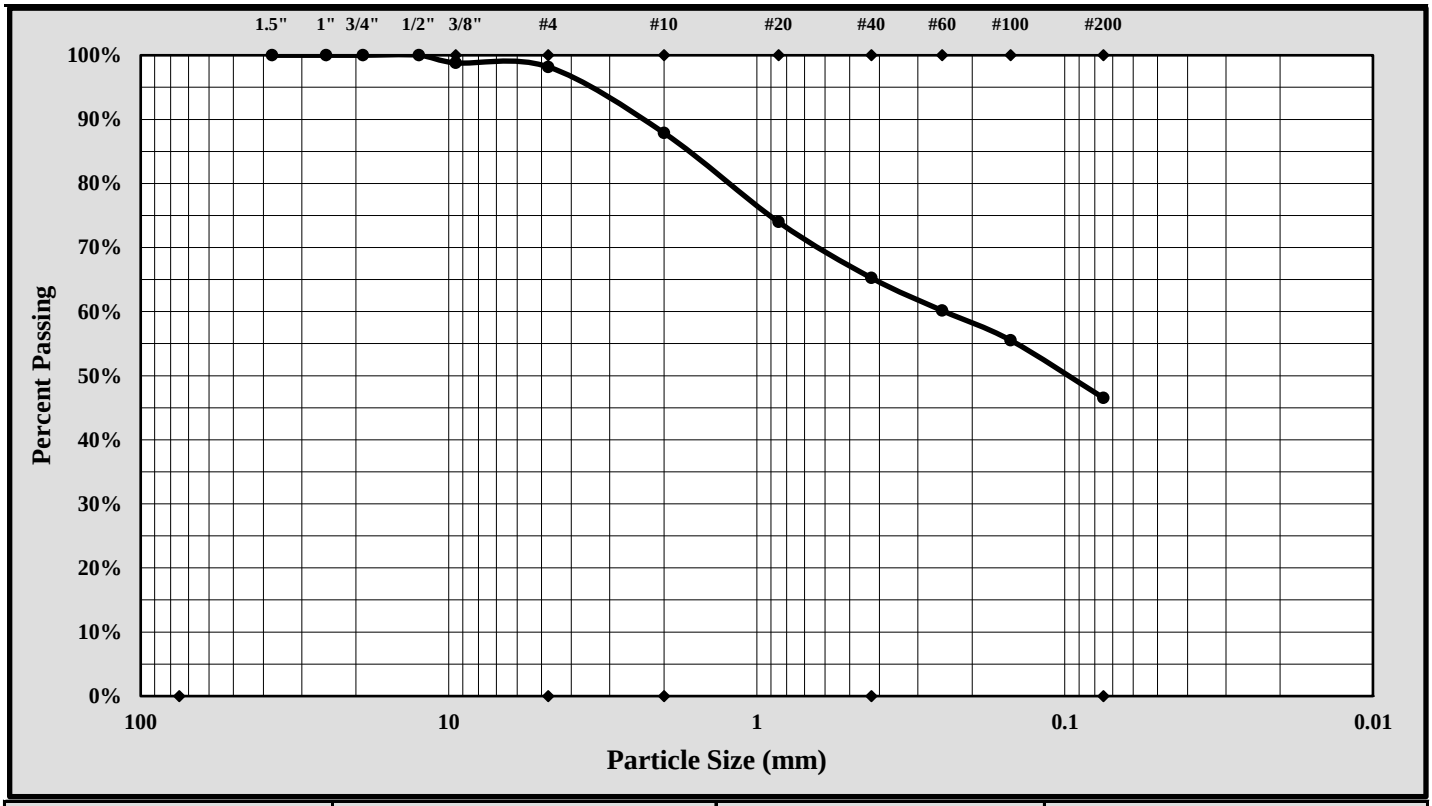
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/26/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/12 - 4/25/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-18	Sample #: SS-3	Sample Date: 3/08/18
Location:	Wall Boring	Type: Split-spoon	Depth: 4.4' - 6.4'
Sample Description:	Silty Clayey Sand (SC-SM, A-4(0))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	12.5 mm	Gravel:	1.8%
Silt & Clay (% Passing #200):	46.5%	Total Sand:	51.6%

Liquid Limit	22	Plastic Limit	17	Plastic Index	5
Coarse Sand:	10.3%	Medium Sand:	22.6%	Fine Sand:	18.7%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/26/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

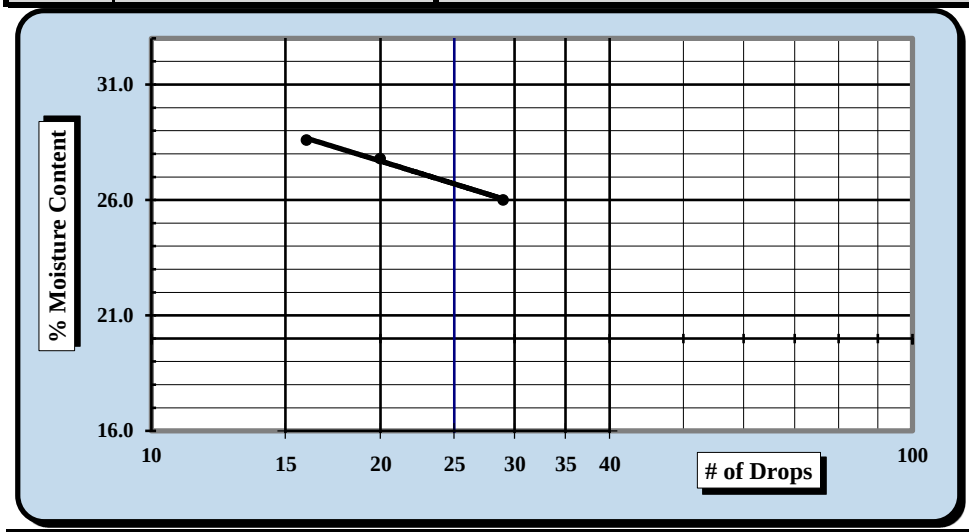
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/26/18
Project Name:	Carolina Crossroads Project	Test Date:	4/23/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-18	Sample #:	SS-5	Sample Date:	3/08/18
Location:	Wall Boring	Type:	Split-spoon	Depth:	8.4' - 10.4'
Sample Description:	Lean Clay (CL, A-6(8))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

	Pan #	Liquid Limit						Plastic Limit		
	Tare #:	36	37	38				39	40	
A	Tare Weight	25.68	26.21	26.31				25.89	26.28	
B	Wet Soil Weight + A	39.33	43.45	41.74				32.22	33.58	
C	Dry Soil Weight + A	36.51	39.70	38.31				31.37	32.62	
D	Water Weight (B-C)	2.82	3.75	3.43				0.85	0.96	
E	Dry Soil Weight (C-A)	10.83	13.49	12.00				5.48	6.34	
F	% Moisture (D/E)*100	26.0%	27.8%	28.6%				15.5%	15.1%	
N	# OF DROPS	29	20	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**15.3%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**27**
Plastic Limit	**15**
Plastic Index	**12**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/26/18	Matthew F. Cooke, P.G.	4/26/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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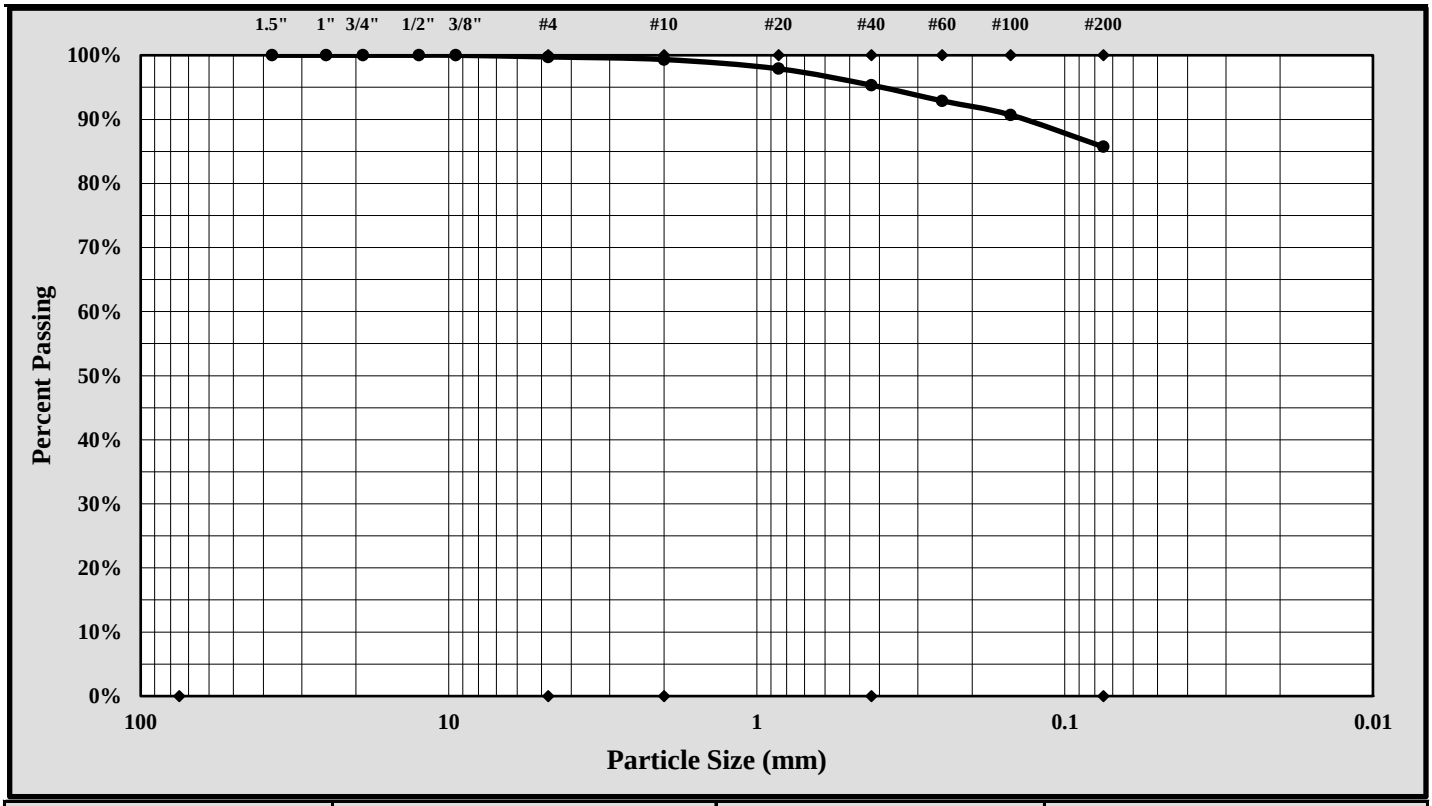
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/26/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/12 - 4/25/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-18	Sample #: SS-5	Sample Date: 3/08/18
Location:	Wall Boring	Type: Split-spoon	Depth: 8.4' - 10.4'
Sample Description:	Lean Clay (CL, A-6(8))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	2.00 mm	Gravel:	0.3%
Silt & Clay (% Passing #200):	85.7%	Total Sand:	14.0%

Liquid Limit	27	Plastic Limit	15	Plastic Index	12
Coarse Sand:	0.4%	Medium Sand:	4.0%	Fine Sand:	9.6%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/26/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

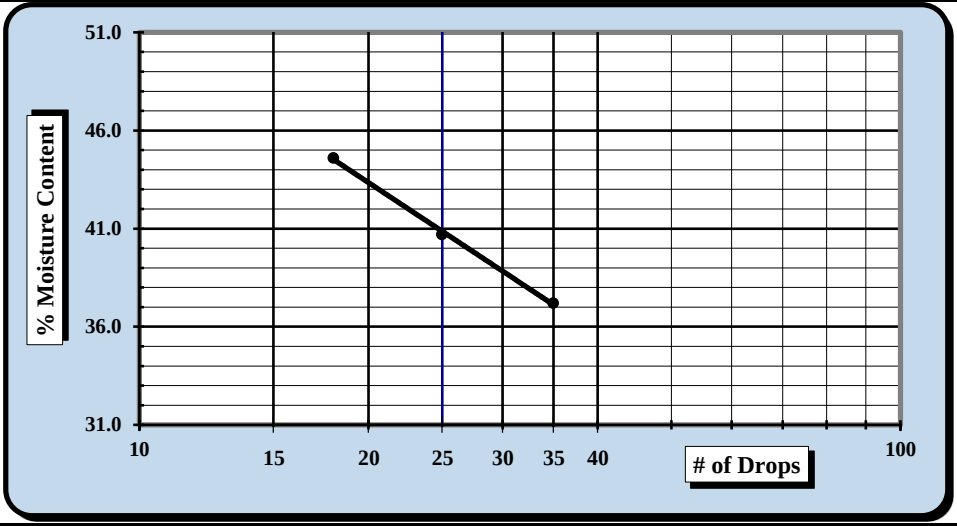
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/26/18
Project Name:	Carolina Crossroads Project	Test Date:	4/23/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-18	Sample #:	SS-6	Sample Date:	3/08/18
Location:	Wall Boring	Type:	Split-spoon	Depth:	13.5' - 15.0'
Sample Description:	Silt (ML, A-7-6(13))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	41	42	43				44	45	
A	Tare Weight	28.74	28.62	28.37				25.78	25.09	
B	Wet Soil Weight + A	42.86	46.17	44.87				31.96	31.43	
C	Dry Soil Weight + A	39.03	41.09	39.78				30.57	30.01	
D	Water Weight (B-C)	3.83	5.08	5.09				1.39	1.42	
E	Dry Soil Weight (C-A)	10.29	12.47	11.41				4.79	4.92	
F	% Moisture (D/E)*100	37.2%	40.7%	44.6%				29.0%	28.9%	
N	# OF DROPS	35	25	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**29.0%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**41**
Plastic Limit	**29**
Plastic Index	**12**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/26/18	Matthew F. Cooke, P.G.	4/26/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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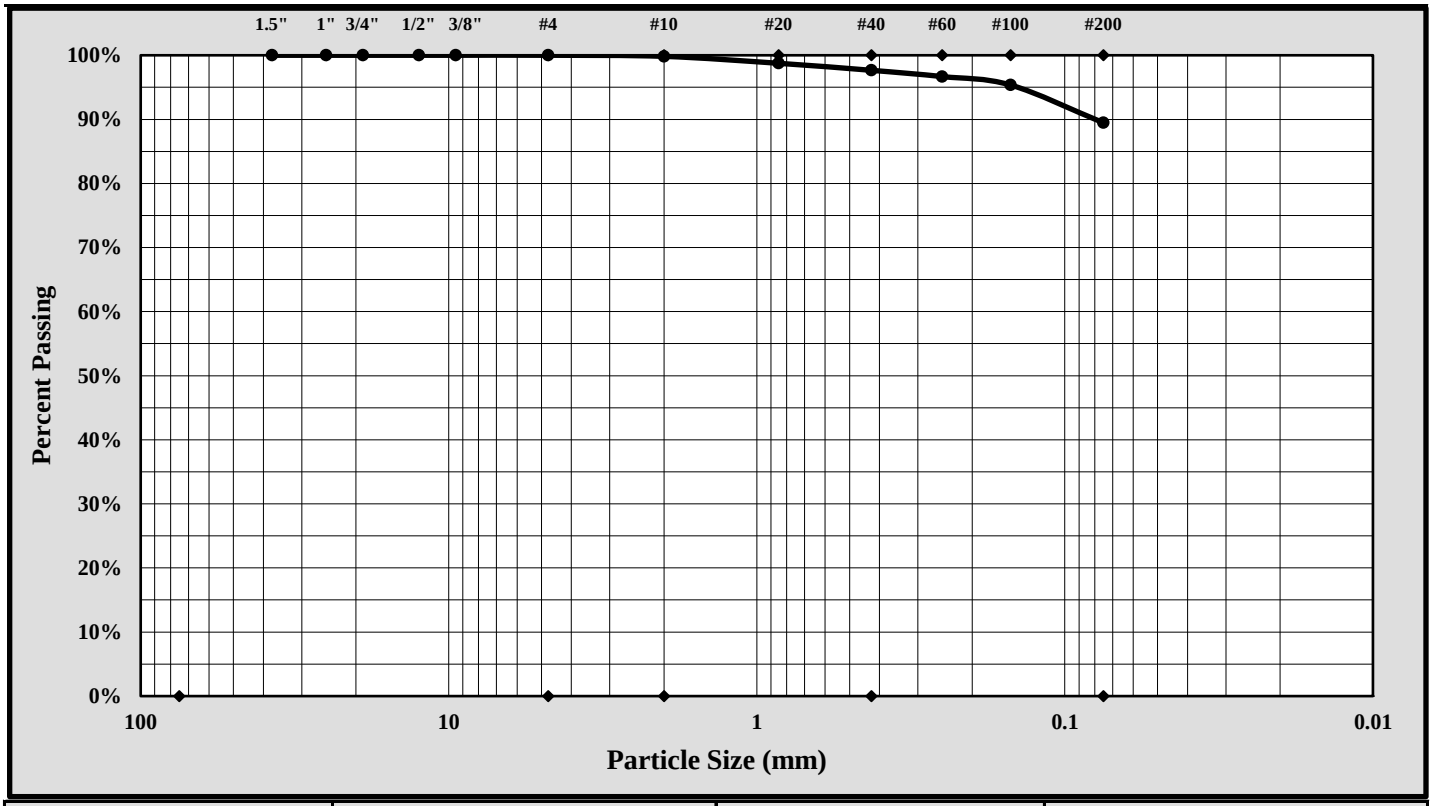
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/26/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/12 - 4/25/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-18	Sample #: SS-6	Sample Date: 3/08/18
Location:	Wall Boring	Type: Split-spoon	Depth: 13.5' - 15.0'
Sample Description:	Silt (ML, A-7-6(13))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	2.00 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	89.5%	Total Sand:	10.5%

Liquid Limit	41	Plastic Limit	29	Plastic Index	12
Coarse Sand:	0.2%	Medium Sand:	2.2%	Fine Sand:	8.2%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/26/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

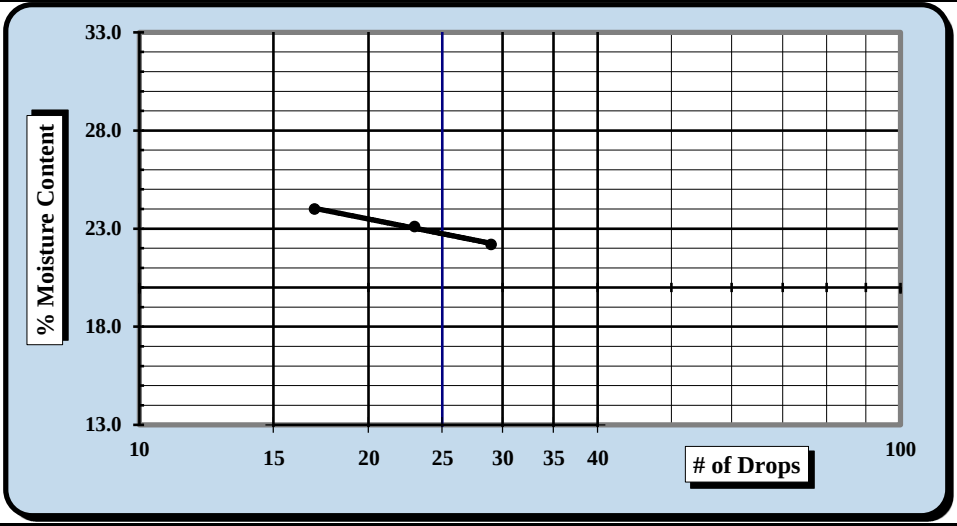
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date:	5/10/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-19	Sample #:	SS-1	Sample Date:	3/19/18
Location:	Wall Boring	Type:	Split-spoon	Depth:	0.0' - 2.0'
Sample Description:	Silty Clayey Sand (SC-SM, A-4(0))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	1	2	3				4	5	
A	Tare Weight	26.69	26.47	26.32				25.93	26.95	
B	Wet Soil Weight + A	43.89	40.86	42.33				32.24	34.15	
C	Dry Soil Weight + A	40.77	38.16	39.23				31.38	33.17	
D	Water Weight (B-C)	3.12	2.70	3.10				0.86	0.98	
E	Dry Soil Weight (C-A)	14.08	11.69	12.91				5.45	6.22	
F	% Moisture (D/E)*100	22.2%	23.1%	24.0%				15.8%	15.8%	
N	# OF DROPS	29	23	17				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**15.8%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**23**
Plastic Limit	**16**
Plastic Index	**7**
Group Symbol	**CL-ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/11/18	Matthew F. Cooke, P.G.	5/11/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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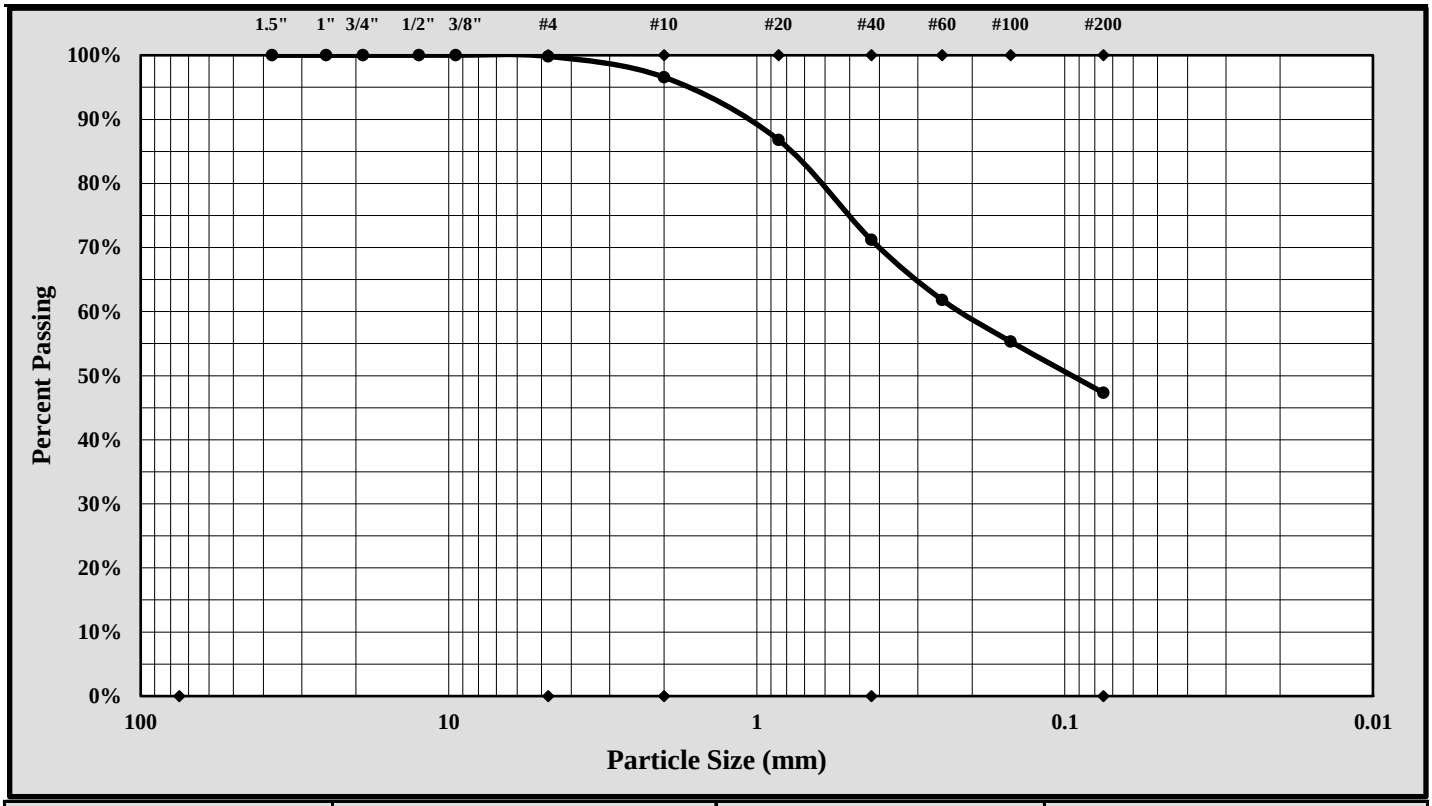
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/08 - 5/10/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-19	Sample #: SS-1	Sample Date: 3/19/18
Location:	Wall Boring	Type: Split-spoon	Depth: 0.0' - 2.0'
Sample Description:	Silty Clayey Sand (SC-SM, A-4(0))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.2%
Silt & Clay (% Passing #200):	47.3%	Total Sand:	52.5%

Liquid Limit	23	Plastic Limit	16	Plastic Index	7
Coarse Sand:	3.2%	Medium Sand:	25.4%	Fine Sand:	23.9%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/11/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date:	5/10/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-19	Sample #:	SS-2	Sample Date:	3/19/18
Location:	Wall Boring	Type:	Split-spoon	Depth:	2.0' - 4.0'
Sample Description:	Fat Clay with Sand (CH, A-7-6(22))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	6	7	8				9	10	
A	Tare Weight	27.78	26.29	27.32				26.83	26.73	
B	Wet Soil Weight + A	41.55	42.29	43.09				33.31	34.46	
C	Dry Soil Weight + A	37.13	36.95	37.74				31.92	32.81	
D	Water Weight (B-C)	4.42	5.34	5.35				1.39	1.65	
E	Dry Soil Weight (C-A)	9.35	10.66	10.42				5.09	6.08	
F	% Moisture (D/E)*100	47.3%	50.1%	51.3%				27.3%	27.1%	
N	# OF DROPS	35	25	20				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**27.2%**		

One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**50**
Plastic Limit	**27**
Plastic Index	**23**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/11/18	Matthew F. Cooke, P.G.	5/11/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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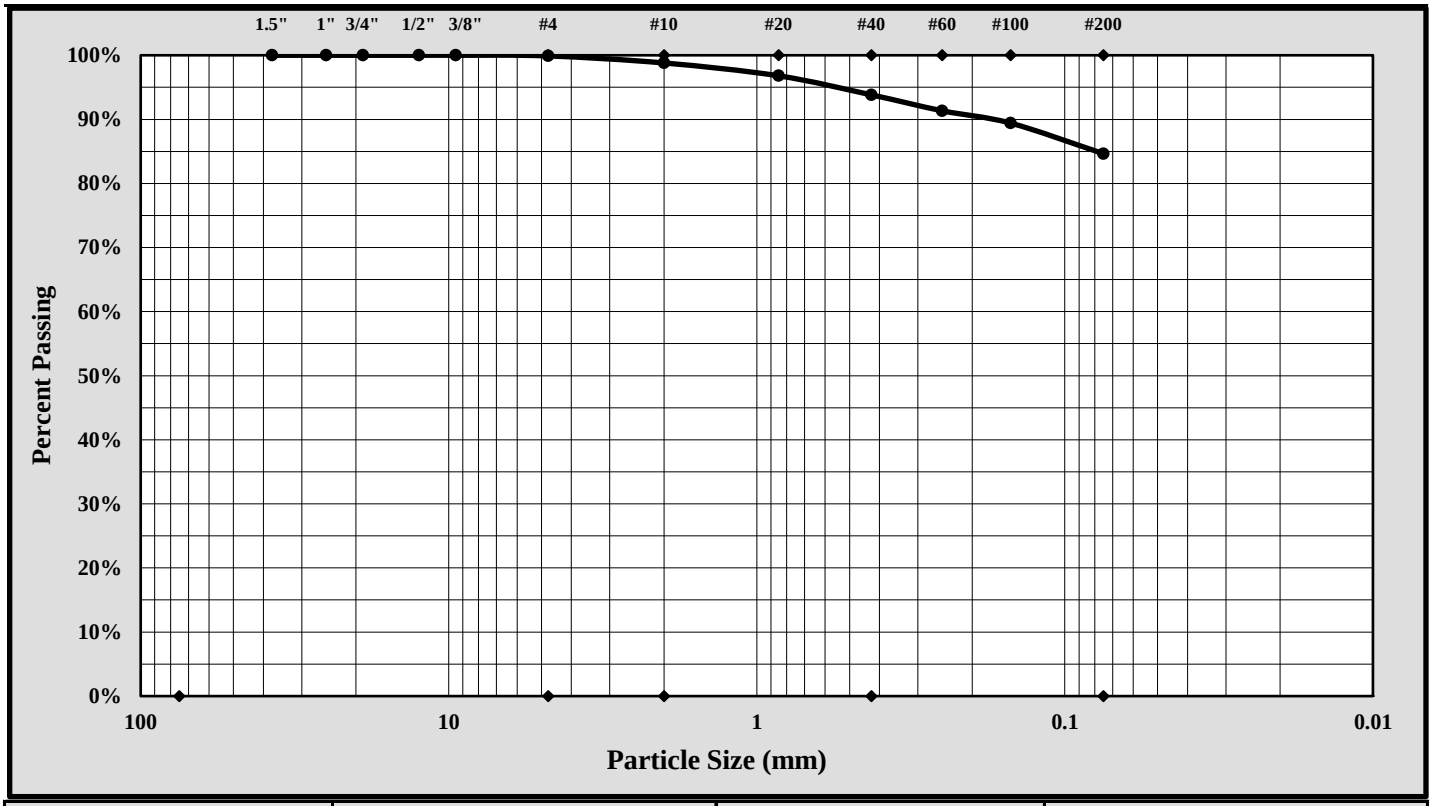
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/08 - 5/10/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-19	Sample #: SS-2	Sample Date: 3/19/18
Location:	Wall Boring	Type: Split-spoon	Depth: 2.0' - 4.0'
Sample Description:	Fat Clay with Sand (CH, A-7-6(22))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.1%
Silt & Clay (% Passing #200):	84.7%	Total Sand:	15.2%

Liquid Limit	50	Plastic Limit	27	Plastic Index	23
Coarse Sand:	1.1%	Medium Sand:	5.0%	Fine Sand:	9.2%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/11/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

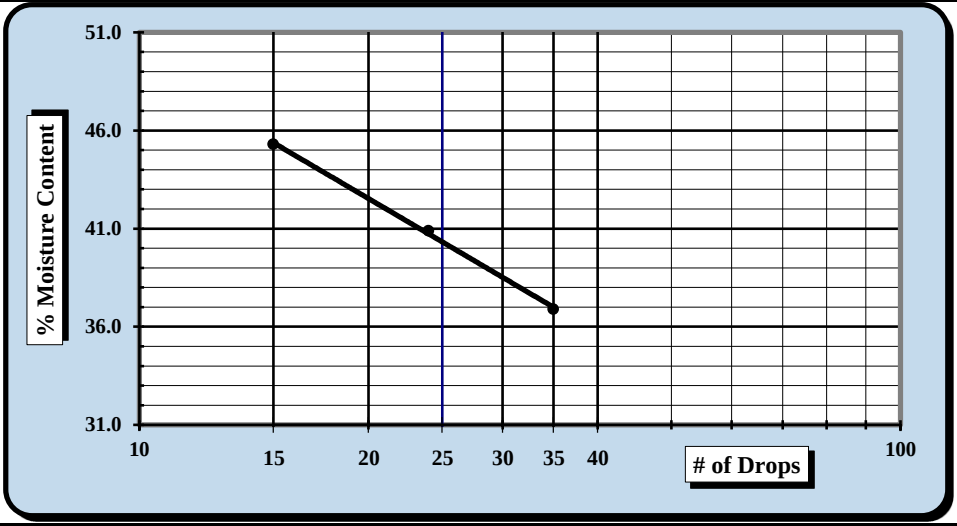
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date:	5/10/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-19	Sample #:	SS-5	Sample Date:	3/19/18
Location:	Wall boring	Type:	Split-spoon	Depth:	8.0 - 10.0'
Sample Description:	Lean Clay with Sand [CL, A-6(11)]				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	11	12	13				14	15	
A	Tare Weight	26.67	26.67	26.77				26.65	27.60	
B	Wet Soil Weight + A	40.26	38.97	40.99				33.17	34.10	
C	Dry Soil Weight + A	36.60	35.40	36.56				31.87	32.81	
D	Water Weight (B-C)	3.66	3.57	4.43				1.30	1.29	
E	Dry Soil Weight (C-A)	9.93	8.73	9.79				5.22	5.21	
F	% Moisture (D/E)*100	36.9%	40.9%	45.3%				24.9%	24.8%	
N	# OF DROPS	35	24	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**24.9%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**40**
Plastic Limit	**25**
Plastic Index	**15**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/11/18	Matthew F. Cooke, P.G.	5/11/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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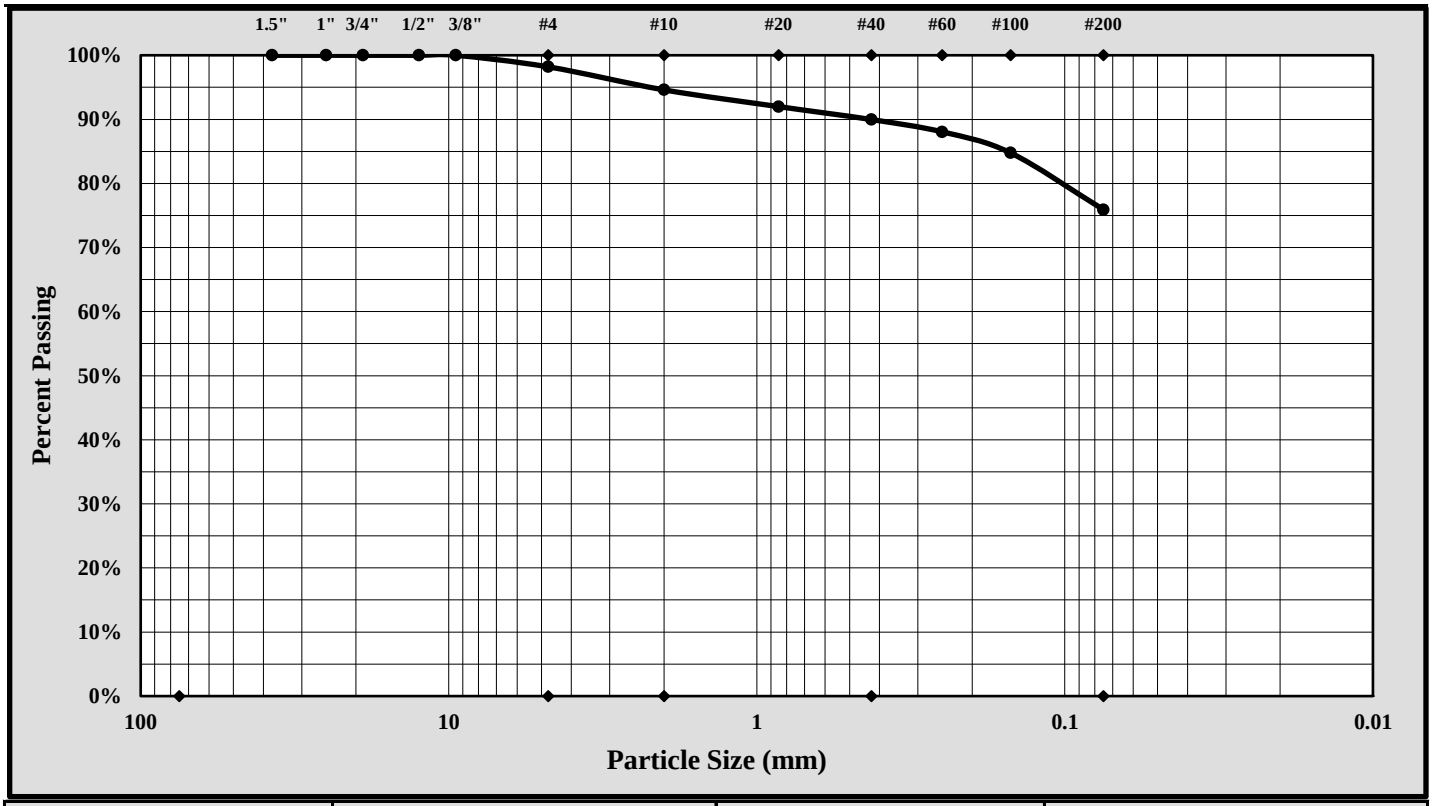
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/08 - 5/10/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-19	Sample #: SS-5	Sample Date: 3/19/18
Location:	Wall Boring	Type: Split-spoon	Depth: 8.0' - 10.0'
Sample Description:	Lean Clay with Sand (CL, A-6(11))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	9.50 mm	Gravel:	1.8%
Silt & Clay (% Passing #200):	75.9%	Total Sand:	22.3%

Liquid Limit	40	Plastic Limit	25	Plastic Index	15
Coarse Sand:	3.6%	Medium Sand:	4.6%	Fine Sand:	14.1%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/11/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

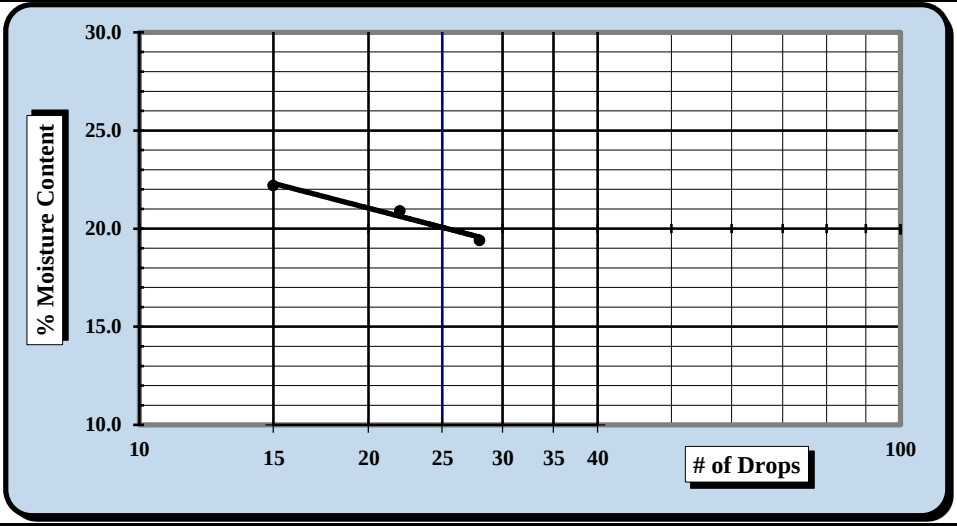
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/04/18
Project Name:	Carolina Crossroads Project	Test Date:	4/03/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-22	Sample #:	SS-1	Sample Date:	2/07/18
Location:	Wall Boring	Type:	Split-spoon	Depth:	0.0' - 2.0'
Sample Description:	Silty Clayey Sand (SC-SM, A-2-4)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	1	2	3				4	5	
A	Tare Weight	26.69	26.46	26.32				25.93	26.94	
B	Wet Soil Weight + A	48.75	44.17	46.75				33.85	33.63	
C	Dry Soil Weight + A	45.16	41.11	43.04				32.89	32.82	
D	Water Weight (B-C)	3.59	3.06	3.71				0.96	0.81	
E	Dry Soil Weight (C-A)	18.47	14.65	16.72				6.96	5.88	
F	% Moisture (D/E)*100	19.4%	20.9%	22.2%				13.8%	13.8%	
N	# OF DROPS	28	22	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**13.8%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**20**
Plastic Limit	**14**
Plastic Index	**6**
Group Symbol	**CL-ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/04/18	Matthew F. Cooke, P.G.	4/04/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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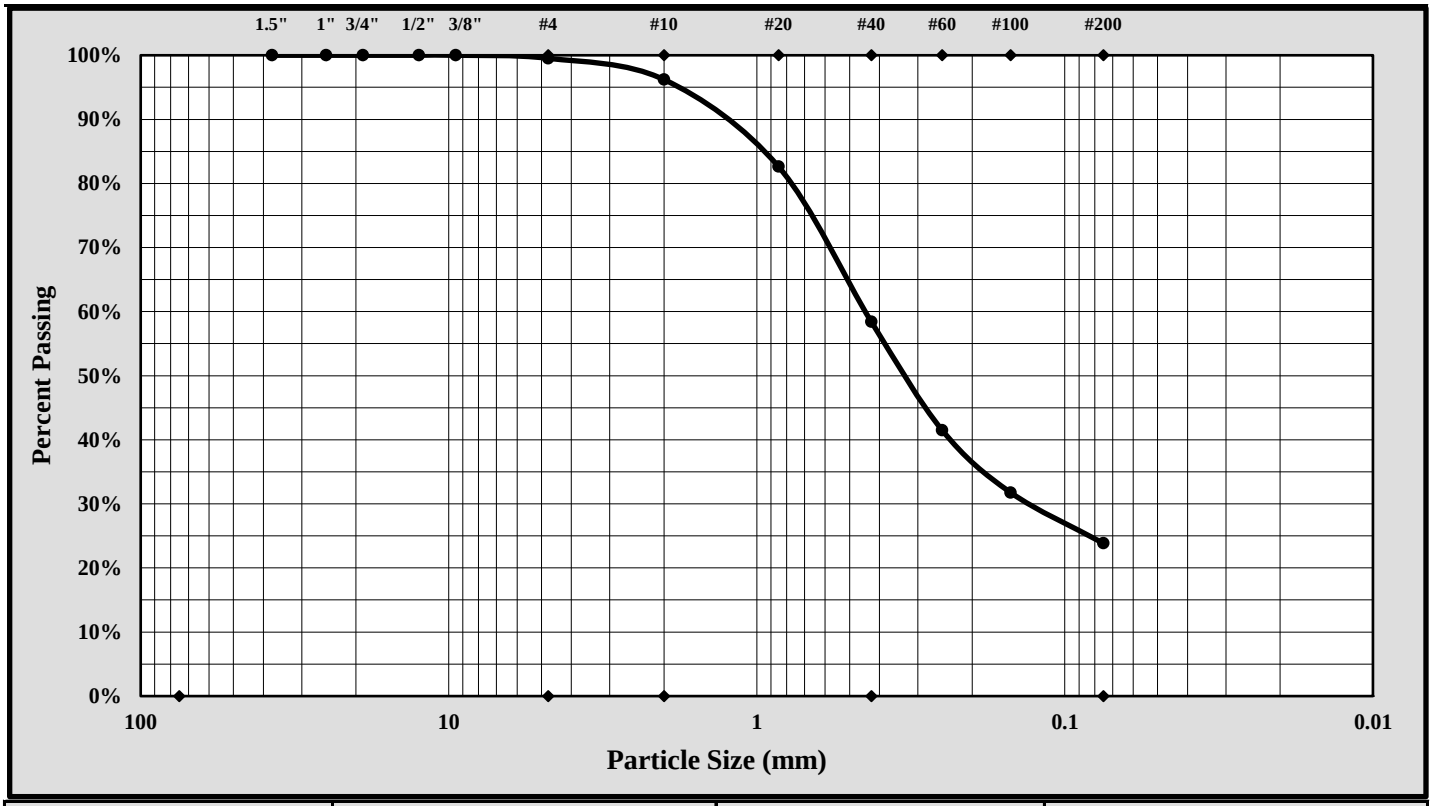
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/04/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/26 - 4/04/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-22	Sample #: SS-1	Sample Date: 2/07/18
Location:	Wall Boring	Type: Split-spoon	Depth: 0.0' - 2.0'
Sample Description:	Silty Clayey Sand (SC-SM, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.5%
Silt & Clay (% Passing #200):	23.8%	Total Sand:	75.7%

Liquid Limit	20	Plastic Limit	14	Plastic Index	6
Coarse Sand:	3.3%	Medium Sand:	37.8%	Fine Sand:	34.6%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/04/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

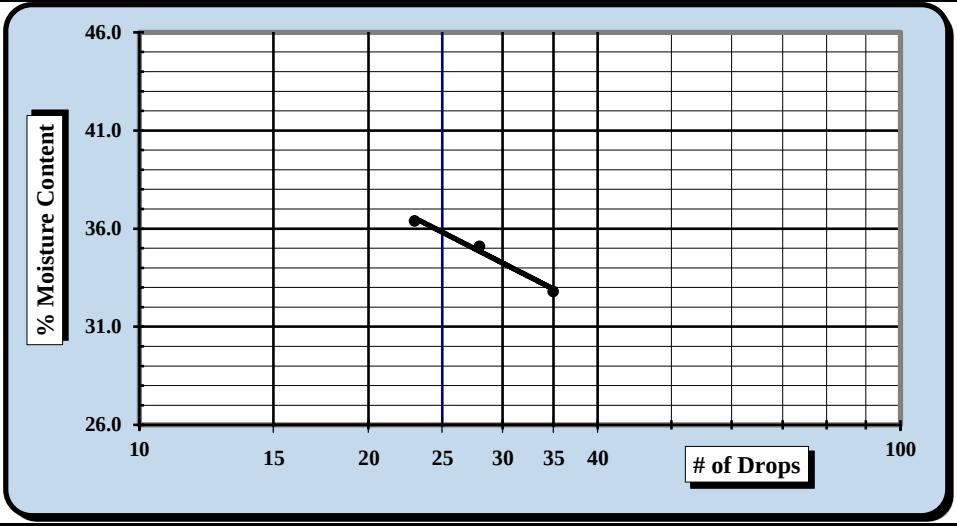
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/04/18
Project Name:	Carolina Crossroads Project	Test Date:	4/03/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-22	Sample #:	SS-4	Sample Date:	2/07/18
Location:	Wall Boring	Type:	Split-spoon	Depth:	6.0' - 8.0'
Sample Description:	Silty Sand (SM, A-6(2))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	6	7	8				9	10	
A	Tare Weight	27.76	26.29	27.33				26.84	26.75	
B	Wet Soil Weight + A	44.24	43.69	41.54				32.91	33.64	
C	Dry Soil Weight + A	40.17	39.17	37.75				31.71	32.26	
D	Water Weight (B-C)	4.07	4.52	3.79				1.20	1.38	
E	Dry Soil Weight (C-A)	12.41	12.88	10.42				4.87	5.51	
F	% Moisture (D/E)*100	32.8%	35.1%	36.4%				24.6%	25.0%	
N	# OF DROPS	35	28	23				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**24.8%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**36**
Plastic Limit	**25**
Plastic Index	**11**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/04/18	Matthew F. Cooke, P.G.	4/04/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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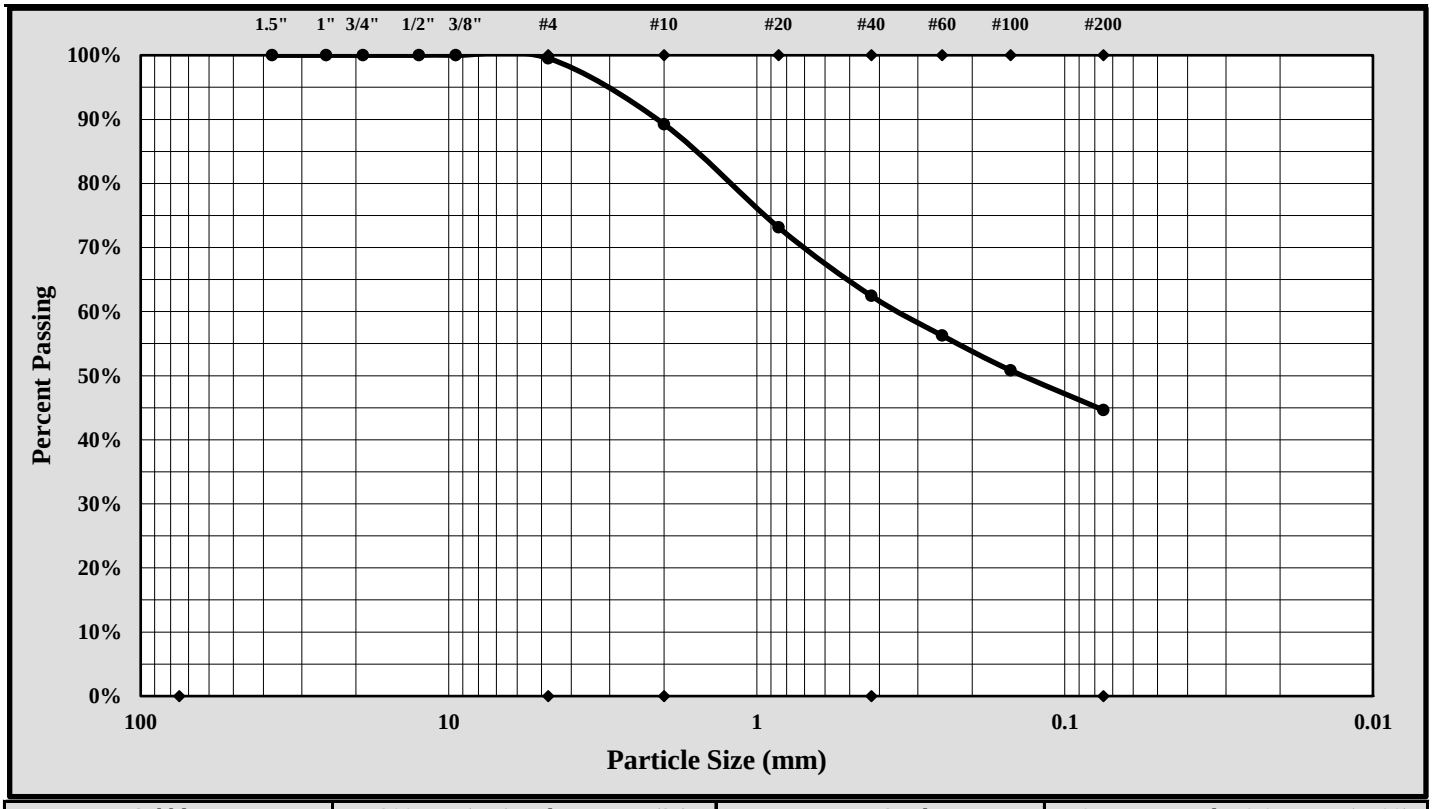
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/04/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/26 - 4/04/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-22 Sample #: SS-4	Sample Date:	2/07/18
Location:	Wall Boring Type: Split-spoon	Depth:	6.0' - 8.0'
Sample Description:	Silty Sand (SM, A-6(2))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.5%
Silt & Clay (% Passing #200):	44.6%	Total Sand:	54.9%

Liquid Limit	36	Plastic Limit	25	Plastic Index	11
Coarse Sand:	10.3%	Medium Sand:	26.8%	Fine Sand:	17.8%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/04/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

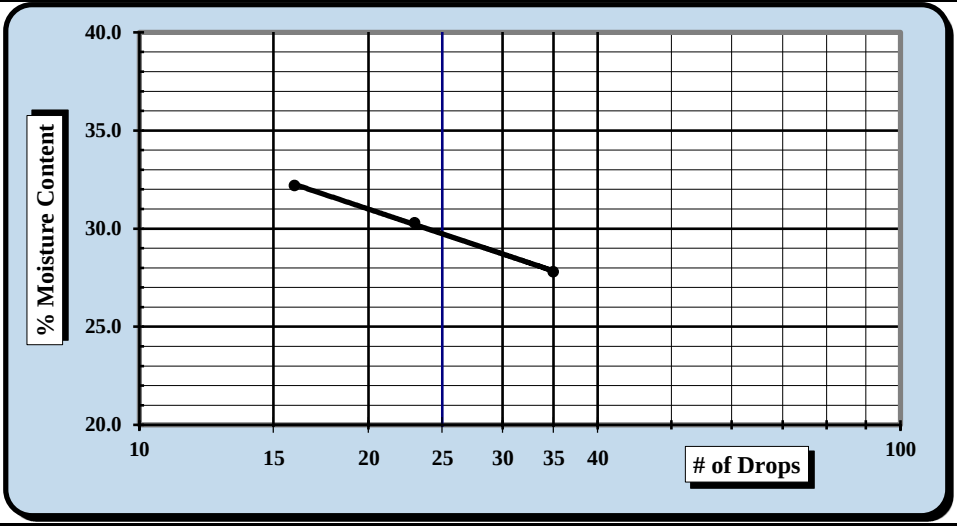
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/04/18
Project Name:	Carolina Crossroads Project	Test Date:	4/03/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-22	Sample #:	SS-6	Sample Date:	2/07/18
Location:	Wall Boring	Type:	Split-spoon	Depth:	13.5' - 15.0'
Sample Description:	Silty Clayey Sand (SC-SM, A-2-4)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	11	12	13				14	15	
A	Tare Weight	26.68	26.63	26.75				26.65	27.60	
B	Wet Soil Weight + A	43.88	43.99	46.09				33.04	34.00	
C	Dry Soil Weight + A	40.14	39.95	41.38				31.84	32.80	
D	Water Weight (B-C)	3.74	4.04	4.71				1.20	1.20	
E	Dry Soil Weight (C-A)	13.46	13.32	14.63				5.19	5.20	
F	% Moisture (D/E)*100	27.8%	30.3%	32.2%				23.1%	23.1%	
N	# OF DROPS	35	23	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**23.1%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**30**
Plastic Limit	**23**
Plastic Index	**7**
Group Symbol	**CL-ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/04/18	Matthew F. Cooke, P.G.	4/04/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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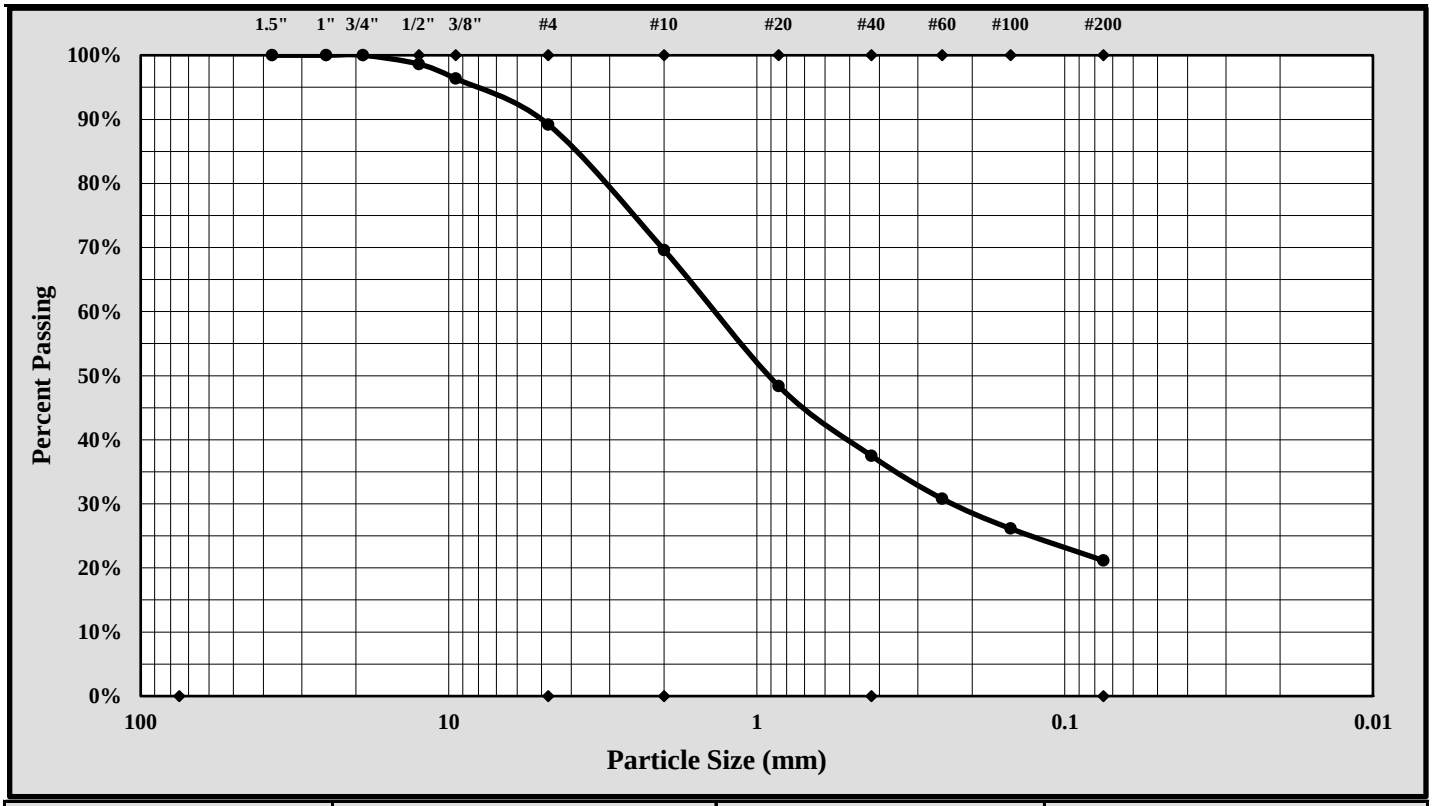
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/04/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/26 - 4/04/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-22	Sample #: SS-6	Sample Date: 2/07/18
Location:	Wall Boring	Type: Split-spoon	Depth: 13.5' - 15.0'
Sample Description:	Silty Clayey Sand (SC-SM, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	19.0 mm	Gravel:	10.8%
Silt & Clay (% Passing #200):	21.2%	Total Sand:	68.0%

Liquid Limit	30	Plastic Limit	23	Plastic Index	7
Coarse Sand:	19.6%	Medium Sand:	32.1%	Fine Sand:	16.4%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/04/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

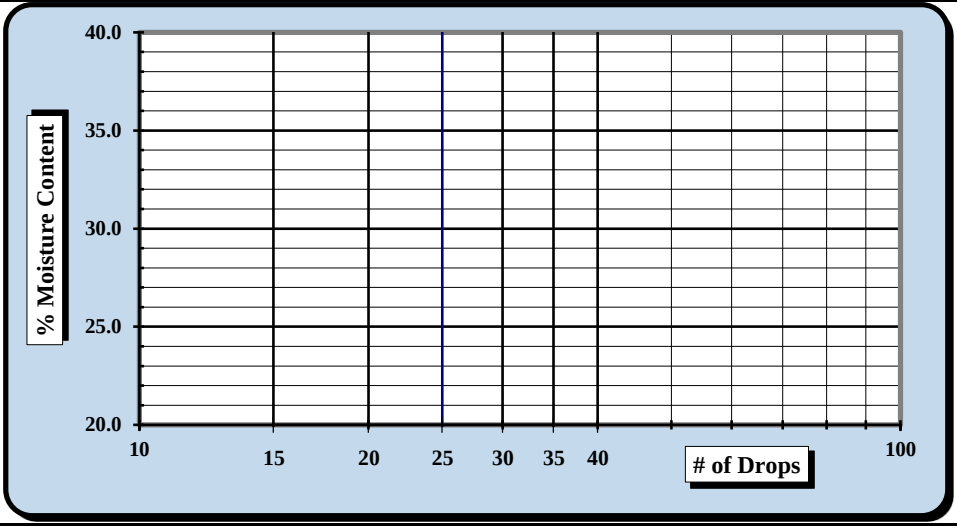
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/04/18
Project Name:	Carolina Crossroads Project	Test Date:	4/03/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-22	Sample #:	SS-8	Sample Date:	2/07/18
Location:	Wall Boring	Type:	Split-spoon	Depth:	23.5' - 25.0'
Sample Description:	Silty Sand (SM, A-2-4)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

	Pan # / Tare #:	Liquid Limit						Plastic Limit		
A	Tare Weight									
B	Wet Soil Weight + A									
C	Dry Soil Weight + A									
D	Water Weight (B-C)									
E	Dry Soil Weight (C-A)									
F	% Moisture (D/E)*100									
N	# OF DROPS							*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*									



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☒

Liquid Limit	---
Plastic Limit	**NP**
Plastic Index	**NP**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/04/18	Matthew F. Cooke, P.G.	4/04/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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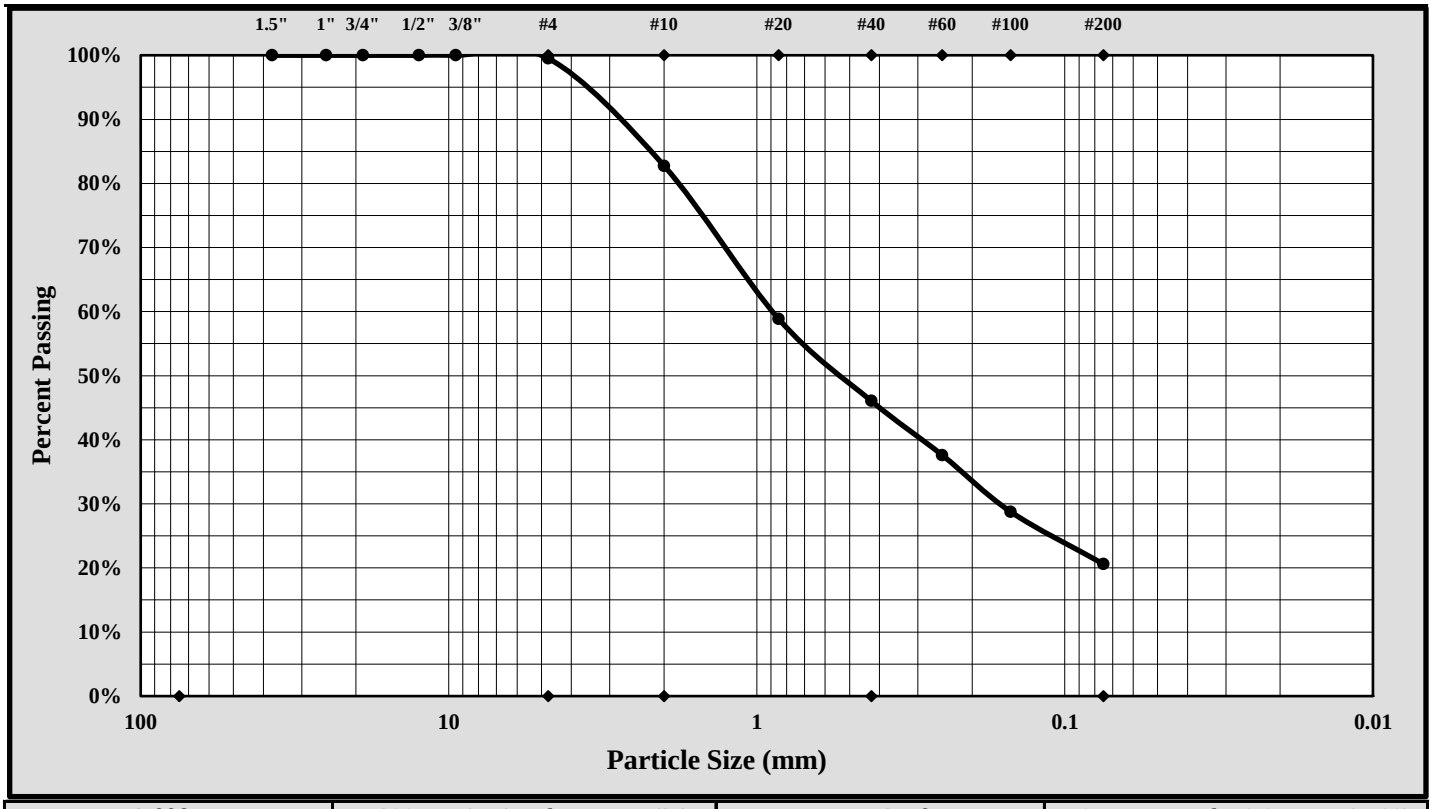
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/04/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/26 - 4/04/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-22	Sample #: SS-8	Sample Date: 2/07/18
Location:	Wall Boring	Type: Split-spoon	Depth: 23.5' - 25.0'
Sample Description:	Silty Sand (SM, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.5%
Silt & Clay (% Passing #200):	20.6%	Total Sand:	78.9%

Liquid Limit	---	Plastic Limit	NP	Plastic Index	NP
Coarse Sand:	16.7%	Medium Sand:	36.7%	Fine Sand:	25.4%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/04/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

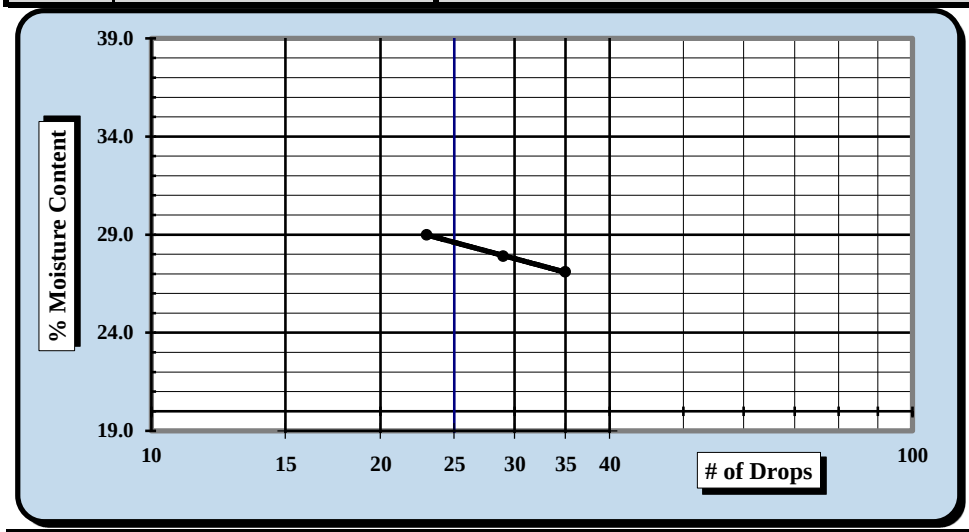
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/26/18
Project Name:	Carolina Crossroads Project	Test Date:	4/23/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-23	Sample #:	SS-1	Sample Date:	3/05/18
Location:	Wall Boring	Type:	Split-spoon	Depth:	0.2' - 2.2'
Sample Description:	Clayey Sand with Gravel (SC, A-2-6(1))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	46	47	48				49	50	
A	Tare Weight	27.57	25.83	26.38				28.66	28.90	
B	Wet Soil Weight + A	42.07	37.23	38.53				35.48	36.41	
C	Dry Soil Weight + A	38.98	34.74	35.80				34.63	35.46	
D	Water Weight (B-C)	3.09	2.49	2.73				0.85	0.95	
E	Dry Soil Weight (C-A)	11.41	8.91	9.42				5.97	6.56	
F	% Moisture (D/E)*100	27.1%	27.9%	29.0%				14.2%	14.5%	
N	# OF DROPS	35	29	23				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**14.4%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐
Liquid Limit **29**
Plastic Limit **14**
Plastic Index **15**
Group Symbol **CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/26/18	Matthew F. Cooke, P.G.	4/26/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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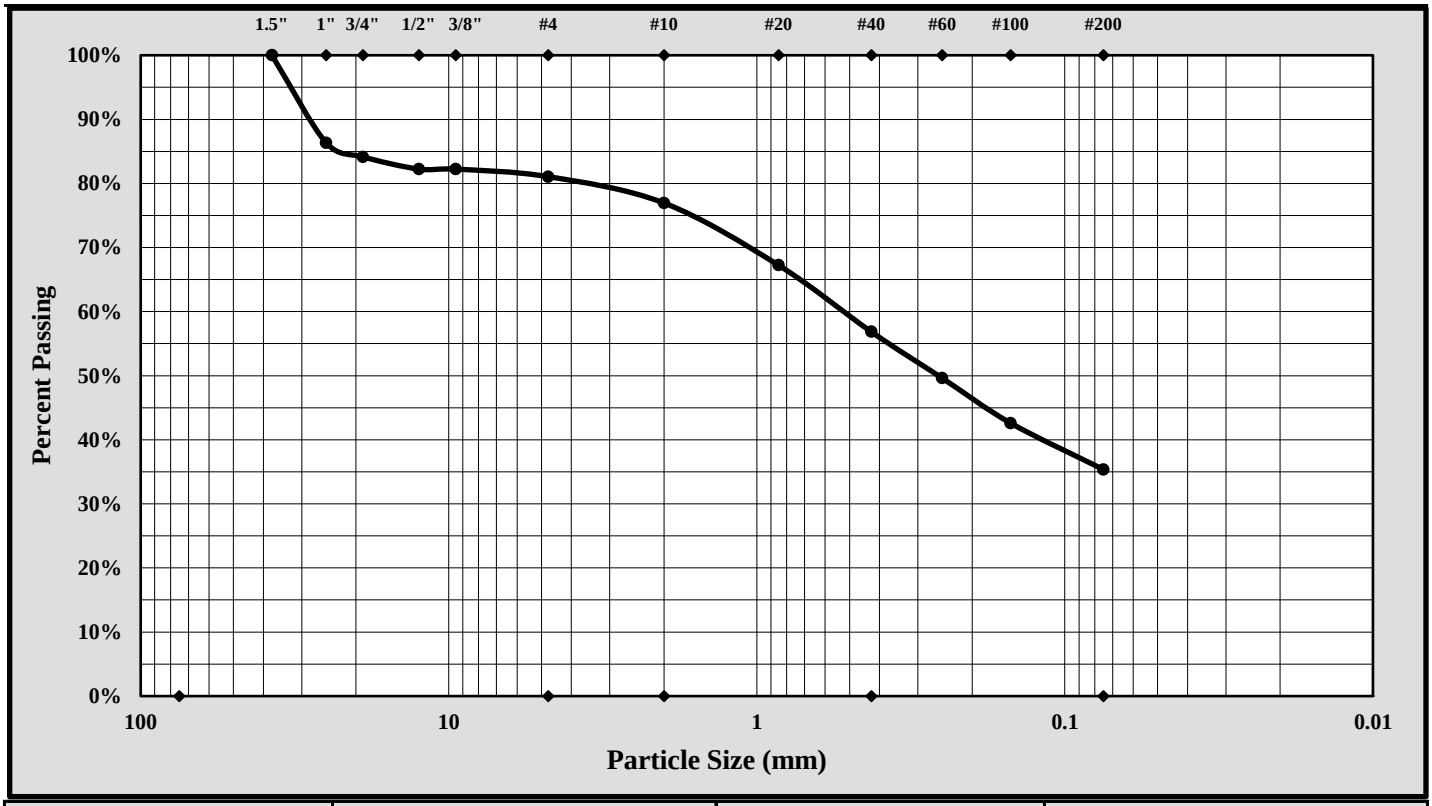
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/26/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/12 - 4/26/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-23	Sample #: SS-1	Sample Date: 3/05/18
Location:	Wall Boring	Type: Split-spoon	Depth: 0.2' - 2.2'
Sample Description:	Clayey Sand with Gravel (SC, A-2-6(1))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	37.5 mm	Gravel:	18.9%
Silt & Clay (% Passing #200):	35.4%	Total Sand:	45.7%

Liquid Limit	29	Plastic Limit	14	Plastic Index	15
Coarse Sand:	4.1%	Medium Sand:	20.1%	Fine Sand:	21.5%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/26/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/26/18
Project Name:	Carolina Crossroads Project	Test Date:	4/23/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-23	Sample #:	SS-4	Sample Date:	3/05/18
Location:	Wall Boring	Type:	Split-spoon	Depth:	6.2' - 8.2'

Sample Description: Fat Clay with Sand (CH, A-7-6(32))

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	51	52	53				54	55	
A	Tare Weight	28.45	24.98	28.39				27.60	26.01	
B	Wet Soil Weight + A	43.65	41.21	44.58				35.10	32.14	
C	Dry Soil Weight + A	38.19	35.12	38.13				33.80	31.08	
D	Water Weight (B-C)	5.46	6.09	6.45				1.30	1.06	
E	Dry Soil Weight (C-A)	9.74	10.14	9.74				6.20	5.07	
F	% Moisture (D/E)*100	56.1%	60.1%	66.2%				21.0%	20.9%	
N	# OF DROPS	35	25	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**21.0%**		

One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**60**
Plastic Limit	**21**
Plastic Index	**39**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/26/18	Matthew F. Cooke, P.G.	4/26/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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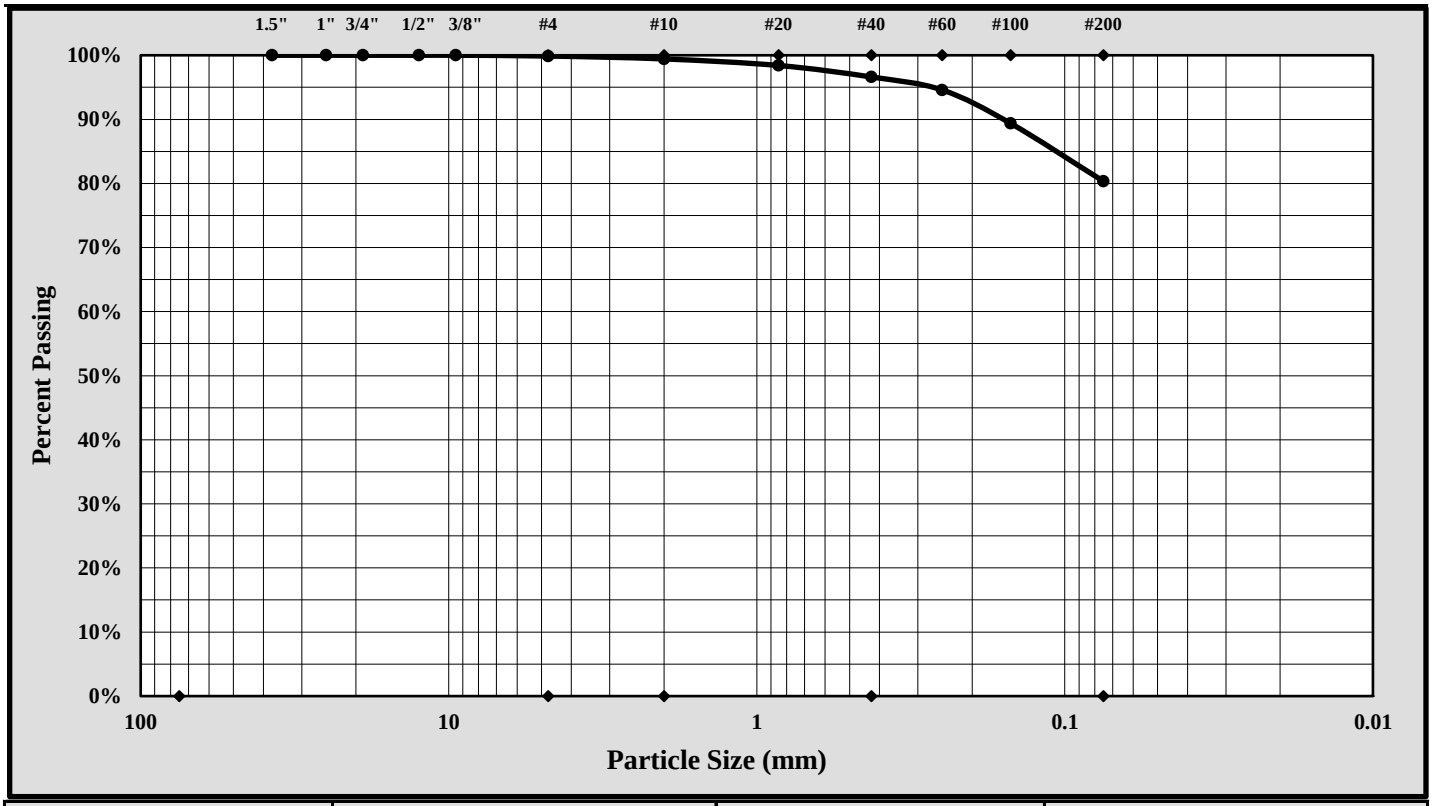
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/26/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/12 - 4/26/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-23	Sample #: SS-4	Sample Date: 3/05/18
Location:	Wall Boring	Type: Split-spoon	Depth: 6.2' - 8.2'
Sample Description:	Fat Clay with Sand (CH, A-7-6(32))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	2.00 mm	Gravel:	0.1%
Silt & Clay (% Passing #200):	80.3%	Total Sand:	19.5%

Liquid Limit	60	Plastic Limit	21	Plastic Index	39
Coarse Sand:	0.4%	Medium Sand:	2.8%	Fine Sand:	16.3%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/26/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

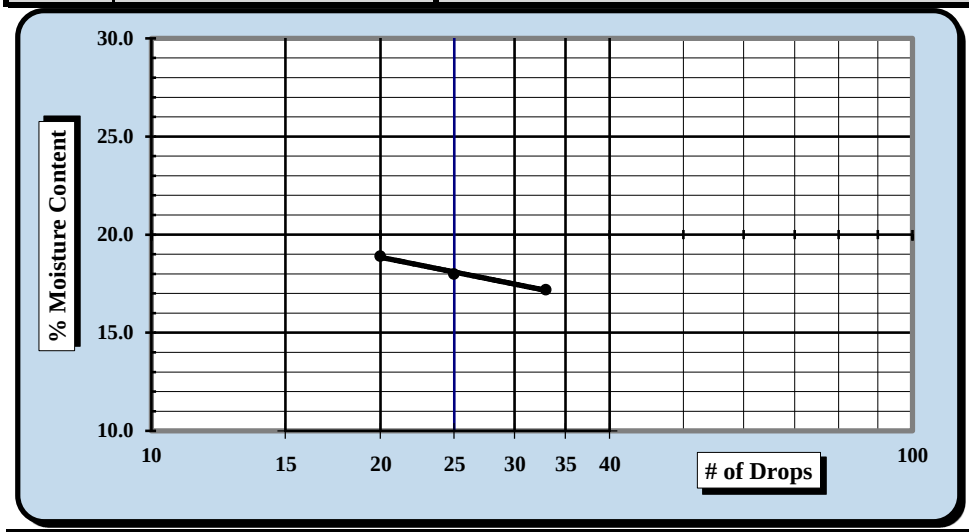
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/26/18
Project Name:	Carolina Crossroads Project	Test Date:	4/23/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-24	Sample #:	SS-1	Sample Date:	3/09/18
Location:	Wall Boring	Type:	Split-spoon	Depth:	0.0' - 2.0'
Sample Description:	Silty Clayey Sand (SC-SM, A-2-4)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	1	2	3				4	5	
A	Tare Weight	26.69	26.48	26.34				25.93	26.96	
B	Wet Soil Weight + A	39.55	41.40	42.85				32.48	33.06	
C	Dry Soil Weight + A	37.66	39.12	40.23				31.67	32.31	
D	Water Weight (B-C)	1.89	2.28	2.62				0.81	0.75	
E	Dry Soil Weight (C-A)	10.97	12.64	13.89				5.74	5.35	
F	% Moisture (D/E)*100	17.2%	18.0%	18.9%				14.1%	14.0%	
N	# OF DROPS	33	25	20				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**14.1%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**18**
Plastic Limit	**14**
Plastic Index	**4**
Group Symbol	**CL-ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/26/18	Matthew F. Cooke, P.G.	4/26/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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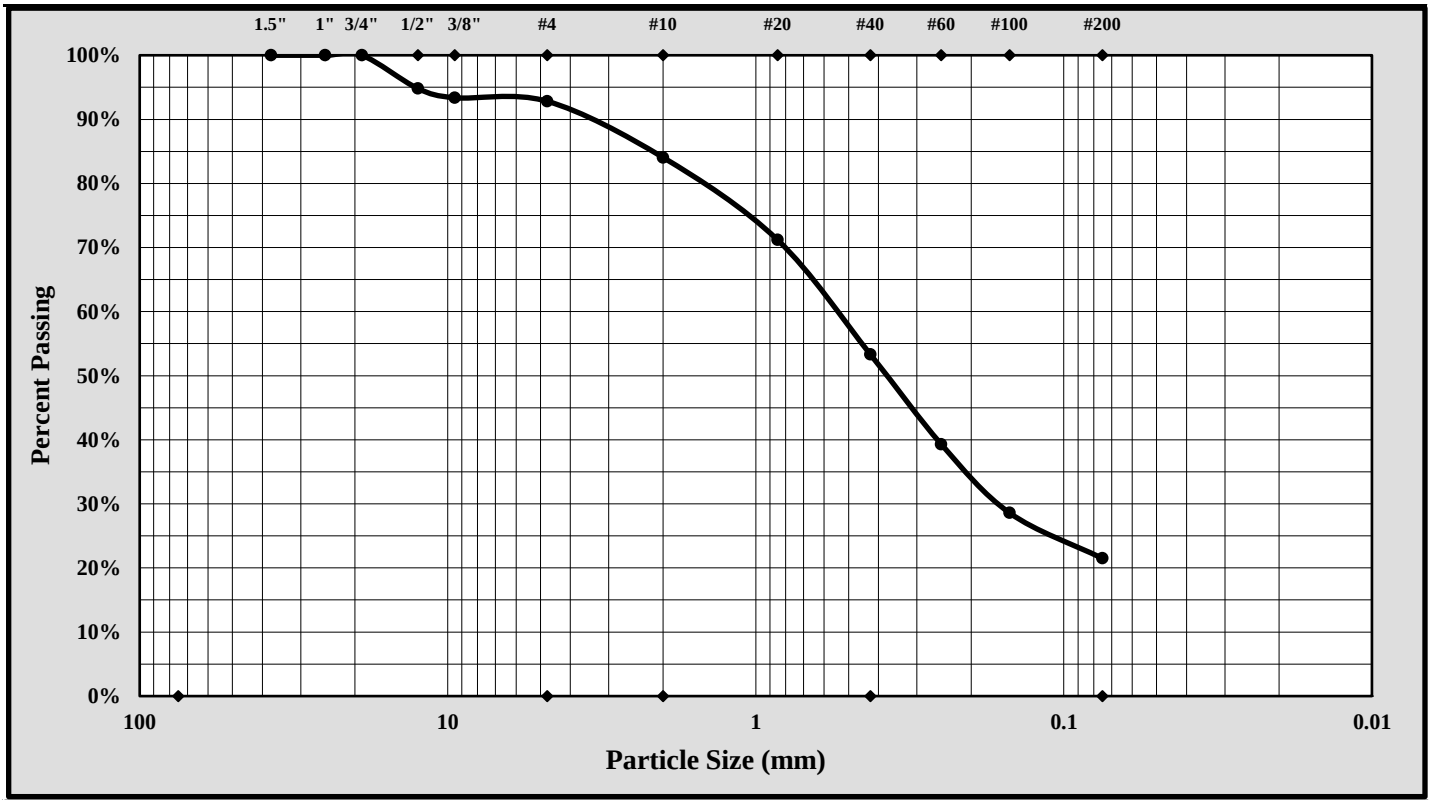
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/26/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/12 - 4/26/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-24	Sample #: SS-1	Sample Date: 3/09/18
Location:	Wall Boring	Type: Split-spoon	Depth: 0.0' - 2.0'
Sample Description:	Silty Clayey Sand (SC-SM, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	19.0 mm	Gravel:	7.2%
Silt & Clay (% Passing #200):	21.5%	Total Sand:	71.3%

Liquid Limit	18	Plastic Limit	14	Plastic Index	4
Coarse Sand:	8.8%	Medium Sand:	30.7%	Fine Sand:	31.9%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/26/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

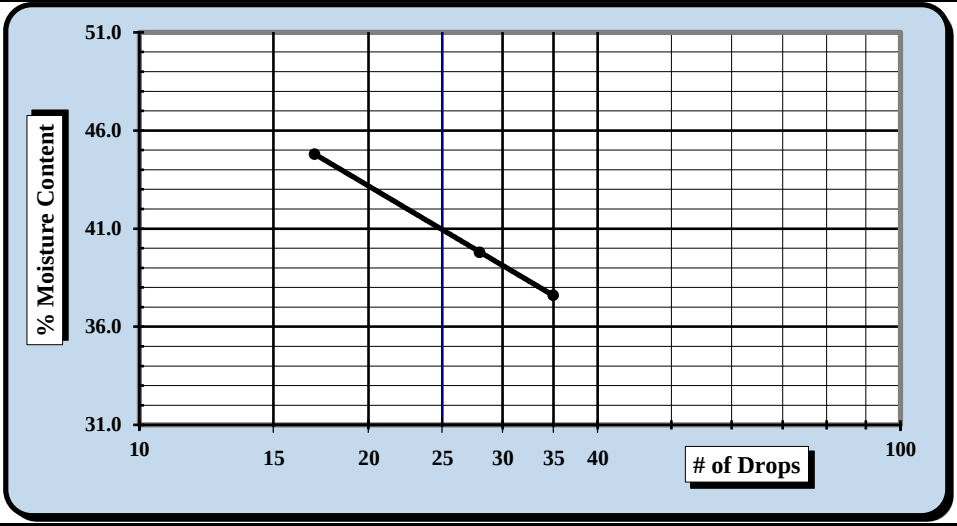
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/26/18
Project Name:	Carolina Crossroads Project	Test Date:	4/24/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-24	Sample #:	SS-2	Sample Date:	3/09/18
Location:	Wall Boring	Type:	Split-spoon	Depth:	2.0' - 4.0'
Sample Description:	Clayey Sand (SC, A-7-6(5))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	6	7	8				9	10	
A	Tare Weight	27.76	26.30	27.31				26.84	26.75	
B	Wet Soil Weight + A	40.05	40.31	41.57				34.66	33.79	
C	Dry Soil Weight + A	36.69	36.32	37.16				33.27	32.53	
D	Water Weight (B-C)	3.36	3.99	4.41				1.39	1.26	
E	Dry Soil Weight (C-A)	8.93	10.02	9.85				6.43	5.78	
F	% Moisture (D/E)*100	37.6%	39.8%	44.8%				21.6%	21.8%	
N	# OF DROPS	35	28	17				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**21.7%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**41**
Plastic Limit	**22**
Plastic Index	**19**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/26/18	Matthew F. Cooke, P.G.	4/26/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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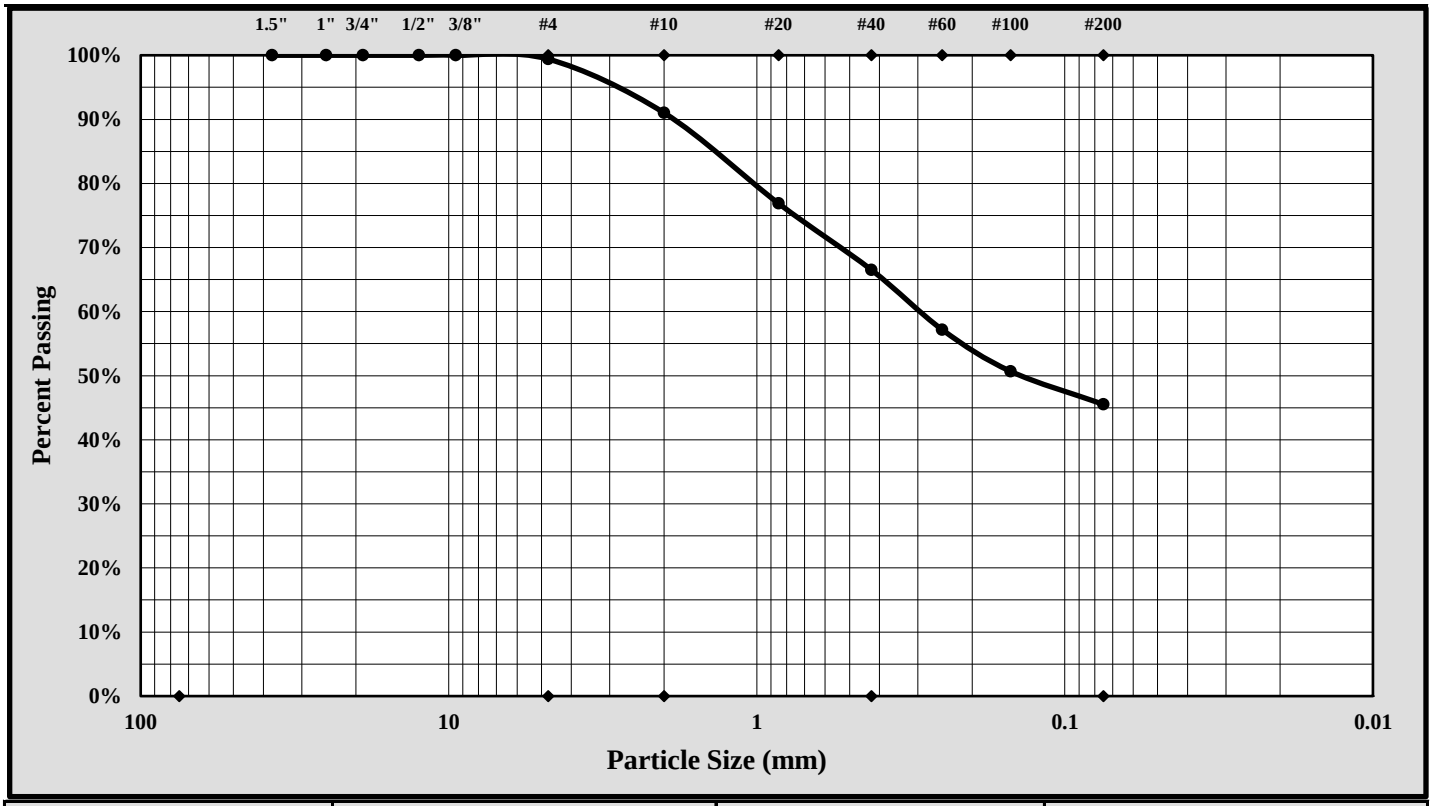
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/26/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/12 - 4/26/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-24	Sample #: SS-2	Sample Date: 3/09/18
Location:	Wall Boring	Type: Split-spoon	Depth: 2.0' - 4.0'
Sample Description:	Clayey Sand (SC, A-7-6(5))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.6%
Silt & Clay (% Passing #200):	45.5%	Total Sand:	53.9%

Liquid Limit	41	Plastic Limit	22	Plastic Index	19
Coarse Sand:	8.4%	Medium Sand:	24.5%	Fine Sand:	21.0%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/26/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

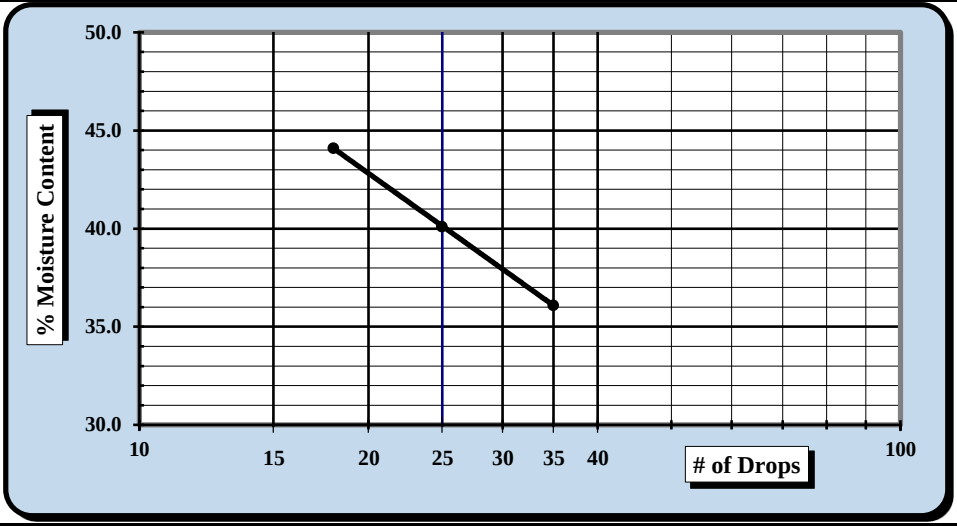
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/26/18
Project Name:	Carolina Crossroads Project	Test Date:	4/24/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-24	Sample #:	SS-5	Sample Date:	3/09/18
Location:	Wall Boring	Type:	Split-spoon	Depth:	8.0' - 10.0'
Sample Description:	Silty Sand (SM, A-6(4))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	11	12	13				14	15	
A	Tare Weight	26.68	26.65	26.76				26.65	27.60	
B	Wet Soil Weight + A	41.76	39.44	40.97				33.28	34.82	
C	Dry Soil Weight + A	37.76	35.78	36.62				31.85	33.29	
D	Water Weight (B-C)	4.00	3.66	4.35				1.43	1.53	
E	Dry Soil Weight (C-A)	11.08	9.13	9.86				5.20	5.69	
F	% Moisture (D/E)*100	36.1%	40.1%	44.1%				27.5%	26.9%	
N	# OF DROPS	35	25	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**27.2%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**40**
Plastic Limit	**27**
Plastic Index	**13**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/26/18	Matthew F. Cooke, P.G.	4/26/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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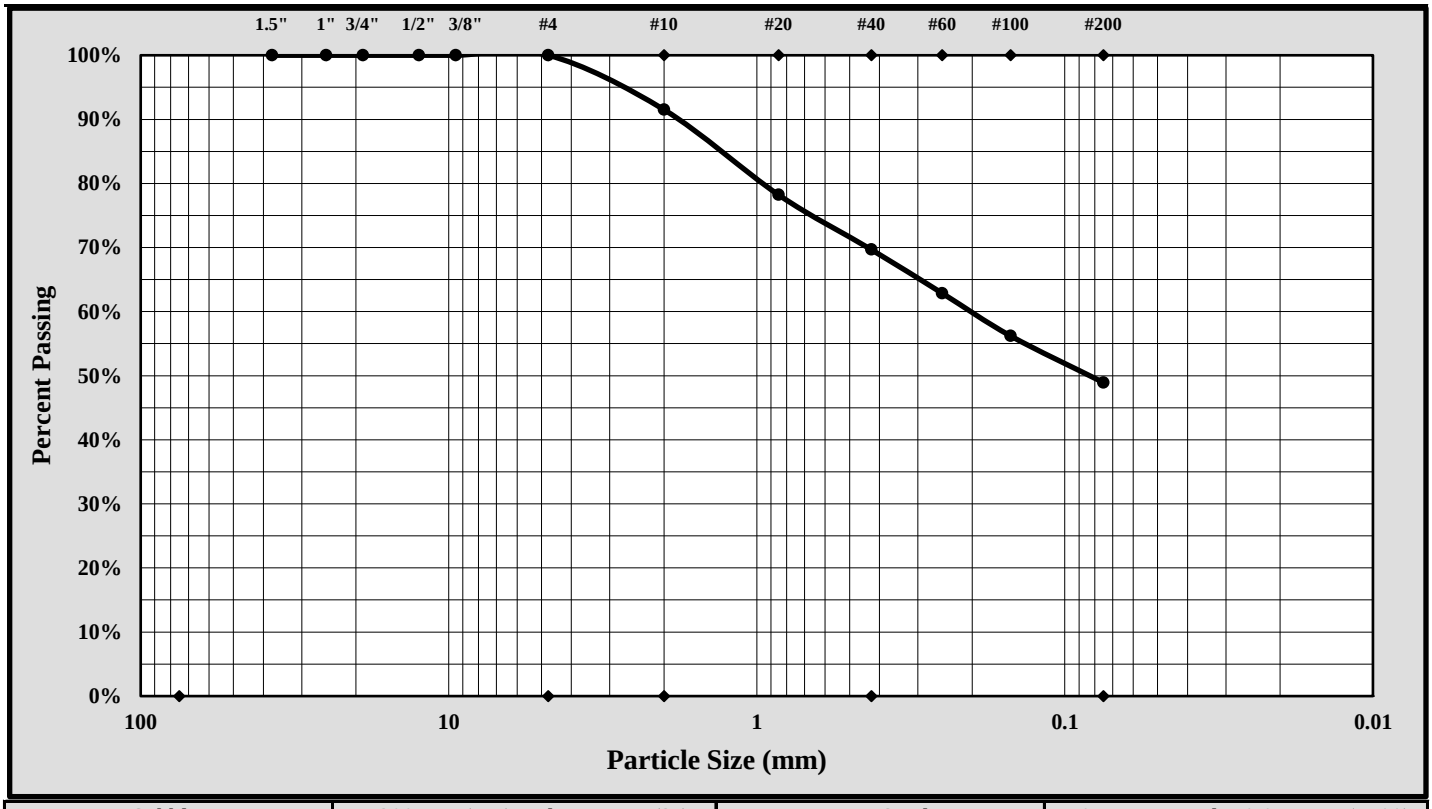
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/26/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/12 - 4/26/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-24	Sample #: SS-5	Sample Date: 3/09/18
Location:	Wall Boring	Type: Split-spoon	Depth: 8.0' - 10.0'
Sample Description:	Silty Sand (SM, A-6(4))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	48.9%	Total Sand:	51.1%

Liquid Limit	40	Plastic Limit	27	Plastic Index	13
Coarse Sand:	8.5%	Medium Sand:	21.8%	Fine Sand:	20.7%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/26/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

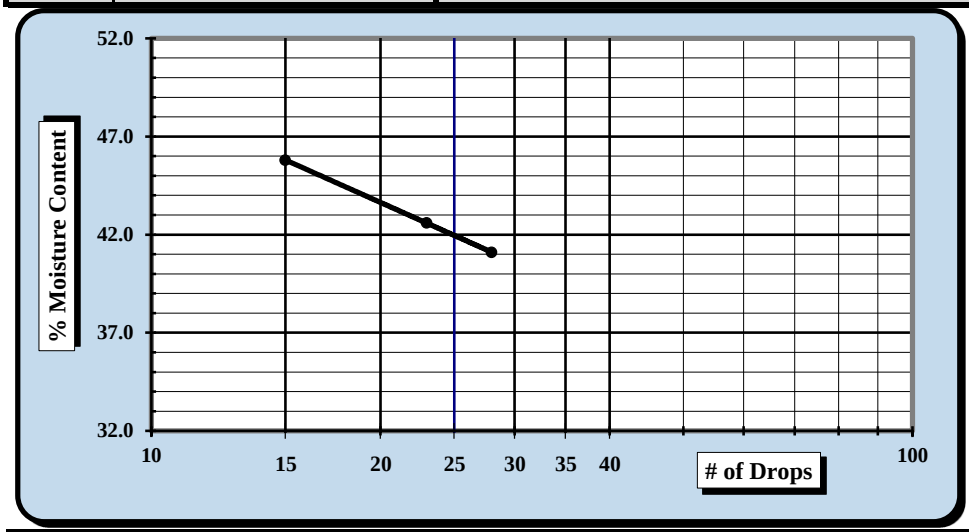
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/26/18
Project Name:	Carolina Crossroads Project	Test Date:	4/24/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-24	Sample #:	SS-7	Sample Date:	3/09/18
Location:	Wall boring	Type:	Split-spoon	Depth:	18.5 - 20.0'
Sample Description:	Silty Sand [SM, A-7-5(3)]				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	16	17	18				19	20	
A	Tare Weight	26.58	26.62	26.78				26.67	26.83	
B	Wet Soil Weight + A	42.04	41.17	41.61				33.42	33.34	
C	Dry Soil Weight + A	37.54	36.82	36.95				31.85	31.85	
D	Water Weight (B-C)	4.50	4.35	4.66				1.57	1.49	
E	Dry Soil Weight (C-A)	10.96	10.20	10.17				5.18	5.02	
F	% Moisture (D/E)*100	41.1%	42.6%	45.8%				30.3%	29.7%	
N	# OF DROPS	28	23	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**30.0%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**42**
Plastic Limit	**30**
Plastic Index	**12**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/26/18	Matthew F. Cooke, P.G.	4/26/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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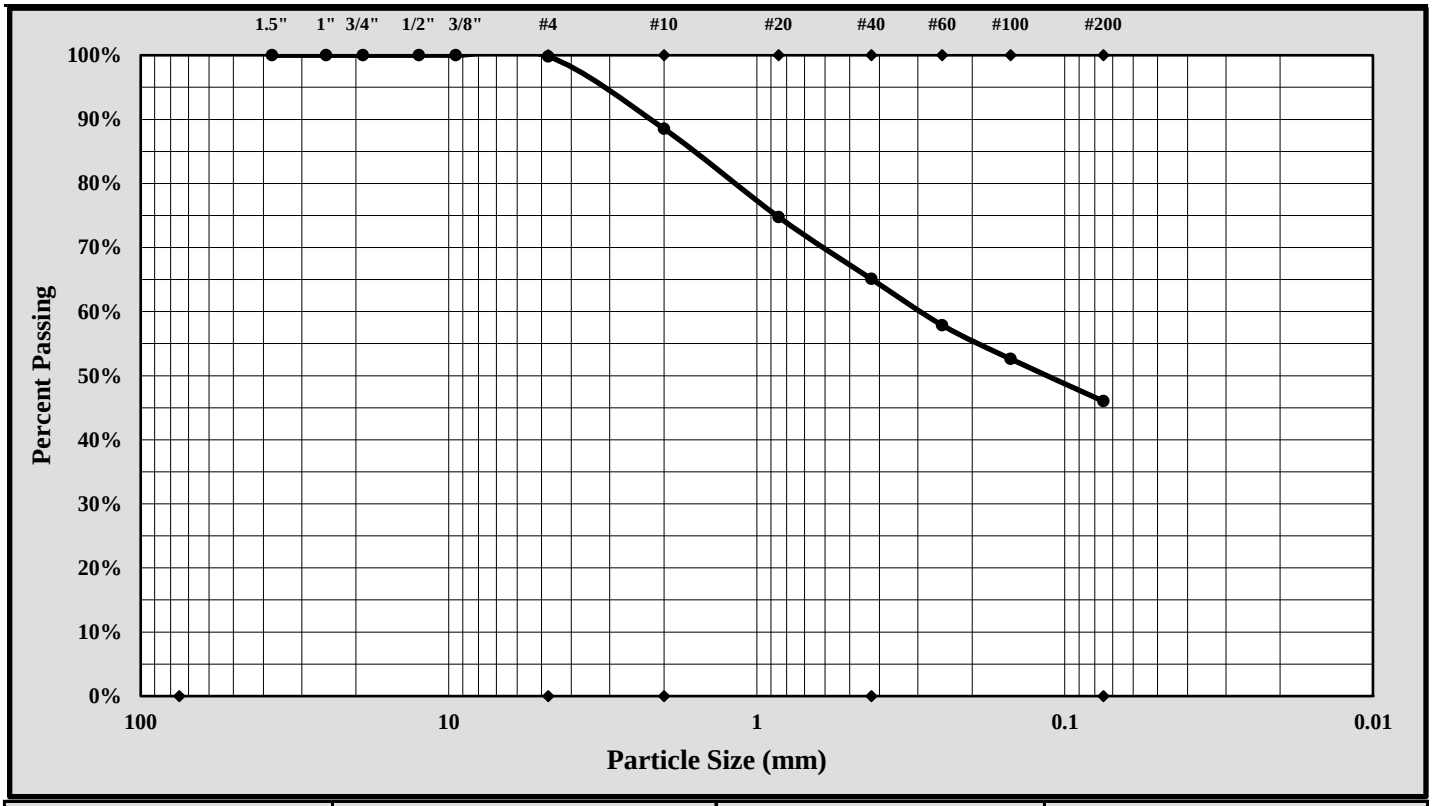
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/26/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/12 - 4/26/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-24	Sample #: SS-7	Sample Date: 3/09/18
Location:	Wall Boring	Type: Split-spoon	Depth: 18.5' - 20.0'
Sample Description:	Silty Sand (SM, A-7-5(3))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.2%
Silt & Clay (% Passing #200):	46.0%	Total Sand:	53.8%

Liquid Limit	42	Plastic Limit	30	Plastic Index	12
Coarse Sand:	11.3%	Medium Sand:	23.4%	Fine Sand:	19.1%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/26/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

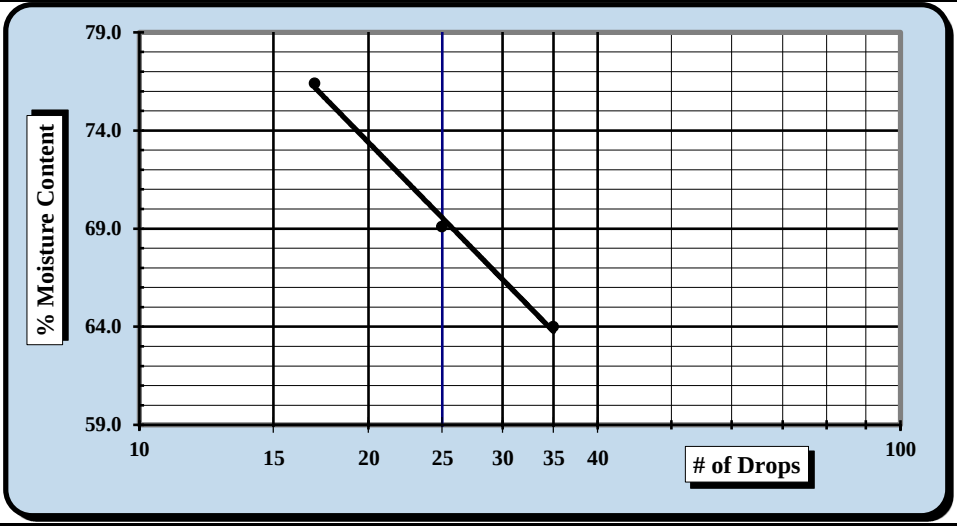
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/04/18
Project Name:	Carolina Crossroads Project	Test Date:	4/03/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-25	Sample #:	SS-2	Sample Date:	2/06/18
Location:	Wall Boring	Type:	Split-spoon	Depth:	2.0' - 4.0'
Sample Description:	Elastic Silt with Sand (MH, A-7-5(26))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	16	17	18				19	20	
A	Tare Weight	26.59	26.63	26.81				26.66	26.81	
B	Wet Soil Weight + A	41.37	39.67	39.35				32.73	33.06	
C	Dry Soil Weight + A	35.60	34.34	33.92				31.03	31.32	
D	Water Weight (B-C)	5.77	5.33	5.43				1.70	1.74	
E	Dry Soil Weight (C-A)	9.01	7.71	7.11				4.37	4.51	
F	% Moisture (D/E)*100	64.0%	69.1%	76.4%				38.9%	38.6%	
N	# OF DROPS	35	25	17				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**38.8%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**69**
Plastic Limit	**39**
Plastic Index	**30**
Group Symbol	**MH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/04/18	Matthew F. Cooke, P.G.	4/04/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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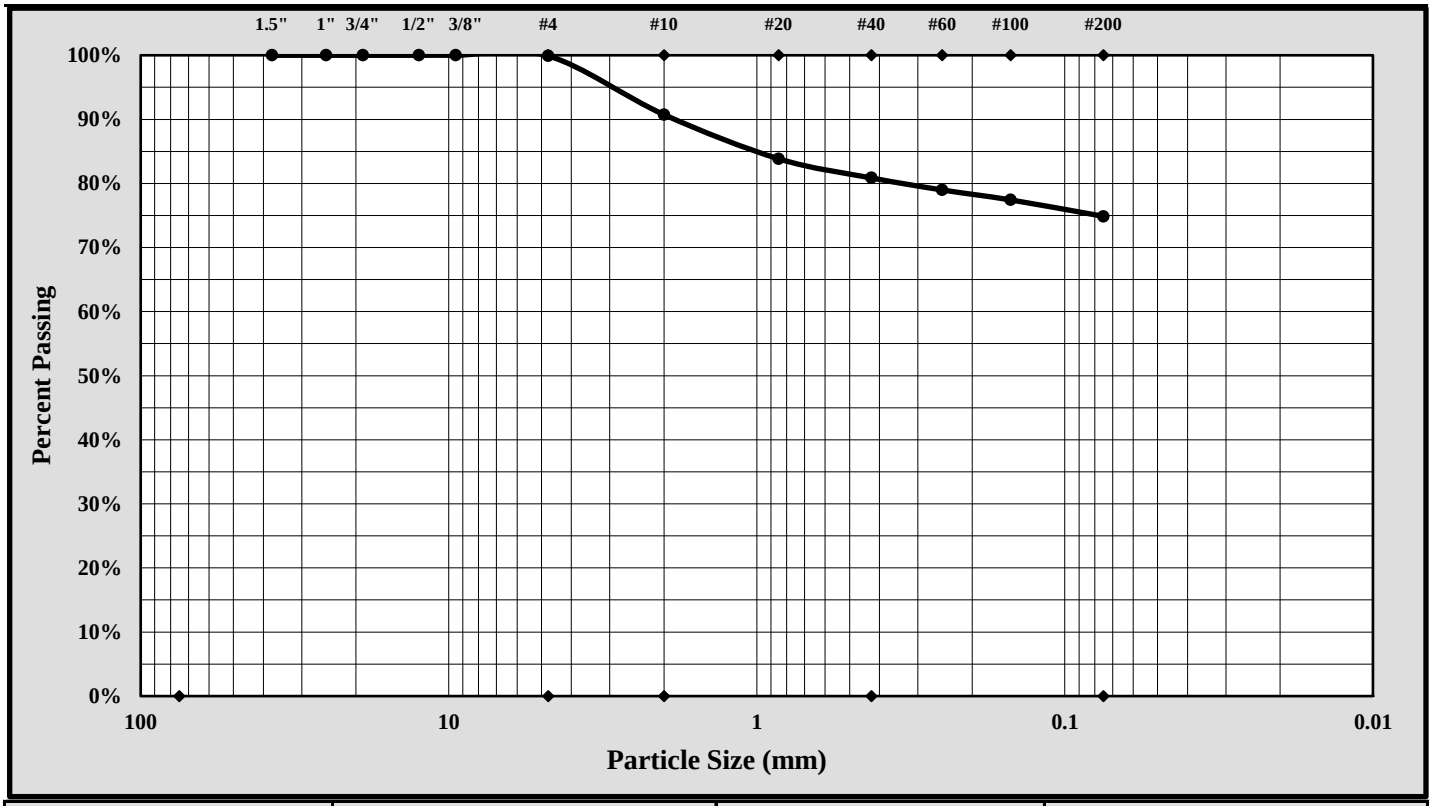
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/04/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/26 - 4/04/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-25	Sample #: SS-2	Sample Date: 2/06/18
Location:	Wall Boring	Type: Split-spoon	Depth: 2.0' - 4.0'
Sample Description:	Elastic Silt with Sand (MH, A-7-5(26))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.1%
Silt & Clay (% Passing #200):	74.9%	Total Sand:	25.0%

Liquid Limit	69	Plastic Limit	39	Plastic Index	30
Coarse Sand:	9.2%	Medium Sand:	9.9%	Fine Sand:	6.0%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/04/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/05/18
Project Name:	Carolina Crossroads Project	Test Date:	4/04/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-25	Sample #:	SS-5	Sample Date:	2/06/18
Location:	Wall Boring	Type:	Split-spoon	Depth:	8.0' - 10.0'
Sample Description:	Silty Sand (SM, A-1-b)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	1	2	3				4	5	
A	Tare Weight	26.69	26.47	26.35				25.93	26.94	
B	Wet Soil Weight + A	38.01	41.04	43.78				34.56	33.09	
C	Dry Soil Weight + A	35.76	37.82	39.52				32.87	31.88	
D	Water Weight (B-C)	2.25	3.22	4.26				1.69	1.21	
E	Dry Soil Weight (C-A)	9.07	11.35	13.17				6.94	4.94	
F	% Moisture (D/E)*100	24.8%	28.4%	32.3%				24.4%	24.5%	
N	# OF DROPS	35	22	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**24.5%**		

One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**28**
Plastic Limit	**24**
Plastic Index	**4**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/05/18	Matthew F. Cooke, P.G.	4/05/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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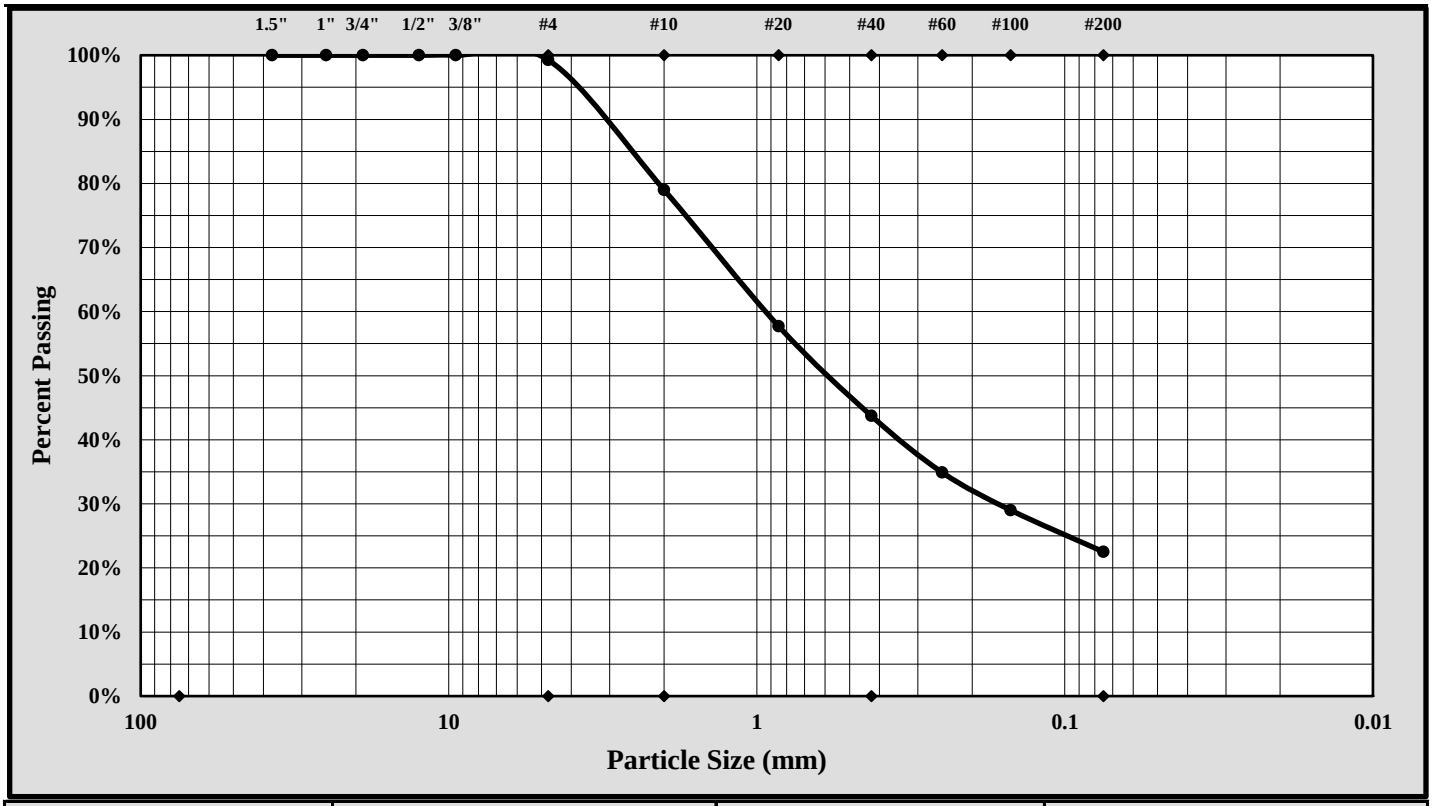
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/04/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/26 - 4/05/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-25	Sample #: SS-5	Sample Date: 2/06/18
Location:	Wall Boring	Type: Split-spoon	Depth: 8.0' - 10.0'
Sample Description:	Silty Sand (SM, A-1-b)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.7%
Silt & Clay (% Passing #200):	22.5%	Total Sand:	76.7%

Liquid Limit	28	Plastic Limit	24	Plastic Index	4
Coarse Sand:	20.3%	Medium Sand:	35.2%	Fine Sand:	21.2%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/04/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

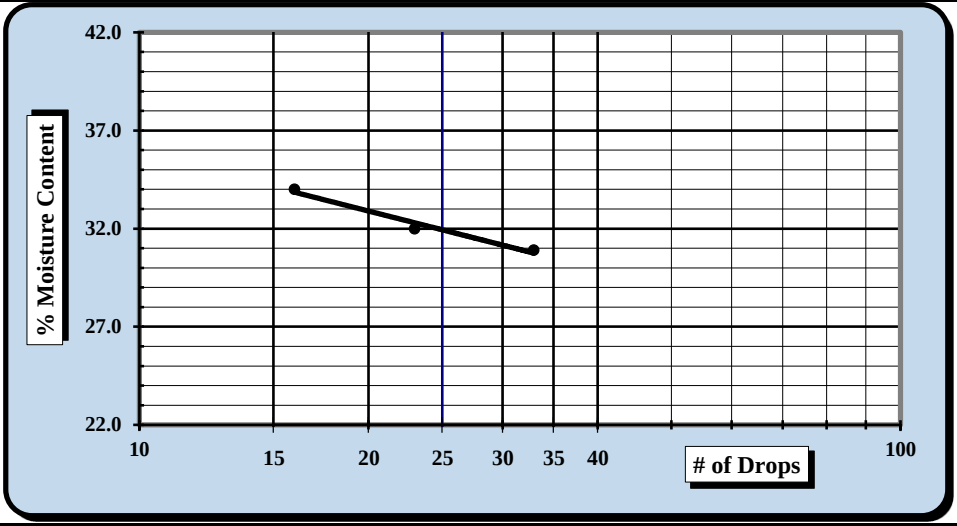
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/05/18
Project Name:	Carolina Crossroads Project	Test Date:	4/04/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-25	Sample #:	SS-8	Sample Date:	2/06/18
Location:	Wall Boring	Type:	Split-spoon	Depth:	23.5' - 25.0'
Sample Description:	Silty Sand (SM, A-2-4)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	6	7	8				9	10	
A	Tare Weight	27.76	26.29	27.31				26.84	26.74	
B	Wet Soil Weight + A	43.26	43.26	43.77				32.84	33.12	
C	Dry Soil Weight + A	39.60	39.15	39.59				31.50	31.70	
D	Water Weight (B-C)	3.66	4.11	4.18				1.34	1.42	
E	Dry Soil Weight (C-A)	11.84	12.86	12.28				4.66	4.96	
F	% Moisture (D/E)*100	30.9%	32.0%	34.0%				28.8%	28.6%	
N	# OF DROPS	33	23	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**28.7%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**32**
Plastic Limit	**29**
Plastic Index	**3**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/05/18	Matthew F. Cooke, P.G.	4/05/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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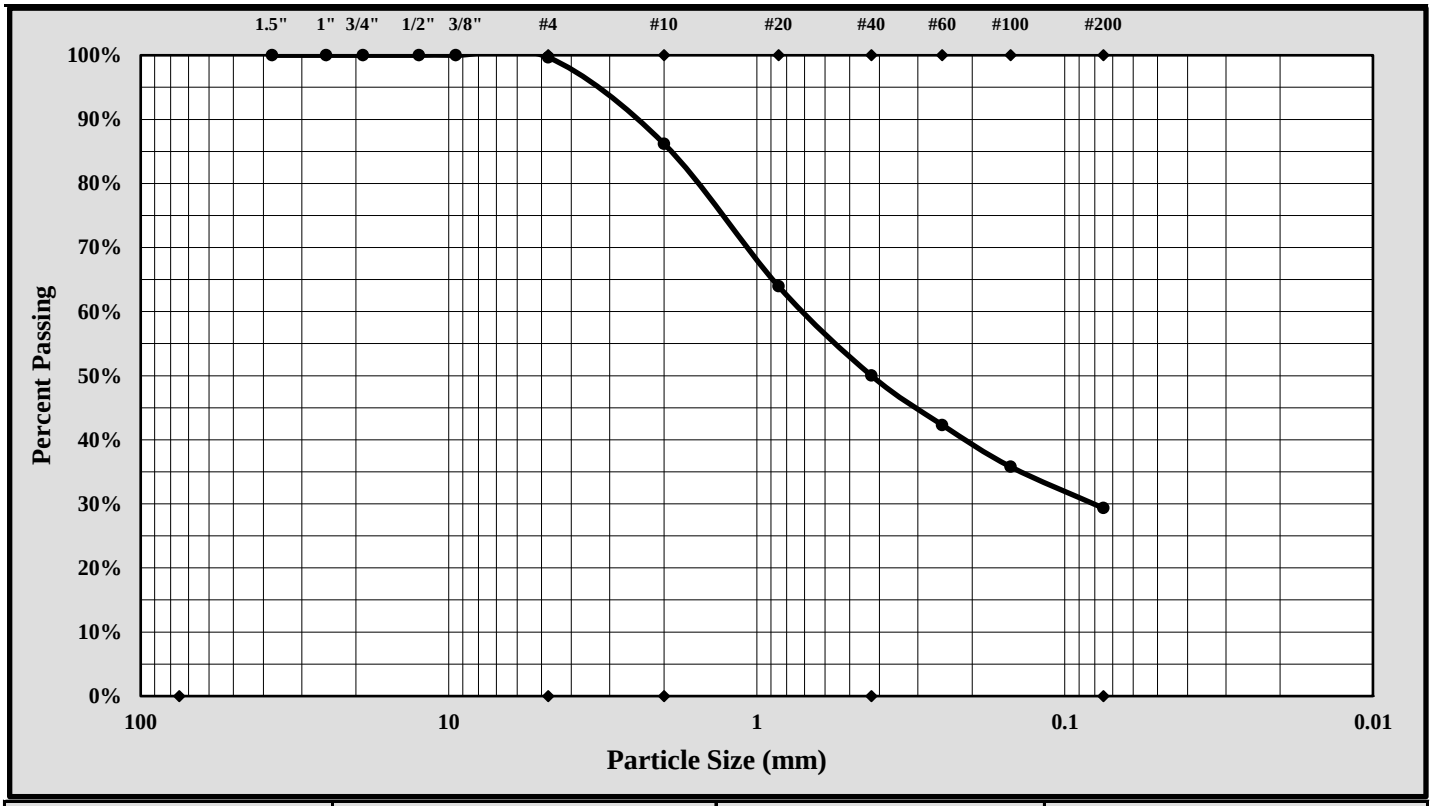
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/04/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/26 - 4/05/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-25	Sample #: SS-8	Sample Date: 2/06/18
Location:	Wall Boring	Type: Split-spoon	Depth: 23.5' - 25.0'
Sample Description:	Silty Sand (SM, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.3%
Silt & Clay (% Passing #200):	29.3%	Total Sand:	70.3%

Liquid Limit	32	Plastic Limit	29	Plastic Index	3
Coarse Sand:	13.5%	Medium Sand:	36.1%	Fine Sand:	20.7%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/04/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/31/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	5/21/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-27	Sample #: SS-1	Sample Date: Various
Log #:	43-2321		Depth: 0.4' - 2.4'
Sample Description:	Clayey sand (SC, A-2-6)		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	24	23	2				14	28-B	
A	Tare Weight	15.43	15.44	15.55				15.46	17.69	
B	Wet Soil Weight + A	26.65	27.63	28.40				23.55	26.57	
C	Dry Soil Weight + A	23.37	24.48	25.35				22.50	25.42	
D	Water Weight (B-C)	3.28	3.15	3.05				1.05	1.15	
E	Dry Soil Weight (C-A)	7.94	9.04	9.80				7.04	7.73	
F	% Moisture (D/E)*100	41.3%	34.8%	31.1%				14.9%	14.9%	
N	# OF DROPS	18	28	35				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**14.9%**		

One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**36**
Plastic Limit	**15**
Plastic Index	**21**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	5/21/2018	Michael D. Kelso, E.I.	5/31/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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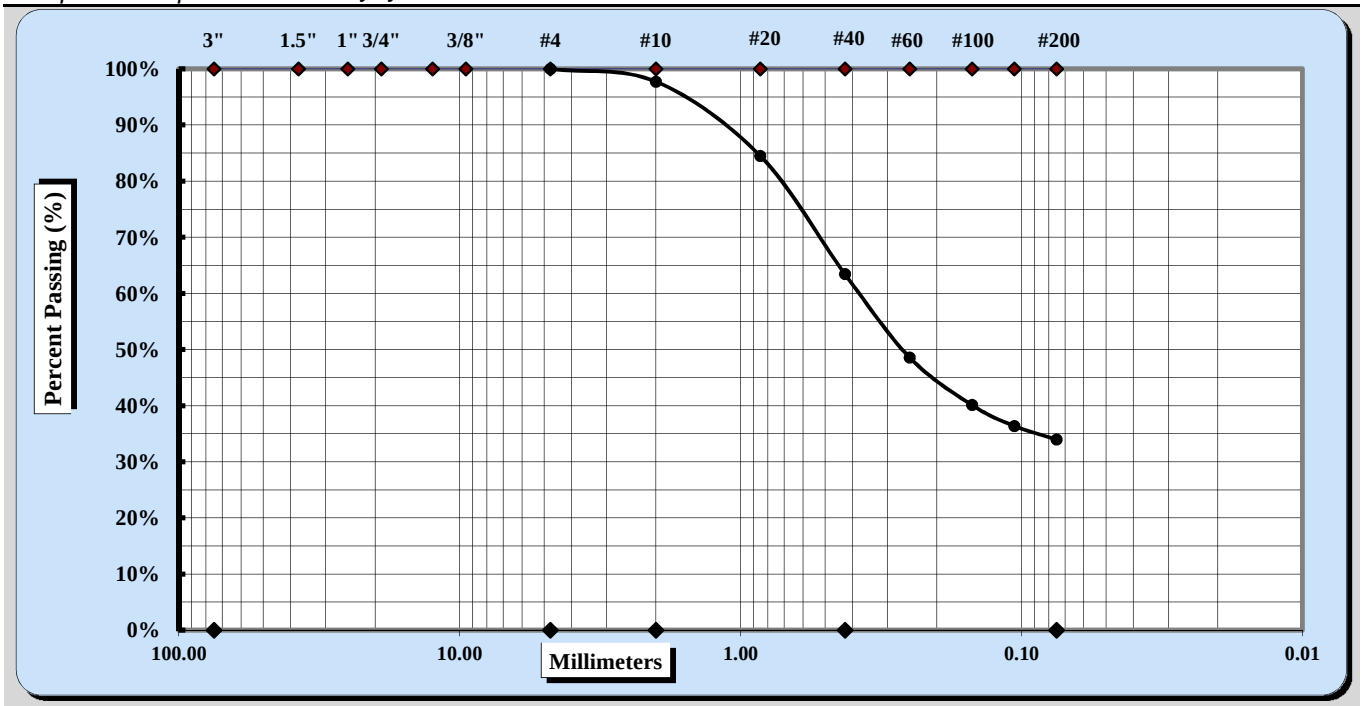
Sieve Analysis of Soils

Quality Assurance | *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/31/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/25/18 - 5/29/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID: W-27	Type: Split Spoon	Sample Date:	Various
Sample Log No.: 43-2321	Sample: 1	Depth:	0.4' - 2.4'
Sample Description:	Clayey sand (SC, A-2-6)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	No. 4	Coarse Sand	2%	Fine Sand	29%
Gravel	0%	Medium Sand	34%	Silt & Clay	34%
Liquid Limit	36	Plastic Limit	15	Plastic Index	21

Coarse Sand	2%	Medium Sand	34%	Fine Sand	29%

Description of Sand & Gravel Particles: Rounded ☐ Angular ☒
Hard & Durable ☐ Soft ☒ Weathered & Friable ☒

Notes / Deviations / References:

Michael D. Kelso, E.I.		Staff Professional	5/31/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/31/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	5/21/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-27	Sample #: SS-2	Sample Date: Various
Log #:	43-2321		Depth: 2.4' - 4.4'
Sample Description:	Sandy fat clay (CH, A-7-5 (18))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	C-78	C-76	30				32-B	29	
A	Tare Weight	15.57	22.59	17.81				17.84	17.80	
B	Wet Soil Weight + A	26.67	27.60	28.75				25.35	25.54	
C	Dry Soil Weight + A	22.05	25.61	24.56				23.60	23.74	
D	Water Weight (B-C)	4.62	1.99	4.19				1.75	1.80	
E	Dry Soil Weight (C-A)	6.48	3.02	6.75				5.76	5.94	
F	% Moisture (D/E)*100	71.3%	65.9%	62.1%				30.4%	30.3%	
N	# OF DROPS	15	25	35				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**30.4%**		

One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**66**
Plastic Limit	**30**
Plastic Index	**36**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	5/21/2018	Michael D. Kelso, E.I.	5/31/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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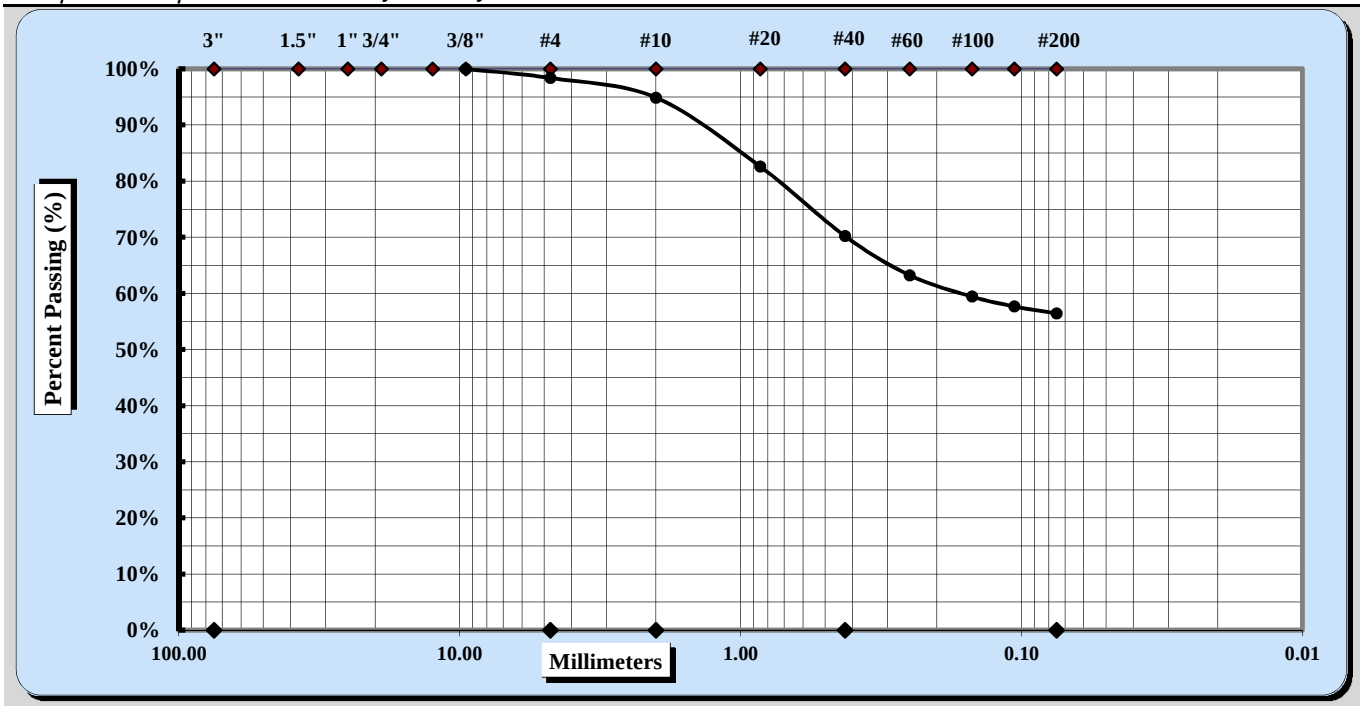
Sieve Analysis of Soils

Quality Assurance | *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/31/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/25/18 - 5/29/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID: W-27	Type: Split Spoon	Sample Date:	Various
Sample Log No.: 43-2321	Sample: 2	Depth:	2.4' - 4.0'
Sample Description:	Sandy fat clay (CH, A-7-5 (18))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	3/8"	Coarse Sand	3%	Fine Sand	14%
Gravel	2%	Medium Sand	25%	Silt & Clay	56%
Liquid Limit	66	Plastic Limit	30	Plastic Index	36

Coarse Sand	3%	Medium Sand	25%	Fine Sand	14%

Description of Sand & Gravel Particles: Rounded ☐ Angular ☒
Hard & Durable ☐ Soft ☒ Weathered & Friable ☒

Notes / Deviations / References:

Michael D. Kelso, E.I.		Staff Professional	5/31/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

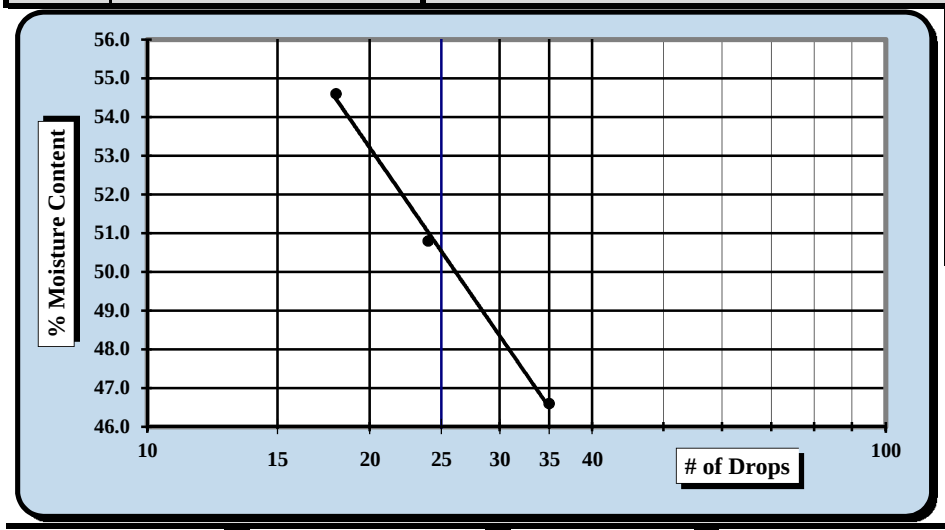
Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/31/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	5/21/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-27	Sample #: SS-4	Sample Date: Various
Log #:	43-2321		Depth: 6.4' - 8.4'
Sample Description:	Clayey sand (SC, A-7-6 (8))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	22	19	15				1	12	
A	Tare Weight	15.38	15.42	15.32				15.34	15.57	
B	Wet Soil Weight + A	25.49	26.35	27.68				22.81	24.17	
C	Dry Soil Weight + A	21.92	22.67	23.75				21.60	22.81	
D	Water Weight (B-C)	3.57	3.68	3.93				1.21	1.36	
E	Dry Soil Weight (C-A)	6.54	7.25	8.43				6.26	7.24	
F	% Moisture (D/E)*100	54.6%	50.8%	46.6%				19.3%	18.8%	
N	# OF DROPS	18	24	35				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**19.1%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**51**
Plastic Limit	**19**
Plastic Index	**32**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	5/21/2018	Michael D. Kelso, E.I.	5/31/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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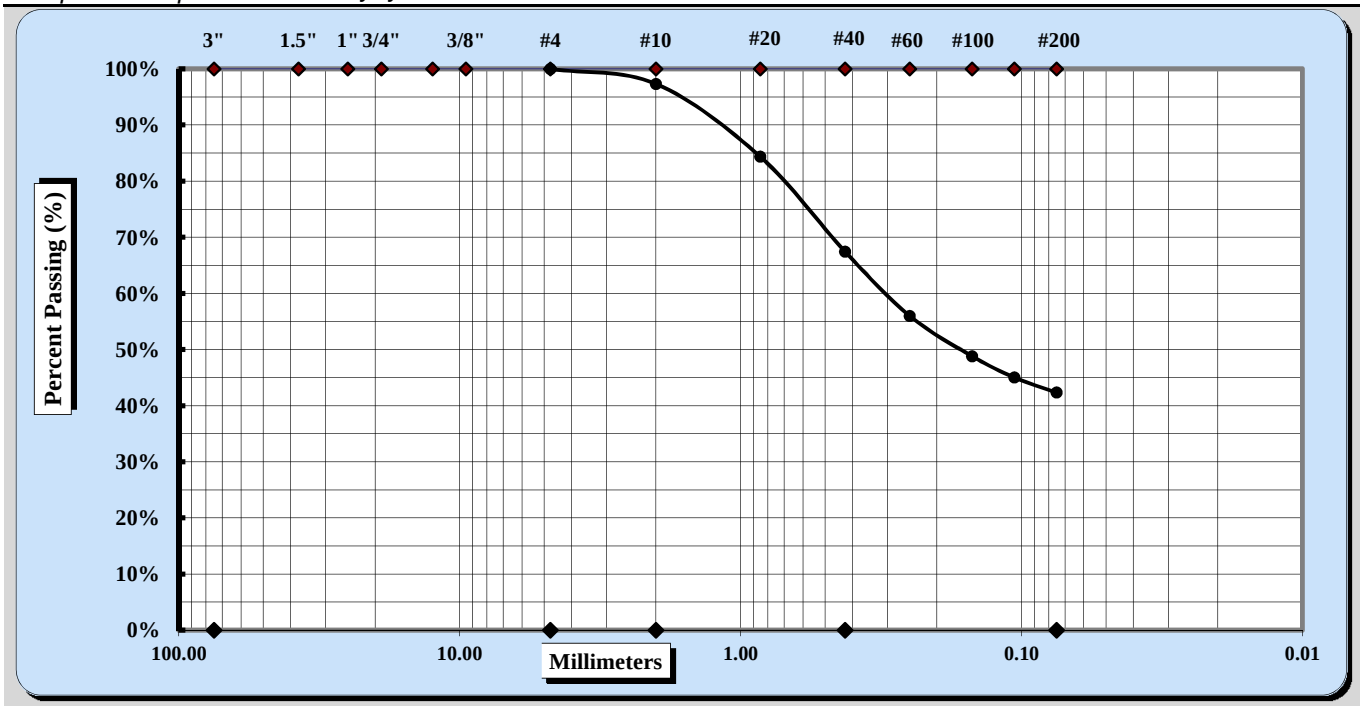
Sieve Analysis of Soils

Quality Assurance | *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/31/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/25/18 - 5/29/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID: W-27	Type: Split Spoon	Sample Date:	Various
Sample Log No.: 43-2321	Sample: 4	Depth:	6.4' - 8.4'
Sample Description:	Clayey sand (SC, A-7-6 (8))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	No. 4	Coarse Sand	3%	Fine Sand	25%
Gravel	0%	Medium Sand	30%	Silt & Clay	42%
Liquid Limit	51	Plastic Limit	19	Plastic Index	32

Coarse Sand	3%	Medium Sand	30%	Fine Sand	25%
Description of Sand & Gravel Particles:		Rounded	☐	Angular	☒
Hard & Durable	☐	Soft	☒	Weathered & Friable	☒

Notes / Deviations / References:

Michael D. Kelso, E.I.		Staff Professional	5/31/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

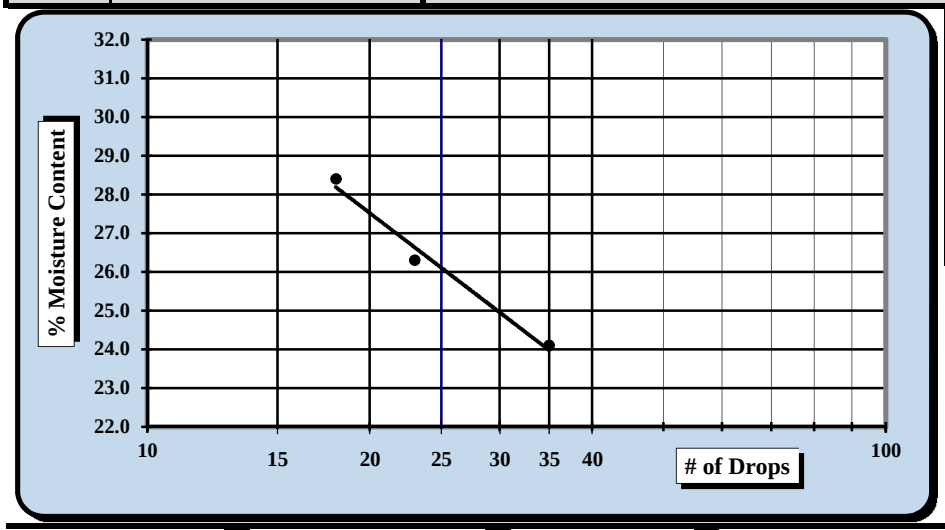
S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/31/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	5/21/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-27	Sample #: SS-5	Sample Date: Various
Log #:	43-2321		Depth: 8.4' - 10.4'
Sample Description:	Clayey sand (SC, A-2-4)		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	5	7	17				11	21	
A	Tare Weight	15.39	15.40	15.50				15.43	15.51	
B	Wet Soil Weight + A	24.70	25.45	26.66				25.10	24.23	
C	Dry Soil Weight + A	22.64	23.36	24.49				23.97	23.22	
D	Water Weight (B-C)	2.06	2.09	2.17				1.13	1.01	
E	Dry Soil Weight (C-A)	7.25	7.96	8.99				8.54	7.71	
F	% Moisture (D/E)*100	28.4%	26.3%	24.1%				13.2%	13.1%	
N	# OF DROPS	18	23	35				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**13.2%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**26**
Plastic Limit	**13**
Plastic Index	**13**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	5/21/2018	Michael D. Kelso, E.I.	5/31/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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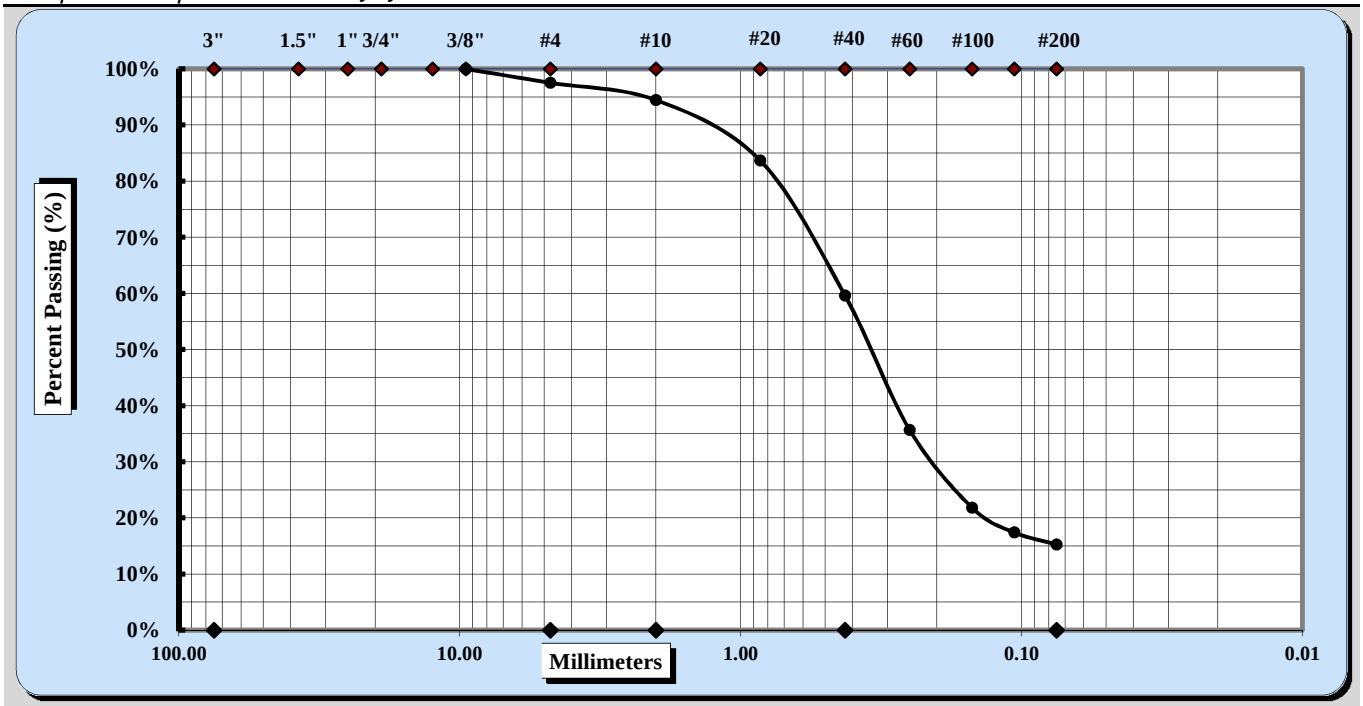
Sieve Analysis of Soils

Quality Assurance | *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/31/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/25/18 - 5/29/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID: W-27	Type: Split Spoon	Sample Date:	Various
Sample Log No.: 43-2321	Sample: 5	Depth:	8.4' - 10.4'
Sample Description:	Clayey sand (SC, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	3/8"	Coarse Sand	3%	Fine Sand	44%
Gravel	2%	Medium Sand	35%	Silt & Clay	15%
Liquid Limit	26	Plastic Limit	13	Plastic Index	13

Coarse Sand	3%	Medium Sand	35%	Fine Sand	44%
Description of Sand & Gravel Particles:		Rounded	☐	Angular	☒
Hard & Durable	☐	Soft	☒	Weathered & Friable	☒

Notes / Deviations / References:

Michael D. Kelso, E.I.		Staff Professional	5/31/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

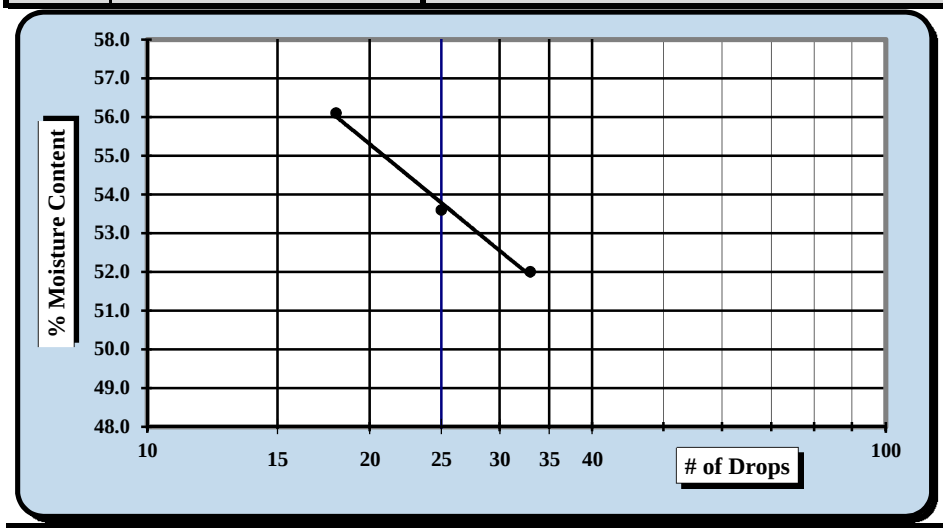
S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/31/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	5/21/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-27	Sample #: SS-6	Sample Date: Various
Log #:	43-2321		Depth: 13.5' - 15.0'
Sample Description:	Fat clay (CH, A-7-6 (26))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	9	3	6				10	18	
A	Tare Weight	15.42	15.48	15.45				15.40	15.41	
B	Wet Soil Weight + A	23.82	24.79	25.89				22.86	22.63	
C	Dry Soil Weight + A	20.80	21.54	22.32				21.19	21.02	
D	Water Weight (B-C)	3.02	3.25	3.57				1.67	1.61	
E	Dry Soil Weight (C-A)	5.38	6.06	6.87				5.79	5.61	
F	% Moisture (D/E)*100	56.1%	53.6%	52.0%				28.8%	28.7%	
N	# OF DROPS	18	25	33				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**28.8%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**54**
Plastic Limit	**29**
Plastic Index	**25**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	5/21/2018	Michael D. Kelso, E.I.	5/31/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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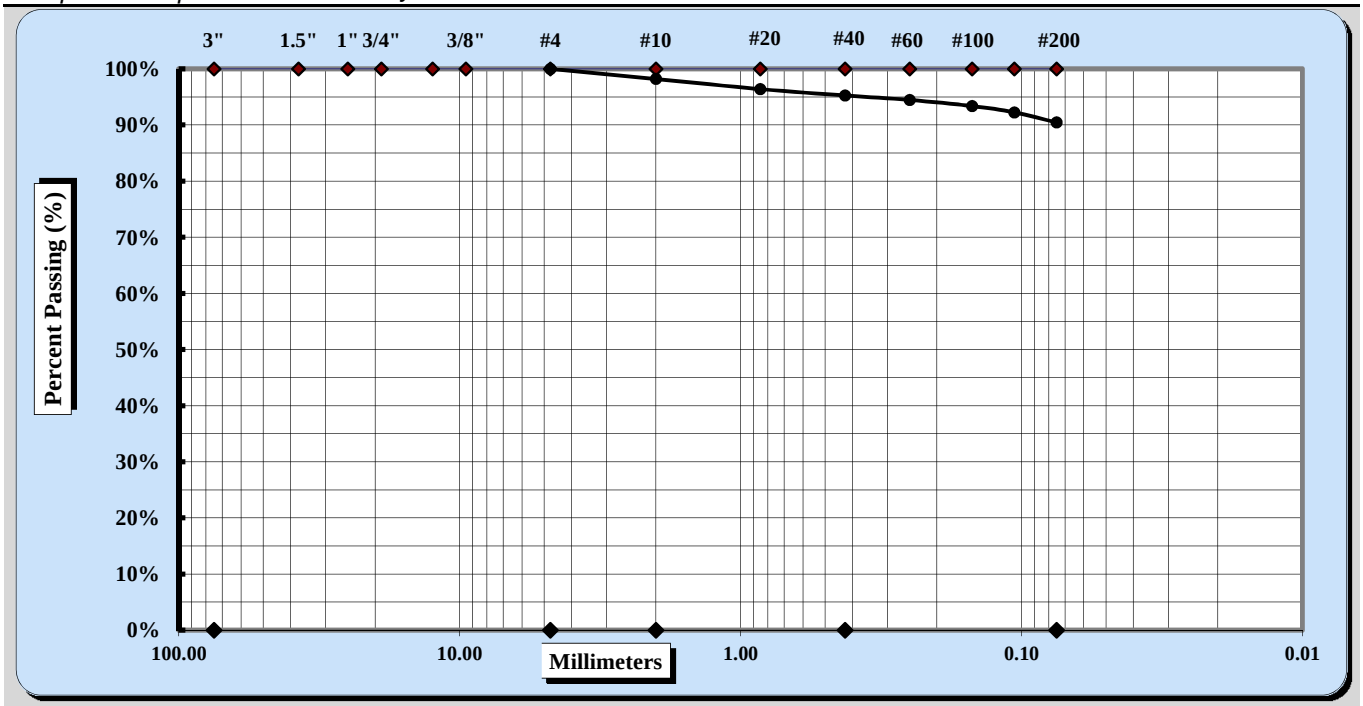
Sieve Analysis of Soils

Quality Assurance | *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/31/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/25/18 - 5/29/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID: W-27	Type: Split Spoon	Sample Date:	Various
Sample Log No.: 43-2321	Sample: 6	Depth:	13.5' - 15.0'
Sample Description:	Fat clay (CH, A-7-6 (26))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	No. 4	Coarse Sand	2%	Fine Sand	5%
Gravel	0%	Medium Sand	3%	Silt & Clay	90%
Liquid Limit	54	Plastic Limit	29	Plastic Index	25

Coarse Sand	2%	Medium Sand	3%	Fine Sand	5%

Description of Sand & Gravel Particles: Rounded ☐ Angular ☒
Hard & Durable ☐ Soft ☒ Weathered & Friable ☒

Notes / Deviations / References:

Michael D. Kelso, E.I.		Staff Professional	5/31/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

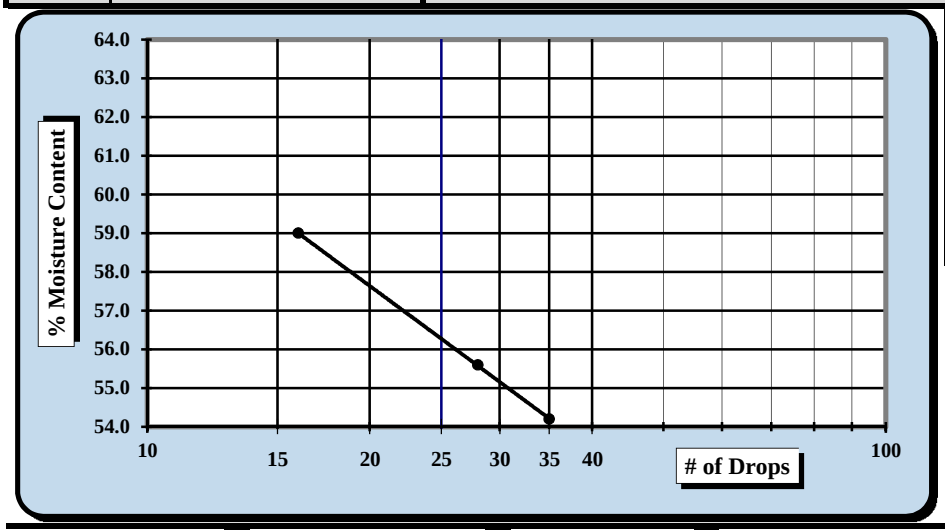
Quality Assurance ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	1461-16-047.2B	Report Date:	5/31/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	5/21/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-27	Sample #: SS-10	Sample Date: Various
Log #:	43-2321		Depth: 33.5' - 35.0'
Sample Description:	Elastic silt with sand (MH, A-7-5 (16))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	18435	4/10/2018	Grooving tool	32239	2/16/2018
LL Apparatus	18414	10/6/2017	No. 40 Sieve	31434	4/7/2018
Oven	12872	3/17/2018			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	8	13	16				4	20	
A	Tare Weight	15.52	15.39	15.63				15.43	15.46	
B	Wet Soil Weight + A	23.63	24.96	26.89				23.61	24.40	
C	Dry Soil Weight + A	20.62	21.54	22.93				21.45	22.03	
D	Water Weight (B-C)	3.01	3.42	3.96				2.16	2.37	
E	Dry Soil Weight (C-A)	5.10	6.15	7.30				6.02	6.57	
F	% Moisture (D/E)*100	59.0%	55.6%	54.2%				35.9%	36.1%	
N	# OF DROPS	16	28	35				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**36.0%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**56**
Plastic Limit	**36**
Plastic Index	**20**
Group Symbol	**MH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑

Notes / Deviations / References: Group symbol is for minus No. 40 portion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Derek Baker	5/21/2018	Michael D. Kelso, E.I.	5/31/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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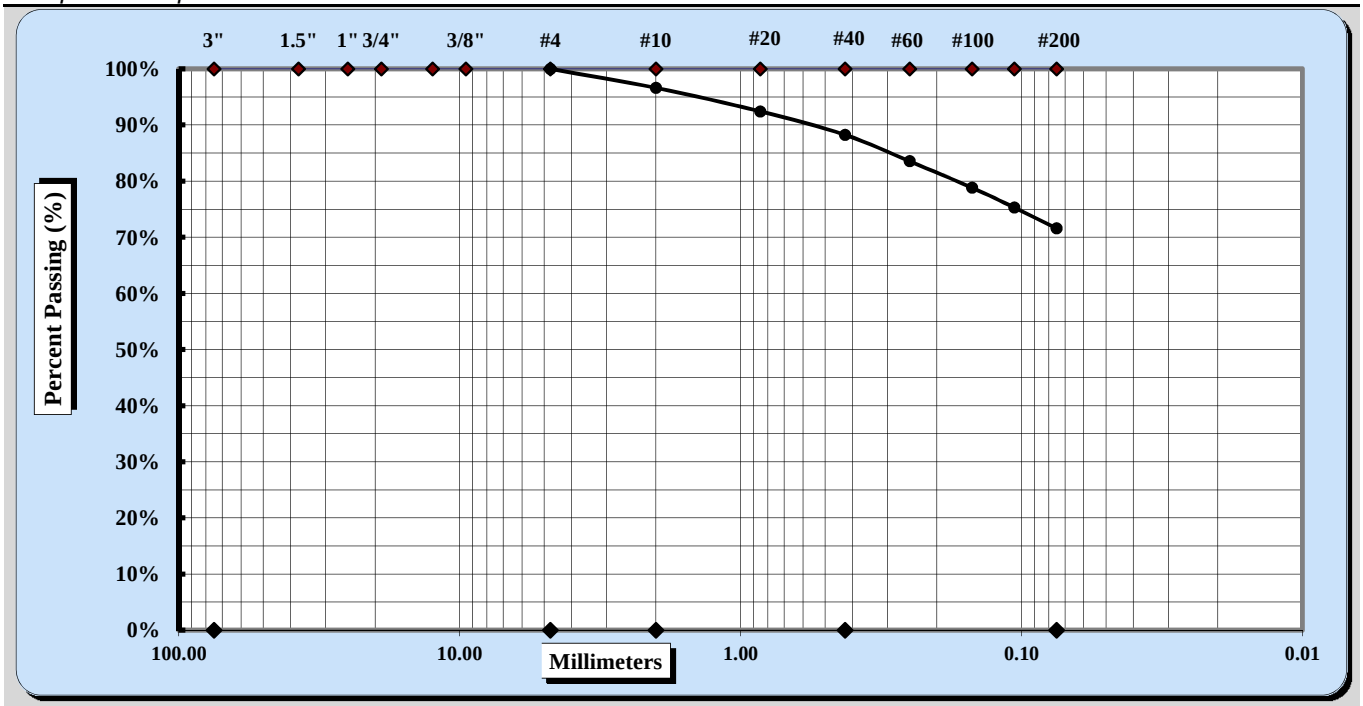
Sieve Analysis of Soils

Quality Assurance *ASTM D6913 Method A*

S&ME, Inc. - Knoxville: 1413 Topside Road, Louisville, TN 37777

Project #:	**1461-16-047.2B**	Report Date:	5/31/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	5/25/18 - 5/29/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID: W-27	Type: Split Spoon	Sample Date:	Various
Sample Log No.: 43-2321	Sample: 10	Depth:	33.5' - 35.0'
Sample Description:	Elastic silt with sand (MH, A-7-5 (16))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	No. 4	Coarse Sand	3%	Fine Sand	17%
Gravel	0%	Medium Sand	8%	Silt & Clay	72%
Liquid Limit	56	Plastic Limit	36	Plastic Index	20

Coarse Sand	3%	Medium Sand	8%	Fine Sand	17%

Description of Sand & Gravel Particles: Rounded ☐ Angular ☒
Hard & Durable ☐ Soft ☒ Weathered & Friable ☒

Notes / Deviations / References:

Michael D. Kelso, E.I.		Staff Professional	5/31/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

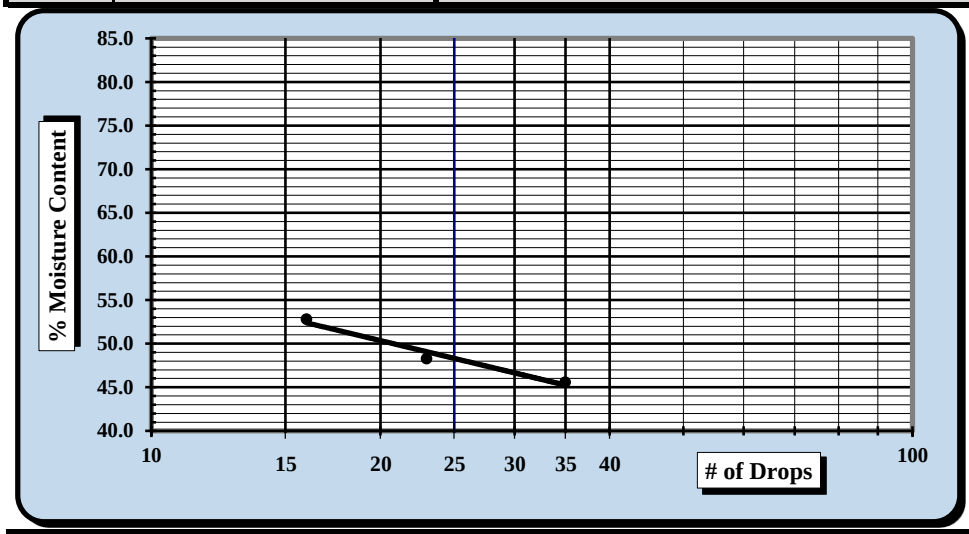
S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-4-18
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-28	Sample #: SS-2		Sample Date: Various	
Location:	Wall Boring	Offset: N/A		Depth: 2.0' - 4.0'	
Sample Description:	Clayey Sand (SC, A-2-7 (0))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 110		Liquid Limit						Plastic Limit		
	Tare #:	55	56	57				58	78	
A	Tare Weight	15.73	15.20	15.34				15.15	15.03	
B	Wet Soil Weight + A	27.06	27.11	25.85				21.59	22.07	
C	Dry Soil Weight + A	23.51	23.23	22.22				20.32	20.67	
D	Water Weight (B-C)	3.55	3.88	3.63				1.27	1.40	
E	Dry Soil Weight (C-A)	7.78	8.03	6.88				5.17	5.64	
F	% Moisture (D/E)*100	45.6%	48.3%	52.8%				24.6%	24.8%	
N	# OF DROPS	35	23	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**24.7%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**49**
Plastic Limit	**25**
Plastic Index	**24**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		5/4/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

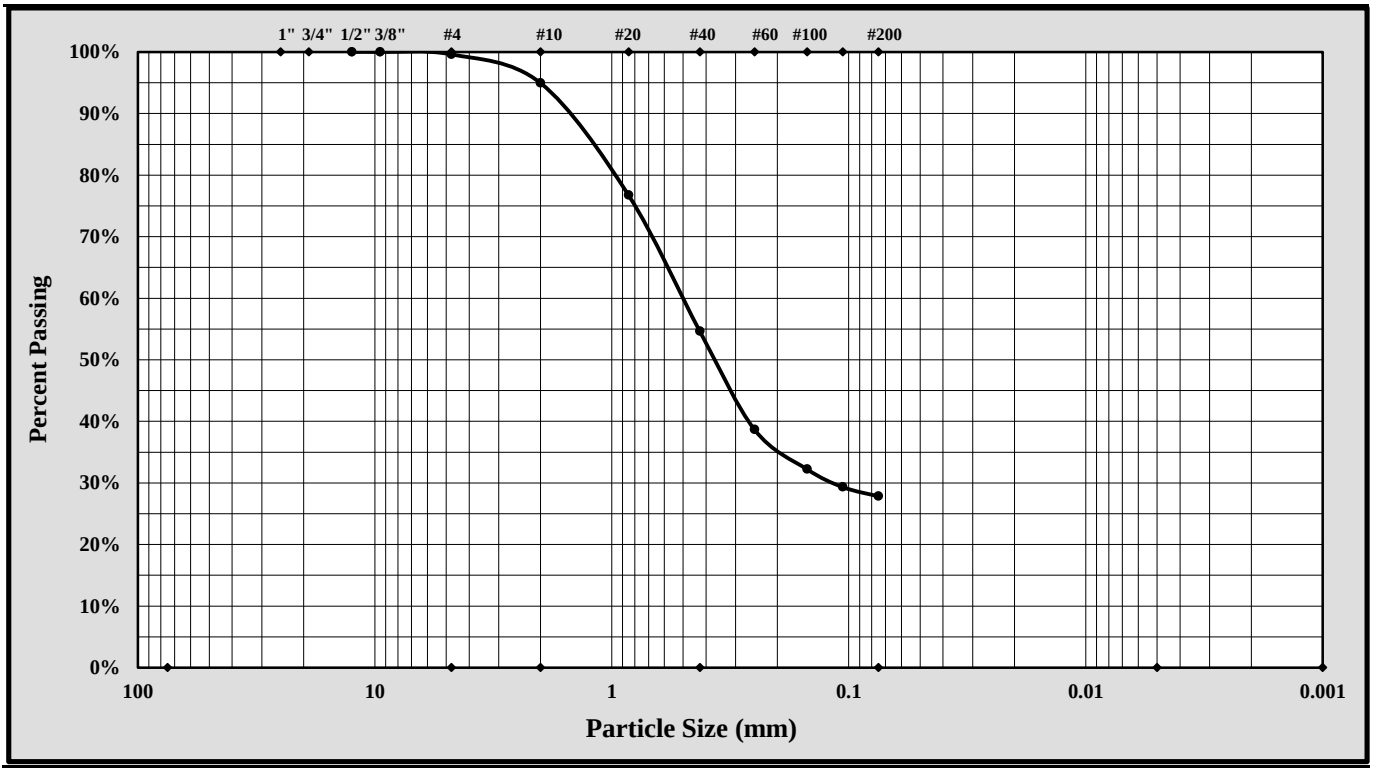
ASTM D6913/D7928

Quality Assurance

Sample Log No.:

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	W-28 Type: Split Spoon	Sample Date:	Various
Location:	Wall Boring Sample No.: SS-2	Depth:	2.0' - 4.0'
Sample Description:	Clayey Sand (SC, A-2-7 (0))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	0.4%
Silt & Clay (% Passing #200):	27.8%	Total Sand:	71.8%
Assumed Specific Gravity:	2.65		
Liquid Limit	49	Plastic Limit	25
		Plastic Index	24

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel: Rounded ☐ Angular ☐ Hard & Durable ☐ Soft ☐ Weathered & Friable ☐

Sample Prep Method: Moist Prep | Dispersion Period: 1 min. | Dispersing Agent: Sodium Hexametaphosphate: 50 g./ Liter

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	5/4/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

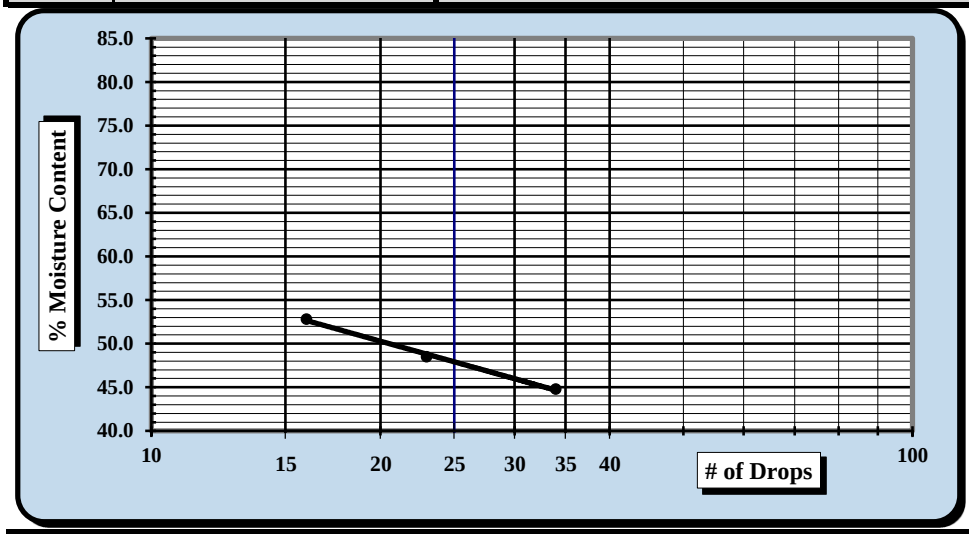
ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-4-18
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-28	Sample #: SS-6	Sample Date: Various
Location:	Wall Boring	Offset: N/A	Depth: 13.5' - 15.0'
Sample Description:	Clayey Sand (SC, A-2-7 (0))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 438		Liquid Limit						Plastic Limit		
	Tare #:	60	61	62				63	64	
A	Tare Weight	16.01	15.06	15.55				15.09	15.88	
B	Wet Soil Weight + A	26.42	26.72	26.61				22.19	23.34	
C	Dry Soil Weight + A	23.20	22.91	22.79				21.07	22.17	
D	Water Weight (B-C)	3.22	3.81	3.82				1.12	1.17	
E	Dry Soil Weight (C-A)	7.19	7.85	7.24				5.98	6.29	
F	% Moisture (D/E)*100	44.8%	48.5%	52.8%				18.7%	18.6%	
N	# OF DROPS	34	23	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**18.7%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**48**
Plastic Limit	**19**
Plastic Index	**29**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		5/4/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

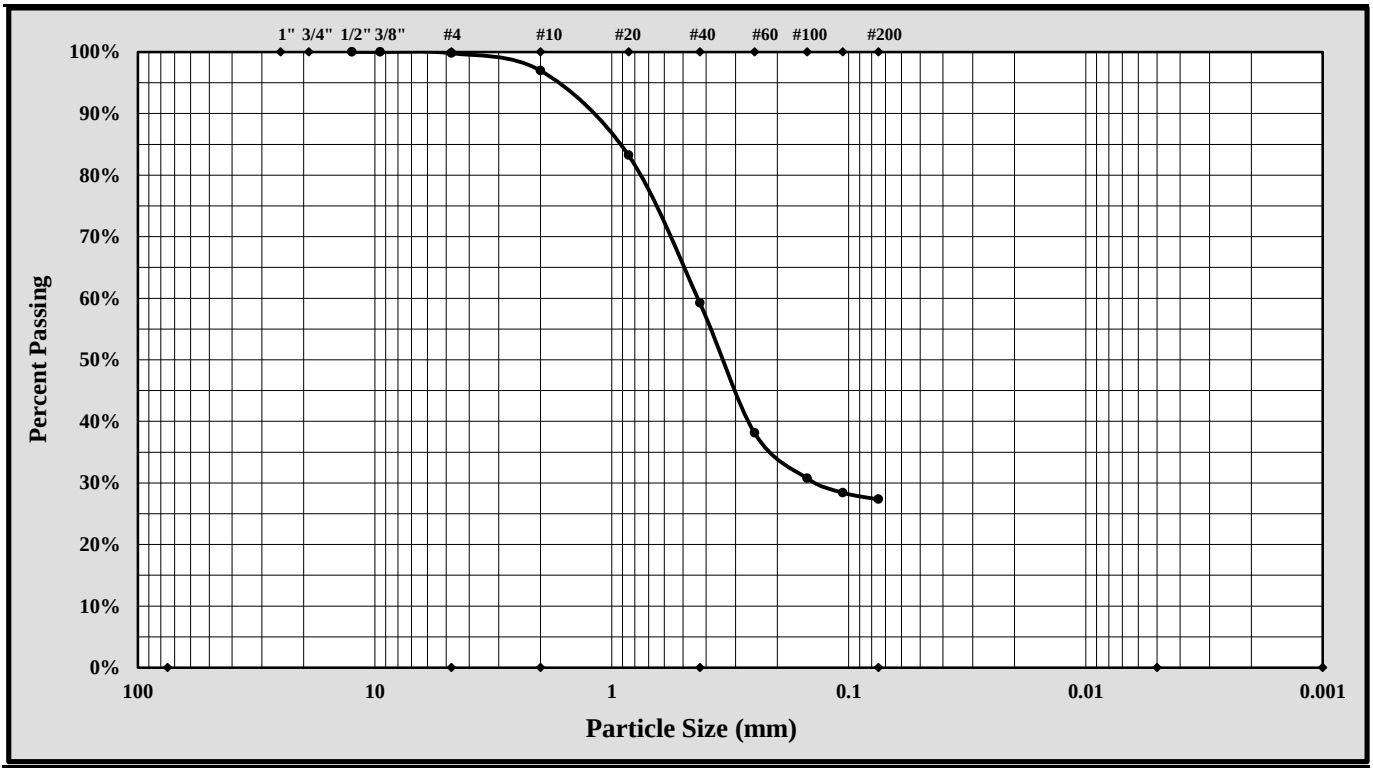
ASTM D6913/D7928

Quality Assurance

Sample Log No.:

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	W-28 Type: Split Spoon	Sample Date:	Various
Location:	Wall Boring Sample No.: SS-6	Depth:	13.5' - 15.0'
Sample Description:	Clayey Sand (SC, A-2-7 (0))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	0.2%
Silt & Clay (% Passing #200):	27.3%	Total Sand:	72.5%
Assumed Specific Gravity:	2.65		

Liquid Limit	Plastic Limit	Plastic Index
48	19	29

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded	☐	Angular	☒	Hard & Durable	☒	Soft	☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter				

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	5/4/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

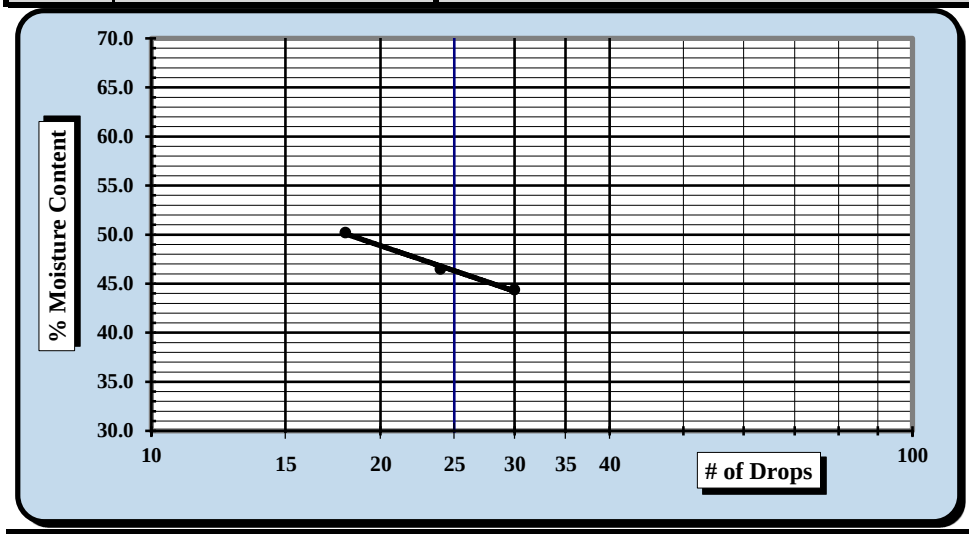
S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-2-2018
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-28	Sample #: SS-8	Sample Date: Various
Location:	Wall Boring	Offset: N/A	Depth: 23.5' - 25.0'
Sample Description:	Clayey Sand (SC, A-2-7 (0))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 450		Liquid Limit						Plastic Limit		
	Tare #:	25	26	27				28	65	
A	Tare Weight	15.22	16.01	15.96				16.06	16.05	
B	Wet Soil Weight + A	25.99	28.64	28.85				26.26	21.96	
C	Dry Soil Weight + A	22.68	24.63	24.54				24.57	20.99	
D	Water Weight (B-C)	3.31	4.01	4.31				1.69	0.97	
E	Dry Soil Weight (C-A)	7.46	8.62	8.58				8.51	4.94	
F	% Moisture (D/E)*100	44.4%	46.5%	50.2%				19.9%	19.6%	
N	# OF DROPS	30	24	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**19.8%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**46**
Plastic Limit	**20**
Plastic Index	**26**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		5/2/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Particle Size Analysis of Soils

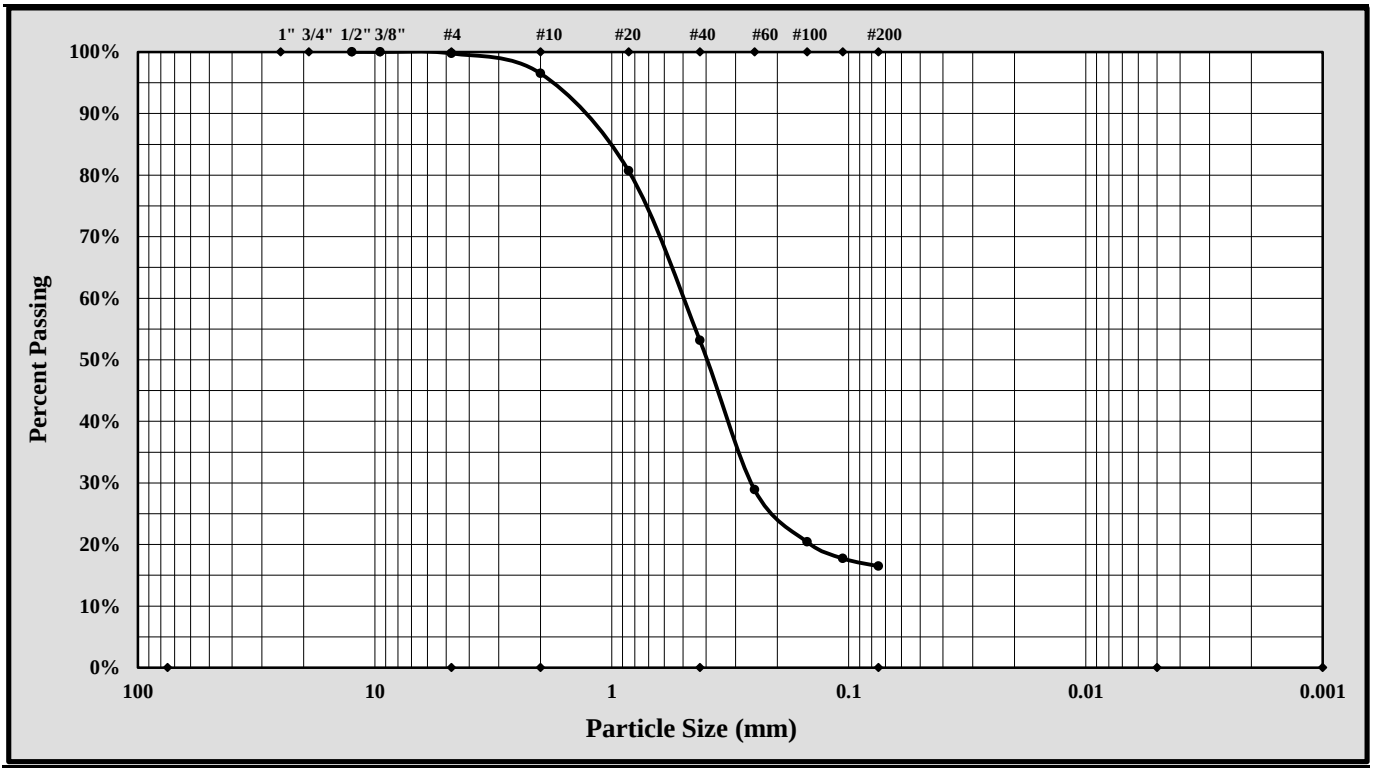
ASTM D6913/D7928

Sample Log No.:

Quality Assurance

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	W-28 Type: Split Spoon	Sample Date:	Various
Location:	Wall Boring Sample No.: SS-8	Depth:	23.5' - 25.0'
Sample Description:	Clayey Sand (SC, A-2-7 (0))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	0.2%
Silt & Clay (% Passing #200):	16.5%	Total Sand:	83.3%
Assumed Specific Gravity:	2.65		

Liquid Limit	46	Plastic Limit	20	Plastic Index	26

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded	☐	Angular	☒	Hard & Durable	☒	Soft	☐	Weathered & Friable ☐

Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate: 50 g./ Liter

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	5/2/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

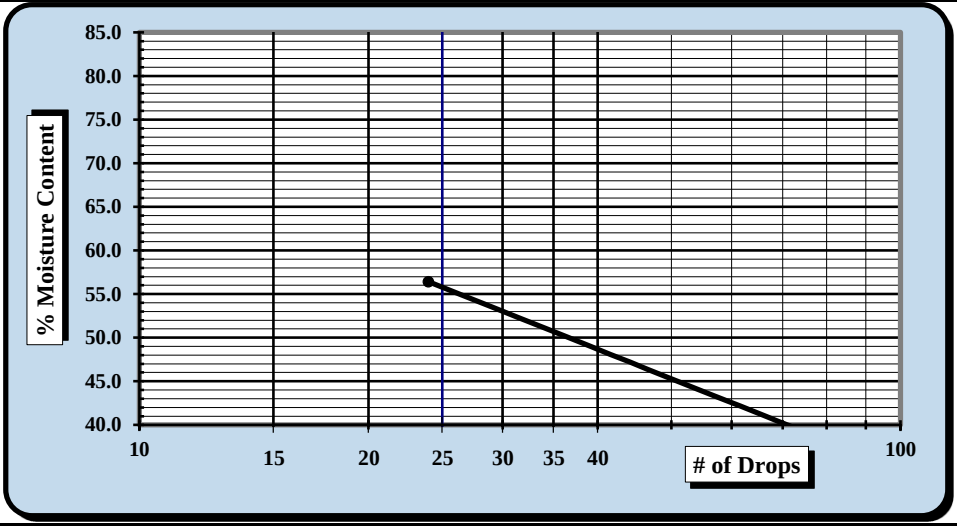
S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-4-18
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-28	Sample #: SS-10	Sample Date: Various
Location:	Wall Boring	Offset: N/A	Depth: 33.5' - 35.0'
Sample Description:	Clayey Sand (SC, A-2-7 (0))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 300		Liquid Limit						Plastic Limit		
	Tare #:	9						83	96	
A	Tare Weight	15.58						14.96	15.05	
B	Wet Soil Weight + A	26.81						21.84	22.73	
C	Dry Soil Weight + A	22.76						20.34	21.08	
D	Water Weight (B-C)	4.05						1.50	1.65	
E	Dry Soil Weight (C-A)	7.18						5.38	6.03	
F	% Moisture (D/E)*100	56.4%						27.9%	27.4%	
N	# OF DROPS	24						*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**27.7%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**56**
Plastic Limit	**28**
Plastic Index	**28**
Group Symbol	**CH**

Multipoint Method ☐
One-point Method ☑

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		5/4/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

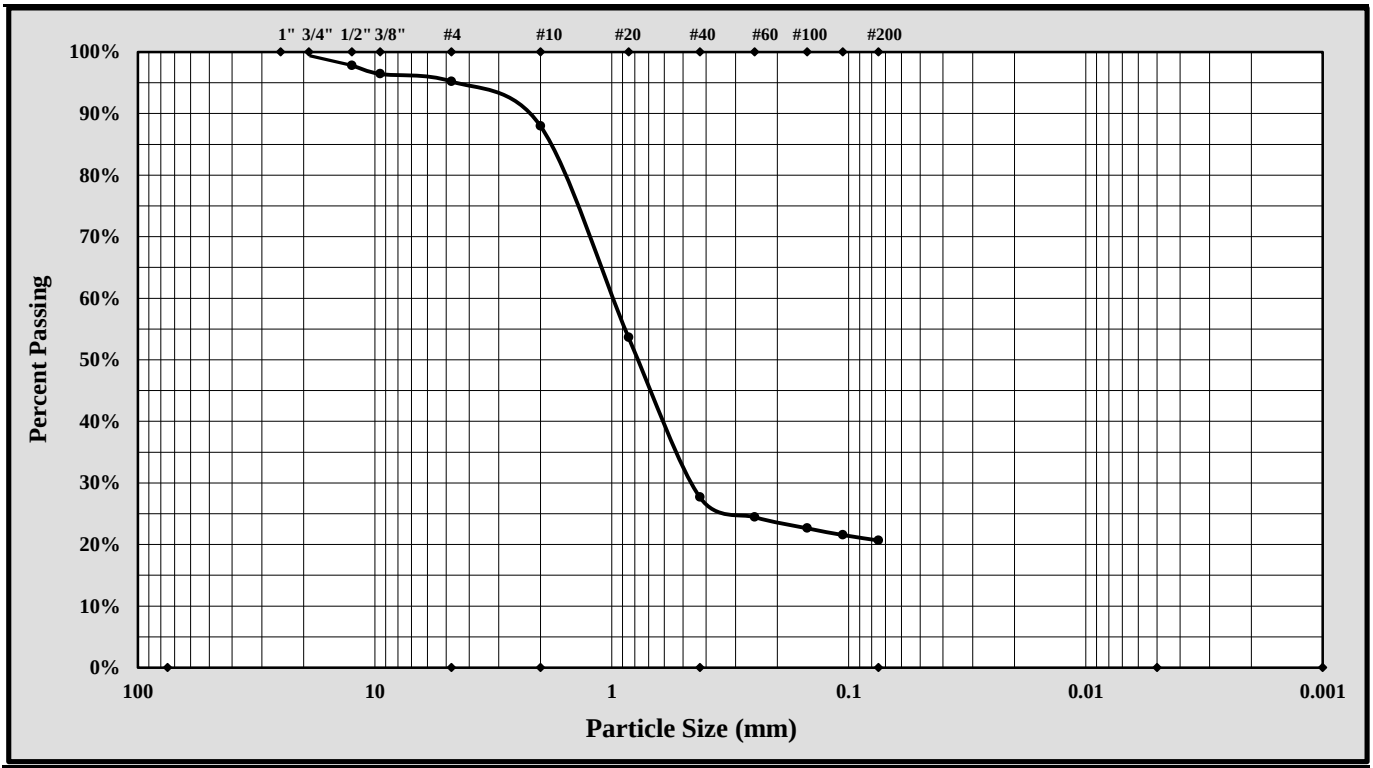
ASTM D6913/D7928

Quality Assurance

Sample Log No.:

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	W-28 Type: Split Spoon	Sample Date:	Various
Location:	Wall Boring Sample No.: SS-10	Depth:	33.5' - 35.0'
Sample Description:	Clayey Sand (SC, A-2-7 (0))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	4.8%
Silt & Clay (% Passing #200):	20.7%	Total Sand:	74.6%
Assumed Specific Gravity:	2.65		

Liquid Limit	56	Plastic Limit	28	Plastic Index	28

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	5/4/2028
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

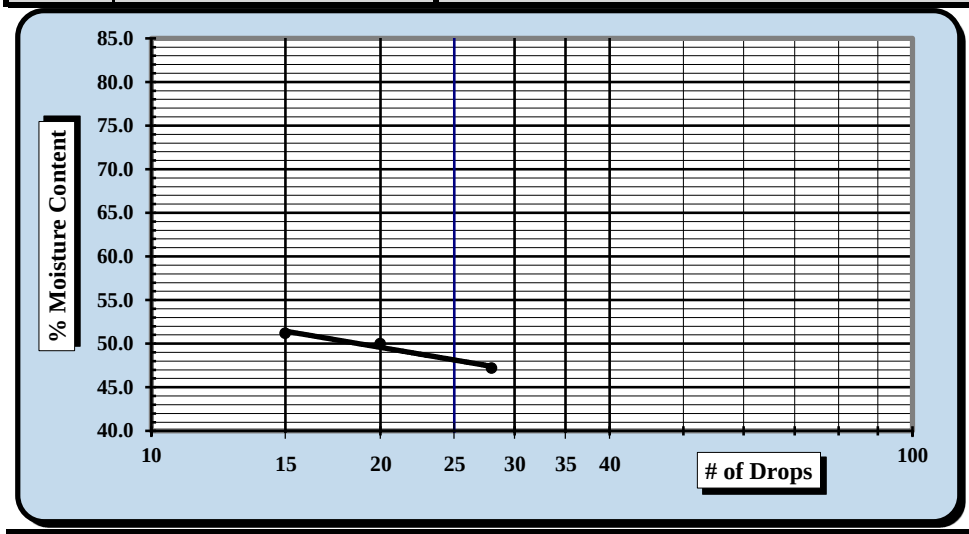
S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-2-18
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-28	Sample #: SS-12		Sample Date: Various	
Location:	Wall Boring	Offset: N/A		Depth: 43.5' - 45.0'	
Sample Description:	Silt with Sand (ML, A-7-5 (16))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 483		Liquid Limit						Plastic Limit		
	Tare #:	45	46	47				48	49	
A	Tare Weight	15.28	15.89	15.70				15.35	15.34	
B	Wet Soil Weight + A	30.63	28.28	26.62				21.69	21.77	
C	Dry Soil Weight + A	25.71	24.15	22.92				20.28	20.27	
D	Water Weight (B-C)	4.92	4.13	3.70				1.41	1.50	
E	Dry Soil Weight (C-A)	10.43	8.26	7.22				4.93	4.93	
F	% Moisture (D/E)*100	47.2%	50.0%	51.2%				28.6%	30.4%	
N	# OF DROPS	28	20	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**29.5%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**48**
Plastic Limit	**30**
Plastic Index	**18**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		5/2/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

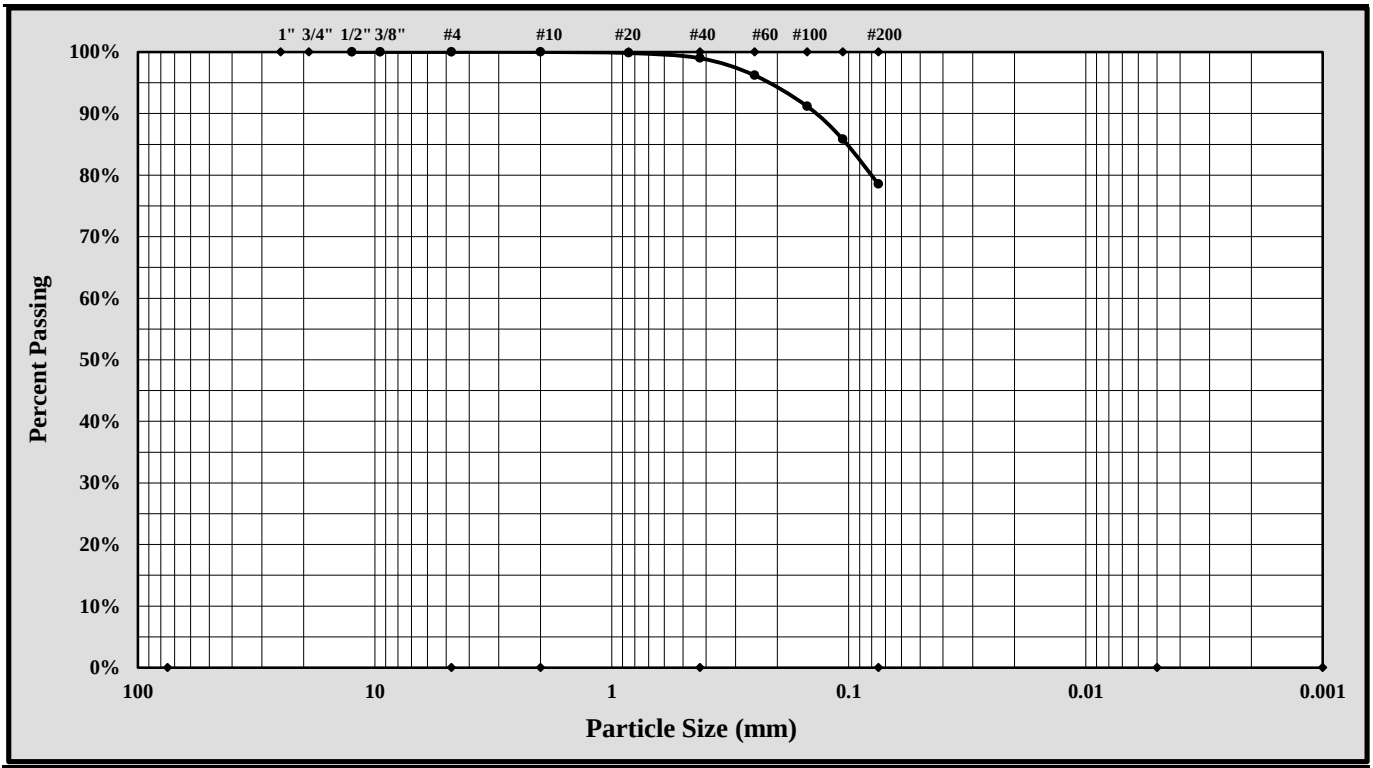
ASTM D6913/D7928

Quality Assurance

Sample Log No.:

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	W-28 Type: Split Spoon	Sample Date:	Various
Location:	Wall Boring Sample No.: SS-12	Depth:	43.5' - 45.0'
Sample Description:	Silt with Sand (ML, A-7-5 (16))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	0.0%
Silt & Clay (% Passing #200):	78.5%	Total Sand:	21.5%
Assumed Specific Gravity:	2.65		

Liquid Limit	48	Plastic Limit	30	Plastic Index	18

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	5/2/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

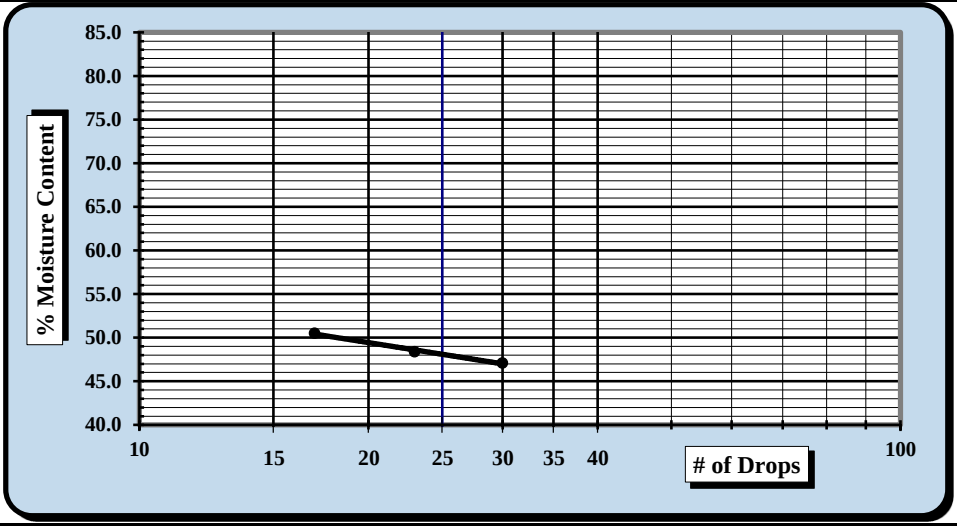
S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-4-18
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-28	Sample #: SS-16		Sample Date: Various	
Location:	Wall Boring	Offset: N/A		Depth: 63.5' - 65.0'	
Sample Description:	Sandy Silt (ML, A-7-6 (13))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 214		Liquid Limit						Plastic Limit		
	Tare #:	91	92	93				94	95	
A	Tare Weight	15.16	15.13	15.07				15.05	15.06	
B	Wet Soil Weight + A	26.69	27.73	28.39				22.90	21.99	
C	Dry Soil Weight + A	23.00	23.62	23.92				21.13	20.42	
D	Water Weight (B-C)	3.69	4.11	4.47				1.77	1.57	
E	Dry Soil Weight (C-A)	7.84	8.49	8.85				6.08	5.36	
F	% Moisture (D/E)*100	47.1%	48.4%	50.5%				29.1%	29.3%	
N	# OF DROPS	30	23	17				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**29.2%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**48**
Plastic Limit	**29**
Plastic Index	**19**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		4/30/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

ASTM D6913/D7928

Quality Assurance

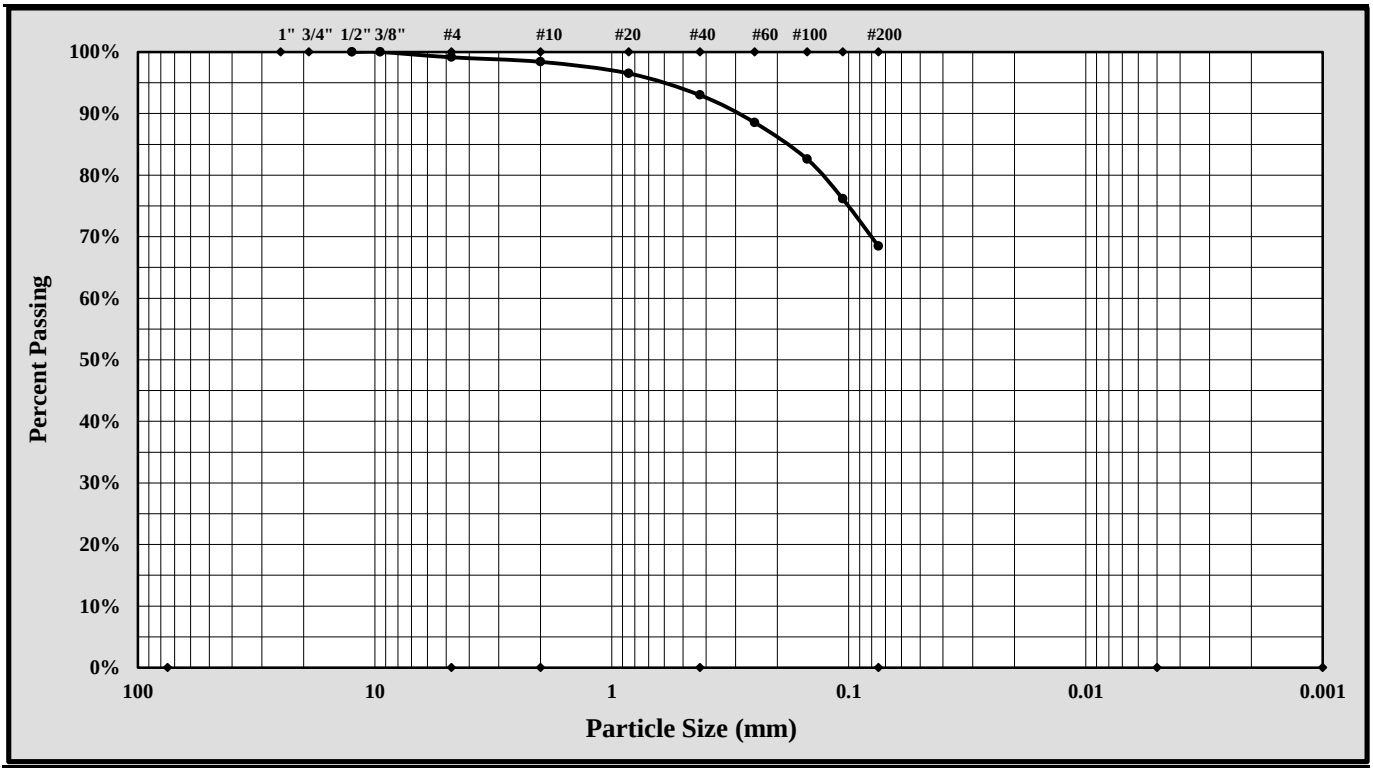
Sample Log No.:

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		

Sample ID:	W-28	Type:	Split Spoon	Sample Date:	Various
Location:	Wall Boring	Sample No.:	SS-16	Depth:	63.5' - 65.0'

Sample Description: Sandy Silt (ML, A-7-6 (13))



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	0.9%
Silt & Clay (% Passing #200):	68.5%	Total Sand:	30.7%
Assumed Specific Gravity:	2.65		

Liquid Limit	48	Plastic Limit	29	Plastic Index	19

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	5/4/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

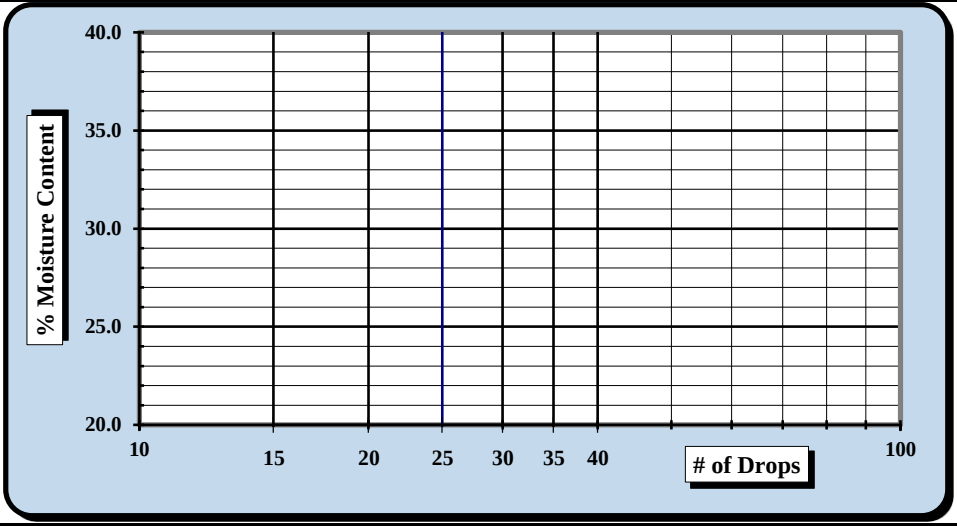
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date:	5/10/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-29	Sample #:	SS-2	Sample Date:	3/23/18
Location:	Wall Boring	Type:	Split-spoon	Depth:	2.0' - 4.0'
Sample Description:	Silty Sand with Gravel (SM, A-1-b)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:									
A	Tare Weight									
B	Wet Soil Weight + A									
C	Dry Soil Weight + A									
D	Water Weight (B-C)									
E	Dry Soil Weight (C-A)									
F	% Moisture (D/E)*100									
N	# OF DROPS							*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*									



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☒

Liquid Limit	---
Plastic Limit	**NP**
Plastic Index	**NP**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/11/18	Matthew F. Cooke, P.G.	5/11/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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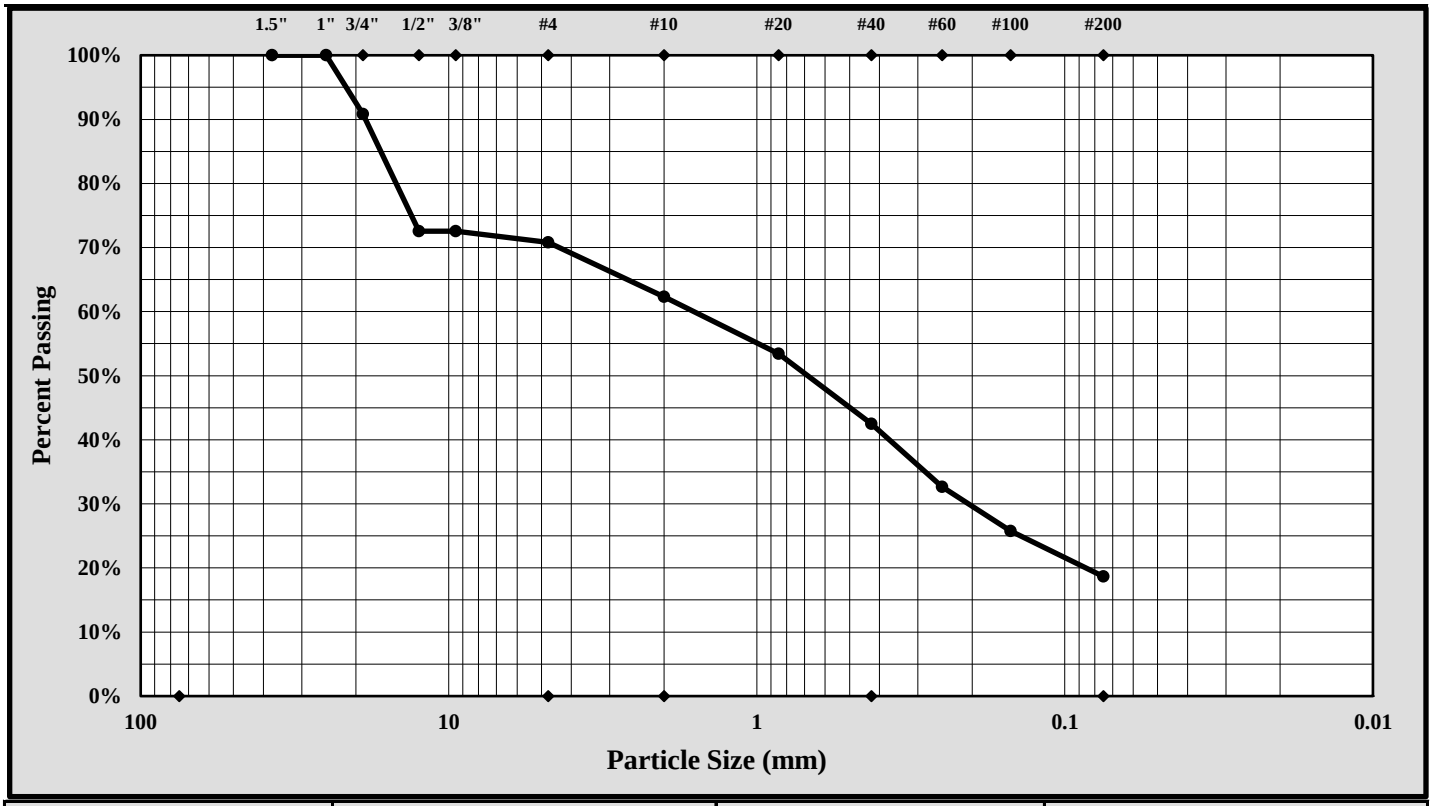
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/08 - 5/10/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-29	Sample #: SS-2	Sample Date: 3/23/18
Location:	Wall Boring	Type: Split-spoon	Depth: 2.0' - 4.0'
Sample Description:	Silty Sand with Gravel (SM, A-1-b)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	25.0 mm	Gravel:	29.2%
Silt & Clay (% Passing #200):	18.7%	Total Sand:	52.1%

Liquid Limit	---	Plastic Limit	NP	Plastic Index	NP
Coarse Sand:	8.5%	Medium Sand:	19.8%	Fine Sand:	23.8%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G.	Project Manager	5/11/18
Technical Responsibility	*Position*	*Date*

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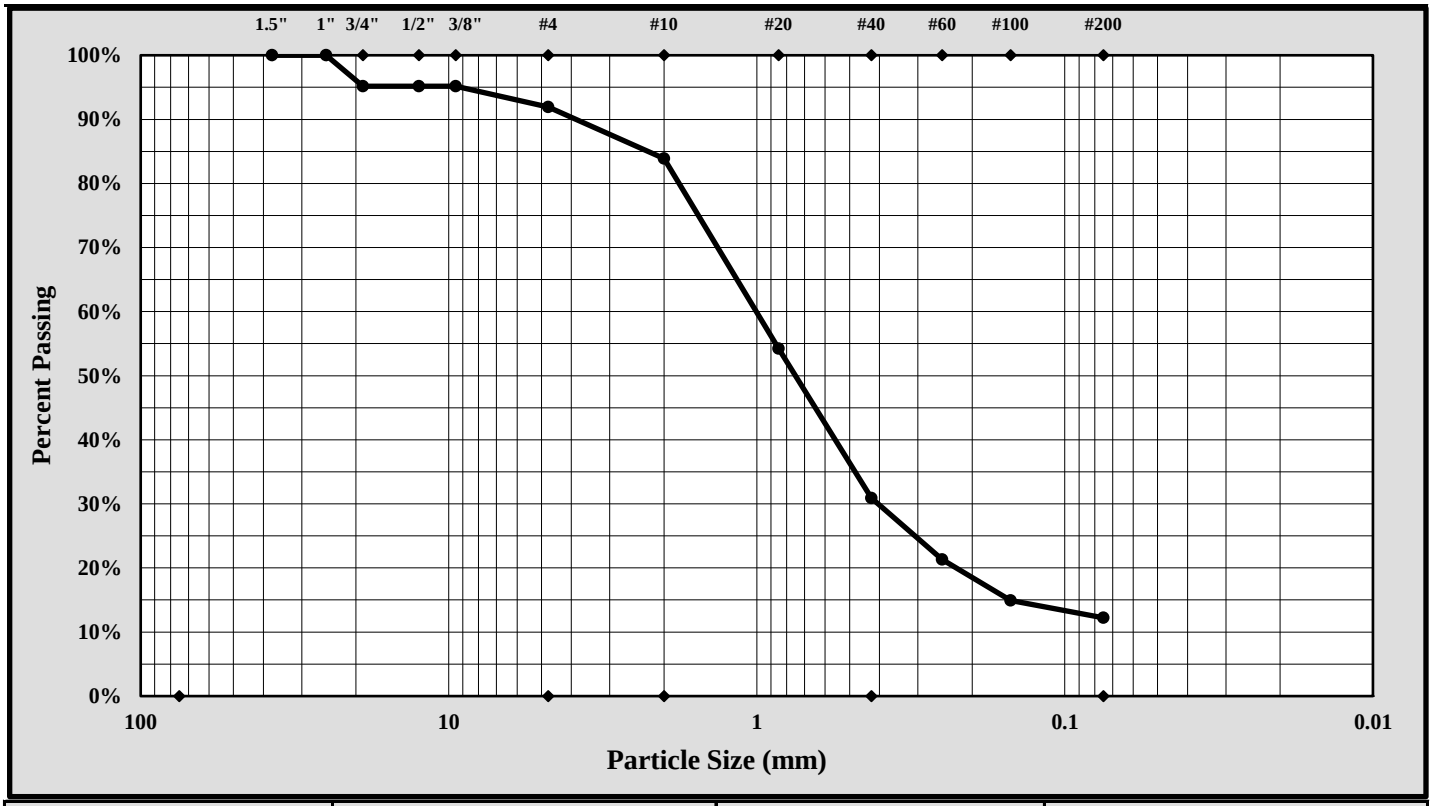
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/08 - 5/10/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-29	Sample #: SS-4	Sample Date: 3/23/18
Location:	Wall Boring	Type: Split-spoon	Depth: 6.0' - 8.0'
Sample Description:	Silty Sand (SM, A-1-b)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	25.0 mm	Gravel:	8.1%
Silt & Clay (% Passing #200):	12.2%	Total Sand:	79.7%

Liquid Limit	N/A	Plastic Limit	N/A	Plastic Index	N/A
Coarse Sand:	8.0%	Medium Sand:	53.0%	Fine Sand:	18.7%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/11/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

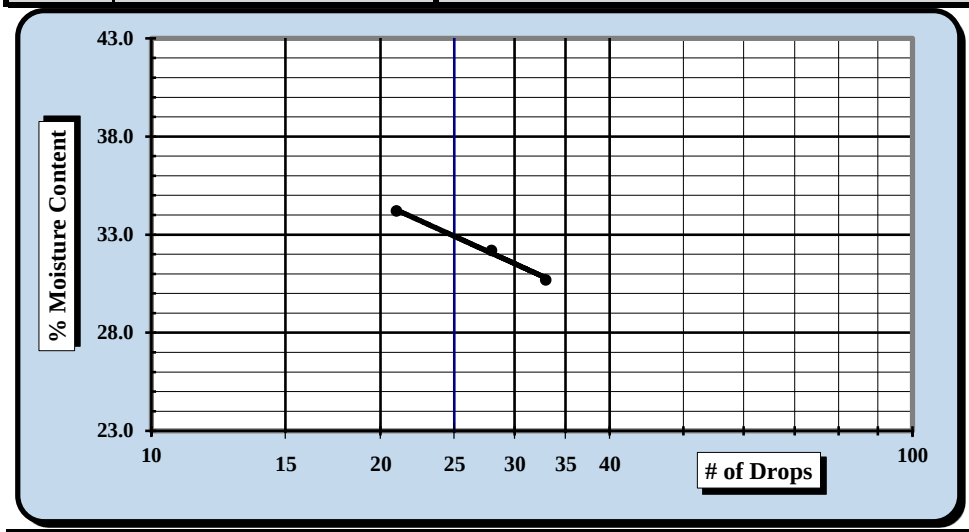
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date:	5/10/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-29	Sample #:	SS-5	Sample Date:	3/23/18
Location:	Wall Boring	Type:	Split-spoon	Depth:	8.0' - 10.0'
Sample Description:	Silty Sand (SM, A-4(0))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	16	17	18				19	20	
A	Tare Weight	26.57	26.63	26.78				26.67	26.83	
B	Wet Soil Weight + A	47.04	47.24	46.58				33.15	33.58	
C	Dry Soil Weight + A	42.23	42.22	41.53				31.90	32.27	
D	Water Weight (B-C)	4.81	5.02	5.05				1.25	1.31	
E	Dry Soil Weight (C-A)	15.66	15.59	14.75				5.23	5.44	
F	% Moisture (D/E)*100	30.7%	32.2%	34.2%				23.9%	24.1%	
N	# OF DROPS	33	28	21				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**24.0%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐
Liquid Limit **33**
Plastic Limit **24**
Plastic Index **9**
Group Symbol **ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/11/18	Matthew F. Cooke, P.G.	5/11/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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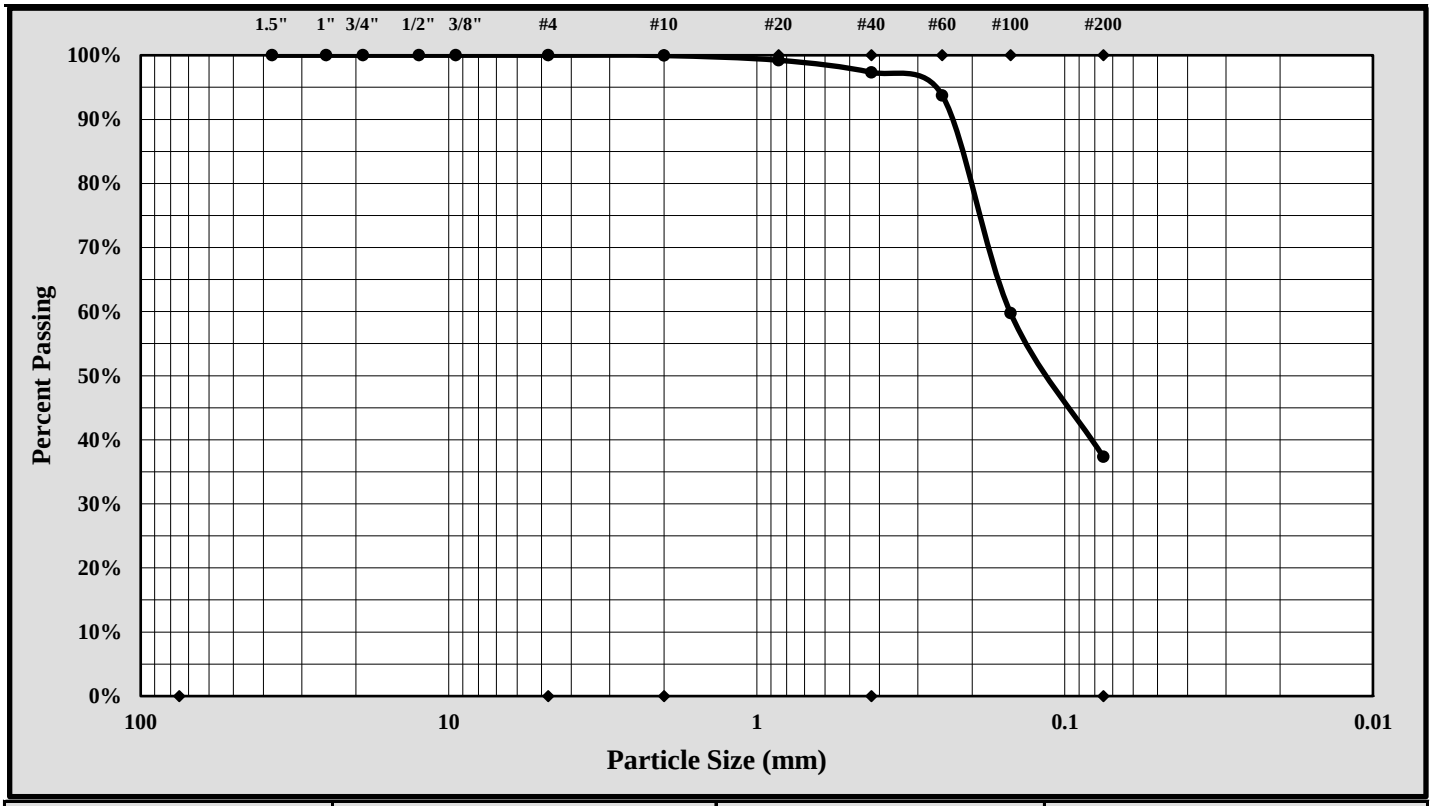
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/08 - 5/10/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-29	Sample #: SS-5	Sample Date: 3/23/18
Location:	Wall Boring	Type: Split-spoon	Depth: 8.0' - 10.0'
Sample Description:	Silty Sand (SM, A-4(0))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	.85 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	37.3%	Total Sand:	62.7%

Liquid Limit	33	Plastic Limit	24	Plastic Index	9
Coarse Sand:	0.1%	Medium Sand:	2.6%	Fine Sand:	60.0%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/11/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

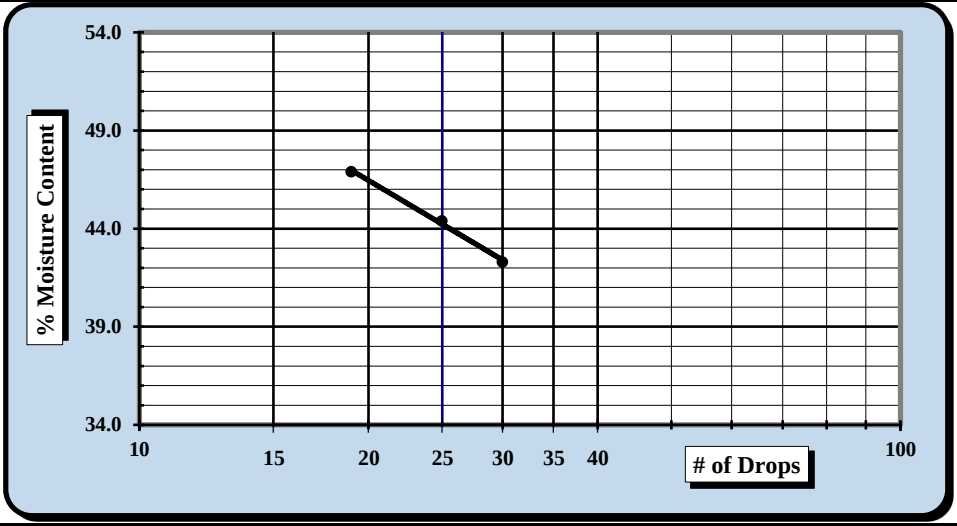
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date:	5/10/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-29	Sample #:	SS-6	Sample Date:	3/23/18
Location:	Wall Boring	Type:	Split-spoon	Depth:	13.5' - 15.0'
Sample Description:	Silty Sand (SM, A-2-7(0))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	21	22	23				24	25	
A	Tare Weight	28.07	25.68	27.28				25.99	26.79	
B	Wet Soil Weight + A	47.36	38.49	43.72				32.23	32.81	
C	Dry Soil Weight + A	41.63	34.55	38.47				30.82	31.45	
D	Water Weight (B-C)	5.73	3.94	5.25				1.41	1.36	
E	Dry Soil Weight (C-A)	13.56	8.87	11.19				4.83	4.66	
F	% Moisture (D/E)*100	42.3%	44.4%	46.9%				29.2%	29.2%	
N	# OF DROPS	30	25	19				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**29.2%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**44**
Plastic Limit	**29**
Plastic Index	**15**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/11/18	Matthew F. Cooke, P.G.	5/11/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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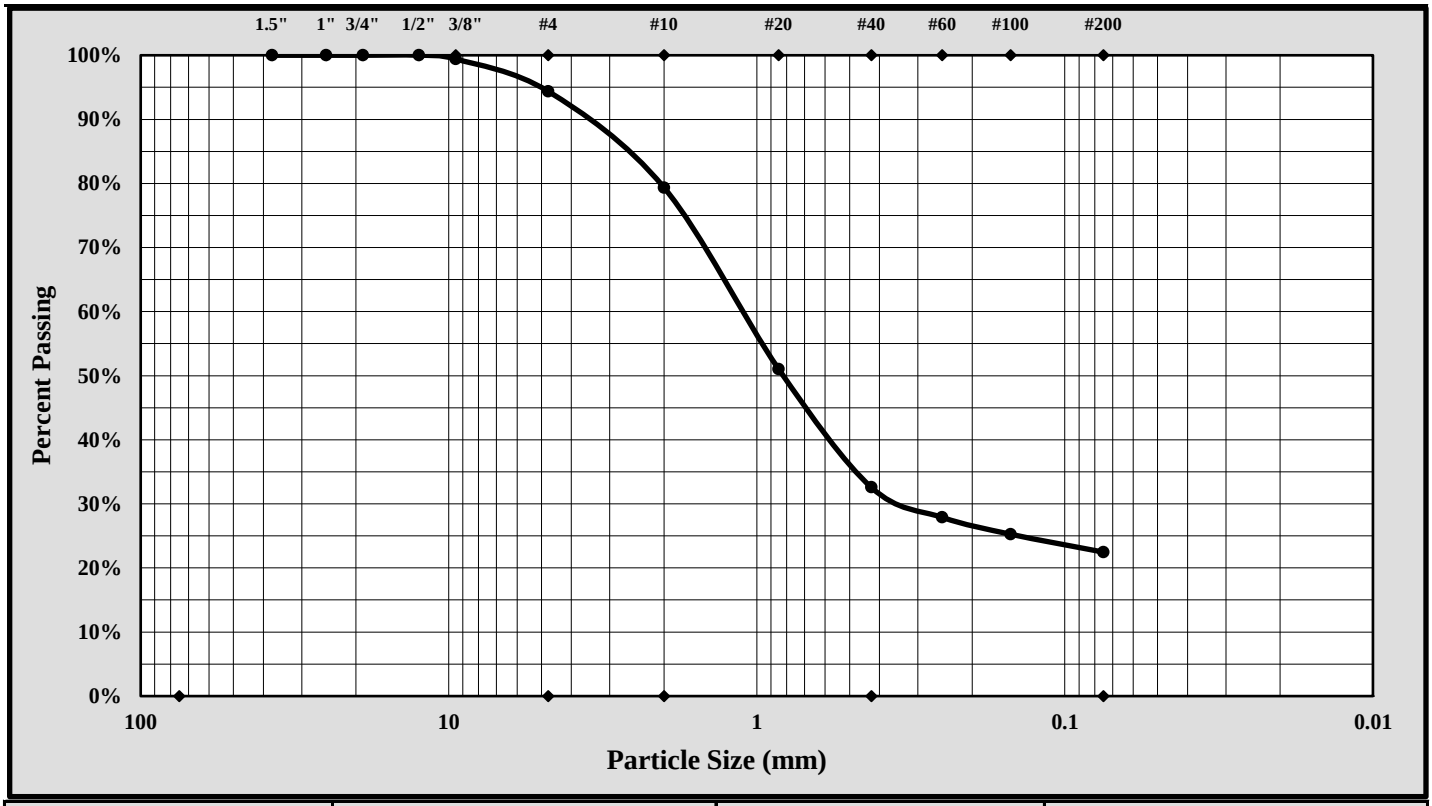
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/08 - 5/10/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-29	Sample #: SS-6	Sample Date: 3/23/18
Location:	Wall Boring	Type: Split-spoon	Depth: 13.5' - 15.0'
Sample Description:	Silty Sand (SM, A-2-7(0))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	9.50 mm	Gravel:	5.6%
Silt & Clay (% Passing #200):	22.5%	Total Sand:	71.9%

Liquid Limit	44	Plastic Limit	29	Plastic Index	15
Coarse Sand:	15.0%	Medium Sand:	46.8%	Fine Sand:	10.1%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/11/18 — *Date*

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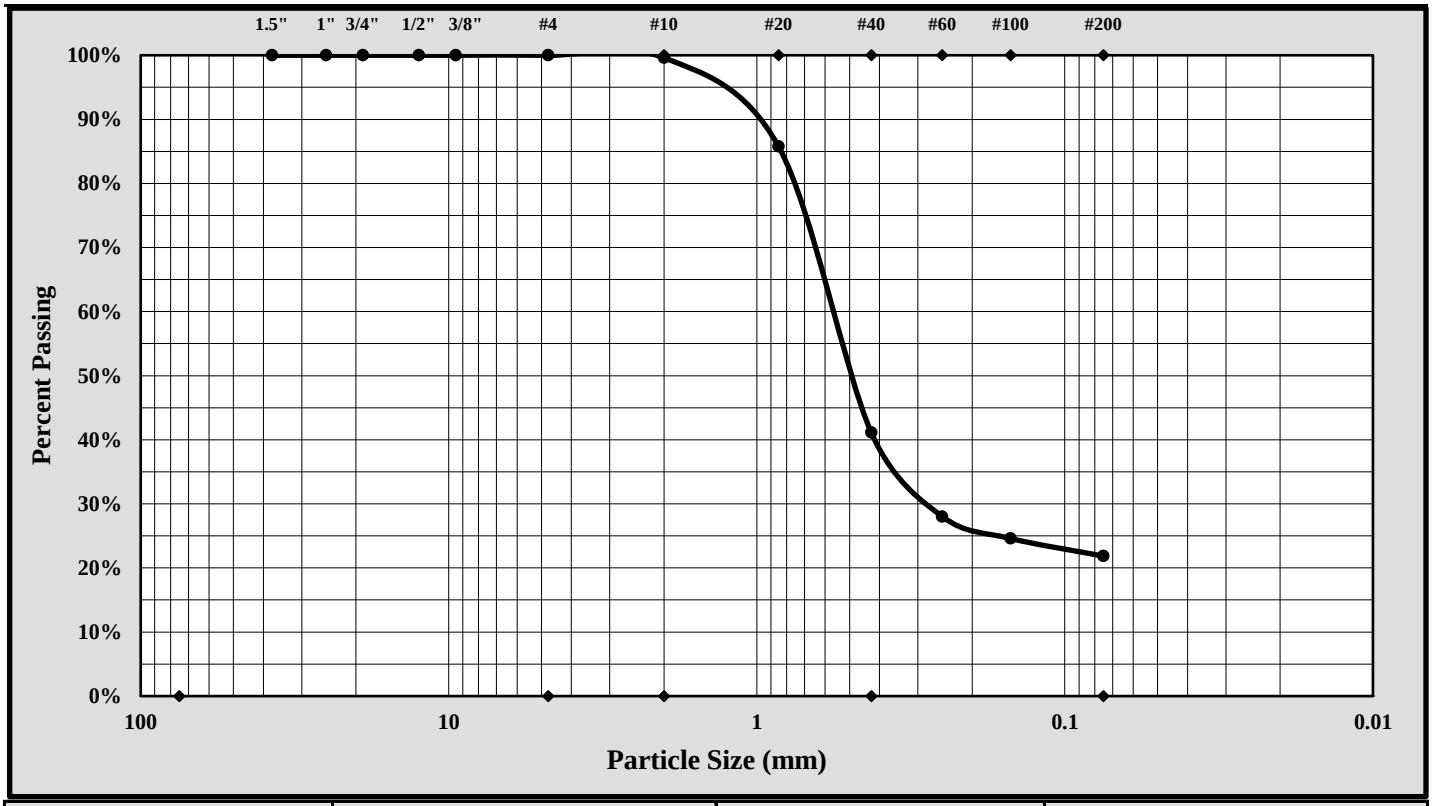
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/08 - 5/10/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-29	Sample #: SS-7	Sample Date: 3/23/18
Location:	Wall Boring	Type: Split-spoon	Depth: 18.5' - 20.0'
Sample Description:	Silty Sand (SM, A-1-b)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	2.00 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	21.8%	Total Sand:	78.2%

Liquid Limit	N/A	Plastic Limit	N/A	Plastic Index	N/A
Coarse Sand:	0.4%	Medium Sand:	58.5%	Fine Sand:	19.3%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/11/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

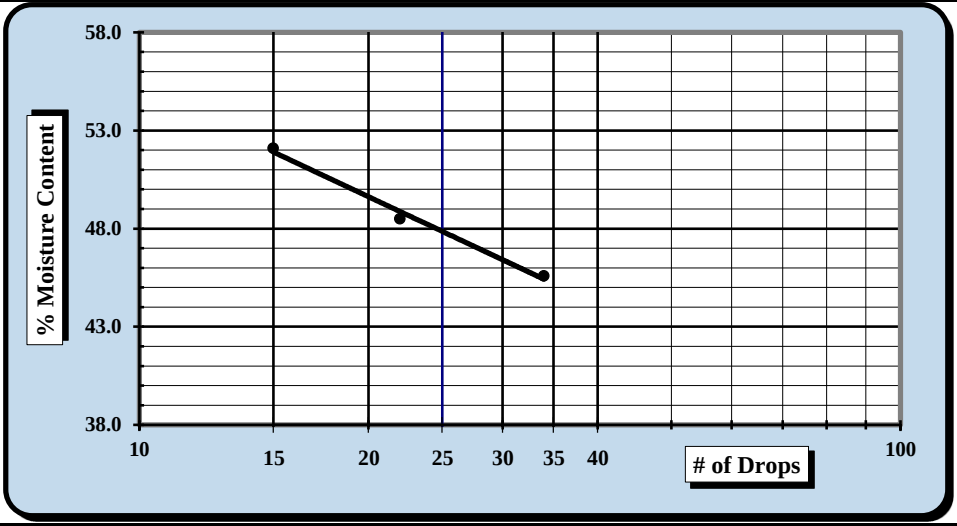
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date:	5/10/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-29	Sample #:	SS-8	Sample Date:	3/23/18
Location:	Wall Boring	Type:	Split-spoon	Depth:	23.5' - 25.0'
Sample Description:	Lean Clay with Sand (CL, A-7-6(18))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	26	27	28				29	30	
A	Tare Weight	27.34	26.98	26.82				26.98	27.36	
B	Wet Soil Weight + A	42.92	40.09	43.55				34.22	34.41	
C	Dry Soil Weight + A	38.04	35.81	37.82				32.67	32.91	
D	Water Weight (B-C)	4.88	4.28	5.73				1.55	1.50	
E	Dry Soil Weight (C-A)	10.70	8.83	11.00				5.69	5.55	
F	% Moisture (D/E)*100	45.6%	48.5%	52.1%				27.2%	27.0%	
N	# OF DROPS	34	22	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**27.1%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**48**
Plastic Limit	**27**
Plastic Index	**21**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/11/18	Matthew F. Cooke, P.G.	5/11/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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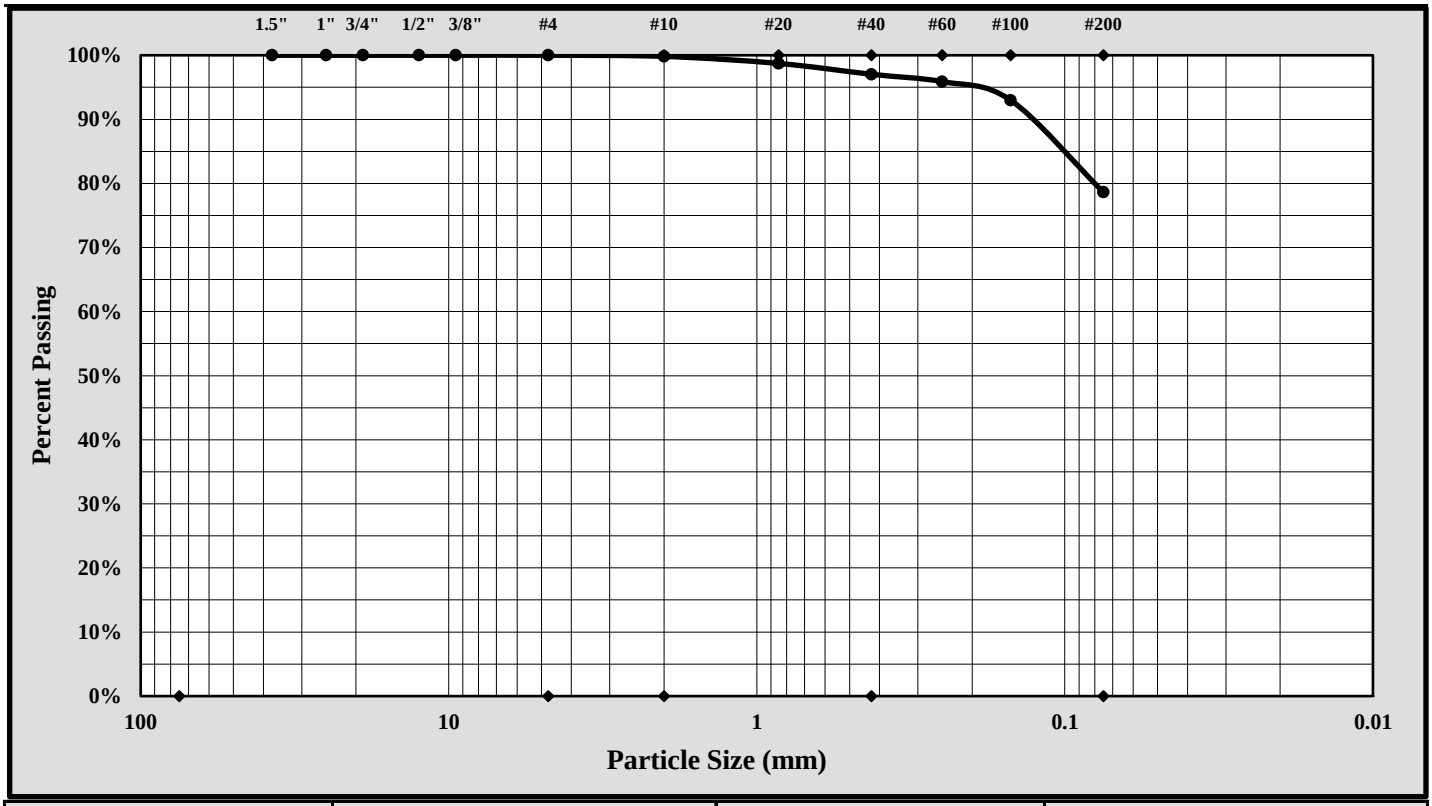
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/08 - 5/10/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-29	Sample #: SS-8	Sample Date: 3/23/18
Location:	Wall Boring	Type: Split-spoon	Depth: 23.5' - 25.0'
Sample Description:	Lean Clay with Sand (CL, A-7-6(18))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	2.00 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	78.6%	Total Sand:	21.4%

Liquid Limit	48	Plastic Limit	27	Plastic Index	21
Coarse Sand:	0.2%	Medium Sand:	2.8%	Fine Sand:	18.4%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/11/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

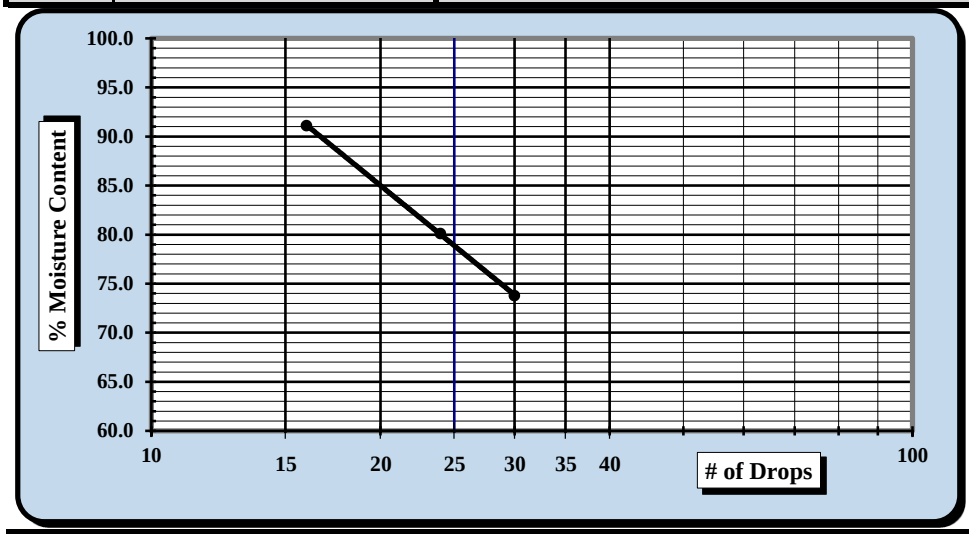
S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-2-2018
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-30	Sample #: SS-1		Sample Date: Various	
Location:	Wall Boring	Offset: N/A		Depth: 1.7' - 3.7'	
Sample Description:	Elastic Silt with Sand (MH, A-7-5 (31))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 455		Liquid Limit						Plastic Limit		
	Tare #:	50	51	52				53	54	
A	Tare Weight	15.19	15.98	15.11				15.45	15.12	
B	Wet Soil Weight + A	24.87	24.75	24.82				21.59	21.34	
C	Dry Soil Weight + A	20.76	20.85	20.19				19.55	19.30	
D	Water Weight (B-C)	4.11	3.90	4.63				2.04	2.04	
E	Dry Soil Weight (C-A)	5.57	4.87	5.08				4.10	4.18	
F	% Moisture (D/E)*100	73.8%	80.1%	91.1%				49.8%	48.8%	
N	# OF DROPS	30	24	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**49.3%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**80**
Plastic Limit	**49**
Plastic Index	**31**
Group Symbol	**MH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		5/2/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

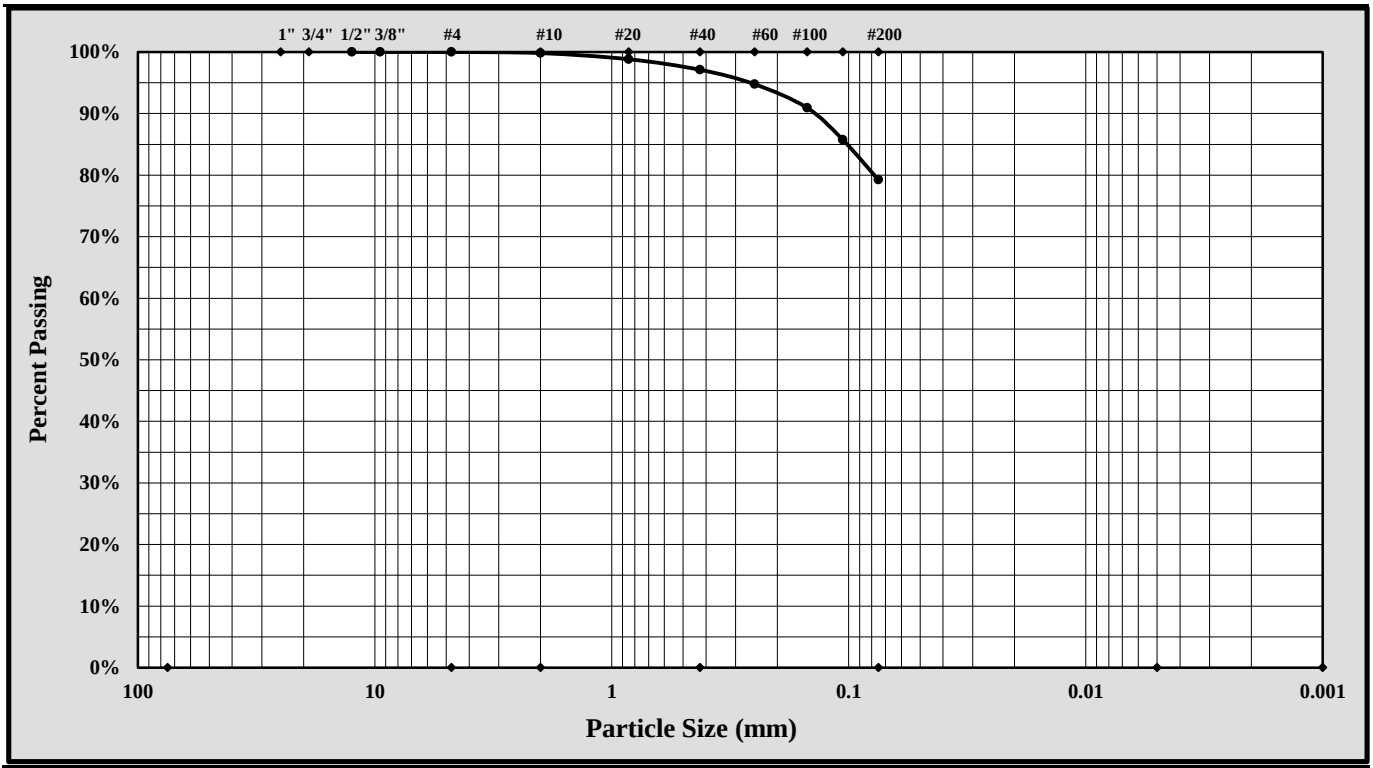
ASTM D6913/D7928

Sample Log No.:

Quality Assurance

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	W-30 Type: Split Spoon	Sample Date:	Various
Location:	Wall Boring Sample No.: SS-1	Depth:	1.7' - 3.7'
Sample Description:	Elastic Silt with Sand (MH, A-7-5 (31))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	0.0%
Silt & Clay (% Passing #200):	79.2%	Total Sand:	20.8%
Assumed Specific Gravity:	2.65		

Liquid Limit	80	Plastic Limit	49	Plastic Index	31

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Nathan Price — *Technical Responsibility*

Laboratory Group Leader — *Position*

5/2/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

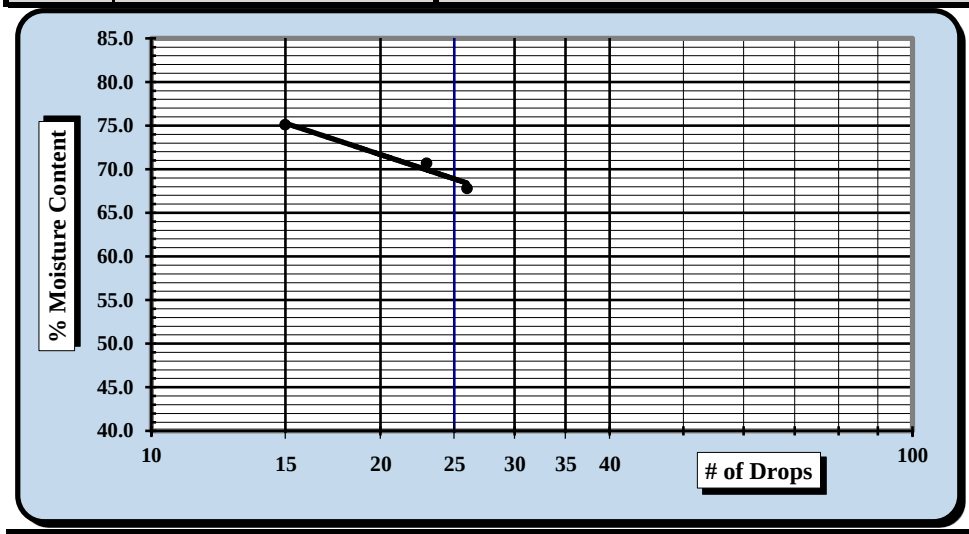
S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-4-18
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-30	Sample #: SS-4		Sample Date: Various	
Location:	Wall Boring	Offset: N/A		Depth: 7.7' - 9.7'	
Sample Description:	Elastic Silt with Sand (MH, A-7-5 (17))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 331		Liquid Limit						Plastic Limit		
	Tare #:	15	16	17				18	19	
A	Tare Weight	16.01	15.09	15.50				15.26	15.08	
B	Wet Soil Weight + A	28.56	26.32	28.88				23.64	21.81	
C	Dry Soil Weight + A	23.49	21.67	23.14				20.76	19.49	
D	Water Weight (B-C)	5.07	4.65	5.74				2.88	2.32	
E	Dry Soil Weight (C-A)	7.48	6.58	7.64				5.50	4.41	
F	% Moisture (D/E)*100	67.8%	70.7%	75.1%				52.4%	52.6%	
N	# OF DROPS	26	23	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR		%							
Ave.	*Average*							**52.5%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**68**
Plastic Limit	**52**
Plastic Index	**16**
Group Symbol	**MH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		4/30/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

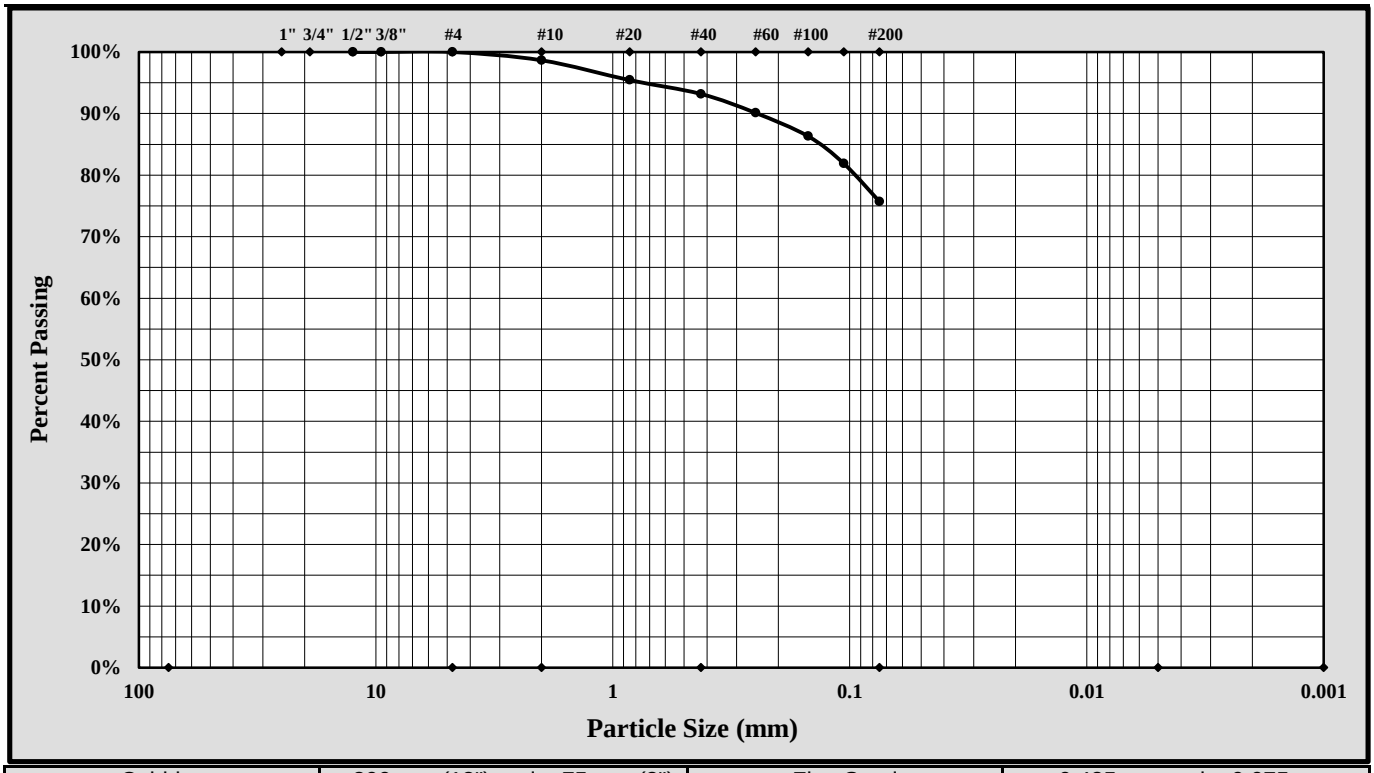
ASTM D6913/D7928

Sample Log No.:

Quality Assurance

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	W-30 Type: Split Spoon	Sample Date:	Various
Location:	Wall Boring Sample No.: SS-4	Depth:	7.7' - 9.7'
Sample Description:	Elastic Silt with Sand (MH, A-7-5 (17))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	0.0%
Silt & Clay (% Passing #200):	75.7%	Total Sand:	24.3%
Assumed Specific Gravity:	2.65		

Liquid Limit	68	Plastic Limit	52	Plastic Index	16

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	5/4/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

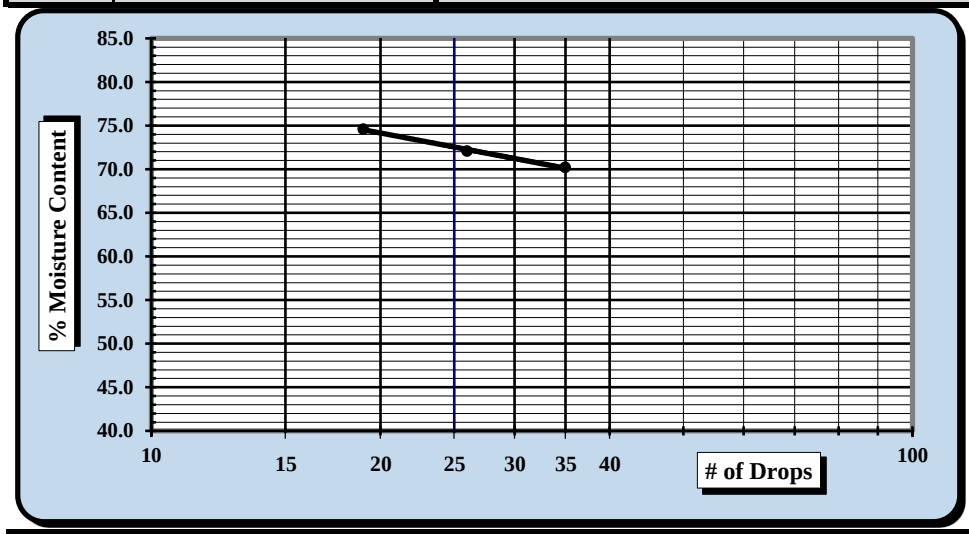
S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-4-18
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-30	Sample #: SS-9		Sample Date: Various	
Location:	Wall Boring	Offset: N/A		Depth: 28.5' - 30.0'	
Sample Description:	Elastic Silt with Sand (MH, A-7-5 (36))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

Pan # 140		Liquid Limit						Plastic Limit		
	Tare #:	10	11	12				13	14	
A	Tare Weight	15.65	14.94	15.17				15.41	15.69	
B	Wet Soil Weight + A	26.97	26.61	26.45				22.28	21.97	
C	Dry Soil Weight + A	22.30	21.72	21.63				20.44	20.40	
D	Water Weight (B-C)	4.67	4.89	4.82				1.84	1.57	
E	Dry Soil Weight (C-A)	6.65	6.78	6.46				5.03	4.71	
F	% Moisture (D/E)*100	70.2%	72.1%	74.6%				36.6%	33.3%	
N	# OF DROPS	35	26	19				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**35.0%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**72**
Plastic Limit	**35**
Plastic Index	**37**
Group Symbol	**MH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		5/4/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Form No: TR-D7928-3
Revision No.: 0
Revision Date: 02/21/17

Particle Size Analysis of Soils

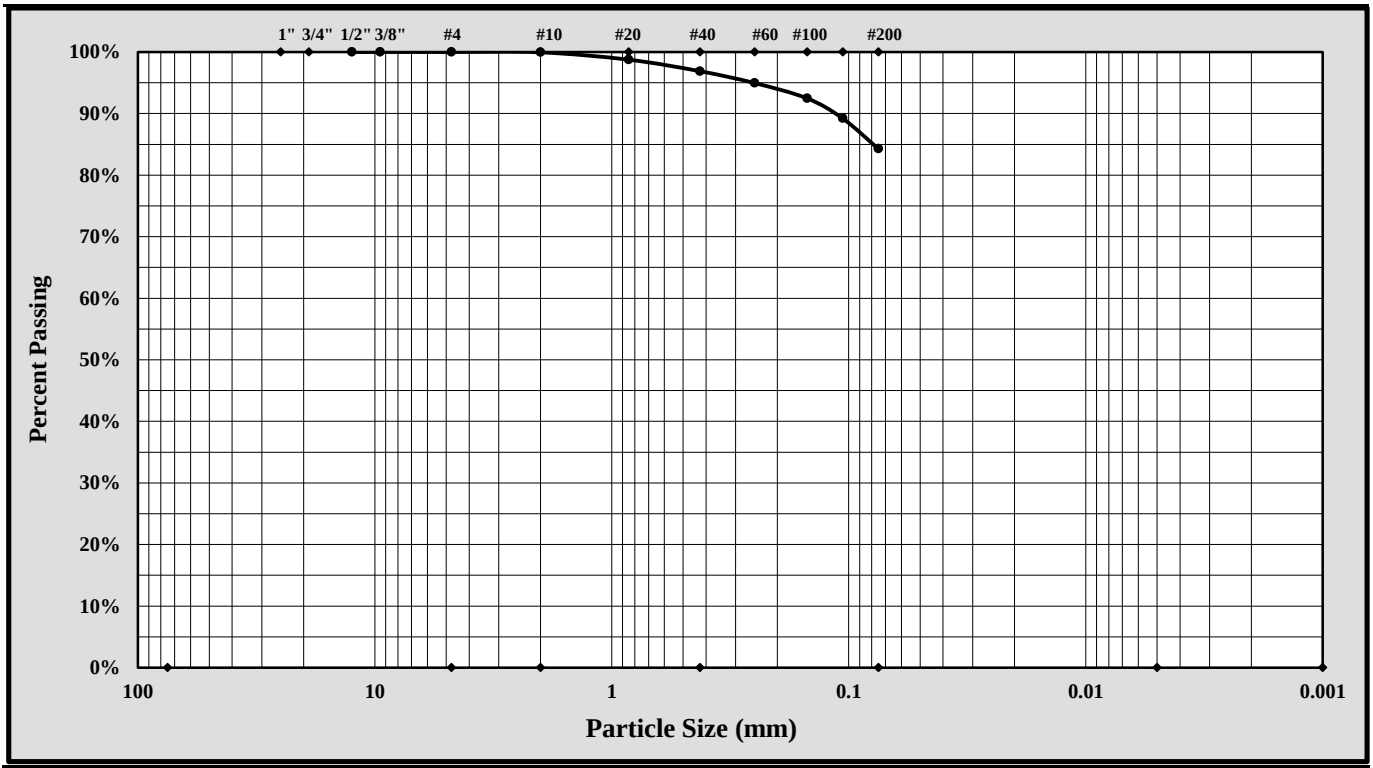
ASTM D6913/D7928

Sample Log No.:

Quality Assurance

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	4/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	W-30 Type: Split Spoon	Sample Date:	Various
Location:	Wall Boring Sample No.: SS-9	Depth:	28.5' - 30.0'
Sample Description:	Elastic Silt with Sand (MH, A-7-5 (36))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	0.0%
Silt & Clay (% Passing #200):	84.3%	Total Sand:	15.7%
Assumed Specific Gravity:	2.65		

Liquid Limit	72	Plastic Limit	35	Plastic Index	37

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	5/4/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

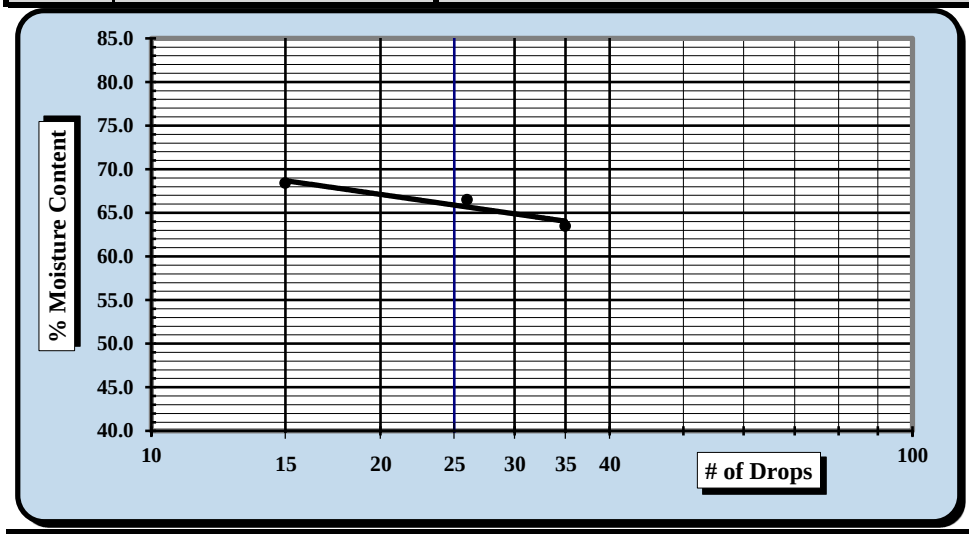
S&ME, Inc. - Atlanta: 4350 River Green Parkway, Suite 200, Duluth, GA 30096

Project #:	1461-16-047.2B	Report Date:	5-2-18
Project Name:	Carolina Crossroads Project	Test Date(s)	4/27-4/28/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-30	Sample #: SS-11		Sample Date: Various	
Location:	Wall Boring	Offset: N/A		Depth: 38.5' - 40'	
Sample Description:	Fat Clay with Sand (CH, A-7-5 (34))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	25128	3/17/2017	Grooving tool	26551	2/23/2018
LL Apparatus	31336	2/23/2018	Grooving tool		
Oven	31332	2/20/2018	Grooving tool		

		Liquid Limit						Plastic Limit		
Pan #	108									
	Tare #:	1	4	5				6	7	
A	Tare Weight	15.03	15.01	15.34				15.58	16.00	
B	Wet Soil Weight + A	26.23	26.70	29.03				21.40	21.34	
C	Dry Soil Weight + A	21.88	22.03	23.47				20.05	20.12	
D	Water Weight (B-C)	4.35	4.67	5.56				1.35	1.22	
E	Dry Soil Weight (C-A)	6.85	7.02	8.13				4.47	4.12	
F	% Moisture (D/E)*100	63.5%	66.5%	68.4%				30.2%	29.6%	
N	# OF DROPS	35	26	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**29.9%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**65**
Plastic Limit	**30**
Plastic Index	**35**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

Jimmy Hanson	4/28/2018		5/2/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Particle Size Analysis of Soils

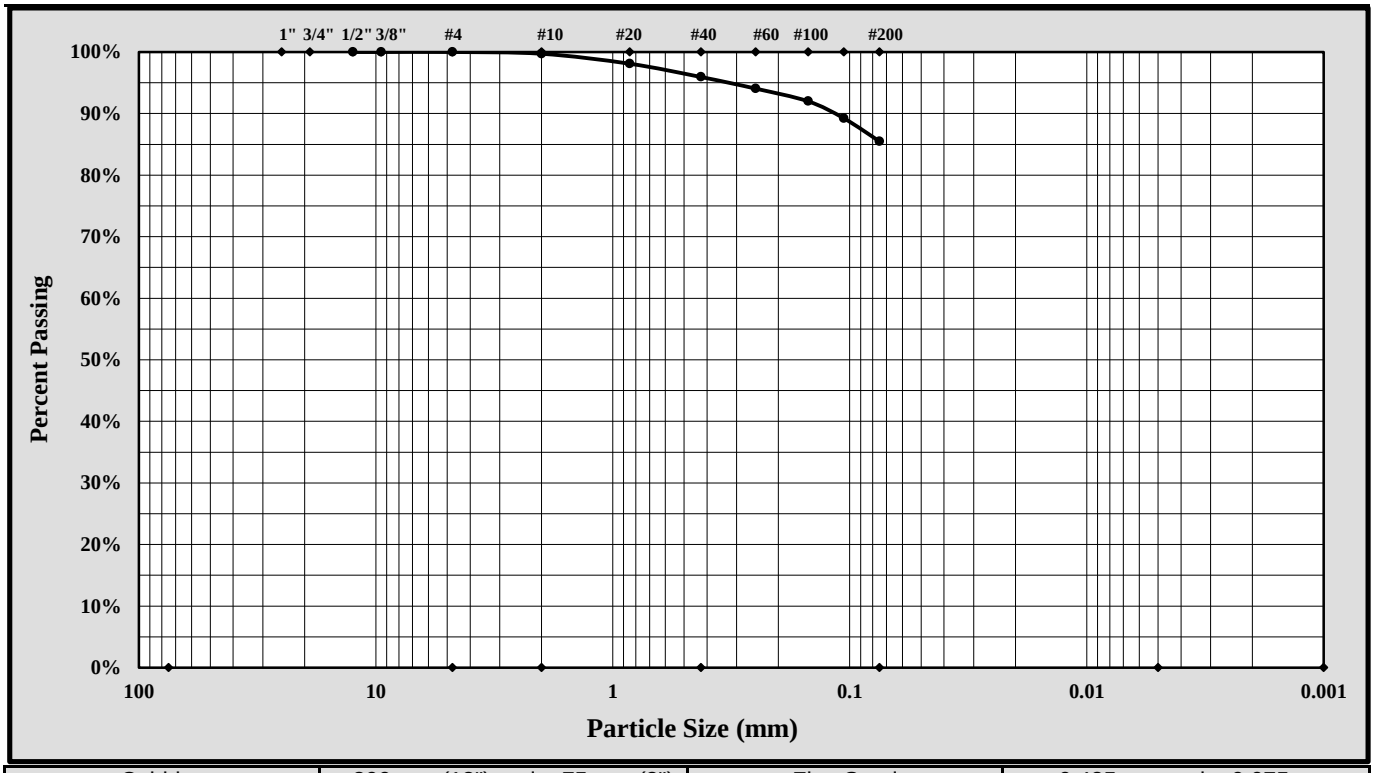
ASTM D6913/D7928

Sample Log No.:

Quality Assurance

S&ME, Inc., 4350 Rivergreen Parkway, Suite 200, Duluth, GA 30096

S&ME Project #:	1461-16-047.2B	Report Date:	5/2/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	4/19-4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample ID:	W-30 Type: Split Spoon	Sample Date:	Various
Location:	Wall Boring Sample No.: SS-11	Depth:	38.5' - 40.0'
Sample Description:	Fat Clay with Sand (CH, A-7-5 (34))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:		Gravel:	0.0%
Silt & Clay (% Passing #200):	85.5%	Total Sand:	14.5%
Assumed Specific Gravity:	2.65		

Liquid Limit	65	Plastic Limit	30	Plastic Index	35

$Cc = D_{30}^2/(D_{10} \times D_{60})$ $Cu = D_{60}/D_{10}$

Description of Sand and Gravel	Rounded ☐	Angular ☐	Hard & Durable ☐	Soft ☐	Weathered & Friable ☐
Sample Prep Method: Moist Prep	Dispersion Period:	1 min.	Dispersing Agent:	Sodium Hexametaphosphate:	50 g./ Liter

References / Comments / Deviations:

Nathan Price		Laboratory Group Leader	5/2/2018
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

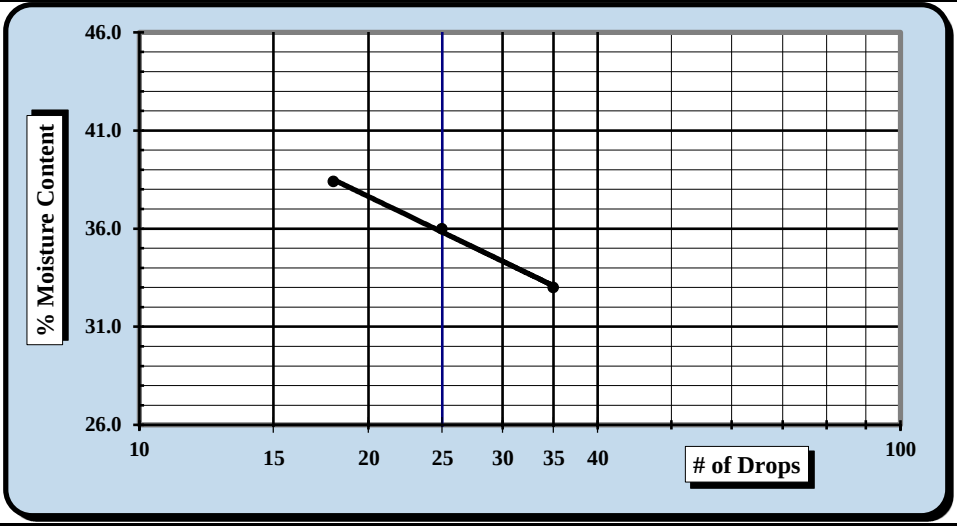
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date:	5/10/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-31	Sample #:	SS-1	Sample Date:	3/13/18
Location:	Wall Boring	Type:	Split-spoon	Depth:	0.0' - 2.0'
Sample Description:	Sandy Lean Clay (CL, A-6(8))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	31	32	33				34	35	
A	Tare Weight	28.61	27.62	26.69				28.25	26.96	
B	Wet Soil Weight + A	43.79	42.29	41.78				35.15	33.19	
C	Dry Soil Weight + A	40.02	38.41	37.59				34.17	32.32	
D	Water Weight (B-C)	3.77	3.88	4.19				0.98	0.87	
E	Dry Soil Weight (C-A)	11.41	10.79	10.90				5.92	5.36	
F	% Moisture (D/E)*100	33.0%	36.0%	38.4%				16.6%	16.2%	
N	# OF DROPS	35	25	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**16.4%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**36**
Plastic Limit	**16**
Plastic Index	**20**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/11/18	Matthew F. Cooke, P.G.	5/11/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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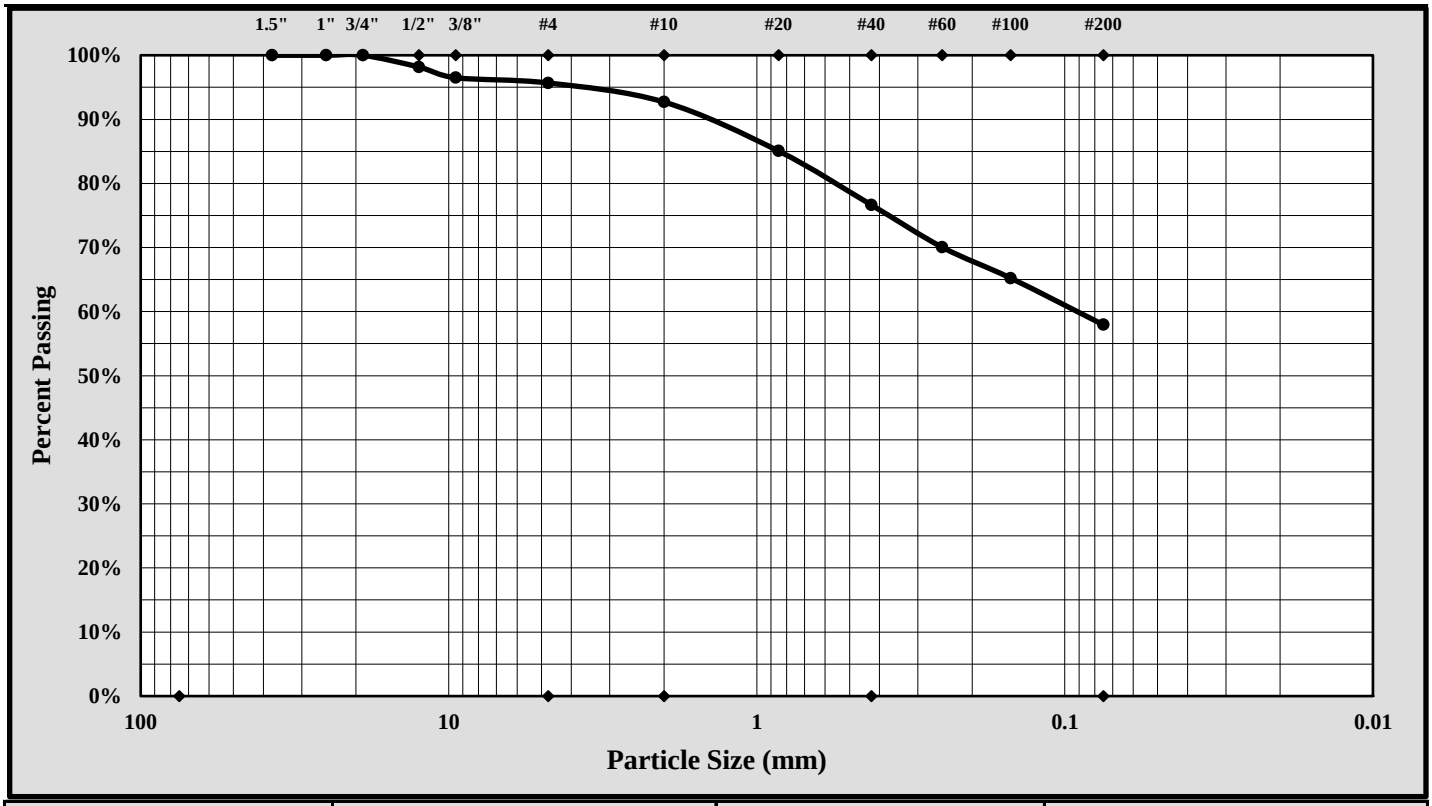
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/08 - 5/10/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-31	Sample #: SS-1	Sample Date: 3/13/18
Location:	Wall Boring	Type: Split-spoon	Depth: 0.0' - 2.0'
Sample Description:	Sandy Lean Clay (CL, A-6(8))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	19.0 mm	Gravel:	4.3%
Silt & Clay (% Passing #200):	57.9%	Total Sand:	37.7%

Liquid Limit	36	Plastic Limit	16	Plastic Index	20
Coarse Sand:	3.0%	Medium Sand:	16.0%	Fine Sand:	18.7%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/11/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

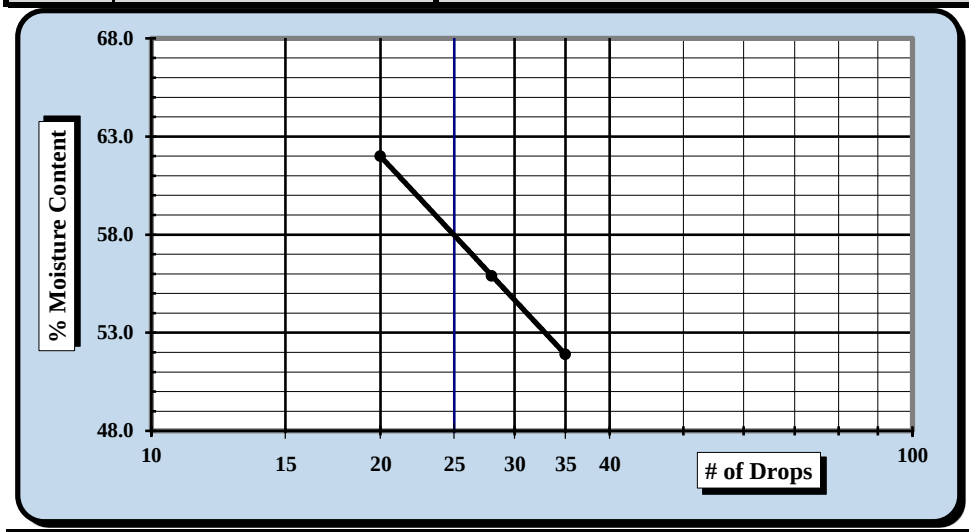
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date:	5/10/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-31	Sample #:	SS-3	Sample Date:	3/13/18
Location:	Wall Boring	Type:	Split-spoon	Depth:	4.0' - 6.0'
Sample Description:	Fat Clay with Sand (CH, A-7-6(31))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	36	37	38				39	40	
A	Tare Weight	25.67	26.19	28.27				25.86	26.96	
B	Wet Soil Weight + A	37.61	39.10	40.58				32.46	33.19	
C	Dry Soil Weight + A	33.53	34.47	35.87				31.36	32.15	
D	Water Weight (B-C)	4.08	4.63	4.71				1.10	1.04	
E	Dry Soil Weight (C-A)	7.86	8.28	7.60				5.50	5.19	
F	% Moisture (D/E)*100	51.9%	55.9%	62.0%				20.0%	20.0%	
N	# OF DROPS	35	28	20				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**20.0%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**58**
Plastic Limit	**20**
Plastic Index	**38**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/11/18	Matthew F. Cooke, P.G.	5/11/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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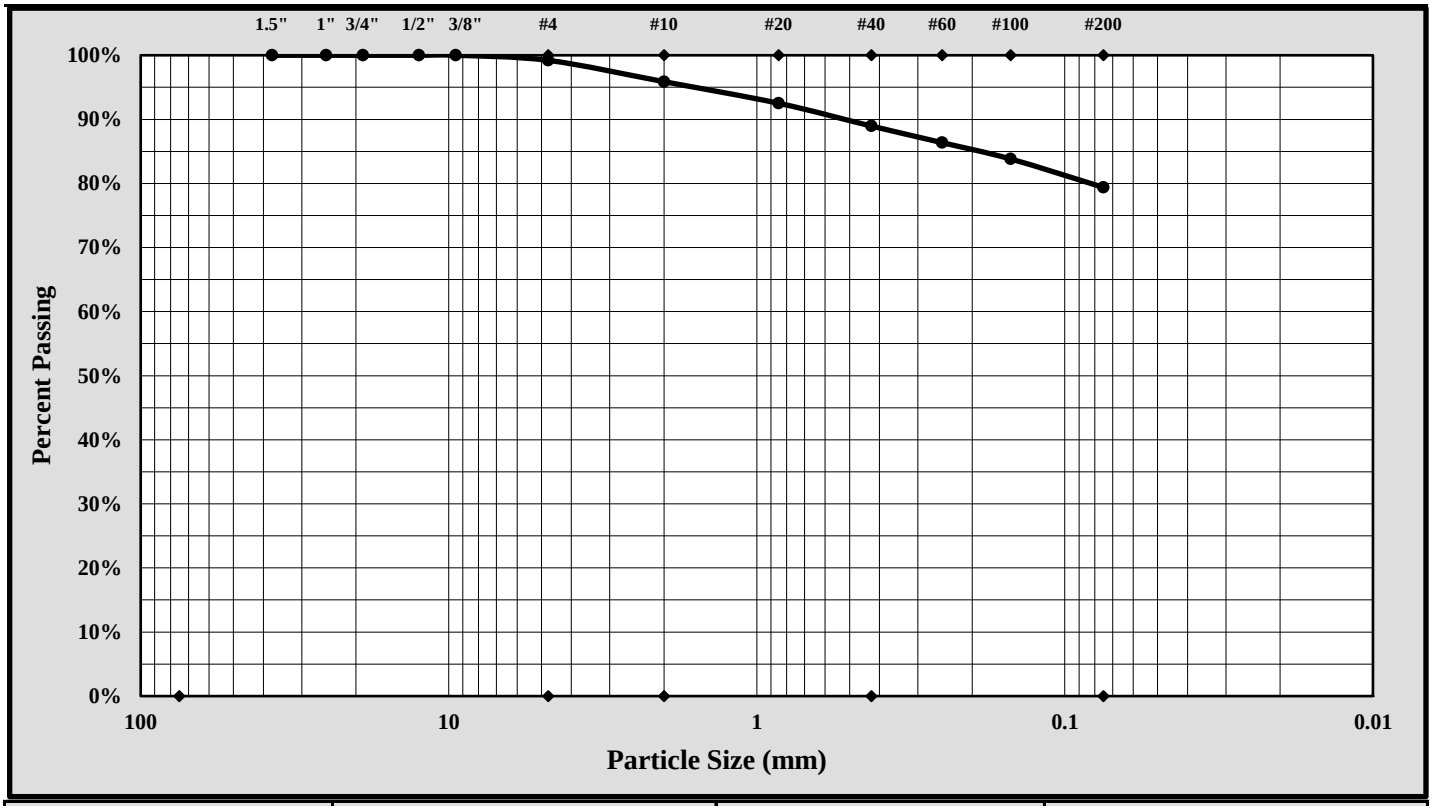
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/08 - 5/10/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-31	Sample #: SS-3	Sample Date: 3/13/18
Location:	Wall Boring	Type: Split-spoon	Depth: 4.0' - 6.0'
Sample Description:	Fat Clay with Sand (CH, A-7-6(31))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.8%
Silt & Clay (% Passing #200):	79.4%	Total Sand:	19.8%

Liquid Limit	58	Plastic Limit	20	Plastic Index	38
Coarse Sand:	3.3%	Medium Sand:	6.9%	Fine Sand:	9.6%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/11/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

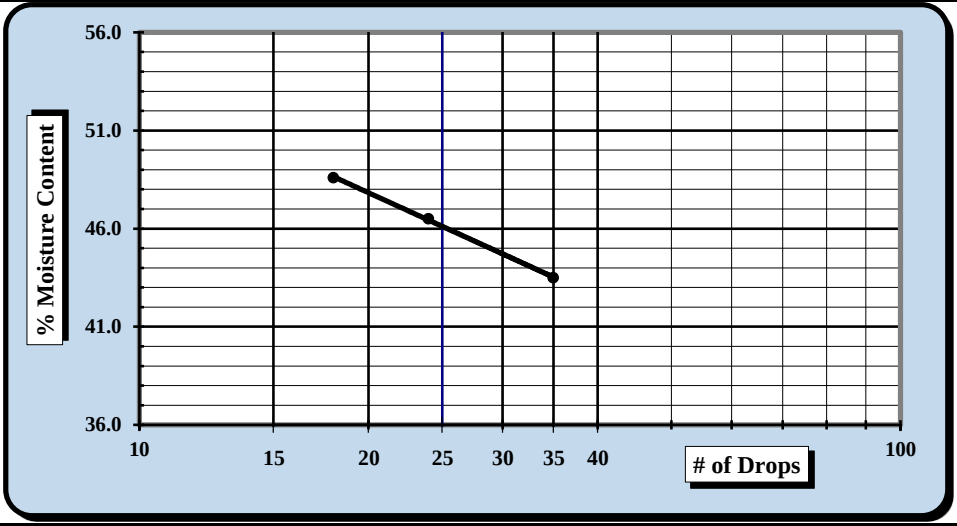
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date:	5/10/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-31	Sample #:	SS-7	Sample Date:	3/13/18
Location:	Wall Boring	Type:	Split-spoon	Depth:	18.5' - 20.0'
Sample Description:	Silt with Sand (ML, A-7-5(14)])				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	41	42	43				44	45	
A	Tare Weight	28.75	28.65	28.37				25.76	25.07	
B	Wet Soil Weight + A	46.17	49.86	46.48				32.16	31.89	
C	Dry Soil Weight + A	40.89	43.13	40.56				30.65	30.26	
D	Water Weight (B-C)	5.28	6.73	5.92				1.51	1.63	
E	Dry Soil Weight (C-A)	12.14	14.48	12.19				4.89	5.19	
F	% Moisture (D/E)*100	43.5%	46.5%	48.6%				30.9%	31.4%	
N	# OF DROPS	35	24	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**31.2%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**46**
Plastic Limit	**31**
Plastic Index	**15**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/11/18	Matthew F. Cooke, P.G.	5/11/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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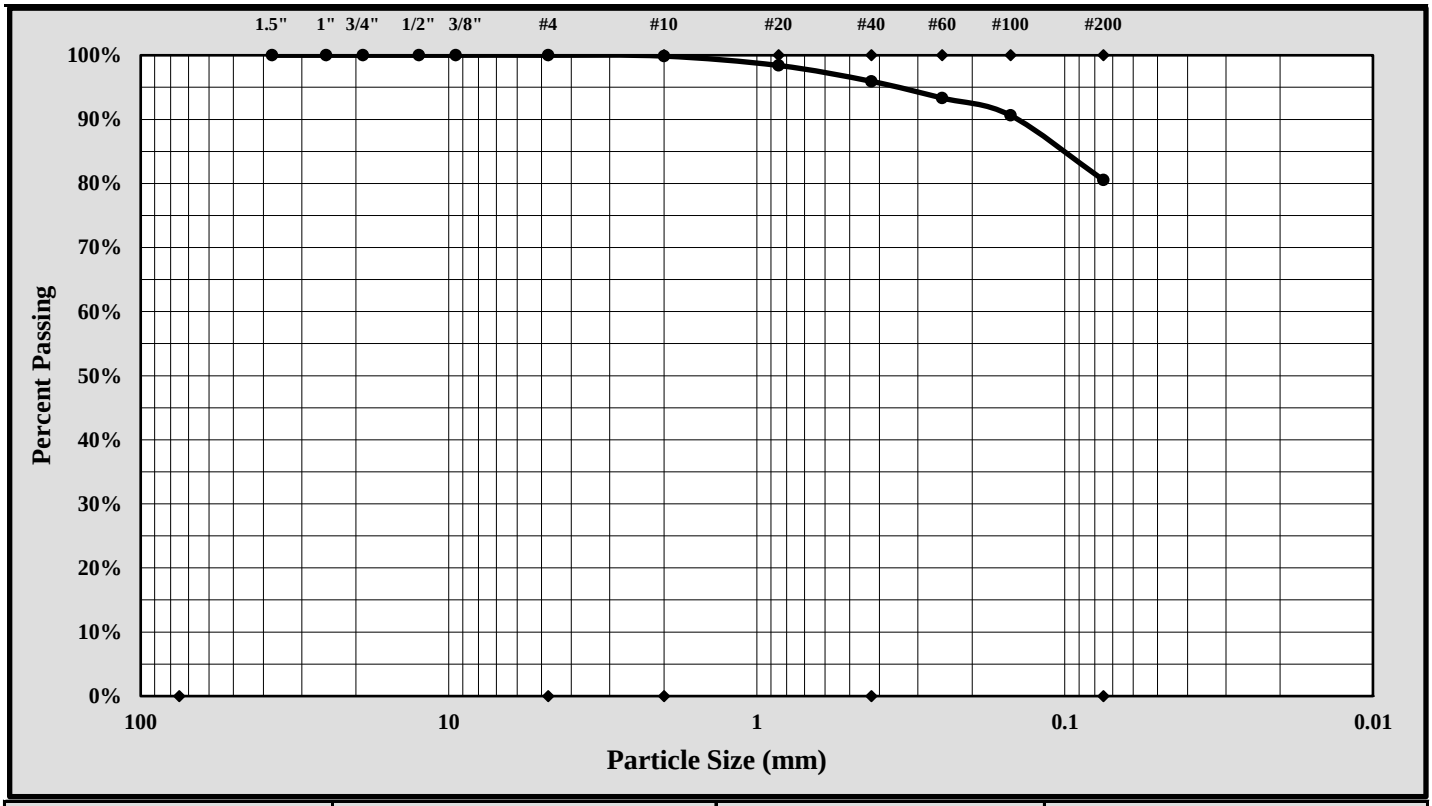
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/11/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/08 - 5/10/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-31	Sample #: SS-7	Sample Date: 3/13/18
Location:	Wall Boring	Type: Split-spoon	Depth: 18.5' - 20.0'
Sample Description:	Silt with Sand (ML, A-7-5(14))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	2.00 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	80.5%	Total Sand:	19.5%

Liquid Limit	46	Plastic Limit	31	Plastic Index	15
Coarse Sand:	0.1%	Medium Sand:	3.9%	Fine Sand:	15.4%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/11/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/05/18
Project Name:	Carolina Crossroads Project	Test Date:	4/04/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-32	Sample #:	SS-2	Sample Date:	2/05/18
Location:	Wall Boring	Type:	Split-spoon	Depth:	2.0' - 4.0'
Sample Description:	Sandy Silt (ML, A-4(5))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	11	12	13				14	15	
A	Tare Weight	26.67	26.64	26.74				26.65	27.60	
B	Wet Soil Weight + A	42.19	43.17	43.54				33.54	34.04	
C	Dry Soil Weight + A	38.67	39.11	39.02				32.17	32.75	
D	Water Weight (B-C)	3.52	4.06	4.52				1.37	1.29	
E	Dry Soil Weight (C-A)	12.00	12.47	12.28				5.52	5.15	
F	% Moisture (D/E)*100	29.3%	32.6%	36.8%				24.8%	25.0%	
N	# OF DROPS	35	25	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**24.9%**		

One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**33**
Plastic Limit	**25**
Plastic Index	**8**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/05/18	Matthew F. Cooke, P.G.	4/05/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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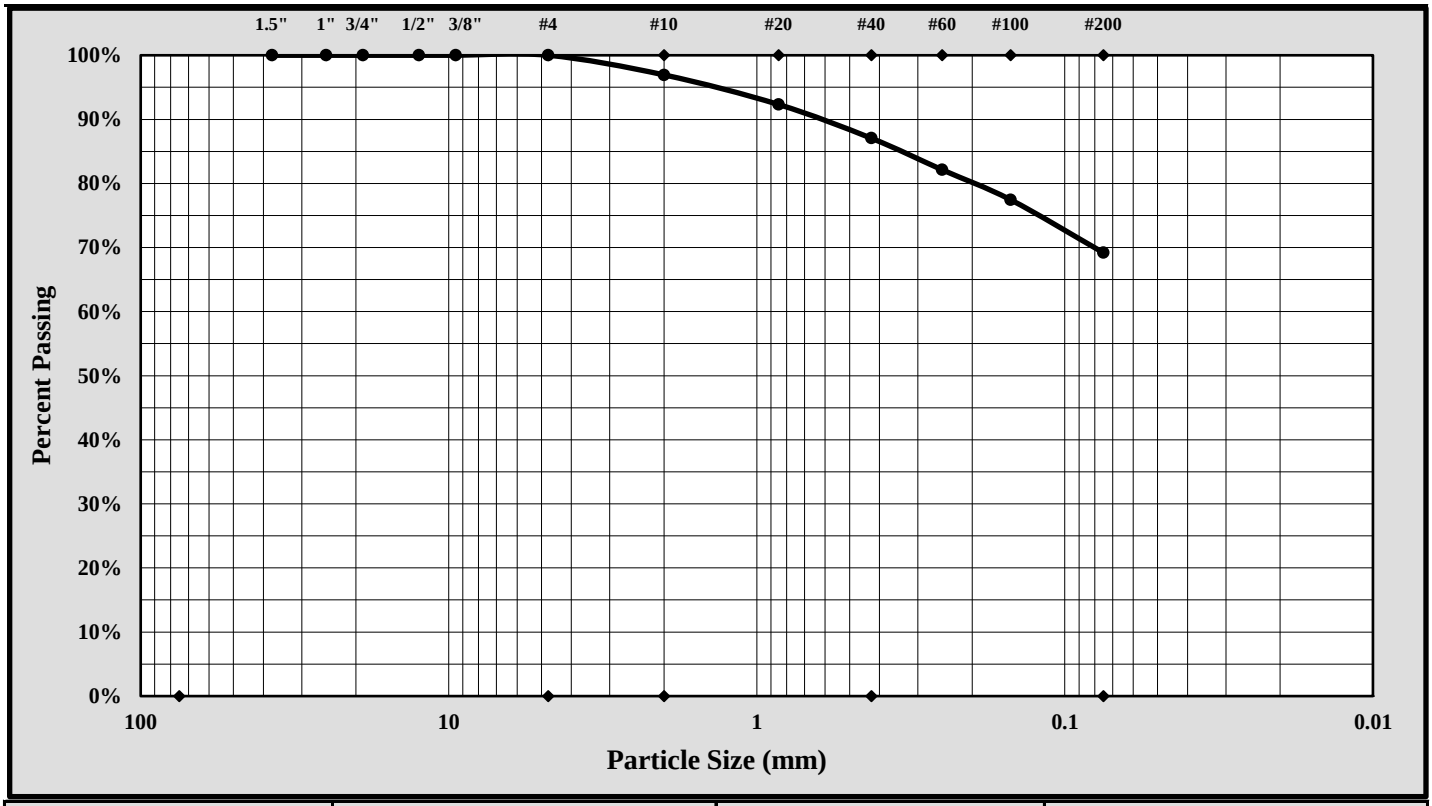
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/04/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/26 - 4/05/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-32	Sample #: SS-2	Sample Date: 2/05/18
Location:	Wall Boring	Type: Split-spoon	Depth: 2.0' - 4.0'
Sample Description:	Sandy Silt (ML, A-4(5))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	69.2%	Total Sand:	30.8%

Liquid Limit	33	Plastic Limit	25	Plastic Index	8
Coarse Sand:	3.1%	Medium Sand:	9.9%	Fine Sand:	17.9%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/04/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

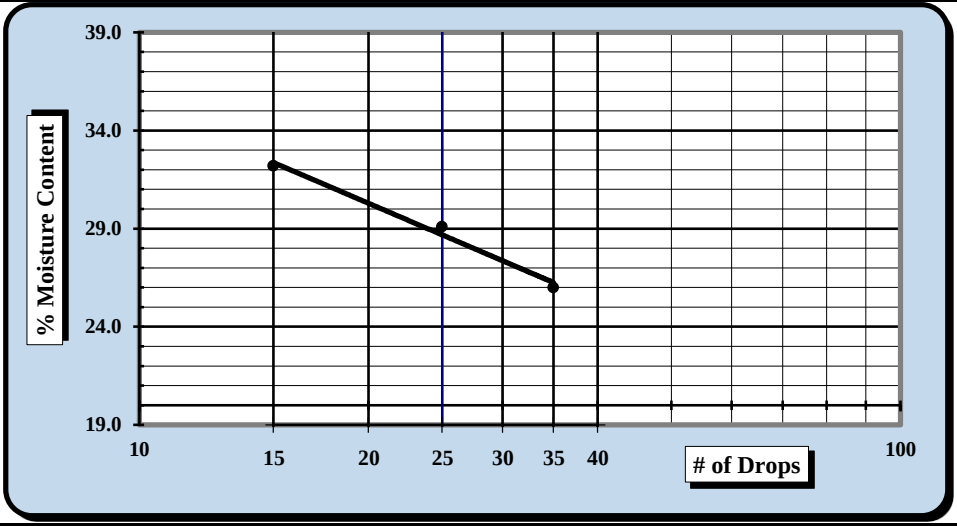
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/05/18
Project Name:	Carolina Crossroads Project	Test Date:	4/04/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-32	Sample #:	SS-5	Sample Date:	2/05/18
Location:	Wall Boring	Type:	Split-spoon	Depth:	8.0' - 10.0'
Sample Description:	Clayey Sand (SC, A-6(2))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

	Pan #	Liquid Limit						Plastic Limit		
	Tare #:	16	17	18				19	20	
A	Tare Weight	26.57	26.64	26.80				26.66	26.82	
B	Wet Soil Weight + A	42.75	43.13	43.03				34.15	34.98	
C	Dry Soil Weight + A	39.41	39.41	39.08				33.13	33.87	
D	Water Weight (B-C)	3.34	3.72	3.95				1.02	1.11	
E	Dry Soil Weight (C-A)	12.84	12.77	12.28				6.47	7.05	
F	% Moisture (D/E)*100	26.0%	29.1%	32.2%				15.8%	15.7%	
N	# OF DROPS	35	25	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**15.8%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐
Liquid Limit **29**
Plastic Limit **16**
Plastic Index **13**
Group Symbol **CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/05/18	Matthew F. Cooke, P.G.	4/05/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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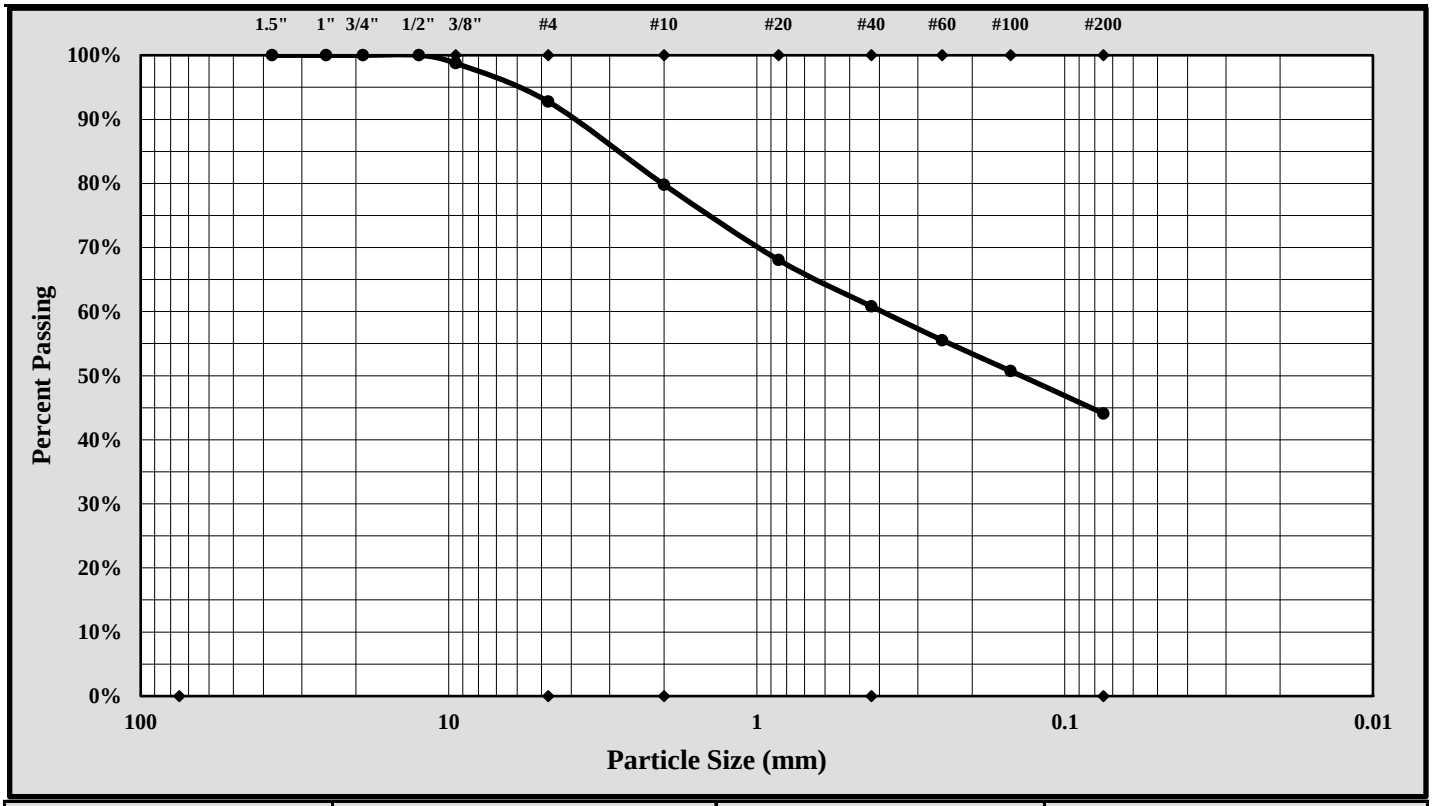
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/04/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/26 - 4/05/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-32	Sample #: SS-5	Sample Date: 2/05/18
Location:	Wall Boring	Type: Split-spoon	Depth: 8.0' - 10.0'
Sample Description:	Clayey Sand (SC, A-6(2))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	12.50 mm	Gravel:	7.2%
Silt & Clay (% Passing #200):	44.1%	Total Sand:	48.6%

Liquid Limit	29	Plastic Limit	16	Plastic Index	13
Coarse Sand:	13.0%	Medium Sand:	19.0%	Fine Sand:	16.7%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G.	Project Manager	4/04/18
Technical Responsibility	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

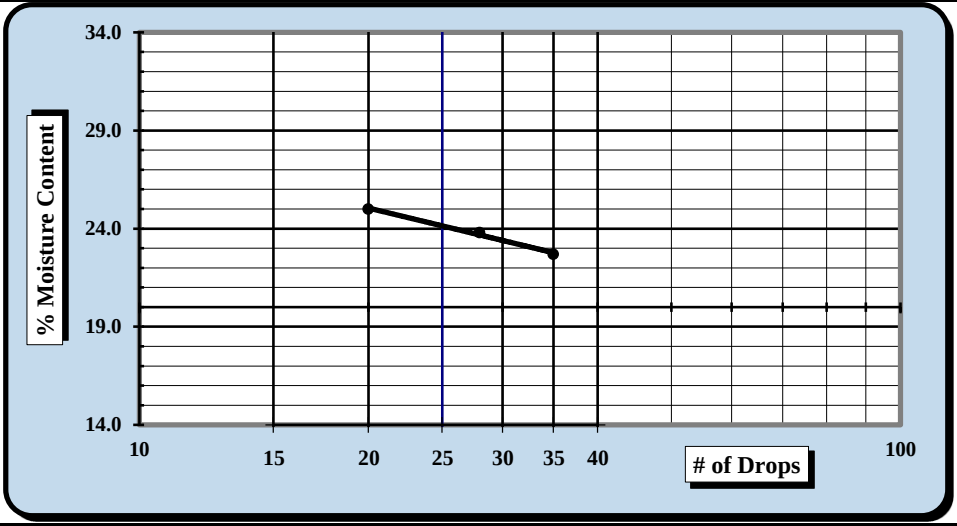
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/05/18
Project Name:	Carolina Crossroads Project	Test Date:	4/04/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-32	Sample #:	SS-6	Sample Date:	2/05/18
Location:	Wall Boring	Type:	Split-spoon	Depth:	13.5' - 15.0'
Sample Description:	Silty Sand with Gravel (SM, A-1-b)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	21	22	23				24	25	
A	Tare Weight	28.09	25.66	27.23				25.99	26.80	
B	Wet Soil Weight + A	46.77	35.27	42.31				33.08	33.41	
C	Dry Soil Weight + A	43.32	33.42	39.29				31.86	32.29	
D	Water Weight (B-C)	3.45	1.85	3.02				1.22	1.12	
E	Dry Soil Weight (C-A)	15.23	7.76	12.06				5.87	5.49	
F	% Moisture (D/E)*100	22.7%	23.8%	25.0%				20.8%	20.4%	
N	# OF DROPS	35	28	20				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**20.6%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**24**
Plastic Limit	**21**
Plastic Index	**3**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/05/18	Matthew F. Cooke, P.G.	4/05/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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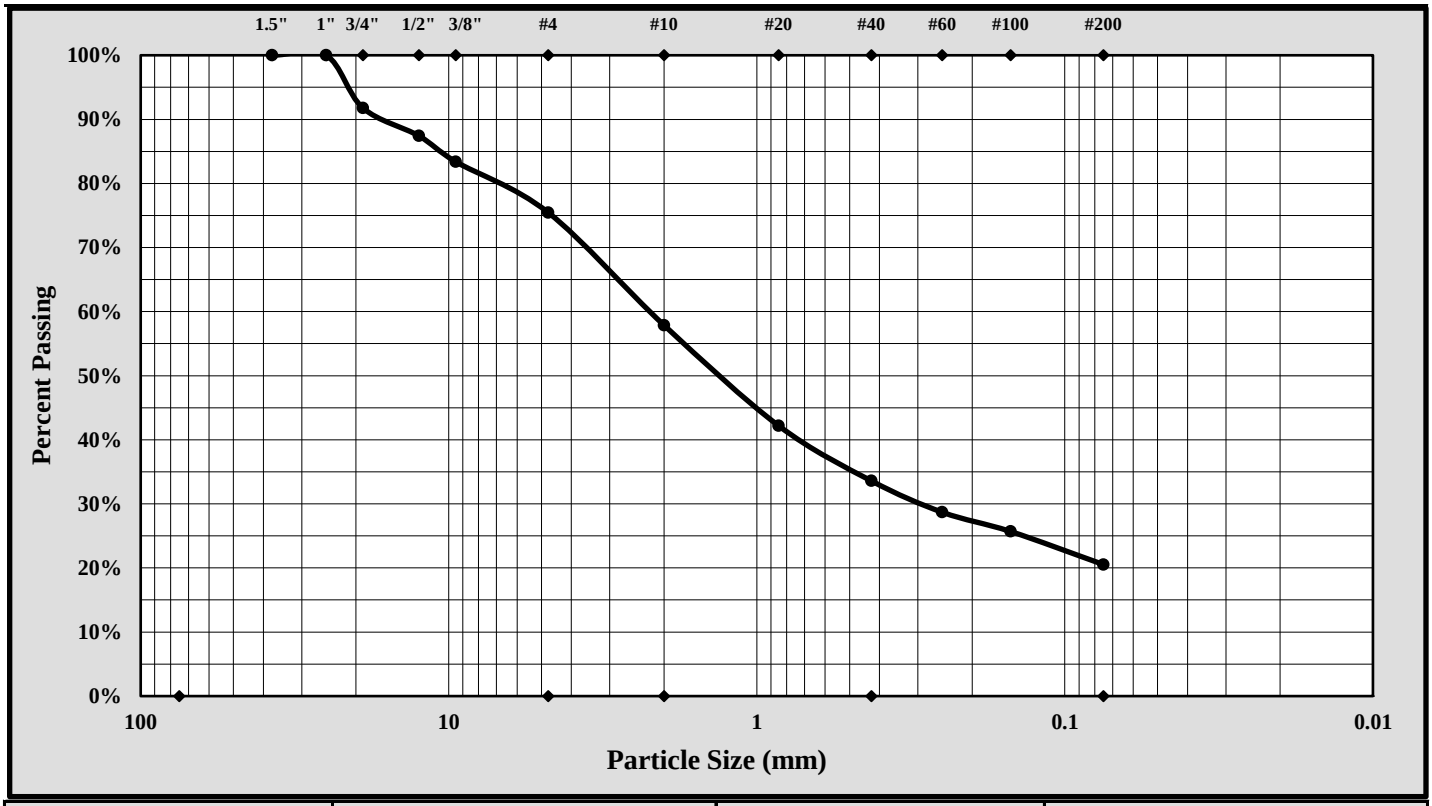
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/04/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/26 - 4/05/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-32	Sample #: SS-6	Sample Date: 2/05/18
Location:	Wall Boring	Type: Split-spoon	Depth: 13.5' - 15.0'
Sample Description:	Silty Sand with Gravel (SM, A-1-b)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	25.0 mm	Gravel:	24.6%
Silt & Clay (% Passing #200):	20.5%	Total Sand:	54.9%

Liquid Limit	24	Plastic Limit	21	Plastic Index	3
Coarse Sand:	17.6%	Medium Sand:	24.3%	Fine Sand:	13.1%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/04/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

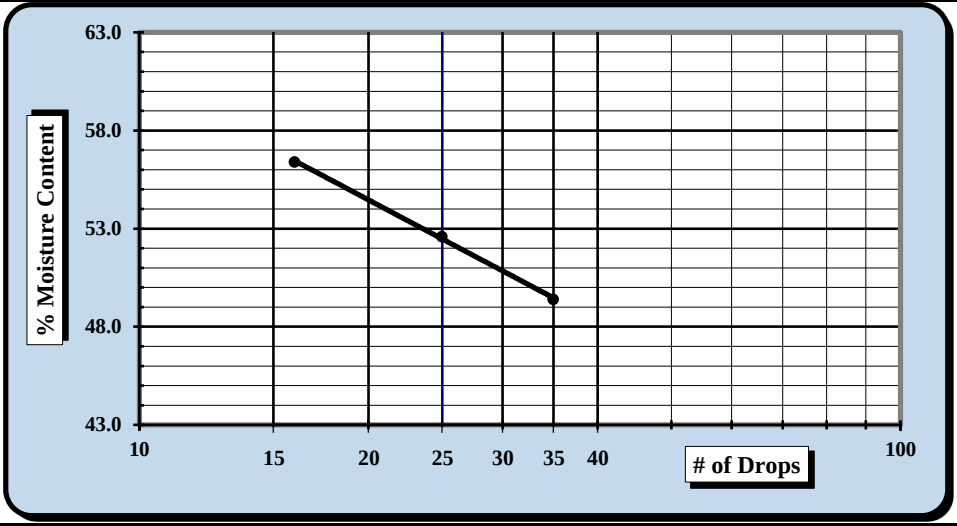
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/05/18
Project Name:	Carolina Crossroads Project	Test Date:	4/04/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	W-32	Sample #:	SS-11	Sample Date:	2/05/18
Location:	Wall Boring	Type:	Split-spoon	Depth:	38.5' - 40.0'
Sample Description:	Fat Clay with Sand (CH, A-7-6(21))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

	Pan #	Liquid Limit						Plastic Limit		
	Tare #:	26	27	28				29	30	
A	Tare Weight	27.35	27.00	26.79				27.00	27.36	
B	Wet Soil Weight + A	43.07	41.54	40.69				33.21	34.75	
C	Dry Soil Weight + A	37.87	36.53	35.68				31.81	33.10	
D	Water Weight (B-C)	5.20	5.01	5.01				1.40	1.65	
E	Dry Soil Weight (C-A)	10.52	9.53	8.89				4.81	5.74	
F	% Moisture (D/E)*100	49.4%	52.6%	56.4%				29.1%	28.7%	
N	# OF DROPS	35	25	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**28.9%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**53**
Plastic Limit	**29**
Plastic Index	**24**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/05/18	Matthew F. Cooke, P.G.	4/05/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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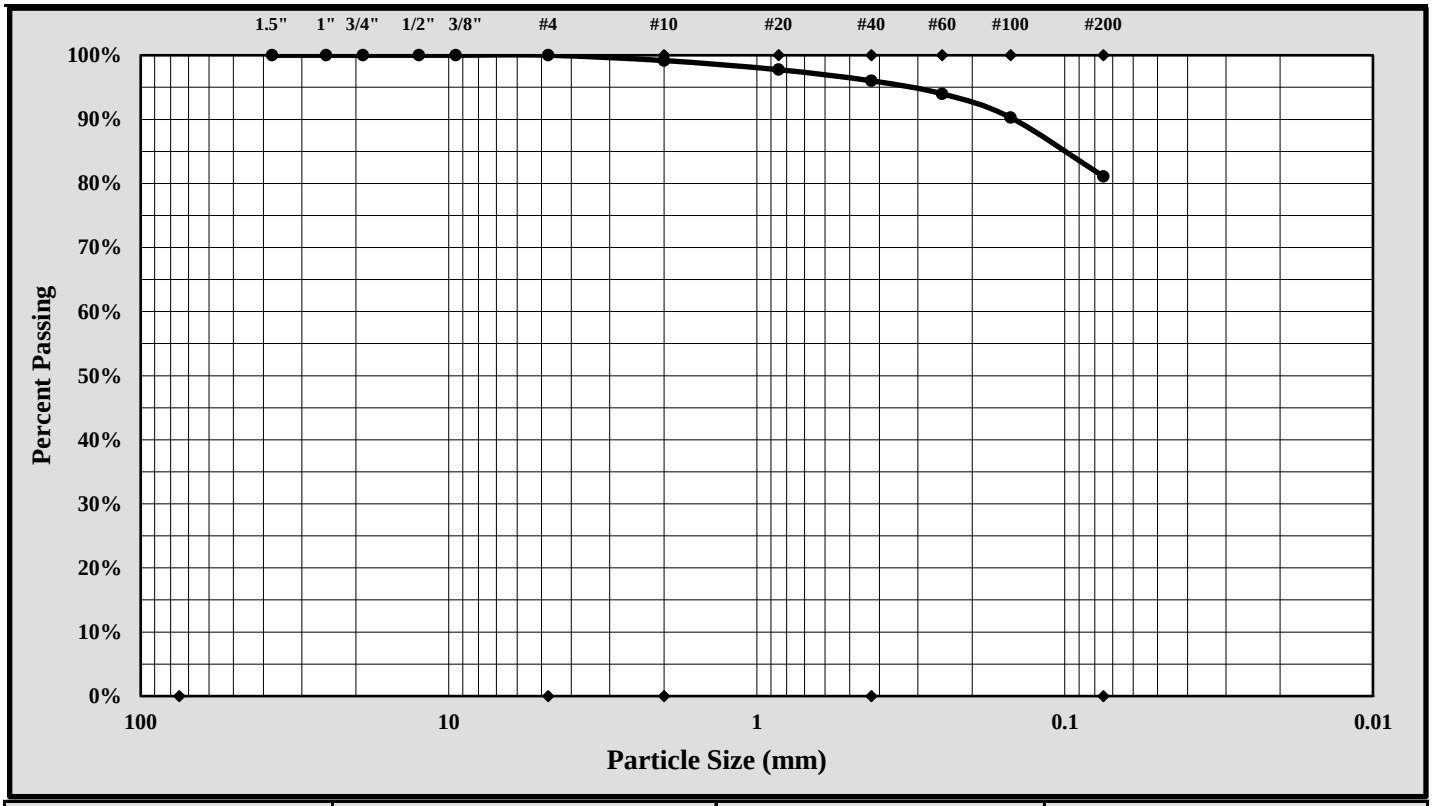
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/04/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/26 - 4/05/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	W-32	Sample #: SS-11	Sample Date: 2/05/18
Location:	Wall Boring	Type: Split-spoon	Depth: 38.5' - 40.0'
Sample Description:	Fat Clay with Sand (CH, A-7-6(21))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	2.00 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	81.1%	Total Sand:	18.9%

Liquid Limit	53	Plastic Limit	29	Plastic Index	24
Coarse Sand:	0.8%	Medium Sand:	3.2%	Fine Sand:	14.9%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/04/18 — *Date*

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Appendix IX – Laboratory Test Data Sheets – Bulk Samples

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	1/29/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	1/23-1/24/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample by:	S&ME	Sample Date(s):	1/21/2018
Sampling Method:	Bulk	Drill Rig :	CME 55

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 25711 Calibration Date: 8/30/17 Oven ID. 25722 Calibration Date: 8/18/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
P-1	BS-1	0.5 - 10.5	7	150.91	729.89	661.09	68.80	13.5%	
P-5	BS-1	0.4 - 10.4	22	150.43	712.10	653.22	58.88	11.7%	

Notes / Deviations / References

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Matthew Wolfe	NICET 123218	1/29/2018
Technician Name	*Certification Type / No.*	*Date*
Matthew F. Cooke, P.G.	Project Manager	3/8/2018
Technical Responsibility	*Position*	*Date*

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	2/14/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/06 - 2/07/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sampled by:	S&ME	Sample Date(s):	Various
Sampling Method:	Bulk	Drill Rig:	CME 55/Diedrich D-50

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 13942 Calibration Date: 8/18/17 Oven ID. 13978 Calibration Date: 10/07/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
P-10	BS-1	1.2 - 5.0	Y-11	0.00	721.7	657.9	63.8	9.7%	
P-20	BS-1	1.5 - 11.4	DM-5	0.00	794.1	625.3	168.8	27.0%	
P-30	BS-1	0.7 - 10.7	DM-20	0.00	696.6	566.5	130.1	23.0%	
P-35	BS-1	0.8 - 10.8	BJ-1	0.00	740.6	626.2	114.4	18.3%	
P-42	BS-1	0.8 - 10.8	BK-7	0.00	621.8	537.7	84.1	15.6%	
RW-37	BS-1	0.0 - 10.0	PC-3	0.00	573.7	498.4	75.3	15.1%	
RW-39	BS-1	0.0 - 10.0	T-1	0.00	534.6	466.7	67.9	14.5%	

Notes / Deviations / References

AASHTO T 265: Laboratory Determination of Moisture Content of Soils

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Benjamin Kovaleski	Benjamin J. Kovaleski	NICET Lab Level III/117226	2/14/18
Technician Name	*Signature*	*Certification Type / No.*	*Date*
Brian Vaughan, P.E.	Brian Vaughan	Group Leader	2/14/18
Technical Responsibility	*Signature*	*Position*	*Date*

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/1/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	1/30-1/31/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample by:	S&ME	Sample Date(s):	1/23/2018
Sampling Method:	Bulk	Drill Rig :	CME 55

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 25711 Calibration Date: 8/30/17 Oven ID. 25722 Calibration Date: 8/18/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
P-15	BS-1	1.0 - 11.0	5	151.13	612.15	556.69	55.46	13.7%	

Notes / Deviations / References

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Matthew Wolfe	NICET 123218	2/1/2018
Technician Name	*Certification Type / No.*	*Date*
Matthew F. Cooke, P.G.	Project Manager	3/8/2018
Technical Responsibility	*Position*	*Date*

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/1/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	1/30-1/31/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample by:	S&ME	Sample Date(s):	1/23/2018
Sampling Method:	Bulk	Drill Rig :	CME 55

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 25711 Calibration Date: 8/30/17 Oven ID. 25722 Calibration Date: 8/18/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
P-25	BS-1	0.8 - 9.8	89	152.01	649.41	571.84	77.57	18.5%	

Notes / Deviations / References

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Matthew Wolfe	NICET 123218	2/1/2018
Technician Name	*Certification Type / No.*	*Date*
Matthew F. Cooke, P.G.	Project Manager	3/8/2018
Technical Responsibility	*Position*	*Date*

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/214/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/14-2/15/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample by:	S&ME	Sample Date(s):	
Sampling Method:	Bulk	Drill Rig :	Not Provided

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 25711 Calibration Date: 8/30/17 Oven ID. 25722 Calibration Date: 8/18/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
P-41	BS-1	0.0 - 10.0	80	155.16	569.38	473.27	96.11	30.2%	

Notes / Deviations / References

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Matthew Wolfe
Technician Name

NICET 123218
Certification Type / No.

Matt Cooke, PG
Technical Responsibility

_____ *Signature*

_____ *Position*

_____ *Date*

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/9/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	1/30-2/1/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample by:	S&ME	Sample Date(s):	1/24/2018
Sampling Method:	Bulk	Drill Rig :	Diedrich D-50

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 25711 Calibration Date: 8/30/17 Oven ID. 25722 Calibration Date: 8/18/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
P-43	BS-1	0.5 - 10.5	201	151.67	821.90	711.92	109.98	19.6%	

Notes / Deviations / References

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Matthew Wolfe
Technician Name

NICET 123218
Certification Type / No.

Matthew F. Cooke, P.G.
Technical Responsibility

Project Manager
Position

3/8/2018
Date

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/09/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/27 - 3/02/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sampled by:	S&ME	Sample Date(s):	Various
Sampling Method:	Bulk	Drill Rig:	CME 55/Diedrich D-50

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 13942 Calibration Date: 8/18/17 Oven ID. 13978 Calibration Date: 10/07/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
P-44	BS-1	1.1 - 11.1	B-2	0.00	592.7	470.8	121.9	25.9%	
RW-40	BS-1	0.0 - 10.0	T-1	0.00	646.0	552.7	93.3	16.9%	

Notes / Deviations / References

AASHTO T 265: Laboratory Determination of Moisture Content of Soils

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Benjamin Kovaleski	Benjamin J. Kovaleski	NICET Lab Level III/117226	3/09/18
Technician Name	*Signature*	*Certification Type / No.*	*Date*
Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/09/18
Technical Responsibility	*Signature*	*Position*	*Date*

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/03/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/08 - 3/09/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sampled by:	S&ME	Sample Date(s):	2/15/18
Sampling Method:	Bulk	Drill Rig:	CME 55

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 13942 Calibration Date: 8/18/17 Oven ID. 13978 Calibration Date: 10/07/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
P-47	BS-1	1.4 - 11.4	P-2	0.00	687.7	589.6	98.1	16.6%	

Notes / Deviations / References

AASHTO T 265: Laboratory Determination of Moisture Content of Soils

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Benjamin Kovaleski	Benjamin J. Kovaleski	NICET Lab Level III/117226	4/03/18
Technician Name	*Signature*	*Certification Type / No.*	*Date*
Matthew F. Cooke, P.G.		Project Manager	4/03/18
Technical Responsibility		*Position*	*Date*

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/14-2/15/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample by:	S&ME	Sample Date(s):	2/7/2018
Sampling Method:	Bulk	Drill Rig :	Diedrich D-50

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 25711 Calibration Date: 8/30/17 Oven ID. 25722 Calibration Date: 8/18/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
P-50	BS-1	1.0 - 11.0	85	156.38	802.54	681.14	121.40	23.1%	

Notes / Deviations / References

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Matthew Wolfe
Technician Name

NICET 123218
Certification Type / No.

Matthew F. Cooke, P.G.
Technical Responsibility

Project Manager
Position

4/25/2018
Date

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	3/2/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/16-2/19/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample by:	S&ME	Sample Date(s):	2/7/2018
Sampling Method:	Bulk	Drill Rig :	Diedrich D-50

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 25711 Calibration Date: 8/30/17 Oven ID. 25722 Calibration Date: 8/18/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
P-53	BS-1	0.6 - 10.6	55	152.93	766.85	685.58	81.27	15.3%	

Notes / Deviations / References

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Matthew Wolfe
Technician Name

NICET 123218
Certification Type / No.

Matthew F. Cooke, P.G.
Technical Responsibility

Project Manager
Position

3/8/2018
Date

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	3/14-3/15/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample by:	S&ME	Sample Date(s):	2/21/2018
Sampling Method:	Bulk	Drill Rig :	CME 55

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 25711 Calibration Date: 8/30/17 Oven ID. 25722 Calibration Date: 8/18/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
P-56	BS-1	0.9 - 10.9	18	150.49	335.02	301.49	33.53	22%	

Notes / Deviations / References

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Matthew Wolfe
Technician Name

NICET 123218
Certification Type / No.

Matthew F. Cooke, P.G.
Technical Responsibility

Project Manager
Position

4/27/2018
Date

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	3/19/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample by:	S&ME	Sample Date(s):	2/26/2018
Sampling Method:	Bulk	Drill Rig :	CME 55

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 25711 Calibration Date: 8/30/17 Oven ID. 25722 Calibration Date: 8/18/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
P-58	BS-1	1.1 - 11.1	22	150.35	355.99	332.28	23.71	13.0%	

Notes / Deviations / References

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Matthew Wolfe
Technician Name

NICET 123218
Certification Type / No.

Matthew F. Cooke, P.G.
Technical Responsibility

Project Manager
Position

4/27/2018
Date

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	3/5/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/16-2/19/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample by:	S&ME	Sample Date(s):	2/6/2018
Sampling Method:	Bulk	Drill Rig :	Diedrich D-50

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 25711 Calibration Date: 8/30/17 Oven ID. 25722 Calibration Date: 8/18/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
P-63	BS-1	1.3 - 11.3	26	149.85	810.13	693.71	116.42	21.4%	

Notes / Deviations / References

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Matthew Wolfe
Technician Name

NICET 123218
Certification Type / No.

Matthew F. Cooke, P.G.
Technical Responsibility

Project Manager
Position

4/27/2018
Date

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/6/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	1/30-2/1/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample by:	S&ME	Sample Date(s):	1/24/2018
Sampling Method:	Bulk	Drill Rig :	CME 55

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 25711 Calibration Date: 8/30/17 Oven ID. 25722 Calibration Date: 8/18/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
P-65	BS-1	0.8 - 10.8	219	152.45	536.04	436.62	99.42	35.0%	

Notes / Deviations / References

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Matthew Wolfe
Technician Name

NICET 123218
Certification Type / No.

Matthew F. Cooke, P.G.
Technical Responsibility

Project Manager
Position

4/27/2018
Date

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/20-2/21/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample by:	S&ME	Sample Date(s):	1/31/2018
Sampling Method:	Bulk	Drill Rig :	CME 55

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 25711 Calibration Date: 8/30/17 Oven ID. 25722 Calibration Date: 8/18/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
P-67	BS-1	0.6 - 10.6	210	156.76	607.01	554.87	52.14	13.1%	

Notes / Deviations / References

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Matthew Wolfe
Technician Name

NICET 123218
Certification Type / No.

Matthew F. Cooke, P.G.
Technical Responsibility

Project Manager
Position

4/27/2018
Date

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	3/2/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/23-2/26/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample by:	S&ME	Sample Date(s):	2/1/2018
Sampling Method:	Bulk	Drill Rig :	CME 55

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 25711 Calibration Date: 8/30/17 Oven ID. 25722 Calibration Date: 8/18/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
P-70	BS-1	0.6 - 10.6	18	150.55	601.94	556.65	45.29	11.2%	

Notes / Deviations / References

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Matthew Wolfe
Technician Name

NICET 123218
Certification Type / No.

Matthew F. Cooke, P.G.
Technical Responsibility

Project Manager
Position

4/27/2018
Date

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/9/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	1/30-2/5/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sample by:	S&ME	Sample Date(s):	1/23-1/24/2018
Sampling Method:	Bulk	Drill Rig :	Diedrich D-50

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 25711 Calibration Date: 8/30/17 Oven ID. 25722 Calibration Date: 8/18/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
RW-35	BS-1	0.0 - 10.0	224	155.05	413.06	350.51	62.55	32.0%	

Notes / Deviations / References

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Matthew Wolfe
Technician Name

NICET 123218
Certification Type / No.

Matthew F. Cooke, P.G.
Technical Responsibility

Project Manager
Position

3/28/2018
Date

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/25/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/26 - 3/27/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sampled by:	S&ME	Sample Date(s):	Various
Sampling Method:	Bulk	Drill Rig:	CME 55/Diedrich D-50

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 13942 Calibration Date: 8/18/17 Oven ID. 13978 Calibration Date: 10/07/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
RW-36	BS-1	0.0 - 10.0	FB-4	0.00	544.5	442.0	102.5	23.2%	
RW-41	BS-1	0.0 - 10.0	DM-5	0.00	561.1	495.4	65.7	13.3%	

Notes / Deviations / References

AASHTO T 265: Laboratory Determination of Moisture Content of Soils

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Benjamin Kovaleski	Benjamin J. Kovaleski	NICET Lab Level III/117226	4/25/18
Technician Name	*Signature*	*Certification Type / No.*	*Date*
Matthew F. Cooke, P.G.		Project Manager	4/25/18
Technical Responsibility		*Position*	*Date*

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/03/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/24 - 4/26/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Sampled by:	S&ME	Sample Date(s):	Various
Sampling Method:	Bulk	Drill Rig:	CME 55/Diedrich D-50

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 13942 Calibration Date: 8/18/17 Oven ID. 13978 Calibration Date: 10/07/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft.		grams	grams	grams	grams	%	
RW-38	BS-1	0.0 - 10.0	BK-12	0.00	228.7	190.7	38.0	19.9%	
RW-42	BS-1	0.0 - 10.0	BK-3	0.00	212.2	192.4	19.8	10.3%	
RW-43	BS-1	0.0 - 10.0	BK-12	0.00	241.5	210.9	30.6	14.5%	

Notes / Deviations / References

AASHTO T 265: Laboratory Determination of Moisture Content of Soils

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Benjamin Kovaleski	Benjamin J. Kovaleski	NICET Lab Level III/117226	5/03/18
Technician Name	*Signature*	*Certification Type / No.*	*Date*
Matthew F. Cooke, P.G.		Project Manager	5/03/18
Technical Responsibility		*Position*	*Date*

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

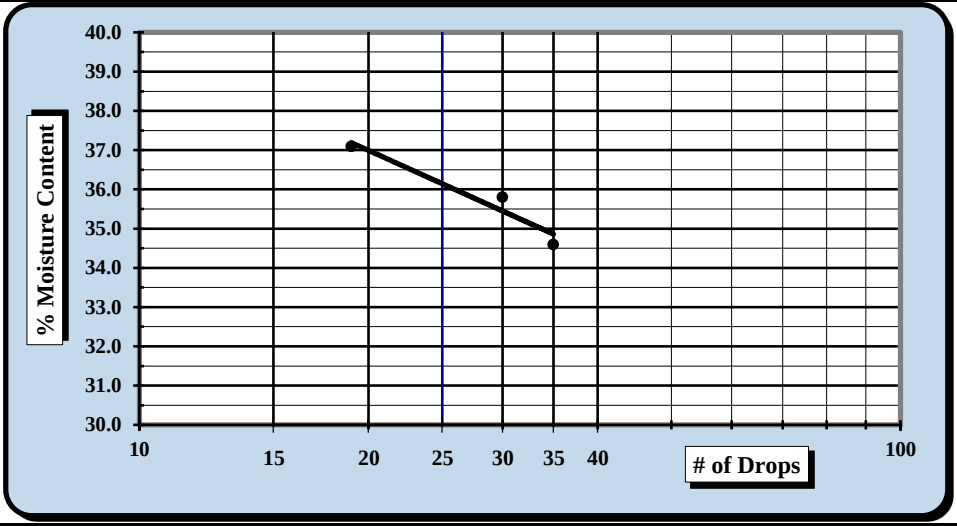
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	1/29/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	1/23-1/25/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-1	Sample #: BS-1		Sample Date: 1/21/2018	
Location:	Pavement Boring	Offset: N/A		Depth: 0.5' - 10.5'	
Sample Description:	Sandy Silt (ML, A-4(4))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28573	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

Pan # 611		Liquid Limit						Plastic Limit		
	Tare #:	146	13	39				204	37	
A	Tare Weight	20.54	20.74	20.80				20.85	20.79	
B	Wet Soil Weight + A	30.80	28.17	29.63				26.97	27.29	
C	Dry Soil Weight + A	28.16	26.21	27.24				25.67	25.92	
D	Water Weight (B-C)	2.64	1.96	2.39				1.30	1.37	
E	Dry Soil Weight (C-A)	7.62	5.47	6.44				4.82	5.13	
F	% Moisture (D/E)*100	34.6%	35.8%	37.1%				27.0%	26.7%	
N	# OF DROPS	35	30	19				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**26.9%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**36**
Plastic Limit	**27**
Plastic Index	**9**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	3/8/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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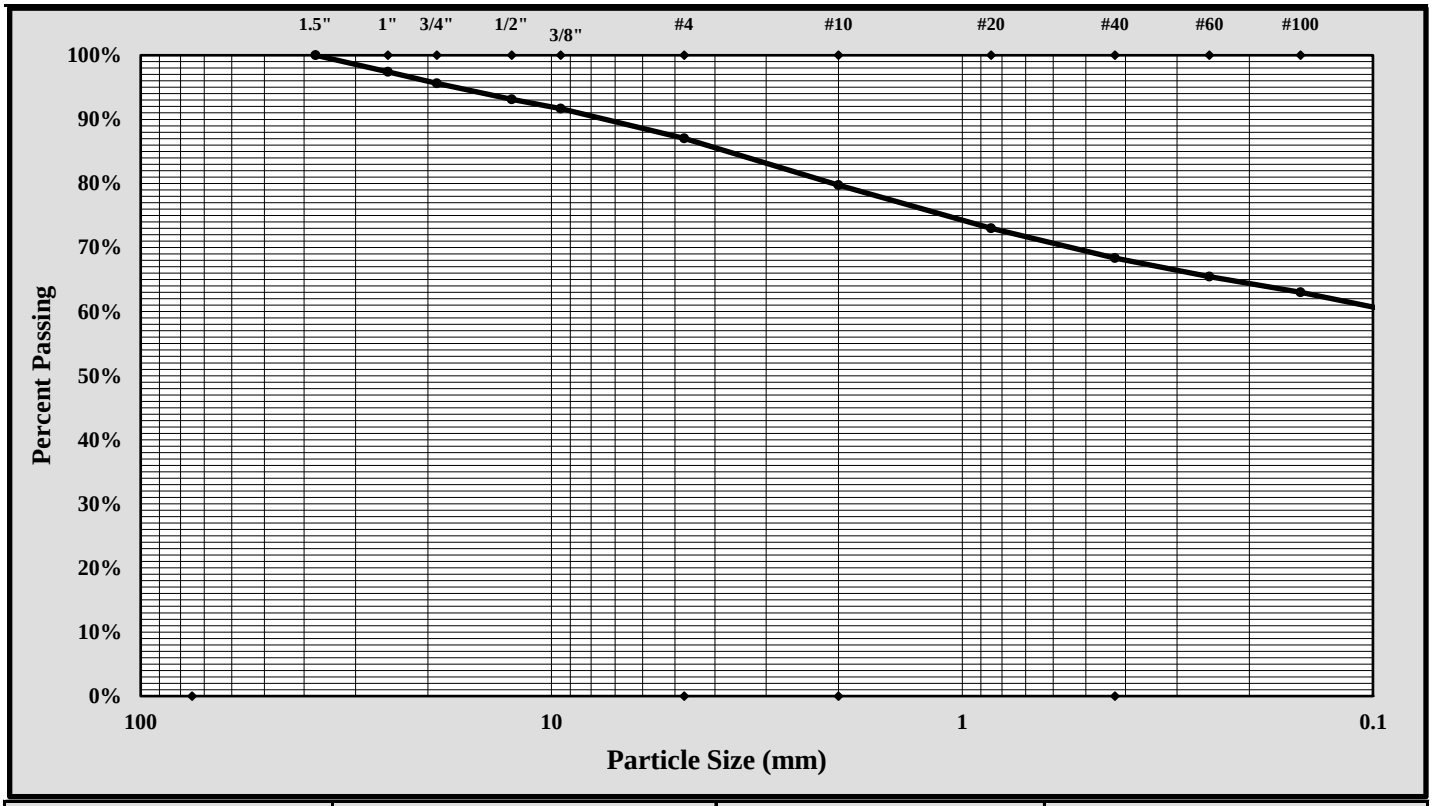
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	1/29/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	1/23-1/25/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-1 Sample #: BS-1	Sample Date:	1/21/2018
Location:	Pavement Boring Offset: N/A	Depth:	0.5' - 10.5'
Sample Description:	Sandy Silt (ML, A-4(4))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	1-inch	Gravel:	13.0%
Silt & Clay (% Passing #200):	59.1%	Total Sand:	27.9%

Liquid Limit	36	Plastic Limit	27	Plastic Index	9
Coarse Sand:	7.3%	Medium Sand:	11.4%	Fine Sand:	9.3%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/8/2018 — *Date*

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Form No. TR-D698-2
Revision No. : 1
Revision Date: 07/25/17

MOISTURE - DENSITY REPORT

Quality Assurance

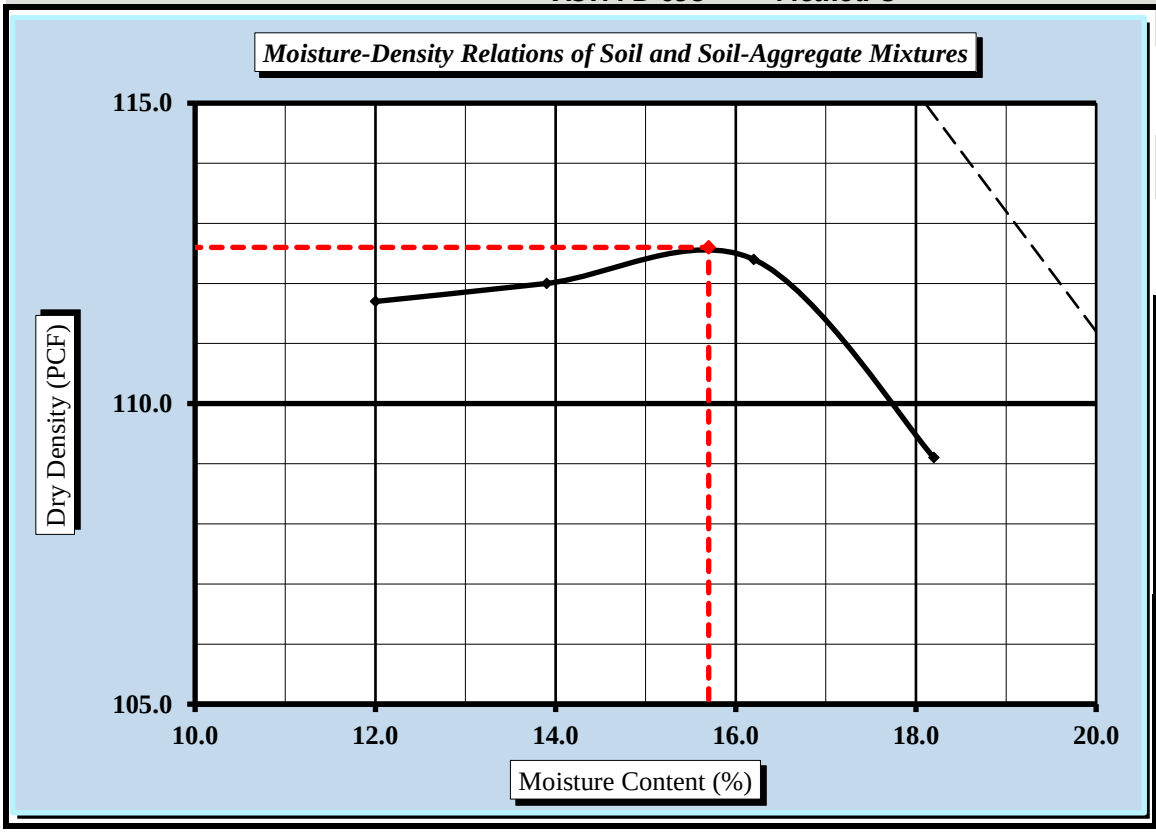
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	1/30/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	1/23-1/25/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-1	Sample #:	BS-1	Sample Date:	1/21/2018
Location:	Pavement Boring	Offset:	N/A	Depth:	0.5' - 10.5'
Sample Description:	Sandy Silt (ML, A-4(4))				

Maximum Dry Density 112.6 PCF. Optimum Moisture Content 15.7%

ASTM D 698 - - Method C



Soil Properties

Natural Moisture Content	13.5%
Specific Gravity of Soil	TNP
Liquid Limit	36
Plastic Limit	27
Plastic Index	9

% Passing	
3/4"	95.6%
3/8"	91.7%
#4	87.0%
#10	79.8%
#40	68.3%
#60	65.5%
#200	59.1%

Oversize Fraction
Bulk Gravity
% Moisture
% Oversize
MDD
Opt. MC

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☐ 3/8 inch Sieve ☐ 3/4 inch Sieve ☒

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations:

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Matthew F. Cooke, P.G.	Project Manager	3/8/2018
Technical Responsibility	*Position*	*Date*

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CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

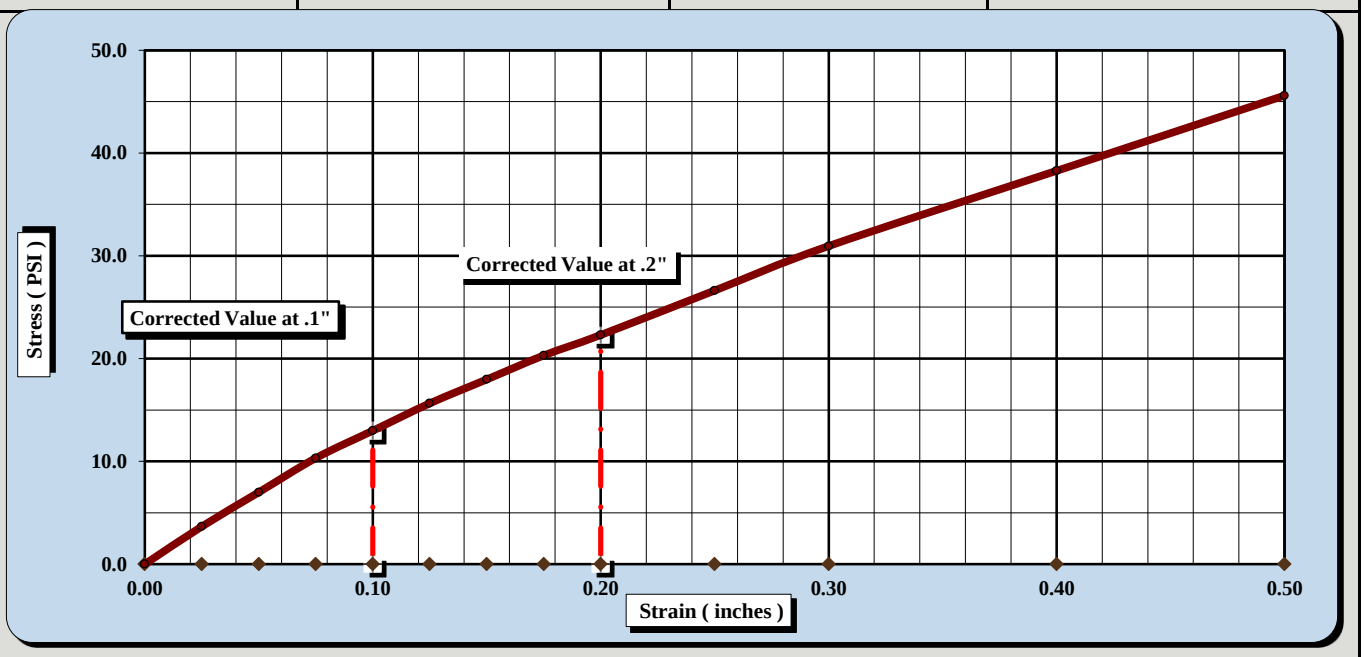
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	1/29/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	1/25-1/29/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-1	Sample #: BS-1	Sample Date: 1/21/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.5' - 10.5'
Sample Description:	Sandy Silt (ML, A-4(4))		

ASTM D 698 *Method C* Maximum Dry Density: 112.6 PCF Optimum Moisture Content: 15.7%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 4.4%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 1.3	CBR at 0.2 in. 1.5	CBR at 0.1 in. 1.3	CBR at 0.2 in. 1.5



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	15		
Initial Dry Density (PCF)	102.3	Final Dry Density (PCF)	100.8
Moisture Content of the Compacted Specimen	15.1%	Moisture Content (top 1" after soaking)	25.8%
Percent Compaction	90.8%	Percent Swell	1.4%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.8
Liquid Limit	36	Plastic Index	9	Apparent Relative Density	TNP

Notes/Deviations/References:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/8/2018 — *Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

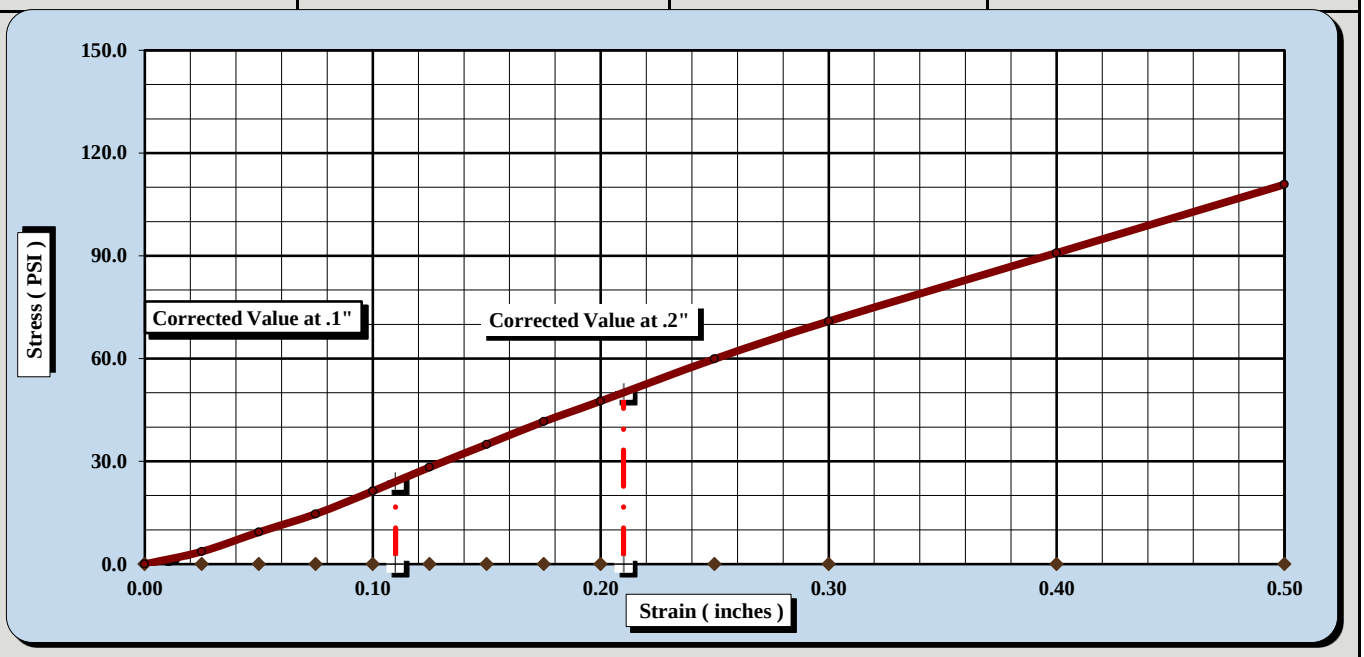
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	1/29/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	1/25-1/29/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-1	Sample #: BS-1	Sample Date: 1/21/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.5' - 10.5'
Sample Description:	Sandy Silt (ML, A-4(4))		

ASTM D 698 *Method C* Maximum Dry Density: 112.6 PCF Optimum Moisture Content: 15.7%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 4.4%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 2.1	CBR at 0.2 in. 3.2	CBR at 0.1 in. 2.4	CBR at 0.2 in. 3.4



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	35		
Initial Dry Density (PCF)	109.2	Final Dry Density (PCF)	106.3
Moisture Content of the Compacted Specimen	16.1%	Moisture Content (top 1" after soaking)	24.2%
Percent Compaction	97.0%	Percent Swell	2.7%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	36	Plastic Index	9	Apparent Relative Density	TNP

Notes/Deviations/References:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/8/2018 — *Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

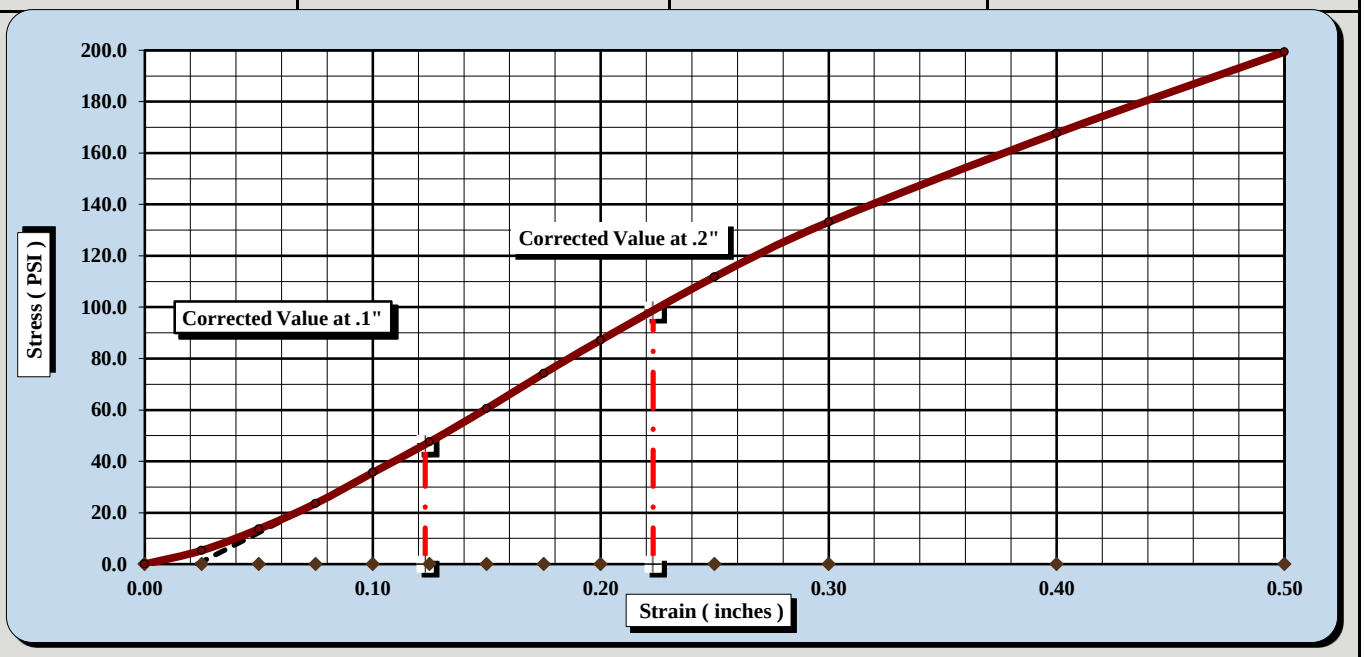
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	1/29/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	1/25-1/29/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-1	Sample #: BS-1	Sample Date: 1/21/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.5' - 10.5'
Sample Description:	Sandy Silt (ML, A-4(4))		

ASTM D 698 *Method C* Maximum Dry Density: 112.6 PCF Optimum Moisture Content: 15.7%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 4.4%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 3.6	CBR at 0.2 in. 5.8	CBR at 0.1 in. 4.7	CBR at 0.2 in. 6.6



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	65		
Initial Dry Density (PCF)	112.3	Final Dry Density (PCF)	109.5
Moisture Content of the Compacted Specimen	15.9%	Moisture Content (top 1" after soaking)	22.6%
Percent Compaction	99.8%	Percent Swell	2.6%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	36	Plastic Index	9	Apparent Relative Density	TNP

Notes/Deviations/References:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/8/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

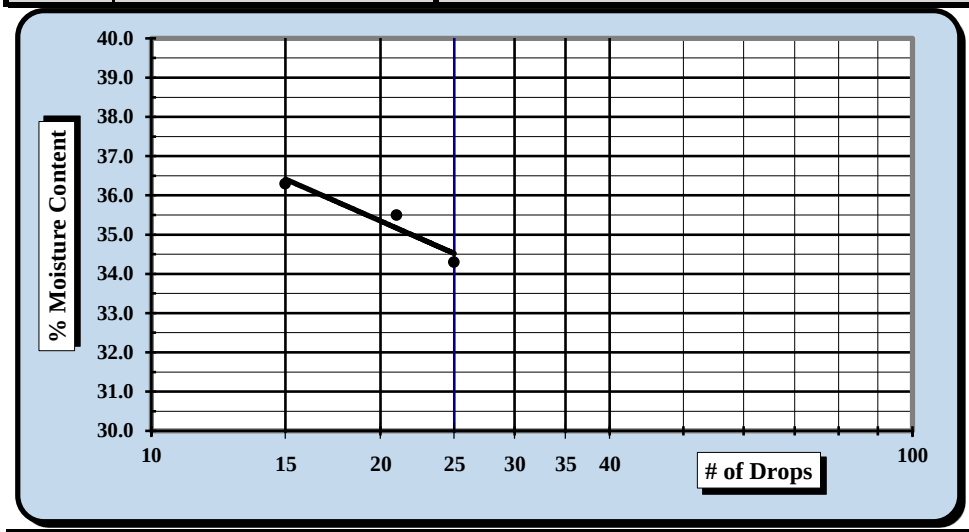
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	1/29/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	1/23-1/25/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-5	Sample #: BS-1	Sample Date: 1/21/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.4' - 10.4'
Sample Description:	Silty Sand (SM, A-4(2))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28573	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

	Pan # 600	Liquid Limit						Plastic Limit		
	Tare #:	195	201	226				17	240	
A	Tare Weight	20.52	20.85	20.92				20.61	20.78	
B	Wet Soil Weight + A	29.53	30.44	30.04				27.03	27.36	
C	Dry Soil Weight + A	27.23	27.93	27.61				25.77	26.05	
D	Water Weight (B-C)	2.30	2.51	2.43				1.26	1.31	
E	Dry Soil Weight (C-A)	6.71	7.08	6.69				5.16	5.27	
F	% Moisture (D/E)*100	34.3%	35.5%	36.3%				24.4%	24.9%	
N	# OF DROPS	25	21	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**24.7%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**35**
Plastic Limit	**25**
Plastic Index	**10**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	3/8/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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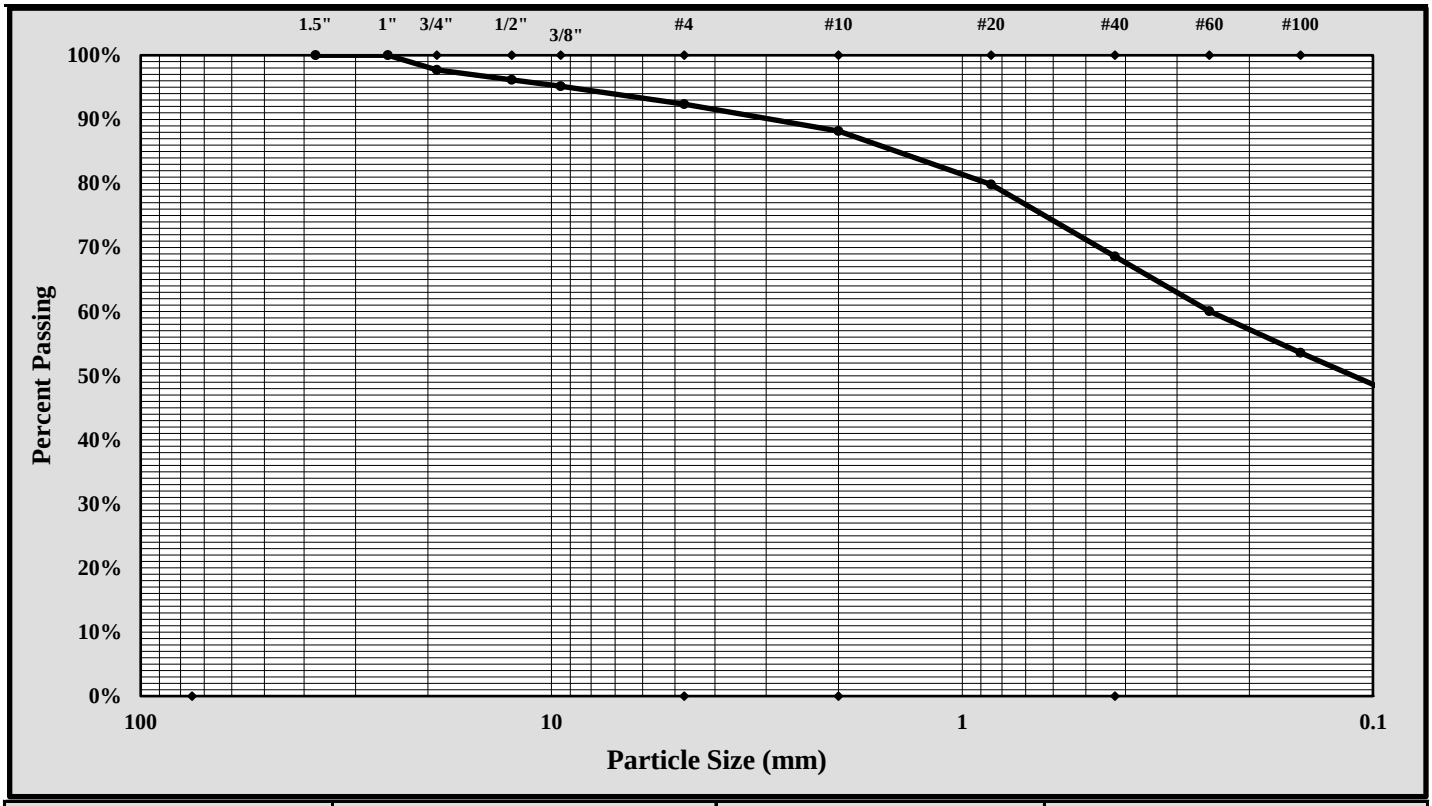
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	1/29/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	1/23-1/25/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-5 Sample #: BS-1	Sample Date:	1/21/2018
Location:	Pavement Boring Offset: N/A	Depth:	0.4' - 10.4'
Sample Description:	Silty Sand (SM, A-4(2))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	3/4-inch	Gravel:	7.6%
Silt & Clay (% Passing #200):	45.1%	Total Sand:	47.2%

Liquid Limit	35	Plastic Limit	25	Plastic Index	10
Coarse Sand:	4.2%	Medium Sand:	19.6%	Fine Sand:	23.5%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/8/2018 — *Date*

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Form No. TR-D698-2
Revision No. : 1
Revision Date: 07/25/17

MOISTURE - DENSITY REPORT

Quality Assurance

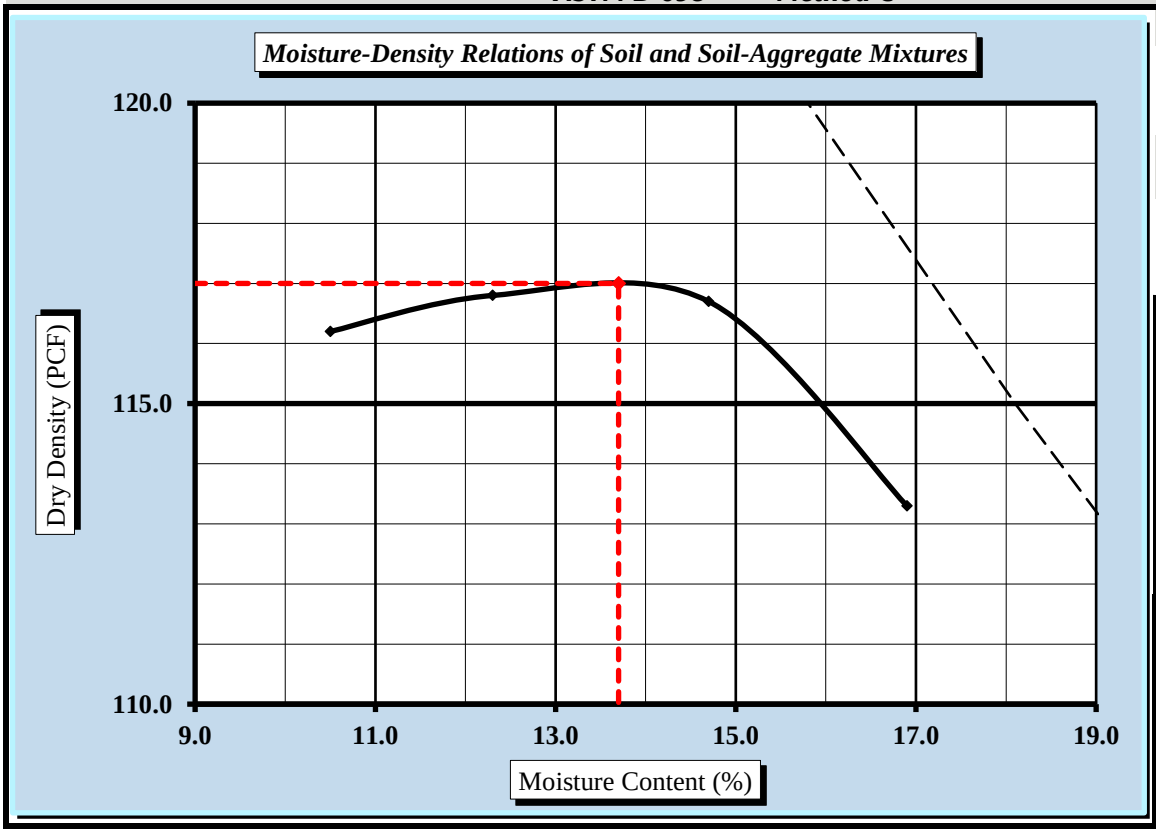
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	1/30/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	1/23-1/25/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-5	Sample #:	BS-1	Sample Date:	1/21/2018
Location:	Pavement Boring	Offset:	N/A	Depth:	0.4' - 10.4'
Sample Description:	Silty Sand (SM, A-4(2))				

Maximum Dry Density 117.0 PCF. Optimum Moisture Content 13.7%

ASTM D 698 - - Method C



Soil Properties

Natural Moisture Content	11.7%
Specific Gravity of Soil	TNP
Liquid Limit	35
Plastic Limit	25
Plastic Index	10

% Passing	
3/4"	97.7%
3/8"	95.2%
#4	92.4%
#10	88.2%
#40	68.6%
#60	60.1%
#200	45.1%

Oversize Fraction
Bulk Gravity
% Moisture
% Oversize
MDD
Opt. MC

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☐ 3/8 inch Sieve ☐ 3/4 inch Sieve ☒

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations:

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Matthew F. Cooke, P.G.	Project Manager	3/8/2018
Technical Responsibility	*Position*	*Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

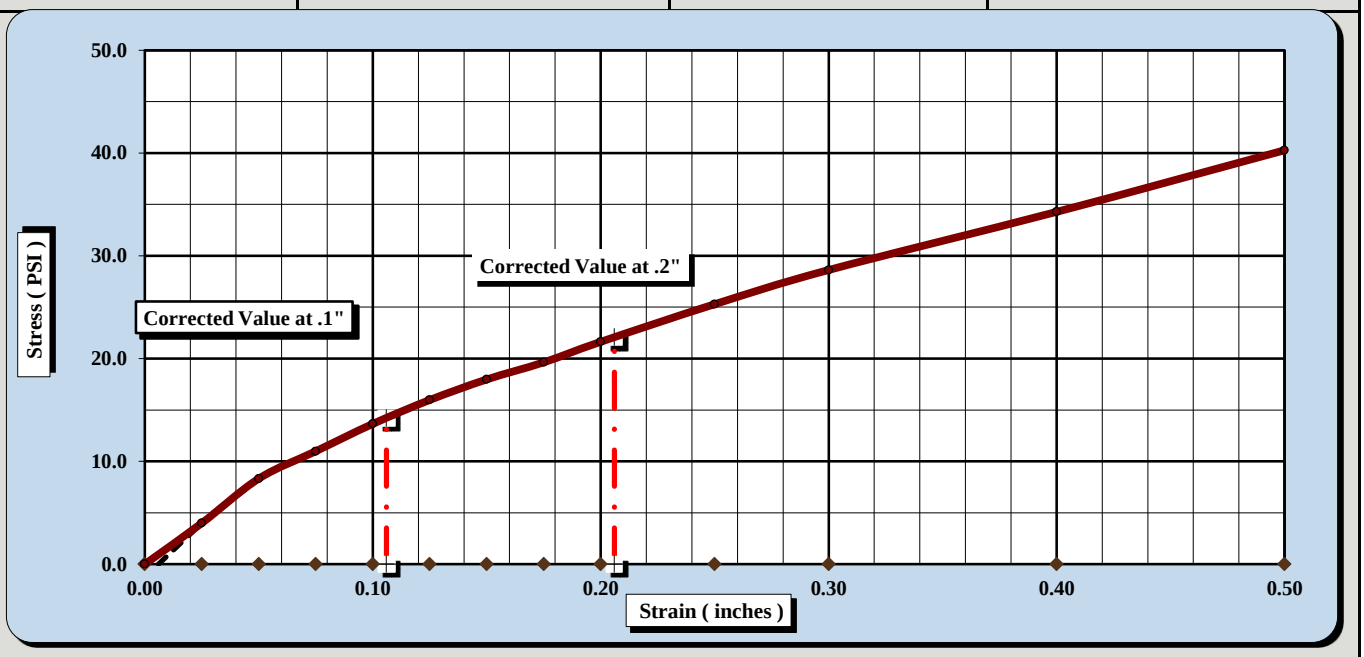
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	1/29/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	1/25-1/29/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-5	Sample #: BS-1	Sample Date: 1/21/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.4' - 10.4'
Sample Description:	Silty Sand (SM, A-4(2))		

ASTM D 698 *Method C* Maximum Dry Density: 117.0 PCF Optimum Moisture Content: 13.7%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 2.3%

Uncorrected CBR Values				Corrected CBR Values			
CBR at 0.1 in.	1.4	CBR at 0.2 in.	1.4	CBR at 0.1 in.	1.4	CBR at 0.2 in.	1.5



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	15		
Initial Dry Density (PCF)	108.1	Final Dry Density (PCF)	106.1
Moisture Content of the Compacted Specimen	14.2%	Moisture Content (top 1" after soaking)	23.1%
Percent Compaction	92.4%	Percent Swell	1.9%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	35	Plastic Index	10	Apparent Relative Density	TNP

Notes/Deviations/References:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/8/2018 — *Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

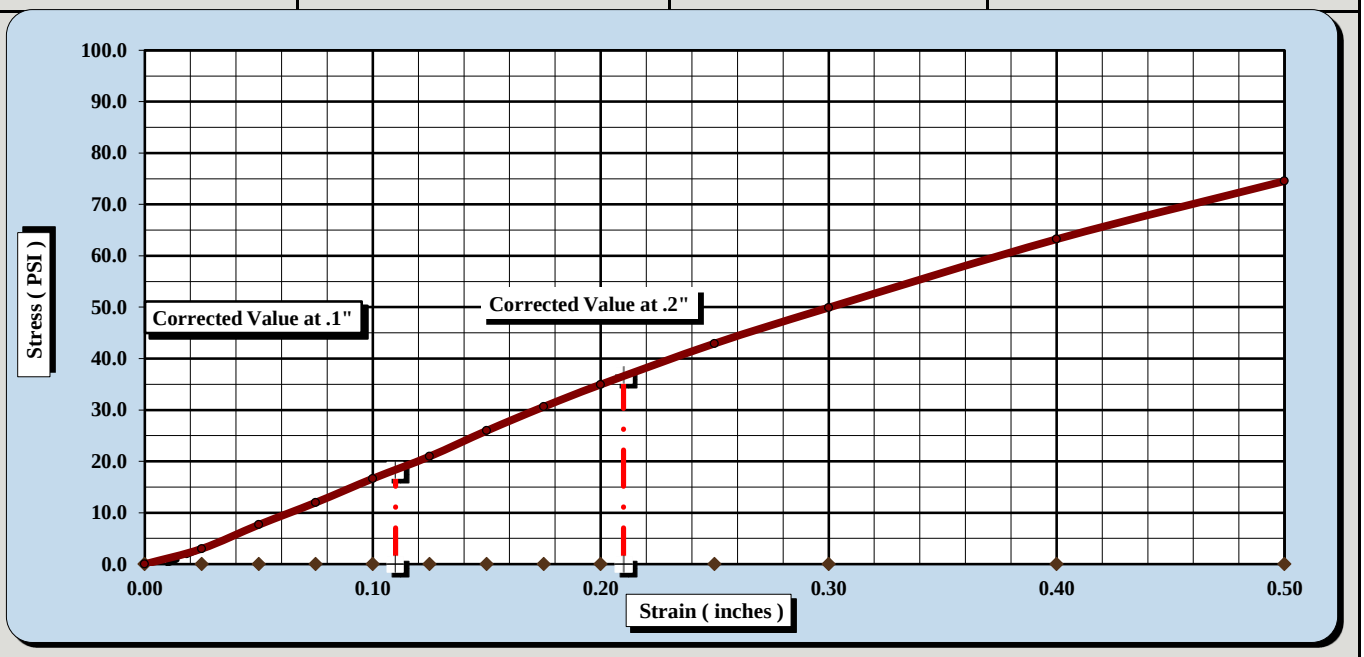
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	1/29/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	1/25-1/29/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-5	Sample #: BS-1	Sample Date: 1/21/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.4' - 10.4'
Sample Description:	Silty Sand (SM, A-4(2))		

ASTM D 698 *Method C* Maximum Dry Density: 117.0 PCF Optimum Moisture Content: 13.7%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 2.3%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 1.7	CBR at 0.2 in. 2.3	CBR at 0.1 in. 1.8	CBR at 0.2 in. 2.5



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	30		
Initial Dry Density (PCF)	111.7	Final Dry Density (PCF)	108.4
Moisture Content of the Compacted Specimen	14.2%	Moisture Content (top 1" after soaking)	23.3%
Percent Compaction	95.5%	Percent Swell	3.0%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	35	Plastic Index	10	Apparent Relative Density	TNP

Notes/Deviations/References:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/8/2018 — *Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

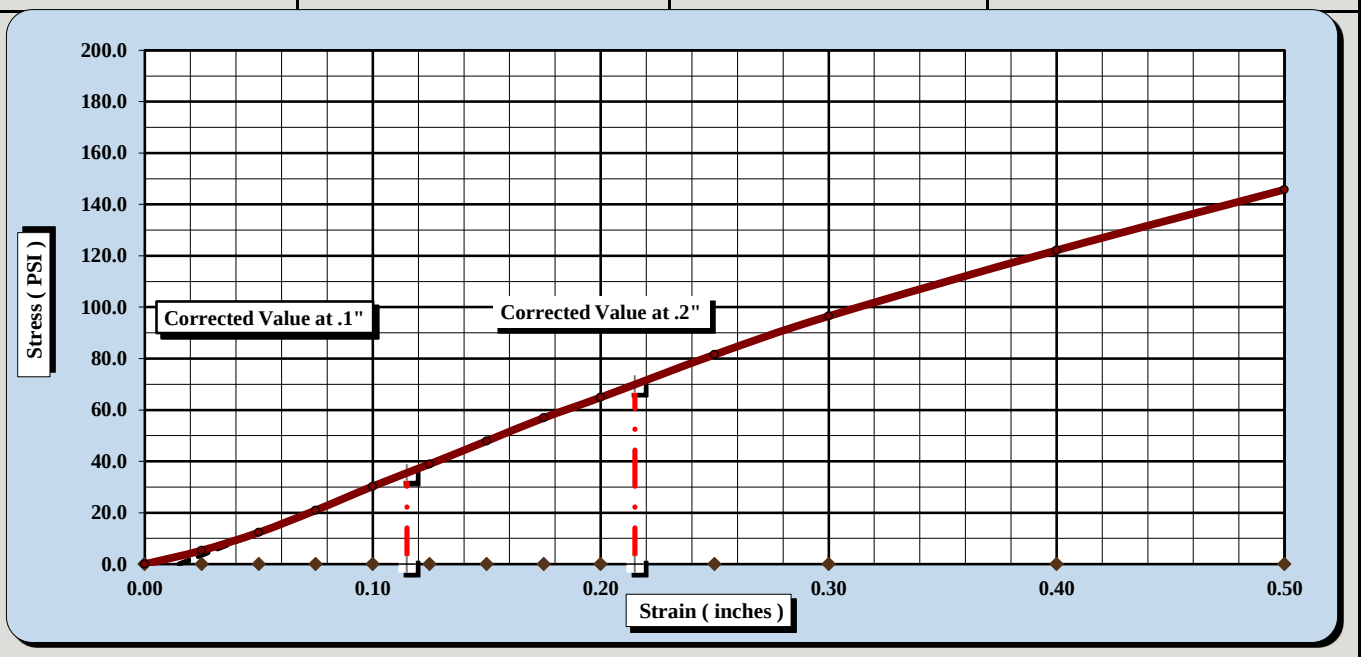
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	1/29/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	1/25-1/29/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-5	Sample #: BS-1	Sample Date: 1/21/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.4' - 10.4'
Sample Description:	Silty Sand (SM, A-4(2))		

ASTM D 698 *Method C* Maximum Dry Density: 117.0 PCF Optimum Moisture Content: 13.7%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 2.3%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 3.0	CBR at 0.2 in. 4.3	CBR at 0.1 in. 3.6	CBR at 0.2 in. 4.7



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	65		
Initial Dry Density (PCF)	116.9	Final Dry Density (PCF)	114.0
Moisture Content of the Compacted Specimen	14.4%	Moisture Content (top 1" after soaking)	21.8%
Percent Compaction	99.9%	Percent Swell	2.6%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	35	Plastic Index	10	Apparent Relative Density	TNP

Notes/Deviations/References:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/8/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

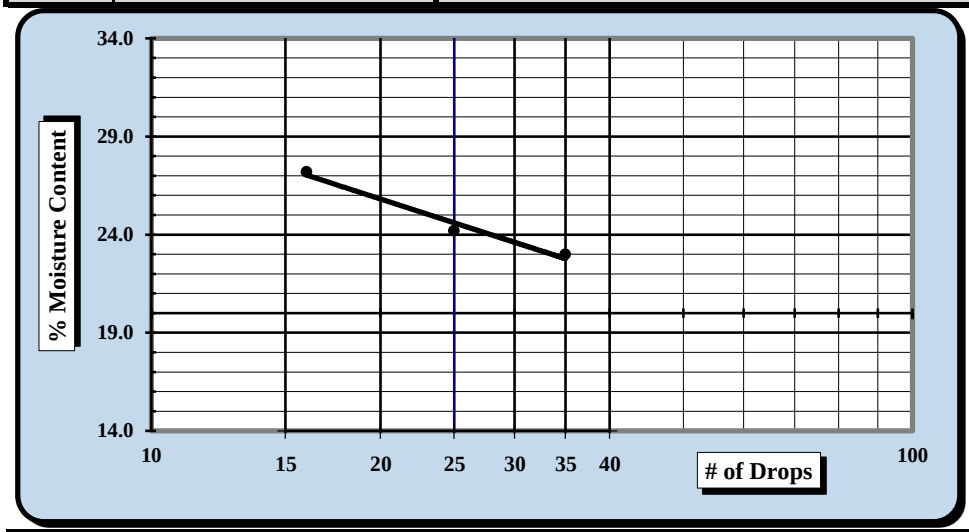
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	2/15/18
Project Name:	Carolina Crossroads Project	Test Date:	2/14/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-10	Sample #:	BS-1	Sample Date:	1/31/2018
Location:	Pavement Boring	Type:	Bulk	Depth:	1.2' - 5.0'
Sample Description:	Clayey Sand (SC, A-2-4)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	1	2	3				4	5	
A	Tare Weight	26.70	26.46	26.35				25.95	26.97	
B	Wet Soil Weight + A	49.50	46.98	43.81				34.90	36.50	
C	Dry Soil Weight + A	45.24	42.98	40.08				33.69	35.20	
D	Water Weight (B-C)	4.26	4.00	3.73				1.21	1.30	
E	Dry Soil Weight (C-A)	18.54	16.52	13.73				7.74	8.23	
F	% Moisture (D/E)*100	23.0%	24.2%	27.2%				15.6%	15.8%	
N	# OF DROPS	35	25	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**15.7%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**24**
Plastic Limit	**16**
Plastic Index	**8**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 29.9%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski — *Technician Name*
2/15/18 — *Date*
Brian Vaughn — *Technical Responsibility*
2/15/18 — *Date*

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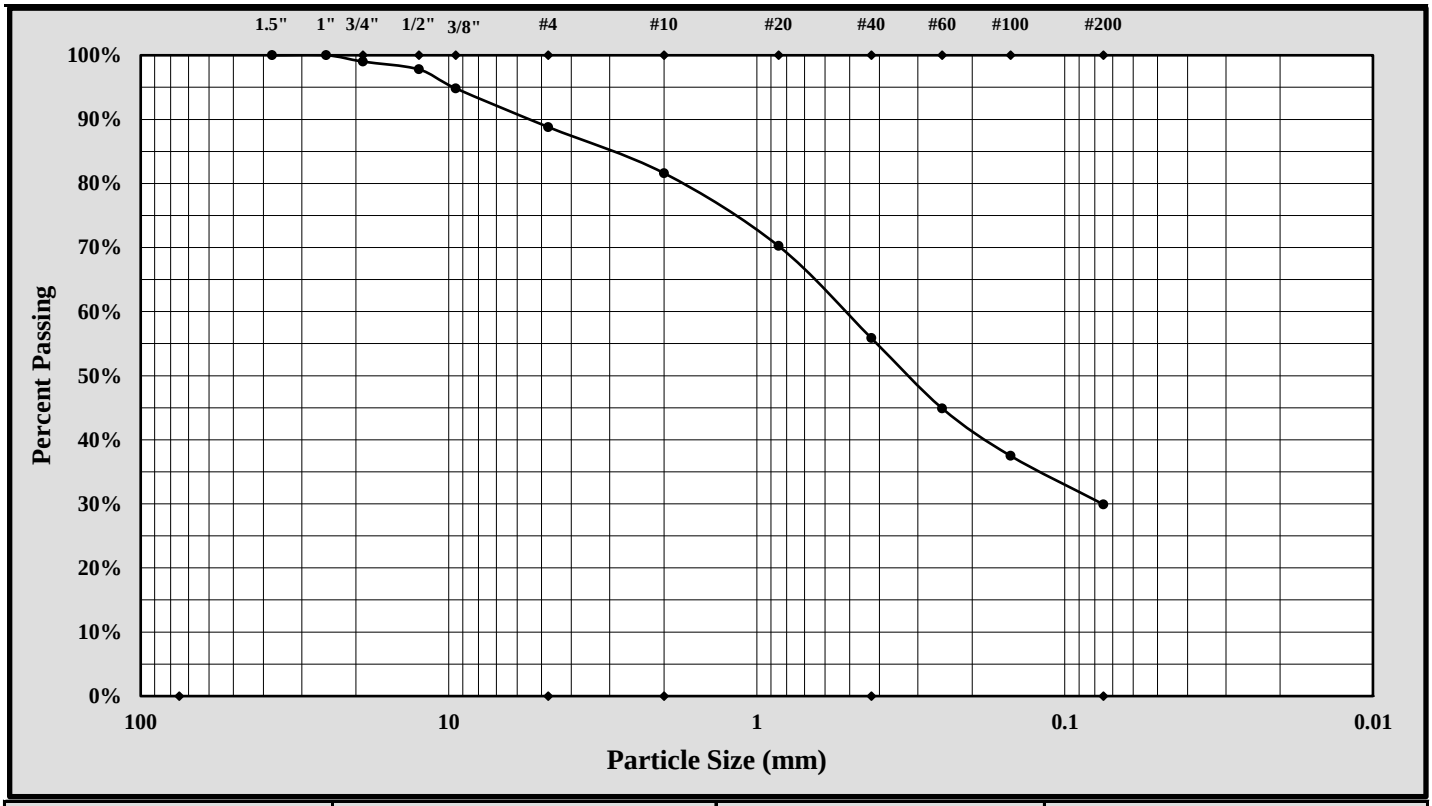
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	2/15/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/13 - 2/15/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-10	Sample #: BS-1	Sample Date: Various
Location:	Pavement Boring	Type: Bulk	Depth: 1.2' - 5.0'
Sample Description:	Clayey Sand (SC, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	19.00 mm	Gravel:	11.2%
Silt & Clay (% Passing #200):	29.9%	Total Sand:	58.9%

Liquid Limit	24	Plastic Limit	16	Plastic Index	8
Coarse Sand:	7.2%	Medium Sand:	25.7%	Fine Sand:	25.9%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	2/15/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D698-2
Revision No. : 1
Revision Date: 07/25/17

MOISTURE - DENSITY REPORT

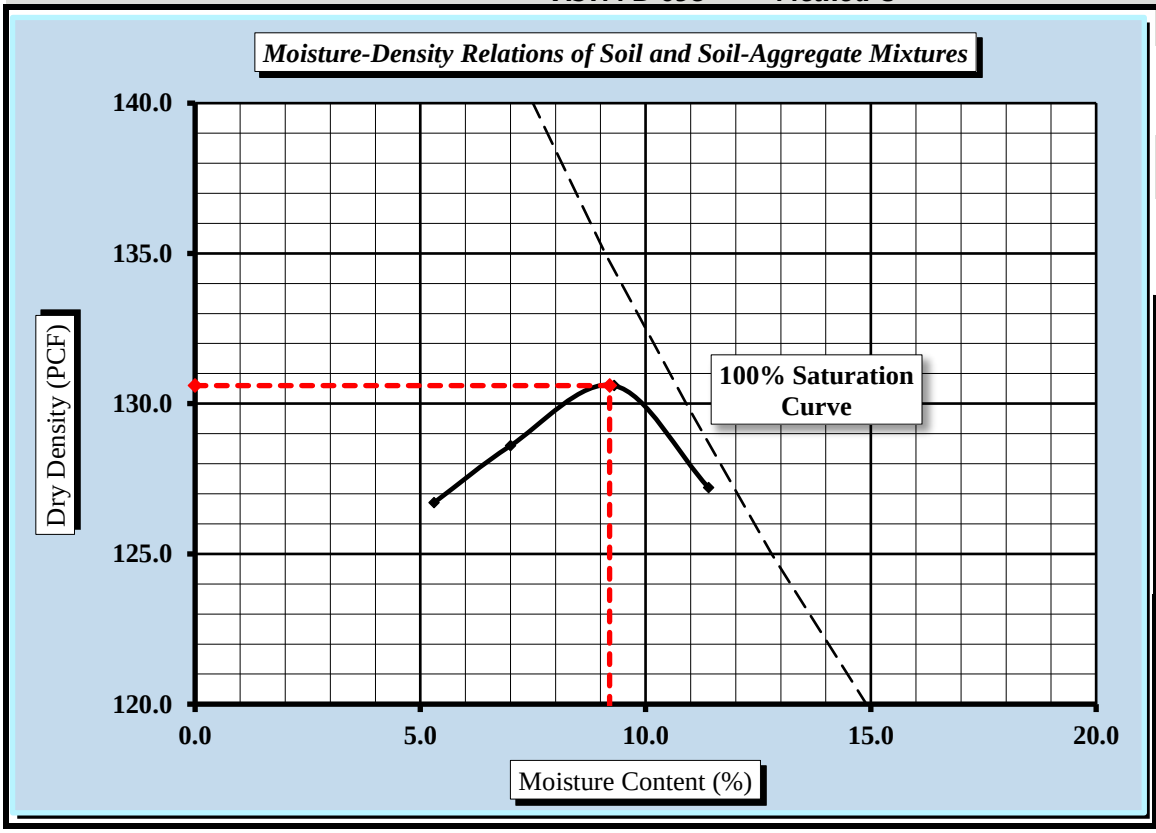
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	2/15/18
Project Name:	Carolina Crossroads Project	Test Date:	2/08/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-10	Sample #:	BS-1	Sample Date:	1/31/18
Location:	Pavement Boring	Type:	Bulk	Depth:	1.2' - 5.0'
Sample Description:	Clayey Sand (SC, A-2-4)				

Maximum Dry Density 130.6 PCF. Optimum Moisture Content 9.2%

ASTM D 698 - - Method C



Soil Properties	
Natural Moisture Content	9.7%
Specific Gravity of Soil	2.700
Liquid Limit	24
Plastic Limit	16
Plastic Index	8

% Passing	
3/4"	99.0%
3/8"	94.8%
#4	88.8%
#10	81.6%
#40	55.9%
#60	44.9%
#100	37.5%
#200	29.9%

Oversize Fraction
Bulk Gravity
% Moisture
% Oversize
MDD
Opt. MC

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☐ 3/8 inch Sieve ☐ 3/4 inch Sieve ☒

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations:

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Brian Vaughan, P.E.		Group Leader	2/15/18
Technical Responsibility	*Signature*	*Position*	*Date*

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CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	2/15/18
Project Name:	Carolina Crossroads Project	Test Date(s)	2/09 - 2/13/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

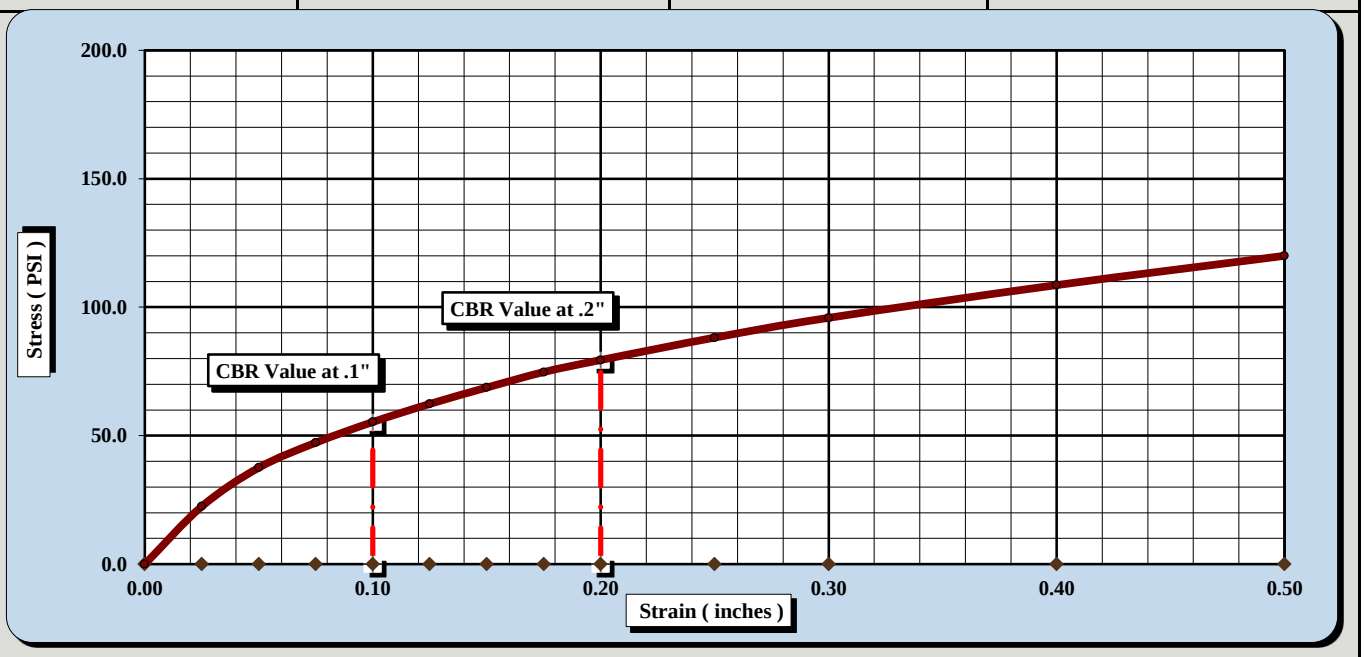
Boring #:	P-10	Sample #:	BS-1	Sample Date:	1/31/2018
Location:	Pavement Boring	Type:	Bulk	Depth:	1.2' - 5.0'

Sample Description: Clayey Sand (SC, A-2-4)

ASTM D 698 *Method C* Maximum Dry Density: 130.6 PCF Optimum Moisture Content: 9.2%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 1.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 5.5	CBR at 0.2 in. 5.3	CBR at 0.1 in. 5.5	CBR at 0.2 in. 5.3



CBR Sample Preparation:

The entire gradation was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	10		
Initial Dry Density (PCF)	117.5	Final Dry Density (PCF)	117.2
Moisture Content of the Compacted Specimen	9.2%	Moisture Content (top 1" after soaking)	14.4%
Percent Compaction	90.0%	Percent Swell	0.3%

Soak Time:	96 hrs.	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	24	Plastic Index	8	% Passing the #200 Sieve	29.9%

Notes/Deviations/References:

Brian Vaughan, P.E.		Group Leader	2/15/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	2/15/18
Project Name:	Carolina Crossroads Project	Test Date(s)	2/09 - 2/13/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

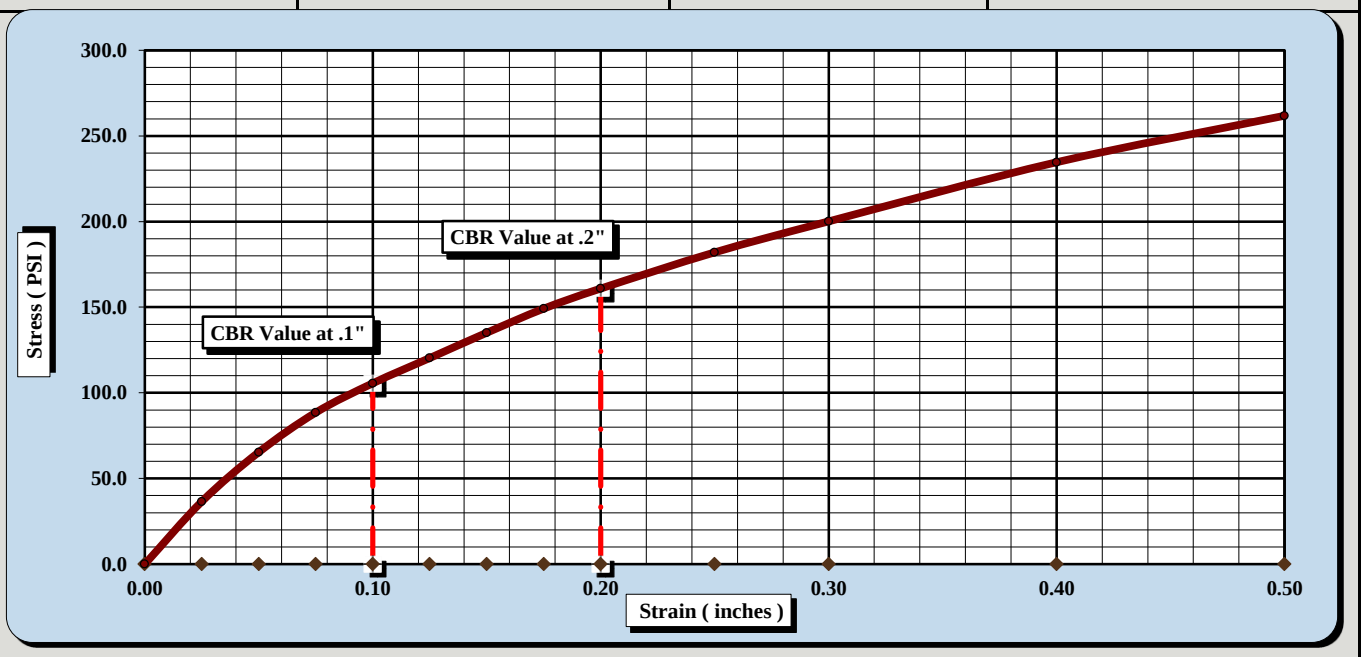
Boring #:	P-10	Sample #:	BS-1	Sample Date:	1/31/2018
Location:	Pavement Boring	Type:	Bulk	Depth:	1.2' - 5.0'

Sample Description: Clayey Sand (SC, A-2-4)

ASTM D 698 *Method C* Maximum Dry Density: 130.6 PCF Optimum Moisture Content: 9.2%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 1.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 10.6	CBR at 0.2 in. 10.7	CBR at 0.1 in. 10.6	CBR at 0.2 in. 10.7



CBR Sample Preparation:

The entire gradation was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	20		
Initial Dry Density (PCF)	124.1	Final Dry Density (PCF)	123.8
Moisture Content of the Compacted Specimen	9.2%	Moisture Content (top 1" after soaking)	12.5%
Percent Compaction	95.0%	Percent Swell	0.2%

Soak Time:	96 hrs.	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	24	Plastic Index	8	% Passing the #200 Sieve	29.9%

Notes/Deviations/References:

Brian Vaughan, P.E. — *Technical Responsibility*
Brian Vaughan — *Signature*
Group Leader — *Position*
2/15/18 — *Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	2/15/18
Project Name:	Carolina Crossroads Project	Test Date(s)	2/09 - 2/13/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

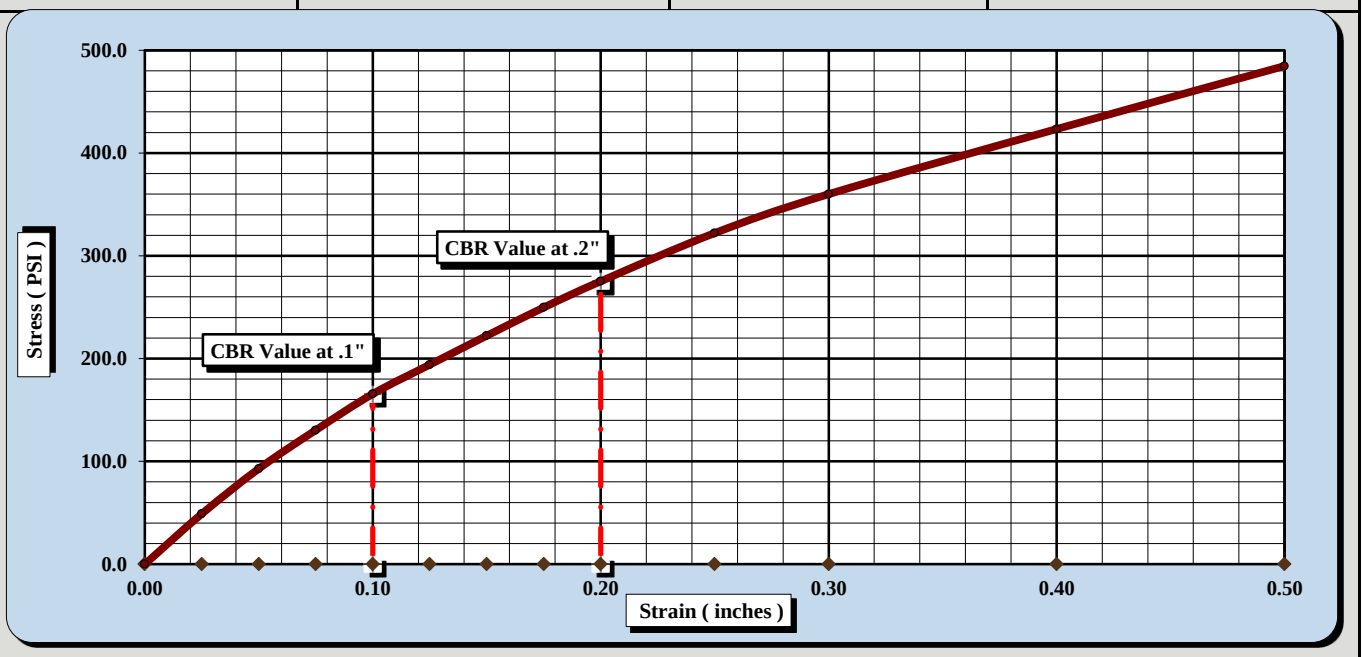
Boring #:	P-10	Sample #:	BS-1	Sample Date:	1/31/2018
Location:	Pavement Boring	Type:	Bulk	Depth:	1.2' - 5.0'

Sample Description: Clayey Sand (SC, A-2-4)

ASTM D 698 *Method C* Maximum Dry Density: 130.6 PCF Optimum Moisture Content: 9.2%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 1.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 16.6	CBR at 0.2 in. 18.3	CBR at 0.1 in. 16.6	CBR at 0.2 in. 18.3



CBR Sample Preparation:

The entire gradation was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	56		
Initial Dry Density (PCF)	130.6	Final Dry Density (PCF)	130.4
Moisture Content of the Compacted Specimen	9.2%	Moisture Content (top 1" after soaking)	11.5%
Percent Compaction	100.0%	Percent Swell	0.2%

Soak Time:	96 hrs.	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	24	Plastic Index	8	% Passing the #200 Sieve	29.9%

Notes/Deviations/References:

Brian Vaughan, P.E. — *Technical Responsibility*
Brian Vaughan — *Signature*
Group Leader — *Position*
2/15/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

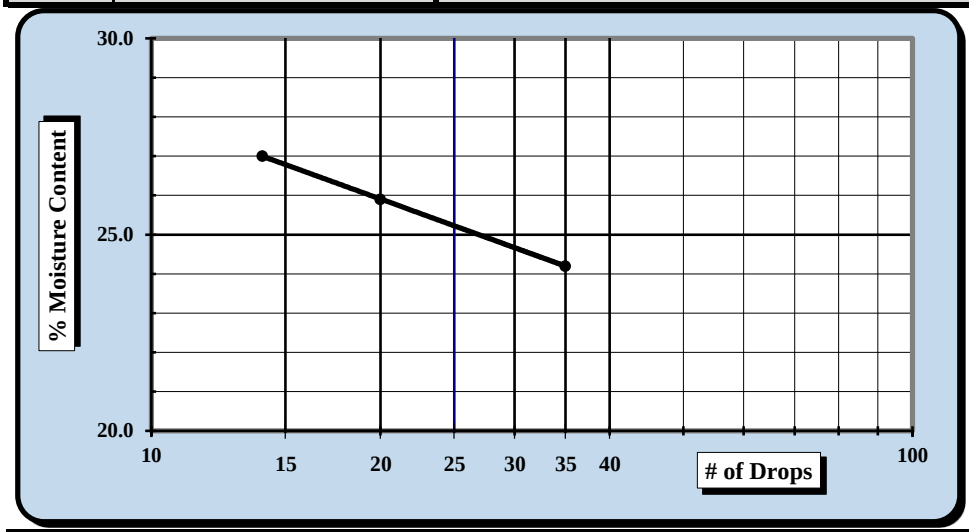
ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/6/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	1/30-2/5/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-15	Sample #: BS-1	Sample Date: 1/23/2018
Location:	Pavement Boring	Offset: N/A	Depth: 1.0' - 11.0'
Sample Description:	Clayey Sand (SC, A-2-4)		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28573	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

	Pan # 610	Liquid Limit						Plastic Limit		
	Tare #:	226	195	245				204	44	
A	Tare Weight	20.92	20.53	20.76				20.85	20.74	
B	Wet Soil Weight + A	32.30	32.16	31.30				29.81	27.48	
C	Dry Soil Weight + A	30.08	29.77	29.06				28.46	26.48	
D	Water Weight (B-C)	2.22	2.39	2.24				1.35	1.00	
E	Dry Soil Weight (C-A)	9.16	9.24	8.30				7.61	5.74	
F	% Moisture (D/E)*100	24.2%	25.9%	27.0%				17.7%	17.4%	
N	# OF DROPS	35	20	14				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**17.6%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**25**
Plastic Limit	**18**
Plastic Index	**7**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	3/8/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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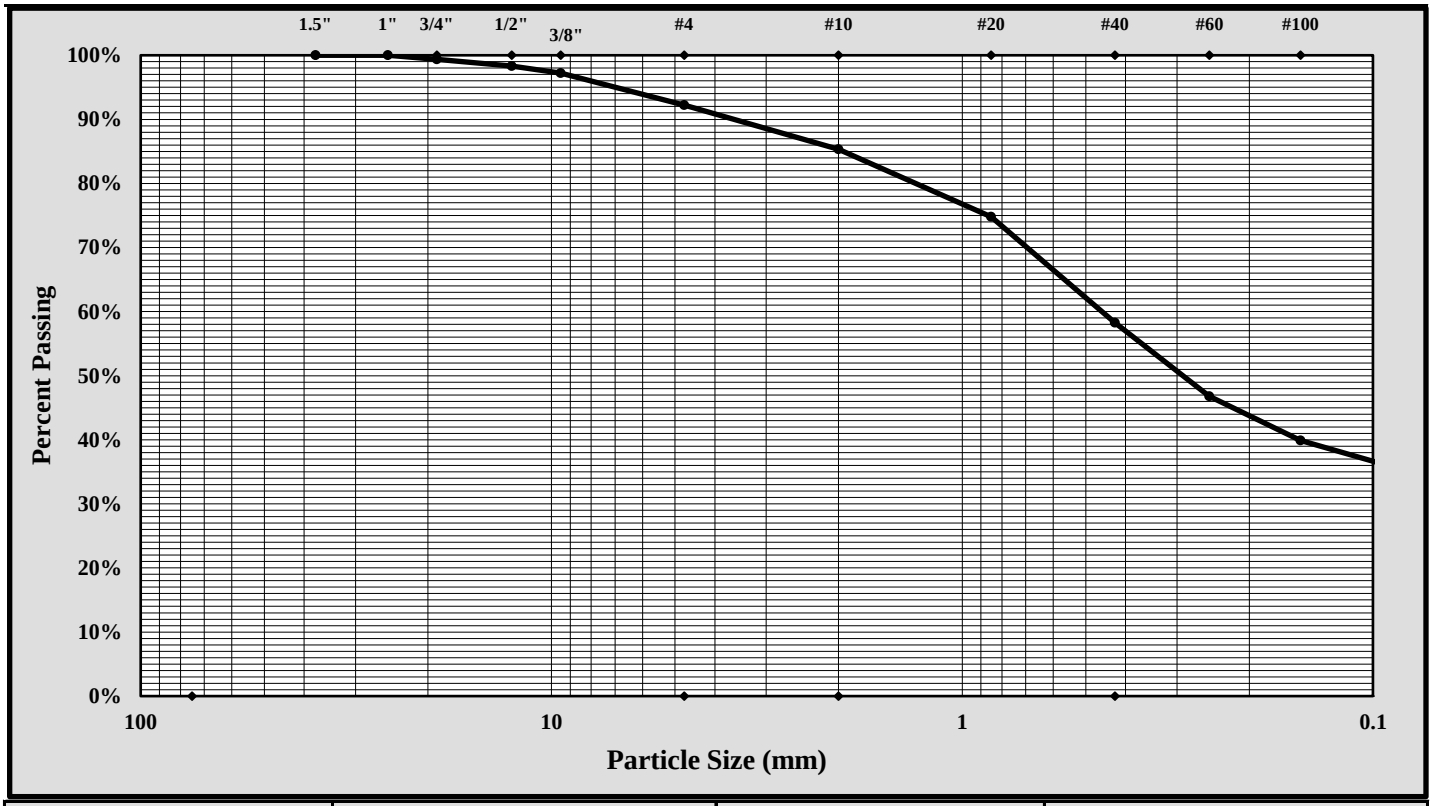
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/6/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	1/30-2/2/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-15 Sample #: BS-1	Sample Date:	1/23/2018
Location:	Pavement Boring Offset: N/A	Depth:	1.0' - 11.0'
Sample Description:	Clayey Sand (SC, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	3/4-inch	Gravel:	7.8%
Silt & Clay (% Passing #200):	34.4%	Total Sand:	57.9%

Liquid Limit	25	Plastic Limit	18	Plastic Index	7
Coarse Sand:	6.9%	Medium Sand:	27.1%	Fine Sand:	23.9%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/8/2018 — *Date*

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Form No. TR-D698-2
Revision No. : 1
Revision Date: 07/25/17

MOISTURE - DENSITY REPORT

Quality Assurance

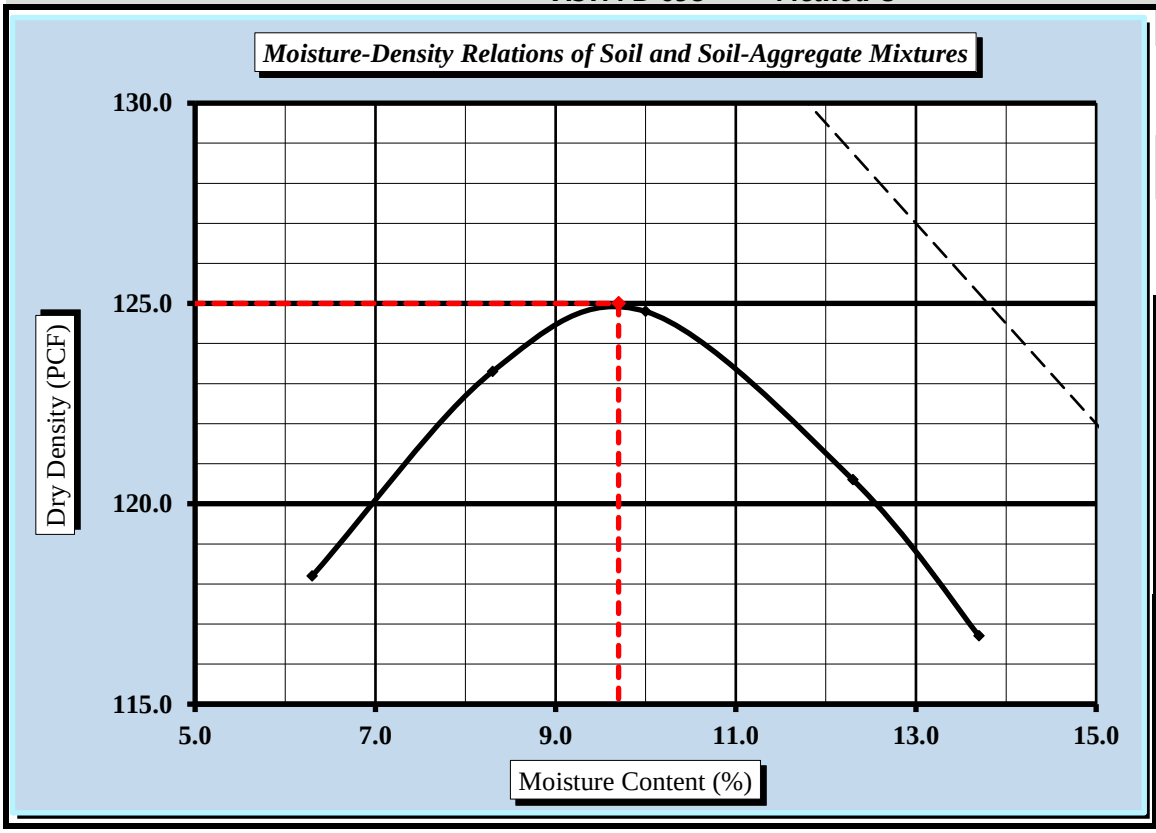
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/6/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	1/30-1/31/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-15	Sample #:	BS-1	Sample Date:	1/23/2018
Location:	Pavement Boring	Offset:	N/A	Depth:	1.0' - 11.0'
Sample Description:	Clayey Sand (SC, A-2-4)				

Maximum Dry Density 125.0 PCF. Optimum Moisture Content 9.7%

ASTM D 698 - - Method C



Soil Properties

Natural Moisture Content	13.7%
Specific Gravity of Soil	TNP
Liquid Limit	25
Plastic Limit	18
Plastic Index	7

% Passing	
3/4"	99.3%
3/8"	97.2%
#4	92.2%
#10	85.3%
#40	58.2%
#60	46.8%
#200	34.4%

Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	0.7%
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction ☐ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☐ 3/8 inch Sieve ☐ 3/4 inch Sieve ☒

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations: Replacement Method used for CBR testing.

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/8/2018 — *Date*

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CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

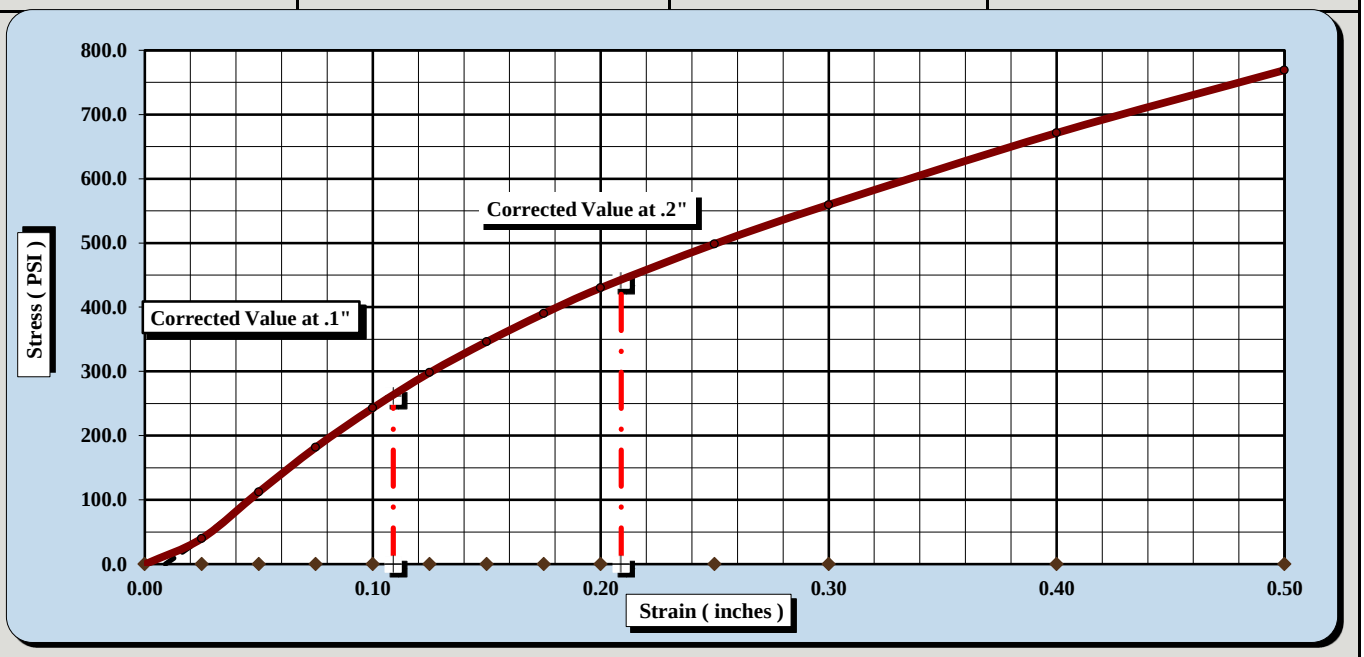
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/6/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/2-2/6/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-15	Sample #: BS-1	Sample Date: 1/22/2018
Location:	Pavement Boring	Offset: N/A	Depth: 1.0' - 11.0'
Sample Description:	Clayey Sand (SC, A-2-4)		

ASTM D 698 *Method C* Maximum Dry Density: 125.0 PCF Optimum Moisture Content: 9.7%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.7%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 24.3	CBR at 0.2 in. 28.7	CBR at 0.1 in. 26.2	CBR at 0.2 in. 29.5



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	65		
Initial Dry Density (PCF)	123.8	Final Dry Density (PCF)	123.7
Moisture Content of the Compacted Specimen	10.2%	Moisture Content (top 1" after soaking)	12.0%
Percent Compaction	99.0%	Percent Swell	0.1%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	25	Plastic Index	7	Apparent Relative Density	TNP

Notes/Deviations/References:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/8/2018 — *Date*

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CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D1883

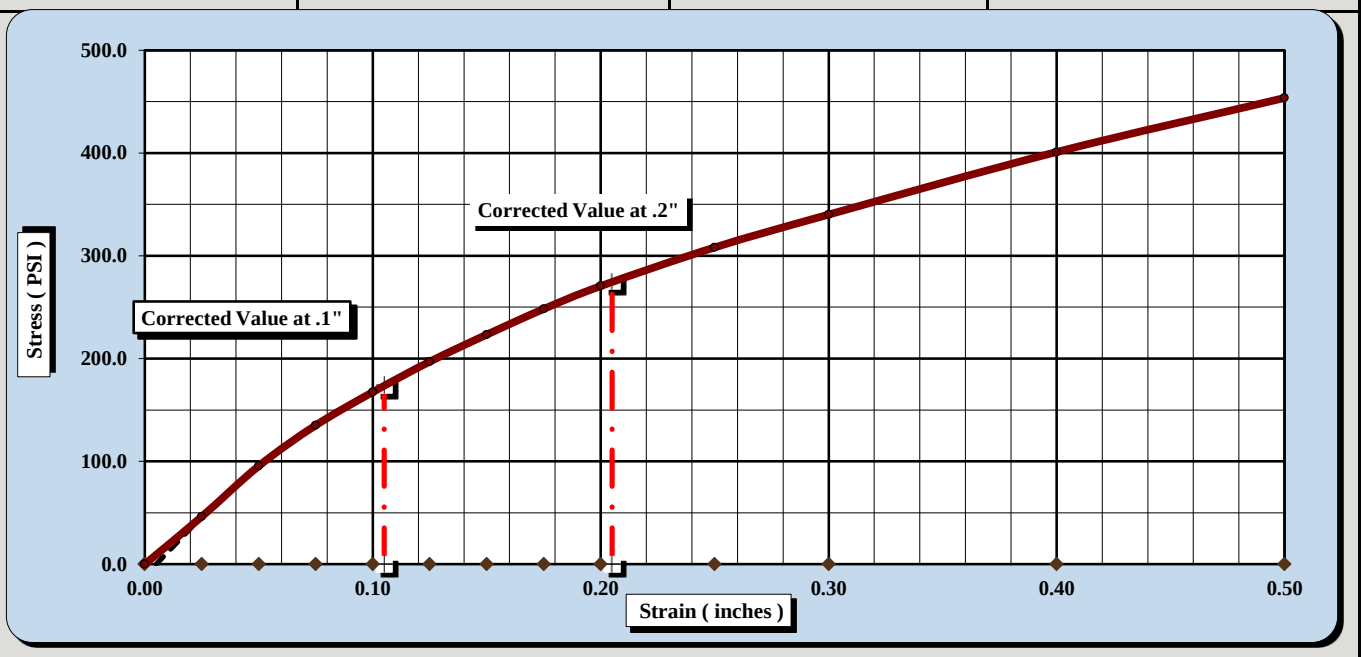
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/6/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/2-2/6/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-15	Sample #: BS-1	Sample Date: 1/22/2018
Location:	Pavement Boring	Offset: N/A	Depth: 1.0' - 11.0'
Sample Description:	Clayey Sand (SC, A-2-4)		

ASTM D 698 *Method C* Maximum Dry Density: 125.0 PCF — Optimum Moisture Content: 9.7%

Compaction Test performed on grading complying with CBR spec. — % Retained on the 3/4" sieve: 0.7%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 16.7	CBR at 0.2 in. 18.0	CBR at 0.1 in. 17.4	CBR at 0.2 in. 18.3



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	35		
Initial Dry Density (PCF)	120.9	Final Dry Density (PCF)	120.6
Moisture Content of the Compacted Specimen	10.7%	Moisture Content (top 1" after soaking)	13.3%
Percent Compaction	96.7%	Percent Swell	0.2%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	25	Plastic Index	7	Apparent Relative Density	TNP

Notes/Deviations/References:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/8/2018 — *Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D1883

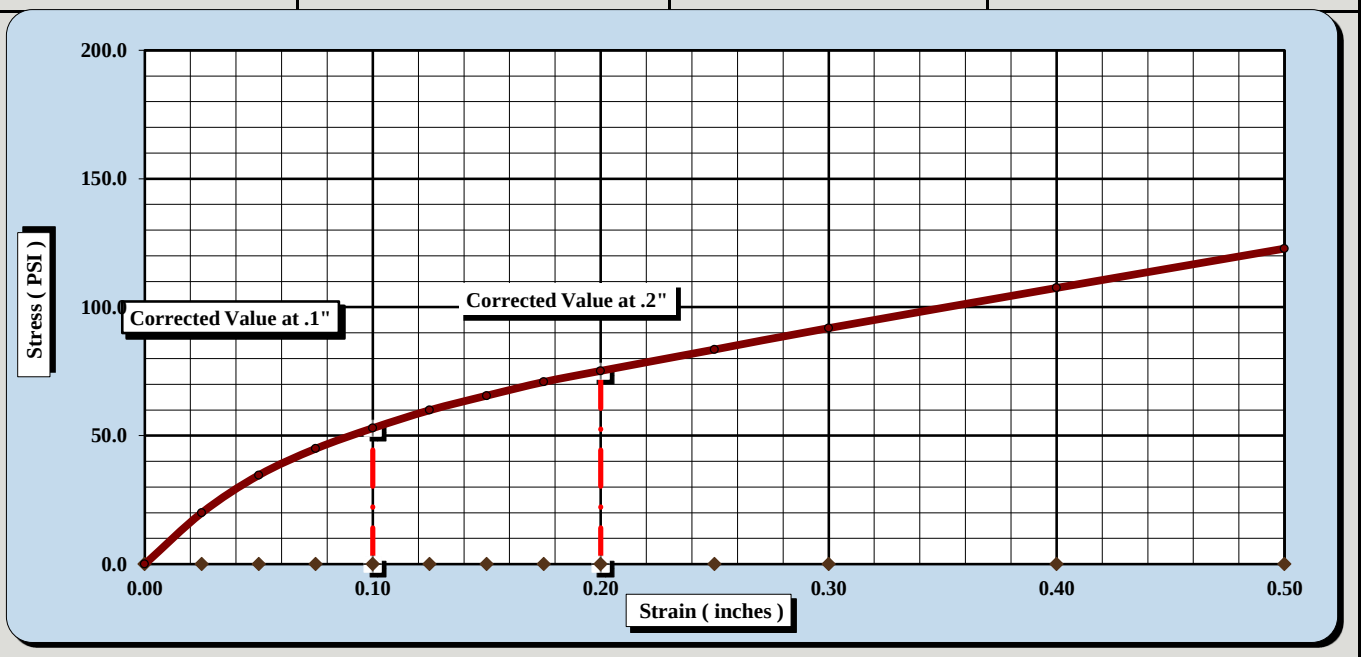
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/6/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/2-2/6/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-15	Sample #: BS-1	Sample Date: 1/22/2018
Location:	Pavement Boring	Offset: N/A	Depth: 1.0' - 11.0'
Sample Description:	Clayey Sand (SC, A-2-4)		

ASTM D 698 *Method C* Maximum Dry Density: 125.0 PCF — Optimum Moisture Content: 9.7%

Compaction Test performed on grading complying with CBR spec. — % Retained on the 3/4" sieve: 0.7%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 5.3	CBR at 0.2 in. 5.0	CBR at 0.1 in. 5.3	CBR at 0.2 in. 5.0



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	15		
Initial Dry Density (PCF)	114.0	Final Dry Density (PCF)	113.6
Moisture Content of the Compacted Specimen	10.1%	Moisture Content (top 1" after soaking)	15.4%
Percent Compaction	91.2%	Percent Swell	0.4%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	25	Plastic Index	7	Apparent Relative Density	TNP

Notes/Deviations/References:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
3/8/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

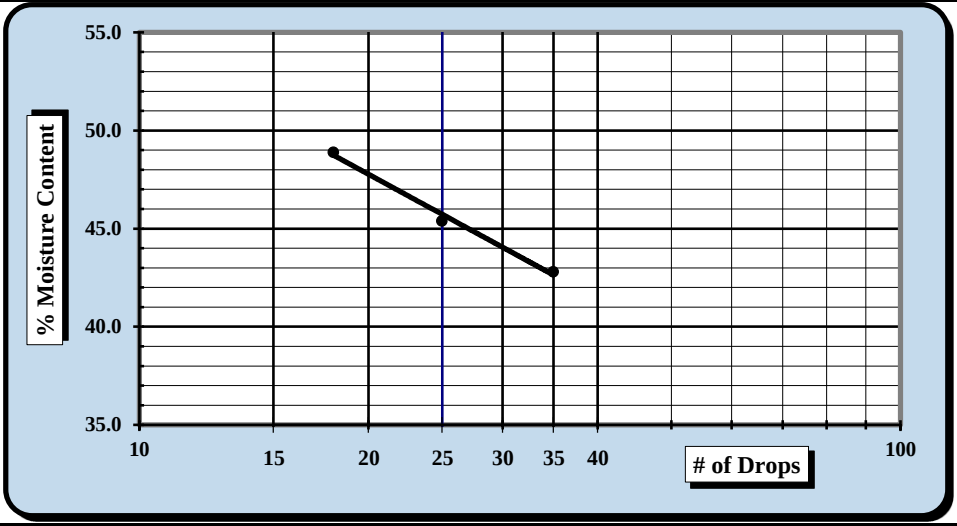
Project #:	1461-16-047.2B	Report Date:	2/24/18
Project Name:	Carolina Crossroads Project	Test Date:	2/21/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-20	Sample #:	BS-1	Sample Date:	1/30/2018
Location:	Pavement Boring	Type:	Bulk	Depth:	1.5' - 11.4'

Sample Description: Lean Clay with Sand (CL, A-7-6(16))

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	6	7	8				9	10	
A	Tare Weight	26.70	26.31	27.32				27.93	26.76	
B	Wet Soil Weight + A	40.28	42.62	42.21				35.66	34.36	
C	Dry Soil Weight + A	36.21	37.53	37.32				34.38	33.13	
D	Water Weight (B-C)	4.07	5.09	4.89				1.28	1.23	
E	Dry Soil Weight (C-A)	9.51	11.22	10.00				6.45	6.37	
F	% Moisture (D/E)*100	42.8%	45.4%	48.9%				19.8%	19.3%	
N	# OF DROPS	35	25	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**19.6%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**45**
Plastic Limit	**20**
Plastic Index	**25**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 70.5%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	2/24/18	Brian Vaughn	2/24/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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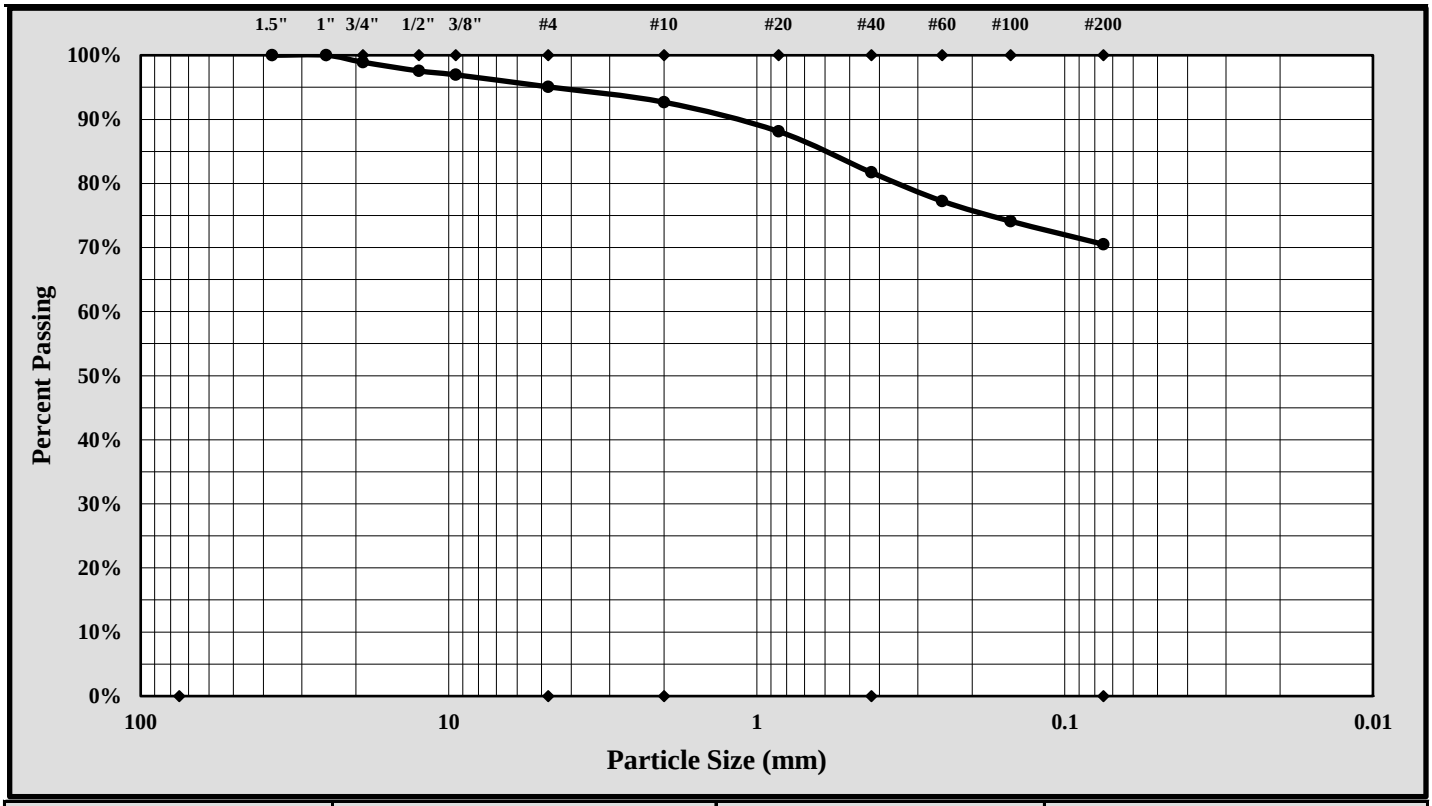
Form No. 61-D422-3
Revision No. 0
Revision Date: 05/05/2017

Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	2/24/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/20 - 2/24/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-20 Sample #: BS-1	Sample Date:	1/30/2018
Location:	Pavement Boring Type: Bulk	Depth:	1.5' - 11.4'
Sample Description:	Lean Clay with Sand (CL, A-7-6(16))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	25.0 mm	Gravel:	4.9%
Silt & Clay (% Passing #200):	70.5%	Total Sand:	24.6%

Liquid Limit	45	Plastic Limit	20	Plastic Index	25
Coarse Sand:	2.4%	Medium Sand:	11.0%	Fine Sand:	11.2%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	2/24/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D698-2
Revision No. : 1
Revision Date: 07/25/17

MOISTURE - DENSITY REPORT

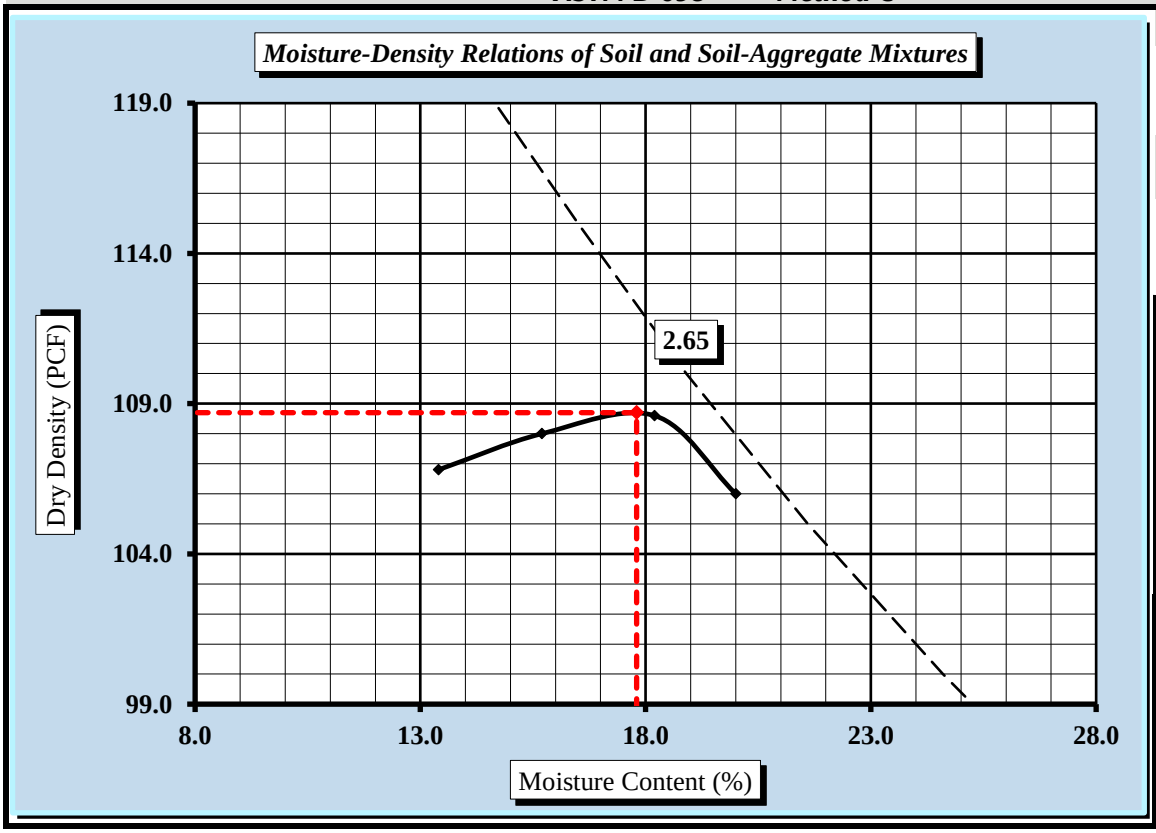
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	2/24/18
Project Name:	Carolina Crossroads Project	Test Date:	2/15/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-20	Sample #:	BS-1	Sample Date:	1/30/18
Location:	Pavement Boring	Type:	Bulk	Depth:	1.5' - 11.4'
Sample Description:	Lean Clay with Sand (CL, A-7-6(16))				

Maximum Dry Density 108.7 PCF. Optimum Moisture Content 17.8%

ASTM D 698 - - Method C



Soil Properties	
Natural Moisture Content	27.0%
Specific Gravity of Soil	2.650
Liquid Limit	45
Plastic Limit	20
Plastic Index	25
% Passing	
3/4"	98.9%
3/8"	97.0%
#4	95.1%
#10	92.7%
#40	81.7%
#60	77.2%
#100	74.1%
#200	70.5%
Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☐ 3/8 inch Sieve ☐ 3/4 inch Sieve ☒

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations:

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Brian Vaughan, P.E.		Group Leader	2/24/18
Technical Responsibility	*Signature*	*Position*	*Date*

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CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	2/24/18
Project Name:	Carolina Crossroads Project	Test Date(s)	2/19 - 2/23/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

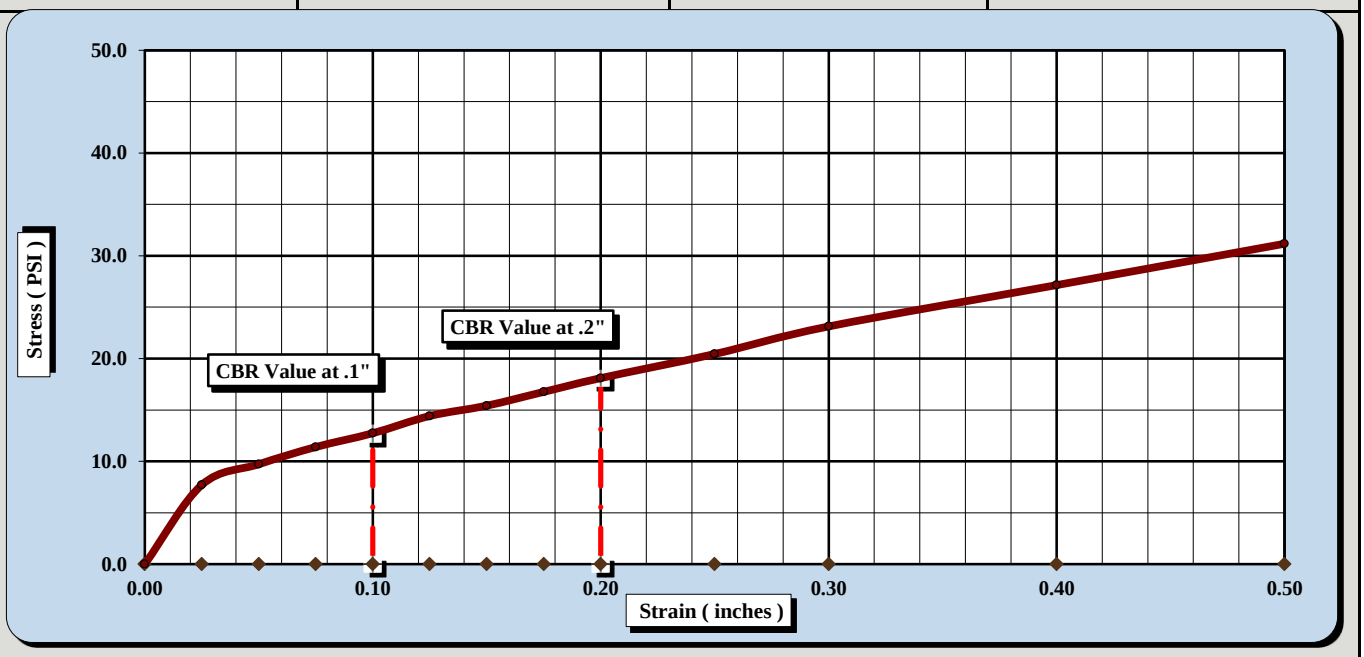
Boring #:	P-20	Sample #:	BS-1	Sample Date:	1/30/2018
Location:	Pavement Boring	Type:	Bulk	Depth:	1.5' - 11.4'

Sample Description: Lean Clay with Sand (CL, A-7-6(16))

ASTM D 698 *Method C* Maximum Dry Density: 108.7 PCF Optimum Moisture Content: 17.8%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 1.1%

Uncorrected CBR Values				Corrected CBR Values			
CBR at 0.1 in.	1.3	CBR at 0.2 in.	1.2	CBR at 0.1 in.	1.3	CBR at 0.2 in.	1.2



CBR Sample Preparation:

The entire gradation was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	15		
Initial Dry Density (PCF)	97.8	Final Dry Density (PCF)	95.7
Moisture Content of the Compacted Specimen	17.8%	Moisture Content (top 1" after soaking)	31.8%
Percent Compaction	90.0%	Percent Swell	2.2%

Soak Time:	96 hrs.	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	45	Plastic Index	25	% Passing the #200 Sieve	70.5%

Notes/Deviations/References:

Brian Vaughan, P.E.		Group Leader	2/24/18
Technical Responsibility	*Signature*	*Position*	*Date*

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CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	2/24/18
Project Name:	Carolina Crossroads Project	Test Date(s)	2/19 - 2/23/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

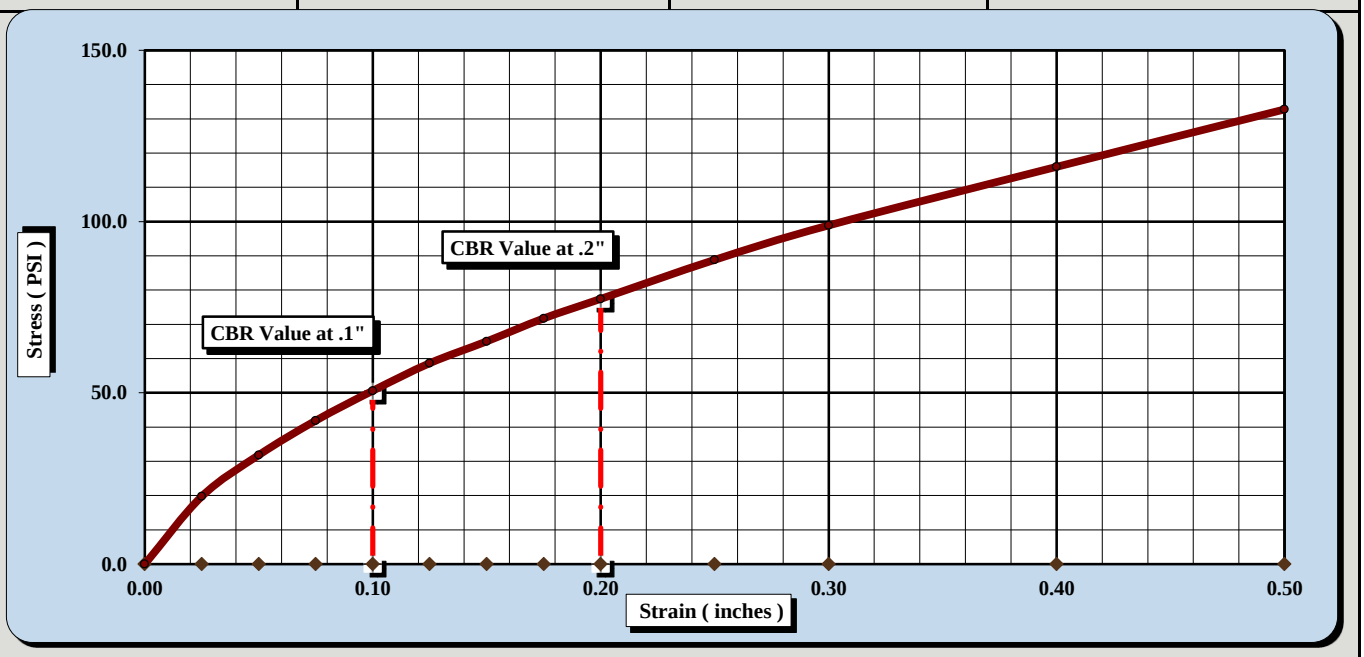
Boring #:	P-20	Sample #:	BS-1	Sample Date:	1/30/2018
Location:	Pavement Boring	Type:	Bulk	Depth:	1.5' - 11.4'

Sample Description: Lean Clay with Sand (CL, A-7-6(16))

ASTM D 698 *Method C* Maximum Dry Density: 108.7 PCF Optimum Moisture Content: 17.8%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 1.1%

Uncorrected CBR Values				Corrected CBR Values			
CBR at 0.1 in.	5.1	CBR at 0.2 in.	5.2	CBR at 0.1 in.	5.1	CBR at 0.2 in.	5.2



CBR Sample Preparation:

The entire gradation was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	30		
Initial Dry Density (PCF)	103.3	Final Dry Density (PCF)	101.7
Moisture Content of the Compacted Specimen	17.8%	Moisture Content (top 1" after soaking)	25.1%
Percent Compaction	95.0%	Percent Swell	1.5%

Soak Time:	96 hrs.	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	45	Plastic Index	25	% Passing the #200 Sieve	70.5%

Notes/Deviations/References:

Brian Vaughan, P.E.		Group Leader	2/24/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	2/24/18
Project Name:	Carolina Crossroads Project	Test Date(s)	2/19 - 2/23/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

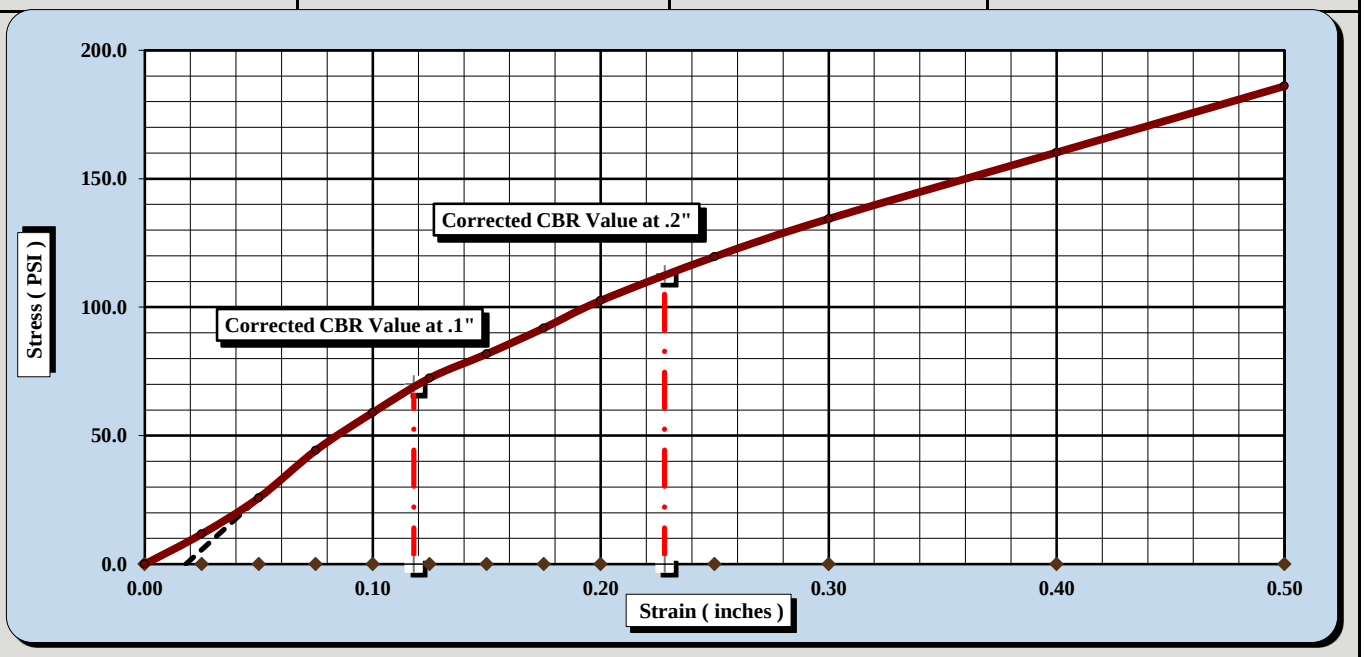
Boring #:	P-20	Sample #:	BS-1	Sample Date:	1/30/2018
Location:	Pavement Boring	Type:	Bulk	Depth:	1.5' - 11.4'

Sample Description: Lean Clay with Sand (CL, A-7-6(17))

ASTM D 698 *Method C* Maximum Dry Density: 108.7 PCF Optimum Moisture Content: 17.8%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 1.1%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 5.9	CBR at 0.2 in. 6.8	CBR at 0.1 in. 7.0	CBR at 0.2 in. 7.5



CBR Sample Preparation:

The entire gradation was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	56		
Initial Dry Density (PCF)	108.7	Final Dry Density (PCF)	107.5
Moisture Content of the Compacted Specimen	17.8%	Moisture Content (top 1" after soaking)	23.3%
Percent Compaction	100.0%	Percent Swell	1.1%

Soak Time:	96 hrs.	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	45	Plastic Index	25	% Passing the #200 Sieve	70.5%

Notes/Deviations/References:

Brian Vaughan, P.E.		Group Leader	2/24/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

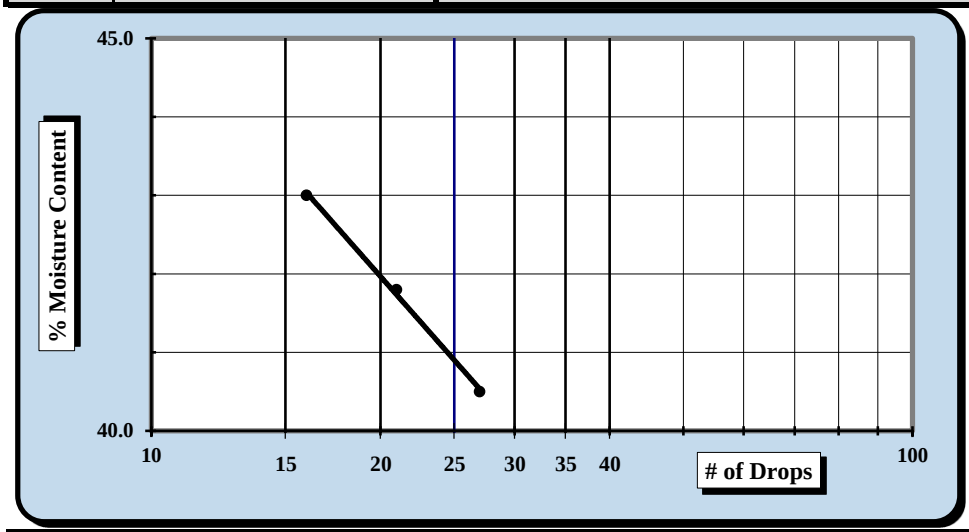
ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/6/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	1/30-2/5/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-25	Sample #: BS-1	Sample Date: 1/23-1/24/2018
Location:	Pavement Boring	Offset: N/A	Depth: 1.0' - 11.0'
Sample Description:	Sandy Lean Clay (CL, A-7-6(7))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28573	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

Pan # 607		Liquid Limit						Plastic Limit		
	Tare #:	13	146	29				37	39	
A	Tare Weight	20.74	20.55	20.81				20.79	20.81	
B	Wet Soil Weight + A	30.55	30.39	30.99				26.99	28.50	
C	Dry Soil Weight + A	27.72	27.49	27.93				25.87	27.12	
D	Water Weight (B-C)	2.83	2.90	3.06				1.12	1.38	
E	Dry Soil Weight (C-A)	6.98	6.94	7.12				5.08	6.31	
F	% Moisture (D/E)*100	40.5%	41.8%	43.0%				22.0%	21.9%	
N	# OF DROPS	27	21	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**22.0%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**41**
Plastic Limit	**22**
Plastic Index	**19**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe — *Technician Name*
NICET 123218 — *Certification*
Matthew F. Cooke, P.G. — *Technical Responsibility*

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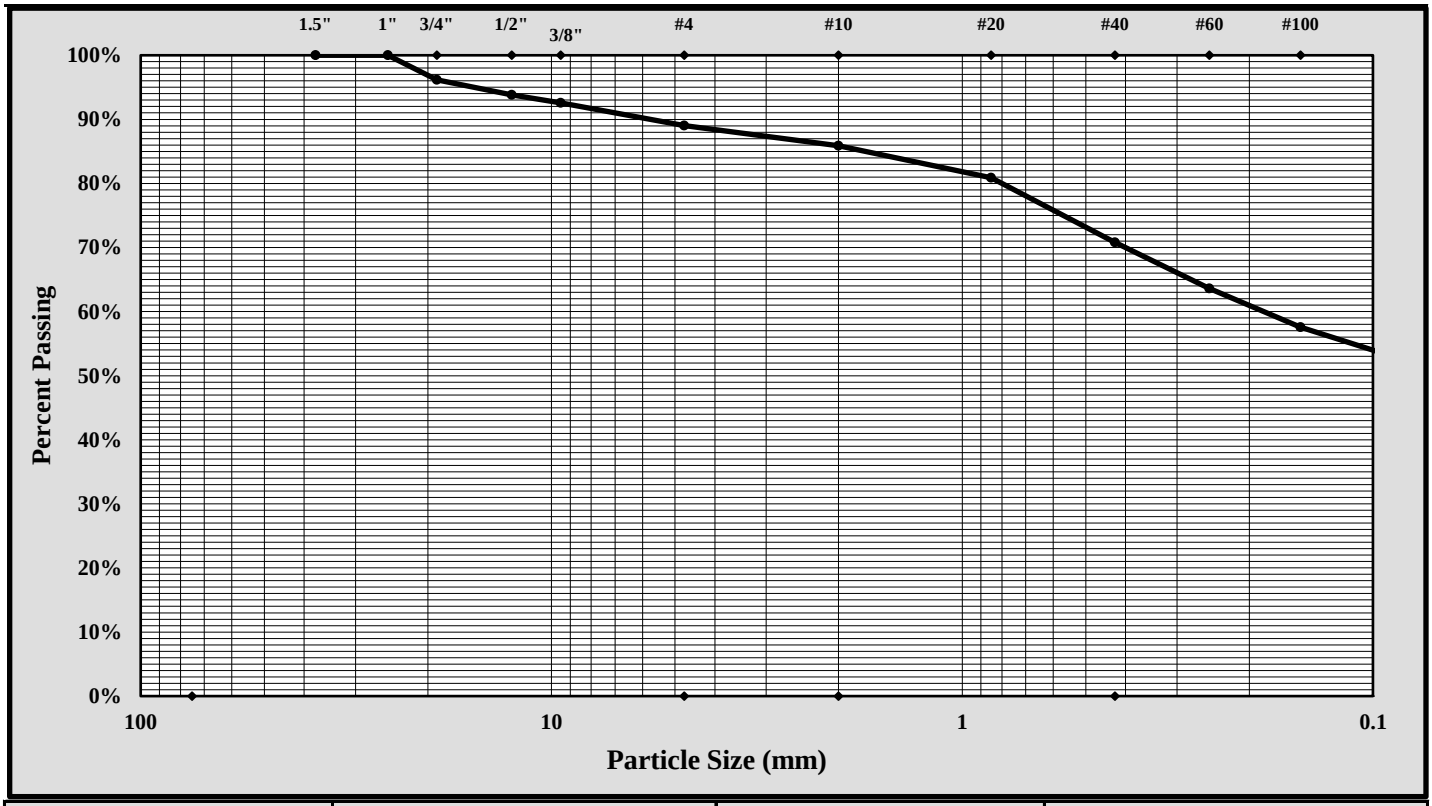
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/6/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	1/30-2/2/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-25 Sample #: BS-1	Sample Date:	1/23-1/24/2018
Location:	Pavement Boring Offset: N/A	Depth:	1.0' - 11.0'
Sample Description:	Sandy Lean Clay (CL, A-7-6(7))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	3/4-inch	Gravel:	11.0%
Silt & Clay (% Passing #200):	51.4%	Total Sand:	37.6%

Liquid Limit	41	Plastic Limit	22	Plastic Index	19
Coarse Sand:	3.2%	Medium Sand:	15.1%	Fine Sand:	19.4%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/23/2018 — *Date*

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Form No. TR-D698-2
Revision No. : 1
Revision Date: 07/25/17

MOISTURE - DENSITY REPORT

Quality Assurance

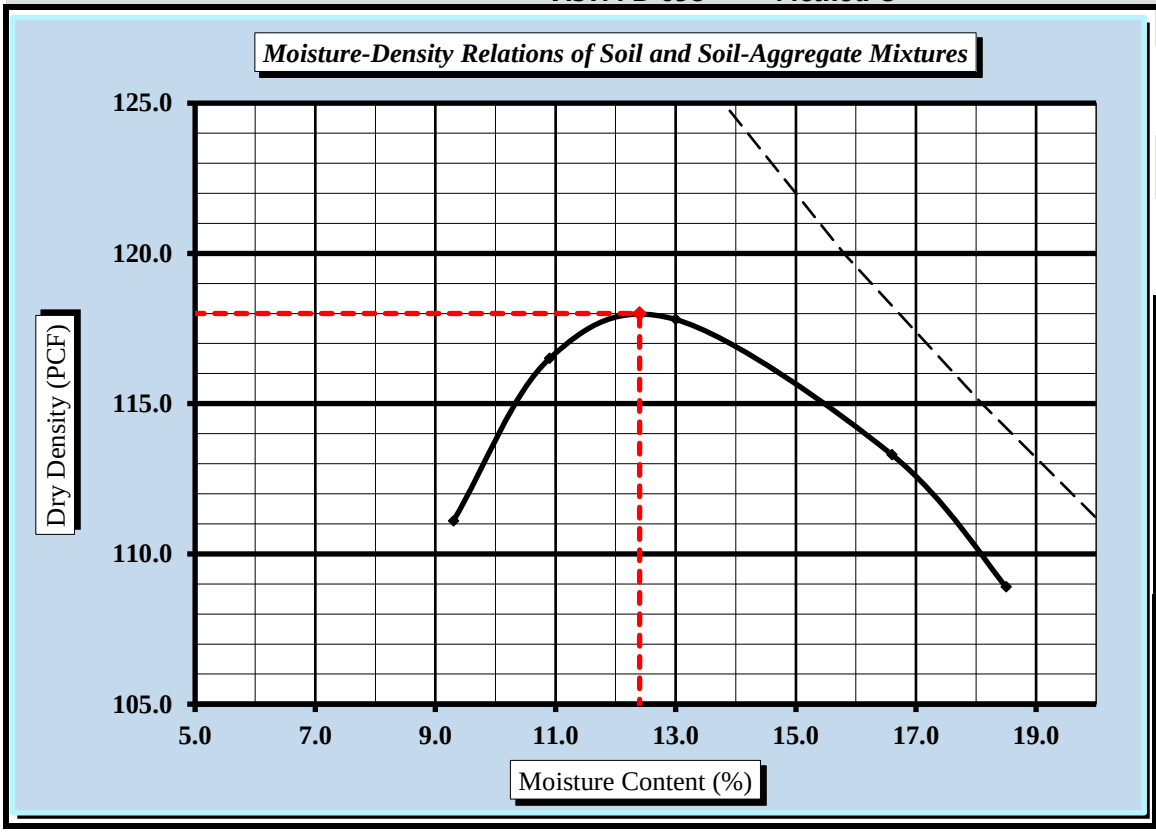
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/6/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	1/30-1/31/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-25	Sample #:	BS-1	Sample Date:	1/23-1/24/2018
Location:	Pavement Boring	Offset:	N/A	Depth:	1.0' - 11.0'
Sample Description:	Sandy Lean Clay (CL, A-7-6)				

Maximum Dry Density 118.0 PCF. Optimum Moisture Content 12.4%

ASTM D 698 - - Method C



Soil Properties

Natural Moisture Content	18.5%
Specific Gravity of Soil	TNP
Liquid Limit	41
Plastic Limit	22
Plastic Index	19

% Passing	
3/4"	96.2%
3/8"	92.6%
#4	89.0%
#10	85.9%
#40	70.8%
#60	63.6%
#200	51.4%

Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	3.8%
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction ☐ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☐ 3/8 inch Sieve ☐ 3/4 inch Sieve ☒

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations: Replacement Method used for CBR testing.

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/23/2018 — *Date*

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CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

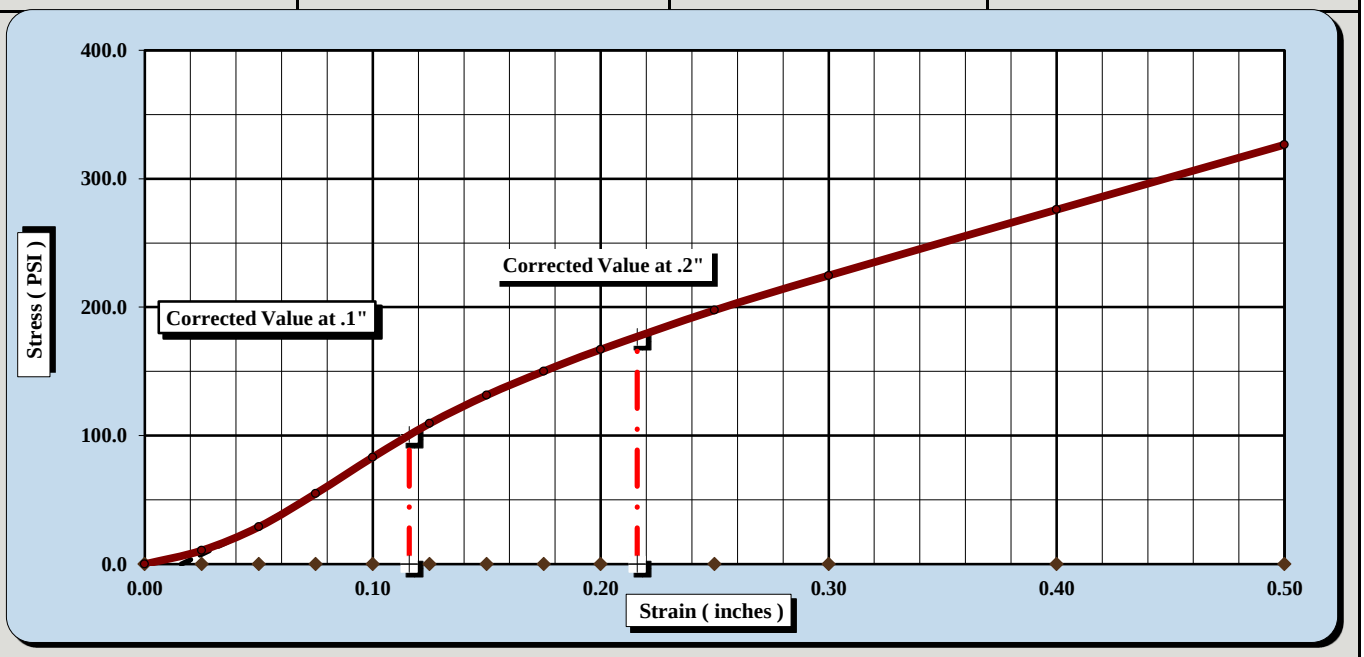
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/6/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/2-2/6/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-25	Sample #: BS-1	Sample Date: 1/23/2018
Location:	Pavement Boring	Offset: N/A	Depth: 1.0' -11.0'
Sample Description:	Sandy Lean Clay (CL, A-7-6(7))		

ASTM D 698 *Method C* Maximum Dry Density: 118.0 PCF — Optimum Moisture Content: 12.4%

Compaction Test performed on grading complying with CBR spec. — % Retained on the 3/4" sieve: 3.8%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 8.3	CBR at 0.2 in. 11.1	CBR at 0.1 in. 10.1	CBR at 0.2 in. 11.8



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	65		
Initial Dry Density (PCF)	116.5	Final Dry Density (PCF)	114.9
Moisture Content of the Compacted Specimen	13.0%	Moisture Content (top 1" after soaking)	19.6%
Percent Compaction	98.7%	Percent Swell	1.4%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.8
Liquid Limit	41	Plastic Index	19	Apparent Relative Density	TNP

Notes/Deviations/References:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/5/2018 — *Date*

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CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

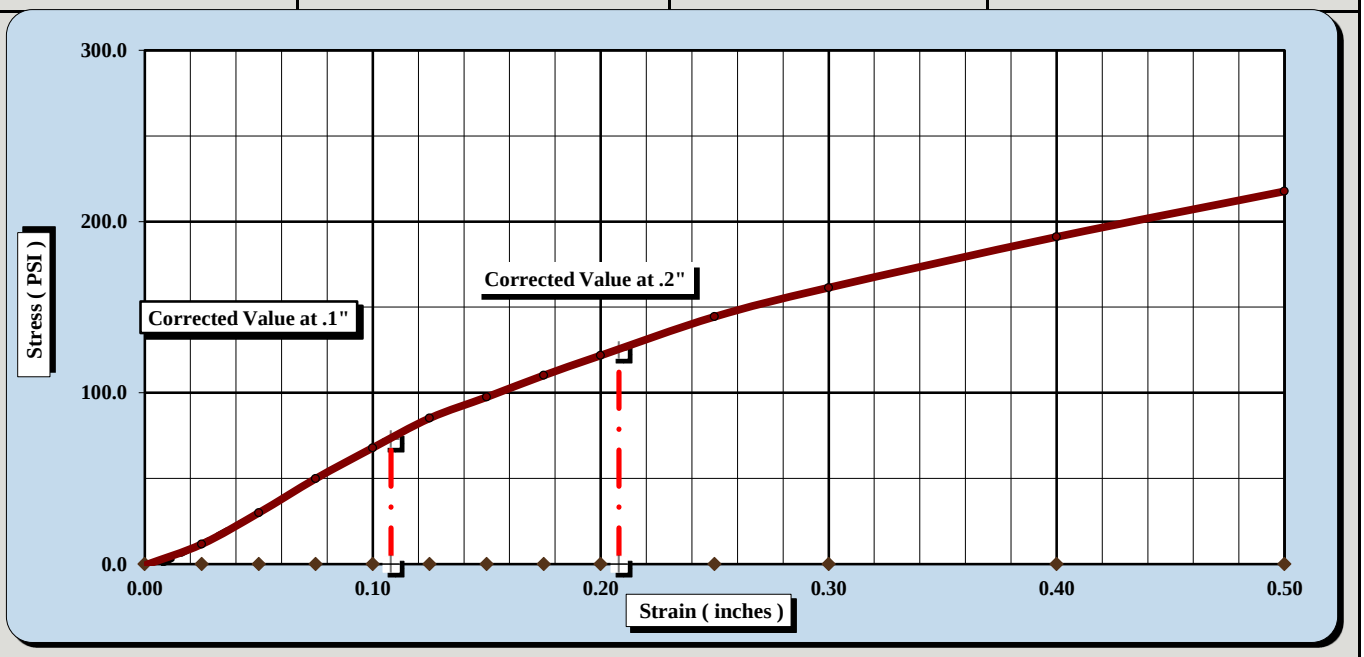
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/6/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/2-2/6/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-25	Sample #: BS-1	Sample Date: 1/23/2018
Location:	Pavement Boring	Offset: N/A	Depth: 1.0' - 11.0'
Sample Description:	Sandy Lean Clay (CL, A-7-6(7))		

ASTM D 698 *Method C* Maximum Dry Density: 118.0 PCF — Optimum Moisture Content: 12.4%

Compaction Test performed on grading complying with CBR spec. — % Retained on the 3/4" sieve: 3.8%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 6.8	CBR at 0.2 in. 8.1	CBR at 0.1 in. 7.3	CBR at 0.2 in. 8.3



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	35		
Initial Dry Density (PCF)	112.5	Final Dry Density (PCF)	110.9
Moisture Content of the Compacted Specimen	12.5%	Moisture Content (top 1" after soaking)	19.5%
Percent Compaction	95.4%	Percent Swell	1.4%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	41	Plastic Index	19	Apparent Relative Density	TNP

Notes/Deviations/References:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/5/2018 — *Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

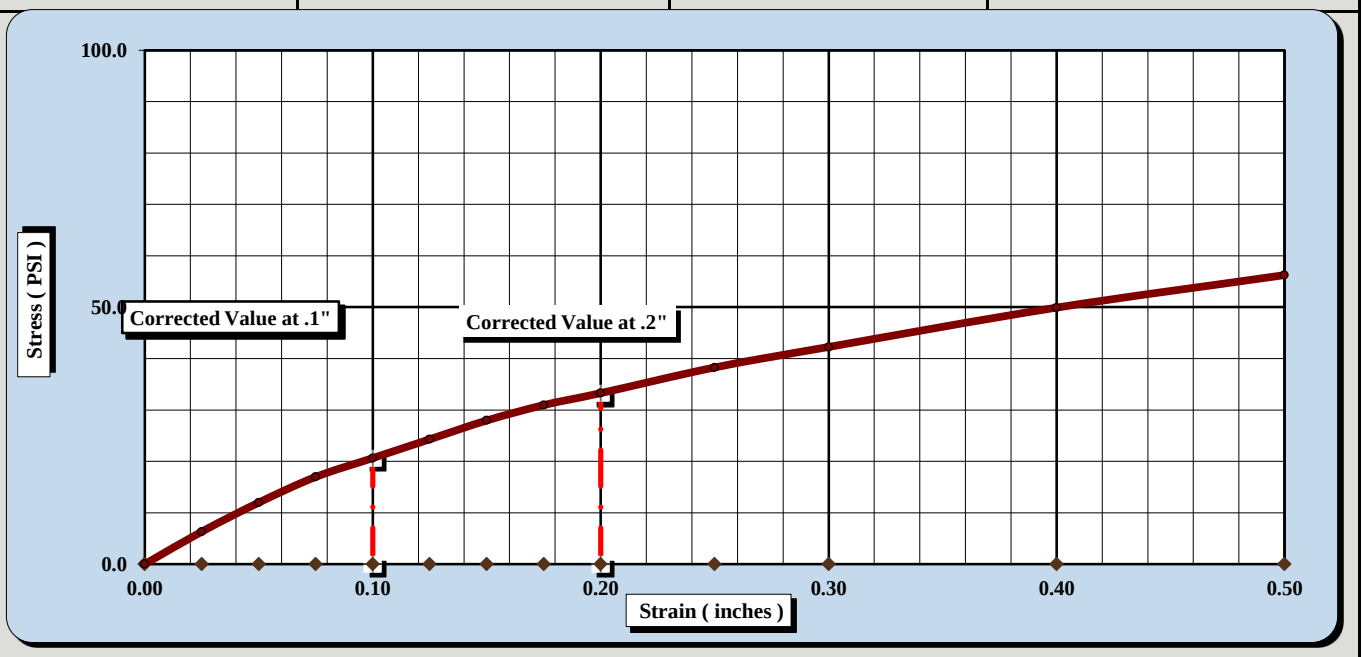
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/6/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/2-2/6/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-25	Sample #: BS-1	Sample Date: 1/23/2018
Location:	Pavement Boring	Offset: N/A	Depth: 1.0' - 11.0'
Sample Description:	Sandy Lean Clay (CL, A-7-6(7))		

ASTM D 698 *Method C* Maximum Dry Density: 118.0 PCF Optimum Moisture Content: 12.4%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 3.8%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 2.1	CBR at 0.2 in. 2.2	CBR at 0.1 in. 2.1	CBR at 0.2 in. 2.2



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	15		
Initial Dry Density (PCF)	104.2	Final Dry Density (PCF)	102.8
Moisture Content of the Compacted Specimen	12.6%	Moisture Content (top 1" after soaking)	21.5%
Percent Compaction	88.3%	Percent Swell	1.4%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	41	Plastic Index	19	Apparent Relative Density	TNP

Notes/Deviations/References:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/5/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

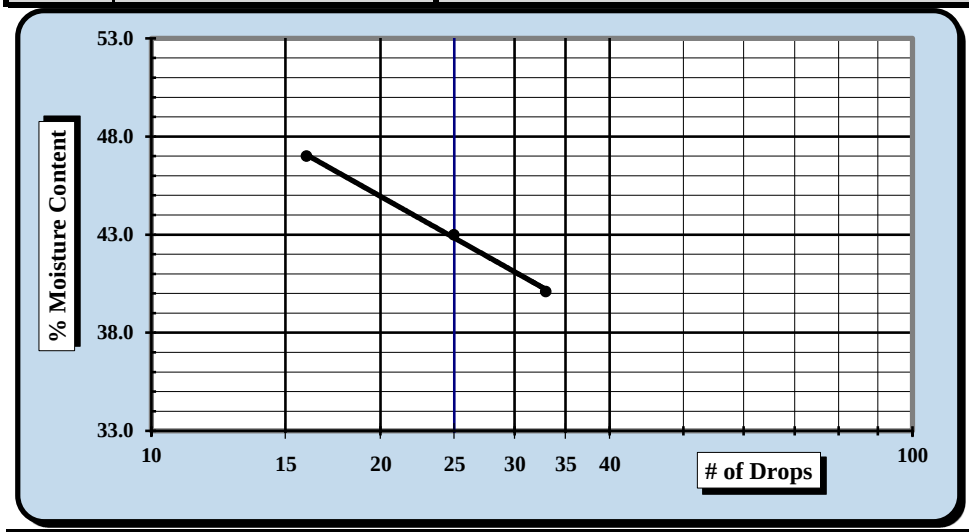
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	2/22/18
Project Name:	Carolina Crossroads Project	Test Date:	2/21/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-30	Sample #:	BS-1	Sample Date:	1/29/2018
Location:	Pavement Boring	Type:	Bulk	Depth:	0.7' - 10.7'
Sample Description:	Sandy Lean Clay (CL, A-7-6(8))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	1	2	3				4	5	
A	Tare Weight	26.70	26.46	26.35				25.95	26.96	
B	Wet Soil Weight + A	42.56	43.08	43.25				33.32	35.56	
C	Dry Soil Weight + A	38.02	38.08	37.85				32.01	34.02	
D	Water Weight (B-C)	4.54	5.00	5.40				1.31	1.54	
E	Dry Soil Weight (C-A)	11.32	11.62	11.50				6.06	7.06	
F	% Moisture (D/E)*100	40.1%	43.0%	47.0%				21.6%	21.8%	
N	# OF DROPS	33	25	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**21.7%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**43**
Plastic Limit	**22**
Plastic Index	**21**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 53.2%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	2/22/18	Brian Vaughn	2/22/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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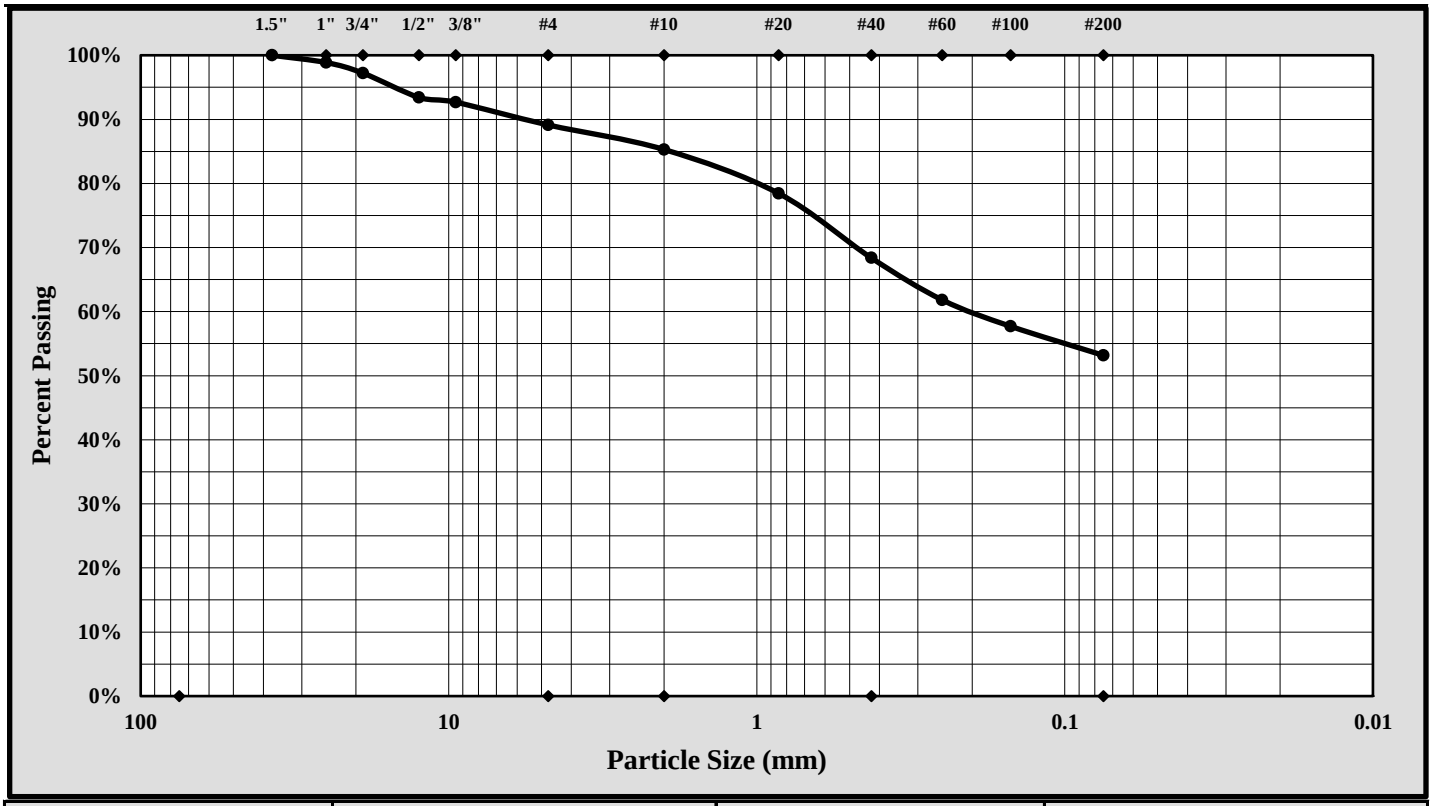
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	2/22/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/20 - 2/22/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-30	Sample #: BS-1	Sample Date: 1/29/2018
Location:	Pavement Boring	Type: Bulk	Depth: 0.7' - 10.7'
Sample Description:	Sandy Lean Clay (CL, A-7-6(8))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	38.1 mm	Gravel:	10.9%
Silt & Clay (% Passing #200):	53.2%	Total Sand:	35.9%

Liquid Limit	43	Plastic Limit	22	Plastic Index	21
Coarse Sand:	3.8%	Medium Sand:	16.9%	Fine Sand:	15.2%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	2/22/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D698-2
Revision No. : 1
Revision Date: 07/25/17

MOISTURE - DENSITY REPORT

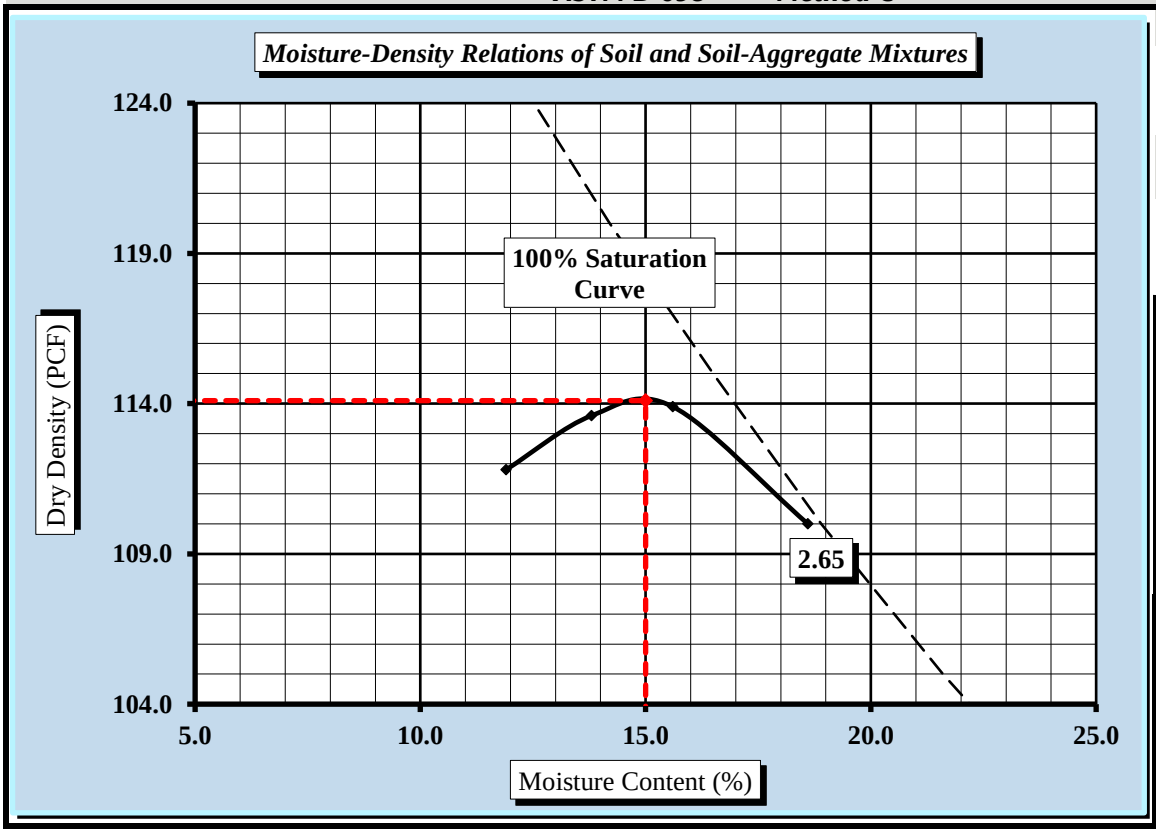
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	2/22/18
Project Name:	Carolina Crossroads Project	Test Date:	2/12/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-30	Sample #:	BS-1	Sample Date:	1/29/18
Location:	Pavement Boring	Type:	Bulk	Depth:	0.7' - 10.7'
Sample Description:	Sandy Lean Clay (CL, A-7-6(8))				

Maximum Dry Density 114.1 PCF. Optimum Moisture Content 15.0%

ASTM D 698 - - Method C



Soil Properties

Natural Moisture Content	23.0%
Specific Gravity of Soil	2.650
Liquid Limit	43
Plastic Limit	22
Plastic Index	21

% Passing	
3/4"	97.1%
3/8"	92.7%
#4	89.1%
#10	85.3%
#40	68.4%
#60	61.8%
#100	57.7%
#200	53.2%

Oversize Fraction
Bulk Gravity
% Moisture
% Oversize
MDD
Opt. MC

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☐ 3/8 inch Sieve ☐ 3/4 inch Sieve ☒

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations:

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	2/22/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	2/22/18
Project Name:	Carolina Crossroads Project	Test Date(s)	2/15 - 2/19/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

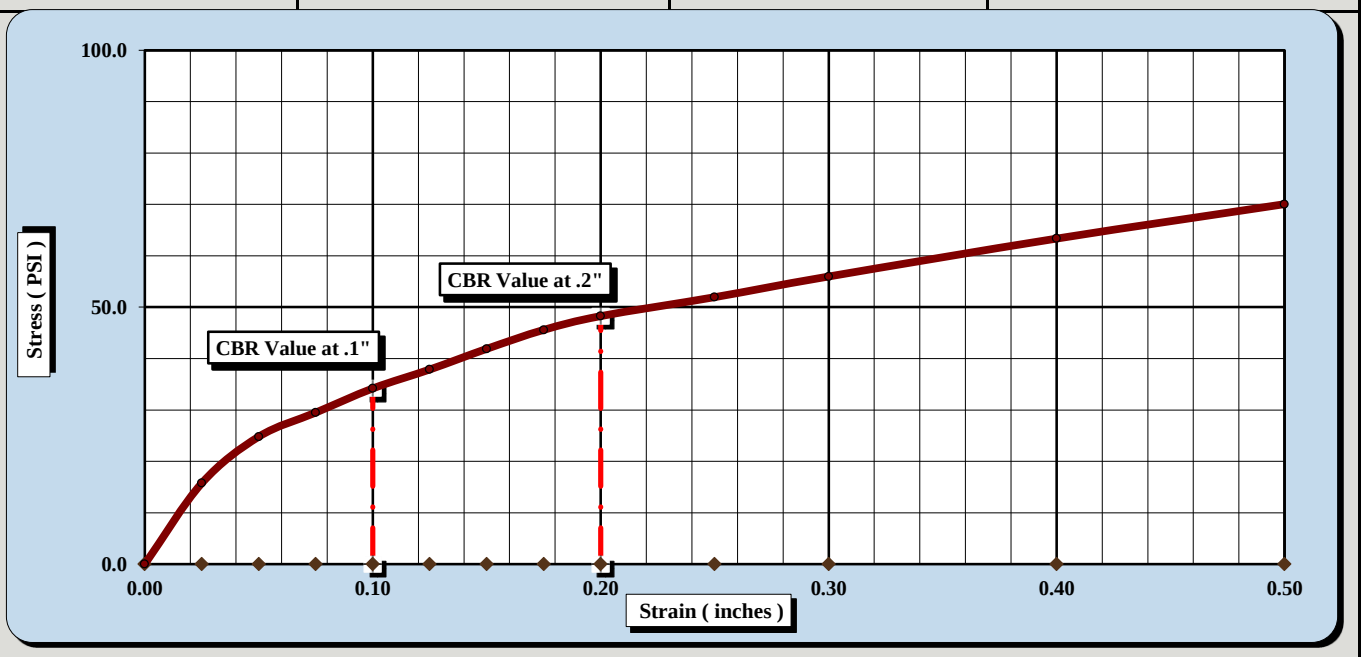
Boring #:	P-30	Sample #:	BS-1	Sample Date:	1/29/2018
Location:	Pavement Boring	Type:	Bulk	Depth:	0.7' - 10.7'

Sample Description: Sandy Lean Clay (CL, A-7-6(8))

ASTM D 698 *Method C* Maximum Dry Density: 114.1 PCF Optimum Moisture Content: 15.0%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 2.8%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 3.4	CBR at 0.2 in. 3.2	CBR at 0.1 in. 3.4	CBR at 0.2 in. 3.2



CBR Sample Preparation:

The entire gradation was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	12		
Initial Dry Density (PCF)	102.7	Final Dry Density (PCF)	101.5
Moisture Content of the Compacted Specimen	15.0%	Moisture Content (top 1" after soaking)	23.4%
Percent Compaction	90.0%	Percent Swell	1.2%

Soak Time:	96 hrs.	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	43	Plastic Index	21	% Passing the #200 Sieve	53.2%

Notes/Deviations/References:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	2/22/18
Technical Responsibility	*Signature*	*Position*	*Date*

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CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	2/22/18
Project Name:	Carolina Crossroads Project	Test Date(s)	2/15 - 2/19/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

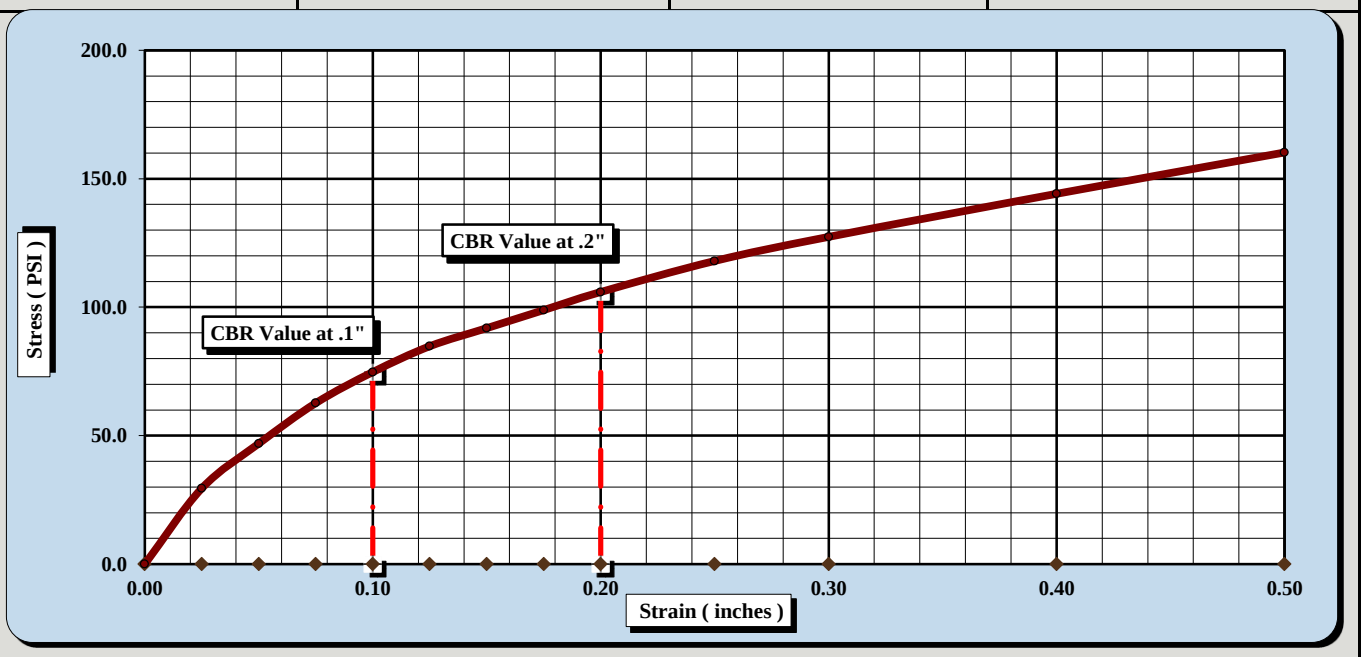
Boring #:	P-30	Sample #:	BS-1	Sample Date:	1/29/2018
Location:	Pavement Boring	Type:	Bulk	Depth:	0.7' - 10.7'

Sample Description: Sandy Lean Clay (CL, A-7-6(8))

ASTM D 698 *Method C* Maximum Dry Density: 114.1 PCF Optimum Moisture Content: 15.0%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 2.8%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 7.5	CBR at 0.2 in. 7.1	CBR at 0.1 in. 7.5	CBR at 0.2 in. 7.1



CBR Sample Preparation:

The entire gradation was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	25		
Initial Dry Density (PCF)	108.4	Final Dry Density (PCF)	107.2
Moisture Content of the Compacted Specimen	15.0%	Moisture Content (top 1" after soaking)	22.3%
Percent Compaction	95.0%	Percent Swell	1.1%

Soak Time:	96 hrs.	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	43	Plastic Index	21	% Passing the #200 Sieve	53.2%

Notes/Deviations/References:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	2/22/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	2/22/18
Project Name:	Carolina Crossroads Project	Test Date(s)	2/15 - 2/19/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

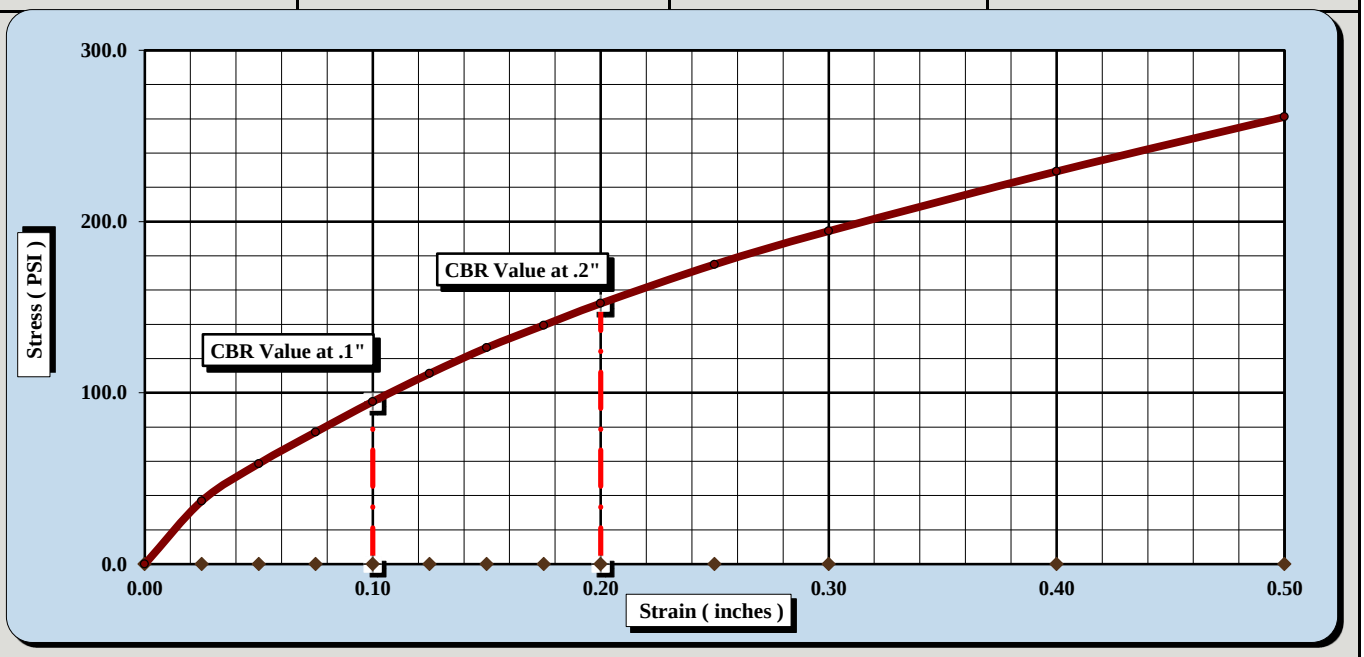
Boring #:	P-30	Sample #:	BS-1	Sample Date:	1/29/2018
Location:	Pavement Boring	Type:	Bulk	Depth:	0.7' - 10.7'

Sample Description: Sandy Lean Clay (CL, A-7-6(8))

ASTM D 698 *Method C* Maximum Dry Density: 114.1 PCF Optimum Moisture Content: 15.0%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 2.8%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 9.5	CBR at 0.2 in. 10.1	CBR at 0.1 in. 9.5	CBR at 0.2 in. 10.1



CBR Sample Preparation:

The entire gradation was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	56		
Initial Dry Density (PCF)	114.1	Final Dry Density (PCF)	113.3
Moisture Content of the Compacted Specimen	15.0%	Moisture Content (top 1" after soaking)	19.5%
Percent Compaction	100.0%	Percent Swell	0.7%

Soak Time:	96 hrs.	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	43	Plastic Index	21	% Passing the #200 Sieve	53.2%

Notes/Deviations/References:

Brian Vaughan, P.E. — *Technical Responsibility*
Brian Vaughan — *Signature*
Group Leader — *Position*
2/22/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

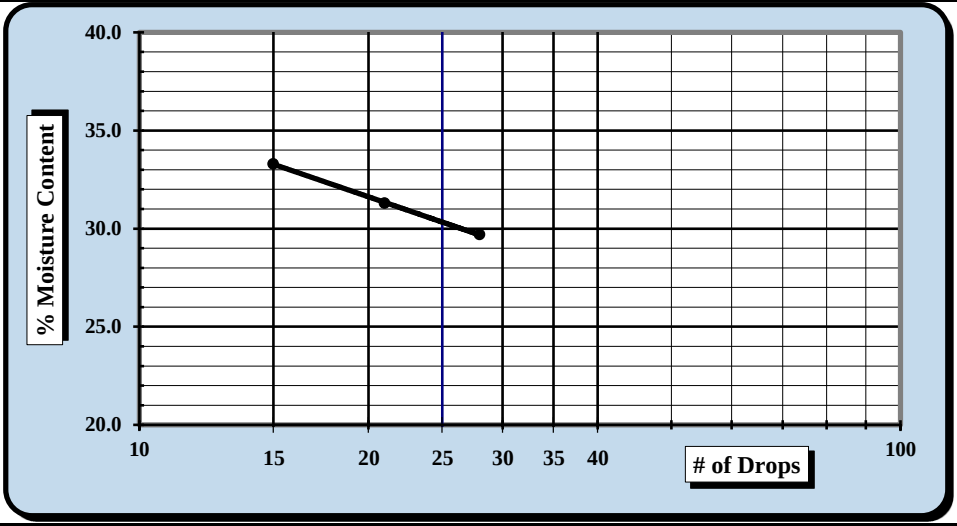
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/05/18
Project Name:	Carolina Crossroads Project	Test Date:	2/27/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-35	Sample #:	BS-1	Sample Date:	1/25/2018
Location:	Pavement Boring	Type:	Bulk	Depth:	0.8' - 10.8'
Sample Description:	Clayey Sand (SC, A-6(2))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	1	2	3				4	5	
A	Tare Weight	26.69	26.47	26.35				25.94	26.96	
B	Wet Soil Weight + A	45.66	46.94	44.31				32.81	33.95	
C	Dry Soil Weight + A	41.32	42.06	39.82				31.89	33.01	
D	Water Weight (B-C)	4.34	4.88	4.49				0.92	0.94	
E	Dry Soil Weight (C-A)	14.63	15.59	13.47				5.95	6.05	
F	% Moisture (D/E)*100	29.7%	31.3%	33.3%				15.5%	15.5%	
N	# OF DROPS	28	21	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**15.5%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**30**
Plastic Limit	**16**
Plastic Index	**14**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 41.0%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	3/05/18		3/05/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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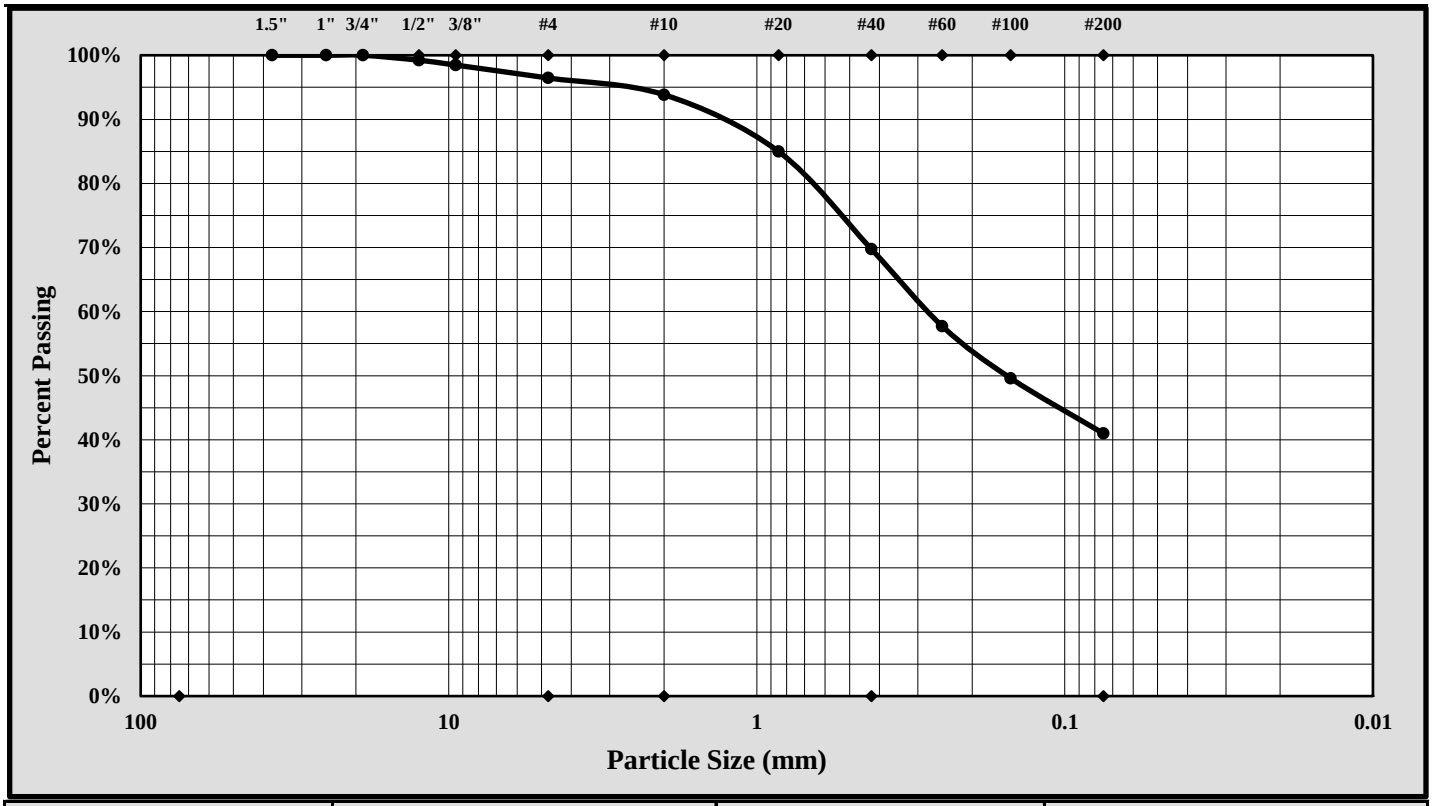
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/05/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/20 - 2/24/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-35	Sample #: BS-1	Sample Date: 1/25/2018
Location:	Pavement Boring	Type: Bulk	Depth: 0.8' - 10.8'
Sample Description:	Clayey Sand (SC, A-6(2))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	12.50 mm	Gravel:	3.5%
Silt & Clay (% Passing #200):	41.0%	Total Sand:	55.5%

Liquid Limit	30	Plastic Limit	16	Plastic Index	14
Coarse Sand:	2.6%	Medium Sand:	24.1%	Fine Sand:	28.8%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☒

References / Comments / Deviations:

Brian Vaughan, P.E. — *Technical Responsibility*
Brian Vaughan — *Signature*
Group Leader — *Position*
3/05/18 — *Date*

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Form No. TR-D698-2
Revision No. : 1
Revision Date: 07/25/17

MOISTURE - DENSITY REPORT

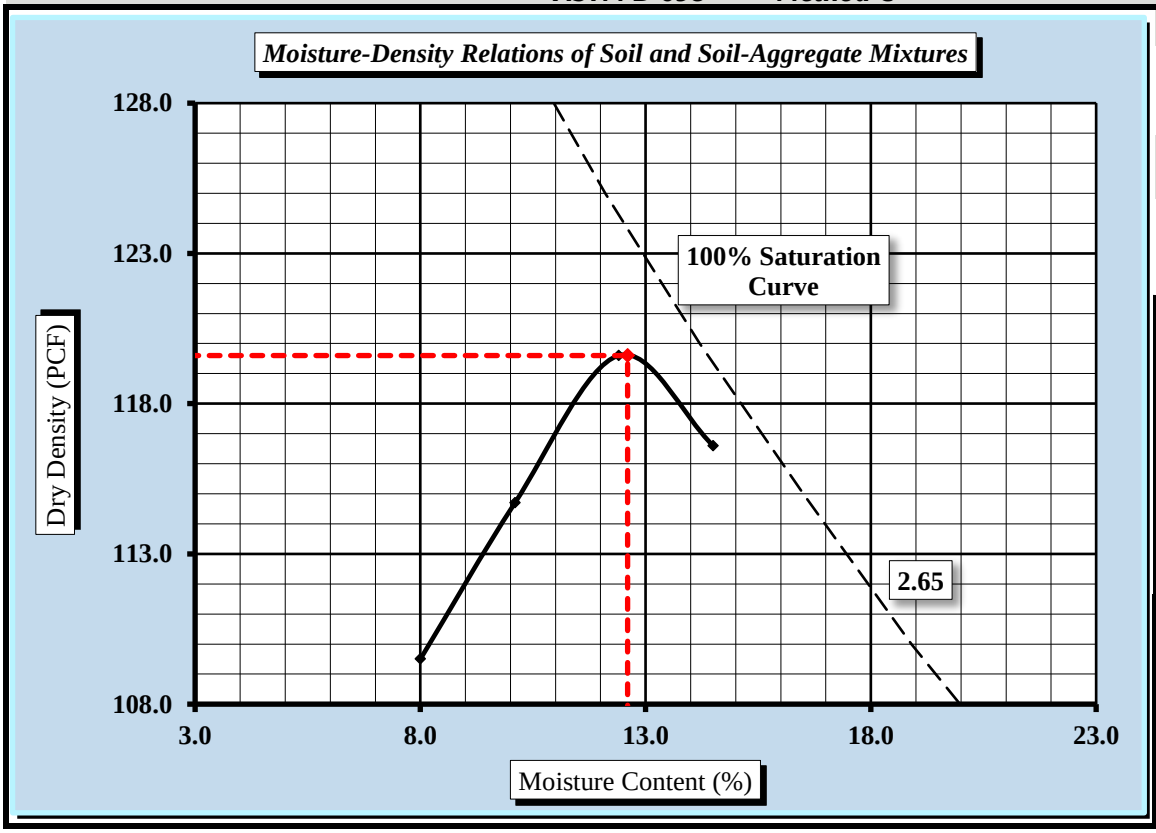
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/05/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/13/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-35	Sample #:	BS-1	Sample Date:	1/25/18
Location:	Pavement Boring	Type:	Bulk	Depth:	0.8' - 10.8'
Sample Description:	Clayey Sand (SC, A-6(2))				

Maximum Dry Density 119.6 PCF. Optimum Moisture Content 12.6%

ASTM D 698 - - Method C



Soil Properties	
Natural Moisture Content	18.3%
Specific Gravity of Soil	2.650
Liquid Limit	30
Plastic Limit	16
Plastic Index	14
% Passing	
3/4"	100.0%
3/8"	98.5%
#4	96.5%
#10	93.8%
#40	69.8%
#60	57.7%
#100	49.6%
#200	41.0%
Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☐ 3/8 inch Sieve ☐ 3/4 inch Sieve ☒

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations:

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/05/18
Technical Responsibility	*Signature*	*Position*	*Date*

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CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

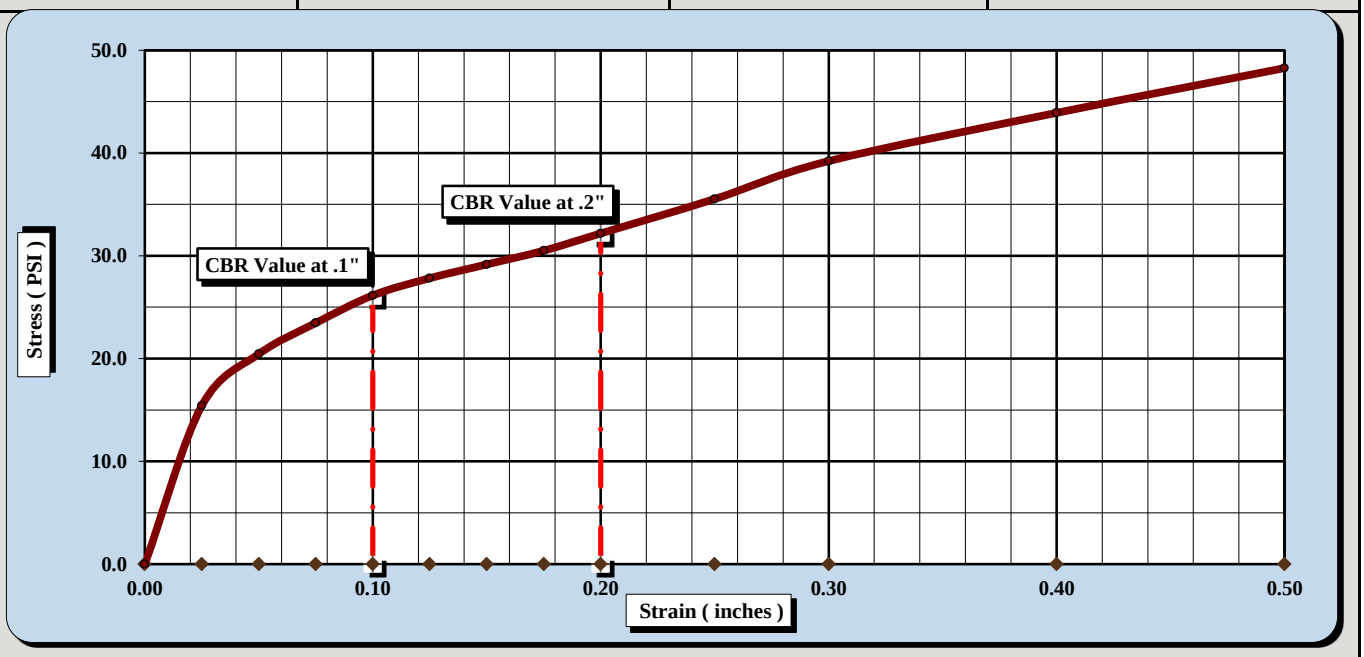
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/05/18
Project Name:	Carolina Crossroads Project	Test Date(s)	3/01 - 3/05/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-35	Sample #: BS-1	Sample Date: 1/25/2018
Location:	Pavement Boring	Type: Bulk	Depth: 0.8' - 10.8'
Sample Description:	Clayey Sand (SC, A-6(2))		

ASTM D 698 *Method C* Maximum Dry Density: 119.6 PCF Optimum Moisture Content: 12.6%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 2.6	CBR at 0.2 in. 2.1	CBR at 0.1 in. 2.6	CBR at 0.2 in. 2.1



CBR Sample Preparation:

The entire gradation was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	15		
Initial Dry Density (PCF)	107.6	Final Dry Density (PCF)	107.1
Moisture Content of the Compacted Specimen	12.6%	Moisture Content (top 1" after soaking)	20.2%
Percent Compaction	90.0%	Percent Swell	0.5%

Soak Time:	96 hrs.	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	43	Plastic Index	23	% Passing the #200 Sieve	40.6%

Notes/Deviations/References:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/05/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/05/18
Project Name:	Carolina Crossroads Project	Test Date(s)	3/01 - 3/05/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

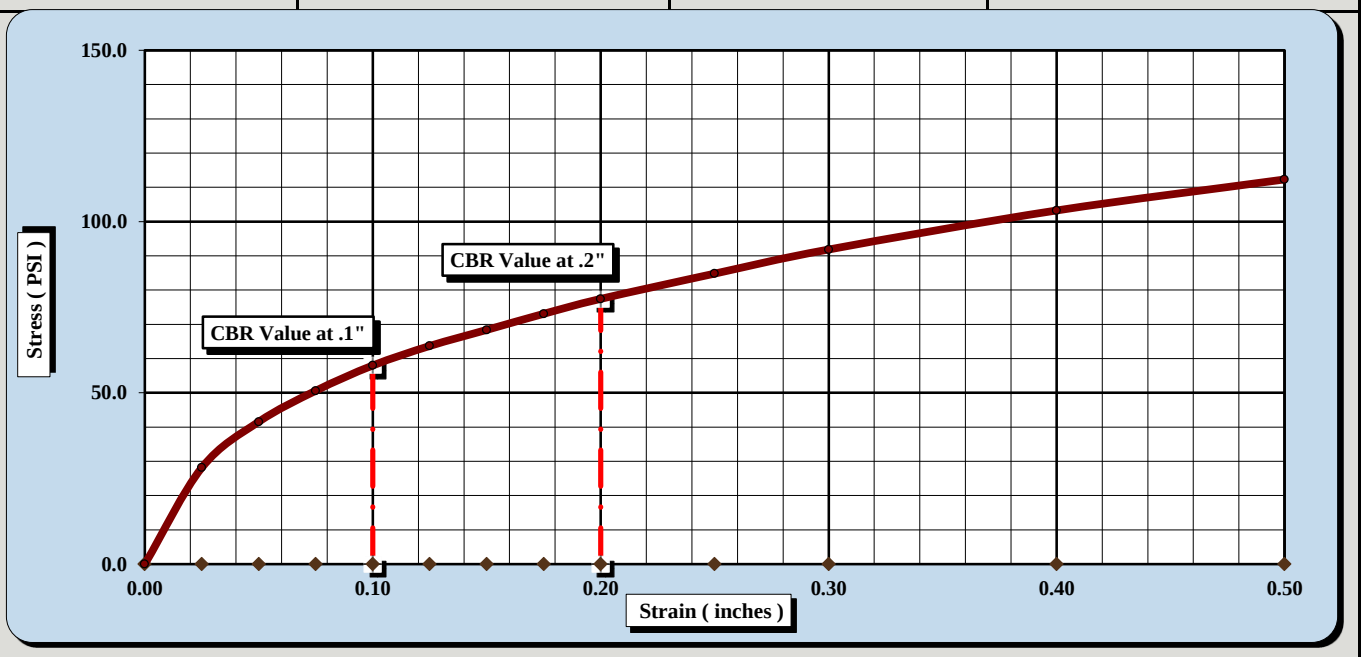
Boring #:	P-35	Sample #:	BS-1	Sample Date:	1/25/2018
Location:	Pavement Boring	Type:	Bulk	Depth:	0.8' - 10.8'

Sample Description: Clayey Sand (SC, A-6(2))

ASTM D 698 *Method C* Maximum Dry Density: 119.6 PCF Optimum Moisture Content: 12.6%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 5.8	CBR at 0.2 in. 5.2	CBR at 0.1 in. 5.8	CBR at 0.2 in. 5.2



CBR Sample Preparation:

The entire gradation was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	25		
Initial Dry Density (PCF)	113.6	Final Dry Density (PCF)	113.2
Moisture Content of the Compacted Specimen	12.6%	Moisture Content (top 1" after soaking)	17.9%
Percent Compaction	95.0%	Percent Swell	0.4%

Soak Time:	96 hrs.	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	43	Plastic Index	23	% Passing the #200 Sieve	40.6%

Notes/Deviations/References:

Brian Vaughan, P.E. — *Technical Responsibility*
Brian Vaughan — *Signature*
Group Leader — *Position*
3/05/18 — *Date*

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CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

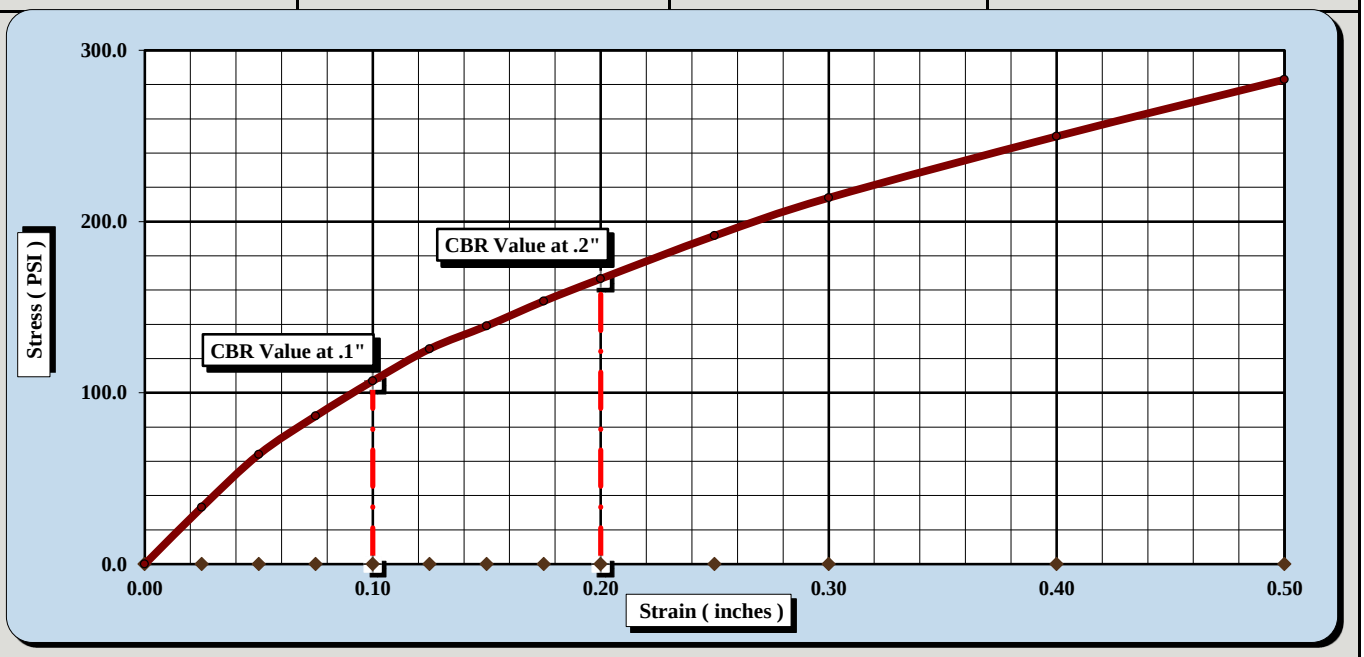
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/05/18
Project Name:	Carolina Crossroads Project	Test Date(s)	3/01 - 3/05/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-35	Sample #: BS-1	Sample Date: 1/25/2018
Location:	Pavement Boring	Type: Bulk	Depth: 0.8' - 10.8'
Sample Description:	Clayey Sand (SC, A-6(2))		

ASTM D 698 *Method C* Maximum Dry Density: 119.6 PCF Optimum Moisture Content: 12.6%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 10.7	CBR at 0.2 in. 11.1	CBR at 0.1 in. 10.7	CBR at 0.2 in. 11.1



CBR Sample Preparation:

The entire gradation was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	56		
Initial Dry Density (PCF)	119.6	Final Dry Density (PCF)	119.4
Moisture Content of the Compacted Specimen	12.6%	Moisture Content (top 1" after soaking)	15.8%
Percent Compaction	100.0%	Percent Swell	0.2%

Soak Time:	96 hrs.	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	51.0
Liquid Limit	43	Plastic Index	23	% Passing the #200 Sieve	40.6%

Notes/Deviations/References:

Brian Vaughan, P.E.		Group Leader	3/05/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

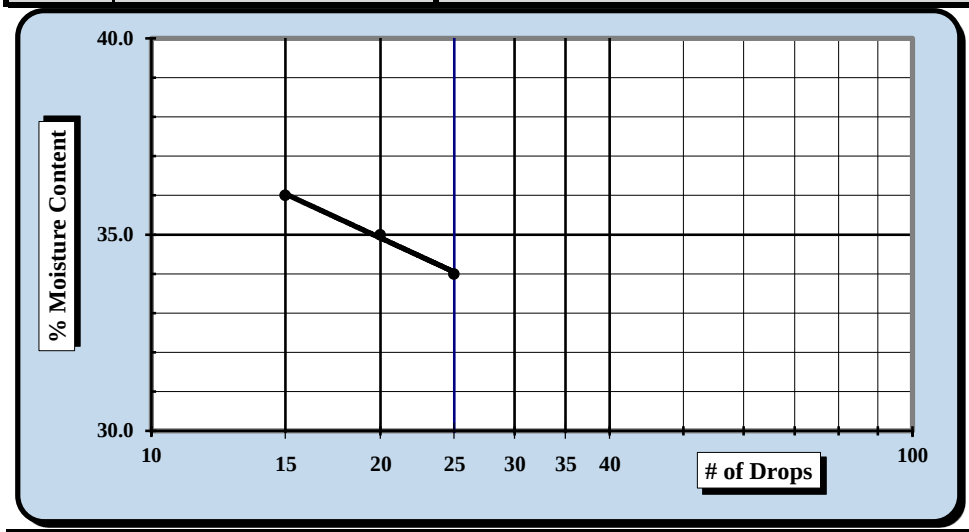
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/14-2/21/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-41	Sample #: BS-1	Sample Date: 1/24/2018
Location:	Pavement Boring	Offset: N/A	Depth: 2.0' - 10.0'
Sample Description:	Silty Sand (SM, A-2-4)		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28574	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

	Pan # 605	Liquid Limit						Plastic Limit		
	Tare #:	244	17	10				207	35	
A	Tare Weight	20.79	20.63	20.79				20.94	20.80	
B	Wet Soil Weight + A	32.72	29.51	30.57				27.65	27.17	
C	Dry Soil Weight + A	29.69	27.21	27.98				26.30	25.88	
D	Water Weight (B-C)	3.03	2.30	2.59				1.35	1.29	
E	Dry Soil Weight (C-A)	8.90	6.58	7.19				5.36	5.08	
F	% Moisture (D/E)*100	34.0%	35.0%	36.0%				25.2%	25.4%	
N	# OF DROPS	25	20	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**25.3%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**34**
Plastic Limit	**25**
Plastic Index	**9**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☑ Dry Preparation ☐ Air Dried ☐ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	4/25/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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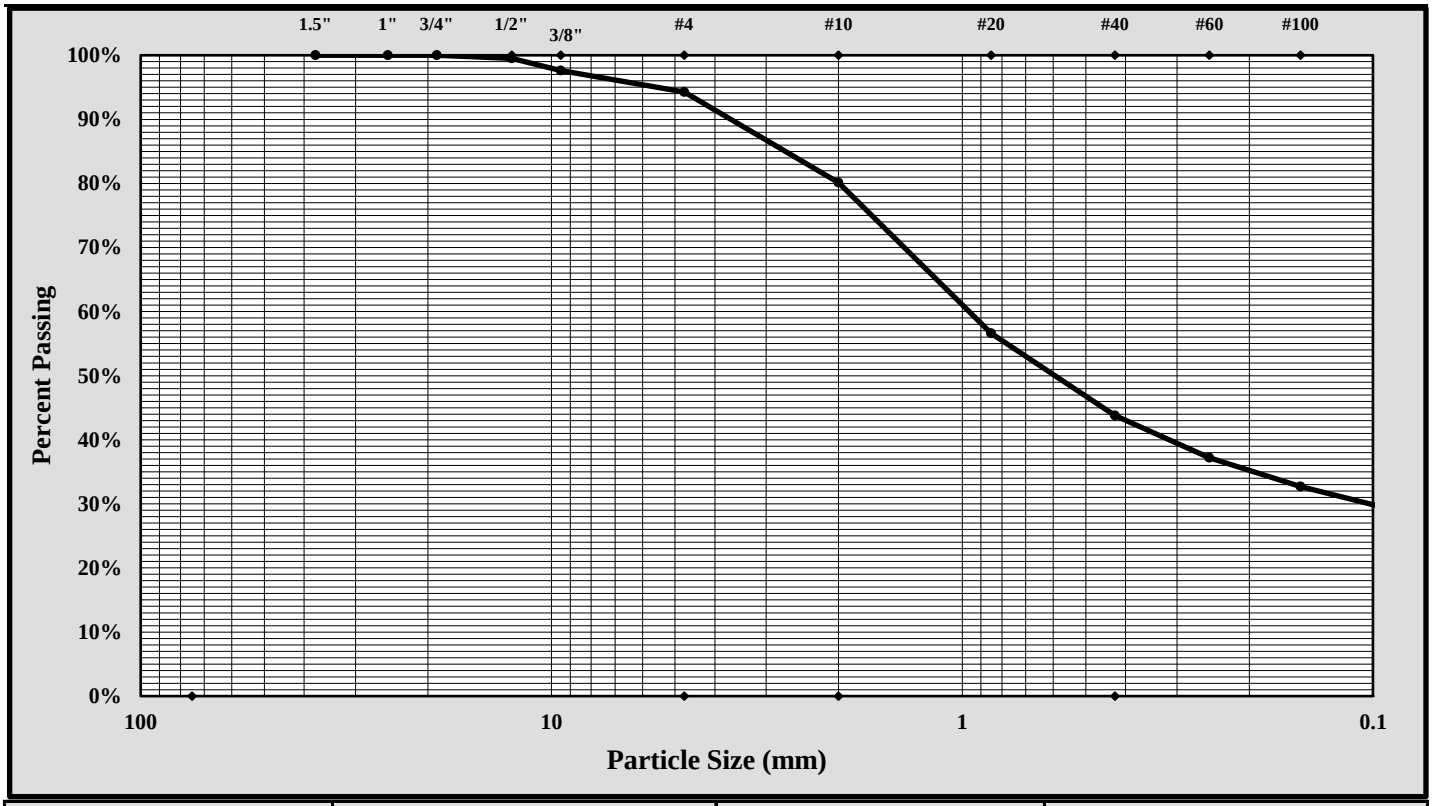
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/14-2/21/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-41	Sample #: BS-1	Sample Date:
Location:	Pavement Boring	Offset: N/A	Depth: 2.0' - 10.0'
Sample Description:	Silty Sand (SM, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	1/2-inch	Gravel:	5.7%
Silt & Clay (% Passing #200):	27.9%	Total Sand:	66.4%

Liquid Limit	34	Plastic Limit	25	Plastic Index	9
Coarse Sand:	14.2%	Medium Sand:	36.3%	Fine Sand:	15.9%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☒

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/25/2018 — *Date*

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Form No. TR-D698-2
Revision No. : 1
Revision Date: 07/25/17

MOISTURE - DENSITY REPORT

Quality Assurance

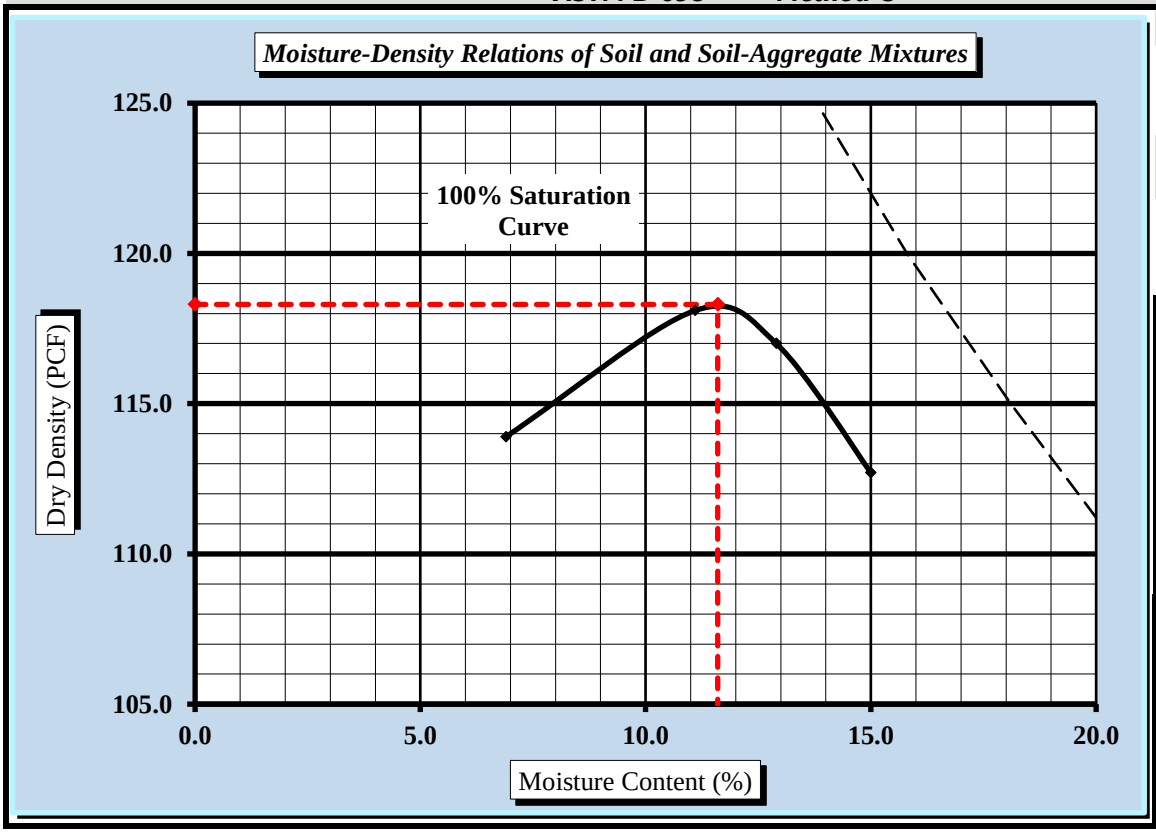
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/15/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/14-2/15/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-41	Sample #:	BS-1	Sample Date:	1/24/2018
Location:	Pavement Boring	Offset:	N/A	Depth:	2.0' - 10.0'
Sample Description:	Silty Sand (SM, A-2-4)				

Maximum Dry Density 118.3 PCF. Optimum Moisture Content 11.6%

ASTM D 698 - - Method C



Soil Properties

Natural Moisture Content	30.2%
Specific Gravity of Soil	TNP
Liquid Limit	34
Plastic Limit	25
Plastic Index	9

% Passing	
3/4"	100.0%
3/8"	97.6%
#4	94.3%
#10	80.1%
#40	43.8%
#60	37.2%
#200	27.9%

Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	0.0%
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☐ 3/8 inch Sieve ☐ 3/4 inch Sieve ☒

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations:

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/25/2018 — *Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

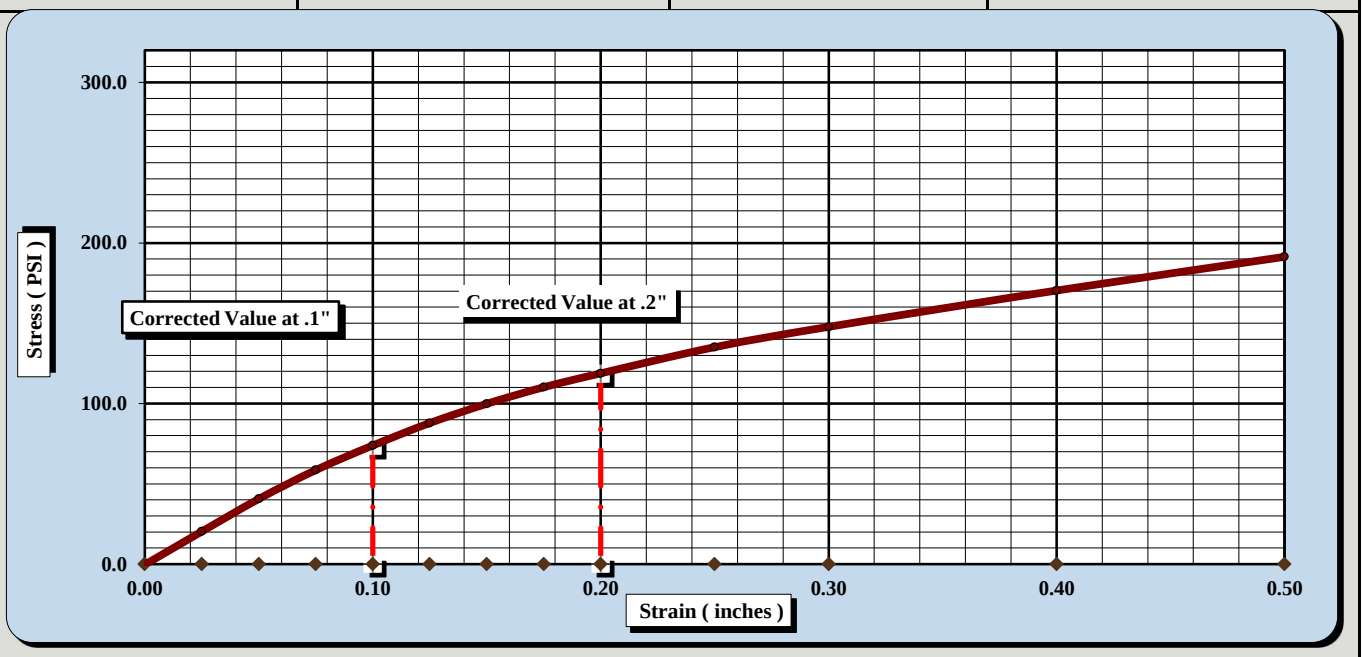
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/16-2/20/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-41	Sample #: BS-1	Sample Date: 1/24/2018
Location:	Pavement Boring	Offset: N/A	Depth: 2.0' -10.0'
Sample Description:	Silty Sand (SM, A-2-4)		

ASTM D 698 *Method C* Maximum Dry Density: 118.3 PCF — Optimum Moisture Content: 11.6%

Compaction Test performed on grading complying with CBR spec. — % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 7.4	CBR at 0.2 in. 7.9	CBR at 0.1 in. 7.4	CBR at 0.2 in. 7.9



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	15		
Initial Dry Density (PCF)	111.4	Final Dry Density (PCF)	111.1
Moisture Content of the Compacted Specimen	12.3%	Moisture Content (top 1" after soaking)	16.0%
Percent Compaction	94.1%	Percent Swell	0.2%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	34	Plastic Index	9	Apparent Relative Density	TNP

Notes/Deviations/References:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/5/2018 — *Date*

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CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

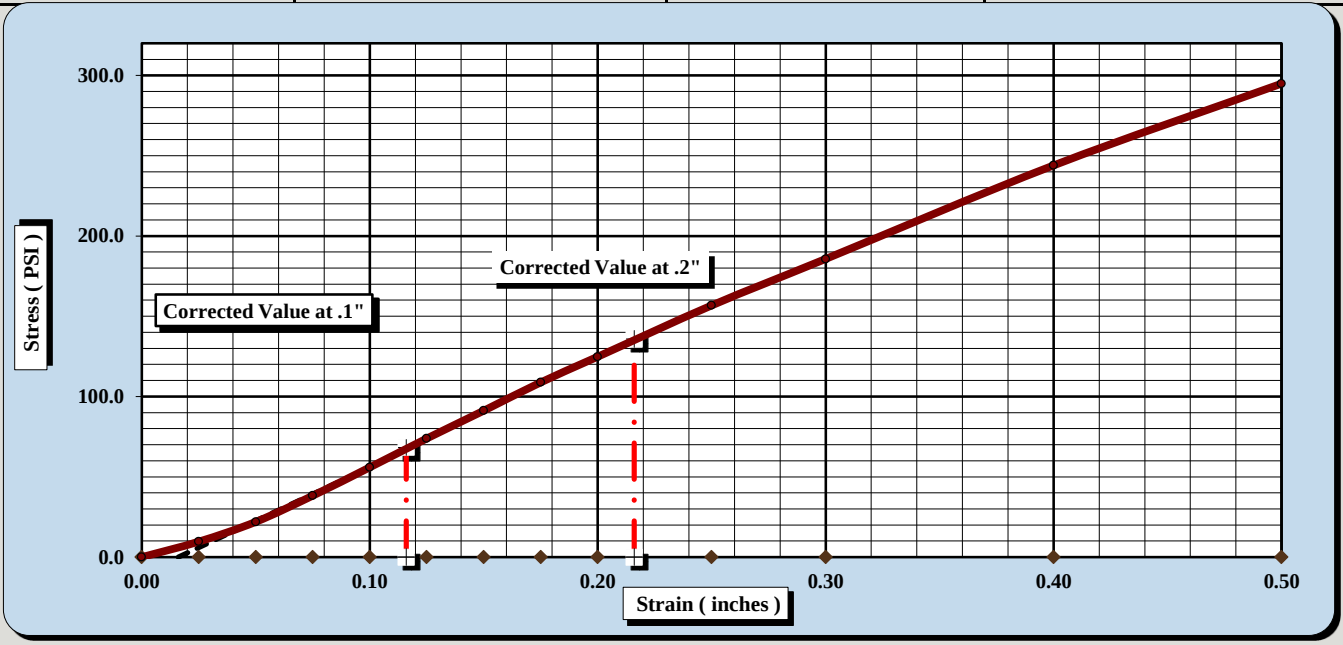
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/16-2/20/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-41	Sample #: BS-1	Sample Date: 1/24/2018
Location:	Pavement Boring	Offset: N/A	Depth: 2.0' - 10.0'
Sample Description:	Silty Sand (SM, A-2-4)		

ASTM D 698 *Method C* Maximum Dry Density: 118.3 PCF — Optimum Moisture Content: 11.6%

Compaction Test performed on grading complying with CBR spec. — % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 5.6	CBR at 0.2 in. 8.3	CBR at 0.1 in. 6.9	CBR at 0.2 in. 9.1



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	35		
Initial Dry Density (PCF)	117.5	Final Dry Density (PCF)	117.4
Moisture Content of the Compacted Specimen	11.9%	Moisture Content (top 1" after soaking)	14.8%
Percent Compaction	99.3%	Percent Swell	0.1%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	34	Plastic Index	9	Apparent Relative Density	TNP

Notes/Deviations/References:

Matthew F. Cooke, P.G.	Project Manager	4/5/2018
Technical Responsibility	*Position*	*Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

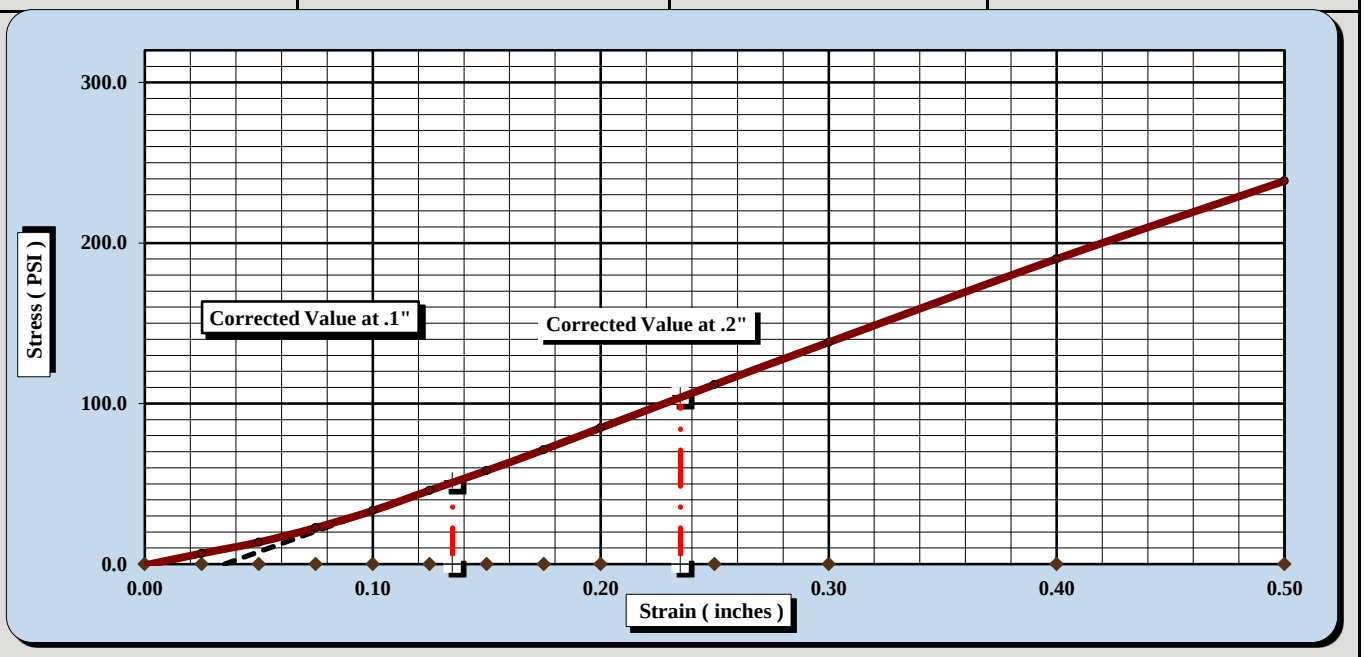
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/16-2/20/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-41	Sample #: BS-1	Sample Date: 1/24/2018
Location:	Pavement Boring	Offset: N/A	Depth: 2.0' - 10.0'
Sample Description:	Silty Sand (SM, A-2-4)		

ASTM D 698 *Method C* Maximum Dry Density: 118.3 PCF — Optimum Moisture Content: 11.6%

Compaction Test performed on grading complying with CBR spec. — % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 3.3	CBR at 0.2 in. 5.7	CBR at 0.1 in. 5.2	CBR at 0.2 in. 7.0



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	65		
Initial Dry Density (PCF)	118.3	Final Dry Density (PCF)	118.2
Moisture Content of the Compacted Specimen	12.2%	Moisture Content (top 1" after soaking)	13.9%
Percent Compaction	100.0%	Percent Swell	0.2%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	34	Plastic Index	9	Apparent Relative Density	TNP

Notes/Deviations/References:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/5/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

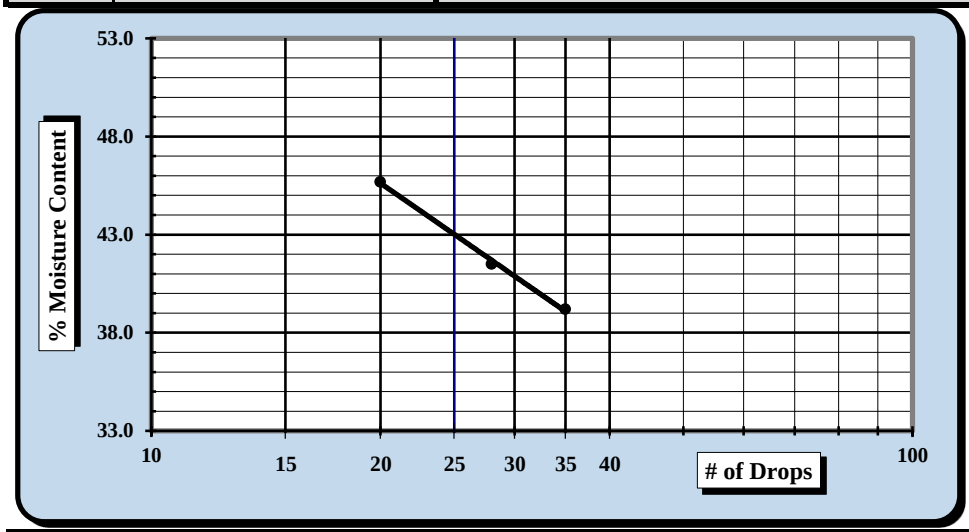
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	2/17/18
Project Name:	Carolina Crossroads Project	Test Date:	2/14/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-42	Sample #:	BS-1	Sample Date:	1/25/2018
Location:	Pavement Boring	Type:	Bulk	Depth:	0.8' - 10.8'
Sample Description:	Clayey Sand (SC, A-7-6(5))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	6	7	8				9	10	
A	Tare Weight	26.72	26.32	27.34				27.93	26.76	
B	Wet Soil Weight + A	44.74	47.39	48.78				35.66	34.36	
C	Dry Soil Weight + A	39.67	41.21	42.06				34.38	33.13	
D	Water Weight (B-C)	5.07	6.18	6.72				1.28	1.23	
E	Dry Soil Weight (C-A)	12.95	14.89	14.72				6.45	6.37	
F	% Moisture (D/E)*100	39.2%	41.5%	45.7%				19.8%	19.3%	
N	# OF DROPS	35	28	20				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**19.6%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**43**
Plastic Limit	**20**
Plastic Index	**23**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 40.6%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	2/17/18	Brian Vaughn	2/17/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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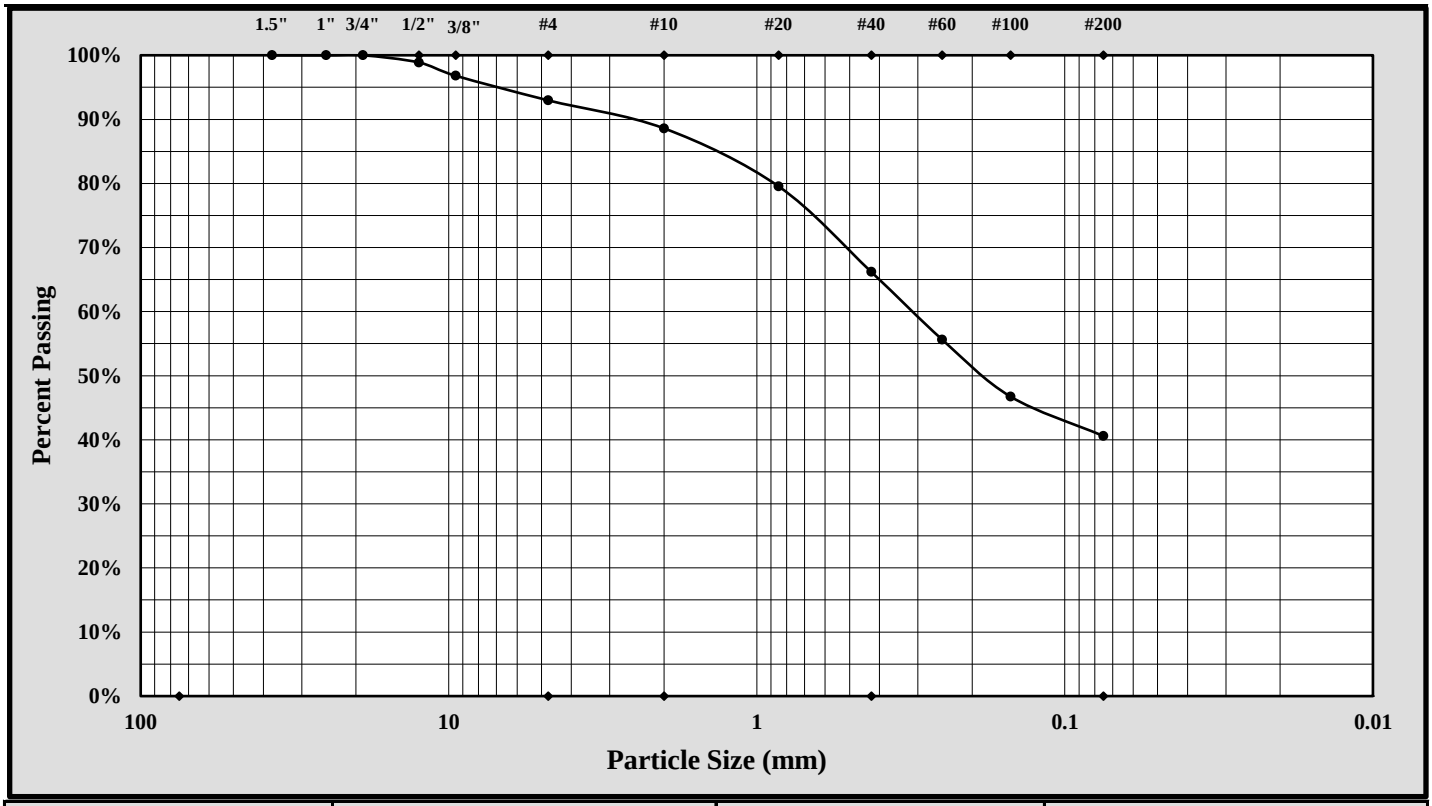
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	2/17/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/13 - 2/15/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-42	Sample #: BS-1	Sample Date: 1/25/2018
Location:	Pavement Boring	Type: Bulk	Depth: 0.8' - 10.8'
Sample Description:	Clayey Sand (SC, A-7-6(5))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	19.00 mm	Gravel:	7.0%
Silt & Clay (% Passing #200):	40.6%	Total Sand:	52.4%

Liquid Limit	43	Plastic Limit	20	Plastic Index	23
Coarse Sand:	4.4%	Medium Sand:	22.4%	Fine Sand:	25.6%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	2/17/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D698-2
Revision No. : 1
Revision Date: 07/25/17

MOISTURE - DENSITY REPORT

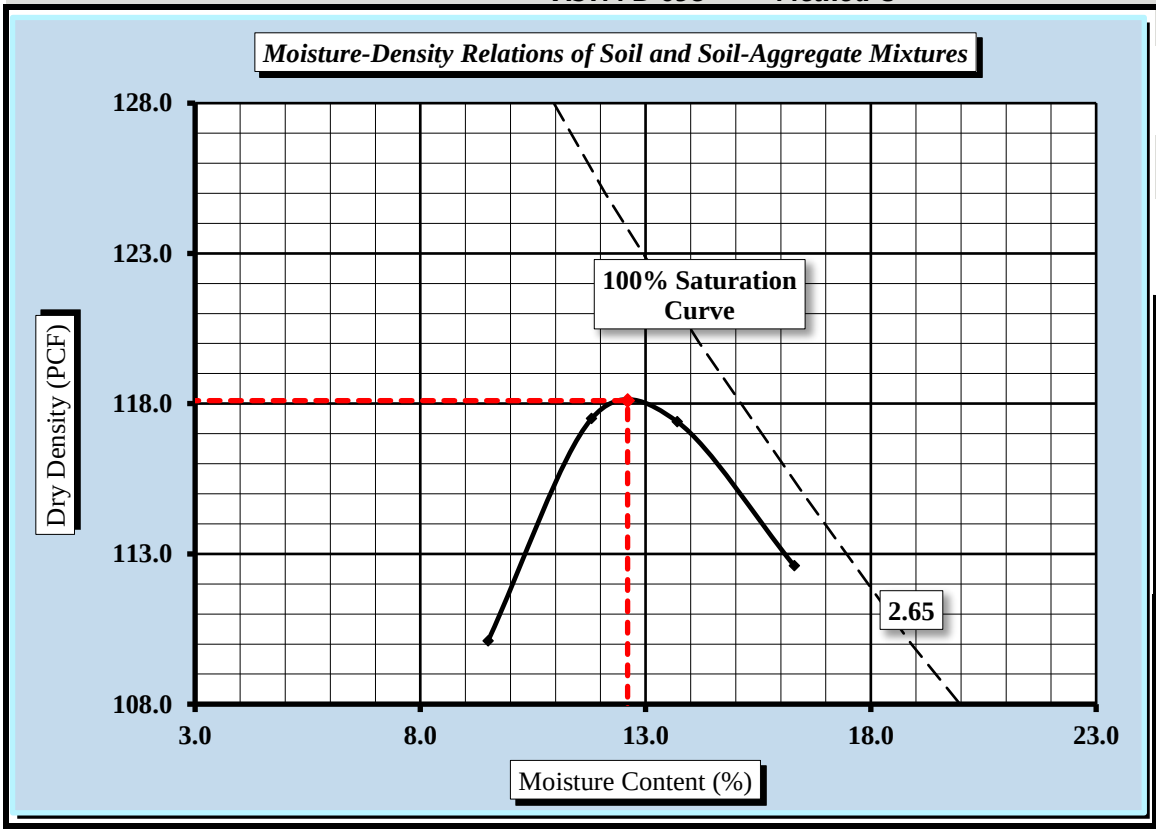
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	2/17/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/11/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-42	Sample #:	BS-1	Sample Date:	1/25/18
Location:	Pavement Boring	Type:	Bulk	Depth:	0.8' - 10.8'
Sample Description:	Clayey Sand (SC, A-7-6(5))				

Maximum Dry Density 118.1 PCF. Optimum Moisture Content 12.6%

ASTM D 698 - - Method C



Soil Properties	
Natural Moisture Content	15.6%
Specific Gravity of Soil	2.650
Liquid Limit	43
Plastic Limit	20
Plastic Index	23
% Passing	
3/4"	100.0%
3/8"	96.8%
#4	93.0%
#10	88.6%
#40	66.2%
#60	55.6%
#100	46.7%
#200	40.6%
Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☐ 3/8 inch Sieve ☐ 3/4 inch Sieve ☒

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations:

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	2/17/18
Technical Responsibility	*Signature*	*Position*	*Date*

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CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	2/17/18
Project Name:	Carolina Crossroads Project	Test Date(s)	2/12 - 2/16/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

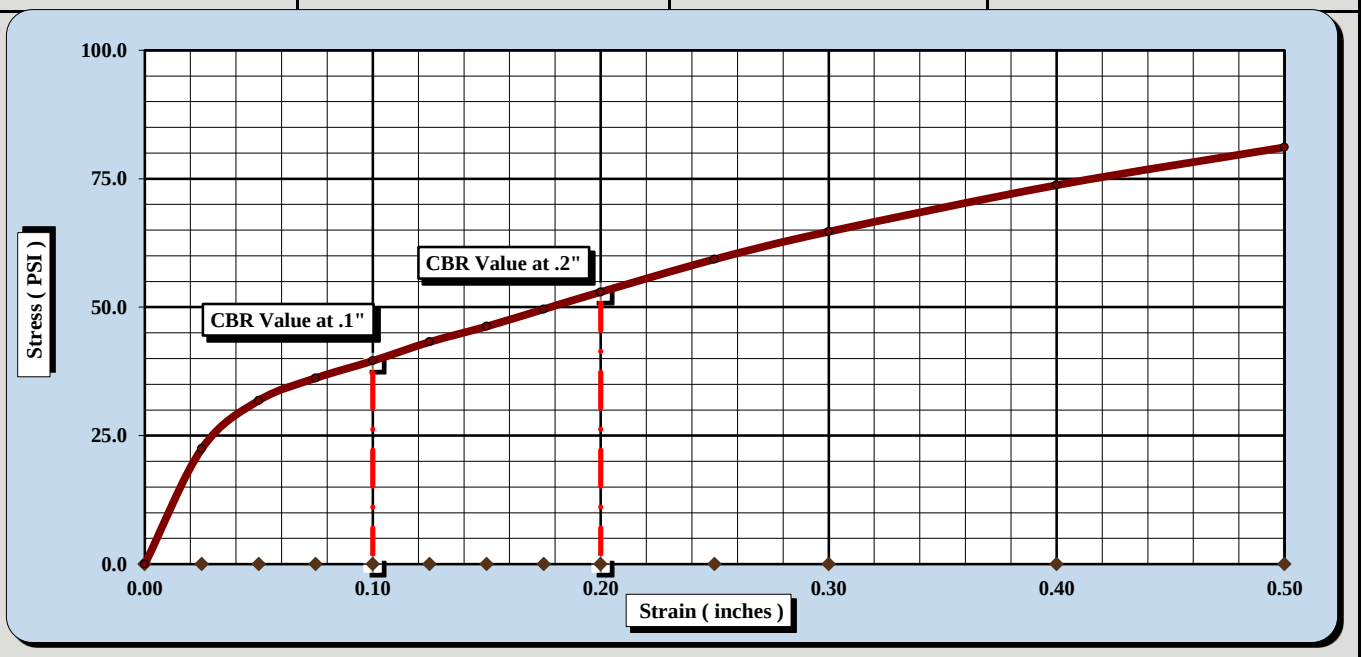
Boring #:	P-42	Sample #:	BS-1	Sample Date:	1/25/2018
Location:	Pavement Boring	Type:	Bulk	Depth:	0.8' - 10.8'

Sample Description: Clayey Sand (SC, A-7-6(5))

ASTM D 698 *Method C* Maximum Dry Density: 118.1 PCF Optimum Moisture Content: 12.6%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 4.0	CBR at 0.2 in. 3.5	CBR at 0.1 in. 4.0	CBR at 0.2 in. 3.5



CBR Sample Preparation:

The entire gradation was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	15		
Initial Dry Density (PCF)	106.3	Final Dry Density (PCF)	106.1
Moisture Content of the Compacted Specimen	12.6%	Moisture Content (top 1" after soaking)	18.6%
Percent Compaction	90.0%	Percent Swell	0.2%

Soak Time:	96 hrs.	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	43	Plastic Index	23	% Passing the #200 Sieve	40.6%

Notes/Deviations/References:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	2/17/18
Technical Responsibility	*Signature*	*Position*	*Date*

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CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	2/17/18
Project Name:	Carolina Crossroads Project	Test Date(s)	2/12 - 2/16/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

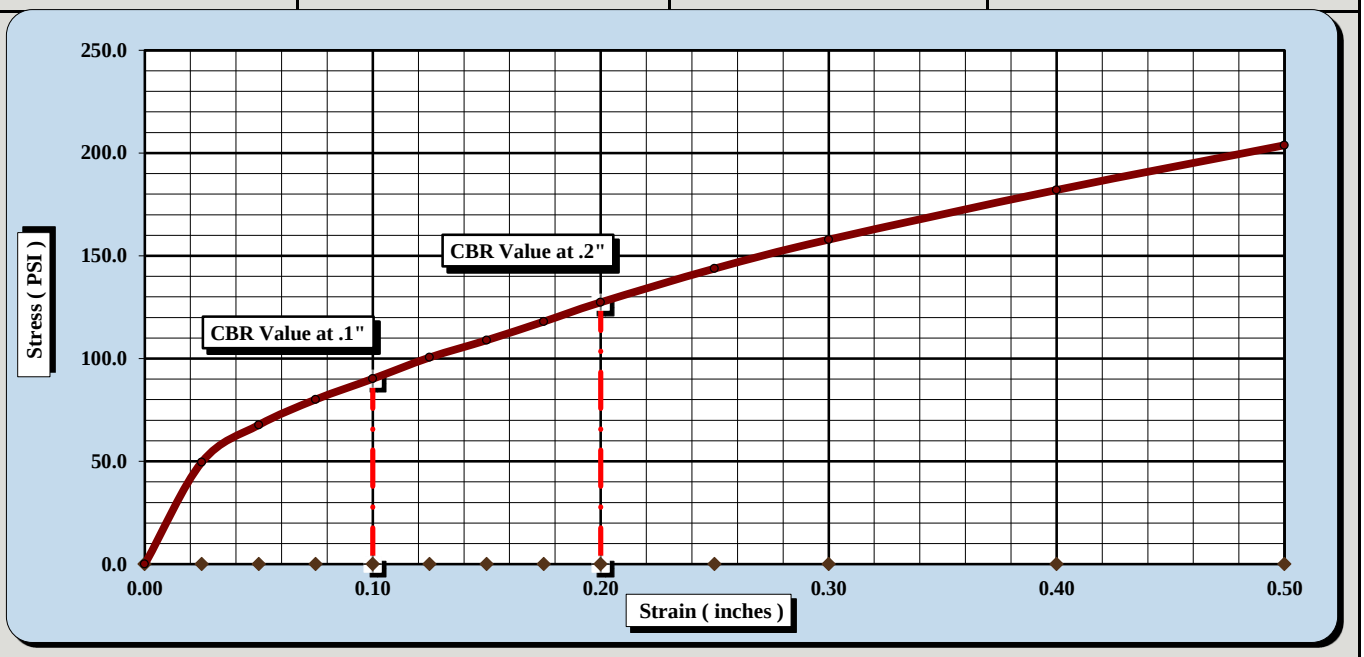
Boring #:	P-42	Sample #:	BS-1	Sample Date:	1/25/2018
Location:	Pavement Boring	Type:	Bulk	Depth:	0.8' - 10.8'

Sample Description: Clayey Sand (SC, A-7-6(5))

ASTM D 698 *Method C* Maximum Dry Density: 118.1 PCF Optimum Moisture Content: 12.6%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 9.0	CBR at 0.2 in. 8.5	CBR at 0.1 in. 9.0	CBR at 0.2 in. 8.5



CBR Sample Preparation:

The entire gradation was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	25		
Initial Dry Density (PCF)	112.2	Final Dry Density (PCF)	112.1
Moisture Content of the Compacted Specimen	12.6%	Moisture Content (top 1" after soaking)	15.9%
Percent Compaction	95.0%	Percent Swell	0.1%

Soak Time:	96 hrs.	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	43	Plastic Index	23	% Passing the #200 Sieve	40.6%

Notes/Deviations/References:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	2/17/18
Technical Responsibility	*Signature*	*Position*	*Date*

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CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	2/17/18
Project Name:	Carolina Crossroads Project	Test Date(s)	2/12 - 2/16/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

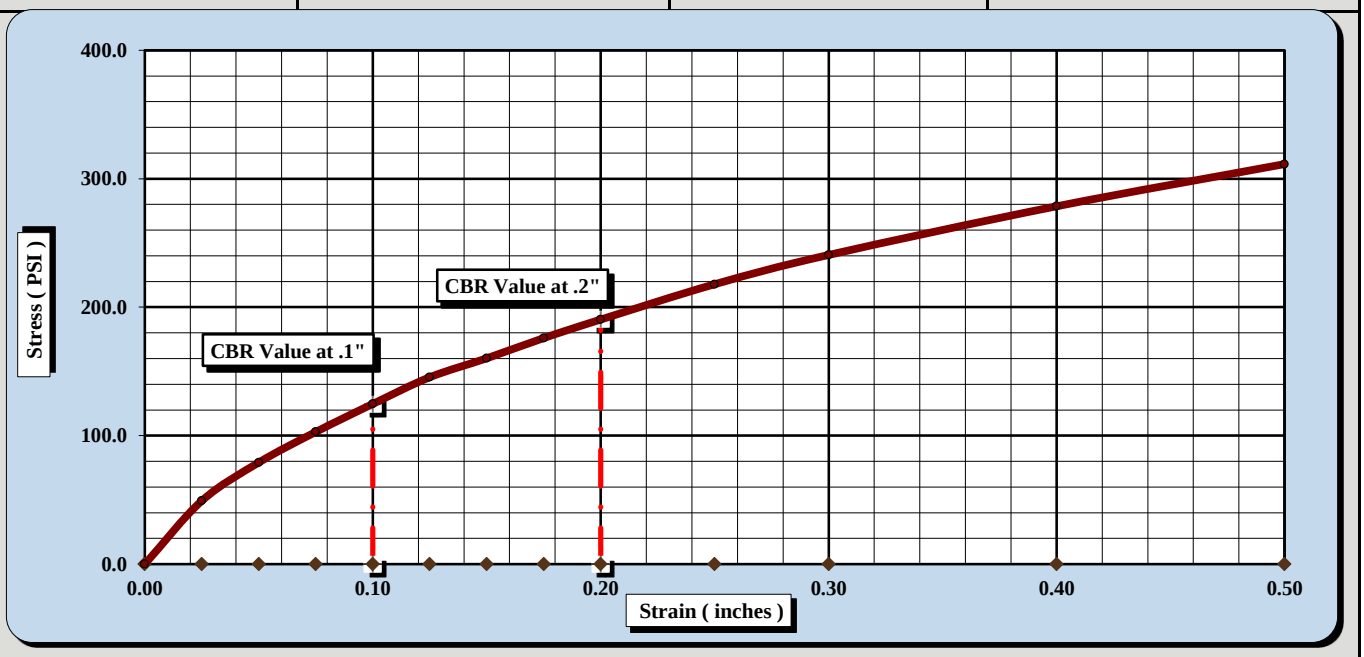
Boring #:	P-42	Sample #:	BS-1	Sample Date:	1/25/2018
Location:	Pavement Boring	Type:	Bulk	Depth:	0.8' - 10.8'

Sample Description: Clayey Sand (SC, A-7-6(5))

ASTM D 698 *Method C* Maximum Dry Density: 118.1 PCF Optimum Moisture Content: 12.6%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 12.5	CBR at 0.2 in. 12.7	CBR at 0.1 in. 12.5	CBR at 0.2 in. 12.7



CBR Sample Preparation:

The entire gradation was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	50		
Initial Dry Density (PCF)	118.1	Final Dry Density (PCF)	118.0
Moisture Content of the Compacted Specimen	12.6%	Moisture Content (top 1" after soaking)	11.5%
Percent Compaction	100.0%	Percent Swell	0.1%

Soak Time:	96 hrs.	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	51.0
Liquid Limit	43	Plastic Index	23	% Passing the #200 Sieve	40.6%

Notes/Deviations/References:

Brian Vaughan, P.E.		Group Leader	2/17/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

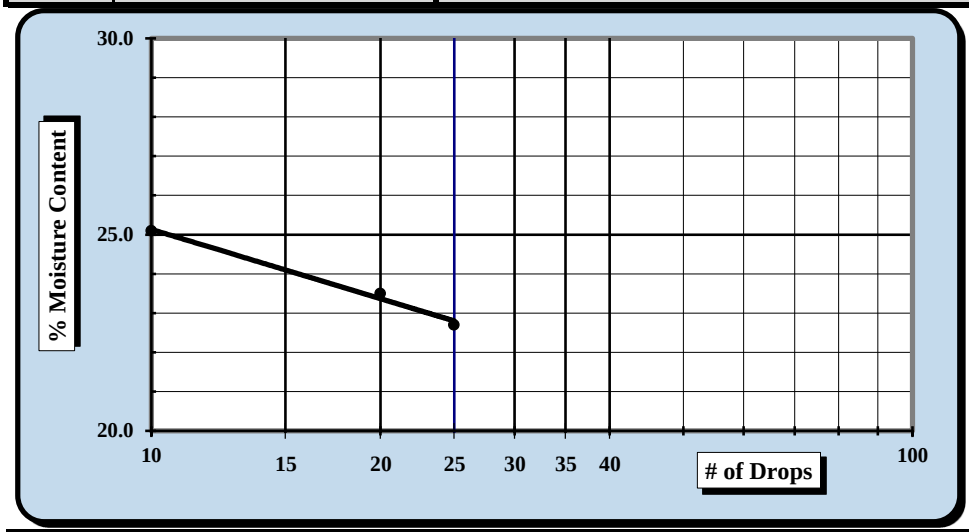
ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/9/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	1/30-2/8/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-43	Sample #: BS-1	Sample Date: 1/24/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.5' - 10.5'
Sample Description:	Clayey Sand (SC, A-6(1))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28573	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

Pan # 3		Liquid Limit						Plastic Limit		
	Tare #:	24	116	209				244	43	
A	Tare Weight	20.76	20.56	21.07				20.77	20.83	
B	Wet Soil Weight + A	33.75	32.23	33.49				27.80	28.86	
C	Dry Soil Weight + A	31.35	30.01	31.00				27.05	27.96	
D	Water Weight (B-C)	2.40	2.22	2.49				0.75	0.90	
E	Dry Soil Weight (C-A)	10.59	9.45	9.93				6.28	7.13	
F	% Moisture (D/E)*100	22.7%	23.5%	25.1%				11.9%	12.6%	
N	# OF DROPS	25	20	10				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**12.3%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**23**
Plastic Limit	**12**
Plastic Index	**11**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☑ Dry Preparation ☐ Air Dried ☐ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	4/25/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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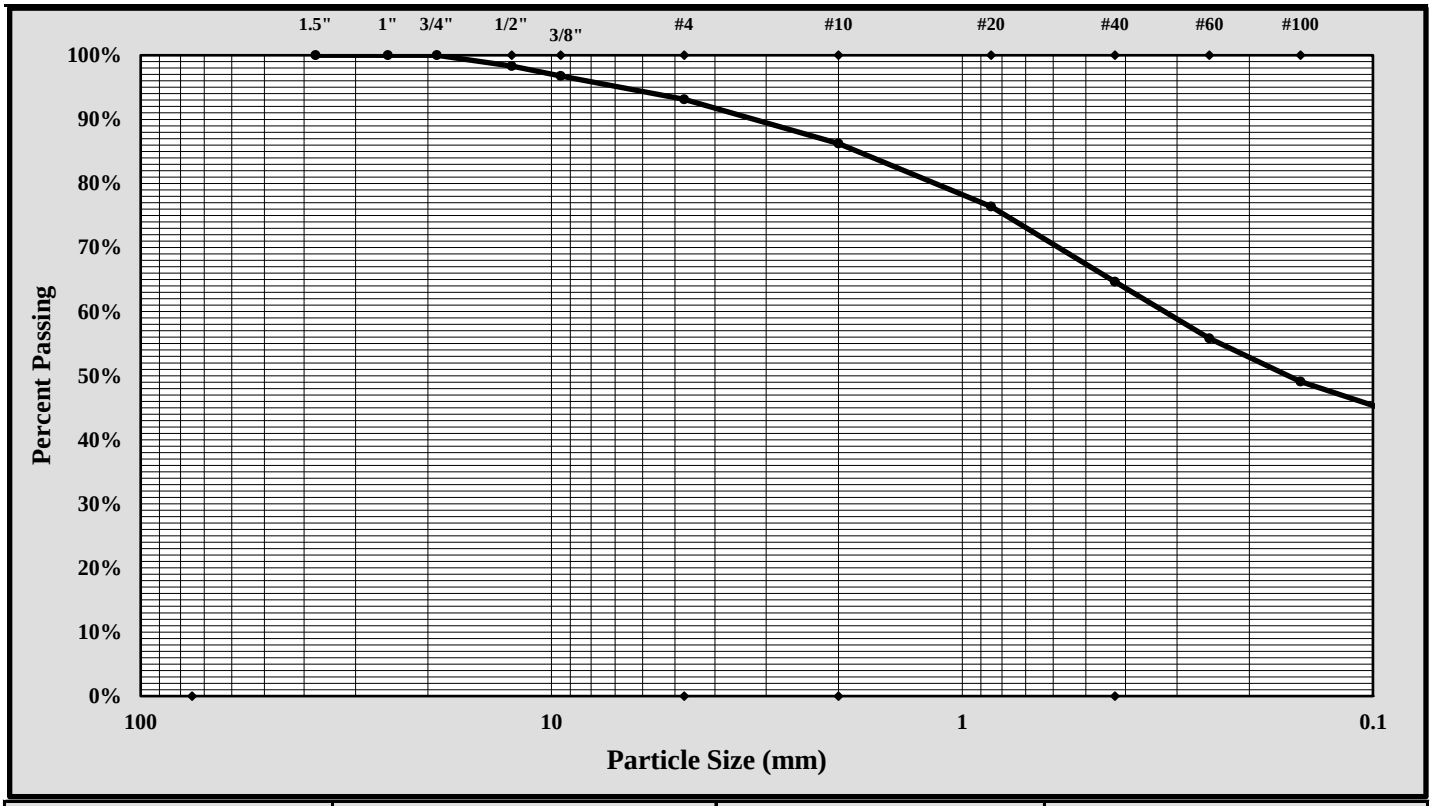
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/9/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	1/30-2/2/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-43 Sample #: BS-1	Sample Date:	1/23-1/24/2018
Location:	Pavement Boring Offset: N/A	Depth:	0.5' - 10.5'
Sample Description:	Clayey Sand (SC, A-6(1))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	1/2-inch	Gravel:	6.9%
Silt & Clay (% Passing #200):	42.7%	Total Sand:	50.4%

Liquid Limit	23	Plastic Limit	12	Plastic Index	11
Coarse Sand:	6.9%	Medium Sand:	21.6%	Fine Sand:	21.9%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/25/2018 — *Date*

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Form No. TR-D698-2
Revision No. : 1
Revision Date: 07/25/17

MOISTURE - DENSITY REPORT

Quality Assurance

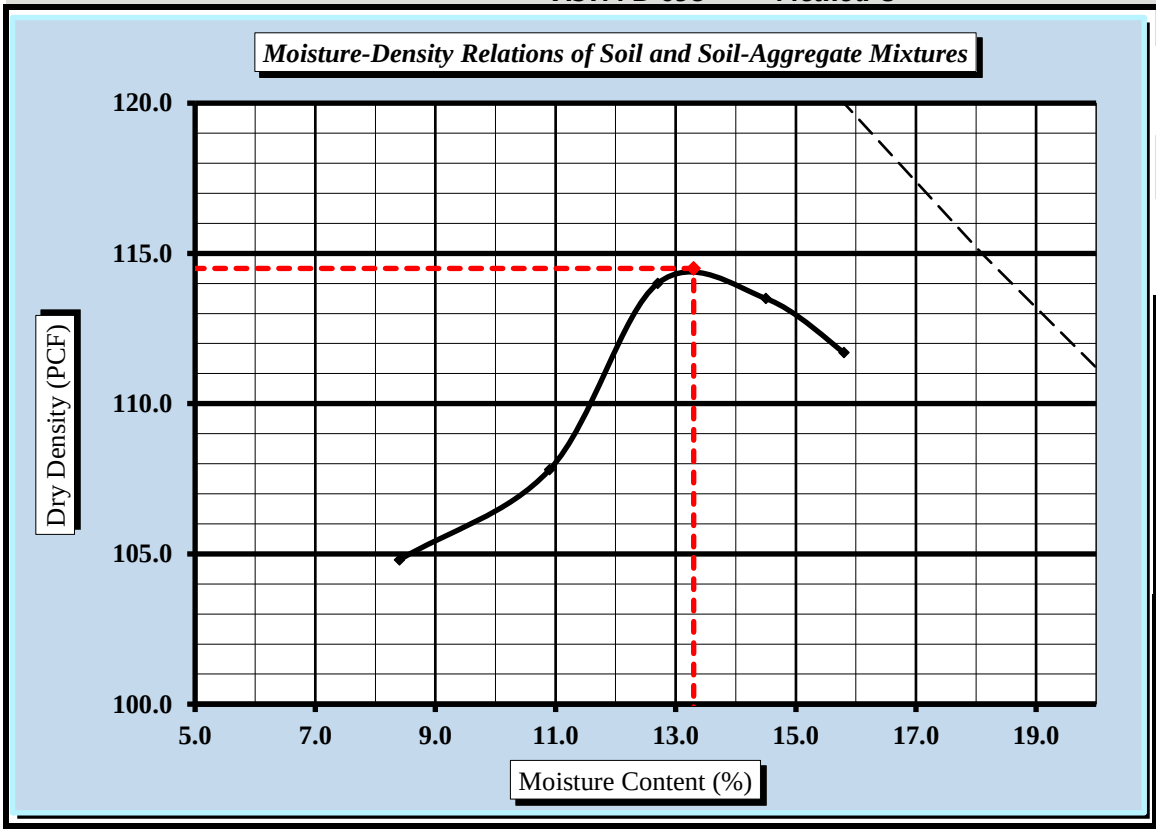
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/13/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	1/31-2/2/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-43	Sample #:	BS-1	Sample Date:	1/24/2018
Location:	Pavement Boring	Offset:	N/A	Depth:	0.5' - 10.5'
Sample Description:	Clayey Sand (SC, A-6(1))				

Maximum Dry Density 114.5 PCF. Optimum Moisture Content 13.3%

ASTM D 698 - - Method C



Soil Properties

Natural Moisture Content	19.6%
Specific Gravity of Soil	TNP
Liquid Limit	23
Plastic Limit	12
Plastic Index	11

% Passing	
3/4"	100.0%
3/8"	96.7%
#4	93.1%
#10	86.2%
#40	64.7%
#60	55.8%
#200	42.7%

Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	0.0%
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☐ 3/8 inch Sieve ☐ 3/4 inch Sieve ☒

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations:

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/25/2018 — *Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

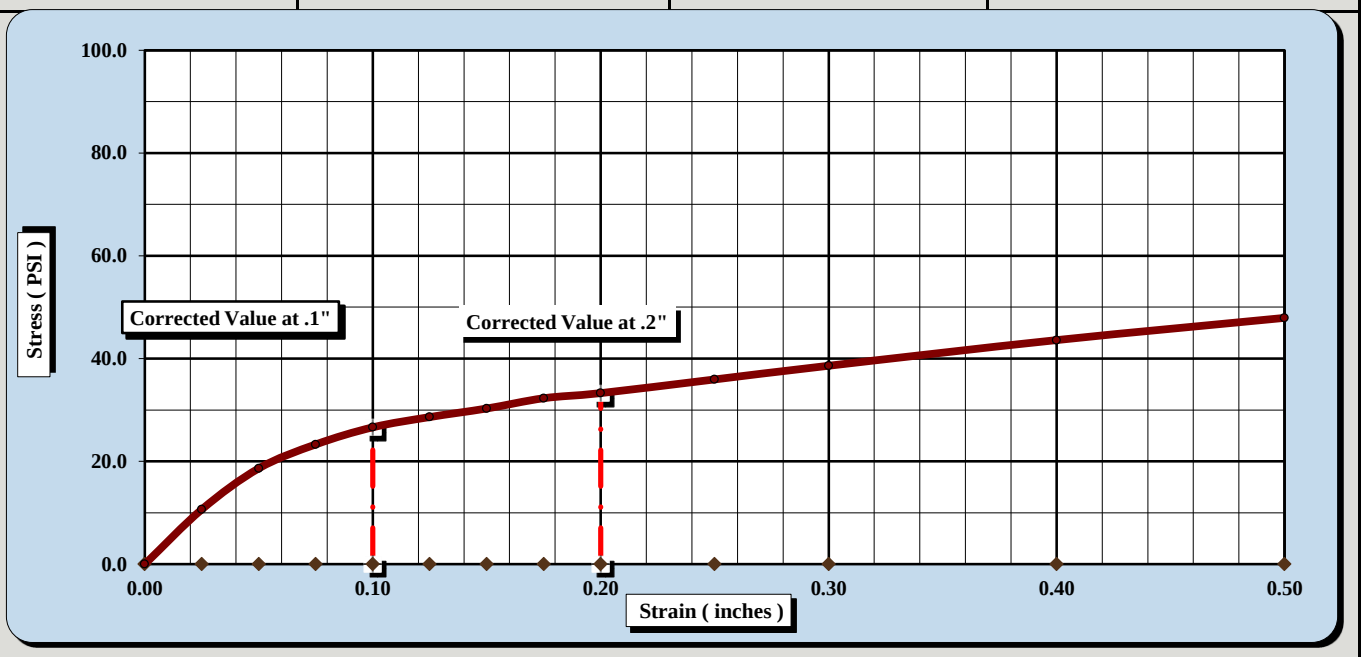
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/13/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/8-2/12/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-43	Sample #: BS-1	Sample Date: 1/24/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.5' - 10.5'
Sample Description:	Clayey Sand (SC, A-6(1))		

ASTM D 698 *Method C* Maximum Dry Density: 114.5 PCF Optimum Moisture Content: 13.3%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 2.7	CBR at 0.2 in. 2.2	CBR at 0.1 in. 2.7	CBR at 0.2 in. 2.2



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	15		
Initial Dry Density (PCF)	103.8	Final Dry Density (PCF)	103.1
Moisture Content of the Compacted Specimen	12.9%	Moisture Content (top 1" after soaking)	18.9%
Percent Compaction	90.6%	Percent Swell	0.6%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	23	Plastic Index	11	Apparent Relative Density	TNP

Notes/Deviations/References:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/5/2018 — *Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

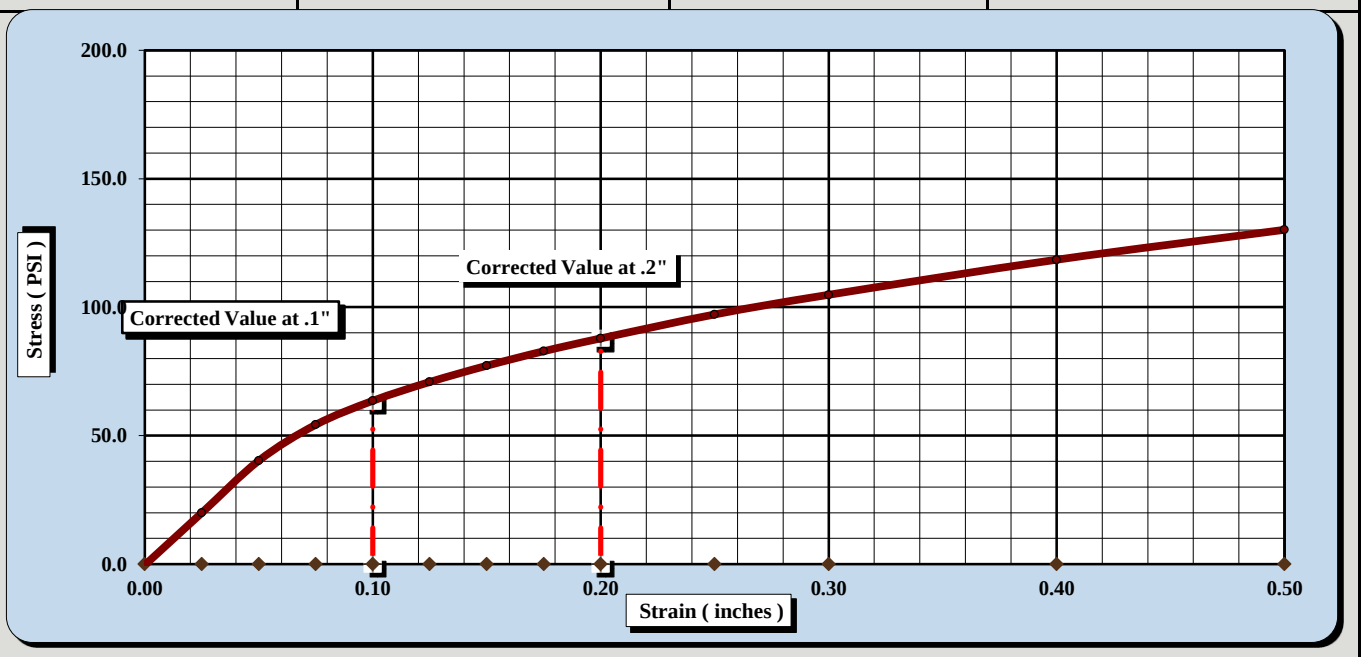
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/13/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/8-2/12/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-43	Sample #: BS-1	Sample Date: 1/24/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.5' - 10.5'
Sample Description:	Clayey Sand (SC, A-6(1))		

ASTM D 698 *Method C* Maximum Dry Density: 114.5 PCF Optimum Moisture Content: 13.3%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 6.4	CBR at 0.2 in. 5.9	CBR at 0.1 in. 6.4	CBR at 0.2 in. 5.9



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	35		
Initial Dry Density (PCF)	109.2	Final Dry Density (PCF)	108.1
Moisture Content of the Compacted Specimen	12.7%	Moisture Content (top 1" after soaking)	18.2%
Percent Compaction	95.4%	Percent Swell	1.0%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	23	Plastic Index	11	Apparent Relative Density	TNP

Notes/Deviations/References:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/5/2018 — *Date*

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CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

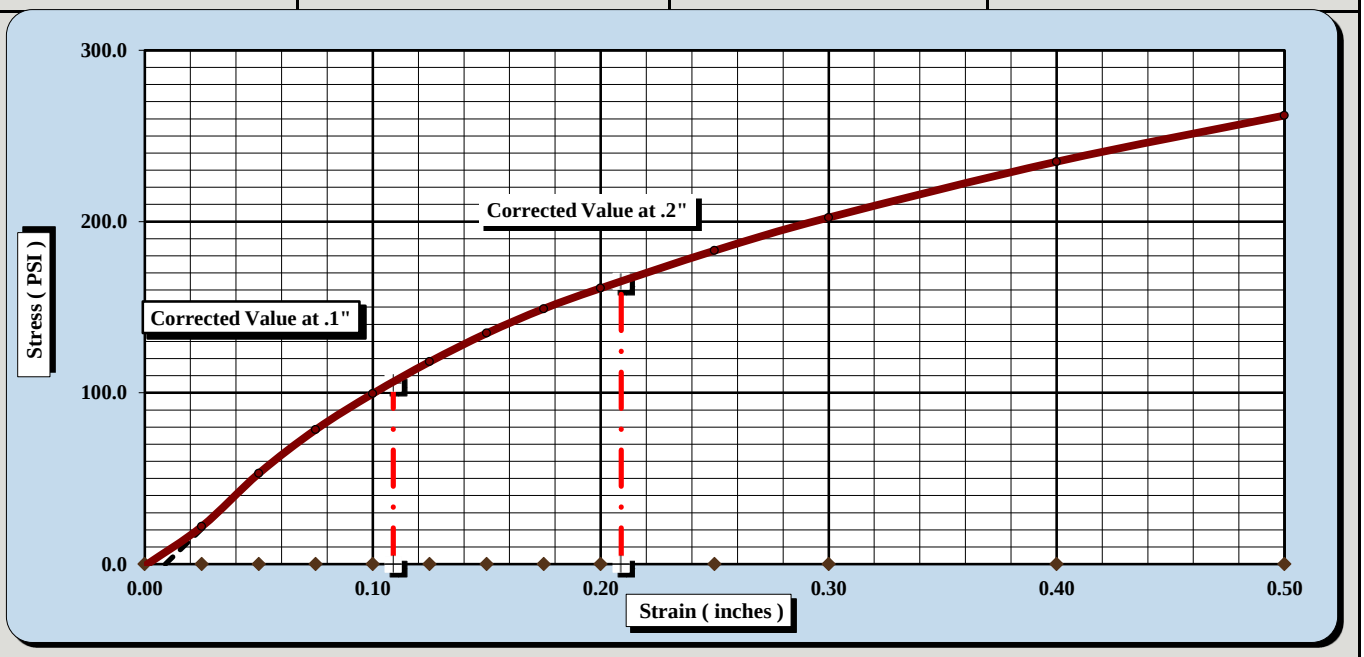
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/13/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/8-2/12/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-43	Sample #: BS-1	Sample Date: 1/21/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.5' - 10.5'
Sample Description:	Clayey Sand (SC, A-6(1))		

ASTM D 698 *Method C* Maximum Dry Density: 114.5 PCF Optimum Moisture Content: 13.3%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 10.0	CBR at 0.2 in. 10.7	CBR at 0.1 in. 10.6	CBR at 0.2 in. 11.0



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	65		
Initial Dry Density (PCF)	115.6	Final Dry Density (PCF)	115.1
Moisture Content of the Compacted Specimen	13.5%	Moisture Content (top 1" after soaking)	15.7%
Percent Compaction	101.0%	Percent Swell	0.4%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	23	Plastic Index	11	Apparent Relative Density	TNP

Notes/Deviations/References:

Matthew F. Cooke, P.G.	Project Manager	4/5/2018
Technical Responsibility	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

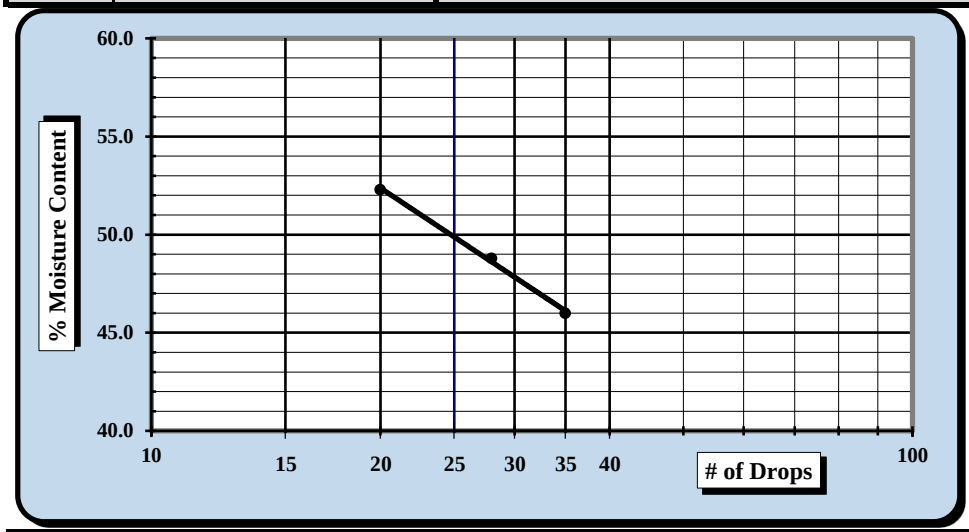
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/09/18
Project Name:	Carolina Crossroads Project	Test Date:	3/08/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-44	Sample #:	BS-1	Sample Date:	2/13/2018
Location:	Pavement Boring	Type:	Bulk	Depth:	1.1' - 11.1'
Sample Description:	Sandy Fat Clay (A-7-6 (17))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	31	32	33				34	35	
A	Tare Weight	28.63	27.68	26.68				28.27	26.96	
B	Wet Soil Weight + A	44.79	43.42	39.75				35.75	33.78	
C	Dry Soil Weight + A	39.70	38.26	35.26				34.33	32.51	
D	Water Weight (B-C)	5.09	5.16	4.49				1.42	1.27	
E	Dry Soil Weight (C-A)	11.07	10.58	8.58				6.06	5.55	
F	% Moisture (D/E)*100	46.0%	48.8%	52.3%				23.4%	22.9%	
N	# OF DROPS	35	28	20				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**23.2%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**50**
Plastic Limit	**23**
Plastic Index	**27**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 66.6%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	3/09/18	Brian Vaughn	3/09/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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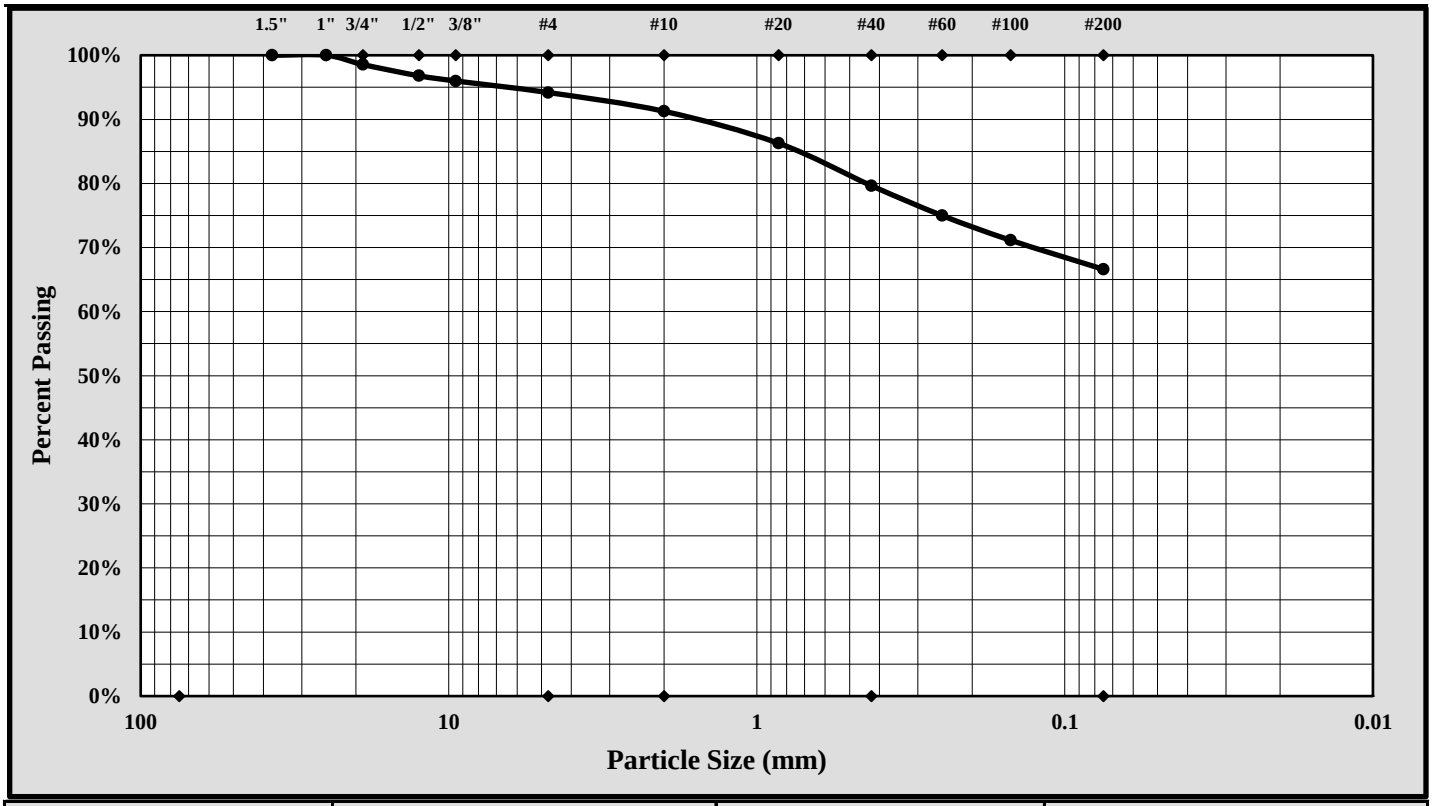
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/09/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/05 - 3/09/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-44	Sample #: BS-1	Sample Date: 2/13/2018
Location:	Pavement Boring	Type: Bulk	Depth: 1.1' - 11.1'
Sample Description:	Sandy Fat Clay (CH, A-7-6(17))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	25.0 mm	Gravel:	5.8%
Silt & Clay (% Passing #200):	66.6%	Total Sand:	27.6%

Liquid Limit	50	Plastic Limit	23	Plastic Index	27
Coarse Sand:	2.9%	Medium Sand:	11.6%	Fine Sand:	13.1%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/09/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D698-2
Revision No. : 1
Revision Date: 07/25/17

MOISTURE - DENSITY REPORT

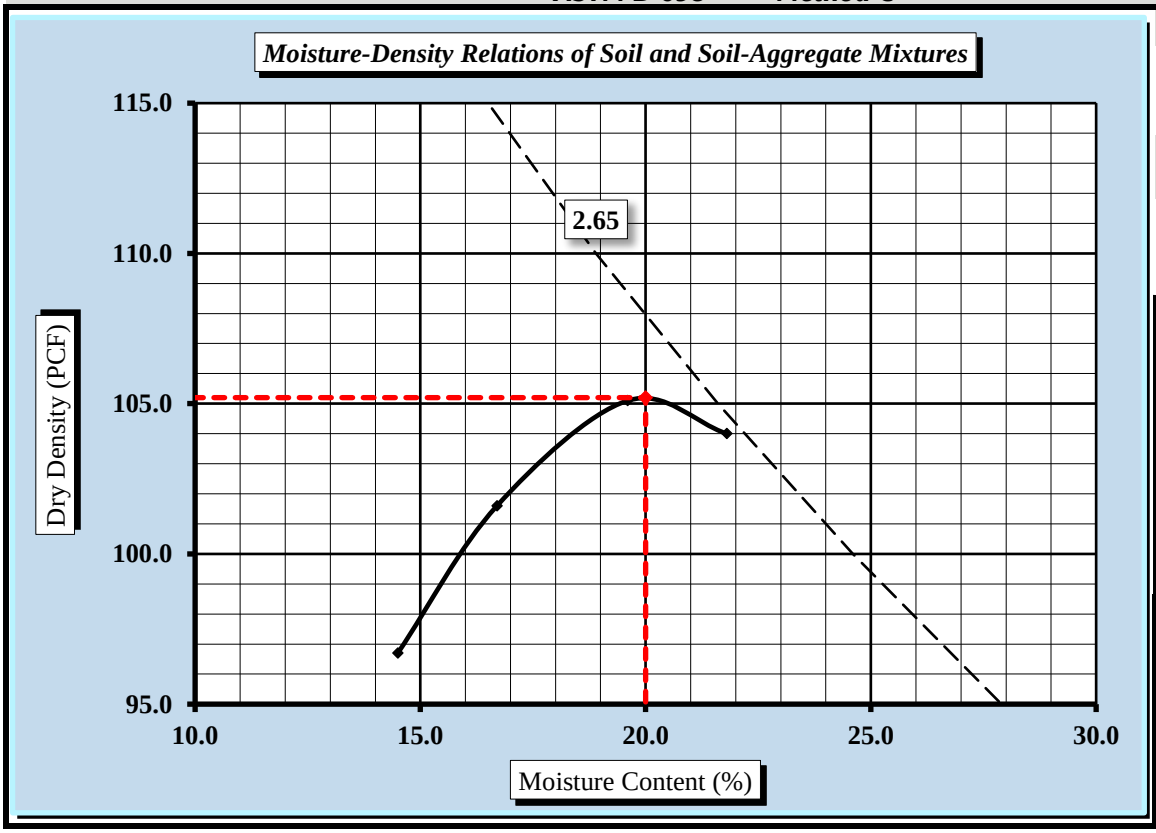
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/09/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/01/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-44	Sample #:	BS-1	Sample Date:	2/13/18
Location:	Pavement Boring	Type:	Bulk	Depth:	1.1' - 11.1'
Sample Description:	Sandy Fat Clay (CH, A-7-6(17))				

Maximum Dry Density 105.2 PCF. Optimum Moisture Content 20.0%

ASTM D 698 - - Method C



Soil Properties	
Natural Moisture Content	25.9%
Specific Gravity of Soil	2.650
Liquid Limit	50
Plastic Limit	23
Plastic Index	27
% Passing	
3/4"	98.6%
3/8"	96.0%
#4	94.2%
#10	91.3%
#40	79.7%
#60	75.0%
#100	71.1%
#200	66.6%
Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☐ 3/8 inch Sieve ☐ 3/4 inch Sieve ☒

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations:

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Brian Vaughan, P.E.		Group Leader	3/09/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/09/18
Project Name:	Carolina Crossroads Project	Test Date(s)	3/02 - 3/06/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

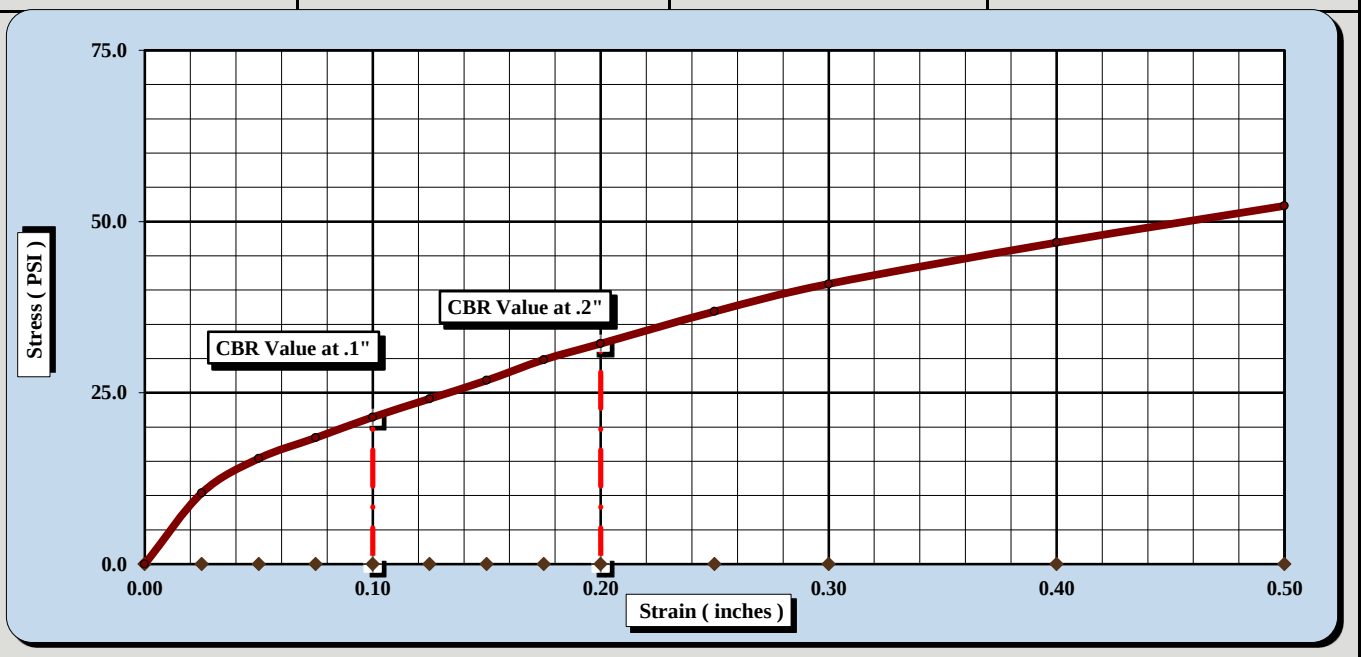
Boring #:	P-44	Sample #:	BS-1	Sample Date:	2/13/2018
Location:	Pavement Boring	Type:	Bulk	Depth:	1.1' - 11.1'

Sample Description: Sandy Fat Clay (CH, A-7-6(17))

ASTM D 698 *Method C* Maximum Dry Density: 105.2 PCF Optimum Moisture Content: 20.0%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 1.4%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 2.1	CBR at 0.2 in. 2.1	CBR at 0.1 in. 2.2	CBR at 0.2 in. 2.1



CBR Sample Preparation:

The entire gradation was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	20		
Initial Dry Density (PCF)	94.7	Final Dry Density (PCF)	92.9
Moisture Content of the Compacted Specimen	20.0%	Moisture Content (top 1" after soaking)	32.4%
Percent Compaction	90.0%	Percent Swell	1.9%

Soak Time:	96 hrs.	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	50	Plastic Index	27	% Passing the #200 Sieve	66.6%

Notes/Deviations/References:

Brian Vaughan, P.E.		Group Leader	3/09/18
Technical Responsibility	*Signature*	*Position*	*Date*

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CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/06/18
Project Name:	Carolina Crossroads Project	Test Date(s)	3/02 - 3/06/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

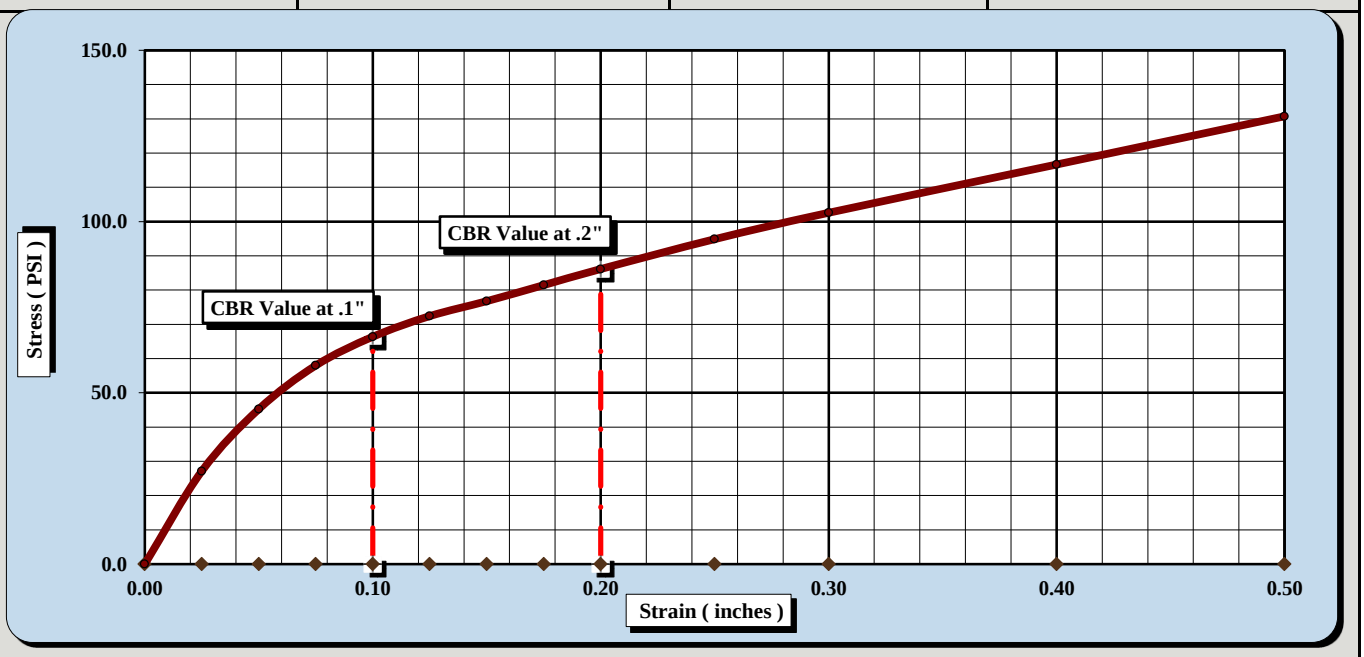
Boring #:	P-44	Sample #:	BS-1	Sample Date:	2/13/2018
Location:	Pavement Boring	Type:	Bulk	Depth:	1.1' - 11.1'

Sample Description: Sandy Fat Clay (CH, A-7-6(17))

ASTM D 698 *Method C* Maximum Dry Density: 105.2 PCF Optimum Moisture Content: 20.0%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 1.4%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 6.6	CBR at 0.2 in. 5.7	CBR at 0.1 in. 6.6	CBR at 0.2 in. 5.7



CBR Sample Preparation:

The entire gradation was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	35		
Initial Dry Density (PCF)	99.9	Final Dry Density (PCF)	98.7
Moisture Content of the Compacted Specimen	20.0%	Moisture Content (top 1" after soaking)	26.7%
Percent Compaction	95.0%	Percent Swell	1.2%

Soak Time:	96 hrs.	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	50	Plastic Index	27	% Passing the #200 Sieve	66.6%

Notes/Deviations/References:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/06/18
Technical Responsibility	*Signature*	*Position*	*Date*

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CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/06/18
Project Name:	Carolina Crossroads Project	Test Date(s)	3/02 - 3/06/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

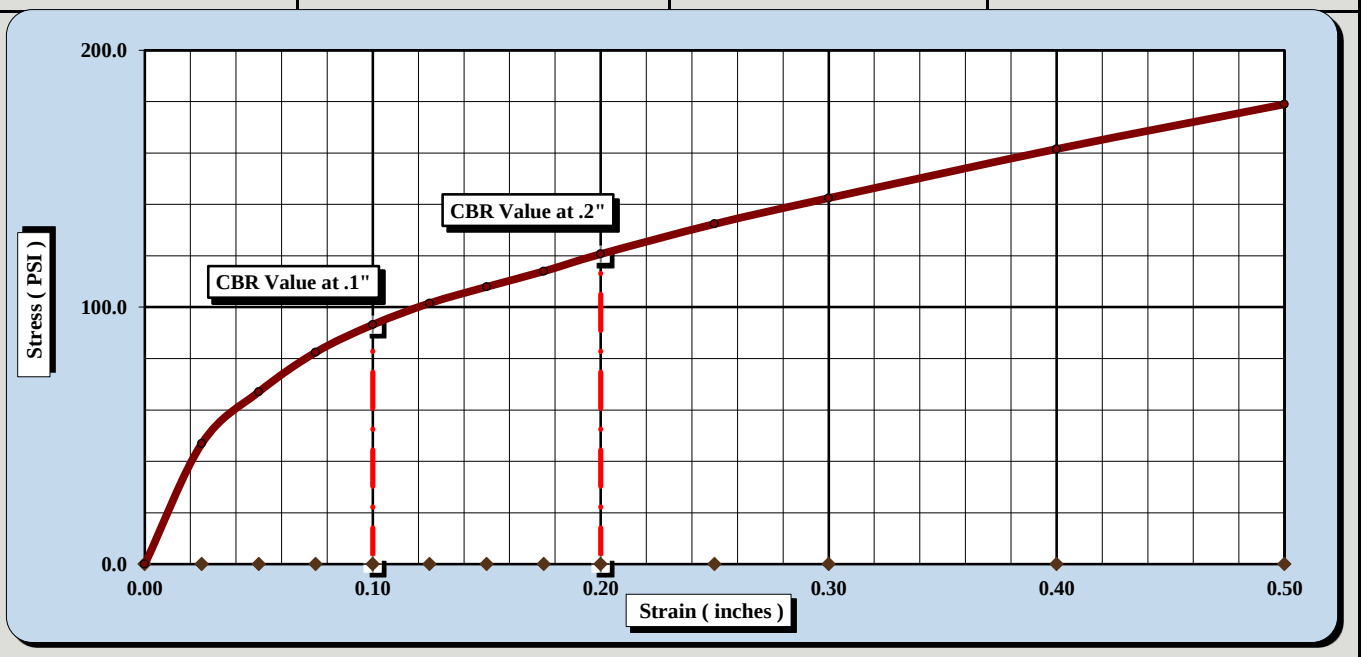
Boring #:	P-44	Sample #:	BS-1	Sample Date:	2/13/2018
Location:	Pavement Boring	Type:	Bulk	Depth:	1.1' - 11.1'

Sample Description: Sandy Fat Clay (CH, A-7-6(17))

ASTM D 698 *Method C* Maximum Dry Density: 105.2 PCF Optimum Moisture Content: 20.0%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 1.4%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 9.3	CBR at 0.2 in. 8.0	CBR at 0.1 in. 9.3	CBR at 0.2 in. 8.0



CBR Sample Preparation:

The entire gradation was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	56		
Initial Dry Density (PCF)	105.2	Final Dry Density (PCF)	104.2
Moisture Content of the Compacted Specimen	20.0%	Moisture Content (top 1" after soaking)	26.9%
Percent Compaction	100.0%	Percent Swell	0.9%

Soak Time:	96 hrs.	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	50	Plastic Index	27	% Passing the #200 Sieve	66.6%

Notes/Deviations/References:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/06/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

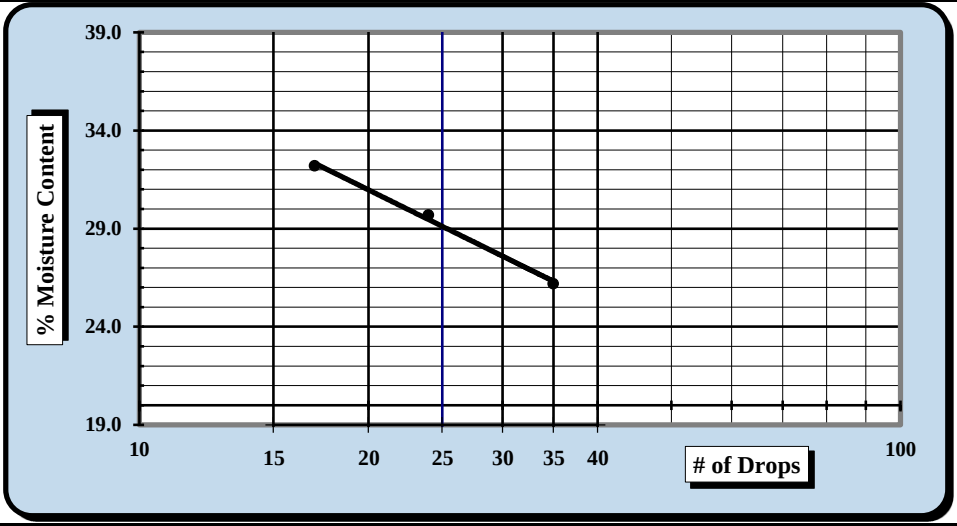
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/03/18
Project Name:	Carolina Crossroads Project	Test Date:	4/02/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-47	Sample #:	BS-1	Sample Date:	2/15/18
Location:	Pavement Boring	Type:	Bulk	Depth:	1.4' - 11.4'
Sample Description:	Clayey Sand (SC, A-6(3))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	1	2	3				4	5	
A	Tare Weight	26.70	26.48	26.36				25.93	26.95	
B	Wet Soil Weight + A	44.16	46.75	43.32				32.68	34.93	
C	Dry Soil Weight + A	40.53	42.11	39.19				31.83	33.94	
D	Water Weight (B-C)	3.63	4.64	4.13				0.85	0.99	
E	Dry Soil Weight (C-A)	13.83	15.63	12.83				5.90	6.99	
F	% Moisture (D/E)*100	26.2%	29.7%	32.2%				14.4%	14.2%	
N	# OF DROPS	35	24	17				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**14.3%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**29**
Plastic Limit	**14**
Plastic Index	**15**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/03/18	Matthew F. Cooke, P.G.	4/03/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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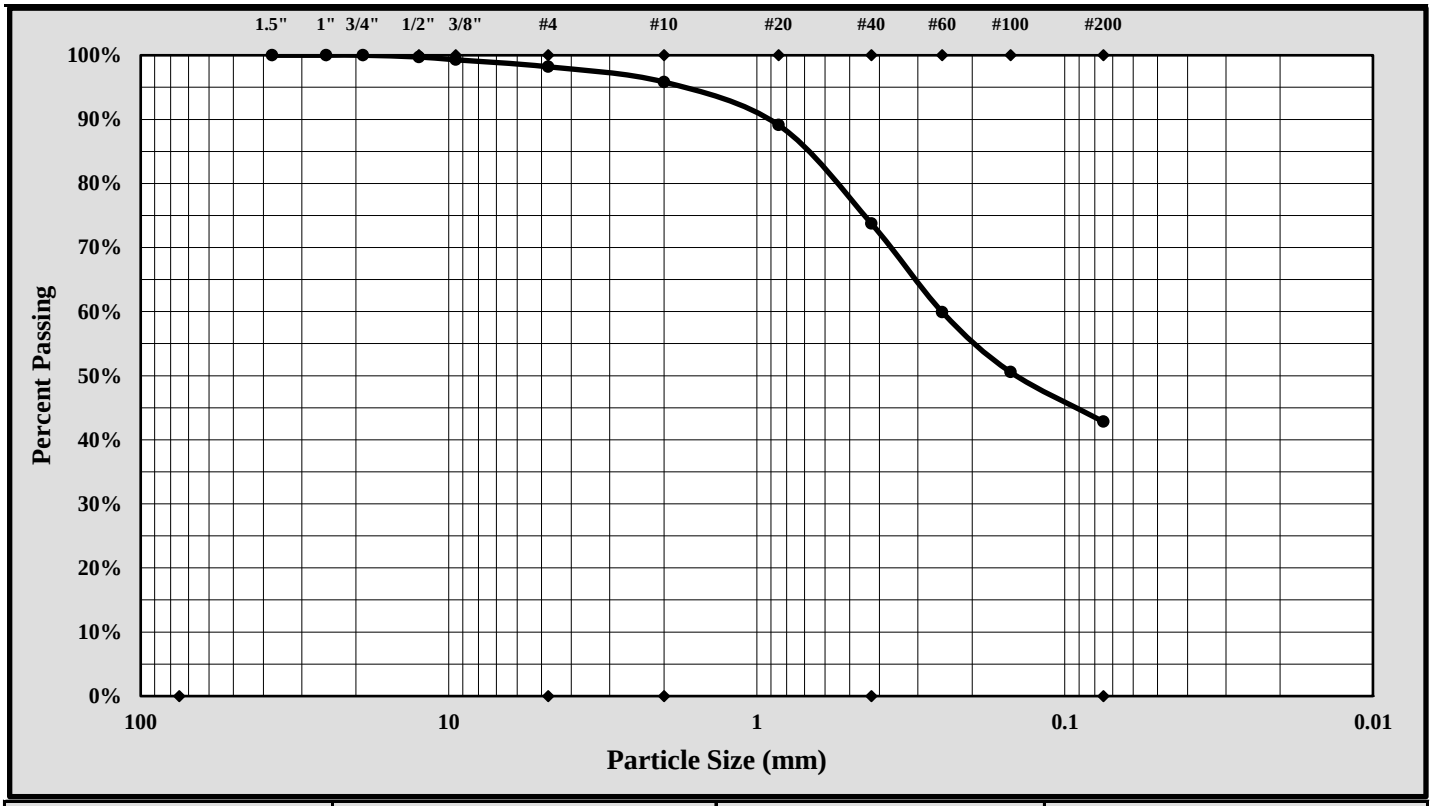
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/03/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/26 - 4/02/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-47 Sample #: BS-1	Sample Date:	2/15/18
Location:	Pavement Boring Type: Bulk	Depth:	1.4' - 11.4'
Sample Description:	Clayey Sand (SC, A-6(3))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	9.50 mm	Gravel:	1.8%
Silt & Clay (% Passing #200):	42.8%	Total Sand:	55.4%

Liquid Limit	29	Plastic Limit	14	Plastic Index	15
Coarse Sand:	2.4%	Medium Sand:	22.1%	Fine Sand:	30.9%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/03/18 — *Date*

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Form No. TR-D698-2
Revision No. : 1
Revision Date: 07/25/17

MOISTURE - DENSITY REPORT

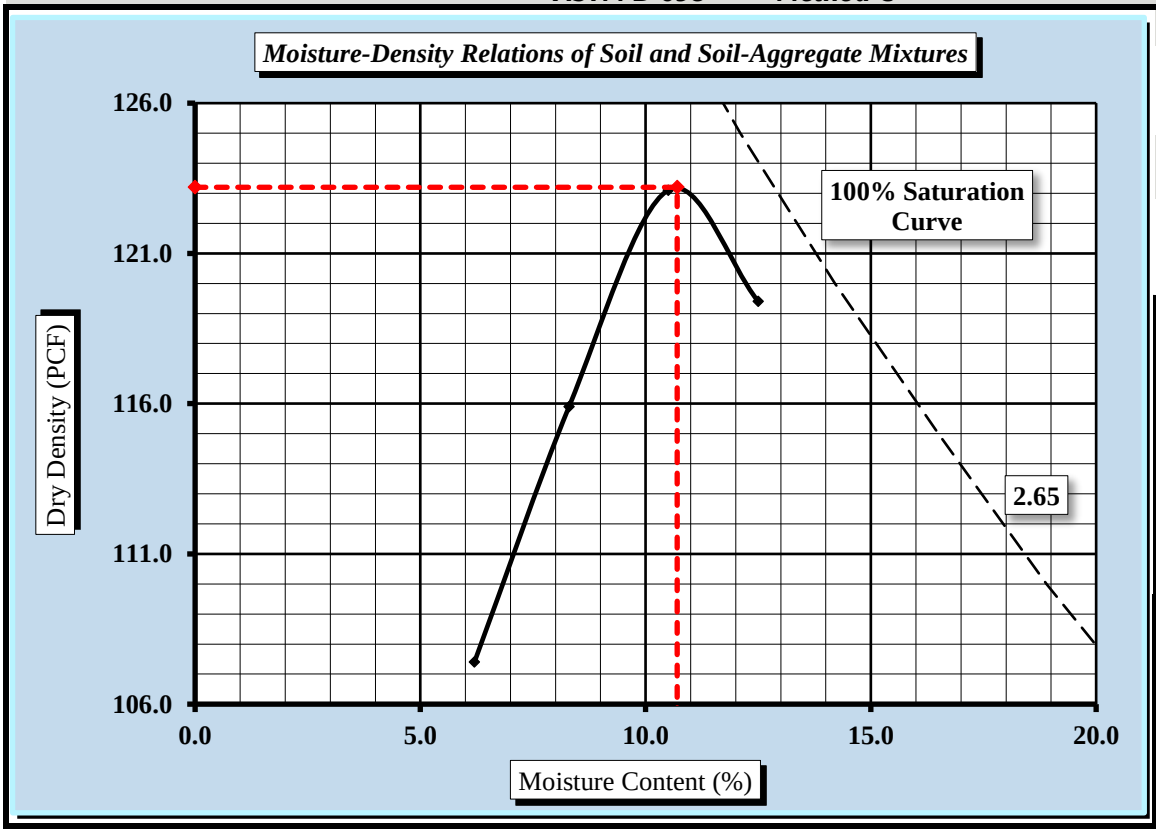
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/03/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/08/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-47	Sample #:	BS-1	Sample Date:	2/15/18
Location:	Pavement Boring	Type:	Bulk	Depth:	1.4' - 11.4'
Sample Description:	Clayey Sand (SC, A-6(3))				

Maximum Dry Density 123.2 PCF. Optimum Moisture Content 10.7%

ASTM D 698 - - Method C



Soil Properties

Natural Moisture Content	16.6%
Specific Gravity of Soil	2.650
Liquid Limit	29
Plastic Limit	14
Plastic Index	15

% Passing	
3/4"	100.0%
3/8"	99.3%
#4	98.2%
#10	96.0%
#40	74.0%
#60	60.0%
#100	50.6%
#200	42.8%

Oversize Fraction
Bulk Gravity
% Moisture
% Oversize
MDD
Opt. MC

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☐ 3/8 inch Sieve ☐ 3/4 inch Sieve ☒

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations:

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Matthew F. Cooke, P.G.	Project Manager	4/03/18
Technical Responsibility	*Position*	*Date*

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CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/03/18
Project Name:	Carolina Crossroads Project	Test Date(s)	3/16 - 3/20/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

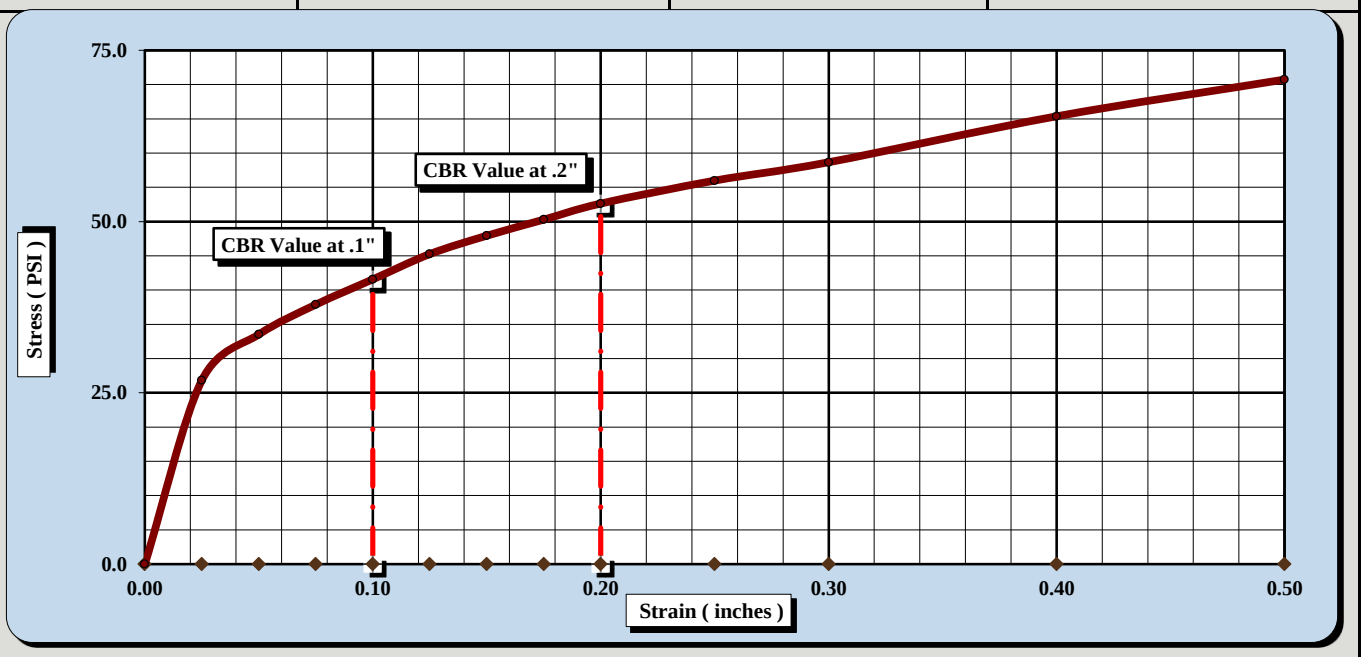
Boring #:	P-47	Sample #:	BS-1	Sample Date:	2/15/18
Location:	Pavement Boring	Type:	Bulk	Depth:	1.4' - 11.4'

Sample Description: Clayey Sand (SC, A-6(3))

ASTM D 698 *Method C* Maximum Dry Density: 123.2 PCF Optimum Moisture Content: 10.7%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 4.2	CBR at 0.2 in. 3.5	CBR at 0.1 in. 4.2	CBR at 0.2 in. 3.5



CBR Sample Preparation:

The entire gradation was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	15		
Initial Dry Density (PCF)	110.9	Final Dry Density (PCF)	110.8
Moisture Content of the Compacted Specimen	10.7%	Moisture Content (top 1" after soaking)	16.3%
Percent Compaction	90.0%	Percent Swell	0.0%

Soak Time:	96 hrs.	Surcharge Weight	20.0	Surcharge Wt. per sq. Ft.	101.9
Liquid Limit	29	Plastic Index	15	% Passing the #200 Sieve	42.8%

Notes/Deviations/References:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/03/18 — *Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/03/18
Project Name:	Carolina Crossroads Project	Test Date(s)	3/16 - 3/20/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

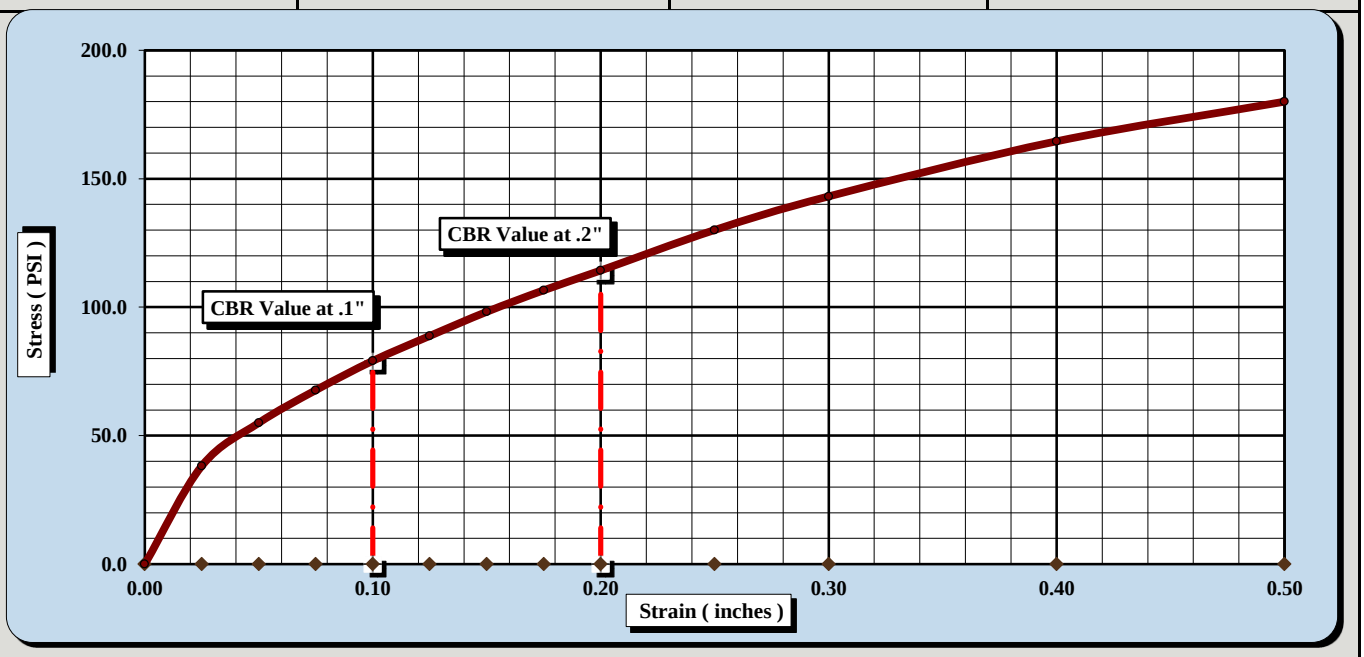
Boring #:	P-47	Sample #:	BS-1	Sample Date:	2/15/18
Location:	Pavement Boring	Type:	Bulk	Depth:	1.4' - 11.4'

Sample Description: Clayey Sand (SC, A-6(3)])

ASTM D 698 *Method C* Maximum Dry Density: 123.2 PCF Optimum Moisture Content: 10.7%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 7.9	CBR at 0.2 in. 7.6	CBR at 0.1 in. 7.9	CBR at 0.2 in. 7.6



CBR Sample Preparation:

The entire gradation was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	25		
Initial Dry Density (PCF)	117.0	Final Dry Density (PCF)	117.0
Moisture Content of the Compacted Specimen	10.7%	Moisture Content (top 1" after soaking)	12.6%
Percent Compaction	95.0%	Percent Swell	0.0%

Soak Time:	96 hrs.	Surcharge Weight	20.0	Surcharge Wt. per sq. Ft.	101.8
Liquid Limit	29	Plastic Index	15	% Passing the #200 Sieve	42.8%

Notes/Deviations/References:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/03/18 — *Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/03/18
Project Name:	Carolina Crossroads Project	Test Date(s)	3/16 - 3/20/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

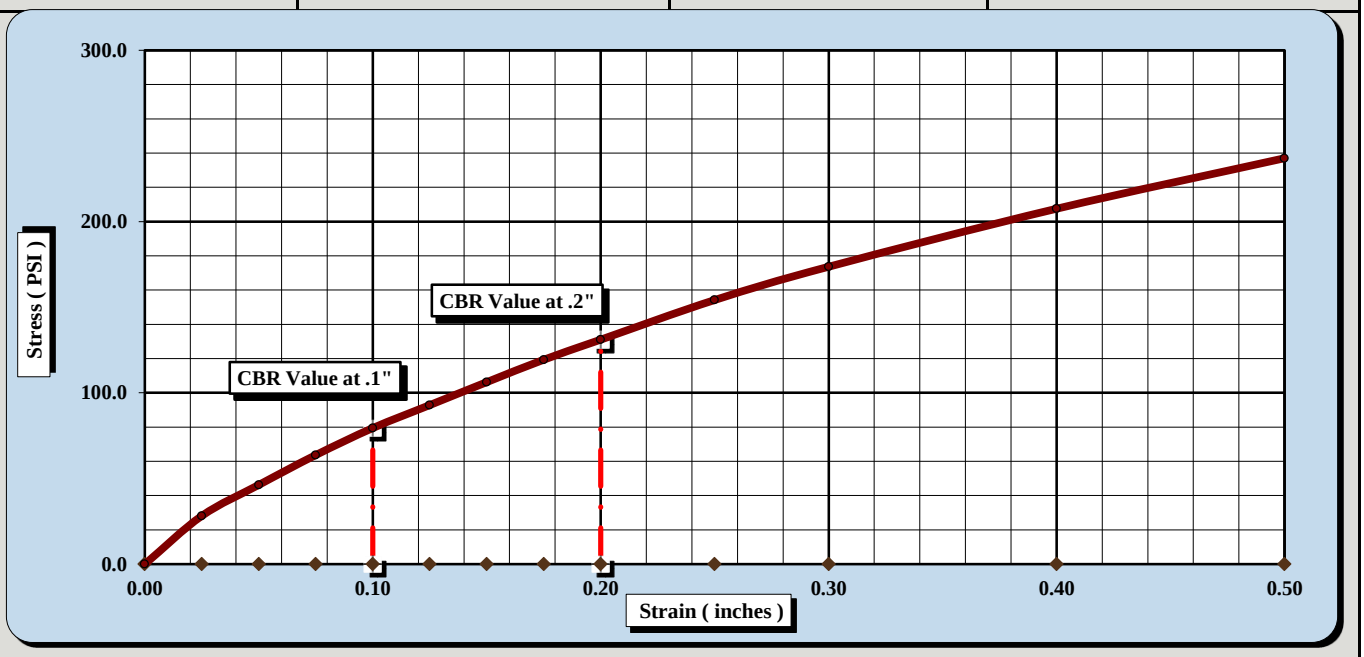
Boring #:	P-47	Sample #:	BS-1	Sample Date:	2/15/18
Location:	Pavement Boring	Type:	Bulk	Depth:	1.4' - 11.4'

Sample Description: Clayey Sand (SC, A-6(3))

ASTM D 698 *Method C* Maximum Dry Density: 123.2 PCF Optimum Moisture Content: 10.7%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 7.9	CBR at 0.2 in. 8.7	CBR at 0.1 in. 8.0	CBR at 0.2 in. 8.7



CBR Sample Preparation:

The entire gradation was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	50		
Initial Dry Density (PCF)	123.2	Final Dry Density (PCF)	123.2
Moisture Content of the Compacted Specimen	10.7%	Moisture Content (top 1" after soaking)	11.9%
Percent Compaction	100.0%	Percent Swell	0.0%

Soak Time:	96 hrs.	Surcharge Weight	20.0	Surcharge Wt. per sq. Ft.	101.9
Liquid Limit	29	Plastic Index	15	% Passing the #200 Sieve	42.8%

Notes/Deviations/References:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/03/18 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

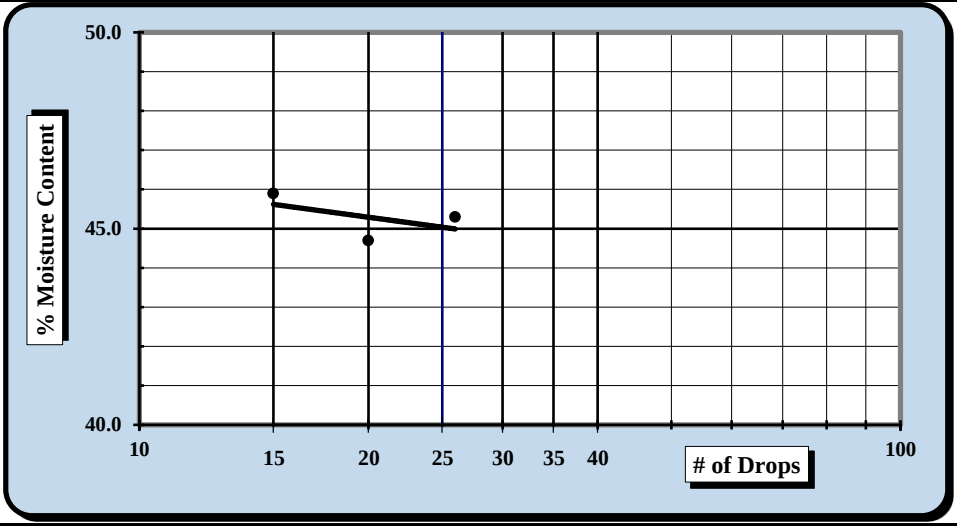
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/14-2/20/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-50	Sample #: BS-1		Sample Date: 2/7/2018	
Location:	Pavement Boring	Offset: N/A		Depth: 1.0' - 11.0'	
Sample Description:	Silt with Sand (ML, A-7-6(15))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28574	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

Pan # 601		Liquid Limit						Plastic Limit		
	Tare #:	244	17	207				209	24	
A	Tare Weight	20.77	20.62	20.93				21.12	20.77	
B	Wet Soil Weight + A	29.69	29.33	28.78				27.83	28.30	
C	Dry Soil Weight + A	26.91	26.64	26.31				26.41	26.67	
D	Water Weight (B-C)	2.78	2.69	2.47				1.42	1.63	
E	Dry Soil Weight (C-A)	6.14	6.02	5.38				5.29	5.90	
F	% Moisture (D/E)*100	45.3%	44.7%	45.9%				26.8%	27.6%	
N	# OF DROPS	26	20	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**27.2%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**45**
Plastic Limit	**27**
Plastic Index	**18**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matt Cooke, PG	
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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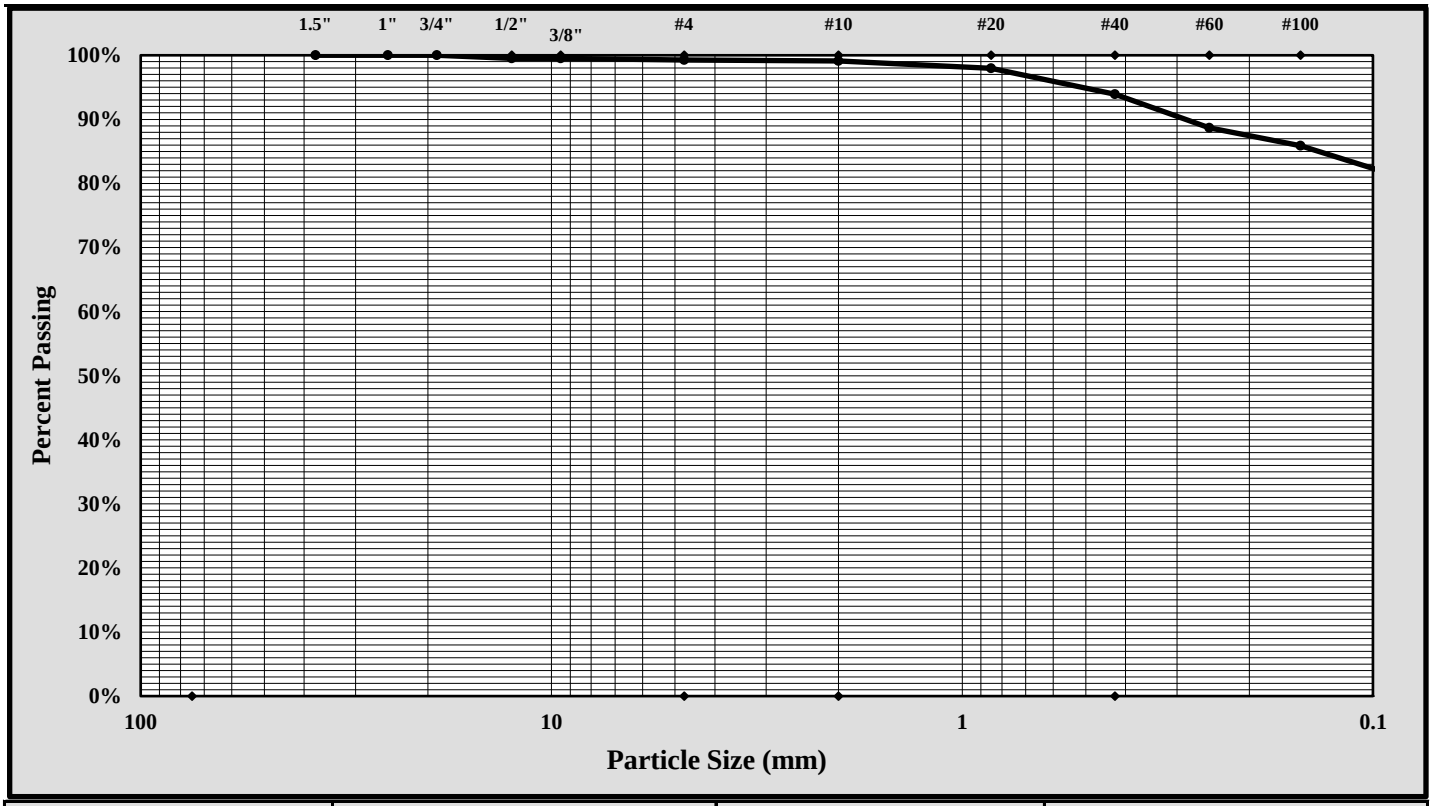
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/14-2/21/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-50 Sample #: BS-1	Sample Date:	2/7/2018
Location:	Pavement Boring Offset: N/A	Depth:	1.0' - 11.0'
Sample Description:	Silt with Sand (ML, A-7-6(15))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	1/2-inch	Gravel:	0.7%
Silt & Clay (% Passing #200):	79.8%	Total Sand:	19.4%

Liquid Limit	45	Plastic Limit	27	Plastic Index	18
Coarse Sand:	0.1%	Medium Sand:	5.2%	Fine Sand:	14.1%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/25/2018 — *Date*

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Form No. TR-D698-2
Revision No. : 1
Revision Date: 07/25/17

MOISTURE - DENSITY REPORT

Quality Assurance

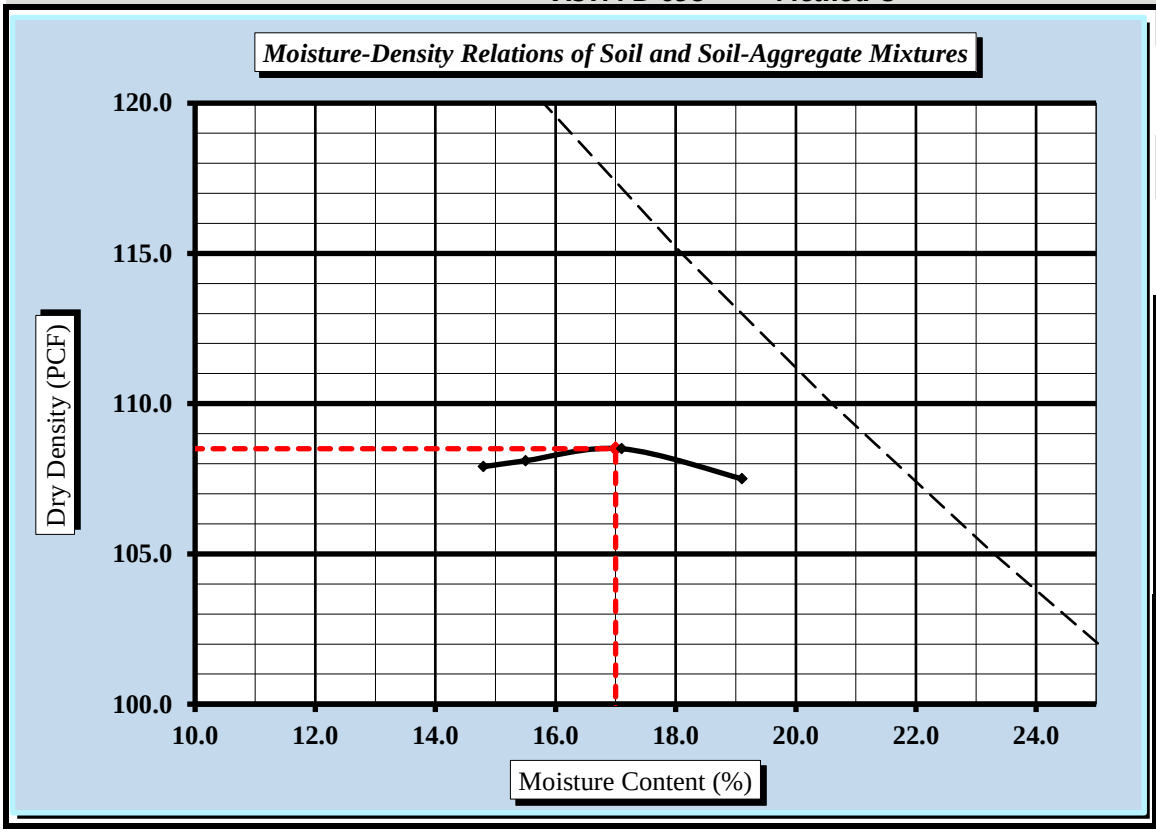
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/16/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/14-2/16/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-50	Sample #:	BS-1	Sample Date:	2/7/2018
Location:	Pavement Boring	Offset:	N/A	Depth:	1.0' - 11.0'
Sample Description:	Silt with Sand (ML, A-7-6(15))				

Maximum Dry Density 108.5 PCF. Optimum Moisture Content 17.0%

ASTM D 698 - - Method C



Soil Properties

Natural Moisture Content	23.1%
Specific Gravity of Soil	TNP
Liquid Limit	45
Plastic Limit	27
Plastic Index	18

% Passing	
3/4"	100.0%
3/8"	99.5%
#4	99.3%
#10	99.1%
#40	93.9%
#60	88.7%
#200	79.8%

Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	0.0%
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☐ 3/8 inch Sieve ☐ 3/4 inch Sieve ☒

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations:

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/25/2018 — *Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

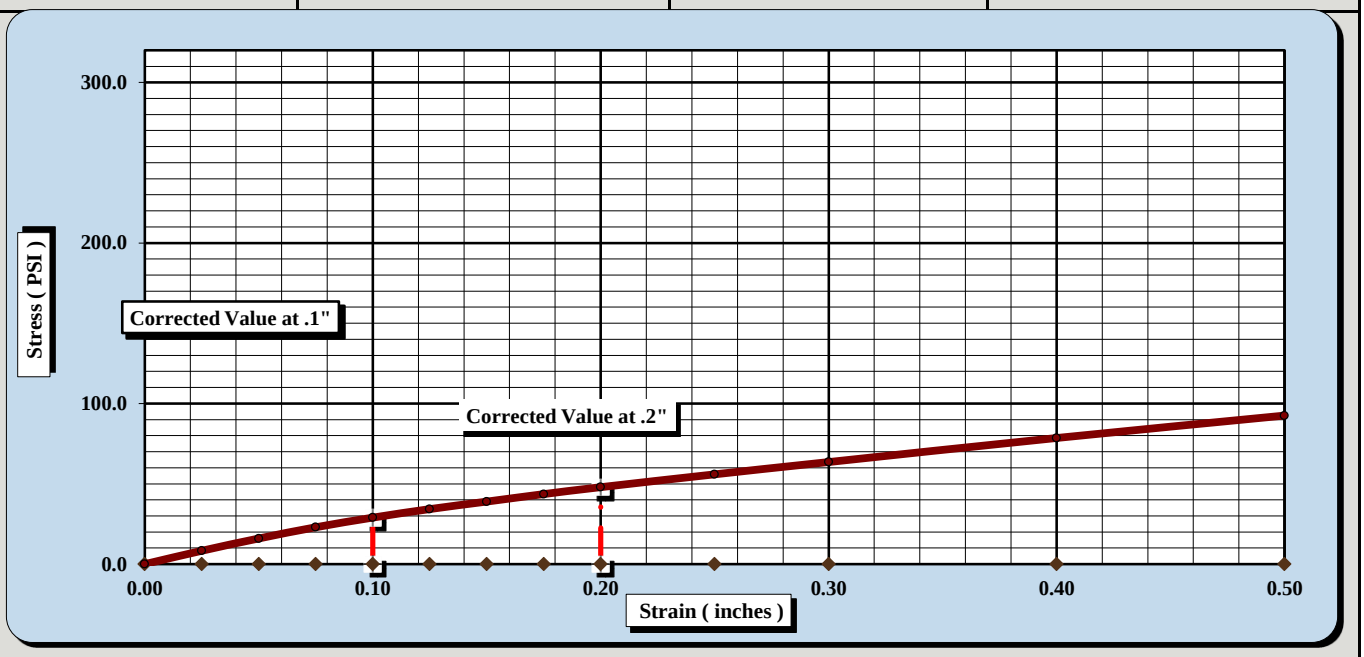
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/16-2/20/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-50	Sample #: BS-1	Sample Date: 2/7/2018
Location:	Pavement Boring	Offset: N/A	Depth: 1.0' - 11.0'
Sample Description:	Silt with Sand (ML, A-7-6(15))		

ASTM D 698 *Method C* Maximum Dry Density: 108.5 PCF Optimum Moisture Content: 17.0%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 2.9	CBR at 0.2 in. 3.2	CBR at 0.1 in. 2.9	CBR at 0.2 in. 3.2



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	15-20		
Initial Dry Density (PCF)	100.6	Final Dry Density (PCF)	98.4
Moisture Content of the Compacted Specimen	15.3%	Moisture Content (top 1" after soaking)	28.4%
Percent Compaction	92.7%	Percent Swell	2.3%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	45	Plastic Index	18	Apparent Relative Density	TNP

Notes/Deviations/References:

Matthew F. Cooke, P.G.	Project Manager	4/5/2018
Technical Responsibility	*Position*	*Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

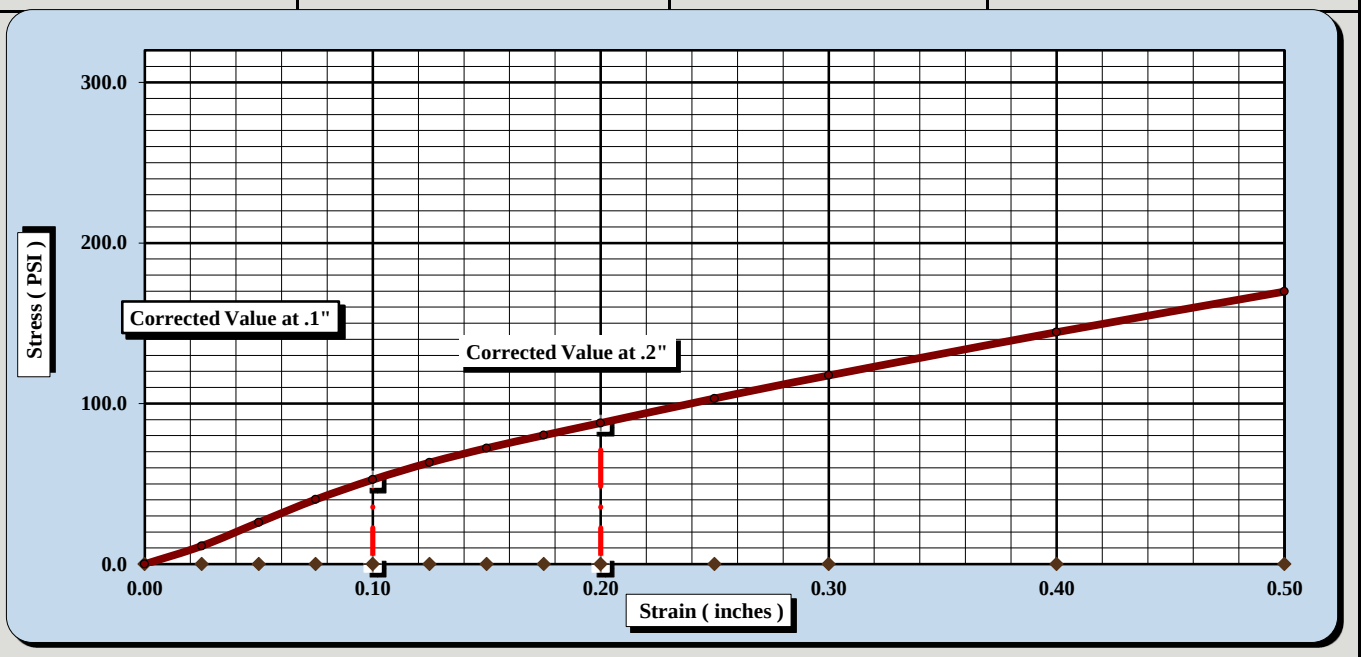
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/20/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/16-2/20/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-50	Sample #: BS-1	Sample Date: 2/7/2018
Location:	Pavement Boring	Offset: N/A	Depth: 1.0' - 11.0'
Sample Description:	Silt with Sand (ML, A-7-6(15))		

ASTM D 698 *Method C* Maximum Dry Density: 108.5 PCF Optimum Moisture Content: 17.0%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 5.3	CBR at 0.2 in. 5.9	CBR at 0.1 in. 5.3	CBR at 0.2 in. 5.9



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	35		
Initial Dry Density (PCF)	105.0	Final Dry Density (PCF)	103.0
Moisture Content of the Compacted Specimen	17.0%	Moisture Content (top 1" after soaking)	27.2%
Percent Compaction	96.8%	Percent Swell	1.9%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	45	Plastic Index	18	Apparent Relative Density	TNP

Notes/Deviations/References:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/5/2018 — *Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

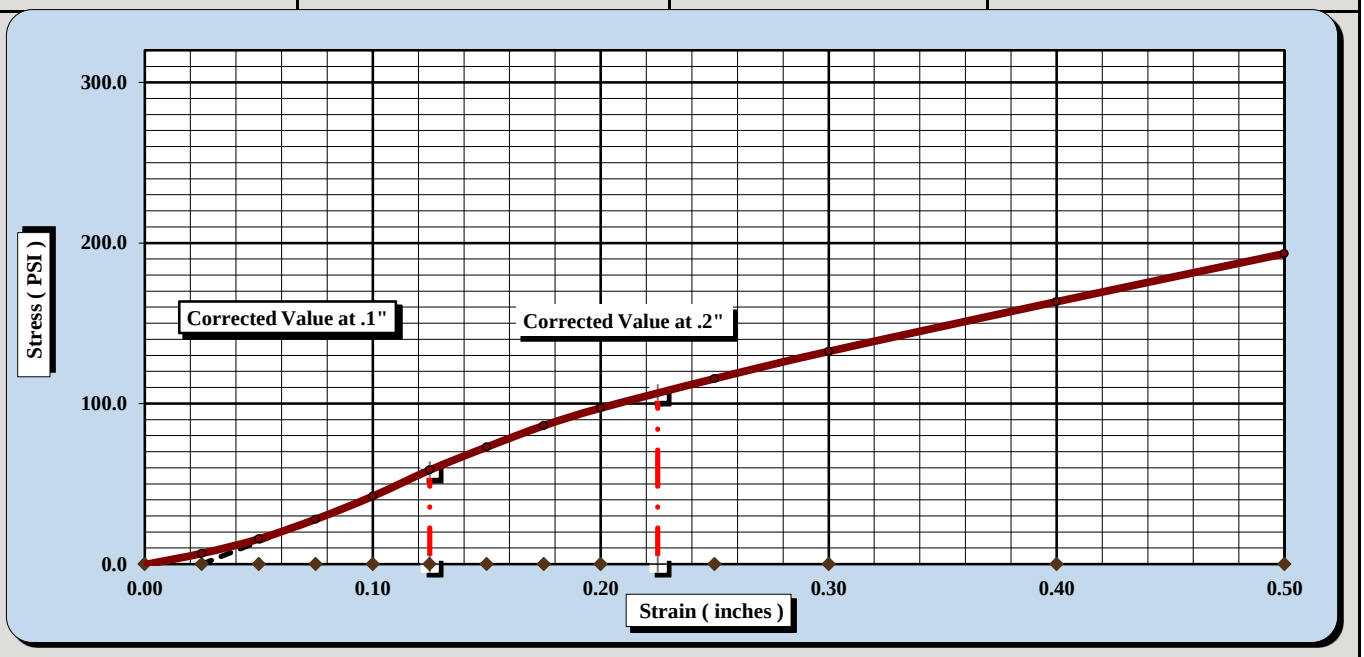
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/20/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/16-2/20/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-50	Sample #: BS-1	Sample Date: 2/7/2018
Location:	Pavement Boring	Offset: N/A	Depth: 1.0' - 11.0'
Sample Description:	Silt with Sand (ML, A-7-6(15))		

ASTM D 698 *Method C* Maximum Dry Density: 108.5 PCF Optimum Moisture Content: 17.0%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 4.2	CBR at 0.2 in. 6.5	CBR at 0.1 in. 5.9	CBR at 0.2 in. 7.1



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	65		
Initial Dry Density (PCF)	107.7	Final Dry Density (PCF)	104.6
Moisture Content of the Compacted Specimen	15.3%	Moisture Content (top 1" after soaking)	27.4%
Percent Compaction	99.3%	Percent Swell	2.9%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.8
Liquid Limit	45	Plastic Index	18	Apparent Relative Density	TNP

Notes/Deviations/References:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/5/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	3/2/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/16-2/23/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-53	Sample #: BS-1		Sample Date: 2/7/2018	
Location:	Pavement Boring	Offset: N/A		Depth: 0.6' - 10.6'	
Sample Description:	Silt with Sand (ML, A-7-6(11))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28574	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

	Pan # 607	Liquid Limit						Plastic Limit		
	Tare #:	207	200	204				17	31	
A	Tare Weight	20.93	20.87	20.87				20.62	20.82	
B	Wet Soil Weight + A	28.54	30.21	29.87				27.06	28.02	
C	Dry Soil Weight + A	26.41	27.52	27.15				25.63	26.40	
D	Water Weight (B-C)	2.13	2.69	2.72				1.43	1.62	
E	Dry Soil Weight (C-A)	5.48	6.65	6.28				5.01	5.58	
F	% Moisture (D/E)*100	38.9%	40.5%	43.3%				28.5%	29.0%	
N	# OF DROPS	35	28	17				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**28.8%**		

One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**41**
Plastic Limit	**29**
Plastic Index	**12**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☐ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	4/25/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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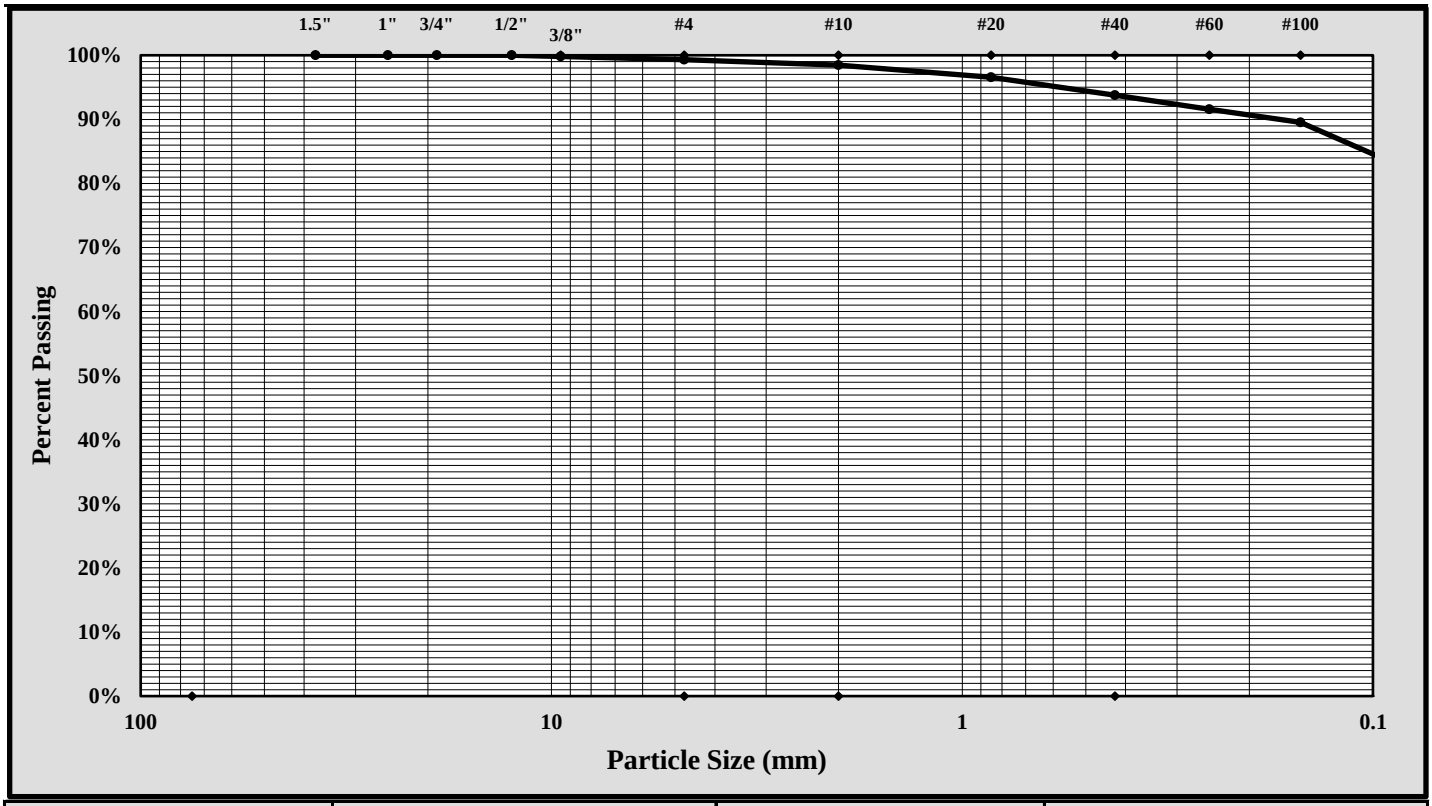
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	3/2/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/16-2/20/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-53 Sample #: BS-1	Sample Date:	2/7/2018
Location:	Pavement Boring Offset: N/A	Depth:	0.6' - 10.6'
Sample Description:	Silt with Sand (ML, A-7-6(11))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	3/8-inch	Gravel:	0.7%
Silt & Clay (% Passing #200):	81.1%	Total Sand:	18.2%

Liquid Limit	41	Plastic Limit	29	Plastic Index	12
Coarse Sand:	0.9%	Medium Sand:	4.7%	Fine Sand:	12.7%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/25/2018 — *Date*

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Form No. TR-D698-2
Revision No. : 1
Revision Date: 07/25/17

MOISTURE - DENSITY REPORT

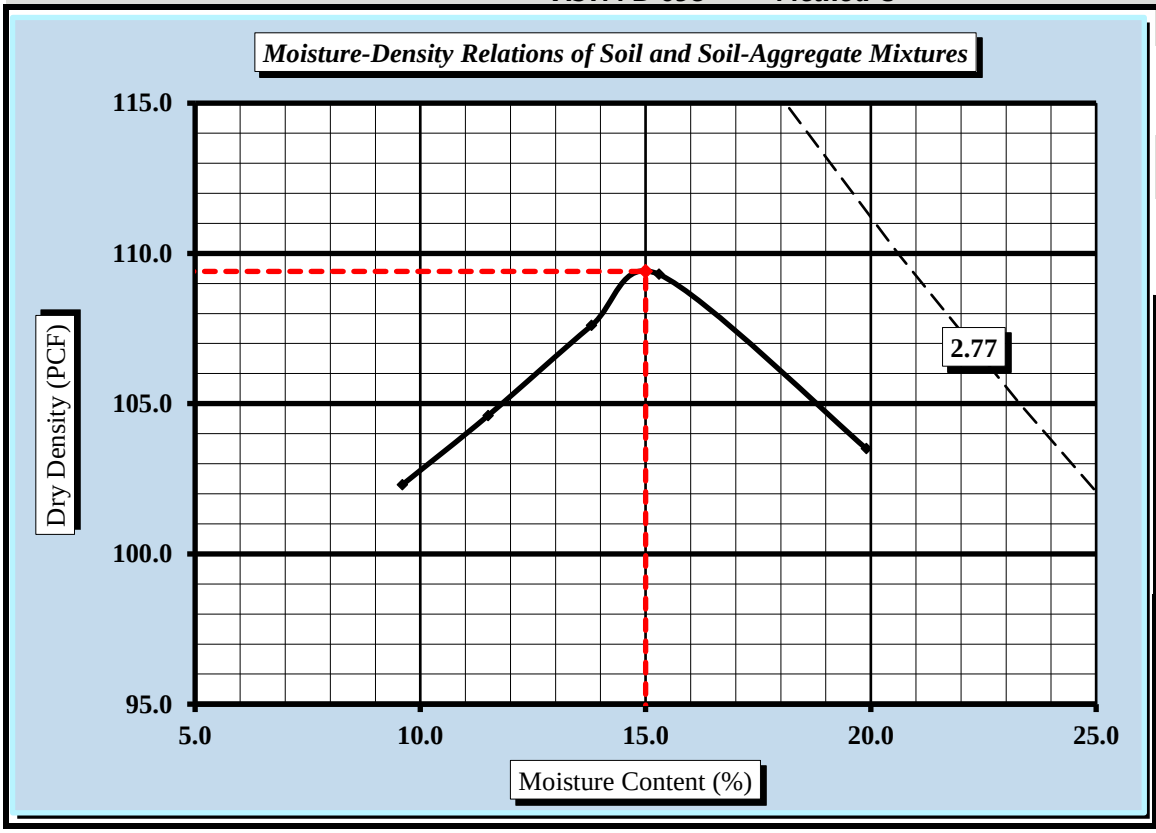
Quality Assurance

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

S&ME Project #:	1461-16-047.2B			Report Date:	
Project Name:	Carolina Crossroads Project			Test Date(s):	2/16-2/22/2018
Client Name:	HDR Engineering, Inc.				
Client Address:	4400 Leeds Ave., North Charleston, South Carolina				
Boring #:	P-53	Sample #:	BS-1	Sample Date:	2/7/2018
Location:	Pavement Boring	Offset:	N/A	Depth:	0.6' - 10.6'
Sample Description:	Silt with Sand (ML, A-7-6(11))				

Maximum Dry Density 109.4 PCF. Optimum Moisture Content 15.0%

ASTM D 698 - - Method C



Soil Properties	
Natural Moisture Content	15.3%
Specific Gravity of Soil	
Liquid Limit	
Plastic Limit	
Plastic Index	
% Passing	
3/4"	
3/8"	
#4	
#10	
#40	
#60	
#200	
Oversize Fraction	
Bulk Gravity	
% Moisture	0.8%
% Oversize	#DIV/0!
MDD	#DIV/0!
Opt. MC	#DIV/0!

Moisture-Density Curve Displayed: Fine Fraction ☐ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☐ 3/8 inch Sieve ☐ 3/4 inch Sieve ☒

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations: Replacement Method used for CBR testing.

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/25/2018 — *Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

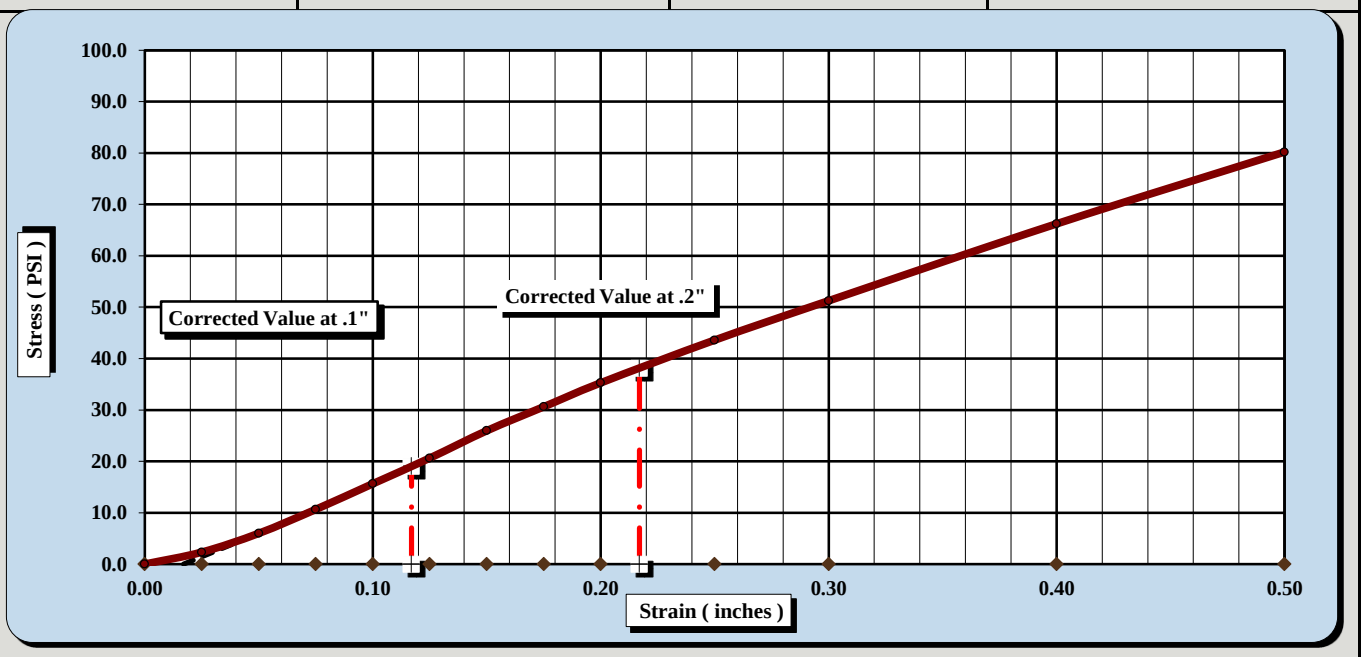
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	3/5/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/23-2/27/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-53	Sample #: BS-1	Sample Date: 2/7/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.6' - 10.6'
Sample Description:	Silt with Sand (ML, A-7-6(11))		

ASTM D 698 *Method C* Maximum Dry Density: 109.4 PCF — Optimum Moisture Content: 15.0%

Compaction Test performed on grading complying with CBR spec. — % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 1.6	CBR at 0.2 in. 2.4	CBR at 0.1 in. 1.9	CBR at 0.2 in. 2.5



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	15		
Initial Dry Density (PCF)	101.3	Final Dry Density (PCF)	97.4
Moisture Content of the Compacted Specimen	16.2%	Moisture Content (top 1" after soaking)	27.4%
Percent Compaction	92.6%	Percent Swell	4.0%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	41	Plastic Index	12	Apparent Relative Density	TNP

Notes/Deviations/References:

Matthew F.Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/5/2018 — *Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

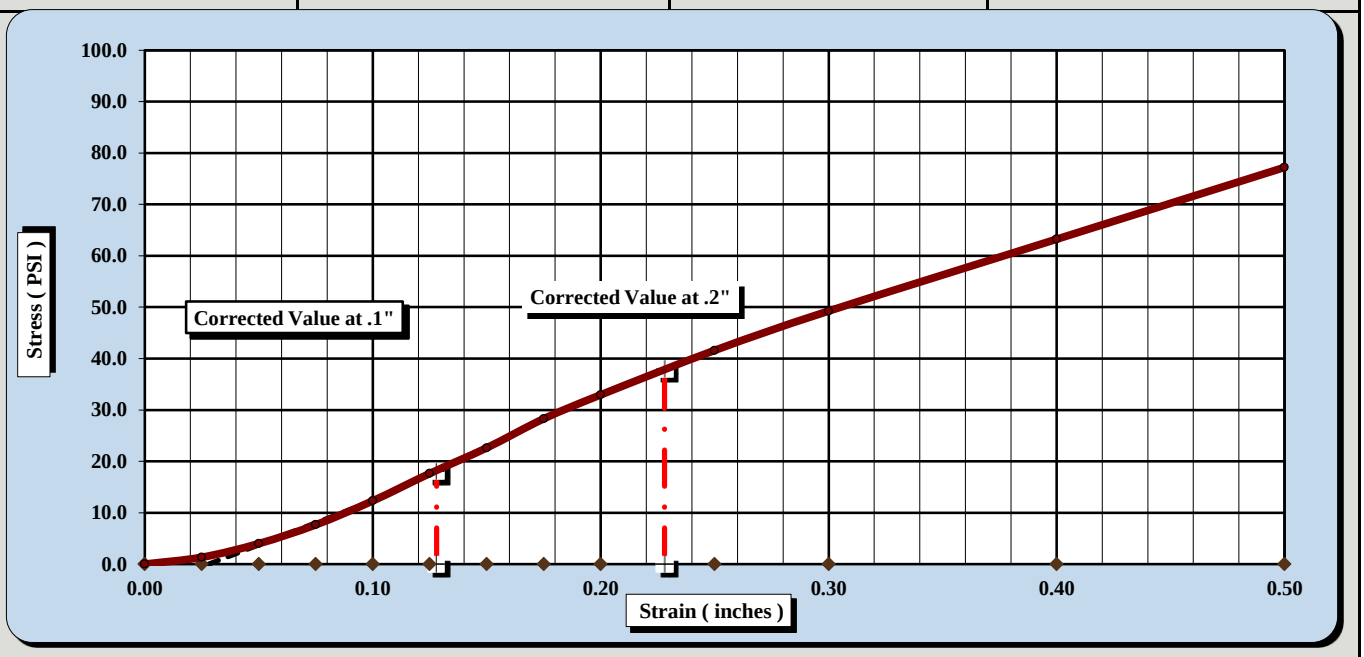
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	3/5/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/23-2/27/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-53	Sample #: BS-1	Sample Date: 2/7/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.6' - 10.6'
Sample Description:	Silt with Sand (ML, A-7-6(11))		

ASTM D 698 *Method C* Maximum Dry Density: 109.4 PCF — Optimum Moisture Content: 15.0%

Compaction Test performed on grading complying with CBR spec. — % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 1.2	CBR at 0.2 in. 2.2	CBR at 0.1 in. 1.8	CBR at 0.2 in. 2.5



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	35		
Initial Dry Density (PCF)	103.7	Final Dry Density (PCF)	100.0
Moisture Content of the Compacted Specimen	15.8%	Moisture Content (top 1" after soaking)	29.4%
Percent Compaction	94.8%	Percent Swell	3.8%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.8
Liquid Limit	41	Plastic Index	12	Apparent Relative Density	TNP

Notes/Deviations/References:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/5/2018 — *Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

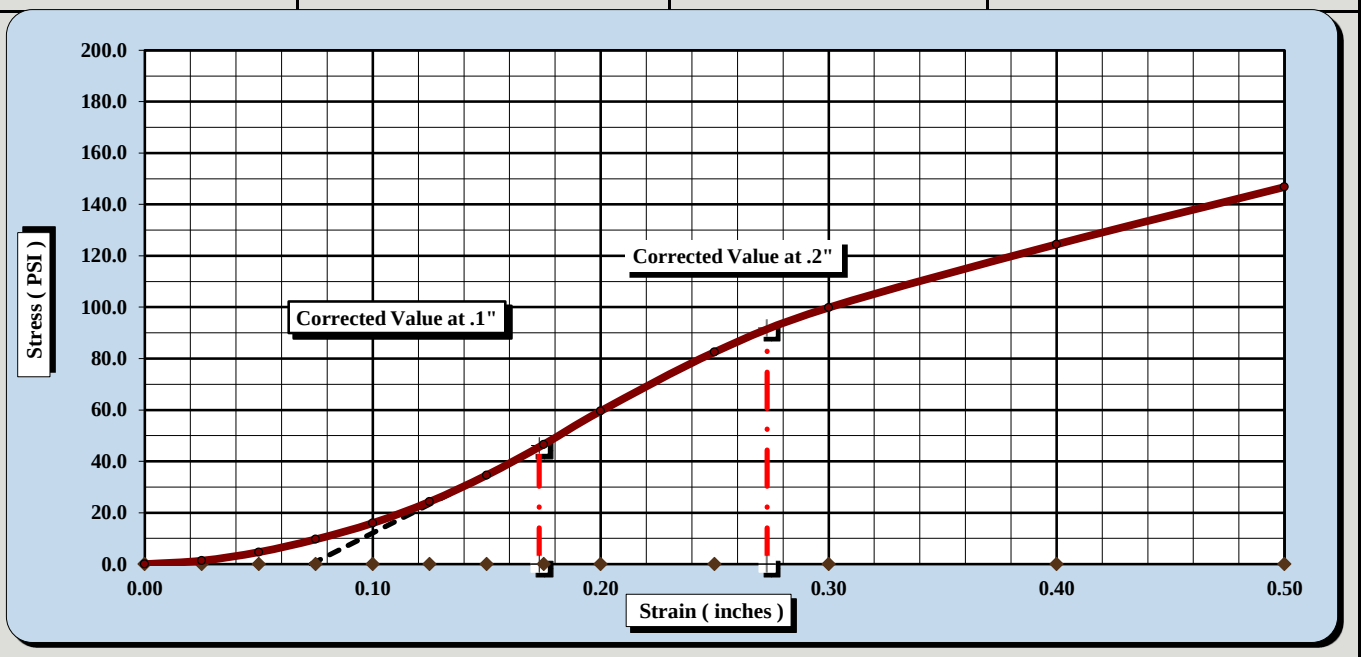
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	3/5/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/23-2/27/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-53	Sample #: BS-1	Sample Date: 2/7/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.6' - 10.6'
Sample Description:	Silt with Sand (ML, A-7-6(11))		

ASTM D 698 *Method C* Maximum Dry Density: 109.4 PCF Optimum Moisture Content: 15.0%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 1.6	CBR at 0.2 in. 4.0	CBR at 0.1 in. 4.6	CBR at 0.2 in. 6.1



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	56		
Initial Dry Density (PCF)	108.0	Final Dry Density (PCF)	105.1
Moisture Content of the Compacted Specimen	15.8%	Moisture Content (top 1" after soaking)	25.8%
Percent Compaction	98.8%	Percent Swell	2.8%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	41	Plastic Index	12	Apparent Relative Density	TNP

Notes/Deviations/References:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/5/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	3/14-3/16/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-56	Sample #: BS-1	Sample Date: 1/21/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.9' - 10.9'
Sample Description:	Clayey Sand (SC, A-7-6(6))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28575	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

Pan #	10	Liquid Limit						Plastic Limit		
	Tare #:	3	10	147				209	1	
A	Tare Weight	20.79	20.78	20.75				21.07	20.64	
B	Wet Soil Weight + A	27.81	28.76	28.07				28.14	27.32	
C	Dry Soil Weight + A	25.65	26.25	25.66				26.96	26.22	
D	Water Weight (B-C)	2.16	2.51	2.41				1.18	1.10	
E	Dry Soil Weight (C-A)	4.86	5.47	4.91				5.89	5.58	
F	% Moisture (D/E)*100	44.4%	45.9%	49.1%				20.0%	19.7%	
N	# OF DROPS	35	25	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**19.9%**		

One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**46**
Plastic Limit	**20**
Plastic Index	**26**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group Symbol for minus No. 40 sieve potion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	4/27/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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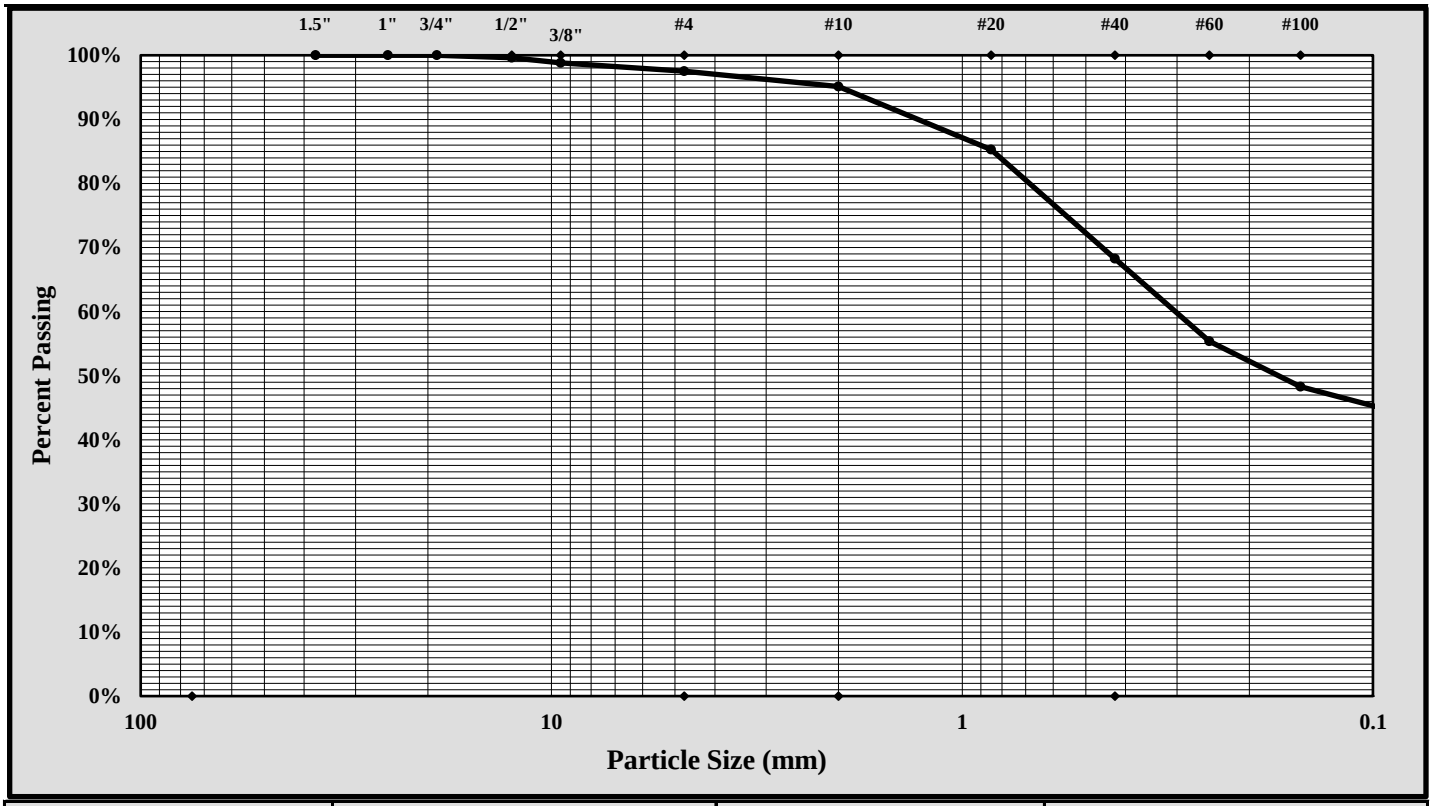
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	3/14-3/15/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-56 Sample #: BS-1	Sample Date:	1/21/2018
Location:	Pavement Boring Offset: N/A	Depth:	0.9' - 10.9'
Sample Description:	Clayey Sand (SC, A-7-6(6))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	1/2-inch	Gravel:	2.5%
Silt & Clay (% Passing #200):	43.2%	Total Sand:	54.3%

Liquid Limit	46	Plastic Limit	20	Plastic Index	26
Coarse Sand:	2.4%	Medium Sand:	26.9%	Fine Sand:	25.0%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/2018 — *Date*

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Form No. TR-D698-2
Revision No. : 1
Revision Date: 07/25/17

MOISTURE - DENSITY REPORT

Quality Assurance

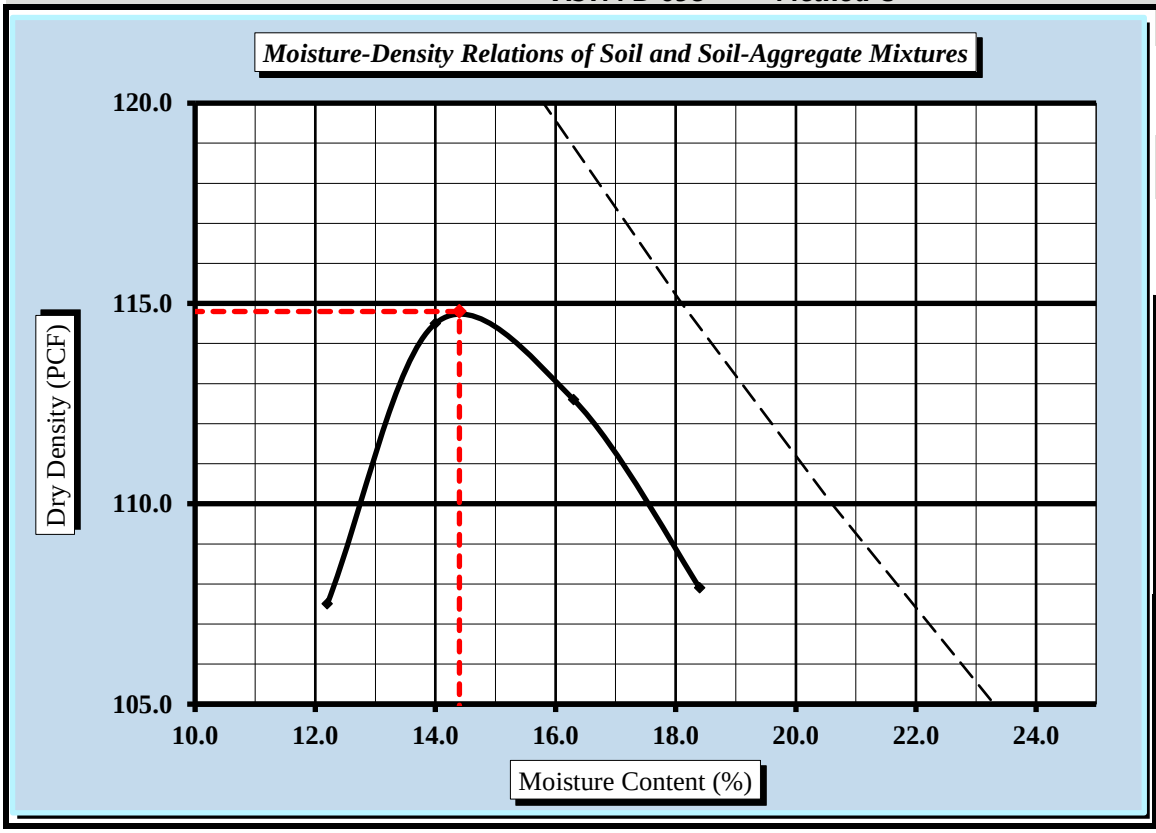
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/24/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	3/14-3/15/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-56	Sample #:	BS-1	Sample Date:	1/21/2018
Location:	Pavement Boring	Offset:	N/A	Depth:	0.9' - 10.9'
Sample Description:	Clayey Sand (SC, A-7-6(6))				

Maximum Dry Density 114.8 PCF. Optimum Moisture Content 14.4%

ASTM D 698 - - Method C



Soil Properties

Natural Moisture Content	22.0%
Specific Gravity of Soil	TNP
Liquid Limit	46
Plastic Limit	20
Plastic Index	26

% Passing	
3/4"	100.0%
3/8"	98.8%
#4	97.5%
#10	95.1%
#40	68.2%
#60	55.4%
#200	43.2%

Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	0.0%
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☐ 3/8 inch Sieve ☐ 3/4 inch Sieve ☒

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations:

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/2018 — *Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

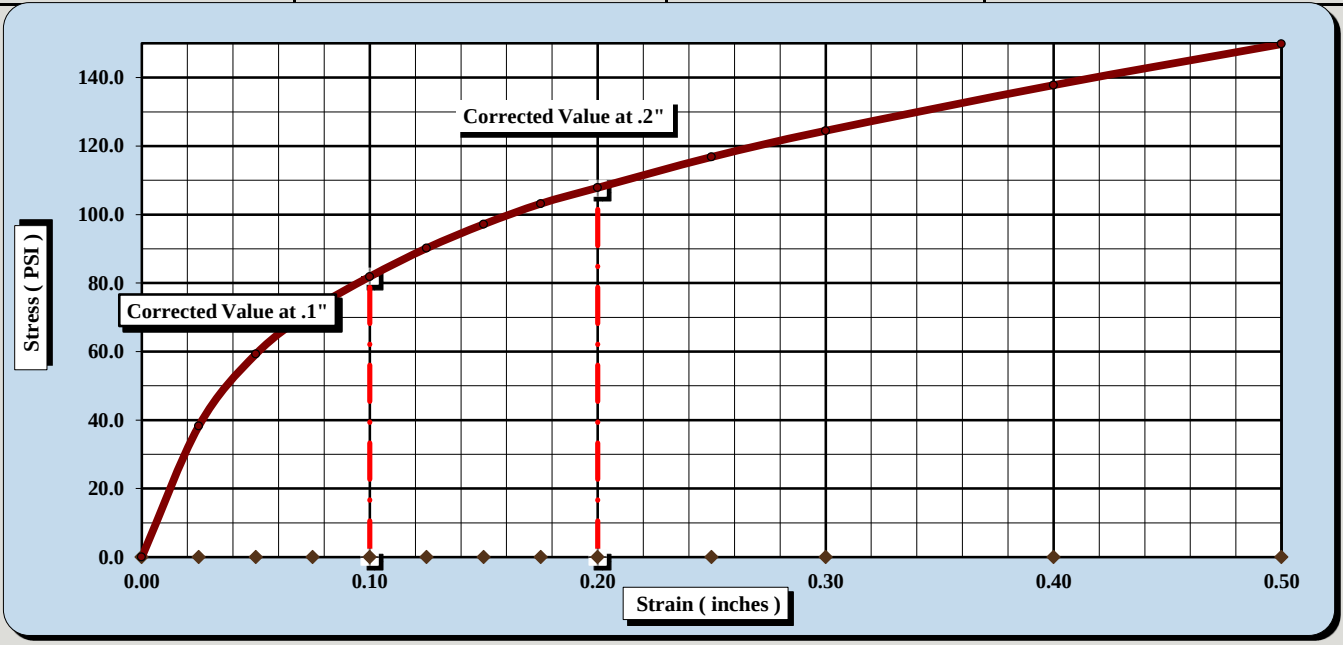
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	3/16-3/20/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-56	Sample #: BS-1	Sample Date: 2/21/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.9' - 10.9'
Sample Description:	Clayey Sand (SC, A-7-6(6))		

ASTM D 698 *Method C* Maximum Dry Density: 114.8 PCF — Optimum Moisture Content: 14.4%

Compaction Test performed on grading complying with CBR spec. — % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 8.2	CBR at 0.2 in. 7.2	CBR at 0.1 in. 8.2	CBR at 0.2 in. 7.2



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	25		
Initial Dry Density (PCF)	105.6	Final Dry Density (PCF)	105.4
Moisture Content of the Compacted Specimen	14.8%	Moisture Content (top 1" after soaking)	19.5%
Percent Compaction	92.0%	Percent Swell	0.1%

Soak Time:	96 hours	Surcharge Weight	20.0	Surcharge Wt. per sq. Ft.	101.8
Liquid Limit	46	Plastic Index	26	Apparent Relative Density	TNP

Notes/Deviations/References: Liquid Limit: ASTM D 4318, Classification: ASTM D 2487

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/2018 — *Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

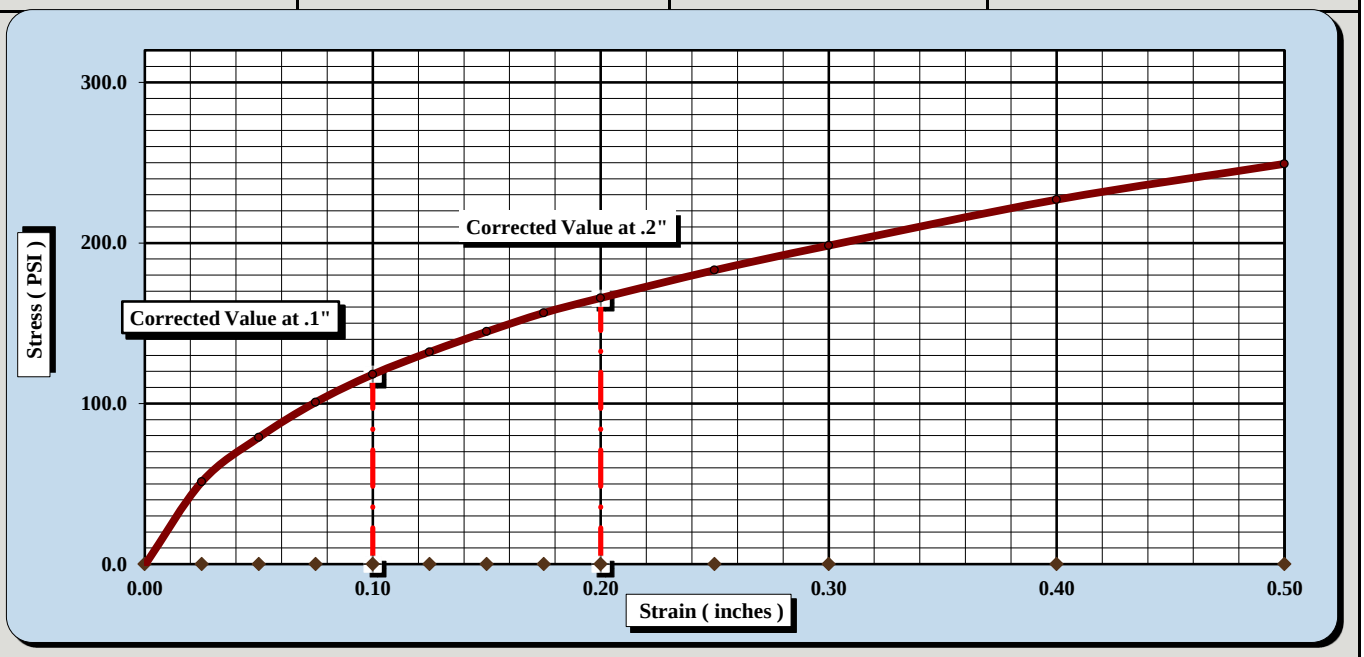
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	3/16-3/20/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-56	Sample #: BS-1	Sample Date: 2/21/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.9' - 10.9'
Sample Description:	Clayey Sand (SC, A-7-6(6))		

ASTM D 698 *Method C* Maximum Dry Density: 114.8 PCF — Optimum Moisture Content: 14.4%

Compaction Test performed on grading complying with CBR spec. — % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 11.8	CBR at 0.2 in. 11.0	CBR at 0.1 in. 11.8	CBR at 0.2 in. 11.0



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	35		
Initial Dry Density (PCF)	111.2	Final Dry Density (PCF)	111.1
Moisture Content of the Compacted Specimen	14.4%	Moisture Content (top 1" after soaking)	19.2%
Percent Compaction	96.9%	Percent Swell	0.1%

Soak Time:	96 hours	Surcharge Weight	20.0	Surcharge Wt. per sq. Ft.	101.9
Liquid Limit	46	Plastic Index	26	Apparent Relative Density	TNP

Notes/Deviations/References: Liquid Limit: ASTM D 4318, Specific Gravity: ASTM D 854, Classification: ASTM D 2487

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/2018 — *Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

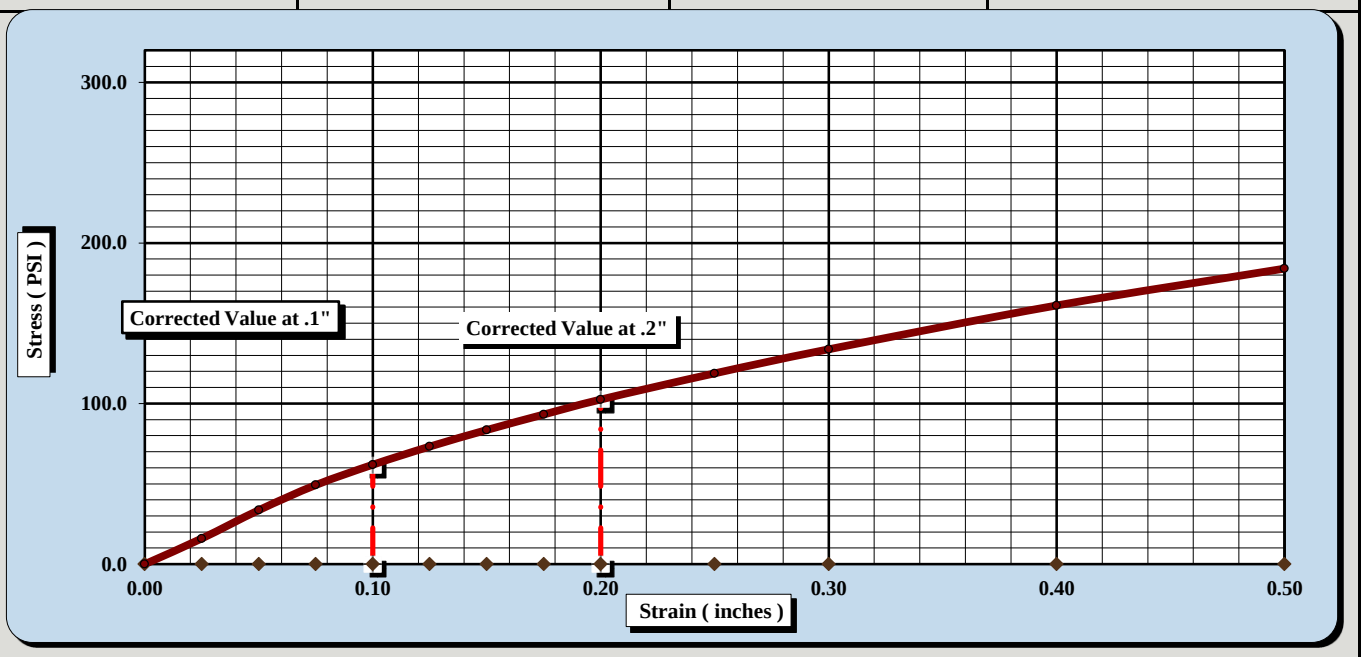
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	3/16-3/20/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-56	Sample #: BS-1	Sample Date: 2/21/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.9' - 10.9'
Sample Description:	Clayey Sand (SC, A-7-6(6))		

ASTM D 698 *Method C* Maximum Dry Density: 114.8 PCF — Optimum Moisture Content: 14.4%

Compaction Test performed on grading complying with CBR spec. — % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 6.2	CBR at 0.2 in. 6.8	CBR at 0.1 in. 6.2	CBR at 0.2 in. 6.8



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	56		
Initial Dry Density (PCF)	114.2	Final Dry Density (PCF)	114.2
Moisture Content of the Compacted Specimen	14.4%	Moisture Content (top 1" after soaking)	17.8%
Percent Compaction	99.5%	Percent Swell	0.0%

Soak Time:	96 hours	Surcharge Weight	20.0	Surcharge Wt. per sq. Ft.	101.8
Liquid Limit	46	Plastic Index	26	Apparent Relative Density	TNP

Notes/Deviations/References: Liquid Limit: ASTM D 4318, Classification: ASTM D 2487

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

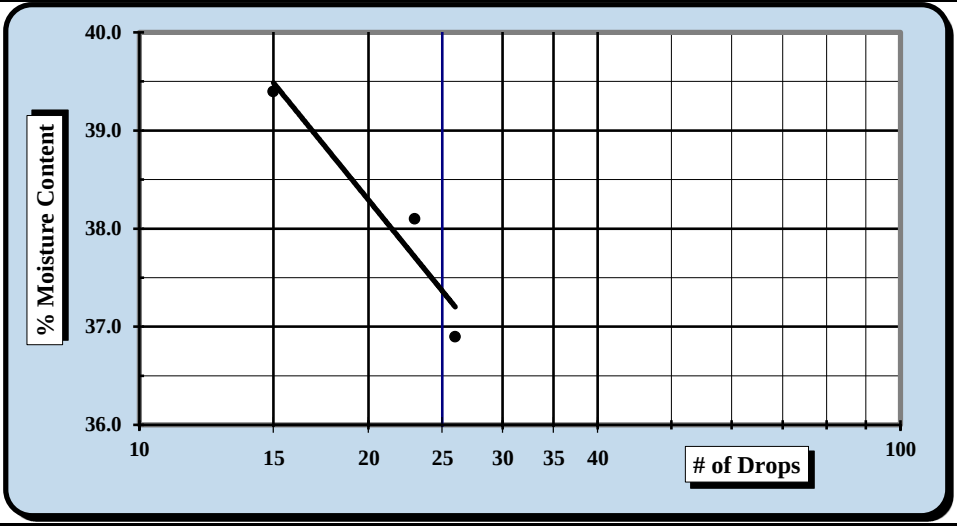
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/24/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	3/19-3/23/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-58	Sample #: BS-1	Sample Date: 2/26/2018
Location:	Pavement Boring	Offset: N/A	Depth: 1.1' - 11.1'
Sample Description:	Clayey Sand (SC, A-6(4))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28574	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

		Liquid Limit						Plastic Limit		
Pan #	14									
	Tare #:	4	235	6				31	227	
A	Tare Weight	20.54	20.76	20.57				20.80	20.81	
B	Wet Soil Weight + A	29.04	29.67	30.41				27.80	28.30	
C	Dry Soil Weight + A	26.75	27.21	27.63				26.77	27.19	
D	Water Weight (B-C)	2.29	2.46	2.78				1.03	1.11	
E	Dry Soil Weight (C-A)	6.21	6.45	7.06				5.97	6.38	
F	% Moisture (D/E)*100	36.9%	38.1%	39.4%				17.3%	17.4%	
N	# OF DROPS	26	23	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**17.4%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**37**
Plastic Limit	**17**
Plastic Index	**20**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group Symbol refers only to material passing the No. 40 sieve.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	4/27/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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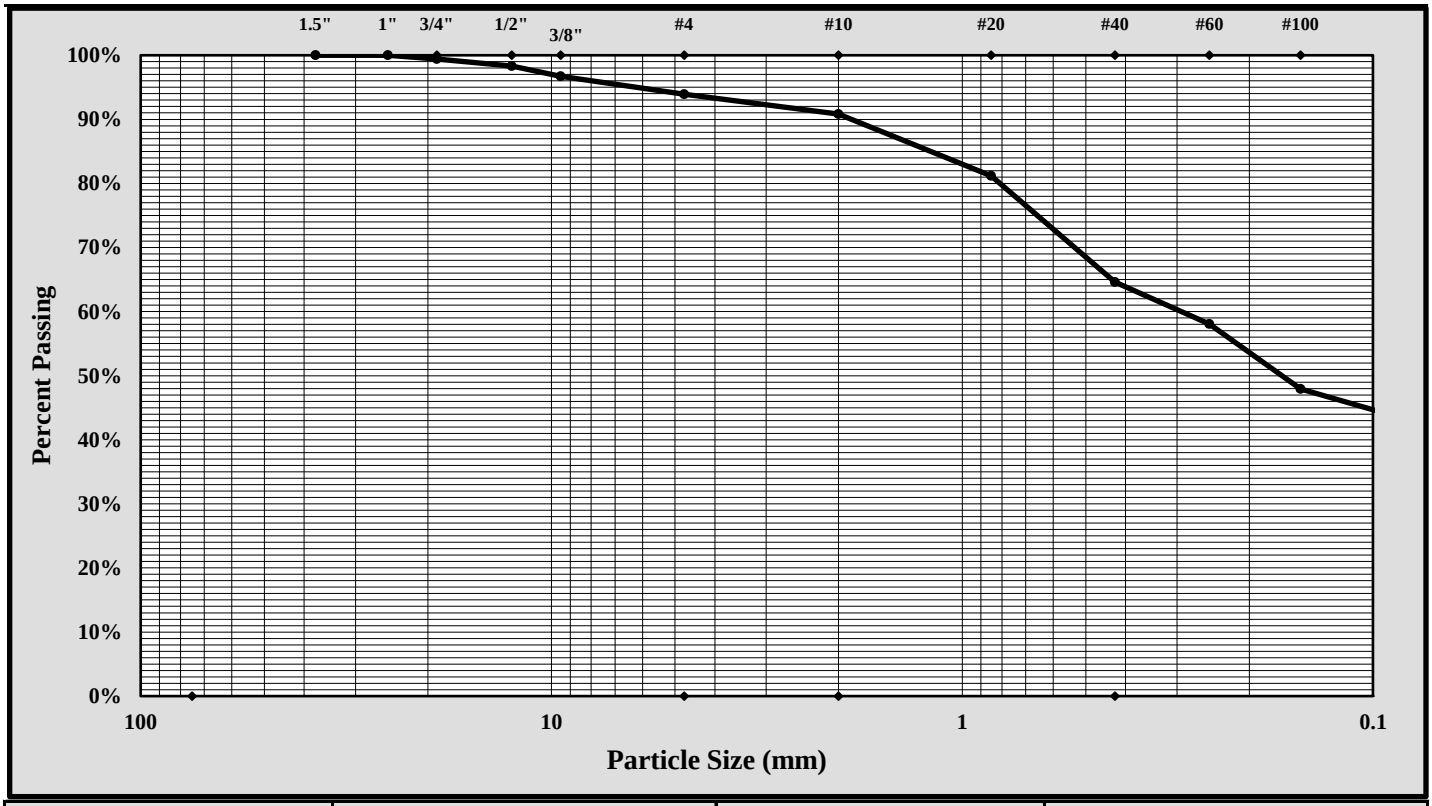
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	3/21/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	3/19-3/20/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-58 Sample #: BS-1	Sample Date:	2/26/2018
Location:	Pavement Boring Offset: N/A	Depth:	1.1' - 11.1'
Sample Description:	Clayey Sand (SC, A-6(4))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	3/4-inch	Gravel:	6.1%
Silt & Clay (% Passing #200):	42.4%	Total Sand:	51.6%

Liquid Limit	37	Plastic Limit	17	Plastic Index	20
Coarse Sand:	3.1%	Medium Sand:	26.2%	Fine Sand:	22.2%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☒

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/2018 — *Date*

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Form No. TR-D698-2
Revision No. : 1
Revision Date: 07/25/17

MOISTURE - DENSITY REPORT

Quality Assurance

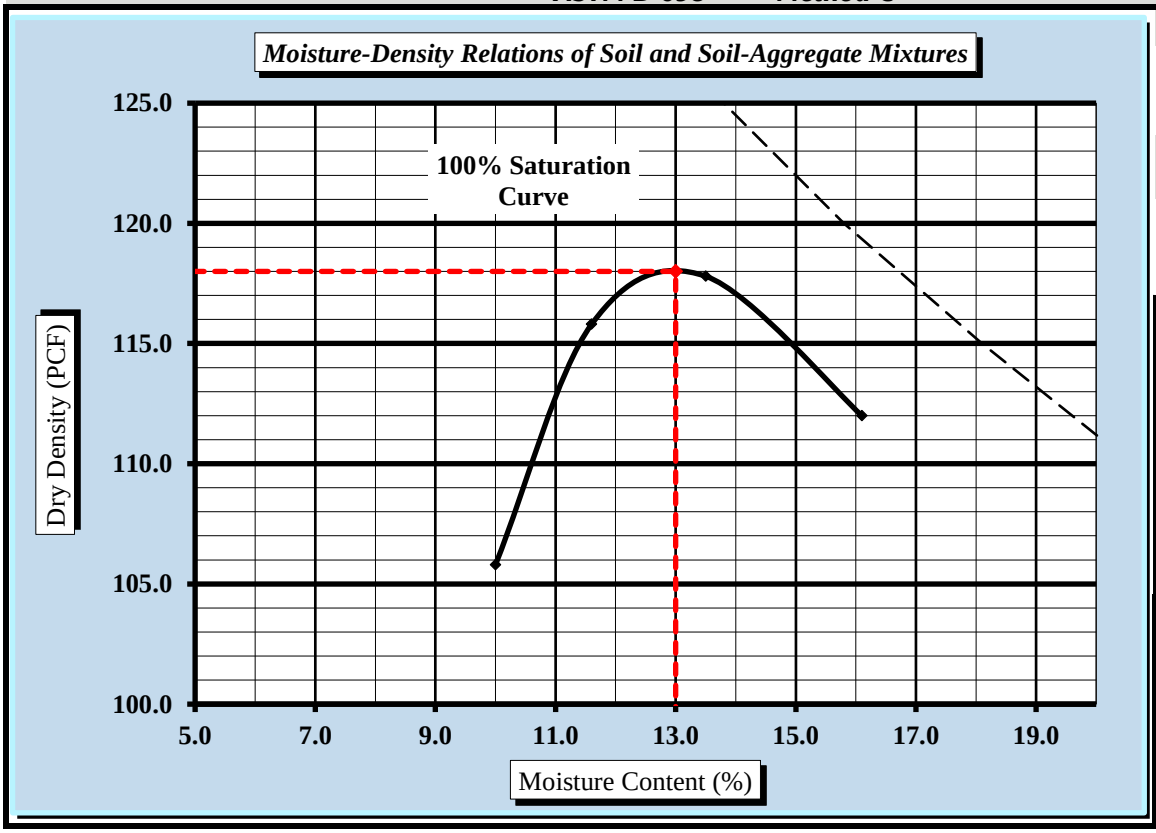
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/24/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	3/19-3/21/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-58	Sample #:	BS-1	Sample Date:	2/26/2018
Location:	Pavement Boring	Offset:	N/A	Depth:	1.1' - 11.1'
Sample Description:	Clayey Sand (SC, A-6(4))				

Maximum Dry Density 118.0 PCF. Optimum Moisture Content 13.0%

ASTM D 698 - - Method C



Soil Properties	
Natural Moisture Content	13.0%
Specific Gravity of Soil	TNP
Liquid Limit	37
Plastic Limit	17
Plastic Index	20
% Passing	
3/4"	99.4%
3/8"	96.7%
#4	93.9%
#10	90.8%
#40	64.6%
#200	42.4%
Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	0.6%
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☐ 3/8 inch Sieve ☐ 3/4 inch Sieve ☒

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations: Replacement method used for CBR preparation.

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/2018 — *Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

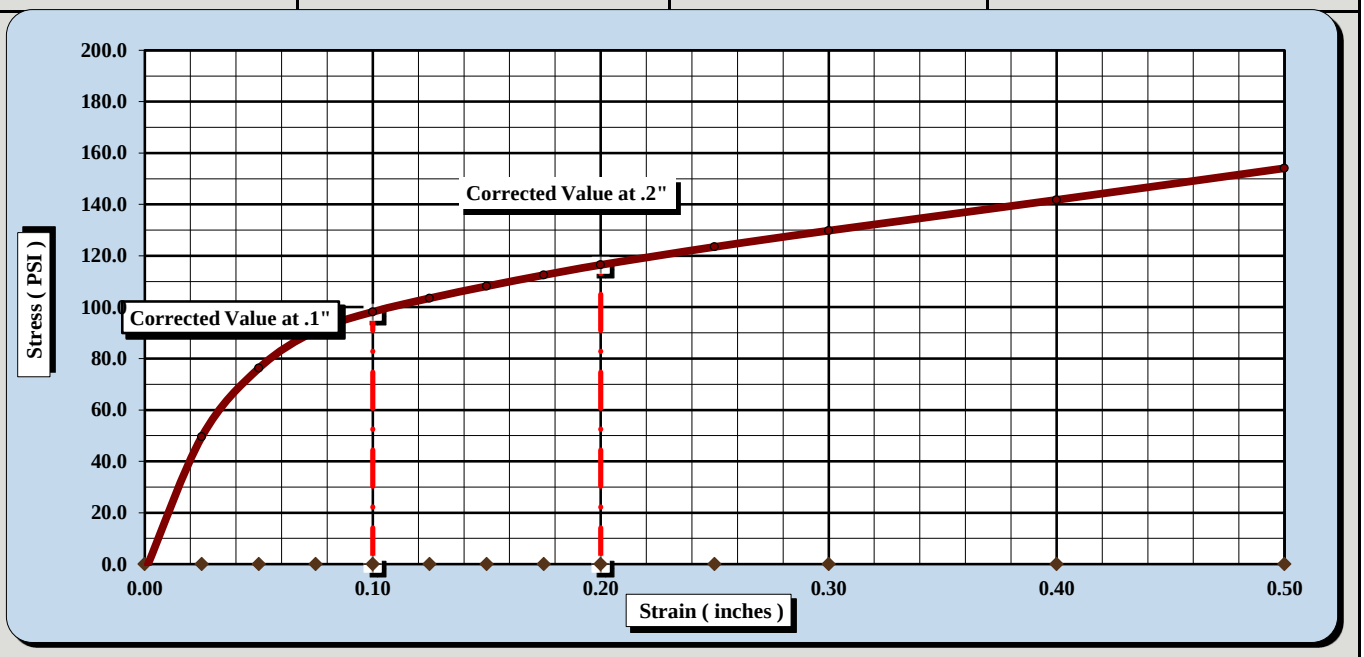
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/24/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	3/23-3/27/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-58	Sample #: BS-1	Sample Date: 2/26/2018
Location:	Pavement Boring	Offset: N/A	Depth: 1.1' - 11.1'
Sample Description:	Clayey Sand (SC, A-6(4))		

ASTM D 698 *Method C* Maximum Dry Density: 118.0 PCF Optimum Moisture Content: 13.0%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 9.8	CBR at 0.2 in. 7.8	CBR at 0.1 in. 9.8	CBR at 0.2 in. 7.8



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	25		
Initial Dry Density (PCF)	108.5	Final Dry Density (PCF)	108.4
Moisture Content of the Compacted Specimen	13.2%	Moisture Content (top 1" after soaking)	17.4%
Percent Compaction	91.9%	Percent Swell	0.1%

Soak Time:	96 hours	Surcharge Weight	20.0	Surcharge Wt. per sq. Ft.	101.8
Liquid Limit	37	Plastic Index	20	Apparent Relative Density	TNP

Notes/Deviations/References: Liquid Limit: ASTM D 4318, Classification: ASTM D 2487

Matthew F. Cooke, P.G.	Project Manager	4/27/2018
Technical Responsibility	*Position*	*Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

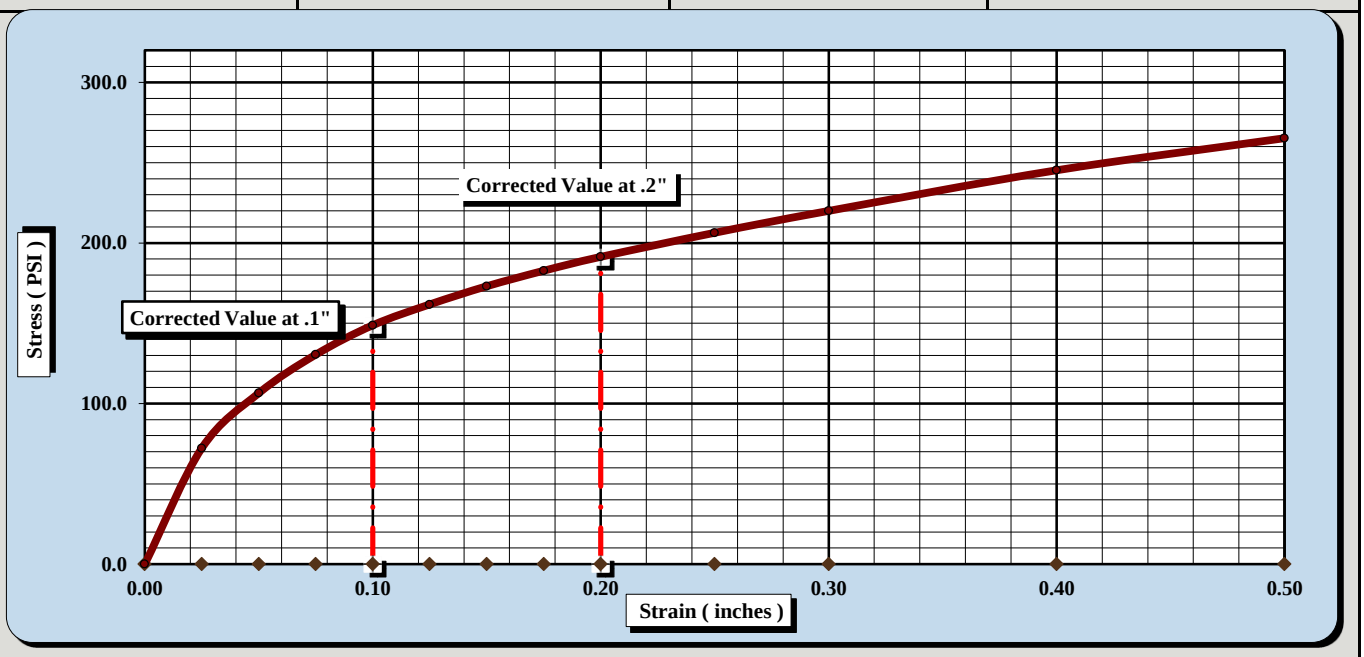
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/24/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	3/23-3/27/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-58	Sample #: BS-1	Sample Date: 2/26/2018
Location:	Pavement Boring	Offset: N/A	Depth: 1.1' - 11.1'
Sample Description:	Clayey Sand (SC, A-6(4))		

ASTM D 698 *Method C* Maximum Dry Density: 118.0 PCF Optimum Moisture Content: 13.0%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 14.9	CBR at 0.2 in. 12.8	CBR at 0.1 in. 14.9	CBR at 0.2 in. 12.8



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	35		
Initial Dry Density (PCF)	113.0	Final Dry Density (PCF)	112.9
Moisture Content of the Compacted Specimen	13.4%	Moisture Content (top 1" after soaking)	15.9%
Percent Compaction	95.8%	Percent Swell	0.1%

Soak Time:	96 hours	Surcharge Weight	20.0	Surcharge Wt. per sq. Ft.	101.8
Liquid Limit	37	Plastic Index	20	Apparent Relative Density	TNP

Notes/Deviations/References: Liquid Limit: ASTM D 4318, Classification: ASTM D 2487

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/2018 — *Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

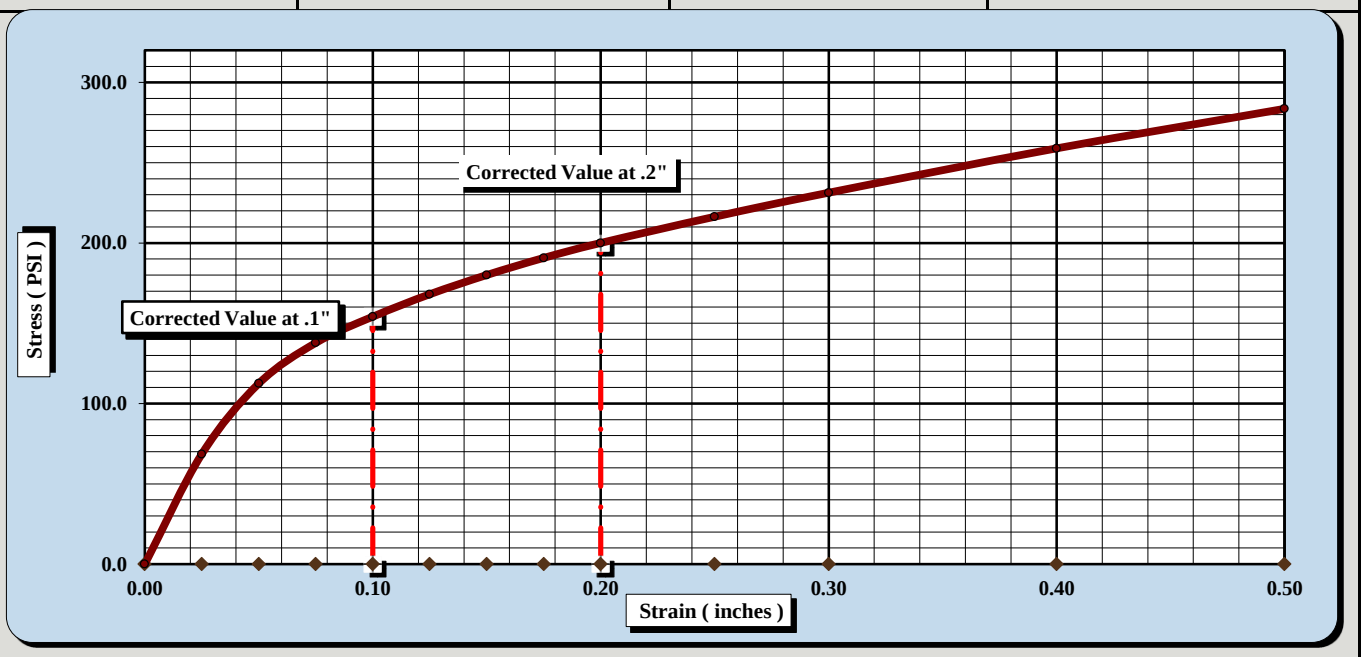
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/24/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	3/23-3/27/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-58	Sample #: BS-1	Sample Date: 2/26/2018
Location:	Pavement Boring	Offset: N/A	Depth: 1.1' - 11.1'
Sample Description:	Clayey Sand (SC, A-6(4))		

ASTM D 698 *Method C* Maximum Dry Density: 118.0 PCF Optimum Moisture Content: 13.0%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 15.4	CBR at 0.2 in. 13.3	CBR at 0.1 in. 15.4	CBR at 0.2 in. 13.3



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	56		
Initial Dry Density (PCF)	114.5	Final Dry Density (PCF)	114.5
Moisture Content of the Compacted Specimen	13.8%	Moisture Content (top 1" after soaking)	14.8%
Percent Compaction	97.1%	Percent Swell	0.1%

Soak Time:	96 hours	Surcharge Weight	20.0	Surcharge Wt. per sq. Ft.	101.9
Liquid Limit	37	Plastic Index	20	Apparent Relative Density	TNP

Notes/Deviations/References: Liquid Limit: ASTM D 4318, Classification: ASTM D 2487

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

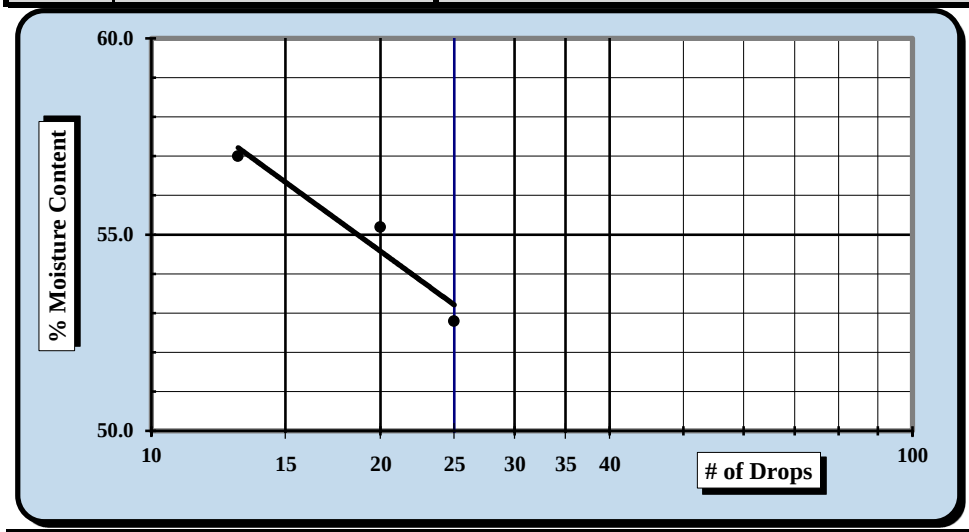
ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	3/5/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/19-2/23/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-63	Sample #: BS-1	Sample Date: 2/6/2018
Location:	Pavement Boring	Offset: N/A	Depth: 1.3' - 11.3'
Sample Description:	Sandy Fat Clay (CH, A-7-6(12))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28574	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

Pan # ZZ		Liquid Limit						Plastic Limit		
	Tare #:	24	209	10				35	244	
A	Tare Weight	20.75	21.10	20.80				20.79	20.79	
B	Wet Soil Weight + A	28.74	28.21	28.51				27.00	27.20	
C	Dry Soil Weight + A	25.98	25.68	25.71				25.77	25.93	
D	Water Weight (B-C)	2.76	2.53	2.80				1.23	1.27	
E	Dry Soil Weight (C-A)	5.23	4.58	4.91				4.98	5.14	
F	% Moisture (D/E)*100	52.8%	55.2%	57.0%				24.7%	24.7%	
N	# OF DROPS	25	20	13				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**24.7%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**53**
Plastic Limit	**25**
Plastic Index	**28**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☐ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group Symbol refers only to material passing the No. 40 sieve.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	4/27/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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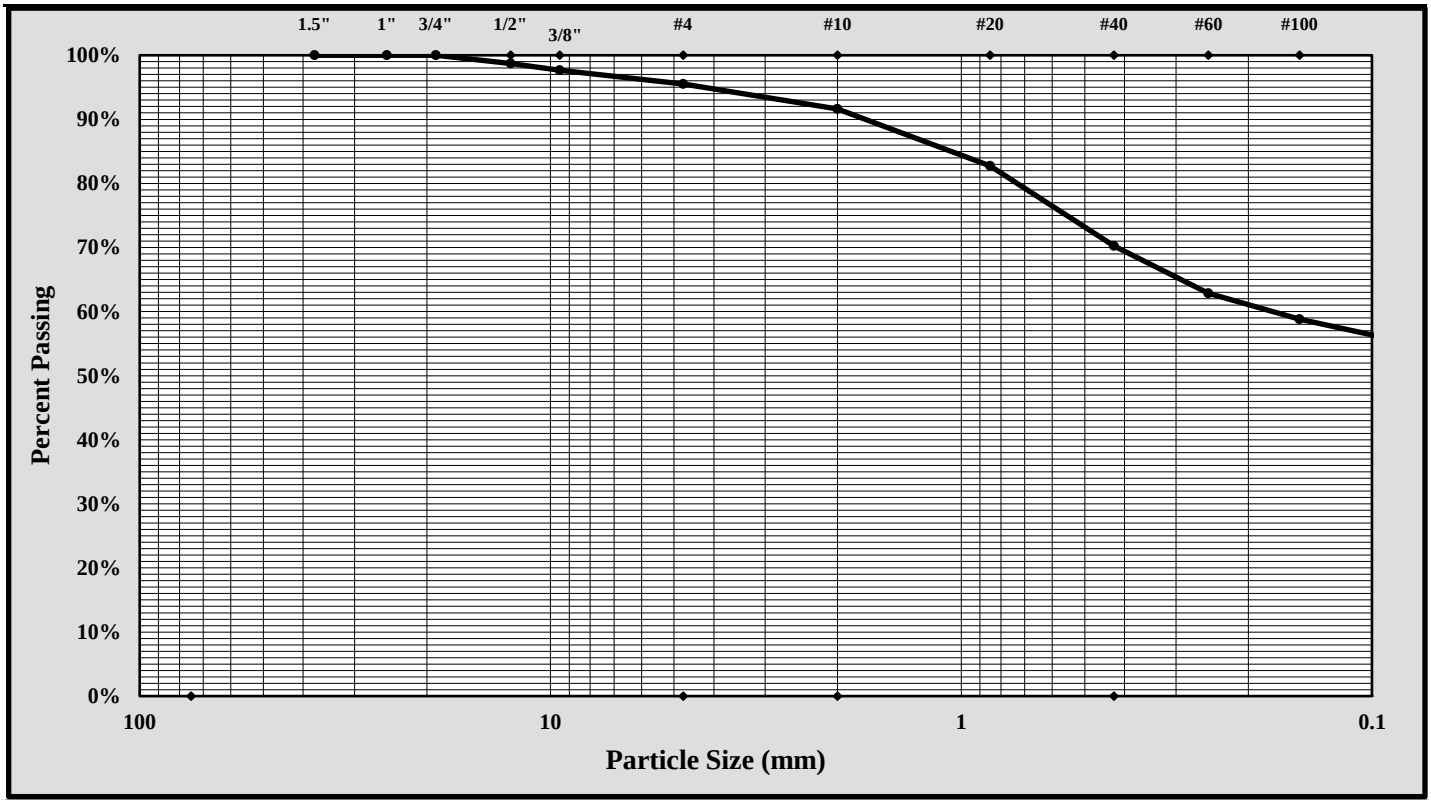
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	3/5/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/19-2/20/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-63 Sample #: BS-1	Sample Date:	2/6/2018
Location:	Pavement Boring Offset: N/A	Depth:	1.3' - 11.3'
Sample Description:	Sandy Fat Clay (CH, A-7-6(12))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	1/2-inch	Gravel:	4.5%
Silt & Clay (% Passing #200):	54.6%	Total Sand:	40.9%

Liquid Limit	53	Plastic Limit	25	Plastic Index	28
Coarse Sand:	3.9%	Medium Sand:	21.4%	Fine Sand:	15.6%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Matthew F. Cooke, P.G.	Project Manager	4/27/2018
Technical Responsibility	*Position*	*Date*

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Form No. TR-D698-2
Revision No. : 1
Revision Date: 07/25/17

MOISTURE - DENSITY REPORT

Quality Assurance

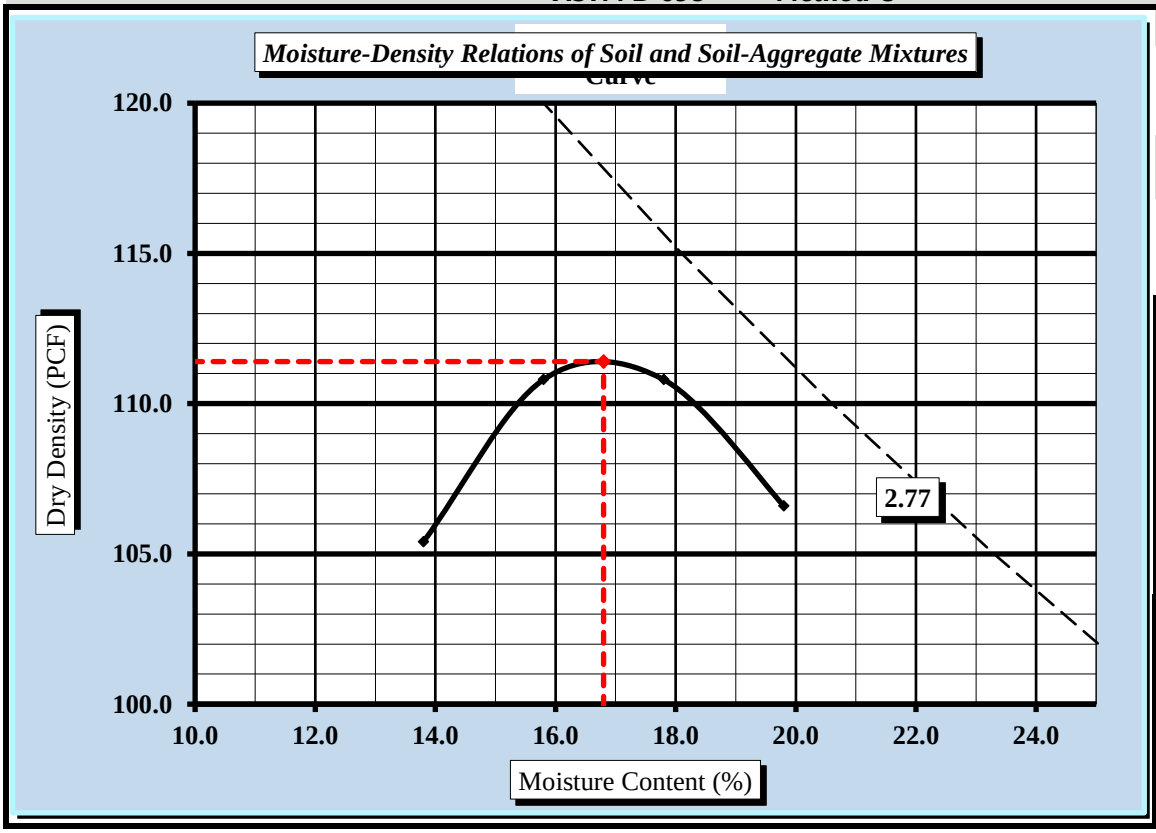
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	3/5/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/19-2/21/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-63	Sample #:	BS-1	Sample Date:	2/6/2018
Location:	Pavement Boring	Offset:	N/A	Depth:	1.3' - 11.3'
Sample Description:	Sandy Fat Clay (CH, A-7-6(12))				

Maximum Dry Density 111.4 PCF. Optimum Moisture Content 16.8%

ASTM D 698 - - Method C



Soil Properties

Natural Moisture Content	21.4%
Specific Gravity of Soil	TNP
Liquid Limit	53
Plastic Limit	25
Plastic Index	28

% Passing	
3/4"	0.0%
3/8"	97.7%
#4	95.5%
#10	91.6%
#40	70.2%
#60	62.9%
#200	54.6%

Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	0.0%
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction ☐ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☐ 3/8 inch Sieve ☐ 3/4 inch Sieve ☒

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations:

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Matthew F. Cooke, P.G.	Project Manager	4/27/2018
Technical Responsibility	*Position*	*Date*

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CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

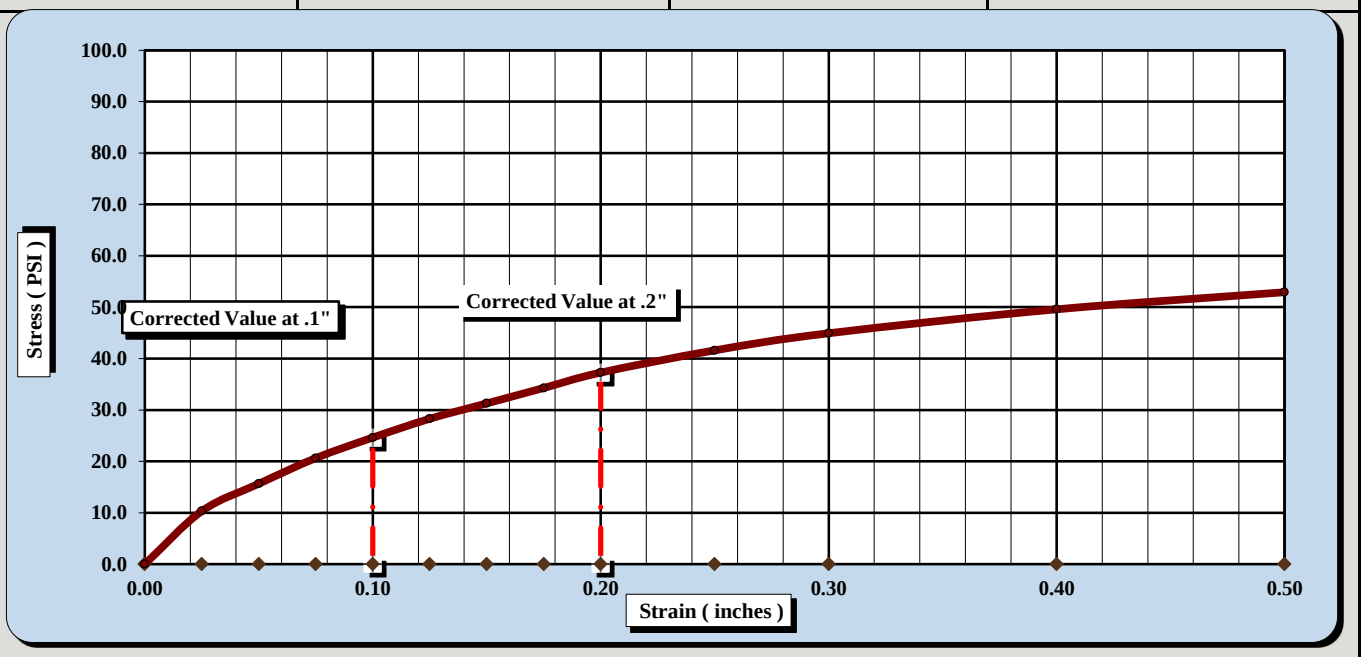
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	3/5/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/23-2/27/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-63	Sample #: BS-1	Sample Date: 2/6/2018
Location:	Pavement Boring	Offset: N/A	Depth: 1.3' - 11.3'
Sample Description:	Sandy Fat Clay (CH, A-7-6(12))		

ASTM D 698 *Method C* Maximum Dry Density: 111.4 PCF Optimum Moisture Content: 16.8%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 2.5	CBR at 0.2 in. 2.5	CBR at 0.1 in. 2.5	CBR at 0.2 in. 2.5



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	15		
Initial Dry Density (PCF)	94.7	Final Dry Density (PCF)	93.7
Moisture Content of the Compacted Specimen	17.2%	Moisture Content (top 1" after soaking)	26.1%
Percent Compaction	85.0%	Percent Swell	1.1%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	53	Plastic Index	28	Apparent Relative Density	TNP

Notes/Deviations/References:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/5/2018 — *Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

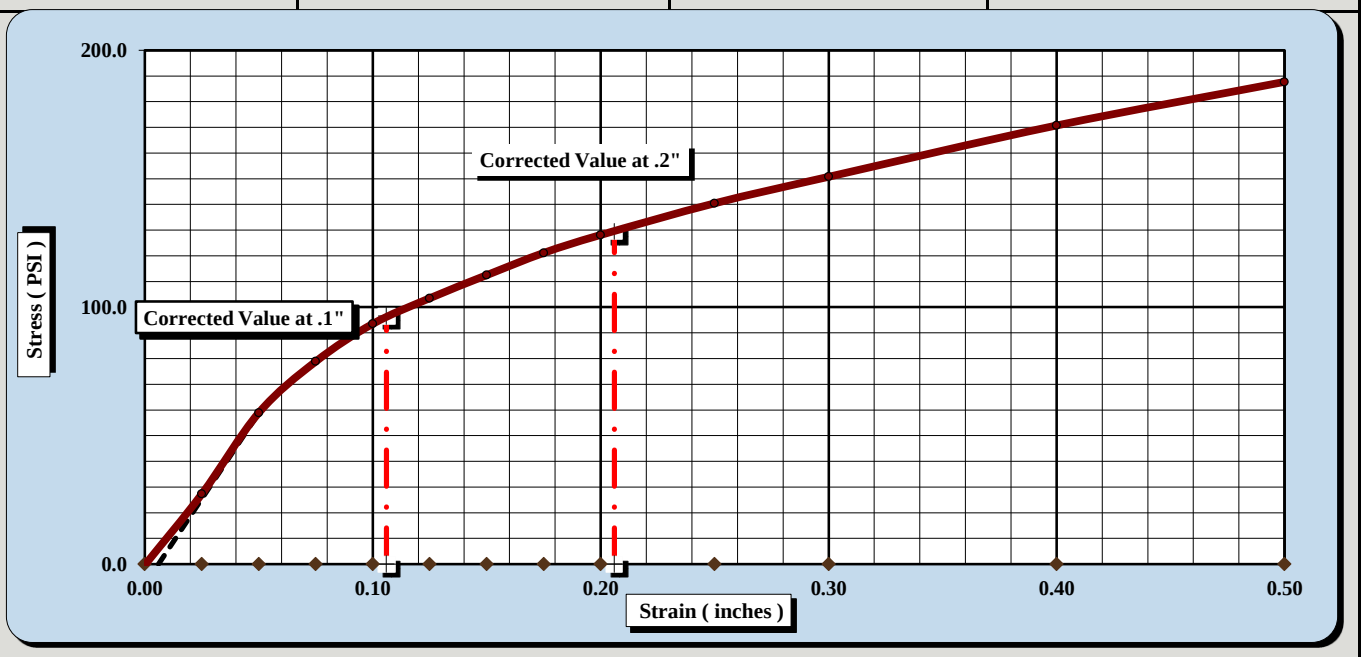
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	3/5/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/23-2/27/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-63	Sample #: BS-1	Sample Date: 2/6/2018
Location:	Pavement Boring	Offset: N/A	Depth: 1.3' - 11.3'
Sample Description:	Sandy Fat Clay (CH, A-7-6(12))		

ASTM D 698 *Method C* Maximum Dry Density: 111.4 PCF Optimum Moisture Content: 16.8%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 9.4	CBR at 0.2 in. 8.5	CBR at 0.1 in. 9.7	CBR at 0.2 in. 8.6



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	35		
Initial Dry Density (PCF)	107.1	Final Dry Density (PCF)	106.6
Moisture Content of the Compacted Specimen	16.8%	Moisture Content (top 1" after soaking)	22.2%
Percent Compaction	96.2%	Percent Swell	0.5%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	53	Plastic Index	28	Apparent Relative Density	TNP

Notes/Deviations/References: Liquid Limit: ASTM D 4318, Specific Gravity: ASTM D 854, Classification: ASTM D 2487

Matthew F. Cooke, P.G.	Project Manager	4/5/2018
Technical Responsibility	*Position*	*Date*

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CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

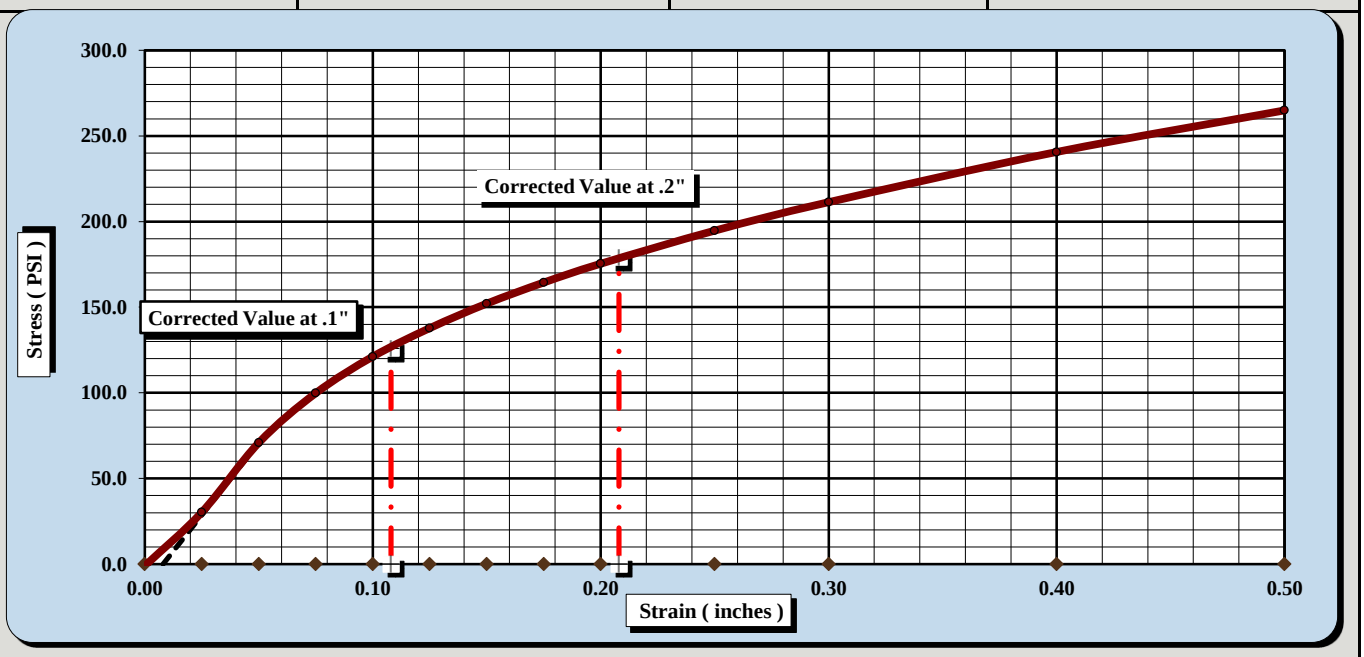
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	3/5/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/23-2/27/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-63	Sample #: BS-1	Sample Date: 2/6/2018
Location:	Pavement Boring	Offset: N/A	Depth: 1.3' - 11.3'
Sample Description:	Sandy Fat Clay (CH, A-7-6(12))		

ASTM D 698 *Method C* Maximum Dry Density: 111.4 PCF Optimum Moisture Content: 16.8%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 12.1	CBR at 0.2 in. 11.7	CBR at 0.1 in. 12.6	CBR at 0.2 in. 11.9



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	56		
Initial Dry Density (PCF)	109.8	Final Dry Density (PCF)	109.3
Moisture Content of the Compacted Specimen	15.8%	Moisture Content (top 1" after soaking)	19.7%
Percent Compaction	98.5%	Percent Swell	0.4%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	53	Plastic Index	28	Apparent Relative Density	TNP

Notes/Deviations/References:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/5/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

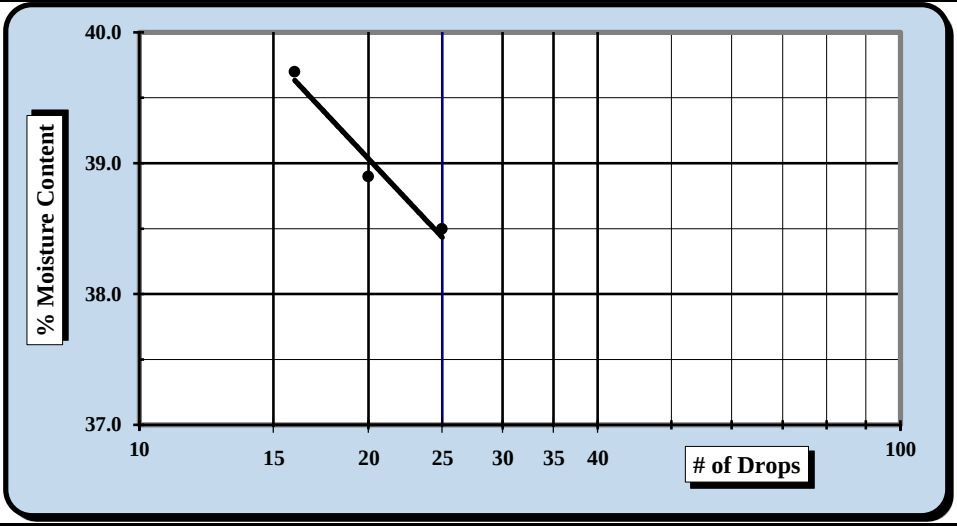
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/9/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	1/30-2/8/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-65	Sample #: BS-1		Sample Date: 1/24/2018	
Location:	Pavement Boring	Offset: N/A		Depth: 0.8' - 10.8'	
Sample Description:	Sandy Lean Clay (CL, A-7-6(6))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28573	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

Pan # 2		Liquid Limit						Plastic Limit		
	Tare #:	229	207	9				6	222	
A	Tare Weight	20.71	20.93	20.78				20.57	20.83	
B	Wet Soil Weight + A	30.49	28.57	28.94				27.09	26.82	
C	Dry Soil Weight + A	27.77	26.43	26.62				25.98	25.80	
D	Water Weight (B-C)	2.72	2.14	2.32				1.11	1.02	
E	Dry Soil Weight (C-A)	7.06	5.50	5.84				5.41	4.97	
F	% Moisture (D/E)*100	38.5%	38.9%	39.7%				20.5%	20.5%	
N	# OF DROPS	25	20	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**20.5%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**38**
Plastic Limit	**21**
Plastic Index	**17**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☑ Dry Preparation ☐ Air Dried ☐ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group Symbol refers only to material passing the No. 40 sieve.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	4/27/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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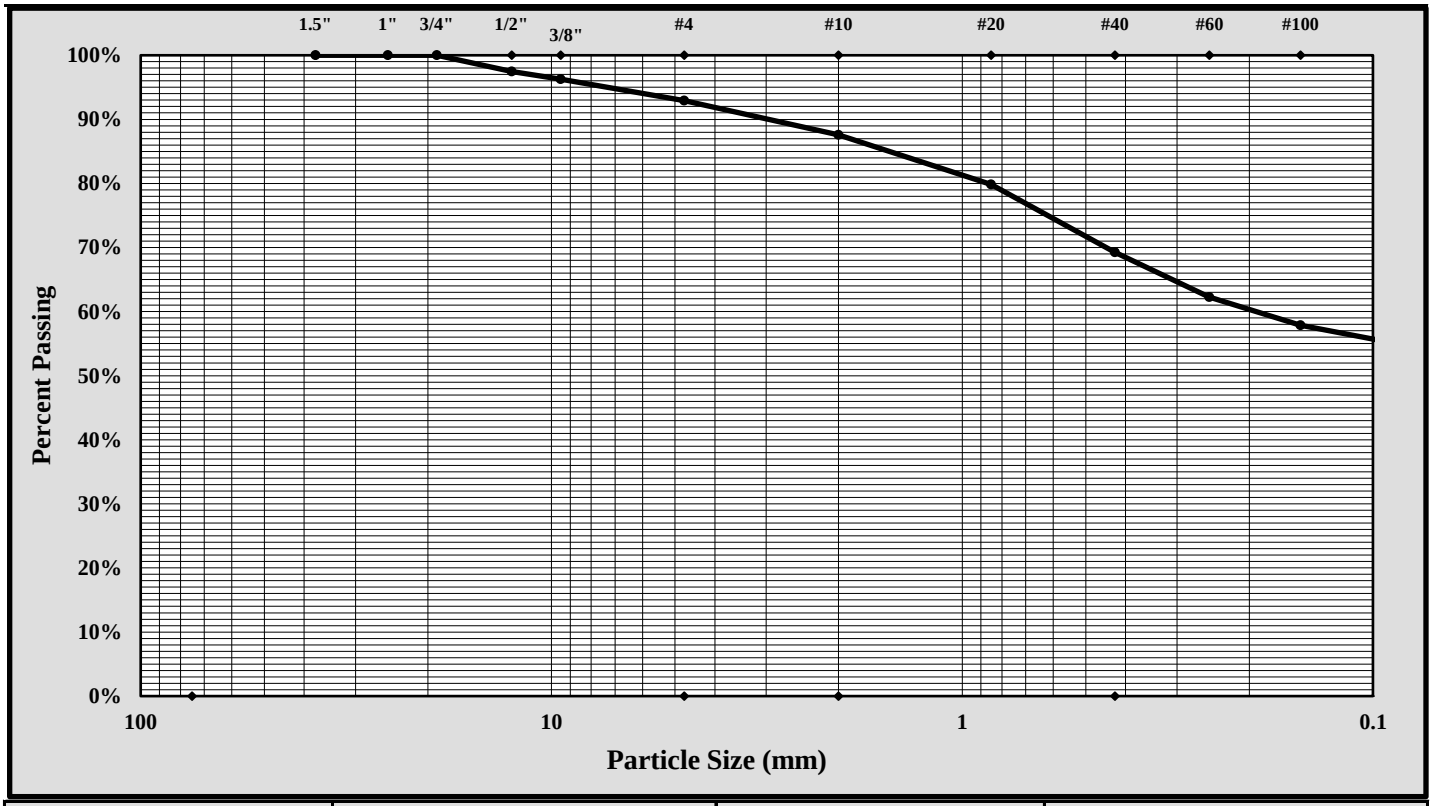
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/6/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	1/30-2/5/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-65 Sample #: BS-1	Sample Date:	1/24/2018
Location:	Pavement Boring Offset: N/A	Depth:	0.8' - 10.8'
Sample Description:	Sandy Lean Clay (CL, A-7-6(6))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	1/2-inch	Gravel:	7.1%
Silt & Clay (% Passing #200):	54.2%	Total Sand:	38.7%

Liquid Limit	38	Plastic Limit	21	Plastic Index	17
Coarse Sand:	5.3%	Medium Sand:	18.3%	Fine Sand:	15.1%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☒

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/2018 — *Date*

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Form No. TR-D698-2
Revision No. : 1
Revision Date: 07/25/17

MOISTURE - DENSITY REPORT

Quality Assurance

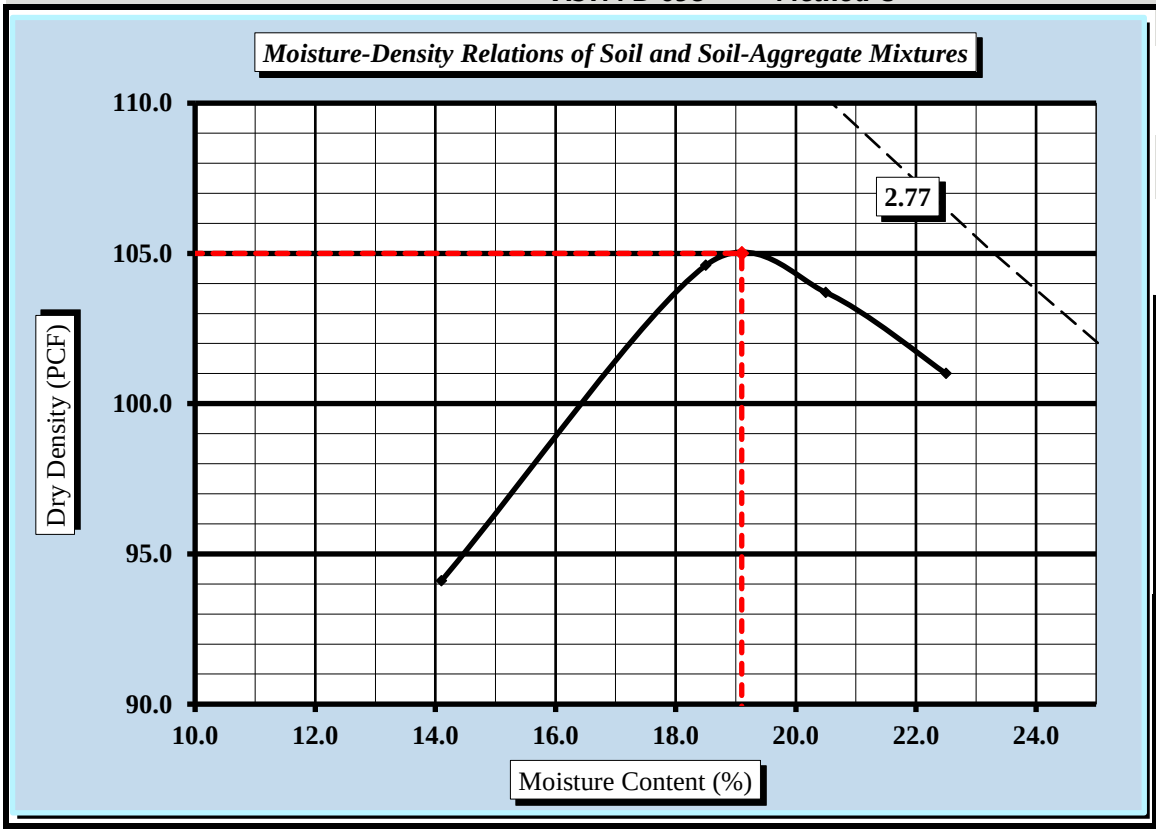
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/16/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/2-2/15/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-65	Sample #:	BS-1	Sample Date:	1/24/2018
Location:	Pavement Boring	Offset:	N/A	Depth:	0.8' - 10.8'
Sample Description:	Sandy Lean Clay (CL, A-7-6(6))				

Maximum Dry Density 105.0 PCF. Optimum Moisture Content 19.1%

ASTM D 698 - - Method C



Soil Properties

Natural Moisture Content	35.0%
Specific Gravity of Soil	TNP
Liquid Limit	38
Plastic Limit	21
Plastic Index	17

% Passing	
3/4"	100.0%
3/8"	96.3%
#4	92.9%
#10	87.6%
#40	69.3%
#60	62.3%
#200	54.2%

Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	0.0%
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☐ 3/8 inch Sieve ☐ 3/4 inch Sieve ☒

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations:

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Matthew F. Cooke, P.G.	Project Manager	4/27/2018
Technical Responsibility	*Position*	*Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

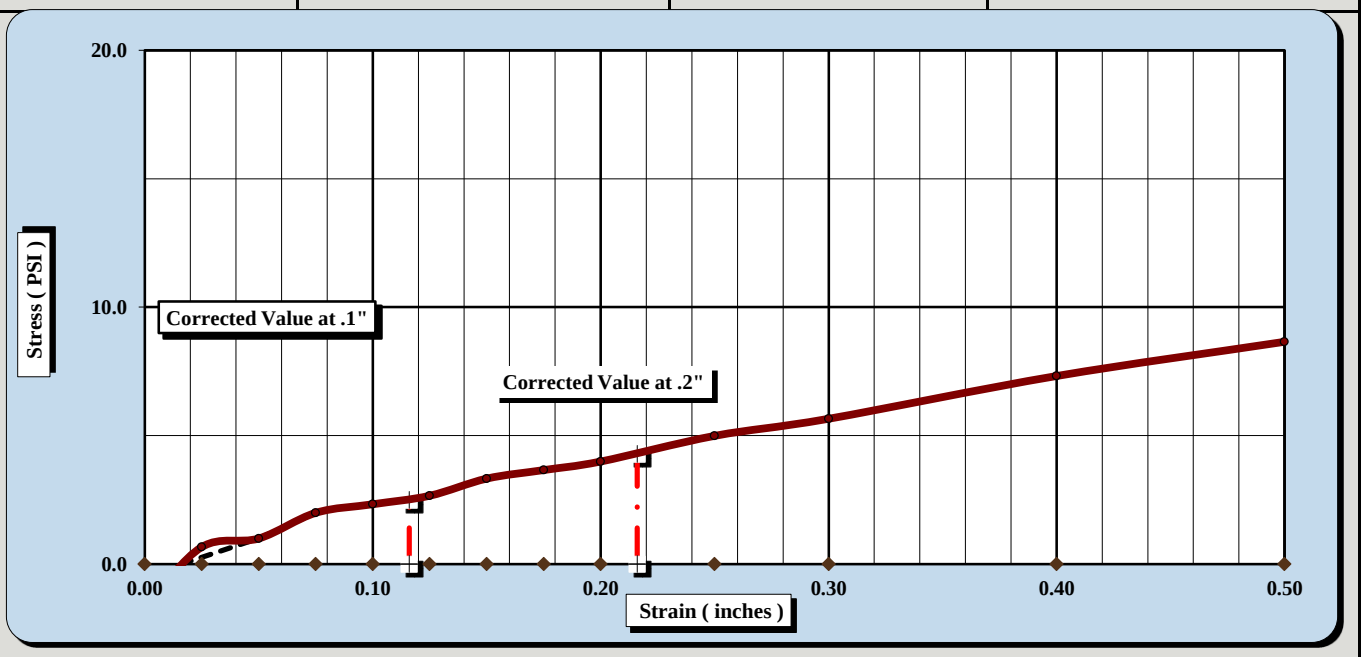
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/16/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/8-2/12/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-65	Sample #: BS-1	Sample Date: 1/24/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.8' - 10.8'
Sample Description:	Sandy Lean Clay (CL, A-7-6(6))		

ASTM D 698 *Method C* Maximum Dry Density: 105.0 PCF Optimum Moisture Content: 19.1%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 0.2	CBR at 0.2 in. 0.3	CBR at 0.1 in. 0.3	CBR at 0.2 in. 0.3



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	15		
Initial Dry Density (PCF)	83.7	Final Dry Density (PCF)	82.1
Moisture Content of the Compacted Specimen	17.7%	Moisture Content (top 1" after soaking)	34.7%
Percent Compaction	79.7%	Percent Swell	2.0%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	38	Plastic Index	17	Apparent Relative Density	TNP

Notes/Deviations/References:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/2018 — *Date*

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CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

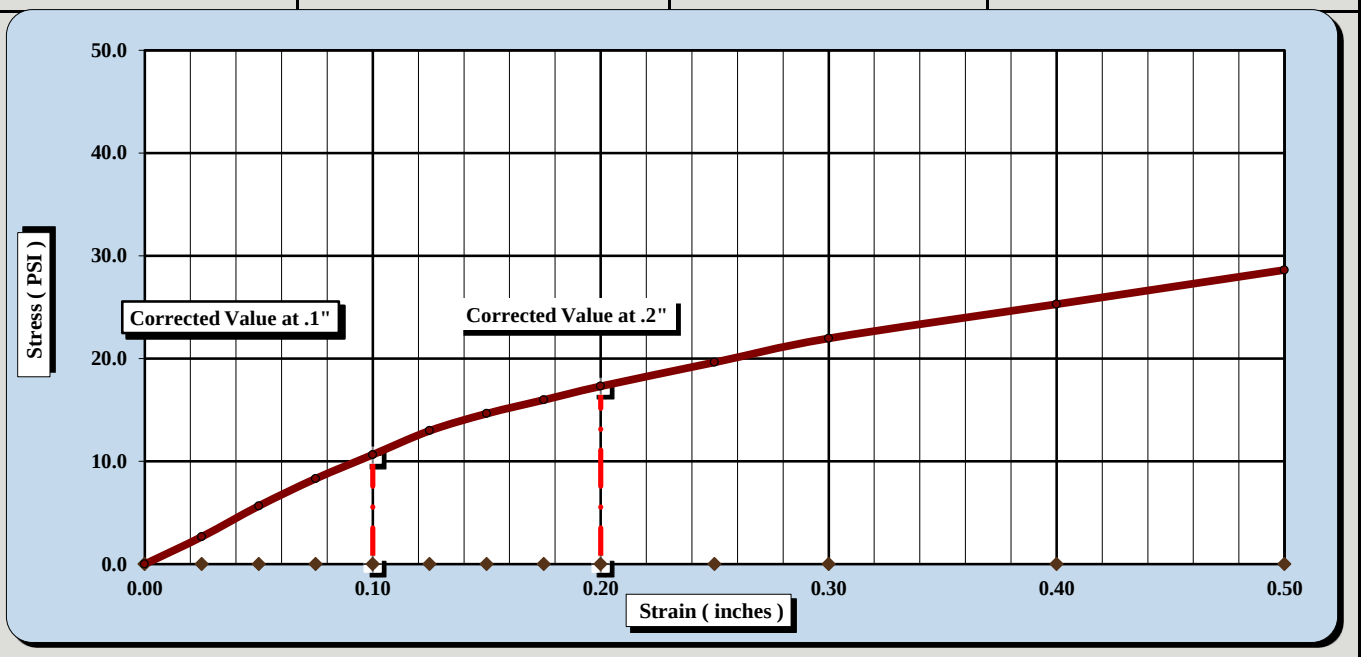
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/16/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/8-2/12/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-65	Sample #: BS-1	Sample Date: 1/24/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.8' - 10.8'
Sample Description:	Sandy Lean Clay (CL, A-7-6(6))		

ASTM D 698 *Method C* Maximum Dry Density: 105.0 PCF Optimum Moisture Content: 19.1%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 1.1	CBR at 0.2 in. 1.2	CBR at 0.1 in. 1.1	CBR at 0.2 in. 1.2



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	35		
Initial Dry Density (PCF)	97.0	Final Dry Density (PCF)	93.2
Moisture Content of the Compacted Specimen	16.9%	Moisture Content (top 1" after soaking)	30.8%
Percent Compaction	92.4%	Percent Swell	4.1%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.8
Liquid Limit	38	Plastic Index	17	Apparent Relative Density	TNP

Notes/Deviations/References:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/2018 — *Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

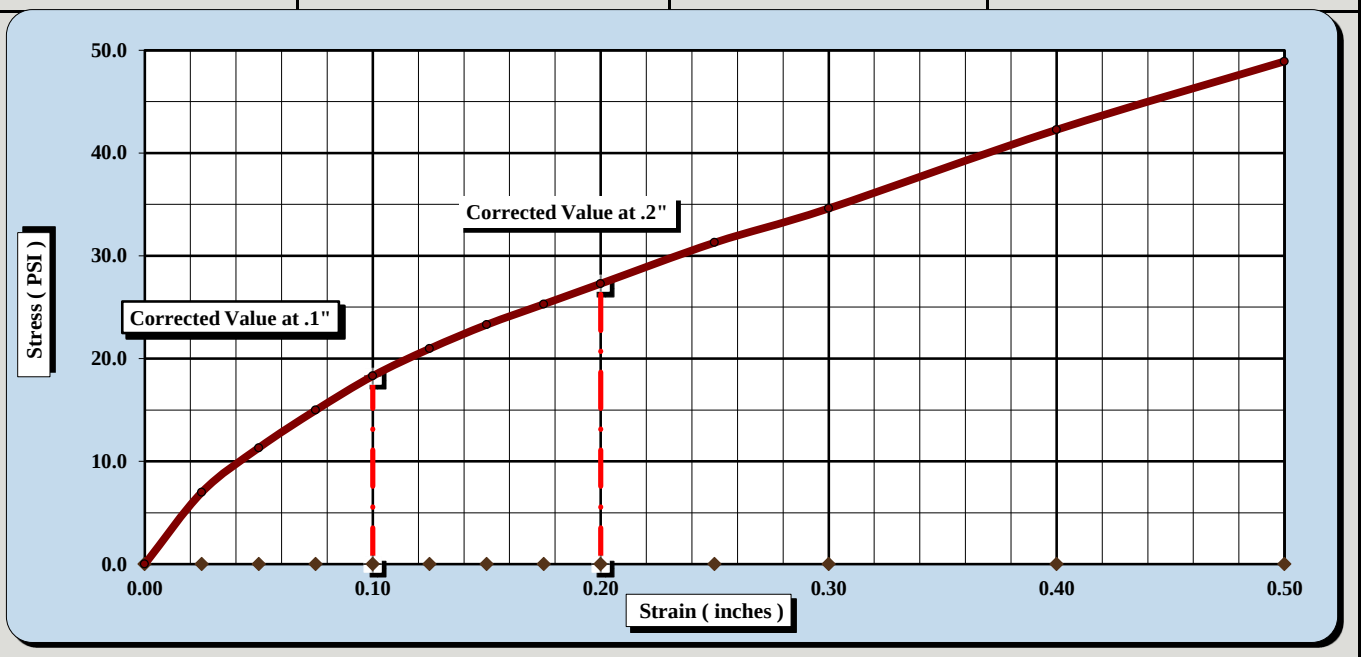
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/13/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/8-2/12/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-65	Sample #: BS-1	Sample Date: 1/24/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.8' - 10.8'
Sample Description:	Sandy Lean Clay (CL, A-7-6(6))		

ASTM D 698 *Method C* Maximum Dry Density: 105.0 PCF Optimum Moisture Content: 19.1%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values				Corrected CBR Values			
CBR at 0.1 in.	1.8	CBR at 0.2 in.	1.8	CBR at 0.1 in.	1.8	CBR at 0.2 in.	1.8



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	65		
Initial Dry Density (PCF)	100.6	Final Dry Density (PCF)	95.6
Moisture Content of the Compacted Specimen	17.0%	Moisture Content (top 1" after soaking)	30.4%
Percent Compaction	95.8%	Percent Swell	5.2%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	38	Plastic Index	17	Apparent Relative Density	TNP

Notes/Deviations/References:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

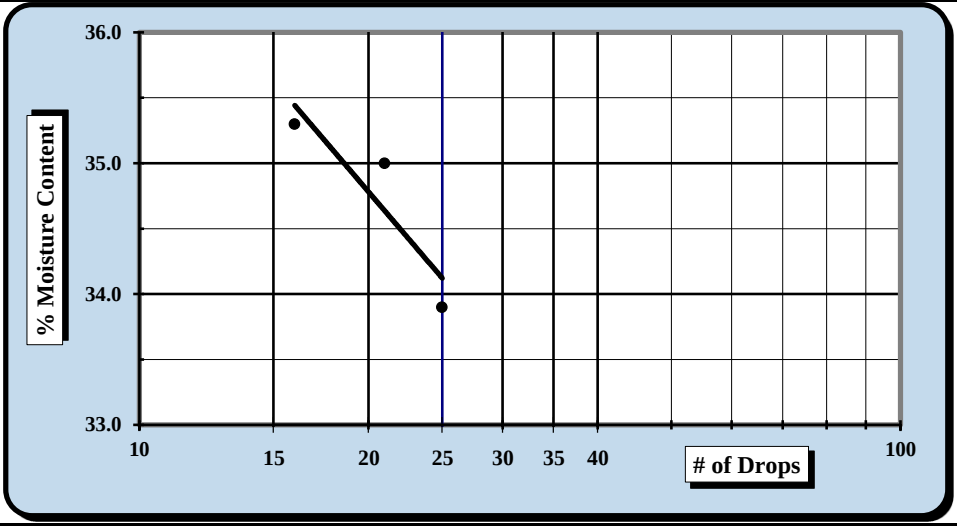
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/22-2/23/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-67	Sample #: BS-1	Sample Date: 1/31/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.6' - 10.6'
Sample Description:	Clayey Sand (SC, A-6(2))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28575	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

Pan #	d-1	Liquid Limit						Plastic Limit		
	Tare #:	10	226	212				24	209	
A	Tare Weight	20.78	20.92	20.85				20.77	21.08	
B	Wet Soil Weight + A	28.68	28.05	27.52				27.09	28.51	
C	Dry Soil Weight + A	26.68	26.20	25.78				26.24	27.53	
D	Water Weight (B-C)	2.00	1.85	1.74				0.85	0.98	
E	Dry Soil Weight (C-A)	5.90	5.28	4.93				5.47	6.45	
F	% Moisture (D/E)*100	33.9%	35.0%	35.3%				15.5%	15.2%	
N	# OF DROPS	25	21	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**15.4%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**34**
Plastic Limit	**15**
Plastic Index	**19**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group Symbol for minus No. 40 sieve potion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	4/27/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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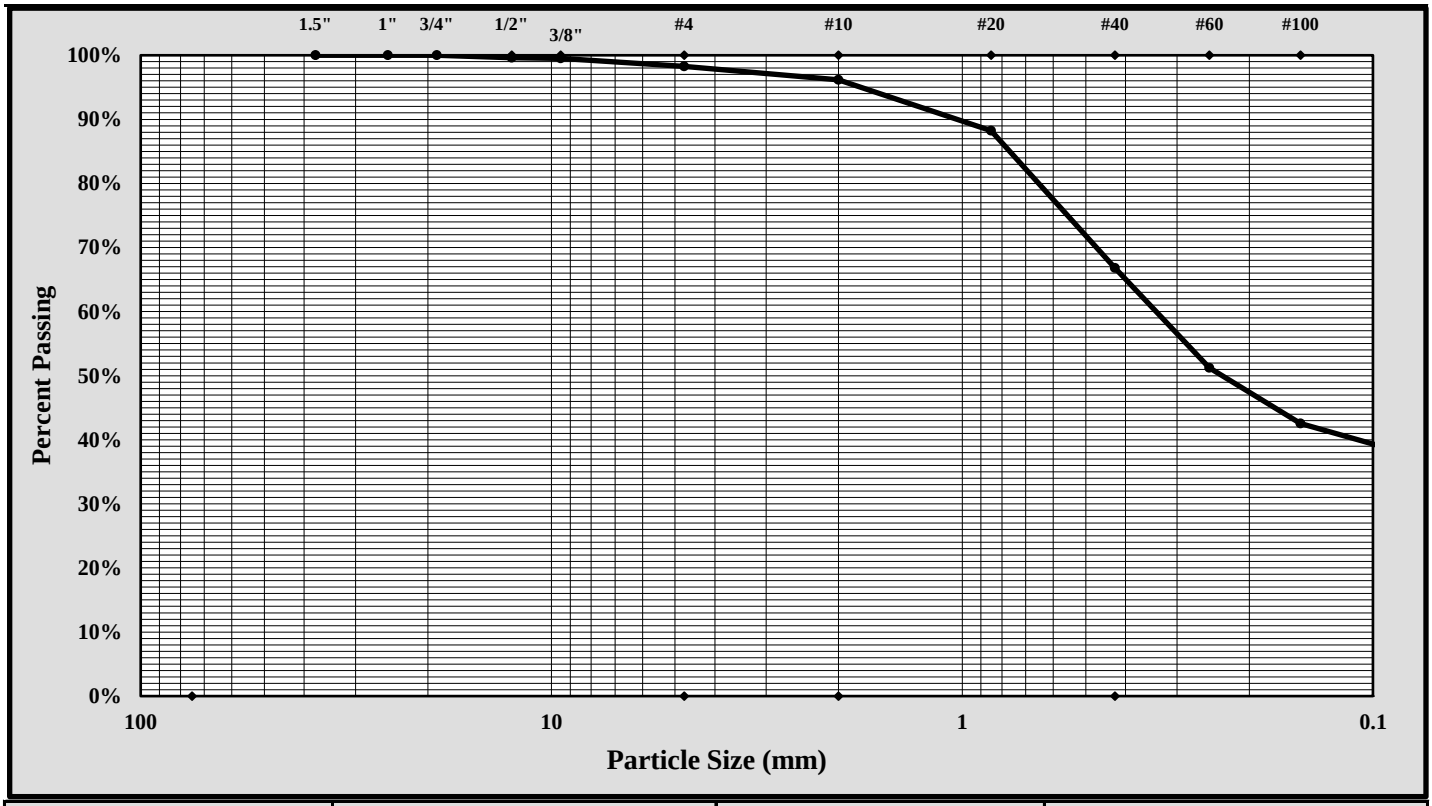
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/20-3/1/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-67 Sample #: BS-1	Sample Date:	1/24/2018
Location:	Pavement Boring Offset: N/A	Depth:	0.6' - 10.6'
Sample Description:	Clayey Sand (SC, A-6(2))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	1/2-inch	Gravel:	1.7%
Silt & Clay (% Passing #200):	37.1%	Total Sand:	61.2%

Liquid Limit	34	Plastic Limit	15	Plastic Index	19
Coarse Sand:	2.1%	Medium Sand:	29.4%	Fine Sand:	29.7%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Matthew F. Cooke, P.G.	Project Manager	4/27/2018
Technical Responsibility	*Position*	*Date*

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Form No. TR-D698-2
Revision No. : 1
Revision Date: 07/25/17

MOISTURE - DENSITY REPORT

Quality Assurance

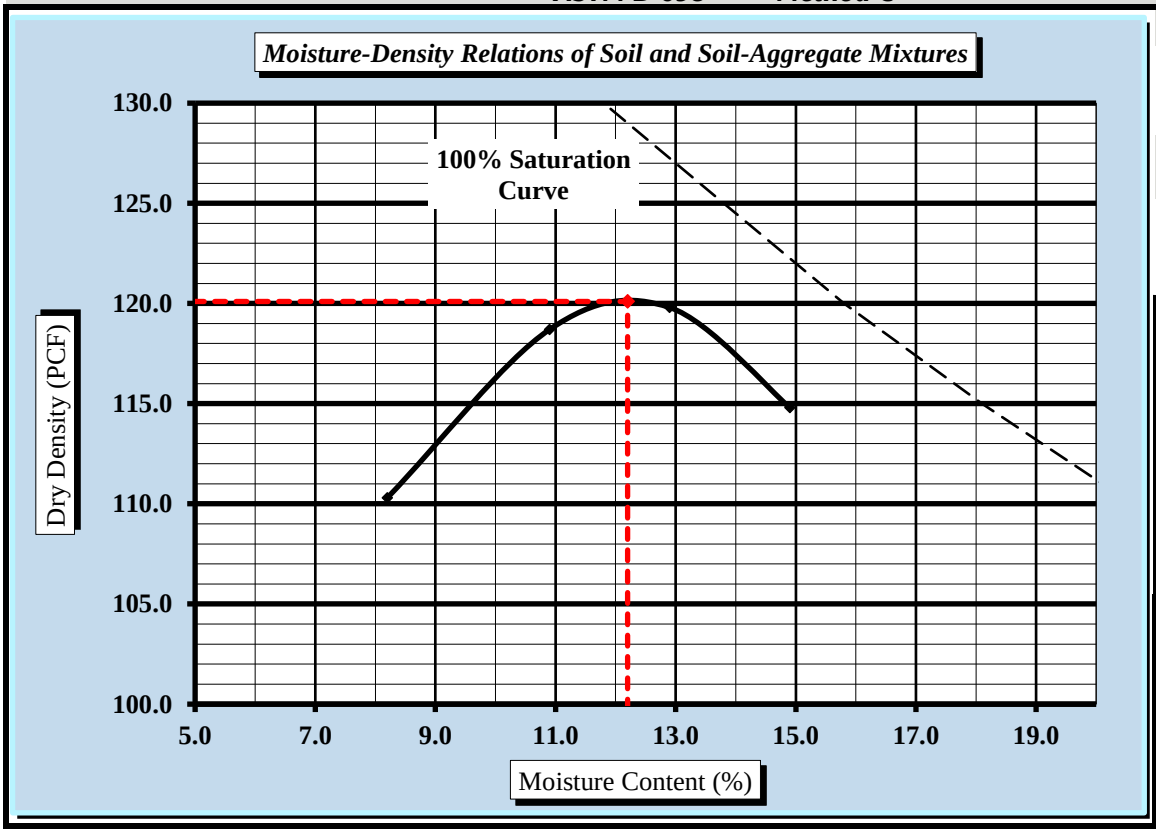
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/22-3/2/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-67	Sample #:	BS-1	Sample Date:	1/24/2018
Location:	Pavement Boring	Offset:	N/A	Depth:	0.6' - 10.6'
Sample Description:	Clayey Sand (SC, A-6(2))				

Maximum Dry Density 120.1 PCF. Optimum Moisture Content 12.2%

ASTM D 698 - - Method C



Soil Properties

Natural Moisture Content	13.1%
Specific Gravity of Soil	TNP
Liquid Limit	34
Plastic Limit	15
Plastic Index	19

% Passing	
3/4"	100.0%
3/8"	99.5%
#4	98.3%
#10	96.2%
#40	66.8%
#60	51.2%
#200	37.1%

Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	0.0%
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☐ 3/8 inch Sieve ☐ 3/4 inch Sieve ☒

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations:

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Matthew F. Cooke, P.G.	Project Manager	4/27/2018
Technical Responsibility	*Position*	*Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

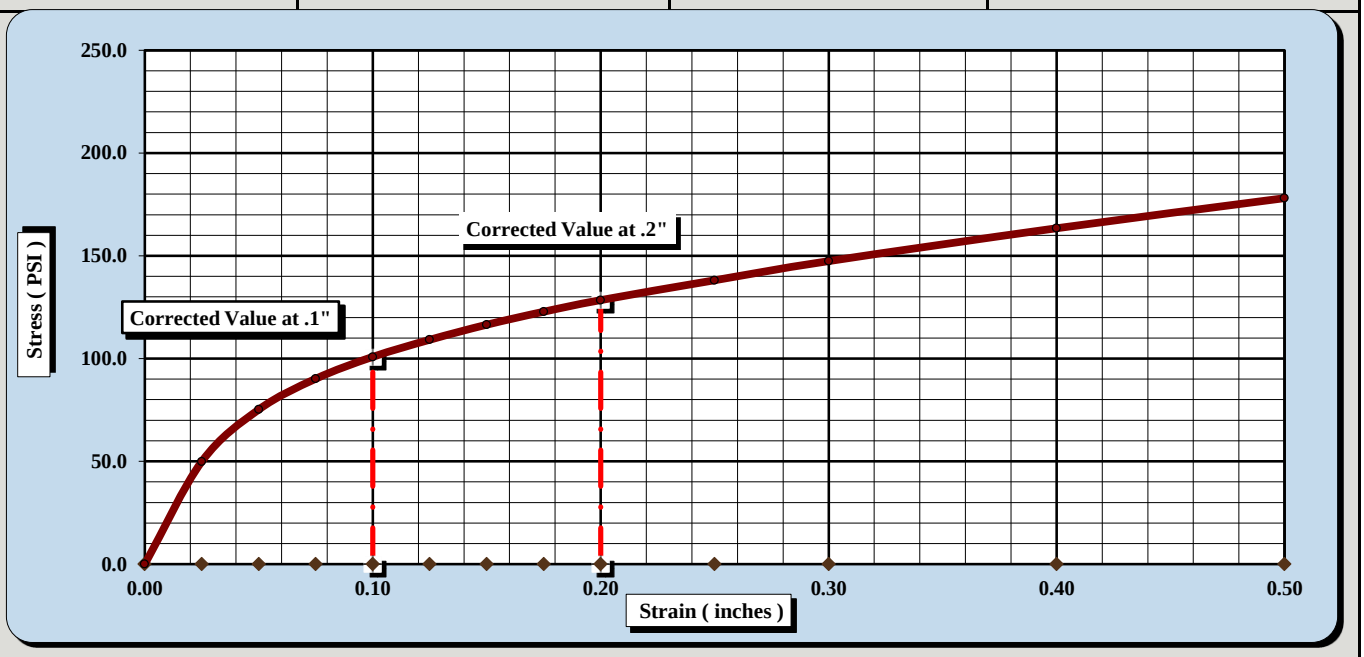
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	3/9-3/13/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-67	Sample #: BS-1	Sample Date: 1/24/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.6' - 10.6'
Sample Description:	Clayey Sand (SC, A-6(2))		

ASTM D 698 *Method C* Maximum Dry Density: 120.1 PCF Optimum Moisture Content: 12.2%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 10.1	CBR at 0.2 in. 8.6	CBR at 0.1 in. 10.1	CBR at 0.2 in. 8.6



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	25		
Initial Dry Density (PCF)	111.7	Final Dry Density (PCF)	111.7
Moisture Content of the Compacted Specimen	11.6%	Moisture Content (top 1" after soaking)	14.8%
Percent Compaction	93.0%	Percent Swell	0.0%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.8
Liquid Limit	34	Plastic Index	19	Apparent Relative Density	TNP

Notes/Deviations/References: Liquid Limit: ASTM D 4318, Classification: ASTM D 2487

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/2018 — *Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

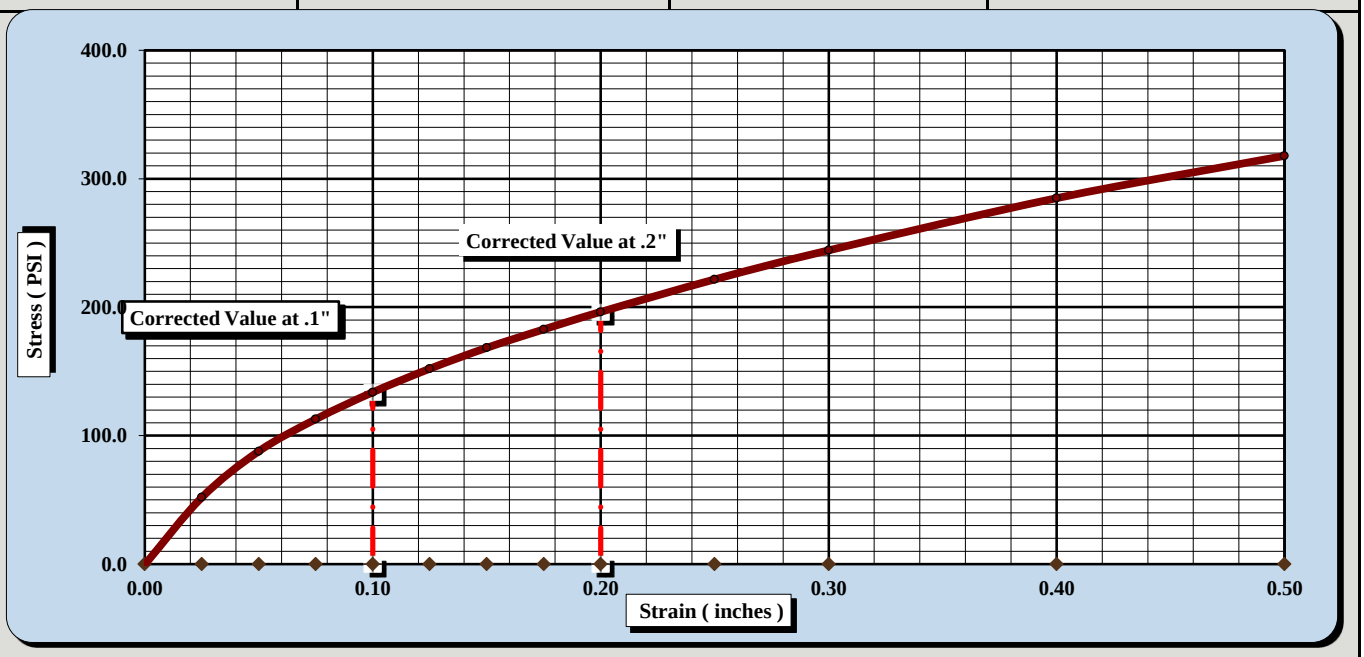
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	3/9-3/13/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-67	Sample #: BS-1	Sample Date: 1/24/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.6' - 10.6'
Sample Description:	Clayey Sand (SC, A-6(2))		

ASTM D 698 *Method C* Maximum Dry Density: 120.1 PCF Optimum Moisture Content: 12.2%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 13.4	CBR at 0.2 in. 13.1	CBR at 0.1 in. 13.4	CBR at 0.2 in. 13.1



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	35		
Initial Dry Density (PCF)	117.1	Final Dry Density (PCF)	117.1
Moisture Content of the Compacted Specimen	11.9%	Moisture Content (top 1" after soaking)	14.4%
Percent Compaction	97.5%	Percent Swell	0.0%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	34	Plastic Index	19	Apparent Relative Density	TNP

Notes/Deviations/References: Liquid Limit: ASTM D 4318, Classification: ASTM D 2487

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/2018 — *Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

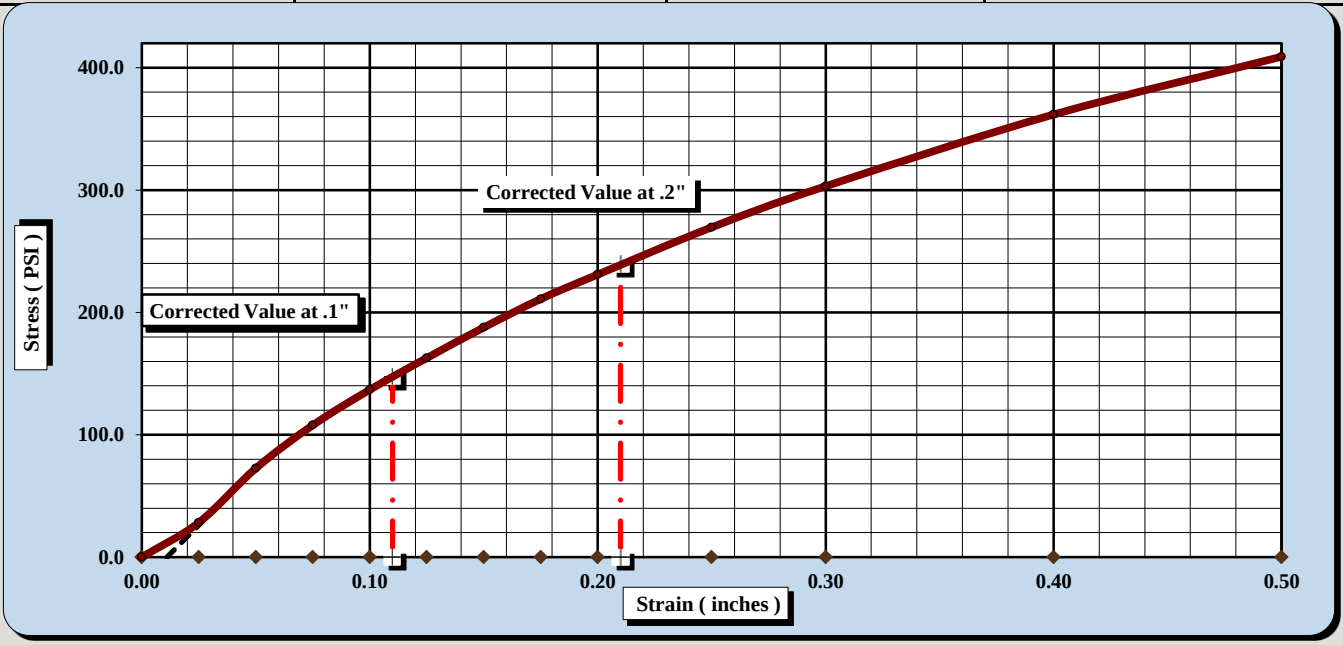
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	3/9-3/13/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-67	Sample #: BS-1	Sample Date: 1/24/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.6' - 10.6'
Sample Description:	Clayey Sand (SC, A-6(2))		

ASTM D 698 *Method C* Maximum Dry Density: 120.1 PCF Optimum Moisture Content: 12.2%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 13.7	CBR at 0.2 in. 15.4	CBR at 0.1 in. 14.8	CBR at 0.2 in. 16.0



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	56		
Initial Dry Density (PCF)	120.1	Final Dry Density (PCF)	120.1
Moisture Content of the Compacted Specimen	11.8%	Moisture Content (top 1" after soaking)	13.1%
Percent Compaction	100.0%	Percent Swell	0.0%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	34	Plastic Index	19	Apparent Relative Density	TNP

Notes/Deviations/References: Liquid Limit: ASTM D 4318, Classification: ASTM D 2487

Matthew F. Cooke, P.G.	Project Manager	4/27/2018
Technical Responsibility	*Position*	*Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

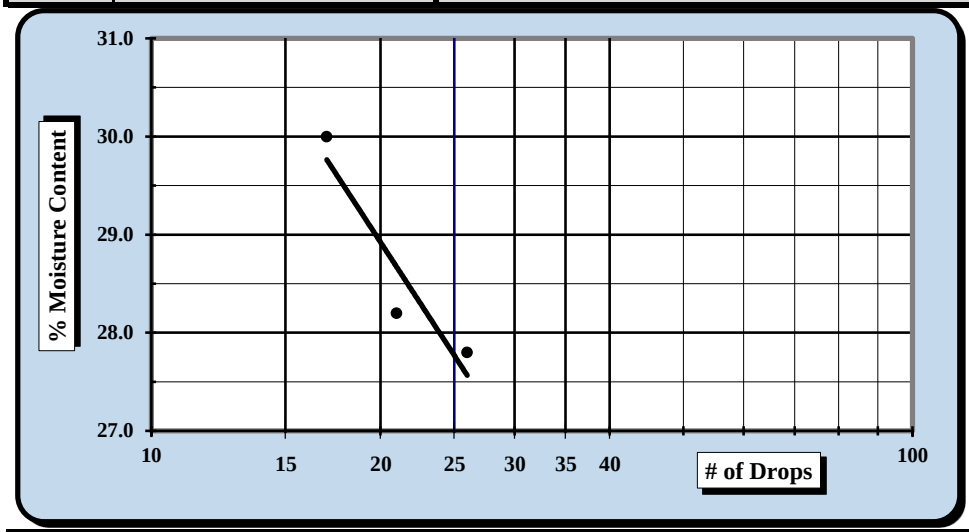
ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	2/26-3/1/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-70	Sample #: BS-1	Sample Date: 2/1/18
Location:	Pavement Boring	Offset: N/A	Depth: 0.6' - 10.6'
Sample Description:	Clayey Sand (SC, A-2-6)		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28575	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

	Pan # 8	Liquid Limit						Plastic Limit		
	Tare #:	3	30	19				4	209	
A	Tare Weight	20.81	20.81	20.52				20.55	21.10	
B	Wet Soil Weight + A	30.06	29.41	29.41				29.23	27.11	
C	Dry Soil Weight + A	28.05	27.52	27.36				28.03	26.28	
D	Water Weight (B-C)	2.01	1.89	2.05				1.20	0.83	
E	Dry Soil Weight (C-A)	7.24	6.71	6.84				7.48	5.18	
F	% Moisture (D/E)*100	27.8%	28.2%	30.0%				16.0%	16.0%	
N	# OF DROPS	26	21	17				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**16.0%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**28**
Plastic Limit	**16**
Plastic Index	**12**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group Symbol for minus No. 40 sieve potion only.

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	4/27/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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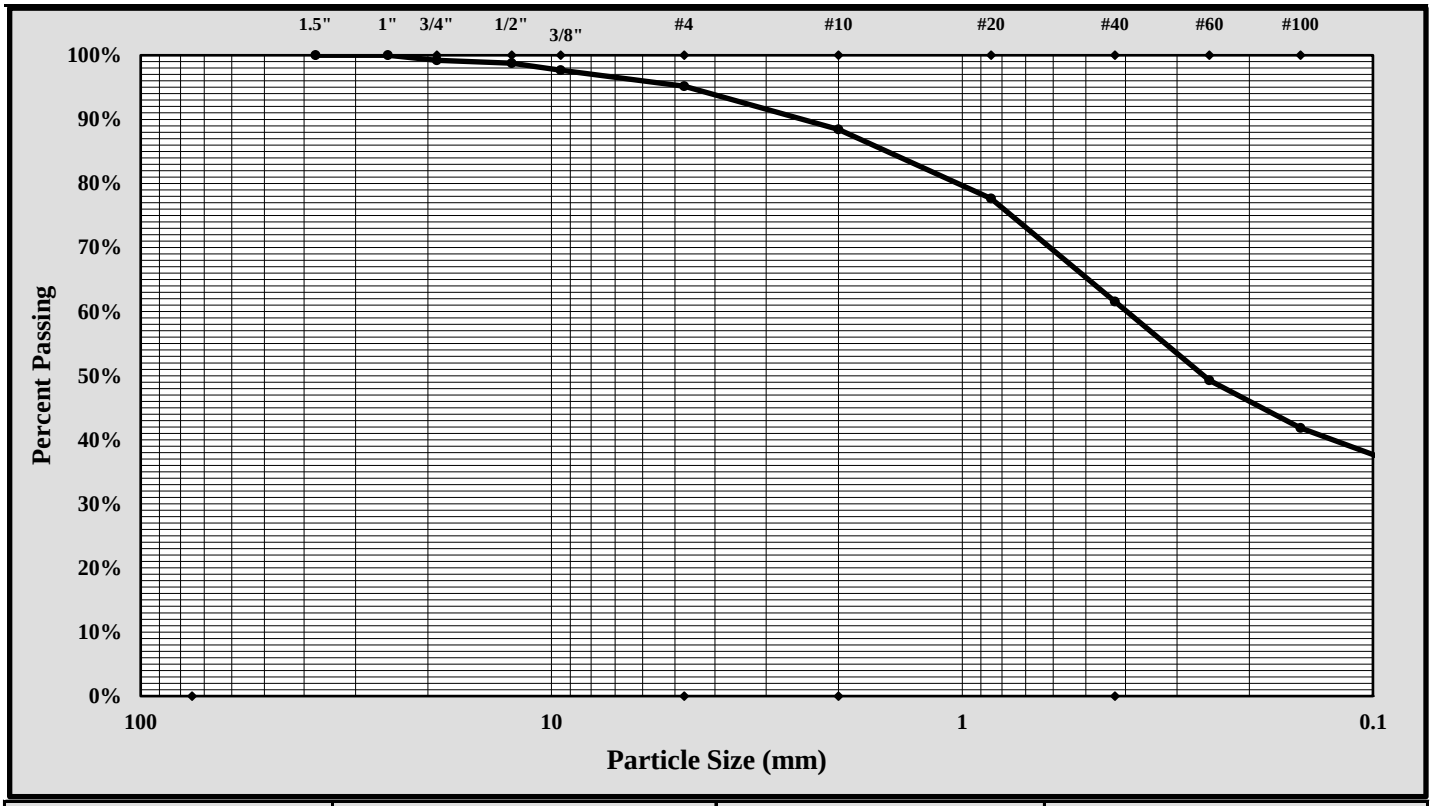
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/23-3/1/2018
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-70 Sample #: BS-1	Sample Date:	2/1/18
Location:	Pavement Boring Offset: N/A	Depth:	0.6' - 10.6'
Sample Description:	Clayey Sand (SC, A-2-6)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	3/4-inch	Gravel:	4.8%
Silt & Clay (% Passing #200):	34.8%	Total Sand:	60.4%

Liquid Limit	28	Plastic Limit	16	Plastic Index	12
Coarse Sand:	6.7%	Medium Sand:	26.9%	Fine Sand:	26.8%

Description of Sand and Gravel — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☒

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/2018 — *Date*

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Form No. TR-D698-2
Revision No. : 1
Revision Date: 07/25/17

MOISTURE - DENSITY REPORT

Quality Assurance

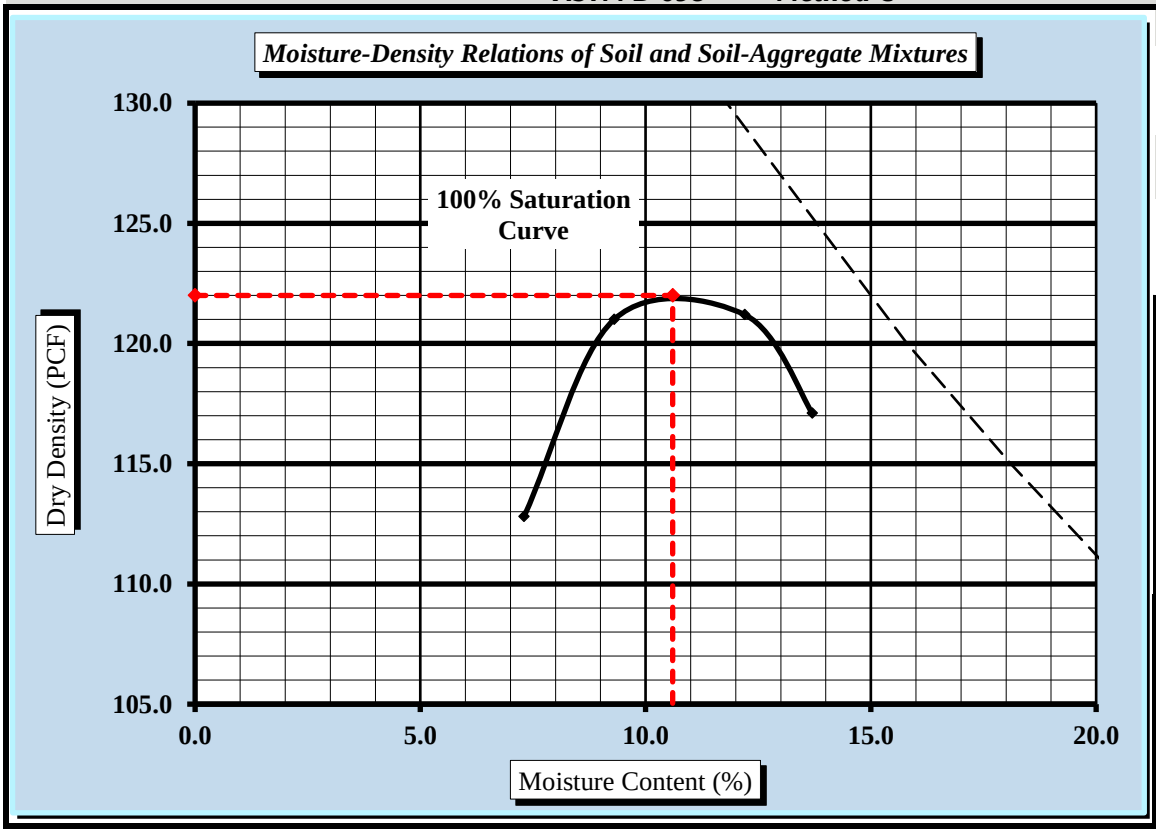
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/22-3/2/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	P-70	Sample #:	BS-1	Sample Date:	2/1/2018
Location:	Pavement Boring	Offset:	N/A	Depth:	0.6' - 10.6'
Sample Description:	Clayey Sand (SC, A-2-6)				

Maximum Dry Density 122.0 PCF. Optimum Moisture Content 10.6%

ASTM D 698 - - Method C



Soil Properties

Natural Moisture Content	11.2%
Specific Gravity of Soil	TNP
Liquid Limit	28
Plastic Limit	16
Plastic Index	12

% Passing	
3/4"	99.2%
3/8"	97.7%
#4	95.2%
#10	88.4%
#40	61.6%
#60	49.3%
#200	34.8%

Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	0.8%
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☐ 3/8 inch Sieve ☐ 3/4 inch Sieve ☒

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations: The replacement method was used for CBR preparation.

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Matthew F. Cooke, P.G.	Project Manager	4/27/2018
Technical Responsibility	*Position*	*Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

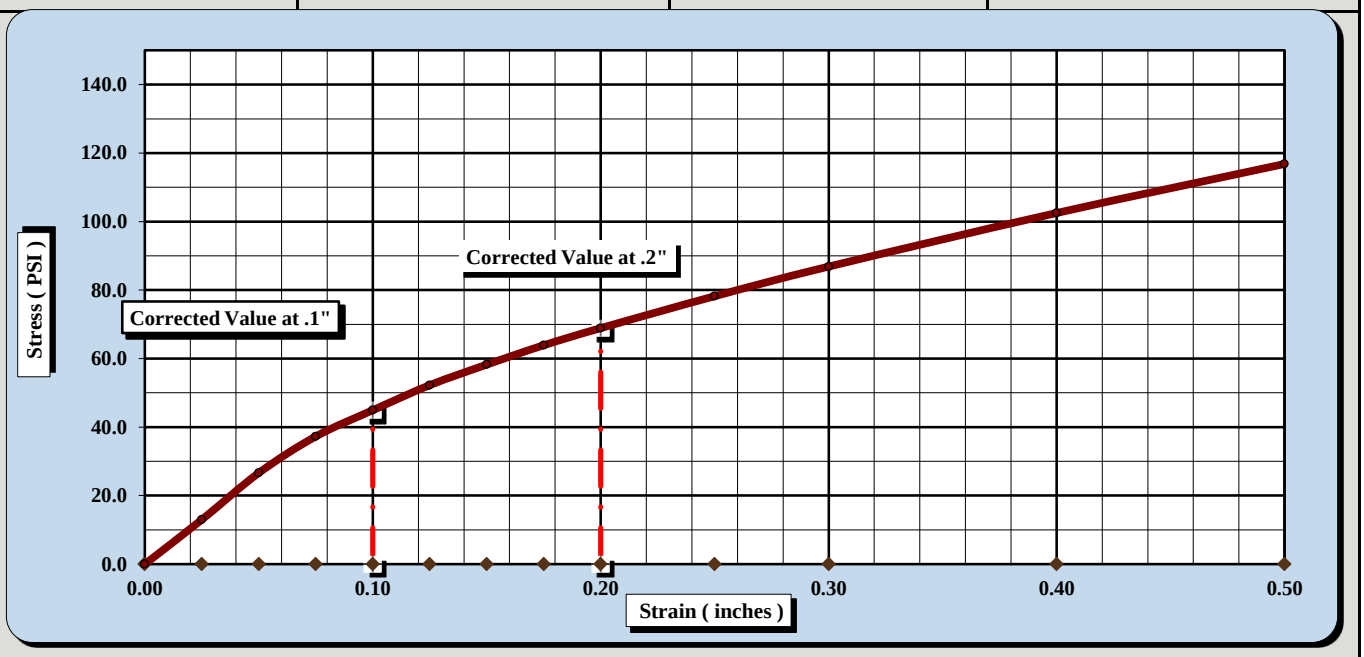
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	3/16-3/20/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-70	Sample #: BS-1	Sample Date: 2/1/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.6' - 10.6'
Sample Description:	Clayey Sand (SC, A-2-6)		

ASTM D 698 *Method C* Maximum Dry Density: 122.0 PCF Optimum Moisture Content: 10.6%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.8%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 4.5	CBR at 0.2 in. 4.6	CBR at 0.1 in. 4.5	CBR at 0.2 in. 4.6



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	25		
Initial Dry Density (PCF)	113.6	Final Dry Density (PCF)	112.7
Moisture Content of the Compacted Specimen	11.2%	Moisture Content (top 1" after soaking)	17.9%
Percent Compaction	93.1%	Percent Swell	0.8%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	28	Plastic Index	12	Apparent Relative Density	TNP

Notes/Deviations/References: Liquid Limit: ASTM D 4318, Classification: ASTM D 2487

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/2018 — *Date*

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CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

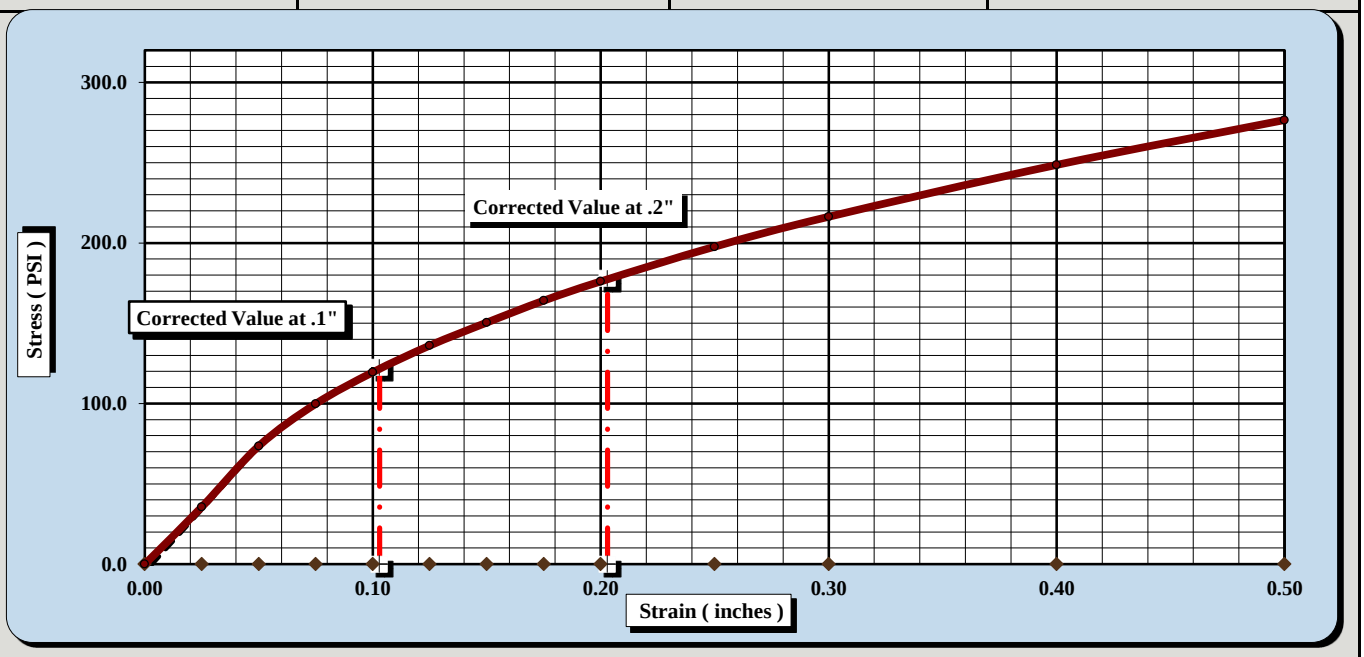
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	3/16-3/20/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-70	Sample #: BS-1	Sample Date: 2/1/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.6' - 10.6'
Sample Description:	Clayey Sand (SC, A-2-6)		

ASTM D 698 *Method C* Maximum Dry Density: 122.0 PCF — Optimum Moisture Content: 10.6%

Compaction Test performed on grading complying with CBR spec. — % Retained on the 3/4" sieve: 0.8%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 11.9	CBR at 0.2 in. 11.7	CBR at 0.1 in. 12.3	CBR at 0.2 in. 11.9



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	35		
Initial Dry Density (PCF)	118.8	Final Dry Density (PCF)	118.3
Moisture Content of the Compacted Specimen	10.4%	Moisture Content (top 1" after soaking)	14.5%
Percent Compaction	97.4%	Percent Swell	0.4%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.9
Liquid Limit	28	Plastic Index	12	Apparent Relative Density	TNP

Notes/Deviations/References: Liquid Limit: ASTM D 4318, Classification: ASTM D 2487

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/2018 — *Date*

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CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

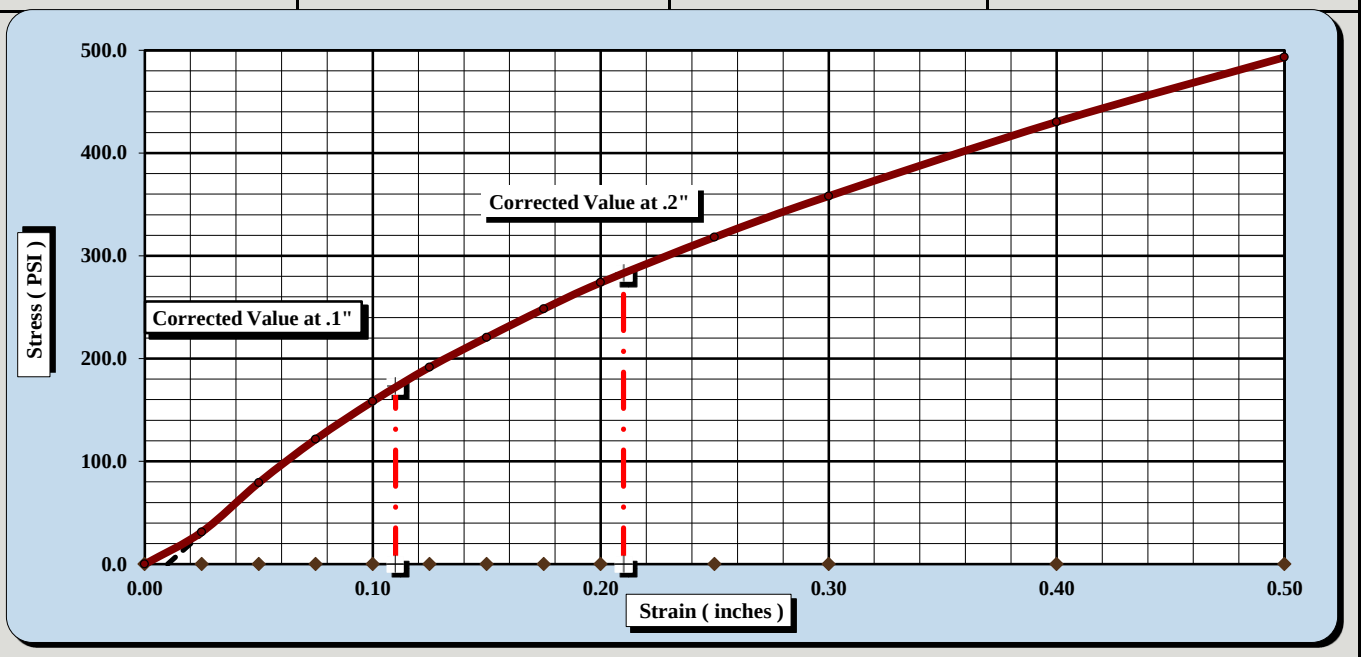
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	4/25/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	3/16-3/20/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	P-70	Sample #: BS-1	Sample Date: 2/1/2018
Location:	Pavement Boring	Offset: N/A	Depth: 0.6' - 10.6'
Sample Description:	Clayey Sand (SC, A-2-6)		

ASTM D 698 *Method C* Maximum Dry Density: 122.0 PCF Optimum Moisture Content: 10.6%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.8%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 15.8	CBR at 0.2 in. 18.3	CBR at 0.1 in. 17.3	CBR at 0.2 in. 18.9



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	56		
Initial Dry Density (PCF)	121.8	Final Dry Density (PCF)	121.5
Moisture Content of the Compacted Specimen	10.6%	Moisture Content (top 1" after soaking)	13.0%
Percent Compaction	99.8%	Percent Swell	0.2%

Soak Time:	96 hours	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.8
Liquid Limit	28	Plastic Index	12	Apparent Relative Density	TNP

Notes/Deviations/References: Liquid Limit: ASTM D 4318, Classification: ASTM D 2487

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/2018 — *Date*

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

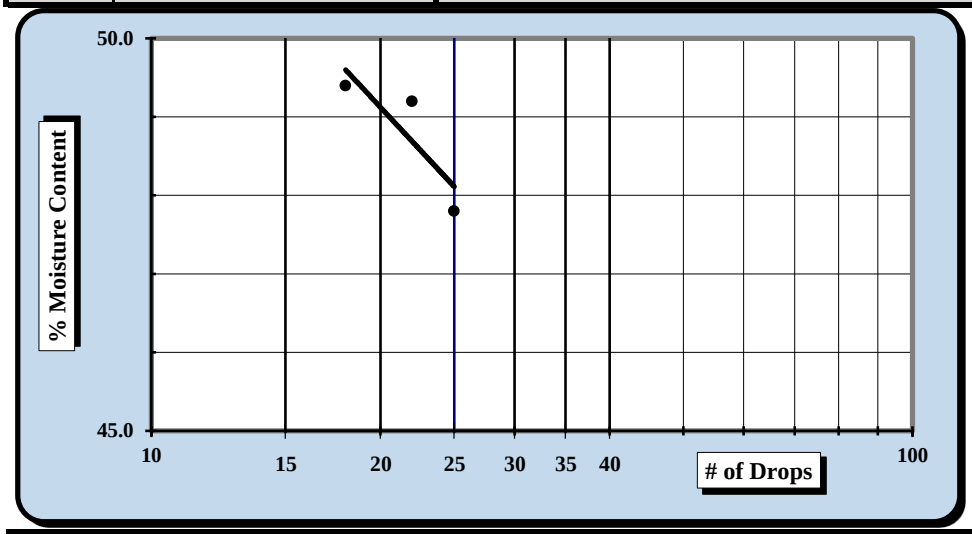
ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

Project #:	1461-16-047.2B	Report Date:	2/9/2018
Project Name:	Carolina Crossroads Project	Test Date(s)	1/30-2/8/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	RW-35	Sample #: BS-1	Sample Date: 1/23-1/24/2018
Location:	Embankment Boring	Offset: N/A	Depth: 0.0' - 10.0'
Sample Description:	Sandy Lean Clay (CL, A-7-6(16))		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	15425	8/30/2017	Flat Grooving tool	28573	11/10/2017
LL Apparatus	28562	5/12/2017			
Oven	25722	8/18/2017	No. 40 Sieve	21775	1/8/2018

Pan # 1		Liquid Limit						Plastic Limit		
	Tare #:	147	100	25				235	35	
A	Tare Weight	20.76	20.56	20.61				20.75	20.76	
B	Wet Soil Weight + A	29.73	29.57	29.62				28.42	27.15	
C	Dry Soil Weight + A	26.83	26.59	26.65				27.00	26.00	
D	Water Weight (B-C)	2.90	2.98	2.97				1.42	1.15	
E	Dry Soil Weight (C-A)	6.07	6.03	6.04				6.25	5.24	
F	% Moisture (D/E)*100	47.8%	49.4%	49.2%				22.7%	21.9%	
N	# OF DROPS	25	18	22				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**22.3%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**48**
Plastic Limit	**22**
Plastic Index	**26**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☑ Dry Preparation ☐ Air Dried ☐ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Matthew Wolfe	NICET 123218	Matthew F. Cooke, P.G.	3/28/2018
Technician Name	*Certification*	*Technical Responsibility*	*Date*

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Form No. 61-D422-2
Revision No. 0
Revision Date: 05/05/2017

Particle Size Analysis of Soils

ASTM D422 / D6913

S&ME, Inc. Columbia Office, 134 Suber Road Columbia SC 29210

Project #:	**1461-16-047.2B**	Report Date:	2/9/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	1/30-2/8/2018
Client Name:	HDR Engineering, Inc.	Address:	4400 Leeds Ave., North Charleston, South C
Boring #:	RW-35	Sample #:	BS-1
Location:	Embankment Boring	Offset:	N/A
Sample Description:	Sandy Lean Clay (CL, A-7-6(16))		

Initial Test Sample Pan #:	SB1								
Split Sample Pan #:	315								
Pan Tare Weight (grams):	458.3		**Moisture Content**		Hygroscopic				
Total Sample Air Dried Wt. + tare wt. (grams):	1999.3		Tare #		219				
Weight of Total Sample Air Dried:	1541.0	A	Tare Wt.		152.42				
Weight of Air Dried Split Sample (g):	116.08	B	Wet Wt. + A		244.98				
Total Sample Oven Dried:	1489.44	C	Dry Wt. + A		241.70				
Split Sample Oven Dried (**W**):	111.97	D	Water Wt. (B-C)		3.28				
% Passing #4:	94.2%	E	Dry Wt. (C-A)		89.28				
			% Moisture (100 x D/E)		3.67%				

Sieve	Retained Wt.	Percent Passing	
3.0"	0.0		100.0%
1.5"	0.0		100.0%
1.0"	0.0		100.0%
3/4"	20.0		98.7%
1/2"	60.4		95.9%
3/8"	69.1		95.4%
#4	85.9	100.0%	94.2%
#10	4.1	96.4%	90.8%
#20	10.4	90.8%	85.5%
#40	17.9	84.0%	79.1%
#60	23.2	79.2%	74.7%
#100	27.2	75.7%	71.3%
#200	32.6	70.9%	66.8%

Description of Sand & Gravel Particles — Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☒

Dispersion Agent Used?: Yes ☒ No ☐

Equipment Used:

Sieve:	*ID No.*	21773	*Cal. Date:* 1/8/2018	*Sieve:*	*ID No.*	21622	*Cal. Date:* 1/8/2018
Sieve:	*ID No.*	21704	*Cal. Date:* 1/8/2018	*Sieve:*	*ID No.*	21251	*Cal. Date:* 1/8/2018
Sieve:	*ID No.*	18204	*Cal. Date:* 1/8/2018				
Sieve:	*ID No.*	8077	*Cal. Date:* 1/8/2018	*Oven:*	*ID No.*	25722	*Cal. Date:* 8/18/2017
Sieve:	*ID No.*	8062	*Cal. Date:* 1/8/2018	*Sieve Shaker:*	*ID No.*	*	*Cal. Date:* *
Sieve:	*ID No.*	8061	*Cal. Date:* 1/8/2018	*Balance:*	*ID No.*	25711	*Cal. Date:* 8/30/2017
Sieve:	*ID No.*	8075	*Cal. Date:* 1/8/2018	*Balance:*	*ID No.*	17866	*Cal. Date:* 8/30/2017
Sieve:	*ID No.*	8064	*Cal. Date:* 1/8/2018	*Timer:*	*ID No.*	28427	*Cal. Date:* 1/22/2018
Sieve:	*ID No.*	8065	*Cal. Date:* 1/8/2018				
Sieve:	*ID No.*	21774	*Cal. Date:* 1/8/2018				
Sieve:	*ID No.*	19476	*Cal. Date:* 1/8/2018				
Sieve:	*ID No.*	8492	*Cal. Date:* 1/8/2018				

References / Comments / Deviations ASTM D 422, D 2487, D 4318, D 6913. Material separated using the #4 sieve. The material passing the #200 sieve was not analyzed.

Matthew Wolfe	NICET 123218	Matt Cooke, PG		
Technician Name	*Certification #*	*Technical Responsibility*	*Position*	*Date*

Form No. TR-D698-2
Revision No. : 1
Revision Date: 07/25/17

MOISTURE - DENSITY REPORT

Quality Assurance

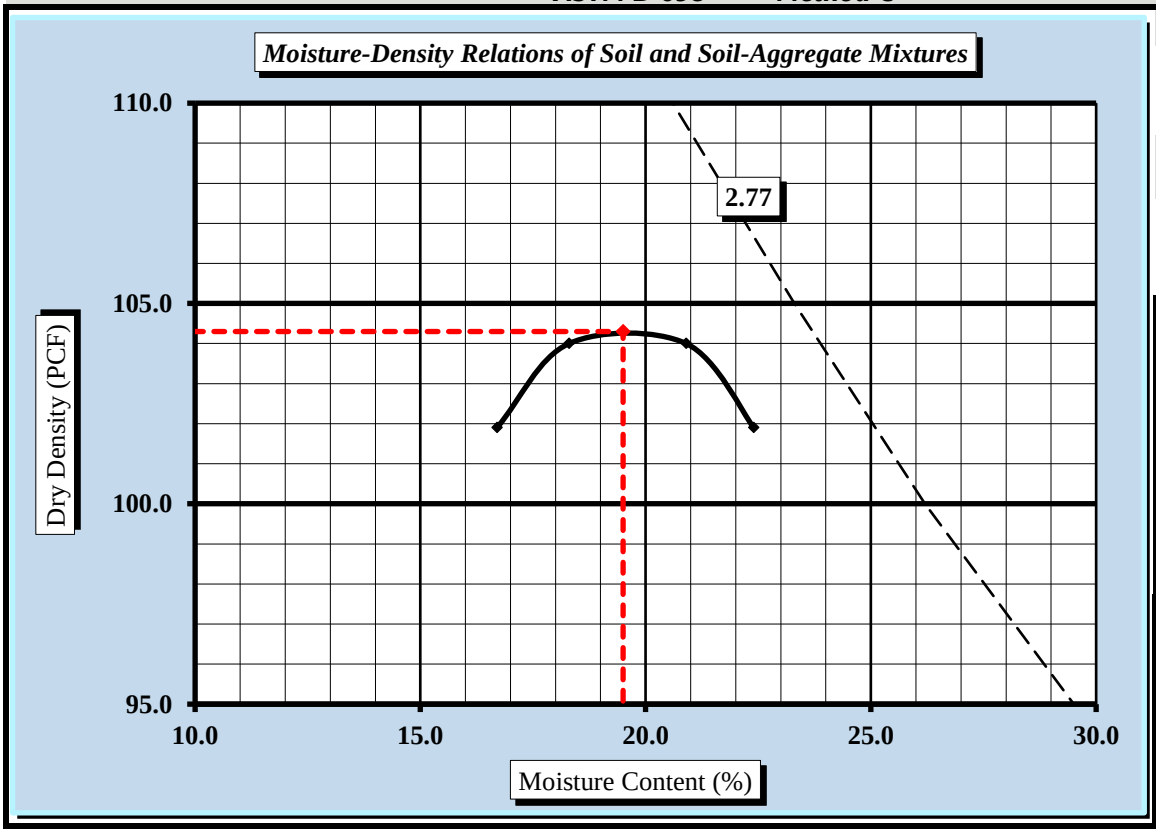
S&ME, Inc. - Columbia: 134 Suber Road, Columbia, SC 29210

S&ME Project #:	1461-16-047.2B	Report Date:	2/9/2018
Project Name:	Carolina Crossroads Project	Test Date(s):	2/5-2/9/2018
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-35	Sample #:	BS-1	Sample Date:	1/23-1/24/2018
Location:	Embankment Boring	Offset:	N/A	Depth:	0.0' - 10.0'
Sample Description:	Sandy Lean Clay (CL, A-7-6(16))				

Maximum Dry Density 104.3 PCF. Optimum Moisture Content 19.5%

ASTM D 698 - - Method C



Soil Properties

Natural Moisture Content	32.0%
Specific Gravity of Soil	TNP
Liquid Limit	48
Plastic Limit	22
Plastic Index	26

% Passing	
3/4"	98.7%
3/8"	95.4%
#4	94.2%
#10	90.8%
#40	79.1%
#60	74.7%
#200	66.8%

Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	1.3%
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☐ 3/8 inch Sieve ☐ 3/4 inch Sieve ☒

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations:

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Matthew F. Cooke, P.G.	Project Manager	3/28/2018
Technical Responsibility	*Position*	*Date*

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Form No. TR-26-SCT36-1
Revision No. 0
Revision Date: 2/21/18

% Ignition Loss of Inorganic Soils

SC T 36

Project #: **1461-16-047.2B** Report Date: 2/28/18
Project Name: **Carolina Crossroads Project** Test Date(s): 2/26/18
Client Name: HDR Engineering, Inc.
Client Address: 4400 Leeds Ave., North Charleston, South Carolina

Boring #:	RW-35	Sample #:	BS-1	Sample Date:	1/24/2018
Location:	Embankment Boring	Type:	Bulk	Depth:	0.0' - 10.0'

Sample Description: Sandy Lean Clay (CL, A-7-6 (16))

Equipment: Balance (GP1/G1): S&ME ID# **13942** *0.01 g.Readability, 500g. Minimum Capacity*
Oven: S&ME ID# **13978** Muffle Furnace: S&ME ID# **23123**

Gradation Percentage Determination

		Tare #	YM-2
T	Total Mass of Oven Dry Sample	grams	213.81
d	Mass Retained on 2mm Sieve	grams	8.70
e	Mass Passing 2mm and Retained on 75µm Sieve	grams	53.56
f	Mass Passing 75µm Sieve	T-(d+e)	151.55
P	%Passing 75µm Sieve of Sample Passing 2mm Sieve	1-(f/(e+f))*100	26.1%

% Ignition Loss Determination

Muffle Furnace Temperature: **1000 + 50** **°C**

		Tare #	B
t	Tare Weight *(Dish plus Aluminum Foil Cover)*	grams	56.78
b	Mass of Oven Dry Specimen + Tare Wt.	grams	77.73
c	Ash Weight + Tare Wt.	grams	77.34
M	Mass of Oven Dry Specimen	(b-t)	20.95
C	Ash Weight	c-t	20.56
L	Loss	M-C	**0.39**
	% Ignition Loss	(P*L)/M*100	**0.5%**

Remarks:

References: SC T 36: Procedure for Determining % Ignition Loss of Inorganic Soils

Technician Name: Benjamin Kovaleski NICET Lab Level III 117226
Certification #

Technical Responsibility: Brian Vaughan, P.E. *Signature* Group Leader *Position*

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

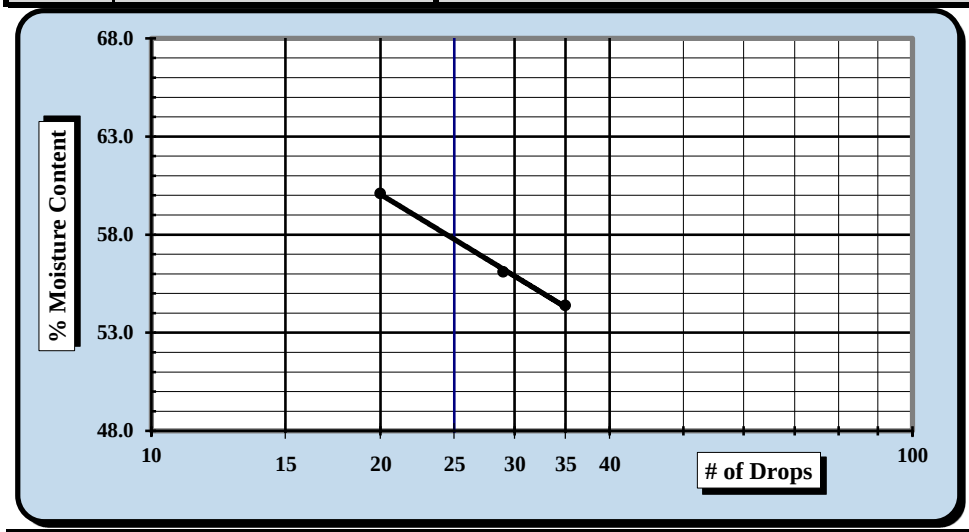
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/25/18
Project Name:	Carolina Crossroads Project	Test Date:	4/21/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-36	Sample #:	BS-1	Sample Date:	3/1/2018
Location:	Embankment Boring	Type:	Bulk	Depth:	0.0' - 10.0'
Sample Description:	Fat Clay with Sand (CH, A-7-6(30))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	1	2	3				4	5	
A	Tare Weight	26.69	26.46	26.34				25.93	26.96	
B	Wet Soil Weight + A	43.13	44.33	47.19				32.24	35.06	
C	Dry Soil Weight + A	37.34	37.91	39.36				31.04	33.55	
D	Water Weight (B-C)	5.79	6.42	7.83				1.20	1.51	
E	Dry Soil Weight (C-A)	10.65	11.45	13.02				5.11	6.59	
F	% Moisture (D/E)*100	54.4%	56.1%	60.1%				23.5%	22.9%	
N	# OF DROPS	35	29	20				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**23.2%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**58**
Plastic Limit	**23**
Plastic Index	**35**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/25/18	Matthew F. Cooke, P.G.	4/27/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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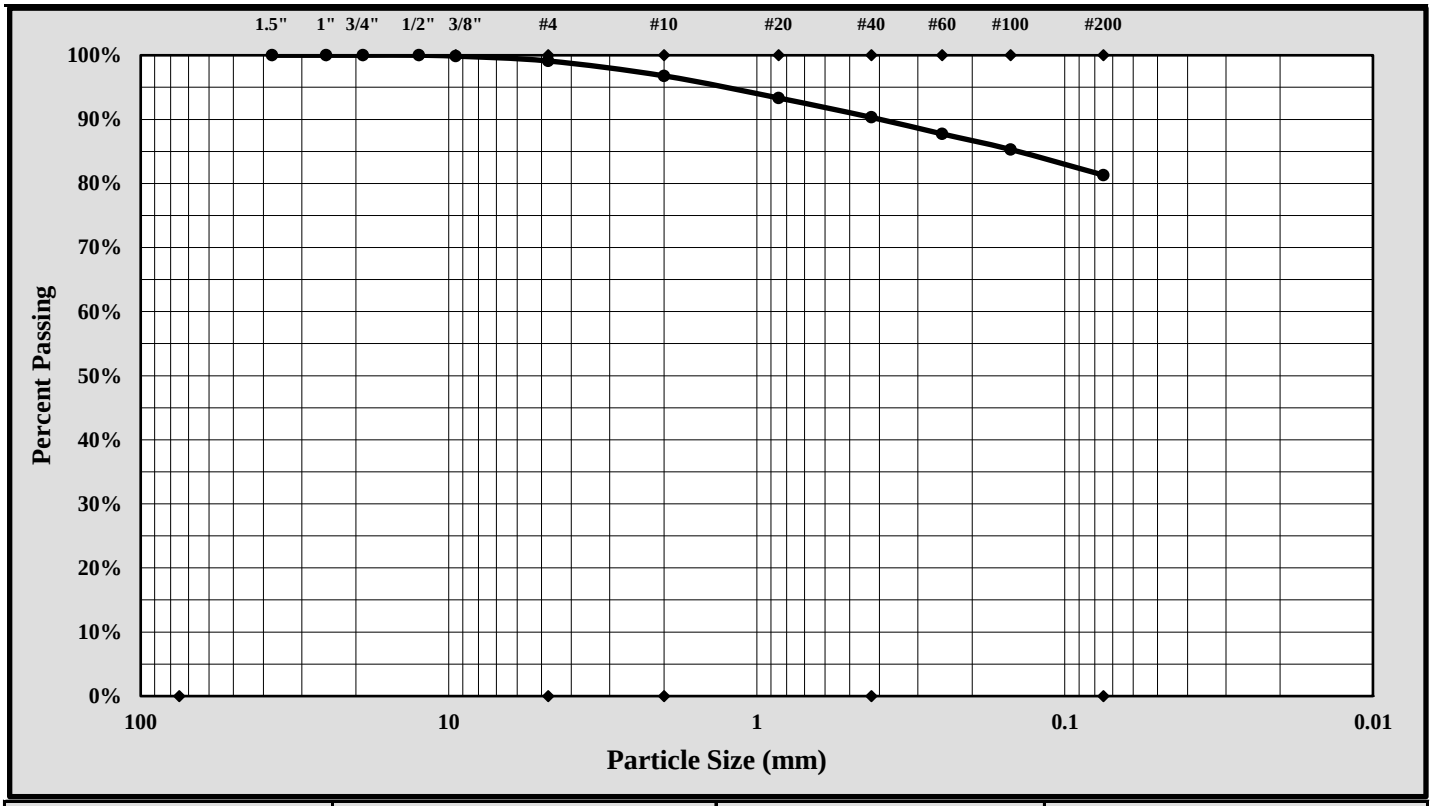
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/11 - 4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	RW-36 Sample #: BS-1	Sample Date:	3/1/2018
Location:	Embankment Boring Type: Bulk	Depth:	0.0' - 10.0'
Sample Description:	Fat Clay with Sand (CH, A-7-6(30))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.9%
Silt & Clay (% Passing #200):	81.3%	Total Sand:	17.8%

Liquid Limit	58	Plastic Limit	23	Plastic Index	35
Coarse Sand:	2.3%	Medium Sand:	6.5%	Fine Sand:	9.0%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/25/18 — *Date*

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Form No. TR-D698-2
Revision No. : 1
Revision Date: 07/25/17

MOISTURE - DENSITY REPORT

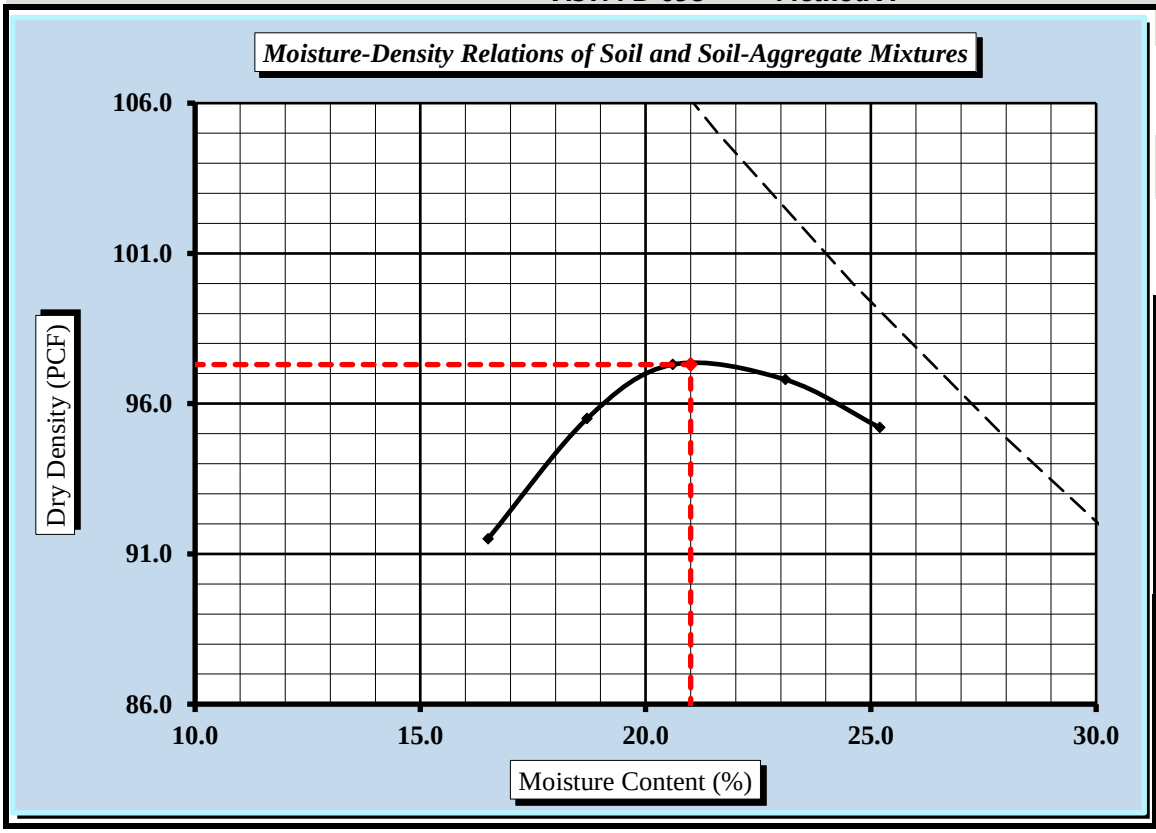
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/26/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-36	Sample #:	BS-1	Sample Date:	3/1/18
Location:	Embankment Boring	Type:	Bulk	Depth:	0.0' - 10.0'
Sample Description:	Fat Clay with Sand (CH, A-7-6(30))				

Maximum Dry Density 97.3 PCF. Optimum Moisture Content 21.0%

ASTM D 698 - - Method A



Soil Properties

Natural Moisture Content	23.2%
Specific Gravity of Soil	2.650
Liquid Limit	58
Plastic Limit	23
Plastic Index	35

% Passing	
3/4"	100.0%
3/8"	99.9%
#4	99.1%
#10	96.8%
#40	90.3%
#60	87.7%
#100	85.3%
#200	81.3%

Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☒ 3/8 inch Sieve ☐ 3/4 inch Sieve ☐

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations:

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Matthew F. Cooke, P.G.	Project Manager	4/27/2018
Technical Responsibility	*Position*	*Date*

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Form No. TR-26-SCT36-1
Revision No. 0
Revision Date: 2/21/18

% Ignition Loss of Inorganic Soils

SC T 36

Project #: **1461-16-047.2B** Report Date: 4/25/18
Project Name: **Carolina Crossroads Project** Test Date(s): 4/21/18
Client Name: HDR Engineering, Inc.
Client Address: 4400 Leeds Ave., North Charleston, South Carolina

Boring #:	RW-36	Sample #:	BS-1	Sample Date:	3/1/2018
Location:	Embankment Boring	Type:	Bulk	Depth:	0.0' - 10.0'

Sample Description: Fat Clay with Sand (CH, A-7-6(30))

Equipment: Balance (GP1/G1): S&ME ID# **13942** *0.01 g.Readability, 500g. Minimum Capacity*
Oven: S&ME ID# **13978** Muffle Furnace: S&ME ID# **23123**

Gradation Percentage Determination

		Tare #	D-7
T	Total Mass of Oven Dry Sample	grams	1641.48
d	Mass Retained on 2mm Sieve	grams	52.53
e	ass Passing 2mm and Retained on 75µm Sieve	grams	254.43
f	Mass Passing 75µm Sieve	T-(d+e)	1334.52
P	%Passing 75µm Sieve of Sample Passing 2mm Sieve	1-(f/(e+f))*100	16.0%

% Ignition Loss Determination

Muffle Furnace Temperature: **1000 ± 50** **°C**

		Tare #	B
t	Tare Weight *(Dish plus Aluminum Foil Cover)*	grams	56.22
b	Mass of Oven Dry Specimen + Tare Wt.	grams	76.46
c	Ash Weight + Tare Wt.	grams	76.12
M	Mass of Oven Dry Specimen	(b-t)	20.24
C	Ash Weight	c-t	19.90
L	Loss	M-C	**0.34**
	% Ignition Loss	(P*L)/M*100	**0.3%**

Remarks:

References: SC T 36: Procedure for Determining % Ignition Loss of Inorganic Soils

Technician Name: Benjamin Kovaleski NICET Lab Level III 117226
Certification #

Technical Responsibility: Matthew F. Cooke, P.G. Project Manager
Position

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

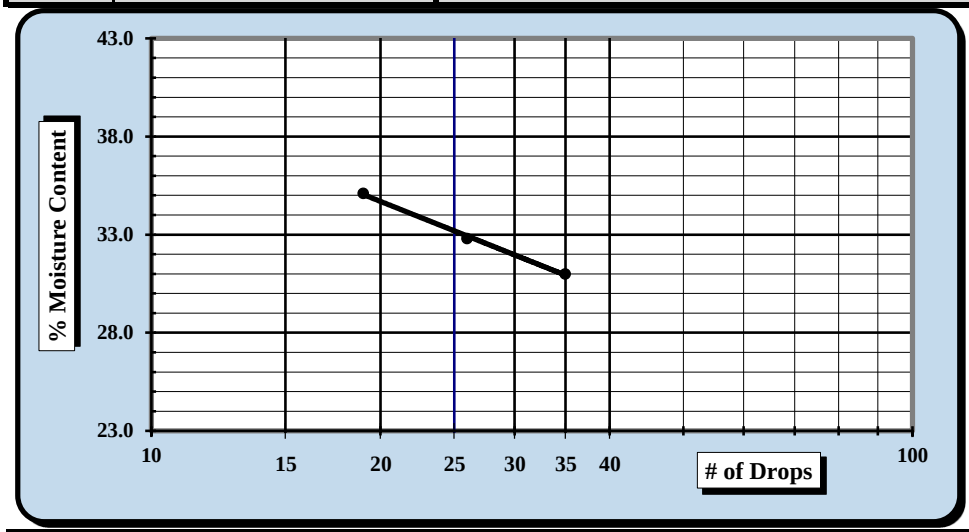
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	2/28/18
Project Name:	Carolina Crossroads Project	Test Date:	2/27/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-37	Sample #:	BS-1	Sample Date:	1/25/2018
Location:	Embankment Boring	Type:	Bulk	Depth:	0.0' - 10.0'
Sample Description:	Clayey Sand (SC, A-6(2))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	6	7	8				9	10	
A	Tare Weight	26.71	26.31	27.35				27.91	26.76	
B	Wet Soil Weight + A	46.46	47.40	47.86				35.39	35.17	
C	Dry Soil Weight + A	41.79	42.19	42.53				34.21	33.85	
D	Water Weight (B-C)	4.67	5.21	5.33				1.18	1.32	
E	Dry Soil Weight (C-A)	15.08	15.88	15.18				6.30	7.09	
F	% Moisture (D/E)*100	31.0%	32.8%	35.1%				18.7%	18.6%	
N	# OF DROPS	35	26	19				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**18.7%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐
Liquid Limit **33**
Plastic Limit **19**
Plastic Index **14**
Group Symbol **CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 43.1%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	2/28/18		2/28/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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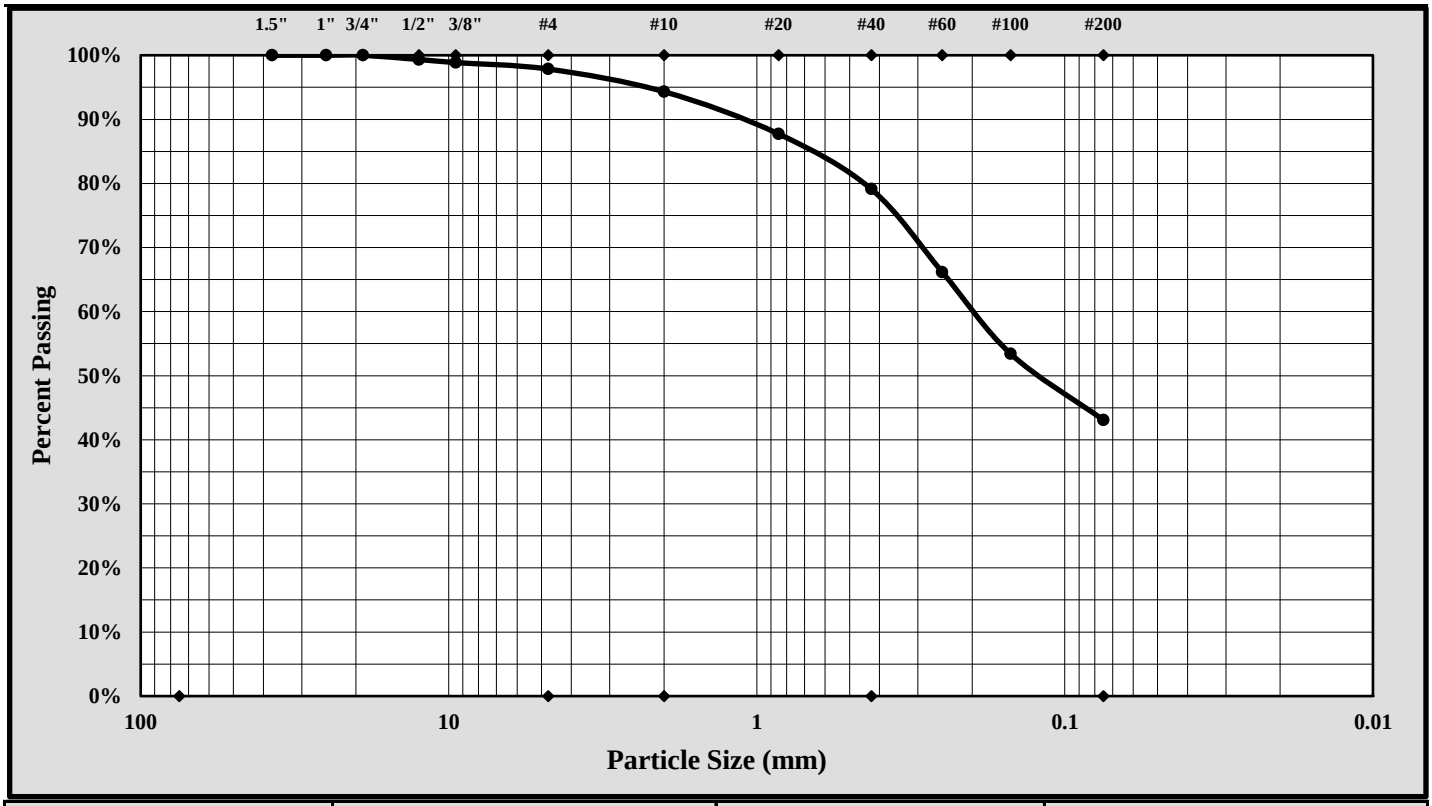
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	2/28/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/20 - 2/24/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	RW-37 Sample #: BS-1	Sample Date:	1/25/2018
Location:	Embankment Boring Type: Bulk	Depth:	0.0' - 10.0'
Sample Description:	Clayey Sand (SC, A-6(2))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	12.50 mm	Gravel:	2.2%
Silt & Clay (% Passing #200):	43.1%	Total Sand:	54.8%

Liquid Limit	33	Plastic Limit	19	Plastic Index	14
Coarse Sand:	3.5%	Medium Sand:	15.2%	Fine Sand:	36.0%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	2/28/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D698-2
Revision No. : 1
Revision Date: 07/25/17

MOISTURE - DENSITY REPORT

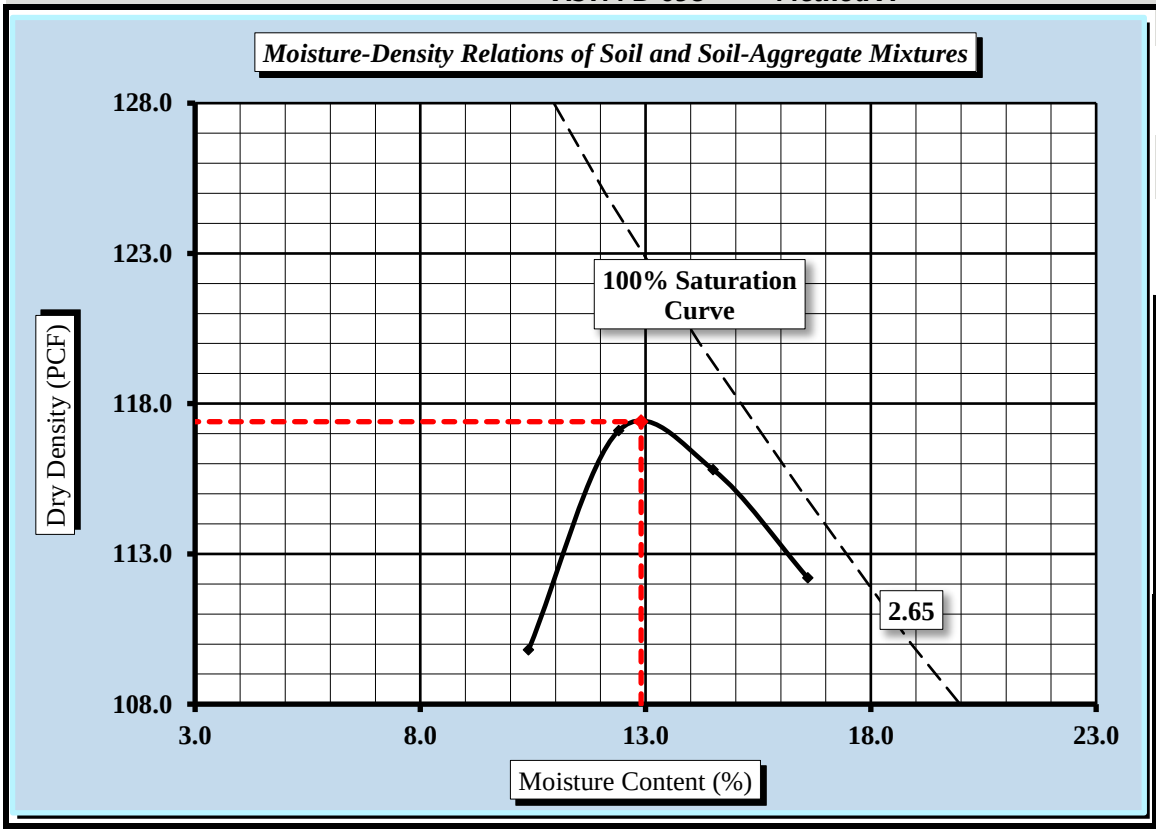
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	2/28/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/14/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-37	Sample #:	BS-1	Sample Date:	1/25/18
Location:	Embankment Boring	Type:	Bulk	Depth:	0.0' - 10.0'
Sample Description:	Clayey Sand (SC, A-6(2))				

Maximum Dry Density 117.4 PCF. Optimum Moisture Content 12.9%

ASTM D 698 - - Method A



Soil Properties	
Natural Moisture Content	15.1%
Specific Gravity of Soil	2.650
Liquid Limit	33
Plastic Limit	19
Plastic Index	14
% Passing	
3/4"	100.0%
3/8"	98.9%
#4	97.8%
#10	94.3%
#40	79.1%
#60	66.2%
#100	53.4%
#200	43.1%
Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☒ 3/8 inch Sieve ☐ 3/4 inch Sieve ☐

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations:

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Brian Vaughan, P.E.		Group Leader	2/28/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-26-SCT36-1
Revision No. 0
Revision Date: 2/21/18

% Ignition Loss of Inorganic Soils

SC T 36

Project #: **1461-16-047.2B** Report Date: 2/28/18
Project Name: **Carolina Crossroads Project** Test Date(s): 2/26/18
Client Name: HDR Engineering, Inc.
Client Address: 4400 Leeds Ave., North Charleston, South Carolina

Boring #:	RW-37	Sample #:	BS-1	Sample Date:	1/25/2018
Location:	Embankment Boring	Type:	Bulk	Depth:	0.0' - 10.0'

Sample Description: Clayey Sand (SC, A-6(2))

Equipment: Balance (GP1/G1): S&ME ID# **13942** *0.01 g.Readability, 500g. Minimum Capacity*
Oven: S&ME ID# **13978** Muffle Furnace: S&ME ID# **23123**

Gradation Percentage Determination

		Tare #	YM-2
T	Total Mass of Oven Dry Sample	grams	1815.20
d	Mass Retained on 2mm Sieve	grams	103.47
e	Mass Passing 2mm and Retained on 75µm Sieve	grams	929.39
f	Mass Passing 75µm Sieve	T-(d+e)	782.34
P	%Passing 75µm Sieve of Sample Passing 2mm Sieve	1-(f/(e+f))*100	54.3%

% Ignition Loss Determination

Muffle Furnace Temperature: **1000 + 50** **°C**

		Tare #	D
t	Tare Weight *(Dish plus Aluminum Foil Cover)*	grams	55.71
b	Mass of Oven Dry Specimen + Tare Wt.	grams	76.46
c	Ash Weight + Tare Wt.	grams	76.42
M	Mass of Oven Dry Specimen	(b-t)	20.75
C	Ash Weight	c-t	20.71
L	Loss	M-C	**0.04**
	% Ignition Loss	(P*L)/M*100	**0.1%**

Remarks:

References: SC T 36: Procedure for Determining % Ignition Loss of Inorganic Soils

Technician Name: Benjamin Kovaleski NICET Lab Level III 117226
Certification #

Technical Responsibility: Brian Vaughan, P.E. *Signature* Group Leader *Position*

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

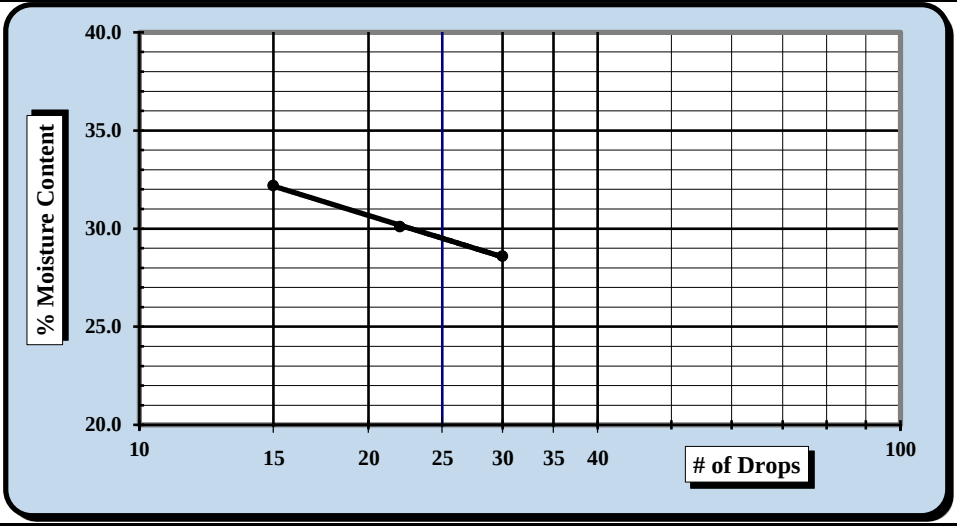
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/3/18
Project Name:	Carolina Crossroads Project	Test Date:	5/2/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-38	Sample #:	BS-1	Sample Date:	4/3/2018
Location:	Embankment Boring	Type:	Bulk	Depth:	0.0' - 10'
Sample Description:	Sandy Lean Clay (CL, A-6(7))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	1	2	3				4	5	
A	Tare Weight	26.69	26.48	26.33				25.93	26.95	
B	Wet Soil Weight + A	41.72	41.16	43.70				34.37	35.03	
C	Dry Soil Weight + A	38.38	37.76	39.47				33.13	33.84	
D	Water Weight (B-C)	3.34	3.40	4.23				1.24	1.19	
E	Dry Soil Weight (C-A)	11.69	11.28	13.14				7.20	6.89	
F	% Moisture (D/E)*100	28.6%	30.1%	32.2%				17.2%	17.3%	
N	# OF DROPS	30	22	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**17.3%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**30**
Plastic Limit	**17**
Plastic Index	**13**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/4/2018	Matthew F. Cooke, P.G.	5/4/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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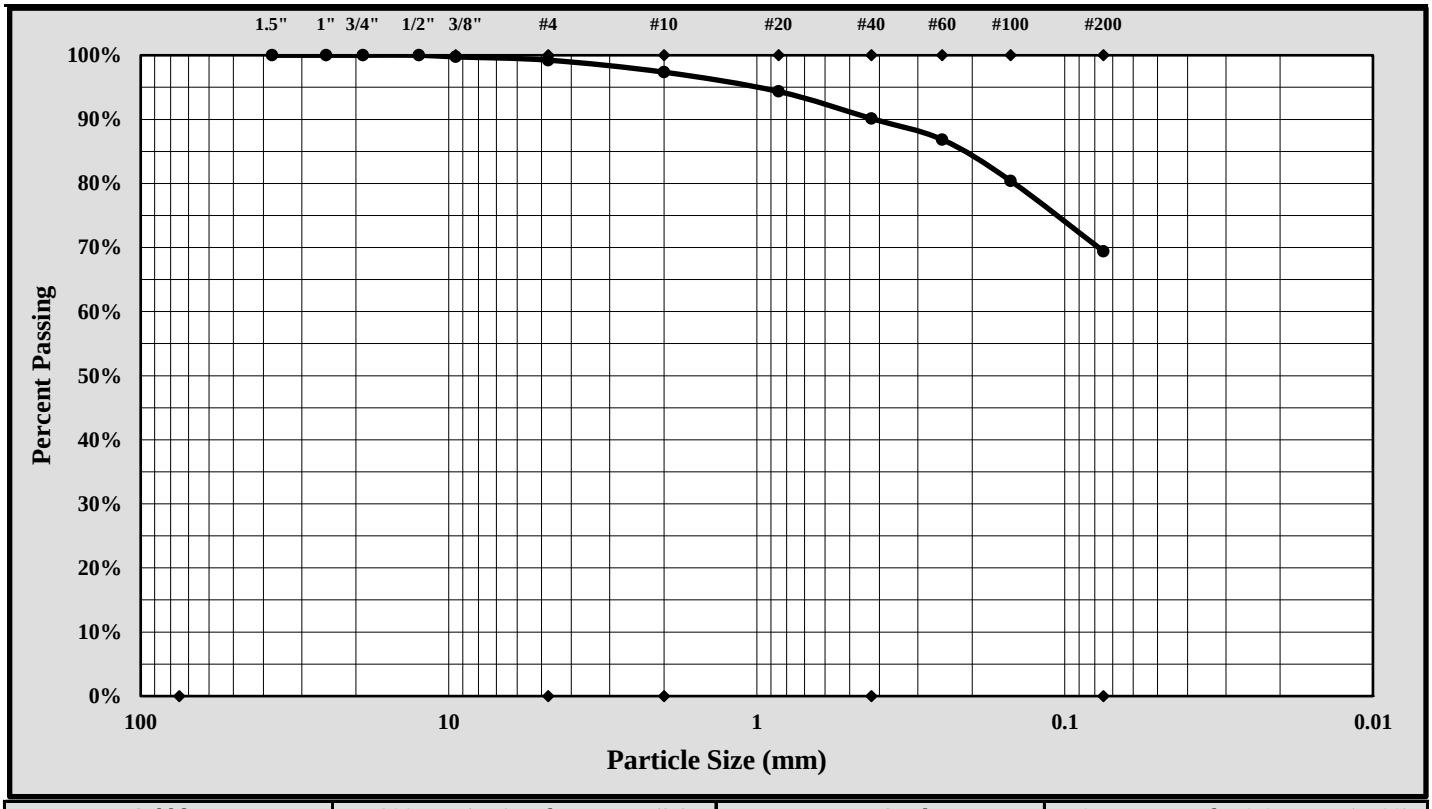
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/03/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/01 - 5/03/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	RW-38 Sample #: BS-1	Sample Date:	4/3/2018
Location:	Embankment Boring Type: Bulk	Depth:	0.0' - 10.0'
Sample Description:	Sandy Lean Clay (CL, A-6(7))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.8%
Silt & Clay (% Passing #200):	69.4%	Total Sand:	29.8%

Liquid Limit	30	Plastic Limit	17	Plastic Index	13
Coarse Sand:	1.9%	Medium Sand:	7.2%	Fine Sand:	20.7%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/03/18 — *Date*

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Form No. TR-D698-2
Revision No. : 1
Revision Date: 07/25/17

MOISTURE - DENSITY REPORT

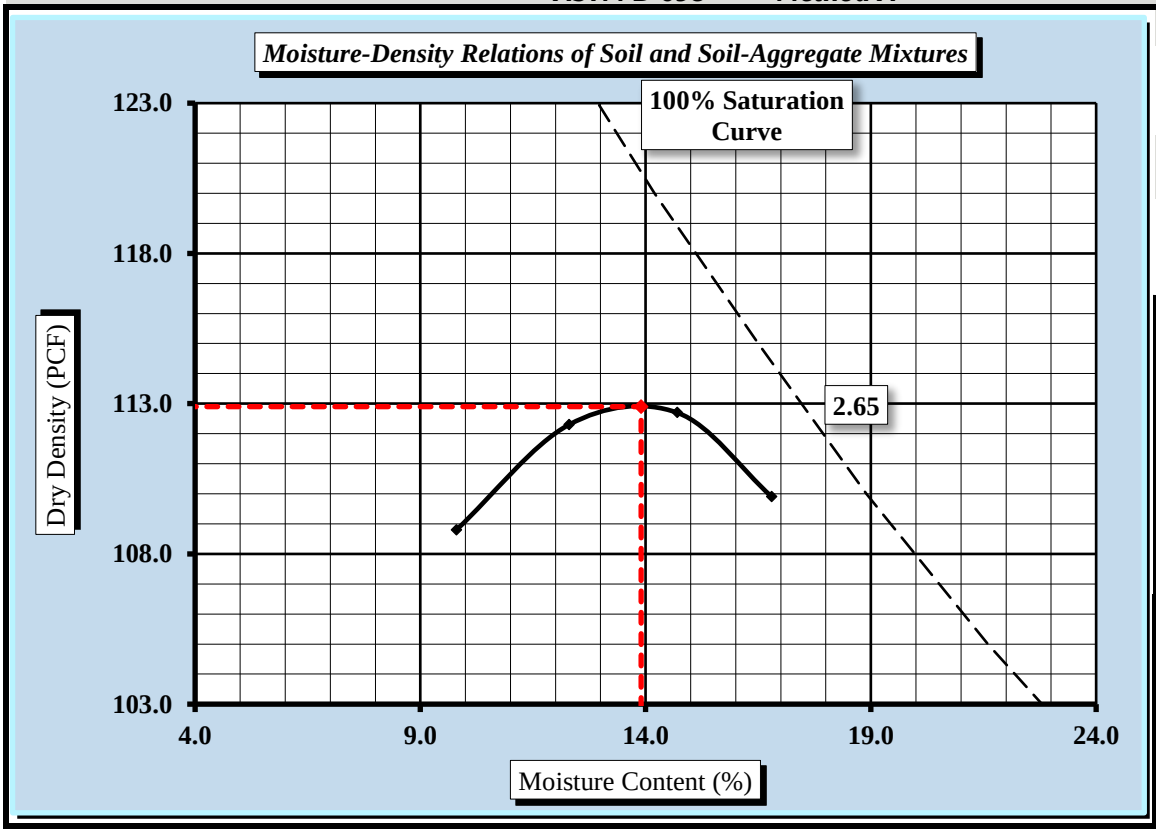
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/03/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/24/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-38	Sample #:	BS-1	Sample Date:	4/3/18
Location:	Embankment Boring	Type:	Bulk	Depth:	0.0' - 10.0'
Sample Description:	Sandy Lean Clay (CL, A-6(7))				

Maximum Dry Density 112.9 PCF. Optimum Moisture Content 13.9%

ASTM D 698 - - Method A



Soil Properties	
Natural Moisture Content	19.9%
Specific Gravity of Soil	2.650
Liquid Limit	30
Plastic Limit	17
Plastic Index	13
% Passing	
3/4"	100.0%
3/8"	99.7%
#4	99.2%
#10	97.4%
#40	90.1%
#60	86.8%
#100	80.4%
#200	69.4%
Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☒ 3/8 inch Sieve ☐ 3/4 inch Sieve ☐

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations:

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Matthew F. Cooke, P.G.	Project Manager	5/03/18
Technical Responsibility	*Position*	*Date*

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Form No. TR-26-SCT36-1
Revision No. 0
Revision Date: 2/21/18

% Ignition Loss of Inorganic Soils

SC T 36

Project #: **1461-16-047.2B** Report Date: 5/04/18
Project Name: **Carolina Crossroads Project** Test Date(s): 5/03/18
Client Name: HDR Engineering, Inc.
Client Address: 4400 Leeds Ave., North Charleston, South Carolina

Boring #:	RW-38	Sample #:	BS-1	Sample Date:	4/3/2018
Location:	Embankment Boring	Type:	Bulk	Depth:	0.0' - 10.0'
Sample Description:	Sandy Lean Clay (CL, A-6(7))				

Equipment: Balance (GP1/G1): S&ME ID# **13942** *0.01 g.Readability, 500g. Minimum Capacity*
Oven: S&ME ID# **13978** Muffle Furnace: S&ME ID# **23123**

Gradation Percentage Determination

		Tare #	D-5
T	Total Mass of Oven Dry Sample	grams	1310.38
d	Mass Retained on 2mm Sieve	grams	34.07
e	ass Passing 2mm and Retained on 75µm Sieve	grams	366.91
f	Mass Passing 75µm Sieve	T-(d+e)	909.40
P	%Passing 75µm Sieve of Sample Passing 2mm Sieve	1-(f/(e+f))*100	28.7%

% Ignition Loss Determination

Muffle Furnace Temperature: **1000 ± 50 °C**

		Tare #	H
t	Tare Weight *(Dish plus Aluminum Foil Cover)*	grams	56.20
b	Mass of Oven Dry Specimen + Tare Wt.	grams	77.04
c	Ash Weight + Tare Wt.	grams	76.80
M	Mass of Oven Dry Specimen	(b-t)	20.84
C	Ash Weight	c-t	20.60
L	Loss	M-C	**0.24**
	% Ignition Loss	(P*L)/M*100	**0.3%**

Remarks:

References: SC T 36: Procedure for Determining % Ignition Loss of Inorganic Soils

Technician Name: Benjamin Kovaleski NICET Lab Level III 117226
Certification #

Technical Responsibility: Matthew F. Cooke, P.G. Project Manager
Position

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

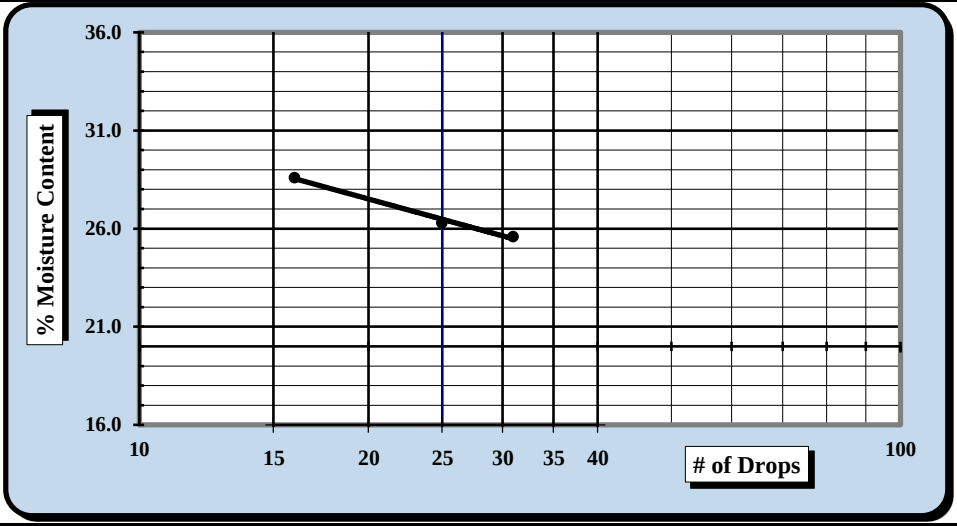
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	2/28/18
Project Name:	Carolina Crossroads Project	Test Date:	2/27/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-39	Sample #:	BS-1	Sample Date:	2/1/2018
Location:	Embankment Boring	Type:	Bulk	Depth:	0.0' - 10.0'
Sample Description:	Clayey Sand (SC, A-4(0))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	11	12	13				14	15	
A	Tare Weight	26.68	26.64	26.78				26.66	27.61	
B	Wet Soil Weight + A	49.31	47.53	47.00				32.89	34.16	
C	Dry Soil Weight + A	44.70	43.18	42.50				31.97	33.20	
D	Water Weight (B-C)	4.61	4.35	4.50				0.92	0.96	
E	Dry Soil Weight (C-A)	18.02	16.54	15.72				5.31	5.59	
F	% Moisture (D/E)*100	25.6%	26.3%	28.6%				17.3%	17.2%	
N	# OF DROPS	31	25	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**17.3%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐
Liquid Limit **26**
Plastic Limit **17**
Plastic Index **9**
Group Symbol **CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 36.4%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski — *Technician Name*
2/28/18 — *Date*
Brian Vaughn — *Technical Responsibility*
2/28/18 — *Date*

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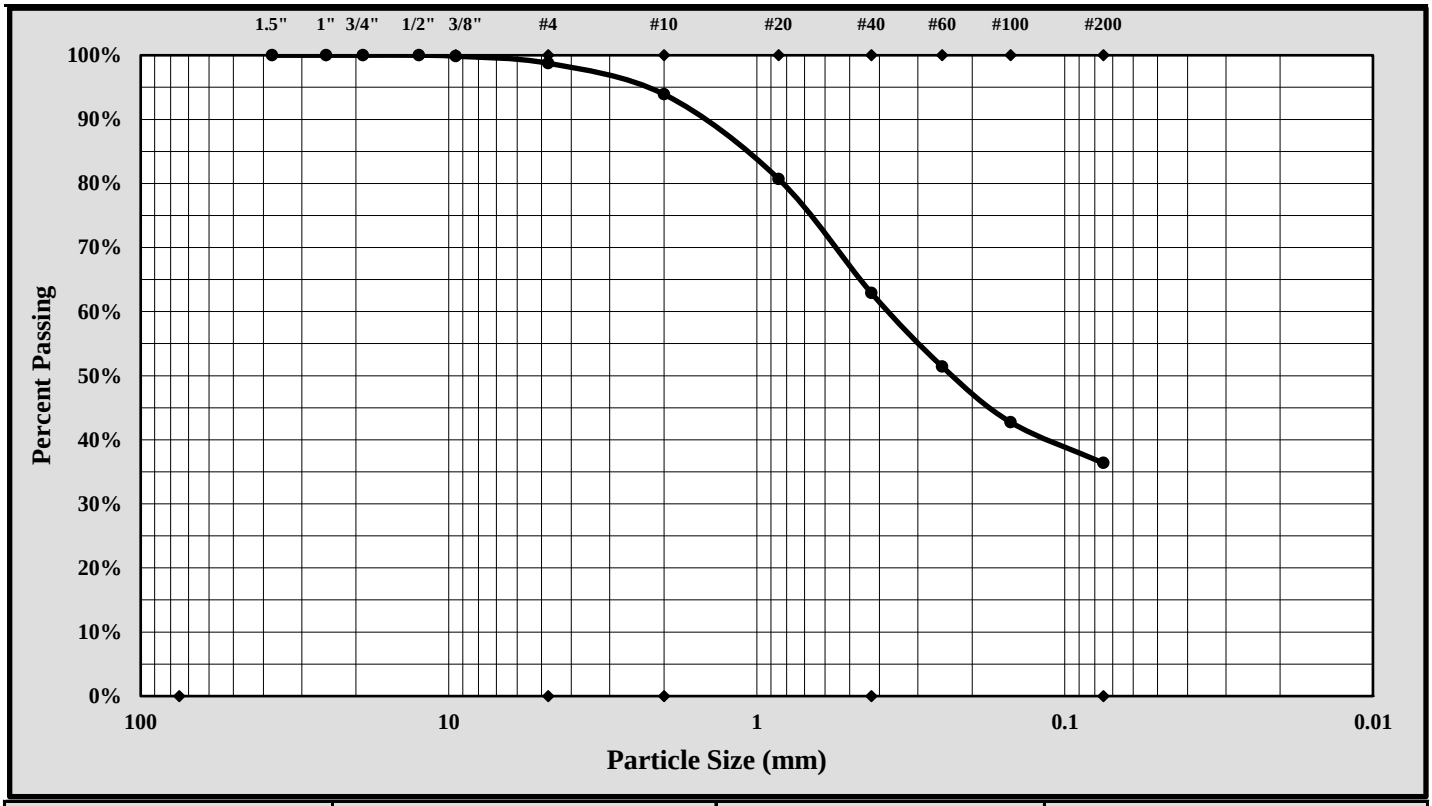
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	2/28/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/20 - 2/24/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	RW-39 Sample #: BS-1	Sample Date:	2/1/2018
Location:	Embankment Boring Type: Bulk	Depth:	0.0' - 10.0'
Sample Description:	Clayey Sand (SC, A-4(0))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	9.50 mm	Gravel:	1.3%
Silt & Clay (% Passing #200):	36.4%	Total Sand:	62.4%

Liquid Limit	26	Plastic Limit	17	Plastic Index	9
Coarse Sand:	4.8%	Medium Sand:	31.0%	Fine Sand:	26.6%

Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☒		

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	2/28/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D698-2
Revision No. : 1
Revision Date: 07/25/17

MOISTURE - DENSITY REPORT

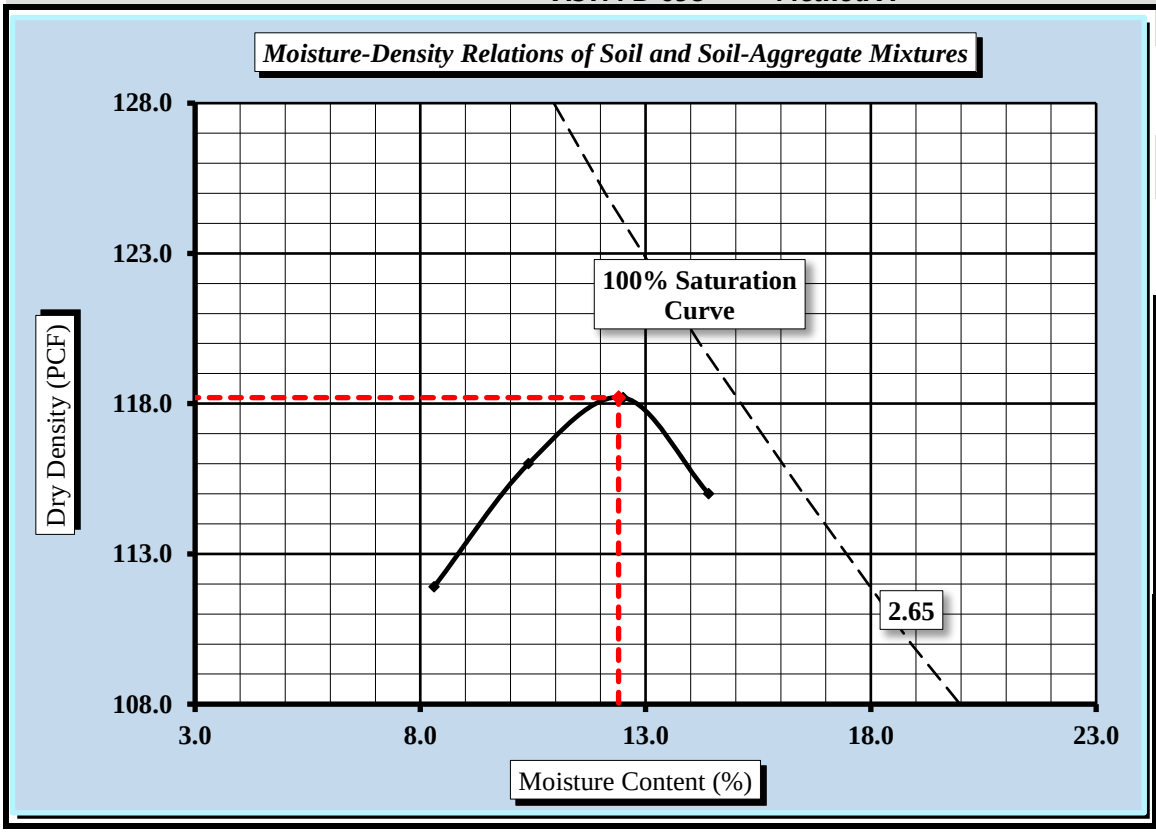
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	2/28/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/14/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-39	Sample #:	BS-1	Sample Date:	2/1/18
Location:	Embankment Boring	Type:	Bulk	Depth:	0.0' - 10.0'
Sample Description:	Clayey Sand (SC, A-4(0))				

Maximum Dry Density 118.2 PCF. Optimum Moisture Content 12.4%

ASTM D 698 - - Method A



Soil Properties

Natural Moisture Content	14.5%
Specific Gravity of Soil	2.650
Liquid Limit	26
Plastic Limit	17
Plastic Index	9

% Passing	
3/4"	100.0%
3/8"	99.9%
#4	98.7%
#10	93.9%
#40	62.9%
#60	51.4%
#100	42.7%
#200	36.4%

Oversize Fraction
Bulk Gravity
% Moisture
% Oversize
MDD
Opt. MC

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☒ 3/8 inch Sieve ☐ 3/4 inch Sieve ☐

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations:

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	2/28/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-26-SCT36-1
Revision No. 0
Revision Date: 2/21/18

% Ignition Loss of Inorganic Soils

SC T 36

Project #: **1461-16-047.2B** Report Date: 2/28/18
Project Name: **Carolina Crossroads Project** Test Date(s): 2/26/18
Client Name: HDR Engineering, Inc.
Client Address: 4400 Leeds Ave., North Charleston, South Carolina

Boring #:	RW-39	Sample #:	BS-1	Sample Date:	2/1/2018
Location:	Embankment Boring	Type:	Bulk	Depth:	0.0' - 10.0'

Sample Description: Clayey Sand (SC, A-4(0))

Equipment: Balance (GP1/G1): S&ME ID# **13942** *0.01 g.Readability, 500g. Minimum Capacity*
Oven: S&ME ID# **13978** Muffle Furnace: S&ME ID# **23123**

Gradation Percentage Determination

		Tare #	BB-5
T	Total Mass of Oven Dry Sample	grams	1824.14
d	Mass Retained on 2mm Sieve	grams	111.27
e	Mass Passing 2mm and Retained on 75µm Sieve	grams	1048.88
f	Mass Passing 75µm Sieve	T-(d+e)	663.99
P	%Passing 75µm Sieve of Sample Passing 2mm Sieve	1-(f/(e+f))*100	61.2%

% Ignition Loss Determination

Muffle Furnace Temperature: **1000 + 50** **°C**

		Tare #	H
t	Tare Weight *(Dish plus Aluminum Foil Cover)*	grams	56.23
b	Mass of Oven Dry Specimen + Tare Wt.	grams	77.36
c	Ash Weight + Tare Wt.	grams	77.22
M	Mass of Oven Dry Specimen	(b-t)	21.13
C	Ash Weight	c-t	20.99
L	Loss	M-C	**0.14**
	% Ignition Loss	(P*L)/M*100	**0.4%**

Remarks:

References: SC T 36: Procedure for Determining % Ignition Loss of Inorganic Soils

Technician Name: Benjamin Kovaleski NICET Lab Level III 117226
Certification #

Technical Responsibility: Brian Vaughan, P.E. *Signature* Group Leader *Position*

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

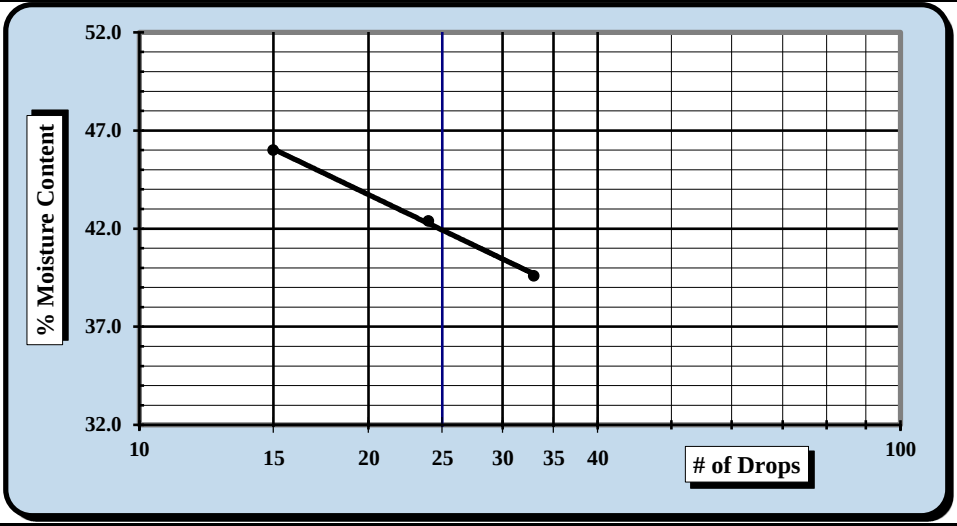
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	3/09/18
Project Name:	Carolina Crossroads Project	Test Date:	3/08/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-40	Sample #:	BS-1	Sample Date:	2/13/2018
Location:	Embankment Boring	Type:	Bulk	Depth:	0.0' - 10.0'
Sample Description:	Lean Clay with Sand (CL, A-7-6(15))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	36	37	38				39	40	
A	Tare Weight	25.70	26.22	26.28				25.90	26.29	
B	Wet Soil Weight + A	42.91	41.96	41.39				34.13	34.35	
C	Dry Soil Weight + A	38.03	37.27	36.63				32.61	32.87	
D	Water Weight (B-C)	4.88	4.69	4.76				1.52	1.48	
E	Dry Soil Weight (C-A)	12.33	11.05	10.35				6.71	6.58	
F	% Moisture (D/E)*100	39.6%	42.4%	46.0%				22.7%	22.5%	
N	# OF DROPS	33	24	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**22.6%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐
Liquid Limit **42**
Plastic Limit **23**
Plastic Index **19**
Group Symbol **CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ % Passing the #200 Sieve: 79.0%

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski — *Technician Name*
3/09/18 — *Date*
Technical Responsibility
3/09/18 — *Date*

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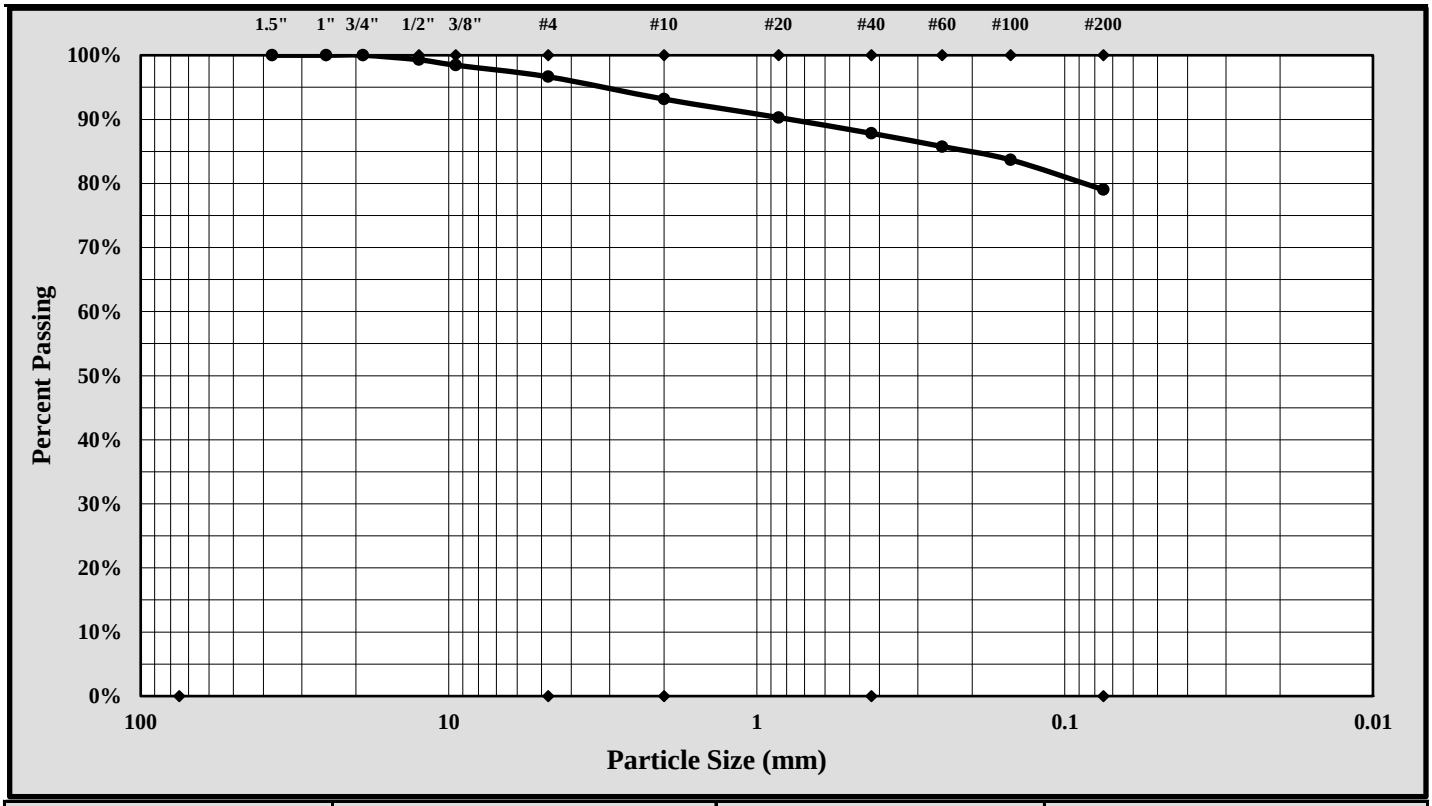
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/09/18
Project Name:	Carolina Crossroads Project	Test Date(s):	3/05 - 3/09/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	RW-40 Sample #: BS-1	Sample Date:	2/13/2018
Location:	Embankment Boring Type: Bulk	Depth:	0.0' - 10.0'
Sample Description:	Lean Clay with Sand (CL, A-7-6(15))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	12.5 mm	Gravel:	3.4%
Silt & Clay (% Passing #200):	79.0%	Total Sand:	17.6%

Liquid Limit	42	Plastic Limit	23	Plastic Index	19
Coarse Sand:	3.5%	Medium Sand:	5.3%	Fine Sand:	8.8%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Brian Vaughan, P.E.	Brian Vaughan	Group Leader	3/09/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D698-2
Revision No. : 1
Revision Date: 07/25/17

MOISTURE - DENSITY REPORT

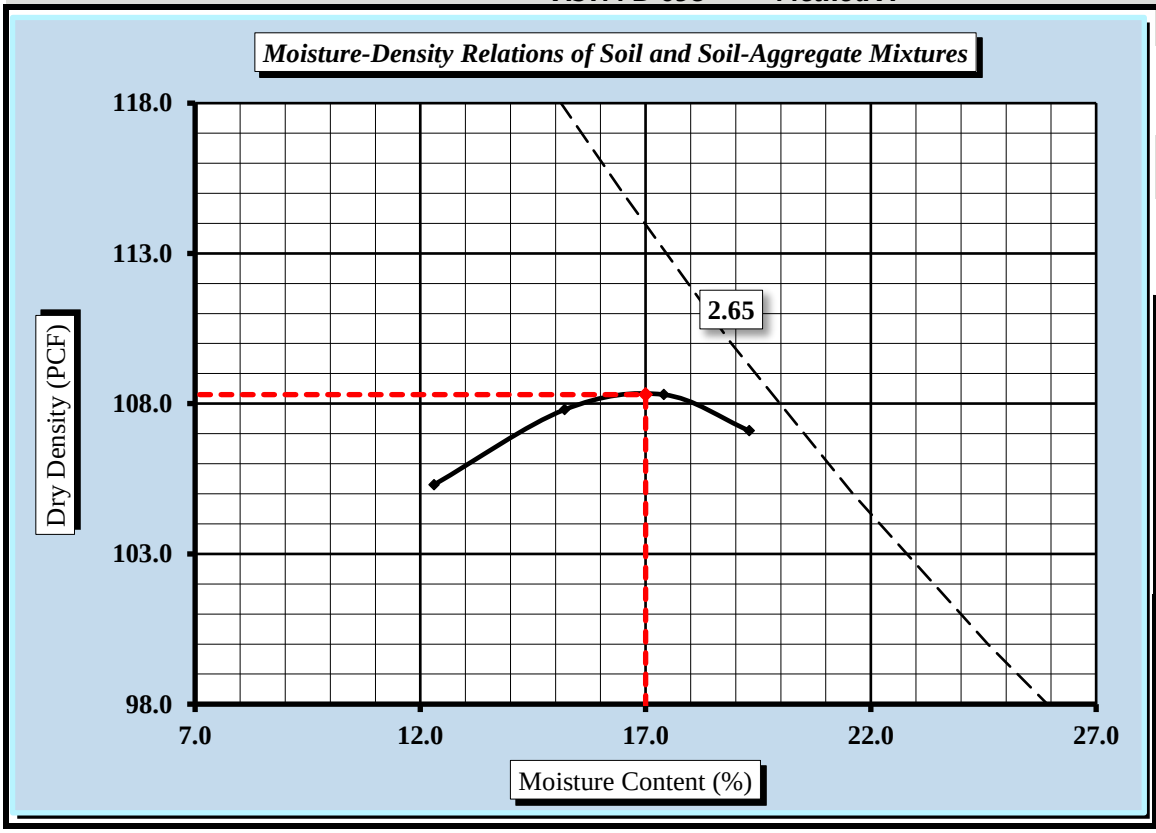
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	3/09/18
Project Name:	Carolina Crossroads Project	Test Date(s):	2/27/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-40	Sample #:	BS-1	Sample Date:	2/13/18
Location:	Embankment Boring	Type:	Bulk	Depth:	0.0' - 10.0'
Sample Description:	Lean Clay with Sand (CL, A-7-6(15))				

Maximum Dry Density 108.3 PCF. Optimum Moisture Content 17.0%

ASTM D 698 - - Method A



Soil Properties	
Natural Moisture Content	16.9%
Specific Gravity of Soil	2.650
Liquid Limit	42
Plastic Limit	23
Plastic Index	19
% Passing	
3/4"	100.0%
3/8"	98.4%
#4	96.6%
#10	93.2%
#40	87.8%
#60	85.8%
#100	83.7%
#200	79.0%
Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☒ 3/8 inch Sieve ☐ 3/4 inch Sieve ☐

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations:

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Brian Vaughan, P.E.		Group Leader	3/09/18
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-26-SCT36-1
Revision No. 0
Revision Date: 2/21/18

% Ignition Loss of Inorganic Soils

SC T 36

Project #: **1461-16-047.2B** Report Date: 3/09/18
Project Name: **Carolina Crossroads Project** Test Date(s): 3/09/18
Client Name: HDR Engineering, Inc.
Client Address: 4400 Leeds Ave., North Charleston, South Carolina

Boring #:	RW-40	Sample #:	BS-1	Sample Date:	2/13/2018
Location:	Embankment Boring	Type:	Bulk	Depth:	0.0' - 10.0'

Sample Description: Lean Clay with Sand (CL, A-7-6(15))

Equipment: Balance (GP1/G1): S&ME ID# **13942** *0.01 g.Readability, 500g. Minimum Capacity*
Oven: S&ME ID# **13978** Muffle Furnace: S&ME ID# **23123**

Gradation Percentage Determination

		Tare #	
T	Total Mass of Oven Dry Sample	grams	2291.37
d	Mass Retained on 2mm Sieve	grams	155.81
e	Mass Passing 2mm and Retained on 75µm Sieve	grams	325.38
f	Mass Passing 75µm Sieve	T-(d+e)	1810.18
P	%Passing 75µm Sieve of Sample Passing 2mm Sieve	1-(f/(e+f))*100	15.2%

% Ignition Loss Determination

Muffle Furnace Temperature: **1000 + 50** **°C**

		Tare #	B
t	Tare Weight *(Dish plus Aluminum Foil Cover)*	grams	56.78
b	Mass of Oven Dry Specimen + Tare Wt.	grams	78.20
c	Ash Weight + Tare Wt.	grams	77.84
M	Mass of Oven Dry Specimen	(b-t)	21.42
C	Ash Weight	c-t	21.06
L	Loss	M-C	**0.36**
	% Ignition Loss	(P*L)/M*100	**0.3%**

Remarks:

References: SC T 36: Procedure for Determining % Ignition Loss of Inorganic Soils

Technician Name: Benjamin Kovaleski NICET Lab Level III 117226
Certification #

Technical Responsibility: Brian Vaughan, P.E. *Signature* Group Leader *Position*

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

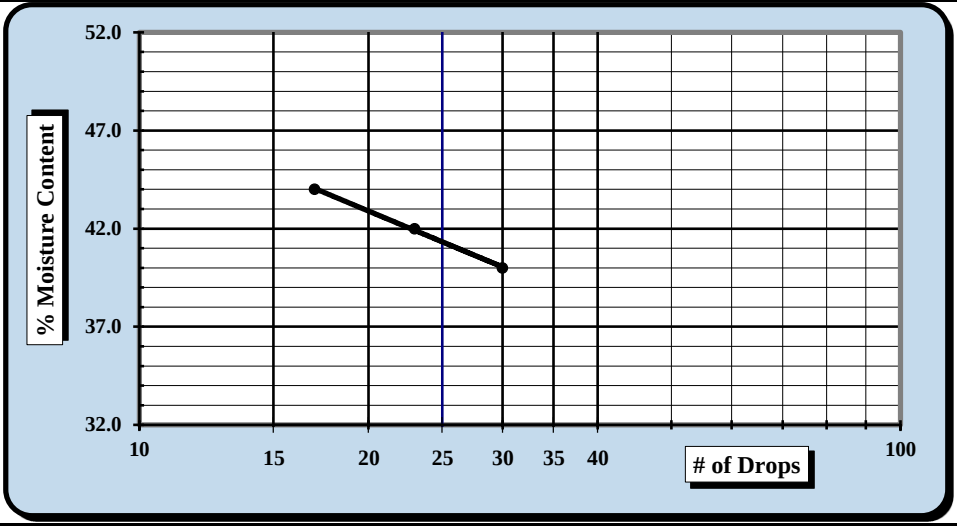
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	4/25/18
Project Name:	Carolina Crossroads Project	Test Date:	4/21/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-41	Sample #:	BS-1	Sample Date:	3/14/2018
Location:	Embankment Boring	Type:	Bulk	Depth:	0.0' - 10.0'
Sample Description:	Sandy Lean Clay (CL, A-7-6(8))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	6	7	8				9	10	
A	Tare Weight	27.75	26.29	27.31				26.84	26.74	
B	Wet Soil Weight + A	48.27	45.74	44.42				33.23	34.26	
C	Dry Soil Weight + A	42.41	39.99	39.19				31.97	32.79	
D	Water Weight (B-C)	5.86	5.75	5.23				1.26	1.47	
E	Dry Soil Weight (C-A)	14.66	13.70	11.88				5.13	6.05	
F	% Moisture (D/E)*100	40.0%	42.0%	44.0%				24.6%	24.3%	
N	# OF DROPS	30	23	17				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**24.5%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐
Liquid Limit **41**
Plastic Limit **24**
Plastic Index **17**
Group Symbol **CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	4/25/18	Matthew F. Cooke, P.G.	4/27/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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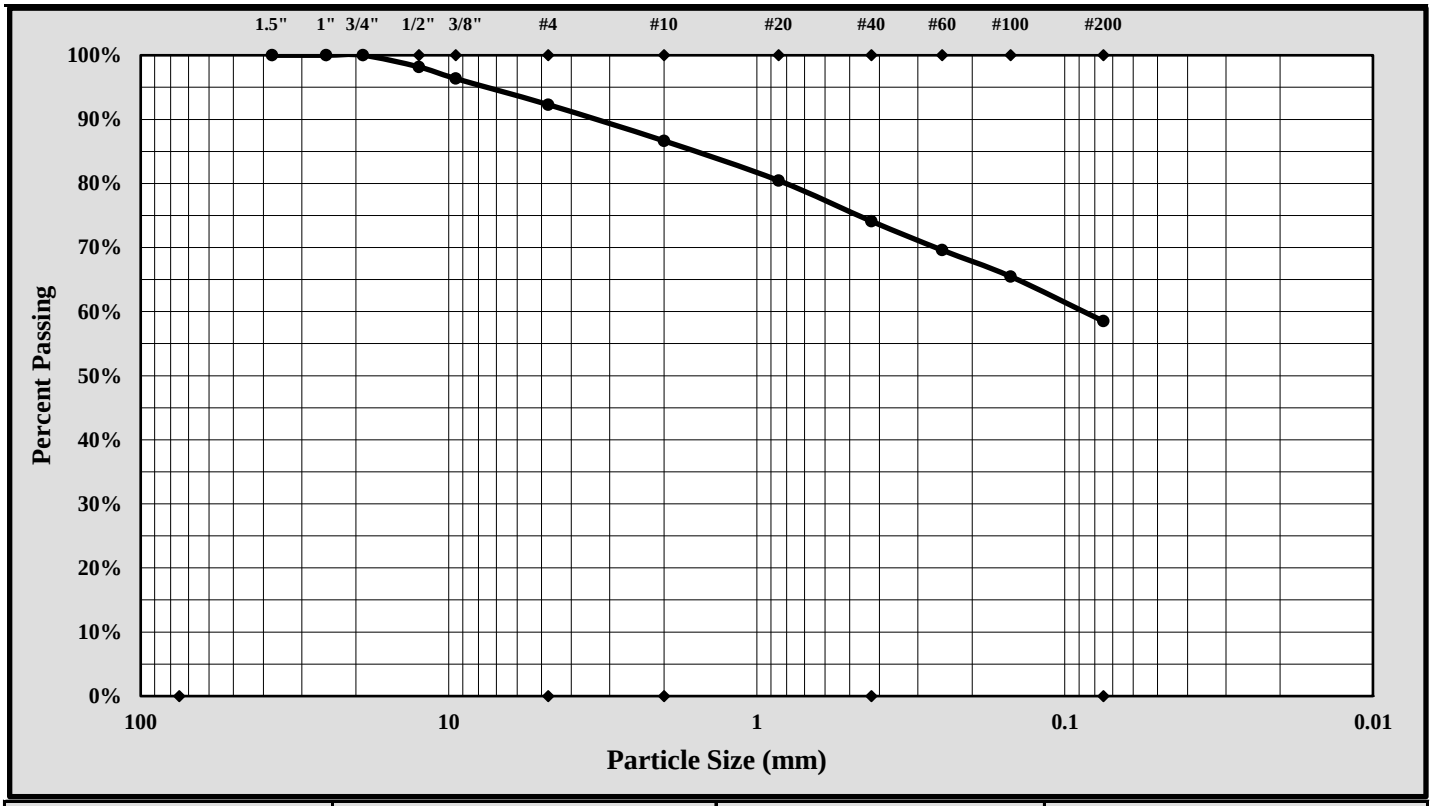
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/11 - 4/20/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	RW-41 Sample #: BS-1	Sample Date:	3/14/2018
Location:	Embankment Boring Type: Bulk	Depth:	0.0' - 10.0'
Sample Description:	Sandy Lean Clay (CL, A-7-6(8))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	19.0 mm	Gravel:	7.7%
Silt & Clay (% Passing #200):	58.5%	Total Sand:	33.8%

Liquid Limit	41	Plastic Limit	24	Plastic Index	17
Coarse Sand:	5.7%	Medium Sand:	12.5%	Fine Sand:	15.6%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
4/27/18 — *Date*

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Form No. TR-D698-2
Revision No. : 1
Revision Date: 07/25/17

MOISTURE - DENSITY REPORT

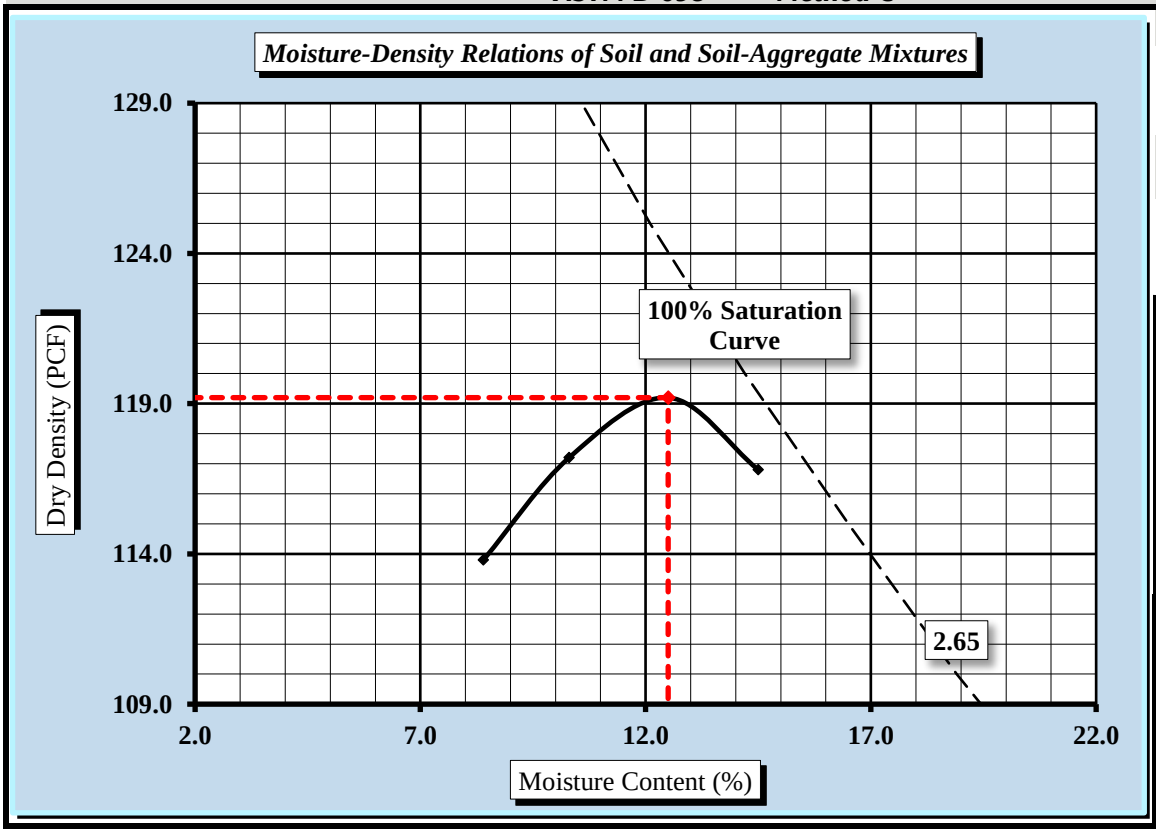
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	4/25/18
Project Name:	Carolina Crossroads Project	Test Date:	3/26/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, SC 29405		

Boring #:	RW-41	Sample #:	BS-1	Sample Date:	3/14/18
Location:	Embankment Boring	Type:	Bulk	Depth:	0.0' - 10.0'
Sample Description:	Sandy Lean Clay (CL, A-7-6(8))				

Maximum Dry Density 119.2 PCF. Optimum Moisture Content 12.5%

ASTM D 698 - - Method C



Soil Properties	
Natural Moisture Content	13.3%
Specific Gravity of Soil	2.65
Liquid Limit	41
Plastic Limit	24
Plastic Index	17
% Passing	
3/4"	100.0%
3/8"	96.4%
#4	92.3%
#10	86.6%
#40	74.1%
#60	69.6%
#100	65.5%
#200	58.5%
Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☐ 3/8 inch Sieve ☐ 3/4 inch Sieve ☒

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations:

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Matthew F. Cooke, P.G.	Project Manager	4/27/2018
Technical Responsibility	*Position*	*Date*

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Form No. TR-26-SCT36-1
Revision No. 0
Revision Date: 2/21/18

% Ignition Loss of Inorganic Soils

SC T 36

Project #: **1461-16-047.2B** Report Date: 4/25/18
Project Name: **Carolina Crossroads Project** Test Date(s): 4/21/18
Client Name: HDR Engineering, Inc.
Client Address: 4400 Leeds Ave., North Charleston, South Carolina

Boring #:	RW-41	Sample #:	BS-1	Sample Date:	3/14/2018
Location:	Embankment Boring	Type:	Bulk	Depth:	0.0' - 10.0'

Sample Description: Sandy Lean Clay (CL, A-7-6(8))

Equipment: Balance (GP1/G1): S&ME ID# **13942** *0.01 g.Readability, 500g. Minimum Capacity*
Oven: S&ME ID# **13978** Muffle Furnace: S&ME ID# **23123**

Gradation Percentage Determination

		Tare #	D-21
T	Total Mass of Oven Dry Sample	grams	1953.02
d	Mass Retained on 2mm Sieve	grams	261.70
e	ass Passing 2mm and Retained on 75µm Sieve	grams	548.80
f	Mass Passing 75µm Sieve	T-(d+e)	1142.52
P	%Passing 75µm Sieve of Sample Passing 2mm Sieve	1-(f/(e+f))*100	32.4%

% Ignition Loss Determination

Muffle Furnace Temperature: **1000 ± 50 °C**

		Tare #	D
t	Tare Weight *(Dish plus Aluminum Foil Cover)*	grams	56.80
b	Mass of Oven Dry Specimen + Tare Wt.	grams	77.23
c	Ash Weight + Tare Wt.	grams	75.82
M	Mass of Oven Dry Specimen	(b-t)	20.43
C	Ash Weight	c-t	19.02
L	Loss	M-C	**1.41**
	% Ignition Loss	(P*L)/M*100	**2.2%**

Remarks:

References: SC T 36: Procedure for Determining % Ignition Loss of Inorganic Soils

Technician Name: Benjamin Kovaleski NICET Lab Level III 117226
Certification #

Technical Responsibility: Matthew F. Cooke, P.G. Project Manager
Position

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

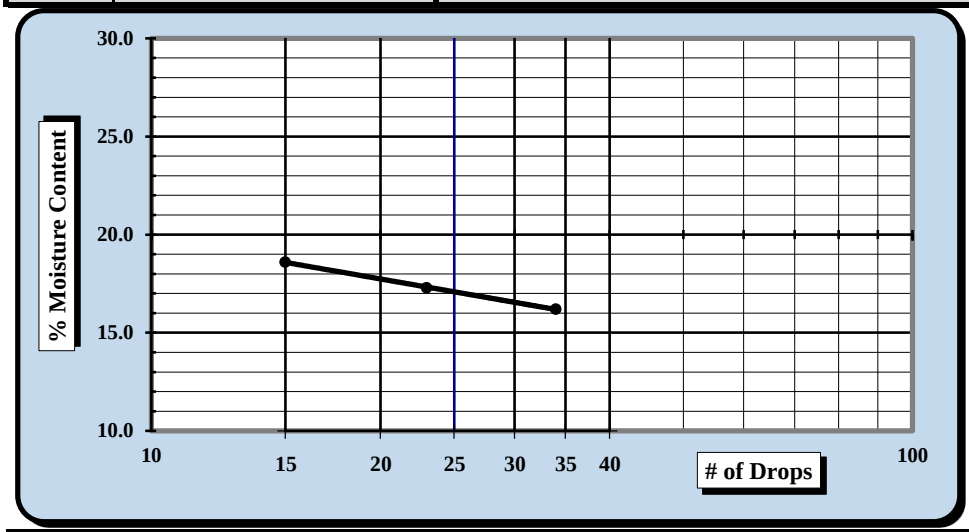
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/3/18
Project Name:	Carolina Crossroads Project	Test Date:	5/2/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-42	Sample #:	BS-1	Sample Date:	3/15/2018
Location:	Embankment Boring	Type:	Bulk	Depth:	0.0' - 10.0'
Sample Description:	Silty Clayey Sand (SC-SM, A-2-4)				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	6	7	8				9	10	
A	Tare Weight	27.74	26.30	27.31				26.84	26.75	
B	Wet Soil Weight + A	47.94	45.58	48.13				35.64	34.09	
C	Dry Soil Weight + A	45.12	42.74	44.87				34.80	33.40	
D	Water Weight (B-C)	2.82	2.84	3.26				0.84	0.69	
E	Dry Soil Weight (C-A)	17.38	16.44	17.56				7.96	6.65	
F	% Moisture (D/E)*100	16.2%	17.3%	18.6%				10.6%	10.4%	
N	# OF DROPS	34	23	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**10.5%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**17**
Plastic Limit	**11**
Plastic Index	**6**
Group Symbol	**CL-ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/4/2018	Matthew F. Cooke, P.G.	5/4/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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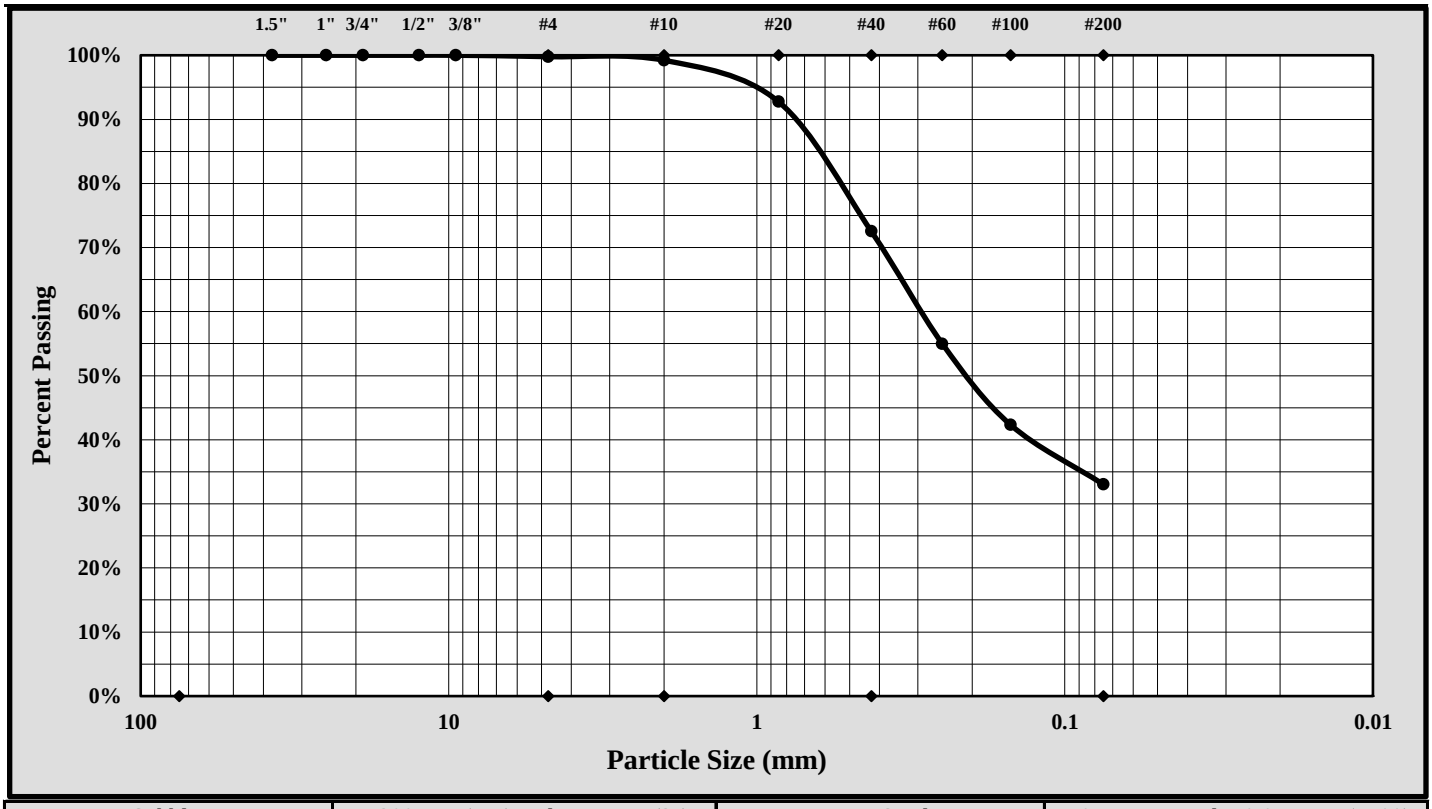
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/03/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/01 - 5/03/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	RW-42 Sample #: BS-1	Sample Date:	3/15/2018
Location:	Embankment Boring Type: Bulk	Depth:	0.0' - 10.0'
Sample Description:	Silty Clayey Sand (SC-SM, A-2-4)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	2.00 mm	Gravel:	0.2%
Silt & Clay (% Passing #200):	33.0%	Total Sand:	66.7%

Liquid Limit	17	Plastic Limit	11	Plastic Index	6
Coarse Sand:	0.6%	Medium Sand:	26.7%	Fine Sand:	39.5%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/03/18 — *Date*

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Form No. TR-D698-2
Revision No. : 1
Revision Date: 07/25/17

MOISTURE - DENSITY REPORT

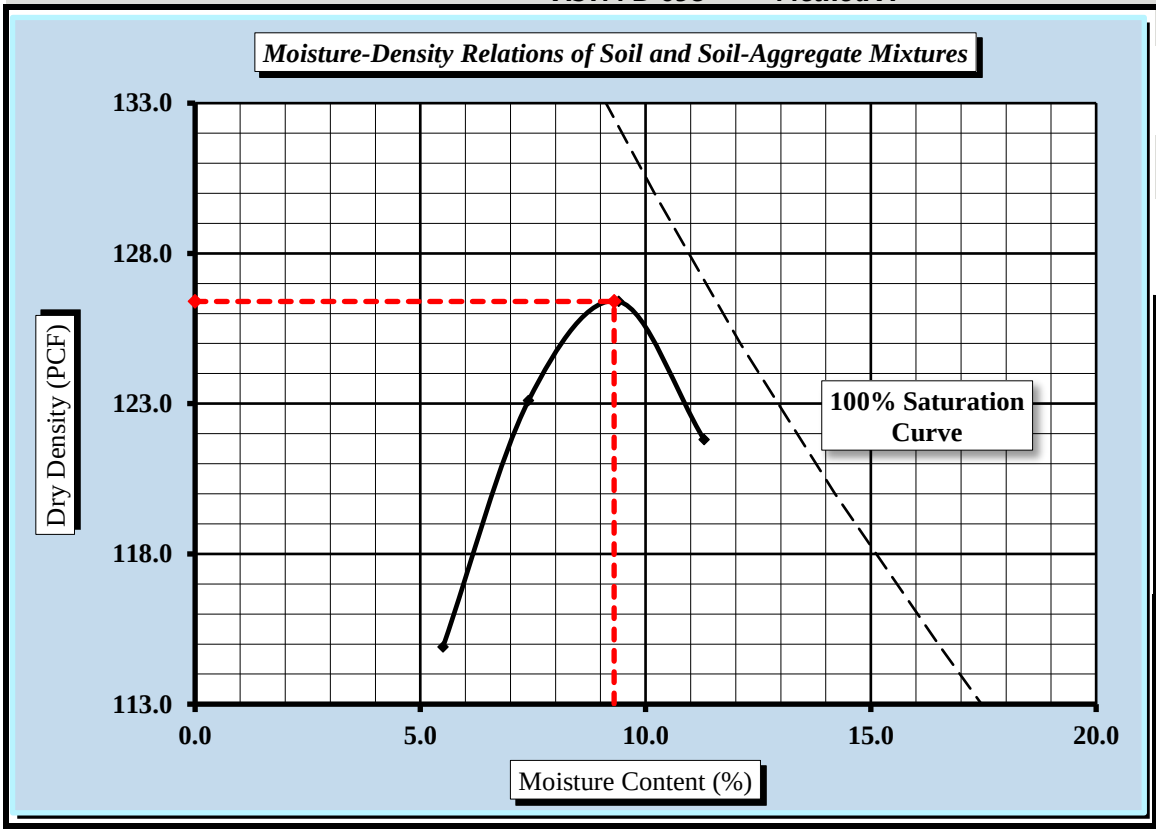
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/03/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/26/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-42	Sample #:	BS-1	Sample Date:	3/15/18
Location:	Embankment Boring	Type:	Bulk	Depth:	0.0' - 10.0'
Sample Description:	Silty Clayey Sand (SC-SM, A-2-4)				

Maximum Dry Density 126.4 PCF. Optimum Moisture Content 9.3%

ASTM D 698 - - Method A



Soil Properties

Natural Moisture Content	10.4%
Specific Gravity of Soil	2.650
Liquid Limit	17
Plastic Limit	11
Plastic Index	6

% Passing	
3/4"	100.0%
3/8"	100.0%
#4	99.8%
#10	99.2%
#40	73.0%
#60	55.0%
#100	42.3%
#200	33.0%

Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☒ 3/8 inch Sieve ☐ 3/4 inch Sieve ☐

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations:

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Matthew F. Cooke, P.G.	Project Manager	5/03/18
Technical Responsibility	*Position*	*Date*

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Form No. TR-26-SCT36-1
Revision No. 0
Revision Date: 2/21/18

% Ignition Loss of Inorganic Soils

SC T 36

Project #: **1461-16-047.2B** Report Date: 5/04/18
Project Name: **Carolina Crossroads Project** Test Date(s): 5/03/18
Client Name: HDR Engineering, Inc.
Client Address: 4400 Leeds Ave., North Charleston, South Carolina

Boring #:	RW-42	Sample #:	BS-1	Sample Date:	3/15/2018
Location:	Embankment Boring	Type:	Bulk	Depth:	0.0' - 10.0'

Sample Description: Silty Clayey Sand (SC-SM, A-2-4)

Equipment: Balance (GP1/G1): S&ME ID# **13942** *0.01 g.Readability, 500g. Minimum Capacity*
Oven: S&ME ID# **13978** Muffle Furnace: S&ME ID# **23123**

Gradation Percentage Determination

		Tare #	D-6
T	Total Mass of Oven Dry Sample	grams	1248.99
d	Mass Retained on 2mm Sieve	grams	9.99
e	ass Passing 2mm and Retained on 75µm Sieve	grams	826.83
f	Mass Passing 75µm Sieve	T-(d+e)	412.17
P	%Passing 75µm Sieve of Sample Passing 2mm Sieve	1-(f/(e+f))*100	66.7%

% Ignition Loss Determination

Muffle Furnace Temperature: **1000 ± 50** **°C**

		Tare #	A
t	Tare Weight *(Dish plus Aluminum Foil Cover)*	grams	57.44
b	Mass of Oven Dry Specimen + Tare Wt.	grams	78.01
c	Ash Weight + Tare Wt.	grams	77.95
M	Mass of Oven Dry Specimen	(b-t)	20.57
C	Ash Weight	c-t	20.51
L	Loss	M-C	**0.06**
	% Ignition Loss	(P*L)/M*100	**0.2%**

Remarks:

References: SC T 36: Procedure for Determining % Ignition Loss of Inorganic Soils

Technician Name: Benjamin Kovaleski NICET Lab Level III 117226
Certification #

Technical Responsibility: Matthew F. Cooke, P.G. Project Manager
Position

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

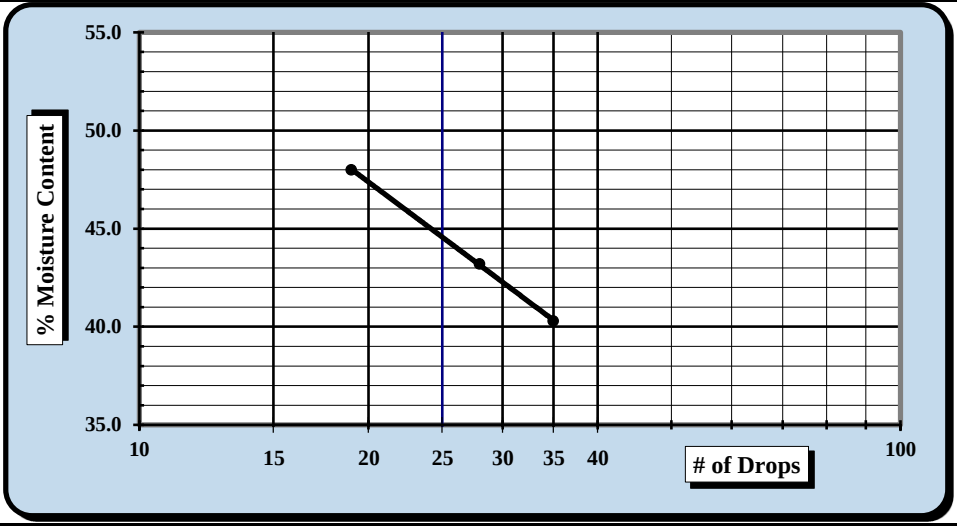
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/3/18
Project Name:	Carolina Crossroads Project	Test Date:	5/2/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-43	Sample #:	BS-1	Sample Date:	4/4/2018
Location:	Embankment Boring	Type:	Bulk	Depth:	0.0' - 10.0'
Sample Description:	Clayey Sand (SC, A-7-6(6))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	11	12	13				14	15	
A	Tare Weight	26.68	26.66	26.76				26.65	27.60	
B	Wet Soil Weight + A	43.05	44.47	43.31				33.28	34.92	
C	Dry Soil Weight + A	38.35	39.10	37.94				32.09	33.60	
D	Water Weight (B-C)	4.70	5.37	5.37				1.19	1.32	
E	Dry Soil Weight (C-A)	11.67	12.44	11.18				5.44	6.00	
F	% Moisture (D/E)*100	40.3%	43.2%	48.0%				21.9%	22.0%	
N	# OF DROPS	35	28	19				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**22.0%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**45**
Plastic Limit	**22**
Plastic Index	**23**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	43223	Matthew F. Cooke, P.G.	43223
Technician Name	*Date*	*Technical Responsibility*	*Date*

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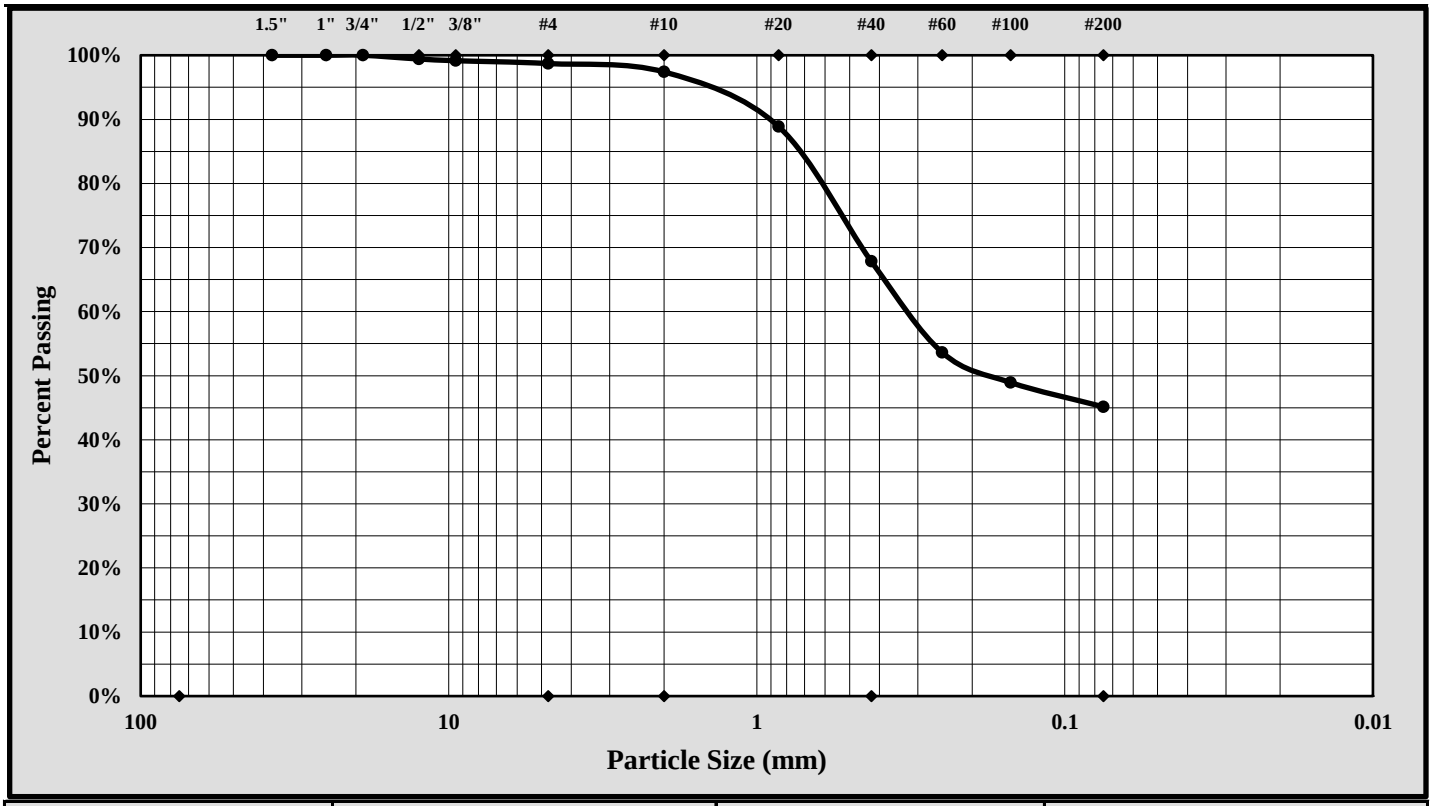
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/03/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/01 - 5/03/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	RW-43 Sample #: BS-1	Sample Date:	4/4/2018
Location:	Embankment Boring Type: Bulk	Depth:	0.0' - 10.0'
Sample Description:	Clayey Sand (SC, A-7-6(6))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	9.50 mm	Gravel:	1.3%
Silt & Clay (% Passing #200):	45.1%	Total Sand:	53.6%

Liquid Limit	45	Plastic Limit	22	Plastic Index	23
Coarse Sand:	1.3%	Medium Sand:	29.5%	Fine Sand:	22.7%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/03/18 — *Date*

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Form No. TR-D698-2
Revision No. : 1
Revision Date: 07/25/17

MOISTURE - DENSITY REPORT

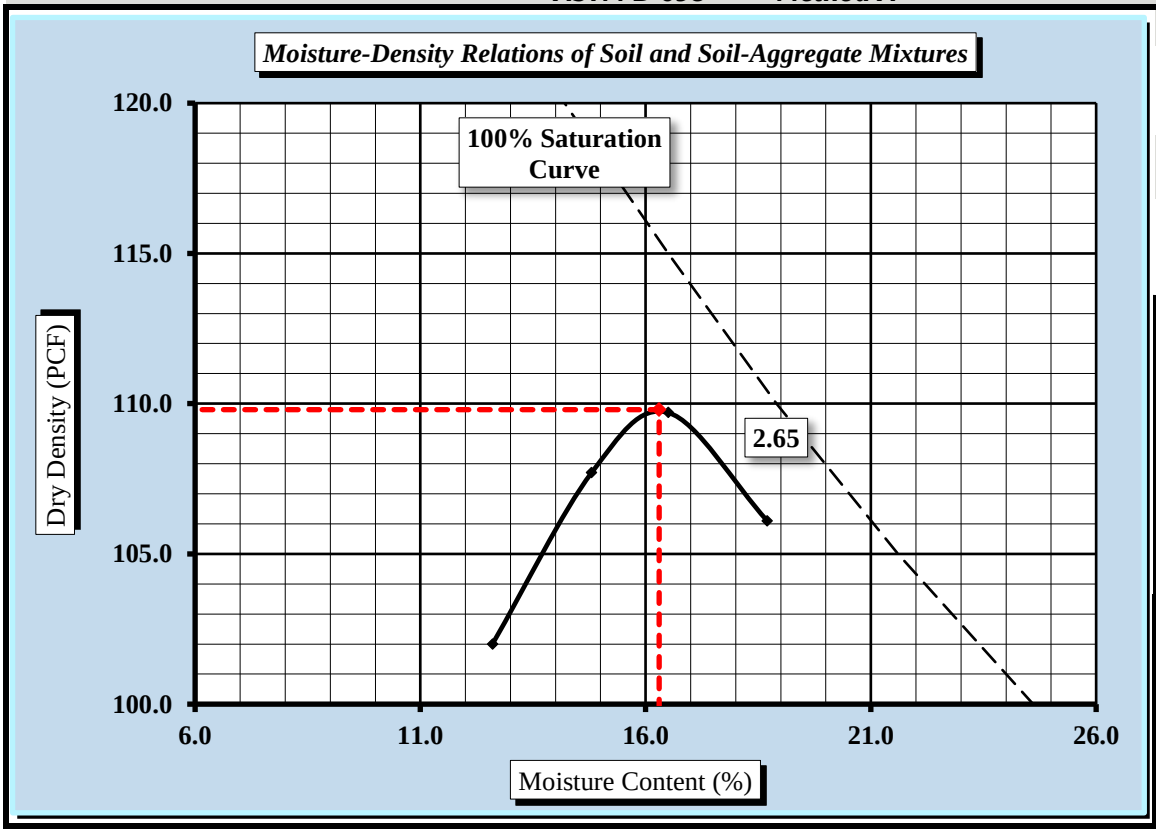
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/03/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/26/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	RW-43	Sample #:	BS-1	Sample Date:	4/4/18
Location:	Embankment Boring	Type:	Bulk	Depth:	0.0' - 10.0'
Sample Description:	Clayey Sand (SC, A-7-6(6))				

Maximum Dry Density 109.8 PCF. Optimum Moisture Content 16.3%

ASTM D 698 - - Method A



Soil Properties	
Natural Moisture Content	14.5%
Specific Gravity of Soil	2.650
Liquid Limit	45
Plastic Limit	22
Plastic Index	23
% Passing	
3/4"	100.0%
3/8"	99.2%
#4	98.7%
#10	97.4%
#40	67.9%
#60	53.6%
#100	48.9%
#200	45.1%
Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☒ 3/8 inch Sieve ☐ 3/4 inch Sieve ☐

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations:

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Matthew F. Cooke, P.G.	Project Manager	5/03/18
Technical Responsibility	*Position*	*Date*

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Form No. TR-26-SCT36-1
Revision No. 0
Revision Date: 2/21/18

% Ignition Loss of Inorganic Soils

SC T 36

Project #: **1461-16-047.2B** Report Date: 5/04/18
Project Name: **Carolina Crossroads Project** Test Date(s): 5/03/18
Client Name: HDR Engineering, Inc.
Client Address: 4400 Leeds Ave., North Charleston, South Carolina

Boring #:	RW-43	Sample #:	BS-1	Sample Date:	4/4/2018
Location:	Embankment Boring	Type:	Bulk	Depth:	0.0' - 10.0'

Sample Description: Clayey Sand (SC, A-7-6(6))

Equipment: Balance (GP1/G1): S&ME ID# **13942** *0.01 g.Readability, 500g. Minimum Capacity*
Oven: S&ME ID# **13978** Muffle Furnace: S&ME ID# **23123**

Gradation Percentage Determination

		Tare #	D-9
T	Total Mass of Oven Dry Sample	grams	1330.13
d	Mass Retained on 2mm Sieve	grams	34.58
e	ass Passing 2mm and Retained on 75µm Sieve	grams	695.66
f	Mass Passing 75µm Sieve	T-(d+e)	599.89
P	%Passing 75µm Sieve of Sample Passing 2mm Sieve	1-(f/(e+f))*100	53.7%

% Ignition Loss Determination

Muffle Furnace Temperature: **1000 ± 50** **°C**

		Tare #	B2
t	Tare Weight *(Dish plus Aluminum Foil Cover)*	grams	152.56
b	Mass of Oven Dry Specimen + Tare Wt.	grams	174.28
c	Ash Weight + Tare Wt.	grams	174.22
M	Mass of Oven Dry Specimen	(b-t)	21.72
C	Ash Weight	c-t	21.66
L	Loss	M-C	**0.06**
	% Ignition Loss	(P*L)/M*100	**0.1%**

Remarks:

References: SC T 36: Procedure for Determining % Ignition Loss of Inorganic Soils

Technician Name: Benjamin Kovaleski NICET Lab Level III 117226
Certification #

Technical Responsibility: Matthew F. Cooke, P.G. Project Manager
Position

Appendix X – Laboratory Test Data Sheets – Corrosion Series Testing

Results Only Soil Testing for Carolina Crossroads Project

March 13, 2018

Prepared for:
Hunter McKenzie
S&ME, Inc
134 Suber Road
Columbia, SC 29210
hmckenzie@smeinc.com

Project X Job#: S180308B
Client Job or PO#: 1461-16-047

Soil Analysis Lab Results

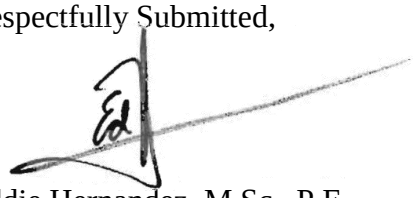
Client: S&ME, Inc
Job Name: Carolina Crossroads Project
Client Job Number: 1461-16-047
Project X Job Number: S180308B
March 13, 2018

	Method	ASTM G187		ASTM D516		ASTM D512B		ASTM G51
Bore# / Description	**Depth**	**Resistivity** As Rec'd	Minimum	**Sulfates**		**Chlorides**		**pH**
	(ft)	(Ohm-cm)	(Ohm-cm)	(mg/kg)	(wt%)	(mg/kg)	(wt%)	
SS-3, SS-5 - DH-4	4.0-10.0	60,300	17,420	21	0.0021	9	0.0009	7.68
SS-5, SS-6, SS-7 - DH-5	8.2-20.0	4,154	3,953	60	0.0060	75	0.0075	7.34
SS-5, SS-6 - DH-6	8.3-15.0	30,820	8,710	30	0.0030	33	0.0033	7.12
SS-6, SS-7 - B-29	14.5-21.0	7,370	7,370	9	0.0009	12	0.0012	7.83
SS-11, SS-12 - B-30	38.5-45.0	1,943	1,943	120	0.0120	120	0.0120	7.87
SS-8, SS-9 - B-34	23.5-30.0	8,040	8,040	3	0.0003	9	0.0009	7.15
SS-11, SS-13 - B-36	38.5-50.0	3,752	3,484	18	0.0018	24	0.0024	7.18
SS-5, SS-6 - B-41	8.8-15.0	19,430	16,750	9	0.0009	24	0.0024	7.25
SS-3, SS-4 - B-43	18.8-22.8	3,417	3,283	90	0.0090	300	0.0300	6.75
SS-9, SS-10 - B-47	29.5-36.0	12,730	10,050	60	0.0060	138	0.0138	7.15
SS-11, SS-12 - B-50	38.5-45.0	54,270	50,920	15	0.0015	3	0.0003	7.18
SS-3, SS-4 - B-51	4.0-8.0	61,640	46,230	6	0.0006	12	0.0012	6.81
SS-10, SS-11 - B-52	33.5-40.0	50,920	36,180	21	0.0021	6	0.0006	6.57
SS-10, SS-11 - B-53	33.5-40.0	63,650	47,570	3	0.0003	6	0.0006	6.55
SS-7, SS-8 - B-55	18.5-25.0	33,500	30,150	12	0.0012	9	0.0009	6.31
SS-4, SS-5 - B-57	6.1-10.1	16,080	15,410	18	0.0018	6	0.0006	5.68
SS-5, SS-6 - B-59	8.3-15.0	120,600	87,100	15	0.0015	9	0.0009	5.86

Unk = Unknown
NT = Not Tested
mg/kg = milligrams per kilogram (parts per million) of dry soil weight
Chemical Analysis performed on 1:3 Soil-To-Water extract

Please call if you have any questions.

Respectfully Submitted,



Eddie Hernandez, M.Sc., P.E.
Sr. Corrosion Consultant
NACE Corrosion Technologist #16592
Professional Engineer
California No. M37102
ehernandez@projectxcorrosion.com

S1803088 S&ME-1461-16-047 - 17 Quads

Project X
Corrosion Engineering
Corrosion Control - Soil, Water, and Metallurgy Lab

Lab Request Sheet Chain of Custody
Phone: (213) 928-7213 · Fax (951) 226-1720 · www.projectxcorrosion.com
Ship Samples To: 29970 Technology Dr, Suite 105F, Murrieta, CA 92563

IMPORTANT: Please complete Project and Sample Identification Data as you would like it to appear in report & include this form with samples.

Project X Job #:	
Date:	3/2/2018

Company Name:	S&ME, Inc.	**Contact Name:**	Hunter McKenzie
Mailing Address:	134 Suber Road, Columbia, SC 29210	**Contact Email:**	hmckenzie@smeinc.com
Accounting Contact:	Kathryn Friedrichs	**Invoice Email:**	mcooke@smeinc.com
Project Name:	Carolina Crossroads Project		
Client Project No:	1461-16-047	**P.O. #:**	1461-16-047

	5 Day Normal	3 Day RUSH 75% mark-up	2 Day RUSH 100% mark-up
Turn Around Time:	✔		

Results By: ☐ Phone ☐ Fax ☑ Email ☐ Mail ☐ Overnight Mail (charges apply)

Received by: **Default Method**

SPECIAL INSTRUCTIONS:

ANALYSIS REQUESTED (Please circle)

	SAMPLE ID - BORE #	DESCRIPTION	DEPTH (ft)	DATE COLLECTED	CORROSION SERIES	Soil Resistivity	pH	Sulfate	Chloride	Redox Potential	BiCarbonate	Alkalinity	Acidity	Nitrate	Ammonia	Sulfide	Moisture Content	Soil Corrosivity Evaluation Report	Metallurgical Analysis	NOTES
					Mm. Resistivity, Sulfate, Chloride, Sulfide, Redox, pH, Ammonia, Nitrate	ASTM G187	AASHTO T2888 Caltrans CTM643	AASHTO T 289 Caltrans CTM643	AASHTO T 290 Caltrans CTM417	AASHTO T 291 Caltrans CTM422	SM 2580B	SM 2320B	SM 2520B	SM 2510B	Hach 835 SM 4500-NO3	Hach 830 SM 4500-NH3	SM 4500-S2	ASTM D2216			
1	SS-3, SS-5 - DH-4		4 - 10	1/4/2018		✔	✔	✔	✔											combine SS-3 & SS-5
2	SS-5, SS-6, SS-7 -	DH-5	8.2 - 20	1/4/2018		✔	✔	✔	✔											combine SS-5, SS-6, & SS-7
3	SS-5, SS-6 - DH-6		8.3 - 15	1/10/2018		✔	✔	✔	✔											combine SS-5 & SS-6
4	SS-6, SS-7 - B-29		14.5 - 21	2/14/2018		✔	✔	✔	✔											combine SS-6 & SS-7
5	SS-11, SS-12 - B-30		38.5 - 45	2/15/2018		✔	✔	✔	✔											combine SS-11 & SS-12
6	SS-8, SS-9 - B-34		23.5 - 30	2/5/2018		✔	✔	✔	✔											combine SS-8 & SS-9
7	SS-11, SS-13 - B-36		38.5 - 50	2/12/2018		✔	✔	✔	✔											combine SS-11 & SS-13
8	SS-5, SS-6 - B-41		8.8 - 15	1/21/2018		✔	✔	✔	✔											combine SS-5 & SS-6
9	SS-3, SS-4 - B-43		18.8 - 22.8	2/26/2018		✔	✔	✔	✔											combine SS-3 & SS-4
10	SS-9, SS-10 - B-47		29.5 - 36	2/12/2018		✔	✔	✔	✔											combine SS-9 & SS-10
11	SS-11, SS-12 - B-50		38.5 - 45	2/18/2018		✔	✔	✔	✔											combine SS-11 & SS-12
12	SS-3, SS-4 - B-51		4 - 8	2/8/2018		✔	✔	✔	✔											combine SS-3 & SS-4
13	SS-10, SS-11 - B-52		33.5 - 40	2/20/2018		✔	✔	✔	✔											combine SS-10 & SS-11
14	SS-10, SS-11 - B-53		33.5 - 40	2/18/2018		✔	✔	✔	✔											combine SS-10 & SS-11

Project X
Corrosion Engineering
Corrosion Control - Soil, Water, and Metallurgy Lab

Lab Request Sheet Chain of Custody
Phone: (213) 928-7213 · Fax (951) 226-1720 · www.projectxcorrosion.com
Ship Samples To: 29970 Technology Dr, Suite 105F, Murrieta, CA 92563

IMPORTANT: Please complete Project and Sample Identification Data as you would like it to appear in report & include this form with samples.

Project X Job #:	
Date:	3/2/2018

Company Name:	S&ME, Inc.	**Contact Name:**	Hunter McKenzie
Mailing Address:	134 Suber Road, Columbia, SC 29210	**Contact Email:**	hmckenzie@smeinc.com
Accounting Contact:	Kathryn Friedrichs	**Invoice Email:**	mcooke@smeinc.com
Project Name:	Carolina Crossroads Project		
Client Project No:	1461-16-047	**P.O. #:**	1461-16-047

	5 Day Normal	3 Day RUSH 75% mark-up	2 Day RUSH 100% mark-up
Turn Around Time:	✔		

Results By: ☐ Phone ☐ Fax ☑ Email ☐ Mail ☐ Overnight Mail (charges apply)

Received by: **Default Method**

SPECIAL INSTRUCTIONS:

ANALYSIS REQUESTED (Please circle)

	SAMPLE ID - BORE #	DESCRIPTION	DEPTH (ft)	DATE COLLECTED	CORROSION SERIES (Mm. Resistivity, Sulfate, Chloride, Sulfide, Redox, pH, Ammonia, Nitrate)	Soil Resistivity (ASTM G187 / AASHTO T2888 / Caltrans CTM643)	pH (ASTM G 51 / AASHTO T 289 / Caltrans CTM643)	Sulfate (ASTM D516 / AASHTO T 290 / Caltrans CTM417)	Chloride (ASTM D512B / AASHTO T 291 / Caltrans CTM422)	Redox Potential (SM 2580B)	BiCarbonate (SM 2320B)	Alkalinity (SM 2520B)	Acidity (SM 2510B)	Nitrate (Hach 835 / SM 4500-NO3)	Ammonia (Hach 830 / SM 4500-NH3)	Sulfide (SM 4500-S2 / SM 4500-S2)	Moisture Content (ASTM D2216)	Soil Corrosivity Evaluation Report	Metallurgical Analysis	NOTES
1	SS-7, SS-8 - B-55		18.5 - 25	2/19/2018		✔	✔	✔	✔											combine SS-7 & SS-8
2	SS-4, SS-5 - B-57		6.1 - 10.1	1/9/2018		✔	✔	✔	✔											combine SS-4 & SS-5
3	SS-5, SS-6 - B-59		8.3 - 15	1/15/2018		✔	✔	✔	✔											combine SS-5 & SS-6
4																				
5																				
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11																				
12																				
13																				
14																				

Results Only Soil Testing for Carolina Crossroads Project

April 27, 2018

Prepared for:
Hunter McKenzie
S&ME, Inc
134 Suber Road
Columbia, SC 29210
hmmckenzie@smeinc.com

Project X Job#: S180420G
Client Job or PO#: 1461-16-047

Soil Analysis Lab Results

Client: S&ME, Inc
Job Name: Carolina Crossroads Project
Client Job Number: 1461-16-047
Project X Job Number: S180420G
April 27, 2018

	Method	ASTM G187		ASTM D516		ASTM D512B		ASTM G51
Bore# / Description	**Depth**	**Resistivity** As Rec'd | Minimum		**Sulfates**		**Chlorides**		**pH**
	(ft)	(Ohm-cm)	(Ohm-cm)	(mg/kg)	(wt%)	(mg/kg)	(wt%)	
SS-7 , SS-8 - B-31	18.5-25.0	3,752	3,752	30	0.0030	63	0.0063	6.43
SS-5 , SS-6 - B-32	8.0-15.0	7,370	7,370	12	0.0012	174	0.0174	7.09
SS-6 , SS-7 - B-33	13.5-20.0	17,420	12,060	18	0.0018	57	0.0057	6.82
SS-6 , SS-7 - B-35	13.5-20.1	14,070	8,710	30	0.0030	72	0.0072	6.99
SS-6 , SS-7 - B-37	13.5-20.2	8,040	6,700	90	0.0090	168	0.0168	7.00
SS-1 , SS-3 - B-38	0.0-6.0	67,670	41,540	12	0.0012	6	0.0006	5.02
SS-8 , SS-9 - B-42	23.5-30.0	50,920	50,920	30	0.0030	3	0.0003	5.97
SS-2 , SS-3 - B-44	2.0-6.0	9,380	9,380	300	0.0300	390	0.0390	6.11
SS-4 , SS-5 - B-46	6.0-10.0	1,608	1,474	270	0.0270	642	0.0642	6.88
SS-6 , SS-7- B-54	13.9-20.4	63,650	60,300	15	0.0015	6	0.0006	4.96
SS-7 , SS-9 - B-56	18.5-30.0	18,090	17,420	24	0.0024	33	0.0033	4.84
SS-11 , SS-12 - B-58	38.5-45.0	100,500	100,500	30	0.0030	3	0.0003	5.10
SS-4 , SS-5 - B-61	6.0-10.0	14,070	1,407	6	0.0006	3	0.0003	7.90
SS-3 , SS-4 - B-62	4.0-8.0	36,850	36,850	9	0.0009	3	0.0003	6.12
SS-4 , SS-5 - B-39	6.0-10.0	4,355	4,355	420	0.0420	765	0.0765	6.84

Unk = Unknown
NT = Not Tested
mg/kg = milligrams per kilogram (parts per million) of dry soil weight
Chemical Analysis performed on 1:3 Soil-To-Water extract

Please call if you have any questions.

Prepared by,

Ernesto Padilla, BSME
Field Engineer

Respectfully Submitted,

Eddie Hernandez, M.Sc., P.E.
Sr. Corrosion Consultant
NACE Corrosion Technologist #16592
Professional Engineer
California No. M37102
ehernandez@projectxcorrosion.com

Project X Corrosion Engineering

Corrosion Control - Soil, Water, and Metallurgy Lab

S1804206 S&ME 1461-16-047 14 QUAD

Lab Request Sheet Chain of Custody

Phone: (213) 928-7213 · Fax (951) 226-1720 · www.projectxcorrosion.com

Ship Samples To: 29970 Technology Dr, Suite 105F, Murrieta, CA 92563

IMPORTANT: Please complete Project and Sample Identification Data as you would like it to appear in report & include this form with samples.

Project X Job #:	
Date:	4/18/2018

Company Name:	S&ME, Inc.	**Contact Name:**	Hunter McKenzie
Mailing Address:	134 Suber Road, Columbia, SC 29210	**Contact Email:**	hmckenzie@smeinc.com
Accounting Contact:	Kathryn Friedrichs	**Invoice Email:**	mcooke@smeinc.com
Project Name:	Carolina Crossroads Project		
Client Project No:	1461-16-047	**P.O. #:**	1461-16-047

	5 Day Normal	3 Day RUSH 75% mark-up	2 Day RUSH 100% mark-up
Turn Around Time:	✔		

Results By: ☐ Phone ☐ Fax ☑ Email ☐ Mail ☐ Overnight Mail (charges apply)

Received by: **Default Method**

SPECIAL INSTRUCTIONS:

	SAMPLE ID - BORE #	DESCRIPTION	DEPTH (ft)	DATE COLLECTED	CORROSION SERIES (Min. Resistivity, Sulfate, Chloride, Sulfide, Redox, pH, Ammonia, Nitrate)	Soil Resistivity (ASTM G187 / AASHTO T2888 / Caltrans CTM643)	pH (ASTM G 51 / AASHTO T 289 / Caltrans CTM643)	Sulfate (ASTM D516 / AASHTO T 290 / Caltrans CTM417)	Chloride (ASTM D512B / AASHTO T 291 / Caltrans CTM422)	Redox Potential (SM 2580B)	BiCarbonate (SM 2320B)	Alkalinity (SM 2520B)	Acidity (SM 2510B)	Nitrate (Hach 835 / SM 4500-NO3)	Ammonia (Hach 830 / SM 4500-NH3)	Sulfide (SM 4500-S2 / SM 4500-S2)	Moisture Content (ASTM D2216)	Soil Corrosivity Evaluation Report	Metallurgical Analysis	NOTES
1	SS-7, SS-8 - B-31		18.5 - 25	3/5/2018		✔	✔	✔	✔											combine SS-7 & SS-8
2	SS-5, SS-6 - B-32		8 - 15	3/13/2018		✔	✔	✔	✔											combine SS-5 & SS-6
3	SS-6, SS-7 - B-33		13.5 - 20	3/8/2018		✔	✔	✔	✔											combine SS-6 & SS-7
4	SS-6, SS-7 - B-35		13.5 - 20	3/2/2018		✔	✔	✔	✔											combine SS-6 & SS-7
5	SS-6, SS-7 - B-37		13.5 - 20	3/7/2018		✔	✔	✔	✔											combine SS-6 & SS-7
6	SS-1, SS-3 - B-38		0 - 6	1/23/2018		✔	✔	✔	✔											combine SS-1 & SS-3
7	SS-8, SS-9 - B-42		23.5 - 30	3/1/2018		✔	✔	✔	✔											combine SS-8 & SS-9
8	SS-2, SS-3 - B-44		2 - 6	3/21/2018		✔	✔	✔	✔											combine SS-2 & SS-3
9	SS-4, SS-5 - B-46		6 - 10	4/2/2018		✔	✔	✔	✔											combine SS-4 & SS-5
10	SS-6, SS-7 - B-54		13.9 - 20.4	3/28/2018		✔	✔	✔	✔											combine SS-6 & SS-7
11	SS-7, SS-9 - B-56		18.5 - 30	3/17/2018		✔	✔	✔	✔											combine SS-7 & SS-9
12	SS-11, SS-12 - B-58		38.5 - 45	4/4/2018		✔	✔	✔	✔											combine SS-11 & SS-12
13	SS-4, SS-5 - B-61		6 - 10	4/12/2018		✔	✔	✔	✔											combine SS-4 & SS-5
14	SS-3, SS-4 - B-62		4 - 8	4/10/2018		✔	✔	✔	✔											combine SS-3 & SS-4

S180420G S&ME 1461-16-047

14 quad + (1)

= 15 Quad

Project X
Corrosion Engineering
Corrosion Control - Soil, Water, and Metallurgy Lab

Lab Request Sheet Chain of Custody
Phone: (213) 928-7213 · Fax (951) 226-1720 · www.projectxcorrosion.com
Ship Samples To: 29970 Technology Dr, Suite 105F, Murrieta, CA 92563

IMPORTANT: Please complete Project and Sample Identification Data as you would like it to appear in report & include this form with samples.

Project X Job #:	
Date:	4/18/2018

Company Name:	S&ME, Inc.	**Contact Name:**	Hunter McKenzie	**Phone No. :**	843-557-5430
Mailing Address:	134 Suber Road, Columbia, SC 29210	**Contact Email:**	hmckenzie@smeinc.com		
Accounting Contact:	Kathryn Friedrichs	**Invoice Email:**	mcooke@smeinc.com		
Project Name:	Carolina Crossroads Project				
Client Project No:	1461-16-047	**P.O. #:**	1461-16-047		

	5 Day Normal	3 Day RUSH 75% mark-up	2 Day RUSH 100% mark-up
Turn Around Time:	✔		

Results By: ☐ Phone ☐ Fax ☑ Email ☐ Mail ☐ Overnight Mail (charges apply)

Received by: **Default Method**

SPECIAL INSTRUCTIONS:

	SAMPLE ID - BORE #	DESCRIPTION	DEPTH (ft)	DATE COLLECTED	CORROSION SERIES	Soil Resistivity	pH	Sulfate	Chloride	Redox Potential	BiCarbonate	Alkalinity	Acidity	Nitrate	Ammonia	Sulfide	Moisture Content	Soil Corrosivity Evaluation Report	Metallurgical Analysis	NOTES
					Min. Resistivity, Sulfate, Chloride, Sulfide, Redox, pH, Ammonia, Nitrate	ASTM G187	ASTM G 51	ASTM D516	ASTM D512B	SM 2580B	SM 2320B	SM 2520B	SM 2510B	Hach 835	Hach 830	SM 4500-S2	ASTM D2216				
						Caltrans CTM643	Caltrans CTM643	Caltrans CTM417	Caltrans CTM422					SM 4500-NO3	SM 4500-NH3	SM 4500-S2				
						AASHTO T2888	AASHTO T 289	AASHTO T 290	AASHTO T 291											
1	SS-4, SS-5 - B-39		6 - 10	4/9/2018		✔	✔	✔	✔											combine SS-4 & SS-5
2																				
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				
11																				
12																				
13																				
14																				

Appendix XI – Laboratory Test Data Sheets – Undisturbed Samples

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

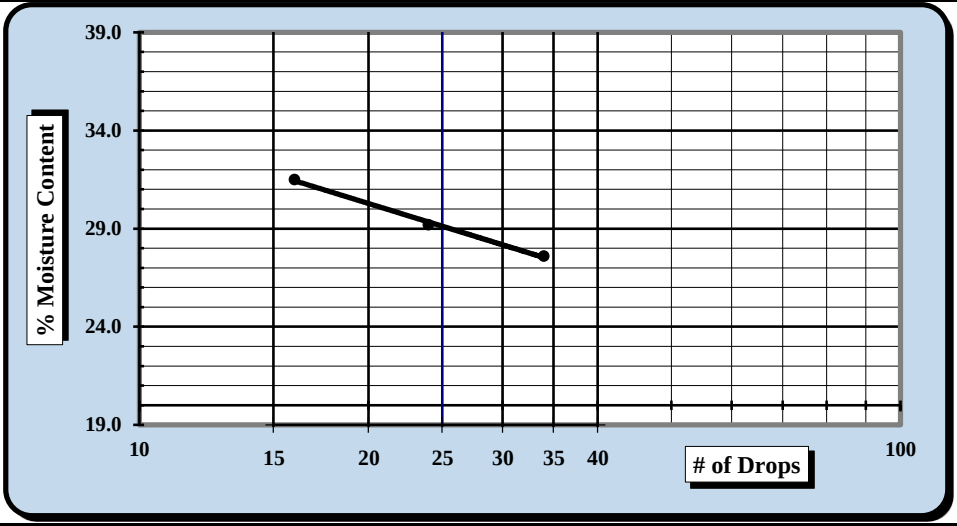
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/22/18
Project Name:	Carolina Crossroads Project	Test Date:	5/14/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-34UD	Sample #:	UD-1	Sample Date:	3/29/2018
Location:	Bridge Boring	Type:	Undisturbed Sample	Depth:	33.5' - 35.5'
Sample Description:	Sandy Lean Clay (CL, A-6(4))				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	6	7	8				9	10	
A	Tare Weight	27.75	26.30	27.30				26.84	26.74	
B	Wet Soil Weight + A	42.16	41.16	42.21				34.85	34.43	
C	Dry Soil Weight + A	39.04	37.80	38.64				33.77	33.40	
D	Water Weight (B-C)	3.12	3.36	3.57				1.08	1.03	
E	Dry Soil Weight (C-A)	11.29	11.50	11.34				6.93	6.66	
F	% Moisture (D/E)*100	27.6%	29.2%	31.5%				15.6%	15.5%	
N	# OF DROPS	34	24	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**15.6%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**29**
Plastic Limit	**16**
Plastic Index	**13**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/22/18	Matthew F. Cooke, P.G.	5/22/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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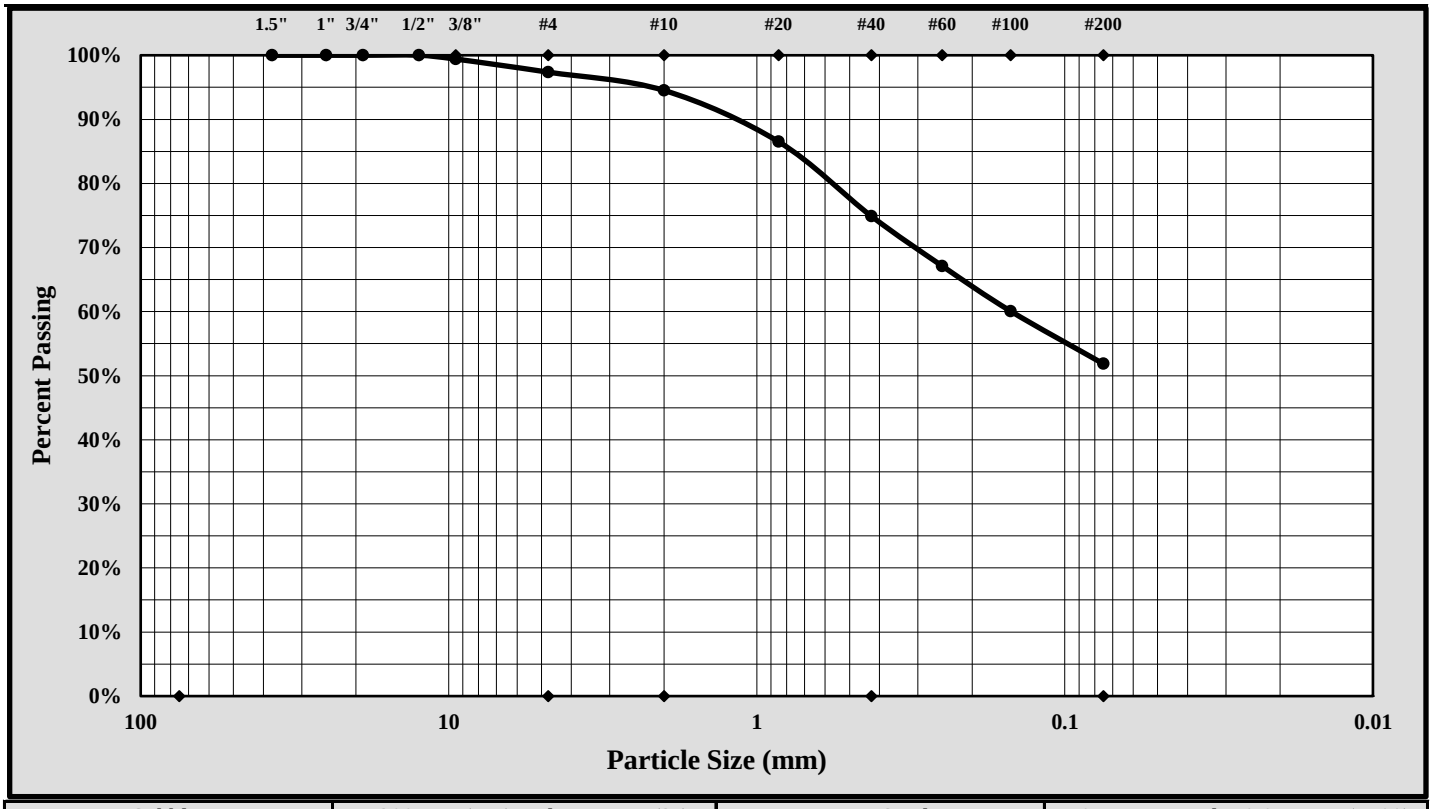
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/22/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/05 - 5/14/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-34UD	Sample #: UD-1	Sample Date: 3/29/2018
Location:	Bridge Boring	Type: Undisturbed	Depth: 33.5' - 35.5'
Sample Description:	Sandy Lean Clay (CL, A-6(4))		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	9.50 mm	Gravel:	2.6%
Silt & Clay (% Passing #200):	51.9%	Total Sand:	45.5%

Liquid Limit	29	Plastic Limit	16	Plastic Index	13
Coarse Sand:	2.8%	Medium Sand:	19.6%	Fine Sand:	23.0%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/22/18 — *Date*

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Form No: TR-D854-1B
Revision No. 1
Revision Date: 08/09/17

SPECIFIC GRAVITY OF SOIL

Oven dried Specimens ASTM D 854 Method B

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/22/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/02 - 5/04/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-34UD	Sample #: UD-1	Sample Date: 3/29/2018
Location:	Bridge Boring	Type: Undisturbed Sample	Depth: 33.5' - 35.5'
Sample Description:	Sandy Lean Clay (CL, A-6(4))		
Material Excluded:	2.6%		% Passing #4 Sieve: 97.4%

Balance ID.	*0.01 gram*	*ID#:*	*13942*	*Cal. Date:*	*8/18/17*	*Cal. Due:*	*8/18/18*
Pycnometer ID No.	*23161*	*Cal. Date:*	*2/10/18*	*Balance Verification*		Check Mass:	500 gram

Pycnometer Volume (V_p)	249.81	ml.	Mass Determination: 500.00 grams
Pycnometer Mass (PM)	110.90	grams	*If [PM-M_p] is greater than .06 grams,*
Ave. Pycnometer Mass (M_p)	110.90	grams	*recalibrate the dry mass of the pycnometer.*

Method B: Oven-dried Specimens

Soaking Time ASTM C127: 24 ± 4 hrs. ☐
Aggregate not initially dried ☐

Table 2 ASTM D 854	Specimen Dry Mass (g.)	
Soil Type	*250-ml. beaker*	*500-ml. beaker*
SP, SP-SM	*60 ± 10*	*100 ± 10*
SP-SC, SM, SC	*45 ± 10*	*75 ± 10*
Silt or Clay	*35 ± 5*	*50 ± 10*

Initial Dry Mass of Test Specimen - *not required.* grams

$M_{psw;t}$ = *Mass of the Pycnometer, soil, and water =* **384.59** *grams*

Mass of Dry Soil (grams)		Tare #	BB-2
A	Tare Weight		227.24
C	Dry Wt. + Tare Wt.		266.08
M_s	Dry Weight	**C-A**	**38.84**

T_t =	Test Temperature T_t	**21.6** °C
K =	Temperature Coefficient at T_t	**0.99966**
K =	Temperature Coefficient at 23°C	**0.99933**
$p_{w;t}$ =	Density of Water at T_t	**0.99786** g./ml.

$M_{pw;t}$ =	Mass of the Pycnometer and water at T_t	$M_{pw;t} = M_p + (V_p \times p_{w;t})$	**360.18** grams
G_t =	Specific Gravity of Soil Solids at the T_t	$G_t = M_s / (M_{pw;t} - (M_{psw;t}-M_s))$	**2.692**
G =	Specific Gravity of Soil Solids at the 20°C	$G = K \times G_t$	**2.691**

Soils containing plus #4 material tested per **ASTM C 127**

R = *% of Soil retained on the #4 sieve* **2.6%**
P = *% of Soil passing the #4 sieve* **97.4%**

G_{+4} Apparent Specific Gravity of plus #4 material at the 23°C per ASTM C127
Apparent Specific Gravity of plus #4 material corrected to 20°C

G_{total} *Total Sample Specific Gravity* **G_{total}** = $\dfrac{1}{\dfrac{R}{100 \times G_{+4}} + \dfrac{P}{100 \times G}}$ = **2.691**

Notes / Deviations / References: ASTM D854: Specific Gravity of Soil Solids by Water Pycnometer

Matthew F. Cooke, P.G. — *Project Manager*
Project Manager — *Position*
5/22/18 — Date

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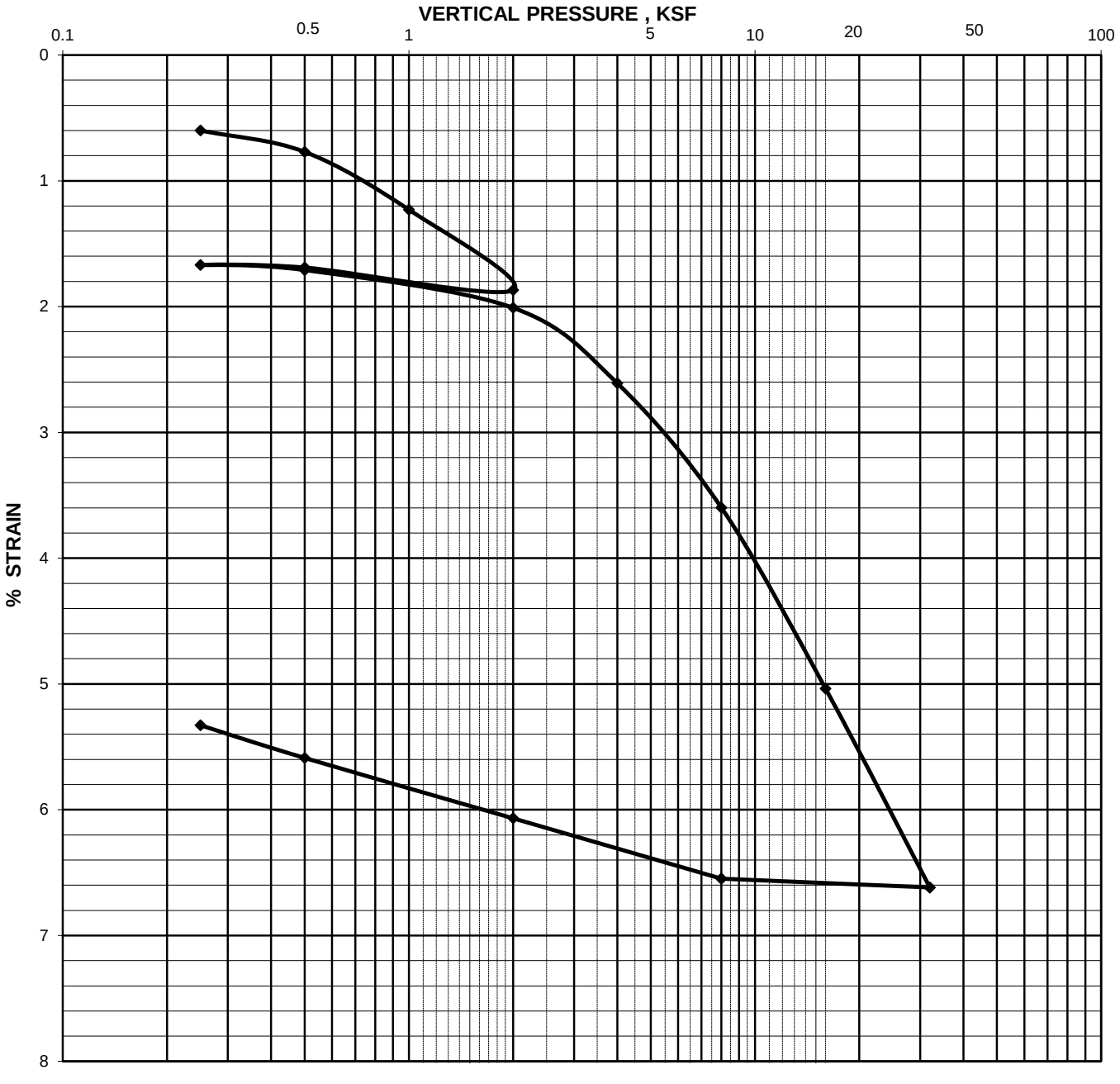
CONSOLIDATION TEST REPORT

(ASTM D 2435)

Project Name:	Carolina Crossroads Project				
Project No.:	**1461-16-047.2B**			**Report Date:**	5/22/2018
Client Name:	HDR Engineering, Inc.			**Boring No.:**	B-34
Client Address:	4400 Leeds Ave., North Charleston, South Carolina			**Depth/Elev.:**	33.5 - 35.5'
Initial Wet Density, γ_{wet}, pcf:	136.3	**Load vs. Time Plot:**	Log of time	**Sample Type:**	Undisturbed
Initial Void Ratio, e_o:	0.403	**Final Void Ratio, e_f:**	0.328	**Log No.:**	UD-1
Initial Saturation, S_O, %:	92.9	**Final Saturation, S_f, %:**	100.0	**Sp. Gravity, G_S:**	2.691
Initial Dry Density, γ_{DRY}, pcf:	119.7	**Final Dry Density, γ_{DRY}, pcf:**	127.2	**Estimated Preconsolidation**	
Initial Moisture Content, %.:	13.9	**Final Moisture Content, %:**	13.3	**Stress, P_e, ksf:**	4.6
Liquid Limit, %:	29	**Plasticity Index, %:**	13	**Fines, %:**	51.9
Sample Description:	Sandy Lean Clay [CL, A-6(4)]				
Remolded Properties:	-	-		-	

Notes: Loading Schedule - (ksf) - 0.25, 0.5, 1.0, 2.0, 0.5, 0.25, 0.5, 2.0, 4.0, 8.0, 16.0, 32.0, 8.0, 2.0, 0.5, 0.25

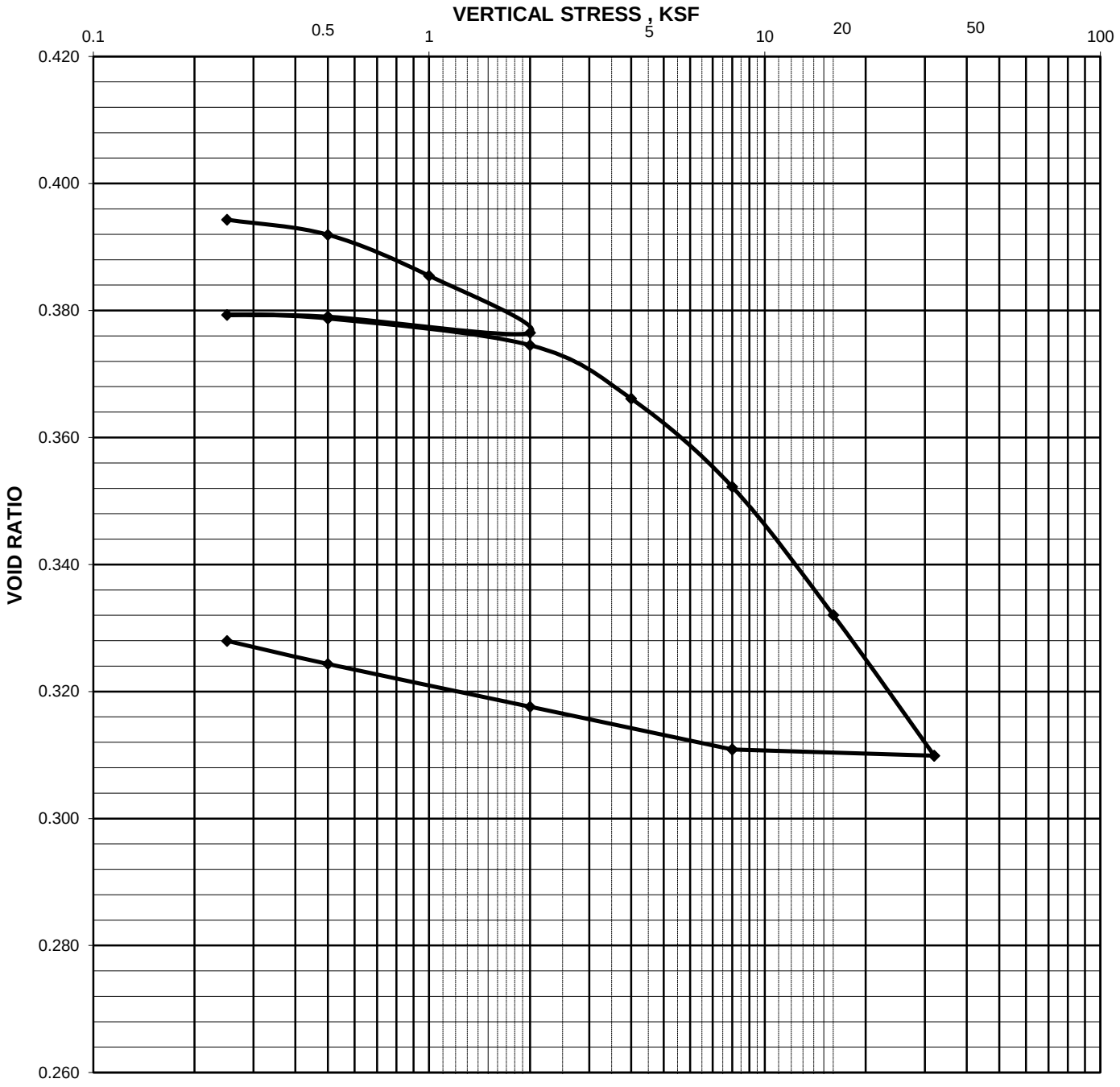


CONSOLIDATION TEST REPORT

(ASTM D 2435)

Project Name:	Carolina Crossroads Project				
Project No.:	**1461-16-047.2B**			**Report Date:**	5/22/2018
Client Name:	HDR Engineering, Inc.			**Boring No.:**	B-34
Client Address:	4400 Leeds Ave., North Charleston, South Carolina			**Depth/Elev.:**	33.5 - 35.5'
Initial Wet Density,γ_{wet}, pcf:	136.3	**Load vs. Time Plot:**	Log of time	**Sample Type:**	Undisturbed
Initial Void Ratio, e_o:	0.403	**Final Void Ratio, e_f:**	0.328	**Log No.:**	UD-1
Initial Saturation, S_O, %:	92.9	**Final Saturation, S_f, %:**	100.0	**Sp. Gravity, G_S:**	2.691
Initial Dry Density, γ_{DRY}, pcf:	119.7	**Final Dry Density, γ_{DRY}, pcf:**	127.2	**Estimated Preconsolidation**	
Initial Moisture Content, %.:	13.9	**Final Moisture Content, %:**	13.3	**Stress, P_e, ksf:**	4.6
Liquid Limit, %:	29	**Plasticity Index, %:**	13	**Fines, %:**	51.9
Sample Description:	Sandy Lean Clay [CL, A-6(4)]				
Remolded Properties:	-	-		-	

Notes: Loading Schedule - (ksf) - 0.25, 0.5, 1.0, 2.0, 0.5, 0.25, 0.5, 2.0, 4.0, 8.0, 16.0, 32.0, 8.0, 2.0, 0.5, 0.25

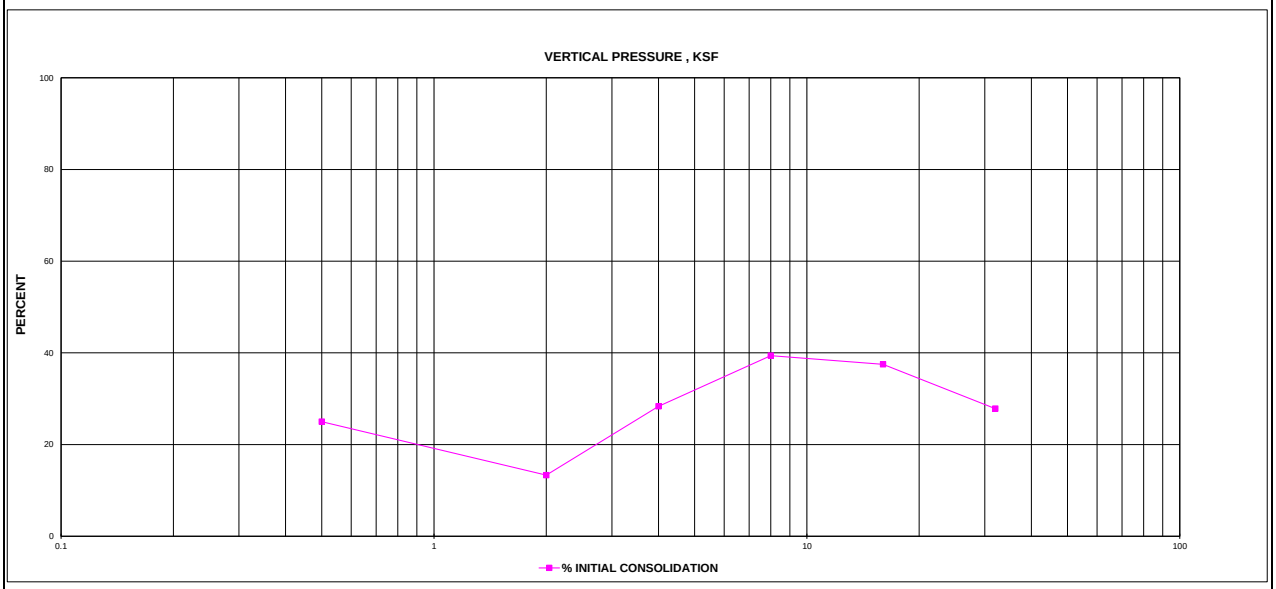


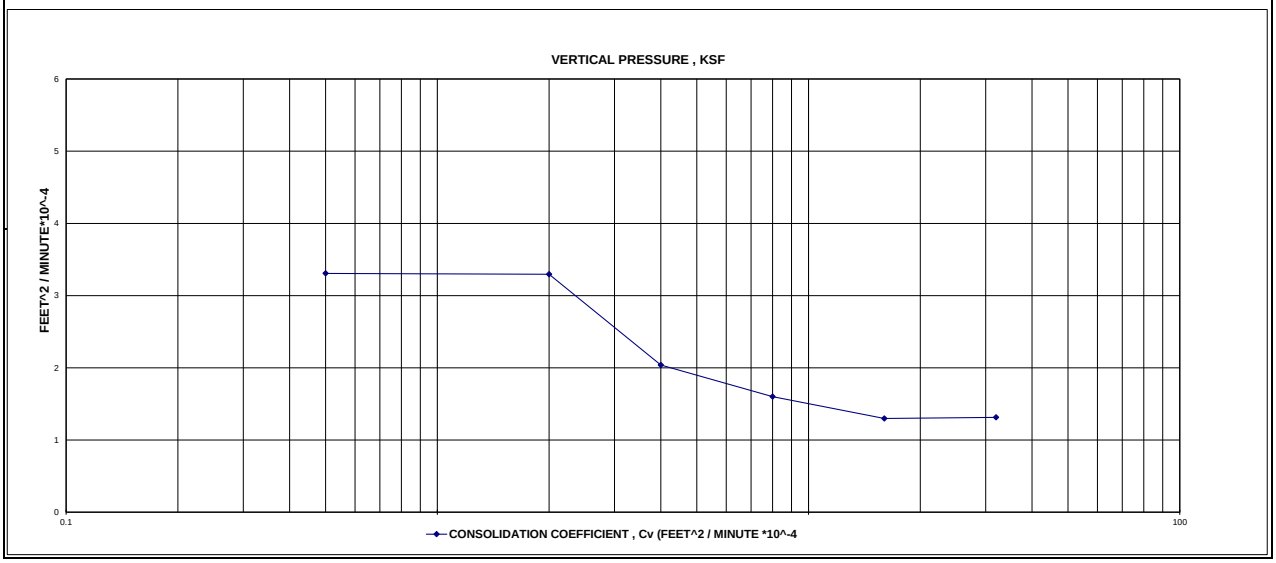
CONSOLIDATION TEST REPORT

(ASTM D 2435)

Project Name:	Carolina Crossroads Project		
Project No.:	**1461-16-047.2B**	**Report Date:**	5/22/2018
Client Name:	HDR Engineering, Inc.	**Boring No.:**	B-34
Client Address:	4400 Leeds Ave., North Charleston, South Carolina	**Depth/Elev.:**	33.5 - 35.5'

Pressure (ksf)	D_0 (in.)	D_{100} (in.)	D_{50} (in.)	Stone Correction (in.)	D_{0c} (in.)	D_{100c}	D_{50c} (in.)	h (in.)	VOID RATIO e	Percent Strain (%)	t_{50}/t_{90} t_{50}	C_v Log of Time ($ft^2/10^{-4}$min)	C_i (%)
0.25		0.0060		0.0000		0.0060			0.394	0.600			
0.5		0.0083		0.0006		0.0077			0.392	0.770			
1.0		0.0135		0.0012		0.0123			0.385	1.230			
2.0		0.0206		0.0019		0.0187			0.377	1.869			
0.5		0.0183		0.0014		0.0169			0.379	1.689			
0.25		0.0175		0.0008		0.0167			0.379	1.669			
0.5	0.0180	0.0183	0.0182	0.0012	0.0168	0.0171	0.0170	0.4917	0.379	1.709	1.0	3.31	25.0
2.0	0.0194	0.0220	0.0207	0.0019	0.0175	0.0201	0.0188	0.4908	0.375	2.009	1.0	3.29	13.3
4.0	0.0250	0.0293	0.0272	0.0032	0.0218	0.0261	0.0240	0.4882	0.366	2.609	1.6	2.04	28.3
8.0	0.0345	0.0405	0.0375	0.0045	0.0300	0.0360	0.0330	0.4837	0.352	3.599	2.0	1.60	39.4
16.0	0.0470	0.0560	0.0515	0.0056	0.0414	0.0504	0.0459	0.4772	0.332	5.038	2.4	1.30	37.5
32.0	0.0614	0.0728	0.0671	0.0066	0.0548	0.0662	0.0605	0.4699	0.310	6.618	2.3	1.31	27.8
8.0		0.0700		0.0045		0.0655			0.311	6.548			
2.0		0.0642		0.0035		0.0607			0.318	6.068			
0.25		0.0548		0.0015		0.0533			0.328	5.328			





Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

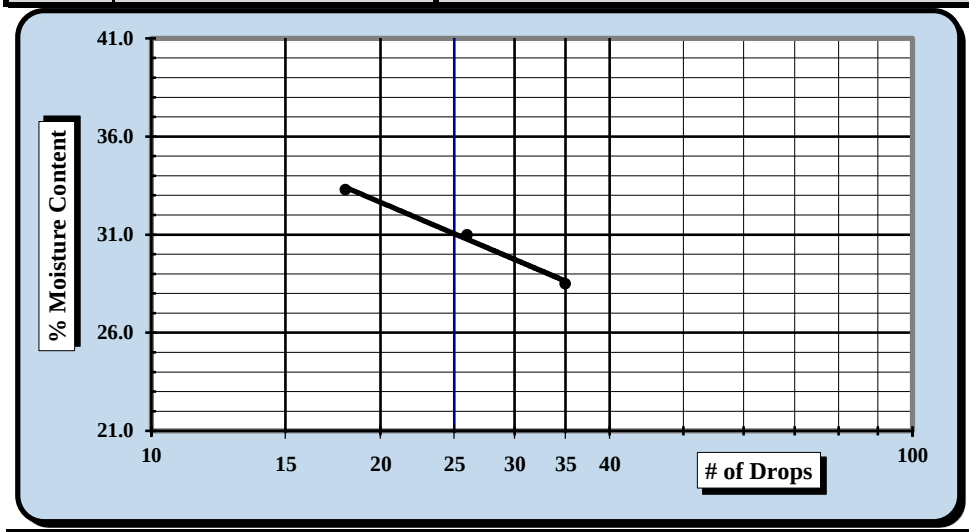
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/15/18
Project Name:	Carolina Crossroads Project	Test Date:	5/14/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-34	Sample #:	UD-2	Sample Date:	Various
Location:	UD borings	Type:	Undisturbed	Depth:	36 - 38'
Sample Description:	Clayey Sand [SC, A-2-6(1)]				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	1	2	3				4	5	
A	Tare Weight	26.70	26.48	26.32				25.92	26.94	
B	Wet Soil Weight + A	42.17	41.88	42.34				34.25	34.27	
C	Dry Soil Weight + A	38.74	38.24	38.34				33.23	33.37	
D	Water Weight (B-C)	3.43	3.64	4.00				1.02	0.90	
E	Dry Soil Weight (C-A)	12.04	11.76	12.02				7.31	6.43	
F	% Moisture (D/E)*100	28.5%	31.0%	33.3%				14.0%	14.0%	
N	# OF DROPS	35	26	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**14.0%**		



One Point Liquid Limit

N	Factor	N	Factor
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**31**
Plastic Limit	**14**
Plastic Index	**17**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/15/18	Matthew F. Cooke, P.G.	5/15/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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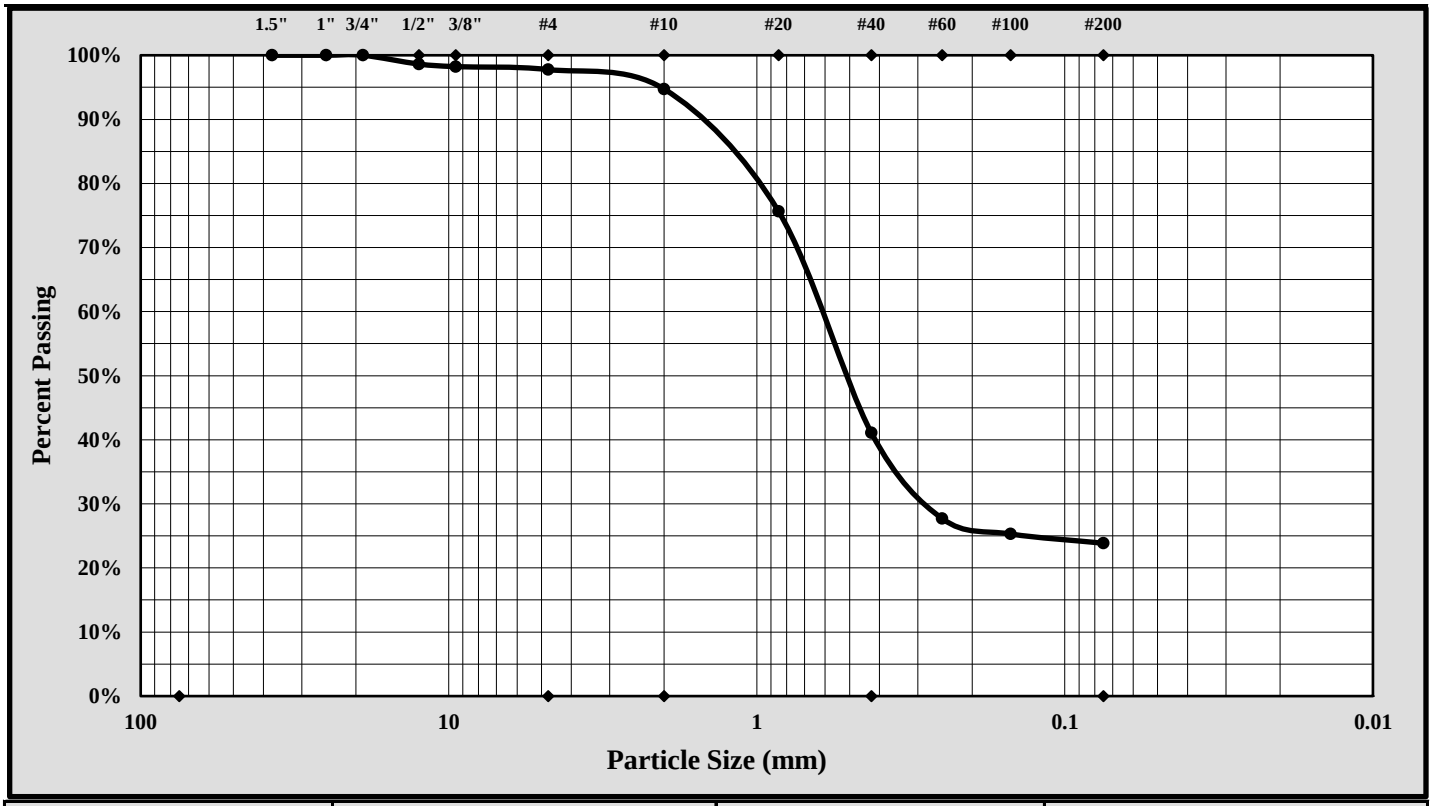
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/15/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/01 - 5/10/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-34	Sample #: UD-2	Sample Date: Various
Location:	UD borings	Type: Undisturbed	Depth: 36 - 38'
Sample Description:	Clayey Sand [SC, A-2-6(1)]		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	19.0 mm	Gravel:	2.2%
Silt & Clay (% Passing #200):	23.9%	Total Sand:	73.9%

Liquid Limit	31	Plastic Limit	14	Plastic Index	17		
Coarse Sand:	3.0%	Medium Sand:	53.6%	Fine Sand:	17.3%		
Description of Sand and Gravel	Rounded ☐	Angular ☒	Hard & Durable ☒	Soft ☐	Weathered & Friable ☐		

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/15/18 — *Date*

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Form No: TR-D854-1B
Revision No. 1
Revision Date: 08/09/17

SPECIFIC GRAVITY OF SOIL

Oven dried Specimens ASTM D 854 Method B

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/15/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/02 - 5/04/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-34	Sample #: UD-2	Sample Date: Various
Location:	UD Borings	Type: Undisturbed	Depth: 36 - 38'
Sample Description:	Clayey Sand [SC, A-2-6(1)]		
Material Excluded:	2.2%		% Passing #4 Sieve: 97.8%

Balance ID. *0.01 gram* *ID#:* *13942* *Cal. Date:* *8/18/17* *Cal. Due:* *8/18/18*

Pycnometer ID No. *23162* *Cal. Date:* *2/10/18* *Balance Verification* Check Mass: 500 gram

Pycnometer Volume (V_p)	249.82	ml.	Mass Determination: 500.00 grams
Pycnometer Mass (PM)	115.03	grams	*If [PM-M_p] is greater than .06 grams,*
Ave. Pycnometer Mass (M_p)	115.03	grams	*recalibrate the dry mass of the pycnometer.*

Method B: Oven-dried Specimens

Soaking Time ASTM C127: 24 ± 4 hrs. ☐
Aggregate not initially dried ☐

Table 2 ASTM D 854	Specimen Dry Mass (g.)	
Soil Type	*250-ml. beaker*	*500-ml. beaker*
SP, SP-SM	*60 ± 10*	*100 ± 10*
SP-SC, SM, SC	*45 ± 10*	*75 ± 10*
Silt or Clay	*35 ± 5*	*50 ± 10*

Initial Dry Mass of Test Specimen - *not required.* grams

$M_{psw;t}$ = *Mass of the Pycnometer, soil, and water* = **388.48** *grams*

Mass of Dry Soil (grams)		Tare #	8
A	Tare Weight		203.88
C	Dry Wt. + Tare Wt.		242.43
M_s	Dry Weight	**C-A**	**38.55**

T_t =	Test Temperature T_t	**21.8** °C
K =	Temperature Coefficient at T_t	**0.99961**
K =	Temperature Coefficient at 23°C	**0.99933**
$p_{w;t}$ =	Density of Water at T_t	**0.99782** g./ml.

$M_{pw;t}$ =	Mass of the Pycnometer and water at T_t	$M_{pw;t} = M_p + (V_p \times p_{w;t})$	**364.31** grams
G_t =	Specific Gravity of Soil Solids at the T_t	$G_t = M_s / (M_{pw;t} - (M_{psw;t}-M_s))$	**2.681**
G =	Specific Gravity of Soil Solids at the 20°C	$G = K \times G_t$	**2.680**

Soils containing plus #4 material tested per ***ASTM C 127***

R = *% of Soil retained on the #4 sieve* **2.2%**
P = *% of Soil passing the #4 sieve* **97.8%**

G_{+4} Apparent Specific Gravity of plus #4 material at the 23°C per ASTM C127
Apparent Specific Gravity of plus #4 material corrected to 20°C

G_{total} *Total Sample Specific Gravity* **G_{total}** = $\dfrac{1}{\dfrac{R}{100 \times G_{+4}} + \dfrac{P}{100 \times G}}$ = **2.680**

Notes / Deviations / References: ASTM D854: Specific Gravity of Soil Solids by Water Pycnometer

Matthew F. Cooke — *Project Manager*
Project Manager — *Position*
5/15/18 — Date

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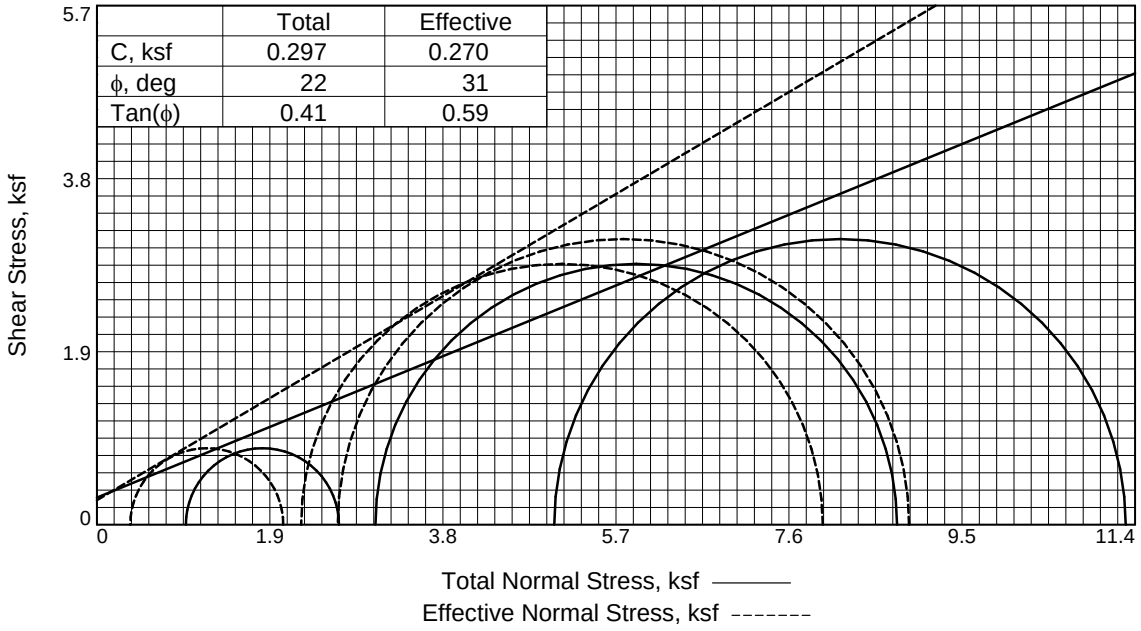
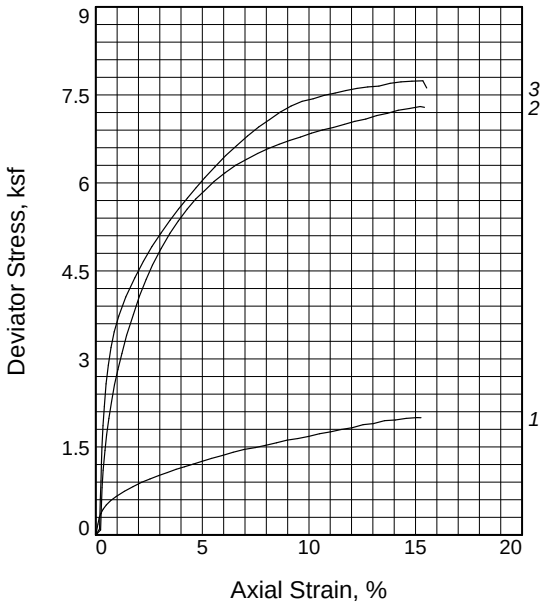
C & phi are not test results but an interpretation of the test results. The designer is responsible for interpreting test data as provided by S&ME.

	Total	Effective
C, ksf	0.297	0.270
ϕ, deg	22	31
Tan(ϕ)	0.41	0.59





Specimen No.		1	2	3
Initial	Water Content, %	17.2	15.6	18.4
	Dry Density, pcf	106.4	111.0	106.9
	Saturation, %	80.3	82.6	87.4
	Void Ratio	0.5729	0.5068	0.5651
	Diameter, in.	2.857	2.886	2.858
	Height, in.	5.796	5.795	5.735
At Test	Water Content, %	20.2	17.2	17.6
	Dry Density, pcf	108.6	114.4	113.6
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.5411	0.4618	0.4722
	Diameter, in.	2.839	2.858	2.802
	Height, in.	5.750	5.732	5.613
Strain rate, %/min.		0.25	0.25	0.25
Eff. Cell Pressure, ksf		0.978	3.059	5.023
Fail. Stress, ksf		1.680	5.727	6.274
Total Pore Pr., ksf		8.531	8.735	10.298
Strain, %		10.0	4.7	5.6
Ult. Stress, ksf		2.000	7.304	7.741
Total Pore Pr., ksf		8.347	7.702	9.435
Strain, %		15.1	15.2	15.3
$\bar{\sigma}_1$ Failure, ksf		2.047	7.971	8.919
$\bar{\sigma}_3$ Failure, ksf		0.367	2.243	2.644

Type of Test:
CU with Pore Pressures
Sample Type: Undisturbed
Description: Clayey Sand [SC, A-2-6(1)]

LL= 31 **PL=** 14 **PI=** 17
Specific Gravity= 2.68
Remarks: Specimen failed in shear. Failure selected at peak obliquity. ASTM D4767. Percent passing the #200 sieve: 23.9%

Figure 1

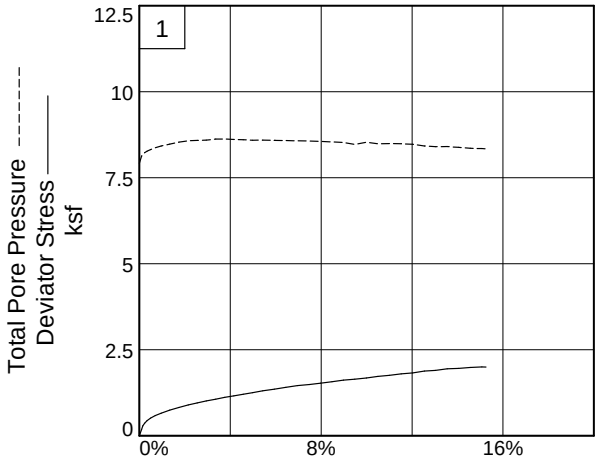
Client: HDR Engineering, Inc.

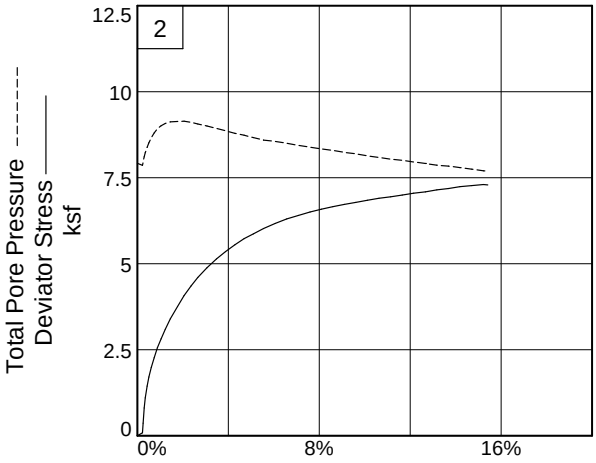
Project: Carolina Crossroads Project

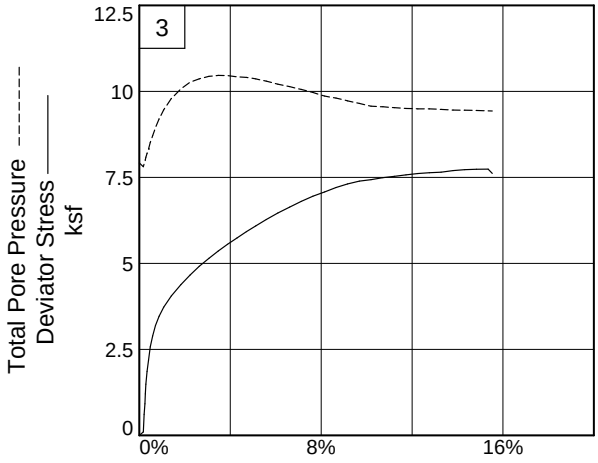
Location: UD borings
Sample Number: B-34 **Depth:** 36 - 38'
Proj. No.: 1461-16-047.2B **Date Sampled:** Various

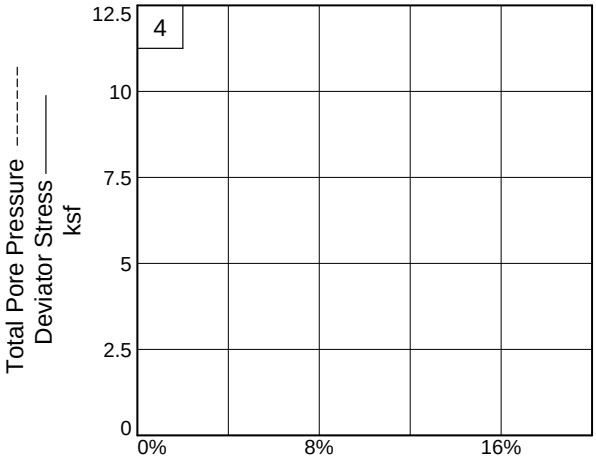
TRIAXIAL SHEAR TEST REPORT
S&ME, Inc.
Greenville, SC

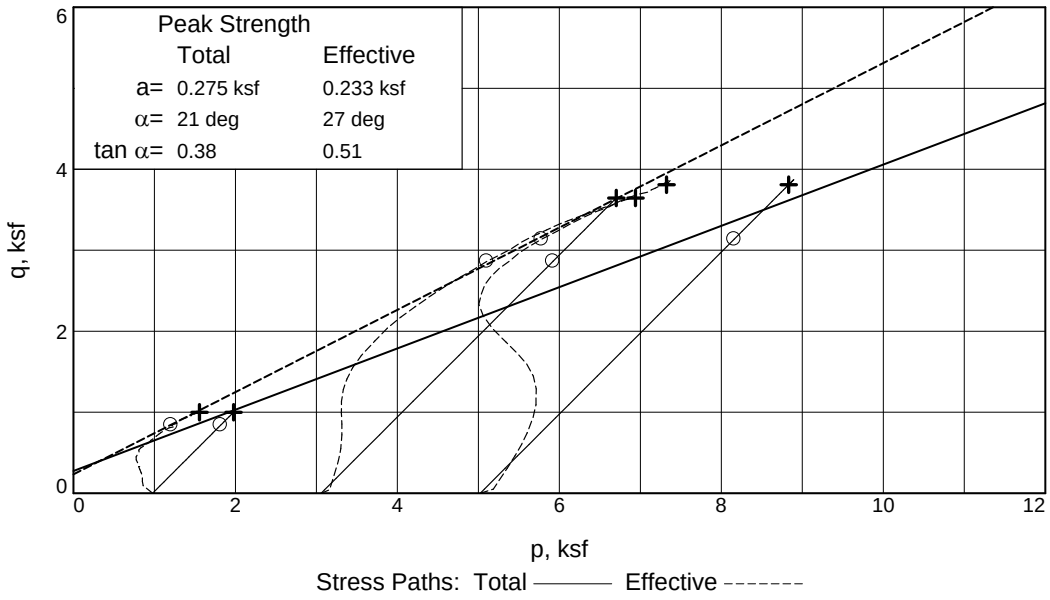
Tested By: Benjamin Kovaleski **Checked By:** Matthew F. Cooke, P.G.











Client: HDR Engineering, Inc.
Project: Carolina Crossroads Project
Location: UD borings **Depth:** 36 - 38' **Sample Number:** B-34
Project No.: 1461-16-047.2B **Figure** 2

S&ME, Inc.

Tested By: Benjamin Kovaleski **Checked By:** Matthew F. Cooke, P.G.

C & phi are not test results but an interpretation of the test results. The designer is responsible for interpreting test data as provided by S&ME.

TRIAXIAL COMPRESSION TEST 5/17/2018

CU with Pore Pressures 4:22 PM

Date: Various
Client: HDR Engineering, Inc.
Project: Carolina Crossroads Project
Project No.: 1461-16-047.2B
Location: UD borings
Depth: 36 - 38' **Sample Number:** B-34
Description: Clayey Sand [SC, A-2-6(1)]
Remarks: Specimen failed in shear. Failure selected at peak obliquity. ASTM D4767. Percent passing the #200 sieve: 23.9%
Type of Sample: Undisturbed
Specific Gravity=2.68 **LL=**31 **PL=**14 **PI=**17
Test Method: ASTM D 4767 Method A

Parameters for Specimen No. 1

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	56.320			1291.150
Moisture content: Dry soil+tare, gms.	48.070			1074.340
Moisture content: Tare, gms.	0.000			0.000
Moisture, %	17.2	21.3	20.2	20.2
Moist specimen weight, gms.	1215.50			
Diameter, in.	2.857	2.856	2.839	
Area, in.²	6.411	6.406	6.331	
Height, in.	5.796	5.794	5.750	
Net decrease in height, in.		0.002	0.044	
Net decrease in water volume, cc.			11.700	
Wet density, pcf	124.6	129.2	130.5	
Dry density, pcf	106.4	106.5	108.6	
Void ratio	0.5729	0.5713	0.5411	
Saturation, %	80.3	100.0	100.0	

Test Readings for Specimen No. 1

Membrane modulus = .167543 kN/cm²
Membrane thickness = .03048 cm
Consolidation cell pressure = 61.790 psi (8.898 ksf)
Consolidation back pressure = 55.000 psi (7.920 ksf)
Consolidation effective confining stress = 0.978 ksf
Strain rate, %/min. = 0.25
Fail. Stress = 1.680 ksf **at reading no.** 27
Ult. Stress = 2.000 ksf **at reading no.** 37

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
0	0.0000	0.000	0.0	0.0	0.000	0.978	0.978	1.00	55.000	0.978	0.000
1	0.0057	8.147	8.1	0.1	0.185	0.769	0.954	1.24	56.450	0.861	0.093
2	0.0089	12.624	12.6	0.2	0.287	0.708	0.995	1.40	56.871	0.852	0.143
3	0.0137	16.132	16.1	0.2	0.366	0.668	1.034	1.55	57.149	0.851	0.183
4	0.0196	19.362	19.4	0.3	0.439	0.628	1.067	1.70	57.429	0.847	0.219
5	0.0284	22.668	22.7	0.5	0.513	0.579	1.092	1.89	57.772	0.835	0.257
6	0.0400	25.893	25.9	0.7	0.585	0.527	1.112	2.11	58.130	0.819	0.292
7	0.0554	29.184	29.2	1.0	0.657	0.477	1.134	2.38	58.481	0.805	0.329
8	0.0769	33.193	33.2	1.3	0.745	0.421	1.166	2.77	58.863	0.794	0.372
9	0.1002	36.809	36.8	1.7	0.823	0.365	1.187	3.26	59.258	0.776	0.411
10	0.1237	40.351	40.4	2.2	0.898	0.325	1.223	3.76	59.534	0.774	0.449
11	0.1466	43.139	43.1	2.5	0.956	0.314	1.270	4.04	59.608	0.792	0.478
12	0.1694	45.840	45.8	2.9	1.012	0.305	1.317	4.31	59.670	0.811	0.506
13	0.1933	48.428	48.4	3.4	1.064	0.275	1.339	4.87	59.882	0.807	0.532
14	0.2164	51.118	51.1	3.8	1.119	0.271	1.390	5.12	59.906	0.831	0.559
15	0.2392	53.307	53.3	4.2	1.162	0.286	1.448	5.07	59.807	0.867	0.581
16	0.2627	55.630	55.6	4.6	1.207	0.292	1.499	5.14	59.766	0.895	0.604
17	0.2866	58.053	58.1	5.0	1.255	0.307	1.562	5.09	59.658	0.934	0.627
18	0.3124	60.707	60.7	5.4	1.306	0.305	1.610	5.28	59.674	0.958	0.653
19	0.3415	63.339	63.3	5.9	1.355	0.313	1.668	5.33	59.618	0.990	0.678
20	0.3706	66.220	66.2	6.4	1.409	0.318	1.727	5.44	59.584	1.022	0.705
21	0.4000	68.896	68.9	7.0	1.458	0.326	1.784	5.48	59.529	1.055	0.729
22	0.4302	70.808	70.8	7.5	1.490	0.330	1.820	5.51	59.495	1.075	0.745
23	0.4583	72.951	73.0	8.0	1.527	0.342	1.869	5.47	59.416	1.105	0.764
24	0.4876	75.475	75.5	8.5	1.571	0.357	1.928	5.40	59.308	1.143	0.786
25	0.5163	78.040	78.0	9.0	1.616	0.372	1.988	5.34	59.205	1.180	0.808
26	0.5452	79.832	79.8	9.5	1.644	0.431	2.074	4.82	58.799	1.253	0.822
27	0.5746	82.069	82.1	10.0	1.680	0.367	2.047	5.58	59.245	1.207	0.840
28	0.6035	84.735	84.7	10.5	1.725	0.412	2.137	5.19	58.929	1.274	0.862
29	0.6330	86.804	86.8	11.0	1.757	0.406	2.163	5.33	58.972	1.284	0.878
30	0.6626	89.421	89.4	11.5	1.799	0.409	2.209	5.40	58.949	1.309	0.900
31	0.6915	91.364	91.4	12.0	1.828	0.427	2.255	5.29	58.827	1.341	0.914
32	0.7211	94.561	94.6	12.5	1.881	0.475	2.356	4.96	58.492	1.415	0.941
33	0.7491	96.012	96.0	13.0	1.899	0.496	2.396	4.83	58.343	1.446	0.950
34	0.7789	99.072	99.1	13.5	1.948	0.492	2.440	4.96	58.371	1.466	0.974
35	0.8080	100.242	100.2	14.1	1.960	0.516	2.476	4.80	58.207	1.496	0.980
36	0.8371	102.236	102.2	14.6	1.987	0.542	2.529	4.66	58.024	1.536	0.993
37	0.8666	103.515	103.5	15.1	2.000	0.550	2.550	4.63	57.968	1.550	1.000
38	0.8771	103.688	103.7	15.3	1.999	0.557	2.556	4.59	57.921	1.556	0.999

Parameters for Specimen No. 2

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	87.210			1268.000
Moisture content: Dry soil+tare, gms.	75.430			1081.530
Moisture content: Tare, gms.	0.000			0.000
Moisture, %	15.6	18.7	17.2	17.2
Moist specimen weight, gms.	1277.46			
Diameter, in.	2.886	2.882	2.858	
Area, in.²	6.542	6.523	6.416	
Height, in.	5.795	5.787	5.732	
Net decrease in height, in.		0.008	0.055	
Net decrease in water volume, cc.			15.950	
Wet density, pcf	128.4	132.3	134.2	
Dry density, pcf	111.0	111.5	114.4	
Void ratio	0.5068	0.5005	0.4618	
Saturation, %	82.6	100.0	100.0	

Test Readings for Specimen No. 2

Membrane modulus = .167543 kN/cm²
Membrane thickness = .03048 cm
Consolidation cell pressure = 76.240 psi (10.979 ksf)
Consolidation back pressure = 55.000 psi (7.920 ksf)
Consolidation effective confining stress = 3.059 ksf
Strain rate, %/min. = 0.25
Fail. Stress = 5.727 ksf **at reading no.** 21
Ult. Stress = 7.304 ksf **at reading no.** 42

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
0	0.0000	0.000	0.0	0.0	0.000	3.059	3.059	1.00	55.000	3.059	0.000
1	0.0128	3.800	3.8	0.2	0.085	3.120	3.205	1.03	54.576	3.162	0.043
2	0.0143	16.333	16.3	0.2	0.366	3.024	3.390	1.12	55.239	3.207	0.183
3	0.0169	36.007	36.0	0.3	0.806	2.869	3.675	1.28	56.313	3.272	0.403
4	0.0199	49.292	49.3	0.3	1.102	2.750	3.853	1.40	57.139	3.302	0.551
5	0.0246	64.530	64.5	0.4	1.442	2.593	4.035	1.56	58.232	3.314	0.721
6	0.0289	76.413	76.4	0.5	1.706	2.462	4.168	1.69	59.143	3.315	0.853
7	0.0351	88.963	89.0	0.6	1.984	2.316	4.300	1.86	60.158	3.308	0.992
8	0.0422	101.886	101.9	0.7	2.270	2.175	4.445	2.04	61.135	3.310	1.135
9	0.0504	115.054	115.1	0.9	2.559	2.052	4.612	2.25	61.987	3.332	1.280
10	0.0597	126.998	127.0	1.0	2.821	1.966	4.787	2.43	62.586	3.376	1.410
11	0.0703	139.513	139.5	1.2	3.093	1.900	4.992	2.63	63.048	3.446	1.546
12	0.0830	153.802	153.8	1.4	3.402	1.854	5.256	2.84	63.367	3.555	1.701
13	0.1011	170.441	170.4	1.8	3.758	1.842	5.600	3.04	63.445	3.721	1.879
14	0.1176	185.431	185.4	2.1	4.076	1.837	5.913	3.22	63.483	3.875	2.038
15	0.1354	198.832	198.8	2.4	4.357	1.870	6.226	3.33	63.257	4.048	2.178
16	0.1523	210.602	210.6	2.7	4.601	1.915	6.516	3.40	62.938	4.216	2.300
17	0.1756	224.422	224.4	3.1	4.882	1.976	6.858	3.47	62.518	4.417	2.441
18	0.1994	237.354	237.4	3.5	5.142	2.046	7.188	3.51	62.032	4.617	2.571
19	0.2221	248.072	248.1	3.9	5.352	2.115	7.467	3.53	61.554	4.791	2.676
20	0.2456	258.444	258.4	4.3	5.552	2.188	7.739	3.54	61.047	4.964	2.776
21	0.2690	267.767	267.8	4.7	5.727	2.243	7.971	3.55	60.662	5.107	2.864
22	0.2924	275.552	275.6	5.1	5.869	2.313	8.182	3.54	60.178	5.247	2.934

Test Readings for Specimen No. 2

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
23	0.3181	284.236	284.2	5.5	6.025	2.384	8.409	3.53	59.685	5.396	3.013
24	0.3472	292.692	292.7	6.1	6.171	2.422	8.593	3.55	59.423	5.507	3.085
25	0.3765	300.619	300.6	6.6	6.304	2.477	8.781	3.54	59.037	5.629	3.152
26	0.4056	307.038	307.0	7.1	6.403	2.536	8.939	3.52	58.629	5.738	3.202
27	0.4352	313.578	313.6	7.6	6.503	2.592	9.096	3.51	58.238	5.844	3.252
28	0.4639	319.311	319.3	8.1	6.586	2.640	9.226	3.49	57.906	5.933	3.293
29	0.4930	324.639	324.6	8.6	6.659	2.686	9.345	3.48	57.587	6.016	3.330
30	0.5219	329.701	329.7	9.1	6.726	2.741	9.467	3.45	57.207	6.104	3.363
31	0.5506	334.298	334.3	9.6	6.782	2.784	9.566	3.44	56.905	6.175	3.391
32	0.5799	339.423	339.4	10.1	6.847	2.842	9.689	3.41	56.505	6.265	3.424
33	0.6092	344.119	344.1	10.6	6.902	2.890	9.792	3.39	56.171	6.341	3.451
34	0.6388	348.359	348.4	11.1	6.947	2.939	9.886	3.36	55.828	6.413	3.473
35	0.6678	352.925	352.9	11.7	6.998	2.972	9.970	3.35	55.601	6.471	3.499
36	0.6966	357.598	357.6	12.2	7.050	3.020	10.070	3.33	55.267	6.545	3.525
37	0.7262	361.733	361.7	12.7	7.090	3.064	10.154	3.31	54.961	6.609	3.545
38	0.7551	366.880	366.9	13.2	7.149	3.115	10.264	3.30	54.611	6.689	3.575
39	0.7843	370.946	370.9	13.7	7.186	3.141	10.327	3.29	54.429	6.734	3.593
40	0.8133	375.877	375.9	14.2	7.239	3.184	10.422	3.27	54.132	6.803	3.619
41	0.8431	379.774	379.8	14.7	7.270	3.231	10.500	3.25	53.805	6.866	3.635
42	0.8725	383.867	383.9	15.2	7.304	3.276	10.580	3.23	53.489	6.928	3.652
43	0.8837	384.022	384.0	15.4	7.290	3.295	10.585	3.21	53.356	6.940	3.645

Parameters for Specimen No. 3

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	80.430			1218.300
Moisture content: Dry soil+tare, gms.	67.910			1035.790
Moisture content: Tare, gms.	0.000			0.000
Moisture, %	18.4	19.9	17.6	17.6
Moist specimen weight, gms.	1222.70			
Diameter, in.	2.858	2.839	2.802	
Area, in.²	6.415	6.330	6.166	
Height, in.	5.735	5.697	5.613	
Net decrease in height, in.		0.038	0.084	
Net decrease in water volume, cc.			23.800	
Wet density, pcf	126.6	130.8	133.7	
Dry density, pcf	106.9	109.1	113.6	
Void ratio	0.5651	0.5340	0.4722	
Saturation, %	87.4	100.0	100.0	

Test Readings for Specimen No. 3

Membrane modulus = .167543 kN/cm²
Membrane thickness = .03048 cm
Consolidation cell pressure = 89.880 psi (12.943 ksf)
Consolidation back pressure = 55.000 psi (7.920 ksf)
Consolidation effective confining stress = 5.023 ksf
Strain rate, %/min. = 0.25
Fail. Stress = 6.274 ksf **at reading no.** 23
Ult. Stress = 7.741 ksf **at reading no.** 42

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
0	0.0000	0.000	0.0	0.0	0.000	5.023	5.023	1.00	55.000	5.023	0.000
1	0.0098	4.372	4.4	0.2	0.102	5.133	5.235	1.02	54.233	5.184	0.051
2	0.0119	26.400	26.4	0.2	0.615	5.048	5.663	1.12	54.826	5.355	0.308
3	0.0138	39.528	39.5	0.2	0.921	4.991	5.912	1.18	55.222	5.451	0.460
4	0.0149	51.755	51.8	0.3	1.206	4.930	6.136	1.24	55.642	5.533	0.603
5	0.0162	63.977	64.0	0.3	1.490	4.858	6.348	1.31	56.142	5.603	0.745
6	0.0191	80.008	80.0	0.3	1.862	4.743	6.605	1.39	56.942	5.674	0.931
7	0.0226	93.986	94.0	0.4	2.186	4.618	6.804	1.47	57.812	5.711	1.093
8	0.0271	110.841	110.8	0.5	2.576	4.426	7.002	1.58	59.143	5.714	1.288
9	0.0330	124.619	124.6	0.6	2.893	4.232	7.125	1.68	60.495	5.678	1.447
10	0.0400	137.721	137.7	0.7	3.194	3.999	7.193	1.80	62.107	5.596	1.597
11	0.0486	149.557	149.6	0.9	3.463	3.745	7.207	1.92	63.876	5.476	1.731
12	0.0603	161.422	161.4	1.1	3.730	3.478	7.207	2.07	65.730	5.342	1.865
13	0.0791	176.188	176.2	1.4	4.057	3.150	7.207	2.29	68.007	5.178	2.028
14	0.1029	191.195	191.2	1.8	4.384	2.868	7.251	2.53	69.964	5.060	2.192
15	0.1254	204.233	204.2	2.2	4.663	2.674	7.338	2.74	71.309	5.006	2.332
16	0.1480	216.211	216.2	2.6	4.917	2.579	7.496	2.91	71.971	5.037	2.458
17	0.1718	227.339	227.3	3.1	5.147	2.505	7.652	3.05	72.482	5.079	2.574
18	0.1951	237.833	237.8	3.5	5.362	2.478	7.840	3.16	72.671	5.159	2.681
19	0.2176	247.438	247.4	3.9	5.555	2.482	8.036	3.24	72.647	5.259	2.777
20	0.2412	256.855	256.9	4.3	5.741	2.520	8.261	3.28	72.378	5.391	2.871
21	0.2644	266.069	266.1	4.7	5.921	2.534	8.456	3.34	72.281	5.495	2.961
22	0.2873	274.869	274.9	5.1	6.091	2.579	8.670	3.36	71.971	5.624	3.045

Test Readings for Specimen No. 3

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
23	0.3134	284.532	284.5	5.6	6.274	2.644	8.919	3.37	71.515	5.782	3.137
24	0.3421	294.825	294.8	6.1	6.466	2.736	9.202	3.36	70.882	5.969	3.233
25	0.3710	304.226	304.2	6.6	6.636	2.805	9.441	3.37	70.401	6.123	3.318
26	0.3997	313.535	313.5	7.1	6.801	2.886	9.687	3.36	69.841	6.286	3.401
27	0.4286	322.299	322.3	7.6	6.953	2.975	9.928	3.34	69.218	6.452	3.476
28	0.4576	330.022	330.0	8.2	7.079	3.080	10.160	3.30	68.488	6.620	3.540
29	0.4857	337.794	337.8	8.7	7.207	3.138	10.344	3.30	68.091	6.741	3.603
30	0.5145	344.666	344.7	9.2	7.312	3.217	10.529	3.27	67.541	6.873	3.656
31	0.5433	350.343	350.3	9.7	7.390	3.293	10.683	3.24	67.013	6.988	3.695
32	0.5723	354.431	354.4	10.2	7.434	3.374	10.808	3.20	66.446	7.091	3.717
33	0.6015	359.334	359.3	10.7	7.493	3.390	10.883	3.21	66.336	7.137	3.747
34	0.6303	363.337	363.3	11.2	7.533	3.416	10.949	3.20	66.155	7.183	3.766
35	0.6587	367.437	367.4	11.7	7.575	3.438	11.012	3.20	66.007	7.225	3.787
36	0.6879	371.433	371.4	12.3	7.612	3.449	11.061	3.21	65.928	7.255	3.806
37	0.7163	374.855	374.9	12.8	7.638	3.451	11.088	3.21	65.918	7.269	3.819
38	0.7453	377.666	377.7	13.3	7.649	3.466	11.115	3.21	65.813	7.290	3.825
39	0.7748	382.373	382.4	13.8	7.698	3.487	11.184	3.21	65.666	7.336	3.849
40	0.8036	385.979	386.0	14.3	7.724	3.489	11.213	3.21	65.654	7.351	3.862
41	0.8324	388.883	388.9	14.8	7.735	3.496	11.232	3.21	65.601	7.364	3.868
42	0.8613	391.533	391.5	15.3	7.741	3.508	11.249	3.21	65.522	7.378	3.871
43	0.8715	386.134	386.1	15.5	7.618	3.515	11.133	3.17	65.473	7.324	3.809

Project Name: Carolina Crossroads Project

Boring #: B-34

Depth: 36 – 38′

Sample #: UD-2

Test Type: Consolidated Undrained Triaxial Shear (ASTM D4767)

Specimen #1 Specimen #2 Specimen #3

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☐ AASHTO T 89 ☐ AASHTO T 90 ☐

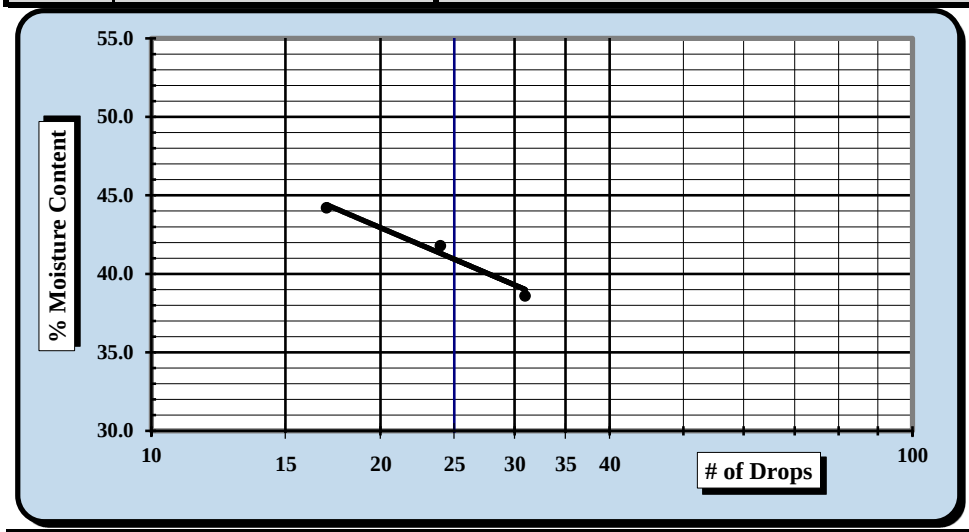
S&ME, Inc. Charlotte: 9751 Southern Pine Boulevard, Charlotte, NC 28273

Project #:	1461-16-047.2B	Report Date:	6/1/18
Project Name:	Carolina Crossroads Project	Test Date(s)	4/18-5/20/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Avenue, North Charleston, SC 29405		

Boring #:	B-41UD	Sample #: UD-1	Sample Date: Various
Location:	UD Borings	Offset: NA	Elevation: 18.5-20.5'
Sample Description:	Gray Silty Clay w/Medium to Fine Sand (CL)		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	3222	7/29/2017	Grooving tool	30427	9/27/2017
LL Apparatus	20336	2/21/2018	Grooving tool		
Oven	10844	8/22/2017	Grooving tool		

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	51	P-2	16				P-4	P-7	
A	Tare Weight	15.78	12.66	15.75				12.38	12.72	
B	Wet Soil Weight + A	26.16	23.65	26.36				20.59	20.94	
C	Dry Soil Weight + A	23.27	20.41	23.11				19.33	19.67	
D	Water Weight (B-C)	2.89	3.24	3.25				1.26	1.27	
E	Dry Soil Weight (C-A)	7.49	7.75	7.36				6.95	6.95	
F	% Moisture (D/E)*100	38.6%	41.8%	44.2%				18.1%	18.3%	
N	# OF DROPS	31	24	17						
LL	LL = **F** * FACTOR									
Ave.	*Average*							**18.2%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**41**
Plastic Limit	**18**
Plastic Index	**23**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:*

Notes / Deviations / References:

Karen Warner	6/1/2018	Matthew F. Cooke, P.G.	7/18/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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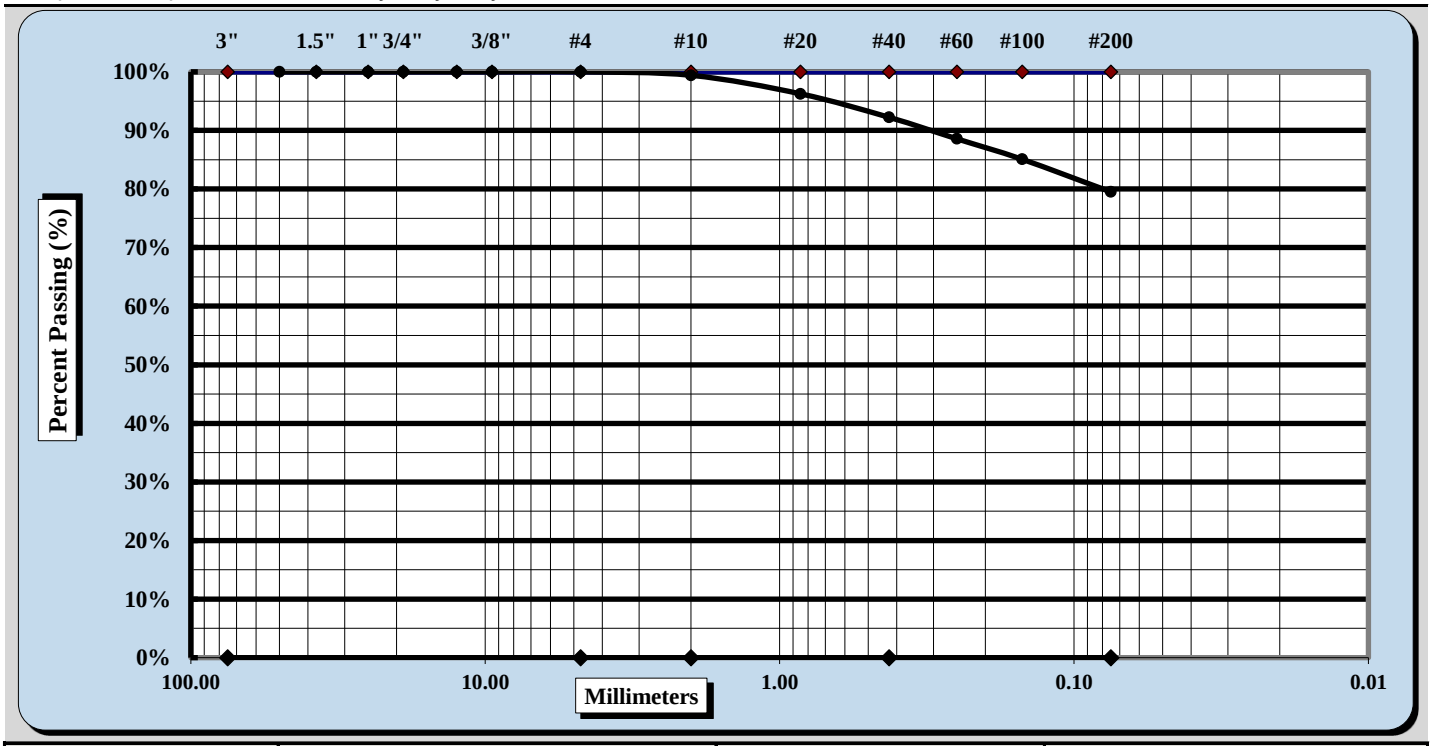
SIEVE ANALYSIS OF SOILS

ASTM D 422

S&ME, Inc. Charlotte: 9751 Southern Pine Boulevard, Charlotte, NC 28273

Project #:	1461-16-047.2B	Report Date:	6/1/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/18-25/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Avenue, North Charleston, SC 29405		
Sample Id.	B-41UD	Type: Undisturbed	Sample Date: Various
Location:	UD Borings	Sample: UD-1	Elevation: 18.5-20.5

Sample Description: Gray Silty Clay w/Medium to Fine Sand (CL)



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	#10	Coarse Sand	0.6%	Fine Sand	12.7%
Gravel	0.0%	Medium Sand	7.2%	Silt & Clay	79.5%
Liquid Limit	41	Plastic Limit	18	Plastic Index	23
Specific Gravity	ND			Moisture Content	Various
Coarse Sand	0.6%	Medium Sand	7.2%	Fine Sand	12.7%

Description of Sand & Gravel Particles: Rounded ☐ Angular ☒
Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

Notes / Deviations / References: ND: Not Determined

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
7/18/2018 — *Date*

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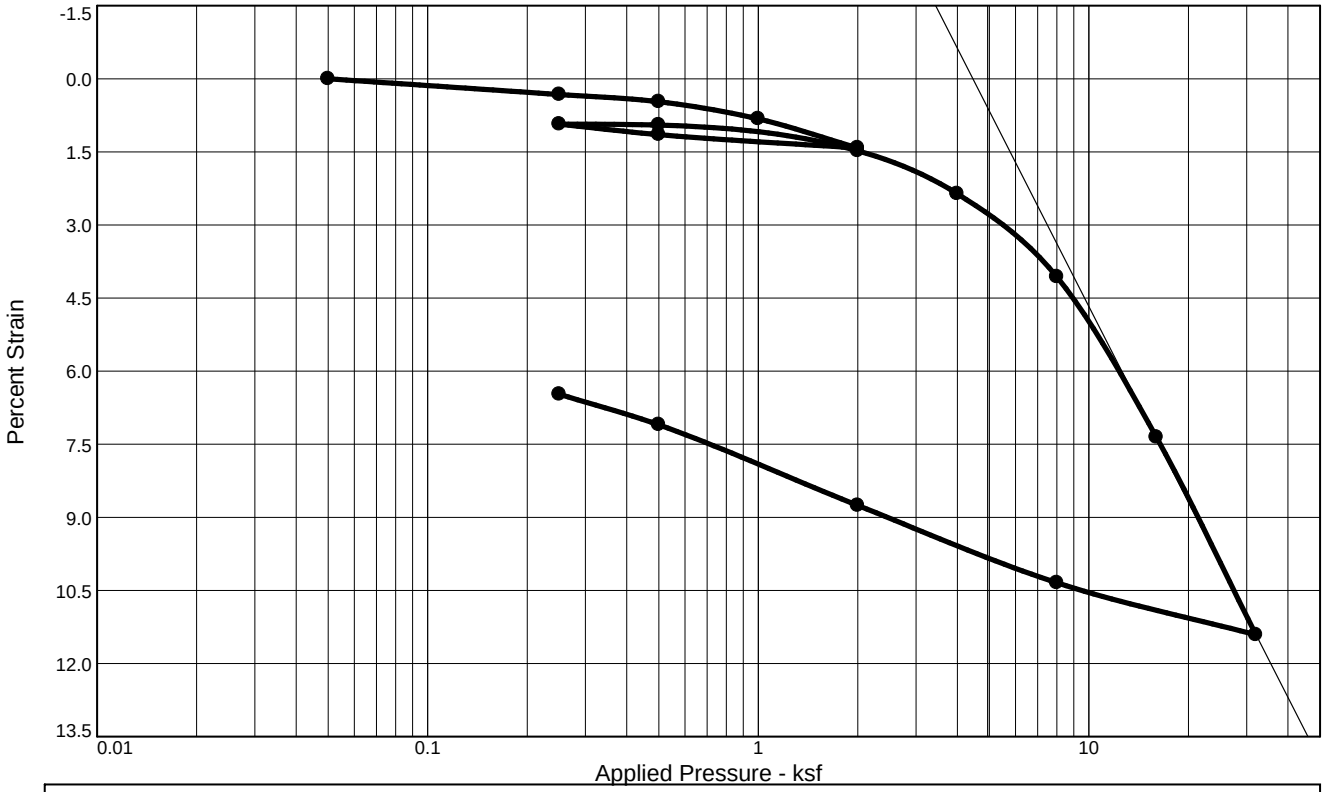
CONSOLIDATION TEST REPORT



Coefficients of Consolidation and Secondary Consolidation

No.	Load (ksf)	C_v (ft.^{2}/day)	C_α	No.	Load (ksf)	C_v (ft.^{2}/day)	C_α	No.	Load (ksf)	C_v (ft.^{2}/day)	C_α
1	0.05	0.100		8	0.50	14.504		15	2.00	0.158	
2	0.25	6.153		9	2.00	12.637		16	0.50	0.030	
3	0.50	3.057		10	4.00	7.884		17	0.25	0.035	
4	1.00	2.855		11	8.00	8.853					
5	2.00	6.801		12	16.00	0.166					
6	0.50	10.454		13	32.00	0.121					
7	0.25	12.790		14	8.00	12.681					

Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (ksf)	e_o	Swell Press. (ksf)	Swell %	C_r
Sat.	Moist.									
98.0 %	25.4 %	100.3	41	23	2.65		0.686			0.02

MATERIAL DESCRIPTION	USCS	AASHTO
Gray Silty Clay w/Medium to Fine Sand (CL)	CL	

Project No. 1461-16- **Client:** HDR Engineering, Inc.

Project: Carolina Crossroads Project

Location: UD Borings **Depth:** 18.5-20.5' **Sample Number:** B-41UD UD-1

Remarks:
Tested as saturated

S & ME, INC.

Charlotte, North Carolina

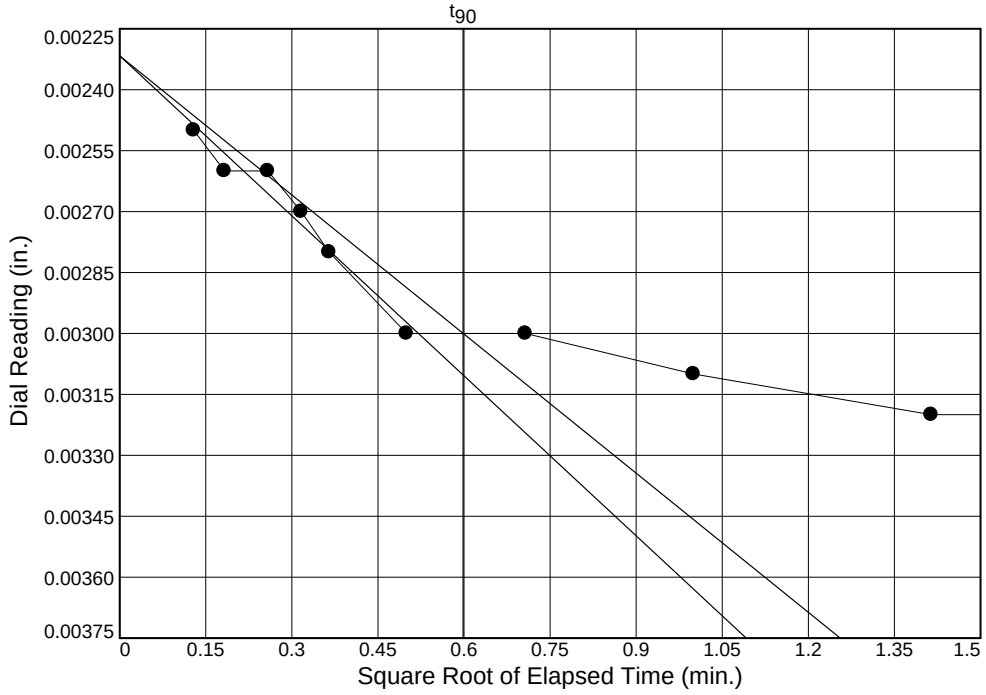
Figure B-41 UD

Tested By: Karen Warner **Checked By:** Jason Reeves

Dial Reading vs. Time

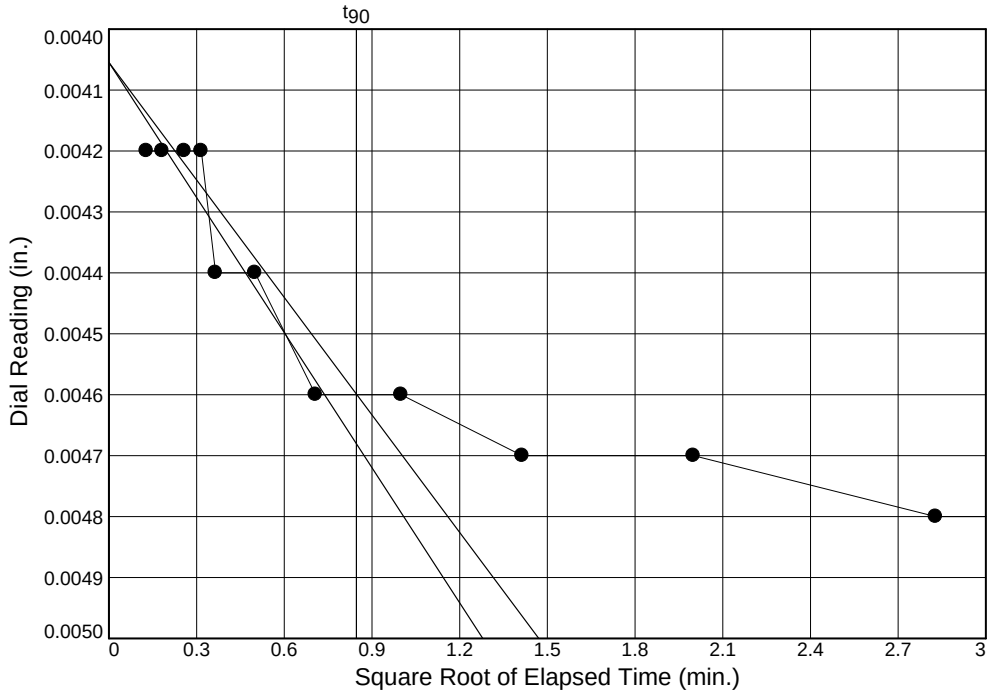
Project No.: 1461-16-047.2B
Project: Carolina Crossroads Project

Location: UD Borings Depth: 18.5-20.5' Sample Number: B-41UD UD-1



Load No.= 2
Load= 0.25 ksf
D_0 = 0.0023
D_{90} = 0.0030
D_{100} = 0.0031
T_{90} = 0.36 min.

C_v @ T_{90}
6.153 ft.^{2}/day



Load No.= 3
Load= 0.50 ksf
D_0 = 0.0041
D_{90} = 0.0046
D_{100} = 0.0047
T_{90} = 0.72 min.

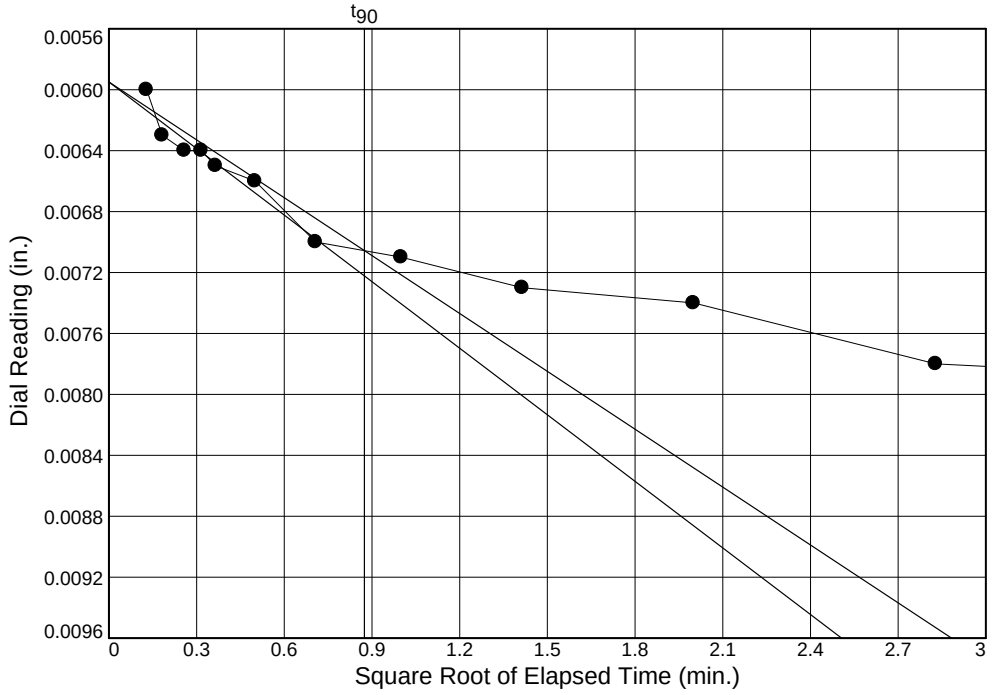
C_v @ T_{90}
3.057 ft.^{2}/day

Figure B-42 UD

Dial Reading vs. Time

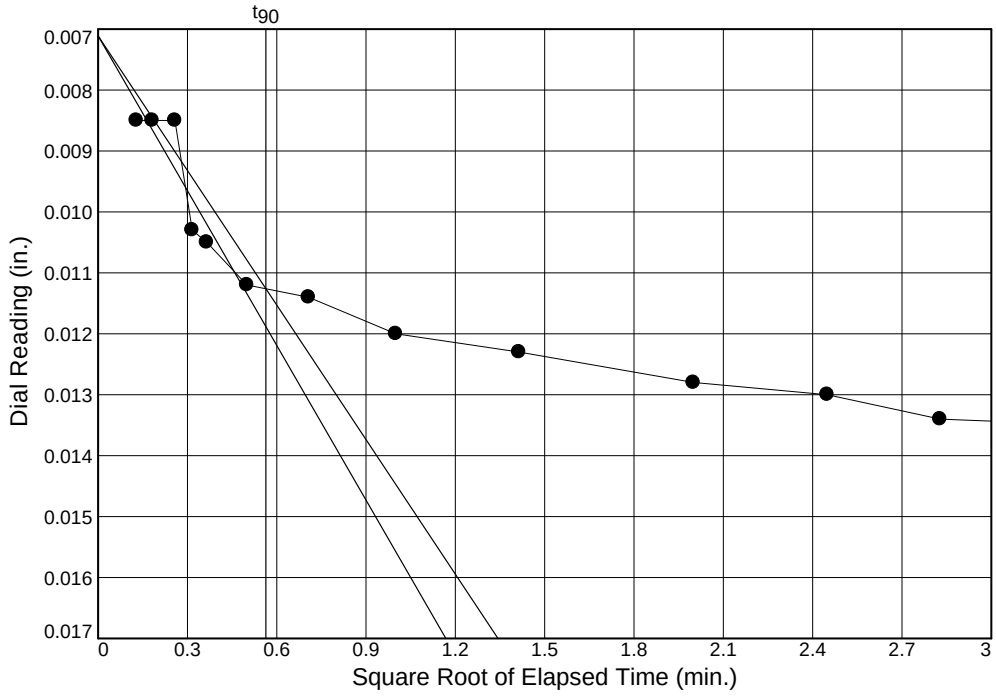
Project No.: 1461-16-047.2B
Project: Carolina Crossroads Project

Location: UD Borings Depth: 18.5-20.5' Sample Number: B-41UD UD-1



Load No.= 4
Load= 1.00 ksf
D_0 = 0.0059
D_{90} = 0.0071
D_{100} = 0.0072
T_{90} = 0.76 min.

C_v @ T_{90}
2.855 ft.^{2}/day



Load No.= 5
Load= 2.00 ksf
D_0 = 0.0071
D_{90} = 0.0113
D_{100} = 0.0117
T_{90} = 0.32 min.

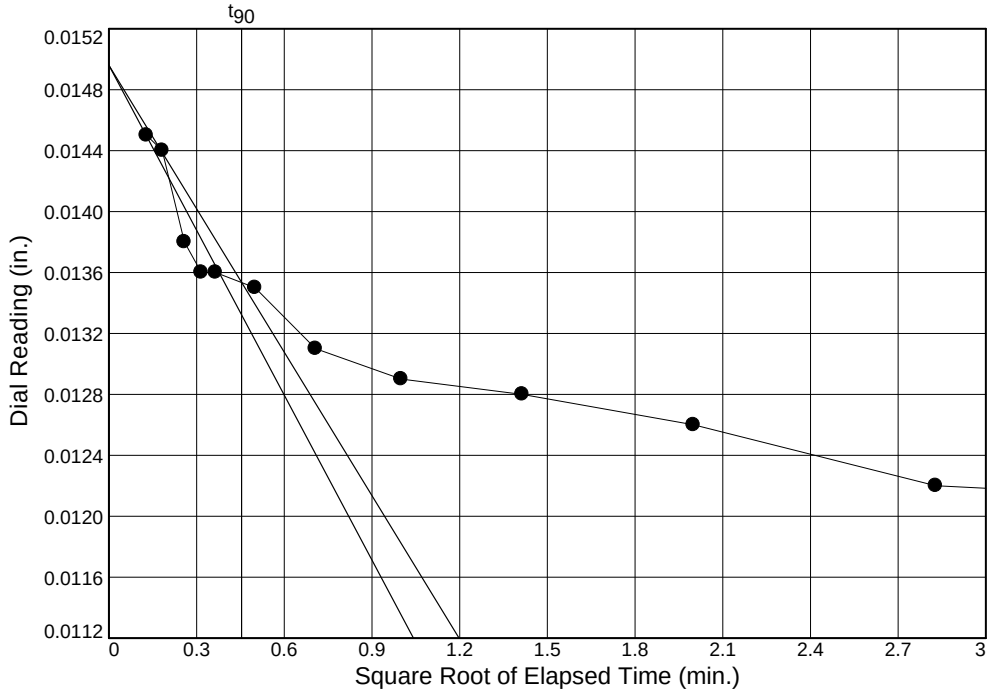
C_v @ T_{90}
6.801 ft.^{2}/day

Figure B-43 UD

Dial Reading vs. Time

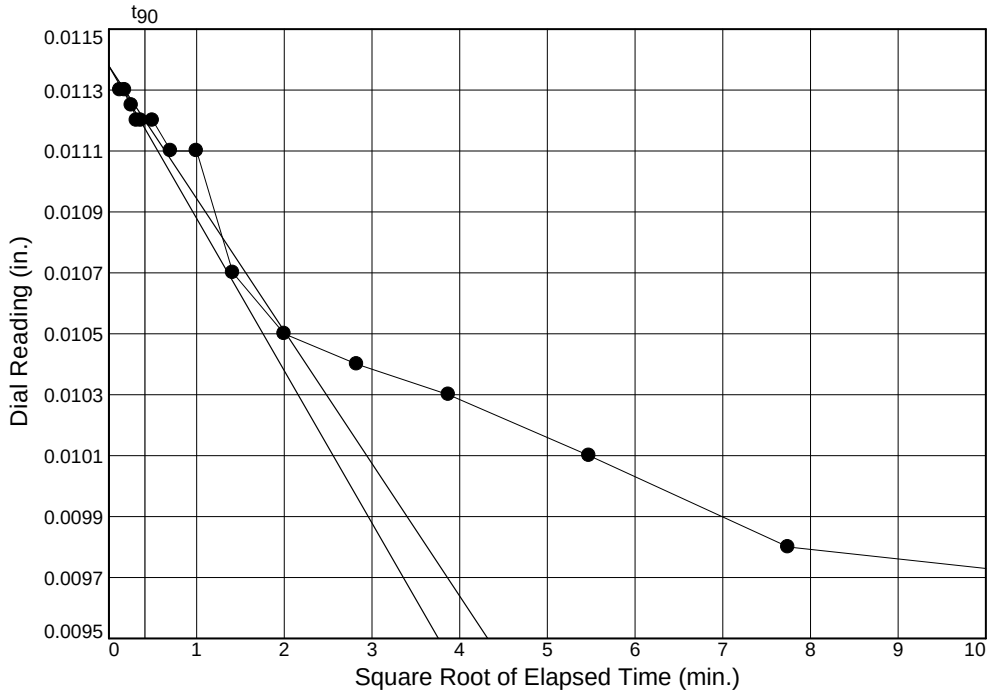
Project No.: 1461-16-047.2B
Project: Carolina Crossroads Project

Location: UD Borings Depth: 18.5-20.5' Sample Number: B-41UD UD-1



Load No.= 6
Load= 0.50 ksf
D_0 = 0.0150
D_{90} = 0.0135
D_{100} = 0.0134
T_{90} = 0.21 min.

C_v @ T_{90}
10.454 ft.^{2}/day



Load No.= 7
Load= 0.25 ksf
D_0 = 0.0114
D_{90} = 0.0112
D_{100} = 0.0112
T_{90} = 0.17 min.

C_v @ T_{90}
12.790 ft.^{2}/day

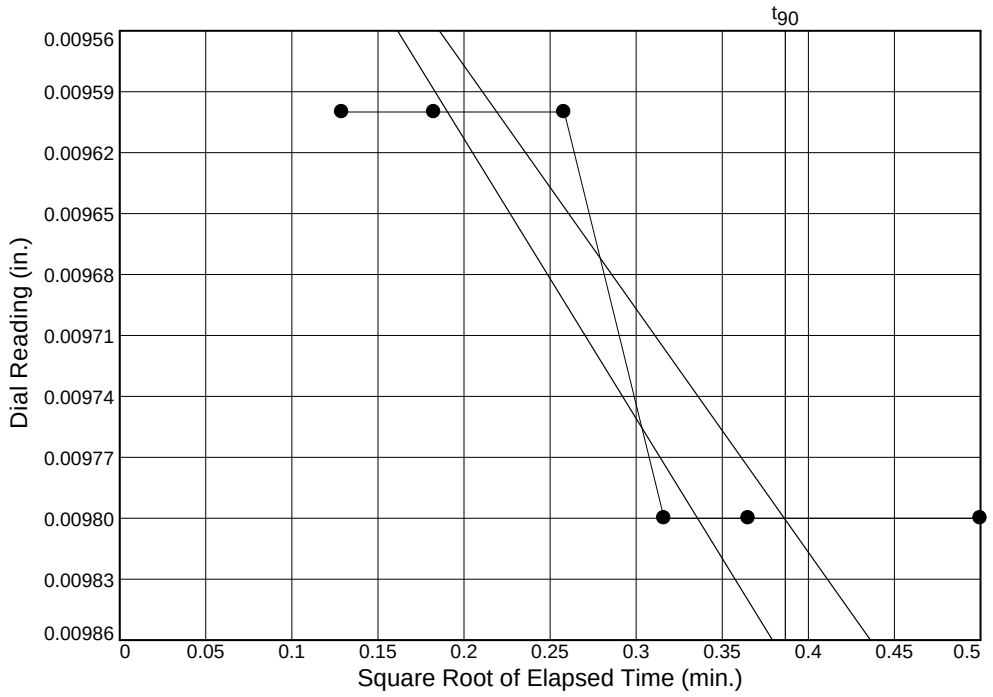
Figure B-44 UD

S & ME, INC.

Dial Reading vs. Time

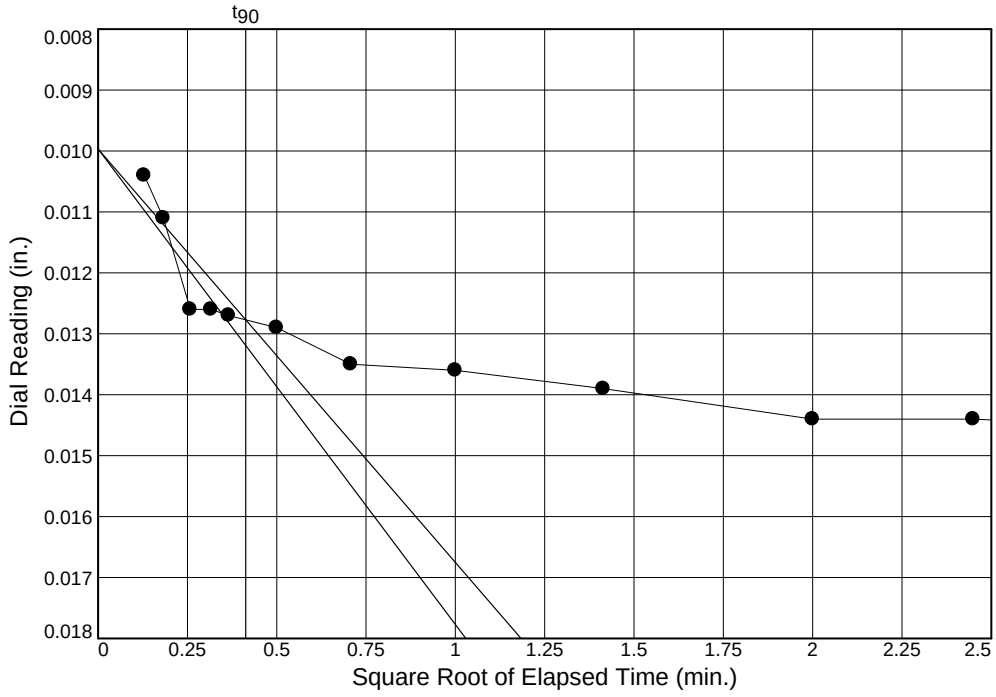
Project No.: 1461-16-047.2B
Project: Carolina Crossroads Project

Location: UD Borings Depth: 18.5-20.5' Sample Number: B-41UD UD-1



Load No.= 8
Load= 0.50 ksf
D_0 = 0.0093
D_{90} = 0.0098
D_{100} = 0.0099
T_{90} = 0.15 min.

C_v @ T_{90}
14.504 ft.^{2}/day



Load No.= 9
Load= 2.00 ksf
D_0 = 0.0100
D_{90} = 0.0128
D_{100} = 0.0131
T_{90} = 0.17 min.

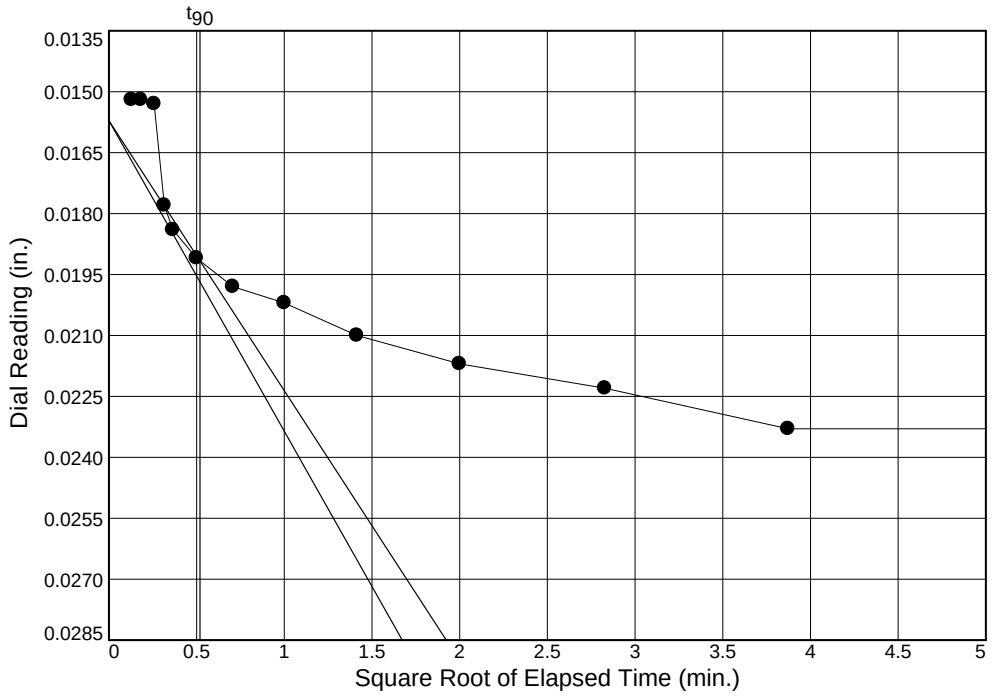
C_v @ T_{90}
12.637 ft.^{2}/day

Figure B-45 UD

Dial Reading vs. Time

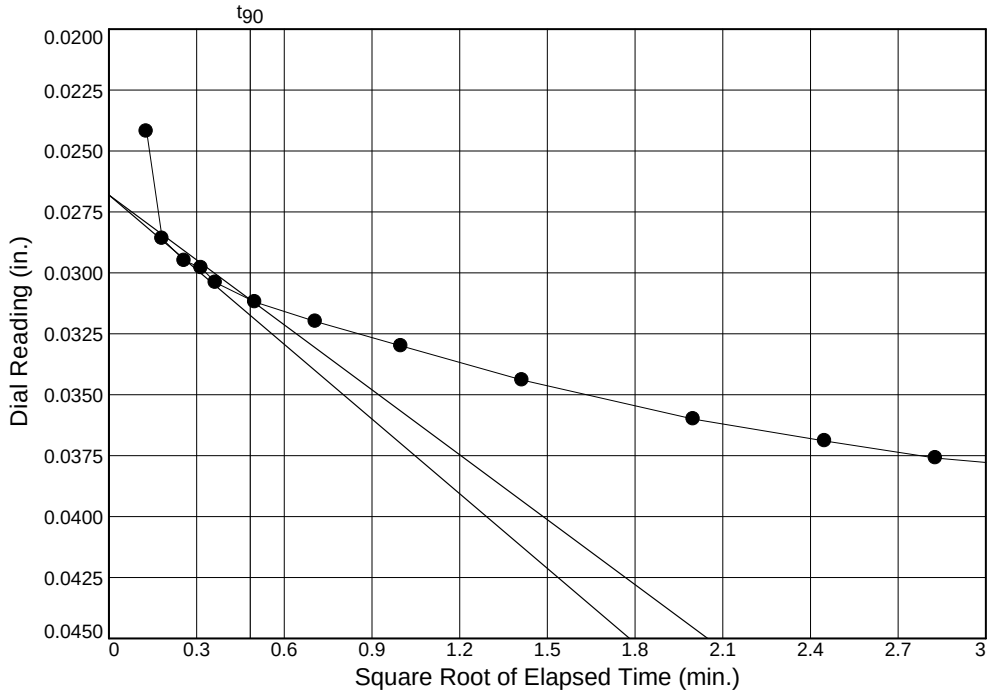
Project No.: 1461-16-047.2B
Project: Carolina Crossroads Project

Location: UD Borings Depth: 18.5-20.5' Sample Number: B-41UD UD-1



Load No.= 10
Load= 4.00 ksf
D_0 = 0.0157
D_{90} = 0.0192
D_{100} = 0.0195
T_{90} = 0.27 min.

C_v @ T_{90}
7.884 ft.^{2}/day



Load No.= 11
Load= 8.00 ksf
D_0 = 0.0268
D_{90} = 0.0311
D_{100} = 0.0316
T_{90} = 0.23 min.

C_v @ T_{90}
8.853 ft.^{2}/day

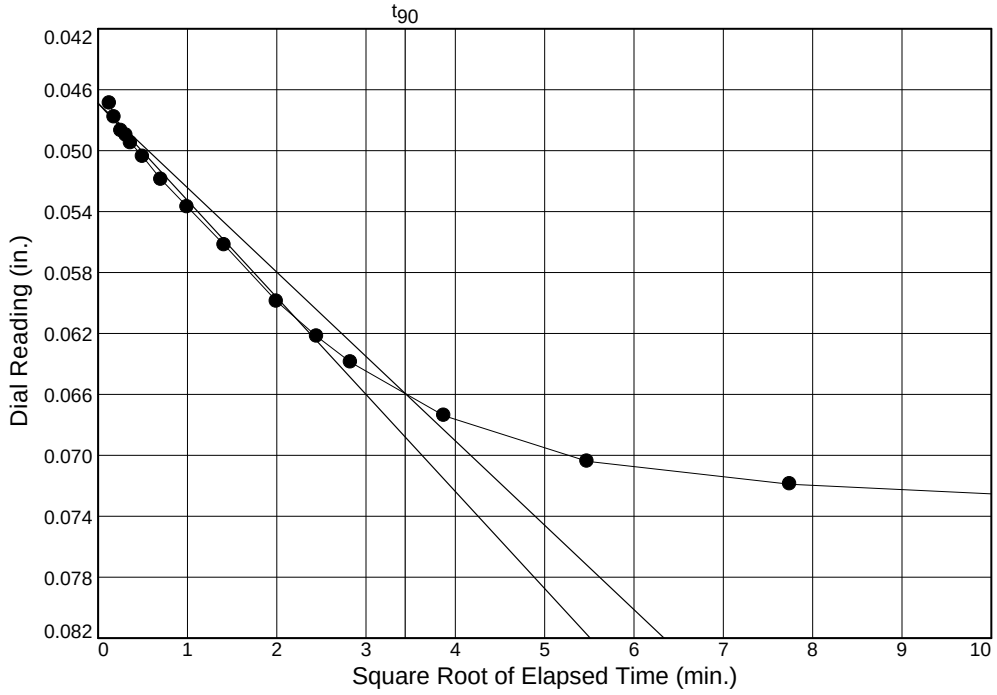
Figure B-46 UD

S & ME, INC.

Dial Reading vs. Time

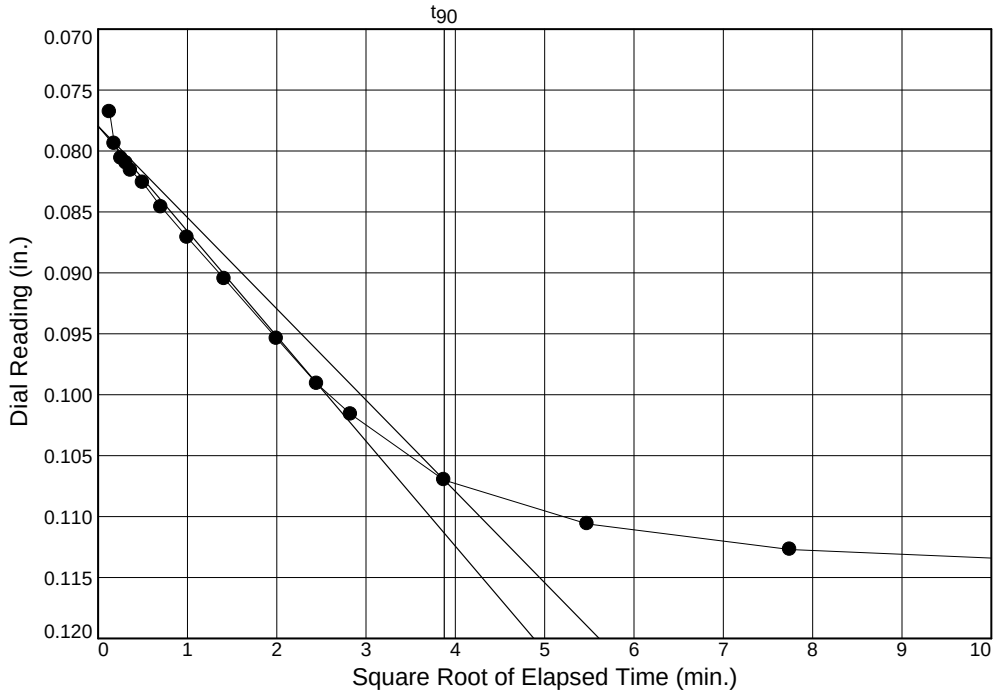
Project No.: 1461-16-047.2B
Project: Carolina Crossroads Project

Location: UD Borings Depth: 18.5-20.5' Sample Number: B-41UD UD-1



Load No.= 12
Load= 16.00 ksf
D_0 = 0.0469
D_{90} = 0.0659
D_{100} = 0.0681
T_{90} = 11.82 min.

C_v @ T_{90}
0.166 ft.^{2}/day



Load No.= 13
Load= 32.00 ksf
D_0 = 0.0780
D_{90} = 0.1070
D_{100} = 0.1102
T_{90} = 15.03 min.

C_v @ T_{90}
0.121 ft.^{2}/day

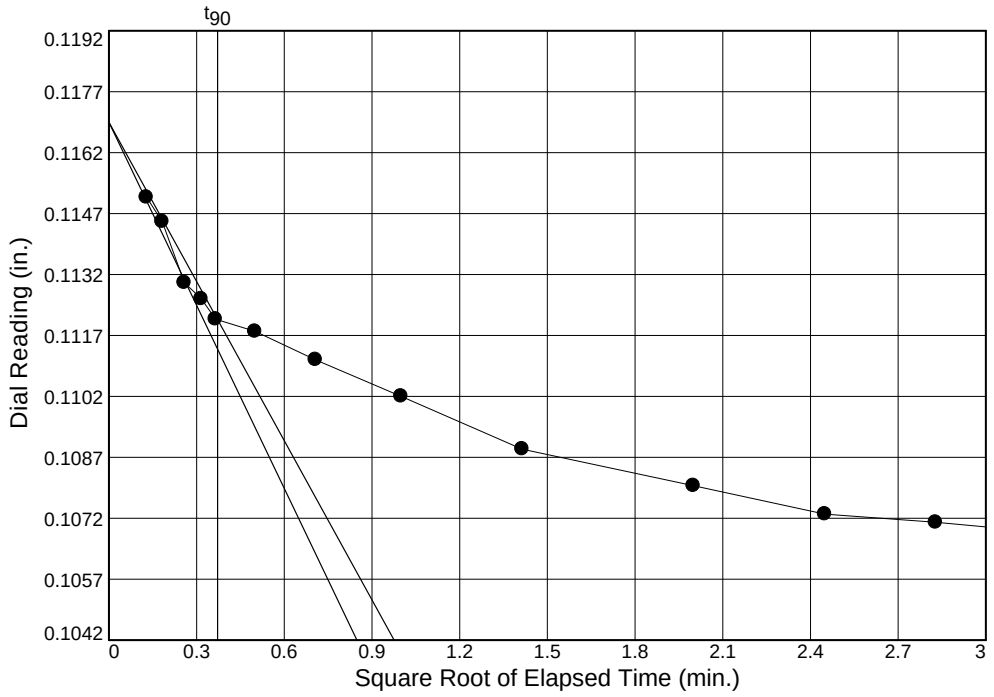
Figure B-47 UD

S & ME, INC.

Dial Reading vs. Time

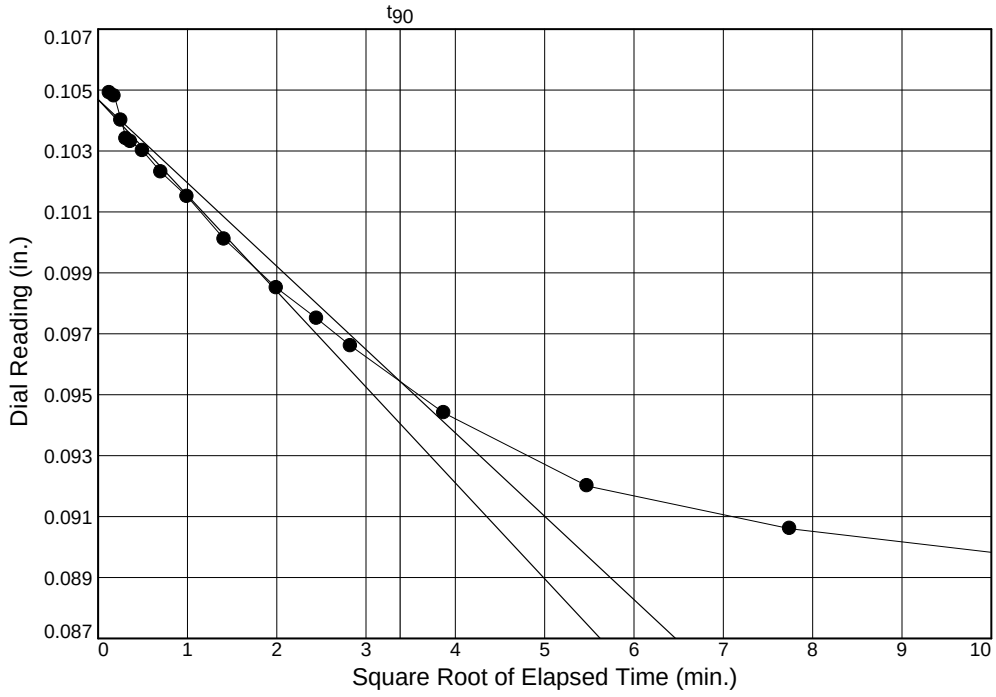
Project No.: 1461-16-047.2B
Project: Carolina Crossroads Project

Location: UD Borings Depth: 18.5-20.5' Sample Number: B-41UD UD-1



Load No.= 14
Load= 8.00 ksf
D_0 = 0.1169
D_{90} = 0.1121
D_{100} = 0.1115
T_{90} = 0.14 min.

C_v @ T_{90}
12.681 ft.^{2}/day



Load No.= 15
Load= 2.00 ksf
D_0 = 0.1047
D_{90} = 0.0954
D_{100} = 0.0944
T_{90} = 11.44 min.

C_v @ T_{90}
0.158 ft.^{2}/day

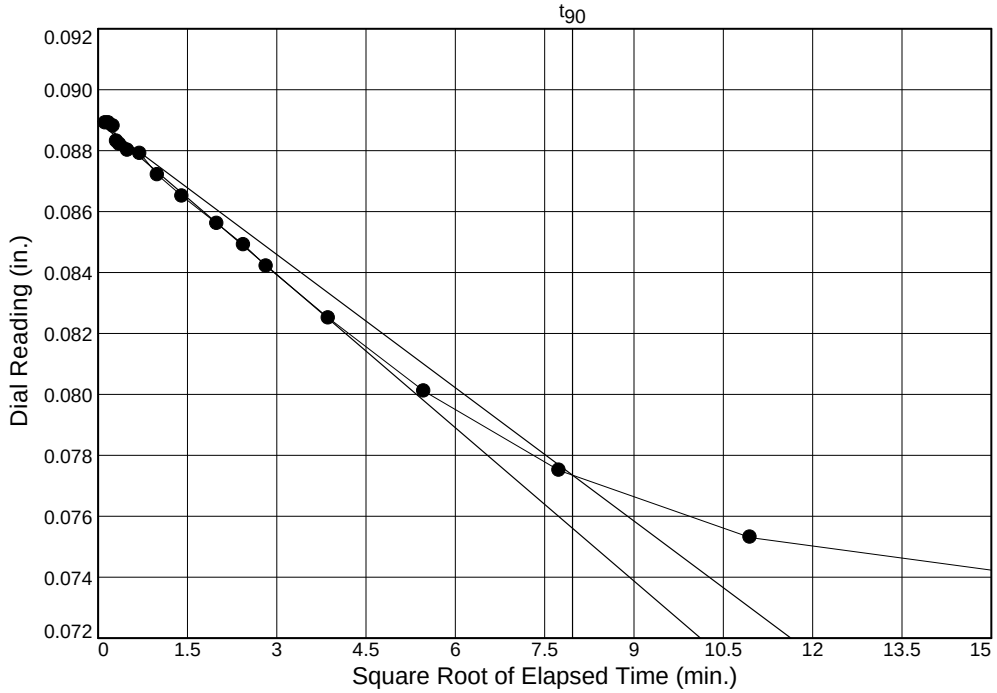
Figure B-48 UD

S & ME, INC.

Dial Reading vs. Time

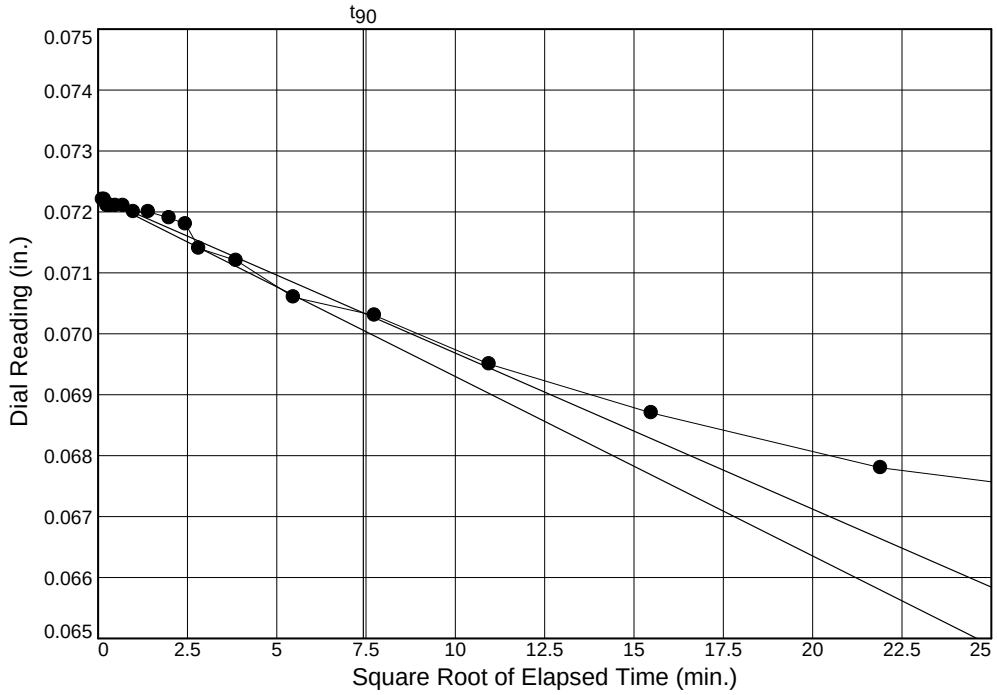
Project No.: 1461-16-047.2B
Project: Carolina Crossroads Project

Location: UD Borings Depth: 18.5-20.5' Sample Number: B-41UD UD-1



Load No.= 16
Load= 0.50 ksf
D_0 = 0.0890
D_{90} = 0.0773
D_{100} = 0.0761
T_{90} = 63.47 min.

C_v @ T_{90}
0.030 ft.^{2}/day



Load No.= 17
Load= 0.25 ksf
D_0 = 0.0722
D_{90} = 0.0703
D_{100} = 0.0701
T_{90} = 55.10 min.

C_v @ T_{90}
0.035 ft.^{2}/day

Figure B-49 UD

CONSOLIDATION TEST DATA

6/26/2018

Client: HDR Engineering, Inc.
Project: Carolina Crossroads Project
Project Number: 1461-16-047.2B
Location: UD Borings
Depth: 18.5-20.5' **Sample Number:** B-41UD UD-1
Material Description: Gray Silty Clay w/Medium to Fine Sand (CL)
Liquid Limit: 41 **Plasticity Index:** 23
USCS: CL
Figure No.: B-41 UD
Testing Remarks: Tested as saturated
Tested by: Karen Warner **Checked by:** Jason Reeves

Test Specimen Data

NATURAL MOISTURE

Wet w+t	= 419.06	g.
Dry w+t	= 350.85	g.
Tare Wt.	= 81.99	g.
Moisture	= 25.4	%

VOID RATIO

Spec. Gr.	= 2.65	
Est. Ht. Solids	= 0.606	in.
Init. V.R.	= 0.686	
Init. Sat.	= 98.0	%

AFTER TEST

Wet w+t	= 264.37	g.
Dry w+t	= 234.75	g.
Tare Wt.	= 106.40	g.
Moisture	= 23.1	%

UNIT WEIGHT

Height	= 0.998	in.
Diameter	= 2.493	in.
Weight	= 160.66	g.
Dry Dens.	= 100.3	pcf

TEST START

Height	= 1.021	in.
Diameter	= 2.493	in.

Dry Wt. =128.35* g.

End-Of-Load Summary

Pressure (ksf)	Final Dial (in.)	Deformation (in.)	C_v (ft.^{2}/day)	C_α	Void Ratio	% Strain
start	0.00010	0.00000			0.686	
0.05	0.00010	0.00000	0.100		0.686	0.0 Comprs.
0.25	0.00340	0.00330	6.153		0.681	0.3 Comprs.
0.50	0.00490	0.00480	3.057		0.678	0.5 Comprs.
1.00	0.00850	0.00840	2.855		0.672	0.8 Comprs.
2.00	0.01460	0.01450	6.801		0.662	1.4 Comprs.
0.50	0.01180	0.01170	10.454		0.667	1.1 Comprs.
0.25	0.00960	0.00950	12.790		0.671	0.9 Comprs.
0.50	0.00980	0.00970	14.504		0.670	1.0 Comprs.
2.00	0.01520	0.01510	12.637		0.661	1.5 Comprs.
4.00	0.02420	0.02410	7.884		0.646	2.4 Comprs.
8.00	0.04160	0.04150	8.853		0.618	4.1 Comprs.
16.00	0.07520	0.07510	0.166		0.562	7.4 Comprs.
32.00	0.11660	0.11650	0.121		0.494	11.4 Comprs.
8.00	0.10570	0.10560	12.681		0.512	10.3 Comprs.
2.00	0.08950	0.08940	0.158		0.539	8.8 Comprs.
0.50	0.07260	0.07250	0.030		0.566	7.1 Comprs.
0.25	0.06620	0.06610	0.035		0.577	6.5 Comprs.

TEST RESULTS SUMMARY

Compression index (C_c), ksf = 0.22 **Preconsolidation pressure (P_p), ksf =** 7.8 **Void ratio at P_p (e_m) =** 0.619

Recompression index (C_r) = 0.02

Pressure: 0.05 ksf — **TEST READINGS** — **Load No. 1**

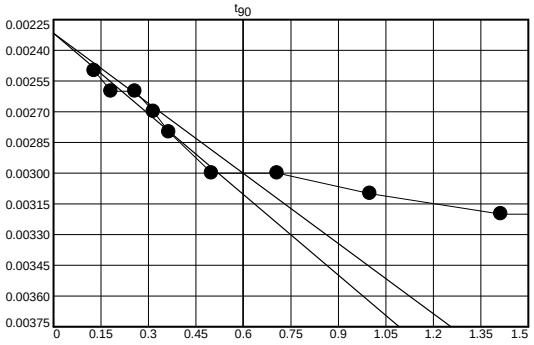
No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	+0 : :	0.00010	11	+0 00:04:00	0.00010
2	+0 00:00:01	0.00010	12	+0 00:08:00	0.00010
3	+0 00:00:02	0.00010	13	+0 00:15:00	0.00010
4	+0 00:00:04	0.00010	14	+0 00:22:00	0.00010
5	+0 00:00:06	0.00010			
6	+0 00:00:08	0.00010			
7	+0 00:00:15	0.00010			
8	+0 00:00:30	0.00010			
9	+0 00:00:60	0.00010			
10	+0 00:02:00	0.00010			

Void Ratio = 0.686 **Compression =** 0.0%

D_0 = 0.0001 **D_{90} =** 0.0001 **D_{100} =** 0.0001 **C_v at 22.00 min. =** 0.100 ft.^{2}/day

Pressure: 0.25 ksf — **TEST READINGS** — **Load No. 2**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.00010	11	+0 00:04:00	0.00320
2	+0 00:00:01	0.00250	12	+0 00:08:00	0.00320
3	+0 00:00:02	0.00260	13	+0 00:15:00	0.00330
4	+0 00:00:04	0.00260	14	+0 00:30:00	0.00330
5	+0 00:00:06	0.00270	15	+0 00:60:00	0.00330
6	+0 00:00:08	0.00280	16	+0 02:00:00	0.00330
7	+0 00:00:15	0.00300	17	+0 04:00:00	0.00340
8	+0 00:00:30	0.00300	18	+0 08:00:00	0.00340
9	+0 00:00:60	0.00310			
10	+0 00:02:00	0.00320			

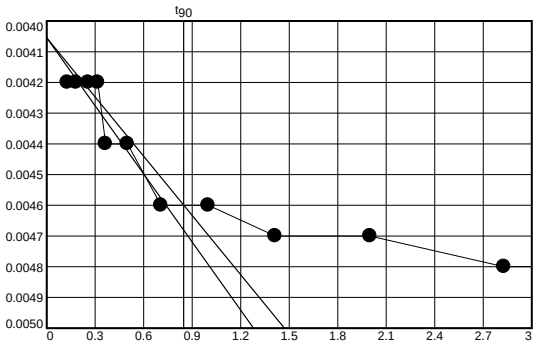


Void Ratio = 0.681 **Compression =** 0.3%

D_0 = 0.0023 **D_{90} =** 0.0030 **D_{100} =** 0.0031 **C_v at 0.36 min. =** 6.153 ft.^{2}/day

Pressure: 0.50 ksf | **TEST READINGS** | **Load No. 3**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.00340	11	+0 00:04:00	0.00470
2	+0 00:00:01	0.00420	12	+0 00:08:00	0.00480
3	+0 00:00:02	0.00420	13	+0 00:15:00	0.00480
4	+0 00:00:04	0.00420	14	+0 00:30:00	0.00480
5	+0 00:00:06	0.00420	15	+0 00:60:00	0.00480
6	+0 00:00:08	0.00440	16	+0 02:00:00	0.00490
7	+0 00:00:15	0.00440	17	+0 04:00:00	0.00490
8	+0 00:00:30	0.00460	18	+0 04:06:00	0.00490
9	+0 00:00:60	0.00460			
10	+0 00:02:00	0.00470			

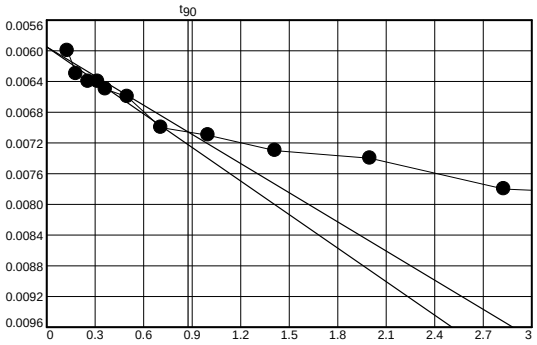


Void Ratio = 0.678 **Compression =** 0.5%

D_0 = 0.0041 **D_{90} =** 0.0046 **D_{100} =** 0.0047 **C_V at 0.72 min. =** 3.057 ft.^{2}/day

Pressure: 1.00 ksf | **TEST READINGS** | **Load No. 4**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.00490	11	+0 00:04:00	0.00740
2	+0 00:00:01	0.00600	12	+0 00:08:00	0.00780
3	+0 00:00:02	0.00630	13	+0 00:15:00	0.00790
4	+0 00:00:04	0.00640	14	+0 00:30:00	0.00810
5	+0 00:00:06	0.00640	15	+0 00:60:00	0.00810
6	+0 00:00:08	0.00650	16	+0 02:00:00	0.00820
7	+0 00:00:15	0.00660	17	+0 04:00:00	0.00850
8	+0 00:00:30	0.00700	18	+0 04:31:00	0.00850
9	+0 00:00:60	0.00710			
10	+0 00:02:00	0.00730			

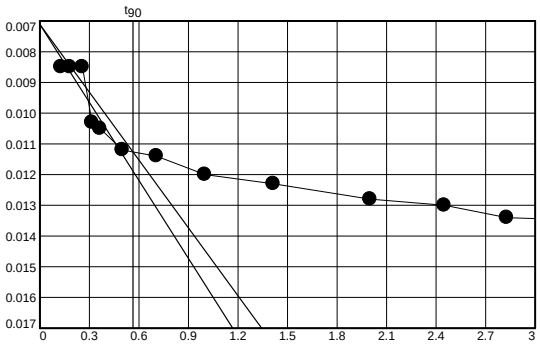


Void Ratio = 0.672 **Compression =** 0.8%

D_0 = 0.0059 **D_{90} =** 0.0071 **D_{100} =** 0.0072 **C_V at 0.76 min. =** 2.855 ft.^{2}/day

Pressure: 2.00 ksf | **TEST READINGS** | **Load No. 5**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.00850	12	+0 00:06:00	0.01300
2	+0 00:00:01	0.00850	13	+0 00:08:00	0.01340
3	+0 00:00:02	0.00850	14	+0 00:15:00	0.01360
4	+0 00:00:04	0.00850	15	+0 00:30:00	0.01380
5	+0 00:00:06	0.01030	16	+0 00:60:00	0.01420
6	+0 00:00:08	0.01050	17	+0 02:00:00	0.01430
7	+0 00:00:15	0.01120	18	+0 04:00:00	0.01440
8	+0 00:00:30	0.01140	19	+0 08:00:00	0.01450
9	+0 00:00:60	0.01200	20	+0 15:00:00	0.01450
10	+0 00:02:00	0.01230	21	+0 18:00:00	0.01460
11	+0 00:04:00	0.01280			

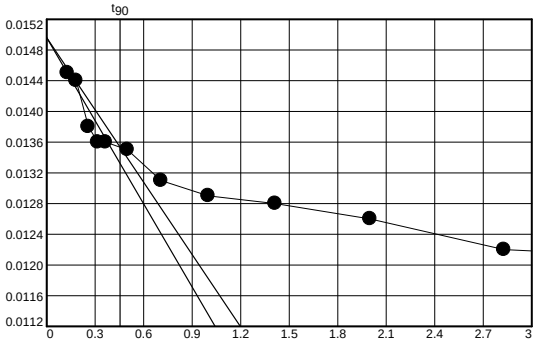


Void Ratio = 0.662 **Compression =** 1.4%

D_0 = 0.0071 **D_{90} =** 0.0113 **D_{100} =** 0.0117 **C_V at 0.32 min. =** 6.801 ft.^{2}/day

Pressure: 0.50 ksf | **TEST READINGS** | **Load No. 6**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.01460	11	+0 00:04:00	0.01260
2	+0 00:00:01	0.01450	12	+0 00:08:00	0.01220
3	+0 00:00:02	0.01440	13	+0 00:15:00	0.01210
4	+0 00:00:04	0.01380	14	+0 00:30:00	0.01190
5	+0 00:00:06	0.01360	15	+0 00:60:00	0.01190
6	+0 00:00:08	0.01360	16	+0 02:00:00	0.01190
7	+0 00:00:15	0.01350	17	+0 02:18:00	0.01180
8	+0 00:00:30	0.01310			
9	+0 00:00:60	0.01290			
10	+0 00:02:00	0.01280			

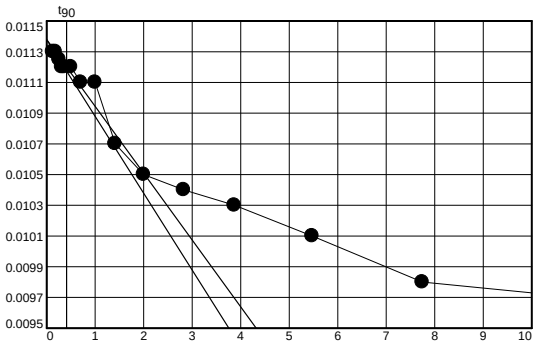


Void Ratio = 0.667 **Compression =** 1.1%

D_0 = 0.0150 **D_{90} =** 0.0135 **D_{100} =** 0.0134 **C_V at 0.21 min. =** 10.454 ft.^{2}/day

Pressure: 0.25 ksf | **TEST READINGS** | **Load No. 7**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.01180	11	+0 00:04:00	0.01050
2	+0 00:00:01	0.01130	12	+0 00:08:00	0.01040
3	+0 00:00:02	0.01130	13	+0 00:15:00	0.01030
4	+0 00:00:04	0.01125	14	+0 00:30:00	0.01010
5	+0 00:00:06	0.01120	15	+0 00:60:00	0.00980
6	+0 00:00:08	0.01120	16	+0 02:00:00	0.00970
7	+0 00:00:15	0.01120	17	+0 04:00:00	0.00960
8	+0 00:00:30	0.01110	18	+0 05:21:00	0.00960
9	+0 00:00:60	0.01110			
10	+0 00:02:00	0.01070			

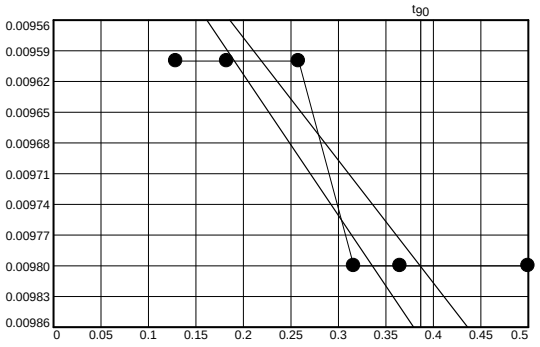


Void Ratio = 0.671 **Compression =** 0.9%

D_0 = 0.0114 **D_{90} =** 0.0112 **D_{100} =** 0.0112 **C_V at 0.17 min. =** 12.790 ft.^{2}/day

Pressure: 0.50 ksf | **TEST READINGS** | **Load No. 8**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.00960	11	+0 00:04:00	0.00980
2	+0 00:00:01	0.00960	12	+0 00:08:00	0.00980
3	+0 00:00:02	0.00960	13	+0 00:15:00	0.00980
4	+0 00:00:04	0.00960	14	+0 00:30:00	0.00980
5	+0 00:00:06	0.00980	15	+0 00:60:00	0.00980
6	+0 00:00:08	0.00980	16	+0 01:39:47	0.00980
7	+0 00:00:15	0.00980			
8	+0 00:00:30	0.00980			
9	+0 00:00:60	0.00980			
10	+0 00:02:00	0.00980			

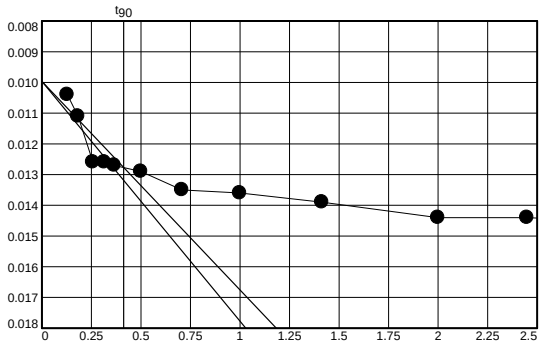


Void Ratio = 0.670 **Compression =** 1.0%

D_0 = 0.0093 **D_{90} =** 0.0098 **D_{100} =** 0.0099 **C_V at 0.15 min. =** 14.504 ft.^{2}/day

Pressure: 2.00 ksf | **TEST READINGS** | **Load No. 9**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.00980	12	+0 00:06:00	0.01440
2	+0 00:00:01	0.01040	13	+0 00:08:00	0.01450
3	+0 00:00:02	0.01110	14	+0 00:15:00	0.01460
4	+0 00:00:04	0.01260	15	+0 00:30:00	0.01480
5	+0 00:00:06	0.01260	16	+0 00:60:00	0.01500
6	+0 00:00:08	0.01270	17	+0 02:00:00	0.01510
7	+0 00:00:15	0.01290	18	+0 04:00:00	0.01510
8	+0 00:00:30	0.01350	19	+0 08:00:00	0.01510
9	+0 00:00:60	0.01360	20	+0 15:00:00	0.01520
10	+0 00:02:00	0.01390	21	+0 24:00:00	0.01520
11	+0 00:04:00	0.01440	22	+1 24:80:00	0.01520

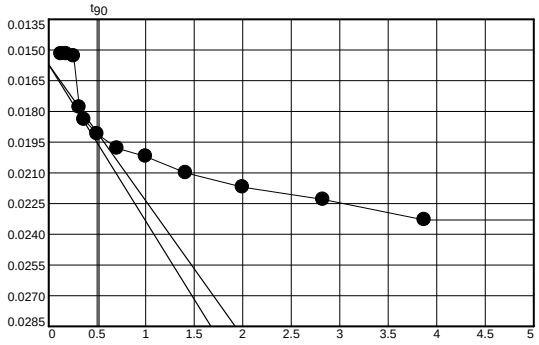


Void Ratio = 0.661 **Compression =** 1.5%

D_0 = 0.0100 **D_{90} =** 0.0128 **D_{100} =** 0.0131 **C_V at 0.17 min. =** 12.637 ft.^{2}/day

Pressure: 4.00 ksf | **TEST READINGS** | **Load No. 10**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.01520	12	+0 00:08:00	0.02230
2	+0 00:00:01	0.01520	13	+0 00:15:00	0.02330
3	+0 00:00:02	0.01520	14	+0 00:30:00	0.02330
4	+0 00:00:04	0.01530	15	+0 00:60:00	0.02360
5	+0 00:00:06	0.01780	16	+0 02:00:00	0.02390
6	+0 00:00:08	0.01840	17	+0 04:00:00	0.02390
7	+0 00:00:15	0.01910	18	+0 08:00:00	0.02410
8	+0 00:00:30	0.01980	19	+0 15:00:00	0.02420
9	+0 00:00:60	0.02020	20	+0 24:00:00	0.02420
10	+0 00:02:00	0.02100	21	+1 31:36:00	0.02420
11	+0 00:04:00	0.02170			

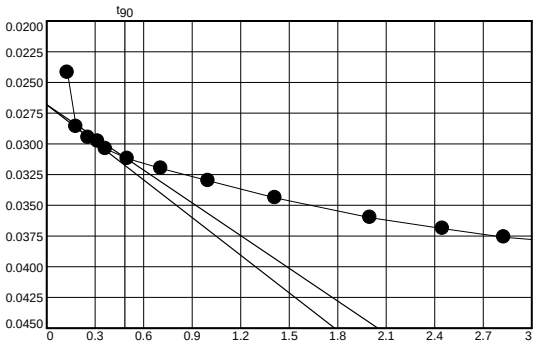


Void Ratio = 0.646 **Compression =** 2.4%

D_0 = 0.0157 **D_{90} =** 0.0192 **D_{100} =** 0.0195 **C_V at 0.27 min. =** 7.884 ft.^{2}/day

Pressure: 8.00 ksf **TEST READINGS** **Load No. 11**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.02420	11	+0 00:04:00	0.03600
2	+0 00:00:01	0.02420	12	+0 00:06:00	0.03690
3	+0 00:00:02	0.02860	13	+0 00:08:00	0.03760
4	+0 00:00:04	0.02950	14	+0 00:15:00	0.03870
5	+0 00:00:06	0.02980	15	+0 00:30:00	0.03980
6	+0 00:00:08	0.03040	16	+0 00:60:00	0.04020
7	+0 00:00:15	0.03120	17	+0 02:00:00	0.04080
8	+0 00:00:30	0.03200	18	+0 04:00:00	0.04140
9	+0 00:00:60	0.03300	19	+0 08:00:00	0.04160
10	+0 00:02:00	0.03440			

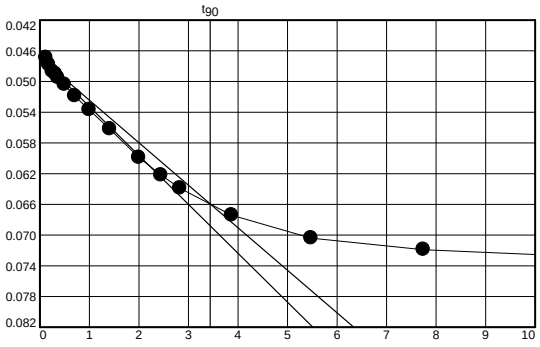


Void Ratio = 0.618 **Compression =** 4.1%

D_0 = 0.0268 **D_{90} =** 0.0311 **D_{100} =** 0.0316 **C_V at 0.23 min. =** 8.853 ft.^{2}/day

Pressure: 16.00 ksf **TEST READINGS** **Load No. 12**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.04160	12	+0 00:06:00	0.06220
2	+0 00:00:01	0.04690	13	+0 00:08:00	0.06390
3	+0 00:00:02	0.04780	14	+0 00:15:00	0.06740
4	+0 00:00:04	0.04870	15	+0 00:30:00	0.07040
5	+0 00:00:06	0.04900	16	+0 00:60:00	0.07190
6	+0 00:00:08	0.04950	17	+0 02:00:00	0.07280
7	+0 00:00:15	0.05040	18	+0 04:00:00	0.07360
8	+0 00:00:30	0.05190	19	+0 08:00:00	0.07430
9	+0 00:00:60	0.05370	20	+0 15:00:00	0.07490
10	+0 00:02:00	0.05620	21	+0 20:00:00	0.07520
11	+0 00:04:00	0.05990			

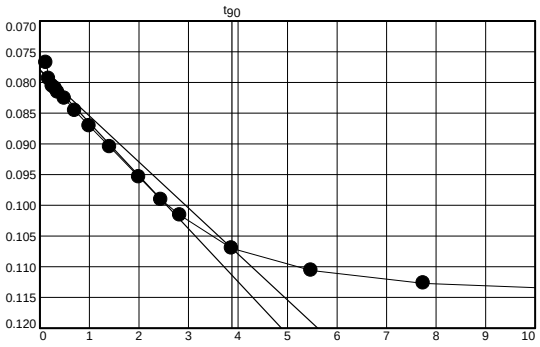


Void Ratio = 0.562 **Compression =** 7.4%

D_0 = 0.0469 **D_{90} =** 0.0659 **D_{100} =** 0.0681 **C_V at 11.82 min. =** 0.166 ft.^{2}/day

Pressure: 32.00 ksf | **TEST READINGS** | **Load No. 13**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.07520	12	+0 00:06:00	0.09910
2	+ 00:00:01	0.07680	13	+0 00:08:00	0.10160
3	+0 00:00:02	0.07940	14	+0 00:15:00	0.10700
4	+0 00:00:04	0.08060	15	+0 00:30:00	0.11060
5	+0 00:00:06	0.08100	16	+0 00:60:00	0.11270
6	+0 00:00:08	0.08160	17	+0 02:00:00	0.11370
7	+0 00:00:15	0.08260	18	+0 04:00:00	0.11460
8	+0 00:00:30	0.08460	19	+0 08:00:00	0.11540
9	+0 00:00:60	0.08710	20	+0 15:00:00	0.11610
10	+0 00:02:00	0.09050	21	+0 22:10:00	0.11660
11	+0 00:04:00	0.09540			

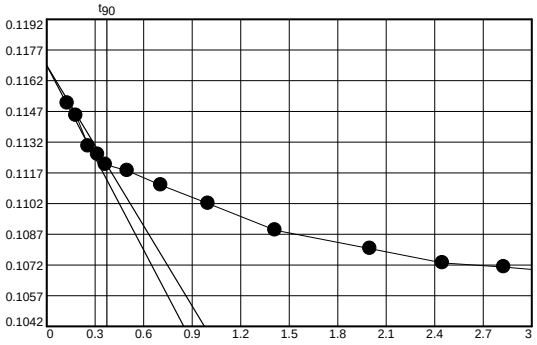


Void Ratio = 0.494 **Compression =** 11.4%

D_0 = 0.0780 **D_{90} =** 0.1070 **D_{100} =** 0.1102 **C_V at 15.03 min. =** 0.121 ft.^{2}/day

Pressure: 8.00 ksf | **TEST READINGS** | **Load No. 14**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.11660	11	+0 00:04:00	0.10800
2	+0 00:00:01	0.11510	12	+0 00:06:00	0.10730
3	+0 00:00:02	0.11450	13	+0 00:08:00	0.10710
4	+0 00:00:04	0.11300	14	+0 00:15:00	0.10640
5	+0 00:00:06	0.11260	15	+0 00:30:00	0.10630
6	+0 00:00:08	0.11210	16	+0 00:60:00	0.10580
7	+0 00:00:15	0.11180	17	+0 02:00:00	0.10570
8	+0 00:00:30	0.11110	18	+0 02:09:00	0.10570
9	+0 00:00:60	0.11020			
10	+0 00:02:00	0.10890			

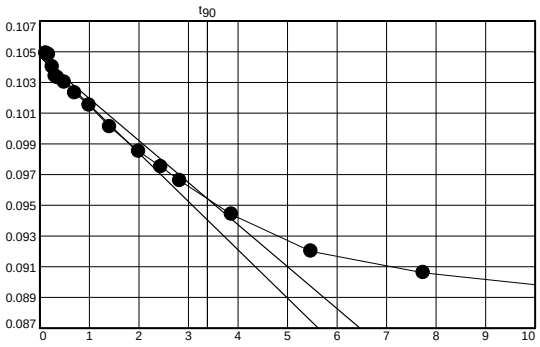


Void Ratio = 0.512 **Compression =** 10.3%

D_0 = 0.1169 **D_{90} =** 0.1121 **D_{100} =** 0.1115 **C_V at 0.14 min. =** 12.681 ft.^{2}/day

Pressure: 2.00 ksf | **TEST READINGS** | **Load No. 15**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.10570	11	+0 00:04:00	0.09850
2	+0 00:00:01	0.10490	12	+0 00:06:00	0.09750
3	+0 00:00:02	0.10480	13	+0 00:08:00	0.09660
4	+0 00:00:04	0.10400	14	+0 00:15:00	0.09440
5	+0 00:00:06	0.10340	15	+0 00:30:00	0.09200
6	+0 00:00:08	0.10330	16	+0 00:60:00	0.09060
7	+0 00:00:15	0.10300	17	+0 02:00:00	0.08950
8	+0 00:00:30	0.10230	18	+0 04:60:00	0.08950
9	+0 00:00:60	0.10150			
10	+0 00:02:00	0.10010			

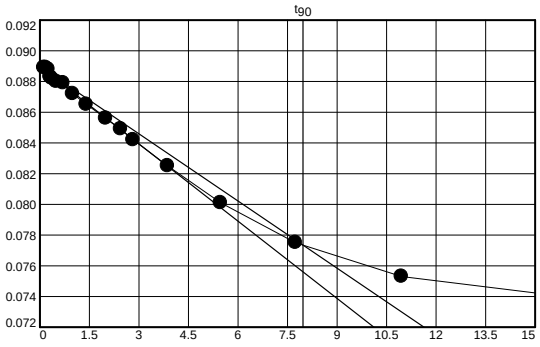


Void Ratio = 0.539 **Compression =** 8.8%

D_0 = 0.1047 **D_{90} =** 0.0954 **D_{100} =** 0.0944 **C_v at 11.44 min. =** 0.158 ft.^{2}/day

Pressure: 0.50 ksf | **TEST READINGS** | **Load No. 16**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.08950	12	+0 00:06:00	0.08490
2	+0 00:00:01	0.08890	13	+0 00:08:00	0.08420
3	+0 00:00:02	0.08890	14	+0 00:15:00	0.08250
4	+0 00:00:04	0.08880	15	+0 00:30:00	0.08010
5	+0 00:00:06	0.08830	16	+0 00:60:00	0.07750
6	+0 00:00:08	0.08820	17	+0 02:00:00	0.07530
7	+0 00:00:15	0.08800	18	+0 04:00:00	0.07410
8	+0 00:00:30	0.08790	19	+0 08:00:00	0.07310
9	+0 00:00:60	0.08720	20	+0 15:00:00	0.07270
10	+0 00:02:00	0.08650	21	+0 17:27:00	0.07260
11	+0 00:04:00	0.08560			

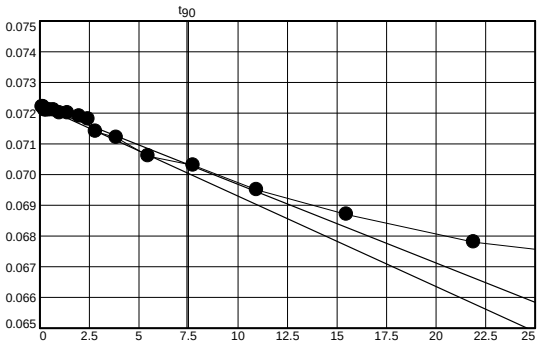


Void Ratio = 0.566 **Compression =** 7.1%

D_0 = 0.0890 **D_{90} =** 0.0773 **D_{100} =** 0.0761 **C_v at 63.47 min. =** 0.030 ft.^{2}/day

Pressure: 0.25 ksf | **TEST READINGS** | **Load No. 17**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.07260	12	+0 00:06:00	0.07180
2	+0 00:00:01	0.07220	13	+0 00:08:00	0.07140
3	+0 00:00:02	0.07220	14	+0 00:15:00	0.07120
4	+0 00:00:04	0.07210	15	+0 00:30:00	0.07060
5	+0 00:00:06	0.07210	16	+0 00:60:00	0.07030
6	+0 00:00:08	0.07210	17	+0 02:00:00	0.06950
7	+0 00:00:15	0.07210	18	+0 04:00:00	0.06870
8	+0 00:00:30	0.07210	19	+0 08:00:00	0.06780
9	+0 00:00:60	0.07200	20	+0 15:00:00	0.06720
10	+0 00:02:00	0.07200	21	+0 24:00:00	0.06620
11	+0 00:04:00	0.07190			



Void Ratio = 0.577 **Compression =** 6.5%

D_0 = 0.0722 **D_{90} =** 0.0703 **D_{100} =** 0.0701 **C_V at 55.10 min. =** 0.035 ft.^{2}/day

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

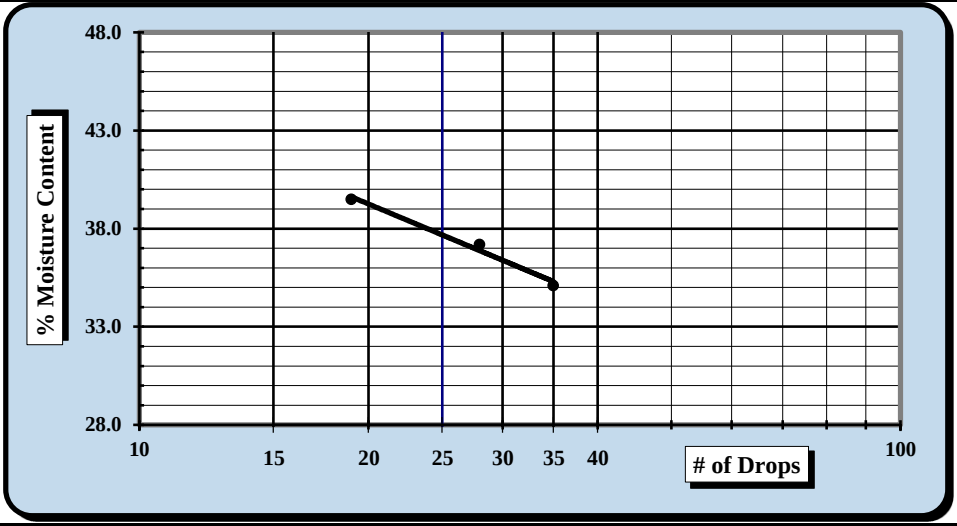
Project #:	1461-16-047.2B	Report Date:	5/17/18
Project Name:	Carolina Crossroads Project	Test Date:	5/14/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-50	Sample #:	UD-1	Sample Date:	Various
Location:	UD borings	Type:	Undisturbed	Depth:	13.5 - 15.5'

Sample Description: Silt with Sand [ML, A-4(7)]

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	21	22	23				24	25	
A	Tare Weight	28.07	25.68	27.28				25.98	26.78	
B	Wet Soil Weight + A	44.13	42.24	48.56				33.02	33.04	
C	Dry Soil Weight + A	39.96	37.75	42.53				31.44	31.64	
D	Water Weight (B-C)	4.17	4.49	6.03				1.58	1.40	
E	Dry Soil Weight (C-A)	11.89	12.07	15.25				5.46	4.86	
F	% Moisture (D/E)*100	35.1%	37.2%	39.5%				28.9%	28.8%	
N	# OF DROPS	35	28	19				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**28.9%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**38**
Plastic Limit	**29**
Plastic Index	**9**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/17/18	Matthew F. Cooke, P.G.	5/17/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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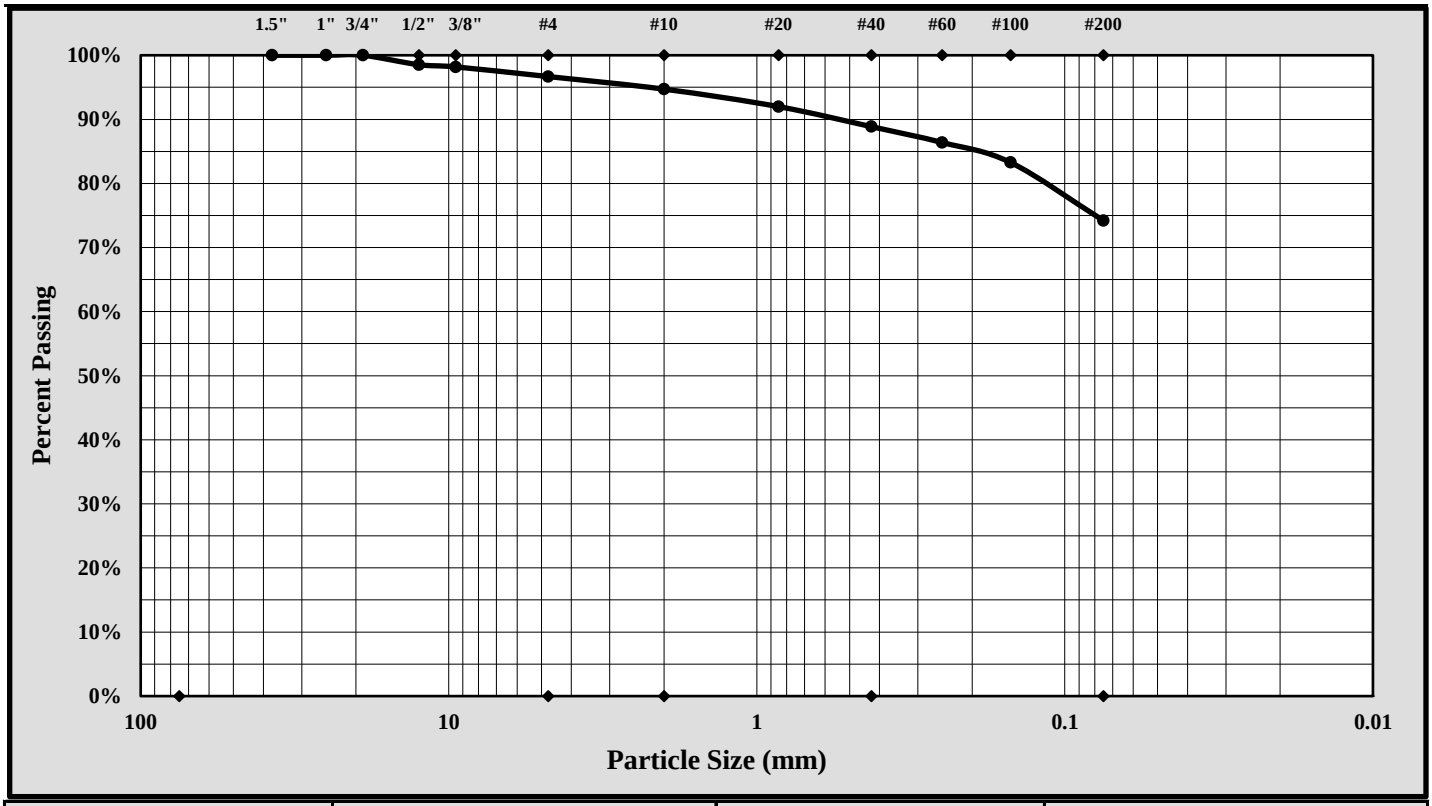
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/17/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/10 - 5/14/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-50	Sample #: UD-1	Sample Date: Various
Location:	UD borings	Type: Undisturbed	Depth: 13.5 - 15.5'
Sample Description:	Silt with Sand [ML, A-4(7)]		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	19.0 mm	Gravel:	3.3%
Silt & Clay (% Passing #200):	74.2%	Total Sand:	22.5%

Liquid Limit	38	Plastic Limit	29	Plastic Index	9
Coarse Sand:	2.0%	Medium Sand:	5.8%	Fine Sand:	14.7%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/17/18 — *Date*

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Form No: TR-D854-1B
Revision No. 1
Revision Date: 08/09/17

SPECIFIC GRAVITY OF SOIL

Oven dried Specimens ASTM D 854 Method B

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/14/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/07 - 5/09/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-50	Sample #: UD-1	Sample Date: Various
Location:	UD Borings	Type: Undisturbed	Depth: 13.5 - 15.5'
Sample Description:	Silt with Sand [ML, A-4(7)]		
Material Excluded:	3.3%		% Passing #4 Sieve: 96.7%

Balance ID. *0.01 gram* *ID#:* *13942* *Cal. Date:* *8/18/17* *Cal. Due:* *8/18/18*

Pycnometer ID No. *23161* *Cal. Date:* *2/10/18* *Balance Verification* Check Mass: 500 gram

Pycnometer Volume (V_p)	249.81	ml.	Mass Determination: 500.00 grams
Pycnometer Mass (PM)	110.90	grams	*If [PM-M_p] is greater than .06 grams,*
Ave. Pycnometer Mass (M_p)	110.90	grams	*recalibrate the dry mass of the pycnometer.*

Method B: Oven-dried Specimens

Soaking Time ASTM C127: 24 ± 4 hrs. ☐
Aggregate not initially dried ☐

Table 2 ASTM D 854	Specimen Dry Mass (g.)	
Soil Type	*250-ml. beaker*	*500-ml. beaker*
SP, SP-SM	*60 ± 10*	*100 ± 10*
SP-SC, SM, SC	*45 ± 10*	*75 ± 10*
Silt or Clay	*35 ± 5*	*50 ± 10*

Initial Dry Mass of Test Specimen - *not required.* grams

$M_{psw;t}$ = *Mass of the Pycnometer, soil, and water* = **384.16** *grams*

Mass of Dry Soil (grams)		Tare #	BB-8
A	Tare Weight		204.29
C	Dry Wt. + Tare Wt.		242.01
M_s	Dry Weight	**C-A**	**37.72**

T_t =	Test Temperature T_t	**21.5** °C
K =	Temperature Coefficient at T_t	**0.99968**
K =	Temperature Coefficient at 23°C	**0.99933**
$p_{w;t}$ =	Density of Water at T_t	**0.99789** g./ml.

$M_{pw;t}$ =	Mass of the Pycnometer and water at T_t	$M_{pw;t} = M_p + (V_p \times p_{w;t})$	**360.18** grams
G_t =	Specific Gravity of Soil Solids at the T_t	$G_t = M_s / (M_{pw;t} - (M_{psw;t}-M_s))$	**2.745**
G =	Specific Gravity of Soil Solids at the 20°C	$G = K \times G_t$	**2.744**

Soils containing plus #4 material tested per **ASTM C 127**

R = *% of Soil retained on the #4 sieve* **3.3%**
P = *% of Soil passing the #4 sieve* **96.7%**

G_{+4} Apparent Specific Gravity of plus #4 material at the 23°C per ASTM C127
Apparent Specific Gravity of plus #4 material corrected to 20°C

G_{total} *Total Sample Specific Gravity* **G_{total}** = $\dfrac{1}{\dfrac{R}{100 \times G_{+4}} + \dfrac{P}{100 \times G}}$ = **2.744**

Notes / Deviations / References: ASTM D854: Specific Gravity of Soil Solids by Water Pycnometer

Matthew F. Cooke — *Project Manager*
Project Manager — *Position*
5/14/18 — Date

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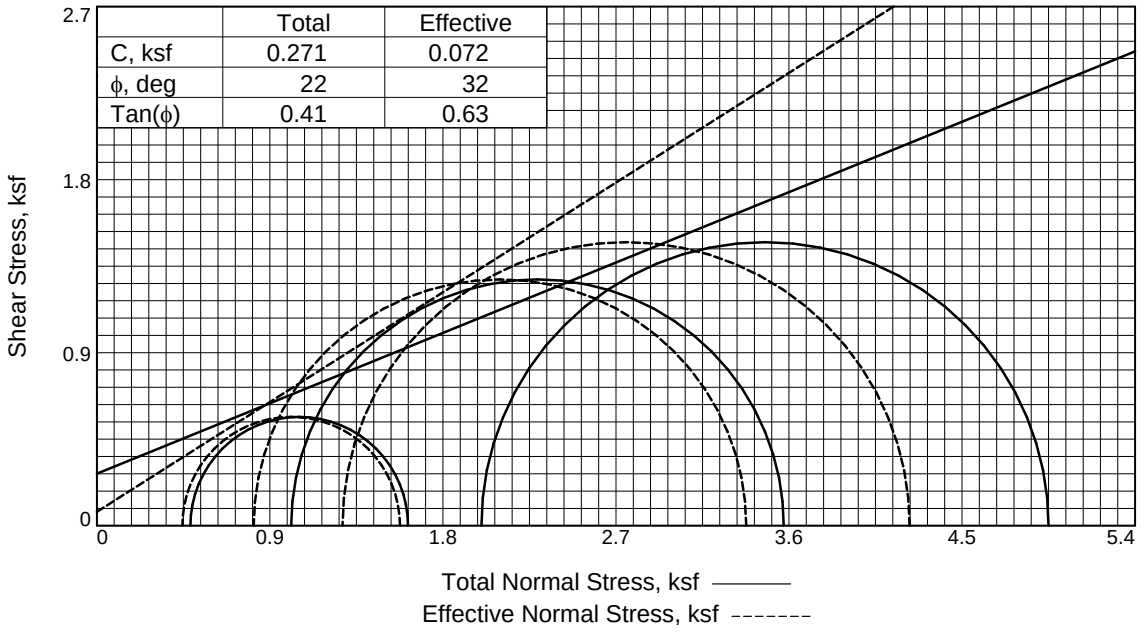
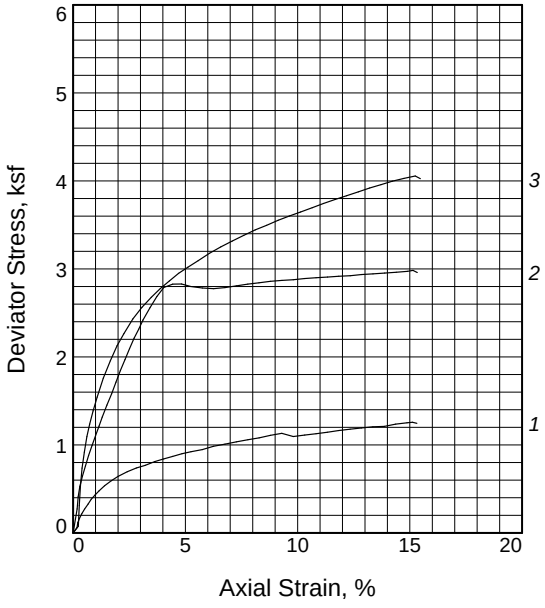
C & phi are not test results but an interpretation of the test results. The designer is responsible for interpreting test data as provided by S&ME.





Specimen No.		1	2	3
Initial	Water Content, %	18.8	20.4	20.0
	Dry Density, pcf	99.2	104.5	103.1
	Saturation, %	71.1	87.6	82.8
	Void Ratio	0.7262	0.6390	0.6622
	Diameter, in.	2.845	2.883	2.862
	Height, in.	5.802	5.897	5.850
At Test	Water Content, %	25.0	21.8	21.9
	Dry Density, pcf	101.6	107.1	107.1
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.6856	0.5990	0.6001
	Diameter, in.	2.823	2.861	2.826
	Height, in.	5.754	5.843	5.775
Strain rate, %/min.		0.34	0.34	0.34
Eff. Cell Pressure, ksf		0.487	1.011	2.000
Fail. Stress, ksf		1.132	2.562	2.950
Total Pore Pr., ksf		7.962	8.115	8.642
Strain, %		9.3	3.4	4.7
Ult. Stress, ksf		1.258	2.983	4.056
Total Pore Pr., ksf		7.873	7.267	7.962
Strain, %		15.1	15.1	15.2
$\bar{\sigma}_1$ Failure, ksf		1.576	3.378	4.227
$\bar{\sigma}_3$ Failure, ksf		0.445	0.816	1.278

Type of Test:
CU with Pore Pressures
Sample Type: Undisturbed
Description: Silt with Sand [ML, A-4(7)]

LL= 38 **PL=** 29 **PI=** 9
Specific Gravity= 2.744
Remarks: The specimens failed with bulging and shear. Failure selected at peak obliquity. ASTM D4767.
Percent passing the #200 sieve: 74.2%
Figure 1

Client: HDR Engineering, Inc.

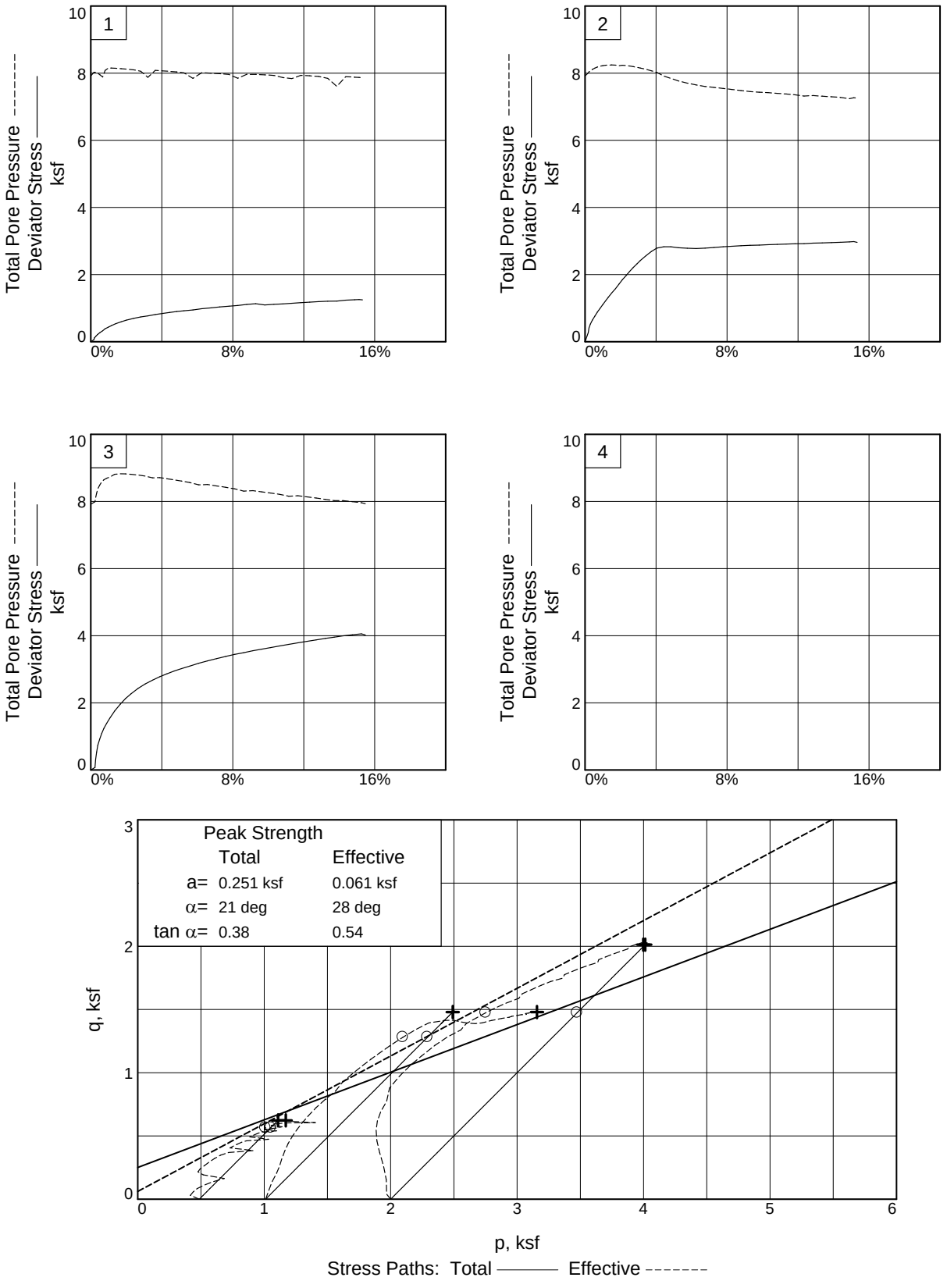
Project: Carolina Crossroads Project

Location: UD borings
Sample Number: B-50 **Depth:** 13.5 - 15.5'
Proj. No.: 1461-16-047.2B **Date Sampled:** Various

TRIAXIAL SHEAR TEST REPORT
S&ME, Inc.
Greenville, SC

Tested By: Benjamin Kovaleski **Checked By:** Matthew F. Cooke, P.G.

C & phi are not test results but an interpretation of the test results. The designer is responsible for interpreting test data as provided by S&ME.



Client: HDR Engineering, Inc.
Project: Carolina Crossroads Project
Location: UD borings **Depth:** 13.5 - 15.5' **Sample Number:** B-50
Project No.: 1461-16-047.2B **Figure** 2

S&ME, Inc.

Tested By: Benjamin Kovaleski **Checked By:** Matthew F. Cooke, P.G.

TRIAXIAL COMPRESSION TEST 5/17/2018

CU with Pore Pressures 4:37 PM

Date: Various
Client: HDR Engineering, Inc.
Project: Carolina Crossroads Project
Project No.: 1461-16-047.2B
Location: UD borings
Depth: 13.5 - 15.5' **Sample Number:** B-50
Description: Silt with Sand [ML, A-4(7)]
Remarks: The specimens failed with bulging and shear. Failure selected at peak obliquity. ASTM D4767. Percent passing the #200 sieve: 74.2%
Type of Sample: Undisturbed
Specific Gravity=2.744 **LL=**38 **PL=**29 **PI=**9
Test Method: ASTM D 4767 Method A

Parameters for Specimen No. 1

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	54.300			1177.430
Moisture content: Dry soil+tare, gms.	45.700			941.960
Moisture content: Tare, gms.	0.000			0.000
Moisture, %	18.8	25.2	25.0	25.0
Moist specimen weight, gms.	1141.60			
Diameter, in.	2.845	2.825	2.823	
Area, in.²	6.357	6.269	6.259	
Height, in.	5.802	5.762	5.754	
Net decrease in height, in.		0.040	0.008	
Net decrease in water volume, cc.			1.700	
Wet density, pcf	117.9	126.8	127.0	
Dry density, pcf	99.2	101.3	101.6	
Void ratio	0.7262	0.6905	0.6856	
Saturation, %	71.1	100.0	100.0	

Test Readings for Specimen No. 1

Membrane modulus = .167543 kN/cm²
Membrane thickness = .03048 cm
Consolidation cell pressure = 58.380 psi (8.407 ksf)
Consolidation back pressure = 55.000 psi (7.920 ksf)
Consolidation effective confining stress = 0.487 ksf
Strain rate, %/min. = 0.34
Fail. Stress = 1.132 ksf **at reading no.** 28
Ult. Stress = 1.258 ksf **at reading no.** 40

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
0	0.0000	0.000	0.0	0.0	0.000	0.487	0.487	1.00	55.000	0.487	0.000
1	0.0099	2.644	2.6	0.2	0.061	0.385	0.446	1.16	55.706	0.415	0.030
2	0.0118	5.079	5.1	0.2	0.117	0.381	0.497	1.31	55.737	0.439	0.058
3	0.0166	7.259	7.3	0.3	0.167	0.386	0.552	1.43	55.700	0.469	0.083
4	0.0223	9.515	9.5	0.4	0.218	0.412	0.630	1.53	55.521	0.521	0.109
5	0.0295	11.892	11.9	0.5	0.272	0.452	0.725	1.60	55.239	0.588	0.136
6	0.0384	14.330	14.3	0.7	0.327	0.521	0.848	1.63	54.764	0.684	0.164
7	0.0464	16.847	16.8	0.8	0.384	0.326	0.710	2.18	56.116	0.518	0.192
8	0.0562	18.967	19.0	1.0	0.432	0.260	0.692	2.66	56.574	0.476	0.216
9	0.0665	21.047	21.0	1.2	0.479	0.254	0.732	2.89	56.618	0.493	0.239
10	0.0807	23.658	23.7	1.4	0.537	0.263	0.799	3.04	56.555	0.531	0.268
11	0.0982	26.300	26.3	1.7	0.595	0.273	0.867	3.18	56.486	0.570	0.297
12	0.1152	28.510	28.5	2.0	0.643	0.286	0.928	3.25	56.397	0.607	0.321
13	0.1389	31.009	31.0	2.4	0.696	0.307	1.003	3.27	56.250	0.655	0.348
14	0.1621	33.043	33.0	2.8	0.739	0.351	1.089	3.11	55.946	0.720	0.369
15	0.1850	34.531	34.5	3.2	0.769	0.530	1.299	2.45	54.697	0.915	0.384
16	0.2090	36.608	36.6	3.6	0.812	0.323	1.135	3.51	56.134	0.729	0.406
17	0.2320	38.116	38.1	4.0	0.842	0.337	1.179	3.49	56.037	0.758	0.421
18	0.2555	39.611	39.6	4.4	0.871	0.353	1.224	3.47	55.930	0.788	0.435
19	0.2787	41.125	41.1	4.8	0.900	0.371	1.271	3.43	55.806	0.821	0.450
20	0.3022	42.327	42.3	5.3	0.923	0.398	1.321	3.32	55.616	0.859	0.461
21	0.3312	43.707	43.7	5.8	0.948	0.561	1.509	2.69	54.481	1.035	0.474
22	0.3599	45.680	45.7	6.3	0.985	0.394	1.379	3.50	55.644	0.887	0.493
23	0.3894	47.098	47.1	6.8	1.010	0.408	1.419	3.47	55.543	0.914	0.505
24	0.4184	48.537	48.5	7.3	1.035	0.424	1.459	3.44	55.435	0.942	0.518
25	0.4480	49.955	50.0	7.8	1.060	0.445	1.504	3.38	55.292	0.975	0.530
26	0.4766	51.197	51.2	8.3	1.080	0.558	1.638	2.94	54.507	1.098	0.540
27	0.5058	52.891	52.9	8.8	1.110	0.442	1.552	3.51	55.311	0.997	0.555
28	0.5348	54.233	54.2	9.3	1.132	0.445	1.576	3.54	55.292	1.011	0.566
29	0.5641	55.606	55.6	9.8	1.095	0.456	1.552	3.40	55.211	1.004	0.548
30	0.5936	56.901	56.9	10.3	1.113	0.474	1.587	3.35	55.087	1.030	0.556
31	0.6225	58.080	58.1	10.8	1.127	0.538	1.665	3.10	54.647	1.101	0.564
32	0.6516	59.434	59.4	11.3	1.145	0.569	1.714	3.01	54.430	1.141	0.573
33	0.6809	60.901	60.9	11.8	1.165	0.473	1.637	3.46	55.098	1.055	0.582
34	0.7099	62.100	62.1	12.3	1.179	0.486	1.665	3.43	55.006	1.075	0.589
35	0.7385	63.315	63.3	12.8	1.193	0.505	1.698	3.36	54.875	1.101	0.597
36	0.7684	64.507	64.5	13.4	1.206	0.562	1.768	3.15	54.477	1.165	0.603
37	0.7976	65.273	65.3	13.9	1.211	0.799	2.010	2.52	52.833	1.404	0.606
38	0.8268	67.158	67.2	14.4	1.237	0.511	1.749	3.42	54.831	1.130	0.619
39	0.8557	68.433	68.4	14.9	1.252	0.526	1.778	3.38	54.724	1.152	0.626
40	0.8699	69.030	69.0	15.1	1.258	0.534	1.792	3.36	54.675	1.163	0.629
41	0.8810	68.640	68.6	15.3	1.246	0.547	1.794	3.28	54.578	1.171	0.623

Parameters for Specimen No. 2

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	58.970			1309.400
Moisture content: Dry soil+tare, gms.	48.980			1074.710
Moisture content: Tare, gms.	0.000			0.000
Moisture, %	20.4	22.6	21.8	21.8
Moist specimen weight, gms.	1271.51			
Diameter, in.	2.883	2.871	2.861	
Area, in.²	6.528	6.475	6.427	
Height, in.	5.897	5.873	5.843	
Net decrease in height, in.		0.024	0.030	
Net decrease in water volume, cc.			7.700	
Wet density, pcf	125.8	129.7	130.5	
Dry density, pcf	104.5	105.8	107.1	
Void ratio	0.6390	0.6190	0.5990	
Saturation, %	87.6	100.0	100.0	

Test Readings for Specimen No. 2

Membrane modulus = .167543 kN/cm²
Membrane thickness = .03048 cm
Consolidation cell pressure = 62.020 psi (8.931 ksf)
Consolidation back pressure = 55.000 psi (7.920 ksf)
Consolidation effective confining stress = 1.011 ksf
Strain rate, %/min. = 0.34
Fail. Stress = 2.562 ksf **at reading no.** 20
Ult. Stress = 2.983 ksf **at reading no.** 45

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
0	0.0000	0.000	0.0	0.0	0.000	1.011	1.011	1.00	55.000	1.011	0.000
1	0.0105	12.245	12.2	0.2	0.274	0.925	1.199	1.30	55.598	1.062	0.137
2	0.0131	18.471	18.5	0.2	0.413	0.892	1.305	1.46	55.826	1.098	0.206
3	0.0172	23.552	23.6	0.3	0.526	0.859	1.385	1.61	56.056	1.122	0.263
4	0.0240	28.779	28.8	0.4	0.642	0.819	1.461	1.78	56.331	1.140	0.321
5	0.0319	34.068	34.1	0.5	0.759	0.782	1.541	1.97	56.587	1.162	0.380
6	0.0403	39.612	39.6	0.7	0.881	0.749	1.630	2.18	56.820	1.189	0.441
7	0.0492	44.768	44.8	0.8	0.995	0.725	1.720	2.37	56.982	1.223	0.497
8	0.0583	49.793	49.8	1.0	1.104	0.708	1.813	2.56	57.102	1.260	0.552
9	0.0673	54.732	54.7	1.2	1.212	0.696	1.908	2.74	57.186	1.302	0.606
10	0.0757	59.496	59.5	1.3	1.316	0.690	2.006	2.91	57.227	1.348	0.658
11	0.0877	65.763	65.8	1.5	1.451	0.686	2.138	3.11	57.254	1.412	0.726
12	0.1002	71.836	71.8	1.7	1.582	0.694	2.275	3.28	57.204	1.484	0.791
13	0.1114	77.894	77.9	1.9	1.712	0.709	2.421	3.41	57.096	1.565	0.856
14	0.1227	84.106	84.1	2.1	1.845	0.695	2.539	3.66	57.196	1.617	0.922
15	0.1351	90.032	90.0	2.3	1.970	0.704	2.674	3.80	57.132	1.689	0.985
16	0.1467	95.874	95.9	2.5	2.094	0.719	2.813	3.91	57.029	1.766	1.047
17	0.1585	101.485	101.5	2.7	2.212	0.737	2.949	4.00	56.903	1.843	1.106
18	0.1707	106.480	106.5	2.9	2.316	0.757	3.073	4.06	56.762	1.915	1.158
19	0.1820	111.526	111.5	3.1	2.421	0.779	3.200	4.11	56.607	1.990	1.210
20	0.2003	118.403	118.4	3.4	2.562	0.816	3.378	4.14	56.354	2.097	1.281
21	0.2179	124.603	124.6	3.7	2.687	0.858	3.546	4.13	56.058	2.202	1.344
22	0.2359	129.726	129.7	4.0	2.789	0.908	3.697	4.07	55.717	2.302	1.395

Test Readings for Specimen No. 2

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
23	0.2591	132.097	132.1	4.4	2.828	1.017	3.845	3.78	54.961	2.431	1.414
24	0.2822	132.695	132.7	4.8	2.829	1.085	3.914	3.61	54.485	2.500	1.415
25	0.3065	131.939	131.9	5.2	2.801	1.162	3.963	3.41	53.952	2.562	1.400
26	0.3364	131.857	131.9	5.8	2.784	1.228	4.012	3.27	53.493	2.620	1.392
27	0.3657	132.211	132.2	6.3	2.777	1.281	4.057	3.17	53.128	2.669	1.388
28	0.3952	133.506	133.5	6.8	2.789	1.328	4.117	3.10	52.798	2.722	1.394
29	0.4247	135.157	135.2	7.3	2.808	1.355	4.163	3.07	52.610	2.759	1.404
30	0.4545	136.873	136.9	7.8	2.828	1.386	4.214	3.04	52.397	2.800	1.414
31	0.4838	138.357	138.4	8.3	2.843	1.417	4.260	3.01	52.179	2.839	1.422
32	0.5132	139.888	139.9	8.8	2.859	1.448	4.307	2.97	51.966	2.877	1.429
33	0.5436	141.275	141.3	9.3	2.871	1.481	4.351	2.94	51.737	2.916	1.435
34	0.5729	142.419	142.4	9.8	2.878	1.498	4.376	2.92	51.614	2.937	1.439
35	0.6029	143.901	143.9	10.3	2.891	1.512	4.403	2.91	51.521	2.957	1.446
36	0.6324	145.204	145.2	10.8	2.901	1.532	4.433	2.89	51.384	2.982	1.451
37	0.6620	146.388	146.4	11.3	2.908	1.552	4.460	2.87	51.241	3.006	1.454
38	0.6913	147.706	147.7	11.8	2.918	1.575	4.492	2.85	51.085	3.033	1.459
39	0.7211	148.827	148.8	12.3	2.923	1.613	4.535	2.81	50.821	3.074	1.461
40	0.7510	150.387	150.4	12.9	2.936	1.598	4.534	2.84	50.921	3.066	1.468
41	0.7807	151.659	151.7	13.4	2.944	1.618	4.561	2.82	50.787	3.089	1.472
42	0.8111	153.086	153.1	13.9	2.954	1.634	4.588	2.81	50.671	3.111	1.477
43	0.8409	154.463	154.5	14.4	2.963	1.653	4.615	2.79	50.542	3.134	1.481
44	0.8704	155.922	155.9	14.9	2.973	1.691	4.664	2.76	50.275	3.178	1.486
45	0.8848	156.909	156.9	15.1	2.983	1.664	4.647	2.79	50.467	3.155	1.492
46	0.8957	156.023	156.0	15.3	2.960	1.677	4.637	2.76	50.372	3.157	1.480

Parameters for Specimen No. 3

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	68.060			1238.980
Moisture content: Dry soil+tare, gms.	56.720			1016.680
Moisture content: Tare, gms.	0.000			0.000
Moisture, %	20.0	23.7	21.9	21.9
Moist specimen weight, gms.	1221.65			
Diameter, in.	2.862	2.855	2.826	
Area, in.²	6.433	6.402	6.273	
Height, in.	5.850	5.836	5.775	
Net decrease in height, in.		0.014	0.061	
Net decrease in water volume, cc.			18.600	
Wet density, pcf	123.7	128.4	130.5	
Dry density, pcf	103.1	103.8	107.1	
Void ratio	0.6622	0.6503	0.6001	
Saturation, %	82.8	100.0	100.0	

Test Readings for Specimen No. 3

Membrane modulus = .167543 kN/cm²
Membrane thickness = .03048 cm
Consolidation cell pressure = 68.890 psi (9.920 ksf)
Consolidation back pressure = 55.000 psi (7.920 ksf)
Consolidation effective confining stress = 2.000 ksf
Strain rate, %/min. = 0.34
Fail. Stress = 2.950 ksf **at reading no.** 19
Ult. Stress = 4.056 ksf **at reading no.** 40

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
0	0.0000	0.000	0.0	0.0	0.000	2.000	2.000	1.00	55.000	2.000	0.000
1	0.0136	3.361	3.4	0.2	0.077	1.930	2.007	1.04	55.487	1.969	0.038
2	0.0157	13.578	13.6	0.3	0.311	1.810	2.121	1.17	56.323	1.965	0.155
3	0.0189	23.513	23.5	0.3	0.538	1.673	2.211	1.32	57.272	1.942	0.269
4	0.0229	32.197	32.2	0.4	0.736	1.545	2.281	1.48	58.161	1.913	0.368
5	0.0287	40.180	40.2	0.5	0.918	1.433	2.350	1.64	58.941	1.892	0.459
6	0.0355	47.946	47.9	0.6	1.094	1.338	2.432	1.82	59.596	1.885	0.547
7	0.0424	54.286	54.3	0.7	1.237	1.277	2.514	1.97	60.022	1.895	0.618
8	0.0514	61.048	61.0	0.9	1.389	1.228	2.617	2.13	60.364	1.922	0.694
9	0.0618	67.961	68.0	1.1	1.543	1.196	2.739	2.29	60.585	1.968	0.772
10	0.0777	77.613	77.6	1.3	1.758	1.112	2.870	2.58	61.166	1.991	0.879
11	0.0957	86.694	86.7	1.7	1.957	1.097	3.054	2.78	61.275	2.075	0.978
12	0.1130	94.501	94.5	2.0	2.127	1.098	3.225	2.94	61.262	2.162	1.063
13	0.1306	101.014	101.0	2.3	2.266	1.112	3.378	3.04	61.171	2.245	1.133
14	0.1537	108.862	108.9	2.7	2.432	1.134	3.566	3.15	61.017	2.350	1.216
15	0.1771	115.259	115.3	3.1	2.564	1.165	3.730	3.20	60.797	2.448	1.282
16	0.2010	120.828	120.8	3.5	2.677	1.217	3.894	3.20	60.439	2.555	1.338
17	0.2243	125.899	125.9	3.9	2.778	1.209	3.987	3.30	60.491	2.598	1.389
18	0.2476	130.386	130.4	4.3	2.865	1.243	4.108	3.30	60.258	2.675	1.432
19	0.2714	134.844	134.8	4.7	2.950	1.278	4.227	3.31	60.017	2.753	1.475
20	0.2952	138.657	138.7	5.1	3.020	1.313	4.333	3.30	59.775	2.823	1.510
21	0.3218	142.744	142.7	5.6	3.094	1.357	4.451	3.28	59.469	2.904	1.547
22	0.3505	147.383	147.4	6.1	3.178	1.425	4.603	3.23	58.995	3.014	1.589

Test Readings for Specimen No. 3

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
23	0.3796	151.545	151.5	6.6	3.250	1.416	4.666	3.29	59.055	3.041	1.625
24	0.4092	155.530	155.5	7.1	3.317	1.457	4.774	3.28	58.771	3.116	1.659
25	0.4390	159.495	159.5	7.6	3.383	1.499	4.881	3.26	58.482	3.190	1.691
26	0.4685	163.293	163.3	8.1	3.444	1.544	4.988	3.23	58.169	3.266	1.722
27	0.4978	166.697	166.7	8.6	3.497	1.612	5.109	3.17	57.693	3.361	1.748
28	0.5275	170.334	170.3	9.1	3.553	1.599	5.151	3.22	57.788	3.375	1.776
29	0.5565	173.629	173.6	9.6	3.601	1.634	5.235	3.20	57.544	3.434	1.801
30	0.5851	176.826	176.8	10.1	3.648	1.669	5.316	3.19	57.302	3.493	1.824
31	0.6150	180.169	180.2	10.6	3.695	1.709	5.404	3.16	57.022	3.557	1.848
32	0.6443	183.620	183.6	11.2	3.745	1.766	5.510	3.12	56.630	3.638	1.872
33	0.6742	186.946	186.9	11.7	3.790	1.751	5.541	3.16	56.730	3.646	1.895
34	0.7036	190.142	190.1	12.2	3.833	1.784	5.617	3.15	56.502	3.700	1.916
35	0.7336	193.407	193.4	12.7	3.875	1.817	5.693	3.13	56.269	3.755	1.938
36	0.7630	196.782	196.8	13.2	3.920	1.858	5.778	3.11	55.985	3.818	1.960
37	0.7921	199.816	199.8	13.7	3.957	1.894	5.852	3.09	55.734	3.873	1.979
38	0.8213	203.050	203.1	14.2	3.998	1.896	5.894	3.11	55.722	3.895	1.999
39	0.8509	205.894	205.9	14.7	4.030	1.927	5.957	3.09	55.508	3.942	2.015
40	0.8803	208.479	208.5	15.2	4.056	1.958	6.014	3.07	55.295	3.986	2.028
41	0.8932	207.492	207.5	15.5	4.026	1.985	6.011	3.03	55.108	3.998	2.013

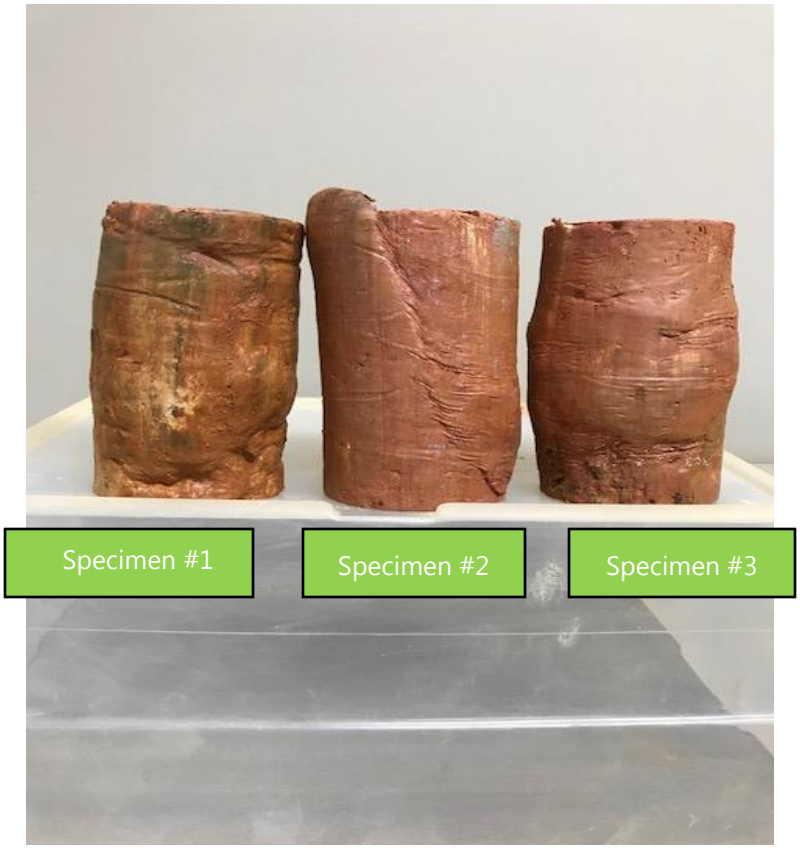
Project Name: Carolina Crossroads Project

Boring #: B-50

Depth: 13.5 – 15.5′

Sample #: UD-1

Test Type: Consolidated Undrained Triaxial Shear (ASTM D4767)



Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

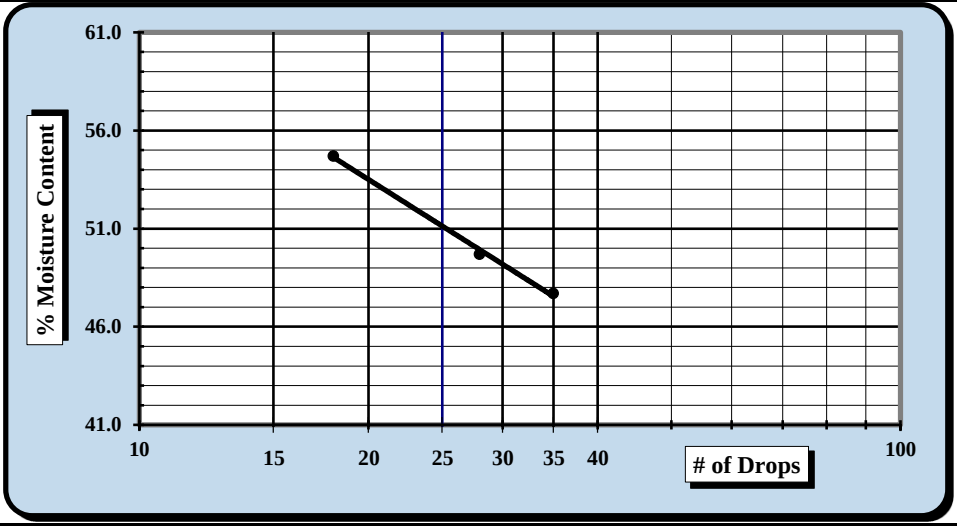
Project #:	1461-16-047.2B	Report Date:	5/18/18
Project Name:	Carolina Crossroads Project	Test Date:	5/16/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-50	Sample #:	UD-2	Sample Date:	Various
Location:	UD borings	Type:	Undisturbed	Depth:	35 - 37'

Sample Description: Sandy Fat Clay [CH, A-7-6(9)]

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	1	2	3				4	5	
A	Tare Weight	26.70	26.48	26.32				25.92	26.94	
B	Wet Soil Weight + A	40.66	43.66	41.90				33.96	34.64	
C	Dry Soil Weight + A	36.15	37.96	36.39				32.19	32.95	
D	Water Weight (B-C)	4.51	5.70	5.51				1.77	1.69	
E	Dry Soil Weight (C-A)	9.45	11.48	10.07				6.27	6.01	
F	% Moisture (D/E)*100	47.7%	49.7%	54.7%				28.2%	28.1%	
N	# OF DROPS	35	28	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**28.2%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**51**
Plastic Limit	**28**
Plastic Index	**23**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/18/18	Matthew F. Cooke, P.G.	5/18/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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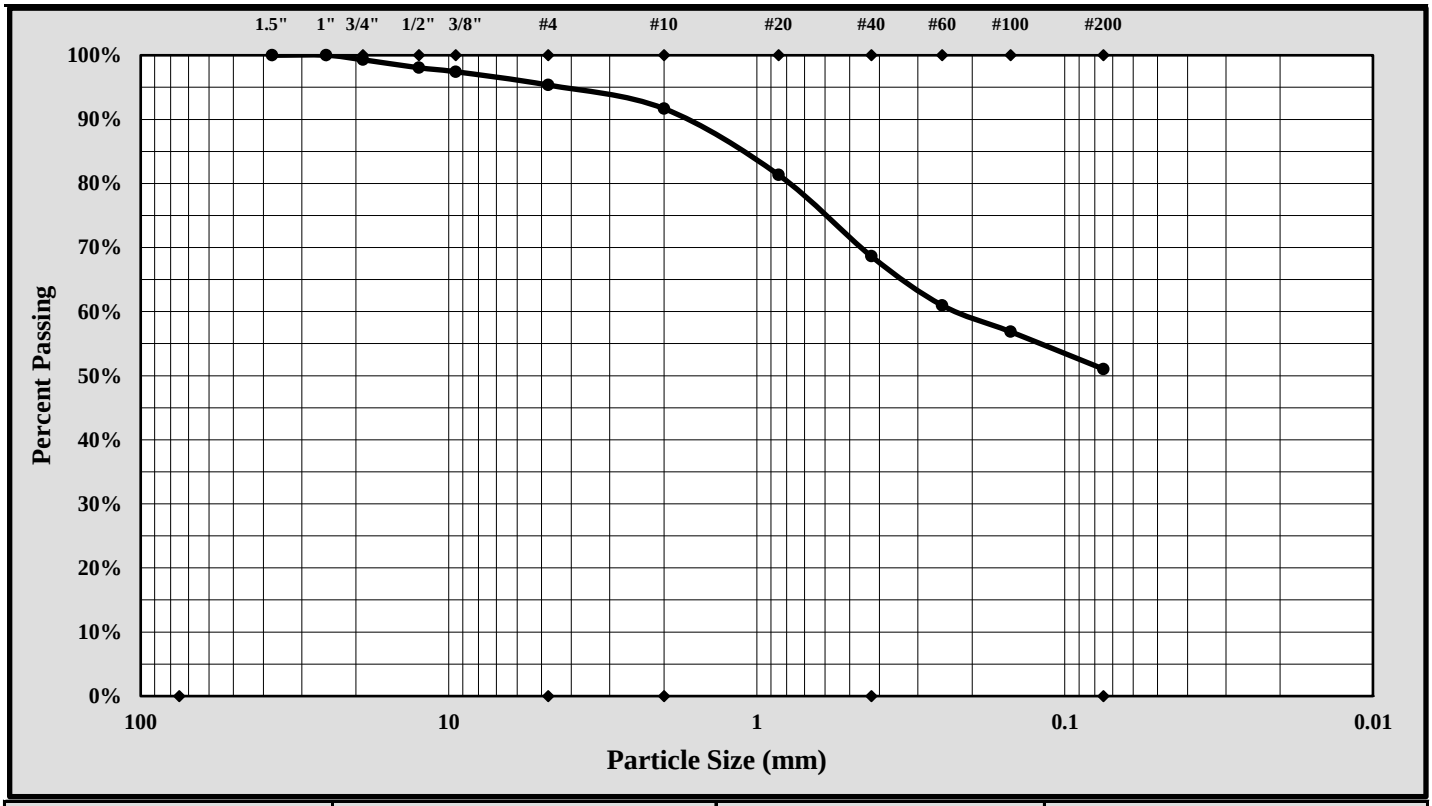
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/18/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/14 - 5/18/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-50	Sample #: UD-2	Sample Date: Various
Location:	UD borings	Type: Undisturbed	Depth: 35 - 37'
Sample Description:	Sandy Fat Clay [CH, A-7-6(9)]		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	19.0 mm	Gravel:	4.7%
Silt & Clay (% Passing #200):	51.0%	Total Sand:	44.3%

Liquid Limit	51	Plastic Limit	28	Plastic Index	23
Coarse Sand:	3.7%	Medium Sand:	23.0%	Fine Sand:	17.6%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/18/18 — *Date*

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Form No: TR-D854-1B
Revision No. 1
Revision Date: 08/09/17

SPECIFIC GRAVITY OF SOIL

Oven dried Specimens ASTM D 854 Method B

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/14/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/08 - 5/10/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-50	Sample #: UD-2	Sample Date: Various
Location:	UD Borings	Type: Undisturbed	Depth: 35 - 37'
Sample Description:	Sandy Fat Clay [CH, A-7-6(9)]		
Material Excluded:	4.7%		% Passing #4 Sieve: 95.3%

Balance ID.	*0.01 gram*	*ID#:*	*13942*	*Cal. Date:*	*8/18/17*	*Cal. Due:*	*8/18/18*
Pycnometer ID No.	*23162*	*Cal. Date:*	*2/10/18*	*Balance Verification*		Check Mass:	500 gram

Pycnometer Volume (V_p)	249.82	ml.	Mass Determination: 500.00 grams
Pycnometer Mass (PM)	115.03	grams	*If [PM-M_p] is greater than .06 grams,*
Ave. Pycnometer Mass (M_p)	115.03	grams	*recalibrate the dry mass of the pycnometer.*

Method B: Oven-dried Specimens

Soaking Time ASTM C127: 24 ± 4 hrs. ☐
Aggregate not initially dried ☐

Table 2 ASTM D 854	Specimen Dry Mass (g.)	
Soil Type	*250-ml. beaker*	*500-ml. beaker*
SP, SP-SM	*60 ± 10*	*100 ± 10*
SP-SC, SM, SC	*45 ± 10*	*75 ± 10*
Silt or Clay	*35 ± 5*	*50 ± 10*

Initial Dry Mass of Test Specimen - *not required.* grams

$M_{psw;t}$ = *Mass of the Pycnometer, soil, and water* = **388.44** *grams*

Mass of Dry Soil (grams)		Tare #	7
A	Tare Weight		192.22
C	Dry Wt. + Tare Wt.		230.33
M_s	Dry Weight	**C-A**	**38.11**

T_t =	Test Temperature T_t	**21.5** °C
K =	Temperature Coefficient at T_t	**0.99968**
K =	Temperature Coefficient at 23°C	**0.99933**
$p_{w;t}$ =	Density of Water at T_t	**0.99789** g./ml.

$M_{pw;t}$ =	Mass of the Pycnometer and water at T_t	$M_{pw;t} = M_p + (V_p \times p_{w;t})$	**364.32** grams
G_t =	Specific Gravity of Soil Solids at the T_t	$G_t = M_s / (M_{pw;t} - (M_{psw;t}-M_s))$	**2.724**
G =	Specific Gravity of Soil Solids at the 20°C	$G = K \times G_t$	**2.723**

Soils containing plus #4 material tested per ***ASTM C 127***

R = *% of Soil retained on the #4 sieve* **4.7%**
P = *% of Soil passing the #4 sieve* **95.3%**

G_{+4} Apparent Specific Gravity of plus #4 material at the 23°C per ASTM C127
Apparent Specific Gravity of plus #4 material corrected to 20°C

G_{total} *Total Sample Specific Gravity*

$$G_{total} = \frac{1}{\frac{R}{100 \times G_{+4}} + \frac{P}{100 \times G}} = 2.723$$

Notes / Deviations / References: ASTM D854: Specific Gravity of Soil Solids by Water Pycnometer

Matthew F. Cooke — *Project Manager*
Project Manager — *Position*
5/14/18 — Date

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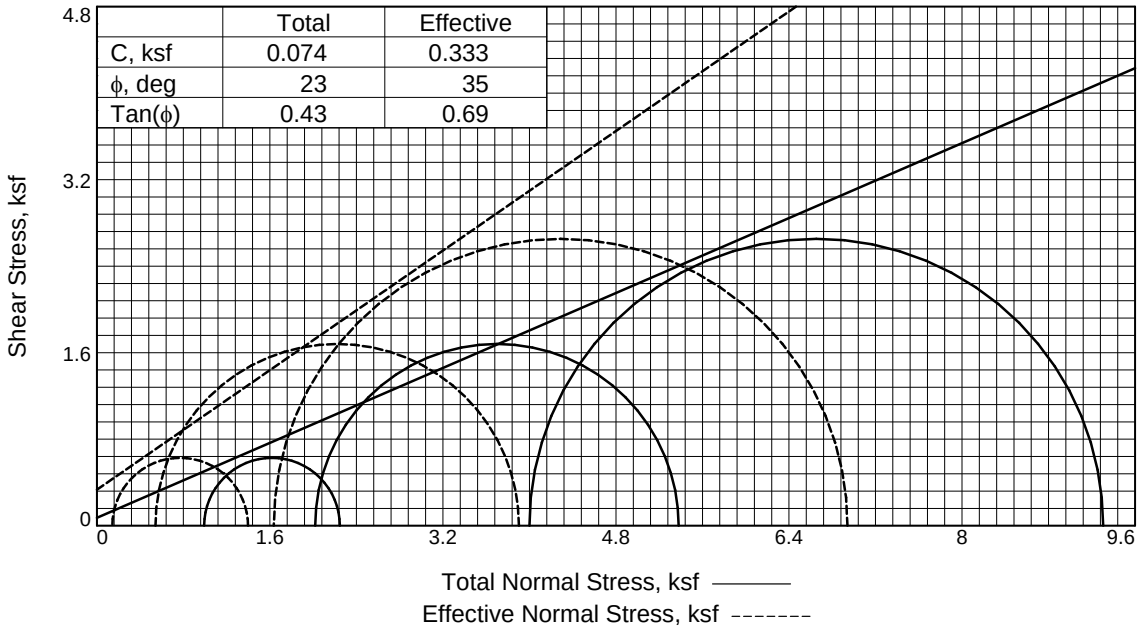
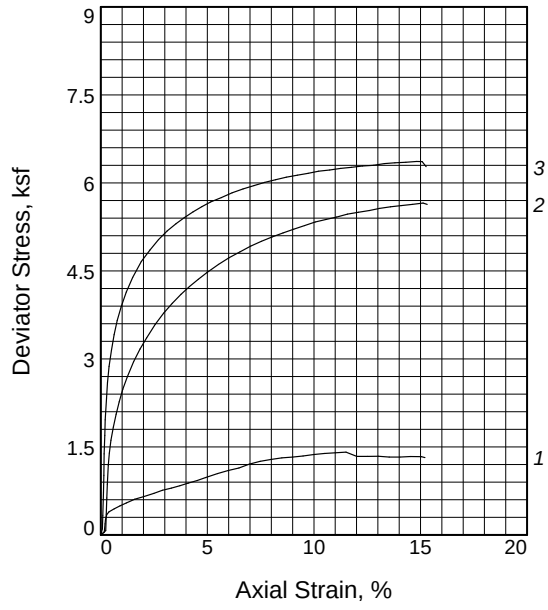
C & phi are not test results but an interpretation of the test results. The designer is responsible for interpreting test data as provided by S&ME.





Specimen No.		1	2	3
Initial	Water Content, %	15.1	20.5	23.0
	Dry Density, pcf	116.9	108.8	103.5
	Saturation, %	90.9	99.4	97.5
	Void Ratio	0.4538	0.5617	0.6422
	Diameter, in.	2.864	2.878	2.879
	Height, in.	5.152	5.354	5.512
At Test	Water Content, %	15.1	19.6	21.3
	Dry Density, pcf	120.4	110.8	107.5
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.4115	0.5338	0.5810
	Diameter, in.	2.827	2.862	2.844
	Height, in.	5.133	5.318	5.439
Strain rate, %/min.		0.25	0.25	0.25
Eff. Cell Pressure, ksf		0.992	2.019	4.000
Fail. Stress, ksf		1.255	3.361	5.305
Total Pore Pr., ksf		8.769	9.397	10.284
Strain, %		7.5	2.2	3.5
Ult. Stress, ksf		1.336	5.657	6.365
Total Pore Pr., ksf		8.668	7.789	9.301
Strain, %		15.0	15.1	15.1
$\bar{\sigma}_1$ Failure, ksf		1.397	3.903	6.941
$\bar{\sigma}_3$ Failure, ksf		0.143	0.542	1.636

Type of Test:
CU with Pore Pressures
Sample Type: Undisturbed
Description: Sandy Fat Clay [CH, A-7-6(9)]

LL= 51 **PL=** 28 **PI=** 23
Specific Gravity= 2.723
Remarks: Specimen failed with shear and bulging. Failure selected at peak obliquity. ASTM D4767.
Percent passing the #200 sieve: 51.0%
Figure 1

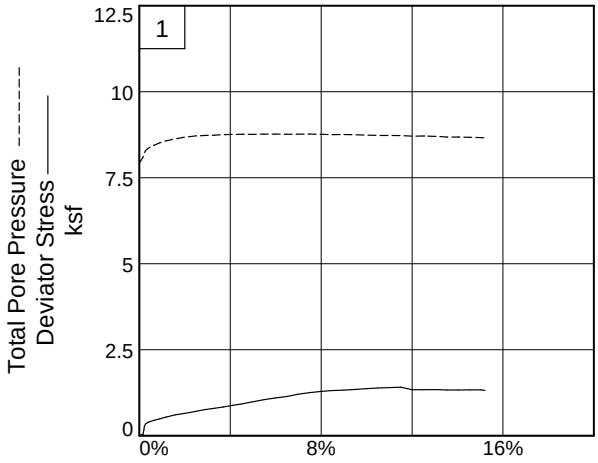
Client: HDR Engineering, Inc.

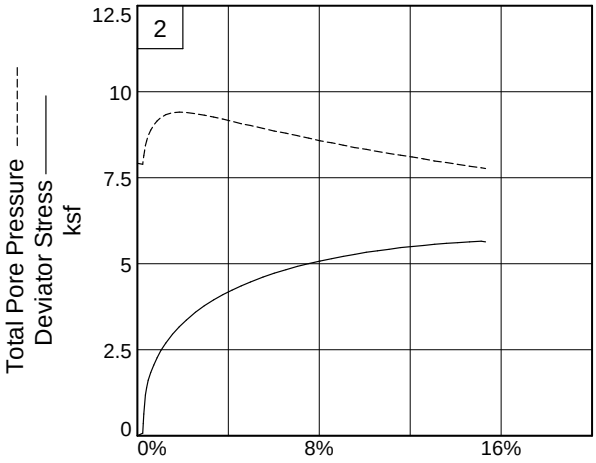
Project: Carolina Crossroads Project

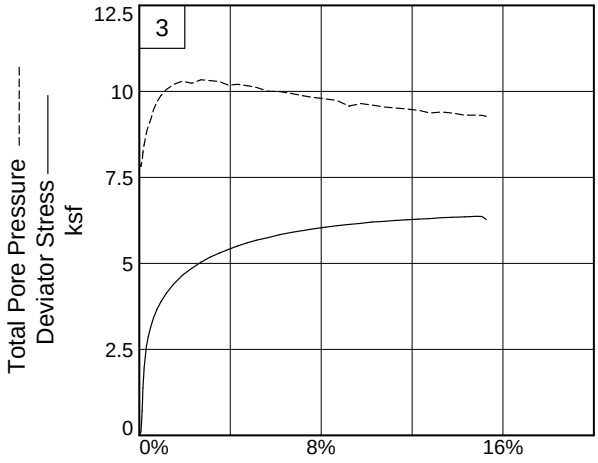
Location: UD borings
Sample Number: B-50 **Depth:** 35 - 37'
Proj. No.: 1461-16-047.2B **Date Sampled:** Various

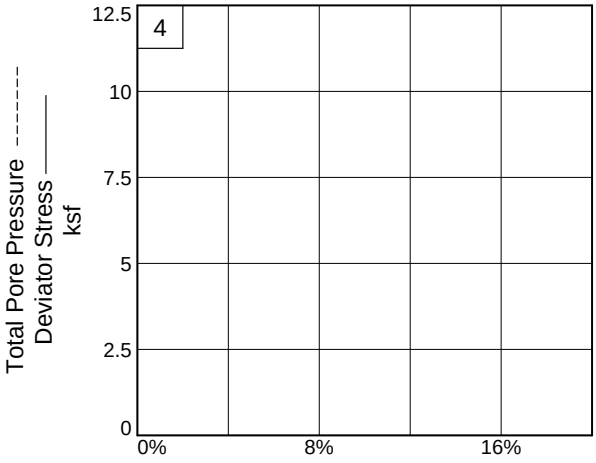
TRIAXIAL SHEAR TEST REPORT
S&ME, Inc.
Greenville, SC

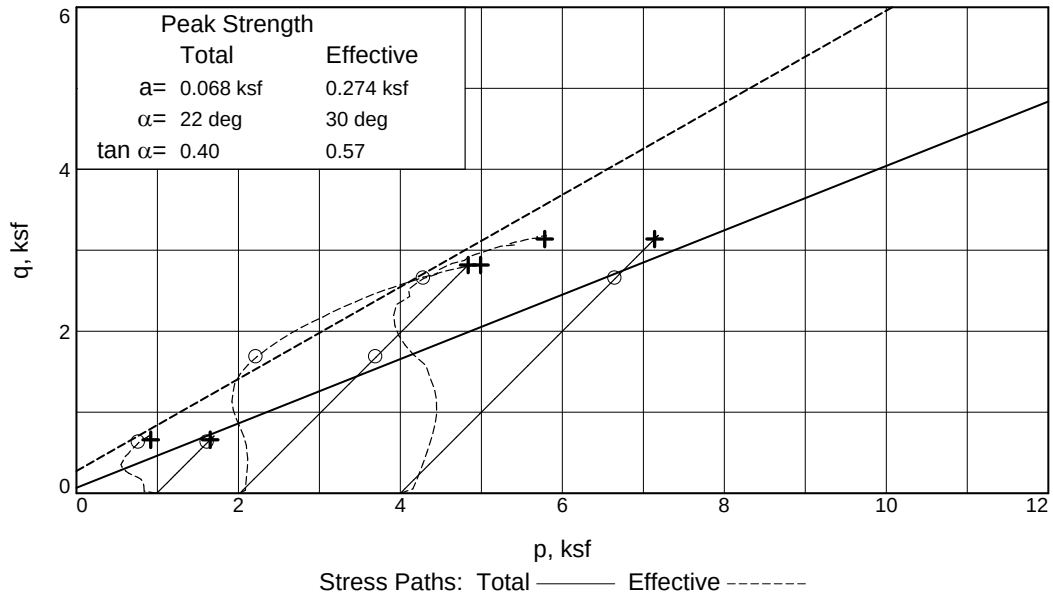
Tested By: Benjamin Kovaleski **Checked By:** Matthew F. Cooke, P.G.











Client: HDR Engineering, Inc.
Project: Carolina Crossroads Project
Location: UD borings **Depth:** 35 - 37' **Sample Number:** B-50
Project No.: 1461-16-047.2B **Figure** 2

S&ME, Inc.

Tested By: Benjamin Kovaleski **Checked By:** Matthew F. Cooke, P.G.

C & phi are not test results but an interpretation of the test results. The designer is responsible for interpreting test data as provided by S&ME.

TRIAXIAL COMPRESSION TEST 5/18/2018

CU with Pore Pressures 4:15 PM

Date: Various
Client: HDR Engineering, Inc.
Project: Carolina Crossroads Project
Project No.: 1461-16-047.2B
Location: UD borings
Depth: 35 - 37' **Sample Number:** B-50
Description: Sandy Fat Clay [CH, A-7-6(9)]
Remarks: Specimen failed with shear and bulging. Failure selected at peak obliquity. ASTM D4767. Percent passing the #200 sieve: 51.0%
Type of Sample: Undisturbed
Specific Gravity=2.723 **LL=**51 **PL=**28 **PI=**23
Test Method: ASTM D 4767 Method A

Parameters for Specimen No. 1

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	15.810			245.850
Moisture content: Dry soil+tare, gms.	13.730			213.570
Moisture content: Tare, gms.	0.000			0.000
Moisture, %	15.1	16.4	15.1	15.1
Moist specimen weight, gms.	1173.09			
Diameter, in.	2.864	2.860	2.827	
Area, in.²	6.442	6.425	6.278	
Height, in.	5.152	5.145	5.133	
Net decrease in height, in.		0.007	0.012	
Net decrease in water volume, cc.			13.600	
Wet density, pcf	134.6	136.7	138.6	
Dry density, pcf	116.9	117.4	120.4	
Void ratio	0.4538	0.4478	0.4115	
Saturation, %	90.9	100.0	100.0	

Test Readings for Specimen No. 1

Membrane modulus = .167543 kN/cm²
Membrane thickness = .03048 cm
Consolidation cell pressure = 61.890 psi (8.912 ksf)
Consolidation back pressure = 55.000 psi (7.920 ksf)
Consolidation effective confining stress = 0.992 ksf
Strain rate, %/min. = 0.25
Fail. Stress = 1.255 ksf **at reading no.** 22
Ult. Stress = 1.336 ksf **at reading no.** 37

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
0	0.0000	0.000	0.0	0.0	0.000	0.992	0.992	1.00	55.000	0.992	0.000
1	0.0085	2.156	2.2	0.2	0.049	0.812	0.862	1.06	56.248	0.837	0.025
2	0.0104	8.268	8.3	0.2	0.189	0.738	0.927	1.26	56.767	0.832	0.095
3	0.0113	11.383	11.4	0.2	0.261	0.692	0.953	1.38	57.083	0.822	0.130
4	0.0140	15.021	15.0	0.3	0.344	0.626	0.970	1.55	57.542	0.798	0.172
5	0.0196	17.274	17.3	0.4	0.395	0.558	0.953	1.71	58.013	0.756	0.197
6	0.0324	19.600	19.6	0.6	0.447	0.469	0.916	1.95	58.634	0.692	0.223
7	0.0464	21.795	21.8	0.9	0.495	0.396	0.891	2.25	59.143	0.643	0.248
8	0.0618	24.090	24.1	1.2	0.546	0.336	0.882	2.62	59.556	0.609	0.273
9	0.0818	27.014	27.0	1.6	0.610	0.282	0.891	3.17	59.934	0.586	0.305
10	0.1030	29.073	29.1	2.0	0.653	0.233	0.886	3.81	60.272	0.560	0.327
11	0.1282	31.769	31.8	2.5	0.710	0.195	0.906	4.64	60.533	0.551	0.355
12	0.1482	34.212	34.2	2.9	0.762	0.184	0.946	5.15	60.615	0.565	0.381
13	0.1697	36.049	36.0	3.3	0.800	0.177	0.976	5.52	60.663	0.577	0.400
14	0.1903	38.050	38.1	3.7	0.840	0.160	1.000	6.26	60.780	0.580	0.420
15	0.2110	40.258	40.3	4.1	0.885	0.153	1.038	6.80	60.830	0.595	0.443
16	0.2322	42.410	42.4	4.5	0.929	0.148	1.077	7.28	60.863	0.612	0.464
17	0.2520	44.833	44.8	4.9	0.978	0.151	1.129	7.47	60.841	0.640	0.489
18	0.2808	48.247	48.2	5.5	1.046	0.144	1.190	8.25	60.887	0.667	0.523
19	0.3065	50.940	50.9	6.0	1.099	0.144	1.243	8.62	60.889	0.693	0.549
20	0.3326	53.210	53.2	6.5	1.141	0.148	1.289	8.72	60.863	0.719	0.571
21	0.3576	56.544	56.5	7.0	1.207	0.147	1.353	9.23	60.872	0.750	0.603
22	0.3838	59.123	59.1	7.5	1.255	0.143	1.397	9.79	60.898	0.770	0.627
23	0.4097	60.991	61.0	8.0	1.287	0.150	1.437	9.60	60.850	0.793	0.644
24	0.4362	62.641	62.6	8.5	1.315	0.160	1.475	9.20	60.777	0.818	0.657
25	0.4621	63.656	63.7	9.0	1.329	0.157	1.486	9.45	60.798	0.822	0.664
26	0.4871	64.800	64.8	9.5	1.345	0.163	1.509	9.24	60.756	0.836	0.673
27	0.5130	66.366	66.4	10.0	1.370	0.175	1.545	8.84	60.676	0.860	0.685
28	0.5389	67.664	67.7	10.5	1.389	0.182	1.571	8.63	60.626	0.877	0.695
29	0.5647	68.581	68.6	11.0	1.400	0.184	1.584	8.60	60.611	0.884	0.700
30	0.5906	69.606	69.6	11.5	1.413	0.186	1.599	8.61	60.601	0.892	0.706
31	0.6164	69.898	69.9	12.0	1.339	0.203	1.543	7.58	60.477	0.873	0.670
32	0.6426	70.487	70.5	12.5	1.340	0.200	1.540	7.71	60.504	0.870	0.670
33	0.6689	71.090	71.1	13.0	1.341	0.209	1.550	7.42	60.439	0.879	0.670
34	0.6947	71.054	71.1	13.5	1.329	0.228	1.557	6.82	60.305	0.893	0.664
35	0.7202	71.613	71.6	14.0	1.329	0.229	1.557	6.81	60.302	0.893	0.664
36	0.7457	72.566	72.6	14.5	1.336	0.236	1.573	6.66	60.249	0.904	0.668
37	0.7722	73.134	73.1	15.0	1.336	0.244	1.580	6.48	60.196	0.912	0.668
38	0.7804	72.461	72.5	15.2	1.319	0.258	1.577	6.12	60.101	0.917	0.660

Parameters for Specimen No. 2

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	36.450			251.200
Moisture content: Dry soil+tare, gms.	30.250			210.020
Moisture content: Tare, gms.	0.000			0.000
Moisture, %	20.5	20.5	19.6	19.6
Moist specimen weight, gms.	1199.13			
Diameter, in.	2.878	2.875	2.862	
Area, in.²	6.505	6.493	6.432	
Height, in.	5.354	5.349	5.318	
Net decrease in height, in.		0.005	0.031	
Net decrease in water volume, cc.			8.600	
Wet density, pcf	131.2	131.5	132.6	
Dry density, pcf	108.8	109.2	110.8	
Void ratio	0.5617	0.5573	0.5338	
Saturation, %	99.4	100.0	100.0	

Test Readings for Specimen No. 2

Membrane modulus = .167543 kN/cm²
Membrane thickness = .03048 cm
Consolidation cell pressure = 69.020 psi (9.939 ksf)
Consolidation back pressure = 55.000 psi (7.920 ksf)
Consolidation effective confining stress = 2.019 ksf
Strain rate, %/min. = 0.25
Fail. Stress = 3.361 ksf **at reading no.** 15
Ult. Stress = 5.657 ksf **at reading no.** 42

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
0	0.0000	0.000	0.0	0.0	0.000	2.019	2.019	1.00	55.000	2.019	0.000
1	0.0124	3.284	3.3	0.2	0.073	2.049	2.122	1.04	54.790	2.086	0.037
2	0.0135	15.819	15.8	0.3	0.353	1.920	2.274	1.18	55.684	2.097	0.177
3	0.0149	28.276	28.3	0.3	0.631	1.796	2.427	1.35	56.550	2.111	0.316
4	0.0164	38.605	38.6	0.3	0.862	1.683	2.545	1.51	57.329	2.114	0.431
5	0.0186	53.037	53.0	0.3	1.183	1.505	2.689	1.79	58.565	2.097	0.592
6	0.0215	62.473	62.5	0.4	1.393	1.371	2.764	2.02	59.496	2.068	0.696
7	0.0253	72.471	72.5	0.5	1.615	1.215	2.829	2.33	60.585	2.022	0.807
8	0.0311	82.558	82.6	0.6	1.837	1.055	2.893	2.74	61.691	1.974	0.919
9	0.0383	92.560	92.6	0.7	2.057	0.908	2.965	3.27	62.714	1.937	1.029
10	0.0461	102.230	102.2	0.9	2.269	0.786	3.055	3.89	63.560	1.921	1.134
11	0.0550	112.118	112.1	1.0	2.484	0.691	3.175	4.59	64.219	1.933	1.242
12	0.0662	121.926	121.9	1.2	2.696	0.605	3.301	5.46	64.818	1.953	1.348
13	0.0820	133.923	133.9	1.5	2.952	0.548	3.500	6.38	65.213	2.024	1.476
14	0.0978	144.197	144.2	1.8	3.169	0.533	3.702	6.95	65.320	2.117	1.584
15	0.1145	153.427	153.4	2.2	3.361	0.542	3.903	7.20	65.258	2.222	1.680
16	0.1357	164.542	164.5	2.6	3.590	0.577	4.167	7.22	65.010	2.372	1.795
17	0.1566	173.931	173.9	2.9	3.779	0.621	4.401	7.08	64.704	2.511	1.890
18	0.1784	182.526	182.5	3.4	3.949	0.674	4.623	6.86	64.341	2.648	1.975
19	0.2000	190.357	190.4	3.8	4.101	0.734	4.836	6.58	63.920	2.785	2.051
20	0.2214	197.343	197.3	4.2	4.234	0.798	5.032	6.30	63.477	2.915	2.117
21	0.2431	203.916	203.9	4.6	4.356	0.869	5.226	6.01	62.982	3.048	2.178
22	0.2644	210.171	210.2	5.0	4.471	0.920	5.391	5.86	62.633	3.155	2.236

Test Readings for Specimen No. 2

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
23	0.2937	218.096	218.1	5.5	4.613	1.003	5.616	5.60	62.052	3.310	2.306
24	0.3201	224.576	224.6	6.0	4.725	1.082	5.807	5.37	61.505	3.445	2.362
25	0.3474	230.566	230.6	6.5	4.824	1.144	5.968	5.22	61.079	3.556	2.412
26	0.3739	236.539	236.5	7.0	4.923	1.216	6.139	5.05	60.577	3.677	2.462
27	0.4007	241.837	241.8	7.5	5.006	1.288	6.294	4.89	60.075	3.791	2.503
28	0.4274	246.704	246.7	8.0	5.079	1.367	6.446	4.72	59.530	3.906	2.540
29	0.4547	251.416	251.4	8.6	5.147	1.425	6.572	4.61	59.123	3.999	2.574
30	0.4812	256.000	256.0	9.0	5.212	1.492	6.704	4.49	58.662	4.098	2.606
31	0.5085	260.400	260.4	9.6	5.272	1.563	6.835	4.37	58.168	4.199	2.636
32	0.5351	264.963	265.0	10.1	5.335	1.614	6.949	4.30	57.808	4.282	2.667
33	0.5619	268.552	268.6	10.6	5.377	1.675	7.052	4.21	57.388	4.363	2.688
34	0.5885	272.114	272.1	11.1	5.418	1.732	7.150	4.13	56.992	4.441	2.709
35	0.6154	276.204	276.2	11.6	5.468	1.785	7.253	4.06	56.621	4.519	2.734
36	0.6426	279.508	279.5	12.1	5.501	1.836	7.337	4.00	56.271	4.586	2.751
37	0.6700	282.652	282.7	12.6	5.531	1.893	7.423	3.92	55.877	4.658	2.765
38	0.6956	286.020	286.0	13.1	5.566	1.954	7.520	3.85	55.451	4.737	2.783
39	0.7229	289.227	289.2	13.6	5.595	1.999	7.594	3.80	55.139	4.796	2.797
40	0.7496	291.911	291.9	14.1	5.614	2.050	7.664	3.74	54.781	4.857	2.807
41	0.7773	294.771	294.8	14.6	5.634	2.104	7.738	3.68	54.410	4.921	2.817
42	0.8041	297.685	297.7	15.1	5.657	2.150	7.806	3.63	54.092	4.978	2.828
43	0.8144	297.257	297.3	15.3	5.636	2.172	7.808	3.59	53.934	4.990	2.818

Parameters for Specimen No. 3

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	15.400			251.450
Moisture content: Dry soil+tare, gms.	12.520			207.250
Moisture content: Tare, gms.	0.000			0.000
Moisture, %	23.0	22.9	21.3	21.3
Moist specimen weight, gms.	1199.30			
Diameter, in.	2.879	2.868	2.844	
Area, in.²	6.510	6.460	6.351	
Height, in.	5.512	5.491	5.439	
Net decrease in height, in.		0.021	0.052	
Net decrease in water volume, cc.			15.200	
Wet density, pcf	127.3	128.7	130.5	
Dry density, pcf	103.5	104.7	107.5	
Void ratio	0.6422	0.6234	0.5810	
Saturation, %	97.5	100.0	100.0	

Test Readings for Specimen No. 3

Membrane modulus = .167543 kN/cm²
Membrane thickness = .03048 cm
Consolidation cell pressure = 82.780 psi (11.920 ksf)
Consolidation back pressure = 55.000 psi (7.920 ksf)
Consolidation effective confining stress = 4.000 ksf
Strain rate, %/min. = 0.25
Fail. Stress = 5.305 ksf **at reading no.** 21
Ult. Stress = 6.365 ksf **at reading no.** 45

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
0	0.0000	0.000	0.0	0.0	0.000	4.000	4.000	1.00	55.000	4.000	0.000
1	0.0040	4.675	4.7	0.1	0.106	4.101	4.207	1.03	54.301	4.154	0.053
2	0.0050	14.771	14.8	0.1	0.335	4.036	4.371	1.08	54.749	4.204	0.167
3	0.0068	31.634	31.6	0.1	0.716	3.918	4.635	1.18	55.569	4.277	0.358
4	0.0077	44.936	44.9	0.1	1.017	3.820	4.838	1.27	56.249	4.329	0.509
5	0.0086	61.058	61.1	0.2	1.382	3.697	5.079	1.37	57.104	4.388	0.691
6	0.0101	74.906	74.9	0.2	1.695	3.579	5.274	1.47	57.925	4.427	0.848
7	0.0114	86.714	86.7	0.2	1.962	3.466	5.428	1.57	58.709	4.447	0.981
8	0.0148	103.026	103.0	0.3	2.329	3.280	5.609	1.71	60.004	4.444	1.165
9	0.0170	114.655	114.7	0.3	2.591	3.123	5.714	1.83	61.095	4.418	1.296
10	0.0213	127.200	127.2	0.4	2.873	2.927	5.799	1.98	62.457	4.363	1.436
11	0.0272	139.521	139.5	0.5	3.147	2.744	5.891	2.15	63.727	4.317	1.574
12	0.0339	151.490	151.5	0.6	3.413	2.459	5.872	2.39	65.702	4.166	1.707
13	0.0418	162.487	162.5	0.8	3.656	2.231	5.887	2.64	67.287	4.059	1.828
14	0.0521	173.287	173.3	1.0	3.891	2.036	5.927	2.91	68.642	3.981	1.946
15	0.0652	184.828	184.8	1.2	4.140	1.861	6.001	3.22	69.856	3.931	2.070
16	0.0813	196.560	196.6	1.5	4.390	1.722	6.112	3.55	70.819	3.917	2.195
17	0.1033	209.552	209.6	1.9	4.661	1.623	6.284	3.87	71.510	3.953	2.330
18	0.1254	219.302	219.3	2.3	4.857	1.686	6.543	3.88	71.074	4.114	2.429
19	0.1473	228.238	228.2	2.7	5.035	1.584	6.618	4.18	71.783	4.101	2.517
20	0.1695	235.940	235.9	3.1	5.183	1.605	6.788	4.23	71.635	4.196	2.591
21	0.1920	242.528	242.5	3.5	5.305	1.636	6.941	4.24	71.420	4.288	2.652
22	0.2135	248.319	248.3	3.9	5.409	1.743	7.152	4.10	70.677	4.447	2.705

Test Readings for Specimen No. 3

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
23	0.2355	253.921	253.9	4.3	5.508	1.714	7.222	4.21	70.878	4.468	2.754
24	0.2580	259.153	259.2	4.7	5.597	1.755	7.352	4.19	70.592	4.554	2.798
25	0.2801	263.950	263.9	5.1	5.676	1.804	7.480	4.15	70.254	4.642	2.838
26	0.3076	268.805	268.8	5.7	5.750	1.918	7.668	4.00	69.458	4.793	2.875
27	0.3353	274.170	274.2	6.2	5.833	1.923	7.756	4.03	69.426	4.839	2.916
28	0.3630	278.770	278.8	6.7	5.899	1.978	7.877	3.98	69.041	4.928	2.949
29	0.3909	282.981	283.0	7.2	5.955	2.044	7.999	3.91	68.582	5.022	2.977
30	0.4182	287.154	287.2	7.7	6.010	2.100	8.110	3.86	68.199	5.105	3.005
31	0.4461	290.878	290.9	8.2	6.054	2.138	8.192	3.83	67.934	5.165	3.027
32	0.4732	294.595	294.6	8.7	6.098	2.187	8.285	3.79	67.590	5.236	3.049
33	0.5014	297.913	297.9	9.2	6.132	2.348	8.480	3.61	66.476	5.414	3.066
34	0.5292	301.211	301.2	9.7	6.165	2.274	8.439	3.71	66.989	5.356	3.082
35	0.5560	304.653	304.7	10.2	6.201	2.316	8.517	3.68	66.699	5.416	3.101
36	0.5844	307.446	307.4	10.7	6.222	2.372	8.594	3.62	66.308	5.483	3.111
37	0.6120	310.477	310.5	11.3	6.247	2.402	8.649	3.60	66.098	5.526	3.124
38	0.6395	313.271	313.3	11.8	6.267	2.433	8.700	3.58	65.884	5.567	3.134
39	0.6678	316.164	316.2	12.3	6.288	2.469	8.757	3.55	65.634	5.613	3.144
40	0.6956	318.683	318.7	12.8	6.301	2.549	8.850	3.47	65.081	5.699	3.151
41	0.7235	322.055	322.1	13.3	6.330	2.521	8.852	3.51	65.270	5.687	3.165
42	0.7505	324.550	324.5	13.8	6.343	2.550	8.893	3.49	65.071	5.722	3.172
43	0.7785	327.018	327.0	14.3	6.353	2.613	8.966	3.43	64.635	5.789	3.177
44	0.8060	329.693	329.7	14.8	6.367	2.609	8.976	3.44	64.661	5.793	3.184
45	0.8200	330.574	330.6	15.1	6.365	2.619	8.984	3.43	64.591	5.802	3.182
46	0.8303	326.751	326.8	15.3	6.277	2.644	8.921	3.37	64.422	5.782	3.139

Project Name: Carolina Crossroads Project

Boring #: B-50

Depth: 35 - 37′

Sample #: UD-2

Test Type: Consolidated Undrained Triaxial Shear (ASTM D4767)

Specimen #1 Specimen #2 Specimen #3

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

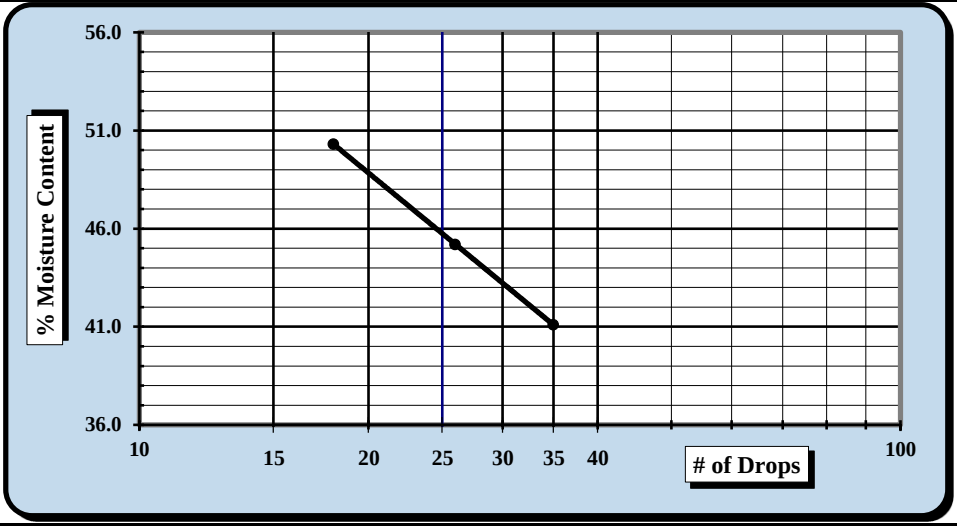
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/23/18
Project Name:	Carolina Crossroads Project	Test Date:	5/14/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-56	Sample #:	UD-1	Sample Date:	Various
Location:	UD borings	Type:	Undisturbed	Depth:	18.5 - 20.5'
Sample Description:	Silty Sand [SM, A-2-7(1)]				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	16	17	18				19	20	
A	Tare Weight	26.57	26.63	26.77				26.66	26.83	
B	Wet Soil Weight + A	38.63	38.09	41.71				34.01	33.20	
C	Dry Soil Weight + A	35.12	34.52	36.71				32.37	31.79	
D	Water Weight (B-C)	3.51	3.57	5.00				1.64	1.41	
E	Dry Soil Weight (C-A)	8.55	7.89	9.94				5.71	4.96	
F	% Moisture (D/E)*100	41.1%	45.2%	50.3%				28.7%	28.4%	
N	# OF DROPS	35	26	18				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**28.6%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**46**
Plastic Limit	**29**
Plastic Index	**17**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/23/18	Matthew F. Cooke, P.G.	5/23/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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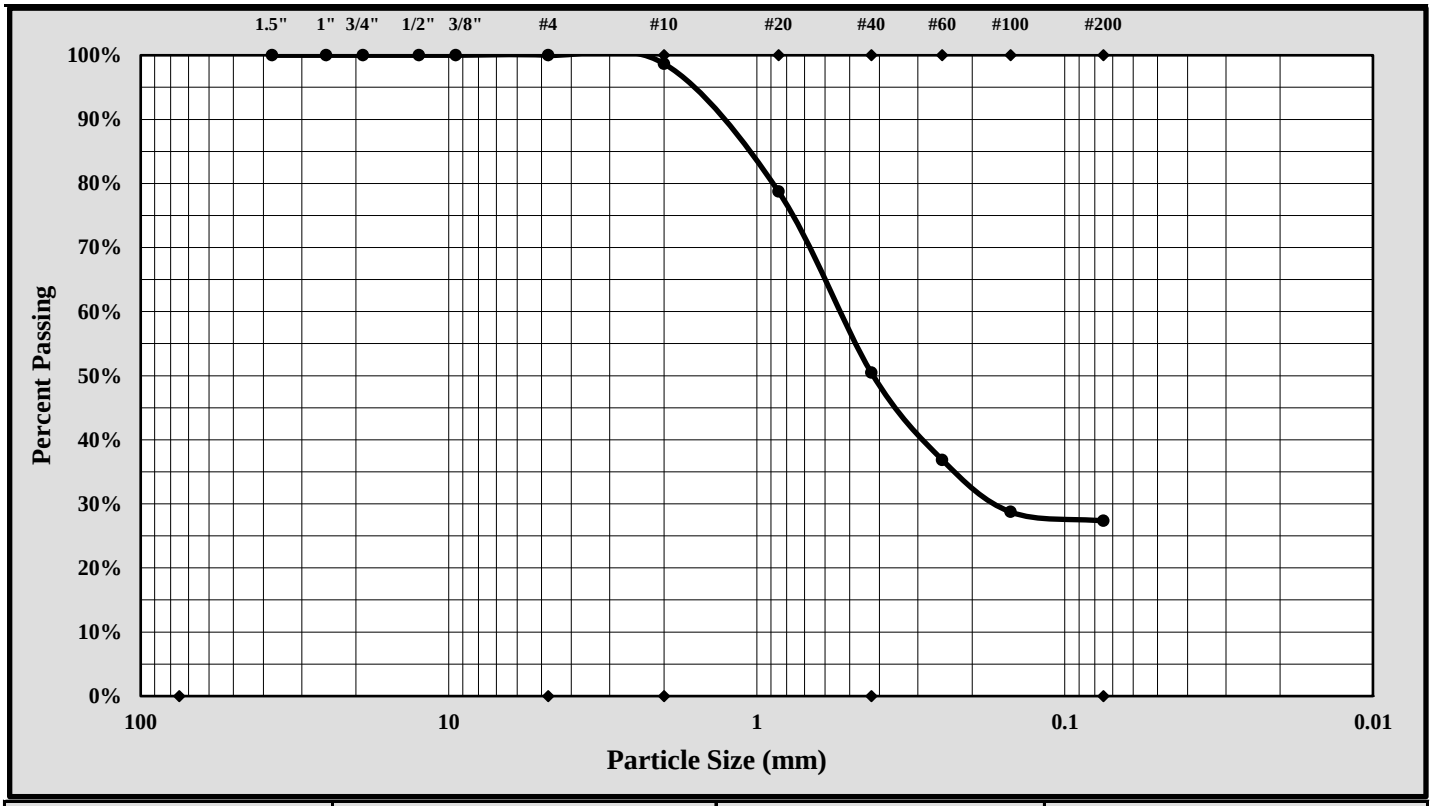
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/05 - 5/14/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-56	Sample #: UD-1	Sample Date: Various
Location:	UD borings	Type: Undisturbed	Depth: 18.5 - 20.5'
Sample Description:	Silty Sand [SM, A-2-7(1)]		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.0%
Silt & Clay (% Passing #200):	27.3%	Total Sand:	72.7%

Liquid Limit	46	Plastic Limit	29	Plastic Index	17
Coarse Sand:	1.3%	Medium Sand:	48.2%	Fine Sand:	23.2%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/23/18 — *Date*

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Form No: TR-D854-1B
Revision No. 1
Revision Date: 08/09/17

SPECIFIC GRAVITY OF SOIL

Oven dried Specimens ASTM D 854 Method B

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/23/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/02 - 5/04/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-56	Sample #: UD-1	Sample Date: Various
Location:	UD Borings	Type: Undisturbed	Depth: 18.5 - 20.5'
Sample Description:	Silty Sand [SM, A-2-7(1)]		
Material Excluded:	0%		% Passing #4 Sieve: 100.0%

Balance ID. *0.01 gram* *ID#:* *13942* *Cal. Date:* *8/18/17* *Cal. Due:* *8/18/18*

Pycnometer ID No. *23169* *Cal. Date:* *3/10/18* *Balance Verification* Check Mass: 500 gram

Pycnometer Volume (V_p)	249.73	ml.	Mass Determination: 500.00 grams
Pycnometer Mass (PM)	104.28	grams	*If [PM-M_p] is greater than .06 grams,*
Ave. Pycnometer Mass (M_p)	104.28	grams	*recalibrate the dry mass of the pycnometer.*

Method B: Oven-dried Specimens

Soaking Time ASTM C127: 24 ± 4 hrs. ☐
Aggregate not initially dried ☐

Table 2 ASTM D 854	Specimen Dry Mass (g.)	
Soil Type	*250-ml. beaker*	*500-ml. beaker*
SP, SP-SM	*60 ± 10*	*100 ± 10*
SP-SC, SM, SC	*45 ± 10*	*75 ± 10*
Silt or Clay	*35 ± 5*	*50 ± 10*

Initial Dry Mass of Test Specimen - *not required.* grams

$M_{psw;t}$ = *Mass of the Pycnometer, soil, and water =* **377.67** *grams*

Mass of Dry Soil (grams)		Tare #	BB-8
A	Tare Weight		204.25
C	Dry Wt. + Tare Wt.		243.03
M_s	Dry Weight	**C-A**	**38.78**

T_t =	Test Temperature T_t	**21.4** °C
K =	Temperature Coefficient at T_t	**0.99970**
K =	Temperature Coefficient at 23°C	**0.99933**
$p_{w;t}$ =	Density of Water at T_t	**0.99791** g./ml.

$M_{pw;t}$ =	Mass of the Pycnometer and water at T_t	$M_{pw;t} = M_p + (V_p \times p_{w;t})$	**353.49** grams
G_t =	Specific Gravity of Soil Solids at the T_t	$G_t = M_s / (M_{pw;t} - (M_{psw;t}-M_s))$	**2.656**
G =	Specific Gravity of Soil Solids at the 20°C	$G = K \times G_t$	**2.655**

Soils containing plus #4 material tested per **ASTM C 127**

R = *% of Soil retained on the #4 sieve* **0.0%**
P = *% of Soil passing the #4 sieve* **100.0%**

G_{+4} Apparent Specific Gravity of plus #4 material at the 23°C per ASTM C127
Apparent Specific Gravity of plus #4 material corrected to 20°C

G_{total} *Total Sample Specific Gravity*

$$G_{total} = \frac{1}{\frac{R}{100 \times G_{+4}} + \frac{P}{100 \times G}} = 2.655$$

Notes / Deviations / References: ASTM D854: Specific Gravity of Soil Solids by Water Pycnometer

Matthew F. Cooke — *Project Manager*
Project Manager — *Position*
5/23/18 — Date

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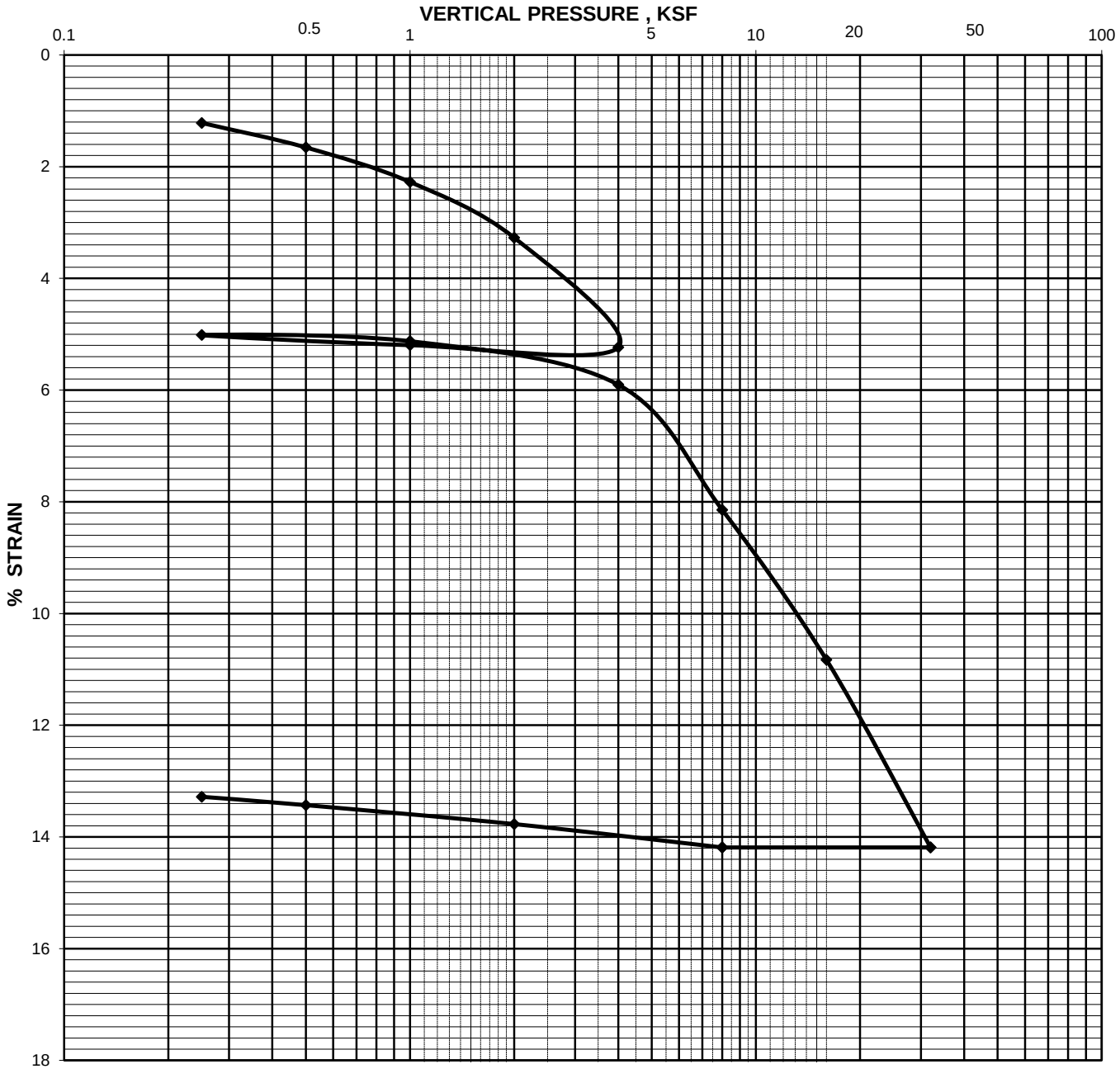
CONSOLIDATION TEST REPORT

(ASTM D 2435)

Project Name:	Carolina Crossroads Project				
Project No.:	**1461-16-047.2B**			**Report Date:**	5/23/2018
Client Name:	HDR Engineering, Inc.			**Boring No.:**	B-56
Client Address:	4400 Leeds Ave., North Charleston, South Carolina			**Depth/Elev.:**	18.5 - 20.5'
Initial Wet Density,γ_{wet}, pcf:	116.7	**Load vs. Time Plot:**	Log of time	**Sample Type:**	Undisturbed
Initial Void Ratio, e_o:	0.702	**Final Void Ratio, e_f:**	0.476	**Log No.:**	UD-1
Initial Saturation, S_O, %:	75.2	**Final Saturation, S_f, %:**	100.0	**Sp. Gravity, G_S:**	2.655
Initial Dry Density, γ_{DRY}, pcf:	97.3	**Final Dry Density,γ_{DRY},pcf:**	107.2	**Estimated Preconsolidation**	
Initial Moisture Content, %.:	19.9	**Final Moisture Content, %:**	21.7	**Stress, P_e, ksf:**	6.6
Liquid Limit, %:	46	**Plasticity Index, %:**	17	**Fines, %:**	27.3
Sample Description:	Silty Sand [SM, A-2-7(1)]				
Remolded Properties:	-	-		-	

Notes: Loading Schedule - (ksf) - 0.25, 0.5, 1.0, 2.0, 4.0, 1.0, 0.25, 1.0, 4.0, 8.0, 16.0, 32.0, 8.0, 2.0, 0.5, 0.25

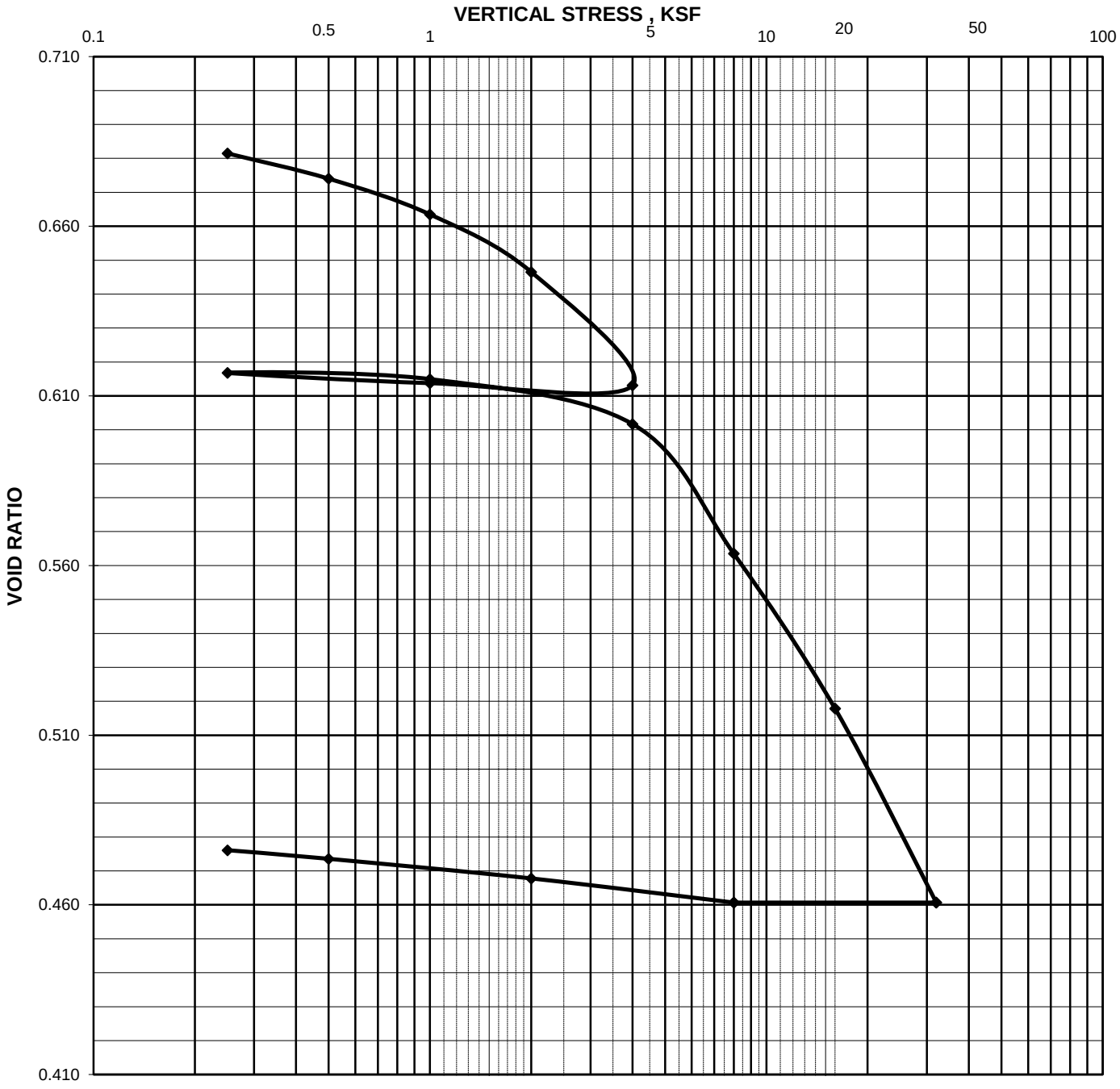


CONSOLIDATION TEST REPORT

(ASTM D 2435)

Project Name:	Carolina Crossroads Project				
Project No.:	**1461-16-047.2B**			**Report Date:**	5/23/2018
Client Name:	HDR Engineering, Inc.			**Boring No.:**	B-56
Client Address:	4400 Leeds Ave., North Charleston, South Carolina			**Depth/Elev.:**	18.5 - 20.5'
Initial Wet Density, γ_{wet}, pcf:	116.7	**Load vs. Time Plot:**	Log of time	**Sample Type:**	Undisturbed
Initial Void Ratio, e_o:	0.702	**Final Void Ratio, e_f:**	0.476	**Log No.:**	UD-1
Initial Saturation, S_O, %:	75.2	**Final Saturation, S_f, %:**	100.0	**Sp. Gravity, G_S:**	2.655
Initial Dry Density, γ_{DRY}, pcf:	97.3	**Final Dry Density, γ_{DRY}, pcf:**	107.2	**Estimated Preconsolidation**	
Initial Moisture Content, %.:	19.9	**Final Moisture Content, %:**	21.7	**Stress, P_e, ksf:**	6.6
Liquid Limit, %:	46	**Plasticity Index, %:**	17	**Fines, %:**	27.3
Sample Description:	Silty Sand [SM, A-2-7(1)]				
Remolded Properties:	-	-		-	

Notes: Loading Schedule - (ksf) - 0.25, 0.5, 1.0, 2.0, 4.0, 1.0, 0.25, 1.0, 4.0, 8.0, 16.0, 32.0, 8.0, 2.0, 0.5, 0.25

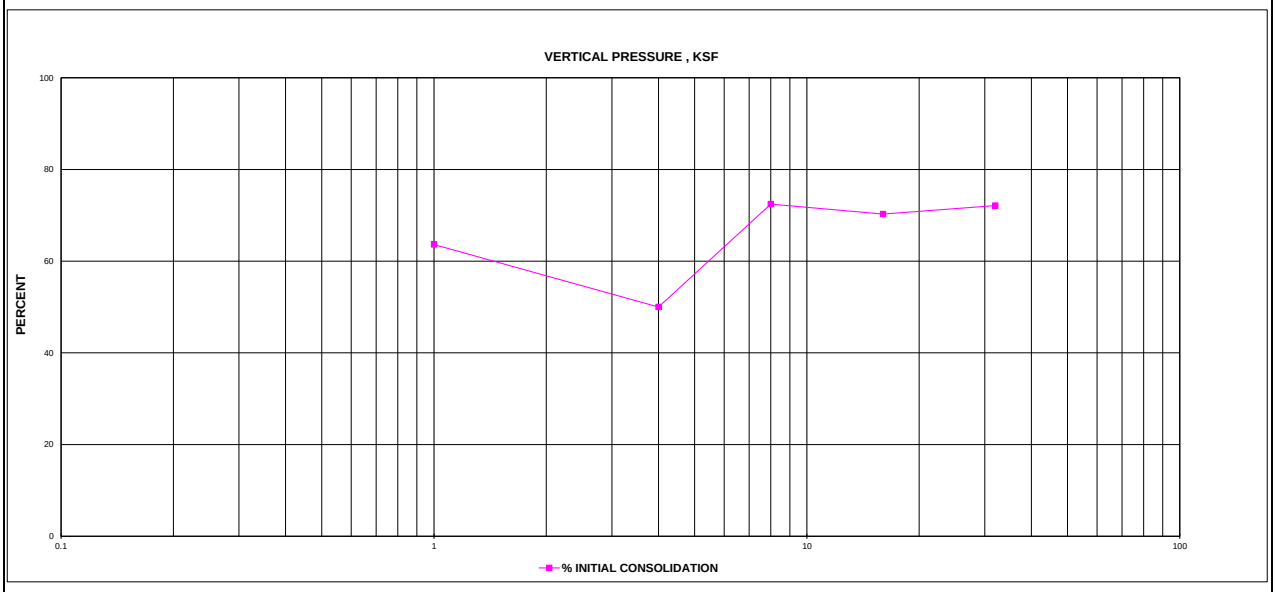


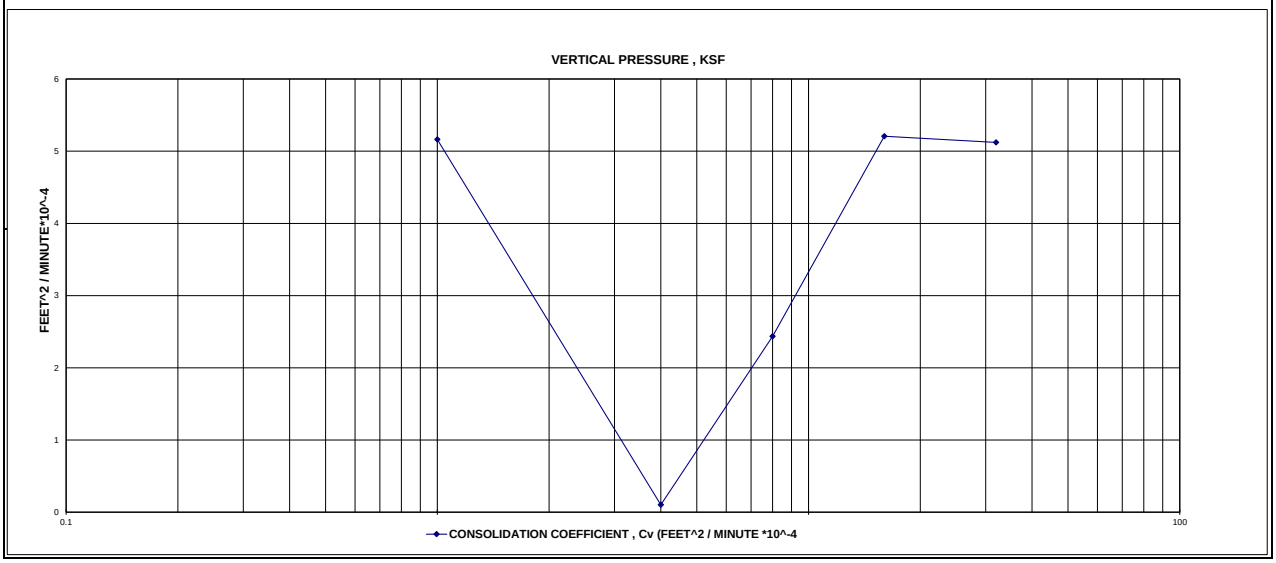
CONSOLIDATION TEST REPORT

(ASTM D 2435)

Project Name:	Carolina Crossroads Project		
Project No.:	**1461-16-047.2B**	**Report Date:**	5/23/2018
Client Name:	HDR Engineering, Inc.	**Boring No.:**	B-56
Client Address:	4400 Leeds Ave., North Charleston, South Carolina	**Depth/Elev.:**	18.5 - 20.5'

Pressure (ksf)	D_0 (in.)	D_{100} (in.)	D_{50} (in.)	Stone Correction (in.)	D_{0c} (in.)	D_{100c}	D_{50c} (in.)	h (in.)	VOID RATIO e	Percent Strain (%)	t_{50}/t_{90} t_{50}	C_v Log of Time ($ft^2/10^{-4}$min)	C_i (%)
0.25		0.0124		0.0002		0.0122			0.681	1.216			
0.5		0.0172		0.0006		0.0166			0.674	1.655			
1.0		0.0243		0.0015		0.0228			0.663	2.273			
2.0		0.0352		0.0024		0.0328			0.647	3.271			
4.0		0.0557		0.0032		0.0525			0.613	5.235			
1.0		0.0545		0.0024		0.0521			0.614	5.195			
0.25		0.0513		0.0010		0.0503			0.617	5.015			
1.0	0.0525	0.0529	0.0527	0.0015	0.0510	0.0514	0.0512	0.4759	0.615	5.125	0.6	5.16	63.6
4.0	0.0585	0.0624	0.0604	0.0032	0.0553	0.0592	0.0572	0.4729	0.602	5.903	30.0	0.10	50.0
8.0	0.0800	0.0862	0.0831	0.0045	0.0755	0.0817	0.0786	0.4622	0.564	8.146	1.2	2.43	72.4
16.0	0.1062	0.1142	0.1102	0.0056	0.1006	0.1086	0.1046	0.4492	0.518	10.829	0.5	5.21	70.3
32.0	0.1395	0.1489	0.1442	0.0066	0.1329	0.1423	0.1376	0.4327	0.461	14.189	0.5	5.12	72.1
8.0		0.1471		0.0048		0.1423			0.461	14.189			
2.0		0.1417		0.0036		0.1381			0.468	13.770			
0.25		0.1347		0.0015		0.1332			0.476	13.281			





Project Name: Carolina Crossroads Project

Boring #: B-56

Depth: 23.5 – 25.5′

Sample #: UD-2

Test Type: Consolidated Undrained Triaxial Shear (ASTM D4767)

Specimen #1 Specimen #2 Specimen #3

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

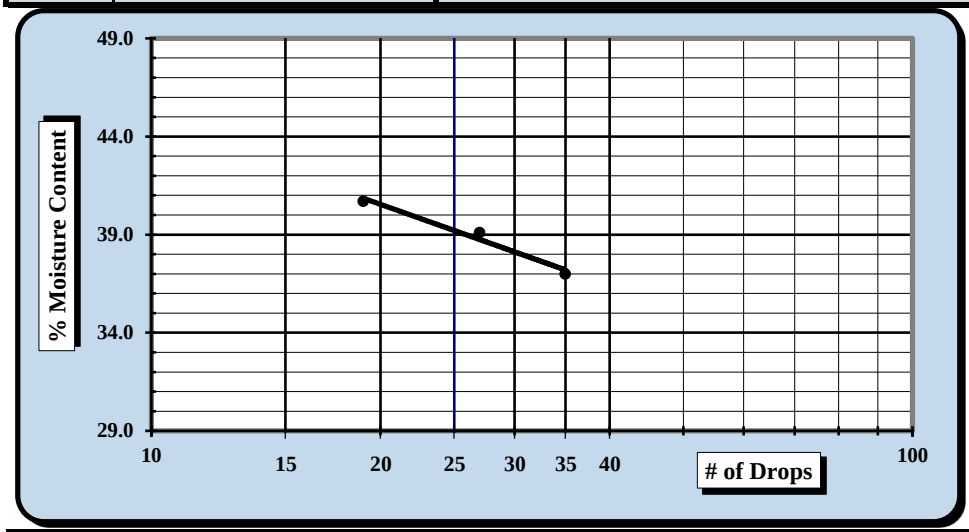
S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/16/18
Project Name:	Carolina Crossroads Project	Test Date:	5/14/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		

Boring #:	B-56	Sample #:	UD-2	Sample Date:	Various
Location:	UD borings	Type:	Undisturbed	Depth:	23.5 - 25.5'
Sample Description:	Silty Sand [SM, A-6(3)]				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	13942	8/18/2017	Grooving tool	23119	10/15/2017
LL Apparatus	23158	2/1/2018			
Oven	13978	10/7/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	11	12	13				14	15	
A	Tare Weight	26.67	26.66	26.76				26.64	27.60	
B	Wet Soil Weight + A	43.58	43.52	40.89				33.74	35.01	
C	Dry Soil Weight + A	39.01	38.78	36.80				32.23	33.44	
D	Water Weight (B-C)	4.57	4.74	4.09				1.51	1.57	
E	Dry Soil Weight (C-A)	12.34	12.12	10.04				5.59	5.84	
F	% Moisture (D/E)*100	37.0%	39.1%	40.7%				27.0%	26.9%	
N	# OF DROPS	35	27	19				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**27.0%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**39**
Plastic Limit	**27**
Plastic Index	**12**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* N/A

Notes / Deviations / References: Group symbol for minus No. 40 sieve portion only

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Benjamin J. Kovaleski	5/16/18	Matthew F. Cooke, P.G.	5/16/18
Technician Name	*Date*	*Technical Responsibility*	*Date*

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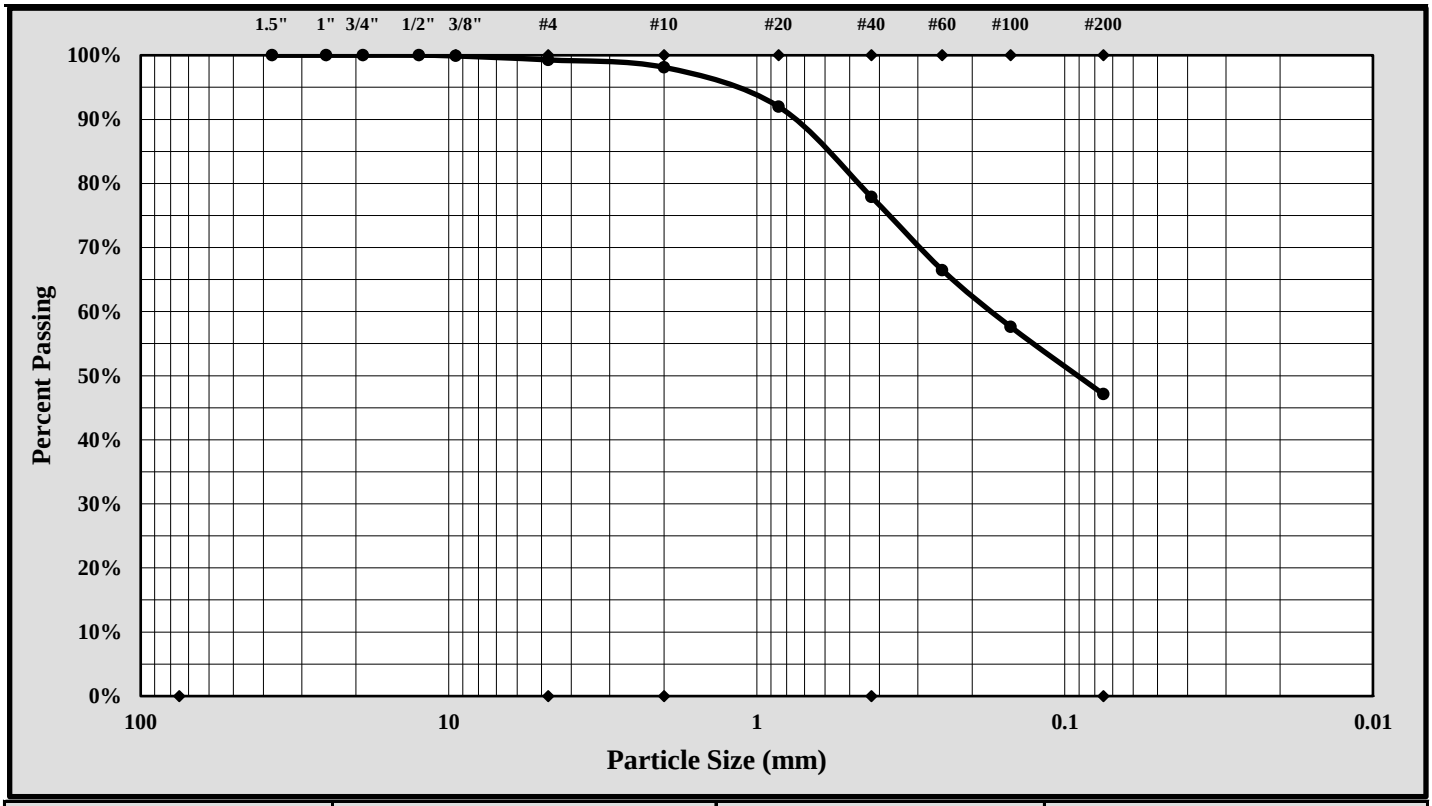
Particle Size Analysis of Soils

ASTM D 6913

S&ME, Inc. Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

S&ME Project #:	1461-16-047.2B	Report Date:	5/16/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/08 - 5/10/18
Client Name:	HDR Engineering, Inc.		
Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-56	Sample #: UD-2	Sample Date: Various
Location:	UD borings	Type: Undisturbed	Depth: 23.5 - 25.5'
Sample Description:	Silty Sand [SM, A-6(3)]		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	4.75 mm	Gravel:	0.7%
Silt & Clay (% Passing #200):	47.1%	Total Sand:	52.2%

Liquid Limit	39	Plastic Limit	27	Plastic Index	12
Coarse Sand:	1.2%	Medium Sand:	20.2%	Fine Sand:	30.8%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

References / Comments / Deviations:

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
5/16/18 — *Date*

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Form No: TR-D854-1B
Revision No. 1
Revision Date: 08/09/17

SPECIFIC GRAVITY OF SOIL

Oven dried Specimens ASTM D 854 Method B

S&ME, Inc. - Greenville 48 Brookfield Oaks Dr., Suite F Greenville, SC 29607

Project #:	1461-16-047.2B	Report Date:	5/04/18
Project Name:	Carolina Crossroads Project	Test Date(s):	5/02 - 5/04/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Ave., North Charleston, South Carolina		
Boring #:	B-56	Sample #: UD-2	Sample Date: Various
Location:	UD Borings	Type: Undisturbed	Depth: 23.5 - 25.5'
Sample Description:	Silty Sand [SM, A-6(3)]		
Material Excluded:	0.7%		% Passing #4 Sieve: 99.3%

Balance ID. *0.01 gram* *ID#:* *13942* *Cal. Date:* *8/18/17* *Cal. Due:* *8/18/18*

Pycnometer ID No. *23170* *Cal. Date:* *3/10/18* *Balance Verification* Check Mass: 500 gram

Pycnometer Volume (V_p)	249.76	ml.	Mass Determination: 500.00 grams
Pycnometer Mass (PM)	106.34	grams	*If [PM-M_p] is greater than .06 grams,*
Ave. Pycnometer Mass (M_p)	106.34	grams	*recalibrate the dry mass of the pycnometer.*

Method B: Oven-dried Specimens

Soaking Time ASTM C127: 24 ± 4 hrs. ☐
Aggregate not initially dried ☐

Table 2 ASTM D 854	Specimen Dry Mass (g.)	
Soil Type	*250-ml. beaker*	*500-ml. beaker*
SP, SP-SM	*60 ± 10*	*100 ± 10*
SP-SC, SM, SC	*45 ± 10*	*75 ± 10*
Silt or Clay	*35 ± 5*	*50 ± 10*

Initial Dry Mass of Test Specimen - *not required.* grams

$M_{psw;t}$ = *Mass of the Pycnometer, soil, and water* = **379.44** *grams*

Mass of Dry Soil (grams)		Tare #	7
A	Tare Weight		192.29
C	Dry Wt. + Tare Wt.		230.56
M_s	Dry Weight	**C-A**	**38.27**

T_t =	Test Temperature T_t	**21.4** °C
K =	Temperature Coefficient at T_t	**0.99970**
K =	Temperature Coefficient at 23°C	**0.99933**
$p_{w;t}$ =	Density of Water at T_t	**0.99791** g./ml.

$M_{pw;t}$ =	Mass of the Pycnometer and water at T_t	$M_{pw;t} = M_p + (V_p \times p_{w;t})$	**355.58** grams
G_t =	Specific Gravity of Soil Solids at the T_t	$G_t = M_s / (M_{pw;t} - (M_{psw;t}-M_s))$	**2.656**
G =	Specific Gravity of Soil Solids at the 20°C	$G = K \times G_t$	**2.655**

Soils containing plus #4 material tested per ***ASTM C 127***

R = *% of Soil retained on the #4 sieve* **0.7%**
P = *% of Soil passing the #4 sieve* **99.3%**

G_{+4} Apparent Specific Gravity of plus #4 material at the 23°C per ASTM C127
Apparent Specific Gravity of plus #4 material corrected to 20°C

G_{total} *Total Sample Specific Gravity*

$$G_{total} = \frac{1}{\frac{R}{100 \times G_{+4}} + \frac{P}{100 \times G}} = 2.655$$

Notes / Deviations / References: ASTM D854: Specific Gravity of Soil Solids by Water Pycnometer

Matthew F. Cooke — *Project Manager*
Project Manager — *Position*
5/04/18 — Date

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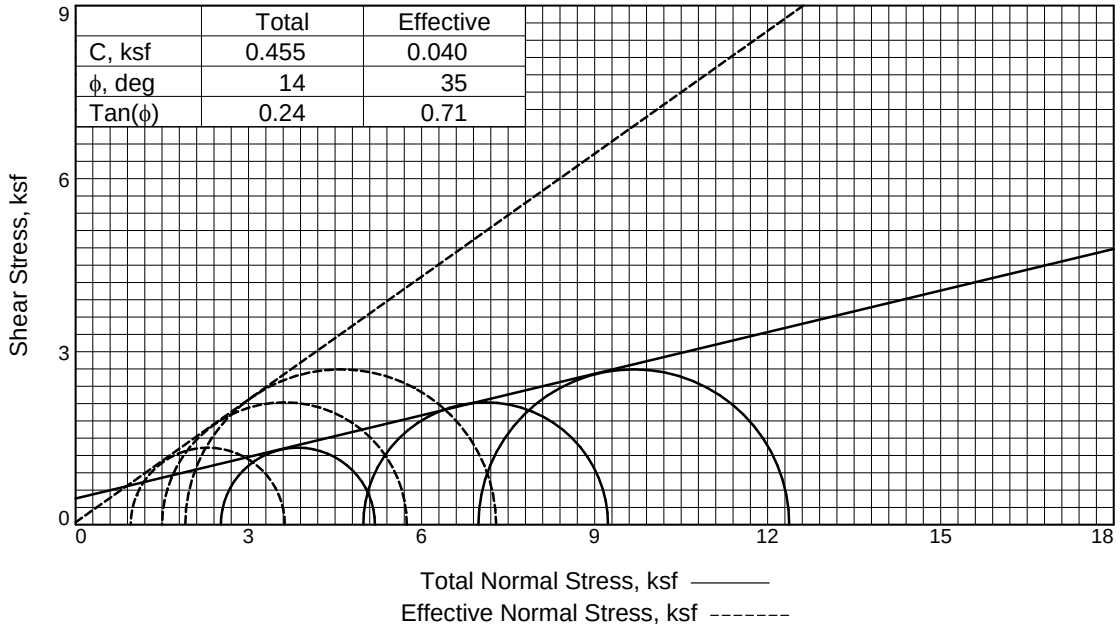
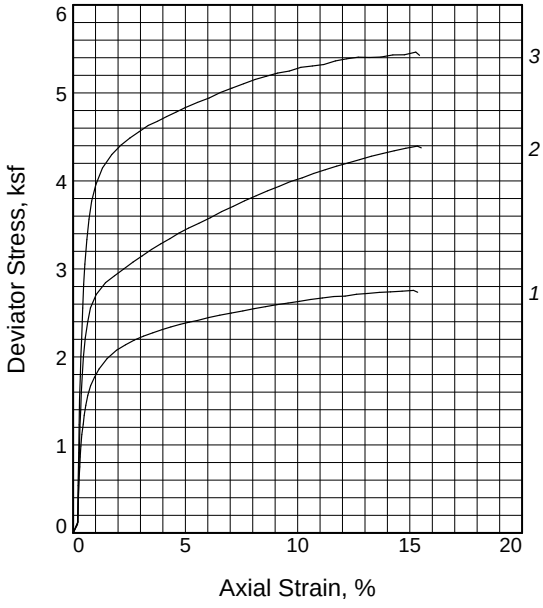
C & phi are not test results but an interpretation of the test results. The designer is responsible for interpreting test data as provided by S&ME.



	Total	Effective
C, ksf	0.455	0.040
ϕ, deg	14	35
Tan(ϕ)	0.24	0.71



Specimen No.		1	2	3
Initial	Water Content, %	22.2	21.5	21.4
	Dry Density, pcf	98.8	97.7	101.6
	Saturation, %	86.9	82.0	89.9
	Void Ratio	0.6784	0.6970	0.6315
	Diameter, in.	2.862	2.900	2.868
	Height, in.	5.803	5.485	5.776
At Test	Water Content, %	23.6	22.5	20.1
	Dry Density, pcf	102.0	103.8	108.0
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.6257	0.5968	0.5342
	Diameter, in.	2.829	2.839	2.803
	Height, in.	5.752	5.387	5.686
Strain rate, %/min.		0.34	0.34	0.34
Eff. Cell Pressure, ksf		2.520	4.990	6.985
Fail. Stress, ksf		2.671	4.243	5.388
Total Pore Pr., ksf		9.483	11.408	13.002
Strain, %		11.1	12.8	12.2
Ult. Stress, ksf		2.756	4.396	5.464
Total Pore Pr., ksf		9.435	11.313	12.960
Strain, %		15.2	15.3	15.3
$\bar{\sigma}_1$ Failure, ksf		3.628	5.744	7.291
$\bar{\sigma}_3$ Failure, ksf		0.957	1.502	1.903

Type of Test: CU with Pore Pressures
Sample Type: Undisturbed
Description: Silty Sand [SM, A-6(3)]

LL= 39 **PL=** 27 **PI=** 12
Specific Gravity= 2.655
Remarks: The specimens failed with bulging. Failure selected at peak obliquity. ASTM D4767. Percent passing the #200: 47.1%

Figure 1

Client: HDR Engineering, Inc.

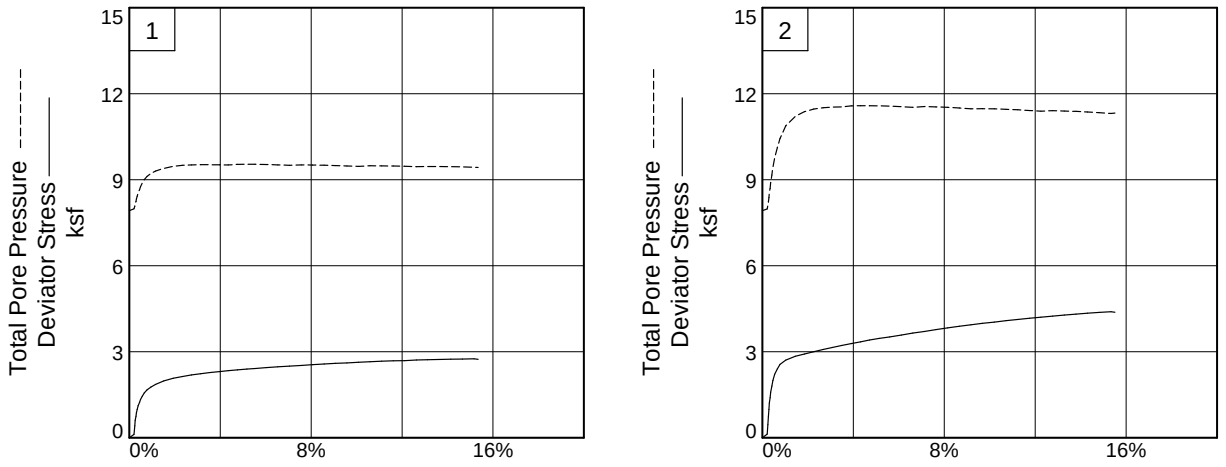
Project: Carolina Crossroads Project

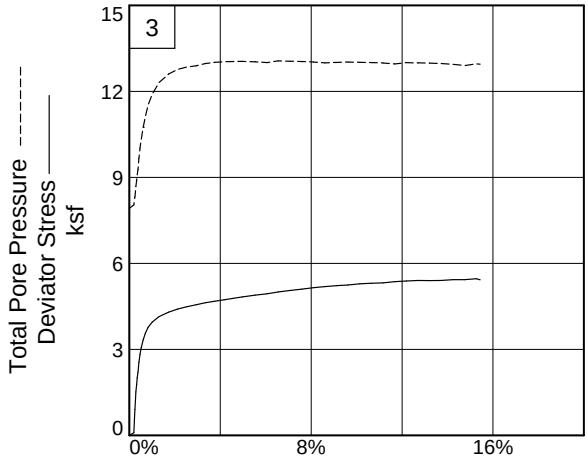
Location: UD borings
Sample Number: B-56 **Depth:** 23.5 - 25.5'
Proj. No.: 1461-16-047.2B **Date Sampled:** Various

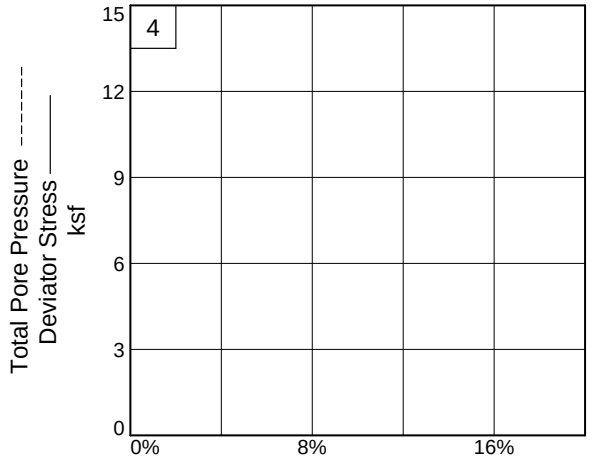
TRIAXIAL SHEAR TEST REPORT
S&ME, Inc.
Greenville, SC

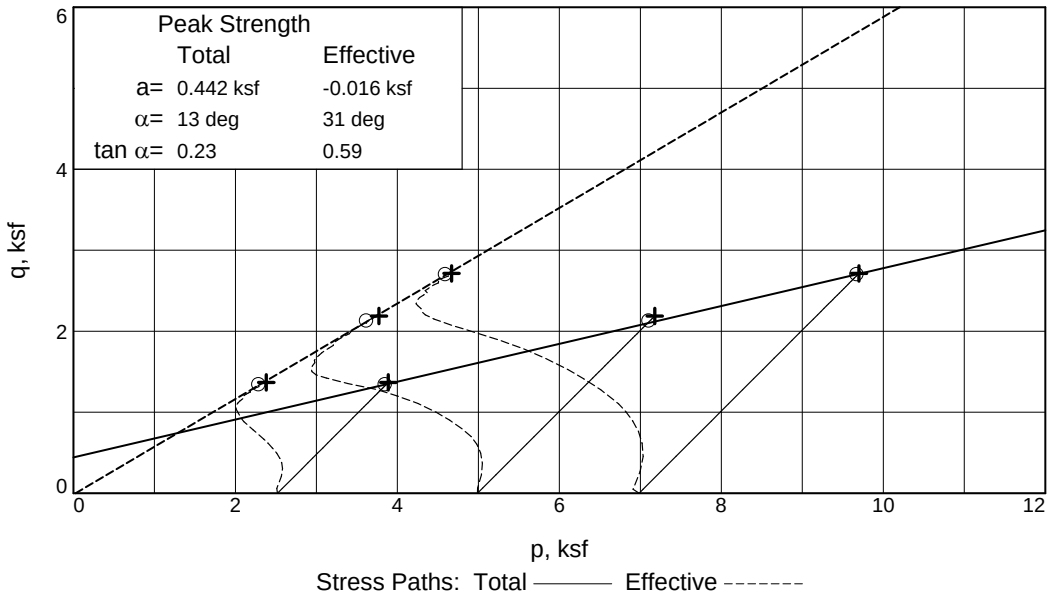
Tested By: Benjamin Kovaleski **Checked By:** Matthew F. Cooke, P.G.

C & phi are not test results but an interpretation of the test results. The designer is responsible for interpreting test data as provided by S&ME.









Client: HDR Engineering, Inc.
Project: Carolina Crossroads Project
Location: UD borings **Depth:** 23.5 - 25.5' **Sample Number:** B-56
Project No.: 1461-16-047.2B **Figure** 2

S&ME, Inc.

Tested By: Benjamin Kovaleski **Checked By:** Matthew F. Cooke, P.G.

TRIAXIAL COMPRESSION TEST 5/17/2018

CU with Pore Pressures 4:25 PM

Date: Various
Client: HDR Engineering, Inc.
Project: Carolina Crossroads Project
Project No.: 1461-16-047.2B
Location: UD borings
Depth: 23.5 - 25.5' **Sample Number:** B-56
Description: Silty Sand [SM, A-6(3)]
Remarks: The specimens failed with bulging. Failure selected at peak obliquity. ASTM D4767. Percent passing the #200: 47.1%
Type of Sample: Undisturbed
Specific Gravity=2.655 **LL=**39 **PL=**27 **PI=**12
Test Method: ASTM D 4767 Method A

Parameters for Specimen No. 1

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	55.750			1179.140
Moisture content: Dry soil+tare, gms.	45.620			954.270
Moisture content: Tare, gms.	0.000			0.000
Moisture, %	22.2	24.9	23.6	23.6
Moist specimen weight, gms.	1182.60			
Diameter, in.	2.862	2.853	2.829	
Area, in.²	6.433	6.391	6.286	
Height, in.	5.803	5.784	5.752	
Net decrease in height, in.		0.019	0.032	
Net decrease in water volume, cc.			13.200	
Wet density, pcf	120.7	124.6	126.0	
Dry density, pcf	98.8	99.7	102.0	
Void ratio	0.6784	0.6619	0.6257	
Saturation, %	86.9	100.0	100.0	

Test Readings for Specimen No. 1

Membrane modulus = .167543 kN/cm²
Membrane thickness = .03048 cm
Consolidation cell pressure = 72.500 psi (10.440 ksf)
Consolidation back pressure = 55.000 psi (7.920 ksf)
Consolidation effective confining stress = 2.520 ksf
Strain rate, %/min. = 0.34
Fail. Stress = 2.671 ksf **at reading no.** 36
Ult. Stress = 2.756 ksf **at reading no.** 44

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
0	0.0000	0.000	0.0	0.0	0.000	2.520	2.520	1.00	55.000	2.520	0.000
1	0.0119	5.118	5.1	0.2	0.117	2.452	2.569	1.05	55.470	2.511	0.058
2	0.0138	18.171	18.2	0.2	0.415	2.359	2.774	1.18	56.117	2.567	0.208
3	0.0149	26.673	26.7	0.3	0.609	2.277	2.887	1.27	56.685	2.582	0.305
4	0.0170	32.842	32.8	0.3	0.750	2.196	2.946	1.34	57.249	2.571	0.375
5	0.0180	37.858	37.9	0.3	0.864	2.116	2.980	1.41	57.808	2.548	0.432
6	0.0199	43.240	43.2	0.3	0.987	2.017	3.004	1.49	58.493	2.511	0.494
7	0.0222	48.937	48.9	0.4	1.117	1.899	3.016	1.59	59.312	2.457	0.558
8	0.0259	54.238	54.2	0.5	1.237	1.784	3.021	1.69	60.113	2.402	0.618
9	0.0284	58.640	58.6	0.5	1.337	1.682	3.019	1.79	60.819	2.350	0.668
10	0.0326	63.662	63.7	0.6	1.450	1.561	3.011	1.93	61.662	2.286	0.725
11	0.0378	68.757	68.8	0.7	1.565	1.436	3.001	2.09	62.526	2.219	0.782
12	0.0449	73.615	73.6	0.8	1.673	1.322	2.995	2.27	63.320	2.158	0.837
13	0.0546	77.942	77.9	0.9	1.768	1.221	2.989	2.45	64.023	2.105	0.884
14	0.0664	82.250	82.3	1.2	1.862	1.136	2.999	2.64	64.608	2.068	0.931
15	0.0870	87.868	87.9	1.5	1.982	1.044	3.026	2.90	65.249	2.035	0.991
16	0.1112	92.446	92.4	1.9	2.077	0.971	3.047	3.14	65.759	2.009	1.038
17	0.1343	95.547	95.5	2.3	2.138	0.938	3.076	3.28	65.983	2.007	1.069
18	0.1572	98.407	98.4	2.7	2.193	0.923	3.115	3.38	66.093	2.019	1.096
19	0.1805	100.781	100.8	3.1	2.236	0.915	3.151	3.44	66.145	2.033	1.118
20	0.2042	102.979	103.0	3.5	2.275	0.916	3.191	3.48	66.140	2.053	1.138
21	0.2283	105.026	105.0	4.0	2.310	0.921	3.231	3.51	66.105	2.076	1.155
22	0.2504	106.887	106.9	4.4	2.342	0.926	3.268	3.53	66.069	2.097	1.171
23	0.2738	108.663	108.7	4.8	2.371	0.904	3.274	3.62	66.224	2.089	1.185
24	0.2976	110.276	110.3	5.2	2.395	0.901	3.296	3.66	66.242	2.099	1.198
25	0.3179	111.584	111.6	5.5	2.415	0.902	3.316	3.68	66.239	2.109	1.207
26	0.3469	113.667	113.7	6.0	2.447	0.909	3.355	3.69	66.191	2.132	1.223
27	0.3758	115.604	115.6	6.5	2.475	0.922	3.397	3.69	66.099	2.159	1.238
28	0.4052	117.338	117.3	7.0	2.498	0.936	3.434	3.67	66.001	2.185	1.249
29	0.4348	119.141	119.1	7.6	2.523	0.924	3.447	3.73	66.085	2.185	1.261
30	0.4635	121.033	121.0	8.1	2.549	0.927	3.476	3.75	66.064	2.201	1.275
31	0.4931	122.793	122.8	8.6	2.572	0.935	3.506	3.75	66.010	2.220	1.286
32	0.5219	124.589	124.6	9.1	2.595	0.945	3.540	3.75	65.936	2.243	1.297
33	0.5507	126.142	126.1	9.6	2.613	0.959	3.572	3.72	65.838	2.266	1.306
34	0.5801	127.813	127.8	10.1	2.632	0.974	3.606	3.70	65.737	2.290	1.316
35	0.6090	129.525	129.5	10.6	2.653	0.954	3.607	3.78	65.876	2.280	1.326
36	0.6385	131.154	131.2	11.1	2.671	0.957	3.628	3.79	65.853	2.293	1.335
37	0.6679	132.722	132.7	11.6	2.687	0.962	3.649	3.79	65.821	2.305	1.344
38	0.6970	133.722	133.7	12.1	2.692	0.971	3.663	3.77	65.755	2.317	1.346
39	0.7264	135.536	135.5	12.6	2.713	0.986	3.699	3.75	65.652	2.342	1.356
40	0.7545	136.741	136.7	13.1	2.721	0.978	3.700	3.78	65.705	2.339	1.361
41	0.7845	138.194	138.2	13.6	2.734	0.979	3.712	3.79	65.703	2.346	1.367
42	0.8135	139.311	139.3	14.1	2.740	0.984	3.724	3.78	65.668	2.354	1.370
43	0.8427	140.518	140.5	14.7	2.747	0.992	3.739	3.77	65.611	2.366	1.374
44	0.8722	141.830	141.8	15.2	2.756	1.005	3.762	3.74	65.518	2.384	1.378
45	0.8829	141.084	141.1	15.3	2.736	1.013	3.749	3.70	65.466	2.381	1.368

Parameters for Specimen No. 2

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	83.010			1104.280
Moisture content: Dry soil+tare, gms.	68.300			901.570
Moisture content: Tare, gms.	0.000			0.000
Moisture, %	21.5	24.9	22.5	22.5
Moist specimen weight, gms.	1128.92			
Diameter, in.	2.900	2.880	2.839	
Area, in.²	6.605	6.513	6.328	
Height, in.	5.485	5.447	5.387	
Net decrease in height, in.		0.038	0.060	
Net decrease in water volume, cc.			22.700	
Wet density, pcf	118.7	124.6	127.1	
Dry density, pcf	97.7	99.7	103.8	
Void ratio	0.6970	0.6617	0.5968	
Saturation, %	82.0	100.0	100.0	

Test Readings for Specimen No. 2

Membrane modulus = .167543 kN/cm²
Membrane thickness = .03048 cm
Consolidation cell pressure = 89.650 psi (12.910 ksf)
Consolidation back pressure = 55.000 psi (7.920 ksf)
Consolidation effective confining stress = 4.990 ksf
Strain rate, %/min. = 0.34
Fail. Stress = 4.243 ksf **at reading no.** 38
Ult. Stress = 4.396 ksf **at reading no.** 43

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
0	0.0000	0.000	0.0	0.0	0.000	4.990	4.990	1.00	55.000	4.990	0.000
1	0.0114	5.623	5.6	0.2	0.128	4.927	5.054	1.03	55.436	4.991	0.064
2	0.0129	20.158	20.2	0.2	0.458	4.809	5.266	1.10	56.256	5.038	0.229
3	0.0143	32.618	32.6	0.3	0.740	4.680	5.420	1.16	57.152	5.050	0.370
4	0.0153	43.601	43.6	0.3	0.989	4.534	5.523	1.22	58.165	5.029	0.495
5	0.0164	53.368	53.4	0.3	1.211	4.376	5.587	1.28	59.261	4.981	0.605
6	0.0181	61.661	61.7	0.3	1.398	4.212	5.610	1.33	60.401	4.911	0.699
7	0.0196	69.959	70.0	0.4	1.586	4.008	5.594	1.40	61.814	4.801	0.793
8	0.0223	79.530	79.5	0.4	1.802	3.745	5.548	1.48	63.640	4.647	0.901
9	0.0248	88.266	88.3	0.5	1.999	3.479	5.479	1.57	65.488	4.479	1.000
10	0.0291	97.892	97.9	0.5	2.215	3.149	5.364	1.70	67.785	4.256	1.108
11	0.0353	106.318	106.3	0.7	2.403	2.794	5.197	1.86	70.248	3.996	1.202
12	0.0417	113.285	113.3	0.8	2.558	2.472	5.029	2.03	72.485	3.751	1.279
13	0.0552	120.329	120.3	1.0	2.710	2.031	4.741	2.33	75.545	3.386	1.355
14	0.0778	126.843	126.8	1.4	2.845	1.701	4.546	2.67	77.837	3.123	1.422
15	0.0996	130.877	130.9	1.8	2.923	1.535	4.458	2.90	78.989	2.997	1.461
16	0.1217	134.940	134.9	2.3	3.001	1.445	4.446	3.08	79.617	2.945	1.501
17	0.1440	139.029	139.0	2.7	3.079	1.398	4.477	3.20	79.945	2.937	1.539
18	0.1657	142.774	142.8	3.1	3.149	1.377	4.526	3.29	80.085	2.952	1.574
19	0.1880	146.717	146.7	3.5	3.222	1.369	4.591	3.35	80.143	2.980	1.611
20	0.2102	150.234	150.2	3.9	3.285	1.333	4.619	3.46	80.390	2.976	1.643
21	0.2324	153.595	153.6	4.3	3.344	1.328	4.672	3.52	80.426	3.000	1.672
22	0.2540	157.205	157.2	4.7	3.408	1.328	4.736	3.57	80.428	3.032	1.704

Test Readings for Specimen No. 2

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
23	0.2766	160.499	160.5	5.1	3.465	1.333	4.797	3.60	80.395	3.065	1.732
24	0.3019	163.814	163.8	5.6	3.519	1.343	4.861	3.62	80.325	3.102	1.759
25	0.3292	167.677	167.7	6.1	3.582	1.361	4.944	3.63	80.195	3.153	1.791
26	0.3563	171.849	171.8	6.6	3.652	1.383	5.035	3.64	80.043	3.209	1.826
27	0.3841	175.578	175.6	7.1	3.710	1.356	5.066	3.74	80.234	3.211	1.855
28	0.4114	179.612	179.6	7.6	3.775	1.370	5.144	3.76	80.138	3.257	1.887
29	0.4392	183.369	183.4	8.2	3.832	1.385	5.217	3.77	80.033	3.301	1.916
30	0.4667	187.072	187.1	8.7	3.888	1.408	5.296	3.76	79.869	3.352	1.944
31	0.4941	190.558	190.6	9.2	3.938	1.437	5.375	3.74	79.673	3.406	1.969
32	0.5213	194.244	194.2	9.7	3.992	1.433	5.425	3.79	79.701	3.429	1.996
33	0.5496	197.499	197.5	10.2	4.035	1.438	5.473	3.81	79.667	3.455	2.018
34	0.5773	201.093	201.1	10.7	4.085	1.452	5.538	3.81	79.563	3.495	2.043
35	0.6052	204.319	204.3	11.2	4.127	1.470	5.597	3.81	79.443	3.533	2.063
36	0.6326	207.531	207.5	11.7	4.168	1.494	5.662	3.79	79.273	3.578	2.084
37	0.6601	210.601	210.6	12.3	4.205	1.517	5.722	3.77	79.113	3.620	2.102
38	0.6878	213.740	213.7	12.8	4.243	1.502	5.744	3.83	79.222	3.623	2.121
39	0.7153	216.934	216.9	13.3	4.281	1.514	5.794	3.83	79.138	3.654	2.140
40	0.7433	219.886	219.9	13.8	4.313	1.526	5.839	3.83	79.053	3.682	2.156
41	0.7705	222.733	222.7	14.3	4.343	1.546	5.889	3.81	78.917	3.717	2.172
42	0.7983	225.502	225.5	14.8	4.371	1.571	5.942	3.78	78.740	3.756	2.185
43	0.8261	228.191	228.2	15.3	4.396	1.597	5.993	3.75	78.560	3.795	2.198
44	0.8353	227.619	227.6	15.5	4.376	1.584	5.961	3.76	78.648	3.772	2.188

Parameters for Specimen No. 3

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	50.960			1180.450
Moisture content: Dry soil+tare, gms.	41.980			982.660
Moisture content: Tare, gms.	0.000			0.000
Moisture, %	21.4	22.9	20.1	20.1
Moist specimen weight, gms.	1207.92			
Diameter, in.	2.868	2.853	2.803	
Area, in.²	6.460	6.395	6.171	
Height, in.	5.776	5.747	5.686	
Net decrease in height, in.		0.029	0.061	
Net decrease in water volume, cc.			27.250	
Wet density, pcf	123.3	126.7	129.8	
Dry density, pcf	101.6	103.1	108.0	
Void ratio	0.6315	0.6069	0.5342	
Saturation, %	89.9	100.0	100.0	

Test Readings for Specimen No. 3

Membrane modulus = .167543 kN/cm²
Membrane thickness = .03048 cm
Consolidation cell pressure = 103.510 psi (14.905 ksf)
Consolidation back pressure = 55.000 psi (7.920 ksf)
Consolidation effective confining stress = 6.985 ksf
Strain rate, %/min. = 0.34
Fail. Stress = 5.388 ksf **at reading no.** 39
Ult. Stress = 5.464 ksf **at reading no.** 45

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
0	0.0000	0.000	0.0	0.0	0.000	6.985	6.985	1.00	55.000	6.985	0.000
1	0.0113	4.143	4.1	0.2	0.096	6.861	6.958	1.01	55.861	6.910	0.048
2	0.0126	23.138	23.1	0.2	0.539	6.729	7.267	1.08	56.783	6.998	0.269
3	0.0141	39.116	39.1	0.2	0.910	6.579	7.490	1.14	57.820	7.035	0.455
4	0.0153	52.830	52.8	0.3	1.229	6.407	7.637	1.19	59.014	7.022	0.615
5	0.0163	65.259	65.3	0.3	1.518	6.219	7.738	1.24	60.321	6.978	0.759
6	0.0184	76.563	76.6	0.3	1.781	6.017	7.798	1.30	61.724	6.908	0.890
7	0.0196	86.336	86.3	0.3	2.008	5.820	7.827	1.34	63.095	6.824	1.004
8	0.0217	94.983	95.0	0.4	2.208	5.627	7.835	1.39	64.435	6.731	1.104
9	0.0242	110.007	110.0	0.4	2.556	5.233	7.789	1.49	67.172	6.511	1.278
10	0.0267	121.702	121.7	0.5	2.826	4.887	7.713	1.58	69.576	6.300	1.413
11	0.0299	131.627	131.6	0.5	3.055	4.578	7.633	1.67	71.721	6.105	1.528
12	0.0347	143.763	143.8	0.6	3.334	4.156	7.491	1.80	74.646	5.823	1.667
13	0.0402	153.913	153.9	0.7	3.566	3.776	7.342	1.94	77.288	5.559	1.783
14	0.0470	162.965	163.0	0.8	3.771	3.386	7.158	2.11	79.994	5.272	1.886
15	0.0573	171.278	171.3	1.0	3.956	3.005	6.961	2.32	82.645	4.983	1.978
16	0.0744	180.056	180.1	1.3	4.147	2.597	6.743	2.60	85.476	4.670	2.073
17	0.0981	187.528	187.5	1.7	4.300	2.303	6.604	2.87	87.514	4.454	2.150
18	0.1204	192.874	192.9	2.1	4.405	2.143	6.548	3.06	88.629	4.345	2.203
19	0.1438	197.313	197.3	2.5	4.488	2.056	6.544	3.18	89.230	4.300	2.244
20	0.1675	201.391	201.4	2.9	4.561	2.011	6.572	3.27	89.546	4.291	2.280
21	0.1901	205.320	205.3	3.3	4.631	1.936	6.566	3.39	90.068	4.251	2.315
22	0.2134	208.299	208.3	3.8	4.678	1.893	6.571	3.47	90.364	4.232	2.339

Test Readings for Specimen No. 3

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
23	0.2371	211.591	211.6	4.2	4.731	1.873	6.604	3.53	90.505	4.238	2.366
24	0.2602	214.717	214.7	4.6	4.781	1.862	6.643	3.57	90.580	4.252	2.390
25	0.2834	217.920	217.9	5.0	4.832	1.859	6.690	3.60	90.602	4.274	2.416
26	0.3151	221.987	222.0	5.5	4.893	1.875	6.768	3.61	90.487	4.322	2.446
27	0.3445	225.484	225.5	6.1	4.943	1.901	6.844	3.60	90.309	4.372	2.471
28	0.3730	229.534	229.5	6.6	5.005	1.840	6.845	3.72	90.729	4.343	2.502
29	0.4022	233.111	233.1	7.1	5.055	1.853	6.908	3.73	90.638	4.381	2.527
30	0.4321	236.729	236.7	7.6	5.104	1.863	6.967	3.74	90.573	4.415	2.552
31	0.4610	240.312	240.3	8.1	5.153	1.881	7.033	3.74	90.451	4.457	2.576
32	0.4894	243.379	243.4	8.6	5.190	1.910	7.101	3.72	90.244	4.505	2.595
33	0.5180	246.421	246.4	9.1	5.226	1.895	7.121	3.76	90.352	4.508	2.613
34	0.5475	248.894	248.9	9.6	5.249	1.882	7.131	3.79	90.440	4.506	2.624
35	0.5767	252.319	252.3	10.1	5.290	1.890	7.180	3.80	90.386	4.535	2.645
36	0.6058	254.486	254.5	10.7	5.306	1.899	7.205	3.79	90.319	4.552	2.653
37	0.6349	256.799	256.8	11.2	5.323	1.915	7.238	3.78	90.213	4.576	2.662
38	0.6642	260.277	260.3	11.7	5.364	1.947	7.311	3.75	89.986	4.629	2.682
39	0.6931	262.976	263.0	12.2	5.388	1.903	7.291	3.83	90.294	4.597	2.694
40	0.7220	265.383	265.4	12.7	5.406	1.912	7.318	3.83	90.231	4.615	2.703
41	0.7507	266.771	266.8	13.2	5.403	1.919	7.322	3.82	90.186	4.620	2.702
42	0.7799	268.565	268.6	13.7	5.407	1.932	7.339	3.80	90.093	4.636	2.704
43	0.8098	271.482	271.5	14.2	5.433	1.964	7.396	3.77	89.874	4.680	2.716
44	0.8389	273.119	273.1	14.8	5.433	2.005	7.437	3.71	89.589	4.721	2.716
45	0.8678	276.326	276.3	15.3	5.464	1.945	7.409	3.81	90.002	4.677	2.732
46	0.8774	275.063	275.1	15.4	5.428	1.955	7.383	3.78	89.932	4.669	2.714

Project Name: Carolina Crossroads Project

Boring #: B-56

Depth: 23.5 – 25.5′

Sample #: UD-2

Test Type: Consolidated Undrained Triaxial Shear (ASTM D4767)

Specimen #1 Specimen #2 Specimen #3

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☐ AASHTO T 89 ☐ AASHTO T 90 ☐

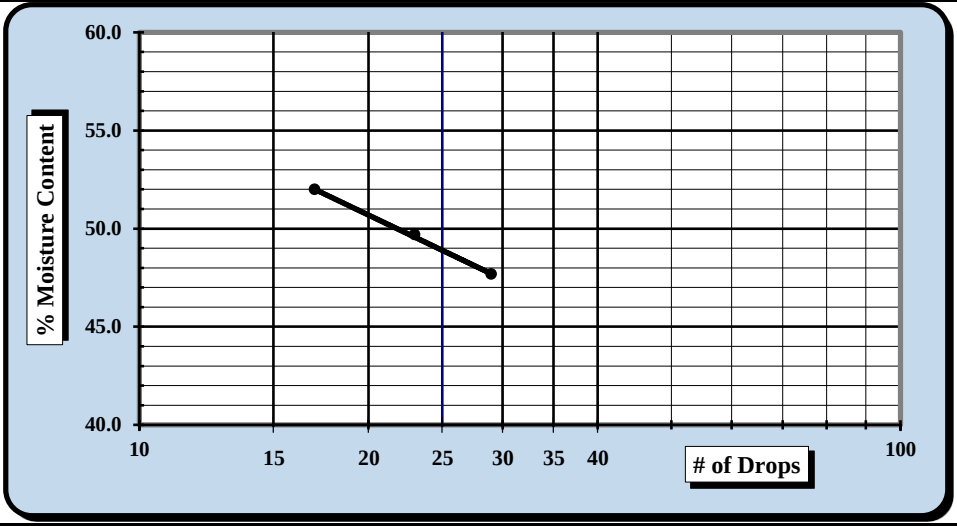
S&ME, Inc. Charlotte: 9751 Southern Pine Boulevard, Charlotte, NC 28273

Project #:	1461-16-047.2B	Report Date:	6/1/18
Project Name:	Carolina Crossroads Project	Test Date(s)	4/18-5/20/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Avenue, North Charleston, SC 29405		

Boring #:	W-18UD	Sample #: UD-1	Sample Date: Various
Location:	UD Borings	Offset: NA	Elevation: 2-4'
Sample Description:	Orange Brown Silty Clay w/Coarse to Fine Sand (CL)		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	3222	7/29/2017	Grooving tool	30427	9/27/2017
LL Apparatus	20336	2/21/2018	Grooving tool		
Oven	10844	8/22/2017	Grooving tool		

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	VV	18	35				5	34	
A	Tare Weight	16.08	15.37	15.66				15.75	14.01	
B	Wet Soil Weight + A	27.44	26.75	26.18				23.96	22.15	
C	Dry Soil Weight + A	23.77	22.97	22.58				22.18	20.39	
D	Water Weight (B-C)	3.67	3.78	3.60				1.78	1.76	
E	Dry Soil Weight (C-A)	7.69	7.60	6.92				6.43	6.38	
F	% Moisture (D/E)*100	47.7%	49.7%	52.0%				27.7%	27.6%	
N	# OF DROPS	29	23	17						
LL	LL = **F** * FACTOR									
Ave.	*Average*							**27.7%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**49**
Plastic Limit	**28**
Plastic Index	**21**
Group Symbol	**CL**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:*

Notes / Deviations / References:

Karen Warner	6/1/2018	Matthew F. Cooke, P.G.	7/18/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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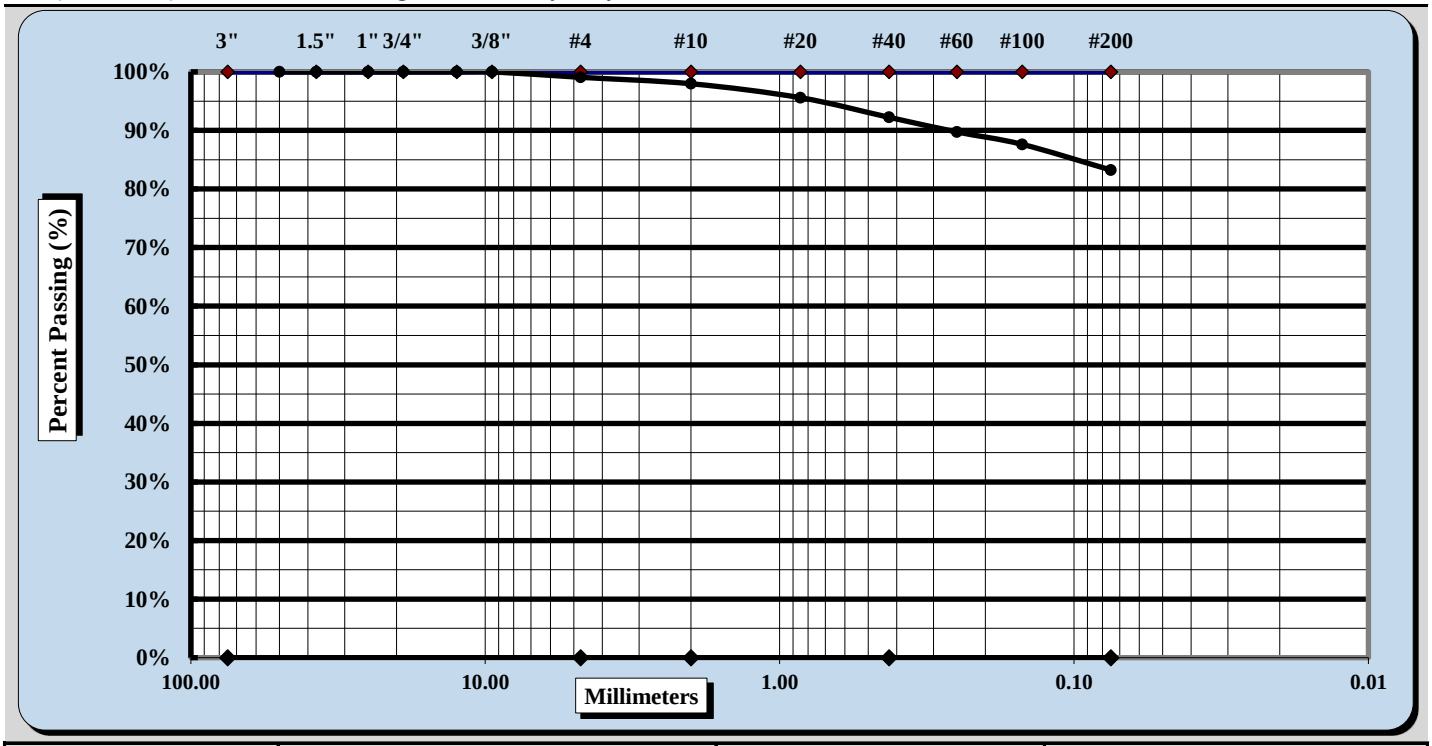
SIEVE ANALYSIS OF SOILS

ASTM D 422

S&ME, Inc. Charlotte: 9751 Southern Pine Boulevard, Charlotte, NC 28273

Project #:	1461-16-047.2B	Report Date:	6/1/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/18-25/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Avenue, North Charleston, SC 29405		
Sample Id.	W-18 UD UD-1	Type: Undisturbed	Sample Date: Various
Location:	UD Borings	Sample: UD-1	Elevation: 18.5-20.5'

Sample Description: Orange Brown Silty Clay w/Coarse to Fine Sand (CL)



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	#4	Coarse Sand	1.1%	Fine Sand	9.0%
Gravel	0.9%	Medium Sand	5.7%	Silt & Clay	83.2%
Liquid Limit	49	Plastic Limit	28	Plastic Index	49
Specific Gravity	ND			Moisture Content	Various
Coarse Sand	1.1%	Medium Sand	5.7%	Fine Sand	9.0%

Description of Sand & Gravel Particles: Rounded ☐ Angular ☒
Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

Notes / Deviations / References: ND: Not Determined

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
7/18/2018 — *Date*

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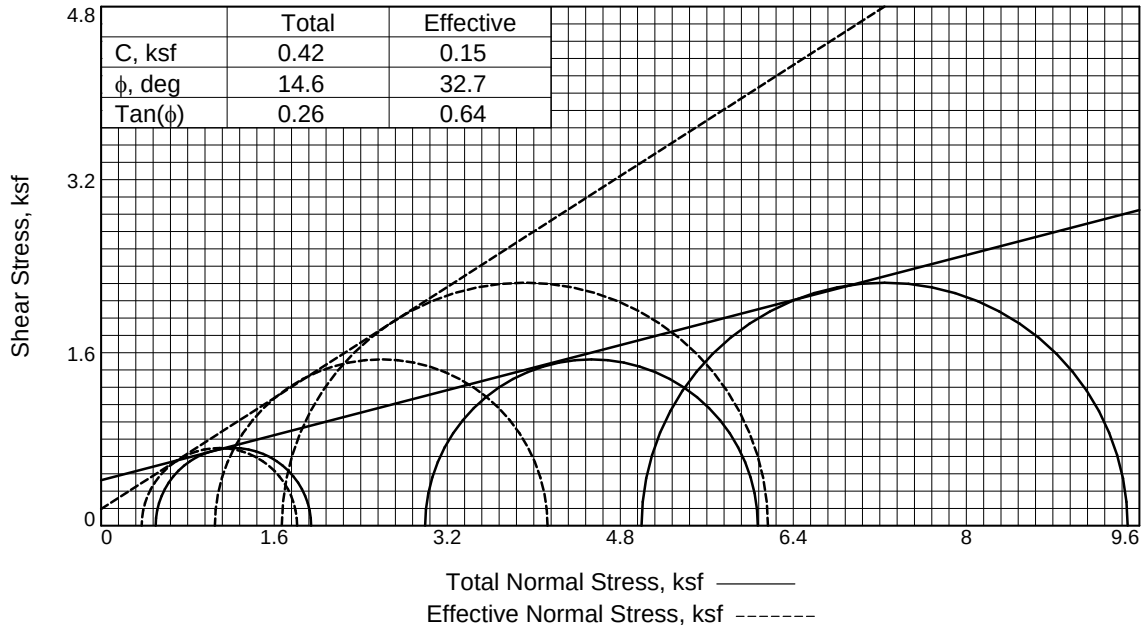
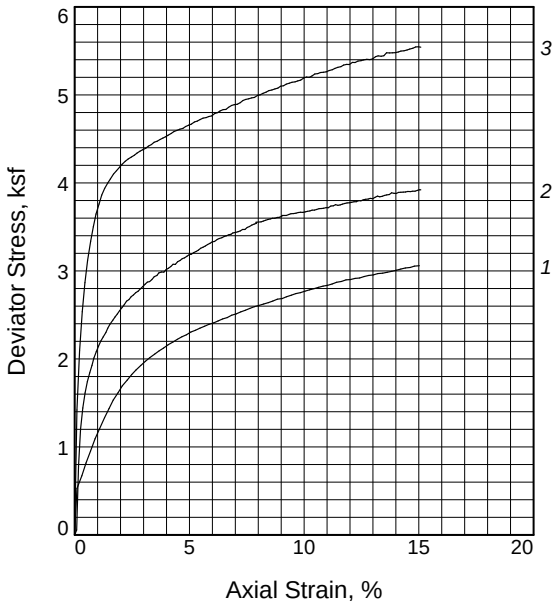
C & phi are not test results but an interpretation of the test results. The designer is responsible for interpreting test data as provided by S&ME.





Sample No.		1	2	3
Initial	Water Content, %	20.8	16.1	20.1
	Dry Density, pcf	105.4	108.9	103.0
	Saturation, %	93.5	79.4	85.4
	Void Ratio	0.5990	0.5480	0.6363
	Diameter, in.	2.868	2.867	2.847
	Height, in.	6.147	6.129	6.102
At Test	Water Content, %	20.2	16.0	21.7
	Dry Density, pcf	109.0	117.8	106.2
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.5463	0.4311	0.5867
	Diameter, in.	2.836	2.793	2.818
	Height, in.	6.079	5.972	6.040
Strain rate, in./min.		0.008	0.004	0.005
Eff. Cell Pressure, ksf		0.50	3.00	5.00
Fail. Stress, ksf		1.44	3.08	4.49
Total Pore Pr., ksf		10.21	12.02	13.41
Strain, %		1.5	4.3	3.7
Ult. Stress, ksf		3.06	3.92	5.54
Total Pore Pr., ksf		9.45	11.59	12.90
Strain, %		15.0	15.1	15.1
$\bar{\sigma}_1$ Failure, ksf		1.81	4.13	6.17
$\bar{\sigma}_3$ Failure, ksf		0.37	1.05	1.67

Type of Test:
CU with Pore Pressures

Sample Type: Undisturbed

Description: Orange Brown Silty Clay w/Coarse to Fine Sand (CL)

LL= 49 **PL=** 28 **PI=** 21

Assumed Specific Gravity= 2.70

Remarks: All specimens failed in shear (ASTM 4767).

Figure W-18UD

Client: HDR Engineering, Inc.

Project: Carolina Crossroads Project

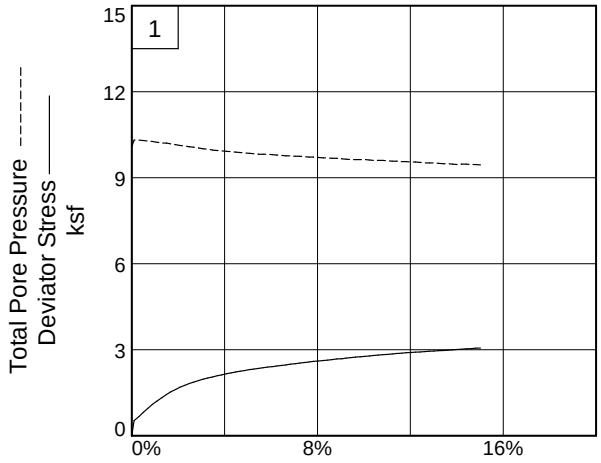
Location: UD Borings

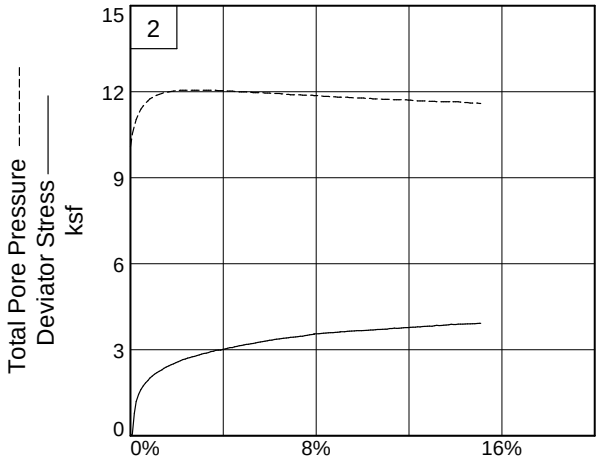
Sample Number: W-18UD UD-1 **Depth:** 2-4'

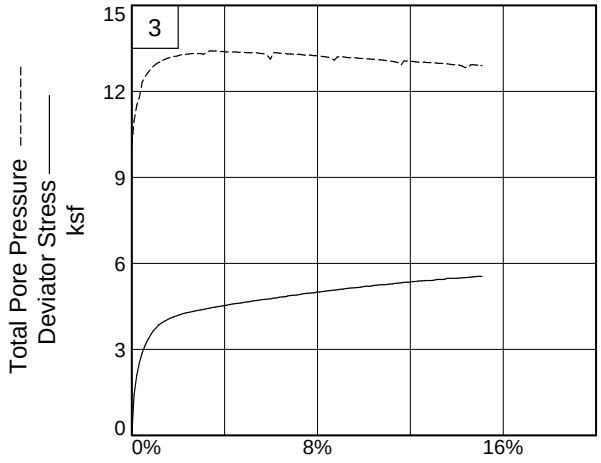
Proj. No.: 1461-16-047.2B **Date Sampled:** Various

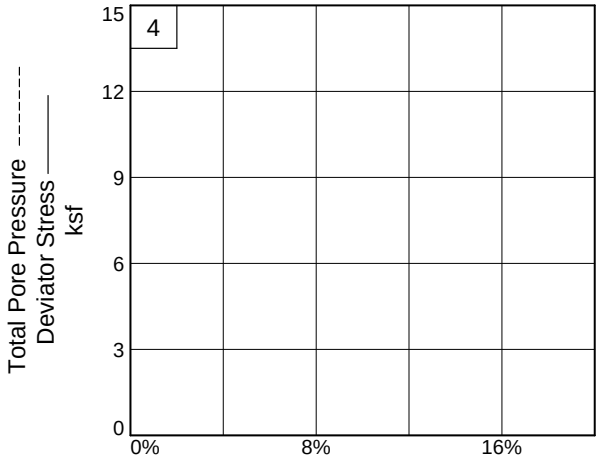
TRIAXIAL SHEAR TEST REPORT
S & ME, INC.
Charlotte, North Carolina

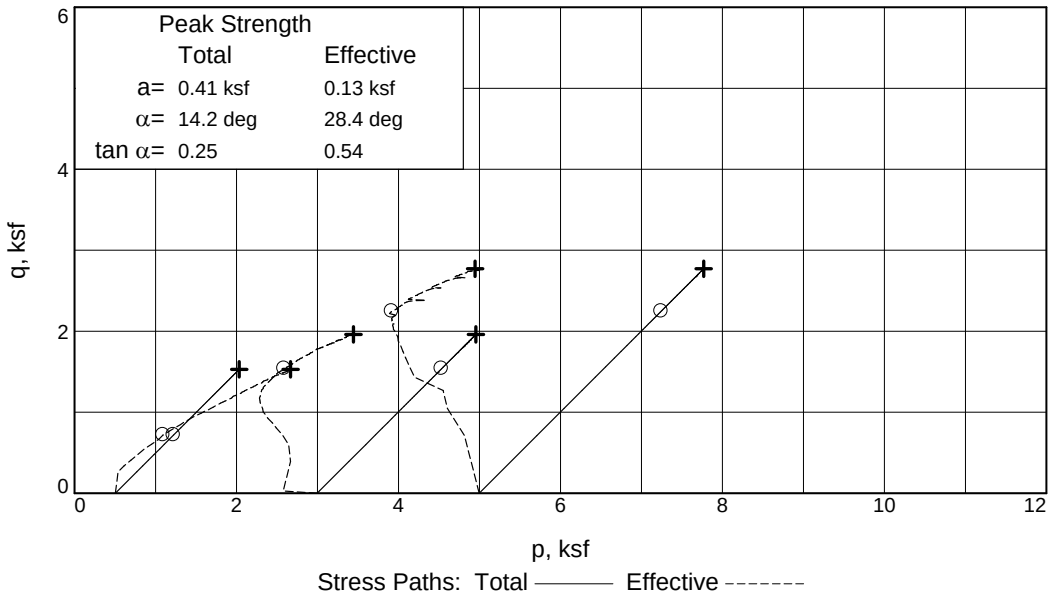
Tested By: Karen Warner **Checked By:** Jason Reeves











Client: HDR Engineering, Inc.
Project: Carolina Crossroads Project
Location: UD Borings **Depth:** 2-4' **Sample Number:** W-18UD UD-1
Project No.: 1461-16-047.2B **Figure** W-18UD

S & ME, INC.

Tested By: Karen Warner **Checked By:** Jason Reeves

C & phi are not test results but an interpretation of the test results. The designer is responsible for interpreting test data as provided by S&ME.

TRIAXIAL COMPRESSION TEST

CU with Pore Pressures

6/26/2018
2:38 PM

Date: Various
Client: HDR Engineering, Inc.
Project: Carolina Crossroads Project
Project No.: 1461-16-047.2B
Location: UD Borings
Depth: 2-4' **Sample Number:** W-18UD UD-1
Description: Orange Brown Silty Clay w/Coarse to Fine Sand (CL)
Remarks: All specimens failed in shear (ASTM 4767).
Type of Sample: Undisturbed
Assumed Specific Gravity=2.70 **LL=**49 **PL=**28 **PI=**21
Test Method: COE uniform strain

Parameters for Specimen No. 1

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	166.770			1421.980
Moisture content: Dry soil+tare, gms.	152.150			1175.210
Moisture content: Tare, gms.	81.700			86.700
Moisture, %	20.8	22.1	20.2	22.7
Moist specimen weight, gms.	1326.87			
Diameter, in.	2.868	2.867	2.836	
Area, in.²	6.460	6.456	6.317	
Height, in.	6.147	6.145	6.079	
Net decrease in height, in.		0.002	0.066	
Wet density, pcf	127.3	128.9	131.1	
Dry density, pcf	105.4	105.5	109.0	
Void ratio	0.5990	0.5974	0.5463	
Saturation, %	93.5	100.0	100.0	

Test Readings for Specimen No. 1

Consolidation cell pressure = 73.50 psi (10.58 ksf)
Consolidation back pressure = 70.00 psi (10.08 ksf)
Consolidation effective confining stress = 0.50 ksf
Strain rate, in./min. = 0.008
Fail. Stress = 1.44 ksf **at reading no.** 8
Ult. Stress = 3.06 ksf **at reading no.** 76

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
0	0.0100	23.800	0.0	0.0	0.00	0.50	0.50	1.00	70.00	0.50	0.00
1	0.0160	47.000	23.2	0.1	0.53	0.27	0.80	2.93	71.60	0.54	0.26
2	0.0290	53.400	29.6	0.3	0.67	0.27	0.95	3.46	71.60	0.61	0.34
3	0.0400	59.800	36.0	0.5	0.82	0.29	1.10	3.84	71.50	0.70	0.41
4	0.0520	65.900	42.1	0.7	0.95	0.30	1.26	4.15	71.40	0.78	0.48
5	0.0640	72.200	48.4	0.9	1.09	0.32	1.41	4.45	71.30	0.86	0.55
6	0.0760	77.400	53.6	1.1	1.21	0.35	1.55	4.50	71.10	0.95	0.60
7	0.0890	83.000	59.2	1.3	1.33	0.37	1.71	4.56	70.90	1.04	0.67
8	0.1010	87.800	64.0	1.5	1.44	0.37	1.81	4.84	70.90	1.09	0.72
9	0.1120	92.200	68.4	1.7	1.53	0.40	1.94	4.80	70.70	1.17	0.77
10	0.1250	96.100	72.3	1.9	1.62	0.43	2.05	4.74	70.50	1.24	0.81
11	0.1360	99.700	75.9	2.1	1.69	0.46	2.16	4.68	70.30	1.31	0.85
12	0.1490	102.800	79.0	2.3	1.76	0.48	2.23	4.70	70.20	1.35	0.88
13	0.1610	105.800	82.0	2.5	1.82	0.50	2.33	4.62	70.00	1.42	0.91
14	0.1720	108.200	84.4	2.7	1.87	0.52	2.39	4.61	69.90	1.45	0.94
15	0.1850	110.800	87.0	2.9	1.93	0.55	2.47	4.52	69.70	1.51	0.96
16	0.1970	113.100	89.3	3.1	1.97	0.58	2.55	4.43	69.50	1.56	0.99
17	0.2090	115.200	91.4	3.3	2.02	0.59	2.61	4.41	69.40	1.60	1.01
18	0.2220	117.200	93.4	3.5	2.05	0.62	2.67	4.32	69.20	1.65	1.03
19	0.2340	119.100	95.3	3.7	2.09	0.63	2.73	4.30	69.10	1.68	1.05
20	0.2450	120.700	96.9	3.9	2.12	0.65	2.77	4.28	69.00	1.71	1.06
21	0.2580	122.700	98.9	4.1	2.16	0.66	2.82	4.26	68.90	1.74	1.08
22	0.2700	124.200	100.4	4.3	2.19	0.68	2.87	4.24	68.80	1.77	1.10
23	0.2820	125.900	102.1	4.5	2.22	0.69	2.91	4.22	68.70	1.80	1.11
24	0.2940	127.400	103.6	4.7	2.25	0.71	2.96	4.19	68.60	1.83	1.13
25	0.3060	128.700	104.9	4.9	2.27	0.72	2.99	4.16	68.50	1.86	1.14
26	0.3180	130.400	106.6	5.1	2.31	0.73	3.04	4.14	68.40	1.89	1.15
27	0.3300	131.500	107.7	5.3	2.33	0.75	3.07	4.11	68.30	1.91	1.16
28	0.3420	132.900	109.1	5.5	2.35	0.76	3.11	4.08	68.20	1.94	1.18
29	0.3540	134.100	110.3	5.7	2.37	0.76	3.14	4.11	68.20	1.95	1.19
30	0.3660	135.400	111.6	5.9	2.39	0.76	3.16	4.14	68.20	1.96	1.20
31	0.3780	136.300	112.5	6.1	2.41	0.78	3.19	4.10	68.10	1.98	1.20
32	0.3900	137.600	113.8	6.3	2.43	0.79	3.22	4.07	68.00	2.01	1.22
33	0.4020	138.900	115.1	6.4	2.45	0.81	3.26	4.04	67.90	2.03	1.23
34	0.4140	139.900	116.1	6.6	2.47	0.82	3.29	4.01	67.80	2.06	1.24
35	0.4260	141.400	117.6	6.8	2.50	0.82	3.32	4.04	67.80	2.07	1.25
36	0.4380	142.400	118.6	7.0	2.51	0.84	3.35	4.01	67.70	2.09	1.26
37	0.4500	143.700	119.9	7.2	2.54	0.84	3.37	4.04	67.70	2.10	1.27
38	0.4620	144.800	121.0	7.4	2.55	0.85	3.40	4.01	67.60	2.13	1.28
39	0.4740	146.100	122.3	7.6	2.57	0.86	3.44	3.98	67.50	2.15	1.29
40	0.4860	147.300	123.5	7.8	2.59	0.86	3.46	4.00	67.50	2.16	1.30
41	0.4980	148.200	124.4	8.0	2.61	0.88	3.49	3.97	67.40	2.18	1.30
42	0.5110	149.300	125.5	8.2	2.62	0.89	3.52	3.94	67.30	2.21	1.31
43	0.5230	150.300	126.5	8.4	2.64	0.89	3.53	3.96	67.30	2.21	1.32
44	0.5350	151.400	127.6	8.6	2.66	0.91	3.56	3.93	67.20	2.24	1.33
45	0.5470	152.700	128.9	8.8	2.68	0.91	3.59	3.95	67.20	2.25	1.34
46	0.5600	153.400	129.6	9.0	2.69	0.92	3.61	3.92	67.10	2.27	1.34

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
47	0.5710	154.600	130.8	9.2	2.71	0.94	3.64	3.89	67.00	2.29	1.35
48	0.5840	155.800	132.0	9.4	2.72	0.95	3.68	3.87	66.90	2.31	1.36
49	0.5960	157.000	133.2	9.6	2.74	0.95	3.69	3.89	66.90	2.32	1.37
50	0.6080	157.800	134.0	9.8	2.75	0.95	3.70	3.90	66.90	2.33	1.38
51	0.6200	158.900	135.1	10.0	2.77	0.95	3.72	3.92	66.90	2.34	1.39
52	0.6320	159.900	136.1	10.2	2.78	0.96	3.75	3.89	66.80	2.36	1.39
53	0.6440	160.900	137.1	10.4	2.80	0.98	3.78	3.86	66.70	2.38	1.40
54	0.6560	161.900	138.1	10.6	2.81	0.98	3.79	3.87	66.70	2.39	1.41
55	0.6680	162.900	139.1	10.8	2.83	0.98	3.81	3.89	66.70	2.39	1.41
56	0.6800	163.700	139.9	11.0	2.84	0.99	3.83	3.86	66.60	2.41	1.42
57	0.6920	164.700	140.9	11.2	2.85	1.01	3.86	3.83	66.50	2.43	1.43
58	0.7040	166.000	142.2	11.4	2.87	1.01	3.88	3.85	66.50	2.44	1.44
59	0.7170	166.800	143.0	11.6	2.88	1.02	3.90	3.82	66.40	2.46	1.44
60	0.7290	168.000	144.2	11.8	2.90	1.02	3.92	3.83	66.40	2.47	1.45
61	0.7400	168.500	144.7	12.0	2.90	1.04	3.94	3.80	66.30	2.49	1.45
62	0.7530	169.500	145.7	12.2	2.92	1.04	3.95	3.81	66.30	2.49	1.46
63	0.7650	170.100	146.3	12.4	2.92	1.05	3.97	3.78	66.20	2.51	1.46
64	0.7770	171.200	147.4	12.6	2.94	1.07	4.00	3.76	66.10	2.53	1.47
65	0.7890	172.200	148.4	12.8	2.95	1.07	4.01	3.77	66.10	2.54	1.47
66	0.8010	172.800	149.0	13.0	2.95	1.07	4.02	3.77	66.10	2.54	1.48
67	0.8130	173.900	150.1	13.2	2.97	1.08	4.05	3.75	66.00	2.56	1.48
68	0.8260	174.500	150.7	13.4	2.97	1.09	4.07	3.72	65.90	2.58	1.49
69	0.8380	175.400	151.6	13.6	2.98	1.09	4.08	3.73	65.90	2.59	1.49
70	0.8500	176.300	152.5	13.8	3.00	1.11	4.10	3.70	65.80	2.61	1.50
71	0.8620	177.300	153.5	14.0	3.01	1.12	4.13	3.68	65.70	2.63	1.50
72	0.8740	178.300	154.5	14.2	3.02	1.11	4.13	3.72	65.80	2.62	1.51
73	0.8860	179.300	155.5	14.4	3.03	1.11	4.14	3.74	65.80	2.63	1.52
74	0.8990	180.000	156.2	14.6	3.04	1.12	4.16	3.71	65.70	2.64	1.52
75	0.9100	181.100	157.3	14.8	3.05	1.12	4.18	3.72	65.70	2.65	1.53
76	0.9230	181.700	157.9	15.0	3.06	1.14	4.20	3.69	65.60	2.67	1.53

Parameters for Specimen No. 2

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	153.180			1391.560
Moisture content: Dry soil+tare, gms.	143.290			1174.400
Moisture content: Tare, gms.	81.890			74.220
Moisture, %	16.1	19.9	16.0	19.7
Moist specimen weight, gms.	1313.09			
Diameter, in.	2.867	2.860	2.793	
Area, in.²	6.456	6.426	6.125	
Height, in.	6.129	6.115	5.972	
Net decrease in height, in.		0.014	0.143	
Wet density, pcf	126.4	131.5	136.6	
Dry density, pcf	108.9	109.6	117.8	
Void ratio	0.5480	0.5374	0.4311	
Saturation, %	79.4	100.0	100.0	

Test Readings for Specimen No. 2

Consolidation cell pressure = 90.80 psi (13.08 ksf)
Consolidation back pressure = 70.00 psi (10.08 ksf)
Consolidation effective confining stress = 3.00 ksf
Strain rate, in./min. = 0.004
Fail. Stress = 3.08 ksf **at reading no.** 43
Ult. Stress = 3.92 ksf **at reading no.** 150

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
0	0.0100	15.700	0.0	0.0	0.00	3.00	3.00	1.00	70.00	3.00	0.00
1	0.0150	18.100	2.4	0.1	0.06	2.55	2.61	1.02	73.10	2.58	0.03
2	0.0200	49.000	33.3	0.2	0.78	2.28	3.06	1.34	75.00	2.67	0.39
3	0.0250	66.800	51.1	0.3	1.20	2.04	3.24	1.59	76.60	2.64	0.60
4	0.0310	77.300	61.6	0.4	1.44	1.84	3.29	1.78	78.00	2.56	0.72
5	0.0370	84.600	68.9	0.5	1.61	1.68	3.30	1.96	79.10	2.49	0.81
6	0.0430	90.200	74.5	0.6	1.74	1.57	3.31	2.11	79.90	2.44	0.87
7	0.0490	94.600	78.9	0.7	1.84	1.47	3.31	2.25	80.60	2.39	0.92
8	0.0550	98.300	82.6	0.8	1.93	1.40	3.32	2.38	81.10	2.36	0.96
9	0.0600	101.900	86.2	0.8	2.01	1.32	3.33	2.52	81.60	2.33	1.00
10	0.0660	105.100	89.4	0.9	2.08	1.28	3.36	2.62	81.90	2.32	1.04
11	0.0720	107.900	92.2	1.0	2.15	1.24	3.38	2.73	82.20	2.31	1.07
12	0.0780	110.500	94.8	1.1	2.20	1.20	3.40	2.84	82.50	2.30	1.10
13	0.0840	112.600	96.9	1.2	2.25	1.17	3.42	2.93	82.70	2.29	1.12
14	0.0910	114.900	99.2	1.4	2.30	1.14	3.44	3.02	82.90	2.29	1.15
15	0.0960	117.100	101.4	1.4	2.35	1.11	3.46	3.12	83.10	2.28	1.17
16	0.1020	119.200	103.5	1.5	2.40	1.09	3.49	3.19	83.20	2.29	1.20
17	0.1090	121.200	105.5	1.7	2.44	1.08	3.52	3.26	83.30	2.30	1.22
18	0.1150	123.000	107.3	1.8	2.48	1.07	3.54	3.33	83.40	2.30	1.24
19	0.1210	124.500	108.8	1.9	2.51	1.05	3.56	3.39	83.50	2.31	1.26
20	0.1270	126.300	110.6	2.0	2.55	1.04	3.59	3.46	83.60	2.31	1.27
21	0.1330	127.900	112.2	2.1	2.58	1.04	3.62	3.49	83.60	2.33	1.29
22	0.1390	129.500	113.8	2.2	2.62	1.02	3.64	3.56	83.70	2.33	1.31
23	0.1450	131.300	115.6	2.3	2.66	1.02	3.68	3.60	83.70	2.35	1.33
24	0.1510	132.200	116.5	2.4	2.67	1.02	3.70	3.62	83.70	2.36	1.34
25	0.1570	133.800	118.1	2.5	2.71	1.02	3.73	3.65	83.70	2.38	1.35

Test Readings for Specimen No. 2

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
26	0.1630	134.800	119.1	2.6	2.73	1.02	3.75	3.67	83.70	2.39	1.36
27	0.1690	136.000	120.3	2.7	2.75	1.02	3.78	3.69	83.70	2.40	1.38
28	0.1750	136.900	121.2	2.8	2.77	1.02	3.79	3.71	83.70	2.41	1.39
29	0.1810	138.200	122.5	2.9	2.80	1.02	3.82	3.74	83.70	2.42	1.40
30	0.1870	139.400	123.7	3.0	2.82	1.02	3.84	3.76	83.70	2.43	1.41
31	0.1930	140.700	125.0	3.1	2.85	1.02	3.87	3.79	83.70	2.45	1.42
32	0.1990	141.900	126.2	3.2	2.87	1.02	3.90	3.81	83.70	2.46	1.44
33	0.2050	142.300	126.6	3.3	2.88	1.02	3.90	3.82	83.70	2.46	1.44
34	0.2110	143.400	127.7	3.4	2.90	1.02	3.92	3.84	83.70	2.47	1.45
35	0.2170	145.000	129.3	3.5	2.93	1.02	3.96	3.87	83.70	2.49	1.47
36	0.2240	145.800	130.1	3.6	2.95	1.02	3.97	3.88	83.70	2.50	1.47
37	0.2290	147.200	131.5	3.7	2.98	1.02	4.00	3.91	83.70	2.51	1.49
38	0.2360	147.800	132.1	3.8	2.99	1.04	4.02	3.88	83.60	2.53	1.49
39	0.2420	147.900	132.2	3.9	2.99	1.04	4.02	3.88	83.60	2.53	1.49
40	0.2480	149.300	133.6	4.0	3.02	1.04	4.05	3.91	83.60	2.54	1.51
41	0.2540	150.100	134.4	4.1	3.03	1.05	4.08	3.88	83.50	2.57	1.52
42	0.2600	151.100	135.4	4.2	3.05	1.05	4.10	3.90	83.50	2.58	1.53
43	0.2660	152.400	136.7	4.3	3.08	1.05	4.13	3.93	83.50	2.59	1.54
44	0.2720	152.500	136.8	4.4	3.08	1.05	4.13	3.93	83.50	2.59	1.54
45	0.2780	154.000	138.3	4.5	3.11	1.07	4.17	3.91	83.40	2.62	1.55
46	0.2840	154.700	139.0	4.6	3.12	1.07	4.18	3.93	83.40	2.62	1.56
47	0.2900	155.800	140.1	4.7	3.14	1.08	4.22	3.91	83.30	2.65	1.57
48	0.2960	156.400	140.7	4.8	3.15	1.08	4.23	3.92	83.30	2.65	1.57
49	0.3020	157.300	141.6	4.9	3.17	1.08	4.25	3.93	83.30	2.66	1.58
50	0.3080	158.300	142.6	5.0	3.19	1.08	4.27	3.95	83.30	2.67	1.59
51	0.3140	158.700	143.0	5.1	3.19	1.09	4.29	3.92	83.20	2.69	1.60
52	0.3200	159.700	144.0	5.2	3.21	1.09	4.30	3.93	83.20	2.70	1.60
53	0.3260	160.400	144.7	5.3	3.22	1.11	4.33	3.91	83.10	2.72	1.61
54	0.3320	161.200	145.5	5.4	3.24	1.11	4.35	3.92	83.10	2.73	1.62
55	0.3380	162.300	146.6	5.5	3.26	1.11	4.37	3.94	83.10	2.74	1.63
56	0.3440	163.000	147.3	5.6	3.27	1.11	4.38	3.95	83.10	2.74	1.63
57	0.3500	163.800	148.1	5.7	3.28	1.11	4.39	3.96	83.10	2.75	1.64
58	0.3560	164.700	149.0	5.8	3.30	1.12	4.42	3.94	83.00	2.77	1.65
59	0.3620	165.500	149.8	5.9	3.31	1.12	4.44	3.95	83.00	2.78	1.66
60	0.3680	166.400	150.7	6.0	3.33	1.12	4.45	3.97	83.00	2.79	1.67
61	0.3740	166.800	151.1	6.1	3.34	1.14	4.47	3.93	82.90	2.81	1.67
62	0.3810	168.000	152.3	6.2	3.36	1.14	4.50	3.95	82.90	2.82	1.68
63	0.3860	168.600	152.9	6.3	3.37	1.14	4.51	3.96	82.90	2.82	1.68
64	0.3930	169.200	153.5	6.4	3.38	1.14	4.51	3.97	82.90	2.83	1.69
65	0.3990	170.000	154.3	6.5	3.39	1.15	4.54	3.94	82.80	2.85	1.70
66	0.4040	170.500	154.8	6.6	3.40	1.15	4.55	3.95	82.80	2.85	1.70
67	0.4110	171.200	155.5	6.7	3.41	1.17	4.58	3.92	82.70	2.87	1.71
68	0.4170	171.700	156.0	6.8	3.42	1.17	4.58	3.93	82.70	2.88	1.71
69	0.4220	172.500	156.8	6.9	3.43	1.18	4.61	3.91	82.60	2.90	1.72
70	0.4290	173.000	157.3	7.0	3.44	1.18	4.62	3.91	82.60	2.90	1.72
71	0.4350	173.500	157.8	7.1	3.45	1.18	4.63	3.92	82.60	2.90	1.72
72	0.4410	174.100	158.4	7.2	3.46	1.18	4.64	3.93	82.60	2.91	1.73

Test Readings for Specimen No. 2

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
73	0.4470	175.000	159.3	7.3	3.47	1.18	4.65	3.94	82.60	2.92	1.74
74	0.4530	175.200	159.5	7.4	3.47	1.20	4.67	3.90	82.50	2.93	1.74
75	0.4590	176.400	160.7	7.5	3.49	1.20	4.69	3.92	82.50	2.94	1.75
76	0.4650	177.100	161.4	7.6	3.51	1.20	4.70	3.93	82.50	2.95	1.75
77	0.4710	178.000	162.3	7.7	3.52	1.20	4.72	3.95	82.50	2.96	1.76
78	0.4770	178.700	163.0	7.8	3.53	1.20	4.73	3.96	82.50	2.96	1.77
79	0.4830	179.300	163.6	7.9	3.54	1.21	4.75	3.93	82.40	2.98	1.77
80	0.4820	179.800	164.1	7.9	3.55	1.21	4.76	3.94	82.40	2.99	1.78
81	0.4950	180.400	164.7	8.1	3.56	1.21	4.77	3.94	82.40	2.99	1.78
82	0.5010	181.000	165.3	8.2	3.57	1.22	4.79	3.91	82.30	3.01	1.78
83	0.5070	181.600	165.9	8.3	3.58	1.24	4.81	3.89	82.20	3.03	1.79
84	0.5130	182.200	166.5	8.4	3.58	1.24	4.82	3.89	82.20	3.03	1.79
85	0.5190	182.700	167.0	8.5	3.59	1.24	4.83	3.90	82.20	3.03	1.80
86	0.5250	183.200	167.5	8.6	3.60	1.25	4.85	3.87	82.10	3.05	1.80
87	0.5310	183.400	167.7	8.7	3.60	1.25	4.85	3.87	82.10	3.05	1.80
88	0.5370	184.000	168.3	8.8	3.61	1.25	4.86	3.88	82.10	3.06	1.80
89	0.5430	184.300	168.6	8.9	3.61	1.27	4.88	3.85	82.00	3.07	1.81
90	0.5490	185.000	169.3	9.0	3.62	1.27	4.89	3.86	82.00	3.08	1.81
91	0.5500	185.500	169.8	9.0	3.63	1.27	4.90	3.87	82.00	3.08	1.82
92	0.5610	185.800	170.1	9.2	3.63	1.27	4.90	3.86	82.00	3.08	1.82
93	0.5680	186.600	170.9	9.3	3.64	1.27	4.91	3.87	82.00	3.09	1.82
94	0.5730	187.100	171.4	9.4	3.65	1.28	4.93	3.85	81.90	3.11	1.82
95	0.5790	187.400	171.7	9.5	3.65	1.28	4.93	3.85	81.90	3.11	1.83
96	0.5860	187.800	172.1	9.6	3.66	1.30	4.95	3.82	81.80	3.12	1.83
97	0.5920	188.400	172.7	9.7	3.66	1.30	4.96	3.83	81.80	3.13	1.83
98	0.5980	188.700	173.0	9.8	3.67	1.30	4.96	3.83	81.80	3.13	1.83
99	0.6040	188.800	173.1	9.9	3.66	1.30	4.96	3.83	81.80	3.13	1.83
100	0.6100	189.300	173.6	10.0	3.67	1.30	4.97	3.83	81.80	3.13	1.84
101	0.6160	189.800	174.1	10.1	3.68	1.31	4.99	3.81	81.70	3.15	1.84
102	0.6220	190.200	174.5	10.2	3.68	1.31	4.99	3.81	81.70	3.15	1.84
103	0.6280	190.800	175.1	10.3	3.69	1.31	5.00	3.82	81.70	3.16	1.85
104	0.6340	191.000	175.3	10.4	3.69	1.32	5.02	3.79	81.60	3.17	1.85
105	0.6400	191.600	175.9	10.5	3.70	1.32	5.02	3.79	81.60	3.17	1.85
106	0.6460	192.200	176.5	10.6	3.71	1.32	5.03	3.80	81.60	3.18	1.85
107	0.6520	192.500	176.8	10.8	3.71	1.32	5.03	3.80	81.60	3.18	1.85
108	0.6580	192.800	177.1	10.9	3.71	1.34	5.05	3.77	81.50	3.20	1.86
109	0.6650	193.400	177.7	11.0	3.72	1.34	5.06	3.78	81.50	3.20	1.86
110	0.6700	193.500	177.8	11.1	3.72	1.34	5.06	3.78	81.50	3.20	1.86
111	0.6770	194.700	179.0	11.2	3.74	1.34	5.08	3.79	81.50	3.21	1.87
112	0.6830	195.000	179.3	11.3	3.74	1.35	5.09	3.76	81.40	3.22	1.87
113	0.6890	195.800	180.1	11.4	3.75	1.35	5.11	3.77	81.40	3.23	1.88
114	0.6950	195.700	180.0	11.5	3.75	1.35	5.10	3.77	81.40	3.23	1.87
115	0.7010	196.100	180.4	11.6	3.75	1.35	5.10	3.77	81.40	3.23	1.88
116	0.7070	196.700	181.0	11.7	3.76	1.35	5.11	3.78	81.40	3.23	1.88
117	0.7130	197.300	181.6	11.8	3.77	1.37	5.13	3.75	81.30	3.25	1.88
118	0.7190	197.800	182.1	11.9	3.77	1.35	5.13	3.79	81.40	3.24	1.89
119	0.7250	198.100	182.4	12.0	3.77	1.37	5.14	3.76	81.30	3.26	1.89

Test Readings for Specimen No. 2

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
120	0.7310	198.600	182.9	12.1	3.78	1.37	5.15	3.76	81.30	3.26	1.89
121	0.7370	199.100	183.4	12.2	3.79	1.38	5.17	3.74	81.20	3.28	1.89
122	0.7430	199.300	183.6	12.3	3.79	1.38	5.17	3.74	81.20	3.28	1.89
123	0.7490	200.100	184.4	12.4	3.80	1.40	5.20	3.72	81.10	3.30	1.90
124	0.7550	200.200	184.5	12.5	3.80	1.40	5.19	3.72	81.10	3.30	1.90
125	0.7610	201.000	185.3	12.6	3.81	1.40	5.21	3.73	81.10	3.30	1.90
126	0.7670	201.500	185.8	12.7	3.81	1.40	5.21	3.73	81.10	3.30	1.91
127	0.7740	201.900	186.2	12.8	3.82	1.41	5.23	3.71	81.00	3.32	1.91
128	0.7790	202.400	186.7	12.9	3.82	1.41	5.24	3.71	81.00	3.32	1.91
129	0.7860	202.500	186.8	13.0	3.82	1.41	5.23	3.71	81.00	3.32	1.91
130	0.7920	203.500	187.8	13.1	3.84	1.41	5.25	3.72	81.00	3.33	1.92
131	0.7980	204.400	188.7	13.2	3.85	1.43	5.28	3.70	80.90	3.35	1.93
132	0.8040	204.200	188.5	13.3	3.84	1.43	5.27	3.70	80.90	3.35	1.92
133	0.8110	204.800	189.1	13.4	3.85	1.43	5.28	3.70	80.90	3.35	1.92
134	0.8160	205.400	189.7	13.5	3.86	1.43	5.28	3.71	80.90	3.35	1.93
135	0.8220	205.900	190.2	13.6	3.86	1.43	5.29	3.71	80.90	3.36	1.93
136	0.8290	206.400	190.7	13.7	3.87	1.43	5.29	3.71	80.90	3.36	1.93
137	0.8350	207.600	191.9	13.8	3.89	1.43	5.31	3.73	80.90	3.37	1.94
138	0.8410	207.500	191.8	13.9	3.88	1.43	5.31	3.72	80.90	3.37	1.94
139	0.8470	207.700	192.0	14.0	3.88	1.43	5.31	3.72	80.90	3.37	1.94
140	0.8530	208.500	192.8	14.1	3.89	1.43	5.32	3.73	80.90	3.37	1.95
141	0.8590	208.800	193.1	14.2	3.89	1.44	5.33	3.70	80.80	3.39	1.95
142	0.8650	209.100	193.4	14.3	3.90	1.44	5.34	3.71	80.80	3.39	1.95
143	0.8710	209.400	193.7	14.4	3.90	1.45	5.35	3.68	80.70	3.40	1.95
144	0.8770	209.900	194.2	14.5	3.90	1.45	5.36	3.68	80.70	3.41	1.95
145	0.8840	210.100	194.4	14.6	3.90	1.47	5.37	3.66	80.60	3.42	1.95
146	0.8900	210.600	194.9	14.7	3.91	1.47	5.38	3.66	80.60	3.42	1.95
147	0.8960	210.800	195.1	14.8	3.91	1.47	5.38	3.66	80.60	3.42	1.95
148	0.9020	211.500	195.8	14.9	3.92	1.47	5.38	3.67	80.60	3.43	1.96
149	0.9080	212.100	196.4	15.0	3.92	1.48	5.41	3.65	80.50	3.44	1.96
150	0.9110	212.100	196.4	15.1	3.92	1.48	5.40	3.64	80.50	3.44	1.96

Parameters for Specimen No. 3

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	204.570			1384.090
Moisture content: Dry soil+tare, gms.	184.170			1142.410
Moisture content: Tare, gms.	82.790			107.800
Moisture, %	20.1	23.1	21.7	23.4
Moist specimen weight, gms.	1261.73			
Diameter, in.	2.847	2.840	2.818	
Area, in.²	6.366	6.335	6.237	
Height, in.	6.102	6.087	6.040	
Net decrease in height, in.		0.015	0.047	
Wet density, pcf	123.7	127.8	129.3	
Dry density, pcf	103.0	103.8	106.2	
Void ratio	0.6363	0.6242	0.5867	
Saturation, %	85.4	100.0	100.0	

Test Readings for Specimen No. 3

Consolidation cell pressure = 104.70 psi (15.08 ksf)
Consolidation back pressure = 70.00 psi (10.08 ksf)
Consolidation effective confining stress = 5.00 ksf
Strain rate, in./min. = 0.005
Fail. Stress = 4.49 ksf **at reading no.** 30
Ult. Stress = 5.54 ksf **at reading no.** 121

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
0	0.0100	17.300	0.0	0.0	0.00	5.00	5.00	1.00	70.00	5.00	0.00
1	0.0160	78.900	61.6	0.1	1.42	4.10	5.52	1.35	76.20	4.81	0.71
2	0.0230	108.200	90.9	0.2	2.09	3.56	5.65	1.59	80.00	4.60	1.05
3	0.0300	127.500	110.2	0.3	2.54	3.28	5.82	1.77	81.90	4.55	1.27
4	0.0370	142.000	124.7	0.4	2.87	2.76	5.63	2.04	85.50	4.20	1.43
5	0.0440	153.200	135.9	0.6	3.12	2.58	5.70	2.21	86.80	4.14	1.56
6	0.0520	162.900	145.6	0.7	3.34	2.42	5.76	2.38	87.90	4.09	1.67
7	0.0590	170.200	152.9	0.8	3.50	2.30	5.81	2.52	88.70	4.05	1.75
8	0.0660	176.700	159.4	0.9	3.65	2.20	5.85	2.66	89.40	4.03	1.82
9	0.0740	181.900	164.6	1.1	3.76	2.12	5.88	2.78	90.00	4.00	1.88
10	0.0810	186.600	169.3	1.2	3.86	2.06	5.92	2.88	90.40	3.99	1.93
11	0.0890	190.100	172.8	1.3	3.94	2.00	5.94	2.97	90.80	3.97	1.97
12	0.0970	193.000	175.7	1.4	4.00	1.96	5.96	3.04	91.10	3.96	2.00
13	0.1040	195.300	178.0	1.6	4.05	1.92	5.96	3.11	91.40	3.94	2.02
14	0.1120	197.900	180.6	1.7	4.10	1.89	5.99	3.17	91.60	3.94	2.05
15	0.1200	199.900	182.6	1.8	4.14	1.86	6.00	3.23	91.80	3.93	2.07
16	0.1280	201.900	184.6	2.0	4.18	1.84	6.02	3.27	91.90	3.93	2.09
17	0.1350	203.600	186.3	2.1	4.21	1.81	6.03	3.32	92.10	3.92	2.11
18	0.1430	205.300	188.0	2.2	4.25	1.79	6.03	3.38	92.30	3.91	2.12
19	0.1510	206.800	189.5	2.3	4.27	1.79	6.06	3.39	92.30	3.92	2.14
20	0.1590	208.000	190.7	2.5	4.29	1.77	6.07	3.42	92.40	3.92	2.15
21	0.1670	209.200	191.9	2.6	4.32	1.76	6.07	3.46	92.50	3.91	2.16
22	0.1740	210.500	193.2	2.7	4.34	1.76	6.10	3.47	92.50	3.93	2.17
23	0.1820	211.700	194.4	2.8	4.36	1.76	6.12	3.48	92.50	3.94	2.18
24	0.1890	212.700	195.4	3.0	4.38	1.76	6.13	3.49	92.50	3.95	2.19
25	0.1970	213.700	196.4	3.1	4.39	1.79	6.18	3.46	92.30	3.98	2.20

Test Readings for Specimen No. 3

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
26	0.2040	215.000	197.7	3.2	4.42	1.71	6.13	3.58	92.80	3.92	2.21
27	0.2120	216.100	198.8	3.3	4.44	1.67	6.11	3.66	93.10	3.89	2.22
28	0.2190	217.500	200.2	3.5	4.46	1.67	6.13	3.67	93.10	3.90	2.23
29	0.2270	218.300	201.0	3.6	4.47	1.67	6.14	3.68	93.10	3.91	2.24
30	0.2350	219.500	202.2	3.7	4.49	1.67	6.17	3.69	93.10	3.92	2.25
31	0.2420	220.400	203.1	3.8	4.51	1.68	6.19	3.68	93.00	3.94	2.25
32	0.2490	221.300	204.0	4.0	4.52	1.68	6.21	3.69	93.00	3.95	2.26
33	0.2560	222.400	205.1	4.1	4.54	1.70	6.24	3.67	92.90	3.97	2.27
34	0.2640	223.600	206.3	4.2	4.56	1.70	6.26	3.69	92.90	3.98	2.28
35	0.2710	224.800	207.5	4.3	4.58	1.70	6.28	3.70	92.90	3.99	2.29
36	0.2790	225.700	208.4	4.5	4.60	1.70	6.30	3.71	92.90	4.00	2.30
37	0.2870	226.600	209.3	4.6	4.61	1.71	6.32	3.69	92.80	4.02	2.31
38	0.2950	227.300	210.0	4.7	4.62	1.71	6.33	3.70	92.80	4.02	2.31
39	0.3020	228.500	211.2	4.8	4.64	1.71	6.35	3.71	92.80	4.03	2.32
40	0.3100	229.500	212.2	5.0	4.66	1.73	6.38	3.69	92.70	4.06	2.33
41	0.3170	230.300	213.0	5.1	4.67	1.73	6.40	3.70	92.70	4.06	2.33
42	0.3250	231.700	214.4	5.2	4.69	1.73	6.42	3.72	92.70	4.07	2.35
43	0.3330	232.500	215.2	5.3	4.70	1.73	6.43	3.72	92.70	4.08	2.35
44	0.3400	233.500	216.2	5.5	4.72	1.74	6.46	3.71	92.60	4.10	2.36
45	0.3480	234.600	217.3	5.6	4.74	1.76	6.49	3.70	92.50	4.13	2.37
46	0.3560	235.200	217.9	5.7	4.74	1.77	6.51	3.68	92.40	4.14	2.37
47	0.3630	236.000	218.7	5.8	4.75	1.83	6.58	3.60	92.00	4.21	2.38
48	0.3710	236.700	219.4	6.0	4.76	1.96	6.72	3.43	91.10	4.34	2.38
49	0.3780	238.100	220.8	6.1	4.79	1.73	6.52	3.77	92.70	4.12	2.39
50	0.3860	238.900	221.6	6.2	4.80	1.73	6.53	3.78	92.70	4.13	2.40
51	0.3930	240.100	222.8	6.3	4.82	1.74	6.56	3.77	92.60	4.15	2.41
52	0.4010	241.100	223.8	6.5	4.83	1.76	6.59	3.75	92.50	4.17	2.42
53	0.4080	241.500	224.2	6.6	4.84	1.76	6.59	3.75	92.50	4.17	2.42
54	0.4150	242.900	225.6	6.7	4.86	1.77	6.63	3.74	92.40	4.20	2.43
55	0.4230	244.200	226.9	6.8	4.88	1.77	6.65	3.76	92.40	4.21	2.44
56	0.4300	244.900	227.6	7.0	4.89	1.79	6.68	3.74	92.30	4.23	2.44
57	0.4380	245.400	228.1	7.1	4.89	1.79	6.68	3.74	92.30	4.23	2.45
58	0.4460	246.600	229.3	7.2	4.91	1.79	6.70	3.75	92.30	4.24	2.46
59	0.4530	248.000	230.7	7.3	4.94	1.80	6.74	3.74	92.20	4.27	2.47
60	0.4600	248.900	231.6	7.5	4.95	1.81	6.76	3.73	92.10	4.29	2.47
61	0.4680	249.600	232.3	7.6	4.96	1.81	6.77	3.73	92.10	4.29	2.48
62	0.4760	250.400	233.1	7.7	4.97	1.81	6.78	3.74	92.10	4.30	2.48
63	0.4830	250.900	233.6	7.8	4.97	1.83	6.80	3.72	92.00	4.31	2.49
64	0.4910	252.300	235.0	8.0	4.99	1.83	6.82	3.73	92.00	4.33	2.50
65	0.4980	253.000	235.7	8.1	5.00	1.84	6.85	3.71	91.90	4.34	2.50
66	0.5060	254.100	236.8	8.2	5.02	1.86	6.88	3.70	91.80	4.37	2.51
67	0.5140	255.100	237.8	8.3	5.03	1.87	6.90	3.69	91.70	4.39	2.52
68	0.5210	256.200	238.9	8.5	5.05	1.89	6.94	3.68	91.60	4.41	2.52
69	0.5290	256.900	239.6	8.6	5.06	1.92	6.97	3.64	91.40	4.44	2.53
70	0.5370	257.800	240.5	8.7	5.07	1.99	7.06	3.55	90.90	4.52	2.53
71	0.5450	258.600	241.3	8.9	5.08	1.87	6.95	3.71	91.70	4.41	2.54
72	0.5520	259.900	242.6	9.0	5.10	1.87	6.97	3.72	91.70	4.42	2.55

Test Readings for Specimen No. 3

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
73	0.5600	260.500	243.2	9.1	5.10	1.87	6.98	3.73	91.70	4.42	2.55
74	0.5670	261.700	244.4	9.2	5.12	1.89	7.01	3.72	91.60	4.45	2.56
75	0.5750	262.600	245.3	9.4	5.13	1.90	7.03	3.70	91.50	4.47	2.57
76	0.5820	263.400	246.1	9.5	5.14	1.90	7.04	3.71	91.50	4.47	2.57
77	0.5900	264.000	246.7	9.6	5.15	1.90	7.05	3.71	91.50	4.48	2.57
78	0.5970	264.800	247.5	9.7	5.16	1.92	7.07	3.69	91.40	4.49	2.58
79	0.6050	265.600	248.3	9.9	5.17	1.93	7.10	3.68	91.30	4.51	2.58
80	0.6130	267.100	249.8	10.0	5.19	1.93	7.12	3.69	91.30	4.53	2.60
81	0.6200	268.000	250.7	10.1	5.20	1.94	7.15	3.68	91.20	4.55	2.60
82	0.6280	268.200	250.9	10.2	5.20	1.94	7.14	3.68	91.20	4.54	2.60
83	0.6350	269.300	252.0	10.3	5.22	1.96	7.17	3.66	91.10	4.57	2.61
84	0.6420	270.700	253.4	10.5	5.24	1.96	7.20	3.67	91.10	4.58	2.62
85	0.6500	271.300	254.0	10.6	5.24	1.97	7.22	3.66	91.00	4.59	2.62
86	0.6570	272.200	254.9	10.7	5.26	1.97	7.23	3.66	91.00	4.60	2.63
87	0.6650	272.700	255.4	10.8	5.26	1.99	7.24	3.65	90.90	4.62	2.63
88	0.6720	273.300	256.0	11.0	5.26	2.00	7.26	3.63	90.80	4.63	2.63
89	0.6800	274.400	257.1	11.1	5.28	2.02	7.29	3.62	90.70	4.65	2.64
90	0.6880	275.200	257.9	11.2	5.29	2.03	7.32	3.60	90.60	4.67	2.64
91	0.6950	276.300	259.0	11.3	5.30	2.04	7.35	3.59	90.50	4.70	2.65
92	0.7030	277.300	260.0	11.5	5.31	2.07	7.39	3.56	90.30	4.73	2.66
93	0.7110	278.000	260.7	11.6	5.32	2.16	7.48	3.46	89.70	4.82	2.66
94	0.7180	279.300	262.0	11.7	5.34	2.02	7.36	3.65	90.70	4.69	2.67
95	0.7260	280.000	262.7	11.9	5.35	2.02	7.36	3.65	90.70	4.69	2.67
96	0.7330	280.300	263.0	12.0	5.35	2.03	7.38	3.63	90.60	4.70	2.67
97	0.7410	281.900	264.6	12.1	5.37	2.03	7.40	3.64	90.60	4.72	2.69
98	0.7480	282.200	264.9	12.2	5.37	2.04	7.41	3.63	90.50	4.73	2.68
99	0.7560	283.400	266.1	12.4	5.39	2.06	7.44	3.62	90.40	4.75	2.69
100	0.7640	284.000	266.7	12.5	5.39	2.06	7.45	3.62	90.40	4.75	2.69
101	0.7710	284.800	267.5	12.6	5.40	2.06	7.46	3.62	90.40	4.76	2.70
102	0.7790	285.500	268.2	12.7	5.40	2.07	7.48	3.61	90.30	4.78	2.70
103	0.7870	285.800	268.5	12.9	5.40	2.07	7.48	3.61	90.30	4.77	2.70
104	0.7940	286.500	269.2	13.0	5.41	2.09	7.50	3.59	90.20	4.79	2.70
105	0.8020	288.200	270.9	13.1	5.43	2.09	7.52	3.60	90.20	4.81	2.72
106	0.8090	289.000	271.7	13.2	5.44	2.10	7.55	3.59	90.10	4.82	2.72
107	0.8170	289.200	271.9	13.4	5.44	2.10	7.54	3.59	90.10	4.82	2.72
108	0.8240	289.900	272.6	13.5	5.45	2.12	7.56	3.57	90.00	4.84	2.72
109	0.8310	291.900	274.6	13.6	5.48	2.12	7.60	3.59	90.00	4.86	2.74
110	0.8390	292.300	275.0	13.7	5.48	2.13	7.61	3.57	89.90	4.87	2.74
111	0.8470	292.800	275.5	13.9	5.48	2.15	7.63	3.55	89.80	4.89	2.74
112	0.8540	293.200	275.9	14.0	5.48	2.15	7.63	3.55	89.80	4.89	2.74
113	0.8620	294.000	276.7	14.1	5.49	2.16	7.65	3.54	89.70	4.90	2.74
114	0.8690	294.900	277.6	14.2	5.50	2.19	7.69	3.51	89.50	4.94	2.75
115	0.8770	295.500	278.2	14.4	5.50	2.25	7.75	3.45	89.10	5.00	2.75
116	0.8850	296.400	279.1	14.5	5.51	2.25	7.76	3.45	89.10	5.00	2.76
117	0.8920	297.300	280.0	14.6	5.52	2.15	7.67	3.57	89.80	4.91	2.76
118	0.9000	298.200	280.9	14.7	5.53	2.15	7.68	3.58	89.80	4.91	2.77
119	0.9080	299.400	282.1	14.9	5.55	2.16	7.71	3.57	89.70	4.93	2.77

Test Readings for Specimen No. 3

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
120	0.9150	299.900	282.6	15.0	5.55	2.17	7.72	3.55	89.60	4.95	2.77
121	0.9210	300.000	282.7	15.1	5.54	2.17	7.72	3.55	89.60	4.95	2.77

ASTM D4767 CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST FOR COHESIVE SOILS

Project No.: 1461-16-047.2B
Project Name: Carolina Crossroads Project

Sample ID: W-18UD UD-1
Depth: 2-4'

Failed Specimens

Specimen No.: 1
Effective Confining Pressure: 3.5 psi
Notes: Failed in shear

Specimen No.: 2
Effective Confining Pressure: 20.8 psi
Notes: Failed in shear

Specimen No.: 3
Effective Confining Pressure: 34.7 psi
Notes: Failed in shear

Sheared By: Karen Warner
Reviewed By: Jason Reeves Date: 6/4/2018

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☐ AASHTO T 89 ☐ AASHTO T 90 ☐

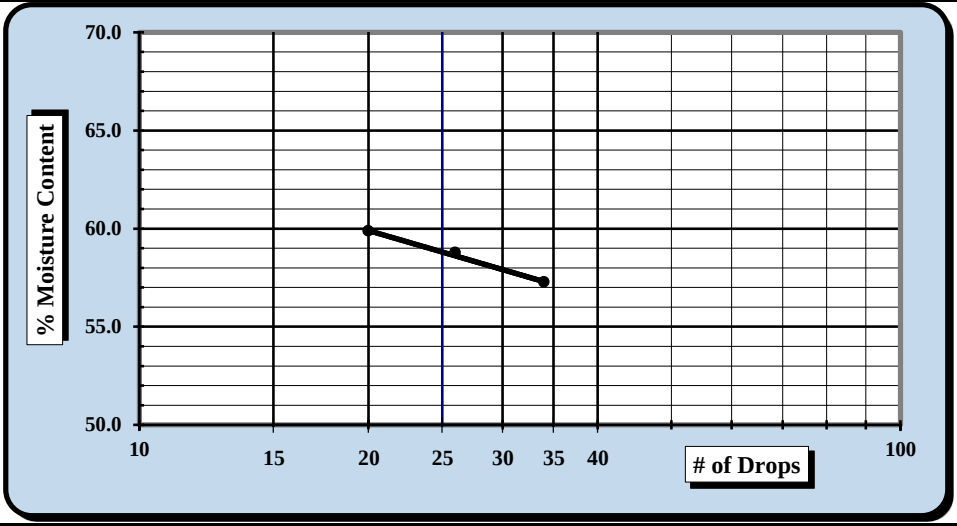
S&ME, Inc. Charlotte: 9751 Southern Pine Boulevard, Charlotte, NC 28273

Project #:	1461-16-047.2B	Report Date:	6/1/18
Project Name:	Carolina Crossroads Project	Test Date(s)	4/18-5/20/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Avenue, North Charleston, SC 29405		

Boring #:	W-23UD	Sample #: UD-2	Sample Date: Various
Location:	UD Borings	Offset: NA	Elevation: 8.5-10
Sample Description:	Brown Gray Clay (CH)		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	3222	7/29/2017	Grooving tool	30427	9/27/2017
LL Apparatus	20336	2/21/2018	Grooving tool		
Oven	10844	8/22/2017	Grooving tool		

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	LL	60	II				BB	23	
A	Tare Weight	16.98	13.90	16.92				15.37	14.09	
B	Wet Soil Weight + A	26.73	24.76	28.05				23.54	22.37	
C	Dry Soil Weight + A	23.18	20.74	23.88				21.96	20.75	
D	Water Weight (B-C)	3.55	4.02	4.17				1.58	1.62	
E	Dry Soil Weight (C-A)	6.20	6.84	6.96				6.59	6.66	
F	% Moisture (D/E)*100	57.3%	58.8%	59.9%				24.0%	24.3%	
N	# OF DROPS	34	26	20						
LL	LL = **F** * FACTOR									
Ave.	*Average*							**24.2%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**59**
Plastic Limit	**24**
Plastic Index	**35**
Group Symbol	**CH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:*

Notes / Deviations / References:

Karen Warner	6/1/2018	Matthew F. Cooke, P.G.	7/18/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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SIEVE ANALYSIS OF SOILS

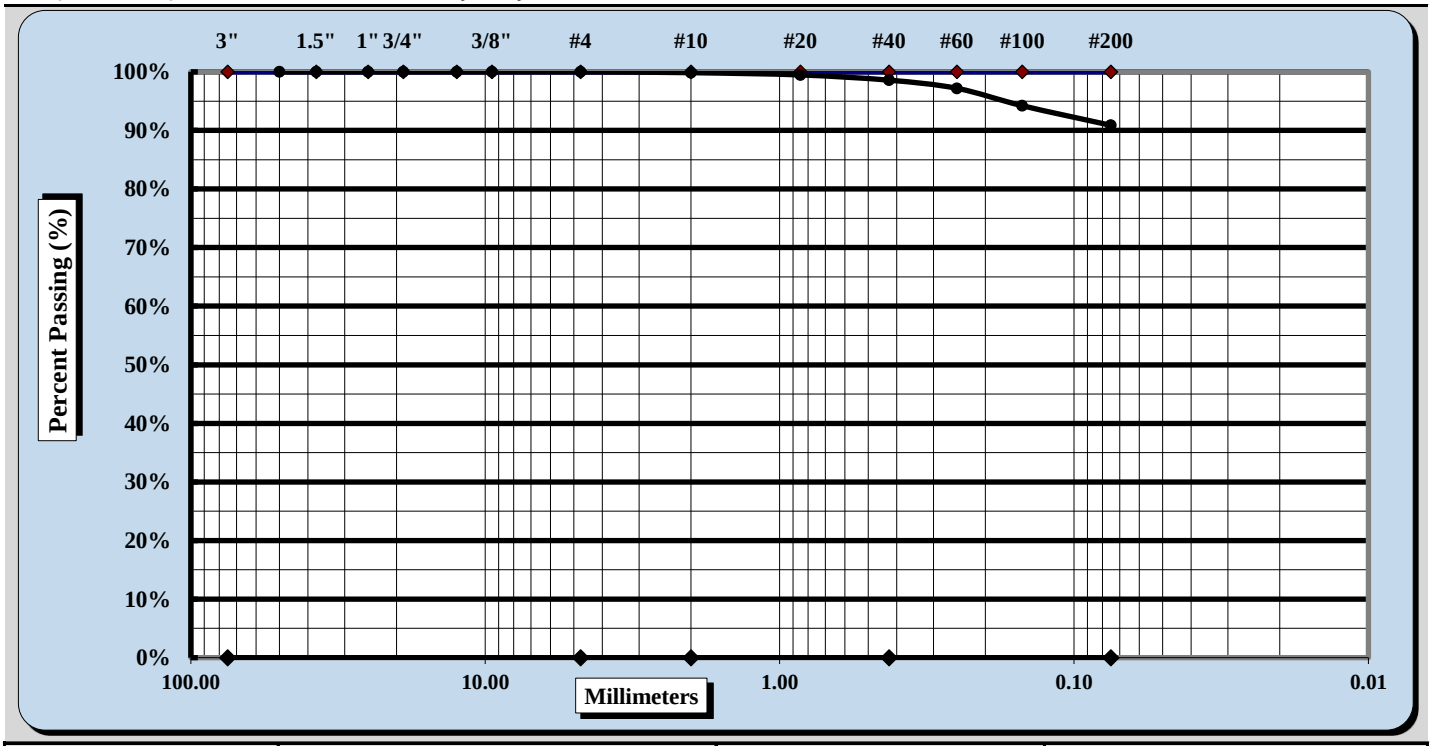
ASTM D 422

S&ME, Inc. Charlotte: 9751 Southern Pine Boulevard, Charlotte, NC 28273

Project #:	1461-16-047.2B	Report Date:	6/1/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/18-25/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Avenue, North Charleston, SC 29405		

Sample Id.	W-23UD	Type:	Undisturbed	Sample Date:	Various
Location:	UD Borings	Sample:	UD-2	Elevation:	8.5-10

Sample Description: Brown Gray Clay (CH)



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	#10	Coarse Sand	0.1%	Fine Sand	7.7%
Gravel	0.0%	Medium Sand	1.3%	Silt & Clay	90.9%
Liquid Limit	59	Plastic Limit	24	Plastic Index	35
Specific Gravity	ND			Moisture Content	Various
Coarse Sand	0.1%	Medium Sand	1.3%	Fine Sand	7.7%

Description of Sand & Gravel Particles: Rounded ☐ Angular ☒
Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

Notes / Deviations / References: ND: Not Determined

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
7/8/2018 — *Date*

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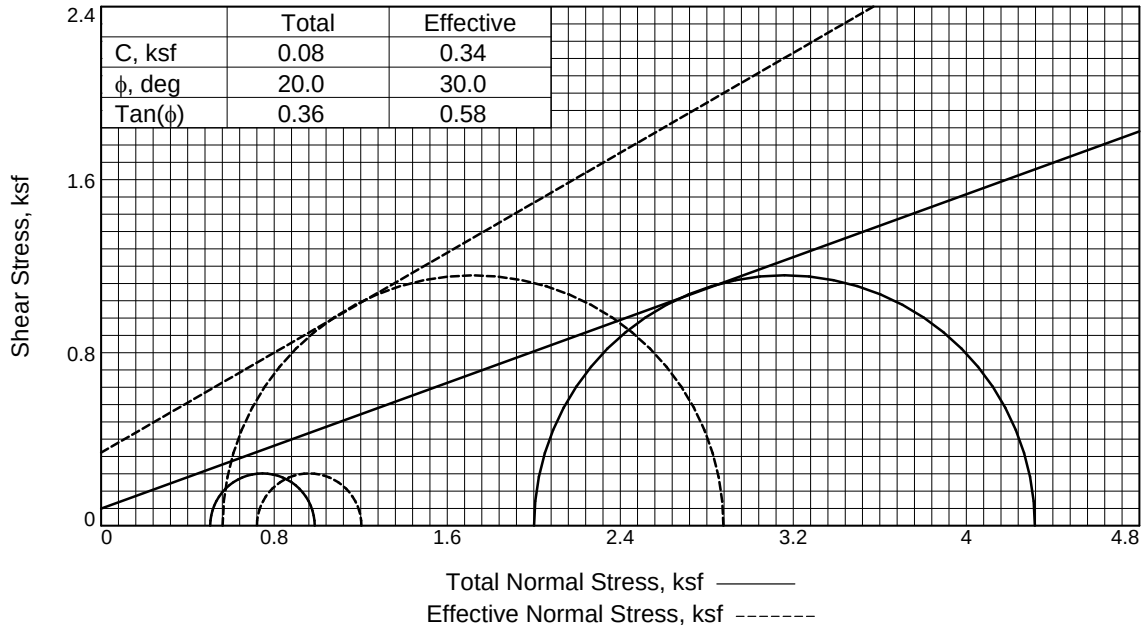
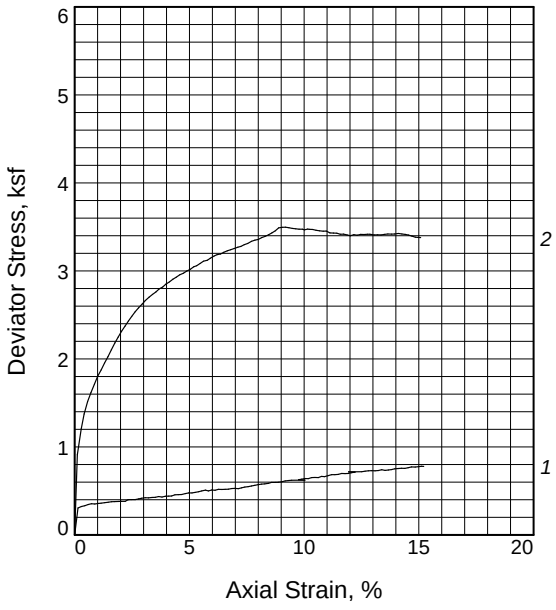
C & phi are not test results but an interpretation of the test results. The designer is responsible for interpreting test data as provided by S&ME.





Sample No.		1	2
Initial	Water Content, %	25.0	25.0
	Dry Density, pcf	84.3	96.2
	Saturation, %	68.8	92.1
	Void Ratio	0.9634	0.7194
	Diameter, in.	2.857	2.854
	Height, in.	6.362	6.180
At Test	Water Content, %	30.1	23.8
	Dry Density, pcf	92.0	101.4
	Saturation, %	100.0	100.0
	Void Ratio	0.7972	0.6320
	Diameter, in.	2.774	2.805
	Height, in.	6.179	6.074
Strain rate, in./min.		0.009	0.009
Eff. Cell Pressure, ksf		0.50	2.00
Fail. Stress, ksf		0.48	2.32
Total Pore Pr., ksf		8.42	10.08
Strain, %		5.2	2.0
Ult. Stress, ksf		0.78	3.38
Total Pore Pr., ksf		8.32	9.00
Strain, %		15.2	15.1
$\bar{\sigma}_1$ Failure, ksf		1.20	2.88
$\bar{\sigma}_3$ Failure, ksf		0.72	0.56

Type of Test:
CU with Pore Pressures
Sample Type: Undisturbed
Description: Brown Gray Clay (CH)

LL= 59 **PL=** 24 **PI=** 35
Assumed Specific Gravity= 2.65
Remarks: Only 2 specimens suitable for testing. Specimen S-1 failed in bulge, S-2 Specimen failed in shear (ASTM 4767).

Figure W-23UD UD-2

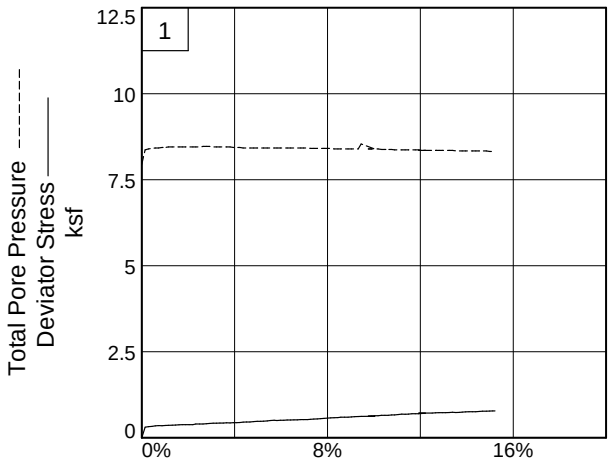
Client: HDR Engineering, Inc.

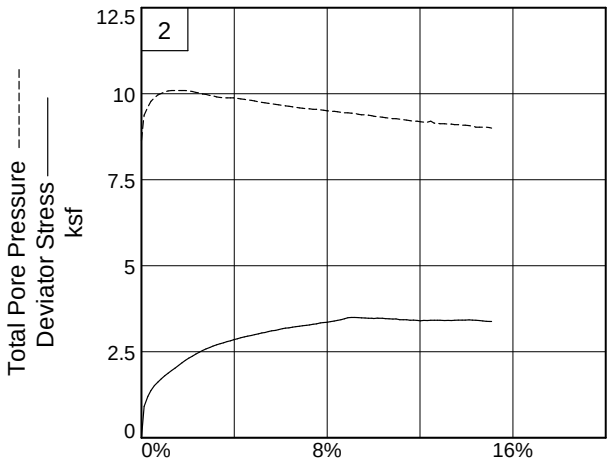
Project: Carolina Crossroads Project

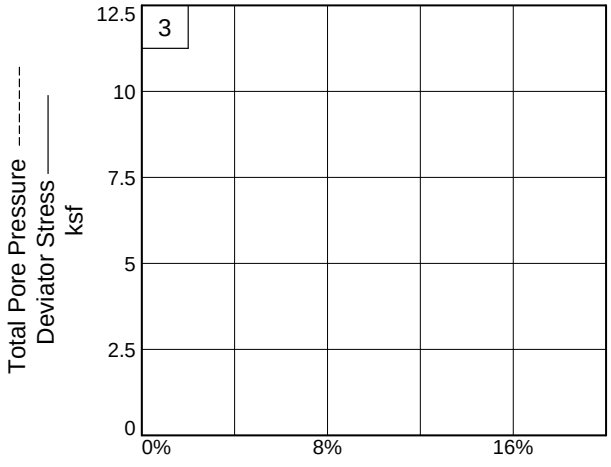
Location: UD Borings
Sample Number: W-23UD UD-2 **Depth:** 8.5-10.5
Proj. No.: 1461-16-047.2B **Date Sampled:** Various

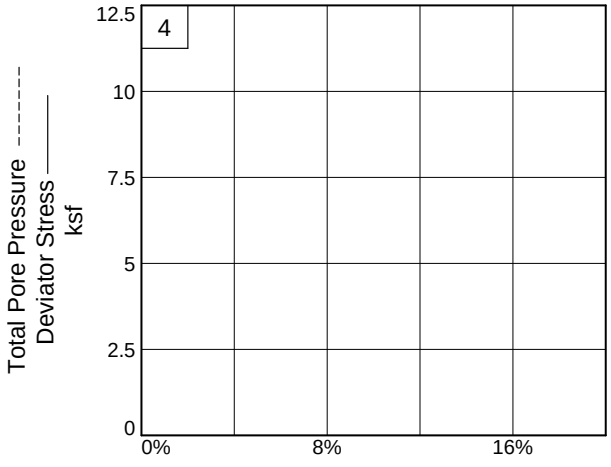
TRIAXIAL SHEAR TEST REPORT
S & ME, INC.
Charlotte, North Carolina

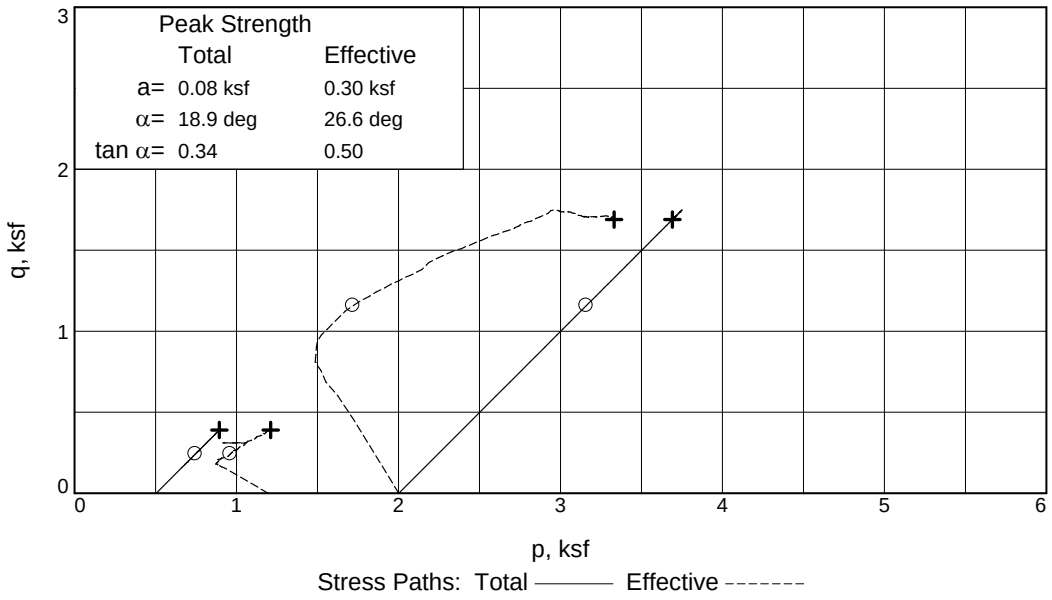
Tested By: Karen Warner **Checked By:** Jason Reeves











Client: HDR Engineering, Inc.
Project: Carolina Crossroads Project
Location: UD Borings **Depth:** 8.5-10.5 **Sample Number:** W-23UD UD-2
Project No.: 1461-16-047.2B **Figure** W-23UD UD-2

S & ME, INC.

Tested By: Karen Warner **Checked By:** Jason Reeves

C & phi are not test results but an interpretation of the test results. The designer is responsible for interpreting test data as provided by S&ME.

TRIAXIAL COMPRESSION TEST

6/28/2018

CU with Pore Pressures

5:03 PM

Date: Various
Client: HDR Engineering, Inc.
Project: Carolina Crossroads Project
Project No.: 1461-16-047.2B
Location: UD Borings
Depth: 8.5-10.5 **Sample Number:** W-23UD UD-2
Description: Brown Gray Clay (CH)
Remarks: Only 2 specimens suitable for testing. Specimen S-1 failed in bulge, S-2 Specimen failed in shear (ASTM 4767).
Type of Sample: Undisturbed
Assumed Specific Gravity=2.65 **LL=**59 **PL=**24 **PI=**35
Test Method: COE uniform strain

Parameters for Specimen No. 1

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	243.730			1261.270
Moisture content: Dry soil+tare, gms.	211.340			1200.000
Moisture content: Tare, gms.	81.830			84.570
Moisture, %	25.0	34.9	30.1	5.5
Moist specimen weight, gms.	1127.68			
Diameter, in.	2.857	2.839	2.774	
Area, in.²	6.411	6.328	6.042	
Height, in.	6.362	6.321	6.179	
Net decrease in height, in.		0.041	0.142	
Wet density, pcf	105.3	115.9	119.7	
Dry density, pcf	84.3	85.9	92.0	
Void ratio	0.9634	0.9256	0.7972	
Saturation, %	68.8	100.0	100.0	

Test Readings for Specimen No. 1

Consolidation cell pressure = 63.50 psi (9.14 ksf)
Consolidation back pressure = 60.00 psi (8.64 ksf)
Consolidation effective confining stress = 0.50 ksf
Strain rate, in./min. = 0.009
Fail. Stress = 0.48 ksf **at reading no.** 36
Ult. Stress = 0.78 ksf **at reading no.** 105

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
0	0.0100	18.100	0.0	0.0	0.00	1.20	1.20	1.00	55.20	1.20	0.00
1	0.0190	31.000	12.9	0.1	0.31	0.78	1.08	1.39	58.10	0.93	0.15
2	0.0280	31.700	13.6	0.3	0.32	0.75	1.07	1.43	58.30	0.91	0.16
3	0.0370	32.100	14.0	0.4	0.33	0.73	1.07	1.45	58.40	0.90	0.17
4	0.0460	32.700	14.6	0.6	0.35	0.72	1.07	1.48	58.50	0.89	0.17
5	0.0550	33.100	15.0	0.7	0.35	0.72	1.07	1.49	58.50	0.90	0.18
6	0.0640	33.000	14.9	0.9	0.35	0.71	1.06	1.50	58.60	0.88	0.18
7	0.0730	33.300	15.2	1.0	0.36	0.71	1.06	1.51	58.60	0.88	0.18
8	0.0810	33.400	15.3	1.1	0.36	0.69	1.05	1.52	58.70	0.87	0.18
9	0.0910	33.700	15.6	1.3	0.37	0.69	1.06	1.53	58.70	0.87	0.18
10	0.1000	33.900	15.8	1.5	0.37	0.69	1.06	1.54	58.70	0.88	0.19
11	0.1090	34.200	16.1	1.6	0.38	0.69	1.07	1.55	58.70	0.88	0.19
12	0.1180	34.300	16.2	1.7	0.38	0.69	1.07	1.55	58.70	0.88	0.19
13	0.1270	34.400	16.3	1.9	0.38	0.69	1.07	1.55	58.70	0.88	0.19
14	0.1360	34.500	16.4	2.0	0.38	0.69	1.07	1.55	58.70	0.88	0.19
15	0.1460	34.500	16.4	2.2	0.38	0.69	1.07	1.55	58.70	0.88	0.19
16	0.1540	35.300	17.2	2.3	0.40	0.69	1.09	1.58	58.70	0.89	0.20
17	0.1640	35.400	17.3	2.5	0.40	0.69	1.09	1.58	58.70	0.89	0.20
18	0.1730	35.400	17.3	2.6	0.40	0.68	1.08	1.59	58.80	0.88	0.20
19	0.1820	35.800	17.7	2.8	0.41	0.68	1.09	1.61	58.80	0.88	0.21
20	0.1900	36.100	18.0	2.9	0.42	0.68	1.09	1.62	58.80	0.89	0.21
21	0.2000	36.400	18.3	3.1	0.42	0.69	1.11	1.61	58.70	0.90	0.21
22	0.2090	36.400	18.3	3.2	0.42	0.69	1.11	1.61	58.70	0.90	0.21
23	0.2180	36.600	18.5	3.4	0.43	0.69	1.12	1.62	58.70	0.90	0.21
24	0.2270	36.700	18.6	3.5	0.43	0.69	1.12	1.62	58.70	0.91	0.21
25	0.2360	37.100	19.0	3.7	0.44	0.69	1.13	1.63	58.70	0.91	0.22
26	0.2450	36.900	18.8	3.8	0.43	0.69	1.12	1.62	58.70	0.91	0.22
27	0.2540	37.300	19.2	3.9	0.44	0.71	1.15	1.62	58.60	0.93	0.22
28	0.2630	37.400	19.3	4.1	0.44	0.71	1.15	1.63	58.60	0.93	0.22
29	0.2710	37.500	19.4	4.2	0.44	0.71	1.15	1.63	58.60	0.93	0.22
30	0.2800	38.100	20.0	4.4	0.46	0.72	1.18	1.63	58.50	0.95	0.23
31	0.2890	38.200	20.1	4.5	0.46	0.72	1.18	1.64	58.50	0.95	0.23
32	0.2980	38.300	20.2	4.7	0.46	0.72	1.18	1.64	58.50	0.95	0.23
33	0.3080	38.800	20.7	4.8	0.47	0.72	1.19	1.65	58.50	0.95	0.23
34	0.3170	39.200	21.1	5.0	0.48	0.72	1.20	1.66	58.50	0.96	0.24
35	0.3260	39.200	21.1	5.1	0.48	0.72	1.20	1.66	58.50	0.96	0.24
36	0.3340	39.500	21.4	5.2	0.48	0.72	1.20	1.67	58.50	0.96	0.24
37	0.3440	39.900	21.8	5.4	0.49	0.72	1.21	1.68	58.50	0.97	0.25
38	0.3520	40.300	22.2	5.5	0.50	0.72	1.22	1.69	58.50	0.97	0.25
39	0.3620	40.800	22.7	5.7	0.51	0.72	1.23	1.71	58.50	0.98	0.26
40	0.3700	40.400	22.3	5.8	0.50	0.72	1.22	1.70	58.50	0.97	0.25
41	0.3790	40.900	22.8	6.0	0.51	0.72	1.23	1.71	58.50	0.98	0.26
42	0.3880	40.800	22.7	6.1	0.51	0.72	1.23	1.71	58.50	0.97	0.25
43	0.3970	41.300	23.2	6.3	0.52	0.72	1.24	1.72	58.50	0.98	0.26
44	0.4060	41.300	23.2	6.4	0.52	0.72	1.24	1.72	58.50	0.98	0.26
45	0.4150	41.400	23.3	6.6	0.52	0.72	1.24	1.72	58.50	0.98	0.26
46	0.4240	41.500	23.4	6.7	0.52	0.72	1.24	1.72	58.50	0.98	0.26

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
47	0.4330	41.900	23.8	6.8	0.53	0.72	1.25	1.73	58.50	0.98	0.26
48	0.4410	42.000	23.9	7.0	0.53	0.72	1.25	1.74	58.50	0.98	0.26
49	0.4510	41.900	23.8	7.1	0.53	0.72	1.25	1.73	58.50	0.98	0.26
50	0.4590	42.300	24.2	7.3	0.53	0.73	1.27	1.73	58.40	1.00	0.27
51	0.4680	42.800	24.7	7.4	0.55	0.73	1.28	1.74	58.40	1.01	0.27
52	0.4770	43.000	24.9	7.6	0.55	0.73	1.28	1.75	58.40	1.01	0.27
53	0.4860	43.400	25.3	7.7	0.56	0.73	1.29	1.76	58.40	1.01	0.28
54	0.4950	43.800	25.7	7.8	0.56	0.73	1.30	1.77	58.40	1.02	0.28
55	0.5040	44.200	26.1	8.0	0.57	0.73	1.31	1.78	58.40	1.02	0.29
56	0.5130	44.500	26.4	8.1	0.58	0.73	1.31	1.79	58.40	1.02	0.29
57	0.5220	44.700	26.6	8.3	0.58	0.75	1.33	1.78	58.30	1.04	0.29
58	0.5320	45.000	26.9	8.4	0.59	0.75	1.34	1.78	58.30	1.04	0.29
59	0.5400	45.500	27.4	8.6	0.60	0.75	1.35	1.80	58.30	1.05	0.30
60	0.5500	45.600	27.5	8.7	0.60	0.75	1.35	1.80	58.30	1.05	0.30
61	0.5590	45.700	27.6	8.9	0.60	0.75	1.35	1.80	58.30	1.05	0.30
62	0.5680	46.000	27.9	9.0	0.60	0.75	1.35	1.81	58.30	1.05	0.30
63	0.5770	46.500	28.4	9.2	0.61	0.75	1.36	1.82	58.30	1.06	0.31
64	0.5860	46.700	28.6	9.3	0.62	0.75	1.37	1.83	58.30	1.06	0.31
65	0.5940	46.900	28.8	9.5	0.62	0.60	1.23	2.03	59.30	0.92	0.31
66	0.6300	47.200	29.1	10.0	0.62	0.75	1.37	1.83	58.30	1.06	0.31
67	0.6130	47.300	29.2	9.8	0.63	0.75	1.38	1.84	58.30	1.06	0.31
68	0.6210	47.600	29.5	9.9	0.63	0.75	1.38	1.85	58.30	1.07	0.32
69	0.6300	48.000	29.9	10.0	0.64	0.75	1.39	1.86	58.30	1.07	0.32
70	0.6390	48.000	29.9	10.2	0.64	0.75	1.39	1.85	58.30	1.07	0.32
71	0.6480	48.600	30.5	10.3	0.65	0.76	1.42	1.85	58.20	1.09	0.33
72	0.6570	48.700	30.6	10.5	0.65	0.76	1.42	1.86	58.20	1.09	0.33
73	0.6660	48.700	30.6	10.6	0.65	0.76	1.42	1.85	58.20	1.09	0.33
74	0.6750	49.400	31.3	10.8	0.67	0.76	1.43	1.87	58.20	1.10	0.33
75	0.6830	49.300	31.2	10.9	0.66	0.78	1.44	1.85	58.10	1.11	0.33
76	0.6930	49.900	31.8	11.1	0.67	0.78	1.45	1.87	58.10	1.11	0.34
77	0.7020	50.500	32.4	11.2	0.69	0.78	1.46	1.88	58.10	1.12	0.34
78	0.7110	50.500	32.4	11.3	0.68	0.78	1.46	1.88	58.10	1.12	0.34
79	0.7200	50.700	32.6	11.5	0.69	0.78	1.47	1.88	58.10	1.12	0.34
80	0.7290	51.300	33.2	11.6	0.70	0.78	1.48	1.90	58.10	1.13	0.35
81	0.7380	51.300	33.2	11.8	0.70	0.78	1.48	1.90	58.10	1.13	0.35
82	0.7470	51.400	33.3	11.9	0.70	0.78	1.48	1.90	58.10	1.13	0.35
83	0.7560	51.900	33.8	12.1	0.71	0.79	1.50	1.89	58.00	1.15	0.35
84	0.7650	52.200	34.1	12.2	0.71	0.79	1.51	1.90	58.00	1.15	0.36
85	0.7474	52.300	34.2	11.9	0.72	0.79	1.51	1.91	58.00	1.15	0.36
86	0.7830	52.600	34.5	12.5	0.72	0.79	1.51	1.91	58.00	1.15	0.36
87	0.7920	52.900	34.8	12.7	0.72	0.79	1.52	1.91	58.00	1.15	0.36
88	0.8010	53.200	35.1	12.8	0.73	0.79	1.52	1.92	58.00	1.16	0.36
89	0.8100	53.300	35.2	12.9	0.73	0.79	1.52	1.92	58.00	1.16	0.37
90	0.8190	53.300	35.2	13.1	0.73	0.79	1.52	1.92	58.00	1.16	0.36
91	0.8280	53.500	35.4	13.2	0.73	0.79	1.52	1.92	58.00	1.16	0.37
92	0.8370	54.000	35.9	13.4	0.74	0.79	1.53	1.94	58.00	1.16	0.37
93	0.8460	53.700	35.6	13.5	0.73	0.81	1.54	1.91	57.90	1.17	0.37

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
94	0.8550	54.000	35.9	13.7	0.74	0.81	1.55	1.92	57.90	1.18	0.37
95	0.8630	54.300	36.2	13.8	0.74	0.81	1.55	1.92	57.90	1.18	0.37
96	0.8720	54.800	36.7	14.0	0.75	0.81	1.56	1.93	57.90	1.18	0.38
97	0.8810	55.000	36.9	14.1	0.76	0.81	1.56	1.94	57.90	1.18	0.38
98	0.8900	55.200	37.1	14.2	0.76	0.81	1.56	1.94	57.90	1.19	0.38
99	0.8990	55.200	37.1	14.4	0.76	0.81	1.56	1.94	57.90	1.18	0.38
100	0.9080	55.600	37.5	14.5	0.76	0.81	1.57	1.95	57.90	1.19	0.38
101	0.9170	56.100	38.0	14.7	0.77	0.81	1.58	1.96	57.90	1.19	0.39
102	0.9270	56.100	38.0	14.8	0.77	0.81	1.58	1.96	57.90	1.19	0.39
103	0.9360	56.400	38.3	15.0	0.78	0.82	1.60	1.95	57.80	1.21	0.39
104	0.9440	56.700	38.6	15.1	0.78	0.82	1.60	1.95	57.80	1.21	0.39
105	0.9500	56.700	38.6	15.2	0.78	0.82	1.60	1.95	57.80	1.21	0.39

Parameters for Specimen No. 2

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	243.730			n/a
Moisture content: Dry soil+tare, gms.	211.340			n/a
Moisture content: Tare, gms.	81.830			n/a
Moisture, %	25.0	26.7	23.8	
Moist specimen weight, gms.	1248.21			
Diameter, in.	2.854	2.848	2.805	
Area, in.²	6.397	6.370	6.178	
Height, in.	6.180	6.167	6.074	
Net decrease in height, in.		0.013	0.093	
Wet density, pcf	120.3	122.7	125.5	
Dry density, pcf	96.2	96.8	101.4	
Void ratio	0.7194	0.7086	0.6320	
Saturation, %	92.1	100.0	100.0	

Test Readings for Specimen No. 2

Consolidation cell pressure = 73.90 psi (10.64 ksf)
Consolidation back pressure = 60.00 psi (8.64 ksf)
Consolidation effective confining stress = 2.00 ksf
Strain rate, in./min. = 0.009
Fail. Stress = 2.32 ksf **at reading no.** 14
Ult. Stress = 3.38 ksf **at reading no.** 103

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
0	0.0190	15.500	0.0	0.0	0.00	2.00	2.00	1.00	60.00	2.00	0.00
1	0.0260	54.600	39.1	0.1	0.91	1.27	2.18	1.72	65.10	1.72	0.46
2	0.0360	67.300	51.8	0.3	1.20	1.02	2.23	2.18	66.80	1.62	0.60
3	0.0440	74.700	59.2	0.4	1.37	0.86	2.24	2.59	67.90	1.55	0.69
4	0.0530	80.900	65.4	0.6	1.52	0.76	2.28	2.99	68.60	1.52	0.76
5	0.0620	85.400	69.9	0.7	1.62	0.68	2.29	3.39	69.20	1.49	0.81
6	0.0710	89.600	74.1	0.9	1.71	0.63	2.35	3.70	69.50	1.49	0.86
7	0.0800	93.700	78.2	1.0	1.80	0.59	2.39	4.06	69.80	1.49	0.90
8	0.0890	96.900	81.4	1.2	1.88	0.56	2.44	4.34	70.00	1.50	0.94
9	0.0980	100.400	84.9	1.3	1.95	0.55	2.50	4.57	70.10	1.52	0.98

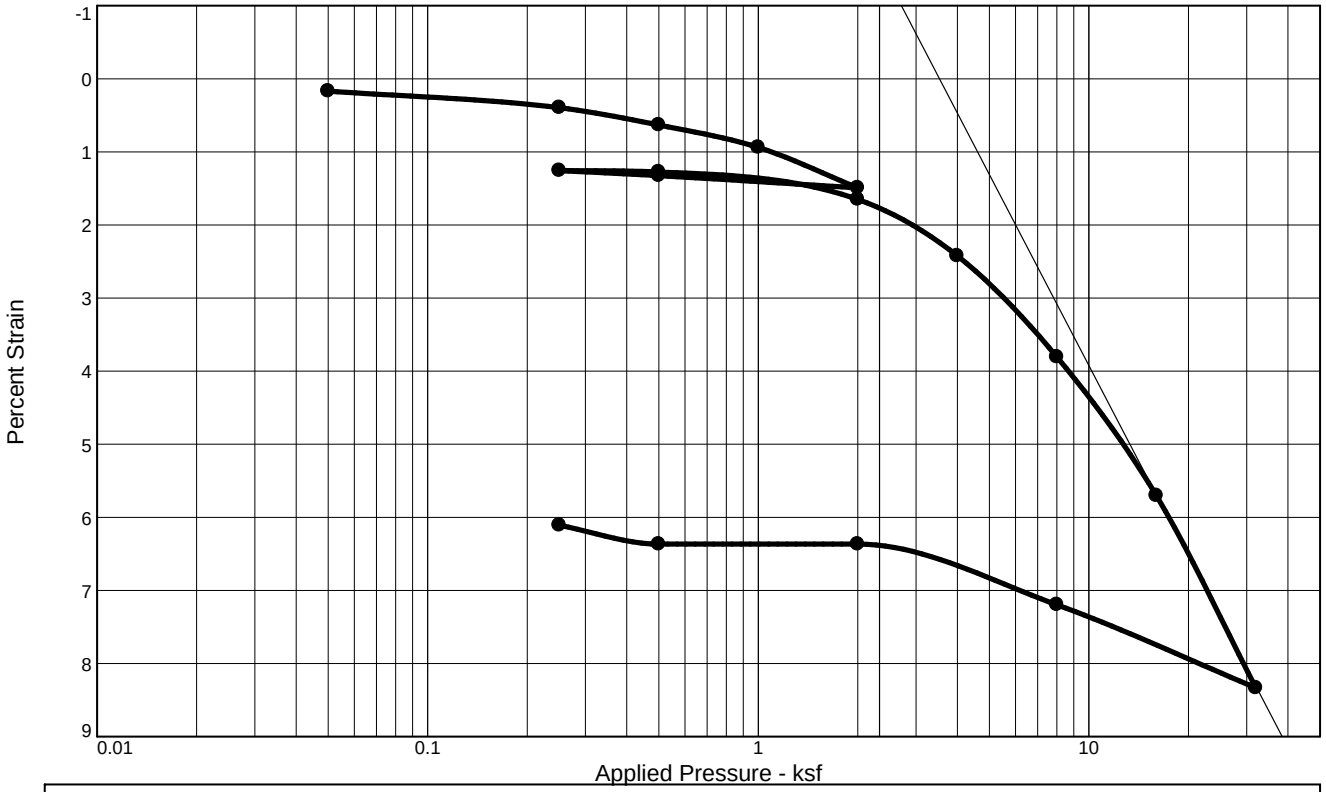
Test Readings for Specimen No. 2

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
10	0.1070	103.700	88.2	1.4	2.03	0.55	2.57	4.70	70.10	1.56	1.01
11	0.1160	107.200	91.7	1.6	2.10	0.55	2.65	4.84	70.10	1.60	1.05
12	0.1250	110.700	95.2	1.7	2.18	0.55	2.73	4.98	70.10	1.64	1.09
13	0.1340	113.800	98.3	1.9	2.25	0.55	2.80	5.11	70.10	1.67	1.12
14	0.1430	116.900	101.4	2.0	2.32	0.56	2.88	5.12	70.00	1.72	1.16
15	0.1520	119.500	104.0	2.2	2.37	0.58	2.95	5.12	69.90	1.76	1.19
16	0.1610	122.300	106.8	2.3	2.43	0.60	3.04	5.02	69.70	1.82	1.22
17	0.1700	124.800	109.3	2.5	2.48	0.62	3.10	5.01	69.60	1.86	1.24
18	0.1790	127.300	111.8	2.6	2.54	0.65	3.19	4.92	69.40	1.92	1.27
19	0.1880	129.400	113.9	2.8	2.58	0.66	3.24	4.90	69.30	1.95	1.29
20	0.1980	131.500	116.0	2.9	2.62	0.69	3.32	4.80	69.10	2.00	1.31
21	0.2060	133.400	117.9	3.1	2.66	0.71	3.37	4.77	69.00	2.04	1.33
22	0.2160	135.300	119.8	3.2	2.70	0.73	3.44	4.68	68.80	2.09	1.35
23	0.2250	136.900	121.4	3.4	2.73	0.75	3.48	4.65	68.70	2.12	1.37
24	0.2340	138.300	122.8	3.5	2.76	0.76	3.52	4.62	68.60	2.14	1.38
25	0.2430	140.100	124.6	3.7	2.80	0.76	3.56	4.67	68.60	2.16	1.40
26	0.2520	141.200	125.7	3.8	2.82	0.76	3.58	4.69	68.60	2.17	1.41
27	0.2600	142.800	127.3	4.0	2.85	0.76	3.61	4.73	68.60	2.19	1.42
28	0.2700	144.200	128.7	4.1	2.88	0.78	3.65	4.70	68.50	2.22	1.44
29	0.2790	145.800	130.3	4.3	2.91	0.79	3.70	4.67	68.40	2.25	1.45
30	0.2880	147.000	131.5	4.4	2.93	0.81	3.74	4.63	68.30	2.27	1.46
31	0.2970	148.400	132.9	4.6	2.96	0.82	3.78	4.60	68.20	2.30	1.48
32	0.3070	149.500	134.0	4.7	2.98	0.84	3.81	4.56	68.10	2.32	1.49
33	0.3150	150.700	135.2	4.9	3.00	0.85	3.85	4.53	68.00	2.35	1.50
34	0.3250	151.900	136.4	5.0	3.02	0.88	3.90	4.44	67.80	2.39	1.51
35	0.3340	153.400	137.9	5.2	3.05	0.89	3.94	4.41	67.70	2.42	1.52
36	0.3420	154.100	138.6	5.3	3.06	0.91	3.97	4.37	67.60	2.44	1.53
37	0.3510	155.500	140.0	5.5	3.08	0.92	4.01	4.35	67.50	2.46	1.54
38	0.3600	156.900	141.4	5.6	3.11	0.94	4.05	4.32	67.40	2.49	1.56
39	0.3700	157.600	142.1	5.8	3.12	0.95	4.07	4.28	67.30	2.51	1.56
40	0.3780	158.900	143.4	5.9	3.14	0.96	4.11	4.26	67.20	2.54	1.57
41	0.3880	160.300	144.8	6.1	3.17	0.98	4.15	4.24	67.10	2.56	1.59
42	0.3960	161.200	145.7	6.2	3.19	0.99	4.18	4.21	67.00	2.59	1.59
43	0.4050	161.800	146.3	6.4	3.19	1.01	4.20	4.17	66.90	2.60	1.60
44	0.4140	162.900	147.4	6.5	3.21	1.02	4.23	4.14	66.80	2.63	1.61
45	0.4230	163.900	148.4	6.7	3.23	1.04	4.27	4.11	66.70	2.65	1.61
46	0.4320	164.700	149.2	6.8	3.24	1.05	4.29	4.08	66.60	2.67	1.62
47	0.4410	165.600	150.1	6.9	3.26	1.07	4.32	4.06	66.50	2.69	1.63
48	0.4510	166.500	151.0	7.1	3.27	1.08	4.35	4.03	66.40	2.71	1.63
49	0.4590	167.200	151.7	7.2	3.28	1.08	4.36	4.04	66.40	2.72	1.64
50	0.4680	168.300	152.8	7.4	3.30	1.09	4.39	4.01	66.30	2.74	1.65
51	0.4770	169.200	153.7	7.5	3.31	1.09	4.41	4.03	66.30	2.75	1.66
52	0.4870	170.600	155.1	7.7	3.34	1.11	4.45	4.01	66.20	2.78	1.67
53	0.4960	171.500	156.0	7.9	3.35	1.12	4.47	3.98	66.10	2.80	1.68
54	0.5050	172.100	156.6	8.0	3.36	1.14	4.50	3.95	66.00	2.82	1.68
55	0.5140	173.300	157.8	8.1	3.38	1.15	4.53	3.93	65.90	2.84	1.69
56	0.5230	174.200	158.7	8.3	3.39	1.15	4.54	3.94	65.90	2.85	1.70

Test Readings for Specimen No. 2

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
57	0.5320	175.300	159.8	8.4	3.41	1.17	4.58	3.92	65.80	2.87	1.71
58	0.5410	176.600	161.1	8.6	3.43	1.18	4.61	3.91	65.70	2.90	1.72
59	0.5500	178.000	162.5	8.7	3.46	1.20	4.65	3.89	65.60	2.92	1.73
60	0.5590	179.800	164.3	8.9	3.49	1.20	4.68	3.92	65.60	2.94	1.74
61	0.5680	180.400	164.9	9.0	3.50	1.21	4.71	3.89	65.50	2.96	1.75
62	0.5770	180.700	165.2	9.2	3.50	1.21	4.71	3.89	65.50	2.96	1.75
63	0.5860	180.700	165.2	9.3	3.49	1.24	4.73	3.82	65.30	2.98	1.75
64	0.5950	180.600	165.1	9.5	3.48	1.25	4.74	3.78	65.20	2.99	1.74
65	0.6040	180.700	165.2	9.6	3.48	1.25	4.73	3.78	65.20	2.99	1.74
66	0.6130	180.700	165.2	9.8	3.47	1.27	4.74	3.74	65.10	3.00	1.74
67	0.6220	181.000	165.5	9.9	3.47	1.28	4.76	3.71	65.00	3.02	1.74
68	0.6270	180.800	165.3	10.0	3.47	1.30	4.76	3.68	64.90	3.03	1.73
69	0.6360	181.500	166.0	10.2	3.48	1.31	4.79	3.65	64.80	3.05	1.74
70	0.6400	181.500	166.0	10.2	3.47	1.31	4.78	3.65	64.80	3.05	1.74
71	0.6490	181.700	166.2	10.4	3.47	1.32	4.80	3.62	64.70	3.06	1.74
72	0.6580	181.500	166.0	10.5	3.46	1.34	4.80	3.59	64.60	3.07	1.73
73	0.6670	181.500	166.0	10.7	3.46	1.35	4.81	3.55	64.50	3.08	1.73
74	0.6770	181.600	166.1	10.8	3.45	1.37	4.82	3.52	64.40	3.09	1.73
75	0.6850	181.900	166.4	11.0	3.45	1.37	4.82	3.52	64.40	3.09	1.73
76	0.6950	181.200	165.7	11.1	3.43	1.38	4.81	3.48	64.30	3.10	1.72
77	0.7040	181.400	165.9	11.3	3.43	1.40	4.83	3.46	64.20	3.11	1.72
78	0.7130	181.600	166.1	11.4	3.43	1.41	4.84	3.43	64.10	3.13	1.71
79	0.7220	181.300	165.8	11.6	3.42	1.43	4.84	3.40	64.00	3.13	1.71
80	0.7310	181.600	166.1	11.7	3.42	1.44	4.86	3.37	63.90	3.15	1.71
81	0.7400	181.500	166.0	11.9	3.41	1.44	4.85	3.37	63.90	3.15	1.71
82	0.7490	181.300	165.8	12.0	3.40	1.45	4.85	3.34	63.80	3.15	1.70
83	0.7580	182.200	166.7	12.2	3.41	1.47	4.88	3.32	63.70	3.18	1.71
84	0.7670	182.200	166.7	12.3	3.41	1.47	4.88	3.32	63.70	3.17	1.70
85	0.7760	182.900	167.4	12.5	3.42	1.44	4.86	3.37	63.90	3.15	1.71
86	0.7850	183.100	167.6	12.6	3.41	1.50	4.91	3.28	63.50	3.20	1.71
87	0.7940	183.500	168.0	12.8	3.42	1.50	4.91	3.28	63.50	3.21	1.71
88	0.8003	183.700	168.2	12.9	3.42	1.51	4.93	3.26	63.40	3.22	1.71
89	0.8120	183.700	168.2	13.1	3.41	1.51	4.92	3.25	63.40	3.22	1.70
90	0.8210	184.100	168.6	13.2	3.41	1.53	4.94	3.23	63.30	3.23	1.71
91	0.8300	184.300	168.8	13.4	3.41	1.53	4.94	3.23	63.30	3.23	1.70
92	0.8390	184.900	169.4	13.5	3.42	1.54	4.96	3.22	63.20	3.25	1.71
93	0.8480	185.400	169.9	13.6	3.42	1.54	4.96	3.22	63.20	3.25	1.71
94	0.8580	185.700	170.2	13.8	3.42	1.56	4.97	3.20	63.10	3.26	1.71
95	0.8660	186.000	170.5	13.9	3.42	1.56	4.98	3.20	63.10	3.27	1.71
96	0.8760	186.600	171.1	14.1	3.43	1.57	5.00	3.18	63.00	3.28	1.71
97	0.8850	186.600	171.1	14.3	3.42	1.58	5.00	3.16	62.90	3.29	1.71
98	0.8940	186.700	171.2	14.4	3.42	1.61	5.03	3.12	62.70	3.32	1.71
99	0.9030	186.600	171.1	14.6	3.41	1.61	5.02	3.11	62.70	3.32	1.70
100	0.9120	186.300	170.8	14.7	3.40	1.61	5.01	3.11	62.70	3.31	1.70
101	0.9210	186.000	170.5	14.9	3.38	1.61	5.00	3.10	62.70	3.30	1.69
102	0.9300	186.100	170.6	15.0	3.38	1.63	5.01	3.08	62.60	3.32	1.69
103	0.9350	186.200	170.7	15.1	3.38	1.64	5.02	3.06	62.50	3.33	1.69

CONSOLIDATION TEST REPORT



Coefficients of Consolidation and Secondary Consolidation

No.	Load (ksf)	C_v (ft.^{2}/day)	C_α	No.	Load (ksf)	C_v (ft.^{2}/day)	C_α	No.	Load (ksf)	C_v (ft.^{2}/day)	C_α
1	0.05	1.833		9	2.00	6.245		17	0.25	1.363	
3	0.50	1.599		10	4.00	22.622					
4	1.00	14.756		11	8.00	11.809					
5	2.00	12.743		12	16.00	10.330					
6	0.50	16.286		13	32.00	12.406					
7	0.25	0.774		14	8.00	11.094					
8	0.50	13.246		16	0.50	1.421					

Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (ksf)	e_o	Swell Press. (ksf)	Swell %	C_r
Sat.	Moist.									
90.5 %	25.0 %	95.6	59	35	2.70		0.746			0.02

MATERIAL DESCRIPTION	USCS	AASHTO
Brown Gray Clay (CH)	CH	

Project No. 1461-16- **Client:** HDR Engineering, Inc.

Project: Carolina Crossroads Project

Location: UD Borings **Depth:** 8.5-10.5 **Sample Number:** W-23UD UD-2

Remarks:
Tested Unsaturated

S & ME, INC.

Charlotte, North Carolina

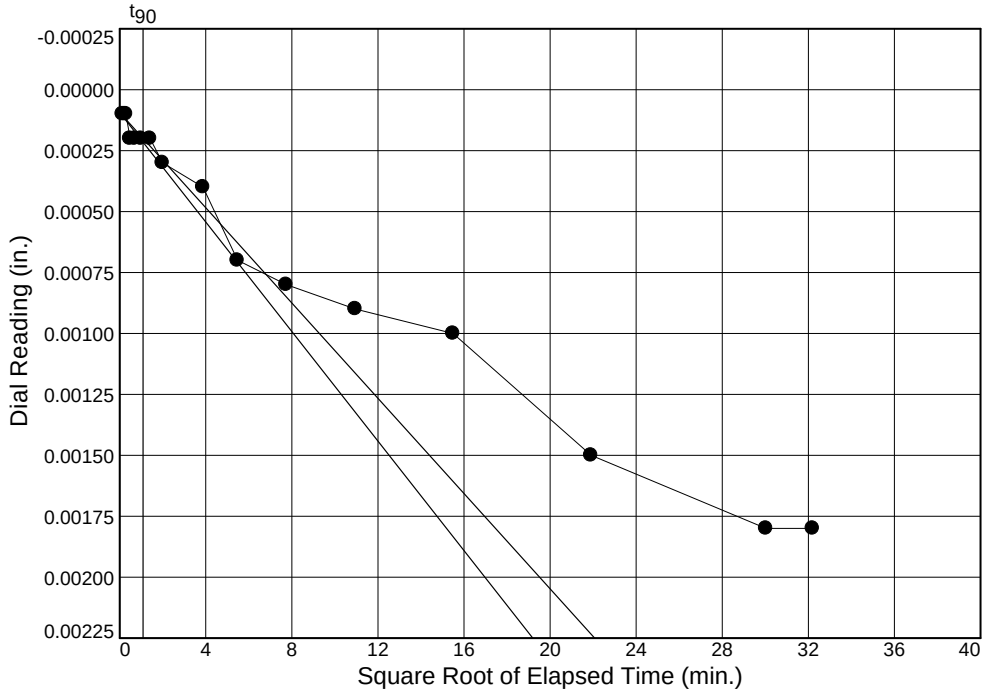
Figure W-23 UD-

Tested By: Karen Warner **Checked By:** Jason Reeves

Dial Reading vs. Time

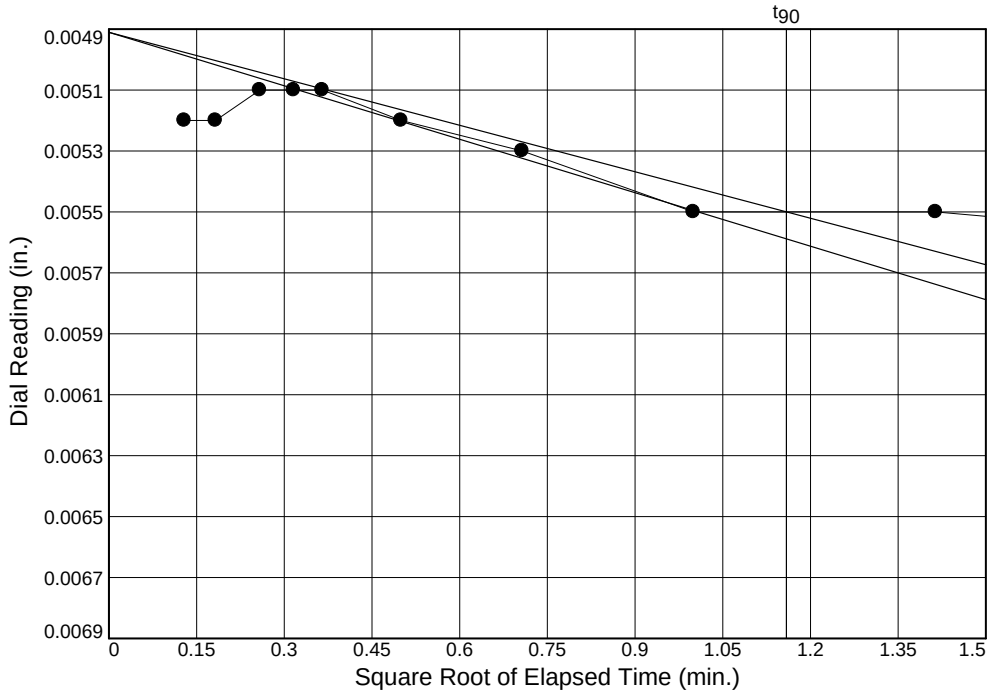
Project No.: 1461-16-047.2B
Project: Carolina Crossroads Project

Location: UD Borings Depth: 8.5-10.5 Sample Number: W-23UD UD-2



Load No.= 1
Load= 0.05 ksf
D_0 = 0.0001
D_{90} = 0.0002
D_{100} = 0.0002
T_{90} = 1.18 min.

C_v @ T_{90}
1.833 ft.^{2}/day



Load No.= 3
Load= 0.50 ksf
D_0 = 0.0049
D_{90} = 0.0055
D_{100} = 0.0056
T_{90} = 1.34 min.

C_v @ T_{90}
1.599 ft.^{2}/day

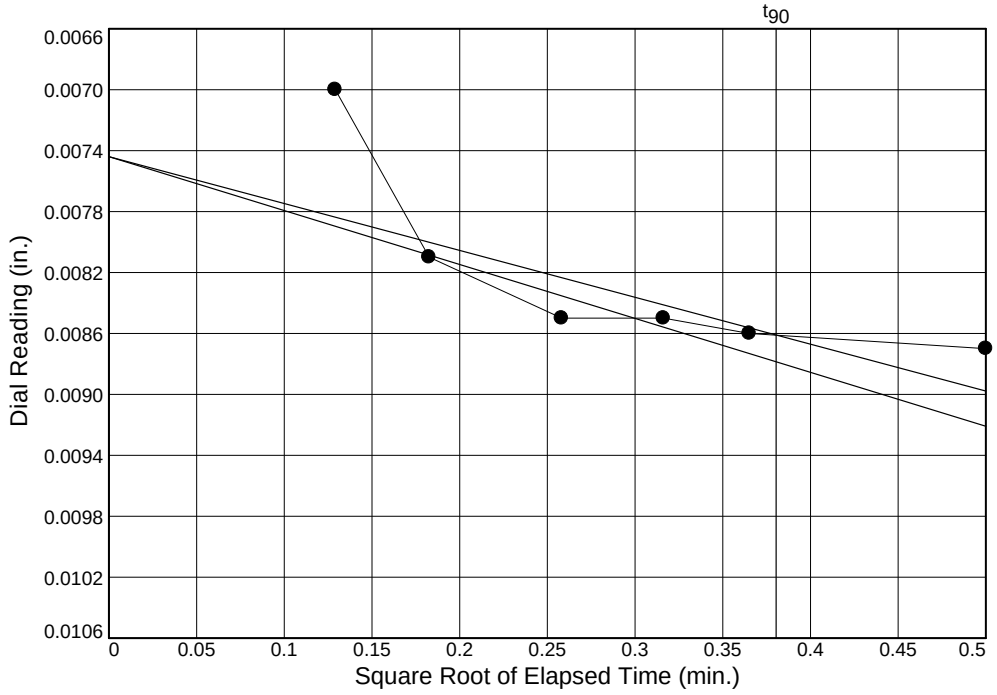
Figure W-23 UD-

S & ME, INC.

Dial Reading vs. Time

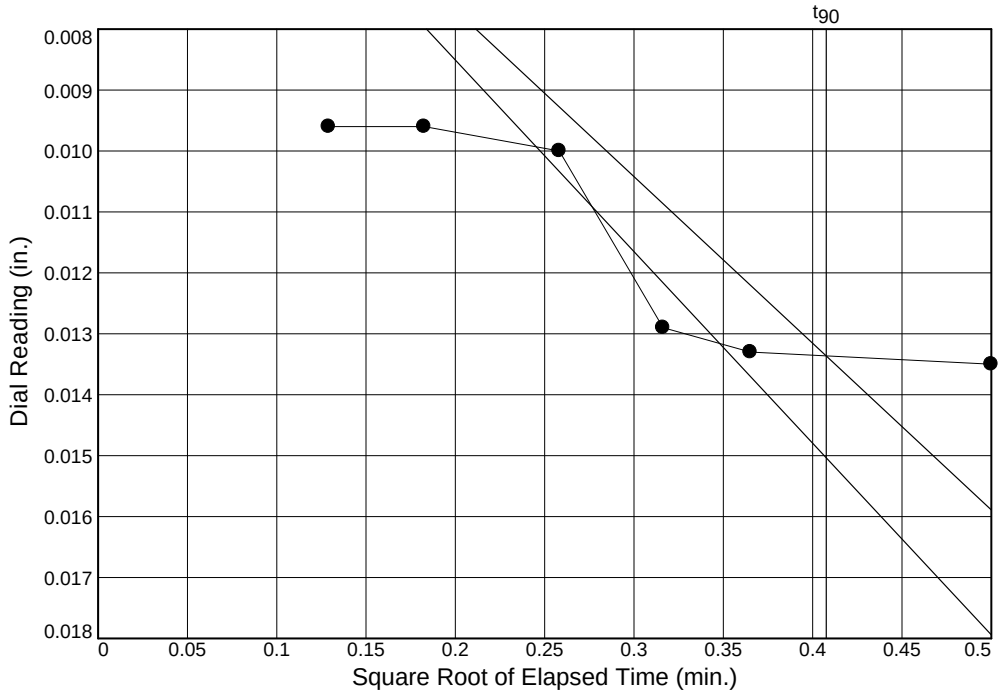
Project No.: 1461-16-047.2B
Project: Carolina Crossroads Project

Location: UD Borings Depth: 8.5-10.5 Sample Number: W-23UD UD-2



Load No.= 4
Load= 1.00 ksf
D_0 = 0.0074
D_{90} = 0.0086
D_{100} = 0.0087
T_{90} = 0.14 min.

C_v @ T_{90}
14.756 ft.^{2}/day



Load No.= 5
Load= 2.00 ksf
D_0 = 0.0022
D_{90} = 0.0134
D_{100} = 0.0146
T_{90} = 0.17 min.

C_v @ T_{90}
12.743 ft.^{2}/day

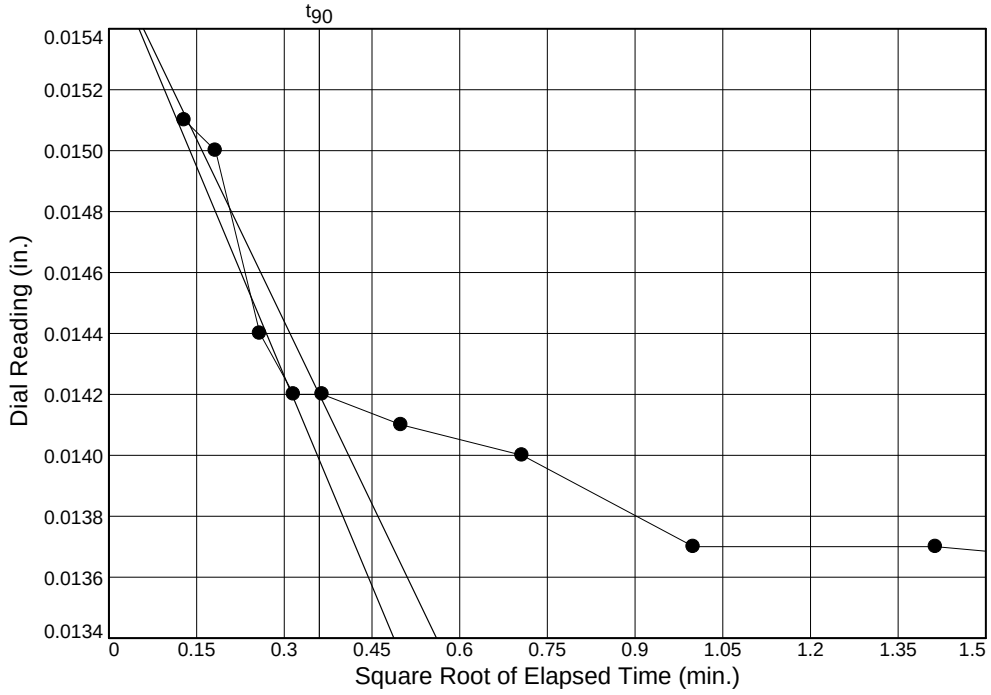
Figure W-23 UD-

S & ME, INC.

Dial Reading vs. Time

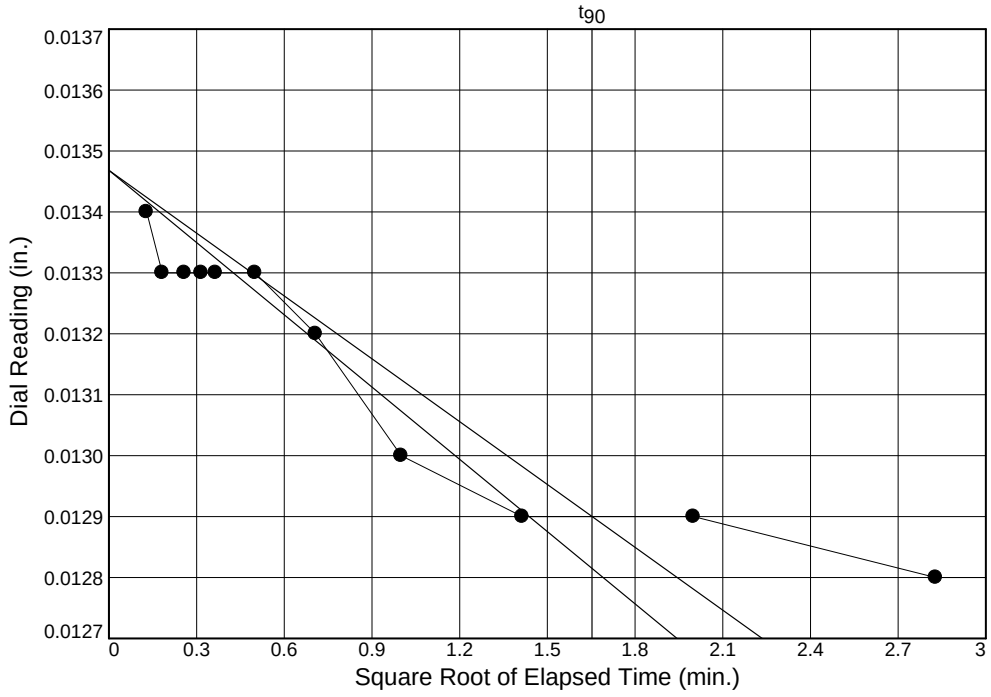
Project No.: 1461-16-047.2B
Project: Carolina Crossroads Project

Location: UD Borings Depth: 8.5-10.5 Sample Number: W-23UD UD-2



Load No.= 6
Load= 0.50 ksf
D_0 = 0.0156
D_{90} = 0.0142
D_{100} = 0.0140
T_{90} = 0.13 min.

C_v @ T_{90}
16.286 ft.^{2}/day



Load No.= 7
Load= 0.25 ksf
D_0 = 0.0135
D_{90} = 0.0129
D_{100} = 0.0128
T_{90} = 2.73 min.

C_v @ T_{90}
0.774 ft.^{2}/day

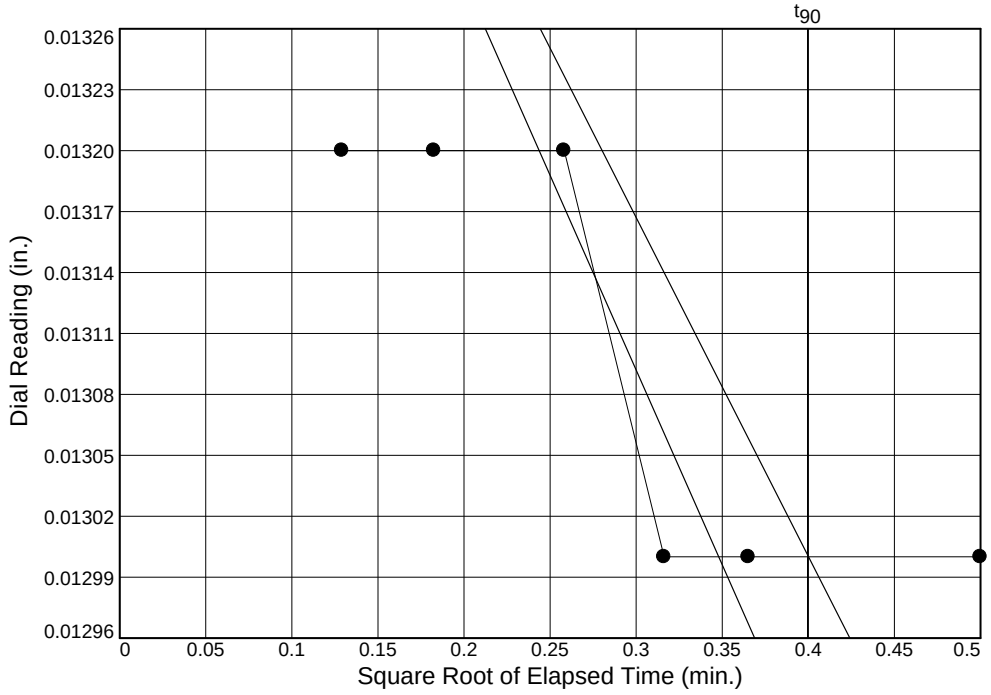
Figure W-23 UD-

S & ME, INC.

Dial Reading vs. Time

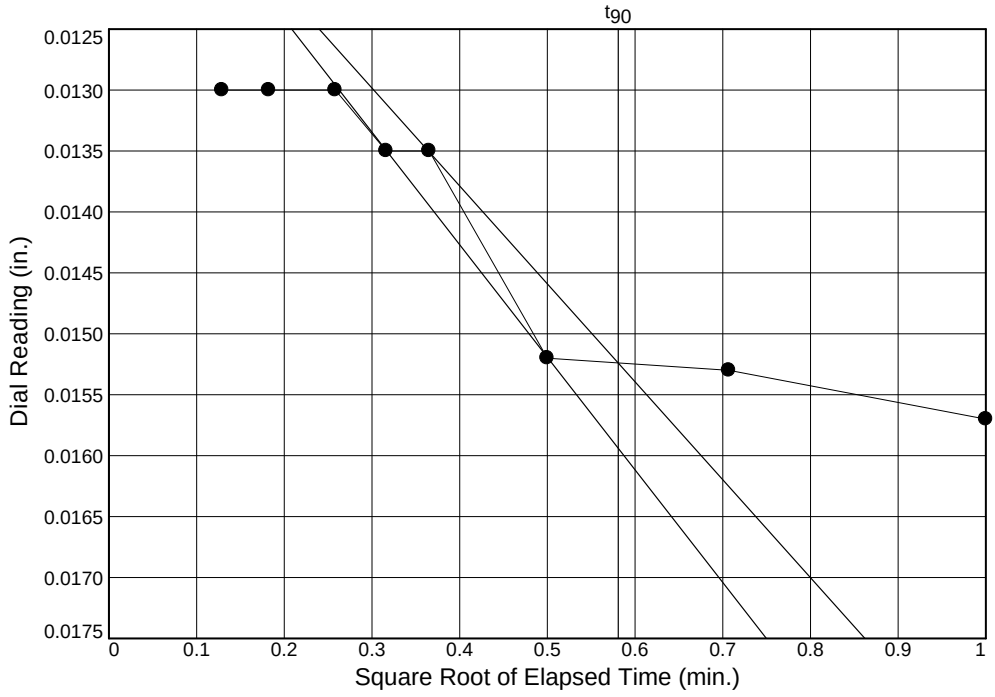
Project No.: 1461-16-047.2B
Project: Carolina Crossroads Project

Location: UD Borings Depth: 8.5-10.5 Sample Number: W-23UD UD-2



Load No.= 8
Load= 0.50 ksf
D_0 = 0.0137
D_{90} = 0.0130
D_{100} = 0.0129
T_{90} = 0.16 min.

C_v @ T_{90}
13.246 ft.^{2}/day



Load No.= 9
Load= 2.00 ksf
D_0 = 0.0106
D_{90} = 0.0152
D_{100} = 0.0158
T_{90} = 0.34 min.

C_v @ T_{90}
6.245 ft.^{2}/day

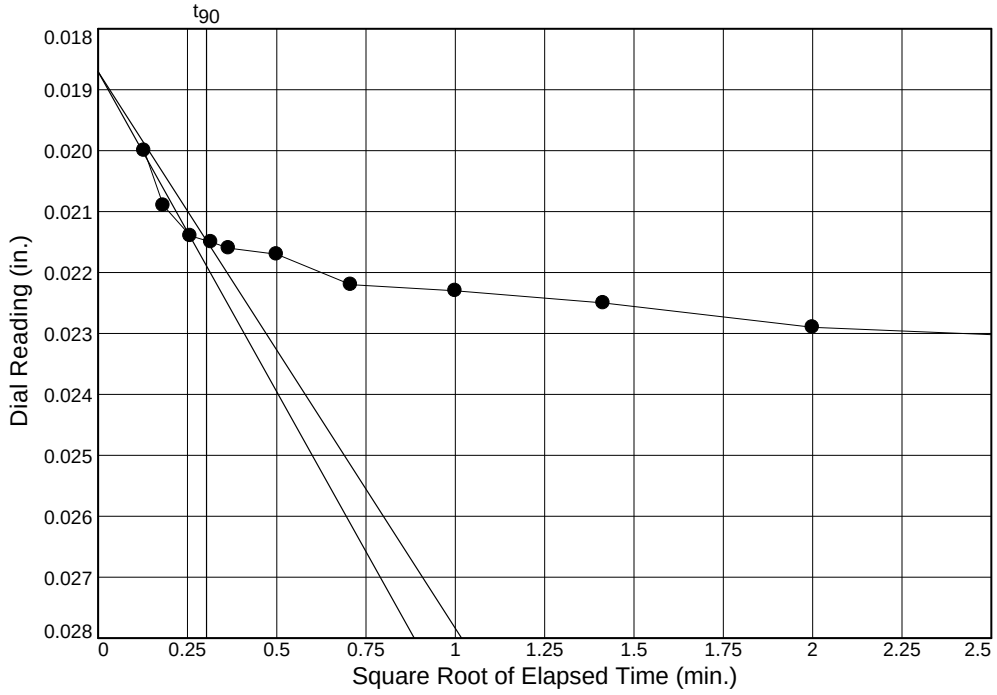
Figure W-23 UD-

S & ME, INC.

Dial Reading vs. Time

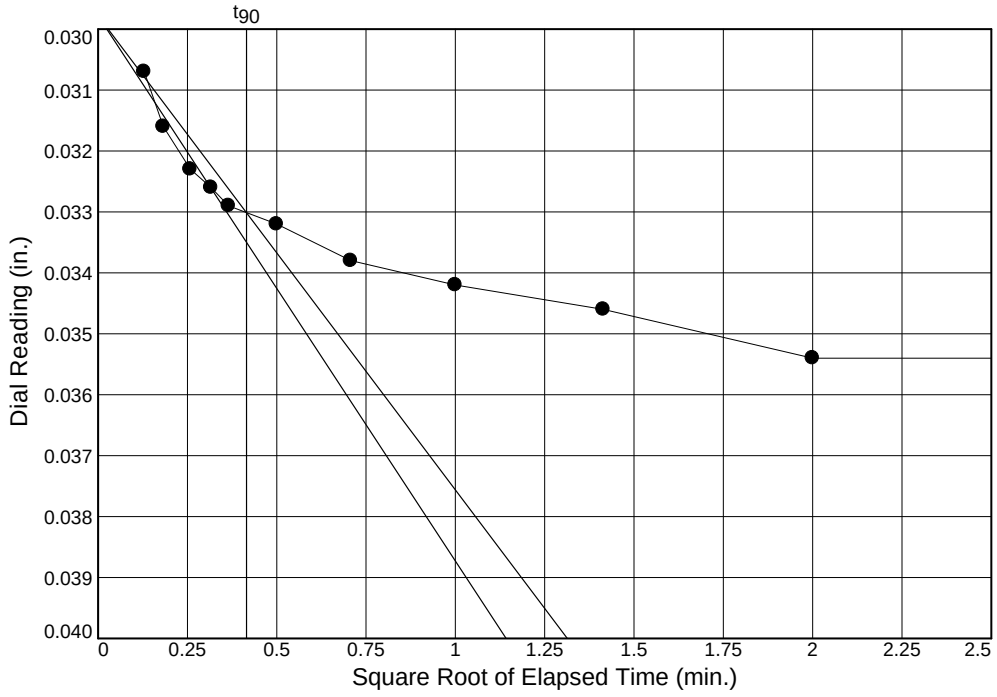
Project No.: 1461-16-047.2B
Project: Carolina Crossroads Project

Location: UD Borings Depth: 8.5-10.5 Sample Number: W-23UD UD-2



Load No.= 10
Load= 4.00 ksf
D_0 = 0.0187
D_{90} = 0.0215
D_{100} = 0.0218
T_{90} = 0.09 min.

C_v @ T_{90}
22.622 ft.^{2}/day



Load No.= 11
Load= 8.00 ksf
D_0 = 0.0298
D_{90} = 0.0330
D_{100} = 0.0334
T_{90} = 0.17 min.

C_v @ T_{90}
11.809 ft.^{2}/day

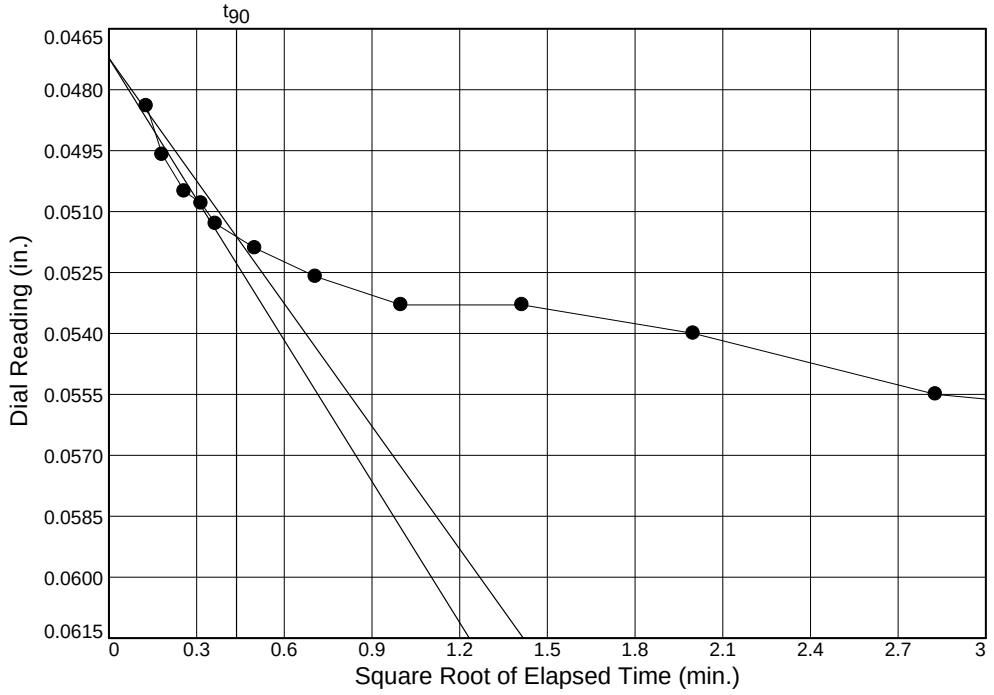
Figure W-23 UD-

S & ME, INC.

Dial Reading vs. Time

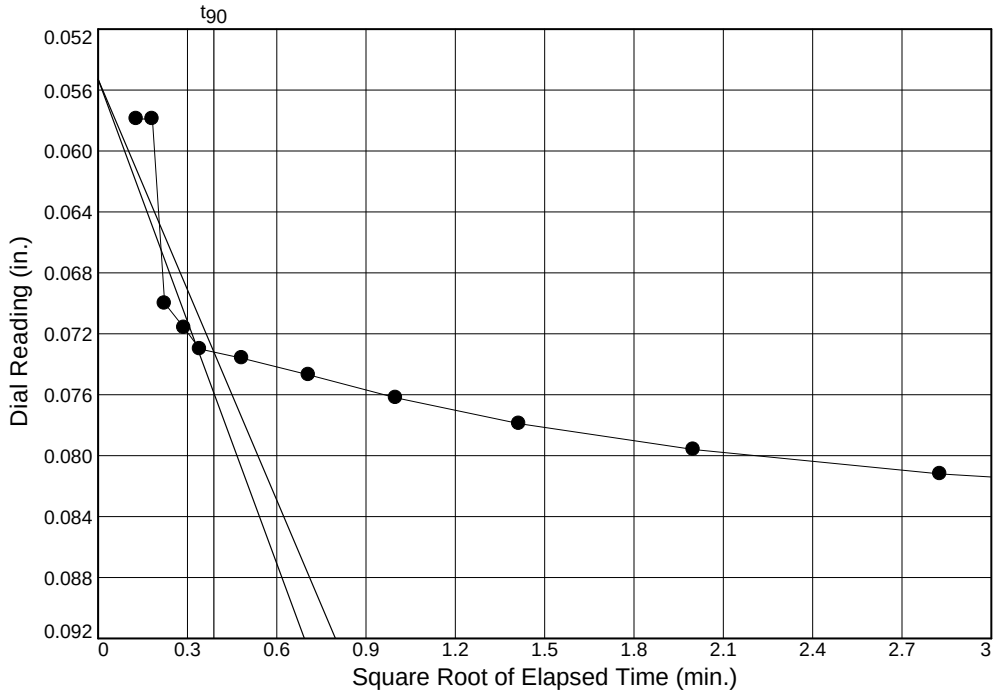
Project No.: 1461-16-047.2B
Project: Carolina Crossroads Project

Location: UD Borings Depth: 8.5-10.5 Sample Number: W-23UD UD-2



Load No.= 12
Load= 16.00 ksf
D_0 = 0.0472
D_{90} = 0.0516
D_{100} = 0.0521
T_{90} = 0.19 min.

C_v @ T_{90}
10.330 ft.^{2}/day



Load No.= 13
Load= 32.00 ksf
D_0 = 0.0553
D_{90} = 0.0732
D_{100} = 0.0752
T_{90} = 0.15 min.

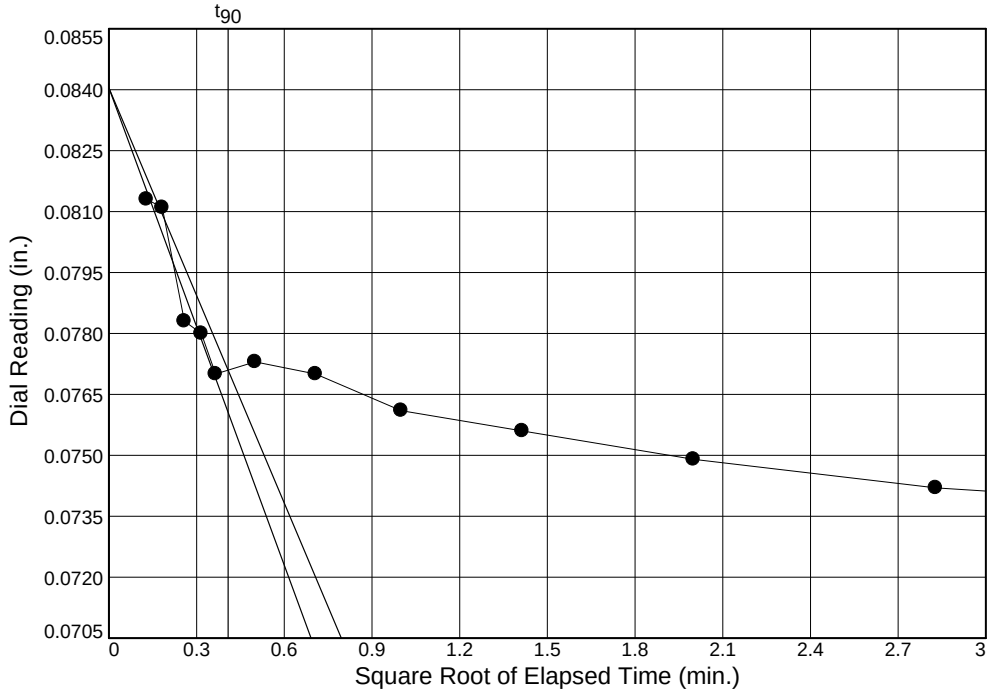
C_v @ T_{90}
12.406 ft.^{2}/day

Figure W-23 UD-

Dial Reading vs. Time

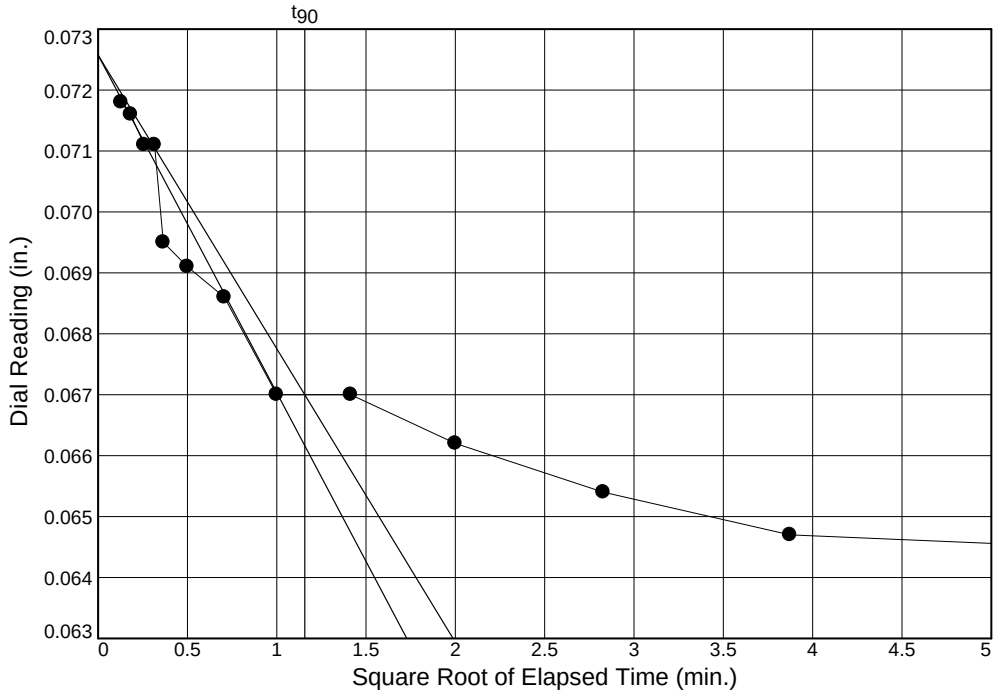
Project No.: 1461-16-047.2B
Project: Carolina Crossroads Project

Location: UD Borings Depth: 8.5-10.5 Sample Number: W-23UD UD-2



Load No.= 14
Load= 8.00 ksf
D_0 = 0.0840
D_{90} = 0.0771
D_{100} = 0.0763
T_{90} = 0.17 min.

C_v @ T_{90}
11.094 ft.^{2}/day



Load No.= 16
Load= 0.50 ksf
D_0 = 0.0726
D_{90} = 0.0670
D_{100} = 0.0664
T_{90} = 1.34 min.

C_v @ T_{90}
1.421 ft.^{2}/day

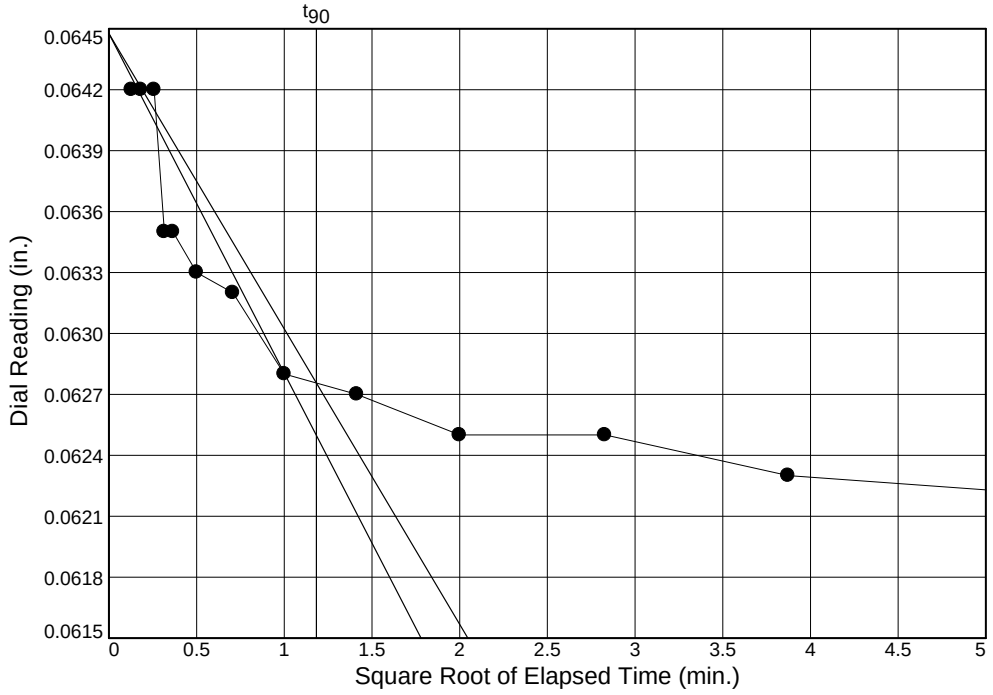
Figure W-23 UD-

S & ME, INC.

Dial Reading vs. Time

Project No.: 1461-16-047.2B
Project: Carolina Crossroads Project

Location: UD Borings Depth: 8.5-10.5 Sample Number: W-23UD UD-2



Load No.= 17

Load= 0.25 ksf

D_0 = 0.0645

D_{90} = 0.0628

D_{100} = 0.0626

T_{90} = 1.40 min.

C_v @ T_{90}
1.363 ft.^{2}/day

Figure W-23 UD-

CONSOLIDATION TEST DATA

6/28/2018

Client: HDR Engineering, Inc.
Project: Carolina Crossroads Project
Project Number: 1461-16-047.2B
Location: UD Borings
Depth: 8.5-10.5 **Sample Number:** W-23UD UD-2
Material Description: Brown Gray Clay (CH)
Liquid Limit: 59 **Plasticity Index:** 35
USCS: CH
Figure No.: W-23 UD-2
Testing Remarks: Tested Unsaturated
Tested by: Karen Warner **Checked by:** Jason Reeves

Test Specimen Data

NATURAL MOISTURE		VOID RATIO		AFTER TEST	
Wet w+t =	243.73 g.	Spec. Gr. =	2.70	Wet w+t =	251.83 g.
Dry w+t =	211.34 g.	Est. Ht. Solids =	0.579 in.	Dry w+t =	223.77 g.
Tare Wt. =	81.83 g.	Init. V.R. =	0.746	Tare Wt. =	98.37 g.
Moisture =	25.0 %	Init. Sat. =	90.5 %	Moisture =	22.4 %
UNIT WEIGHT		TEST START		Dry Wt. =	125.40* g.
Height =	0.998 in.	Height =	1.012 in.		
Diameter =	2.496 in.	Diameter =	2.496 in.		
Weight =	153.16 g.				
Dry Dens. =	95.6 pcf				

End-Of-Load Summary

Pressure (ksf)	Final Dial (in.)	Deformation (in.)	C_v (ft.^{2}/day)	C_α	Void Ratio	% Strain
start	0.00010	0.00000			0.746	
0.05	0.00180	0.00170	1.833		0.743	0.2 Comprs.
0.25	0.00410	0.00400			0.739	0.4 Comprs.
0.50	0.00650	0.00640	1.599		0.735	0.6 Comprs.
1.00	0.00960	0.00950	14.756		0.729	0.9 Comprs.
2.00	0.01520	0.01510	12.743		0.720	1.5 Comprs.
0.50	0.01350	0.01340	16.286		0.723	1.3 Comprs.
0.25	0.01280	0.01270	0.774		0.724	1.3 Comprs.
0.50	0.01300	0.01290	13.246		0.724	1.3 Comprs.
2.00	0.01680	0.01670	6.245		0.717	1.7 Comprs.
4.00	0.02460	0.02450	22.622		0.704	2.4 Comprs.
8.00	0.03860	0.03850	11.809		0.679	3.8 Comprs.
16.00	0.05780	0.05770	10.330		0.646	5.7 Comprs.
32.00	0.08440	0.08430	12.406		0.600	8.3 Comprs.
8.00	0.07290	0.07280	11.094		0.620	7.2 Comprs.
2.00	0.06450	0.06440			0.635	6.4 Comprs.
0.50	0.06450	0.06440	1.421		0.635	6.4 Comprs.
0.25	0.06190	0.06180	1.363		0.639	6.1 Comprs.

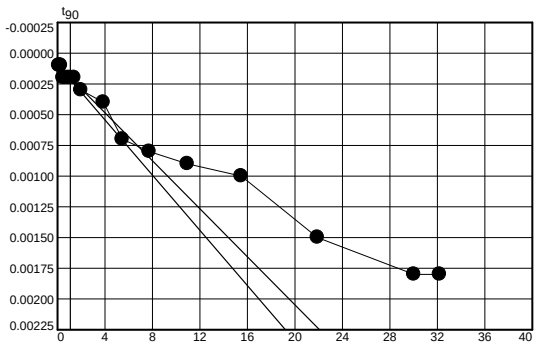
TEST RESULTS SUMMARY

Compression index (C_c), ksf = 0.15 **Preconsolidation pressure (P_p), ksf =** 6.4 **Void ratio at P_p (e_m) =** 0.688

Recompression index (C_r) = 0.02

Pressure: 0.05 ksf **TEST READINGS** **Load No. 1**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	+0 00:00:01	0.00010	11	+0 00:30:00	0.00070
2	+0 00:00:02	0.00010	12	+0 00:60:00	0.00080
3	+0 00:00:04	0.00010	13	+0 02:00:00	0.00090
4	+0 00:00:06	0.00010	14	+0 04:00:00	0.00100
5	+0 00:00:15	0.00020	15	+0 08:00:00	0.00150
6	+0 00:00:30	0.00020	16	+0 15:02:00	0.00180
7	+0 00:00:60	0.00020	17	+0 17:17:00	0.00180
8	+0 00:02:00	0.00020			
9	+0 00:04:00	0.00030			
10	+0 00:15:00	0.00040			



Void Ratio = 0.743 **Compression =** 0.2%

D_0 = 0.0001 **D_{90} =** 0.0002 **D_{100} =** 0.0002 **C_v at 1.18 min. =** 1.833 ft.^{2}/day

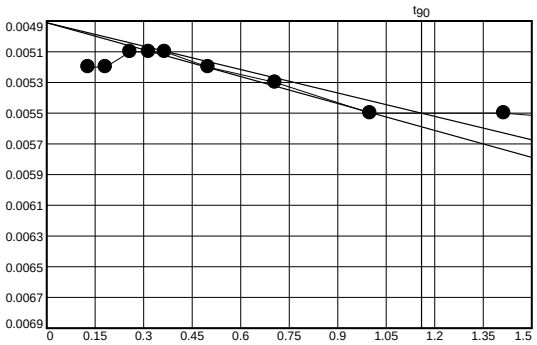
Pressure: 0.25 ksf **TEST READINGS** **Load No. 2**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.00180	11	+0 00:04:00	0.00350
2	+0 00:00:01	0.00250	12	+0 00:08:00	0.00350
3	+0 00:00:02	0.00350	13	+0 00:15:00	0.00360
4	+0 00:00:04	0.00350	14	+0 00:30:00	0.00360
5	+0 00:00:06	0.00350	15	+0 00:60:00	0.00390
6	+0 00:00:08	0.00350	16	+0 02:00:00	0.00410
7	+0 00:00:15	0.00350	17	+0 02:35:00	0.00410
8	+0 00:00:30	0.00350			
9	+0 00:00:60	0.00350			
10	+0 00:02:00	0.00350			

Void Ratio = 0.739 **Compression =** 0.4%

Pressure: 0.50 ksf | **TEST READINGS** | **Load No. 3**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.00410	11	+0 00:04:00	0.00560
2	+0 00:00:01	0.00520	12	+0 00:08:00	0.00570
3	+0 00:00:02	0.00520	13	+0 00:15:00	0.00580
4	+0 00:00:04	0.00510	14	+0 00:30:00	0.00580
5	+0 00:00:06	0.00510	15	+0 00:60:00	0.00600
6	+0 00:00:08	0.00510	16	+0 02:00:00	0.00630
7	+0 00:00:15	0.00520	17	+0 03:20:00	0.00650
8	+0 00:00:30	0.00530			
9	+0 00:00:60	0.00550			
10	+0 00:02:00	0.00550			

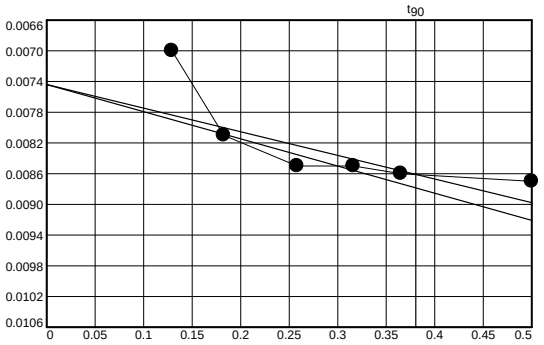


Void Ratio = 0.735 **Compression =** 0.6%

D_0 = 0.0049 **D_{90} =** 0.0055 **D_{100} =** 0.0056 **C_V at 1.34 min. =** 1.599 ft.^{2}/day

Pressure: 1.00 ksf | **TEST READINGS** | **Load No. 4**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.00650	11	+0 00:04:00	0.00890
2	+0 00:00:01	0.00700	12	+0 00:08:00	0.00920
3	+0 00:00:02	0.00810	13	+0 00:15:00	0.00930
4	+0 00:00:04	0.00850	14	+0 00:30:00	0.00950
5	+0 00:00:06	0.00850	15	+0 00:60:00	0.00960
6	+0 00:00:08	0.00860	16	+0 00:63:00	0.00960
7	+0 00:00:15	0.00870			
8	+0 00:00:30	0.00870			
9	+0 00:00:60	0.00880			
10	+0 00:02:00	0.00880			

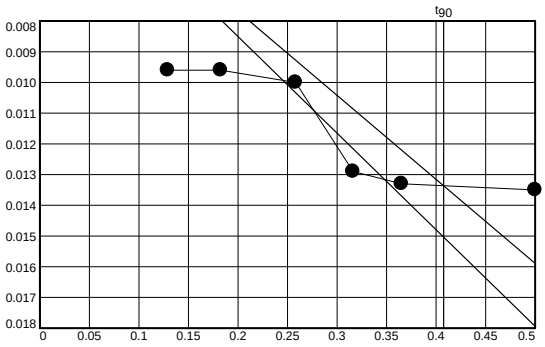


Void Ratio = 0.729 **Compression =** 0.9%

D_0 = 0.0074 **D_{90} =** 0.0086 **D_{100} =** 0.0087 **C_V at 0.14 min. =** 14.756 ft.^{2}/day

Pressure: 2.00 ksf | **TEST READINGS** | **Load No. 5**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.00960	11	+0 00:04:00	0.01430
2	+0 00:00:01	0.00960	12	+0 00:08:00	0.01440
3	+0 00:00:02	0.00960	13	+0 00:15:00	0.01460
4	+0 00:00:04	0.01000	14	+0 00:30:00	0.01490
5	+0 00:00:06	0.01290	15	+0 00:60:00	0.01510
6	+0 00:00:08	0.01330	16	+0 00:68:00	0.01520
7	+0 00:00:15	0.01350			
8	+0 00:00:30	0.01360			
9	+0 00:00:60	0.01390			
10	+0 00:02:00	0.01420			

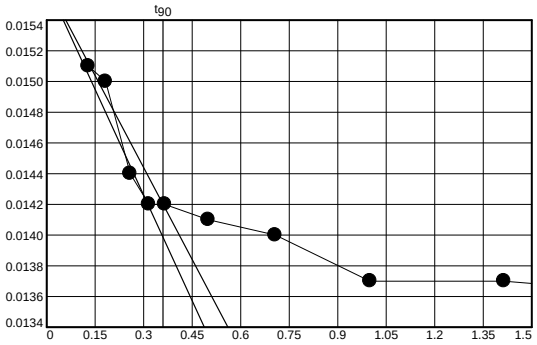


Void Ratio = 0.720 **Compression =** 1.5%

D_0 = 0.0022 **D_{90} =** 0.0134 **D_{100} =** 0.0146 **C_V at 0.17 min. =** 12.743 ft.^{2}/day

Pressure: 0.50 ksf | **TEST READINGS** | **Load No. 6**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.01520	11	+0 00:04:00	0.01360
2	+0 00:00:01	0.01510	12	+0 00:08:00	0.01360
3	+0 00:00:02	0.01500	13	+0 00:15:00	0.01360
4	+0 00:00:04	0.01440	14	+0 00:30:00	0.01360
5	+0 00:00:06	0.01420	15	+0 00:60:00	0.01360
6	+0 00:00:08	0.01420	16	+0 01:30:00	0.01350
7	+0 00:00:15	0.01410			
8	+0 00:00:30	0.01400			
9	+0 00:00:60	0.01370			
10	+0 00:02:00	0.01370			

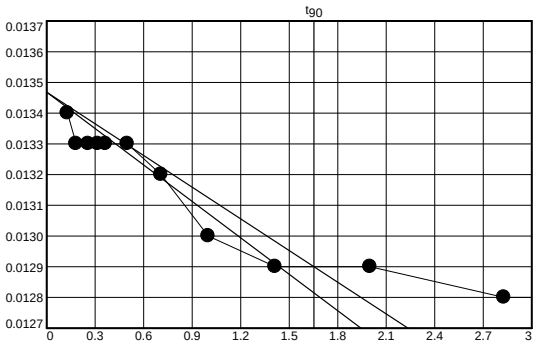


Void Ratio = 0.723 **Compression =** 1.3%

D_0 = 0.0156 **D_{90} =** 0.0142 **D_{100} =** 0.0140 **C_V at 0.13 min. =** 16.286 ft.^{2}/day

Pressure: 0.25 ksf | **TEST READINGS** | **Load No. 7**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.01350	11	+0 00:04:00	0.01290
2	+0 00:00:01	0.01340	12	+0 00:08:00	0.01280
3	+0 00:00:02	0.01330	13	+0 00:15:00	0.01280
4	+0 00:00:04	0.01330	14	+0 00:30:00	0.01280
5	+0 00:00:06	0.01330	15	+0 00:60:00	0.01280
6	+0 00:00:08	0.01330	16	+0 02:00:00	0.01280
7	+0 00:00:15	0.01330	17	+0 04:00:00	0.01280
8	+0 00:00:30	0.01320	18	+0 08:00:00	0.01280
9	+0 00:00:60	0.01300	19	+0 14:10:00	0.01280
10	+0 00:02:00	0.01290			

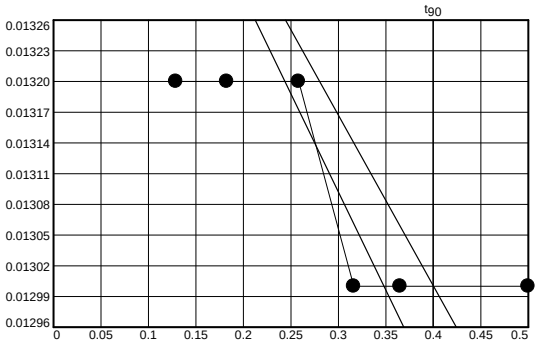


Void Ratio = 0.724 **Compression =** 1.3%

D_0 = 0.0135 **D_{90} =** 0.0129 **D_{100} =** 0.0128 **C_v at 2.73 min. =** 0.774 ft.^{2}/day

Pressure: 0.50 ksf | **TEST READINGS** | **Load No. 8**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.01280	11	+0 00:04:00	0.01300
2	+0 00:00:01	0.01320	12	+0 00:08:02	0.01300
3	+0 00:00:02	0.01320	13	+0 00:15:00	0.01300
4	+0 00:00:04	0.01320	14	+0 00:30:05	0.01300
5	+0 00:00:06	0.01300	15	+0 00:60:01	0.01300
6	+0 00:00:08	0.01300	16	+0 00:77:10	0.01300
7	+0 00:00:15	0.01300			
8	+0 00:00:30	0.01300			
9	+0 00:00:60	0.01300			
10	+0 00:02:00	0.01300			

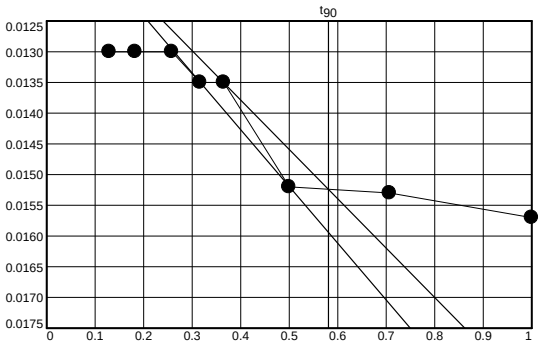


Void Ratio = 0.724 **Compression =** 1.3%

D_0 = 0.0137 **D_{90} =** 0.0130 **D_{100} =** 0.0129 **C_v at 0.16 min. =** 13.246 ft.^{2}/day

Pressure: 2.00 ksf | **TEST READINGS** | **Load No. 9**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.01300	11	+0 00:04:00	0.01580
2	+0 00:00:01	0.01300	12	+0 00:08:00	0.01590
3	+0 00:00:02	0.01300	13	+0 00:15:00	0.01600
4	+0 00:00:04	0.01300	14	+0 00:30:05	0.01610
5	+0 00:00:06	0.01350	15	+0 00:60:00	0.01650
6	+0 00:00:08	0.01350	16	+0 02:00:00	0.01660
7	+0 00:00:15	0.01520	17	+0 03:29:00	0.01680
8	+0 00:00:30	0.01530			
9	+0 00:00:60	0.01570			
10	+0 00:02:00	0.01580			

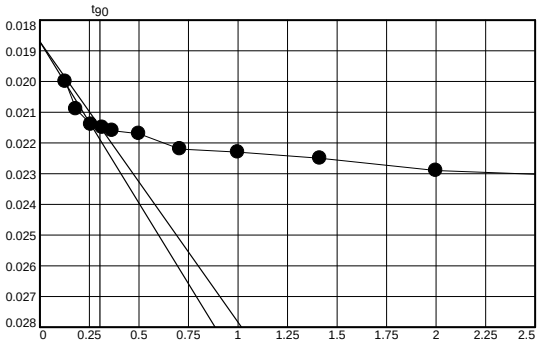


Void Ratio = 0.717 **Compression =** 1.7%

D_0 = 0.0106 **D_{90} =** 0.0152 **D_{100} =** 0.0158 **C_v at 0.34 min. =** 6.245 ft.^{2}/day

Pressure: 4.00 ksf | **TEST READINGS** | **Load No. 10**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.01680	11	+0 00:04:00	0.02290
2	+0 00:00:01	0.02000	12	+0 00:08:00	0.02310
3	+0 00:00:02	0.02090	13	+0 00:15:00	0.02320
4	+0 00:00:04	0.02140	14	+0 00:30:00	0.02350
5	+0 00:00:06	0.02150	15	+0 00:60:00	0.02380
6	+0 00:00:08	0.02160	16	+0 02:00:00	0.02400
7	+0 00:00:15	0.02170	17	+0 04:00:00	0.02460
8	+0 00:00:30	0.02220	18	+0 04:55:00	0.02460
9	+0 00:00:60	0.02230			
10	+0 00:02:00	0.02250			

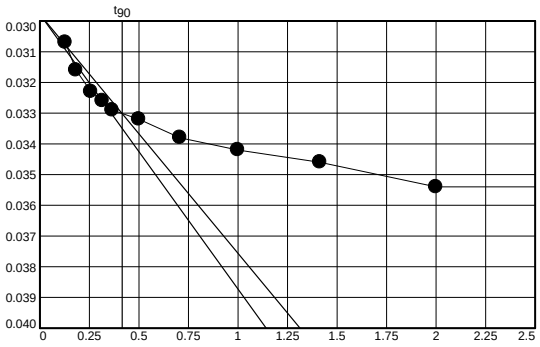


Void Ratio = 0.704 **Compression =** 2.4%

D_0 = 0.0187 **D_{90} =** 0.0215 **D_{100} =** 0.0218 **C_v at 0.09 min. =** 22.622 ft.^{2}/day

Pressure: 8.00 ksf | **TEST READINGS** | **Load No. 11**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.02460	11	+0 00:04:00	0.03540
2	+0 00:00:01	0.03070	12	+0 00:08:00	0.03540
3	+0 00:00:02	0.03160	13	+0 00:15:00	0.03580
4	+0 00:00:04	0.03230	14	+0 00:30:00	0.03620
5	+0 00:00:06	0.03260	15	+0 00:60:00	0.03650
6	+0 00:00:08	0.03290	16	+0 02:00:00	0.03700
7	+0 00:00:15	0.03320	17	+0 04:00:00	0.03720
8	+0 00:00:30	0.03380	18	+0 08:00:00	0.03780
9	+0 00:00:60	0.03420	19	+0 15:00:00	0.03850
10	+0 00:02:00	0.03460	20	+0 16:16:00	0.03860

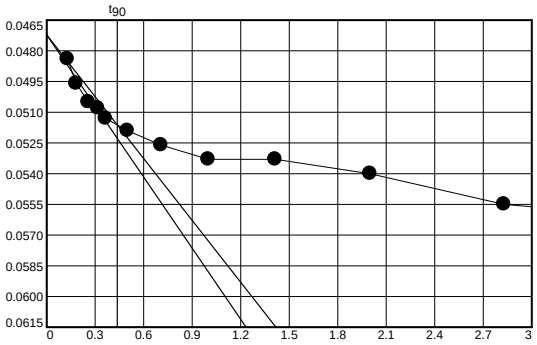


Void Ratio = 0.679 **Compression =** 3.8%

D_0 = 0.0298 **D_{90} =** 0.0330 **D_{100} =** 0.0334 **C_V at 0.17 min. =** 11.809 ft.^{2}/day

Pressure: 16.00 ksf | **TEST READINGS** | **Load No. 12**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.03860	11	+0 00:04:00	0.05400
2	+0 00:00:01	0.04840	12	+0 00:08:00	0.05550
3	+0 00:00:02	0.04960	13	+0 00:15:00	0.05620
4	+0 00:00:04	0.05050	14	+0 00:30:00	0.05670
5	+0 00:00:06	0.05080	15	+0 00:60:00	0.05710
6	+0 00:00:08	0.05130	16	+0 02:00:00	0.05740
7	+0 00:00:15	0.05190	17	+0 03:47:00	0.05780
8	+0 00:00:30	0.05260			
9	+0 00:00:60	0.05330			
10	+0 00:02:00	0.05330			

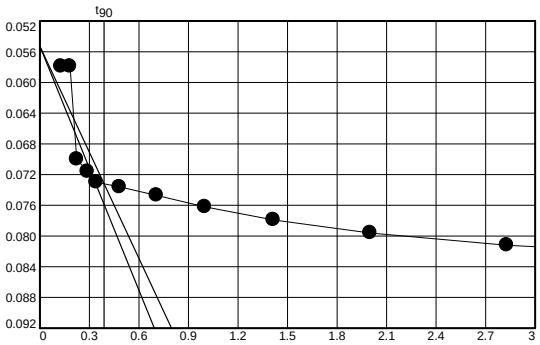


Void Ratio = 0.646 **Compression =** 5.7%

D_0 = 0.0472 **D_{90} =** 0.0516 **D_{100} =** 0.0521 **C_V at 0.19 min. =** 10.330 ft.^{2}/day

Pressure: 32.00 ksf | **TEST READINGS** | **Load No. 13**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.05780	11	+0 00:04:00	0.07960
2	+0 00:00:01	0.05790	12	+0 00:08:00	0.08120
3	+0 00:00:02	0.05790	13	+0 00:15:00	0.08240
4	+0 00:00:03	0.07000	14	+0 00:30:00	0.08310
5	+0 00:00:05	0.07160	15	+0 00:60:00	0.08350
6	+0 00:00:07	0.07300	16	+0 02:00:00	0.08410
7	+0 00:00:14	0.07360	17	+0 04:00:00	0.08440
8	+0 00:00:30	0.07470	18	+0 08:00:00	0.08440
9	+0 00:00:60	0.07620	19	+0 15:00:00	0.08440
10	+0 00:02:00	0.07790	20	+0 29:25:00	0.08440

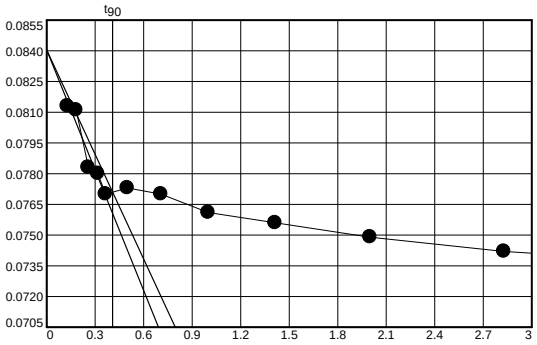


Void Ratio = 0.600 **Compression =** 8.3%

D_0 = 0.0553 **D_{90} =** 0.0732 **D_{100} =** 0.0752 **C_V at 0.15 min. =** 12.406 ft.^{2}/day

Pressure: 8.00 ksf | **TEST READINGS** | **Load No. 14**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.08440	11	+0 00:04:00	0.07490
2	+0 00:00:01	0.08130	12	+0 00:08:00	0.07420
3	+0 00:00:02	0.08110	13	+0 00:15:02	0.07370
4	+0 00:00:04	0.07830	14	+0 00:30:03	0.07340
5	+0 00:00:06	0.07800	15	+0 00:60:00	0.07340
6	+0 00:00:08	0.07700	16	+0 02:00:00	0.07320
7	+0 00:00:15	0.07730	17	+0 03:20:05	0.07290
8	+0 00:00:30	0.07700			
9	+0 00:00:60	0.07610			
10	+0 00:02:00	0.07560			



Void Ratio = 0.620 **Compression =** 7.2%

D_0 = 0.0840 **D_{90} =** 0.0771 **D_{100} =** 0.0763 **C_V at 0.17 min. =** 11.094 ft.^{2}/day

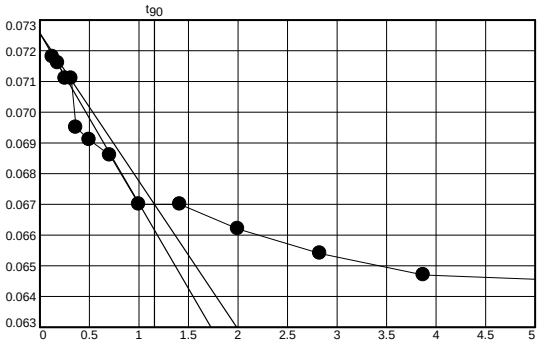
Pressure: 2.00 ksf | **TEST READINGS** | **Load No. 15**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.07290	11	+0 00:04:00	0.06620
2	+0 00:00:01	0.01780	12	+0 00:08:20	0.06540
3	+0 00:00:02	0.07160	13	+0 00:15:00	0.06470
4	+0 00:00:04	0.07110	14	+0 00:30:00	0.06450
5	+0 00:00:06	0.07000	15	+0 00:60:00	0.06450
6	+0 00:00:08	0.06950	16	+0 00:67:00	0.06450
7	+0 00:00:15	0.06910			
8	+0 00:00:30	0.06860			
9	+0 00:00:60	0.06790			
10	+0 00:02:00	0.06710			

Void Ratio = 0.635 **Compression =** 6.4%

Pressure: 0.50 ksf | **TEST READINGS** | **Load No. 16**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.06450	11	+0 00:04:00	0.06620
2	+0 00:00:01	0.07180	12	+0 00:08:00	0.06540
3	+0 00:00:02	0.07160	13	+0 00:15:00	0.06470
4	+0 00:00:04	0.07110	14	+0 00:30:00	0.06450
5	+0 00:00:06	0.07110	15	+0 00:60:00	0.06450
6	+0 00:00:08	0.06950	16	+0 00:67:00	0.06450
7	+0 00:00:15	0.06910			
8	+0 00:00:30	0.06860			
9	+0 00:00:60	0.06700			
10	+0 00:02:00	0.06700			

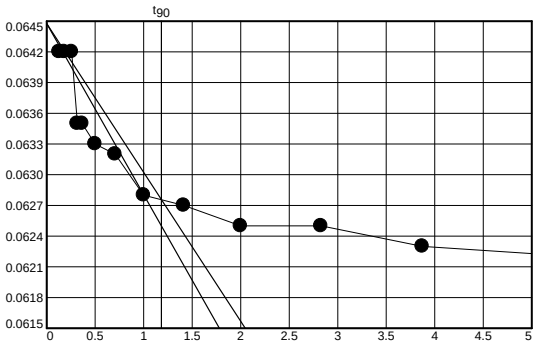


Void Ratio = 0.635 **Compression =** 6.4%

D_0 = 0.0726 **D_{90} =** 0.0670 **D_{100} =** 0.0664 **C_V at 1.34 min. =** 1.421 ft.^{2}/day

Pressure: 0.25 ksf | **TEST READINGS** | **Load No. 17**

No.	Clock Time	Dial Reading	No.	Clock Time	Dial Reading
1	0	0.06450	11	+0 00:04:00	0.06250
2	+0 00:00:01	0.06420	12	+0 00:08:00	0.06250
3	+0 00:00:02	0.06420	13	+0 00:15:00	0.06230
4	+0 00:00:04	0.06420	14	+0 00:30:00	0.06220
5	+0 00:00:06	0.06350	15	+0 00:60:00	0.06210
6	+0 00:00:08	0.06350	16	+0 02:00: 0	0.06190
7	+0 00:00:15	0.06330	17	+0 04:00:00	0.06190
8	+0 00:00:30	0.06320	18	+0 06:09:00	0.06190
9	+0 00:00:60	0.06280			
10	+0 00:02:00	0.06270			



Void Ratio = 0.639 **Compression =** 6.1%

D_0 = 0.0645 **D_{90} =** 0.0628 **D_{100} =** 0.0626 **C_V at 1.40 min. =** 1.363 ft.^{2}/day

ASTM D4767 CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST FOR COHESIVE SOILS

Project No.: 1461-16-047 .2B
Project Name: Carolina Crossroads

Sample ID: 1461-16-047.2B W-23UD UD-2
Depth: 8.5-10.5'

Failed Specimens

Specimen No.: 1
Effective Confining Pressure: 3.5 psi
Notes: Failed in shear

Specimen No.:
Effective Confining Pressure:
Notes: No Specimen

Specimen No.: 3
Effective Confining Pressure: 13.9 psi
Notes: Failed in shear

Sheared By: Karen Warner
Reviewed By: Jason Reeves Date: 6/26/2018

Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☐ AASHTO T 89 ☐ AASHTO T 90 ☐

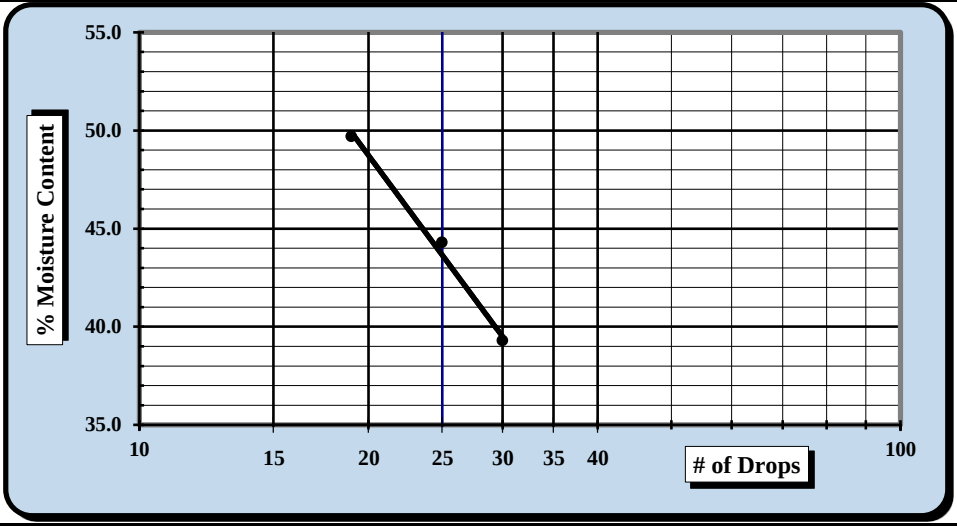
S&ME, Inc. Charlotte: 9751 Southern Pine Boulevard, Charlotte, NC 28273

Project #:	1461-16-047.2B	Report Date:	6/1/18
Project Name:	Carolina Crossroads Project	Test Date(s)	4/18-5/20/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Avenue, North Charleston, SC 29405		

Boring #:	W-27UD	Sample #: UD-1	Sample Date: Various
Location:	UD Borings	Offset: NA	Elevation: 13.5-15.5'
Sample Description:	Pink Gray Tan Fine to Coarse Sandy Silt (ML)		

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	3222	7/29/2017	Grooving tool	30427	9/27/2017
LL Apparatus	20336	2/21/2018	Grooving tool		
Oven	10844	8/22/2017	Grooving tool		

Pan #		Liquid Limit						Plastic Limit		
	Tare #:	29	1	41				PP	P-17	
A	Tare Weight	14.21	13.89	15.80				16.18	12.36	
B	Wet Soil Weight + A	26.48	26.88	27.07				24.54	20.42	
C	Dry Soil Weight + A	23.02	22.89	23.33				22.66	18.63	
D	Water Weight (B-C)	3.46	3.99	3.74				1.88	1.79	
E	Dry Soil Weight (C-A)	8.81	9.00	7.53				6.48	6.27	
F	% Moisture (D/E)*100	39.3%	44.3%	49.7%				29.0%	28.5%	
N	# OF DROPS	30	25	19						
LL	LL = **F** * FACTOR									
Ave.	*Average*							**28.8%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**44**
Plastic Limit	**29**
Plastic Index	**15**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:*

Notes / Deviations / References:

Karen Warner	6/1/2018	Matthew F. Cooke, P.G.	7/18/2018
Technician Name	*Date*	*Technical Responsibility*	*Date*

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Form No: TR-D422-WH-1Ga
Revision No. 1
Revision Date: 8/10/17

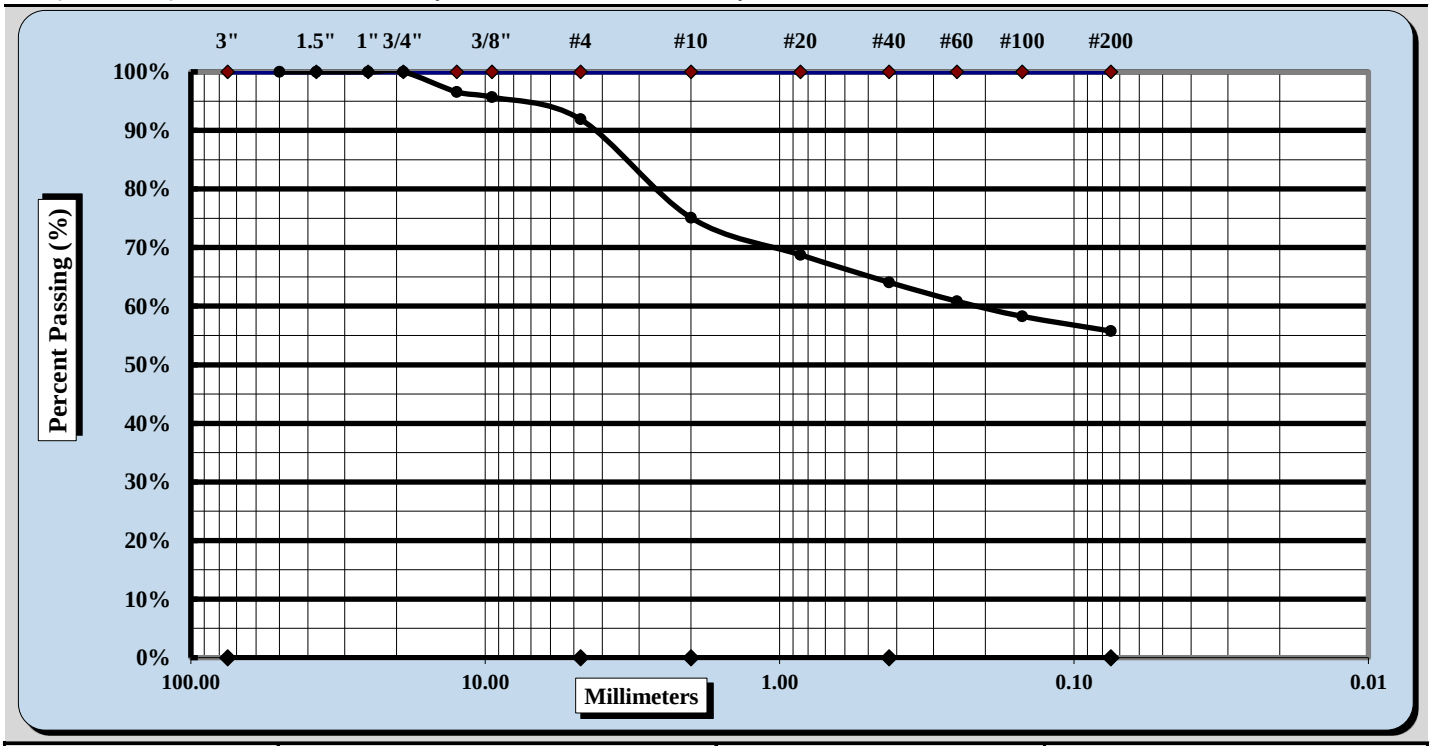
SIEVE ANALYSIS OF SOILS

ASTM D 422

S&ME, Inc. Charlotte: 9751 Southern Pine Boulevard, Charlotte, NC 28273

Project #:	1461-16-047.2B	Report Date:	6/1/18
Project Name:	Carolina Crossroads Project	Test Date(s):	4/18-25/18
Client Name:	HDR Engineering, Inc.		
Client Address:	4400 Leeds Avenue, North Charleston, SC 29405		
Sample Id.	W-27UD	Type: Undisturbed	Sample Date: Various
Location:	UD Borings	Sample: UD-1	Elevation: 13.5-15.5

Sample Description: Pink Gray Tan Fine to Coarse Sandy Silt (ML)



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	1/2"	Coarse Sand	16.8%	Fine Sand	8.3%
Gravel	8.1%	Medium Sand	11.0%	Silt & Clay	55.8%
Liquid Limit	44	Plastic Limit	29	Plastic Index	15
Specific Gravity	ND			Moisture Content	Various
Coarse Sand	16.8%	Medium Sand	11.0%	Fine Sand	8.3%

Description of Sand & Gravel Particles: Rounded ☐ Angular ☒
Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

Notes / Deviations / References: ND: Not Determined

Matthew F. Cooke, P.G. — *Technical Responsibility*
Project Manager — *Position*
7/18/2018 — *Date*

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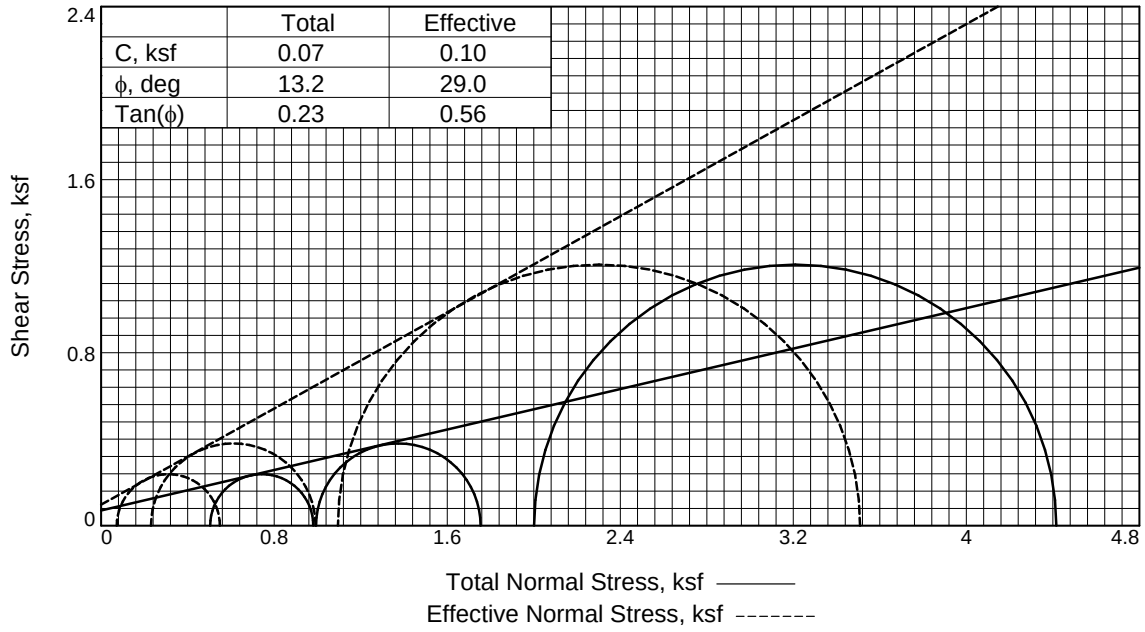
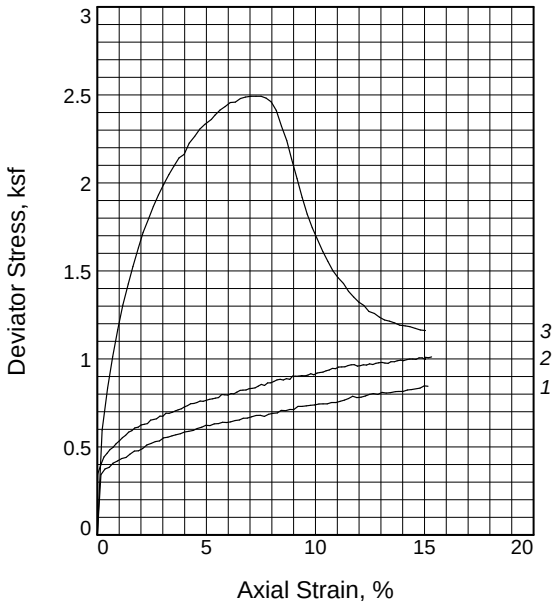
C & phi are not test results but an interpretation of the test results. The designer is responsible for interpreting test data as provided by S&ME.





Sample No.		1	2	3
Initial	Water Content, %	29.4	29.4	40.7
	Dry Density, pcf	84.9	90.7	78.9
	Saturation, %	82.1	94.5	98.3
	Void Ratio	0.9482	0.8239	1.0978
	Diameter, in.	2.876	2.859	2.868
	Height, in.	6.501	6.462	6.130
At Test	Water Content, %	27.5	24.9	36.8
	Dry Density, pcf	95.6	99.7	83.8
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.7301	0.6596	0.9742
	Diameter, in.	2.764	2.770	2.810
	Height, in.	6.252	6.264	6.008
Strain rate, in./min.		0.006	0.004	0.007
Eff. Cell Pressure, ksf		0.50	0.99	2.00
Fail. Stress, ksf		0.48	0.76	2.41
Total Pore Pr., ksf		9.07	9.40	9.55
Strain, %		1.7	4.7	5.6
Ult. Stress, ksf		0.85	1.01	1.16
Total Pore Pr., ksf		8.99	9.29	9.43
Strain, %		15.2	15.3	15.0
$\bar{\sigma}_1$ Failure, ksf		0.55	0.99	3.51
$\bar{\sigma}_3$ Failure, ksf		0.07	0.23	1.09

Type of Test:
CU with Pore Pressures

Sample Type: Undisturbed

Description: Pink Gray Tan Fine to Coarse Sandy Silt (ML)

LL= 44 **PL=** 29 **PI=** 15

Assumed Specific Gravity= 2.65

Remarks: Specimen S-1 was wet and disturbed, failed in bulge. Specimens S-2 and S-3 failed in shear (ASTM 4767).

Figure W-27UD UD-1

Client: HDR Engineering, Inc.

Project: Carolina Crossroads Project

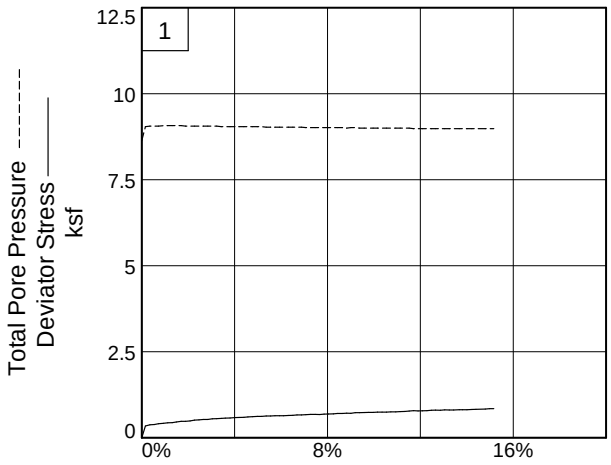
Location: UD Borings

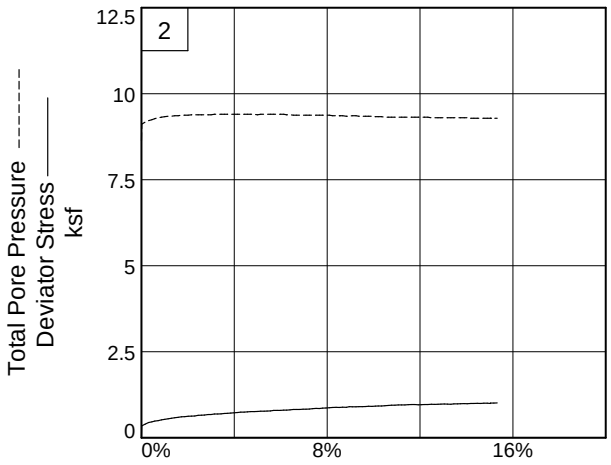
Sample Number: W-27UD UD-1 **Depth:** 13.5-15.5

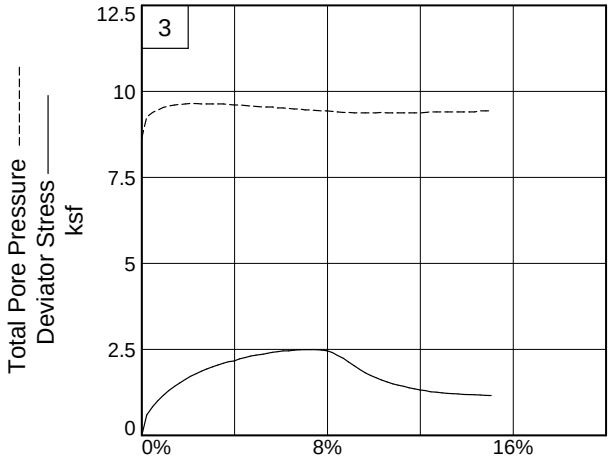
Proj. No.: 1461-16-047.2B **Date Sampled:** Various

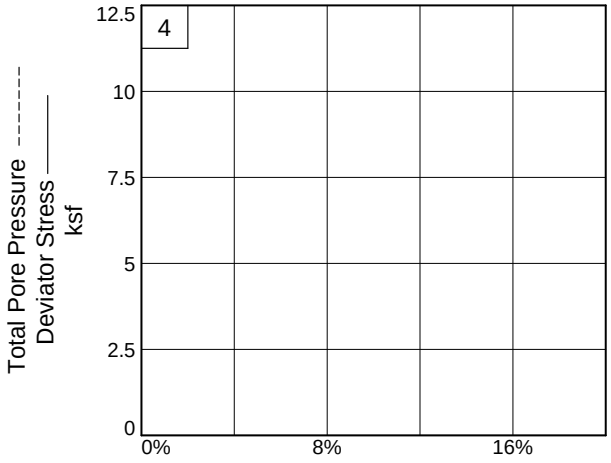
TRIAXIAL SHEAR TEST REPORT
S & ME, INC.
Charlotte, North Carolina

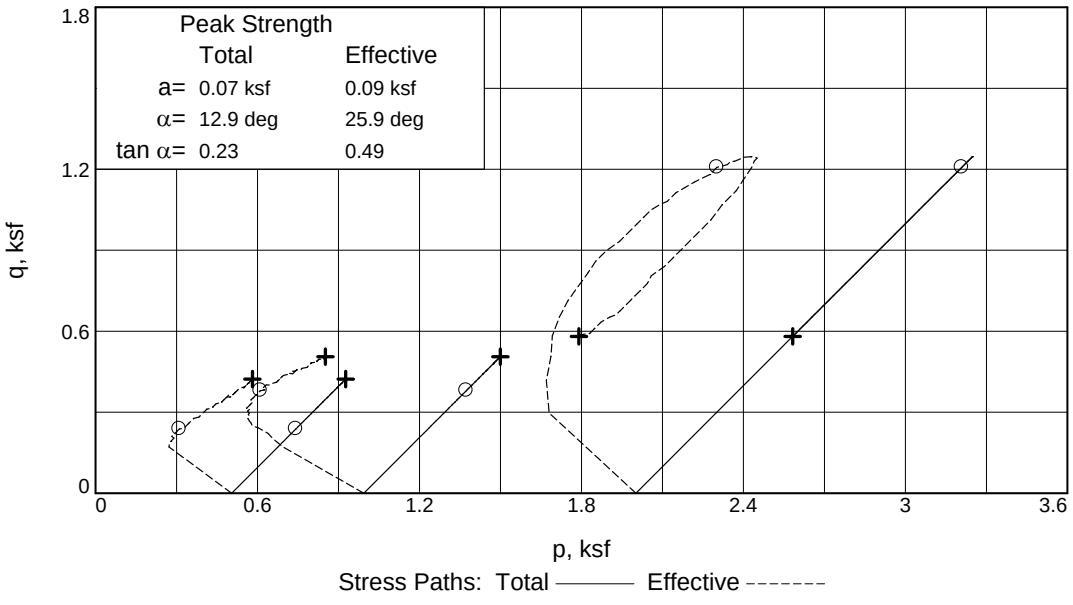
Tested By: Karen Warner **Checked By:** Jason Reeves











Client: HDR Engineering, Inc.
Project: Carolina Crossroads Project
Location: UD Borings **Depth:** 13.5-15.5 **Sample Number:** W-27UD UD-1
Project No.: 1461-16-047.2B **Figure** W-27UD UD-1

S & ME, INC.

Tested By: Karen Warner **Checked By:** Jason Reeves

C & phi are not test results but an interpretation of the test results. The designer is responsible for interpreting test data as provided by S&ME.

TRIAXIAL COMPRESSION TEST 6/26/2018

CU with Pore Pressures 3:09 PM

Date: Various
Client: HDR Engineering, Inc.
Project: Carolina Crossroads Project
Project No.: 1461-16-047.2B
Location: UD Borings
Depth: 13.5-15.5 **Sample Number:** W-27UD UD-1
Description: Pink Gray Tan Fine to Coarse Sandy Silt (ML)
Remarks: Specimen S-1 was wet and disturbed, failed in shear. Specimens S-2 and S-3 failed in shear (ASTM 4767).
Type of Sample: Undisturbed
Assumed Specific Gravity=2.65 **LL=**44 **PL=**29 **PI=**15
Test Method: COE uniform strain

Parameters for Specimen No. 1

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	384.010			1238.430
Moisture content: Dry soil+tare, gms.	315.570			996.410
Moisture content: Tare, gms.	82.500			84.850
Moisture, %	29.4	33.1	27.5	26.6
Moist specimen weight, gms.	1217.79			
Diameter, in.	2.876	2.840	2.764	
Area, in.²	6.496	6.334	5.999	
Height, in.	6.501	6.420	6.252	
Net decrease in height, in.		0.081	0.168	
Wet density, pcf	109.9	117.3	122.0	
Dry density, pcf	84.9	88.2	95.6	
Void ratio	0.9482	0.8760	0.7301	
Saturation, %	82.1	100.0	100.0	

Test Readings for Specimen No. 1

Consolidation cell pressure = 63.50 psi (9.14 ksf)
Consolidation back pressure = 60.00 psi (8.64 ksf)
Consolidation effective confining stress = 0.50 ksf
Strain rate, in./min. = 0.006
Fail. Stress = 0.48 ksf **at reading no.** 9
Ult. Stress = 0.85 ksf **at reading no.** 78

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
0	0.0460	18.400	0.0	0.0	0.00	0.50	0.50	1.00	60.00	0.50	0.00
1	0.0560	32.700	14.3	0.2	0.34	0.10	0.44	4.40	62.80	0.27	0.17
2	0.0680	34.100	15.7	0.4	0.38	0.09	0.46	5.35	62.90	0.27	0.19
3	0.0800	34.500	16.1	0.5	0.38	0.09	0.47	5.45	62.90	0.28	0.19
4	0.0910	35.500	17.1	0.7	0.41	0.09	0.49	5.72	62.90	0.29	0.20
5	0.1040	36.100	17.7	0.9	0.42	0.07	0.49	6.85	63.00	0.28	0.21
6	0.1160	36.700	18.3	1.1	0.43	0.07	0.51	7.03	63.00	0.29	0.22
7	0.1280	37.000	18.6	1.3	0.44	0.07	0.51	7.12	63.00	0.29	0.22
8	0.1390	37.800	19.4	1.5	0.46	0.07	0.53	7.37	63.00	0.30	0.23
9	0.1520	38.600	20.2	1.7	0.48	0.07	0.55	7.62	63.00	0.31	0.24
10	0.1640	38.700	20.3	1.9	0.48	0.09	0.56	6.53	62.90	0.33	0.24
11	0.1760	39.300	20.9	2.1	0.49	0.09	0.58	6.69	62.90	0.33	0.25
12	0.1880	40.200	21.8	2.3	0.51	0.09	0.60	6.92	62.90	0.34	0.26
13	0.2000	40.600	22.2	2.5	0.52	0.09	0.61	7.02	62.90	0.35	0.26
14	0.2120	41.100	22.7	2.7	0.53	0.09	0.62	7.14	62.90	0.35	0.27
15	0.2240	41.300	22.9	2.8	0.53	0.09	0.62	7.18	62.90	0.35	0.27
16	0.2360	42.100	23.7	3.0	0.55	0.09	0.64	7.38	62.90	0.36	0.28
17	0.2480	42.300	23.9	3.2	0.56	0.09	0.64	7.43	62.90	0.36	0.28
18	0.2600	42.700	24.3	3.4	0.56	0.10	0.66	6.59	62.80	0.38	0.28
19	0.2710	43.000	24.6	3.6	0.57	0.10	0.67	6.65	62.80	0.39	0.28
20	0.2840	43.300	24.9	3.8	0.57	0.10	0.68	6.70	62.80	0.39	0.29
21	0.2960	43.800	25.4	4.0	0.59	0.10	0.69	6.81	62.80	0.39	0.29
22	0.3080	44.000	25.6	4.2	0.59	0.10	0.69	6.84	62.80	0.40	0.29
23	0.3210	44.300	25.9	4.4	0.59	0.10	0.70	6.90	62.80	0.40	0.30
24	0.3320	44.800	26.4	4.6	0.60	0.10	0.71	7.00	62.80	0.40	0.30
25	0.3450	45.200	26.8	4.8	0.61	0.10	0.71	7.08	62.80	0.41	0.31
26	0.3570	45.700	27.3	5.0	0.62	0.10	0.72	7.18	62.80	0.41	0.31
27	0.3690	45.700	27.3	5.2	0.62	0.10	0.72	7.17	62.80	0.41	0.31
28	0.3810	46.200	27.8	5.4	0.63	0.12	0.75	6.48	62.70	0.43	0.32
29	0.3930	46.300	27.9	5.6	0.63	0.12	0.75	6.49	62.70	0.43	0.32
30	0.4050	46.700	28.3	5.7	0.64	0.12	0.76	6.56	62.70	0.44	0.32
31	0.4170	46.700	28.3	5.9	0.64	0.12	0.75	6.55	62.70	0.43	0.32
32	0.4280	46.900	28.5	6.1	0.64	0.12	0.76	6.58	62.70	0.44	0.32
33	0.4410	47.300	28.9	6.3	0.65	0.12	0.77	6.64	62.70	0.44	0.32
34	0.4530	47.500	29.1	6.5	0.65	0.12	0.77	6.67	62.70	0.44	0.33
35	0.4640	48.000	29.6	6.7	0.66	0.12	0.78	6.76	62.70	0.45	0.33
36	0.4760	48.100	29.7	6.9	0.66	0.12	0.78	6.76	62.70	0.45	0.33
37	0.4880	48.500	30.1	7.1	0.67	0.13	0.80	6.18	62.60	0.47	0.34
38	0.5010	48.900	30.5	7.3	0.68	0.13	0.81	6.24	62.60	0.47	0.34
39	0.5130	49.000	30.6	7.5	0.68	0.13	0.81	6.24	62.60	0.47	0.34
40	0.5250	48.800	30.4	7.7	0.67	0.13	0.80	6.20	62.60	0.47	0.34
41	0.5370	49.400	31.0	7.9	0.69	0.13	0.82	6.29	62.60	0.47	0.34
42	0.5490	49.700	31.3	8.0	0.69	0.13	0.82	6.33	62.60	0.48	0.35
43	0.5620	49.900	31.5	8.3	0.69	0.13	0.82	6.35	62.60	0.48	0.35
44	0.5730	50.600	32.2	8.4	0.71	0.13	0.84	6.46	62.60	0.48	0.35
45	0.5860	50.600	32.2	8.6	0.71	0.13	0.84	6.45	62.60	0.48	0.35
46	0.5980	51.000	32.6	8.8	0.71	0.14	0.86	5.95	62.50	0.50	0.36

Test Readings for Specimen No. 1

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
47	0.6090	51.000	32.6	9.0	0.71	0.13	0.84	6.49	62.60	0.49	0.36
48	0.6210	51.900	33.5	9.2	0.73	0.13	0.86	6.63	62.60	0.49	0.37
49	0.6330	52.000	33.6	9.4	0.73	0.14	0.87	6.08	62.50	0.51	0.37
50	0.6450	52.200	33.8	9.6	0.73	0.14	0.88	6.09	62.50	0.51	0.37
51	0.6570	52.400	34.0	9.8	0.74	0.14	0.88	6.11	62.50	0.51	0.37
52	0.6690	52.600	34.2	10.0	0.74	0.14	0.88	6.13	62.50	0.51	0.37
53	0.6810	52.900	34.5	10.2	0.74	0.14	0.89	6.17	62.50	0.52	0.37
54	0.6930	53.000	34.6	10.3	0.74	0.14	0.89	6.17	62.50	0.52	0.37
55	0.7050	53.100	34.7	10.5	0.75	0.14	0.89	6.17	62.50	0.52	0.37
56	0.7170	53.500	35.1	10.7	0.75	0.14	0.90	6.22	62.50	0.52	0.38
57	0.7300	53.600	35.2	10.9	0.75	0.14	0.90	6.23	62.50	0.52	0.38
58	0.7420	54.000	35.6	11.1	0.76	0.14	0.90	6.27	62.50	0.52	0.38
59	0.7540	54.400	36.0	11.3	0.77	0.14	0.91	6.32	62.50	0.53	0.38
60	0.7660	54.900	36.5	11.5	0.78	0.14	0.92	6.38	62.50	0.53	0.39
61	0.7780	55.600	37.2	11.7	0.79	0.16	0.95	5.98	62.40	0.55	0.39
62	0.7900	55.300	36.9	11.9	0.78	0.16	0.94	5.93	62.40	0.55	0.39
63	0.8020	55.500	37.1	12.1	0.78	0.16	0.94	5.94	62.40	0.55	0.39
64	0.8140	55.900	37.5	12.3	0.79	0.16	0.95	5.98	62.40	0.55	0.39
65	0.8260	56.400	38.0	12.5	0.80	0.16	0.96	6.04	62.40	0.56	0.40
66	0.8370	56.700	38.3	12.7	0.80	0.16	0.96	6.07	62.40	0.56	0.40
67	0.8500	56.600	38.2	12.9	0.80	0.16	0.96	6.04	62.40	0.56	0.40
68	0.8620	57.200	38.8	13.1	0.81	0.16	0.97	6.11	62.40	0.56	0.40
69	0.8740	57.100	38.7	13.2	0.81	0.16	0.96	6.09	62.40	0.56	0.40
70	0.8860	57.300	38.9	13.4	0.81	0.16	0.97	6.10	62.40	0.56	0.40
71	0.9010	57.700	39.3	13.7	0.81	0.16	0.97	6.14	62.40	0.57	0.41
72	0.9100	57.800	39.4	13.8	0.82	0.16	0.97	6.15	62.40	0.57	0.41
73	0.9220	57.900	39.5	14.0	0.82	0.16	0.97	6.15	62.40	0.57	0.41
74	0.9350	58.400	40.0	14.2	0.82	0.16	0.98	6.20	62.40	0.57	0.41
75	0.9460	58.600	40.2	14.4	0.83	0.16	0.98	6.22	62.40	0.57	0.41
76	0.9710	59.200	40.8	14.8	0.83	0.16	0.99	6.27	62.40	0.58	0.42
77	0.9830	59.900	41.5	15.0	0.85	0.16	1.01	6.35	62.40	0.58	0.42
78	0.9940	59.900	41.5	15.2	0.85	0.16	1.00	6.34	62.40	0.58	0.42

Parameters for Specimen No. 2

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	384.010			1292.340
Moisture content: Dry soil+tare, gms.	315.570			1011.260
Moisture content: Tare, gms.	82.500			84.410
Moisture, %	29.4	28.8	24.9	30.3
Moist specimen weight, gms.	1277.77			
Diameter, in.	2.859	2.827	2.770	
Area, in.²	6.420	6.277	6.026	
Height, in.	6.462	6.390	6.264	
Net decrease in height, in.		0.072	0.126	
Wet density, pcf	117.3	120.8	124.5	
Dry density, pcf	90.7	93.8	99.7	
Void ratio	0.8239	0.7634	0.6596	
Saturation, %	94.5	100.0	100.0	

Test Readings for Specimen No. 2

Consolidation cell pressure = 66.90 psi (9.63 ksf)
Consolidation back pressure = 60.00 psi (8.64 ksf)
Consolidation effective confining stress = 0.99 ksf
Strain rate, in./min. = 0.004
Fail. Stress = 0.76 ksf **at reading no.** 34
Ult. Stress = 1.01 ksf **at reading no.** 110

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
0	0.0100	17.900	0.0	0.0	0.00	0.99	0.99	1.00	60.00	0.99	0.00
1	0.0110	32.400	14.5	0.0	0.35	0.52	0.86	1.67	63.30	0.69	0.17
2	0.0200	34.600	16.7	0.2	0.40	0.46	0.86	1.86	63.70	0.66	0.20
3	0.0290	36.500	18.6	0.3	0.44	0.42	0.86	2.06	64.00	0.64	0.22
4	0.0380	37.400	19.5	0.4	0.46	0.39	0.85	2.19	64.20	0.62	0.23
5	0.0460	38.300	20.4	0.6	0.48	0.36	0.84	2.35	64.40	0.60	0.24
6	0.0550	38.900	21.0	0.7	0.50	0.33	0.83	2.50	64.60	0.58	0.25
7	0.0640	39.800	21.9	0.9	0.52	0.32	0.84	2.64	64.70	0.58	0.26
8	0.0730	40.500	22.6	1.0	0.53	0.30	0.84	2.77	64.80	0.57	0.27
9	0.0820	41.300	23.4	1.1	0.55	0.29	0.84	2.92	64.90	0.56	0.28
10	0.0910	41.900	24.0	1.3	0.57	0.29	0.85	2.97	64.90	0.57	0.28
11	0.1000	42.700	24.8	1.4	0.58	0.27	0.86	3.13	65.00	0.57	0.29
12	0.1090	43.100	25.2	1.6	0.59	0.27	0.87	3.17	65.00	0.57	0.30
13	0.1180	43.800	25.9	1.7	0.61	0.26	0.87	3.35	65.10	0.56	0.30
14	0.1270	44.000	26.1	1.9	0.61	0.26	0.87	3.36	65.10	0.57	0.31
15	0.1360	44.600	26.7	2.0	0.63	0.26	0.88	3.41	65.10	0.57	0.31
16	0.1450	44.800	26.9	2.2	0.63	0.24	0.87	3.57	65.20	0.56	0.31
17	0.1540	45.000	27.1	2.3	0.63	0.24	0.88	3.58	65.20	0.56	0.32
18	0.1630	45.900	28.0	2.4	0.65	0.24	0.90	3.67	65.20	0.57	0.33
19	0.1720	46.100	28.2	2.6	0.66	0.24	0.90	3.68	65.20	0.57	0.33
20	0.1800	46.300	28.4	2.7	0.66	0.24	0.91	3.70	65.20	0.57	0.33
21	0.1900	47.000	29.1	2.9	0.68	0.24	0.92	3.76	65.20	0.58	0.34
22	0.1980	47.000	29.1	3.0	0.67	0.24	0.92	3.76	65.20	0.58	0.34
23	0.2070	47.800	29.9	3.1	0.69	0.23	0.92	4.00	65.30	0.58	0.35
24	0.2160	47.800	29.9	3.3	0.69	0.23	0.92	4.00	65.30	0.58	0.35
25	0.2250	48.100	30.2	3.4	0.70	0.23	0.93	4.02	65.30	0.58	0.35

Test Readings for Specimen No. 2

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
26	0.2340	48.500	30.6	3.6	0.71	0.23	0.94	4.06	65.30	0.58	0.35
27	0.2420	48.800	30.9	3.7	0.71	0.23	0.94	4.09	65.30	0.59	0.36
28	0.2510	49.100	31.2	3.8	0.72	0.23	0.95	4.11	65.30	0.59	0.36
29	0.2600	49.600	31.7	4.0	0.73	0.23	0.96	4.16	65.30	0.59	0.36
30	0.2690	50.000	32.1	4.1	0.74	0.23	0.97	4.19	65.30	0.60	0.37
31	0.2780	50.500	32.6	4.3	0.75	0.23	0.98	4.24	65.30	0.60	0.37
32	0.2870	50.600	32.7	4.4	0.75	0.23	0.98	4.24	65.30	0.60	0.37
33	0.2960	50.900	33.0	4.6	0.75	0.23	0.98	4.27	65.30	0.61	0.38
34	0.3050	51.300	33.4	4.7	0.76	0.23	0.99	4.30	65.30	0.61	0.38
35	0.3140	51.300	33.4	4.9	0.76	0.23	0.99	4.30	65.30	0.61	0.38
36	0.3230	51.600	33.7	5.0	0.77	0.24	1.01	4.13	65.20	0.63	0.38
37	0.3320	51.900	34.0	5.1	0.77	0.23	1.00	4.34	65.30	0.62	0.39
38	0.3410	52.100	34.2	5.3	0.77	0.23	1.00	4.36	65.30	0.62	0.39
39	0.3490	52.300	34.4	5.4	0.78	0.23	1.01	4.37	65.30	0.62	0.39
40	0.3580	52.500	34.6	5.6	0.78	0.23	1.01	4.39	65.30	0.62	0.39
41	0.3670	53.300	35.4	5.7	0.80	0.23	1.03	4.46	65.30	0.63	0.40
42	0.3760	53.300	35.4	5.8	0.80	0.23	1.03	4.46	65.30	0.63	0.40
43	0.3850	53.300	35.4	6.0	0.80	0.23	1.03	4.45	65.30	0.63	0.40
44	0.3940	53.700	35.8	6.1	0.80	0.23	1.03	4.49	65.30	0.63	0.40
45	0.4020	53.700	35.8	6.3	0.80	0.24	1.05	4.28	65.20	0.65	0.40
46	0.4110	54.200	36.3	6.4	0.81	0.24	1.06	4.32	65.20	0.65	0.41
47	0.4200	54.700	36.8	6.5	0.82	0.26	1.08	4.17	65.10	0.67	0.41
48	0.4280	54.800	36.9	6.7	0.82	0.26	1.08	4.17	65.10	0.67	0.41
49	0.4370	54.900	37.0	6.8	0.82	0.26	1.08	4.18	65.10	0.67	0.41
50	0.4460	55.300	37.4	7.0	0.83	0.26	1.09	4.21	65.10	0.67	0.42
51	0.4540	55.400	37.5	7.1	0.83	0.26	1.09	4.21	65.10	0.68	0.42
52	0.4630	55.600	37.7	7.2	0.84	0.26	1.09	4.22	65.10	0.68	0.42
53	0.4720	56.100	38.2	7.4	0.85	0.26	1.10	4.26	65.10	0.68	0.42
54	0.4810	56.600	38.7	7.5	0.86	0.26	1.11	4.30	65.10	0.69	0.43
55	0.4900	56.400	38.5	7.7	0.85	0.26	1.11	4.28	65.10	0.68	0.42
56	0.4990	57.100	39.2	7.8	0.86	0.26	1.12	4.33	65.10	0.69	0.43
57	0.5080	57.200	39.3	8.0	0.86	0.26	1.12	4.33	65.10	0.69	0.43
58	0.5170	57.600	39.7	8.1	0.87	0.26	1.13	4.36	65.10	0.70	0.44
59	0.5260	58.100	40.2	8.2	0.88	0.27	1.16	4.22	65.00	0.71	0.44
60	0.5350	58.300	40.4	8.4	0.88	0.27	1.16	4.23	65.00	0.72	0.44
61	0.5440	58.200	40.3	8.5	0.88	0.27	1.15	4.22	65.00	0.71	0.44
62	0.5530	58.600	40.7	8.7	0.89	0.27	1.16	4.25	65.00	0.72	0.44
63	0.5630	58.500	40.6	8.8	0.88	0.29	1.17	4.07	64.90	0.73	0.44
64	0.5710	59.400	41.5	9.0	0.90	0.29	1.19	4.13	64.90	0.74	0.45
65	0.5790	59.400	41.5	9.1	0.90	0.27	1.18	4.30	65.00	0.72	0.45
66	0.5890	59.500	41.6	9.2	0.90	0.27	1.18	4.30	65.00	0.72	0.45
67	0.5970	59.700	41.8	9.4	0.91	0.29	1.19	4.14	64.90	0.74	0.45
68	0.6060	59.700	41.8	9.5	0.90	0.29	1.19	4.14	64.90	0.74	0.45
69	0.6150	60.000	42.1	9.7	0.91	0.29	1.20	4.16	64.90	0.74	0.45
70	0.6230	60.400	42.5	9.8	0.92	0.29	1.20	4.18	64.90	0.75	0.46
71	0.6320	60.200	42.3	9.9	0.91	0.29	1.20	4.16	64.90	0.74	0.46
72	0.6410	60.700	42.8	10.1	0.92	0.30	1.22	4.04	64.80	0.76	0.46

Test Readings for Specimen No. 2

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
73	0.6490	60.900	43.0	10.2	0.92	0.30	1.23	4.05	64.80	0.76	0.46
74	0.6580	61.100	43.2	10.3	0.93	0.30	1.23	4.06	64.80	0.77	0.46
75	0.6670	61.500	43.6	10.5	0.93	0.32	1.25	3.94	64.70	0.78	0.47
76	0.6760	61.800	43.9	10.6	0.94	0.32	1.25	3.96	64.70	0.79	0.47
77	0.6850	62.300	44.4	10.8	0.95	0.32	1.26	3.99	64.70	0.79	0.47
78	0.6940	62.300	44.4	10.9	0.95	0.32	1.26	3.98	64.70	0.79	0.47
79	0.7030	62.800	44.9	11.1	0.95	0.32	1.27	4.01	64.70	0.79	0.48
80	0.7120	62.900	45.0	11.2	0.95	0.32	1.27	4.01	64.70	0.79	0.48
81	0.7210	63.000	45.1	11.4	0.96	0.32	1.27	4.02	64.70	0.79	0.48
82	0.7300	63.400	45.5	11.5	0.96	0.32	1.28	4.04	64.70	0.80	0.48
83	0.7390	63.700	45.8	11.6	0.97	0.32	1.28	4.05	64.70	0.80	0.48
84	0.7480	63.800	45.9	11.8	0.97	0.32	1.28	4.05	64.70	0.80	0.48
85	0.7570	63.500	45.6	11.9	0.96	0.32	1.28	4.03	64.70	0.80	0.48
86	0.7660	63.700	45.8	12.1	0.96	0.32	1.28	4.04	64.70	0.80	0.48
87	0.7740	64.000	46.1	12.2	0.97	0.32	1.28	4.05	64.70	0.80	0.48
88	0.7830	64.000	46.1	12.3	0.97	0.32	1.28	4.05	64.70	0.80	0.48
89	0.7920	64.400	46.5	12.5	0.97	0.33	1.30	3.94	64.60	0.82	0.49
90	0.8010	64.300	46.4	12.6	0.97	0.33	1.30	3.92	64.60	0.82	0.48
91	0.8100	64.700	46.8	12.8	0.98	0.33	1.31	3.95	64.60	0.82	0.49
92	0.8180	64.900	47.0	12.9	0.98	0.33	1.31	3.95	64.60	0.82	0.49
93	0.8270	65.100	47.2	13.0	0.98	0.33	1.31	3.96	64.60	0.82	0.49
94	0.8360	65.000	47.1	13.2	0.98	0.33	1.31	3.95	64.60	0.82	0.49
95	0.8450	65.000	47.1	13.3	0.98	0.33	1.31	3.95	64.60	0.82	0.49
96	0.8530	65.500	47.6	13.5	0.98	0.33	1.32	3.97	64.60	0.82	0.49
97	0.8630	65.600	47.7	13.6	0.98	0.33	1.32	3.97	64.60	0.82	0.49
98	0.8710	65.900	48.0	13.7	0.99	0.33	1.32	3.99	64.60	0.83	0.49
99	0.8810	66.200	48.3	13.9	0.99	0.33	1.32	4.00	64.60	0.83	0.50
100	0.8890	66.100	48.2	14.0	0.99	0.33	1.32	3.99	64.60	0.83	0.50
101	0.8990	66.500	48.6	14.2	1.00	0.35	1.34	3.88	64.50	0.84	0.50
102	0.9070	66.700	48.8	14.3	1.00	0.35	1.34	3.89	64.50	0.85	0.50
103	0.9160	66.800	48.9	14.5	1.00	0.35	1.35	3.89	64.50	0.85	0.50
104	0.9250	66.800	48.9	14.6	1.00	0.35	1.34	3.89	64.50	0.84	0.50
105	0.9340	67.300	49.4	14.8	1.01	0.35	1.35	3.91	64.50	0.85	0.50
106	0.9430	67.400	49.5	14.9	1.01	0.35	1.35	3.91	64.50	0.85	0.50
107	0.9520	67.000	49.1	15.0	1.00	0.35	1.34	3.88	64.50	0.84	0.50
108	0.9520	67.600	49.7	15.0	1.01	0.35	1.35	3.92	64.50	0.85	0.50
109	0.9610	67.600	49.7	15.2	1.01	0.35	1.35	3.91	64.50	0.85	0.50
110	0.9700	67.900	50.0	15.3	1.01	0.35	1.36	3.93	64.50	0.85	0.51

Parameters for Specimen No. 3

Specimen Parameter	Initial	Saturated	Consolidated	Final
Moisture content: Moist soil+tare, gms.	152.150			1210.500
Moisture content: Dry soil+tare, gms.	132.150			889.070
Moisture content: Tare, gms.	83.050			73.330
Moisture, %	40.7	40.2	36.8	39.4
Moist specimen weight, gms.	1153.70			
Diameter, in.	2.868	2.853	2.810	
Area, in.²	6.460	6.391	6.203	
Height, in.	6.130	6.097	6.008	
Net decrease in height, in.		0.033	0.089	
Wet density, pcf	111.0	112.3	114.6	
Dry density, pcf	78.9	80.2	83.8	
Void ratio	1.0978	1.0640	0.9742	
Saturation, %	98.3	100.0	100.0	

Test Readings for Specimen No. 3

Consolidation cell pressure = 73.90 psi (10.64 ksf)
Consolidation back pressure = 60.00 psi (8.64 ksf)
Consolidation effective confining stress = 2.00 ksf
Strain rate, in./min. = 0.007
Fail. Stress = 2.41 ksf **at reading no.** 24
Ult. Stress = 1.16 ksf **at reading no.** 64

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
0	0.0100	24.100	0.0	0.0	0.00	2.00	2.00	1.00	60.00	2.00	0.00
1	0.0230	49.800	25.7	0.2	0.60	1.38	1.98	1.43	64.30	1.68	0.30
2	0.0380	60.200	36.1	0.5	0.83	1.25	2.09	1.67	65.20	1.67	0.42
3	0.0520	68.000	43.9	0.7	1.01	1.18	2.19	1.86	65.70	1.69	0.51
4	0.0660	74.800	50.7	0.9	1.17	1.11	2.27	2.05	66.20	1.69	0.58
5	0.0800	81.000	56.9	1.2	1.31	1.07	2.37	2.23	66.50	1.72	0.65
6	0.0950	86.400	62.3	1.4	1.43	1.04	2.46	2.38	66.70	1.75	0.71
7	0.1080	90.900	66.8	1.6	1.53	1.02	2.55	2.49	66.80	1.79	0.76
8	0.1230	95.700	71.6	1.9	1.63	1.01	2.64	2.62	66.90	1.82	0.82
9	0.1360	99.700	75.6	2.1	1.72	0.99	2.71	2.73	67.00	1.85	0.86
10	0.1510	103.300	79.2	2.3	1.80	0.99	2.79	2.81	67.00	1.89	0.90
11	0.1640	106.600	82.5	2.6	1.87	1.01	2.87	2.85	66.90	1.94	0.93
12	0.1780	109.700	85.6	2.8	1.93	1.01	2.94	2.92	66.90	1.97	0.97
13	0.1930	112.700	88.6	3.0	1.99	1.01	3.00	2.98	66.90	2.01	1.00
14	0.2070	115.300	91.2	3.3	2.05	1.01	3.06	3.03	66.90	2.03	1.02
15	0.2210	117.700	93.6	3.5	2.10	1.01	3.10	3.08	66.90	2.06	1.05
16	0.2350	120.000	95.9	3.7	2.14	1.02	3.17	3.10	66.80	2.09	1.07
17	0.2490	121.100	97.0	4.0	2.16	1.04	3.20	3.09	66.70	2.12	1.08
18	0.2630	124.200	100.1	4.2	2.23	1.04	3.26	3.15	66.70	2.15	1.11
19	0.2780	126.200	102.1	4.5	2.26	1.05	3.32	3.15	66.60	2.18	1.13
20	0.2920	128.300	104.2	4.7	2.31	1.07	3.37	3.16	66.50	2.22	1.15
21	0.3060	129.800	105.7	4.9	2.33	1.08	3.41	3.16	66.40	2.25	1.17
22	0.3240	131.400	107.3	5.2	2.36	1.09	3.46	3.16	66.30	2.27	1.18
23	0.3340	132.700	108.6	5.4	2.39	1.09	3.48	3.18	66.30	2.29	1.19
24	0.3480	134.300	110.2	5.6	2.41	1.09	3.51	3.21	66.30	2.30	1.21
25	0.3620	135.500	111.4	5.9	2.43	1.12	3.56	3.17	66.10	2.34	1.22

Test Readings for Specimen No. 3

No.	Def. Dial in.	Load Dial	Load lbs.	Strain %	Deviator Stress ksf	Minor Eff. Stress ksf	Major Eff. Stress ksf	1:3 Ratio	Pore Press. psi	P ksf	Q ksf
26	0.3760	136.800	112.7	6.1	2.46	1.12	3.58	3.19	66.10	2.35	1.23
27	0.3900	137.200	113.1	6.3	2.46	1.14	3.60	3.16	66.00	2.37	1.23
28	0.4040	138.400	114.3	6.6	2.48	1.15	3.63	3.15	65.90	2.39	1.24
29	0.4180	139.100	115.0	6.8	2.49	1.15	3.64	3.16	65.90	2.40	1.24
30	0.4330	139.600	115.5	7.0	2.49	1.18	3.67	3.11	65.70	2.43	1.25
31	0.4470	139.900	115.8	7.3	2.49	1.18	3.67	3.11	65.70	2.43	1.25
32	0.4610	140.200	116.1	7.5	2.49	1.20	3.69	3.09	65.60	2.44	1.25
33	0.4750	140.000	115.9	7.7	2.48	1.21	3.69	3.05	65.50	2.45	1.24
34	0.4890	139.300	115.2	8.0	2.46	1.21	3.67	3.03	65.50	2.44	1.23
35	0.5030	137.300	113.2	8.2	2.41	1.22	3.64	2.97	65.40	2.43	1.21
36	0.5170	133.400	109.3	8.4	2.32	1.24	3.56	2.88	65.30	2.40	1.16
37	0.5320	129.800	105.7	8.7	2.24	1.25	3.49	2.79	65.20	2.37	1.12
38	0.5450	125.100	101.0	8.9	2.14	1.25	3.39	2.70	65.20	2.32	1.07
39	0.5600	120.100	96.0	9.2	2.02	1.27	3.29	2.60	65.10	2.28	1.01
40	0.5740	115.300	91.2	9.4	1.92	1.27	3.19	2.51	65.10	2.23	0.96
41	0.5880	111.000	86.9	9.6	1.82	1.27	3.09	2.44	65.10	2.18	0.91
42	0.6020	107.500	83.4	9.9	1.75	1.27	3.01	2.38	65.10	2.14	0.87
43	0.6160	104.600	80.5	10.1	1.68	1.27	2.95	2.33	65.10	2.11	0.84
44	0.6310	101.500	77.4	10.3	1.61	1.25	2.86	2.29	65.20	2.06	0.81
45	0.6450	99.000	74.9	10.6	1.55	1.27	2.82	2.23	65.10	2.04	0.78
46	0.6590	96.600	72.5	10.8	1.50	1.27	2.77	2.18	65.10	2.02	0.75
47	0.6730	94.900	70.8	11.0	1.46	1.27	2.73	2.15	65.10	2.00	0.73
48	0.6880	93.500	69.4	11.3	1.43	1.27	2.70	2.13	65.10	1.98	0.71
49	0.7020	91.500	67.4	11.5	1.38	1.27	2.65	2.09	65.10	1.96	0.69
50	0.7160	90.100	66.0	11.8	1.35	1.27	2.62	2.07	65.10	1.94	0.68
51	0.7300	88.900	64.8	12.0	1.32	1.27	2.59	2.04	65.10	1.93	0.66
52	0.7440	88.100	64.0	12.2	1.30	1.25	2.56	2.04	65.20	1.90	0.65
53	0.7580	86.600	62.5	12.5	1.27	1.24	2.51	2.03	65.30	1.87	0.64
54	0.7730	86.200	62.1	12.7	1.26	1.24	2.50	2.02	65.30	1.87	0.63
55	0.7870	85.300	61.2	12.9	1.24	1.24	2.48	2.00	65.30	1.86	0.62
56	0.8010	84.700	60.6	13.2	1.22	1.24	2.46	1.99	65.30	1.85	0.61
57	0.8150	84.500	60.4	13.4	1.21	1.24	2.45	1.98	65.30	1.85	0.61
58	0.8290	84.200	60.1	13.6	1.20	1.24	2.44	1.97	65.30	1.84	0.60
59	0.8430	83.700	59.6	13.9	1.19	1.24	2.43	1.96	65.30	1.83	0.60
60	0.8580	83.700	59.6	14.1	1.19	1.24	2.43	1.96	65.30	1.83	0.59
61	0.8710	83.600	59.5	14.3	1.18	1.24	2.42	1.96	65.30	1.83	0.59
62	0.8860	83.300	59.2	14.6	1.17	1.21	2.38	1.97	65.50	1.80	0.59
63	0.9000	83.000	58.9	14.8	1.16	1.21	2.37	1.96	65.50	1.79	0.58
64	0.9140	83.000	58.9	15.0	1.16	1.21	2.37	1.96	65.50	1.79	0.58

ASTM D4767 CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TEST FOR COHESIVE SOILS

Project No.: 1461-16-047.2B
Project Name: Carolina Crossroads Project

Sample ID: W-27 UD-1
Depth: 13.5-15.5'

Failed Specimens

Specimen No.: 1
Effective Confining Pressure: 3.5 psi
Notes: Failed in bulge

Specimen No.: 2
Effective Confining Pressure: 6.9 psi
Notes: Failed in shear

Specimen No.: 3
Effective Confining Pressure: 13.9
Notes: Failed in shear

Sheared By: Karen Warner
Reviewed By: Jason Reeves Date: 6/26/2018

Appendix XII – Laboratory Test Data Sheets Rock Core Samples

UNCONFINED COMPRESSION
(ASTM D7012 Method C)

S&ME, Inc. - Knoxville 1413 Topside Road, Louisville, TN 37777

Project Name: Carolina Crossroads Project
Project Number: 1461-16-047 Phase 2B

Report Date: February 26, 2018
Reviewed By: Jason B. Burgess

Boring No.	Sample No.	Depth (ft)	Dimensions, in.		Shape (See Key)	Area (in^2)	Unit Weight (lbs/ft^3)	Loading Rate (psi/sec)	Maximum Load (lbs)	Strength (psi)	Moisture (%)
			Length	Diameter							
DH-4	RC-2	55.2 - 56.4	5.48	2.48	C	4.83	176.0	50	5,270	1,091	0.2
DH-4	RC-4	65.2 - 66.3	5.57	2.49	A	4.87	170.1	67	57,443	11,795	0.1
DH-4	RC-6	75.2 - 76.3	5.51	2.49	A	4.87	169.5	72	66,081	13,569	0.1
DH-4	RC-8	85.5 - 86.7	5.61	2.49	A	4.87	178.5	57	44,481	9,134	0.2
DH-4	RC-10	96.5 - 97.5	5.47	2.49	D	4.87	169.5	74	71,392	14,660	0.2

NOTES: Effective (as received) unit weight as determined by RTH 109-93.
Loading rates were selected to target reaching failure between 2 and 15 minutes.
Test results for specimens not meeting the requirements of ASTM D4543 may differ from a test specimen that meets the requirements of ASTM D4543.

SHAPE KEY

ASTM D4543-08$^{\epsilon 1}$ *Standard Practice for Preparing Rock Core as Cylindrical Test Specimens and Verifying Conformance to Dimensional and Shape Tolerance* Section 1.2 - "Rock is a complex engineering material that can vary greatly as a function of lithology, stress history, weathering, moisture content and chemistry, and other natural geologic processes. As such, it is not always possible to obtain or prepare rock core specimens that satisfy the desirable tolerances given in this practice. Most commonly, this situation presents itself with weaker, more porous, and poorly cemented rock types and rock types containing significant or weak (or both) structural features. For these and other rock types which are difficult to prepare, all reasonable efforts shall be made to prepare a specimen in accordance with this practice and for the intended test procedure. However, when it has been determined by trial that this is not possible, prepare the rock specimen to the closest tolerances practicable and consider this to be the best effort and report it as such and if allowable or necessary for the intended test, capping the ends of the specimen as discussed in this practice is permitted."

A Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)

B Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism, and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness. Specimen prepared to closest tolerances practicable.

C Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism. Specimen did not meet the desired tolerances for side straightness and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

D Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness. Specimen did not meet the desired tolerances for side straightness, parallelism and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

E Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness and parallelism. Specimen prepared to closest tolerances practicable.

UNCONFINED COMPRESSION
(ASTM D7012 Method C)

S&ME, Inc. - Knoxville 1413 Topside Road, Louisville, TN 37777

Project Name: Carolina Crossroads Project
Project Number: 1461-16-047 Phase 2B

Report Date: February 26, 2018
Reviewed By: Jason B. Burgess

Boring No.	Sample No.	Depth (ft)	Dimensions, in.		Shape (See Key)	Area (in^2)	Unit Weight (lbs/ft^3)	Loading Rate (psi/sec)	Maximum Load (lbs)	Strength (psi)	Moisture (%)
			Length	Diameter							
DH-4	RC-12	106.2 - 107.5	5.58	2.49	C	4.87	171.3	62	62,084	12,748	0.1
DH-4	RC-14	115.2 - 116.4	5.40	2.49	D	4.87	170.9	75	37,068	7,611	0.1
DH-5	RC-2	45.6 - 46.8	5.41	2.48	D	4.83	178.5	53	18,593	3,849	0.3
DH-5	RC-4	56.2 - 57.3	5.39	2.49	D	4.87	170.9	49	7,406	1,521	0.1
DH-5	RC-8	75.9 - 76.9	5.46	2.49	D	4.87	172.4	65	24,591	5,049	0.2

NOTES: Effective (as received) unit weight as determined by RTH 109-93.
Loading rates were selected to target reaching failure between 2 and 15 minutes.
Test results for specimens not meeting the requirements of ASTM D4543 may differ from a test specimen that meets the requirements of ASTM D4543.

SHAPE KEY

ASTM D4543-08$^{\epsilon 1}$ *Standard Practice for Preparing Rock Core as Cylindrical Test Specimens and Verifying Conformance to Dimensional and Shape Tolerance* Section 1.2 - "Rock is a complex engineering material that can vary greatly as a function of lithology, stress history, weathering, moisture content and chemistry, and other natural geologic processes. As such, it is not always possible to obtain or prepare rock core specimens that satisfy the desirable tolerances given in this practice. Most commonly, this situation presents itself with weaker, more porous, and poorly cemented rock types and rock types containing significant or weak (or both) structural features. For these and other rock types which are difficult to prepare, all reasonable efforts shall be made to prepare a specimen in accordance with this practice and for the intended test procedure. However, when it has been determined by trial that this is not possible, prepare the rock specimen to the closest tolerances practicable and consider this to be the best effort and report it as such and if allowable or necessary for the intended test, capping the ends of the specimen as discussed in this practice is permitted."

A Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)

B Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism, and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness. Specimen prepared to closest tolerances practicable.

C Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism. Specimen did not meet the desired tolerances for side straightness and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

D Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness. Specimen did not meet the desired tolerances for side straightness, parallelism and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

E Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness and parallelism. Specimen prepared to closest tolerances practicable.

UNCONFINED COMPRESSION
(ASTM D7012 Method C)

S&ME, Inc. - Knoxville 1413 Topside Road, Louisville, TN 37777

Project Name: Carolina Crossroads Project
Project Number: 1461-16-047 Phase 2B

Report Date: February 26, 2018
Reviewed By: Jason B. Burgess

Boring No.	Sample No.	Depth (ft)	Dimensions, in.		Shape (See Key)	Area (in^2)	Unit Weight (lbs/ft^3)	Loading Rate (psi/sec)	Maximum Load (lbs)	Strength (psi)	Moisture (%)
			Length	Diameter							
DH-5	RC-10	88.4 - 89.4	5.64	2.49	E	4.87	171.2	71	52,888	10,860	0.1
DH-5	RC-12	95.6 - 96.5	5.54	2.49	D	4.87	174.8	61	36,274	7,448	0.1
DH-5	RC-14	106.2 - 107.3	5.70	2.49	B	4.87	176.0	73	64,454	13,235	0.1
DH-6	RC-1	25.6 - 26.6	5.65	2.47	D	4.79	165.1	75	133,865	27,947	0.2
DH-6	RC-3	35.4 - 36.5	5.64	2.49	A	4.87	165.7	85	161,125	33,085	0.2

NOTES: Effective (as received) unit weight as determined by RTH 109-93.
Loading rates were selected to target reaching failure between 2 and 15 minutes.
Test results for specimens not meeting the requirements of ASTM D4543 may differ from a test specimen that meets the requirements of ASTM D4543.

SHAPE KEY

ASTM D4543-08$^{\epsilon 1}$ *Standard Practice for Preparing Rock Core as Cylindrical Test Specimens and Verifying Conformance to Dimensional and Shape Tolerance* Section 1.2 - "Rock is a complex engineering material that can vary greatly as a function of lithology, stress history, weathering, moisture content and chemistry, and other natural geologic processes. As such, it is not always possible to obtain or prepare rock core specimens that satisfy the desirable tolerances given in this practice. Most commonly, this situation presents itself with weaker, more porous, and poorly cemented rock types and rock types containing significant or weak (or both) structural features. For these and other rock types which are difficult to prepare, all reasonable efforts shall be made to prepare a specimen in accordance with this practice and for the intended test procedure. However, when it has been determined by trial that this is not possible, prepare the rock specimen to the closest tolerances practicable and consider this to be the best effort and report it as such and if allowable or necessary for the intended test, capping the ends of the specimen as discussed in this practice is permitted."

A Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)

B Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism, and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness. Specimen prepared to closest tolerances practicable.

C Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism. Specimen did not meet the desired tolerances for side straightness and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

D Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness. Specimen did not meet the desired tolerances for side straightness, parallelism and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

E Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness and parallelism. Specimen prepared to closest tolerances practicable.

UNCONFINED COMPRESSION
(ASTM D7012 Method C)

S&ME, Inc. - Knoxville 1413 Topside Road, Louisville, TN 37777

Project Name: Carolina Crossroads Project
Project Number: 1461-16-047 Phase 2B

Report Date: February 26, 2018
Reviewed By: Jason B. Burgess

Boring No.	Sample No.	Depth (ft)	Dimensions, in.		Shape (See Key)	Area (in^2)	Unit Weight (lbs/ft^3)	Loading Rate (psi/sec)	Maximum Load (lbs)	Strength (psi)	Moisture (%)
			Length	Diameter							
DH-6	RC-5	47.3 - 48.6	5.69	2.49	A	4.87	165.4	81	145,892	29,957	0.3
DH-6	RC-7	58.2 - 59.2	5.68	2.49	A	4.87	165.2	80	150,011	30,803	0.2
DH-6	RC-9	60.6 - 61.7	4.54	1.98	A	3.08	165.4	83	104,528	33,938	0.2
DH-6	RC-11	70.6 - 71.8	4.51	1.98	A	3.08	165.9	69	105,328	34,197	0.2
DH-6	RC-13	80.6 - 81.8	4.52	1.98	A	3.08	165.6	77	111,542	36,215	0.2

NOTES: Effective (as received) unit weight as determined by RTH 109-93.
Loading rates were selected to target reaching failure between 2 and 15 minutes.
Test results for specimens not meeting the requirements of ASTM D4543 may differ from a test specimen that meets the requirements of ASTM D4543.

SHAPE KEY

ASTM D4543-08$^{\epsilon 1}$ *Standard Practice for Preparing Rock Core as Cylindrical Test Specimens and Verifying Conformance to Dimensional and Shape Tolerance* Section 1.2 - "Rock is a complex engineering material that can vary greatly as a function of lithology, stress history, weathering, moisture content and chemistry, and other natural geologic processes. As such, it is not always possible to obtain or prepare rock core specimens that satisfy the desirable tolerances given in this practice. Most commonly, this situation presents itself with weaker, more porous, and poorly cemented rock types and rock types containing significant or weak (or both) structural features. For these and other rock types which are difficult to prepare, all reasonable efforts shall be made to prepare a specimen in accordance with this practice and for the intended test procedure. However, when it has been determined by trial that this is not possible, prepare the rock specimen to the closest tolerances practicable and consider this to be the best effort and report it as such and if allowable or necessary for the intended test, capping the ends of the specimen as discussed in this practice is permitted."

A Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)

B Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism, and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness. Specimen prepared to closest tolerances practicable.

C Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism. Specimen did not meet the desired tolerances for side straightness and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

D Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness. Specimen did not meet the desired tolerances for side straightness, parallelism and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

E Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness and parallelism. Specimen prepared to closest tolerances practicable.

UNCONFINED COMPRESSION
(ASTM D7012 Method C)

S&ME, Inc. - Knoxville 1413 Topside Road, Louisville, TN 37777

Project Name: Carolina Crossroads Project
Project Number: 1461-16-047 Phase 2B

Report Date: February 26, 2018
Reviewed By: Jason B. Burgess

Boring No.	Sample No.	Depth (ft)	Dimensions, in.		Shape (See Key)	Area (in^2)	Unit Weight (lbs/ft^3)	Loading Rate (psi/sec)	Maximum Load (lbs)	Strength (psi)	Moisture (%)
			Length	Diameter							
DH-6	RC-15	94.4 - 95.6	4.49	1.98	A	3.08	165.8	84	106,709	34,646	0.2
B-38	RC-1	11.9 - 13.1	4.50	1.98	A	3.08	168.9	63	71,285	23,144	0.2
B-38	RC-3	20.5 - 21.6	4.46	1.98	A	3.08	165.4	75	98,802	32,079	0.1
B-38	RC-5	30.5 - 31.7	4.51	1.98	A	3.08	166.0	74	100,801	32,728	0.1
B-40	RC-1	77.7 - 78.5	4.51	1.98	A	3.08	163.0	62	40,733	13,225	0.3

NOTES: Effective (as received) unit weight as determined by RTH 109-93.
Loading rates were selected to target reaching failure between 2 and 15 minutes.
Test results for specimens not meeting the requirements of ASTM D4543 may differ from a test specimen that meets the requirements of ASTM D4543.

SHAPE KEY

ASTM D4543-08$^{\epsilon 1}$ *Standard Practice for Preparing Rock Core as Cylindrical Test Specimens and Verifying Conformance to Dimensional and Shape Tolerance* Section 1.2 - "Rock is a complex engineering material that can vary greatly as a function of lithology, stress history, weathering, moisture content and chemistry, and other natural geologic processes. As such, it is not always possible to obtain or prepare rock core specimens that satisfy the desirable tolerances given in this practice. Most commonly, this situation presents itself with weaker, more porous, and poorly cemented rock types and rock types containing significant or weak (or both) structural features. For these and other rock types which are difficult to prepare, all reasonable efforts shall be made to prepare a specimen in accordance with this practice and for the intended test procedure. However, when it has been determined by trial that this is not possible, prepare the rock specimen to the closest tolerances practicable and consider this to be the best effort and report it as such and if allowable or necessary for the intended test, capping the ends of the specimen as discussed in this practice is permitted."

A Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)

B Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism, and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness. Specimen prepared to closest tolerances practicable.

C Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism. Specimen did not meet the desired tolerances for side straightness and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

D Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness. Specimen did not meet the desired tolerances for side straightness, parallelism and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

E Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness and parallelism. Specimen prepared to closest tolerances practicable.

UNCONFINED COMPRESSION
(ASTM D7012 Method C)

S&ME, Inc. - Knoxville 1413 Topside Road, Louisville, TN 37777

Project Name: Carolina Crossroads Project
Project Number: 1461-16-047 Phase 2B

Report Date: February 26, 2018
Reviewed By: Jason B. Burgess

Boring No.	Sample No.	Depth (ft)	Dimensions, in.		Shape (See Key)	Area (in^2)	Unit Weight (lbs/ft^3)	Loading Rate (psi/sec)	Maximum Load (lbs)	Strength (psi)	Moisture (%)
			Length	Diameter							
B-40	RC-3	84.3 - 85.1	4.53	1.98	A	3.08	165.8	74	57,320	18,610	0.1
B-41	RC-2	60.2 - 61.3	4.23	1.98	A	3.08	158.8	37	15,227	4,944	0.4
B-41	RC-5	75.5 - 76.4	4.50	1.98	A	3.08	164.5	88	72,883	23,663	0.3
B-59	RC-2	115.4 - 116.1	4.32	1.98	A	3.08	170.6	19	4,038	1,311	1.3

NOTES: Effective (as received) unit weight as determined by RTH 109-93.
Loading rates were selected to target reaching failure between 2 and 15 minutes.
Test results for specimens not meeting the requirements of ASTM D4543 may differ from a test specimen that meets the requirements of ASTM D4543.

SHAPE KEY

ASTM D4543-08$^{\epsilon 1}$ *Standard Practice for Preparing Rock Core as Cylindrical Test Specimens and Verifying Conformance to Dimensional and Shape Tolerance* Section 1.2 - "Rock is a complex engineering material that can vary greatly as a function of lithology, stress history, weathering, moisture content and chemistry, and other natural geologic processes. As such, it is not always possible to obtain or prepare rock core specimens that satisfy the desirable tolerances given in this practice. Most commonly, this situation presents itself with weaker, more porous, and poorly cemented rock types and rock types containing significant or weak (or both) structural features. For these and other rock types which are difficult to prepare, all reasonable efforts shall be made to prepare a specimen in accordance with this practice and for the intended test procedure. However, when it has been determined by trial that this is not possible, prepare the rock specimen to the closest tolerances practicable and consider this to be the best effort and report it as such and if allowable or necessary for the intended test, capping the ends of the specimen as discussed in this practice is permitted."

A Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)

B Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism, and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness. Specimen prepared to closest tolerances practicable.

C Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism. Specimen did not meet the desired tolerances for side straightness and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

D Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness. Specimen did not meet the desired tolerances for side straightness, parallelism and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

E Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness and parallelism. Specimen prepared to closest tolerances practicable.

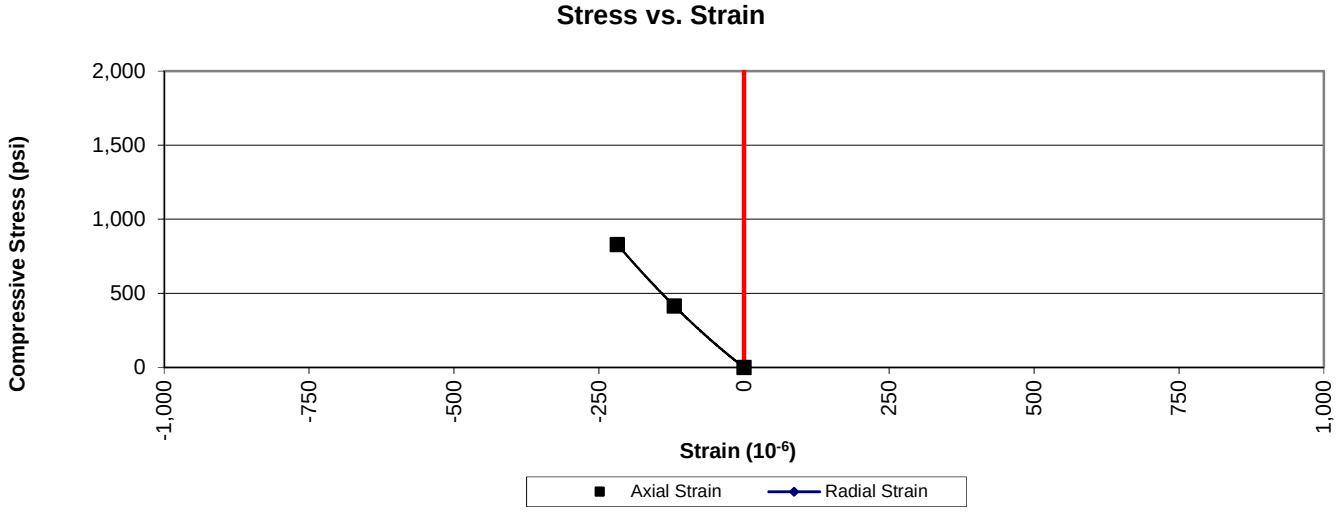
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	2.48	**Date:**	2/19/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	5.48	**Tested by:**	BKP / MG
Boring Id:	DH-4	**Unit Weight, pcf:**	176.0	**Reviewed by:**	JBB
Sample No:	RC-2	**Moisture Content, %:**	0.2		
Depth (ft):	55.2 - 56.4	**Load Rate, psi/sec:**	50		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-120		2,000	414	3.45		
3	-218		4,000	828	3.80		
4			5,270	1,091			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Due to the low compressive strength of this specimen, readings of deformation at a minimum of ten evenly spaced load intervals were not able to be obtained.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism. Specimen did not meet the desired tolerances for side straightness and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.



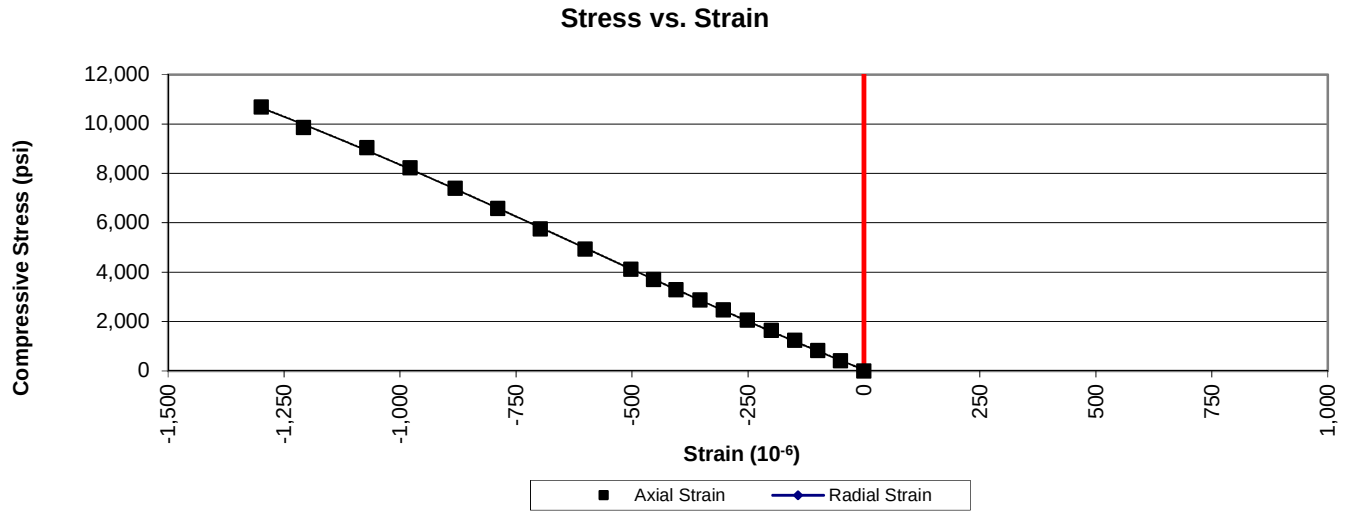
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	2.49	**Date:**	2/19/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	5.57	**Tested by:**	BKP / MG
Boring Id:	DH-4	**Unit Weight, pcf:**	170.1	**Reviewed by:**	JBB
Sample No:	RC-4	**Moisture Content, %:**	0.1		
Depth (ft):	65.2 - 66.3	**Load Rate, psi/sec:**	67		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-50		2,000	411	8.22		
3	-99		4,000	821	8.29		
4	-149		6,000	1,232	8.27		
5	-199		8,000	1,643	8.26		
6	-251		10,000	2,053	8.18		
7	-303		12,000	2,464	8.13		
8	-353		14,000	2,875	8.14		
9	-405		16,000	3,285	8.11		
10	-453		18,000	3,696	8.16		
11	-502		20,000	4,107	8.18		
12	-601		24,000	4,928	8.20		
13	-697		28,000	5,749	8.25		
14	-789		32,000	6,571	8.33		
15	-881		36,000	7,392	8.39		
16	-978		40,000	8,214	8.40		
17	-1,071		44,000	9,035	8.44		
18	-1,208		48,000	9,856	8.16		
19	-1,299		52,000	10,678	8.22		
20			57,443	11,795			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



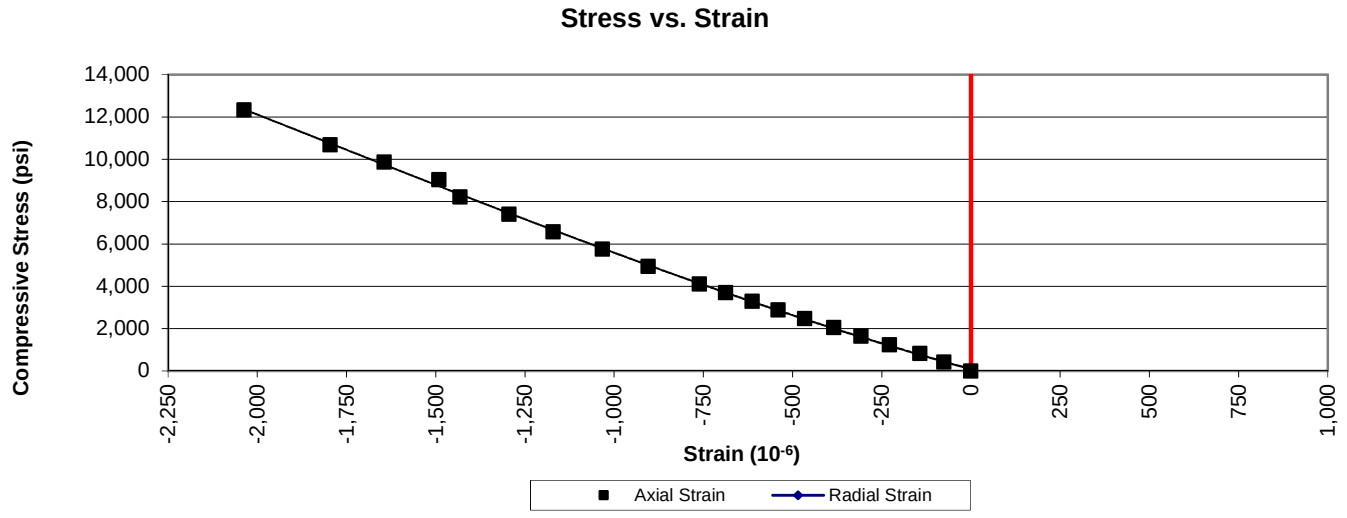
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	2.49	**Date:**	2/19/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	5.51	**Tested by:**	BKP / MG
Boring Id:	DH-4	**Unit Weight, pcf:**	169.5	**Reviewed by:**	JBB
Sample No:	RC-6	**Moisture Content, %:**	0.1		
Depth (ft):	75.2 - 76.3	**Load Rate, psi/sec:**	72		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-76		2,000	411	5.41		
3	-143		4,000	821	5.74		
4	-228		6,000	1,232	5.40		
5	-308		8,000	1,643	5.33		
6	-384		10,000	2,053	5.35		
7	-466		12,000	2,464	5.29		
8	-540		14,000	2,875	5.32		
9	-613		16,000	3,285	5.36		
10	-687		18,000	3,696	5.38		
11	-761		20,000	4,107	5.40		
12	-904		24,000	4,928	5.45		
13	-1,033		28,000	5,749	5.57		
14	-1,171		32,000	6,571	5.61		
15	-1,294		36,000	7,392	5.71		
16	-1,432		40,000	8,214	5.74		
17	-1,491		44,000	9,035	6.06		
18	-1,644		48,000	9,856	6.00		
19	-1,796		52,000	10,678	5.95		
20	-2,037		60,000	12,320	6.05		
			66,081	13,569			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



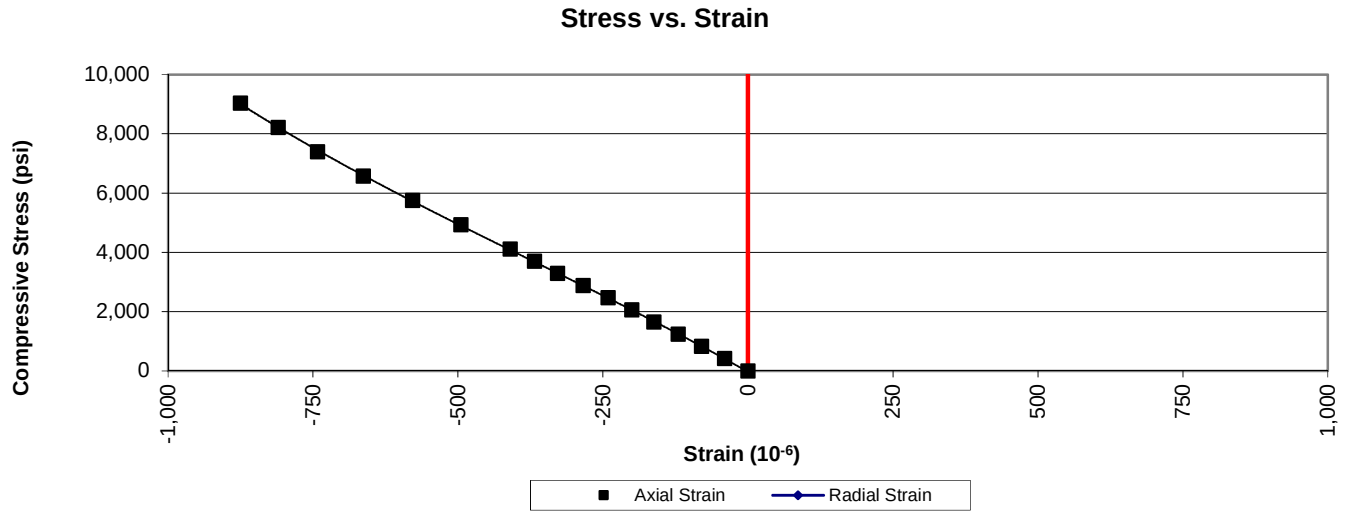
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	2.49	**Date:**	2/19/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	5.61	**Tested by:**	BKP / MG
Boring Id:	DH-4	**Unit Weight, pcf:**	178.5	**Reviewed by:**	JBB
Sample No:	RC-8	**Moisture Content, %:**	0.2		
Depth (ft):	85.5 - 86.7	**Load Rate, psi/sec:**	57		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-40		2,000	411	10.28		
3	-80		4,000	821	10.26		
4	-120		6,000	1,232	10.27		
5	-162		8,000	1,643	10.14		
6	-200		10,000	2,053	10.27		
7	-241		12,000	2,464	10.22		
8	-284		14,000	2,875	10.12		
9	-328		16,000	3,285	10.02		
10	-368		18,000	3,696	10.04		
11	-410		20,000	4,107	10.02		
12	-495		24,000	4,928	9.96		
13	-578		28,000	5,749	9.95		
14	-663		32,000	6,571	9.91		
15	-742		36,000	7,392	9.96		
16	-810		40,000	8,214	10.14		
17	-875		44,000	9,035	10.33		
18			44,481	9,134			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



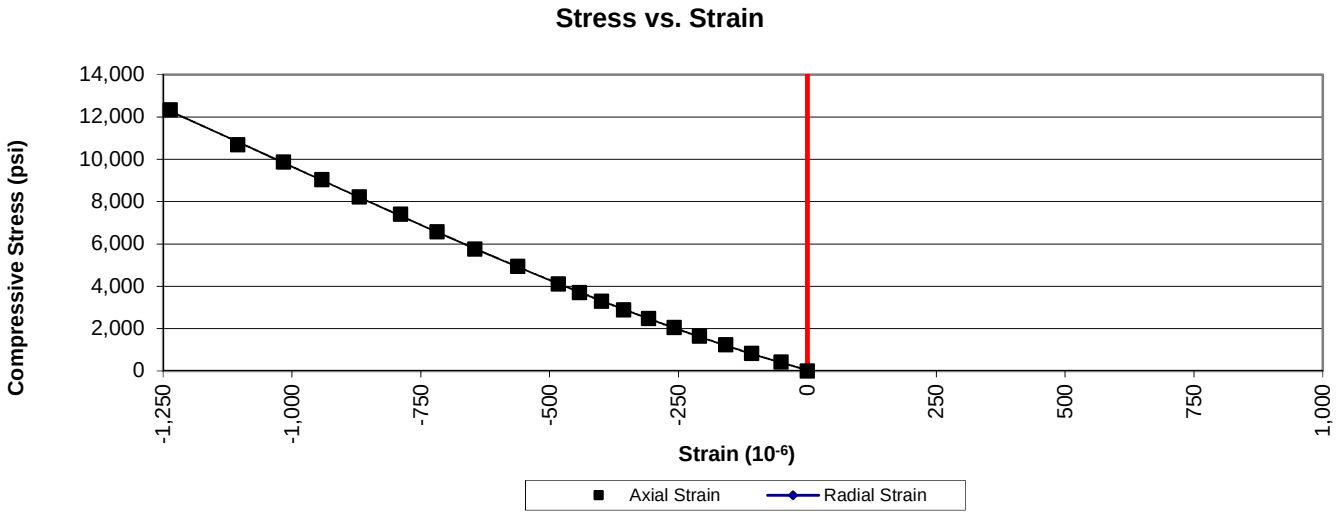
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	2.49	**Date:**	2/19/2018
Project No.:	3783-17-009	**Length, in.:**	5.47	**Tested by:**	BKP / MG
Boring Id:	DH-4	**Unit Weight, pcf:**	169.5	**Reviewed by:**	JBB
Sample No:	RC-10	**Moisture Content, %:**	0.2		
Depth (ft):	96.5 - 97.5	**Load Rate, psi/sec:**	74		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-51		2,000	411	8.06		
3	-108		4,000	821	7.60		
4	-158		6,000	1,232	7.80		
5	-209		8,000	1,643	7.86		
6	-258		10,000	2,053	7.96		
7	-308		12,000	2,464	8.00		
8	-356		14,000	2,875	8.08		
9	-399		16,000	3,285	8.23		
10	-442		18,000	3,696	8.36		
11	-483		20,000	4,107	8.50		
12	-562		24,000	4,928	8.77		
13	-645		28,000	5,749	8.91		
14	-718		32,000	6,571	9.15		
15	-789		36,000	7,392	9.37		
16	-869		40,000	8,214	9.45		
17	-942		44,000	9,035	9.59		
18	-1,016		48,000	9,856	9.70		
19	-1,105		52,000	10,678	9.66		
20	-1,236		60,000	12,320	9.97		
21			71,392	14,660			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness. Specimen did not meet the desired tolerances for side straightness, parallelism and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.



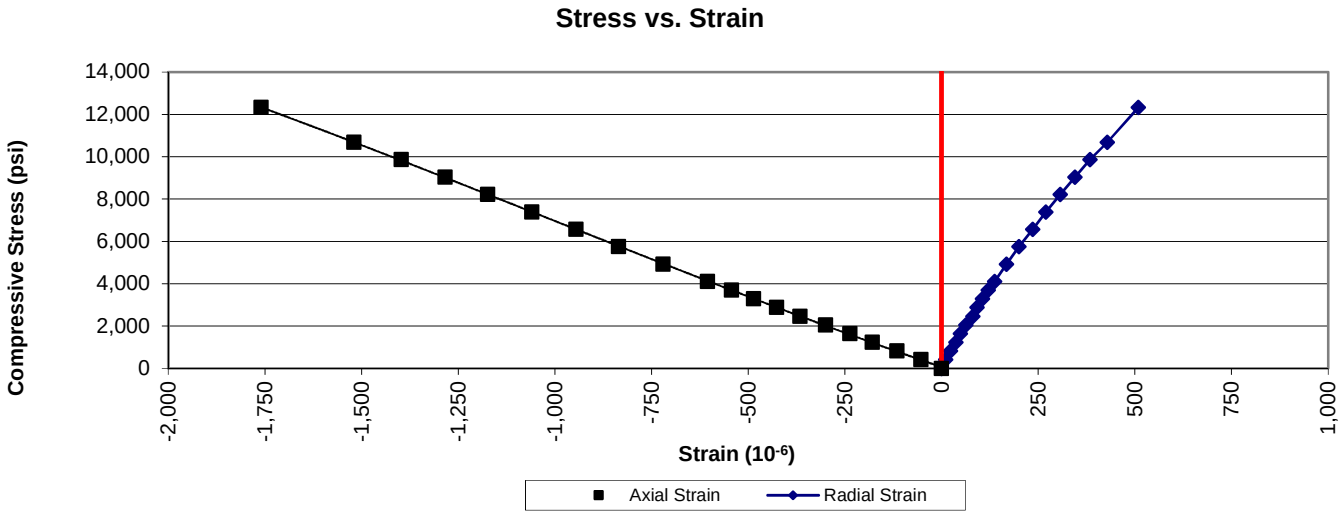
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS AND POISSON'S RATIO
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	2.49	**Date:**	2/19/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	5.58	**Tested by:**	BKP / MG
Boring Id:	DH-4	**Unit Weight, pcf:**	171.3	**Reviewed by:**	JBB
Sample No:	RC-12	**Moisture Content, %:**	0.1		
Depth (ft):	106.2 - 107.5	**Load Rate, psi/sec:**	62		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0	0	0	0	0.00	0.00	
2	-53	11	2,000	411	7.75	0.21	
3	-115	23	4,000	821	7.14	0.20	
4	-179	37	6,000	1,232	6.88	0.21	
5	-237	49	8,000	1,643	6.93	0.21	
6	-300	63	10,000	2,053	6.84	0.21	
7	-366	81	12,000	2,464	6.73	0.22	
8	-426	92	14,000	2,875	6.75	0.22	
9	-486	106	16,000	3,285	6.76	0.22	
10	-543	121	18,000	3,696	6.81	0.22	
11	-605	137	20,000	4,107	6.79	0.23	
12	-720	168	24,000	4,928	6.84	0.23	
13	-835	200	28,000	5,749	6.89	0.24	
14	-945	236	32,000	6,571	6.95	0.25	
15	-1,060	270	36,000	7,392	6.97	0.25	
16	-1,174	307	40,000	8,214	7.00	0.26	
17	-1,284	345	44,000	9,035	7.04	0.27	
18	-1,397	384	48,000	9,856	7.06	0.27	
19	-1,520	429	52,000	10,678	7.03	0.28	
20	-1,760	509	60,000	12,320	7.00	0.29	
21			62,084	12,748			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism. Specimen did not meet the desired tolerances for side straightness and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.



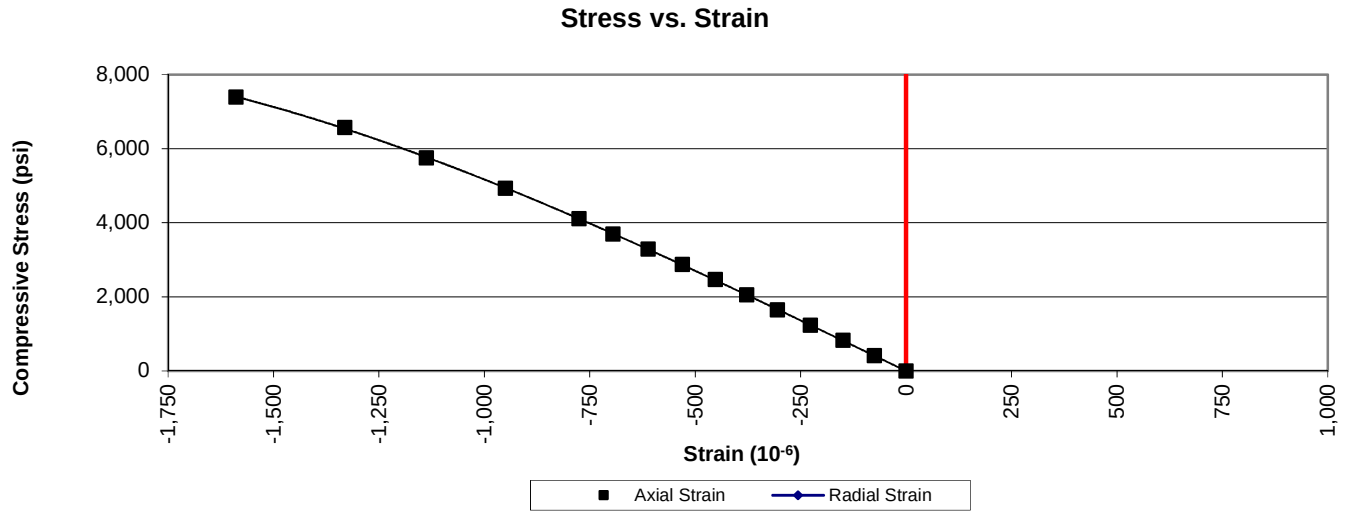
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	2.49	**Date:**	2/19/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	5.40	**Tested by:**	BKP / MG
Boring Id:	DH-4	**Unit Weight, pcf:**	170.9	**Reviewed by:**	JBB
Sample No:	RC-14	**Moisture Content, %:**	0.1		
Depth (ft):	115.2 - 116.4	**Load Rate, psi/sec:**	75		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-75		2,000	411	5.48		
3	-149		4,000	821	5.51		
4	-227		6,000	1,232	5.43		
5	-305		8,000	1,643	5.39		
6	-378		10,000	2,053	5.43		
7	-452		12,000	2,464	5.45		
8	-530		14,000	2,875	5.42		
9	-611		16,000	3,285	5.38		
10	-695		18,000	3,696	5.32		
11	-775		20,000	4,107	5.30		
12	-950		24,000	4,928	5.19		
13	-1,137		28,000	5,749	5.06		
14	-1,331		32,000	6,571	4.94		
15	-1,589		36,000	7,392	4.65		
16			37,068	7,611			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness. Specimen did not meet the desired tolerances for side straightness, parallelism and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.



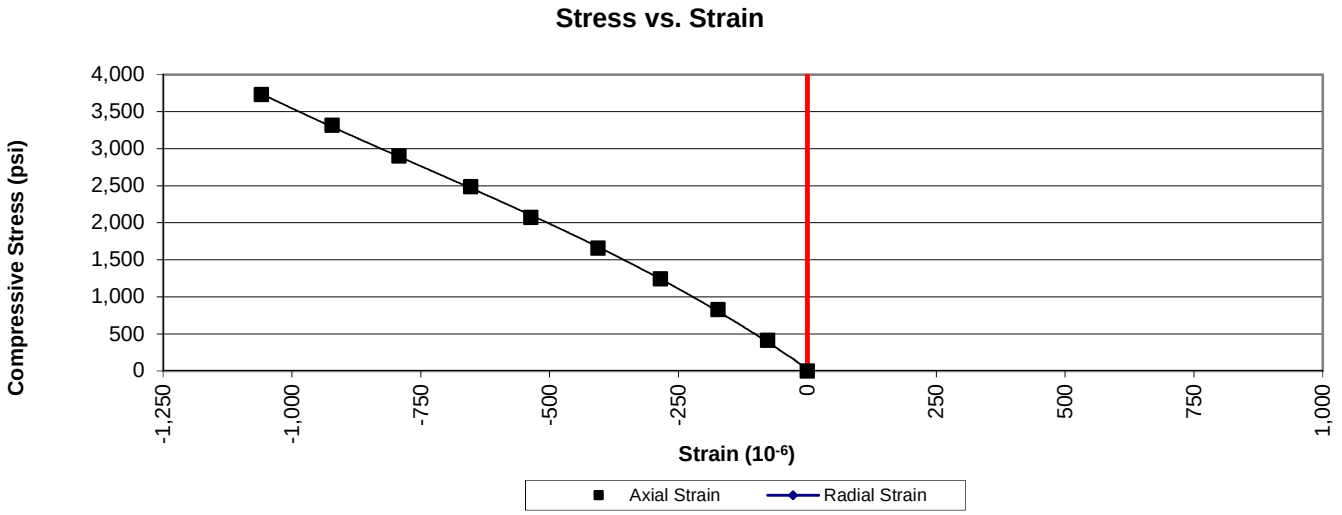
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	2.48	**Date:**	2/19/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	5.41	**Tested by:**	BKP / MG
Boring Id:	DH-5	**Unit Weight, pcf:**	178.5	**Reviewed by:**	JBB
Sample No:	RC-2	**Moisture Content, %:**	0.3		
Depth (ft):	45.6 - 46.8	**Load Rate, psi/sec:**	53		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-77		2,000	414	5.38		
3	-173		4,000	828	4.79		
4	-285		6,000	1,242	4.36		
5	-406		8,000	1,656	4.08		
6	-536		10,000	2,070	3.86		
7	-653		12,000	2,484	3.80		
8	-792		14,000	2,899	3.66		
9	-922		16,000	3,313	3.59		
10	-1,059		18,000	3,727	3.52		
11			18,593	3,849			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness. Specimen did not meet the desired tolerances for side straightness, parallelism and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.



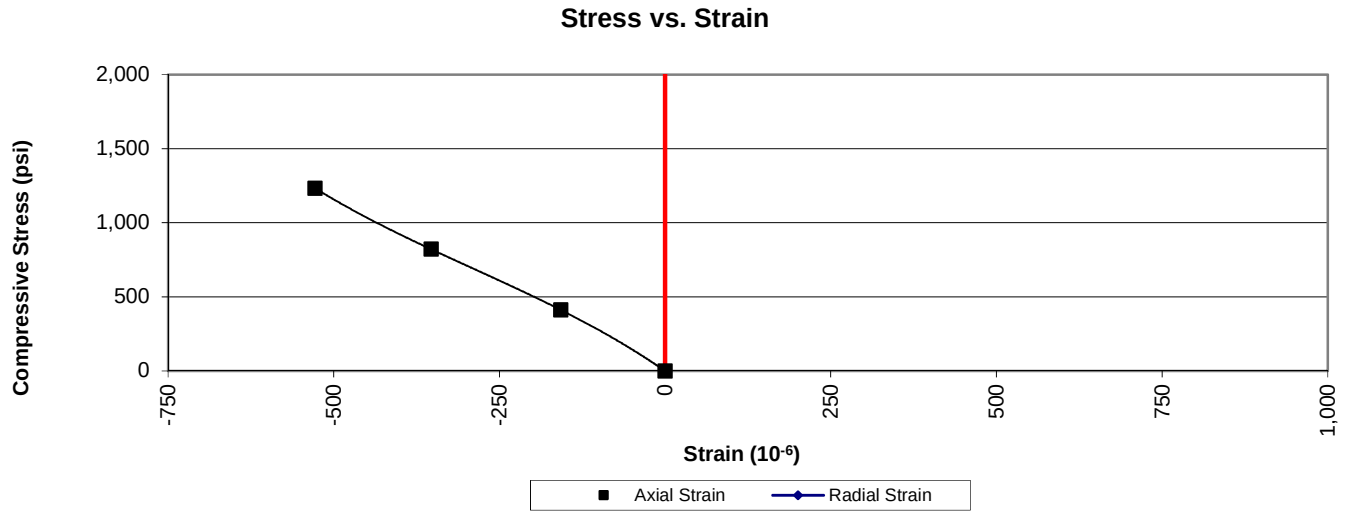
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	2.49	**Date:**	2/19/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	5.39	**Tested by:**	BKP / MG
Boring Id:	DH-5	**Unit Weight, pcf:**	170.9	**Reviewed by:**	JBB
Sample No:	RC-4	**Moisture Content, %:**	0.1		
Depth (ft):	56.2 - 57.3	**Load Rate, psi/sec:**	49		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-157		2,000	411	2.62		
3	-353		4,000	821	2.33		
4	-528		6,000	1,232	2.33		
5			7,406	1,521			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Due to the low compressive strength of this specimen, readings of deformation at a minimum of ten evenly spaced load intervals were not able to be obtained.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness. Specimen did not meet the desired tolerances for side straightness, parallelism and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.



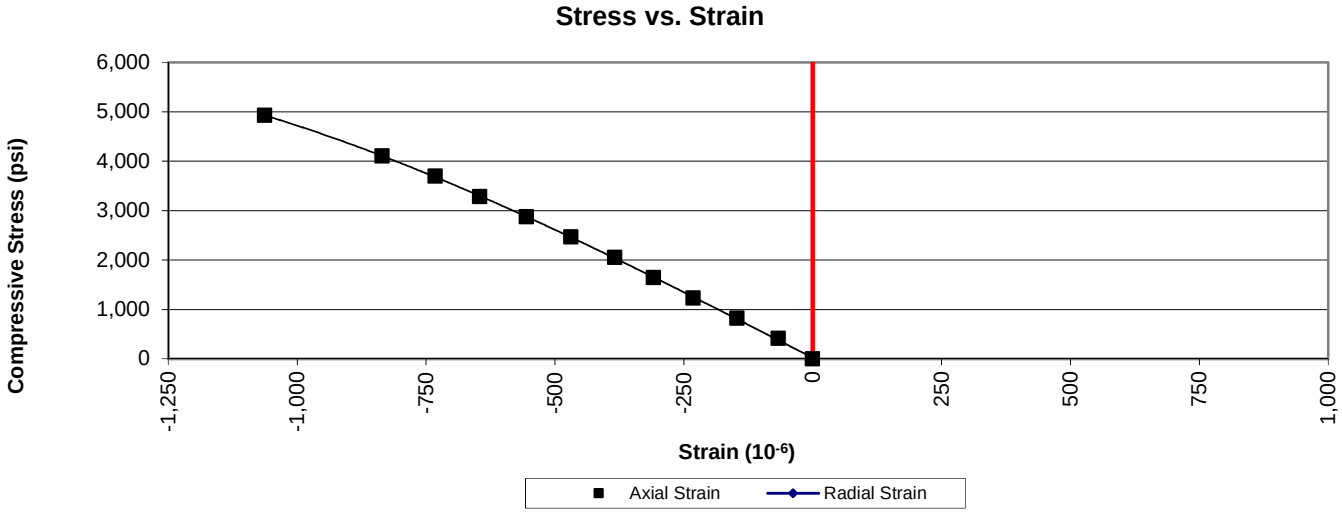
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	2.49	**Date:**	2/19/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	5.46	**Tested by:**	BKP / MG
Boring Id:	DH-5	**Unit Weight, pcf:**	172.4	**Reviewed by:**	JBB
Sample No:	RC-8	**Moisture Content, %:**	0.2		
Depth (ft):	75.9 - 76.9	**Load Rate, psi/sec:**	65		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-67		2,000	411	6.13		
3	-147		4,000	821	5.59		
4	-232		6,000	1,232	5.31		
5	-309		8,000	1,643	5.32		
6	-384		10,000	2,053	5.35		
7	-469		12,000	2,464	5.25		
8	-555		14,000	2,875	5.18		
9	-646		16,000	3,285	5.09		
10	-732		18,000	3,696	5.05		
11	-835		20,000	4,107	4.92		
12	-1,063		24,000	4,928	4.64		
13			24,591	5,049			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness. Specimen did not meet the desired tolerances for side straightness, parallelism and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.



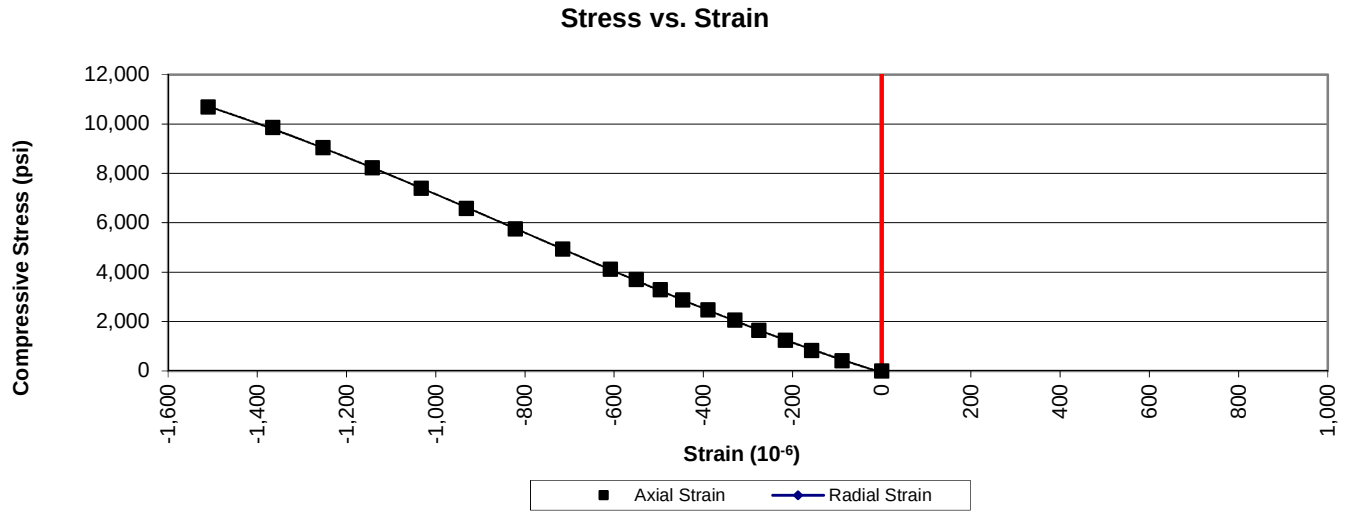
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	2.49	**Date:**	2/19/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	5.64	**Tested by:**	BKP / MG
Boring Id:	DH-5	**Unit Weight, pcf:**	171.2	**Reviewed by:**	JBB
Sample No:	RC-10	**Moisture Content, %:**	0.1		
Depth (ft):	88.4 - 89.4	**Load Rate, psi/sec:**	71		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-89		2,000	411	4.62		
3	-157		4,000	821	5.23		
4	-216		6,000	1,232	5.70		
5	-275		8,000	1,643	5.97		
6	-329		10,000	2,053	6.24		
7	-389		12,000	2,464	6.33		
8	-446		14,000	2,875	6.45		
9	-496		16,000	3,285	6.62		
10	-550		18,000	3,696	6.72		
11	-608		20,000	4,107	6.75		
12	-715		24,000	4,928	6.89		
13	-821		28,000	5,749	7.00		
14	-931		32,000	6,571	7.06		
15	-1,032		36,000	7,392	7.16		
16	-1,142		40,000	8,214	7.19		
17	-1,252		44,000	9,035	7.22		
18	-1,365		48,000	9,856	7.22		
19	-1,510		52,000	10,678	7.07		
20			52,888	10,860			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness and parallelism. Specimen prepared to closest tolerances practicable.



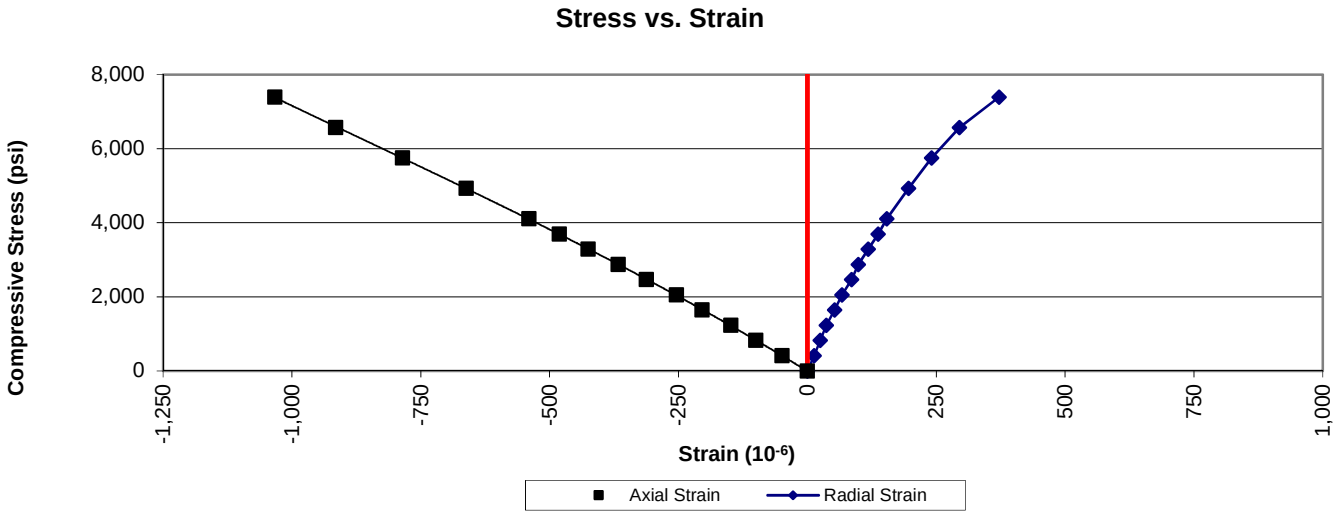
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS AND POISSON'S RATIO
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	2.49	**Date:**	2/19/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	5.54	**Tested by:**	BKP / MG
Boring Id:	DH-5	**Unit Weight, pcf:**	174.8	**Reviewed by:**	JBB
Sample No:	RC-12	**Moisture Content, %:**	0.1		
Depth (ft):	95.6 - 96.5	**Load Rate, psi/sec:**	61		

Data Point	Strain (10^{-6}) axial	Strain (10^{-6}) radial	Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
1	0	0	0	0	0.00	0.00	
2	-49	13	2,000	411	8.39	0.27	
3	-100	25	4,000	821	8.21	0.25	
4	-148	37	6,000	1,232	8.32	0.25	
5	-204	53	8,000	1,643	8.05	0.26	
6	-254	67	10,000	2,053	8.08	0.26	
7	-312	86	12,000	2,464	7.90	0.28	
8	-367	99	14,000	2,875	7.83	0.27	
9	-425	118	16,000	3,285	7.73	0.28	
10	-481	137	18,000	3,696	7.68	0.28	
11	-540	154	20,000	4,107	7.61	0.29	
12	-662	196	24,000	4,928	7.44	0.30	
13	-785	241	28,000	5,749	7.32	0.31	
14	-915	295	32,000	6,571	7.18	0.32	
15	-1,033	372	36,000	7,392	7.16	0.36	
16			36,274	7,448			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness. Specimen did not meet the desired tolerances for side straightness, parallelism and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.



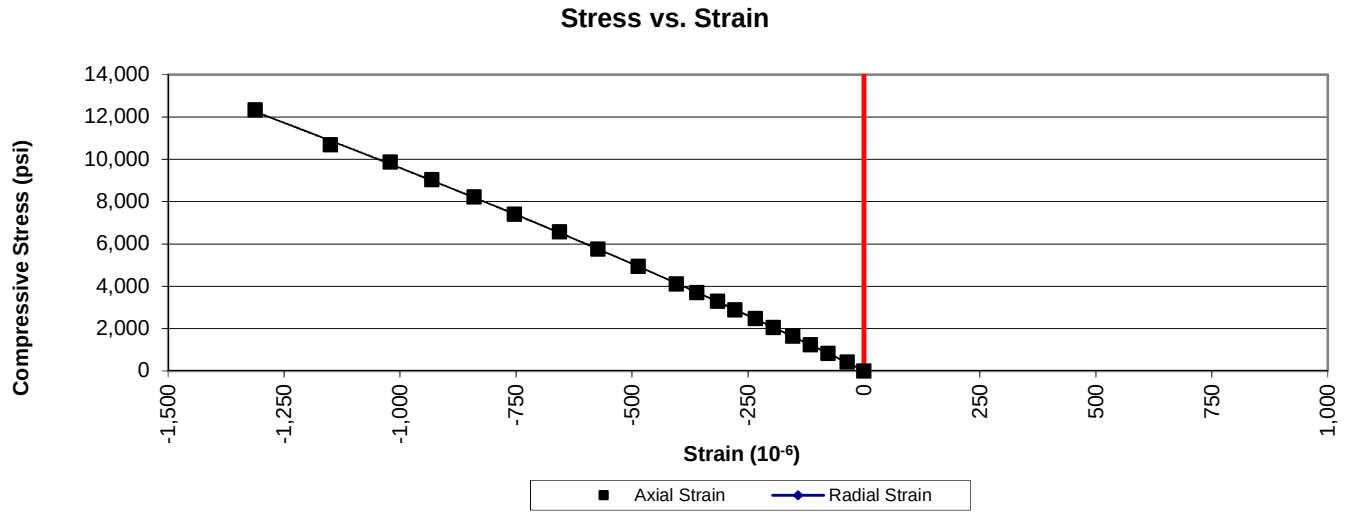
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	2.49	**Date:**	2/19/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	5.70	**Tested by:**	BKP / MG
Boring Id:	DH-5	**Unit Weight, pcf:**	176.0	**Reviewed by:**	JBB
Sample No:	RC-14	**Moisture Content, %:**	0.1		
Depth (ft):	106.2 - 107.3	**Load Rate, psi/sec:**	73		

Data Point	Strain (10^{-6}) axial	Strain (10^{-6}) radial	Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
1	0		0	0	0.00		
2	-36		2,000	411	11.42		
3	-77		4,000	821	10.66		
4	-115		6,000	1,232	10.71		
5	-153		8,000	1,643	10.74		
6	-195		10,000	2,053	10.53		
7	-234		12,000	2,464	10.53		
8	-278		14,000	2,875	10.34		
9	-315		16,000	3,285	10.43		
10	-360		18,000	3,696	10.27		
11	-404		20,000	4,107	10.17		
12	-486		24,000	4,928	10.14		
13	-573		28,000	5,749	10.03		
14	-656		32,000	6,571	10.02		
15	-753		36,000	7,392	9.82		
16	-840		40,000	8,214	9.78		
17	-931		44,000	9,035	9.70		
18	-1,021		48,000	9,856	9.65		
19	-1,150		52,000	10,678	9.29		
20	-1,312		60,000	12,320	9.39		
21			64,454	13,235			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism, and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness. Specimen prepared to closest tolerances practicable.



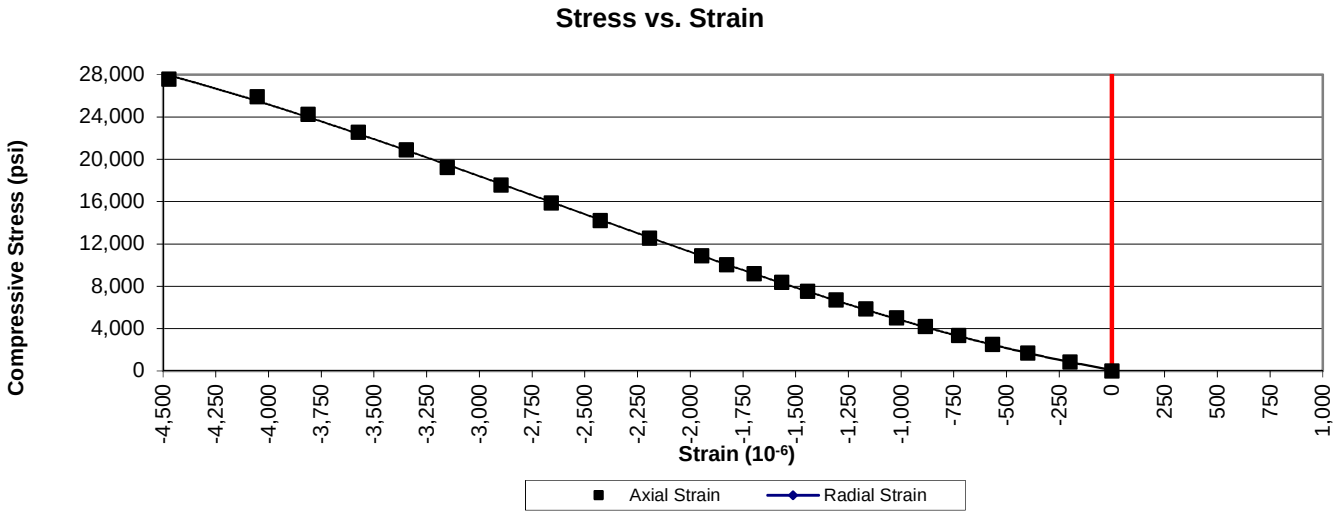
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	2.47	**Date:**	2/19/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	5.65	**Tested by:**	BKP / MG
Boring Id:	DH-6	**Unit Weight, pcf:**	165.1	**Reviewed by:**	JBB
Sample No:	RC-1	**Moisture Content, %:**	0.2		
Depth (ft):	25.6 - 26.6	**Load Rate, psi/sec:**	75		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-199		4,000	835	4.20		
3	-398		8,000	1,670	4.20		
4	-566		12,000	2,505	4.43		
5	-727		16,000	3,340	4.59		
6	-885		20,000	4,175	4.72		
7	-1,021		24,000	5,010	4.91		
8	-1,166		28,000	5,846	5.01		
9	-1,307		32,000	6,681	5.11		
10	-1,443		36,000	7,516	5.21		
11	-1,566		40,000	8,351	5.33		
12	-1,696		44,000	9,186	5.42		
13	-1,826		48,000	10,021	5.49		
14	-1,945		52,000	10,856	5.58		
15	-2,192		60,000	12,526	5.71		
16	-2,426		68,000	14,196	5.85		
17	-2,659		76,000	15,866	5.97		
18	-2,897		84,000	17,537	6.05		
19	-3,152		92,000	19,207	6.09		
20	-3,346		100,000	20,877	6.24		
21	-3,574		108,000	22,547	6.31		
22	-3,812		116,000	24,217	6.35		
23	-4,053		124,000	25,887	6.39		
24	-4,471		132,000	27,557	6.16		
25			133,865	27,947			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness. Specimen did not meet the desired tolerances for side straightness, parallelism and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.



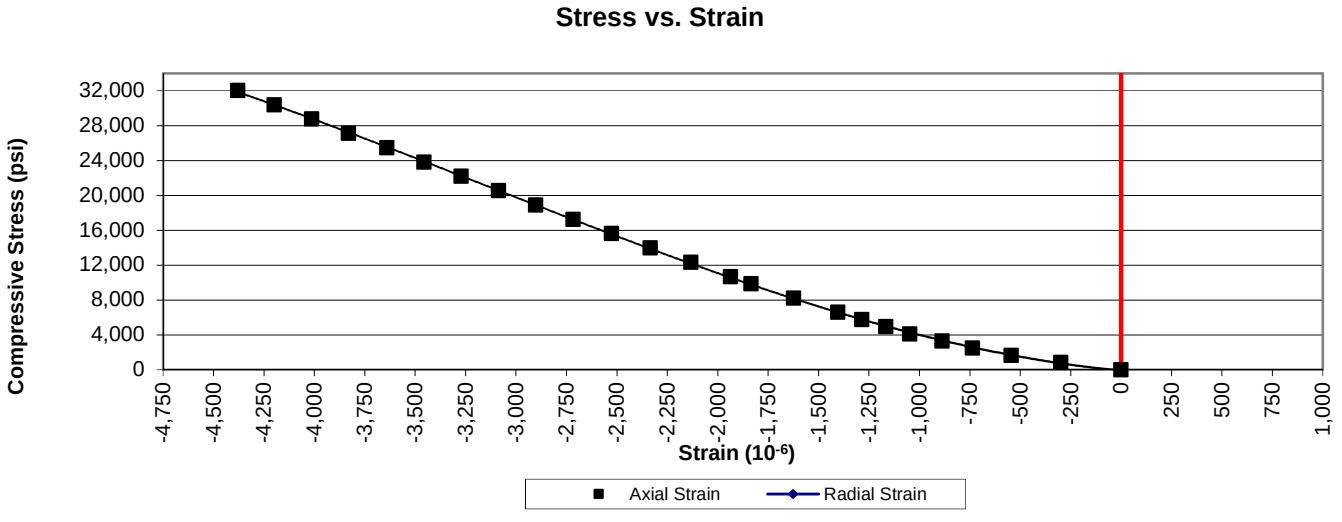
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	2.49	**Date:**	2/19/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	5.64	**Tested by:**	BKP / MG
Boring Id:	DH-6	**Unit Weight, pcf:**	165.7	**Reviewed by:**	JBB
Sample No:	RC-3	**Moisture Content, %:**	0.2		
Depth (ft):	35.4 - 36.5	**Load Rate, psi/sec:**	85		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-299		4,000	821	2.75		
3	-544		8,000	1,643	3.02		
4	-737		12,000	2,464	3.34		
5	-887		16,000	3,285	3.70		
6	-1,048		20,000	4,107	3.92		
7	-1,167		24,000	4,928	4.22		
8	-1,286		28,000	5,749	4.47		
9	-1,405		32,000	6,571	4.68		
10	-1,623		40,000	8,214	5.06		
11	-1,835		48,000	9,856	5.37		
12	-1,936		52,000	10,678	5.52		
13	-2,133		60,000	12,320	5.78		
14	-2,334		68,000	13,963	5.98		
15	-2,527		76,000	15,606	6.18		
16	-2,717		84,000	17,248	6.35		
17	-2,903		92,000	18,891	6.51		
18	-3,087		100,000	20,534	6.65		
19	-3,272		108,000	22,177	6.78		
20	-3,456		116,000	23,819	6.89		
21	-3,640		124,000	25,462	7.00		
22	-3,830		132,000	27,105	7.08		
23	-4,013		140,000	28,747	7.16		
24	-4,199		148,000	30,390	7.24		
25	-4,380		156,000	32,033	7.31		
26			161,125	33,085			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



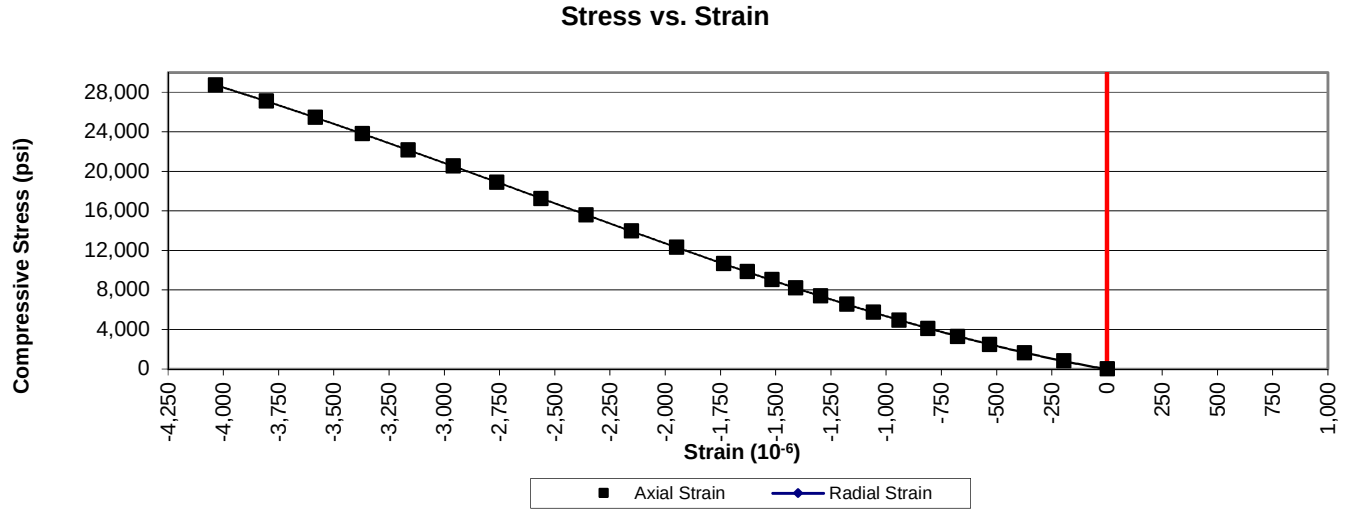
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	2.49	**Date:**	2/19/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	5.69	**Tested by:**	BKP / MG
Boring Id:	DH-6	**Unit Weight, pcf:**	165.4	**Reviewed by:**	JBB
Sample No:	RC-5	**Moisture Content, %:**	0.3		
Depth (ft):	47.3 - 48.6	**Load Rate, psi/sec:**	81		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-196		4,000	821	4.19		
3	-375		8,000	1,643	4.38		
4	-532		12,000	2,464	4.63		
5	-678		16,000	3,285	4.85		
6	-812		20,000	4,107	5.06		
7	-942		24,000	4,928	5.23		
8	-1,058		28,000	5,749	5.43		
9	-1,179		32,000	6,571	5.57		
10	-1,297		36,000	7,392	5.70		
11	-1,411		40,000	8,214	5.82		
12	-1,518		44,000	9,035	5.95		
13	-1,629		48,000	9,856	6.05		
14	-1,737		52,000	10,678	6.15		
15	-1,949		60,000	12,320	6.32		
16	-2,154		68,000	13,963	6.48		
17	-2,359		76,000	15,606	6.62		
18	-2,563		84,000	17,248	6.73		
19	-2,764		92,000	18,891	6.83		
20	-2,961		100,000	20,534	6.93		
21	-3,164		108,000	22,177	7.01		
22	-3,372		116,000	23,819	7.06		
23	-3,585		124,000	25,462	7.10		
24	-3,807		132,000	27,105	7.12		
25	-4,037		140,000	28,747	7.12		
26			145,892	29,957			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



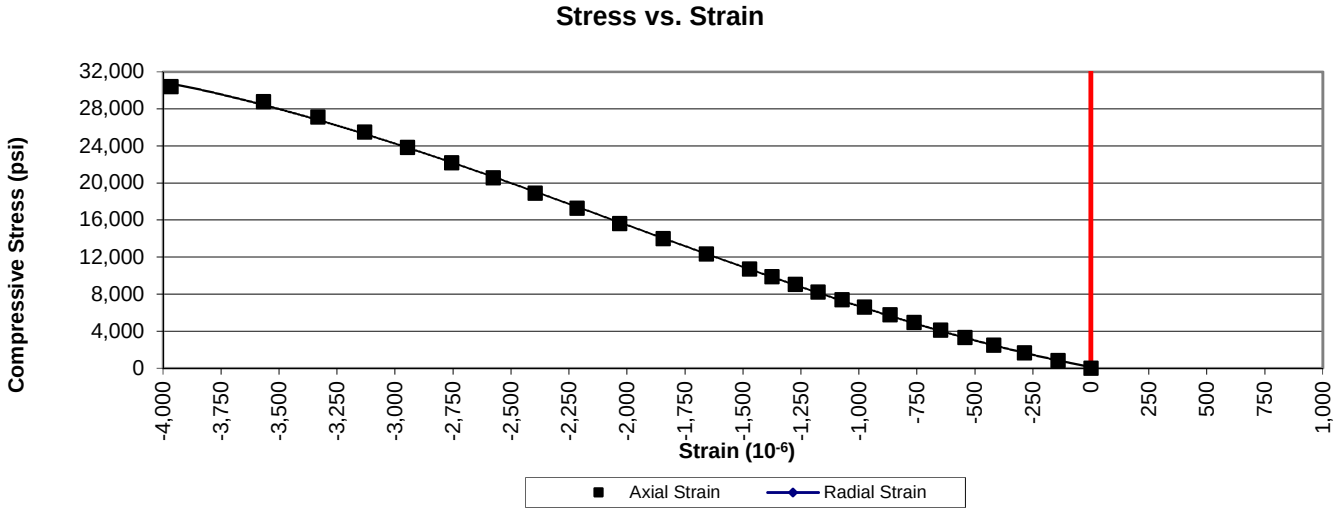
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	2.49	**Date:**	2/20/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	5.68	**Tested by:**	BKP / MG
Boring Id:	DH-6	**Unit Weight, pcf:**	165.2	**Reviewed by:**	JBB
Sample No:	RC-7	**Moisture Content, %:**	0.2		
Depth (ft):	58.2 - 59.2	**Load Rate, psi/sec:**	80		

Data Point	Strain (10^{-6}) axial	Strain (10^{-6}) radial	Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
1	0		0	0	0.00		
2	-142		4,000	821	5.78		
3	-287		8,000	1,643	5.72		
4	-420		12,000	2,464	5.87		
5	-543		16,000	3,285	6.05		
6	-648		20,000	4,107	6.34		
7	-763		24,000	4,928	6.46		
8	-867		28,000	5,749	6.63		
9	-977		32,000	6,571	6.73		
10	-1,074		36,000	7,392	6.88		
11	-1,177		40,000	8,214	6.98		
12	-1,275		44,000	9,035	7.09		
13	-1,375		48,000	9,856	7.17		
14	-1,472		52,000	10,678	7.25		
15	-1,659		60,000	12,320	7.43		
16	-1,844		68,000	13,963	7.57		
17	-2,032		76,000	15,606	7.68		
18	-2,215		84,000	17,248	7.79		
19	-2,397		92,000	18,891	7.88		
20	-2,577		100,000	20,534	7.97		
21	-2,756		108,000	22,177	8.05		
22	-2,947		116,000	23,819	8.08		
23	-3,132		124,000	25,462	8.13		
24	-3,333		132,000	27,105	8.13		
25	-3,568		140,000	28,747	8.06		
26	-3,967		148,000	30,390	7.66		
27			150,011	30,803			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



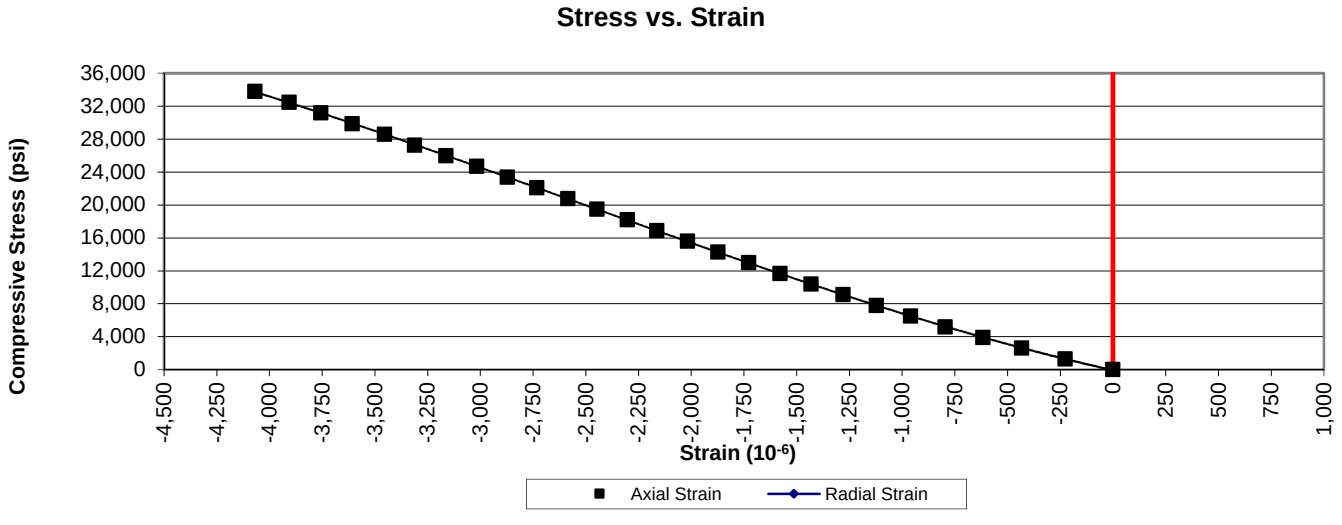
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	2/19/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.54	**Tested by:**	BKP / MG
Boring Id:	DH-6	**Unit Weight, pcf:**	165.4	**Reviewed by:**	JBB
Sample No:	RC-9	**Moisture Content, %:**	0.2		
Depth (ft):	60.6 - 61.7	**Load Rate, psi/sec:**	83		

Data Point	Strain (10^{-6}) axial	Strain (10^{-6}) radial	Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
1	0		0	0	0.00		
2	-226		4,000	1,299	5.75		
3	-433		8,000	2,597	6.00		
4	-617		12,000	3,896	6.31		
5	-796		16,000	5,195	6.53		
6	-960		20,000	6,494	6.76		
7	-1,122		24,000	7,792	6.94		
8	-1,279		28,000	9,091	7.11		
9	-1,432		32,000	10,390	7.26		
10	-1,579		36,000	11,688	7.40		
11	-1,727		40,000	12,987	7.52		
12	-1,873		44,000	14,286	7.63		
13	-2,018		48,000	15,584	7.72		
14	-2,163		52,000	16,883	7.81		
15	-2,303		56,000	18,182	7.89		
16	-2,447		60,000	19,481	7.96		
17	-2,585		64,000	20,779	8.04		
18	-2,732		68,000	22,078	8.08		
19	-2,872		72,000	23,377	8.14		
20	-3,017		76,000	24,675	8.18		
21	-3,163		80,000	25,974	8.21		
22	-3,312		84,000	27,273	8.23		
23	-3,454		88,000	28,571	8.27		
24	-3,607		92,000	29,870	8.28		
25	-3,757		96,000	31,169	8.30		
26	-3,907		100,000	32,468	8.31		
27	-4,069		104,000	33,766	8.30		
28			104,528	33,938			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



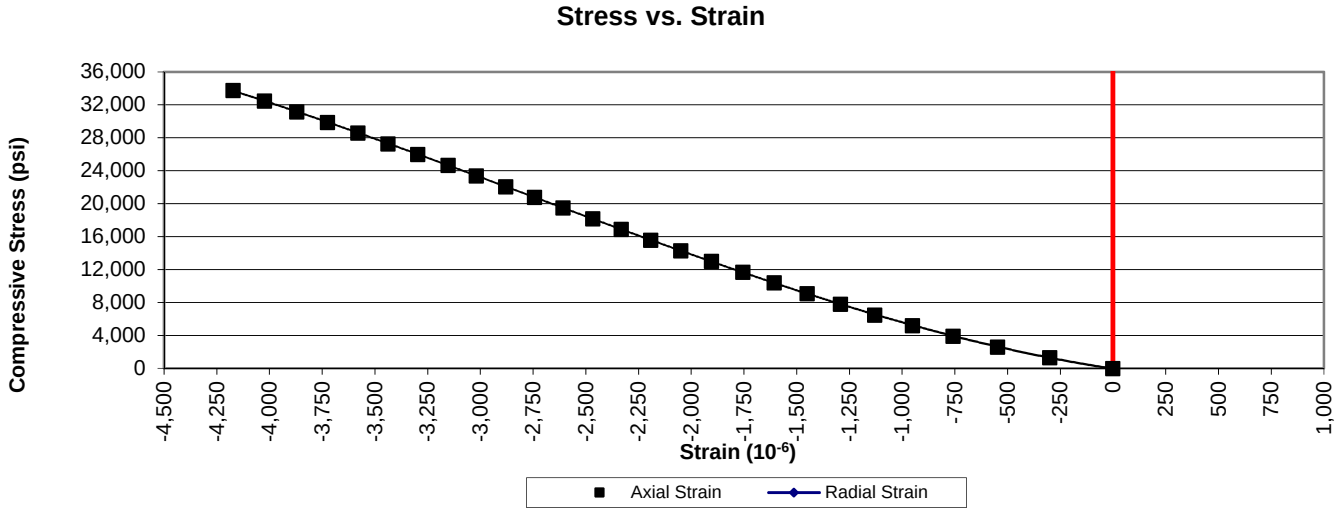
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	2/20/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.51	**Tested by:**	BKP / MG
Boring Id:	DH-6	**Unit Weight, pcf:**	165.9	**Reviewed by:**	JBB
Sample No:	RC-11	**Moisture Content, %:**	0.2		
Depth (ft):	70.6 - 71.8	**Load Rate, psi/sec:**	69		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-300		4,000	1,299	4.33		
3	-547		8,000	2,597	4.75		
4	-757		12,000	3,896	5.15		
5	-950		16,000	5,195	5.47		
6	-1,129		20,000	6,494	5.75		
7	-1,292		24,000	7,792	6.03		
8	-1,450		28,000	9,091	6.27		
9	-1,606		32,000	10,390	6.47		
10	-1,755		36,000	11,688	6.66		
11	-1,904		40,000	12,987	6.82		
12	-2,049		44,000	14,286	6.97		
13	-2,192		48,000	15,584	7.11		
14	-2,332		52,000	16,883	7.24		
15	-2,466		56,000	18,182	7.37		
16	-2,607		60,000	19,481	7.47		
17	-2,743		64,000	20,779	7.58		
18	-2,879		68,000	22,078	7.67		
19	-3,019		72,000	23,377	7.74		
20	-3,152		76,000	24,675	7.83		
21	-3,297		80,000	25,974	7.88		
22	-3,438		84,000	27,273	7.93		
23	-3,580		88,000	28,571	7.98		
24	-3,725		92,000	29,870	8.02		
25	-3,870		96,000	31,169	8.05		
26	-4,024		100,000	32,468	8.07		
27	-4,172		104,000	33,766	8.09		
28			105,328	34,197			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



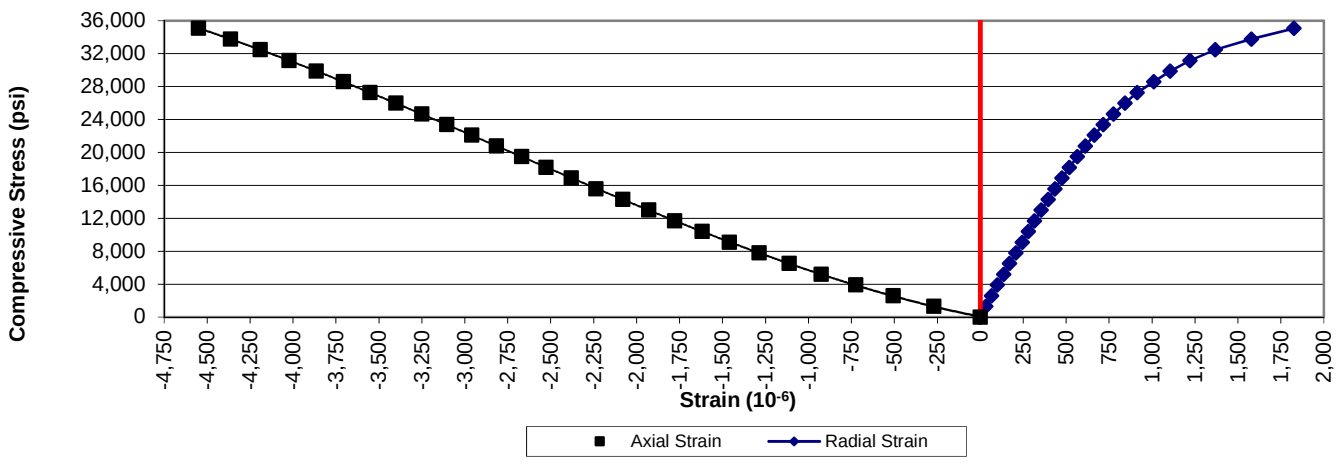
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS AND POISSON'S RATIO
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	2/20/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.52	**Tested by:**	BKP / MG
Boring Id:	DH-6	**Unit Weight, pcf:**	165.6	**Reviewed by:**	JBB
Sample No:	RC-13	**Moisture Content, %:**	0.2		
Depth (ft):	80.6 - 81.8	**Load Rate, psi/sec:**	77		

Data Point	Strain (10^{-6}) axial	Strain (10^{-6}) radial	Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
1	0	0	0	0	0.00	0.00	
2	-270	32	4,000	1,299	4.81	0.12	
3	-507	65	8,000	2,597	5.12	0.13	
4	-724	100	12,000	3,896	5.38	0.14	
5	-925	137	16,000	5,195	5.62	0.15	
6	-1,112	170	20,000	6,494	5.84	0.15	
7	-1,287	207	24,000	7,792	6.05	0.16	
8	-1,460	244	28,000	9,091	6.23	0.17	
9	-1,618	280	32,000	10,390	6.42	0.17	
10	-1,779	316	36,000	11,688	6.57	0.18	
11	-1,929	355	40,000	12,987	6.73	0.18	
12	-2,080	395	44,000	14,286	6.87	0.19	
13	-2,236	435	48,000	15,584	6.97	0.19	
14	-2,380	475	52,000	16,883	7.09	0.20	
15	-2,527	519	56,000	18,182	7.20	0.21	
16	-2,669	564	60,000	19,481	7.30	0.21	
17	-2,815	611	64,000	20,779	7.38	0.22	
18	-2,959	663	68,000	22,078	7.46	0.22	
19	-3,104	716	72,000	23,377	7.53	0.23	
20	-3,250	776	76,000	24,675	7.59	0.24	
21	-3,400	842	80,000	25,974	7.64	0.25	
22	-3,552	913	84,000	27,273	7.68	0.26	
23	-3,706	1,009	88,000	28,571	7.71	0.27	
24	-3,864	1,104	92,000	29,870	7.73	0.29	
25	-4,023	1,220	96,000	31,169	7.75	0.30	
26	-4,191	1,368	100,000	32,468	7.75	0.33	
27	-4,363	1,578	104,000	33,766	7.74	0.36	
28	-4,550	1,826	108,000	35,065	7.71	0.40	
29			111,542	36,215			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



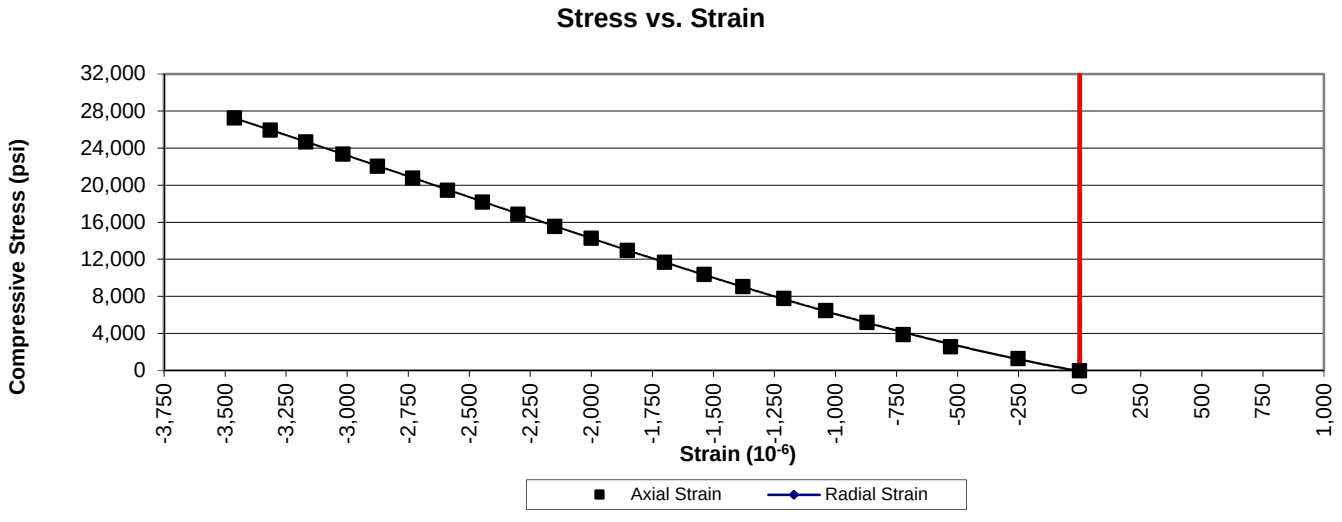
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	2/20/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.49	**Tested by:**	BKP / MG
Boring Id:	DH-6	**Unit Weight, pcf:**	165.8	**Reviewed by:**	JBB
Sample No:	RC-15	**Moisture Content, %:**	0.2		
Depth (ft):	94.4 - 95.6	**Load Rate, psi/sec:**	84		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-252		4,000	1,299	5.15		
3	-528		8,000	2,597	4.92		
4	-722		12,000	3,896	5.40		
5	-870		16,000	5,195	5.97		
6	-1,040		20,000	6,494	6.24		
7	-1,211		24,000	7,792	6.43		
8	-1,379		28,000	9,091	6.59		
9	-1,538		32,000	10,390	6.76		
10	-1,700		36,000	11,688	6.88		
11	-1,852		40,000	12,987	7.01		
12	-2,000		44,000	14,286	7.14		
13	-2,150		48,000	15,584	7.25		
14	-2,300		52,000	16,883	7.34		
15	-2,446		56,000	18,182	7.43		
16	-2,589		60,000	19,481	7.52		
17	-2,732		64,000	20,779	7.61		
18	-2,876		68,000	22,078	7.68		
19	-3,018		72,000	23,377	7.75		
20	-3,169		76,000	24,675	7.79		
21	-3,315		80,000	25,974	7.84		
22	-3,462		84,000	27,273	7.88		lost readings
23			106,709	34,646			Failure
24							
25							
26							
27							
28							

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



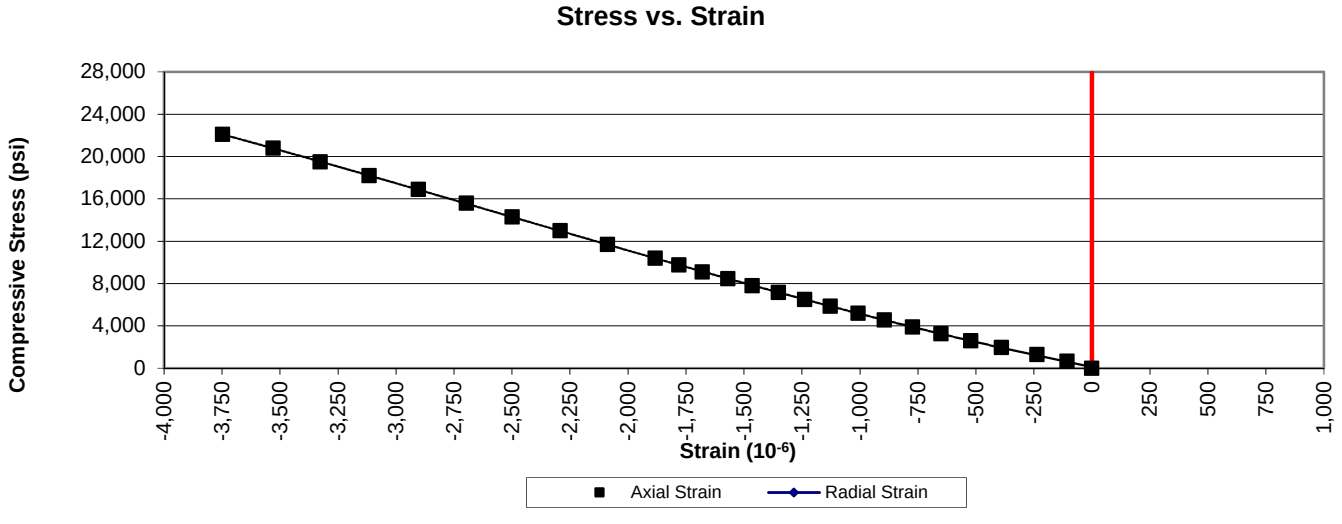
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	2/20/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.50	**Tested by:**	BKP / MG
Boring Id:	B-38	**Unit Weight, pcf:**	168.9	**Reviewed by:**	JBB
Sample No:	RC-1	**Moisture Content, %:**	0.2		
Depth (ft):	11.9 - 13.1	**Load Rate, psi/sec:**	63		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-107		2,000	649	6.07		
3	-237		4,000	1,299	5.48		
4	-389		6,000	1,948	5.01		
5	-522		8,000	2,597	4.98		
6	-650		10,000	3,247	5.00		
7	-773		12,000	3,896	5.04		
8	-894		14,000	4,545	5.08		
9	-1,008		16,000	5,195	5.15		
10	-1,127		18,000	5,844	5.19		
11	-1,238		20,000	6,494	5.25		
12	-1,351		22,000	7,143	5.29		
13	-1,464		24,000	7,792	5.32		
14	-1,569		26,000	8,442	5.38		
15	-1,679		28,000	9,091	5.41		
16	-1,780		30,000	9,740	5.47		
17	-1,883		32,000	10,390	5.52		
18	-2,088		36,000	11,688	5.60		
19	-2,292		40,000	12,987	5.67		
20	-2,499		44,000	14,286	5.72		
21	-2,696		48,000	15,584	5.78		
22	-2,903		52,000	16,883	5.82		
23	-3,115		56,000	18,182	5.84		
24	-3,327		60,000	19,481	5.86		
25	-3,529		64,000	20,779	5.89		
26	-3,748		68,000	22,078	5.89		
27			71,285	23,144			Failure
28							

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



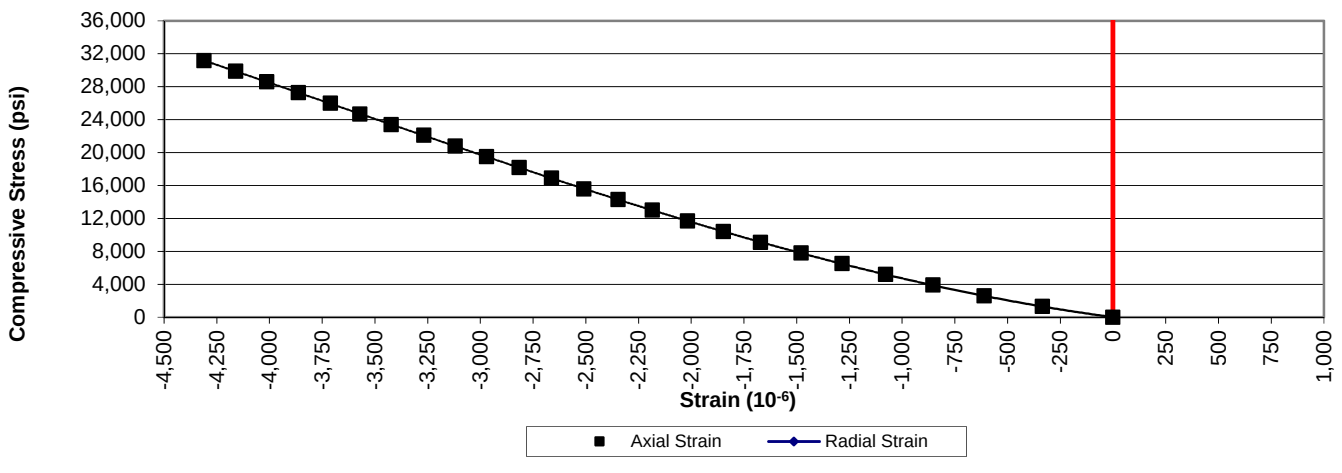
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	2/20/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.46	**Tested by:**	BKP / MG
Boring Id:	B-38	**Unit Weight, pcf:**	165.4	**Reviewed by:**	JBB
Sample No:	RC-3	**Moisture Content, %:**	0.1		
Depth (ft):	20.5 - 21.6	**Load Rate, psi/sec:**	75		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-335		4,000	1,299	3.88		
3	-611		8,000	2,597	4.25		
4	-854		12,000	3,896	4.56		
5	-1,078		16,000	5,195	4.82		
6	-1,285		20,000	6,494	5.05		
7	-1,478		24,000	7,792	5.27		
8	-1,672		28,000	9,091	5.44		
9	-1,848		32,000	10,390	5.62		
10	-2,018		36,000	11,688	5.79		
11	-2,184		40,000	12,987	5.95		
12	-2,346		44,000	14,286	6.09		
13	-2,509		48,000	15,584	6.21		
14	-2,662		52,000	16,883	6.34		
15	-2,815		56,000	18,182	6.46		
16	-2,971		60,000	19,481	6.56		
17	-3,119		64,000	20,779	6.66		
18	-3,268		68,000	22,078	6.76		
19	-3,422		72,000	23,377	6.83		
20	-3,571		76,000	24,675	6.91		
21	-3,711		80,000	25,974	7.00		
22	-3,862		84,000	27,273	7.06		
23	-4,013		88,000	28,571	7.12		
24	-4,160		92,000	29,870	7.18		
25	-4,311		96,000	31,169	7.23		
26			98,802	32,079			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



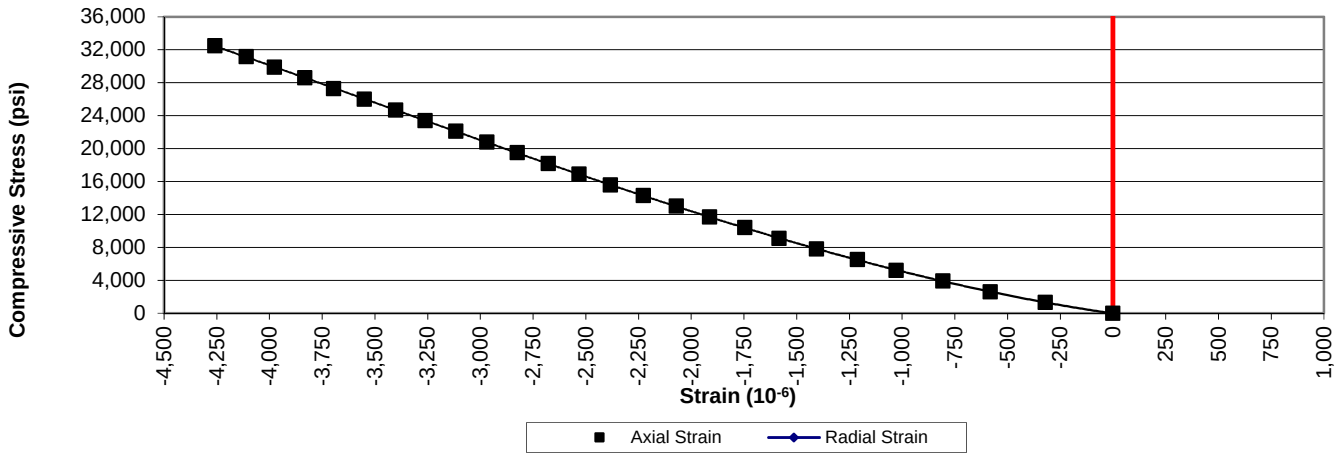
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	2/20/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.51	**Tested by:**	BKP / MG
Boring Id:	B-38	**Unit Weight, pcf:**	166.0	**Reviewed by:**	JBB
Sample No:	RC-5	**Moisture Content, %:**	0.1		
Depth (ft):	30.5 - 31.7	**Load Rate, psi/sec:**	74		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-321		4,000	1,299	4.05		
3	-581		8,000	2,597	4.47		
4	-807		12,000	3,896	4.83		
5	-1,028		16,000	5,195	5.05		
6	-1,212		20,000	6,494	5.36		
7	-1,405		24,000	7,792	5.55		
8	-1,583		28,000	9,091	5.74		
9	-1,745		32,000	10,390	5.95		
10	-1,912		36,000	11,688	6.11		
11	-2,071		40,000	12,987	6.27		
12	-2,227		44,000	14,286	6.41		
13	-2,383		48,000	15,584	6.54		
14	-2,531		52,000	16,883	6.67		
15	-2,678		56,000	18,182	6.79		
16	-2,825		60,000	19,481	6.90		
17	-2,969		64,000	20,779	7.00		
18	-3,116		68,000	22,078	7.09		
19	-3,261		72,000	23,377	7.17		
20	-3,401		76,000	24,675	7.26		
21	-3,550		80,000	25,974	7.32		
22	-3,696		84,000	27,273	7.38		
23	-3,832		88,000	28,571	7.46		
24	-3,977		92,000	29,870	7.51		
25	-4,110		96,000	31,169	7.58		
26	-4,258		100,000	32,468			
27			100,801	32,728			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



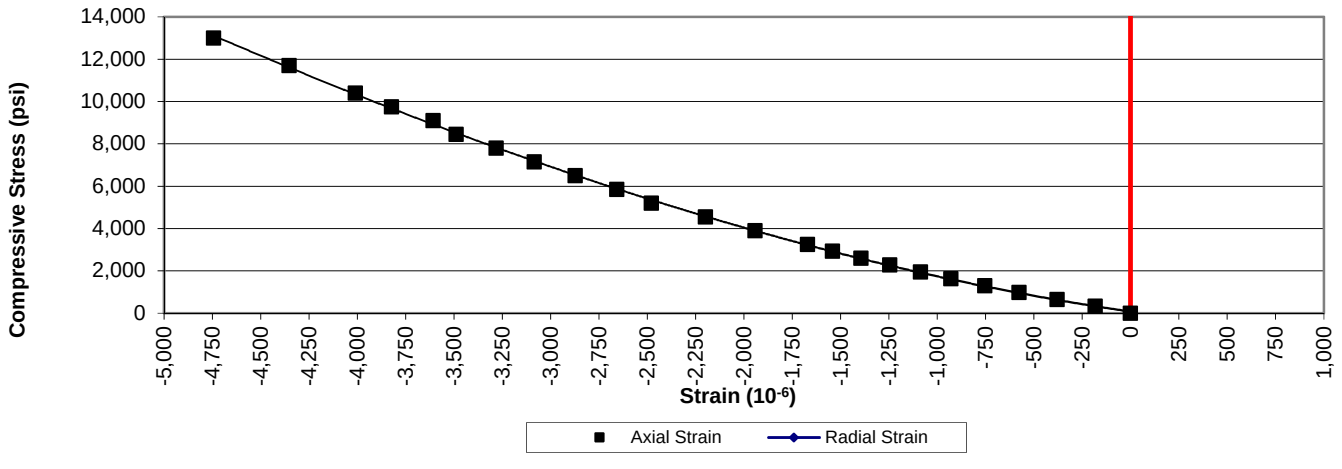
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	2/20/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.51	**Tested by:**	BKP / MG
Boring Id:	B-40	**Unit Weight, pcf:**	163.0	**Reviewed by:**	JBB
Sample No:	RC-1	**Moisture Content, %:**	0.3		
Depth (ft):	77.7 - 78.5	**Load Rate, psi/sec:**	62		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-182		1,000	325	1.79		
3	-379		2,000	649	1.71		
4	-576		3,000	974	1.69		
5	-754		4,000	1,299	1.72		
6	-929		5,000	1,623	1.75		
7	-1,087		6,000	1,948	1.79		
8	-1,245		7,000	2,273	1.83		
9	-1,394		8,000	2,597	1.86		
10	-1,542		9,000	2,922	1.89		
11	-1,671		10,000	3,247	1.94		
12	-1,942		12,000	3,896	2.01		
13	-2,199		14,000	4,545	2.07		
14	-2,479		16,000	5,195	2.10		
15	-2,658		18,000	5,844	2.20		
16	-2,872		20,000	6,494	2.26		
17	-3,085		22,000	7,143	2.32		
18	-3,281		24,000	7,792	2.37		
19	-3,488		26,000	8,442	2.42		
20	-3,608		28,000	9,091	2.52		
21	-3,823		30,000	9,740	2.55		
22	-4,010		32,000	10,390	2.59		
23	-4,353		36,000	11,688	2.69		
24	-4,744		40,000	12,987	2.74		
25			40,733	13,225			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



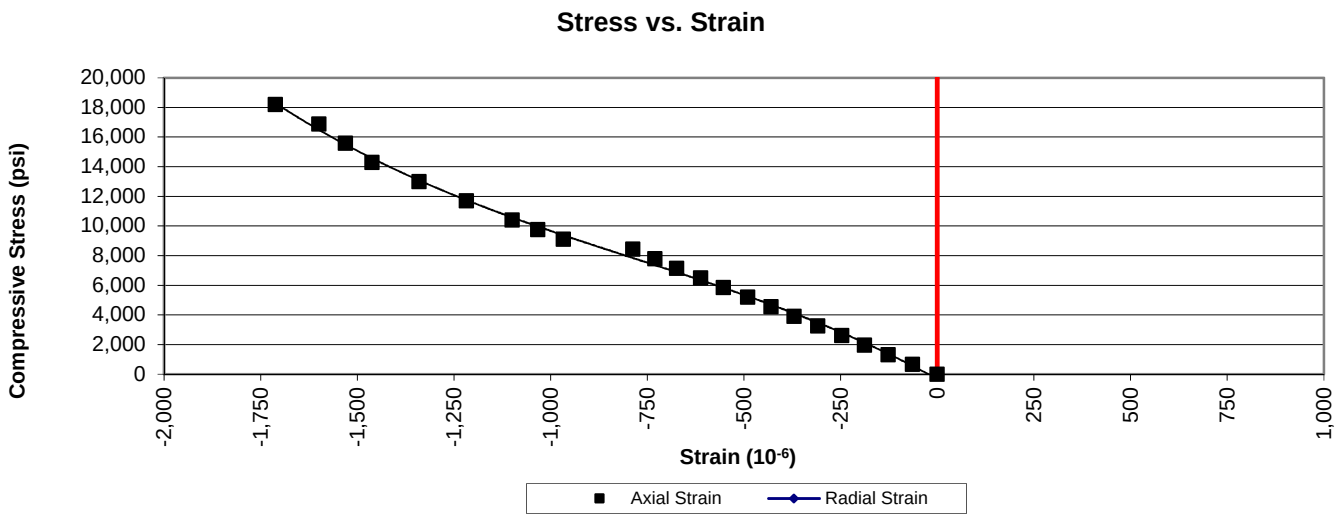
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	2/20/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.53	**Tested by:**	BKP / MG
Boring Id:	B-40	**Unit Weight, pcf:**	165.8	**Reviewed by:**	JBB
Sample No:	RC-3	**Moisture Content, %:**	0.1		
Depth (ft):	84.3 - 85.1	**Load Rate, psi/sec:**	74		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-64		2,000	649	10.14		
3	-127		4,000	1,299	10.23		
4	-188		6,000	1,948	10.36		
5	-247		8,000	2,597	10.51		
6	-309		10,000	3,247	10.51		
7	-370		12,000	3,896	10.53		
8	-430		14,000	4,545	10.57		
9	-490		16,000	5,195	10.60		
10	-553		18,000	5,844	10.57		
11	-612		20,000	6,494	10.61		
12	-674		22,000	7,143	10.60		
13	-730		24,000	7,792	10.67		
14	-787		26,000	8,442	10.73		
15	-967		28,000	9,091	9.40		
16	-1,033		30,000	9,740	9.43		
17	-1,099		32,000	10,390	9.45		
18	-1,218		36,000	11,688	9.60		
19	-1,340		40,000	12,987	9.69		
20	-1,462		44,000	14,286	9.77		
21	-1,531		48,000	15,584	10.18		
22	-1,599		52,000	16,883	10.56		
23	-1,712		56,000	18,182	10.62		
24			57,320	18,610			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



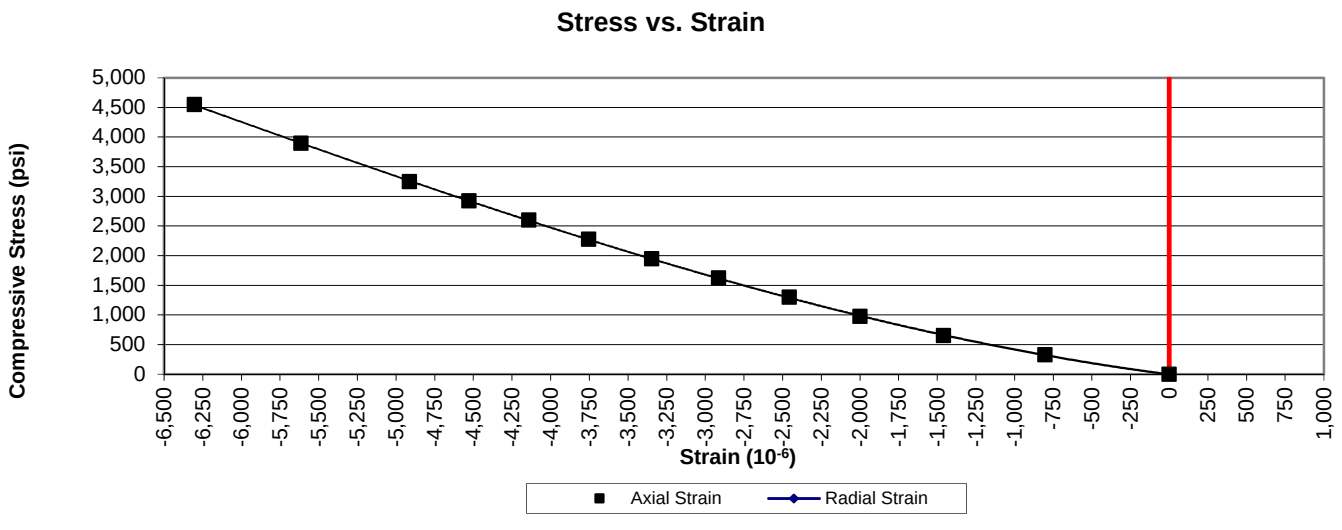
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	2/20/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.23	**Tested by:**	BKP / MG
Boring Id:	B-41	**Unit Weight, pcf:**	158.8	**Reviewed by:**	JBB
Sample No:	RC-2	**Moisture Content, %:**	0.4		
Depth (ft):	60.2 - 61.3	**Load Rate, psi/sec:**	37		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-803		1,000	325	0.40		
3	-1,458		2,000	649	0.45		
4	-2,000		3,000	974	0.49		
5	-2,457		4,000	1,299	0.53		
6	-2,914		5,000	1,623	0.56		
7	-3,346		6,000	1,948	0.58		
8	-3,754		7,000	2,273	0.61		
9	-4,140		8,000	2,597	0.63		
10	-4,527		9,000	2,922	0.65		
11	-4,913		10,000	3,247	0.66		
12	-5,615		12,000	3,896	0.69		
13	-6,304		14,000	4,545	0.72		
14			15,227	4,944			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



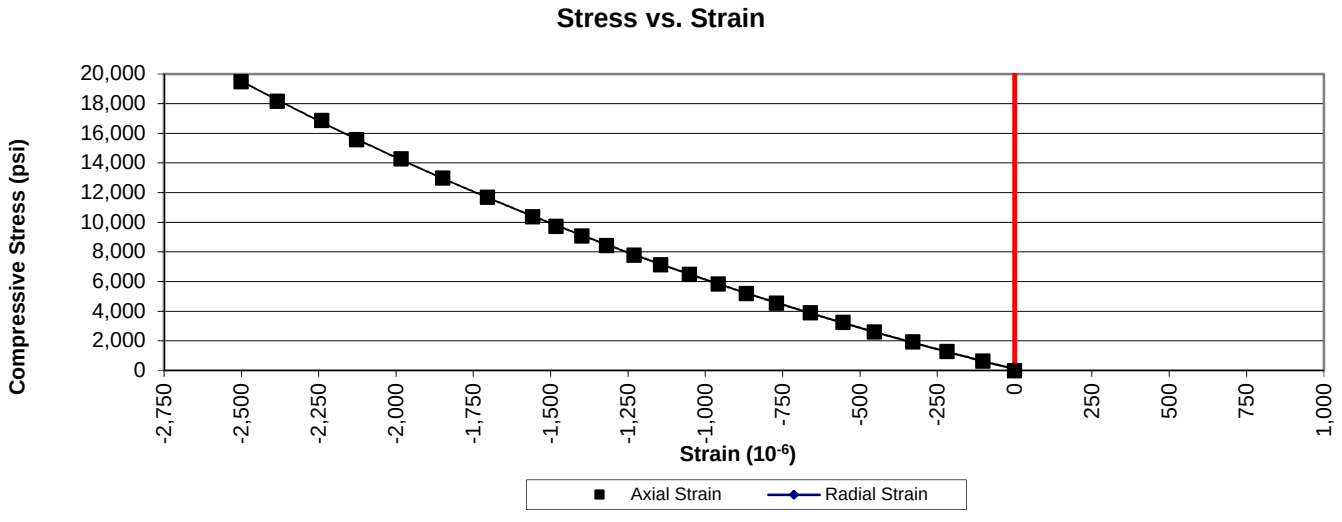
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	2/20/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.50	**Tested by:**	BKP / MG
Boring Id:	B-41	**Unit Weight, pcf:**	164.5	**Reviewed by:**	JBB
Sample No:	RC-5	**Moisture Content, %:**	0.3		
Depth (ft):	75.5 - 76.4	**Load Rate, psi/sec:**	88		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0	0	0	0	0.00		
2	-102		2,000	649	6.36		
3	-218		4,000	1,299	5.96		
4	-329		6,000	1,948	5.92		
5	-453		8,000	2,597	5.73		
6	-554		10,000	3,247	5.86		
7	-660		12,000	3,896	5.90		
8	-770		14,000	4,545	5.90		
9	-867		16,000	5,195	5.99		
10	-958		18,000	5,844	6.10		
11	-1,051		20,000	6,494	6.18		
12	-1,144		22,000	7,143	6.24		
13	-1,230		24,000	7,792	6.33		
14	-1,319		26,000	8,442	6.40		
15	-1,399		28,000	9,091	6.50		
16	-1,482		30,000	9,740	6.57		
17	-1,558		32,000	10,390	6.67		
18	-1,704		36,000	11,688	6.86		
19	-1,849		40,000	12,987	7.02		
20	-1,983		44,000	14,286	7.20		
21	-2,127		48,000	15,584	7.33		
22	-2,240		52,000	16,883	7.54		
23	-2,384		56,000	18,182	7.63		
24	-2,501		60,000	19,481	7.79		lost readings
25			72,883	23,663			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



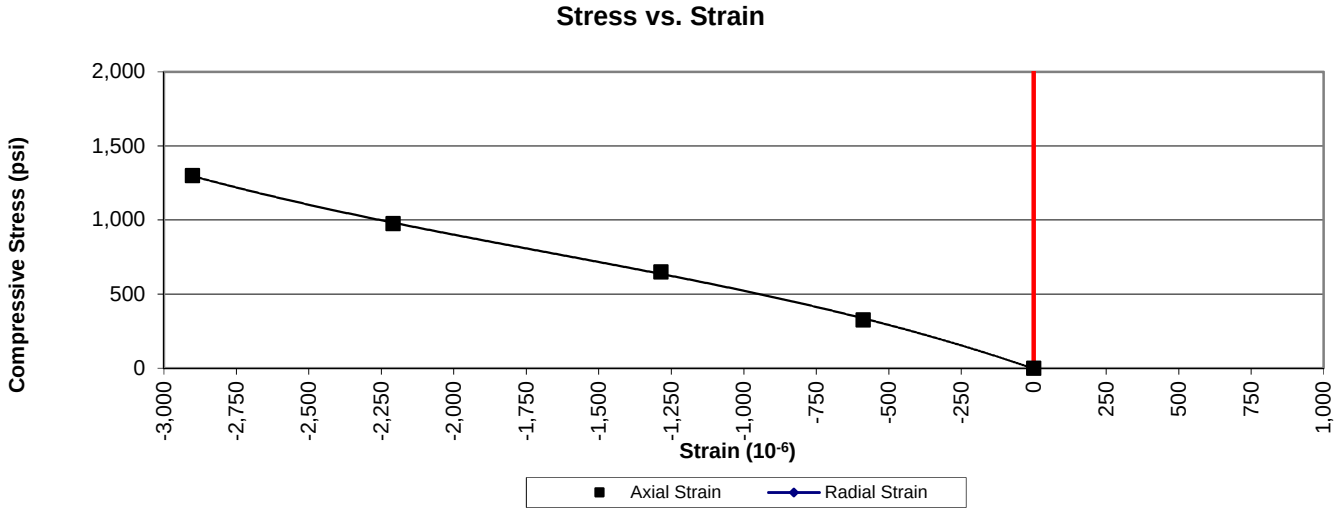
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	2/20/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.32	**Tested by:**	BKP / MG
Boring Id:	B-59	**Unit Weight, pcf:**	170.6	**Reviewed by:**	JBB
Sample No:	RC-2	**Moisture Content, %:**	1.3		
Depth (ft):	115.4 - 116.1	**Load Rate, psi/sec:**	19		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-588		1,000	325	0.55		
3	-1,285		2,000	649	0.51		
4	-2,209		3,000	974	0.44		
5	-2,901		4,000	1,299	0.45		
6			4,038	1,311			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Due to the low compressive strength of this specimen, readings of deformation at a minimum of ten evenly spaced load intervals were not able to be obtained.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

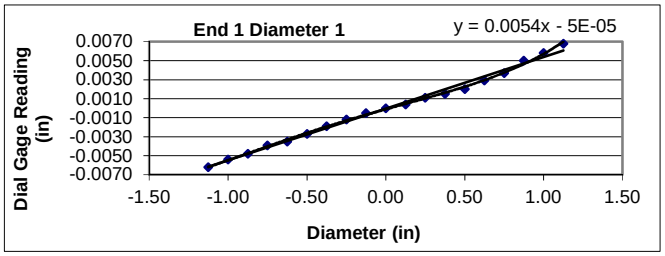
Project:	Carolina Crossroads Project	**Diameter (in):**	2.48	**Date:**	2/8/2018
Project No.:	1461-16-047 Phase 2B	**Length (in):**	5.48	**Tested by:**	BKP
Boring Id:	DH-4	**Unit Weight (pcf):**	176.0	**Reviewed by:**	JBB
Sample No.:	RC-2	**Moisture Content (%):**	0.2		
Depth (ft):	55.2 - 56.4				

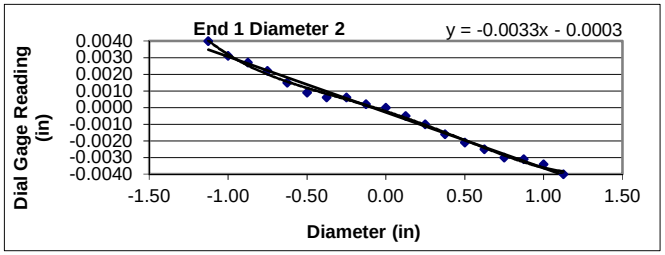
Deviation From Straightness (Procedure S1)

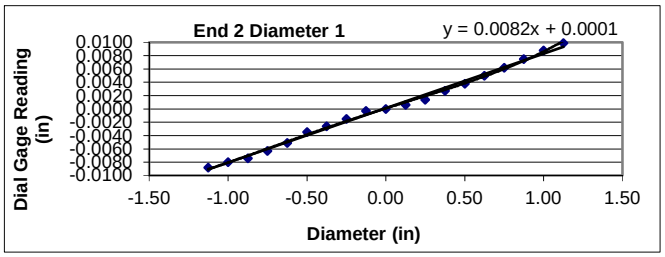
Is the maximum gap ≤ 0.02 in.? **NO** Straightness Tolerance Met? **NO**

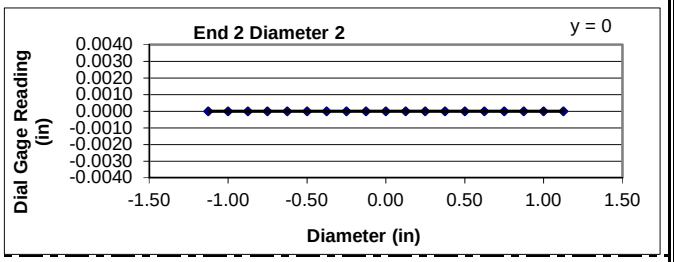
End Flatness and Parallelism Readings (Procedure FP1)

Position	End 1	End 1(90)	End 2	End 2(90)
-1 1/8	-0.0062	0.0040	-0.0088	0.0000
-1	-0.0054	0.0031	-0.0080	0.0000
- 7/8	-0.0048	0.0027	-0.0074	0.0000
- 6/8	-0.0039	0.0022	-0.0063	0.0000
- 5/8	-0.0035	0.0015	-0.0051	0.0000
- 4/8	-0.0027	0.0009	-0.0035	0.0000
- 3/8	-0.0019	0.0006	-0.0026	0.0000
- 2/8	-0.0012	0.0006	-0.0015	0.0000
- 1/8	-0.0005	0.0002	-0.0003	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0004	-0.0005	0.0006	0.0000
2/8	0.0011	-0.0010	0.0014	0.0000
3/8	0.0015	-0.0016	0.0027	0.0000
4/8	0.0020	-0.0021	0.0038	0.0000
5/8	0.0029	-0.0025	0.0050	0.0000
6/8	0.0037	-0.0030	0.0062	0.0000
7/8	0.0050	-0.0031	0.0075	0.0000
1	0.0058	-0.0034	0.0088	0.0000
1 1/8	0.0068	-0.0040	0.0099	0.0000









Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? YES

Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	0.00544
	Angle of Best Fit Line:	0.31145
End 2:	Slope of Best Fit Line:	0.00820
	Angle of Best Fit Line:	0.46987
	Max Angular Difference:	**-0.16**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00334
	Angle of Best Fit Line:	-0.19163
End 2:	Slope of Best Fit Line:	0.00000
	Angle of Best Fit Line:	0.00000
	Max Angular Difference:	**-0.19**

Parallelism Tolerance Met? YES

Perpendicularity (Procedure P1)is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0130	0.0052	**NO**
End 1 Diam 2	0.0080	0.0032	**YES**
End 2 Diam 1	0.0187	0.0075	**NO**
End 2 Diam 2	0.0000	0.0000	**YES**

Perpendicularity Tolerance Met? NO

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

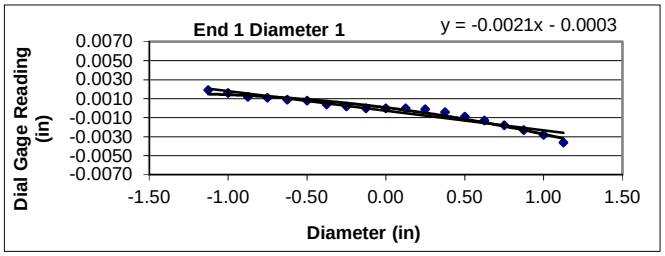
Project:	Carolina Crossroads Project	**Diameter (in):**	2.49	**Date:**	2/8/2018
Project No.:	1461-16-047 Phase 2B	**Length (in):**	5.57	**Tested by:**	BKP
Boring Id:	DH-4	**Unit Weight (pcf):**	170.1	**Reviewed by:**	JBB
Sample No.:	RC-4	**Moisture Content (%):**	0.1		
Depth (ft):	65.2-66.3				

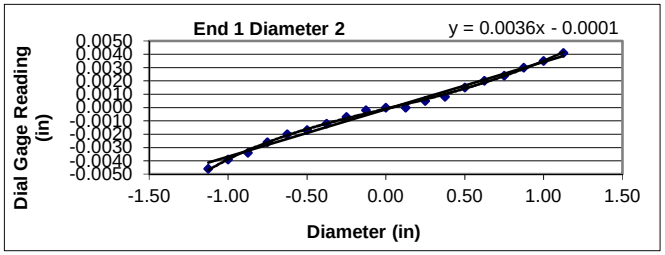
Deviation From Straightness (Procedure S1)

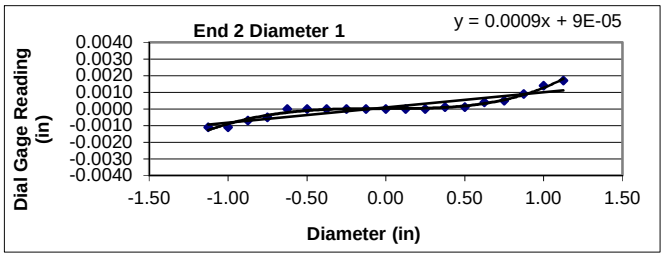
Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

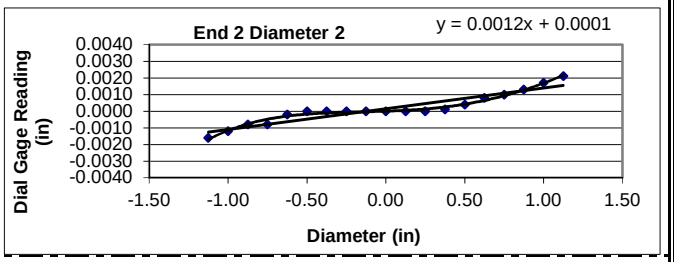
End Flatness and Parallelism Readings (Procedure FP1)

Position	End 1	End 1(90)	End 2	End 2(90)
-1 1/8	0.0019	-0.0046	-0.0011	-0.0016
-1	0.0016	-0.0039	-0.0011	-0.0012
- 7/8	0.0012	-0.0034	-0.0007	-0.0008
- 6/8	0.0011	-0.0026	-0.0005	-0.0008
- 5/8	0.0009	-0.0020	0.0000	-0.0002
- 4/8	0.0008	-0.0017	0.0000	0.0000
- 3/8	0.0004	-0.0012	0.0000	0.0000
- 2/8	0.0002	-0.0007	0.0000	0.0000
- 1/8	0.0000	-0.0002	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	0.0000
2/8	-0.0001	0.0005	0.0000	0.0000
3/8	-0.0004	0.0008	0.0001	0.0001
4/8	-0.0009	0.0015	0.0001	0.0004
5/8	-0.0013	0.0020	0.0004	0.0008
6/8	-0.0018	0.0024	0.0005	0.0010
7/8	-0.0023	0.0030	0.0009	0.0013
1	-0.0028	0.0035	0.0014	0.0017
1 1/8	-0.0036	0.0041	0.0017	0.0021









Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? YES

Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00207
	Angle of Best Fit Line:	-0.11853
End 2:	Slope of Best Fit Line:	0.00091
	Angle of Best Fit Line:	0.05235
	Max Angular Difference:	**-0.17**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00356
	Angle of Best Fit Line:	0.20401
End 2:	Slope of Best Fit Line:	0.00125
	Angle of Best Fit Line:	0.07149
	Max Angular Difference:	**0.13**

Parallelism Tolerance Met? YES

Perpendicularity (Procedure P1)is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0055	0.0022	**YES**
End 1 Diam 2	0.0087	0.0035	**YES**
End 2 Diam 1	0.0028	0.0011	**YES**
End 2 Diam 2	0.0037	0.0015	**YES**

Perpendicularity Tolerance Met? YES

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

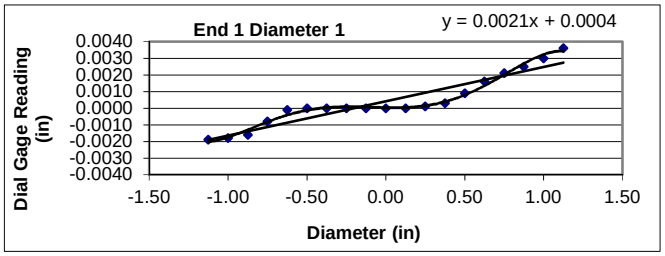
Project:	Carolina Crossroads Project	**Diameter (in):**	2.49	**Date:**	2/8/2018
Project No.:	1461-16-047 Phase 2B	**Length (in):**	5.51	**Tested by:**	BKP
Boring Id:	DH-4	**Unit Weight (pcf):**	169.5	**Reviewed by:**	JBB
Sample No.:	RC-6	**Moisture Content (%):**	0.1		
Depth (ft):	75.2-76.3				

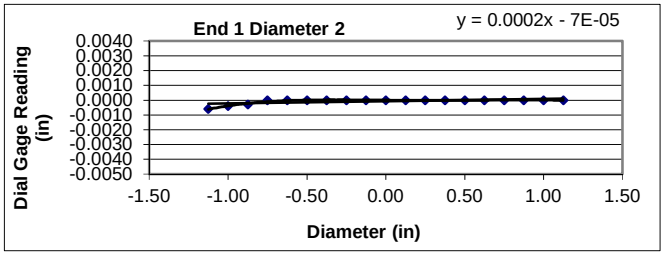
Deviation From Straightness (Procedure S1)

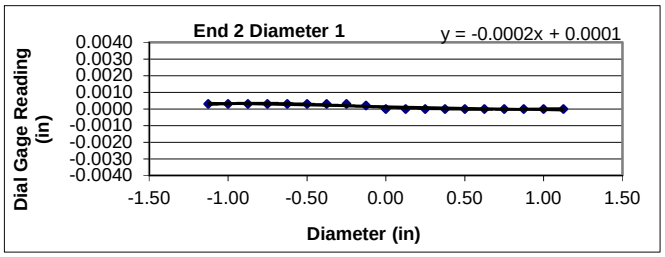
Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

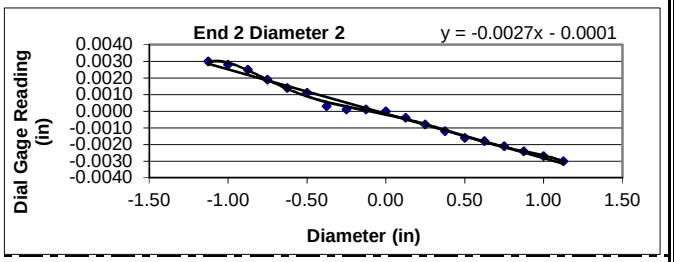
End Flatness and Parallelism Readings (Procedure FP1)

Position	End 1	End 1(90)	End 2	End 2(90)
-1 1/8	-0.0019	-0.0006	0.0003	0.0030
-1	-0.0018	-0.0004	0.0003	0.0028
- 7/8	-0.0016	-0.0003	0.0003	0.0025
- 6/8	-0.0008	0.0000	0.0003	0.0019
- 5/8	-0.0001	0.0000	0.0003	0.0014
- 4/8	0.0000	0.0000	0.0003	0.0011
- 3/8	0.0000	0.0000	0.0003	0.0003
- 2/8	0.0000	0.0000	0.0003	0.0001
- 1/8	0.0000	0.0000	0.0002	0.0001
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	-0.0004
2/8	0.0001	0.0000	0.0000	-0.0008
3/8	0.0003	0.0000	0.0000	-0.0012
4/8	0.0009	0.0000	0.0000	-0.0016
5/8	0.0016	0.0000	0.0000	-0.0018
6/8	0.0021	0.0000	0.0000	-0.0021
7/8	0.0025	0.0000	0.0000	-0.0024
1	0.0030	0.0000	0.0000	-0.0027
1 1/8	0.0036	0.0000	0.0000	-0.0030









Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**

Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	0.00207
	Angle of Best Fit Line:	0.11837
End 2:	Slope of Best Fit Line:	-0.00019
	Angle of Best Fit Line:	-0.01078
	Max Angular Difference:	**0.13**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00015
	Angle of Best Fit Line:	0.00860
End 2:	Slope of Best Fit Line:	-0.00267
	Angle of Best Fit Line:	-0.15271
	Max Angular Difference:	**0.16**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1)is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0055	0.0022	**YES**
End 1 Diam 2	0.0006	0.0002	**YES**
End 2 Diam 1	0.0003	0.0001	**YES**
End 2 Diam 2	0.0060	0.0024	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

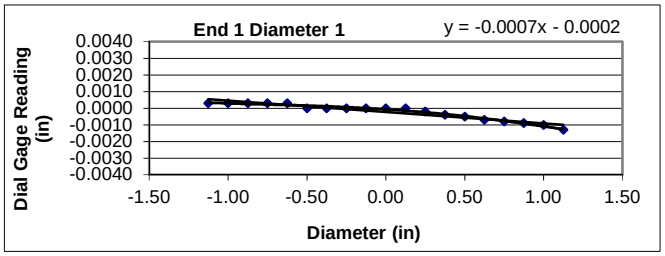
Project:	Carolina Crossroads Project	**Diameter (in):**	2.49	**Date:**	2/8/2018
Project No.:	1461-16-047 Phase 2B	**Length (in):**	5.61	**Tested by:**	BKP
Boring Id:	DH-4	**Unit Weight (pcf):**	178.5	**Reviewed by:**	JBB
Sample No.:	RC-8	**Moisture Content (%):**	0.2		
Depth (ft):	85.5-86.7				

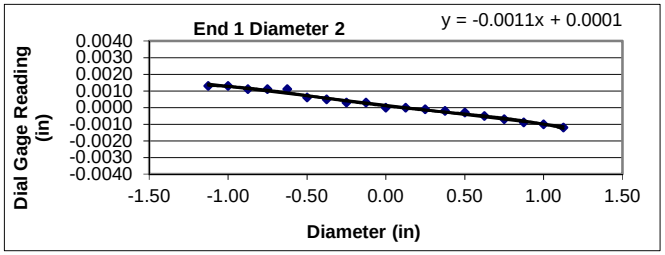
Deviation From Straightness (Procedure S1)

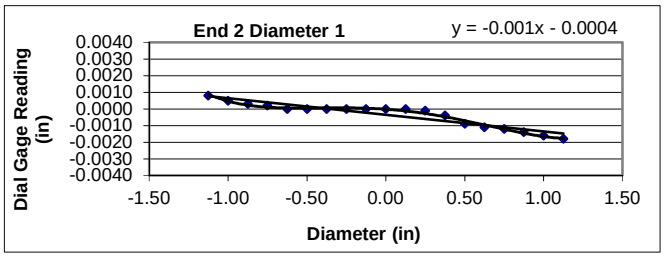
Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

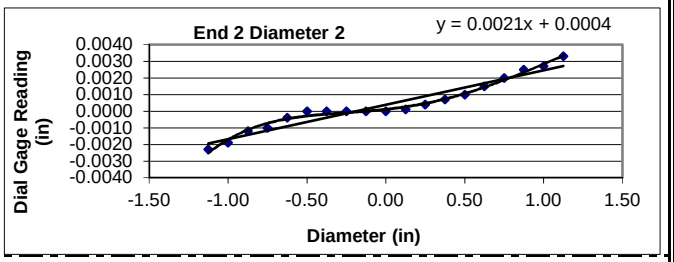
End Flatness and Parallelism Readings (Procedure FP1)

Position	End 1	End 1(90)	End 2	End 2(90)
-1 1/8	0.0003	0.0013	0.0008	-0.0023
-1	0.0003	0.0013	0.0005	-0.0019
- 7/8	0.0003	0.0011	0.0003	-0.0012
- 6/8	0.0003	0.0011	0.0002	-0.0010
- 5/8	0.0003	0.0011	0.0000	-0.0004
- 4/8	0.0000	0.0006	0.0000	0.0000
- 3/8	0.0000	0.0005	0.0000	0.0000
- 2/8	0.0000	0.0003	0.0000	0.0000
- 1/8	0.0000	0.0003	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	0.0001
2/8	-0.0002	-0.0001	-0.0001	0.0004
3/8	-0.0004	-0.0002	-0.0004	0.0007
4/8	-0.0005	-0.0003	-0.0009	0.0010
5/8	-0.0007	-0.0005	-0.0011	0.0015
6/8	-0.0008	-0.0007	-0.0012	0.0020
7/8	-0.0009	-0.0009	-0.0014	0.0025
1	-0.0010	-0.0010	-0.0016	0.0027
1 1/8	-0.0013	-0.0012	-0.0018	0.0033









Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? YES

Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00068
	Angle of Best Fit Line:	-0.03892
End 2:	Slope of Best Fit Line:	-0.00100
	Angle of Best Fit Line:	-0.05709
	Max Angular Difference:	**0.02**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00113
	Angle of Best Fit Line:	-0.06473
End 2:	Slope of Best Fit Line:	0.00207
	Angle of Best Fit Line:	0.11869
	Max Angular Difference:	**-0.18**

Parallelism Tolerance Met? YES

Perpendicularity (Procedure P1)is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0016	0.0006	**YES**
End 1 Diam 2	0.0025	0.0010	**YES**
End 2 Diam 1	0.0026	0.0010	**YES**
End 2 Diam 2	0.0056	0.0022	**YES**

Perpendicularity Tolerance Met? YES

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

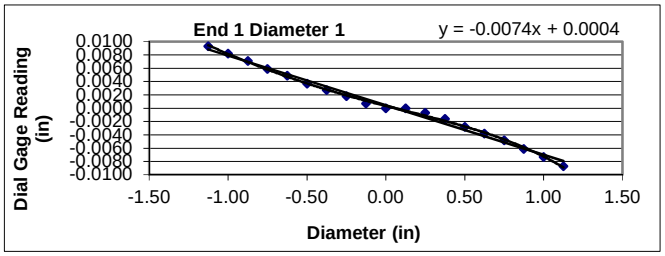
Project:	Carolina Crossroads Project	**Diameter (in):**	2.49	**Date:**	2/8/2018
Project No.:	1461-16-047 Phase 2B	**Length (in):**	5.47	**Tested by:**	BKP
Boring Id:	DH-4	**Unit Weight (pcf):**	169.5	**Reviewed by:**	JBB
Sample No.:	RC-10	**Moisture Content (%):**	0.2		
Depth (ft):	96.5-97.5				

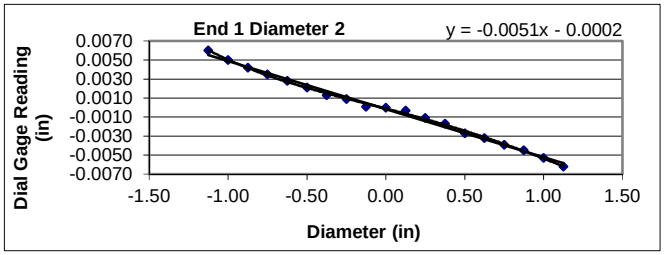
Deviation From Straightness (Procedure S1)

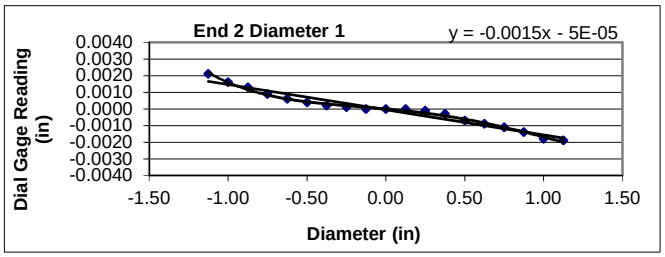
Is the maximum gap ≤ 0.02 in.? **NO** Straightness Tolerance Met? **NO**

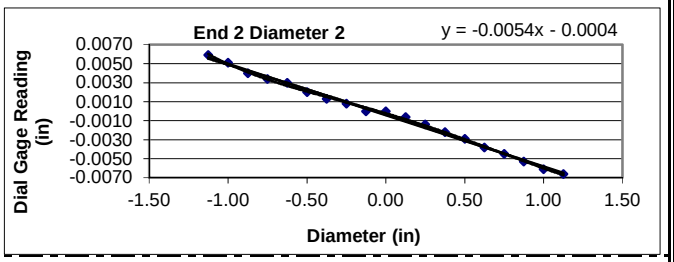
End Flatness and Parallelism Readings (Procedure FP1)

Position	End 1	End 1(90)	End 2	End 2(90)
-1 1/8	0.0093	0.0060	0.0021	0.0059
-1	0.0082	0.0050	0.0016	0.0051
- 7/8	0.0071	0.0042	0.0013	0.0040
- 6/8	0.0059	0.0035	0.0009	0.0034
- 5/8	0.0049	0.0028	0.0006	0.0030
- 4/8	0.0037	0.0021	0.0004	0.0020
- 3/8	0.0027	0.0013	0.0002	0.0013
- 2/8	0.0018	0.0009	0.0001	0.0008
- 1/8	0.0007	0.0001	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	-0.0003	0.0000	-0.0006
2/8	-0.0007	-0.0011	-0.0001	-0.0014
3/8	-0.0016	-0.0017	-0.0003	-0.0022
4/8	-0.0028	-0.0027	-0.0007	-0.0029
5/8	-0.0038	-0.0032	-0.0009	-0.0038
6/8	-0.0048	-0.0039	-0.0011	-0.0045
7/8	-0.0061	-0.0045	-0.0014	-0.0053
1	-0.0073	-0.0053	-0.0018	-0.0061
1 1/8	-0.0087	-0.0062	-0.0019	-0.0066









Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**

Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00745
	Angle of Best Fit Line:	-0.42676
End 2:	Slope of Best Fit Line:	-0.00151
	Angle of Best Fit Line:	-0.08677
	Max Angular Difference:	**-0.34**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00505
	Angle of Best Fit Line:	-0.28957
End 2:	Slope of Best Fit Line:	-0.00539
	Angle of Best Fit Line:	-0.30855
	Max Angular Difference:	**0.02**

Parallelism Tolerance Met? **NO**

Perpendicularity (Procedure P1)is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0180	0.0072	**NO**
End 1 Diam 2	0.0122	0.0049	**NO**
End 2 Diam 1	0.0040	0.0016	**YES**
End 2 Diam 2	0.0125	0.0050	**NO**

Perpendicularity Tolerance Met? **NO**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

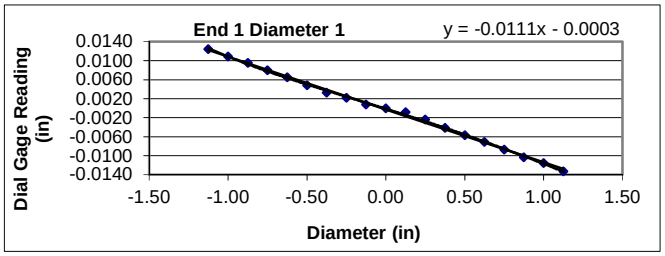
Project:	Carolina Crossroads Project	**Diameter (in):**	2.49	**Date:**	2/8/2018
Project No.:	1461-16-047 Phase 2B	**Length (in):**	5.58	**Tested by:**	BKP
Boring Id:	DH-4	**Unit Weight (pcf):**	171.3	**Reviewed by:**	JBB
Sample No.:	RC-12	**Moisture Content (%):**	0.1		
Depth (ft):	106.2-107.5				

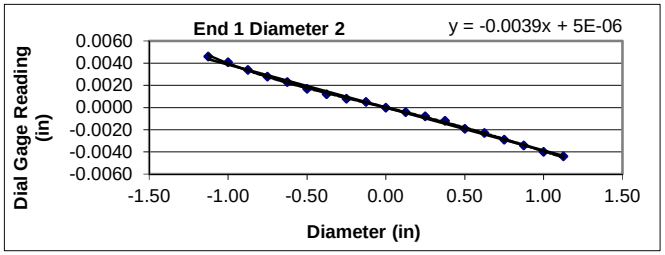
Deviation From Straightness (Procedure S1)

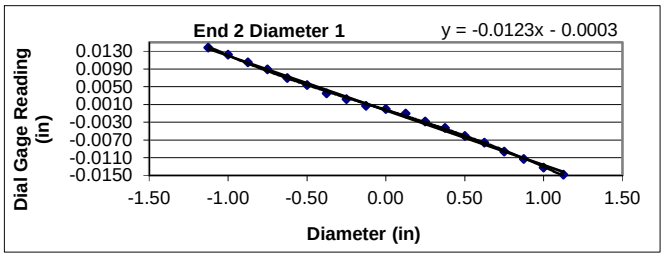
Is the maximum gap ≤ 0.02 in.? **NO** Straightness Tolerance Met? **NO**

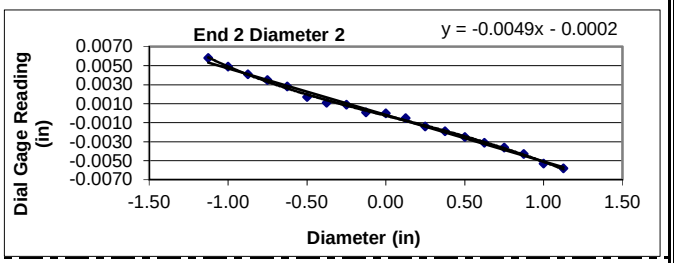
End Flatness and Parallelism Readings (Procedure FP1)

Position	End 1	End 1(90)	End 2	End 2(90)
-1 1/8	0.0124	0.0046	0.0138	0.0058
-1	0.0109	0.0041	0.0122	0.0049
- 7/8	0.0095	0.0034	0.0105	0.0041
- 6/8	0.0080	0.0028	0.0089	0.0035
- 5/8	0.0065	0.0023	0.0070	0.0028
- 4/8	0.0048	0.0017	0.0054	0.0017
- 3/8	0.0033	0.0012	0.0035	0.0011
- 2/8	0.0022	0.0008	0.0022	0.0009
- 1/8	0.0008	0.0005	0.0007	0.0001
0	0.0000	0.0000	0.0000	0.0000
1/8	-0.0008	-0.0004	-0.0010	-0.0005
2/8	-0.0024	-0.0008	-0.0028	-0.0014
3/8	-0.0041	-0.0012	-0.0043	-0.0019
4/8	-0.0057	-0.0019	-0.0061	-0.0025
5/8	-0.0071	-0.0023	-0.0076	-0.0031
6/8	-0.0087	-0.0029	-0.0096	-0.0036
7/8	-0.0103	-0.0034	-0.0113	-0.0043
1	-0.0115	-0.0040	-0.0132	-0.0053
1 1/8	-0.0133	-0.0044	-0.0148	-0.0058









Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**

Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.01112
	Angle of Best Fit Line:	-0.63713
End 2:	Slope of Best Fit Line:	-0.01233
	Angle of Best Fit Line:	-0.70629
	Max Angular Difference:	**0.07**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00388
	Angle of Best Fit Line:	-0.22219
End 2:	Slope of Best Fit Line:	-0.00488
	Angle of Best Fit Line:	-0.27976
	Max Angular Difference:	**0.06**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1)is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0257	0.0103	**NO**
End 1 Diam 2	0.0090	0.0036	**YES**
End 2 Diam 1	0.0286	0.0115	**NO**
End 2 Diam 2	0.0116	0.0047	**NO**

Perpendicularity Tolerance Met? **NO**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

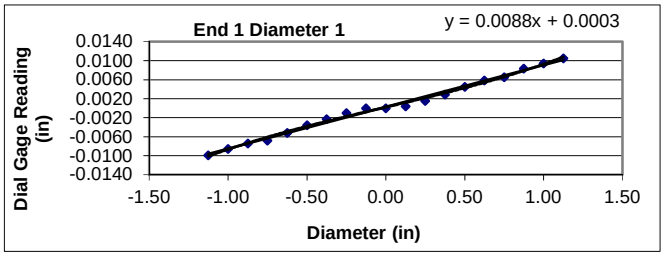
Project:	Carolina Crossroads Project	**Diameter (in):**	2.49	**Date:**	2/8/2018
Project No.:	1461-16-047 Phase 2B	**Length (in):**	5.40	**Tested by:**	BKP
Boring Id:	DH-4	**Unit Weight (pcf):**	170.9	**Reviewed by:**	JBB
Sample No.:	RC-14	**Moisture Content (%):**	0.1		
Depth (ft):	115.2-116.4				

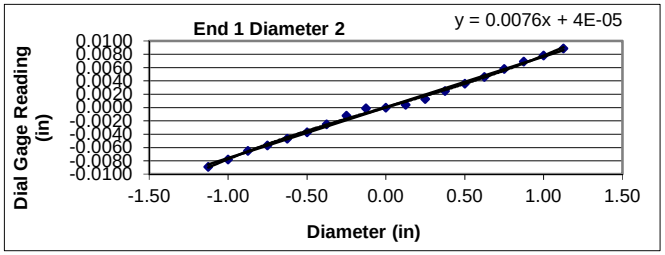
Deviation From Straightness (Procedure S1)

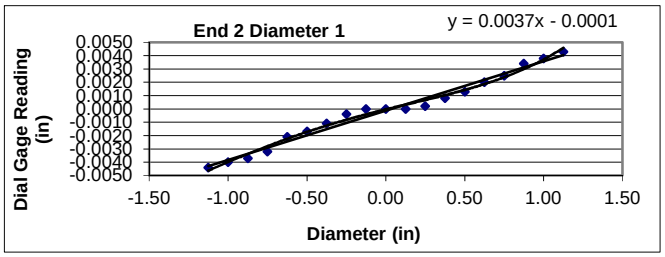
Is the maximum gap ≤ 0.02 in.? **NO** Straightness Tolerance Met? **NO**

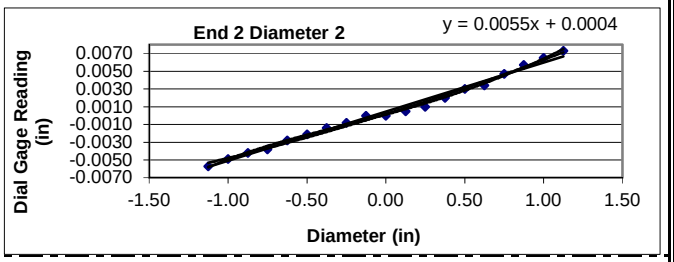
End Flatness and Parallelism Readings (Procedure FP1)

Position	End 1	End 1(90)	End 2	End 2(90)
-1 1/8	-0.0099	-0.0089	-0.0044	-0.0057
-1	-0.0086	-0.0078	-0.0040	-0.0049
- 7/8	-0.0074	-0.0065	-0.0037	-0.0042
- 6/8	-0.0068	-0.0057	-0.0032	-0.0038
- 5/8	-0.0052	-0.0047	-0.0021	-0.0028
- 4/8	-0.0036	-0.0037	-0.0017	-0.0021
- 3/8	-0.0023	-0.0025	-0.0011	-0.0014
- 2/8	-0.0010	-0.0012	-0.0004	-0.0008
- 1/8	0.0000	-0.0001	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0004	0.0004	0.0000	0.0005
2/8	0.0015	0.0013	0.0002	0.0010
3/8	0.0029	0.0025	0.0008	0.0020
4/8	0.0045	0.0036	0.0013	0.0030
5/8	0.0058	0.0046	0.0020	0.0034
6/8	0.0065	0.0058	0.0025	0.0047
7/8	0.0083	0.0069	0.0034	0.0057
1	0.0094	0.0078	0.0038	0.0065
1 1/8	0.0105	0.0089	0.0043	0.0073









Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? YES

Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	0.00878
	Angle of Best Fit Line:	0.50316
End 2:	Slope of Best Fit Line:	0.00371
	Angle of Best Fit Line:	0.21230
	Max Angular Difference:	**0.29**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00764
	Angle of Best Fit Line:	0.43746
End 2:	Slope of Best Fit Line:	0.00553
	Angle of Best Fit Line:	0.31700
	Max Angular Difference:	**0.12**

Parallelism Tolerance Met? NO

Perpendicularity (Procedure P1)is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0204	0.0082	**NO**
End 1 Diam 2	0.0178	0.0071	**NO**
End 2 Diam 1	0.0087	0.0035	**YES**
End 2 Diam 2	0.0130	0.0052	**NO**

Perpendicularity Tolerance Met? NO

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

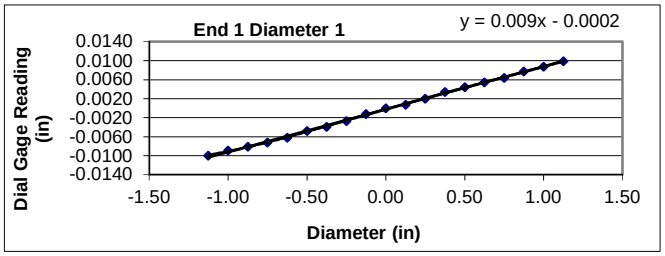
Project:	Carolina Crossroads Project	**Diameter (in):**	2.48	**Date:**	2/8/2018
Project No.:	1461-16-047 Phase 2B	**Length (in):**	5.41	**Tested by:**	BKP
Boring Id:	DH-5	**Unit Weight (pcf):**	178.5	**Reviewed by:**	JBB
Sample No.:	RC-2	**Moisture Content (%):**	0.3		
Depth (ft):	45.6-46.8				

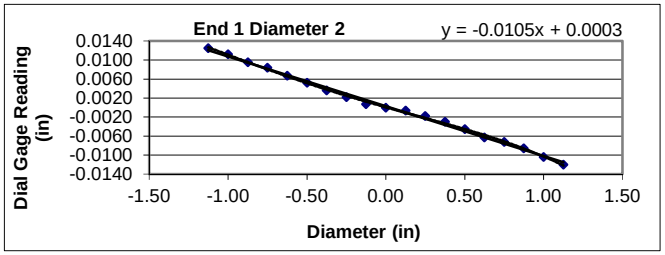
Deviation From Straightness (Procedure S1)

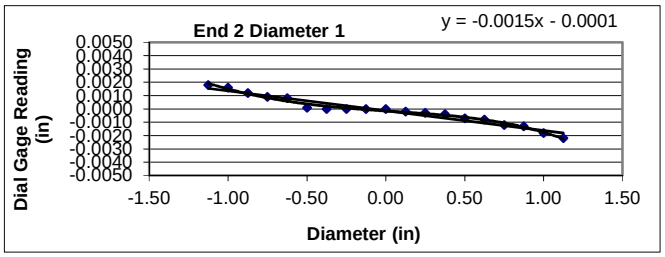
Is the maximum gap ≤ 0.02 in.? **NO** Straightness Tolerance Met? **NO**

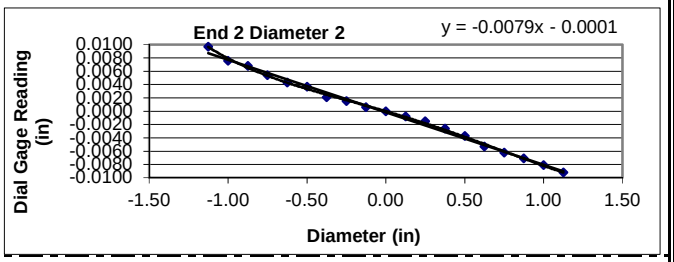
End Flatness and Parallelism Readings (Procedure FP1)

Position	End 1	End 1(90)	End 2	End 2(90)
-1 1/8	-0.0100	0.0125	0.0018	0.0097
-1	-0.0089	0.0112	0.0016	0.0076
- 7/8	-0.0081	0.0095	0.0012	0.0068
- 6/8	-0.0072	0.0084	0.0009	0.0054
- 5/8	-0.0062	0.0067	0.0008	0.0043
- 4/8	-0.0048	0.0052	0.0001	0.0037
- 3/8	-0.0039	0.0036	0.0000	0.0021
- 2/8	-0.0027	0.0022	0.0000	0.0015
- 1/8	-0.0012	0.0007	0.0000	0.0006
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0007	-0.0006	-0.0002	-0.0008
2/8	0.0020	-0.0018	-0.0003	-0.0015
3/8	0.0034	-0.0030	-0.0004	-0.0026
4/8	0.0044	-0.0045	-0.0007	-0.0037
5/8	0.0054	-0.0063	-0.0008	-0.0053
6/8	0.0064	-0.0072	-0.0012	-0.0062
7/8	0.0077	-0.0086	-0.0013	-0.0071
1	0.0087	-0.0104	-0.0018	-0.0081
1 1/8	0.0099	-0.0120	-0.0022	-0.0092









Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? YES

Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	0.00898
	Angle of Best Fit Line:	0.51474
End 2:	Slope of Best Fit Line:	-0.00149
	Angle of Best Fit Line:	-0.08564
	Max Angular Difference:	**0.60**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.01048
	Angle of Best Fit Line:	-0.60030
End 2:	Slope of Best Fit Line:	-0.00788
	Angle of Best Fit Line:	-0.45169
	Max Angular Difference:	**-0.15**

Parallelism Tolerance Met? NO

Perpendicularity (Procedure P1)is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0199	0.0080	**NO**
End 1 Diam 2	0.0245	0.0099	**NO**
End 2 Diam 1	0.0040	0.0016	**YES**
End 2 Diam 2	0.0189	0.0076	**NO**

Perpendicularity Tolerance Met? NO

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

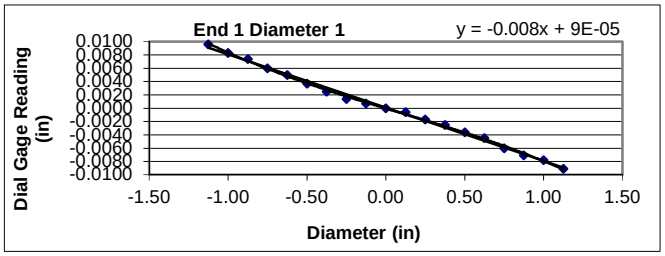
Project:	Carolina Crossroads Project	**Diameter (in):**	2.49	**Date:**	2/8/2018
Project No.:	1461-16-047 Phase 2B	**Length (in):**	5.39	**Tested by:**	BKP
Boring Id:	DH-5	**Unit Weight (pcf):**	170.9	**Reviewed by:**	JBB
Sample No.:	RC-4	**Moisture Content (%):**	0.1		
Depth (ft):	56.2-57.3				

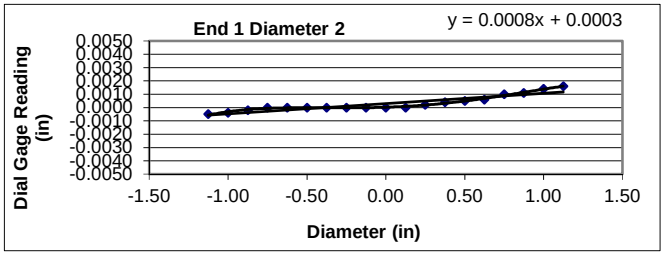
Deviation From Straightness (Procedure S1)

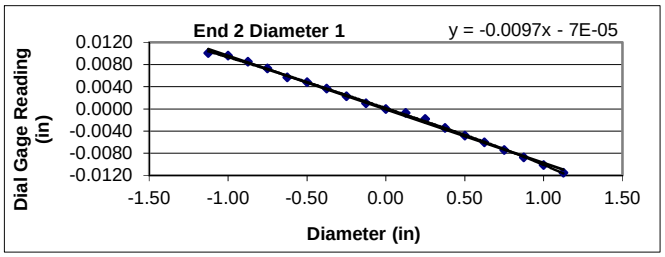
Is the maximum gap ≤ 0.02 in.? **NO** Straightness Tolerance Met? **NO**

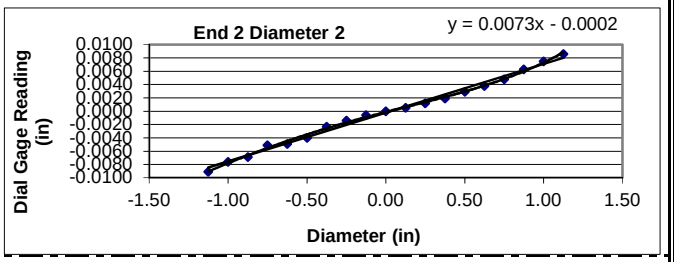
End Flatness and Parallelism Readings (Procedure FP1)

Position	End 1	End 1(90)	End 2	End 2(90)
-1 1/8	0.0096	-0.0005	0.0101	-0.0091
-1	0.0083	-0.0004	0.0096	-0.0076
- 7/8	0.0074	-0.0002	0.0085	-0.0069
- 6/8	0.0060	0.0000	0.0073	-0.0051
- 5/8	0.0050	0.0000	0.0057	-0.0049
- 4/8	0.0037	0.0000	0.0048	-0.0040
- 3/8	0.0025	0.0000	0.0037	-0.0023
- 2/8	0.0014	0.0000	0.0023	-0.0014
- 1/8	0.0007	0.0000	0.0010	-0.0006
0	0.0000	0.0000	0.0000	0.0000
1/8	-0.0006	0.0000	-0.0007	0.0005
2/8	-0.0017	0.0002	-0.0018	0.0012
3/8	-0.0025	0.0004	-0.0034	0.0019
4/8	-0.0036	0.0005	-0.0048	0.0029
5/8	-0.0045	0.0006	-0.0060	0.0038
6/8	-0.0060	0.0010	-0.0074	0.0048
7/8	-0.0071	0.0011	-0.0087	0.0063
1	-0.0078	0.0014	-0.0101	0.0075
1 1/8	-0.0091	0.0016	-0.0115	0.0086









Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? YES

Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00800
	Angle of Best Fit Line:	-0.45821
End 2:	Slope of Best Fit Line:	-0.00967
	Angle of Best Fit Line:	-0.55382
	Max Angular Difference:	**0.10**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00077
	Angle of Best Fit Line:	0.04423
End 2:	Slope of Best Fit Line:	0.00732
	Angle of Best Fit Line:	0.41969
	Max Angular Difference:	**-0.38**

Parallelism Tolerance Met? NO

Perpendicularity (Procedure P1)is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0187	0.0075	**NO**
End 1 Diam 2	0.0021	0.0008	**YES**
End 2 Diam 1	0.0216	0.0087	**NO**
End 2 Diam 2	0.0177	0.0071	**NO**

Perpendicularity Tolerance Met? NO

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

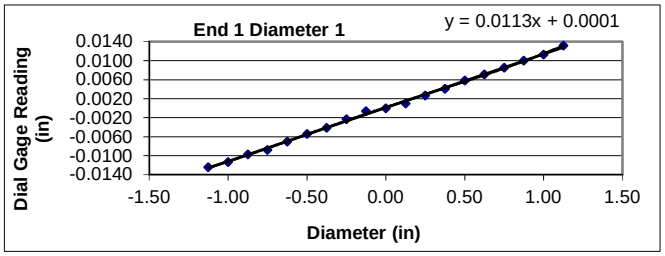
Project:	Carolina Crossroads Project	**Diameter (in):**	2.49	**Date:**	2/8/2018
Project No.:	1461-16-047 Phase 2B	**Length (in):**	5.46	**Tested by:**	BKP
Boring Id:	DH-5	**Unit Weight (pcf):**	172.4	**Reviewed by:**	JBB
Sample No.:	RC-8	**Moisture Content (%):**	0.2		
Depth (ft):	75.9-76.9				

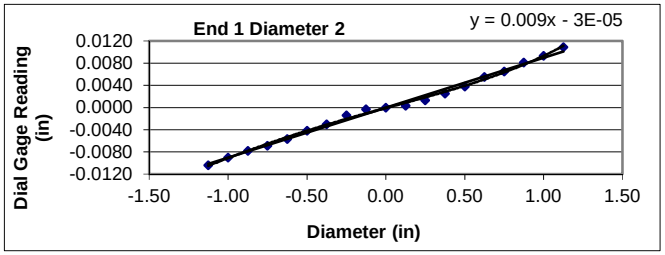
Deviation From Straightness (Procedure S1)

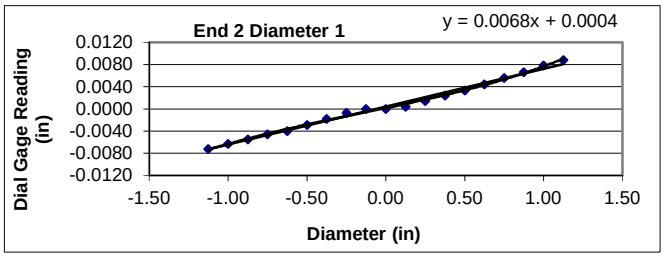
Is the maximum gap ≤ 0.02 in.? **NO** Straightness Tolerance Met? **NO**

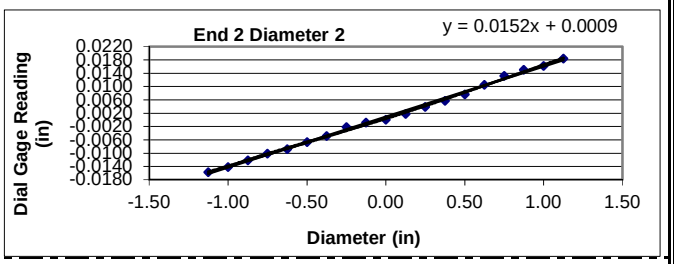
End Flatness and Parallelism Readings (Procedure FP1)

Position	End 1	End 1(90)	End 2	End 2(90)
-1 1/8	-0.0124	-0.0104	-0.0072	-0.0157
-1	-0.0113	-0.0090	-0.0063	-0.0142
- 7/8	-0.0097	-0.0078	-0.0055	-0.0122
- 6/8	-0.0088	-0.0069	-0.0046	-0.0101
- 5/8	-0.0070	-0.0057	-0.0040	-0.0088
- 4/8	-0.0054	-0.0042	-0.0029	-0.0067
- 3/8	-0.0041	-0.0030	-0.0018	-0.0049
- 2/8	-0.0023	-0.0014	-0.0007	-0.0022
- 1/8	-0.0006	-0.0003	0.0000	-0.0008
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0010	0.0003	0.0004	0.0018
2/8	0.0027	0.0013	0.0014	0.0039
3/8	0.0041	0.0025	0.0024	0.0057
4/8	0.0058	0.0038	0.0033	0.0076
5/8	0.0071	0.0055	0.0044	0.0105
6/8	0.0085	0.0065	0.0056	0.0132
7/8	0.0100	0.0081	0.0066	0.0150
1	0.0113	0.0093	0.0078	0.0162
1 1/8	0.0132	0.0109	0.0088	0.0184









Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? YES

Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	0.01129
	Angle of Best Fit Line:	0.64686
End 2:	Slope of Best Fit Line:	0.00683
	Angle of Best Fit Line:	0.39138
	Max Angular Difference:	**0.26**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00899
	Angle of Best Fit Line:	0.51490
End 2:	Slope of Best Fit Line:	0.01517
	Angle of Best Fit Line:	0.86897
	Max Angular Difference:	**-0.35**

Parallelism Tolerance Met? NO

Perpendicularity (Procedure P1)is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0256	0.0103	**NO**
End 1 Diam 2	0.0213	0.0086	**NO**
End 2 Diam 1	0.0160	0.0064	**NO**
End 2 Diam 2	0.0341	0.0137	**NO**

Perpendicularity Tolerance Met? NO

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

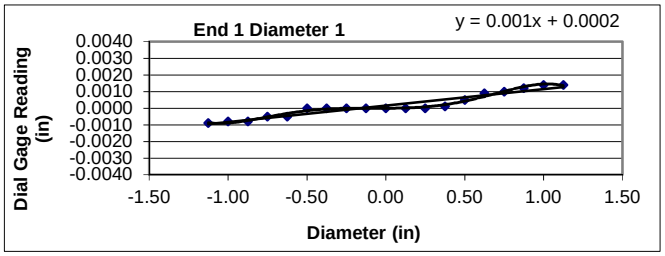
Project:	Carolina Crossroads Project	**Diameter (in):**	2.49	**Date:**	2/8/2018
Project No.:	1461-16-047 Phase 2B	**Length (in):**	5.64	**Tested by:**	BKP
Boring Id:	DH-5	**Unit Weight (pcf):**	171.2	**Reviewed by:**	JBB
Sample No.:	RC-10	**Moisture Content (%):**	0.1		
Depth (ft):	88.4-89.4				

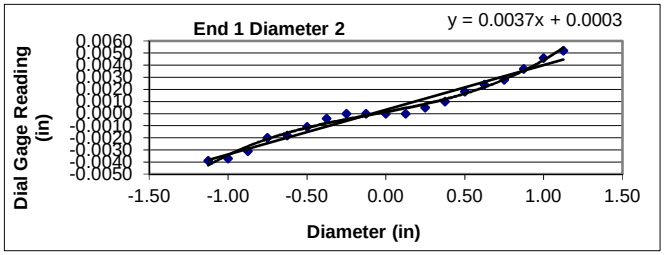
Deviation From Straightness (Procedure S1)

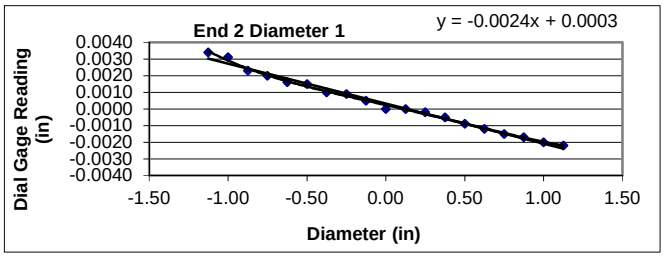
Is the maximum gap ≤ 0.02 in.? **NO** Straightness Tolerance Met? **NO**

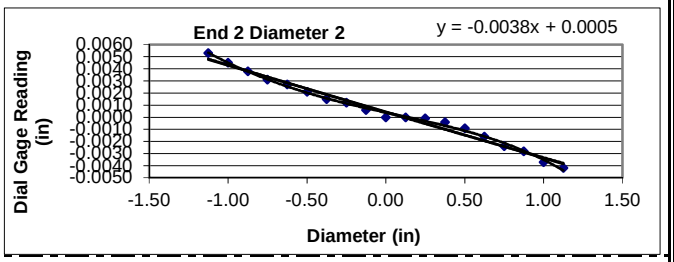
End Flatness and Parallelism Readings (Procedure FP1)

Position	End 1	End 1(90)	End 2	End 2(90)
-1 1/8	-0.0009	-0.0039	0.0034	0.0053
-1	-0.0008	-0.0037	0.0031	0.0045
- 7/8	-0.0008	-0.0031	0.0023	0.0038
- 6/8	-0.0005	-0.0020	0.0020	0.0031
- 5/8	-0.0005	-0.0018	0.0016	0.0027
- 4/8	0.0000	-0.0011	0.0015	0.0021
- 3/8	0.0000	-0.0004	0.0010	0.0015
- 2/8	0.0000	0.0000	0.0009	0.0012
- 1/8	0.0000	0.0000	0.0005	0.0006
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	0.0000
2/8	0.0000	0.0005	-0.0002	-0.0001
3/8	0.0001	0.0010	-0.0005	-0.0004
4/8	0.0005	0.0018	-0.0009	-0.0009
5/8	0.0009	0.0024	-0.0012	-0.0016
6/8	0.0010	0.0028	-0.0015	-0.0024
7/8	0.0012	0.0037	-0.0017	-0.0028
1	0.0014	0.0046	-0.0020	-0.0037
1 1/8	0.0014	0.0052	-0.0022	-0.0042









Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? YES

Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	0.00099
	Angle of Best Fit Line:	0.05677
End 2:	Slope of Best Fit Line:	-0.00240
	Angle of Best Fit Line:	-0.13751
	Max Angular Difference:	**0.19**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00368
	Angle of Best Fit Line:	0.21109
End 2:	Slope of Best Fit Line:	-0.00383
	Angle of Best Fit Line:	-0.21929
	Max Angular Difference:	**0.43**

Parallelism Tolerance Met? NO

Perpendicularity (Procedure P1)is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0023	0.0009	**YES**
End 1 Diam 2	0.0091	0.0037	**YES**
End 2 Diam 1	0.0056	0.0022	**YES**
End 2 Diam 2	0.0095	0.0038	**YES**

Perpendicularity Tolerance Met? YES

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

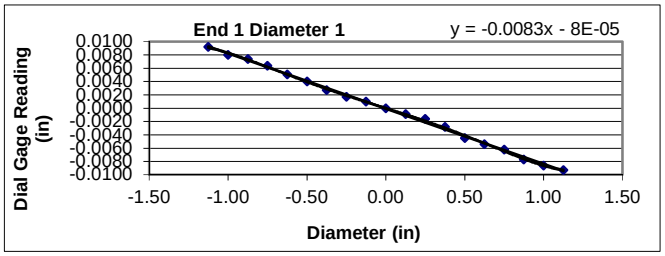
Project:	Carolina Crossroads Project	**Diameter (in):**	2.49	**Date:**	2/8/2018
Project No.:	1461-16-047 Phase 2B	**Length (in):**	5.54	**Tested by:**	BKP
Boring Id:	DH-5	**Unit Weight (pcf):**	174.8	**Reviewed by:**	JBB
Sample No.:	RC-12	**Moisture Content (%):**	0.1		
Depth (ft):	95.6-96.5				

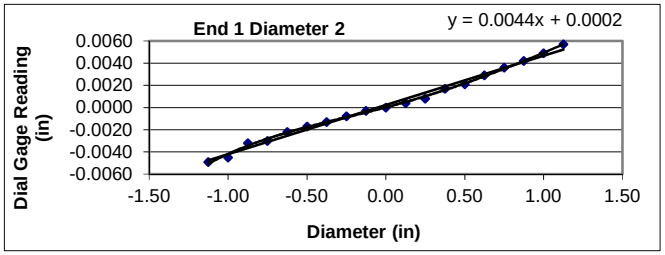
Deviation From Straightness (Procedure S1)

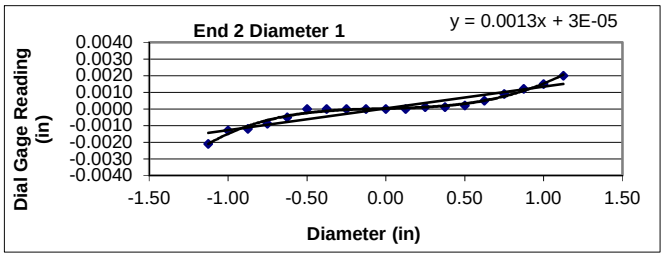
Is the maximum gap ≤ 0.02 in.? **NO** Straightness Tolerance Met? **NO**

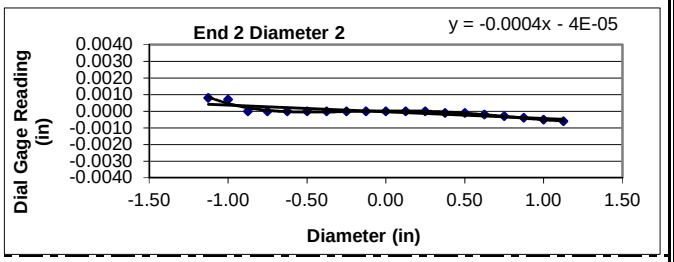
End Flatness and Parallelism Readings (Procedure FP1)

Position	End 1	End 1(90)	End 2	End 2(90)
-1 1/8	0.0092	-0.0049	-0.0021	0.0008
-1	0.0080	-0.0045	-0.0013	0.0007
- 7/8	0.0074	-0.0032	-0.0012	0.0000
- 6/8	0.0064	-0.0030	-0.0009	0.0000
- 5/8	0.0051	-0.0022	-0.0005	0.0000
- 4/8	0.0040	-0.0017	0.0000	0.0000
- 3/8	0.0027	-0.0013	0.0000	0.0000
- 2/8	0.0017	-0.0008	0.0000	0.0000
- 1/8	0.0010	-0.0003	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	-0.0009	0.0004	0.0000	0.0000
2/8	-0.0016	0.0008	0.0001	0.0000
3/8	-0.0028	0.0017	0.0001	-0.0001
4/8	-0.0045	0.0021	0.0002	-0.0001
5/8	-0.0054	0.0029	0.0005	-0.0002
6/8	-0.0062	0.0036	0.0009	-0.0003
7/8	-0.0077	0.0042	0.0012	-0.0004
1	-0.0086	0.0049	0.0015	-0.0005
1 1/8	-0.0093	0.0057	0.0020	-0.0006









Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? YES

Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00831
	Angle of Best Fit Line:	-0.47614
End 2:	Slope of Best Fit Line:	0.00131
	Angle of Best Fit Line:	0.07495
	Max Angular Difference:	**-0.55**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00443
	Angle of Best Fit Line:	0.25379
End 2:	Slope of Best Fit Line:	-0.00040
	Angle of Best Fit Line:	-0.02292
	Max Angular Difference:	**0.28**

Parallelism Tolerance Met? NO

Perpendicularity (Procedure P1)is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0185	0.0074	**NO**
End 1 Diam 2	0.0106	0.0043	**YES**
End 2 Diam 1	0.0041	0.0016	**YES**
End 2 Diam 2	0.0014	0.0006	**YES**

Perpendicularity Tolerance Met? NO

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

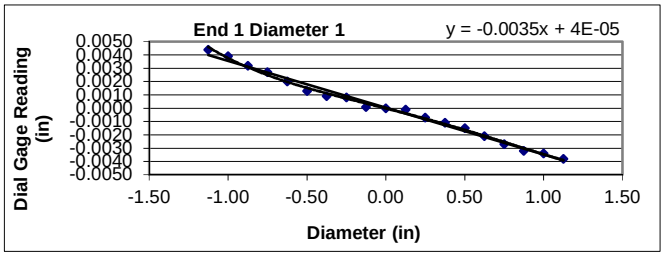
Project:	Carolina Crossroads Project	**Diameter (in):**	2.49	**Date:**	2/8/2018
Project No.:	1461-16-047 Phase 2B	**Length (in):**	5.70	**Tested by:**	BKP
Boring Id:	DH-5	**Unit Weight (pcf):**	176.0	**Reviewed by:**	JBB
Sample No.:	RC-14	**Moisture Content (%):**	0.1		
Depth (ft):	106.2-107.3				

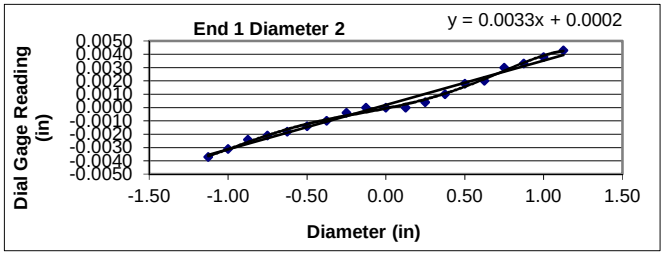
Deviation From Straightness (Procedure S1)

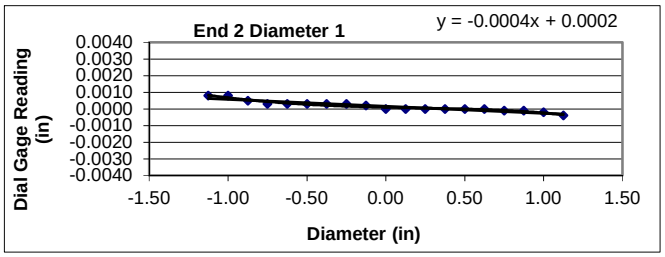
Is the maximum gap ≤ 0.02 in.? **NO** Straightness Tolerance Met? **NO**

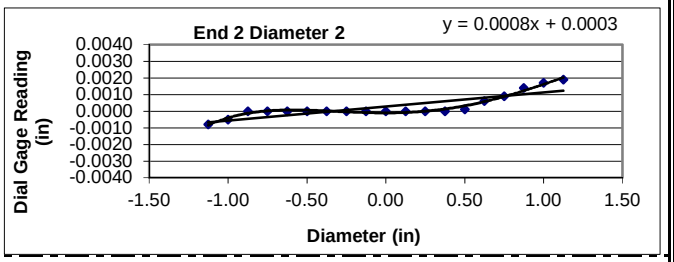
End Flatness and Parallelism Readings (Procedure FP1)

Position	End 1	End 1(90)	End 2	End 2(90)
-1 1/8	0.0044	-0.0037	0.0008	-0.0008
-1	0.0039	-0.0031	0.0008	-0.0005
- 7/8	0.0032	-0.0024	0.0005	0.0000
- 6/8	0.0027	-0.0021	0.0003	0.0000
- 5/8	0.0020	-0.0018	0.0003	0.0000
- 4/8	0.0013	-0.0014	0.0003	0.0000
- 3/8	0.0009	-0.0010	0.0003	0.0000
- 2/8	0.0008	-0.0004	0.0003	0.0000
- 1/8	0.0001	0.0000	0.0002	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	-0.0001	0.0000	0.0000	0.0000
2/8	-0.0007	0.0004	0.0000	0.0000
3/8	-0.0011	0.0010	0.0000	0.0000
4/8	-0.0015	0.0018	0.0000	0.0001
5/8	-0.0021	0.0020	0.0000	0.0006
6/8	-0.0027	0.0030	-0.0001	0.0009
7/8	-0.0032	0.0033	-0.0001	0.0014
1	-0.0034	0.0038	-0.0002	0.0017
1 1/8	-0.0038	0.0043	-0.0004	0.0019









Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? YES

Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00351
	Angle of Best Fit Line:	-0.20128
End 2:	Slope of Best Fit Line:	-0.00042
	Angle of Best Fit Line:	-0.02396
	Max Angular Difference:	**-0.18**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00333
	Angle of Best Fit Line:	0.19066
End 2:	Slope of Best Fit Line:	0.00085
	Angle of Best Fit Line:	0.04865
	Max Angular Difference:	**0.14**

Parallelism Tolerance Met? YES

Perpendicularity (Procedure P1)is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0082	0.0033	**YES**
End 1 Diam 2	0.0080	0.0032	**YES**
End 2 Diam 1	0.0012	0.0005	**YES**
End 2 Diam 2	0.0027	0.0011	**YES**

Perpendicularity Tolerance Met? YES

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

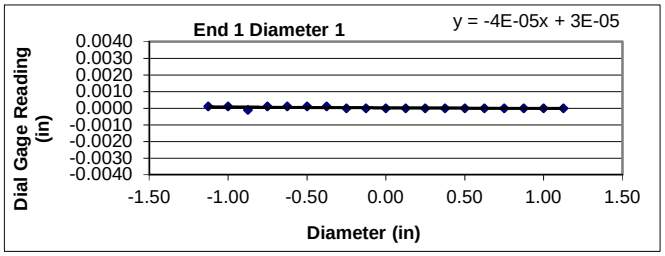
Project:	Carolina Crossroads Project	**Diameter (in):**	2.47	**Date:**	2/8/2018
Project No.:	1461-16-047 Phase 2B	**Length (in):**	5.65	**Tested by:**	BKP
Boring Id:	DH-6	**Unit Weight (pcf):**	165.1	**Reviewed by:**	JBB
Sample No.:	RC-1	**Moisture Content (%):**	0.2		
Depth (ft):	25.6 - 26.6				

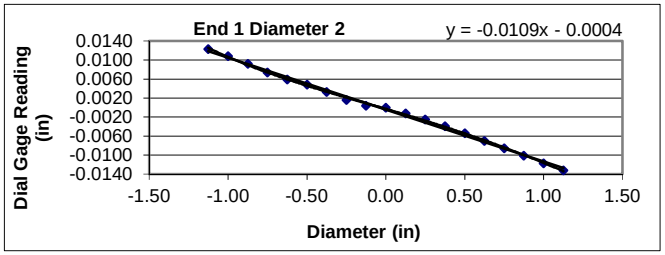
Deviation From Straightness (Procedure S1)

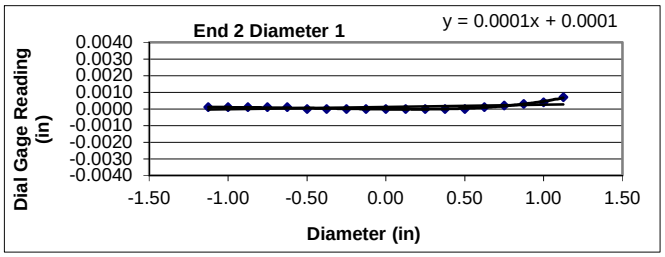
Is the maximum gap ≤ 0.02 in.? **NO** Straightness Tolerance Met? **NO**

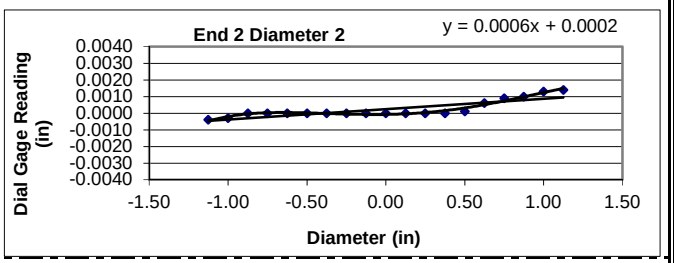
End Flatness and Parallelism Readings (Procedure FP1)

Position	End 1	End 1(90)	End 2	End 2(90)
-1 1/8	0.0001	0.0123	0.0001	-0.0004
-1	0.0001	0.0108	0.0001	-0.0003
- 7/8	-0.0001	0.0092	0.0001	0.0000
- 6/8	0.0001	0.0074	0.0001	0.0000
- 5/8	0.0001	0.0059	0.0001	0.0000
- 4/8	0.0001	0.0048	0.0000	0.0000
- 3/8	0.0001	0.0033	0.0000	0.0000
- 2/8	0.0000	0.0016	0.0000	0.0000
- 1/8	0.0000	0.0004	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	-0.0012	0.0000	0.0000
2/8	0.0000	-0.0025	0.0000	0.0000
3/8	0.0000	-0.0039	0.0000	0.0000
4/8	0.0000	-0.0054	0.0000	0.0001
5/8	0.0000	-0.0070	0.0001	0.0006
6/8	0.0000	-0.0086	0.0002	0.0009
7/8	0.0000	-0.0101	0.0003	0.0010
1	0.0000	-0.0117	0.0004	0.0013
1 1/8	0.0000	-0.0132	0.0007	0.0014









Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? YES

Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00004
	Angle of Best Fit Line:	-0.00225
End 2:	Slope of Best Fit Line:	0.00014
	Angle of Best Fit Line:	0.00788
	Max Angular Difference:	**-0.01**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.01091
	Angle of Best Fit Line:	-0.62507
End 2:	Slope of Best Fit Line:	0.00063
	Angle of Best Fit Line:	0.03603
	Max Angular Difference:	**-0.66**

Parallelism Tolerance Met? NO

Perpendicularity (Procedure P1)is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0002	0.0001	**YES**
End 1 Diam 2	0.0255	0.0103	**NO**
End 2 Diam 1	0.0007	0.0003	**YES**
End 2 Diam 2	0.0018	0.0007	**YES**

Perpendicularity Tolerance Met? NO

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

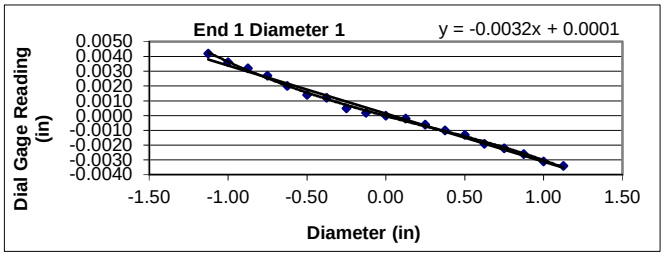
Project:	Carolina Crossroads Project	**Diameter (in):**	2.49	**Date:**	2/8/2018
Project No.:	1461-16-047 Phase 2B	**Length (in):**	5.64	**Tested by:**	BKP
Boring Id:	DH-6	**Unit Weight (pcf):**	165.7	**Reviewed by:**	JBB
Sample No.:	RC-3	**Moisture Content (%):**	0.2		
Depth (ft):	35.4-36.5				

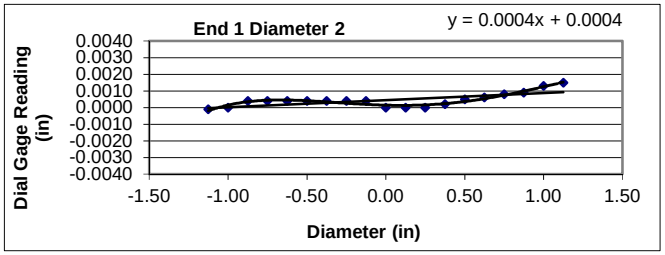
Deviation From Straightness (Procedure S1)

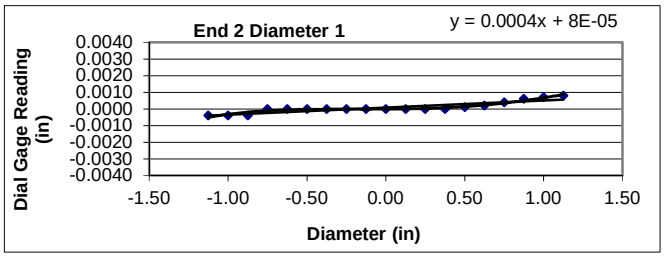
Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

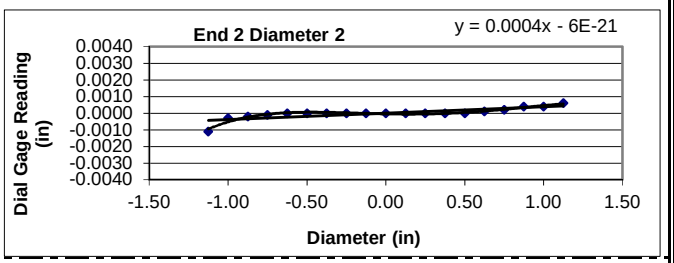
End Flatness and Parallelism Readings (Procedure FP1)

Position	End 1	End 1(90)	End 2	End 2(90)
-1 1/8	0.0042	-0.0001	-0.0004	-0.0011
-1	0.0036	0.0000	-0.0004	-0.0003
- 7/8	0.0032	0.0004	-0.0004	-0.0002
- 6/8	0.0027	0.0004	0.0000	-0.0001
- 5/8	0.0020	0.0004	0.0000	0.0000
- 4/8	0.0014	0.0004	0.0000	0.0000
- 3/8	0.0012	0.0004	0.0000	0.0000
- 2/8	0.0005	0.0004	0.0000	0.0000
- 1/8	0.0002	0.0004	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	-0.0002	0.0000	0.0000	0.0000
2/8	-0.0006	0.0000	0.0000	0.0000
3/8	-0.0010	0.0002	0.0000	0.0000
4/8	-0.0013	0.0005	0.0001	0.0000
5/8	-0.0019	0.0006	0.0002	0.0001
6/8	-0.0022	0.0008	0.0004	0.0002
7/8	-0.0026	0.0009	0.0006	0.0004
1	-0.0031	0.0013	0.0007	0.0004
1 1/8	-0.0034	0.0015	0.0008	0.0006









Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? YES

Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00325
	Angle of Best Fit Line:	-0.18616
End 2:	Slope of Best Fit Line:	0.00043
	Angle of Best Fit Line:	0.02445
	Max Angular Difference:	**-0.21**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00043
	Angle of Best Fit Line:	0.02437
End 2:	Slope of Best Fit Line:	0.00038
	Angle of Best Fit Line:	0.02203
	Max Angular Difference:	**0.00**

Parallelism Tolerance Met? YES

Perpendicularity (Procedure P1)is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0076	0.0031	**YES**
End 1 Diam 2	0.0016	0.0006	**YES**
End 2 Diam 1	0.0012	0.0005	**YES**
End 2 Diam 2	0.0017	0.0007	**YES**

Perpendicularity Tolerance Met? YES

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

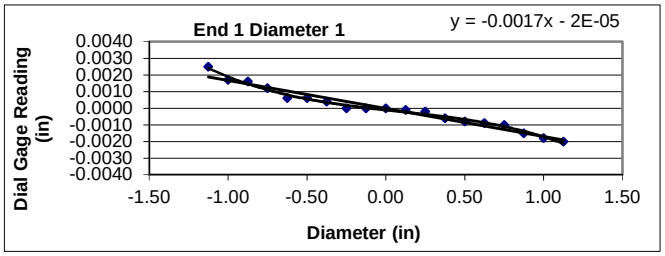
Project:	Carolina Crossroads Project	**Diameter (in):**	2.49	**Date:**	2/8/2018
Project No.:	1461-16-047 Phase 2B	**Length (in):**	5.69	**Tested by:**	BKP
Boring Id:	DH-6	**Unit Weight (pcf):**	165.4	**Reviewed by:**	JBB
Sample No.:	RC-5	**Moisture Content (%):**	0.3		
Depth (ft):	47.3-48.6				

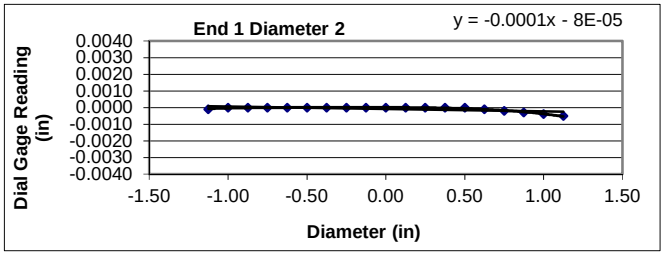
Deviation From Straightness (Procedure S1)

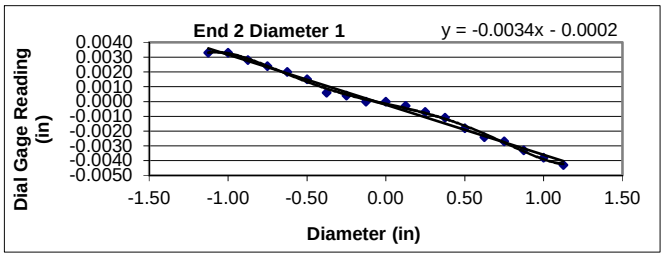
Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

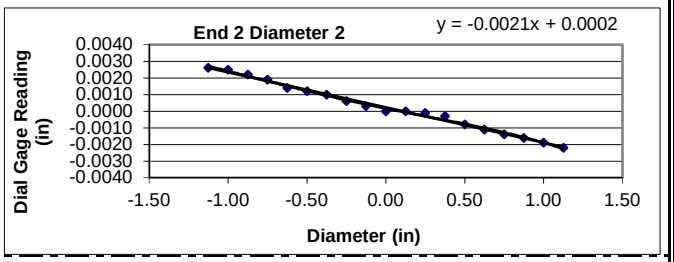
End Flatness and Parallelism Readings (Procedure FP1)

Position	End 1	End 1(90)	End 2	End 2(90)
-1 1/8	0.0025	-0.0001	0.0033	0.0026
-1	0.0017	0.0000	0.0033	0.0025
- 7/8	0.0016	0.0000	0.0028	0.0022
- 6/8	0.0012	0.0000	0.0024	0.0019
- 5/8	0.0006	0.0000	0.0020	0.0014
- 4/8	0.0006	0.0000	0.0015	0.0012
- 3/8	0.0004	0.0000	0.0006	0.0010
- 2/8	0.0000	0.0000	0.0004	0.0006
- 1/8	0.0000	0.0000	0.0000	0.0003
0	0.0000	0.0000	0.0000	0.0000
1/8	-0.0001	0.0000	-0.0003	0.0000
2/8	-0.0002	0.0000	-0.0007	-0.0001
3/8	-0.0006	0.0000	-0.0011	-0.0003
4/8	-0.0008	0.0000	-0.0018	-0.0008
5/8	-0.0009	-0.0001	-0.0024	-0.0011
6/8	-0.0010	-0.0002	-0.0027	-0.0014
7/8	-0.0015	-0.0003	-0.0033	-0.0016
1	-0.0018	-0.0004	-0.0038	-0.0019
1 1/8	-0.0020	-0.0005	-0.0043	-0.0022









Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? YES

Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00168
	Angle of Best Fit Line:	-0.09650
End 2:	Slope of Best Fit Line:	-0.00339
	Angle of Best Fit Line:	-0.19404
	Max Angular Difference:	**0.10**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00015
	Angle of Best Fit Line:	-0.00852
End 2:	Slope of Best Fit Line:	-0.00212
	Angle of Best Fit Line:	-0.12135
	Max Angular Difference:	**0.11**

Parallelism Tolerance Met? YES

Perpendicularity (Procedure P1)is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0045	0.0018	**YES**
End 1 Diam 2	0.0005	0.0002	**YES**
End 2 Diam 1	0.0076	0.0031	**YES**
End 2 Diam 2	0.0048	0.0019	**YES**

Perpendicularity Tolerance Met? YES

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

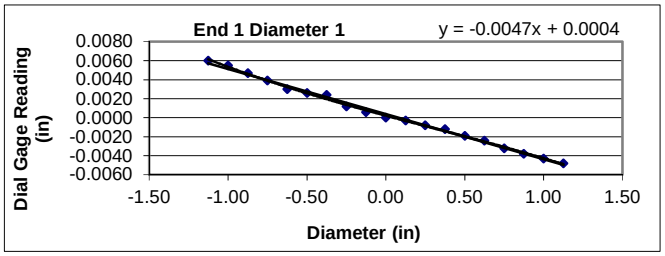
Project:	Carolina Crossroads Project	**Diameter (in):**	2.49	**Date:**	2/8/2018
Project No.:	1461-16-047 Phase 2B	**Length (in):**	5.68	**Tested by:**	BKP
Boring Id:	DH-6	**Unit Weight (pcf):**	165.2	**Reviewed by:**	JBB
Sample No.:	RC-7	**Moisture Content (%):**	0.2		
Depth (ft):	58.2-59.2				

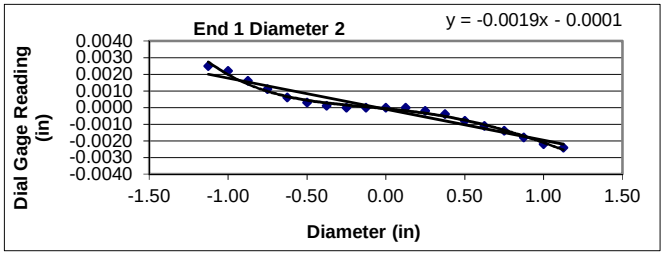
Deviation From Straightness (Procedure S1)

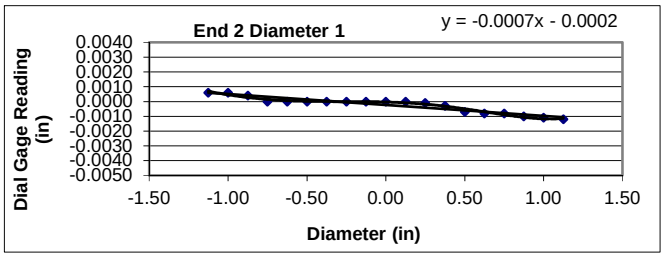
Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

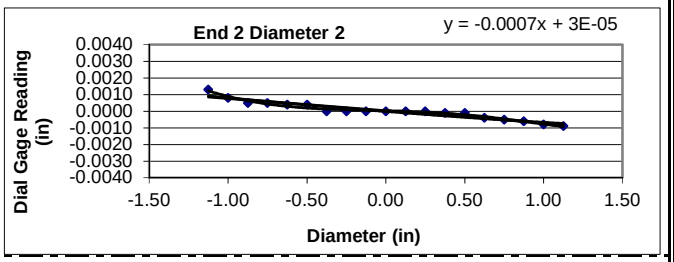
End Flatness and Parallelism Readings (Procedure FP1)

Position	End 1	End 1(90)	End 2	End 2(90)
-1 1/8	0.0060	0.0025	0.0006	0.0013
-1	0.0055	0.0022	0.0006	0.0008
- 7/8	0.0047	0.0016	0.0004	0.0005
- 6/8	0.0039	0.0011	0.0000	0.0005
- 5/8	0.0030	0.0006	0.0000	0.0004
- 4/8	0.0026	0.0003	0.0000	0.0004
- 3/8	0.0024	0.0001	0.0000	0.0000
- 2/8	0.0012	0.0000	0.0000	0.0000
- 1/8	0.0006	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	-0.0003	0.0000	0.0000	0.0000
2/8	-0.0008	-0.0002	-0.0001	0.0000
3/8	-0.0012	-0.0004	-0.0003	-0.0001
4/8	-0.0019	-0.0008	-0.0007	-0.0001
5/8	-0.0024	-0.0011	-0.0008	-0.0004
6/8	-0.0032	-0.0014	-0.0008	-0.0005
7/8	-0.0038	-0.0018	-0.0010	-0.0006
1	-0.0043	-0.0022	-0.0011	-0.0008
1 1/8	-0.0048	-0.0024	-0.0012	-0.0009









Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? YES

Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00475
	Angle of Best Fit Line:	-0.27212
End 2:	Slope of Best Fit Line:	-0.00073
	Angle of Best Fit Line:	-0.04206
	Max Angular Difference:	**-0.23**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00187
	Angle of Best Fit Line:	-0.10687
End 2:	Slope of Best Fit Line:	-0.00074
	Angle of Best Fit Line:	-0.04230
	Max Angular Difference:	**-0.06**

Parallelism Tolerance Met? YES

Perpendicularity (Procedure P1)is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0108	0.0043	**YES**
End 1 Diam 2	0.0049	0.0020	**YES**
End 2 Diam 1	0.0018	0.0007	**YES**
End 2 Diam 2	0.0022	0.0009	**YES**

Perpendicularity Tolerance Met? YES

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

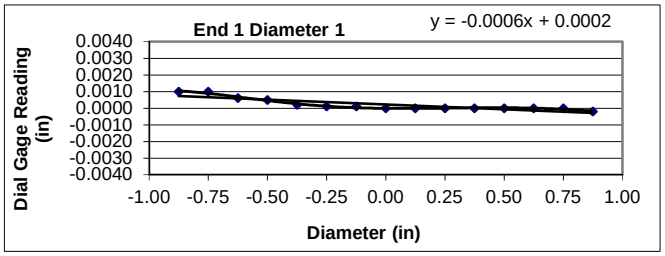
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	2/9/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.54	**Tested by:**	BKP
Boring Id:	DH-6	**Unit Weight (pcf):**	165.4	**Reviewed by:**	JBB
Sample No.:	RC-9	**Moisture Content (%):**	0.2		
Depth (ft):	60.6 - 61.7				

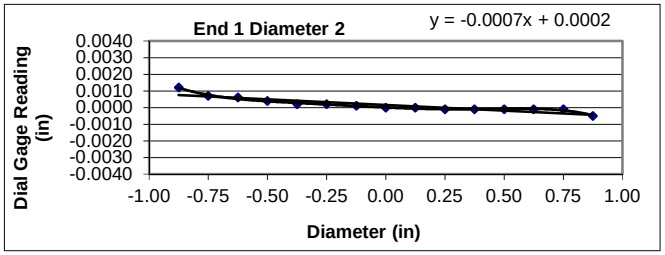
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

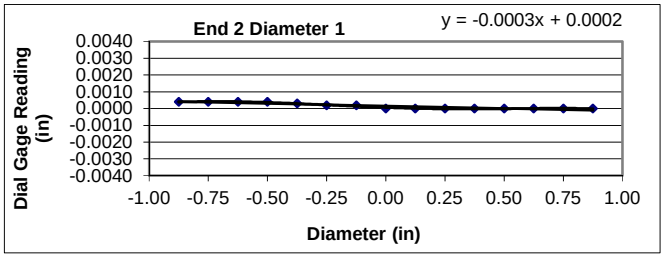
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0010	0.0012	0.0004	0.0015
- 6/8	0.0010	0.0007	0.0004	0.0008
- 5/8	0.0006	0.0006	0.0004	0.0008
- 4/8	0.0005	0.0004	0.0004	0.0007
- 3/8	0.0002	0.0002	0.0003	0.0007
- 2/8	0.0001	0.0002	0.0002	0.0006
- 1/8	0.0001	0.0001	0.0002	0.0003
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	0.0000
2/8	0.0000	-0.0001	0.0000	-0.0002
3/8	0.0000	-0.0001	0.0000	-0.0005
4/8	0.0000	-0.0001	0.0000	-0.0009
5/8	0.0000	-0.0001	0.0000	-0.0011
6/8	0.0000	-0.0001	0.0000	-0.0015
7/8	-0.0002	-0.0005	0.0000	-0.0018

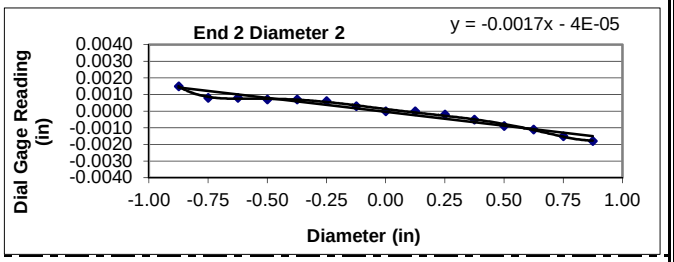




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00058
	Angle of Best Fit Line:	-0.03323
End 2:	Slope of Best Fit Line:	-0.00029
	Angle of Best Fit Line:	-0.01686
	Max Angular Difference:	**-0.02**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00068
	Angle of Best Fit Line:	-0.03896
End 2:	Slope of Best Fit Line:	-0.00167
	Angle of Best Fit Line:	-0.09544
	Max Angular Difference:	**0.06**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0012	0.0006	**YES**
End 1 Diam 2	0.0017	0.0009	**YES**
End 2 Diam 1	0.0004	0.0002	**YES**
End 2 Diam 2	0.0033	0.0017	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

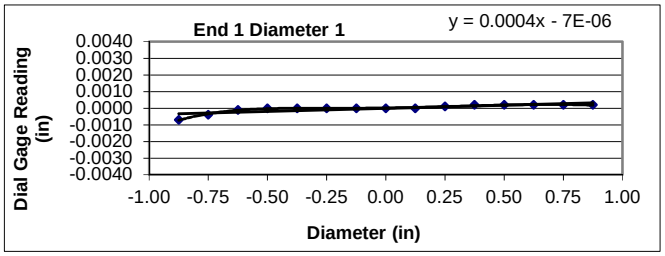
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	2/9/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.51	**Tested by:**	BKP
Boring Id:	DH-6	**Unit Weight (pcf):**	165.9	**Reviewed by:**	JBB
Sample No.:	RC-11	**Moisture Content (%):**	0.2		
Depth (ft):	70.6 - 71.8				

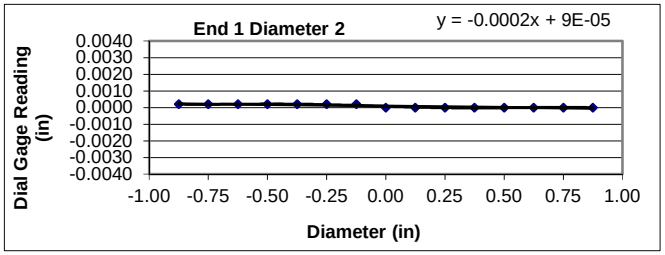
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

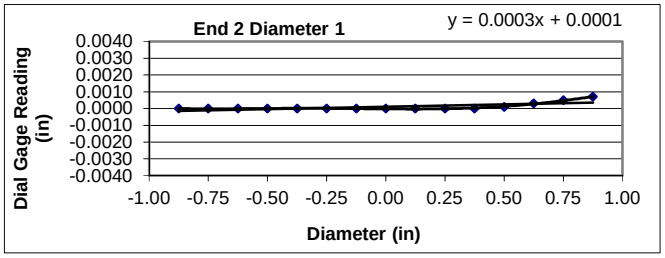
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	-0.0007	0.0002	0.0000	0.0000
- 6/8	-0.0004	0.0002	0.0000	0.0000
- 5/8	-0.0001	0.0002	0.0000	0.0000
- 4/8	0.0000	0.0002	0.0000	0.0000
- 3/8	0.0000	0.0002	0.0000	0.0000
- 2/8	0.0000	0.0002	0.0000	0.0000
- 1/8	0.0000	0.0002	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	0.0000
2/8	0.0001	0.0000	0.0000	-0.0002
3/8	0.0002	0.0000	0.0000	-0.0004
4/8	0.0002	0.0000	0.0001	-0.0006
5/8	0.0002	0.0000	0.0003	-0.0007
6/8	0.0002	0.0000	0.0005	-0.0008
7/8	0.0002	0.0000	0.0007	-0.0011

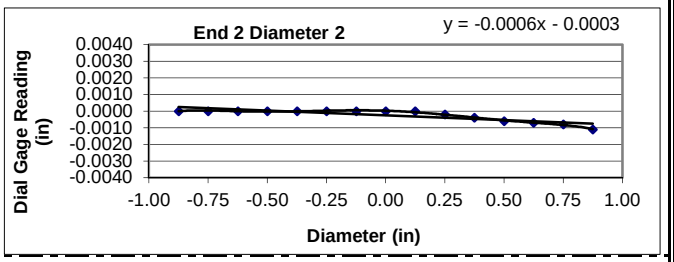




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	0.00037
	Angle of Best Fit Line:	0.02128
End 2:	Slope of Best Fit Line:	0.00028
	Angle of Best Fit Line:	0.01604
	Max Angular Difference:	**0.01**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00016
	Angle of Best Fit Line:	-0.00917
End 2:	Slope of Best Fit Line:	-0.00057
	Angle of Best Fit Line:	-0.03274
	Max Angular Difference:	**0.02**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0009	0.0005	**YES**
End 1 Diam 2	0.0002	0.0001	**YES**
End 2 Diam 1	0.0007	0.0004	**YES**
End 2 Diam 2	0.0011	0.0006	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

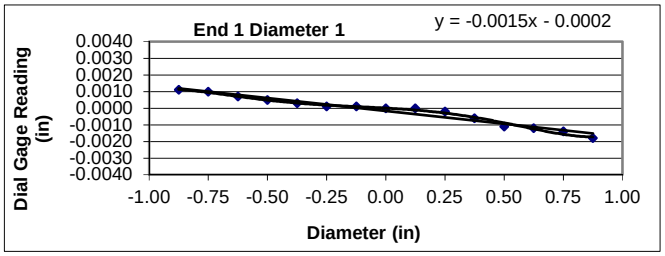
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	2/9/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.52	**Tested by:**	BKP
Boring Id:	DH-6	**Unit Weight (pcf):**	165.6	**Reviewed by:**	JBB
Sample No.:	RC-13	**Moisture Content (%):**	0.2		
Depth (ft):	80.6 - 81.8				

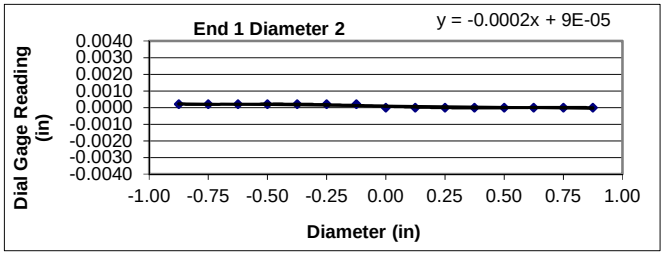
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

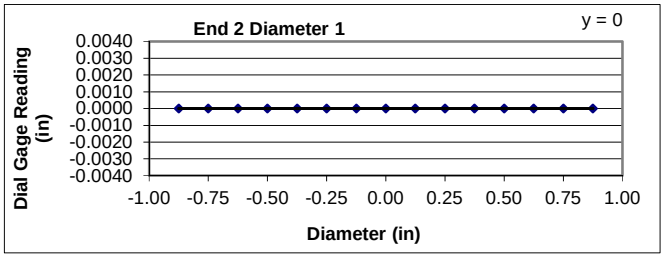
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0011	0.0002	0.0000	-0.0007
- 6/8	0.0010	0.0002	0.0000	-0.0004
- 5/8	0.0007	0.0002	0.0000	-0.0003
- 4/8	0.0005	0.0002	0.0000	0.0000
- 3/8	0.0003	0.0002	0.0000	0.0000
- 2/8	0.0001	0.0002	0.0000	0.0000
- 1/8	0.0001	0.0002	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	0.0000
2/8	-0.0002	0.0000	0.0000	0.0002
3/8	-0.0006	0.0000	0.0000	0.0004
4/8	-0.0011	0.0000	0.0000	0.0005
5/8	-0.0012	0.0000	0.0000	0.0008
6/8	-0.0014	0.0000	0.0000	0.0011
7/8	-0.0018	0.0000	0.0000	0.0013

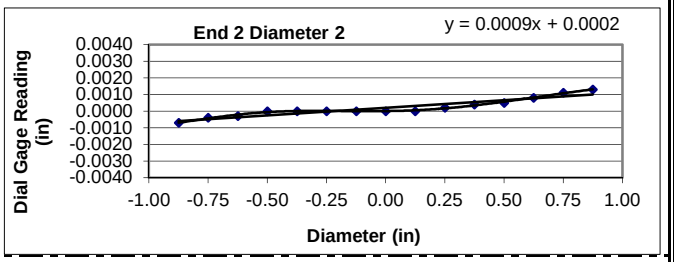




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00154
	Angle of Best Fit Line:	-0.08840
End 2:	Slope of Best Fit Line:	0.00000
	Angle of Best Fit Line:	0.00000
	Max Angular Difference:	**-0.09**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00016
	Angle of Best Fit Line:	-0.00917
End 2:	Slope of Best Fit Line:	0.00092
	Angle of Best Fit Line:	0.05255
	Max Angular Difference:	**-0.06**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0029	0.0015	**YES**
End 1 Diam 2	0.0002	0.0001	**YES**
End 2 Diam 1	0.0000	0.0000	**YES**
End 2 Diam 2	0.0020	0.0010	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

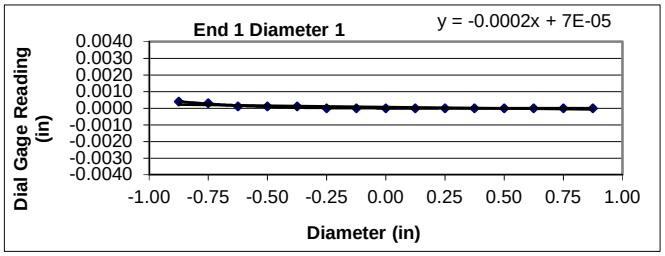
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	2/9/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.49	**Tested by:**	BKP
Boring Id:	DH-6	**Unit Weight (pcf):**	165.8	**Reviewed by:**	JBB
Sample No.:	RC-15	**Moisture Content (%):**	0.2		
Depth (ft):	94.4 - 95.6				

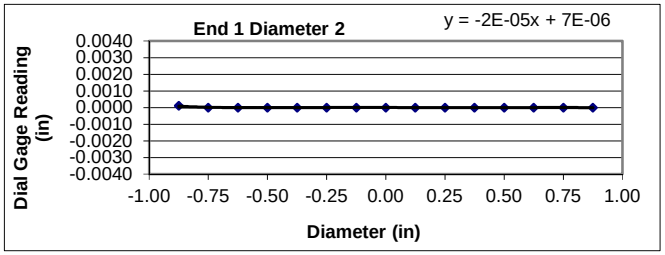
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

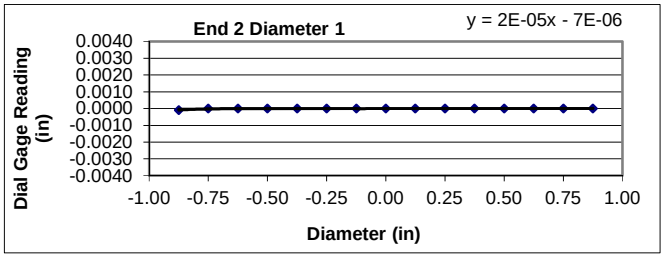
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0004	0.0001	-0.0001	0.0001
- 6/8	0.0003	0.0000	0.0000	0.0001
- 5/8	0.0001	0.0000	0.0000	0.0000
- 4/8	0.0001	0.0000	0.0000	0.0000
- 3/8	0.0001	0.0000	0.0000	0.0000
- 2/8	0.0000	0.0000	0.0000	0.0000
- 1/8	0.0000	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	0.0000
2/8	0.0000	0.0000	0.0000	0.0000
3/8	0.0000	0.0000	0.0000	0.0000
4/8	0.0000	0.0000	0.0000	0.0000
5/8	0.0000	0.0000	0.0000	0.0000
6/8	0.0000	0.0000	0.0000	0.0000
7/8	0.0000	0.0000	0.0000	0.0000

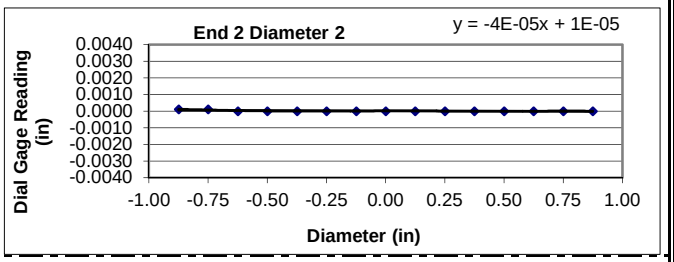




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00017
	Angle of Best Fit Line:	-0.00949
End 2:	Slope of Best Fit Line:	0.00002
	Angle of Best Fit Line:	0.00115
	Max Angular Difference:	**-0.01**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00002
	Angle of Best Fit Line:	-0.00115
End 2:	Slope of Best Fit Line:	-0.00004
	Angle of Best Fit Line:	-0.00213
	Max Angular Difference:	**0.00**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0004	0.0002	**YES**
End 1 Diam 2	0.0001	0.0001	**YES**
End 2 Diam 1	0.0001	0.0001	**YES**
End 2 Diam 2	0.0001	0.0001	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

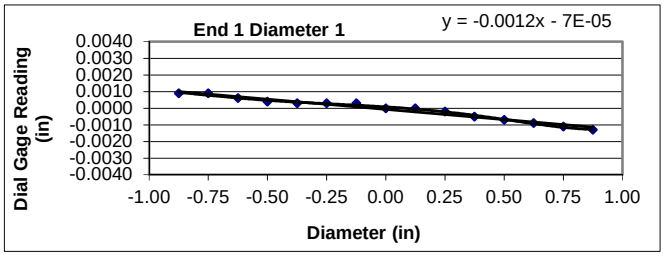
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	2/9/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.50	**Tested by:**	BKP
Boring Id:	B-38	**Unit Weight (pcf):**	168.9	**Reviewed by:**	JBB
Sample No.:	RC-1	**Moisture Content (%):**	0.2		
Depth (ft):	11.9 - 13.1				

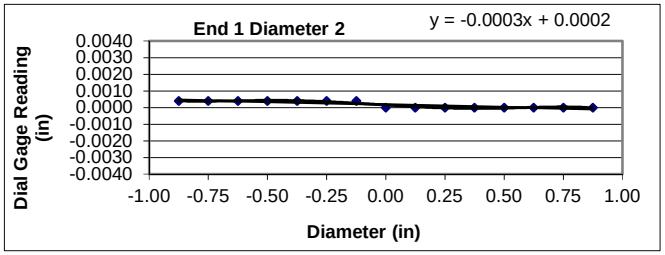
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

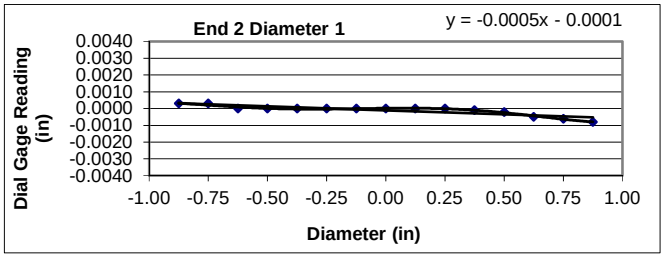
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0009	0.0004	0.0003	-0.0033
- 6/8	0.0009	0.0004	0.0003	-0.0025
- 5/8	0.0006	0.0004	0.0000	-0.0018
- 4/8	0.0004	0.0004	0.0000	-0.0018
- 3/8	0.0003	0.0004	0.0000	-0.0013
- 2/8	0.0003	0.0004	0.0000	-0.0005
- 1/8	0.0003	0.0004	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	0.0001
2/8	-0.0002	0.0000	0.0000	0.0003
3/8	-0.0005	0.0000	-0.0001	0.0009
4/8	-0.0007	0.0000	-0.0002	0.0016
5/8	-0.0009	0.0000	-0.0005	0.0019
6/8	-0.0011	0.0000	-0.0006	0.0027
7/8	-0.0013	0.0000	-0.0008	0.0035

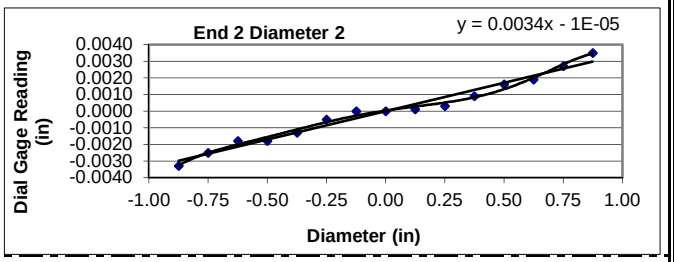




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00123
	Angle of Best Fit Line:	-0.07039
End 2:	Slope of Best Fit Line:	-0.00048
	Angle of Best Fit Line:	-0.02734
	Max Angular Difference:	**-0.04**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00032
	Angle of Best Fit Line:	-0.01833
End 2:	Slope of Best Fit Line:	0.00341
	Angle of Best Fit Line:	0.19513
	Max Angular Difference:	**-0.21**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0022	0.0011	**YES**
End 1 Diam 2	0.0004	0.0002	**YES**
End 2 Diam 1	0.0011	0.0006	**YES**
End 2 Diam 2	0.0068	0.0034	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

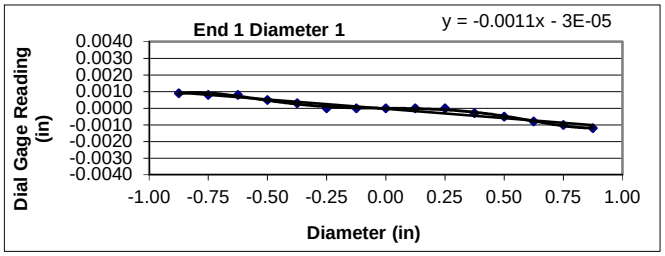
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	2/9/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.46	**Tested by:**	BKP
Boring Id:	B-38	**Unit Weight (pcf):**	165.3	**Reviewed by:**	JBB
Sample No.:	RC-3	**Moisture Content (%):**	0.1		
Depth (ft):	20.5 - 21.6				

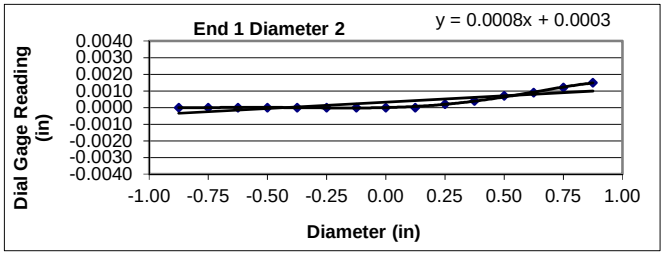
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

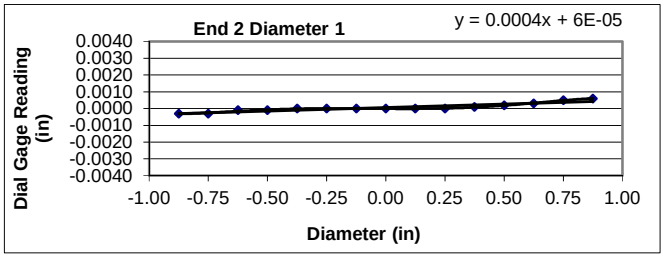
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0009	0.0000	-0.0003	0.0000
- 6/8	0.0008	0.0000	-0.0003	0.0000
- 5/8	0.0008	0.0000	-0.0001	0.0000
- 4/8	0.0005	0.0000	-0.0001	0.0000
- 3/8	0.0003	0.0000	0.0000	0.0000
- 2/8	0.0000	0.0000	0.0000	0.0000
- 1/8	0.0000	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	0.0000
2/8	0.0000	0.0002	0.0000	0.0001
3/8	-0.0003	0.0004	0.0001	0.0003
4/8	-0.0005	0.0007	0.0002	0.0003
5/8	-0.0008	0.0009	0.0003	0.0008
6/8	-0.0010	0.0012	0.0005	0.0011
7/8	-0.0012	0.0015	0.0006	0.0012

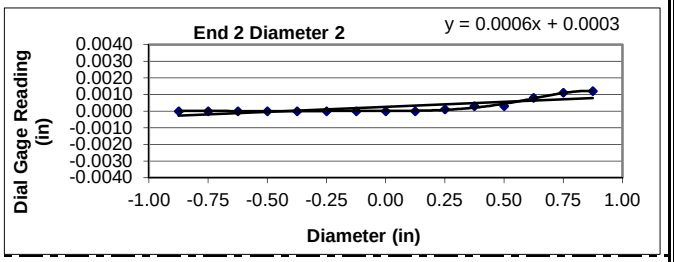




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00112
	Angle of Best Fit Line:	-0.06433
End 2:	Slope of Best Fit Line:	0.00042
	Angle of Best Fit Line:	0.02390
	Max Angular Difference:	**-0.09**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00076
	Angle of Best Fit Line:	0.04354
End 2:	Slope of Best Fit Line:	0.00061
	Angle of Best Fit Line:	0.03487
	Max Angular Difference:	**0.01**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0021	0.0011	**YES**
End 1 Diam 2	0.0015	0.0008	**YES**
End 2 Diam 1	0.0009	0.0005	**YES**
End 2 Diam 2	0.0012	0.0006	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

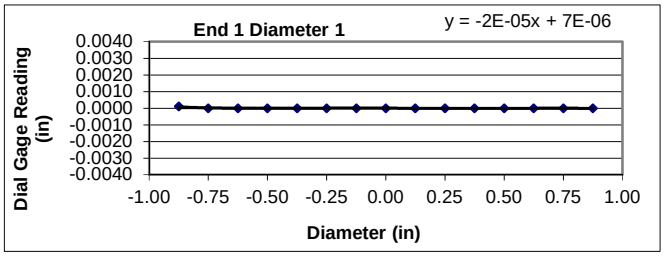
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	2/9/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.51	**Tested by:**	BKP
Boring Id:	B-38	**Unit Weight (pcf):**	166.0	**Reviewed by:**	JBB
Sample No.:	RC-5	**Moisture Content (%):**	0.1		
Depth (ft):	30.5 - 31.7				

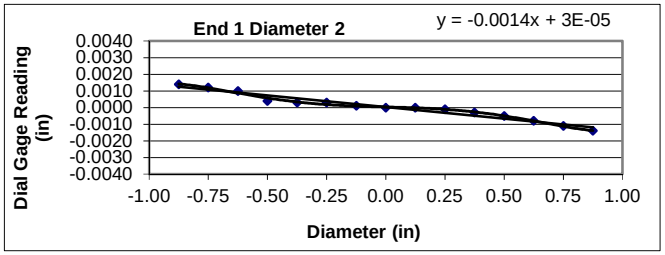
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

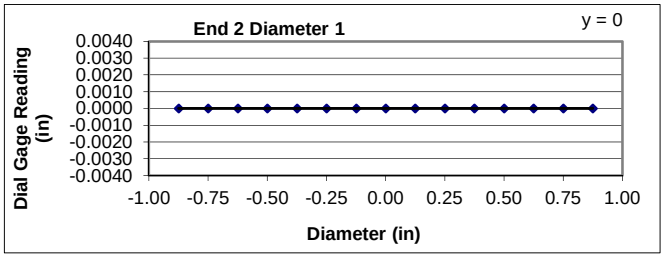
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0001	0.0014	0.0000	0.0032
- 6/8	0.0000	0.0012	0.0000	0.0024
- 5/8	0.0000	0.0010	0.0000	0.0018
- 4/8	0.0000	0.0004	0.0000	0.0010
- 3/8	0.0000	0.0003	0.0000	0.0005
- 2/8	0.0000	0.0003	0.0000	0.0001
- 1/8	0.0000	0.0001	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	-0.0003
2/8	0.0000	-0.0001	0.0000	-0.0009
3/8	0.0000	-0.0003	0.0000	-0.0016
4/8	0.0000	-0.0005	0.0000	-0.0019
5/8	0.0000	-0.0008	0.0000	-0.0024
6/8	0.0000	-0.0011	0.0000	-0.0030
7/8	0.0000	-0.0014	0.0000	-0.0036

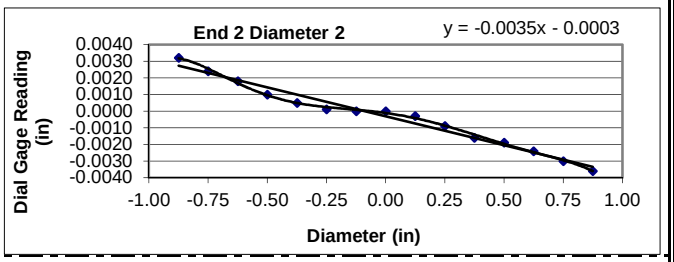




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00002
	Angle of Best Fit Line:	-0.00115
End 2:	Slope of Best Fit Line:	0.00000
	Angle of Best Fit Line:	0.00000
	Max Angular Difference:	**0.00**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00139
	Angle of Best Fit Line:	-0.07972
End 2:	Slope of Best Fit Line:	-0.00346
	Angle of Best Fit Line:	-0.19841
	Max Angular Difference:	**0.12**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0001	0.0001	**YES**
End 1 Diam 2	0.0028	0.0014	**YES**
End 2 Diam 1	0.0000	0.0000	**YES**
End 2 Diam 2	0.0068	0.0034	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

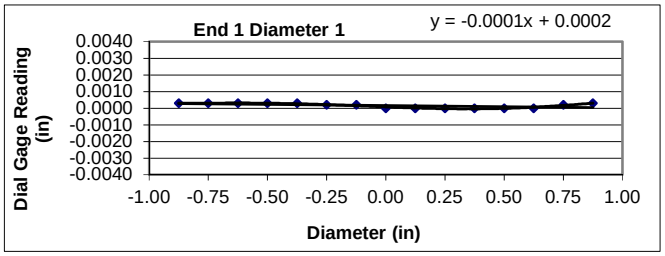
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	2/9/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.51	**Tested by:**	BKP
Boring Id:	B-40	**Unit Weight (pcf):**	163.0	**Reviewed by:**	JBB
Sample No.:	RC-1	**Moisture Content (%):**	0.3		
Depth (ft):	77.7 - 78.5				

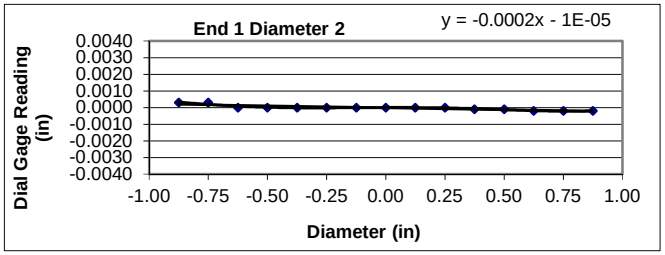
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

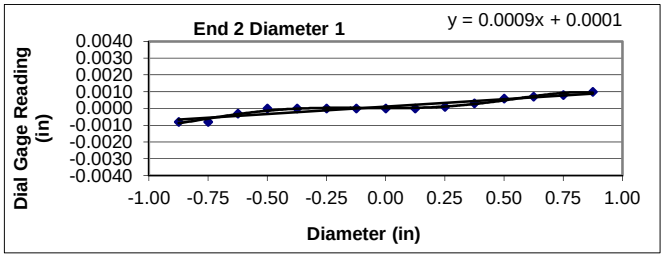
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0003	0.0003	-0.0008	0.0012
- 6/8	0.0003	0.0003	-0.0008	0.0010
- 5/8	0.0003	0.0000	-0.0003	0.0010
- 4/8	0.0003	0.0000	0.0000	0.0008
- 3/8	0.0003	0.0000	0.0000	0.0007
- 2/8	0.0002	0.0000	0.0000	0.0007
- 1/8	0.0002	0.0000	0.0000	0.0004
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	-0.0001
2/8	0.0000	0.0000	0.0001	-0.0001
3/8	0.0000	-0.0001	0.0003	-0.0003
4/8	0.0000	-0.0001	0.0006	-0.0004
5/8	0.0000	-0.0002	0.0007	-0.0006
6/8	0.0002	-0.0002	0.0008	-0.0009
7/8	0.0003	-0.0002	0.0010	-0.0010

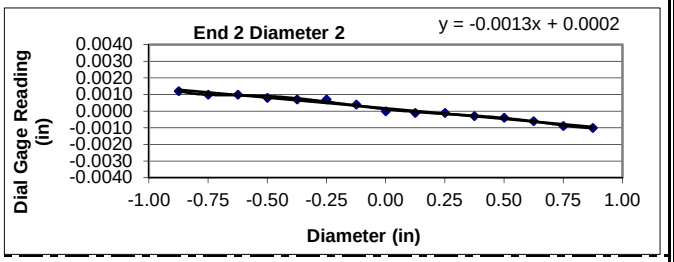




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00014
	Angle of Best Fit Line:	-0.00786
End 2:	Slope of Best Fit Line:	0.00088
	Angle of Best Fit Line:	0.05026
	Max Angular Difference:	**-0.06**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00023
	Angle of Best Fit Line:	-0.01342
End 2:	Slope of Best Fit Line:	-0.00128
	Angle of Best Fit Line:	-0.07317
	Max Angular Difference:	**0.06**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0003	0.0002	**YES**
End 1 Diam 2	0.0005	0.0003	**YES**
End 2 Diam 1	0.0018	0.0009	**YES**
End 2 Diam 2	0.0022	0.0011	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

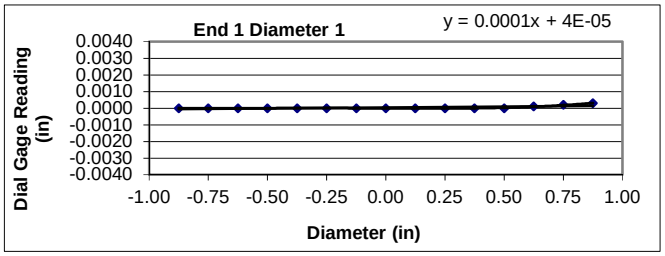
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	2/9/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.53	**Tested by:**	BKP
Boring Id:	B-40	**Unit Weight (pcf):**	165.8	**Reviewed by:**	JBB
Sample No.:	RC-3	**Moisture Content (%):**	0.1		
Depth (ft):	84.3 - 85.1				

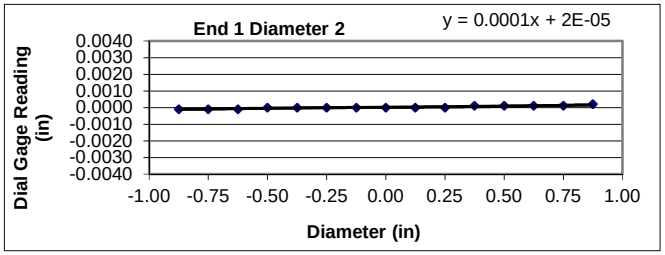
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

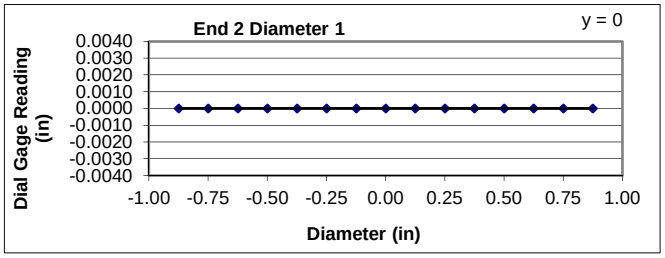
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0000	-0.0001	0.0000	0.0000
- 6/8	0.0000	-0.0001	0.0000	0.0000
- 5/8	0.0000	-0.0001	0.0000	0.0000
- 4/8	0.0000	0.0000	0.0000	0.0000
- 3/8	0.0000	0.0000	0.0000	0.0000
- 2/8	0.0000	0.0000	0.0000	0.0000
- 1/8	0.0000	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	0.0000
2/8	0.0000	0.0000	0.0000	0.0000
3/8	0.0000	0.0001	0.0000	0.0000
4/8	0.0000	0.0001	0.0000	0.0000
5/8	0.0001	0.0001	0.0000	-0.0001
6/8	0.0002	0.0001	0.0000	-0.0001
7/8	0.0003	0.0002	0.0000	-0.0001

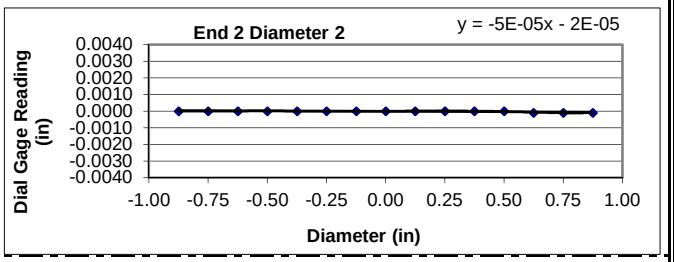




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	0.00011
	Angle of Best Fit Line:	0.00622
End 2:	Slope of Best Fit Line:	0.00000
	Angle of Best Fit Line:	0.00000
	Max Angular Difference:	**0.01**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00014
	Angle of Best Fit Line:	0.00819
End 2:	Slope of Best Fit Line:	-0.00005
	Angle of Best Fit Line:	-0.00295
	Max Angular Difference:	**0.01**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0003	0.0002	**YES**
End 1 Diam 2	0.0003	0.0002	**YES**
End 2 Diam 1	0.0000	0.0000	**YES**
End 2 Diam 2	0.0001	0.0001	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

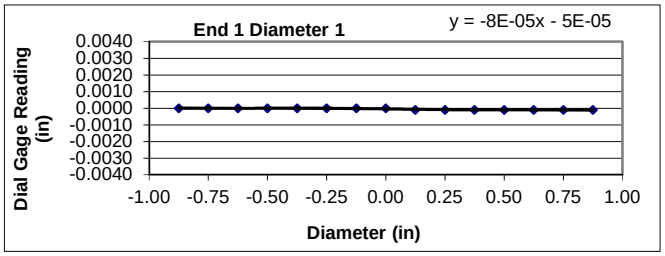
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	2/9/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.23	**Tested by:**	BKP
Boring Id:	B-41	**Unit Weight (pcf):**	158.8	**Reviewed by:**	JBB
Sample No.:	RC-2	**Moisture Content (%):**	0.4		
Depth (ft):	60.2 - 61.3				

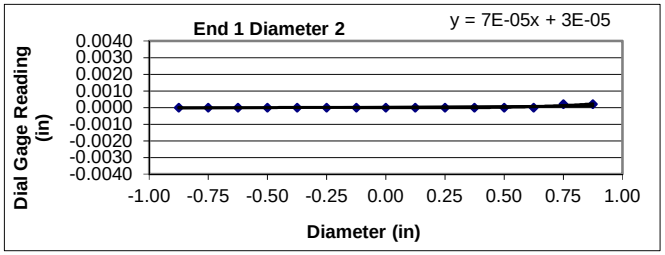
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

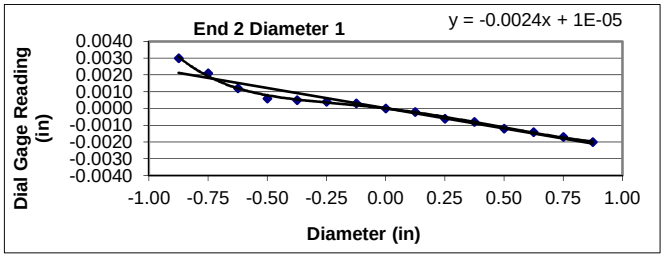
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0000	0.0000	0.0030	0.0004
- 6/8	0.0000	0.0000	0.0021	0.0000
- 5/8	0.0000	0.0000	0.0012	0.0000
- 4/8	0.0000	0.0000	0.0006	0.0000
- 3/8	0.0000	0.0000	0.0005	0.0000
- 2/8	0.0000	0.0000	0.0004	0.0000
- 1/8	0.0000	0.0000	0.0003	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	-0.0001	0.0000	-0.0002	0.0000
2/8	-0.0001	0.0000	-0.0006	0.0000
3/8	-0.0001	0.0000	-0.0008	0.0000
4/8	-0.0001	0.0000	-0.0012	0.0000
5/8	-0.0001	0.0000	-0.0014	0.0000
6/8	-0.0001	0.0002	-0.0017	0.0000
7/8	-0.0001	0.0002	-0.0020	0.0000

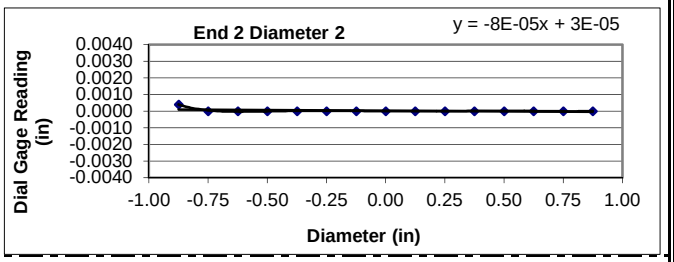




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00008
	Angle of Best Fit Line:	-0.00458
End 2:	Slope of Best Fit Line:	-0.00241
	Angle of Best Fit Line:	-0.13816
	Max Angular Difference:	**0.13**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00007
	Angle of Best Fit Line:	0.00426
End 2:	Slope of Best Fit Line:	-0.00008
	Angle of Best Fit Line:	-0.00458
	Max Angular Difference:	**0.01**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0001	0.0001	**YES**
End 1 Diam 2	0.0002	0.0001	**YES**
End 2 Diam 1	0.0050	0.0025	**YES**
End 2 Diam 2	0.0004	0.0002	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

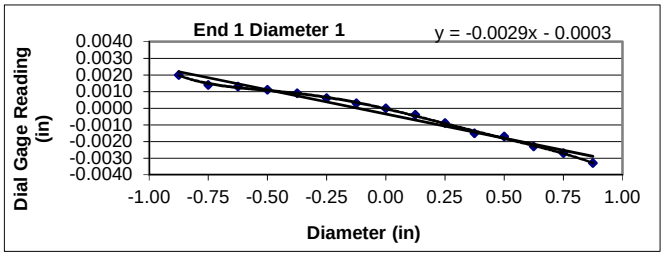
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	2/9/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.50	**Tested by:**	BKP
Boring Id:	B-41	**Unit Weight (pcf):**	164.5	**Reviewed by:**	JBB
Sample No.:	RC-5	**Moisture Content (%):**	0.3		
Depth (ft):	75.5 - 76.4				

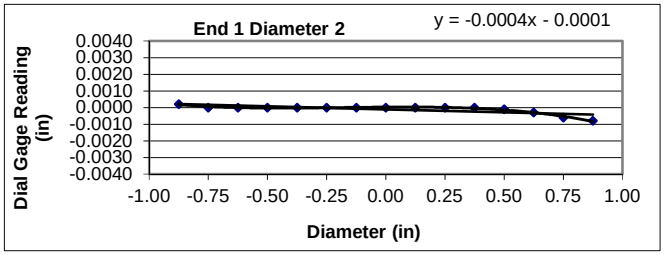
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

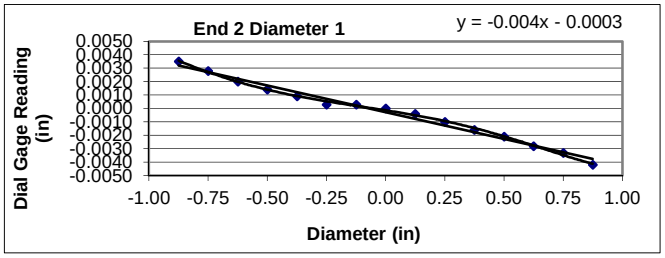
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0020	0.0002	0.0035	-0.0005
- 6/8	0.0014	0.0000	0.0028	-0.0001
- 5/8	0.0013	0.0000	0.0020	0.0001
- 4/8	0.0011	0.0000	0.0014	0.0002
- 3/8	0.0009	0.0000	0.0009	0.0002
- 2/8	0.0006	0.0000	0.0003	0.0002
- 1/8	0.0003	0.0000	0.0003	0.0002
0	0.0000	0.0000	0.0000	0.0000
1/8	-0.0004	0.0000	-0.0004	0.0000
2/8	-0.0009	0.0000	-0.0010	0.0002
3/8	-0.0015	0.0000	-0.0016	0.0006
4/8	-0.0017	-0.0001	-0.0021	0.0008
5/8	-0.0023	-0.0003	-0.0028	0.0014
6/8	-0.0027	-0.0006	-0.0033	0.0015
7/8	-0.0033	-0.0008	-0.0042	0.0018

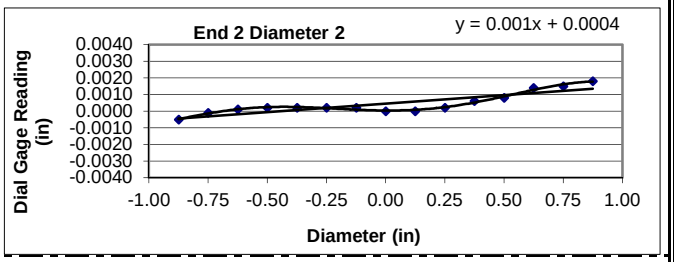




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00291
	Angle of Best Fit Line:	-0.16665
End 2:	Slope of Best Fit Line:	-0.00398
	Angle of Best Fit Line:	-0.22804
	Max Angular Difference:	**0.06**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00036
	Angle of Best Fit Line:	-0.02046
End 2:	Slope of Best Fit Line:	0.00102
	Angle of Best Fit Line:	0.05828
	Max Angular Difference:	**-0.08**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0053	0.0027	**YES**
End 1 Diam 2	0.0010	0.0005	**YES**
End 2 Diam 1	0.0077	0.0039	**YES**
End 2 Diam 2	0.0023	0.0012	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

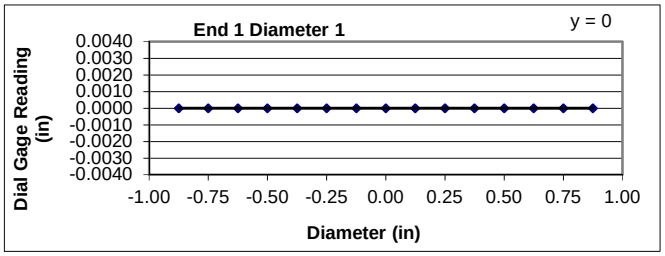
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	2/9/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.32	**Tested by:**	BKP
Boring Id:	B-59	**Unit Weight (pcf):**	170.6	**Reviewed by:**	JBB
Sample No.:	RC-2	**Moisture Content (%):**	1.3		
Depth (ft):	115.4 - 116.1				

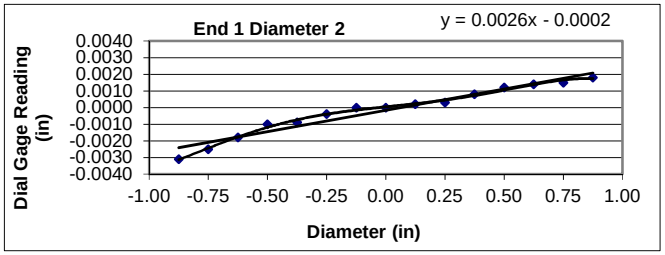
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

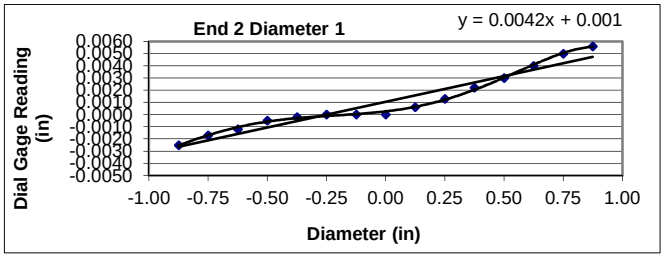
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0000	-0.0031	-0.0025	-0.0040
- 6/8	0.0000	-0.0025	-0.0017	-0.0033
- 5/8	0.0000	-0.0018	-0.0012	-0.0028
- 4/8	0.0000	-0.0010	-0.0005	-0.0025
- 3/8	0.0000	-0.0009	-0.0002	-0.0019
- 2/8	0.0000	-0.0004	0.0000	-0.0010
- 1/8	0.0000	0.0000	0.0000	-0.0002
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0002	0.0006	0.0000
2/8	0.0000	0.0003	0.0013	0.0004
3/8	0.0000	0.0008	0.0022	0.0013
4/8	0.0000	0.0012	0.0030	0.0022
5/8	0.0000	0.0014	0.0040	0.0030
6/8	0.0000	0.0015	0.0050	0.0037
7/8	0.0000	0.0018	0.0056	0.0040

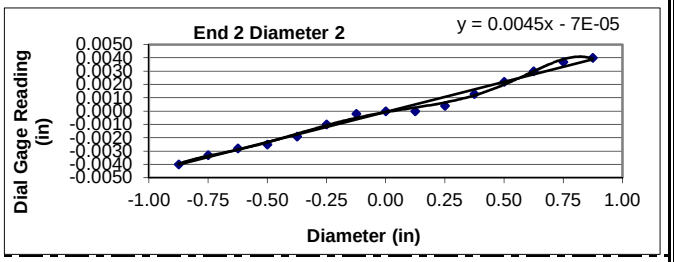




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	0.00000
	Angle of Best Fit Line:	0.00000
End 2:	Slope of Best Fit Line:	0.00421
	Angle of Best Fit Line:	0.24113
	Max Angular Difference:	**-0.24**

Parrallelism Diameter 2

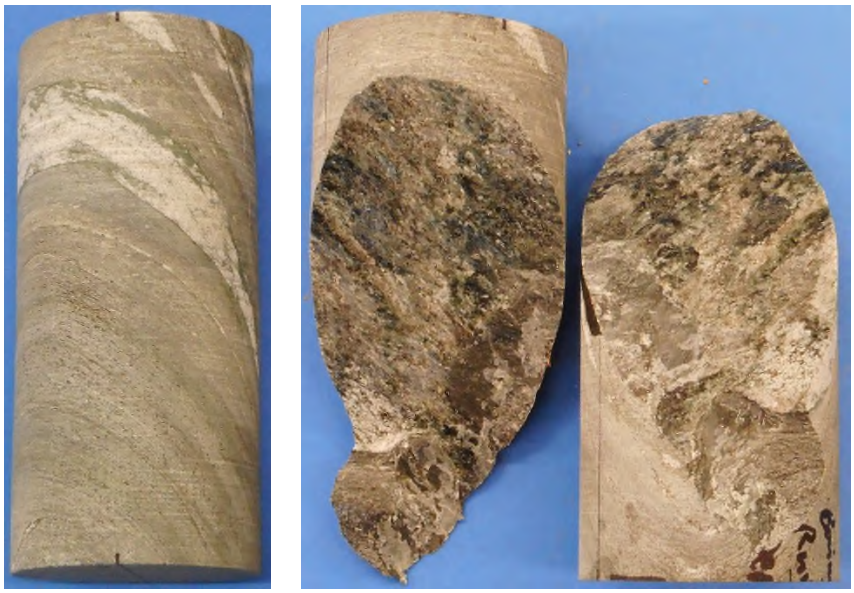
End 1:	Slope of Best Fit Line:	0.00257
	Angle of Best Fit Line:	0.14700
End 2:	Slope of Best Fit Line:	0.00453
	Angle of Best Fit Line:	0.25930
	Max Angular Difference:	**-0.11**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0000	0.0000	**YES**
End 1 Diam 2	0.0049	0.0025	**YES**
End 2 Diam 1	0.0081	0.0041	**YES**
End 2 Diam 2	0.0080	0.0040	**YES**

Perpendicularity Tolerance Met? **YES**



Date: 2/19/2018

Photographer: Ben Painter

1	**Location / Orientation**	DH-4, RC-2 (55.2' – 56.4')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 2/19/2018

Photographer: Ben Painter

2	**Location / Orientation**	DH-4, RC-4 (65.2' – 66.3')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 2/19/2018

Photographer: Ben Painter

3	**Location / Orientation**	DH-4, RC-6 (75.2' – 76.3')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 2/19/2018

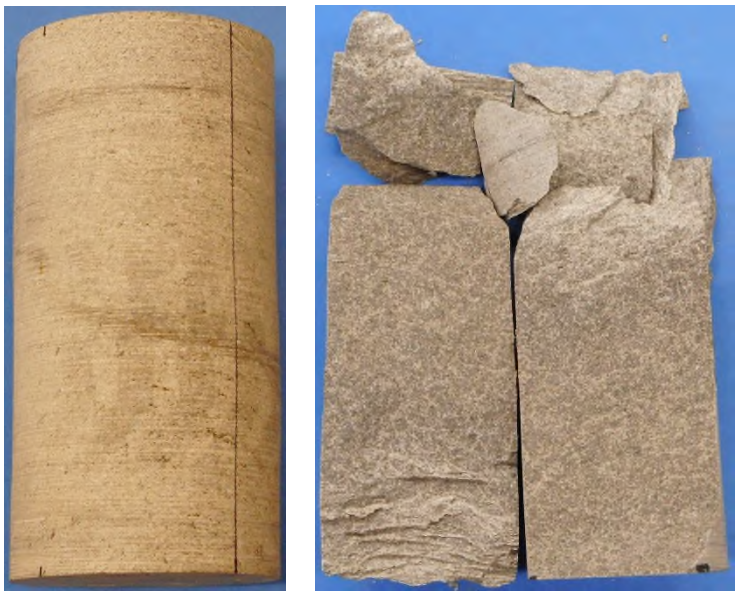
Photographer: Ben Painter

4	**Location / Orientation**	DH-4, RC-8 (85.2' – 86.7')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 2/19/2018

Photographer: Ben Painter

5	**Location / Orientation**	DH-4, RC-10 (96.7' – 97.5')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)



Date: 2/19/2018

Photographer: Ben Painter

6	**Location / Orientation**	DH-4, RC-12 (106.2' – 107.5')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 2/19/2018

Photographer: Ben Painter

7	**Location / Orientation**	DH-4, RC-14 (115.2' – 116.4')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 2/19/2018

Photographer: Ben Painter

8	**Location / Orientation**	DH-5, RC-2 (45.6' – 46.8')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 2/19/2018

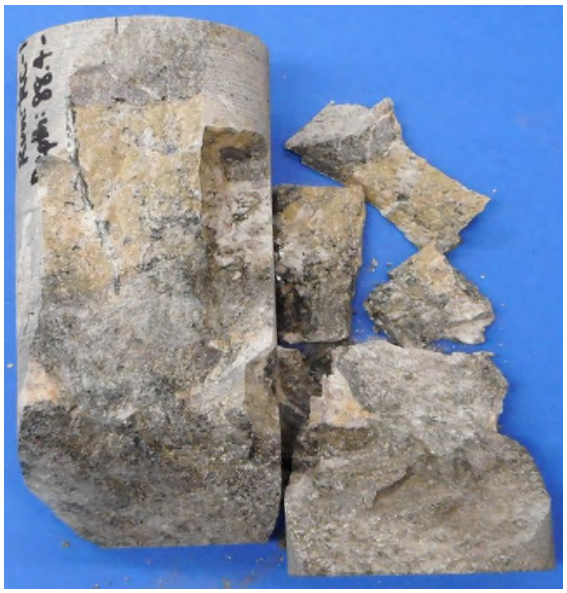
Photographer: Ben Painter

9	**Location / Orientation**	DH-5, RC-4 (56.2' – 57.3')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 2/19/2018

Photographer: Ben Painter

10	**Location / Orientation**	DH-5, RC-8 (75.9' – 76.9')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)



Date: 2/19/2018

Photographer: Ben Painter

11	**Location / Orientation**	DH-5, RC-10 (88.4' – 89.4')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 2/19/2018

Photographer: Ben Painter

12	**Location / Orientation**	DH-5, RC-12 (95.6' – 96.5')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 2/19/2018

Photographer: Ben Painter

13	**Location / Orientation**	DH-5, RC-14 (106.2' – 107.3')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 2/19/2018

Photographer: Ben Painter

14	**Location / Orientation**	DH-6, RC-1 (25.6' – 26.6')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 2/19/2018

Photographer: Ben Painter

15	**Location / Orientation**	DH-6, RC-3 (35.4' – 36.5')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 2/19/2018

Photographer: Ben Painter

16	**Location / Orientation**	DH-6, RC-5 (47.3' – 48.6')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 2/19/2018

Photographer: Ben Painter

17	**Location / Orientation**	DH-6, RC-7 (58.2' – 59.2')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 2/19/2018

Photographer: Ben Painter

18	**Location / Orientation**	DH-6, RC-9 (60.6' – 61.7')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 2/19/2018

Photographer: Ben Painter

19	**Location / Orientation**	DH-6, RC-11 (70.6' – 71.8')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 2/19/2018

Photographer: Ben Painter

20	**Location / Orientation**	DH-6, RC-13 (80.6' – 81.8')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 2/19/2018

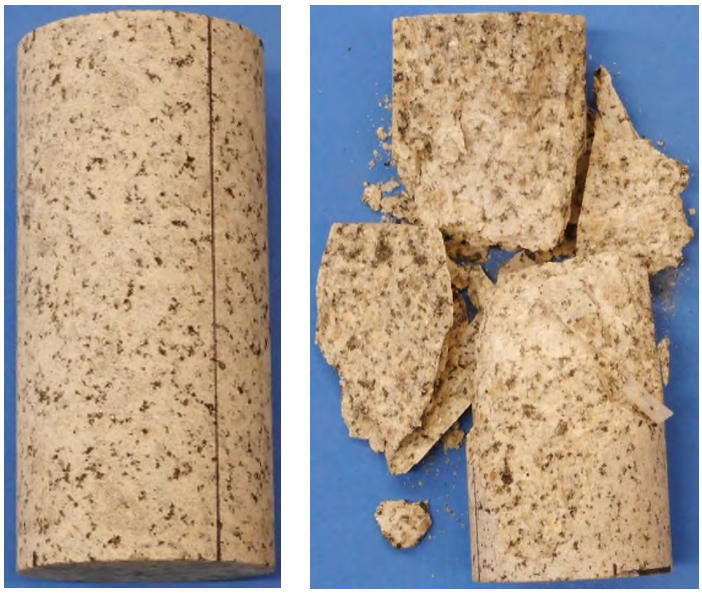
Photographer: Ben Painter

21	**Location / Orientation**	DH-6, RC-15 (94.4' – 95.6')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 2/19/2018

Photographer: Ben Painter

22	**Location / Orientation**	B-38, RC-1 (11.9' – 13.1')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)



Date: 2/19/2018

Photographer: Ben Painter

23	**Location / Orientation**	B-38, RC-3 (20.5' – 21.6')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 2/19/2018

Photographer: Ben Painter

24	**Location / Orientation**	B-38, RC-5 (30.5' – 31.7')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 2/19/2018

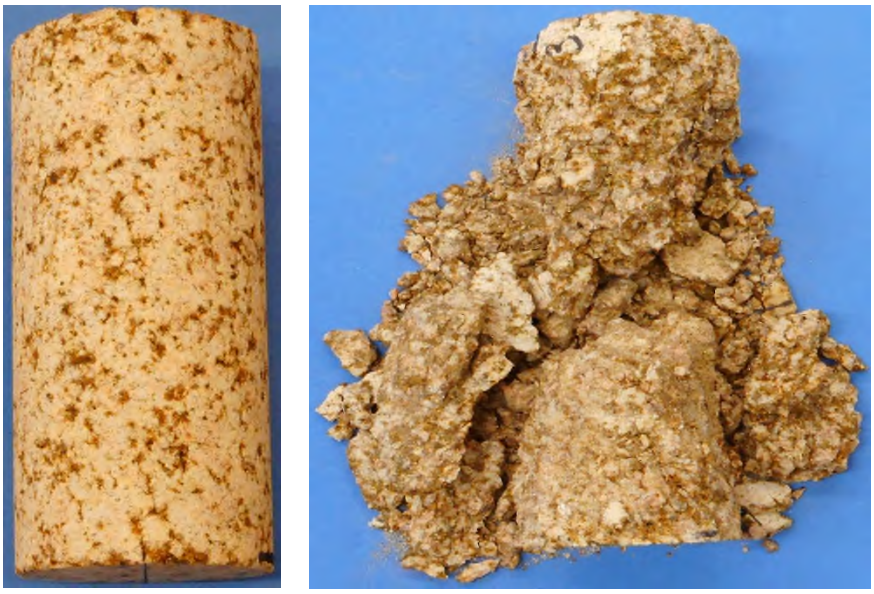
Photographer: Ben Painter

25	**Location / Orientation**	B-40, RC-1 (77.7' – 78.5')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 2/19/2018

Photographer: Ben Painter

26	**Location / Orientation**	B-40, RC-3 (84.3' – 85.1')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)



Date: 2/19/2018

Photographer: Ben Painter

27	**Location / Orientation**	B-41, RC-2 (60.2' – 61.3')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 2/19/2018

Photographer: Ben Painter

28	**Location / Orientation**	B-41, RC-5 (75.5' – 76.4')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 2/19/2018

Photographer: Ben Painter

29	**Location / Orientation**	B-59, RC-2 (115.4' – 116.1')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

UNCONFINED COMPRESSION
(ASTM D7012 Method C)

S&ME, Inc. - Knoxville 1413 Topside Road, Louisville, TN 37777

Project Name: Carolina Crossroads Project
Project Number: 1461-16-047 Phase 2B

Report Date: March 6, 2018
Reviewed By: Jason B. Burgess

Boring No.	Sample No.	Depth (ft)	Dimensions, in.		Shape (See Key)	Area (in^2)	Unit Weight (lbs/ft^3)	Loading Rate (psi/sec)	Maximum Load (lbs)	Strength (psi)	Moisture (%)
			Length	Diameter							
B-29	RC-3	65.4 - 66.1	4.35	1.98	A	3.08	183.1	88	132,108	42,892	0.0
B-29	RC-4	70.3 - 70.9	4.38	1.98	A	3.08	180.9	82	60,645	19,690	0.1
B-29	RC-5	75.6 - 76.4	4.39	1.98	A	3.08	182.3	91	69,013	22,407	0.1
B-36	RC-3	69.3 - 69.9	4.36	1.98	A	3.08	198.6	77	69,199	22,467	0.1
B-45	RC-2	30.6 - 31.4	4.37	1.98	A	3.08	163.5	86	74,649	24,237	0.4

NOTES: Effective (as received) unit weight as determined by RTH 109-93.
Loading rates were selected to target reaching failure between 2 and 15 minutes.
Test results for specimens not meeting the requirements of ASTM D4543 may differ from a test specimen that meets the requirements of ASTM D4543.

SHAPE KEY

ASTM D4543-08$^{\epsilon 1}$ *Standard Practice for Preparing Rock Core as Cylindrical Test Specimens and Verifying Conformance to Dimensional and Shape Tolerance* Section 1.2 - "Rock is a complex engineering material that can vary greatly as a function of lithology, stress history, weathering, moisture content and chemistry, and other natural geologic processes. As such, it is not always possible to obtain or prepare rock core specimens that satisfy the desirable tolerances given in this practice. Most commonly, this situation presents itself with weaker, more porous, and poorly cemented rock types and rock types containing significant or weak (or both) structural features. For these and other rock types which are difficult to prepare, all reasonable efforts shall be made to prepare a specimen in accordance with this practice and for the intended test procedure. However, when it has been determined by trial that this is not possible, prepare the rock specimen to the closest tolerances practicable and consider this to be the best effort and report it as such and if allowable or necessary for the intended test, capping the ends of the specimen as discussed in this practice is permitted."

A Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)

B Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism, and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness. Specimen prepared to closest tolerances practicable.

C Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism. Specimen did not meet the desired tolerances for side straightness and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

D Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness. Specimen did not meet the desired tolerances for side straightness, parallelism and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

E Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness and parallelism. Specimen prepared to closest tolerances practicable.

UNCONFINED COMPRESSION
(ASTM D7012 Method C)

S&ME, Inc. - Knoxville 1413 Topside Road, Louisville, TN 37777

Project Name: Carolina Crossroads Project
Project Number: 1461-16-047 Phase 2B

Report Date: March 6, 2018
Reviewed By: Jason B. Burgess

Boring No.	Sample No.	Depth (ft)	Dimensions, in.		Shape (See Key)	Area (in^2)	Unit Weight (lbs/ft^3)	Loading Rate (psi/sec)	Maximum Load (lbs)	Strength (psi)	Moisture (%)
			Length	Diameter							
B-45	RC-3	37.9 - 38.5	4.48	1.98	A	3.08	163.9	89	94,201	30,585	0.3
B-45	RC-6	42.8 - 43.4	4.37	1.98	A	3.08	163.3	82	68,417	22,213	0.4
B-47	RC-1	47.2 - 47.8	4.40	1.99	A	3.11	166.4	48	19,469	6,260	0.4
B-47	RC-3	55.4 - 56.2	4.47	1.98	A	3.08	170.6	42	14,859	4,824	0.4
B-47	RC-4	64.0 - 65.0	4.45	1.98	A	3.08	169.3	44	10,041	3,260	0.4

NOTES: Effective (as received) unit weight as determined by RTH 109-93.
Loading rates were selected to target reaching failure between 2 and 15 minutes.
Test results for specimens not meeting the requirements of ASTM D4543 may differ from a test specimen that meets the requirements of ASTM D4543.

SHAPE KEY

ASTM D4543-08$^{\epsilon 1}$ *Standard Practice for Preparing Rock Core as Cylindrical Test Specimens and Verifying Conformance to Dimensional and Shape Tolerance* Section 1.2 - "Rock is a complex engineering material that can vary greatly as a function of lithology, stress history, weathering, moisture content and chemistry, and other natural geologic processes. As such, it is not always possible to obtain or prepare rock core specimens that satisfy the desirable tolerances given in this practice. Most commonly, this situation presents itself with weaker, more porous, and poorly cemented rock types and rock types containing significant or weak (or both) structural features. For these and other rock types which are difficult to prepare, all reasonable efforts shall be made to prepare a specimen in accordance with this practice and for the intended test procedure. However, when it has been determined by trial that this is not possible, prepare the rock specimen to the closest tolerances practicable and consider this to be the best effort and report it as such and if allowable or necessary for the intended test, capping the ends of the specimen as discussed in this practice is permitted."

A Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)

B Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism, and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness. Specimen prepared to closest tolerances practicable.

C Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism. Specimen did not meet the desired tolerances for side straightness and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

D Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness. Specimen did not meet the desired tolerances for side straightness, parallelism and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

E Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness and parallelism. Specimen prepared to closest tolerances practicable.

UNCONFINED COMPRESSION
(ASTM D7012 Method C)

S&ME, Inc. - Knoxville 1413 Topside Road, Louisville, TN 37777

Project Name: Carolina Crossroads Project
Project Number: 1461-16-047 Phase 2B

Report Date: March 6, 2018
Reviewed By: Jason B. Burgess

Boring No.	Sample No.	Depth (ft)	Dimensions, in.		Shape (See Key)	Area (in^2)	Unit Weight (lbs/ft^3)	Loading Rate (psi/sec)	Maximum Load (lbs)	Strength (psi)	Moisture (%)
			Length	Diameter							
B-50	RC-1	73.7 - 74.3	4.32	1.96	A	3.02	170.8	22	5,945	1,969	0.3
B-50	RC-4	87.7 - 88.5	4.34	1.95	A	2.99	167.6	22	2,590	866	0.3
W-22	RC-3	16.5 - 17.0	4.39	1.98	A	3.08	164.2	85	81,245	26,378	0.3
W-25	RC-2	30.5 - 31.3	4.38	1.98	A	3.08	165.3	89	98,111	31,854	0.3
W-32	RC-1	48.0 - 48.7	4.39	1.98	A	3.08	179.9	95	61,645	20,015	0.2

NOTES: Effective (as received) unit weight as determined by RTH 109-93.
Loading rates were selected to target reaching failure between 2 and 15 minutes.
Test results for specimens not meeting the requirements of ASTM D4543 may differ from a test specimen that meets the requirements of ASTM D4543.

SHAPE KEY

ASTM D4543-08$^{\epsilon 1}$ *Standard Practice for Preparing Rock Core as Cylindrical Test Specimens and Verifying Conformance to Dimensional and Shape Tolerance* Section 1.2 - "Rock is a complex engineering material that can vary greatly as a function of lithology, stress history, weathering, moisture content and chemistry, and other natural geologic processes. As such, it is not always possible to obtain or prepare rock core specimens that satisfy the desirable tolerances given in this practice. Most commonly, this situation presents itself with weaker, more porous, and poorly cemented rock types and rock types containing significant or weak (or both) structural features. For these and other rock types which are difficult to prepare, all reasonable efforts shall be made to prepare a specimen in accordance with this practice and for the intended test procedure. However, when it has been determined by trial that this is not possible, prepare the rock specimen to the closest tolerances practicable and consider this to be the best effort and report it as such and if allowable or necessary for the intended test, capping the ends of the specimen as discussed in this practice is permitted."

A Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)

B Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism, and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness. Specimen prepared to closest tolerances practicable.

C Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism. Specimen did not meet the desired tolerances for side straightness and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

D Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness. Specimen did not meet the desired tolerances for side straightness, parallelism and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

E Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness and parallelism. Specimen prepared to closest tolerances practicable.

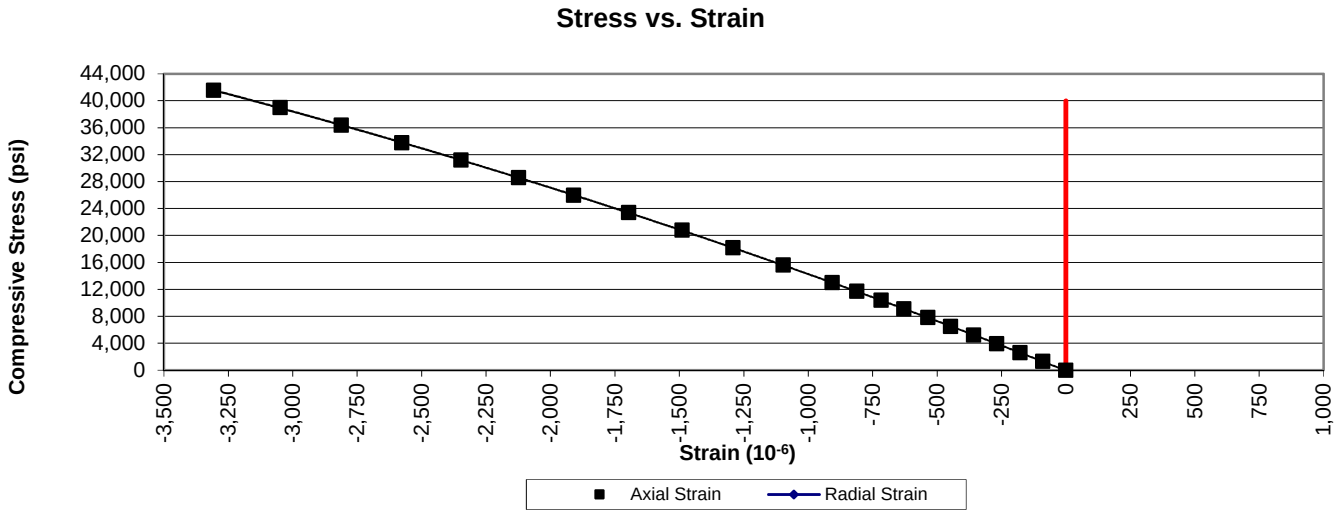
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	3/1/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.35	**Tested by:**	BKP / MG
Boring Id:	B-29	**Unit Weight, pcf:**	183.1	**Reviewed by:**	JBB
Sample No:	RC-3	**Moisture Content, %:**	0.0		
Depth (ft):	65.4 - 66.1	**Load Rate, psi/sec:**	88		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-90		4,000	1,299	14.43		
3	-178		8,000	2,597	14.59		
4	-269		12,000	3,896	14.48		
5	-358		16,000	5,195	14.51		
6	-447		20,000	6,494	14.53		
7	-535		24,000	7,792	14.56		
8	-628		28,000	9,091	14.48		
9	-717		32,000	10,390	14.49		
10	-811		36,000	11,688	14.41		
11	-907		40,000	12,987	14.32		
12	-1,097		48,000	15,584	14.21		
13	-1,291		56,000	18,182	14.08		
14	-1,489		64,000	20,779	13.96		
15	-1,696		72,000	23,377	13.78		
13	-1,910		80,000	25,974	13.60		
14	-2,123		88,000	28,571	13.46		
15	-2,347		96,000	31,169	13.28		
16	-2,577		104,000	33,766	13.10		
17	-2,811		112,000	36,364	12.94		
18	-3,049		120,000	38,961	12.78		
19	-3,307		128,000	41,558	12.57		
20			132,108	42,892			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



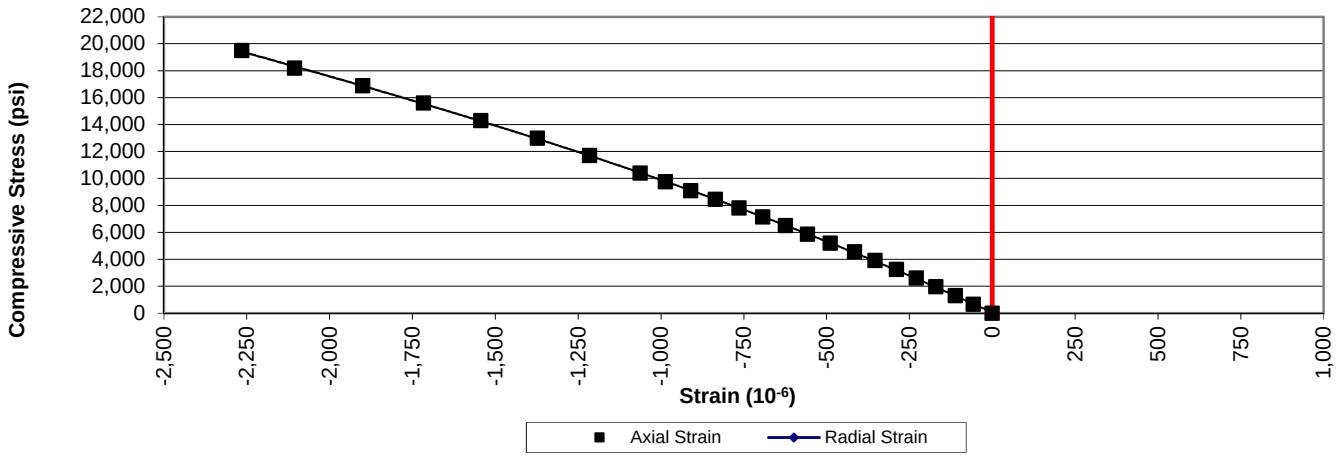
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	3/1/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.38	**Tested by:**	BKP / MG
Boring Id:	B-29	**Unit Weight, pcf:**	180.9	**Reviewed by:**	JBB
Sample No:	RC-4	**Moisture Content, %:**	0.1		
Depth (ft):	70.3 - 70.9	**Load Rate, psi/sec:**	82		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-57		2,000	649	11.39		
3	-111		4,000	1,299	11.70		
4	-170		6,000	1,948	11.46		
5	-229		8,000	2,597	11.34		
6	-289		10,000	3,247	11.24		
7	-354		12,000	3,896	11.01		
8	-415		14,000	4,545	10.95		
9	-489		16,000	5,195	10.62		
10	-557		18,000	5,844	10.49		
11	-624		20,000	6,494	10.41		
12	-693		22,000	7,143	10.31		
13	-764		24,000	7,792	10.20		
14	-835		26,000	8,442	10.11		
15	-910		28,000	9,091	9.99		
16	-986		30,000	9,740	9.88		
17	-1,062		32,000	10,390	9.78		
18	-1,215		36,000	11,688	9.62		
19	-1,372		40,000	12,987	9.47		
20	-1,543		44,000	14,286	9.26		
21	-1,716		48,000	15,584	9.08		
22	-1,900		52,000	16,883	8.89		
23	-2,105		56,000	18,182	8.64		
24	-2,265		60,000	19,481	8.60		
25			60,645	19,690			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



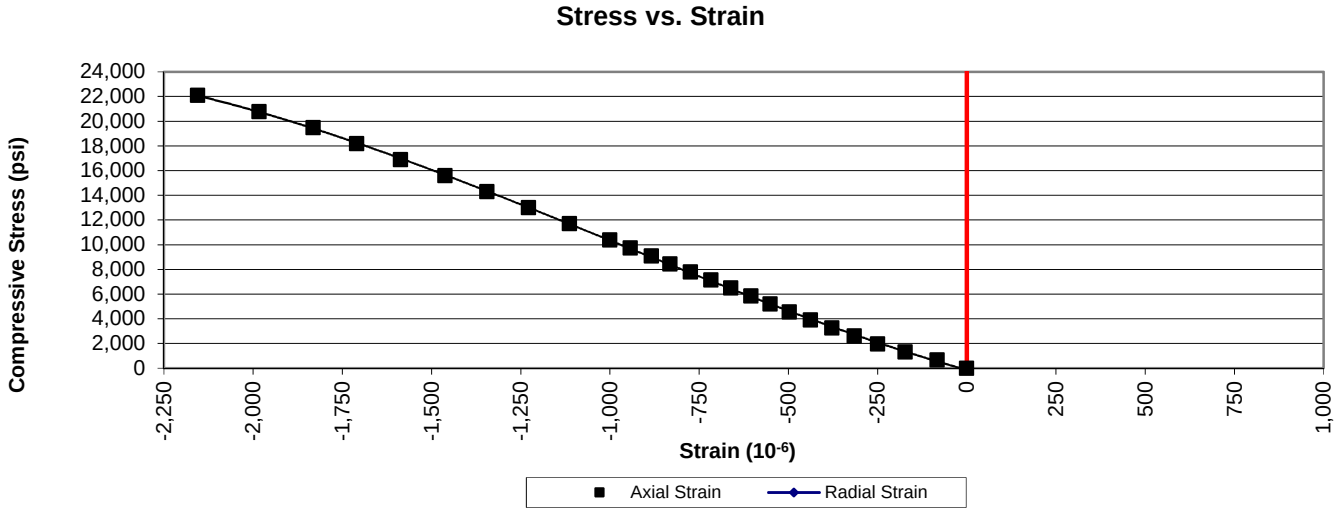
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	3/1/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.39	**Tested by:**	BKP / MG
Boring Id:	B-29	**Unit Weight, pcf:**	182.3	**Reviewed by:**	JBB
Sample No:	RC-5	**Moisture Content, %:**	0.1		
Depth (ft):	75.6 - 76.4	**Load Rate, psi/sec:**	91		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-83		2,000	649	7.82		
3	-173		4,000	1,299	7.51		
4	-250		6,000	1,948	7.79		
5	-315		8,000	2,597	8.24		
6	-378		10,000	3,247	8.59		
7	-438		12,000	3,896	8.89		
8	-497		14,000	4,545	9.14		
9	-551		16,000	5,195	9.43		
10	-605		18,000	5,844	9.66		
11	-661		20,000	6,494	9.82		
12	-717		22,000	7,143	9.96		
13	-774		24,000	7,792	10.07		
14	-832		26,000	8,442	10.15		
15	-884		28,000	9,091	10.28		
16	-943		30,000	9,740	10.33		
17	-1,000		32,000	10,390	10.39		
18	-1,113		36,000	11,688	10.50		
19	-1,228		40,000	12,987	10.58		
20	-1,345		44,000	14,286	10.62		
21	-1,462		48,000	15,584	10.66		
22	-1,587		52,000	16,883	10.64		
23	-1,710		56,000	18,182	10.63		
24	-1,832		60,000	19,481	10.63		
25	-1,983		64,000	20,779	10.48		
26	-2,155		68,000	22,078	10.25		
27			69,013	22,407			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

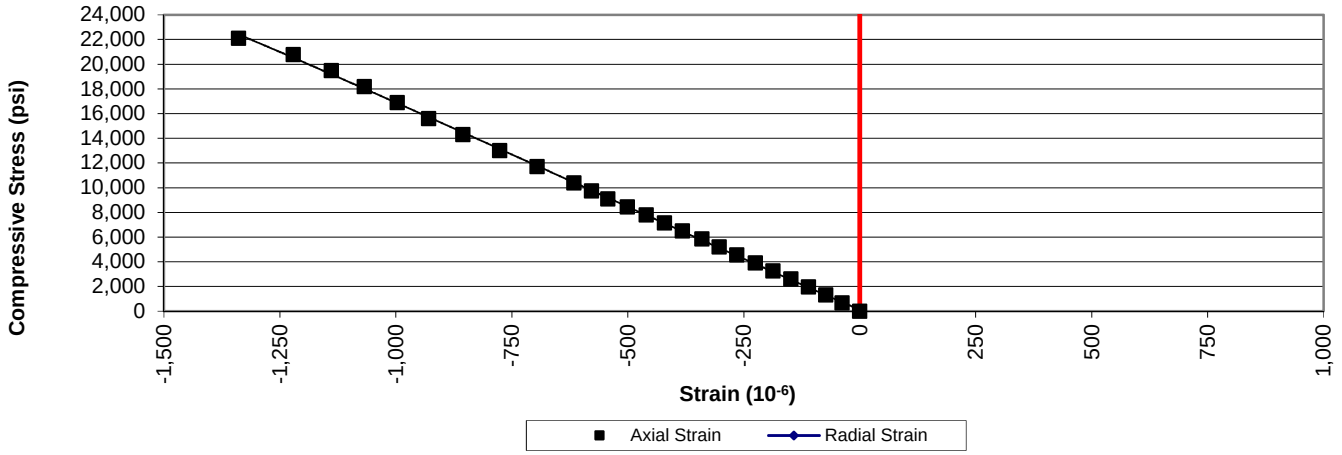
1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	3/1/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.36	**Tested by:**	BKP / MG
Boring Id:	B-36	**Unit Weight, pcf:**	198.6	**Reviewed by:**	JBB
Sample No:	RC-3	**Moisture Content, %:**	0.1		
Depth (ft):	69.3 - 69.9	**Load Rate, psi/sec:**	77		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-38		2,000	649	17.08		
3	-73		4,000	1,299	17.79		
4	-110		6,000	1,948	17.71		
5	-148		8,000	2,597	17.55		
6	-187		10,000	3,247	17.36		
7	-225		12,000	3,896	17.32		
8	-265		14,000	4,545	17.15		
9	-303		16,000	5,195	17.15		
10	-340		18,000	5,844	17.19		
11	-382		20,000	6,494	17.00		
12	-421		22,000	7,143	16.97		
13	-460		24,000	7,792	16.94		
14	-501		26,000	8,442	16.85		
15	-543		28,000	9,091	16.74		
16	-578		30,000	9,740	16.85		
17	-616		32,000	10,390	16.87		
18	-695		36,000	11,688	16.82		
19	-776		40,000	12,987	16.74		
20	-855		44,000	14,286	16.71		
21	-929		48,000	15,584	16.78		
22	-997		52,000	16,883	16.93		
23	-1,068		56,000	18,182	17.02		
24	-1,139		60,000	19,481	17.10		
25	-1,221		64,000	20,779	17.02		
26	-1,339		68,000	22,078	16.49		
27			69,199	22,467			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)

Stress vs. Strain



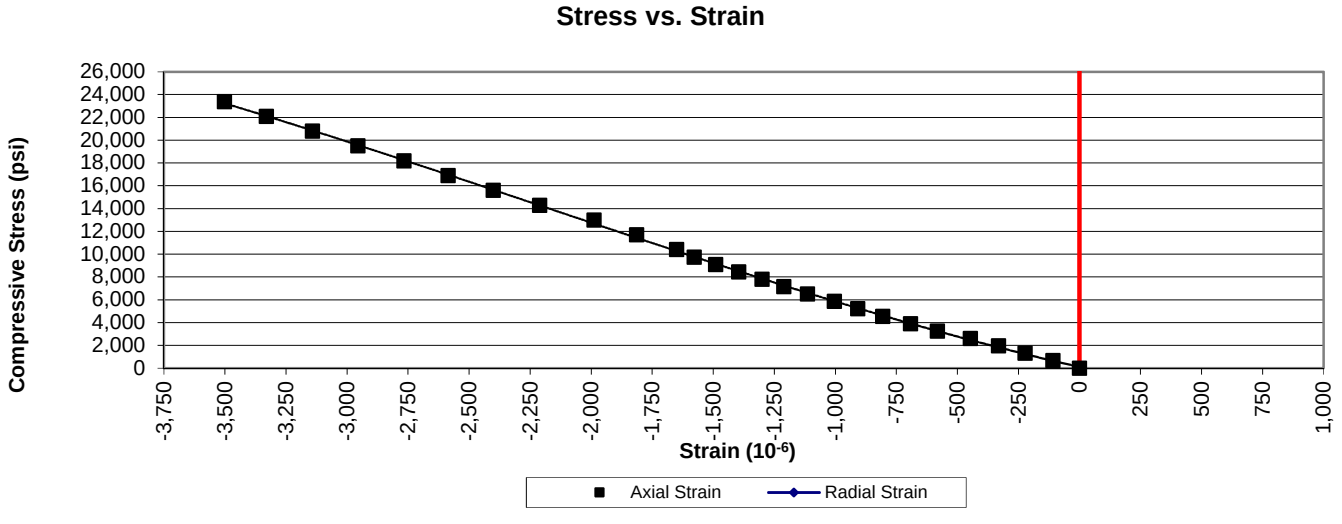
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	3/1/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.37	**Tested by:**	BKP / MG
Boring Id:	B-45	**Unit Weight, pcf:**	163.5	**Reviewed by:**	JBB
Sample No:	RC-2	**Moisture Content, %:**	0.4		
Depth (ft):	30.6 - 31.4	**Load Rate, psi/sec:**	86		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-108		2,000	649	6.01		
3	-222		4,000	1,299	5.85		
4	-331		6,000	1,948	5.89		
5	-447		8,000	2,597	5.81		
6	-581		10,000	3,247	5.59		
7	-691		12,000	3,896	5.64		
8	-805		14,000	4,545	5.65		
9	-908		16,000	5,195	5.72		
10	-1,003		18,000	5,844	5.83		
11	-1,114		20,000	6,494	5.83		
12	-1,211		22,000	7,143	5.90		
13	-1,300		24,000	7,792	5.99		
14	-1,395		26,000	8,442	6.05		
15	-1,490		28,000	9,091	6.10		
16	-1,578		30,000	9,740	6.17		
17	-1,650		32,000	10,390	6.30		
18	-1,814		36,000	11,688	6.44		
19	-1,988		40,000	12,987	6.53		
20	-2,210		44,000	14,286	6.46		
21	-2,401		48,000	15,584	6.49		
22	-2,586		52,000	16,883	6.53		
23	-2,766		56,000	18,182	6.57		
24	-2,955		60,000	19,481	6.59		
25	-3,141		64,000	20,779	6.62		
26	-3,330		68,000	22,078	6.63		
27	-3,502		72,000	23,377	6.68		
28			74,649	24,237			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



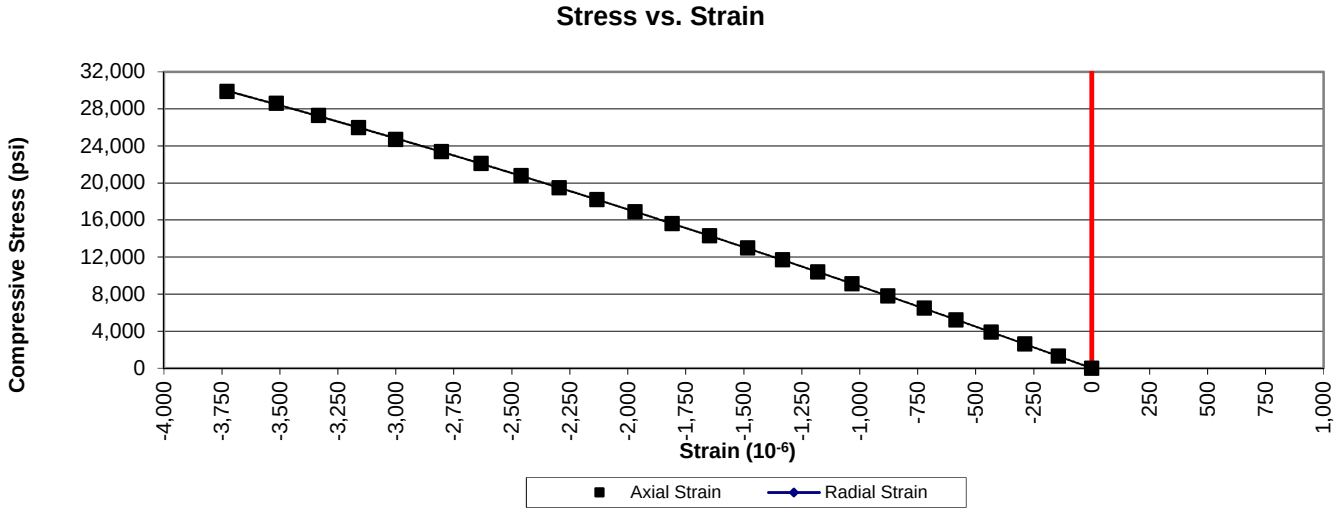
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	3/1/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.48	**Tested by:**	BKP / MG
Boring Id:	B-45	**Unit Weight, pcf:**	163.9	**Reviewed by:**	JBB
Sample No:	RC-3	**Moisture Content, %:**	0.3		
Depth (ft):	37.9 - 38.5	**Load Rate, psi/sec:**	89		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-143		4,000	1,299	9.08		
3	-288		8,000	2,597	9.02		
4	-433		12,000	3,896	9.00		
5	-585		16,000	5,195	8.88		
6	-721		20,000	6,494	9.01		
7	-879		24,000	7,792	8.86		
8	-1,033		28,000	9,091	8.80		
9	-1,180		32,000	10,390	8.81		
10	-1,332		36,000	11,688	8.77		
11	-1,483		40,000	12,987	8.76		
12	-1,647		44,000	14,286	8.67		
13	-1,808		48,000	15,584	8.62		
14	-1,968		52,000	16,883	8.58		
15	-2,132		56,000	18,182	8.53		
16	-2,296		60,000	19,481	8.48		
17	-2,459		64,000	20,779	8.45		
18	-2,632		68,000	22,078	8.39		
19	-2,803		72,000	23,377	8.34		
20	-3,000		76,000	24,675	8.23		
21	-3,160		80,000	25,974	8.22		
22	-3,333		84,000	27,273	8.18		
23	-3,515		88,000	28,571	8.13		
24	-3,728		92,000	29,870	8.01		
25			94,201	30,585			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



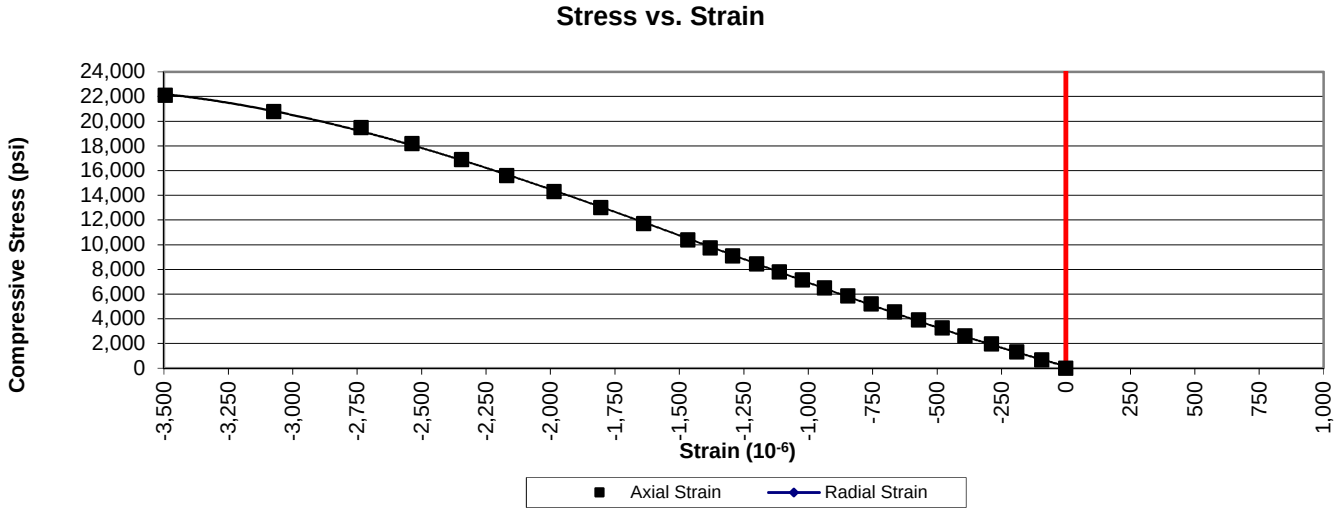
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	3/1/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.37	**Tested by:**	BKP / MG
Boring Id:	B-45	**Unit Weight, pcf:**	163.3	**Reviewed by:**	JBB
Sample No:	RC-6	**Moisture Content, %:**	0.4		
Depth (ft):	42.8 - 43.4	**Load Rate, psi/sec:**	82		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-93		2,000	649	6.98		
3	-190		4,000	1,299	6.84		
4	-288		6,000	1,948	6.76		
5	-391		8,000	2,597	6.64		
6	-479		10,000	3,247	6.78		
7	-572		12,000	3,896	6.81		
8	-664		14,000	4,545	6.84		
9	-755		16,000	5,195	6.88		
10	-846		18,000	5,844	6.91		
11	-936		20,000	6,494	6.94		
12	-1,022		22,000	7,143	6.99		
13	-1,111		24,000	7,792	7.01		
14	-1,200		26,000	8,442	7.04		
15	-1,293		28,000	9,091	7.03		
16	-1,380		30,000	9,740	7.06		
17	-1,467		32,000	10,390	7.08		
18	-1,638		36,000	11,688	7.14		
19	-1,805		40,000	12,987	7.20		
20	-1,986		44,000	14,286	7.19		
21	-2,169		48,000	15,584	7.18		
22	-2,344		52,000	16,883	7.20		
23	-2,537		56,000	18,182	7.17		
24	-2,734		60,000	19,481	7.13		
25	-3,073		64,000	20,779	6.76		
26	-3,494		68,000	22,078	6.32		
27			68,417	22,213			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



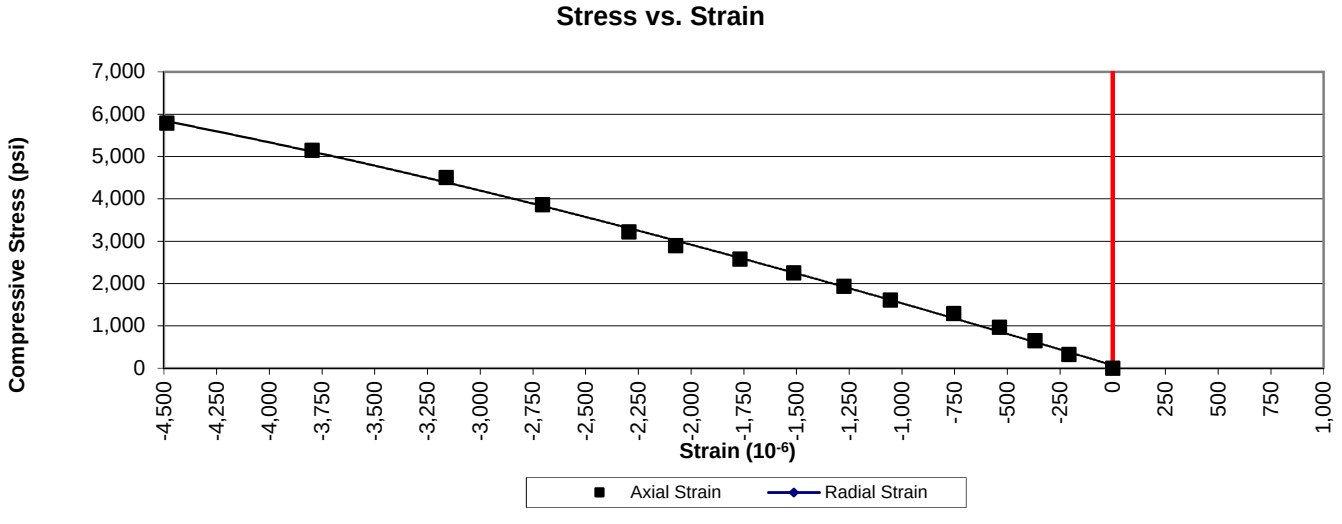
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.99	**Date:**	3/1/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.40	**Tested by:**	BKP / MG
Boring Id:	B-47	**Unit Weight, pcf:**	166.4	**Reviewed by:**	JBB
Sample No:	RC-1	**Moisture Content, %:**	0.4		
Depth (ft):	47.2 - 47.8	**Load Rate, psi/sec:**	48		

Data Point	Strain (10^{-6}) axial	Strain (10^{-6}) radial	Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
1	0		0	0	0.00		
2	-208		1,000	322	1.55		
3	-369		2,000	643	1.74		
4	-536		3,000	965	1.80		
5	-754		4,000	1,286	1.71		
6	-1,054		5,000	1,608	1.53		
7	-1,275		6,000	1,929	1.51		
8	-1,513		7,000	2,251	1.49		
9	-1,767		8,000	2,572	1.46		
10	-2,072		9,000	2,894	1.40		
11	-2,294		10,000	3,215	1.40		
12	-2,704		12,000	3,859	1.43		
13	-3,161		14,000	4,502	1.42		
14	-3,796		16,000	5,145	1.36		
15	-4,485		18,000	5,788	1.29		
16			19,469	6,260			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



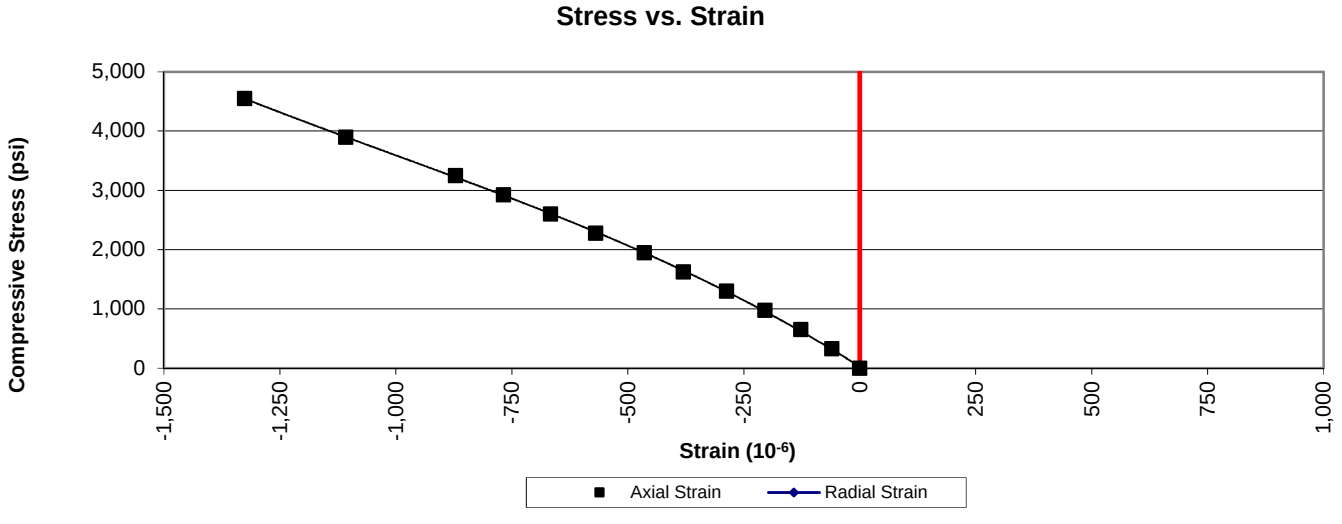
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	3/1/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.47	**Tested by:**	BKP / MG
Boring Id:	B-47	**Unit Weight, pcf:**	170.6	**Reviewed by:**	JBB
Sample No:	RC-3	**Moisture Content, %:**	0.4		
Depth (ft):	55.4 - 56.2	**Load Rate, psi/sec:**	42		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-60		1,000	325	5.42		
3	-127		2,000	649	5.11		
4	-204		3,000	974	4.77		
5	-287		4,000	1,299	4.53		
6	-380		5,000	1,623	4.27		
7	-464		6,000	1,948	4.20		
8	-569		7,000	2,273	3.99		
9	-666		8,000	2,597	3.90		
10	-768		9,000	2,922	3.80		
11	-871		10,000	3,247	3.73		
12	-1,108		12,000	3,896	3.52		
13	-1,326		14,000	4,545	3.43		
14			14,859	4,824			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



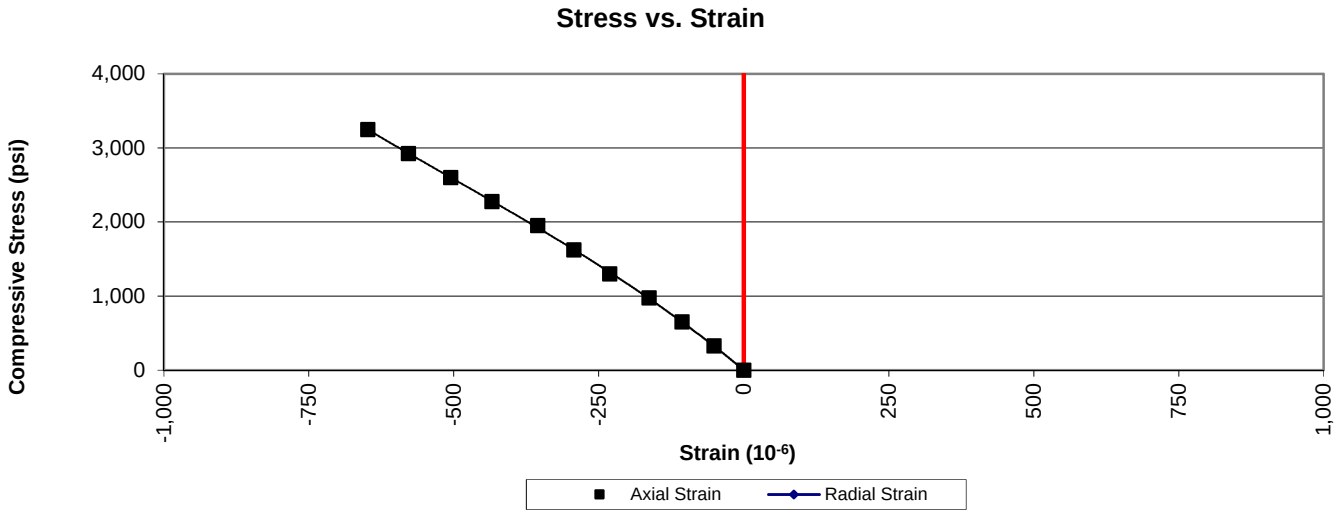
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	3/1/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.45	**Tested by:**	BKP / MG
Boring Id:	B-47	**Unit Weight, pcf:**	169.3	**Reviewed by:**	JBB
Sample No:	RC-4	**Moisture Content, %:**	0.4		
Depth (ft):	64.0 - 65.0	**Load Rate, psi/sec:**	44		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-51		1,000	325	6.37		
3	-106		2,000	649	6.12		
4	-163		3,000	974	5.98		
5	-231		4,000	1,299	5.62		
6	-293		5,000	1,623	5.54		
7	-355		6,000	1,948	5.49		
8	-434		7,000	2,273	5.24		
9	-505		8,000	2,597	5.14		
10	-578		9,000	2,922	5.06		
11	-648		10,000	3,247	5.01		
12			10,041	3,260			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



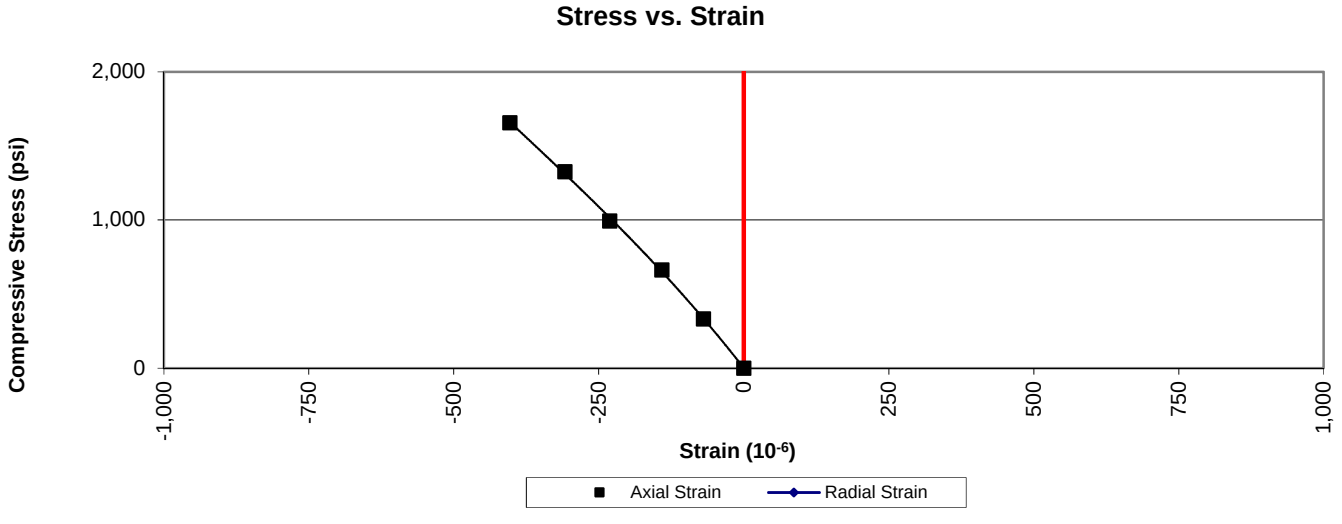
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.96	**Date:**	3/1/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.32	**Tested by:**	BKP / MG
Boring Id:	B-50	**Unit Weight, pcf:**	170.8	**Reviewed by:**	JBB
Sample No:	RC-1	**Moisture Content, %:**	0.3		
Depth (ft):	73.7 - 74.3	**Load Rate, psi/sec:**	22		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-69		1,000	331	4.80		
3	-141		2,000	662	4.70		
4	-231		3,000	993	4.30		
5	-308		4,000	1,325	4.30		
6	-403		5,000	1,656	4.11		
7			5,945	1,969			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Due to the low compressive strength of this specimen, readings of deformation at a minimum of ten evenly spaced load intervals were not able to be obtained.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



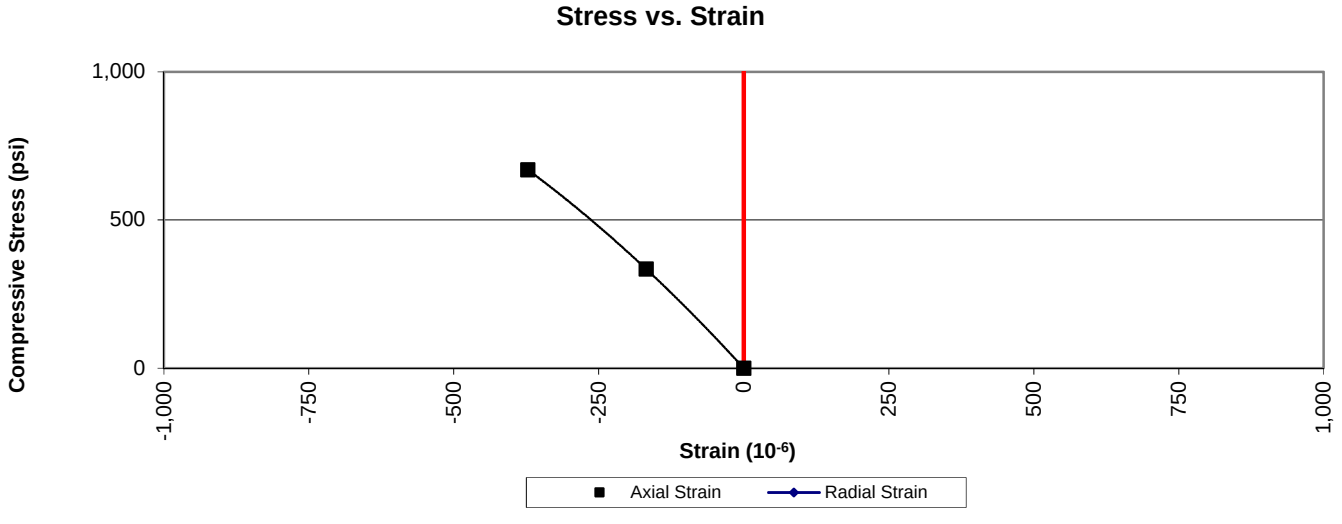
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.95	**Date:**	3/2/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.34	**Tested by:**	BKP / MG
Boring Id:	B-50	**Unit Weight, pcf:**	167.6	**Reviewed by:**	JBB
Sample No:	RC-4	**Moisture Content, %:**	0.3		
Depth (ft):	87.7 - 88.5	**Load Rate, psi/sec:**	22		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-168		1,000	334	1.99		
3	-372		2,000	669	1.80		
4			2,590	866			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Due to the low compressive strength of this specimen, readings of deformation at a minimum of ten evenly spaced load intervals were not able to be obtained.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

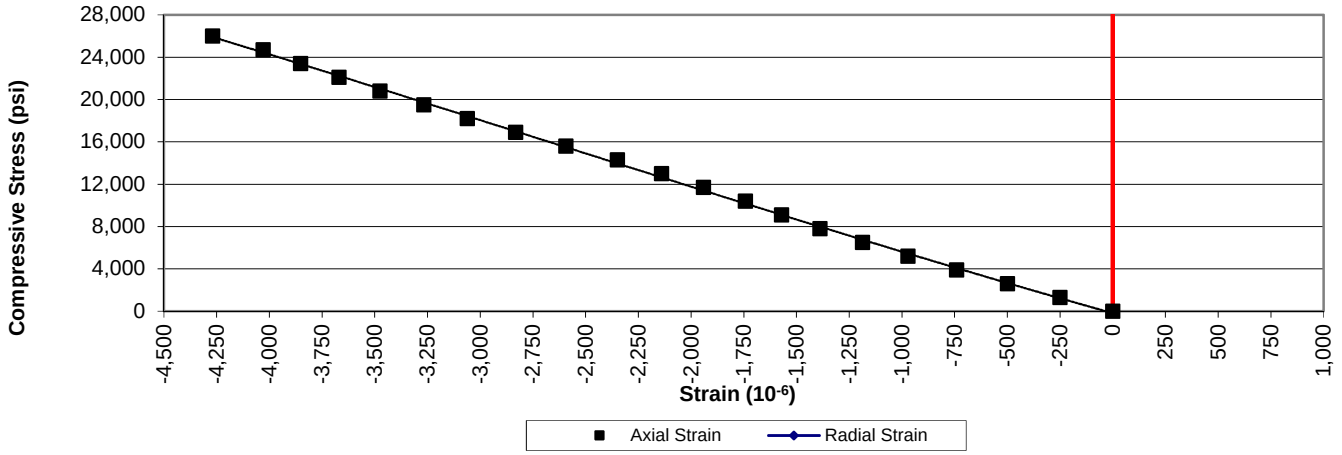
1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	3/1/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.39	**Tested by:**	BKP / MG
Boring Id:	W-22	**Unit Weight, pcf:**	164.2	**Reviewed by:**	JBB
Sample No:	RC-3	**Moisture Content, %:**	0.3		
Depth (ft):	16.5 - 17.0	**Load Rate, psi/sec:**	85		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-250		4,000	1,299	5.20		
3	-499		8,000	2,597	5.20		
4	-740		12,000	3,896	5.26		
5	-970		16,000	5,195	5.36		
6	-1,186		20,000	6,494	5.48		
7	-1,388		24,000	7,792	5.61		
8	-1,570		28,000	9,091	5.79		
9	-1,741		32,000	10,390	5.97		
10	-1,941		36,000	11,688	6.02		
11	-2,139		40,000	12,987	6.07		
12	-2,348		44,000	14,286	6.08		
13	-2,593		48,000	15,584	6.01		
14	-2,831		52,000	16,883	5.96		
15	-3,061		56,000	18,182	5.94		
16	-3,267		60,000	19,481	5.96		
17	-3,475		64,000	20,779	5.98		
18	-3,669		68,000	22,078	6.02		
19	-3,851		72,000	23,377	6.07		
20	-4,029		76,000	24,675	6.12		
21	-4,268		80,000	25,974	6.09		
22			81,245	26,378			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)

Stress vs. Strain



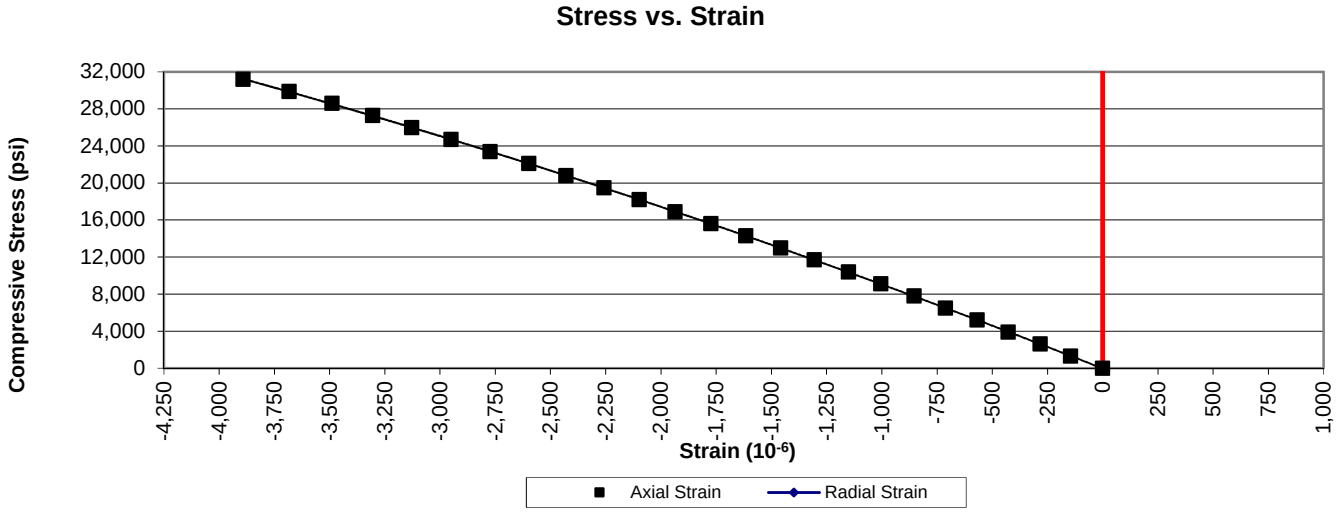
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	3/1/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.38	**Tested by:**	BKP / MG
Boring Id:	W-25	**Unit Weight, pcf:**	165.3	**Reviewed by:**	JBB
Sample No:	RC-2	**Moisture Content, %:**	0.3		
Depth (ft):	30.5 - 31.3	**Load Rate, psi/sec:**	89		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-145		4,000	1,299	8.96		
3	-283		8,000	2,597	9.18		
4	-428		12,000	3,896	9.10		
5	-568		16,000	5,195	9.15		
6	-711		20,000	6,494	9.13		
7	-854		24,000	7,792	9.12		
8	-1,004		28,000	9,091	9.05		
9	-1,151		32,000	10,390	9.03		
10	-1,306		36,000	11,688	8.95		
11	-1,457		40,000	12,987	8.91		
12	-1,616		44,000	14,286	8.84		
13	-1,774		48,000	15,584	8.78		
14	-1,936		52,000	16,883	8.72		
15	-2,098		56,000	18,182	8.67		
16	-2,258		60,000	19,481	8.63		
17	-2,429		64,000	20,779	8.55		
18	-2,598		68,000	22,078	8.50		
19	-2,773		72,000	23,377	8.43		
20	-2,950		76,000	24,675	8.36		
21	-3,128		80,000	25,974	8.30		
22	-3,304		84,000	27,273	8.25		
23	-3,488		88,000	28,571	8.19		
24	-3,682		92,000	29,870	8.11		
25	-3,892		96,000	31,169	8.01		
26			98,111	31,854			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



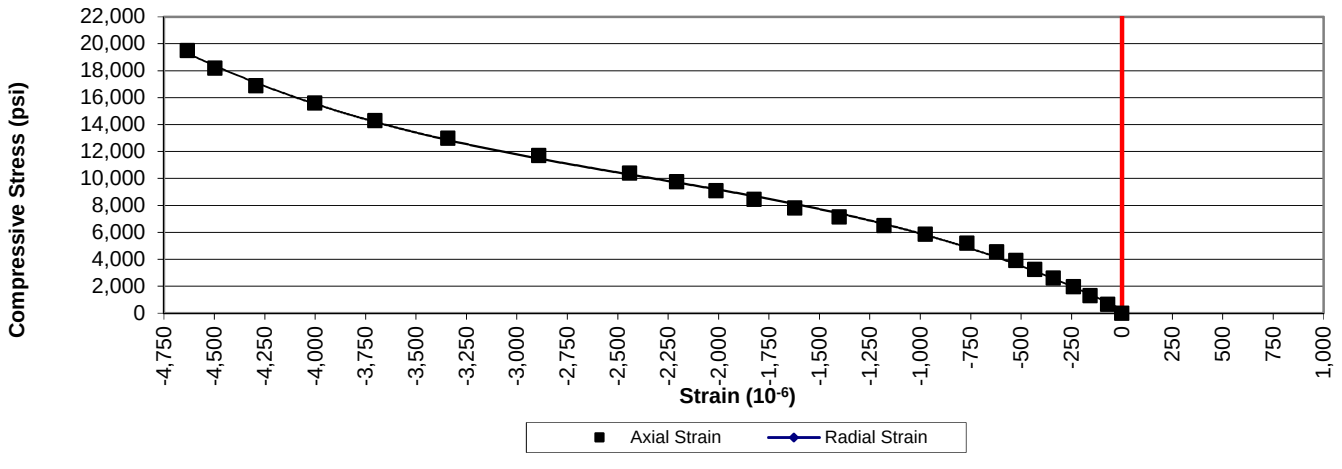
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	3/1/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.39	**Tested by:**	BKP / MG
Boring Id:	W-32	**Unit Weight, pcf:**	179.9	**Reviewed by:**	JBB
Sample No:	RC-1	**Moisture Content, %:**	0.2		
Depth (ft):	48.0 - 48.7	**Load Rate, psi/sec:**	95		

Data Point	Strain (10^{-6}) axial	Strain (10^{-6}) radial	Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
1	0		0	0	0.00		
2	-71		2,000	649	9.14		
3	-157		4,000	1,299	8.27		
4	-240		6,000	1,948	8.12		
5	-340		8,000	2,597	7.64		
6	-432		10,000	3,247	7.52		
7	-526		12,000	3,896	7.41		
8	-621		14,000	4,545	7.32		
9	-768		16,000	5,195	6.76		
10	-974		18,000	5,844	6.00		
11	-1,180		20,000	6,494	5.50		
12	-1,402		22,000	7,143	5.09		
13	-1,622		24,000	7,792	4.80		
14	-1,823		26,000	8,442	4.63		
15	-2,013		28,000	9,091	4.52		
16	-2,207		30,000	9,740	4.41		
17	-2,441		32,000	10,390	4.26		
18	-2,891		36,000	11,688	4.04		
19	-3,341		40,000	12,987	3.89		
20	-3,704		44,000	14,286	3.86		
21	-4,001		48,000	15,584	3.90		
22	-4,293		52,000	16,883	3.93		
23	-4,497		56,000	18,182	4.04		
24	-4,633		60,000	19,481	4.20		
25			61,645	20,015			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

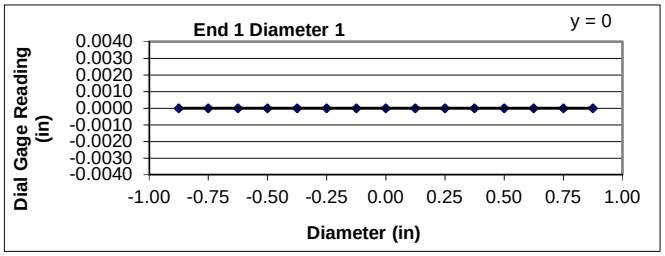
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	2/27/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.35	**Tested by:**	BKP
Boring Id:	B-29	**Unit Weight (pcf):**	183.1	**Reviewed by:**	JBB
Sample No.:	RC-3	**Moisture Content (%):**	0.0		
Depth (ft):	65.4 - 66.1				

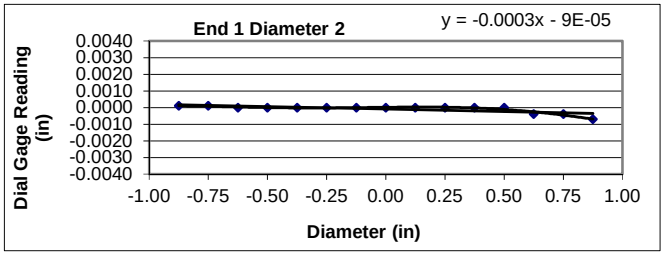
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

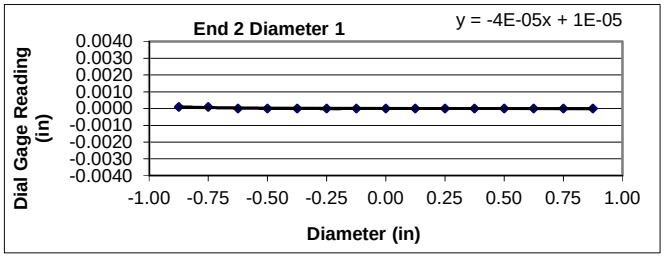
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0000	0.0001	0.0001	0.0008
- 6/8	0.0000	0.0001	0.0001	0.0003
- 5/8	0.0000	0.0000	0.0000	0.0000
- 4/8	0.0000	0.0000	0.0000	0.0000
- 3/8	0.0000	0.0000	0.0000	0.0000
- 2/8	0.0000	0.0000	0.0000	0.0000
- 1/8	0.0000	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	0.0000
2/8	0.0000	0.0000	0.0000	0.0000
3/8	0.0000	0.0000	0.0000	-0.0004
4/8	0.0000	0.0000	0.0000	-0.0008
5/8	0.0000	-0.0004	0.0000	-0.0008
6/8	0.0000	-0.0004	0.0000	-0.0008
7/8	0.0000	-0.0007	0.0000	-0.0011

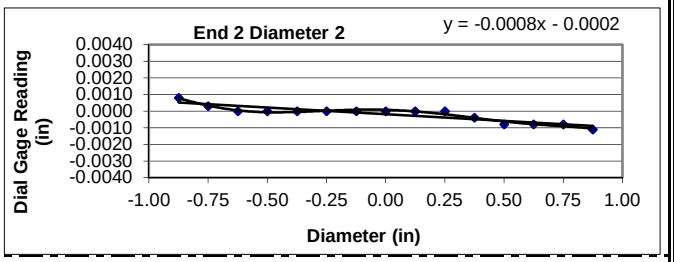




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	0.00000
	Angle of Best Fit Line:	0.00000
End 2:	Slope of Best Fit Line:	-0.00004
	Angle of Best Fit Line:	-0.00213
	Max Angular Difference:	**0.00**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00030
	Angle of Best Fit Line:	-0.01735
End 2:	Slope of Best Fit Line:	-0.00081
	Angle of Best Fit Line:	-0.04633
	Max Angular Difference:	**0.03**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0000	0.0000	**YES**
End 1 Diam 2	0.0008	0.0004	**YES**
End 2 Diam 1	0.0001	0.0001	**YES**
End 2 Diam 2	0.0019	0.0010	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

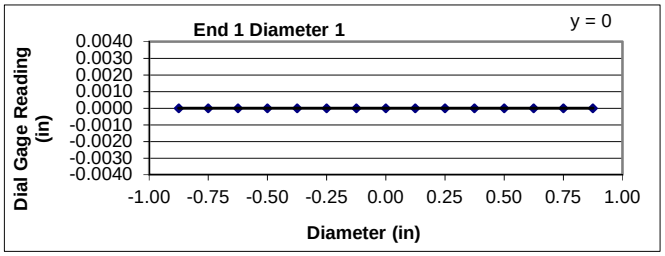
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	3/1/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.38	**Tested by:**	BKP
Boring Id:	B-29	**Unit Weight (pcf):**	180.9	**Reviewed by:**	JBB
Sample No.:	RC-4	**Moisture Content (%):**	0.1		
Depth (ft):	70.3 - 70.9				

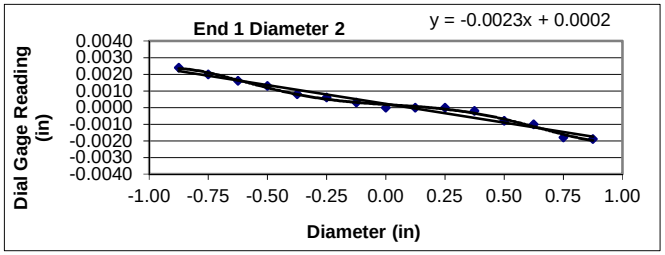
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

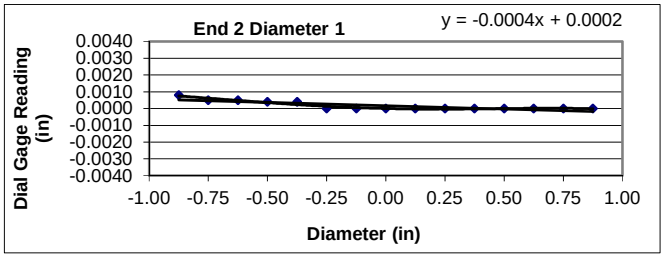
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0000	0.0024	0.0008	0.0016
- 6/8	0.0000	0.0020	0.0005	0.0013
- 5/8	0.0000	0.0016	0.0005	0.0011
- 4/8	0.0000	0.0013	0.0004	0.0009
- 3/8	0.0000	0.0008	0.0004	0.0005
- 2/8	0.0000	0.0006	0.0000	0.0004
- 1/8	0.0000	0.0003	0.0000	0.0002
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	0.0000
2/8	0.0000	0.0000	0.0000	0.0000
3/8	0.0000	-0.0002	0.0000	0.0000
4/8	0.0000	-0.0008	0.0000	0.0000
5/8	0.0000	-0.0010	0.0000	0.0000
6/8	0.0000	-0.0018	0.0000	-0.0004
7/8	0.0000	-0.0019	0.0000	-0.0006

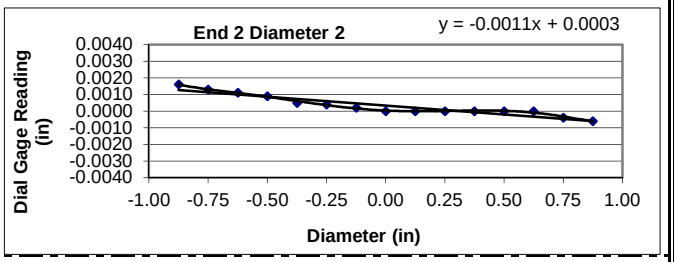




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	0.00000
	Angle of Best Fit Line:	0.00000
End 2:	Slope of Best Fit Line:	-0.00040
	Angle of Best Fit Line:	-0.02275
	Max Angular Difference:	**0.02**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00225
	Angle of Best Fit Line:	-0.12900
End 2:	Slope of Best Fit Line:	-0.00106
	Angle of Best Fit Line:	-0.06090
	Max Angular Difference:	**-0.07**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0000	0.0000	**YES**
End 1 Diam 2	0.0043	0.0022	**YES**
End 2 Diam 1	0.0008	0.0004	**YES**
End 2 Diam 2	0.0022	0.0011	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

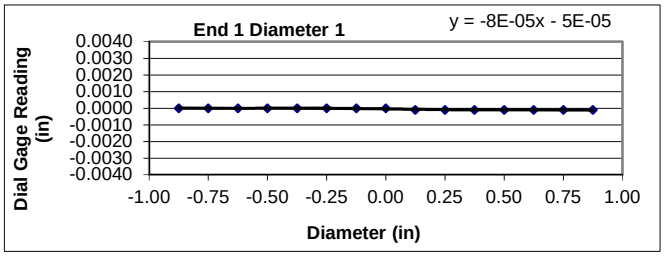
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	2/27/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.39	**Tested by:**	BKP
Boring Id:	B-29	**Unit Weight (pcf):**	182.3	**Reviewed by:**	JBB
Sample No.:	RC-5	**Moisture Content (%):**	0.1		
Depth (ft):	75.6 - 76.4				

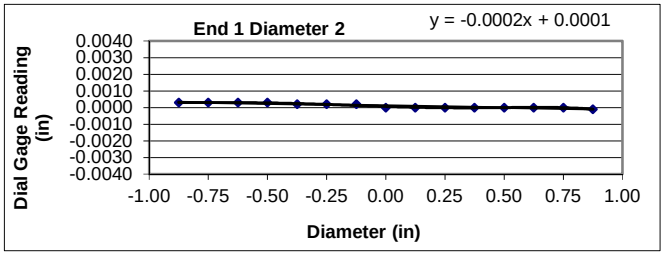
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

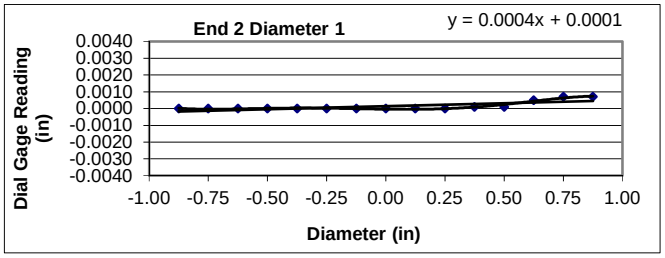
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0000	0.0003	0.0000	0.0009
- 6/8	0.0000	0.0003	0.0000	0.0009
- 5/8	0.0000	0.0003	0.0000	0.0008
- 4/8	0.0000	0.0003	0.0000	0.0008
- 3/8	0.0000	0.0002	0.0000	0.0007
- 2/8	0.0000	0.0002	0.0000	0.0005
- 1/8	0.0000	0.0002	0.0000	0.0004
0	0.0000	0.0000	0.0000	0.0000
1/8	-0.0001	0.0000	0.0000	0.0000
2/8	-0.0001	0.0000	0.0000	-0.0001
3/8	-0.0001	0.0000	0.0001	-0.0001
4/8	-0.0001	0.0000	0.0001	-0.0004
5/8	-0.0001	0.0000	0.0005	-0.0007
6/8	-0.0001	0.0000	0.0007	-0.0008
7/8	-0.0001	-0.0001	0.0007	-0.0009

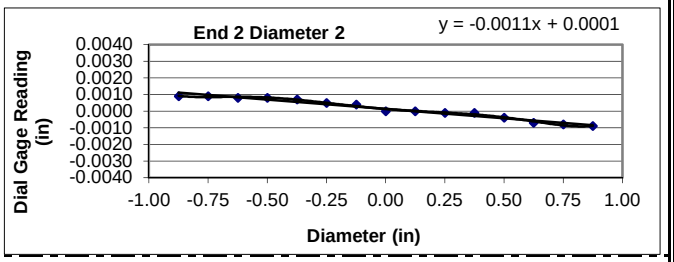




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00008
	Angle of Best Fit Line:	-0.00458
End 2:	Slope of Best Fit Line:	0.00035
	Angle of Best Fit Line:	0.02014
	Max Angular Difference:	**-0.02**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00024
	Angle of Best Fit Line:	-0.01391
End 2:	Slope of Best Fit Line:	-0.00112
	Angle of Best Fit Line:	-0.06401
	Max Angular Difference:	**0.05**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0001	0.0001	**YES**
End 1 Diam 2	0.0004	0.0002	**YES**
End 2 Diam 1	0.0007	0.0004	**YES**
End 2 Diam 2	0.0018	0.0009	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

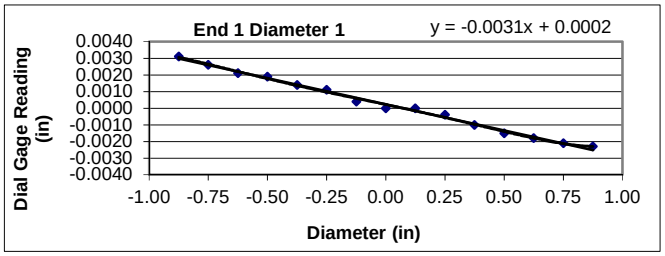
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	2/27/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.36	**Tested by:**	BKP
Boring Id:	B-36	**Unit Weight (pcf):**	198.6	**Reviewed by:**	JBB
Sample No.:	RC-3	**Moisture Content (%):**	0.1		
Depth (ft):	69.3 - 69.9				

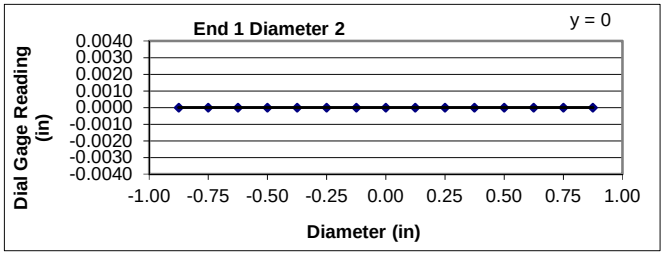
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

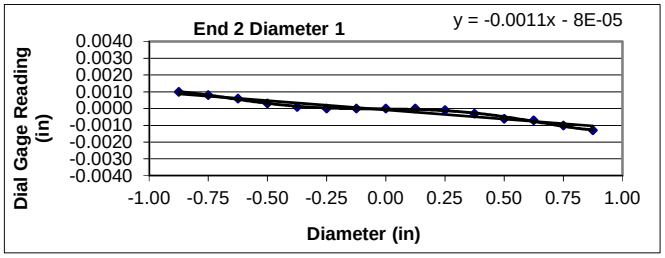
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0031	0.0000	0.0010	0.0000
- 6/8	0.0026	0.0000	0.0008	0.0000
- 5/8	0.0021	0.0000	0.0006	0.0000
- 4/8	0.0019	0.0000	0.0003	0.0000
- 3/8	0.0014	0.0000	0.0001	0.0000
- 2/8	0.0011	0.0000	0.0000	0.0000
- 1/8	0.0004	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	0.0000
2/8	-0.0004	0.0000	-0.0001	0.0000
3/8	-0.0010	0.0000	-0.0003	0.0000
4/8	-0.0015	0.0000	-0.0006	0.0000
5/8	-0.0018	0.0000	-0.0007	0.0000
6/8	-0.0021	0.0000	-0.0010	0.0000
7/8	-0.0023	0.0000	-0.0013	0.0000

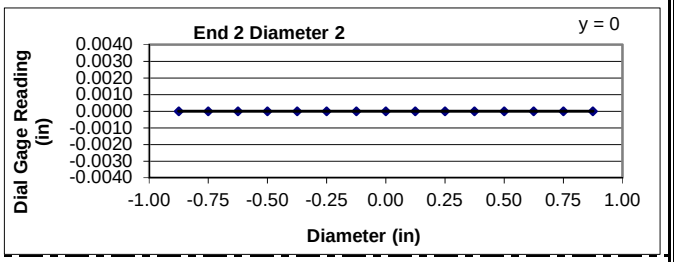




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00313
	Angle of Best Fit Line:	-0.17958
End 2:	Slope of Best Fit Line:	-0.00110
	Angle of Best Fit Line:	-0.06286
	Max Angular Difference:	**-0.12**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00000
	Angle of Best Fit Line:	0.00000
End 2:	Slope of Best Fit Line:	0.00000
	Angle of Best Fit Line:	0.00000
	Max Angular Difference:	**0.00**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0054	0.0027	**YES**
End 1 Diam 2	0.0000	0.0000	**YES**
End 2 Diam 1	0.0023	0.0012	**YES**
End 2 Diam 2	0.0000	0.0000	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

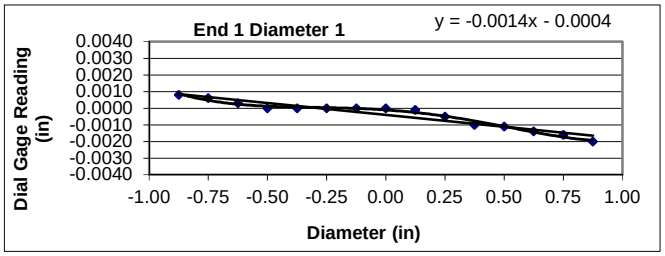
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	2/27/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.37	**Tested by:**	BKP
Boring Id:	B-45	**Unit Weight (pcf):**	163.5	**Reviewed by:**	JBB
Sample No.:	RC-2	**Moisture Content (%):**	0.4		
Depth (ft):	30.6 - 31.4				

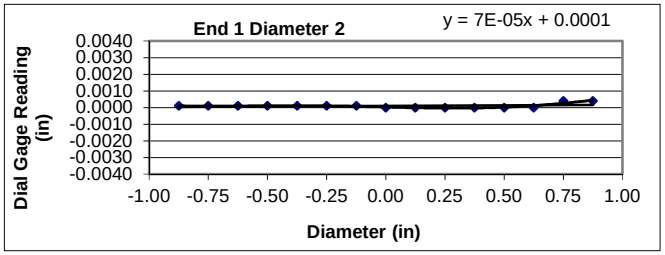
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

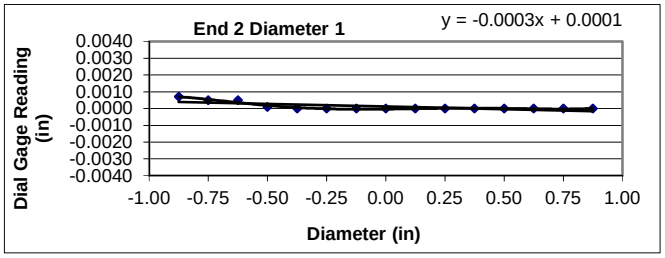
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0008	0.0001	0.0007	0.0000
- 6/8	0.0006	0.0001	0.0005	0.0000
- 5/8	0.0003	0.0001	0.0005	0.0000
- 4/8	0.0000	0.0001	0.0001	0.0000
- 3/8	0.0000	0.0001	0.0000	0.0000
- 2/8	0.0000	0.0001	0.0000	0.0000
- 1/8	0.0000	0.0001	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	-0.0001	0.0000	0.0000	0.0000
2/8	-0.0005	0.0000	0.0000	0.0000
3/8	-0.0010	0.0000	0.0000	0.0000
4/8	-0.0011	0.0000	0.0000	0.0000
5/8	-0.0014	0.0000	0.0000	0.0000
6/8	-0.0016	0.0004	0.0000	0.0005
7/8	-0.0020	0.0004	0.0000	0.0005

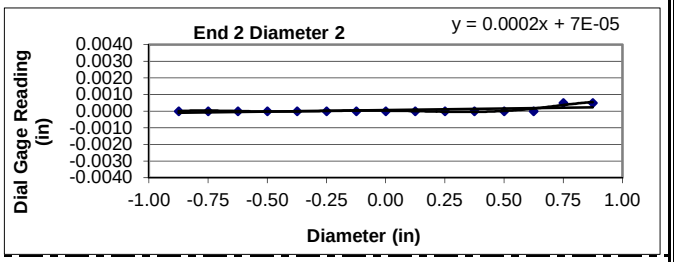




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00142
	Angle of Best Fit Line:	-0.08152
End 2:	Slope of Best Fit Line:	-0.00031
	Angle of Best Fit Line:	-0.01768
	Max Angular Difference:	**-0.06**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00007
	Angle of Best Fit Line:	0.00393
End 2:	Slope of Best Fit Line:	0.00019
	Angle of Best Fit Line:	0.01064
	Max Angular Difference:	**-0.01**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0028	0.0014	**YES**
End 1 Diam 2	0.0004	0.0002	**YES**
End 2 Diam 1	0.0007	0.0004	**YES**
End 2 Diam 2	0.0005	0.0003	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

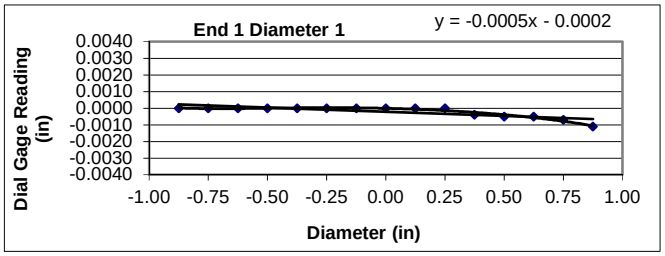
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	2/27/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.48	**Tested by:**	BKP
Boring Id:	B-45	**Unit Weight (pcf):**	163.9	**Reviewed by:**	JBB
Sample No.:	RC-3	**Moisture Content (%):**	0.3		
Depth (ft):	37.9 - 38.5				

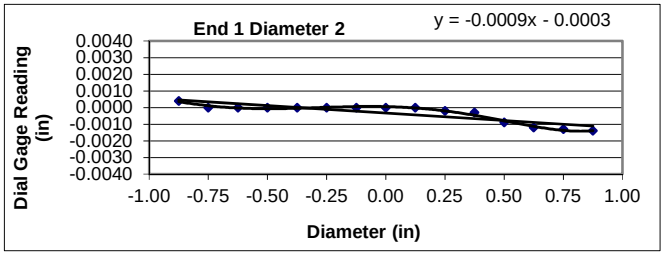
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

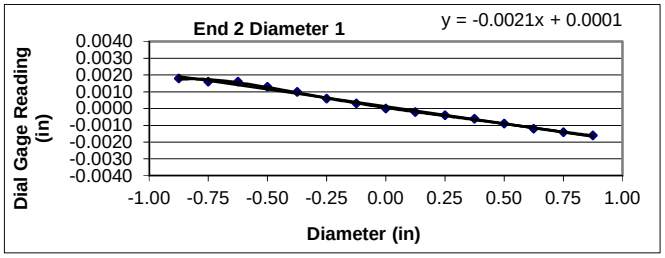
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0000	0.0004	0.0018	0.0014
- 6/8	0.0000	0.0000	0.0016	0.0010
- 5/8	0.0000	0.0000	0.0016	0.0006
- 4/8	0.0000	0.0000	0.0013	0.0006
- 3/8	0.0000	0.0000	0.0010	0.0003
- 2/8	0.0000	0.0000	0.0006	0.0001
- 1/8	0.0000	0.0000	0.0003	0.0001
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	-0.0002	-0.0001
2/8	0.0000	-0.0002	-0.0004	-0.0004
3/8	-0.0004	-0.0003	-0.0006	-0.0005
4/8	-0.0005	-0.0009	-0.0009	-0.0007
5/8	-0.0005	-0.0012	-0.0012	-0.0010
6/8	-0.0007	-0.0013	-0.0014	-0.0013
7/8	-0.0011	-0.0014	-0.0016	-0.0014

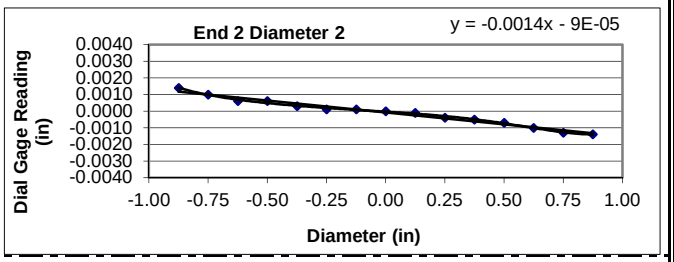




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00050
	Angle of Best Fit Line:	-0.02881
End 2:	Slope of Best Fit Line:	-0.00205
	Angle of Best Fit Line:	-0.11770
	Max Angular Difference:	**0.09**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00089
	Angle of Best Fit Line:	-0.05124
End 2:	Slope of Best Fit Line:	-0.00143
	Angle of Best Fit Line:	-0.08218
	Max Angular Difference:	**0.03**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0011	0.0006	**YES**
End 1 Diam 2	0.0018	0.0009	**YES**
End 2 Diam 1	0.0034	0.0017	**YES**
End 2 Diam 2	0.0028	0.0014	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

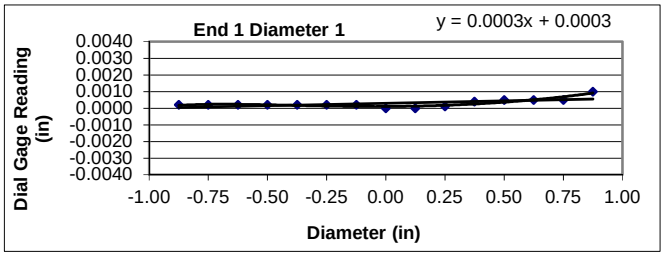
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	2/27/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.37	**Tested by:**	BKP
Boring Id:	B-45	**Unit Weight (pcf):**	163.3	**Reviewed by:**	JBB
Sample No.:	RC-6	**Moisture Content (%):**	0.4		
Depth (ft):	42.8 - 43.4				

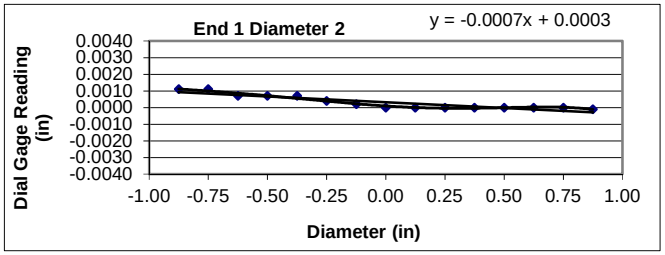
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

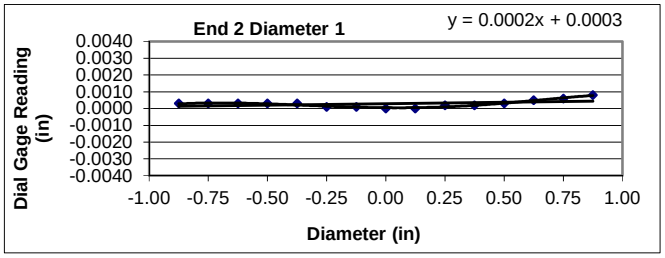
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0002	0.0011	0.0003	0.0003
- 6/8	0.0002	0.0011	0.0003	0.0003
- 5/8	0.0002	0.0007	0.0003	0.0003
- 4/8	0.0002	0.0007	0.0003	0.0003
- 3/8	0.0002	0.0007	0.0003	0.0003
- 2/8	0.0002	0.0004	0.0001	0.0002
- 1/8	0.0002	0.0002	0.0001	0.0002
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	0.0000
2/8	0.0001	0.0000	0.0002	-0.0003
3/8	0.0004	0.0000	0.0002	-0.0004
4/8	0.0005	0.0000	0.0003	-0.0007
5/8	0.0005	0.0000	0.0005	-0.0008
6/8	0.0005	0.0000	0.0006	-0.0008
7/8	0.0010	-0.0001	0.0008	-0.0008

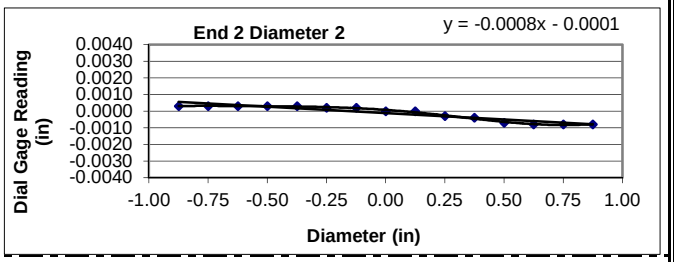




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	0.00029
	Angle of Best Fit Line:	0.01686
End 2:	Slope of Best Fit Line:	0.00017
	Angle of Best Fit Line:	0.00999
	Max Angular Difference:	**0.01**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00070
	Angle of Best Fit Line:	-0.03994
End 2:	Slope of Best Fit Line:	-0.00077
	Angle of Best Fit Line:	-0.04436
	Max Angular Difference:	**0.00**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0010	0.0005	**YES**
End 1 Diam 2	0.0012	0.0006	**YES**
End 2 Diam 1	0.0008	0.0004	**YES**
End 2 Diam 2	0.0011	0.0006	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

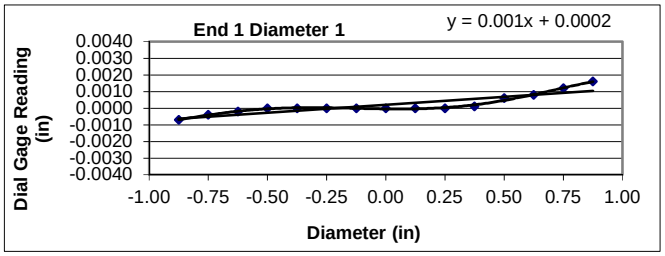
Project:	Carolina Crossroads Project	**Diameter (in):**	1.99	**Date:**	2/27/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.40	**Tested by:**	BKP
Boring Id:	B-47	**Unit Weight (pcf):**	166.4	**Reviewed by:**	JBB
Sample No.:	RC-1	**Moisture Content (%):**	0.4		
Depth (ft):	47.2 - 47.8				

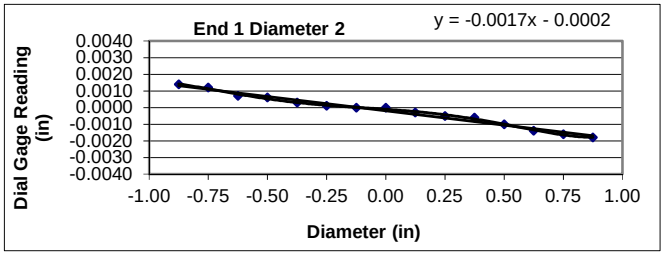
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

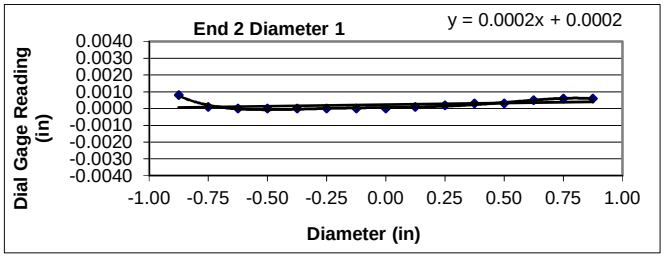
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	-0.0007	0.0014	0.0008	0.0002
- 6/8	-0.0004	0.0012	0.0001	0.0000
- 5/8	-0.0002	0.0007	0.0000	0.0000
- 4/8	0.0000	0.0006	0.0000	0.0000
- 3/8	0.0000	0.0003	0.0000	0.0000
- 2/8	0.0000	0.0001	0.0000	0.0000
- 1/8	0.0000	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	-0.0003	0.0001	0.0000
2/8	0.0000	-0.0005	0.0002	0.0000
3/8	0.0001	-0.0006	0.0003	0.0000
4/8	0.0006	-0.0010	0.0003	0.0000
5/8	0.0008	-0.0014	0.0005	-0.0002
6/8	0.0012	-0.0016	0.0006	-0.0005
7/8	0.0016	-0.0018	0.0006	-0.0007

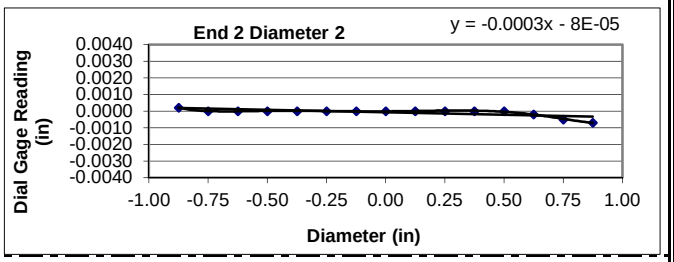




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	0.00095
	Angle of Best Fit Line:	0.05468
End 2:	Slope of Best Fit Line:	0.00019
	Angle of Best Fit Line:	0.01097
	Max Angular Difference:	**0.04**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00172
	Angle of Best Fit Line:	-0.09871
End 2:	Slope of Best Fit Line:	-0.00029
	Angle of Best Fit Line:	-0.01686
	Max Angular Difference:	**-0.08**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0023	0.0012	**YES**
End 1 Diam 2	0.0032	0.0016	**YES**
End 2 Diam 1	0.0008	0.0004	**YES**
End 2 Diam 2	0.0009	0.0005	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

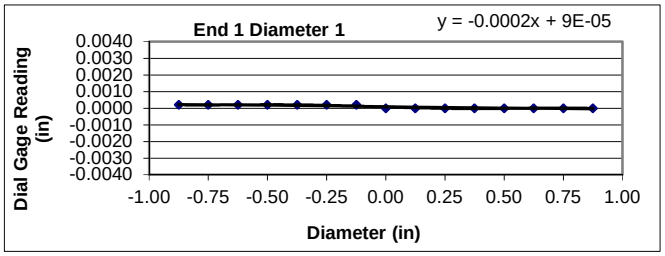
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	2/27/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.47	**Tested by:**	BKP
Boring Id:	B-47	**Unit Weight (pcf):**	170.6	**Reviewed by:**	JBB
Sample No.:	RC-3	**Moisture Content (%):**	0.4		
Depth (ft):	55.4 - 56.2				

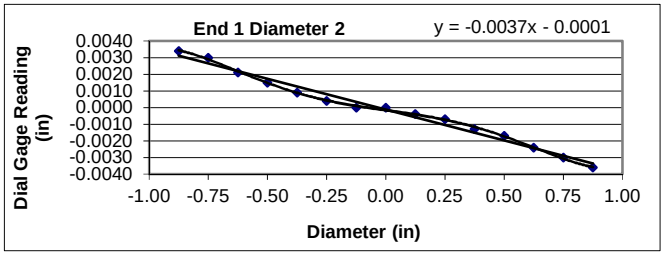
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

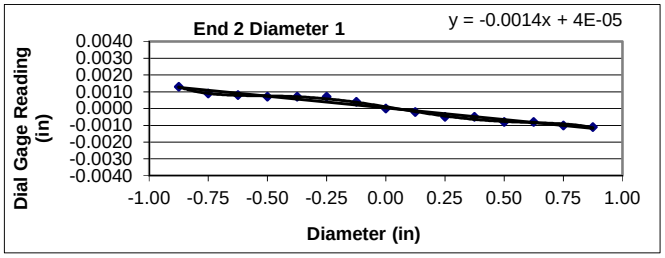
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0002	0.0034	0.0013	0.0000
- 6/8	0.0002	0.0030	0.0009	0.0000
- 5/8	0.0002	0.0021	0.0008	0.0000
- 4/8	0.0002	0.0015	0.0007	0.0000
- 3/8	0.0002	0.0009	0.0007	0.0000
- 2/8	0.0002	0.0004	0.0007	0.0000
- 1/8	0.0002	0.0000	0.0004	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	-0.0004	-0.0002	0.0000
2/8	0.0000	-0.0007	-0.0005	0.0000
3/8	0.0000	-0.0013	-0.0005	0.0000
4/8	0.0000	-0.0017	-0.0008	0.0000
5/8	0.0000	-0.0024	-0.0008	0.0000
6/8	0.0000	-0.0030	-0.0010	0.0000
7/8	0.0000	-0.0036	-0.0011	0.0000

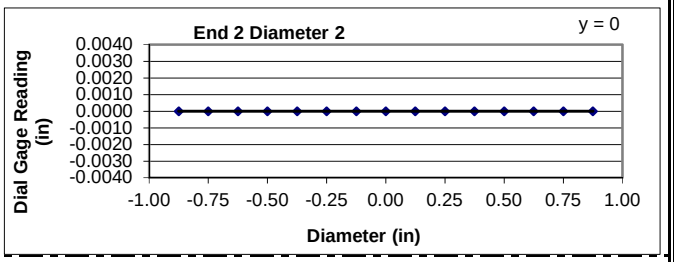




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00016
	Angle of Best Fit Line:	-0.00917
End 2:	Slope of Best Fit Line:	-0.00139
	Angle of Best Fit Line:	-0.07989
	Max Angular Difference:	**0.07**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00370
	Angle of Best Fit Line:	-0.21199
End 2:	Slope of Best Fit Line:	0.00000
	Angle of Best Fit Line:	0.00000
	Max Angular Difference:	**-0.21**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0002	0.0001	**YES**
End 1 Diam 2	0.0070	0.0035	**YES**
End 2 Diam 1	0.0024	0.0012	**YES**
End 2 Diam 2	0.0000	0.0000	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

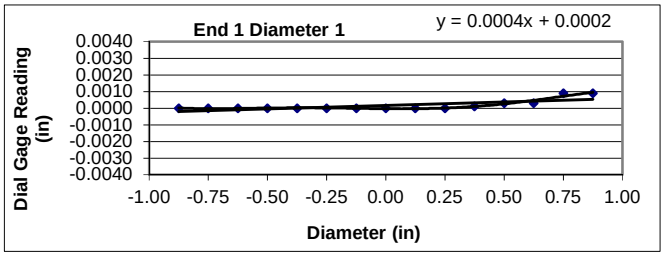
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	2/27/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.45	**Tested by:**	BKP
Boring Id:	B-47	**Unit Weight (pcf):**	169.3	**Reviewed by:**	JBB
Sample No.:	RC-4	**Moisture Content (%):**	0.4		
Depth (ft):	64.0 - 65.0				

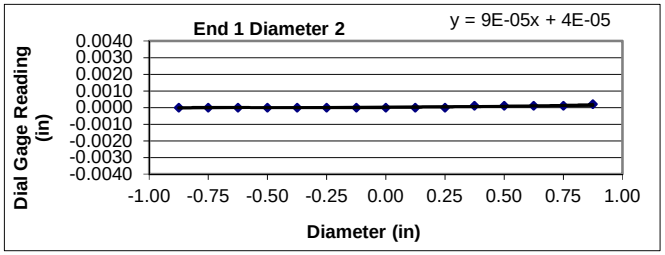
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

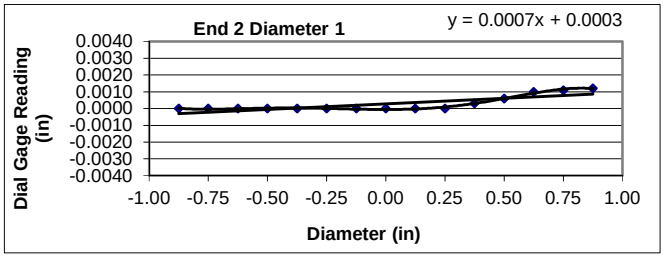
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0000	0.0000	0.0000	0.0003
- 6/8	0.0000	0.0000	0.0000	0.0002
- 5/8	0.0000	0.0000	0.0000	0.0001
- 4/8	0.0000	0.0000	0.0000	0.0000
- 3/8	0.0000	0.0000	0.0000	0.0000
- 2/8	0.0000	0.0000	0.0000	0.0000
- 1/8	0.0000	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	-0.0002
2/8	0.0000	0.0000	0.0000	-0.0007
3/8	0.0001	0.0001	0.0003	-0.0010
4/8	0.0003	0.0001	0.0006	-0.0012
5/8	0.0003	0.0001	0.0010	-0.0015
6/8	0.0009	0.0001	0.0011	-0.0016
7/8	0.0009	0.0002	0.0012	-0.0017

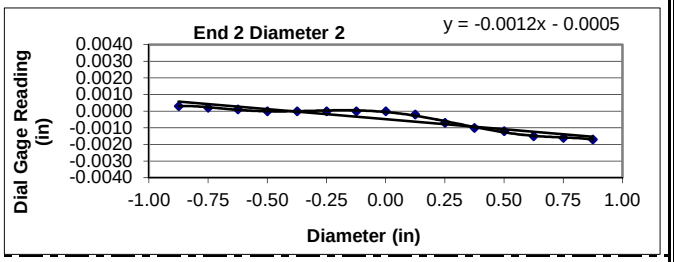




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	0.00042
	Angle of Best Fit Line:	0.02406
End 2:	Slope of Best Fit Line:	0.00067
	Angle of Best Fit Line:	0.03814
	Max Angular Difference:	**-0.01**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00009
	Angle of Best Fit Line:	0.00524
End 2:	Slope of Best Fit Line:	-0.00121
	Angle of Best Fit Line:	-0.06908
	Max Angular Difference:	**0.07**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0009	0.0005	**YES**
End 1 Diam 2	0.0002	0.0001	**YES**
End 2 Diam 1	0.0012	0.0006	**YES**
End 2 Diam 2	0.0020	0.0010	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

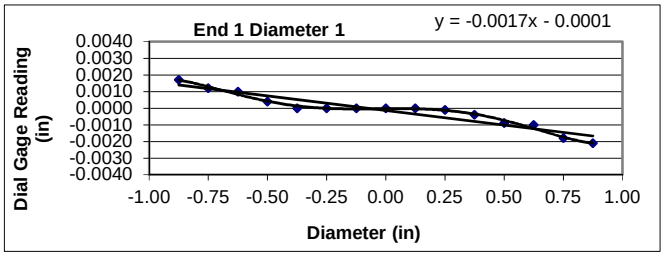
Project:	Carolina Crossroads Project	**Diameter (in):**	1.96	**Date:**	2/27/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.32	**Tested by:**	BKP
Boring Id:	B-50	**Unit Weight (pcf):**	170.8	**Reviewed by:**	JBB
Sample No.:	RC-1	**Moisture Content (%):**	0.3		
Depth (ft):	73.7 - 74.3				

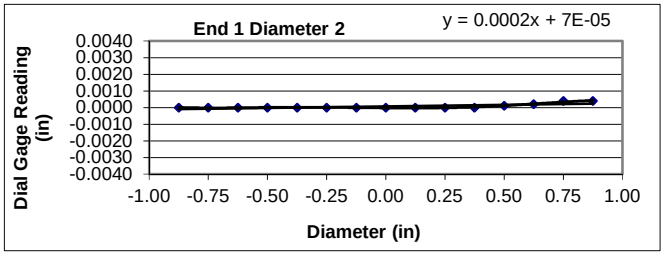
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

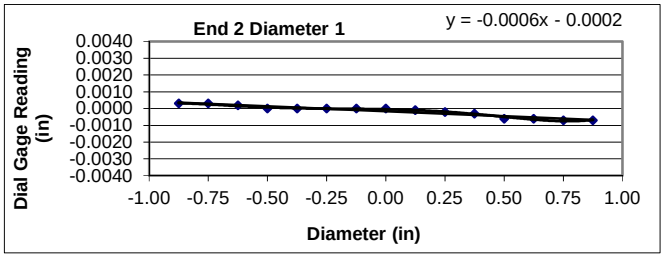
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0017	0.0000	0.0003	0.0028
- 6/8	0.0012	0.0000	0.0003	0.0026
- 5/8	0.0010	0.0000	0.0002	0.0023
- 4/8	0.0004	0.0000	0.0000	0.0018
- 3/8	0.0000	0.0000	0.0000	0.0010
- 2/8	0.0000	0.0000	0.0000	0.0007
- 1/8	0.0000	0.0000	0.0000	0.0003
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	-0.0001	-0.0001
2/8	-0.0001	0.0000	-0.0002	-0.0006
3/8	-0.0004	0.0000	-0.0003	-0.0012
4/8	-0.0009	0.0001	-0.0006	-0.0013
5/8	-0.0010	0.0002	-0.0006	-0.0018
6/8	-0.0018	0.0004	-0.0007	-0.0021
7/8	-0.0021	0.0004	-0.0007	-0.0026

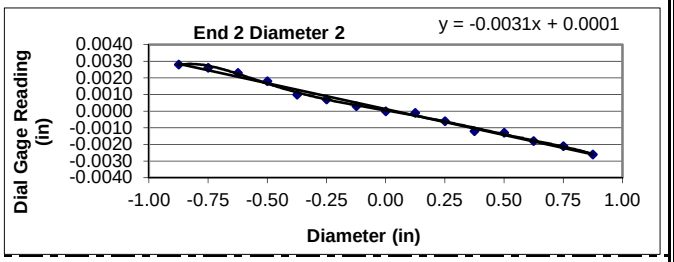




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00175
	Angle of Best Fit Line:	-0.10019
End 2:	Slope of Best Fit Line:	-0.00059
	Angle of Best Fit Line:	-0.03405
	Max Angular Difference:	**-0.07**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00019
	Angle of Best Fit Line:	0.01080
End 2:	Slope of Best Fit Line:	-0.00310
	Angle of Best Fit Line:	-0.17762
	Max Angular Difference:	**0.19**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0038	0.0019	**YES**
End 1 Diam 2	0.0004	0.0002	**YES**
End 2 Diam 1	0.0010	0.0005	**YES**
End 2 Diam 2	0.0054	0.0028	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

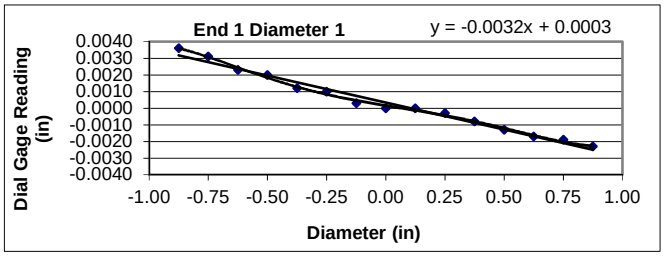
Project:	Carolina Crossroads Project	**Diameter (in):**	1.95	**Date:**	2/27/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.34	**Tested by:**	BKP
Boring Id:	B-50	**Unit Weight (pcf):**	167.6	**Reviewed by:**	JBB
Sample No.:	RC-4	**Moisture Content (%):**	0.3		
Depth (ft):	87.7 - 88.5				

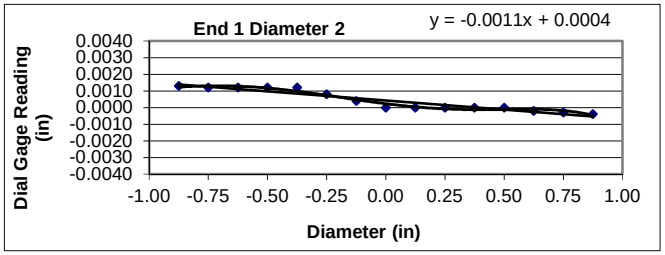
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

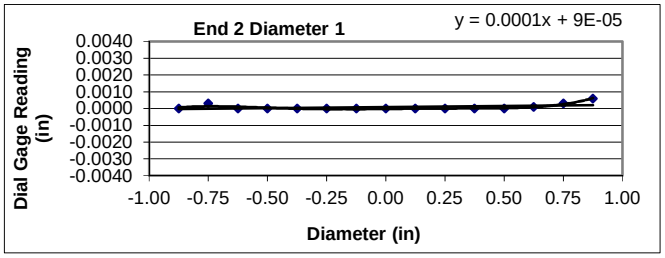
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0036	0.0013	0.0000	0.0042
- 6/8	0.0031	0.0012	0.0003	0.0037
- 5/8	0.0023	0.0012	0.0000	0.0030
- 4/8	0.0020	0.0012	0.0000	0.0022
- 3/8	0.0012	0.0012	0.0000	0.0013
- 2/8	0.0010	0.0008	0.0000	0.0008
- 1/8	0.0003	0.0004	0.0000	0.0004
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	-0.0001
2/8	-0.0003	0.0000	0.0000	-0.0006
3/8	-0.0008	0.0000	0.0000	-0.0012
4/8	-0.0013	0.0000	0.0000	-0.0019
5/8	-0.0017	-0.0002	0.0001	-0.0024
6/8	-0.0019	-0.0003	0.0003	-0.0031
7/8	-0.0023	-0.0004	0.0006	-0.0037

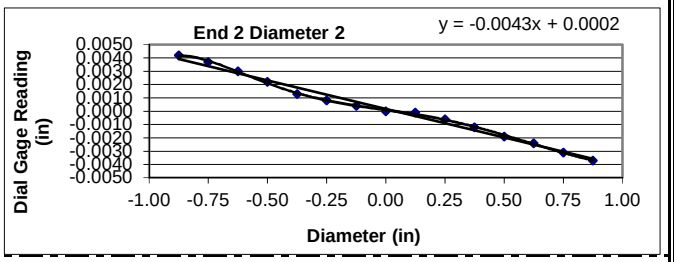




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00324
	Angle of Best Fit Line:	-0.18564
End 2:	Slope of Best Fit Line:	0.00013
	Angle of Best Fit Line:	0.00769
	Max Angular Difference:	**-0.19**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00109
	Angle of Best Fit Line:	-0.06270
End 2:	Slope of Best Fit Line:	-0.00429
	Angle of Best Fit Line:	-0.24604
	Max Angular Difference:	**0.18**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0059	0.0030	**YES**
End 1 Diam 2	0.0017	0.0009	**YES**
End 2 Diam 1	0.0006	0.0003	**YES**
End 2 Diam 2	0.0079	0.0041	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

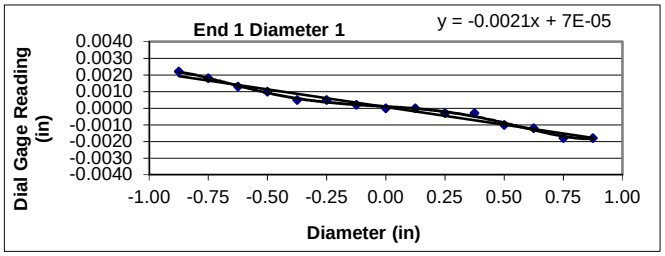
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	2/27/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.39	**Tested by:**	BKP
Boring Id:	W-22	**Unit Weight (pcf):**	164.2	**Reviewed by:**	JBB
Sample No.:	RC-3	**Moisture Content (%):**	0.3		
Depth (ft):	16.5 - 17.0				

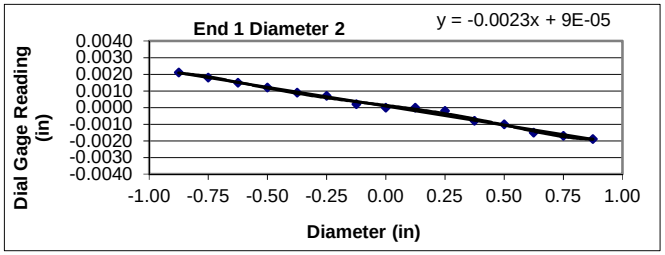
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

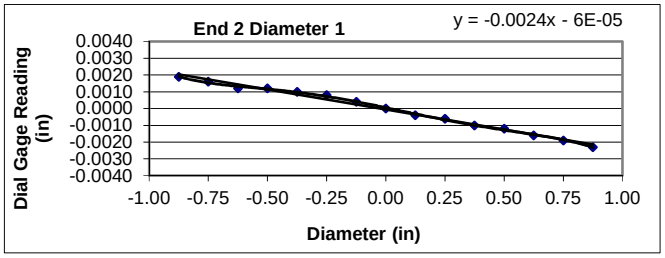
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0022	0.0021	0.0019	0.0003
- 6/8	0.0018	0.0018	0.0016	0.0003
- 5/8	0.0013	0.0015	0.0012	0.0000
- 4/8	0.0010	0.0012	0.0012	0.0000
- 3/8	0.0005	0.0009	0.0010	0.0000
- 2/8	0.0005	0.0007	0.0008	0.0000
- 1/8	0.0002	0.0002	0.0004	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	-0.0004	0.0000
2/8	-0.0003	-0.0002	-0.0006	-0.0001
3/8	-0.0003	-0.0008	-0.0010	-0.0001
4/8	-0.0010	-0.0010	-0.0012	-0.0001
5/8	-0.0012	-0.0015	-0.0016	-0.0001
6/8	-0.0018	-0.0017	-0.0019	-0.0001
7/8	-0.0018	-0.0019	-0.0023	-0.0001

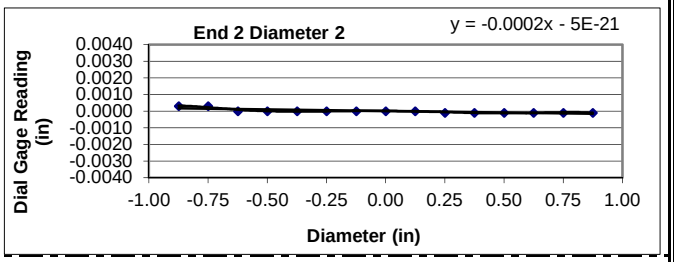




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00212
	Angle of Best Fit Line:	-0.12163
End 2:	Slope of Best Fit Line:	-0.00239
	Angle of Best Fit Line:	-0.13686
	Max Angular Difference:	**0.02**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00228
	Angle of Best Fit Line:	-0.13080
End 2:	Slope of Best Fit Line:	-0.00019
	Angle of Best Fit Line:	-0.01080
	Max Angular Difference:	**-0.12**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0040	0.0020	**YES**
End 1 Diam 2	0.0040	0.0020	**YES**
End 2 Diam 1	0.0042	0.0021	**YES**
End 2 Diam 2	0.0004	0.0002	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

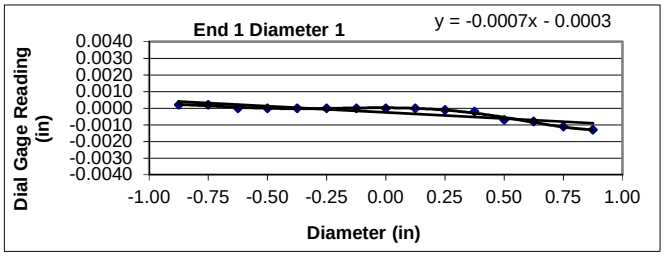
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	2/27/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.38	**Tested by:**	BKP
Boring Id:	W-25	**Unit Weight (pcf):**	165.3	**Reviewed by:**	JBB
Sample No.:	RC-2	**Moisture Content (%):**	0.3		
Depth (ft):	30.5 - 31.3				

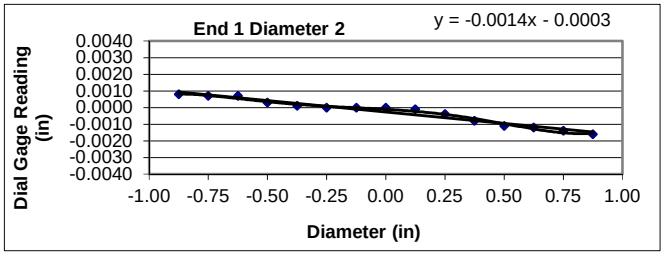
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

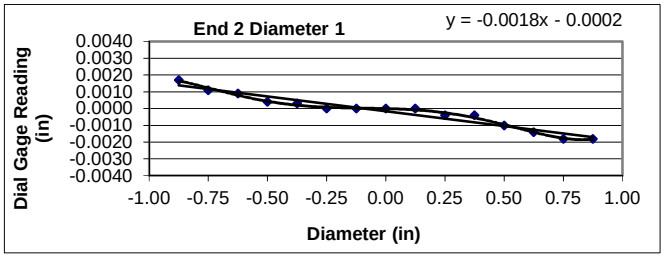
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0002	0.0008	0.0017	0.0000
- 6/8	0.0002	0.0007	0.0011	0.0000
- 5/8	0.0000	0.0007	0.0009	0.0000
- 4/8	0.0000	0.0003	0.0004	0.0000
- 3/8	0.0000	0.0001	0.0003	0.0000
- 2/8	0.0000	0.0000	0.0000	0.0000
- 1/8	0.0000	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	-0.0001	0.0000	0.0000
2/8	-0.0001	-0.0004	-0.0004	0.0000
3/8	-0.0002	-0.0008	-0.0004	0.0000
4/8	-0.0007	-0.0011	-0.0010	-0.0001
5/8	-0.0008	-0.0012	-0.0014	-0.0004
6/8	-0.0011	-0.0014	-0.0018	-0.0005
7/8	-0.0013	-0.0016	-0.0018	-0.0007

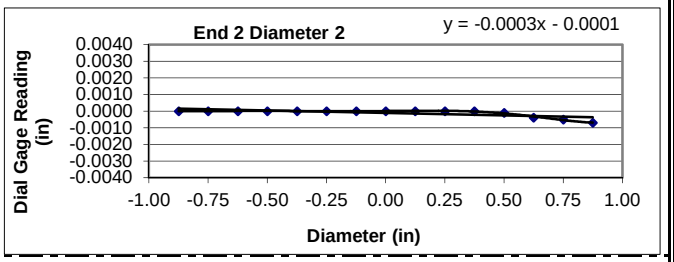




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00074
	Angle of Best Fit Line:	-0.04240
End 2:	Slope of Best Fit Line:	-0.00177
	Angle of Best Fit Line:	-0.10133
	Max Angular Difference:	**0.06**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00137
	Angle of Best Fit Line:	-0.07874
End 2:	Slope of Best Fit Line:	-0.00029
	Angle of Best Fit Line:	-0.01686
	Max Angular Difference:	**-0.06**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0015	0.0008	**YES**
End 1 Diam 2	0.0024	0.0012	**YES**
End 2 Diam 1	0.0035	0.0018	**YES**
End 2 Diam 2	0.0007	0.0004	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

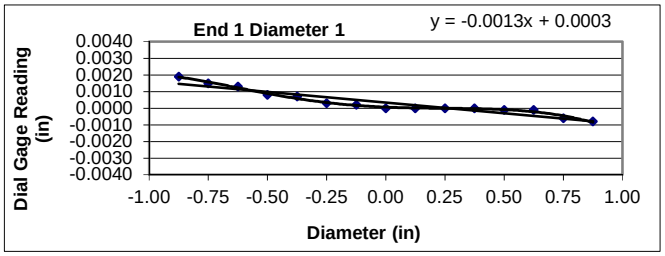
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	2/27/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.39	**Tested by:**	BKP
Boring Id:	W-32	**Unit Weight (pcf):**	179.9	**Reviewed by:**	JBB
Sample No.:	RC-1	**Moisture Content (%):**	0.2		
Depth (ft):	48.0 - 48.7				

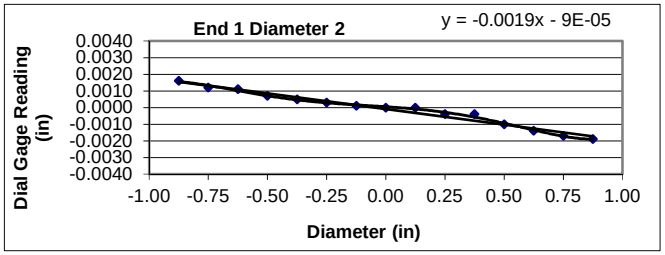
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

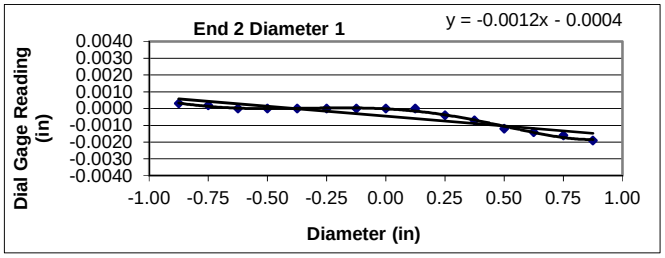
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0019	0.0016	0.0003	-0.0003
- 6/8	0.0015	0.0012	0.0002	0.0000
- 5/8	0.0013	0.0011	0.0000	0.0000
- 4/8	0.0008	0.0007	0.0000	0.0000
- 3/8	0.0007	0.0005	0.0000	0.0000
- 2/8	0.0003	0.0003	0.0000	0.0000
- 1/8	0.0002	0.0001	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	0.0000
2/8	0.0000	-0.0004	-0.0004	0.0000
3/8	0.0000	-0.0004	-0.0007	0.0000
4/8	-0.0001	-0.0010	-0.0012	0.0003
5/8	-0.0001	-0.0014	-0.0014	0.0005
6/8	-0.0006	-0.0017	-0.0016	0.0008
7/8	-0.0008	-0.0019	-0.0019	0.0008

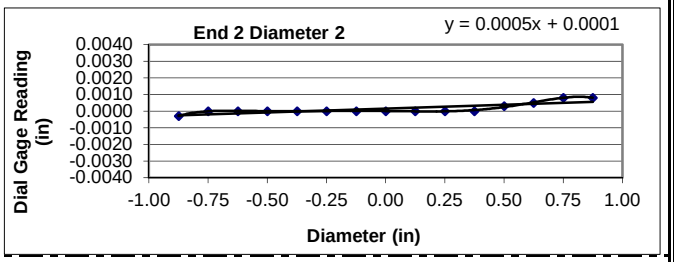




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00129
	Angle of Best Fit Line:	-0.07367
End 2:	Slope of Best Fit Line:	-0.00117
	Angle of Best Fit Line:	-0.06695
	Max Angular Difference:	**-0.01**

Parrallelism Diameter 2

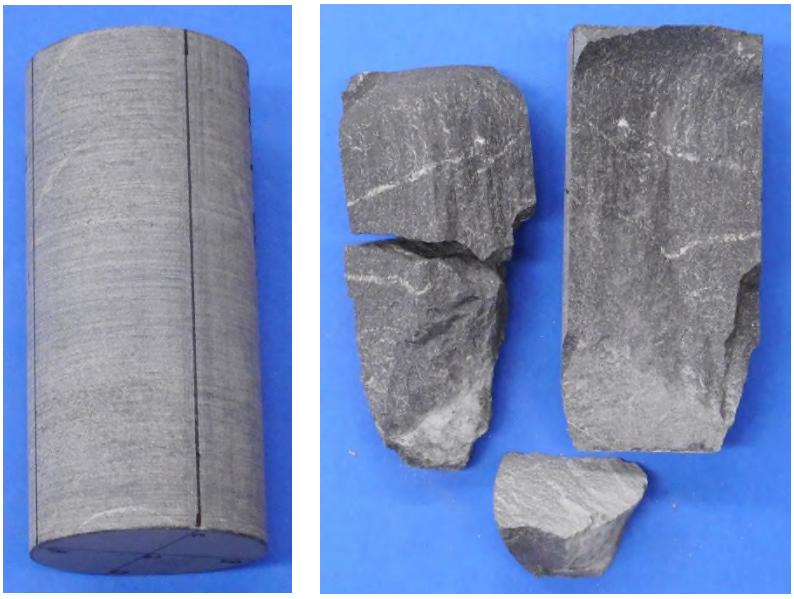
End 1:	Slope of Best Fit Line:	-0.00187
	Angle of Best Fit Line:	-0.10706
End 2:	Slope of Best Fit Line:	0.00046
	Angle of Best Fit Line:	0.02652
	Max Angular Difference:	**-0.13**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0027	0.0014	**YES**
End 1 Diam 2	0.0035	0.0018	**YES**
End 2 Diam 1	0.0022	0.0011	**YES**
End 2 Diam 2	0.0011	0.0006	**YES**

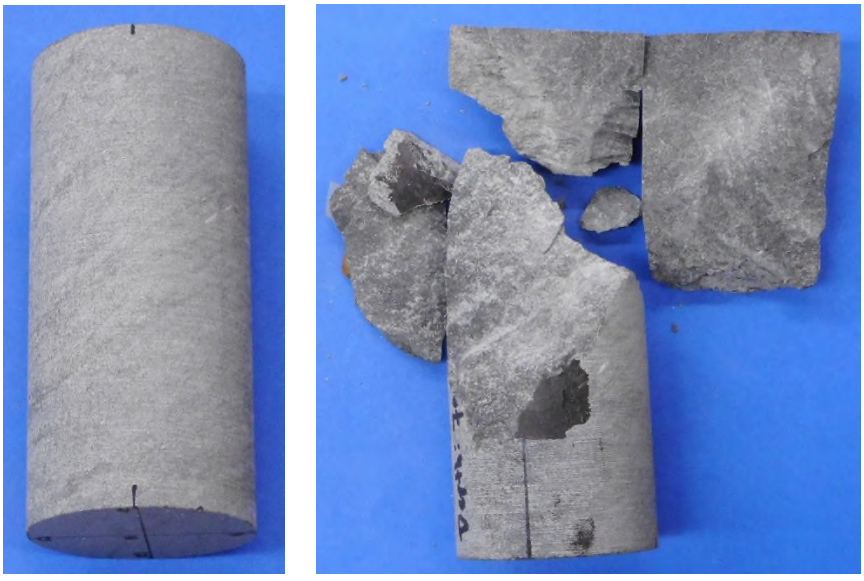
Perpendicularity Tolerance Met? **YES**



Date: 3/1/2018

Photographer: Ben Painter

1	**Location / Orientation**	B-29, RC-3 (65.4' – 66.1')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)



Date: 3/1/2018

Photographer: Ben Painter

2	**Location / Orientation**	B-29, RC-4 (70.3' – 70.9')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 3/1/2018

Photographer: Ben Painter

3	**Location / Orientation**	B-29, RC-5 (75.6' – 76.4')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 3/1/2018

Photographer: Ben Painter

4	**Location / Orientation**	B-36, RC-3 (69.3' – 69.9')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 3/1/2018

Photographer: Ben Painter

5	**Location / Orientation**	B-45, RC-2 (30.6' – 31.4')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 3/1/2018

Photographer: Ben Painter

6	**Location / Orientation**	B-45, RC-3 (37.9' – 38.5')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 3/1/2018

Photographer: Ben Painter

7	**Location / Orientation**	B-45, RC-6 (42.8' – 43.4')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 3/1/2018

Photographer: Ben Painter

8	**Location / Orientation**	B-47, RC-1 (47.2' – 47.8')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 3/1/2018

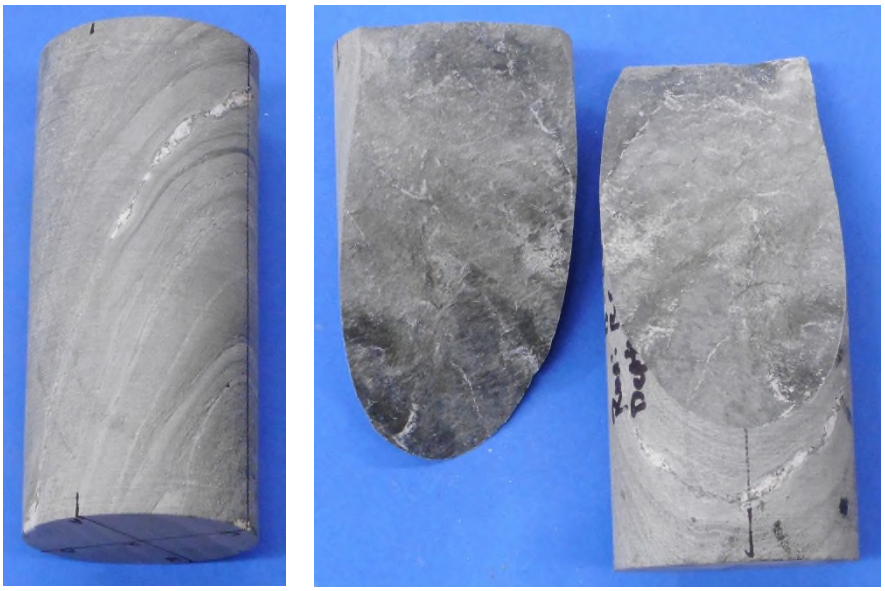
Photographer: Ben Painter

9	**Location / Orientation**	B-47, RC-3 (55.4' – 56.2')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 3/1/2018

Photographer: Ben Painter

10	**Location / Orientation**	B-47, RC-4 (64.0' – 65.0')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)



Date: 3/1/2018

Photographer: Ben Painter

11	**Location / Orientation**	B-50, RC-1 (73.7' – 74.3')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 3/1/2018

Photographer: Ben Painter

12	**Location / Orientation**	B-50, RC-4 (87.7' – 88.5')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 3/1/2018

Photographer: Ben Painter

13	**Location / Orientation**	W-22, RC-3 (16.5' – 17.0')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 3/1/2018

Photographer: Ben Painter

14	**Location / Orientation**	W-25, RC-2 (30.5' – 31.3')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 3/1/2018

Photographer: Ben Painter

15	**Location / Orientation**	W-32, RC-1 (48.0' – 48.7')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

UNCONFINED COMPRESSION
(ASTM D7012 Method C)

S&ME, Inc. - Knoxville 1413 Topside Road, Louisville, TN 37777

Project Name: Carolina Crossroads Project
Project Number: 1461-16-047 Phase 2B

Report Date: March 14, 2018
Reviewed By: Jason B. Burgess

Boring No.	Sample No.	Depth (ft)	Dimensions, in.		Shape (See Key)	Area (in^2)	Unit Weight (lbs/ft^3)	Loading Rate (psi/sec)	Maximum Load (lbs)	Strength (psi)	Moisture (%)
			Length	Diameter							
DH-5	RC-5	60.6 - 62.1	5.55	2.49	B	4.87	171.1	32	26,017	5,342	0.1
DH-5	RC-15	112.5 - 113.5	5.57	2.49	B	4.87	171.5	30	20,867	4,285	0.4
B-50	RC-2	81.2 - 82.2	4.43	1.96	A	3.02	172.5	22	4,745	1,571	0.3
B-49	RC-3	49.2 - 50.3	4.48	1.98	D	3.08	167.8	46	18,229	5,919	0.3
B-49	RC-5	56.6 - 57.6	4.38	1.98	A	3.08	169.4	46	19,997	6,493	0.4

NOTES: Effective (as received) unit weight as determined by RTH 109-93.
Loading rates were selected to target reaching failure between 2 and 15 minutes.
Test results for specimens not meeting the requirements of ASTM D4543 may differ from a test specimen that meets the requirements of ASTM D4543.

SHAPE KEY

ASTM D4543-08$^{\epsilon 1}$ *Standard Practice for Preparing Rock Core as Cylindrical Test Specimens and Verifying Conformance to Dimensional and Shape Tolerance* Section 1.2 - "Rock is a complex engineering material that can vary greatly as a function of lithology, stress history, weathering, moisture content and chemistry, and other natural geologic processes. As such, it is not always possible to obtain or prepare rock core specimens that satisfy the desirable tolerances given in this practice. Most commonly, this situation presents itself with weaker, more porous, and poorly cemented rock types and rock types containing significant or weak (or both) structural features. For these and other rock types which are difficult to prepare, all reasonable efforts shall be made to prepare a specimen in accordance with this practice and for the intended test procedure. However, when it has been determined by trial that this is not possible, prepare the rock specimen to the closest tolerances practicable and consider this to be the best effort and report it as such and if allowable or necessary for the intended test, capping the ends of the specimen as discussed in this practice is permitted."

A Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)

B Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism, and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness. Specimen prepared to closest tolerances practicable.

C Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism. Specimen did not meet the desired tolerances for side straightness and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

D Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness. Specimen did not meet the desired tolerances for side straightness, parallelism and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

E Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness and parallelism. Specimen prepared to closest tolerances practicable.

UNCONFINED COMPRESSION
(ASTM D7012 Method C)

S&ME, Inc. - Knoxville 1413 Topside Road, Louisville, TN 37777

Project Name: Carolina Crossroads Project
Project Number: 1461-16-047 Phase 2B

Report Date: March 14, 2018
Reviewed By: Jason B. Burgess

Boring No.	Sample No.	Depth (ft)	Dimensions, in.		Shape (See Key)	Area (in^2)	Unit Weight (lbs/ft^3)	Loading Rate (psi/sec)	Maximum Load (lbs)	Strength (psi)	Moisture (%)
			Length	Diameter							
B-55	RC-2	59.6 - 60.6	4.40	1.96	A	3.02	163.6	41	17,835	5,906	0.5
B-55	RC-3	65.5 - 66.4	4.33	1.94	A	2.96	155.9	23	4,911	1,659	0.8
B-55	RC-4	72.9 - 73.6	4.37	1.96	A	3.02	160.0	30	8,836	2,926	0.5
B-52	RC-2	75.4 - 76.4	4.37	1.97	A	3.05	166.0	65	39,610	12,987	0.5
B-52	RC-5	90.4 - 91.4	4.48	1.98	A	3.08	164.7	37	14,609	4,743	0.6

NOTES: Effective (as received) unit weight as determined by RTH 109-93.
Loading rates were selected to target reaching failure between 2 and 15 minutes.
Test results for specimens not meeting the requirements of ASTM D4543 may differ from a test specimen that meets the requirements of ASTM D4543.

SHAPE KEY

ASTM D4543-08$^{\epsilon 1}$ *Standard Practice for Preparing Rock Core as Cylindrical Test Specimens and Verifying Conformance to Dimensional and Shape Tolerance* Section 1.2 - "Rock is a complex engineering material that can vary greatly as a function of lithology, stress history, weathering, moisture content and chemistry, and other natural geologic processes. As such, it is not always possible to obtain or prepare rock core specimens that satisfy the desirable tolerances given in this practice. Most commonly, this situation presents itself with weaker, more porous, and poorly cemented rock types and rock types containing significant or weak (or both) structural features. For these and other rock types which are difficult to prepare, all reasonable efforts shall be made to prepare a specimen in accordance with this practice and for the intended test procedure. However, when it has been determined by trial that this is not possible, prepare the rock specimen to the closest tolerances practicable and consider this to be the best effort and report it as such and if allowable or necessary for the intended test, capping the ends of the specimen as discussed in this practice is permitted."

A Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)

B Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism, and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness. Specimen prepared to closest tolerances practicable.

C Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism. Specimen did not meet the desired tolerances for side straightness and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

D Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness. Specimen did not meet the desired tolerances for side straightness, parallelism and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

E Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness and parallelism. Specimen prepared to closest tolerances practicable.

UNCONFINED COMPRESSION
(ASTM D7012 Method C)

S&ME, Inc. - Knoxville 1413 Topside Road, Louisville, TN 37777

Project Name: Carolina Crossroads Project
Project Number: 1461-16-047 Phase 2B

Report Date: March 14, 2018
Reviewed By: Jason B. Burgess

Boring No.	Sample No.	Depth (ft)	Dimensions, in.		Shape (See Key)	Area (in^2)	Unit Weight (lbs/ft^3)	Loading Rate (psi/sec)	Maximum Load (lbs)	Strength (psi)	Moisture (%)
			Length	Diameter							
B-42	RC-2	70.8 - 71.7	4.44	1.98	A	3.08	166.0	85	98,530	31,990	0.2
B-42	RC-4	79.5 - 80.4	4.46	1.98	A	3.08	165.9	85	78,260	25,409	0.2
W-23	RC-2	20.7 - 21.5	4.42	1.98	A	3.08	164.2	88	89,833	29,167	0.3

NOTES: Effective (as received) unit weight as determined by RTH 109-93.
Loading rates were selected to target reaching failure between 2 and 15 minutes.
Test results for specimens not meeting the requirements of ASTM D4543 may differ from a test specimen that meets the requirements of ASTM D4543.

SHAPE KEY

ASTM D4543-08$^{\epsilon 1}$ *Standard Practice for Preparing Rock Core as Cylindrical Test Specimens and Verifying Conformance to Dimensional and Shape Tolerance* Section 1.2 - "Rock is a complex engineering material that can vary greatly as a function of lithology, stress history, weathering, moisture content and chemistry, and other natural geologic processes. As such, it is not always possible to obtain or prepare rock core specimens that satisfy the desirable tolerances given in this practice. Most commonly, this situation presents itself with weaker, more porous, and poorly cemented rock types and rock types containing significant or weak (or both) structural features. For these and other rock types which are difficult to prepare, all reasonable efforts shall be made to prepare a specimen in accordance with this practice and for the intended test procedure. However, when it has been determined by trial that this is not possible, prepare the rock specimen to the closest tolerances practicable and consider this to be the best effort and report it as such and if allowable or necessary for the intended test, capping the ends of the specimen as discussed in this practice is permitted."

A Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)

B Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism, and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness. Specimen prepared to closest tolerances practicable.

C Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism. Specimen did not meet the desired tolerances for side straightness and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

D Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness. Specimen did not meet the desired tolerances for side straightness, parallelism and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

E Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness and parallelism. Specimen prepared to closest tolerances practicable.

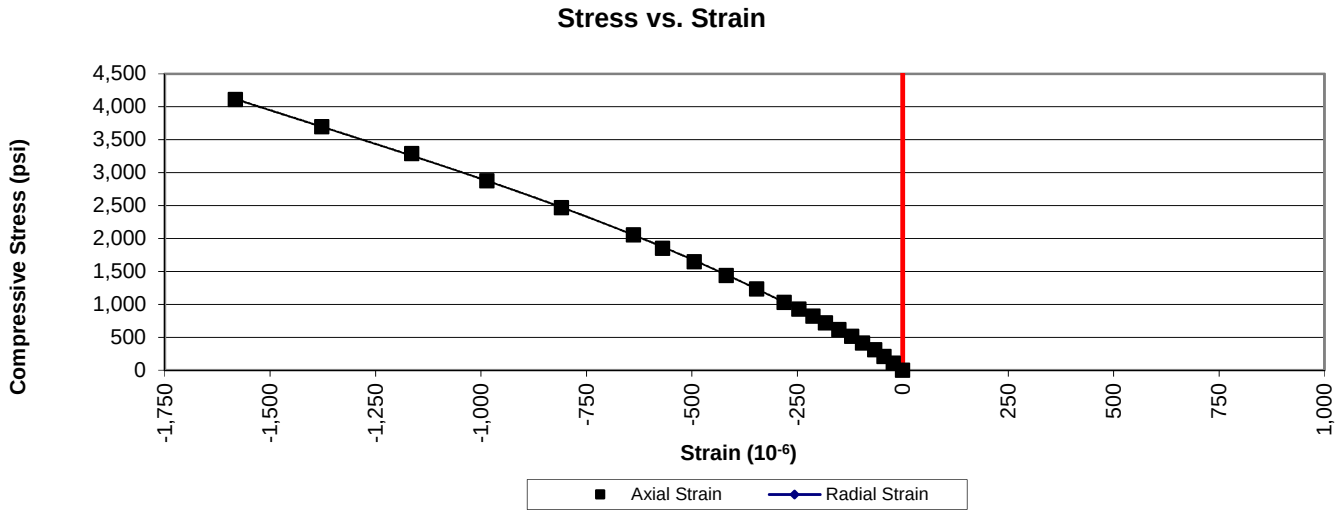
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	2.49	**Date:**	3/12/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	5.57	**Tested by:**	BKP / MG
Boring Id:	DH-5	**Unit Weight, pcf:**	171.5	**Reviewed by:**	JBB
Sample No:	RC-15	**Moisture Content, %:**	0.4		
Depth (ft):	112.5 - 113.5	**Load Rate, psi/sec:**	30		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-22		500	103	4.68		
3	-44		1,000	205	4.66		
4	-66		1,500	308	4.67		
5	-95		2,000	411	4.33		
6	-121		2,500	513	4.24		
7	-151		3,000	616	4.08		
8	-183		3,500	719	3.93		
9	-213		4,000	821	3.85		
10	-246		4,500	924	3.76		
11	-281		5,000	1,027	3.65		
12	-346		6,000	1,232	3.56		
13	-418		7,000	1,437	3.44		
14	-494		8,000	1,643	3.33		
15	-569		9,000	1,848	3.25		
13	-638		10,000	2,053	3.22		
14	-809		12,000	2,464	3.05		
15	-986		14,000	2,875	2.92		
16	-1,164		16,000	3,285	2.82		
17	-1,377		18,000	3,696	2.68		
18	-1,582		20,000	4,107	2.60		
19			20,867	4,285			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism, and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness. Specimen prepared to closest tolerances practicable.



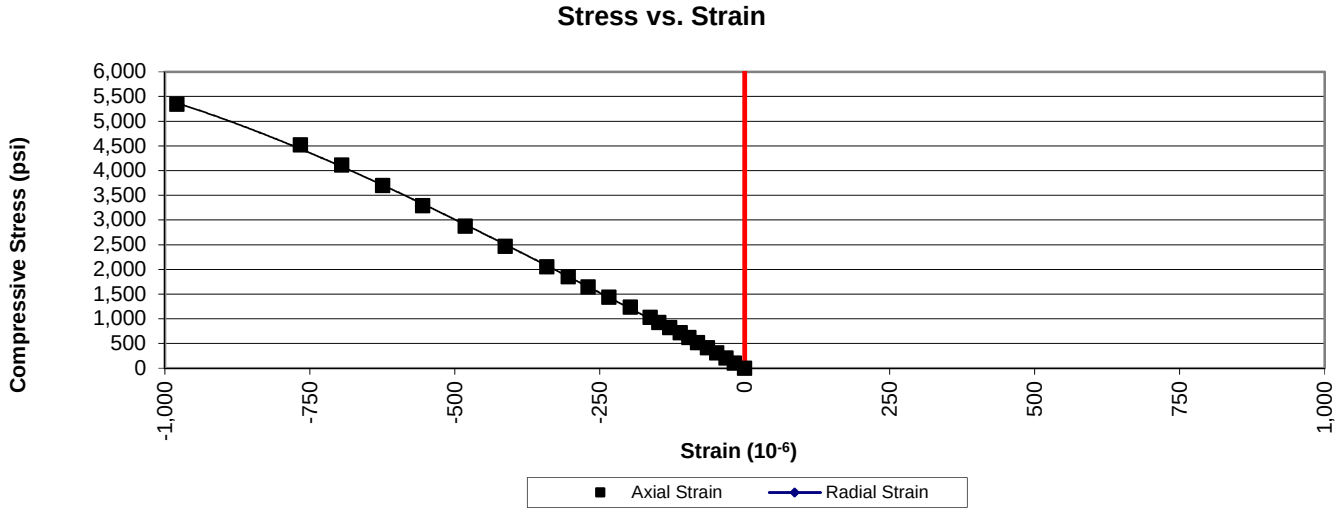
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	2.49	**Date:**	3/12/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	5.55	**Tested by:**	BKP / MG
Boring Id:	DH-5	**Unit Weight, pcf:**	171.1	**Reviewed by:**	JBB
Sample No:	RC-5	**Moisture Content, %:**	0.1		
Depth (ft):	60.6 - 62.1	**Load Rate, psi/sec:**	32		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-18		500	103	5.72		
3	-32		1,000	205	6.41		
4	-48		1,500	308	6.42		
5	-64		2,000	411	6.42		
6	-81		2,500	513	6.33		
7	-96		3,000	616	6.42		
8	-111		3,500	719	6.48		
9	-129		4,000	821	6.36		
10	-148		4,500	924	6.24		
11	-163		5,000	1,027	6.30		
12	-197		6,000	1,232	6.25		
13	-234		7,000	1,437	6.14		
14	-270		8,000	1,643	6.09		
15	-304		9,000	1,848	6.08		
13	-341		10,000	2,053	6.02		
14	-413		12,000	2,464	5.97		
15	-482		14,000	2,875	5.96		
16	-555		16,000	3,285	5.92		
17	-624		18,000	3,696	5.92		
18	-695		20,000	4,107	5.91		
19	-766		22,000	4,517	5.90		
20	-979		26,000	5,339	5.45		
21			26,017	5,342			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism, and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness. Specimen prepared to closest tolerances practicable.



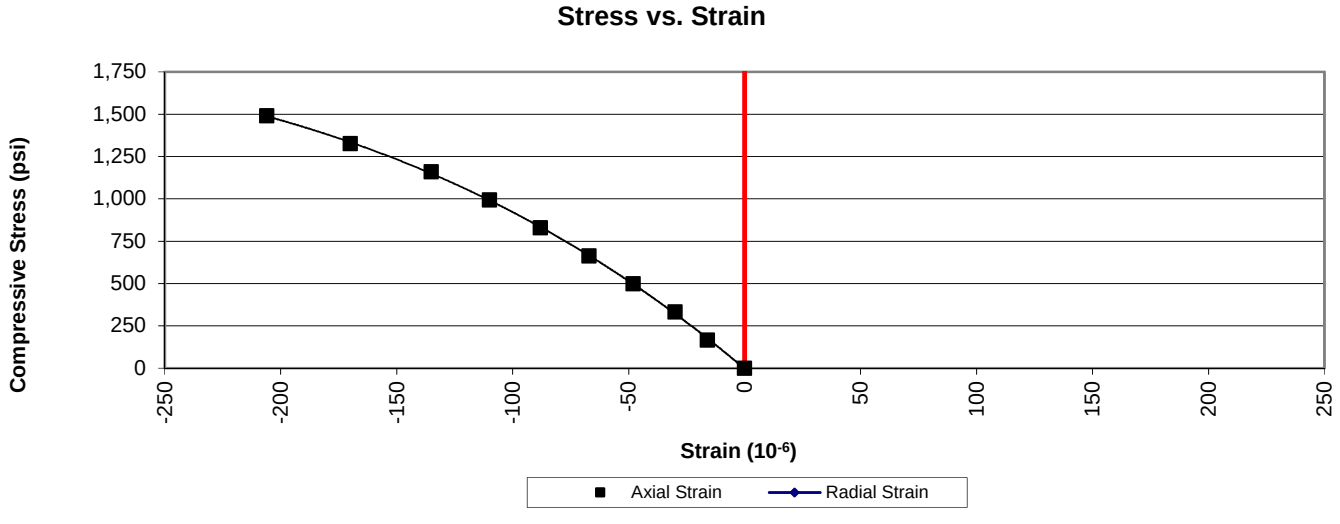
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.96	**Date:**	3/12/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.43	**Tested by:**	BKP / MG
Boring Id:	B-50	**Unit Weight, pcf:**	172.5	**Reviewed by:**	JBB
Sample No:	RC-2	**Moisture Content, %:**	0.3		
Depth (ft):	81.2 - 82.2	**Load Rate, psi/sec:**	22		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-16		500	166	10.38		
3	-30		1,000	331	11.03		
4	-48		1,500	497	10.35		
5	-67		2,000	662	9.88		
6	-88		2,500	828	9.41		
7	-110		3,000	993	9.03		
8	-135		3,500	1,159	8.59		
9	-170		4,000	1,325	7.79		
10	-206		4,500	1,490	7.23		
11			4,745	1,571			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

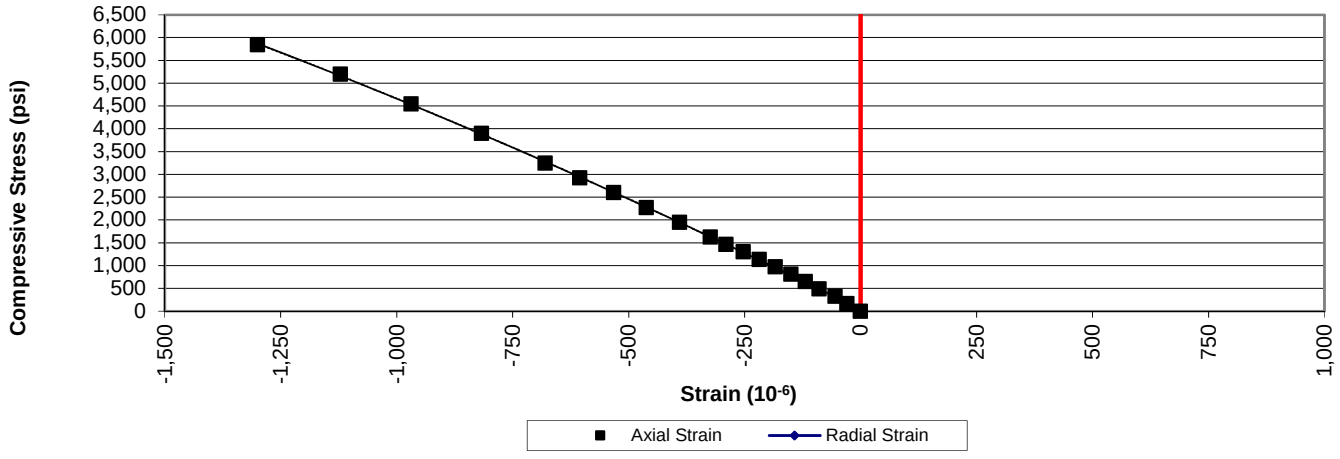
1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	3/12/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.48	**Tested by:**	BKP / MG
Boring Id:	B-49	**Unit Weight, pcf:**	167.8	**Reviewed by:**	JBB
Sample No:	RC-3	**Moisture Content, %:**	0.3		
Depth (ft):	49.2 - 50.3	**Load Rate, psi/sec:**	46		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-29		500	162	5.59		
3	-55		1,000	325	5.91		
4	-89		1,500	487	5.47		
5	-119		2,000	649	5.45		
6	-150		2,500	812	5.41		
7	-184		3,000	974	5.29		
8	-218		3,500	1,136	5.21		
9	-253		4,000	1,299	5.13		
10	-290		4,500	1,461	5.04		
11	-324		5,000	1,623	5.01		
12	-390		6,000	1,948	4.99		
13	-462		7,000	2,273	4.92		
14	-532		8,000	2,597	4.88		
15	-605		9,000	2,922	4.83		
16	-680		10,000	3,247	4.78		
17	-817		12,000	3,896	4.77		
18	-969		14,000	4,545	4.69		
19	-1,121		16,000	5,195	4.63		
20	-1,300		18,000	5,844	4.50		
21			18,229	5,919			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness. Specimen did not meet the desired tolerances for side straightness, parallelism and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

Stress vs. Strain



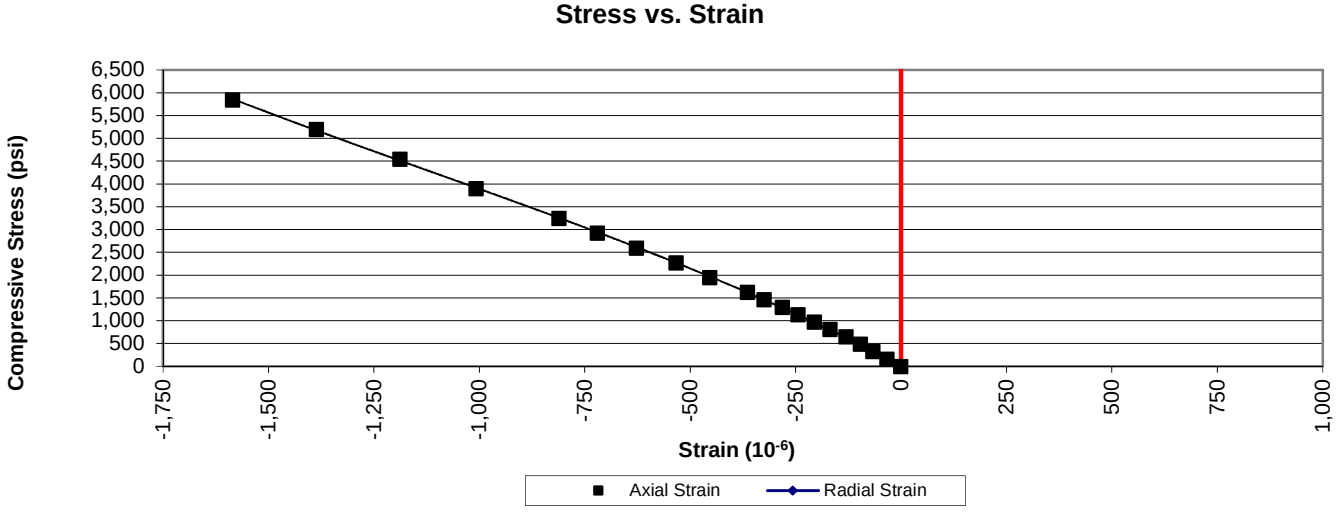
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	3/12/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.38	**Tested by:**	BKP / MG
Boring Id:	B-49	**Unit Weight, pcf:**	169.4	**Reviewed by:**	JBB
Sample No:	RC-5	**Moisture Content, %:**	0.4		
Depth (ft):	56.6 - 57.6	**Load Rate, psi/sec:**	46		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-33		500	162	4.91		
3	-66		1,000	325	4.92		
4	-96		1,500	487	5.07		
5	-130		2,000	649	4.99		
6	-168		2,500	812	4.83		
7	-205		3,000	974	4.75		
8	-244		3,500	1,136	4.66		
9	-281		4,000	1,299	4.62		
10	-324		4,500	1,461	4.51		
11	-364		5,000	1,623	4.46		
12	-453		6,000	1,948	4.30		
13	-533		7,000	2,273	4.26		
14	-627		8,000	2,597	4.14		
15	-720		9,000	2,922	4.06		
16	-811		10,000	3,247	4.00		
17	-1,007		12,000	3,896	3.87		
18	-1,188		14,000	4,545	3.83		
19	-1,386		16,000	5,195	3.75		
20	-1,585		18,000	5,844	3.69		
21			19,997	6,493			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

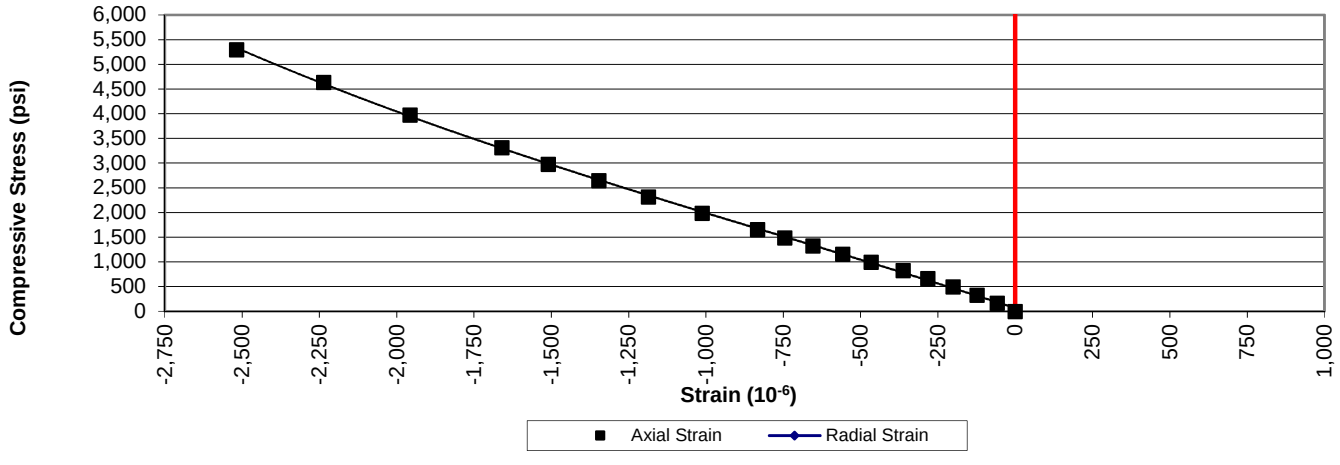
1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.96	**Date:**	3/12/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.40	**Tested by:**	BKP / MG
Boring Id:	B-55	**Unit Weight, pcf:**	163.6	**Reviewed by:**	JBB
Sample No:	RC-2	**Moisture Content, %:**	0.5		
Depth (ft):	59.6 - 60.6	**Load Rate, psi/sec:**	41		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-58		500	166	2.86		
3	-123		1,000	331	2.69		
4	-200		1,500	497	2.49		
5	-282		2,000	662	2.35		
6	-362		2,500	828	2.29		
7	-465		3,000	993	2.14		
8	-557		3,500	1,159	2.08		
9	-654		4,000	1,325	2.03		
10	-745		4,500	1,490	2.00		
11	-833		5,000	1,656	1.99		
12	-1,012		6,000	1,987	1.96		
13	-1,185		7,000	2,318	1.96		
14	-1,346		8,000	2,649	1.97		
15	-1,509		9,000	2,980	1.97		
16	-1,659		10,000	3,311	2.00		
17	-1,956		12,000	3,974	2.03		
18	-2,236		14,000	4,636	2.07		
19	-2,517		16,000	5,298	2.10		
20			17,835	5,906			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)

Stress vs. Strain



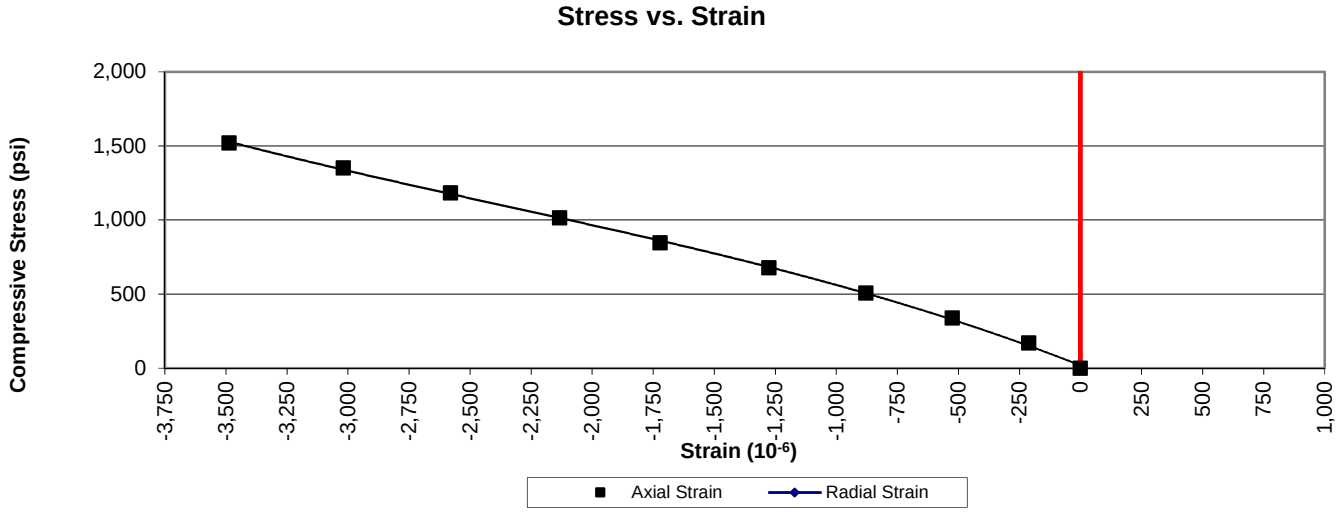
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.94	**Date:**	3/12/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.33	**Tested by:**	BKP / MG
Boring Id:	B-55	**Unit Weight, pcf:**	155.9	**Reviewed by:**	JBB
Sample No:	RC-3	**Moisture Content, %:**	0.8		
Depth (ft):	65.5 - 66.4	**Load Rate, psi/sec:**	23		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-211		500	169	0.80		
3	-525		1,000	338	0.64		
4	-878		1,500	507	0.58		
5	-1,275		2,000	676	0.53		
6	-1,721		2,500	845	0.49		
7	-2,133		3,000	1,014	0.48		
8	-2,580		3,500	1,182	0.46		
9	-3,019		4,000	1,351	0.45		
10	-3,487		4,500	1,520	0.44		
11			4,911	1,659			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



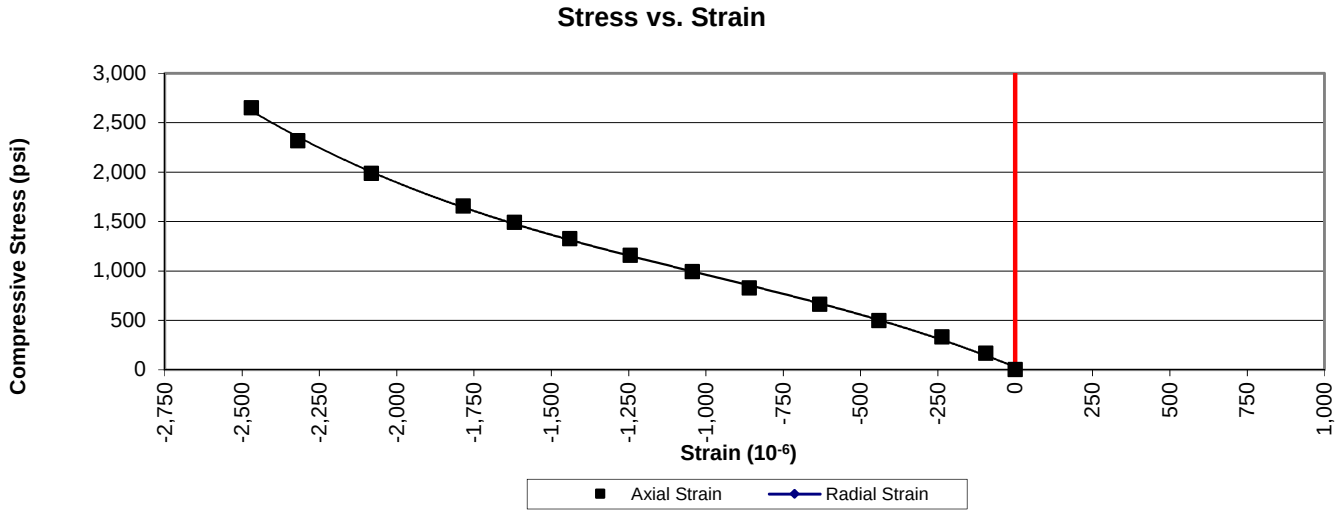
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.96	**Date:**	3/12/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.37	**Tested by:**	BKP / MG
Boring Id:	B-55	**Unit Weight, pcf:**	160.0	**Reviewed by:**	JBB
Sample No:	RC-4	**Moisture Content, %:**	0.5		
Depth (ft):	72.9 - 73.6	**Load Rate, psi/sec:**	30		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-95		500	166	1.75		
3	-237		1,000	331	1.40		
4	-440		1,500	497	1.13		
5	-632		2,000	662	1.05		
6	-859		2,500	828	0.96		
7	-1,044		3,000	993	0.95		
8	-1,244		3,500	1,159	0.93		
9	-1,440		4,000	1,325	0.92		
10	-1,619		4,500	1,490	0.92		
11	-1,784		5,000	1,656	0.93		
12	-2,081		6,000	1,987	0.95		
13	-2,319		7,000	2,318	1.00		
14	-2,469		8,000	2,649	1.07		
15			8,836	2,926			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

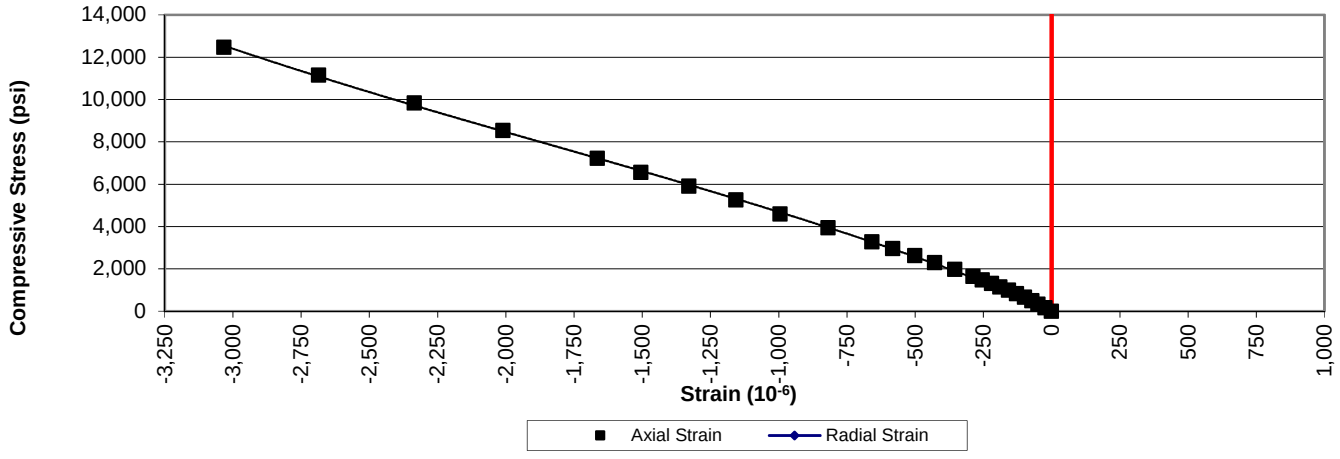
1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.97	**Date:**	3/12/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.37	**Tested by:**	BKP / MG
Boring Id:	B-52	**Unit Weight, pcf:**	166.0	**Reviewed by:**	JBB
Sample No:	RC-2	**Moisture Content, %:**	0.5		
Depth (ft):	75.4 - 76.4	**Load Rate, psi/sec:**	65		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-24		500	164	6.83		
3	-50		1,000	328	6.56		
4	-72		1,500	492	6.83		
5	-99		2,000	656	6.63		
6	-128		2,500	820	6.41		
7	-157		3,000	984	6.27		
8	-189		3,500	1,148	6.07		
9	-220		4,000	1,311	5.96		
10	-254		4,500	1,475	5.81		
11	-288		5,000	1,639	5.69		
12	-355		6,000	1,967	5.54		
13	-429		7,000	2,295	5.35		
14	-501		8,000	2,623	5.24		
15	-582		9,000	2,951	5.07		
16	-658		10,000	3,279	4.98		
17	-819		12,000	3,934	4.80		
18	-995		14,000	4,590	4.61		
19	-1,157		16,000	5,246	4.53		
20	-1,329		18,000	5,902	4.44		
21	-1,505		20,000	6,557	4.36		
22	-1,665		22,000	7,213	4.33		
23	-2,010		26,000	8,525	4.24		
24	-2,335		30,000	9,836	4.21		
25	-2,686		34,000	11,148	4.15		
26	-3,033		38,000	12,459	4.11		
27			39,610	12,987			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)

Stress vs. Strain



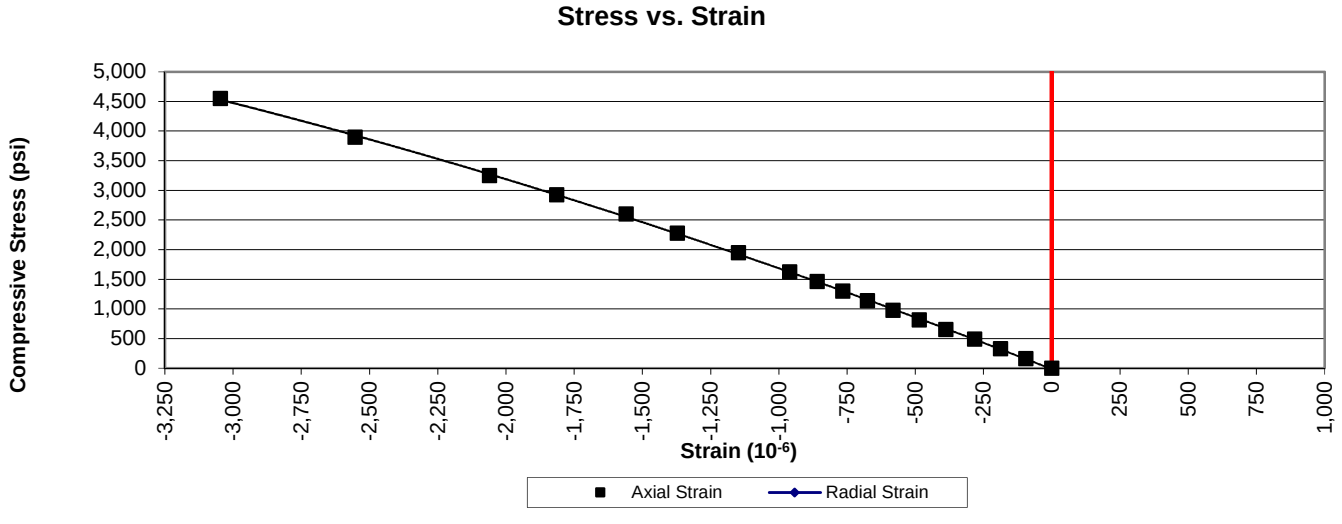
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	3/12/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.48	**Tested by:**	BKP / MG
Boring Id:	B-52	**Unit Weight, pcf:**	164.7	**Reviewed by:**	JBB
Sample No:	RC-5	**Moisture Content, %:**	0.6		
Depth (ft):	90.4 - 91.4	**Load Rate, psi/sec:**	37		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-94		500	162	1.72		
3	-187		1,000	325	1.74		
4	-282		1,500	487	1.73		
5	-387		2,000	649	1.68		
6	-485		2,500	812	1.67		
7	-581		3,000	974	1.68		
8	-675		3,500	1,136	1.68		
9	-765		4,000	1,299	1.70		
10	-859		4,500	1,461	1.70		
11	-960		5,000	1,623	1.69		
12	-1,148		6,000	1,948	1.70		
13	-1,371		7,000	2,273	1.66		
14	-1,559		8,000	2,597	1.67		
15	-1,813		9,000	2,922	1.61		
16	-2,060		10,000	3,247	1.58		
17	-2,552		12,000	3,896	1.53		
18	-3,046		14,000	4,545	1.49		
19			14,609	4,743			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



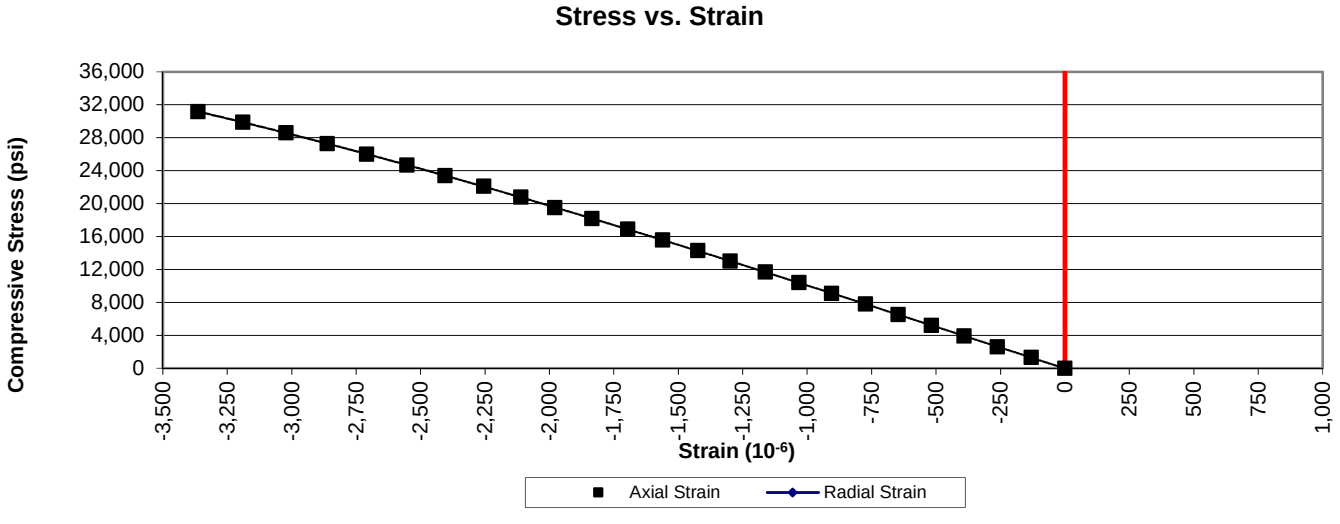
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	3/12/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.44	**Tested by:**	BKP / MG
Boring Id:	B-42	**Unit Weight, pcf:**	166.0	**Reviewed by:**	JBB
Sample No:	RC-2	**Moisture Content, %:**	0.2		
Depth (ft):	70.8 - 71.7	**Load Rate, psi/sec:**	85		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-130		4,000	1,299	9.99		
3	-262		8,000	2,597	9.91		
4	-391		12,000	3,896	9.96		
5	-518		16,000	5,195	10.03		
6	-647		20,000	6,494	10.04		
7	-774		24,000	7,792	10.07		
8	-905		28,000	9,091	10.05		
9	-1,032		32,000	10,390	10.07		
10	-1,162		36,000	11,688	10.06		
11	-1,298		40,000	12,987	10.01		
12	-1,424		44,000	14,286	10.03		
13	-1,561		48,000	15,584	9.98		
14	-1,696		52,000	16,883	9.95		
15	-1,835		56,000	18,182	9.91		
16	-1,979		60,000	19,481	9.84		
17	-2,111		64,000	20,779	9.84		
18	-2,255		68,000	22,078	9.79		
19	-2,405		72,000	23,377	9.72		
20	-2,553		76,000	24,675	9.67		
21	-2,709		80,000	25,974	9.59		
22	-2,862		84,000	27,273	9.53		
23	-3,022		88,000	28,571	9.45		
24	-3,189		92,000	29,870	9.37		
25	-3,363		96,000	31,169	9.27		
26			98,530	31,990			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



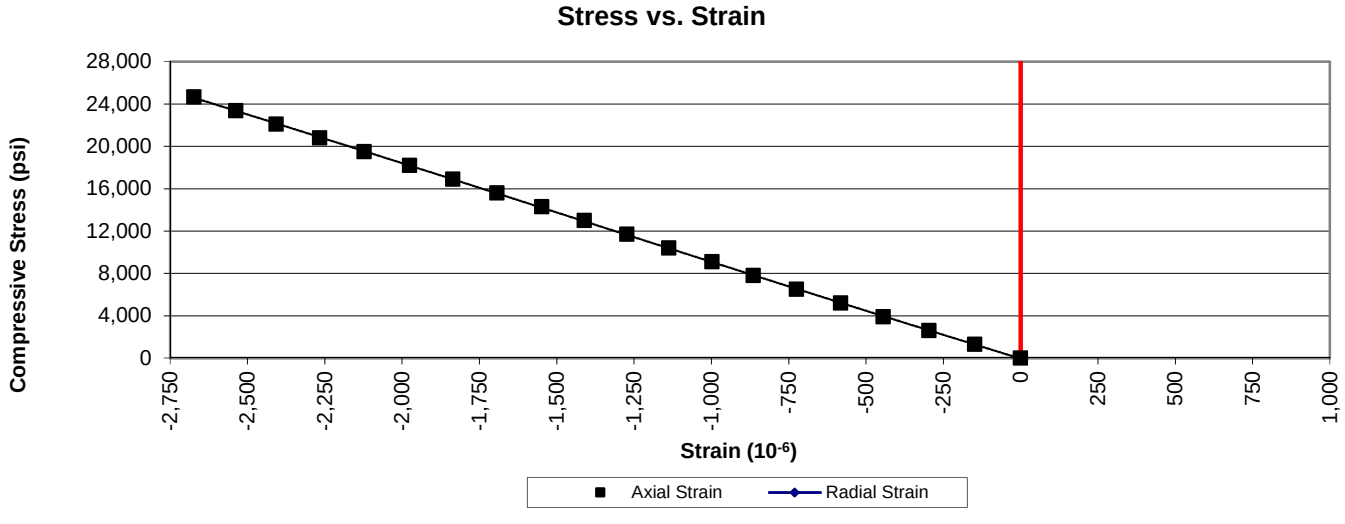
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	3/12/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.46	**Tested by:**	BKP / MG
Boring Id:	B-42	**Unit Weight, pcf:**	165.9	**Reviewed by:**	JBB
Sample No:	RC-4	**Moisture Content, %:**	0.2		
Depth (ft):	79.5 - 80.4	**Load Rate, psi/sec:**	85		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-148		4,000	1,299	8.78		
3	-296		8,000	2,597	8.77		
4	-444		12,000	3,896	8.77		
5	-582		16,000	5,195	8.93		
6	-725		20,000	6,494	8.96		
7	-864		24,000	7,792	9.02		
8	-998		28,000	9,091	9.11		
9	-1,138		32,000	10,390	9.13		
10	-1,273		36,000	11,688	9.18		
11	-1,411		40,000	12,987	9.20		
12	-1,548		44,000	14,286	9.23		
13	-1,693		48,000	15,584	9.20		
14	-1,836		52,000	16,883	9.20		
15	-1,976		56,000	18,182	9.20		
16	-2,123		60,000	19,481	9.18		
17	-2,266		64,000	20,779	9.17		
18	-2,407		68,000	22,078	9.17		
19	-2,537		72,000	23,377	9.21		
20	-2,673		76,000	24,675	9.23		
21			78,260	25,409			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



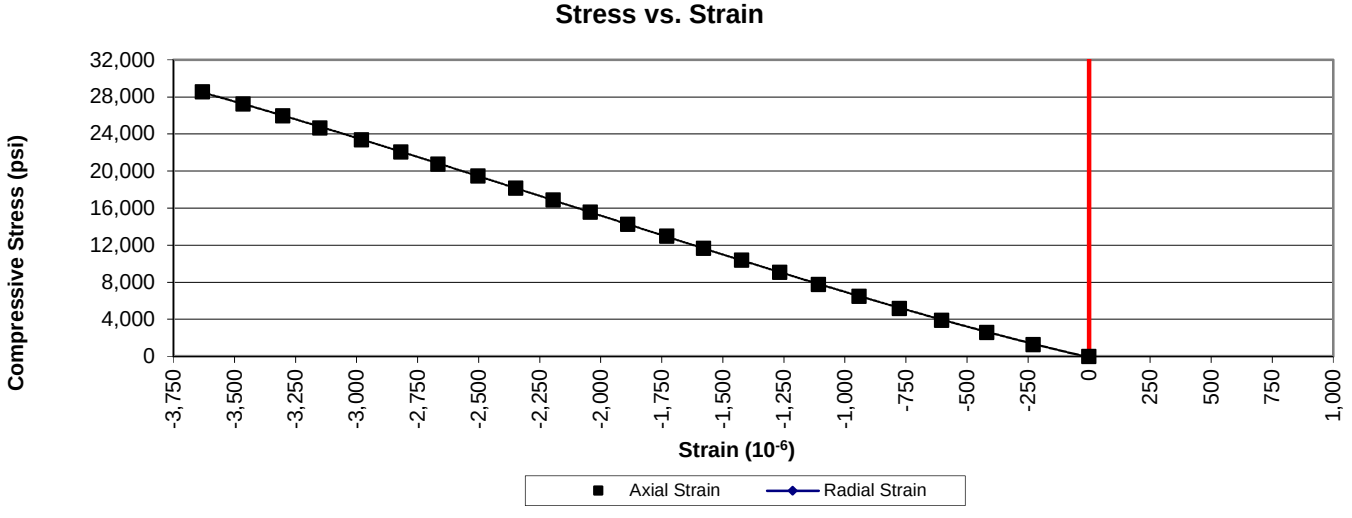
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	3/12/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.42	**Tested by:**	BKP / MG
Boring Id:	W-23	**Unit Weight, pcf:**	164.2	**Reviewed by:**	JBB
Sample No:	RC-2	**Moisture Content, %:**	0.3		
Depth (ft):	20.7 - 21.5	**Load Rate, psi/sec:**	88		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-228		4,000	1,299	5.70		
3	-419		8,000	2,597	6.20		
4	-604		12,000	3,896	6.45		
5	-777		16,000	5,195	6.69		
6	-941		20,000	6,494	6.90		
7	-1,108		24,000	7,792	7.03		
8	-1,266		28,000	9,091	7.18		
9	-1,423		32,000	10,390	7.30		
10	-1,579		36,000	11,688	7.40		
11	-1,729		40,000	12,987	7.51		
12	-1,889		44,000	14,286	7.56		
13	-2,043		48,000	15,584	7.63		
14	-2,195		52,000	16,883	7.69		
15	-2,348		56,000	18,182	7.74		
16	-2,503		60,000	19,481	7.78		
17	-2,667		64,000	20,779	7.79		
18	-2,819		68,000	22,078	7.83		
19	-2,979		72,000	23,377	7.85		
20	-3,150		76,000	24,675	7.83		
21	-3,302		80,000	25,974	7.87		
22	-3,465		84,000	27,273	7.87		
23	-3,631		88,000	28,571	7.87		
24			89,833	29,167			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

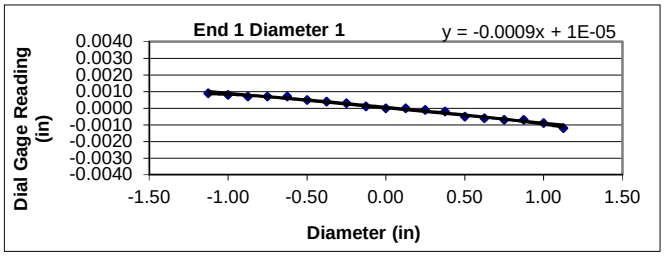
Project:	Carolina Crossroads Project	**Diameter (in):**	2.49	**Date:**	2/8/2018
Project No.:	1461-16-047 Phase 2B	**Length (in):**	5.55	**Tested by:**	BKP
Boring Id:	DH-5	**Unit Weight (pcf):**	171.1	**Reviewed by:**	JBB
Sample No.:	RC-5	**Moisture Content (%):**	0.1		
Depth (ft):	60.6 - 62.1				

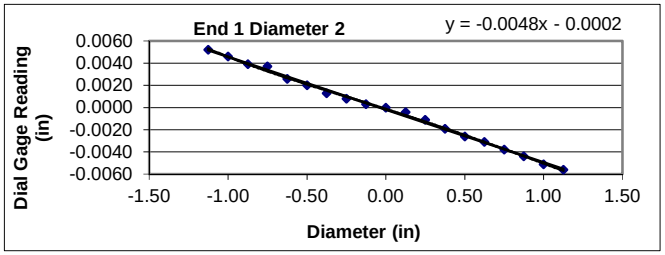
Deviation From Straightness (Procedure S1)

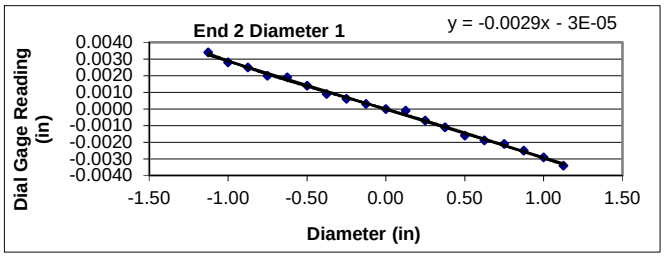
Is the maximum gap ≤ 0.02 in.? **NO** Straightness Tolerance Met? **NO**

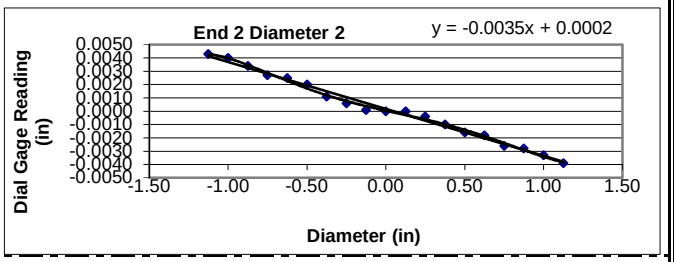
End Flatness and Parallelism Readings (Procedure FP1)

Position	End 1	End 1(90)	End 2	End 2(90)
-1 1/8	0.0009	0.0052	0.0034	0.0043
-1	0.0008	0.0046	0.0028	0.0040
- 7/8	0.0007	0.0039	0.0025	0.0034
- 6/8	0.0007	0.0037	0.0020	0.0027
- 5/8	0.0007	0.0026	0.0019	0.0025
- 4/8	0.0005	0.0020	0.0014	0.0020
- 3/8	0.0004	0.0013	0.0009	0.0011
- 2/8	0.0003	0.0008	0.0006	0.0006
- 1/8	0.0001	0.0003	0.0003	0.0001
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	-0.0004	-0.0001	0.0000
2/8	-0.0001	-0.0011	-0.0007	-0.0004
3/8	-0.0002	-0.0019	-0.0011	-0.0010
4/8	-0.0005	-0.0026	-0.0016	-0.0016
5/8	-0.0006	-0.0031	-0.0019	-0.0018
6/8	-0.0007	-0.0038	-0.0021	-0.0026
7/8	-0.0007	-0.0044	-0.0025	-0.0028
1	-0.0009	-0.0051	-0.0029	-0.0033
1 1/8	-0.0012	-0.0056	-0.0034	-0.0039









Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**

Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00090
	Angle of Best Fit Line:	-0.05139
End 2:	Slope of Best Fit Line:	-0.00290
	Angle of Best Fit Line:	-0.16598
	Max Angular Difference:	**0.11**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00476
	Angle of Best Fit Line:	-0.27253
End 2:	Slope of Best Fit Line:	-0.00353
	Angle of Best Fit Line:	-0.20240
	Max Angular Difference:	**-0.07**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1)is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0021	0.0008	**YES**
End 1 Diam 2	0.0108	0.0043	**YES**
End 2 Diam 1	0.0068	0.0027	**YES**
End 2 Diam 2	0.0082	0.0033	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

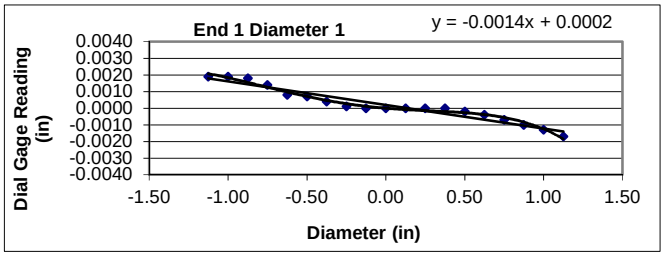
Project:	Carolina Crossroads Project	**Diameter (in):**	2.49	**Date:**	3/8/2018
Project No.:	1461-16-047 Phase 2B	**Length (in):**	5.57	**Tested by:**	BKP
Boring Id:	DH-5	**Unit Weight (pcf):**	171.5	**Reviewed by:**	JBB
Sample No.:	RC-15	**Moisture Content (%):**	0.4		
Depth (ft):	112.5 - 113.5				

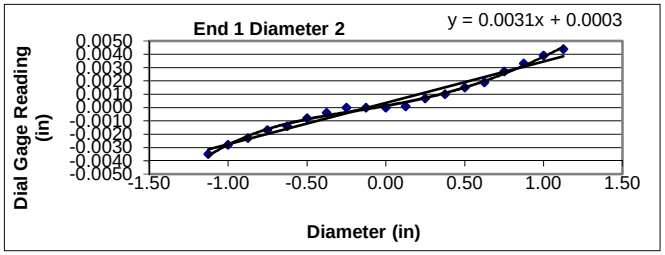
Deviation From Straightness (Procedure S1)

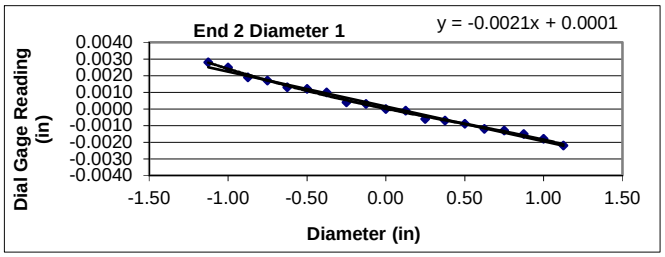
Is the maximum gap ≤ 0.02 in.? **NO** Straightness Tolerance Met? **NO**

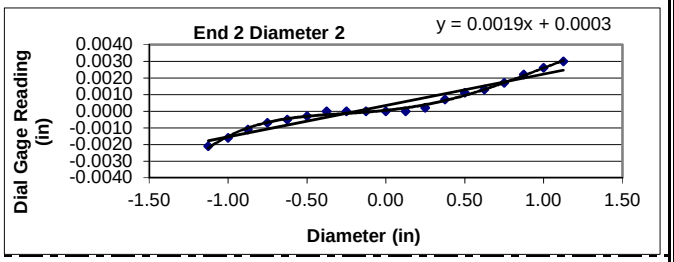
End Flatness and Parallelism Readings (Procedure FP1)

Position	End 1	End 1(90)	End 2	End 2(90)
-1 1/8	0.0019	-0.0035	0.0028	-0.0021
-1	0.0019	-0.0028	0.0025	-0.0016
- 7/8	0.0018	-0.0023	0.0019	-0.0011
- 6/8	0.0014	-0.0017	0.0017	-0.0007
- 5/8	0.0008	-0.0014	0.0013	-0.0005
- 4/8	0.0007	-0.0008	0.0012	-0.0003
- 3/8	0.0004	-0.0004	0.0010	0.0000
- 2/8	0.0001	0.0000	0.0004	0.0000
- 1/8	0.0000	0.0000	0.0003	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0001	-0.0001	0.0000
2/8	0.0000	0.0007	-0.0006	0.0002
3/8	0.0000	0.0010	-0.0007	0.0007
4/8	-0.0002	0.0015	-0.0009	0.0011
5/8	-0.0004	0.0019	-0.0012	0.0013
6/8	-0.0007	0.0027	-0.0013	0.0017
7/8	-0.0010	0.0033	-0.0015	0.0022
1	-0.0013	0.0039	-0.0018	0.0026
1 1/8	-0.0017	0.0044	-0.0022	0.0030









Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? YES

Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00142
	Angle of Best Fit Line:	-0.08138
End 2:	Slope of Best Fit Line:	-0.00210
	Angle of Best Fit Line:	-0.12030
	Max Angular Difference:	**0.04**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00311
	Angle of Best Fit Line:	0.17828
End 2:	Slope of Best Fit Line:	0.00188
	Angle of Best Fit Line:	0.10784
	Max Angular Difference:	**0.07**

Parallelism Tolerance Met? YES

Perpendicularity (Procedure P1)is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0036	0.0014	**YES**
End 1 Diam 2	0.0079	0.0032	**YES**
End 2 Diam 1	0.0050	0.0020	**YES**
End 2 Diam 2	0.0051	0.0020	**YES**

Perpendicularity Tolerance Met? YES

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

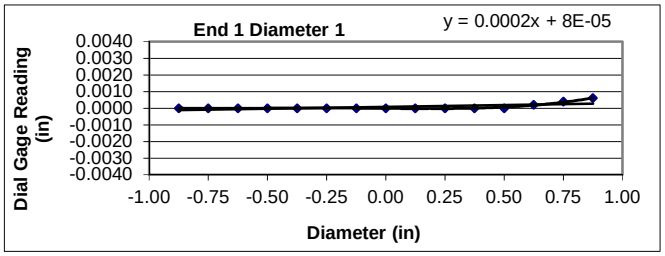
Project:	Carolina Crossroads Project	**Diameter (in):**	1.96	**Date:**	3/8/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.43	**Tested by:**	BKP
Boring Id:	B-50	**Unit Weight (pcf):**	172.5	**Reviewed by:**	JBB
Sample No.:	RC-2	**Moisture Content (%):**	0.3		
Depth (ft):	81.2 - 82.2				

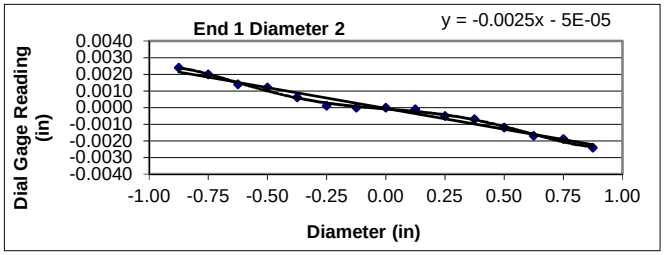
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

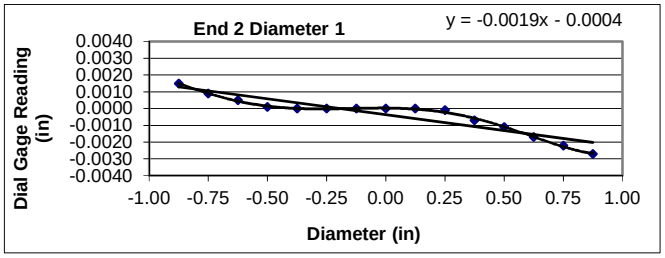
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0000	0.0024	0.0015	0.0015
- 6/8	0.0000	0.0020	0.0009	0.0010
- 5/8	0.0000	0.0014	0.0005	0.0008
- 4/8	0.0000	0.0012	0.0001	0.0005
- 3/8	0.0000	0.0006	0.0000	0.0002
- 2/8	0.0000	0.0001	0.0000	0.0000
- 1/8	0.0000	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	-0.0001	0.0000	0.0000
2/8	0.0000	-0.0005	-0.0001	-0.0007
3/8	0.0000	-0.0007	-0.0007	-0.0010
4/8	0.0000	-0.0012	-0.0011	-0.0015
5/8	0.0002	-0.0017	-0.0017	-0.0022
6/8	0.0004	-0.0019	-0.0022	-0.0026
7/8	0.0006	-0.0024	-0.0027	-0.0031

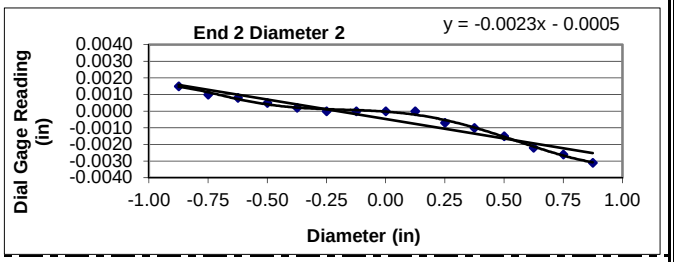




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	0.00022
	Angle of Best Fit Line:	0.01244
End 2:	Slope of Best Fit Line:	-0.00189
	Angle of Best Fit Line:	-0.10821
	Max Angular Difference:	**0.12**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00249
	Angle of Best Fit Line:	-0.14291
End 2:	Slope of Best Fit Line:	-0.00234
	Angle of Best Fit Line:	-0.13391
	Max Angular Difference:	**-0.01**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0006	0.0003	**YES**
End 1 Diam 2	0.0048	0.0024	**YES**
End 2 Diam 1	0.0042	0.0021	**YES**
End 2 Diam 2	0.0046	0.0023	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

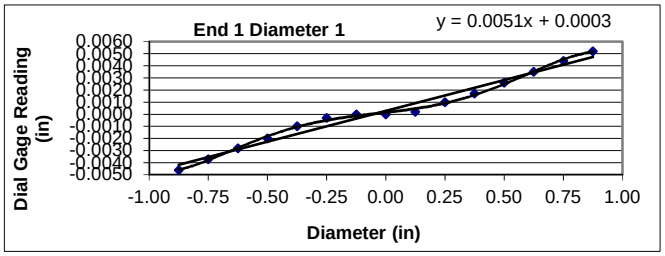
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	3/8/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.48	**Tested by:**	BKP
Boring Id:	B-49	**Unit Weight (pcf):**	167.8	**Reviewed by:**	JBB
Sample No.:	RC-3	**Moisture Content (%):**	0.3		
Depth (ft):	49.2 - 50.3				

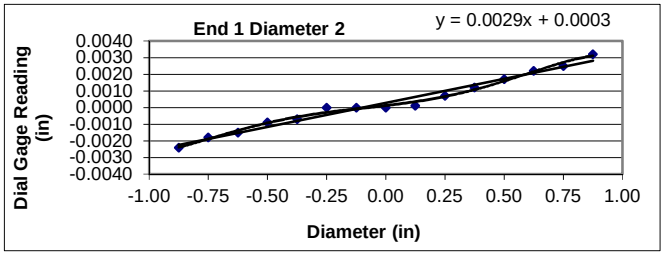
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **NO** Straightness Tolerance Met? **NO**

End Flatness and Parallelism Readings (Procedure FP1)

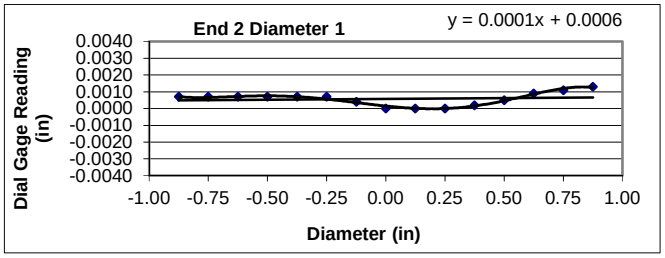
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	-0.0046	-0.0024	0.0007	0.0000
- 6/8	-0.0037	-0.0018	0.0007	0.0000
- 5/8	-0.0028	-0.0015	0.0007	0.0000
- 4/8	-0.0020	-0.0009	0.0007	0.0000
- 3/8	-0.0010	-0.0007	0.0007	0.0000
- 2/8	-0.0003	0.0000	0.0007	0.0000
- 1/8	0.0000	0.0000	0.0004	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0002	0.0001	0.0000	0.0000
2/8	0.0010	0.0007	0.0000	0.0000
3/8	0.0017	0.0012	0.0002	0.0000
4/8	0.0026	0.0017	0.0005	0.0000
5/8	0.0035	0.0022	0.0009	0.0000
6/8	0.0044	0.0025	0.0011	0.0000
7/8	0.0052	0.0032	0.0013	0.0000

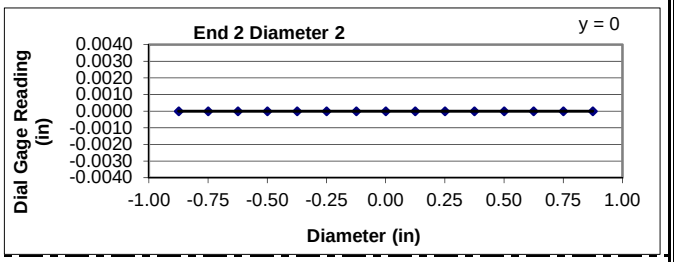




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	0.00509
	Angle of Best Fit Line:	0.29139
End 2:	Slope of Best Fit Line:	0.00010
	Angle of Best Fit Line:	0.00573
	Max Angular Difference:	**0.29**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00289
	Angle of Best Fit Line:	0.16550
End 2:	Slope of Best Fit Line:	0.00000
	Angle of Best Fit Line:	0.00000
	Max Angular Difference:	**0.17**

Parallelism Tolerance Met? **NO**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0098	0.0049	**NO**
End 1 Diam 2	0.0056	0.0028	**YES**
End 2 Diam 1	0.0013	0.0007	**YES**
End 2 Diam 2	0.0000	0.0000	**YES**

Perpendicularity Tolerance Met? **NO**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

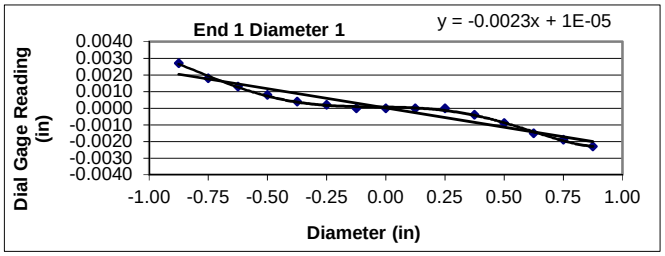
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	3/8/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.38	**Tested by:**	BKP
Boring Id:	B-49	**Unit Weight (pcf):**	169.4	**Reviewed by:**	JBB
Sample No.:	RC-5	**Moisture Content (%):**	0.4		
Depth (ft):	56.6 - 57.6				

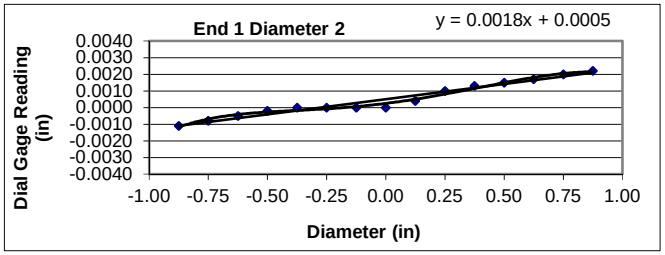
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

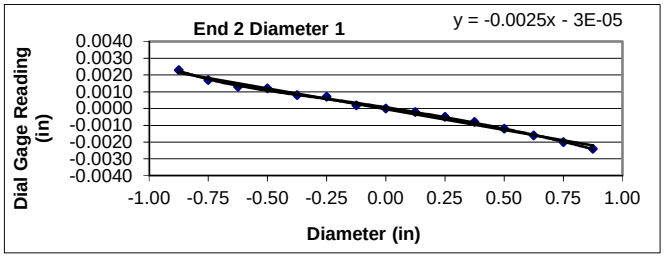
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0027	-0.0011	0.0023	-0.0013
- 6/8	0.0018	-0.0008	0.0017	-0.0011
- 5/8	0.0013	-0.0005	0.0013	-0.0010
- 4/8	0.0008	-0.0002	0.0012	-0.0002
- 3/8	0.0004	0.0000	0.0008	0.0000
- 2/8	0.0002	0.0000	0.0007	0.0000
- 1/8	0.0000	0.0000	0.0002	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0004	-0.0002	0.0000
2/8	0.0000	0.0010	-0.0005	0.0000
3/8	-0.0004	0.0013	-0.0008	0.0000
4/8	-0.0009	0.0015	-0.0012	0.0002
5/8	-0.0015	0.0017	-0.0016	0.0005
6/8	-0.0019	0.0020	-0.0020	0.0010
7/8	-0.0023	0.0022	-0.0024	0.0014

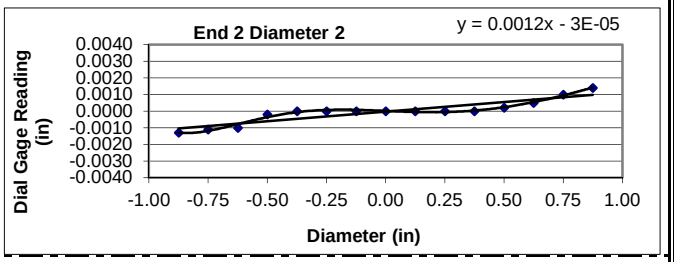




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00231
	Angle of Best Fit Line:	-0.13227
End 2:	Slope of Best Fit Line:	-0.00248
	Angle of Best Fit Line:	-0.14209
	Max Angular Difference:	**0.01**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00183
	Angle of Best Fit Line:	0.10477
End 2:	Slope of Best Fit Line:	0.00116
	Angle of Best Fit Line:	0.06646
	Max Angular Difference:	**0.04**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0050	0.0025	**YES**
End 1 Diam 2	0.0033	0.0017	**YES**
End 2 Diam 1	0.0047	0.0024	**YES**
End 2 Diam 2	0.0027	0.0014	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

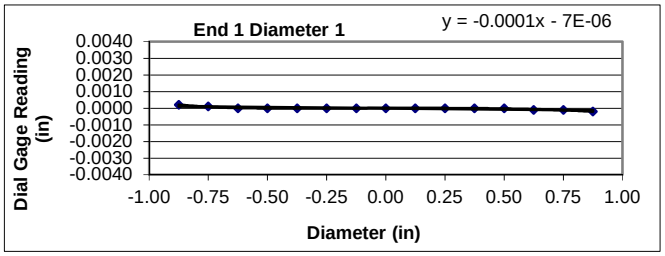
Project:	Carolina Crossroads Project	**Diameter (in):**	1.96	**Date:**	3/8/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.40	**Tested by:**	BKP
Boring Id:	B-55	**Unit Weight (pcf):**	163.6	**Reviewed by:**	JBB
Sample No.:	RC-2	**Moisture Content (%):**	0.5		
Depth (ft):	59.6 - 60.6				

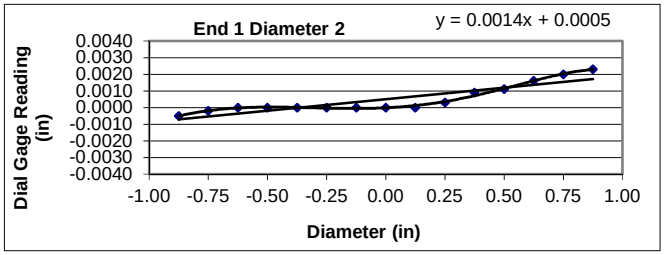
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

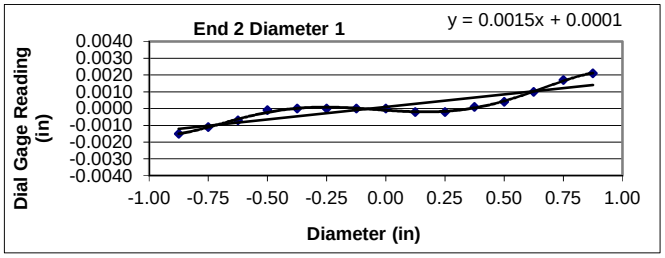
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0002	-0.0005	-0.0015	-0.0033
- 6/8	0.0001	-0.0002	-0.0011	-0.0028
- 5/8	0.0000	0.0000	-0.0007	-0.0019
- 4/8	0.0000	0.0000	-0.0001	-0.0012
- 3/8	0.0000	0.0000	0.0000	-0.0005
- 2/8	0.0000	0.0000	0.0000	0.0000
- 1/8	0.0000	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	-0.0002	0.0004
2/8	0.0000	0.0003	-0.0002	0.0009
3/8	0.0000	0.0009	0.0001	0.0015
4/8	0.0000	0.0011	0.0004	0.0025
5/8	-0.0001	0.0016	0.0010	0.0033
6/8	-0.0001	0.0020	0.0017	0.0042
7/8	-0.0002	0.0023	0.0021	0.0048

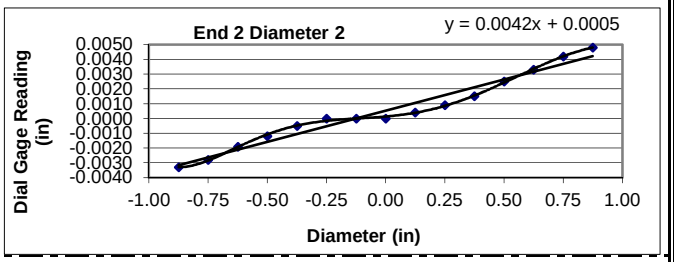




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00013
	Angle of Best Fit Line:	-0.00737
End 2:	Slope of Best Fit Line:	0.00149
	Angle of Best Fit Line:	0.08545
	Max Angular Difference:	**-0.09**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00139
	Angle of Best Fit Line:	0.07940
End 2:	Slope of Best Fit Line:	0.00422
	Angle of Best Fit Line:	0.24179
	Max Angular Difference:	**-0.16**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0004	0.0002	**YES**
End 1 Diam 2	0.0028	0.0014	**YES**
End 2 Diam 1	0.0036	0.0018	**YES**
End 2 Diam 2	0.0081	0.0041	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

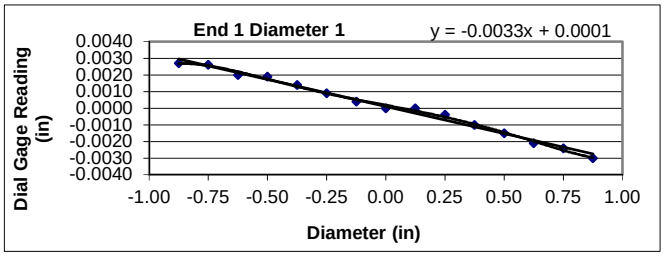
Project:	Carolina Crossroads Project	**Diameter (in):**	1.94	**Date:**	3/8/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.33	**Tested by:**	BKP
Boring Id:	B-55	**Unit Weight (pcf):**	155.9	**Reviewed by:**	JBB
Sample No.:	RC-3	**Moisture Content (%):**	0.8		
Depth (ft):	65.5 - 66.4				

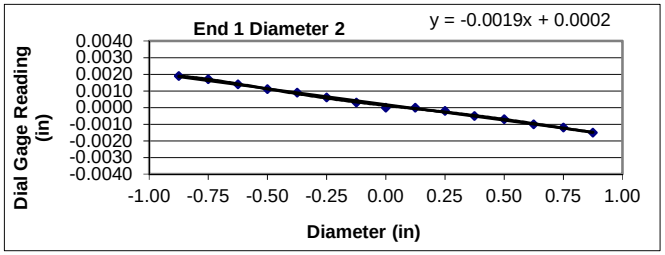
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

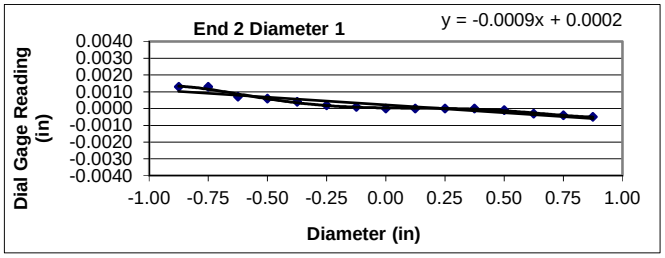
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0027	0.0019	0.0013	0.0001
- 6/8	0.0026	0.0017	0.0013	0.0001
- 5/8	0.0020	0.0014	0.0007	0.0001
- 4/8	0.0019	0.0011	0.0006	0.0001
- 3/8	0.0014	0.0009	0.0004	0.0001
- 2/8	0.0009	0.0006	0.0002	0.0001
- 1/8	0.0004	0.0003	0.0001	0.0001
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	0.0000
2/8	-0.0004	-0.0002	0.0000	0.0000
3/8	-0.0010	-0.0005	0.0000	0.0000
4/8	-0.0015	-0.0007	-0.0001	0.0000
5/8	-0.0021	-0.0010	-0.0003	0.0000
6/8	-0.0024	-0.0012	-0.0004	0.0000
7/8	-0.0030	-0.0015	-0.0005	0.0000

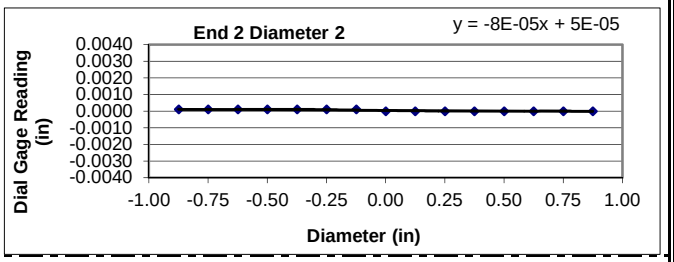




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00326
	Angle of Best Fit Line:	-0.18695
End 2:	Slope of Best Fit Line:	-0.00092
	Angle of Best Fit Line:	-0.05288
	Max Angular Difference:	**-0.13**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00190
	Angle of Best Fit Line:	-0.10886
End 2:	Slope of Best Fit Line:	-0.00008
	Angle of Best Fit Line:	-0.00458
	Max Angular Difference:	**-0.10**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0057	0.0029	**YES**
End 1 Diam 2	0.0034	0.0018	**YES**
End 2 Diam 1	0.0018	0.0009	**YES**
End 2 Diam 2	0.0001	0.0001	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

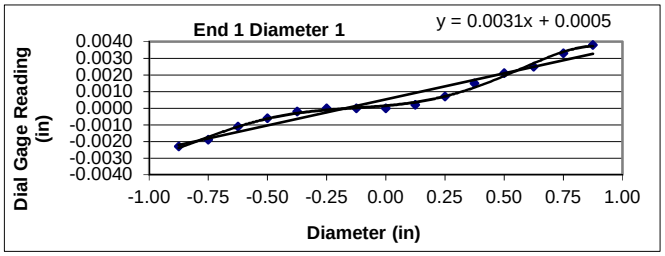
Project:	Carolina Crossroads Project	**Diameter (in):**	1.96	**Date:**	3/8/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.37	**Tested by:**	BKP
Boring Id:	B-55	**Unit Weight (pcf):**	160.0	**Reviewed by:**	JBB
Sample No.:	RC-4	**Moisture Content (%):**	0.5		
Depth (ft):	72.9 - 73.6				

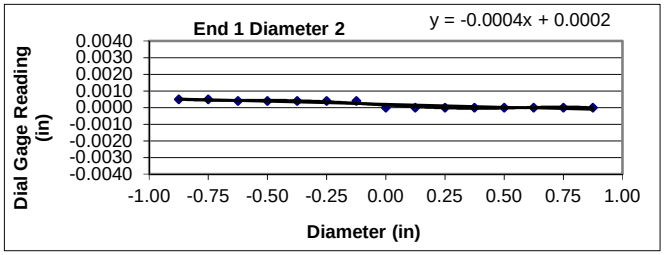
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

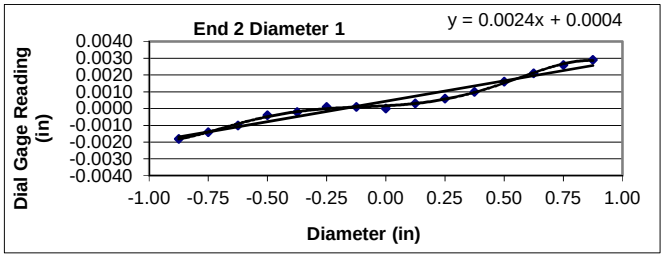
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	-0.0023	0.0005	-0.0018	-0.0004
- 6/8	-0.0019	0.0005	-0.0014	-0.0001
- 5/8	-0.0011	0.0004	-0.0010	0.0000
- 4/8	-0.0006	0.0004	-0.0004	0.0000
- 3/8	-0.0002	0.0004	-0.0002	0.0000
- 2/8	0.0000	0.0004	0.0001	0.0000
- 1/8	0.0000	0.0004	0.0001	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0002	0.0000	0.0003	0.0000
2/8	0.0007	0.0000	0.0006	0.0000
3/8	0.0015	0.0000	0.0010	0.0000
4/8	0.0021	0.0000	0.0016	0.0000
5/8	0.0025	0.0000	0.0021	0.0000
6/8	0.0033	0.0000	0.0026	0.0000
7/8	0.0038	0.0000	0.0029	0.0000

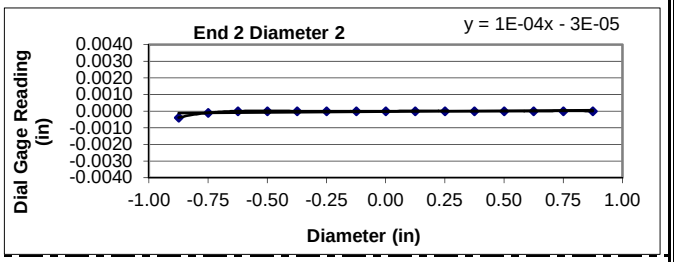




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	0.00313
	Angle of Best Fit Line:	0.17909
End 2:	Slope of Best Fit Line:	0.00243
	Angle of Best Fit Line:	0.13947
	Max Angular Difference:	**0.04**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00036
	Angle of Best Fit Line:	-0.02046
End 2:	Slope of Best Fit Line:	0.00010
	Angle of Best Fit Line:	0.00557
	Max Angular Difference:	**-0.03**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0061	0.0031	**YES**
End 1 Diam 2	0.0005	0.0003	**YES**
End 2 Diam 1	0.0047	0.0024	**YES**
End 2 Diam 2	0.0004	0.0002	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

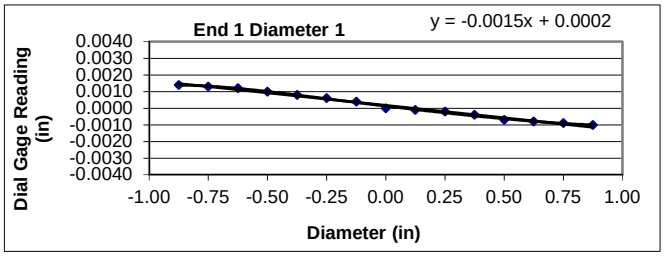
Project:	Carolina Crossroads Project	**Diameter (in):**	1.97	**Date:**	3/8/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.37	**Tested by:**	BKP
Boring Id:	B-52	**Unit Weight (pcf):**	166.0	**Reviewed by:**	JBB
Sample No.:	RC-2	**Moisture Content (%):**	0.5		
Depth (ft):	75.4 - 76.4				

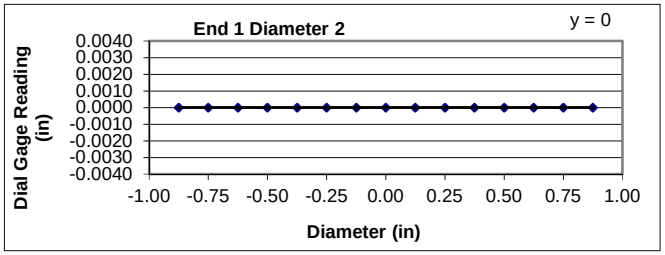
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

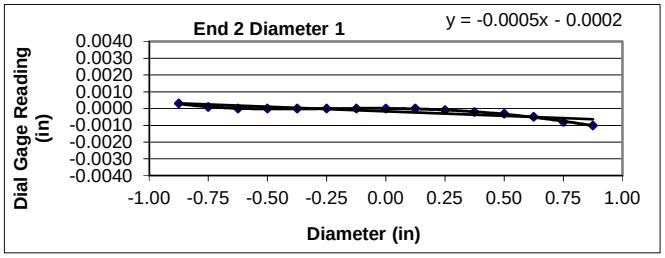
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0014	0.0000	0.0003	-0.0014
- 6/8	0.0013	0.0000	0.0001	-0.0011
- 5/8	0.0012	0.0000	0.0000	-0.0006
- 4/8	0.0010	0.0000	0.0000	-0.0003
- 3/8	0.0008	0.0000	0.0000	0.0000
- 2/8	0.0006	0.0000	0.0000	0.0000
- 1/8	0.0004	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	-0.0001	0.0000	0.0000	0.0000
2/8	-0.0002	0.0000	-0.0001	0.0004
3/8	-0.0004	0.0000	-0.0002	0.0006
4/8	-0.0007	0.0000	-0.0003	0.0013
5/8	-0.0008	0.0000	-0.0005	0.0018
6/8	-0.0009	0.0000	-0.0008	0.0023
7/8	-0.0010	0.0000	-0.0010	0.0026

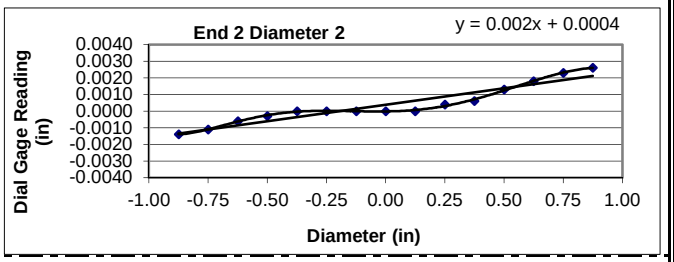




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00150
	Angle of Best Fit Line:	-0.08594
End 2:	Slope of Best Fit Line:	-0.00054
	Angle of Best Fit Line:	-0.03110
	Max Angular Difference:	**-0.05**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00000
	Angle of Best Fit Line:	0.00000
End 2:	Slope of Best Fit Line:	0.00198
	Angle of Best Fit Line:	0.11361
	Max Angular Difference:	**-0.11**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0024	0.0012	**YES**
End 1 Diam 2	0.0000	0.0000	**YES**
End 2 Diam 1	0.0013	0.0007	**YES**
End 2 Diam 2	0.0040	0.0020	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

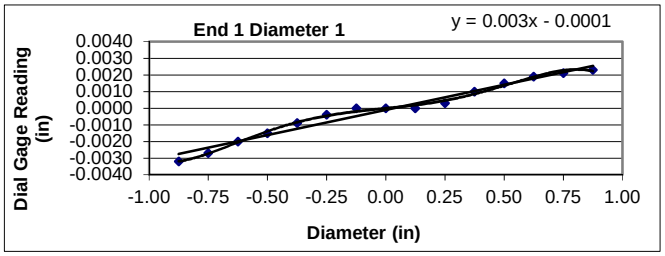
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	3/8/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.48	**Tested by:**	BKP
Boring Id:	B-52	**Unit Weight (pcf):**	164.7	**Reviewed by:**	JBB
Sample No.:	RC-5	**Moisture Content (%):**	0.6		
Depth (ft):	90.4 - 91.4				

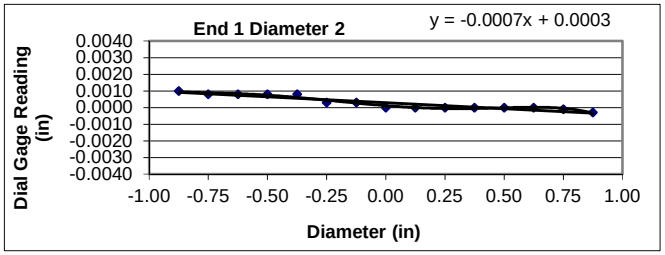
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

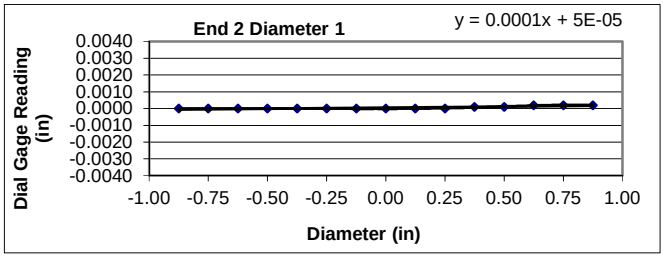
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	-0.0032	0.0010	0.0000	0.0017
- 6/8	-0.0027	0.0008	0.0000	0.0014
- 5/8	-0.0020	0.0008	0.0000	0.0008
- 4/8	-0.0015	0.0008	0.0000	0.0005
- 3/8	-0.0009	0.0008	0.0000	0.0003
- 2/8	-0.0004	0.0003	0.0000	0.0000
- 1/8	0.0000	0.0003	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	0.0000
2/8	0.0003	0.0000	0.0000	-0.0003
3/8	0.0010	0.0000	0.0001	-0.0007
4/8	0.0015	0.0000	0.0001	-0.0008
5/8	0.0019	0.0000	0.0002	-0.0009
6/8	0.0021	-0.0001	0.0002	-0.0012
7/8	0.0023	-0.0003	0.0002	-0.0013

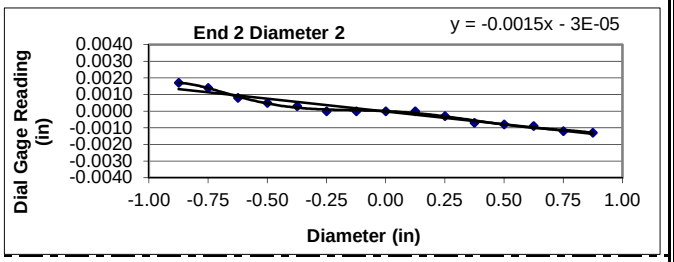




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	0.00303
	Angle of Best Fit Line:	0.17336
End 2:	Slope of Best Fit Line:	0.00012
	Angle of Best Fit Line:	0.00704
	Max Angular Difference:	**0.17**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00071
	Angle of Best Fit Line:	-0.04093
End 2:	Slope of Best Fit Line:	-0.00154
	Angle of Best Fit Line:	-0.08824
	Max Angular Difference:	**0.05**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0055	0.0028	**YES**
End 1 Diam 2	0.0013	0.0007	**YES**
End 2 Diam 1	0.0002	0.0001	**YES**
End 2 Diam 2	0.0030	0.0015	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

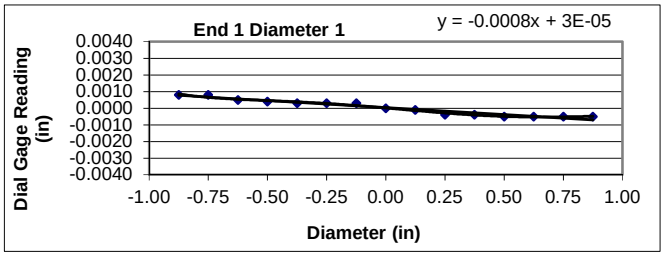
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	3/8/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.44	**Tested by:**	BKP
Boring Id:	B-42	**Unit Weight (pcf):**	166.0	**Reviewed by:**	JBB
Sample No.:	RC-2	**Moisture Content (%):**	0.2		
Depth (ft):	70.8 - 71.7				

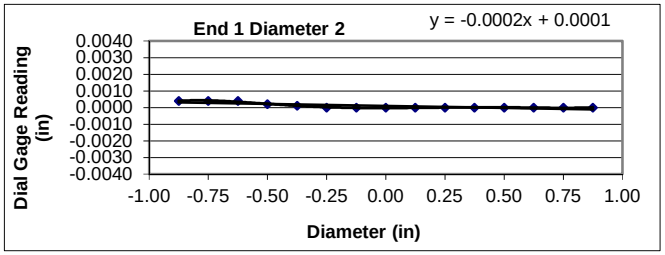
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

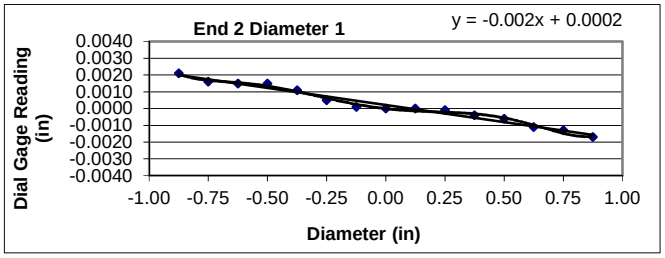
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0008	0.0004	0.0021	0.0002
- 6/8	0.0008	0.0004	0.0016	0.0002
- 5/8	0.0005	0.0004	0.0015	0.0002
- 4/8	0.0004	0.0002	0.0015	0.0001
- 3/8	0.0003	0.0001	0.0011	0.0001
- 2/8	0.0003	0.0000	0.0005	0.0001
- 1/8	0.0003	0.0000	0.0001	0.0001
0	0.0000	0.0000	0.0000	0.0000
1/8	-0.0001	0.0000	0.0000	0.0000
2/8	-0.0004	0.0000	-0.0001	0.0000
3/8	-0.0004	0.0000	-0.0004	0.0000
4/8	-0.0005	0.0000	-0.0006	0.0000
5/8	-0.0005	0.0000	-0.0011	0.0000
6/8	-0.0005	0.0000	-0.0013	0.0000
7/8	-0.0005	0.0000	-0.0017	0.0000

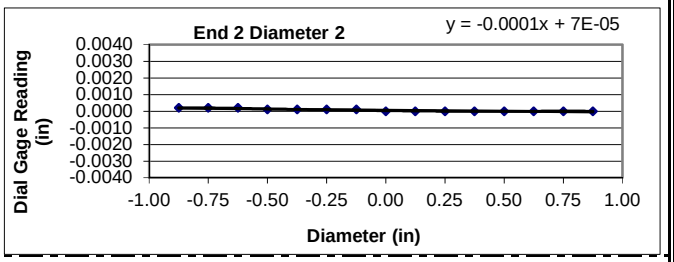




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00084
	Angle of Best Fit Line:	-0.04813
End 2:	Slope of Best Fit Line:	-0.00203
	Angle of Best Fit Line:	-0.11656
	Max Angular Difference:	**0.07**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00024
	Angle of Best Fit Line:	-0.01359
End 2:	Slope of Best Fit Line:	-0.00013
	Angle of Best Fit Line:	-0.00753
	Max Angular Difference:	**-0.01**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0013	0.0007	**YES**
End 1 Diam 2	0.0004	0.0002	**YES**
End 2 Diam 1	0.0038	0.0019	**YES**
End 2 Diam 2	0.0002	0.0001	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

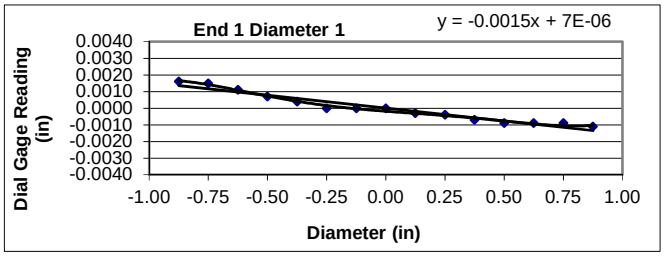
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	3/8/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.46	**Tested by:**	BKP
Boring Id:	B-42	**Unit Weight (pcf):**	165.9	**Reviewed by:**	JBB
Sample No.:	RC-4	**Moisture Content (%):**	0.2		
Depth (ft):	79.5 - 80.4				

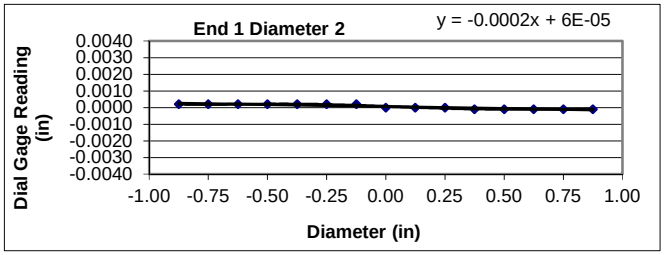
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

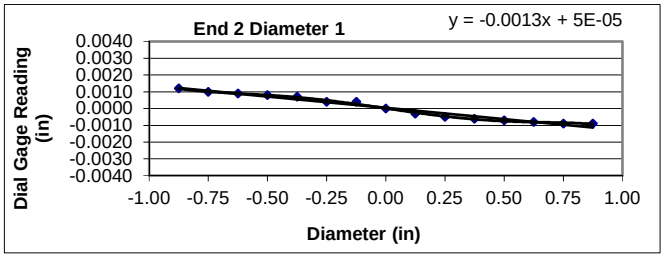
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0016	0.0002	0.0012	-0.0006
- 6/8	0.0015	0.0002	0.0010	-0.0003
- 5/8	0.0011	0.0002	0.0009	-0.0001
- 4/8	0.0007	0.0002	0.0008	0.0000
- 3/8	0.0004	0.0002	0.0007	0.0000
- 2/8	0.0000	0.0002	0.0004	0.0000
- 1/8	0.0000	0.0002	0.0004	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	-0.0003	0.0000	-0.0003	0.0000
2/8	-0.0004	0.0000	-0.0005	0.0000
3/8	-0.0007	-0.0001	-0.0006	0.0004
4/8	-0.0009	-0.0001	-0.0007	0.0005
5/8	-0.0009	-0.0001	-0.0008	0.0009
6/8	-0.0009	-0.0001	-0.0009	0.0013
7/8	-0.0011	-0.0001	-0.0009	0.0016

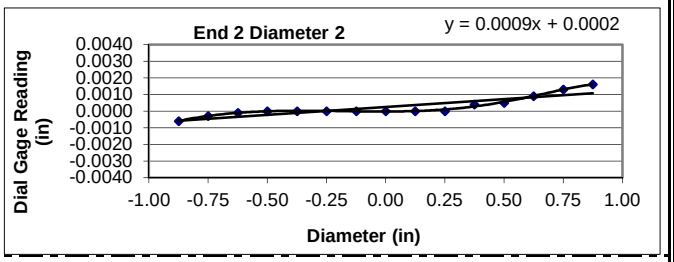




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00155
	Angle of Best Fit Line:	-0.08856
End 2:	Slope of Best Fit Line:	-0.00134
	Angle of Best Fit Line:	-0.07694
	Max Angular Difference:	**-0.01**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00023
	Angle of Best Fit Line:	-0.01326
End 2:	Slope of Best Fit Line:	0.00095
	Angle of Best Fit Line:	0.05435
	Max Angular Difference:	**-0.07**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0027	0.0014	**YES**
End 1 Diam 2	0.0003	0.0002	**YES**
End 2 Diam 1	0.0021	0.0011	**YES**
End 2 Diam 2	0.0022	0.0011	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

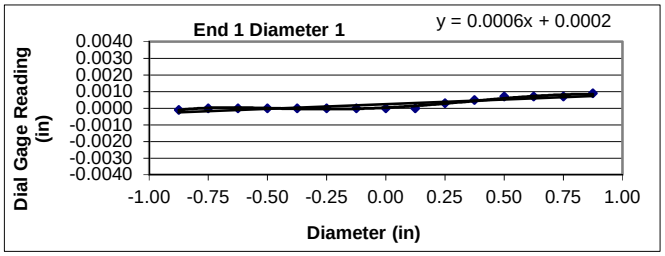
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	3/8/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.42	**Tested by:**	BKP
Boring Id:	W-23	**Unit Weight (pcf):**	164.2	**Reviewed by:**	JBB
Sample No.:	RC-2	**Moisture Content (%):**	0.3		
Depth (ft):	20.7 - 21.5				

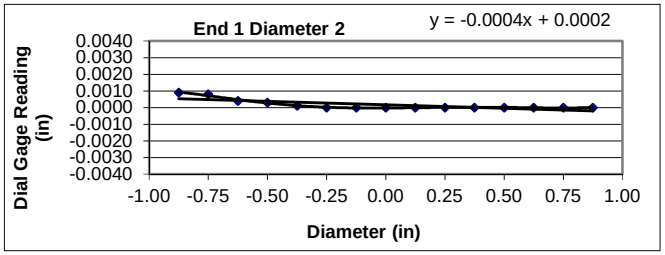
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

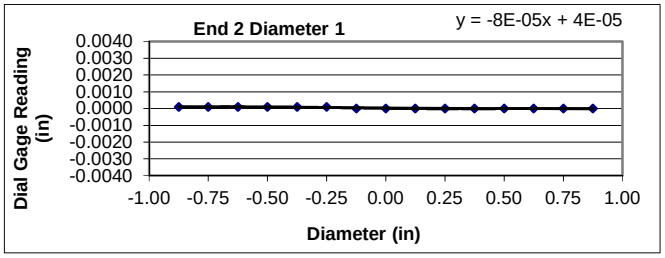
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	-0.0001	0.0009	0.0001	-0.0030
- 6/8	0.0000	0.0008	0.0001	-0.0022
- 5/8	0.0000	0.0004	0.0001	-0.0016
- 4/8	0.0000	0.0003	0.0001	-0.0012
- 3/8	0.0000	0.0001	0.0001	-0.0009
- 2/8	0.0000	0.0000	0.0001	-0.0004
- 1/8	0.0000	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	0.0003
2/8	0.0003	0.0000	0.0000	0.0009
3/8	0.0005	0.0000	0.0000	0.0011
4/8	0.0007	0.0000	0.0000	0.0016
5/8	0.0007	0.0000	0.0000	0.0021
6/8	0.0007	0.0000	0.0000	0.0026
7/8	0.0009	0.0000	0.0000	0.0029

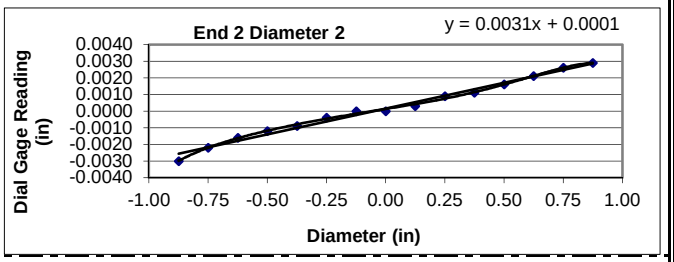




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	0.00056
	Angle of Best Fit Line:	0.03209
End 2:	Slope of Best Fit Line:	-0.00008
	Angle of Best Fit Line:	-0.00442
	Max Angular Difference:	**0.04**

Parrallelism Diameter 2

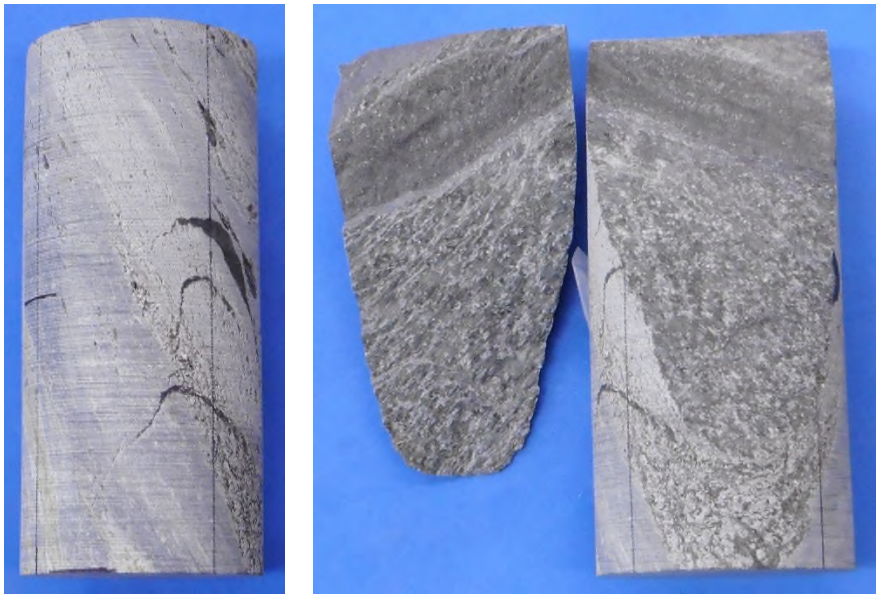
End 1:	Slope of Best Fit Line:	-0.00042
	Angle of Best Fit Line:	-0.02390
End 2:	Slope of Best Fit Line:	0.00311
	Angle of Best Fit Line:	0.17794
	Max Angular Difference:	**-0.20**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0010	0.0005	**YES**
End 1 Diam 2	0.0009	0.0005	**YES**
End 2 Diam 1	0.0001	0.0001	**YES**
End 2 Diam 2	0.0059	0.0030	**YES**

Perpendicularity Tolerance Met? **YES**



Date: 3/12/2018

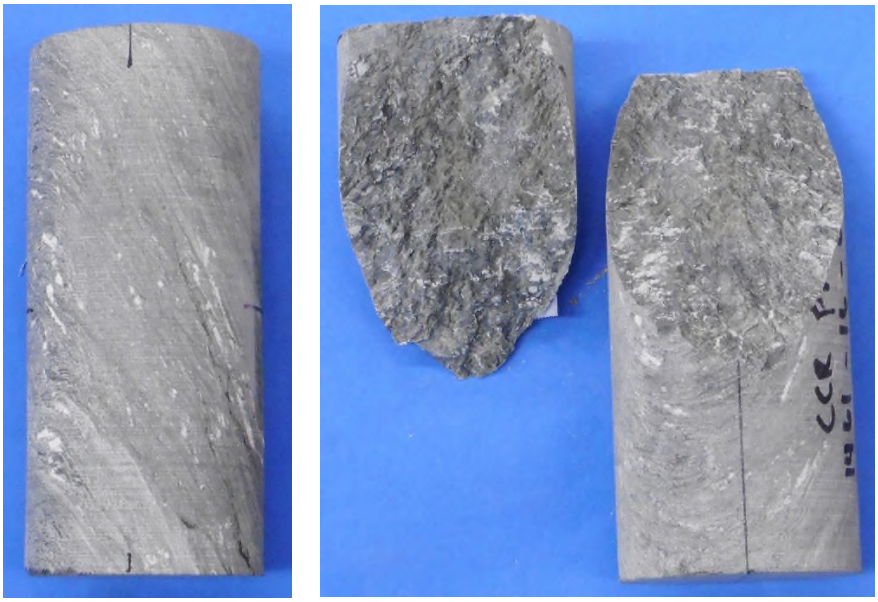
Photographer: Ben Painter

1	**Location / Orientation**	DH-5, RC-5 (60.6' – 62.1')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 3/12/2018

Photographer: Ben Painter

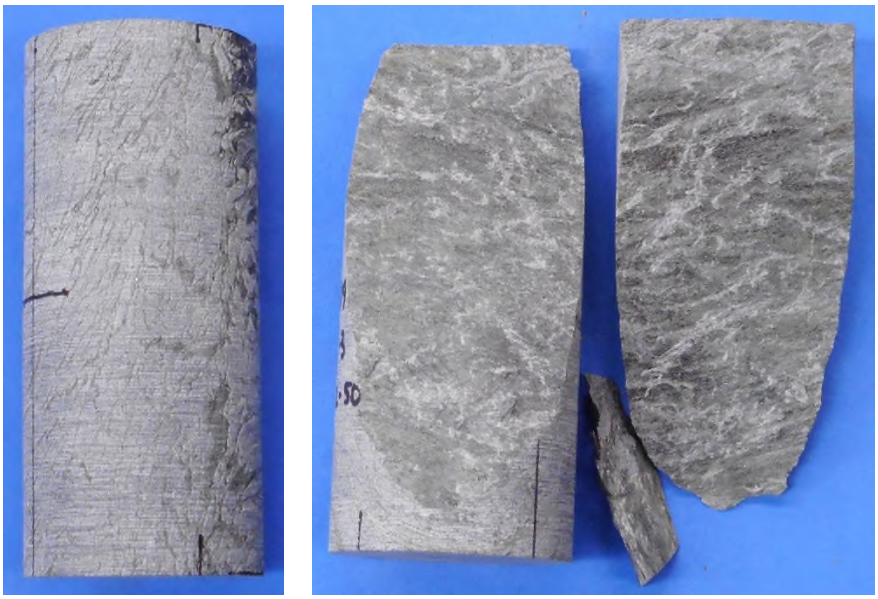
2	**Location / Orientation**	DH-5, RC-15 (112.5' – 113.5')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)



Date: 3/12/2018

Photographer: Ben Painter

3	**Location / Orientation**	B-50, RC-2 (81.2' – 82.2')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)



Date: 3/12/2018

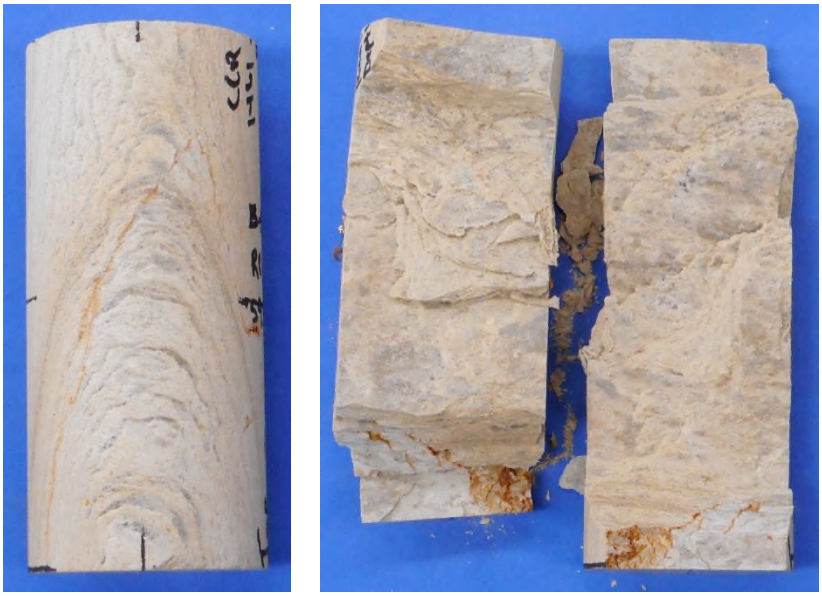
Photographer: Ben Painter

4	**Location / Orientation**	B-49, RC-3 (49.2' – 50.3')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 3/12/2018

Photographer: Ben Painter

5	**Location / Orientation**	B-49, RC-5 (56.6' – 57.6')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)



Date: 3/12/2018

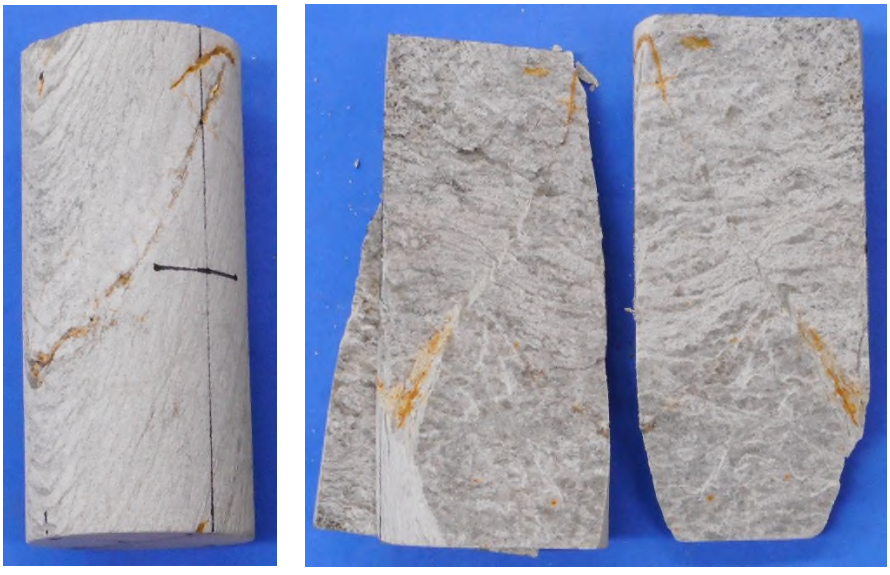
Photographer: Ben Painter

6	**Location / Orientation**	B-55, RC-2 (59.6' – 60.6')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 3/12/2018

Photographer: Ben Painter

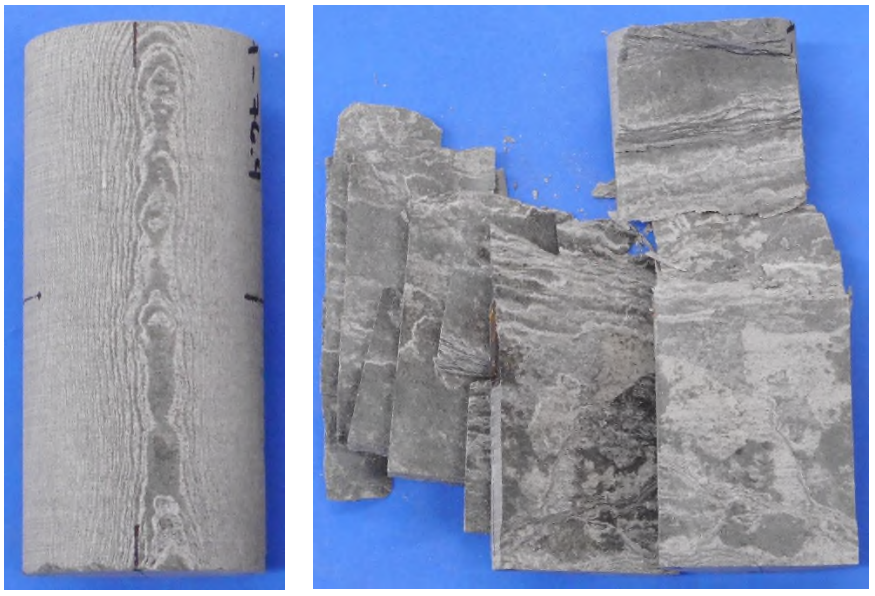
7	**Location / Orientation**	B-55, RC-3 (65.5' – 66.4')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)



Date: 3/12/2018

Photographer: Ben Painter

8	**Location / Orientation**	B-55, RC-4 (72.9' – 73.6')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)



Date: 3/12/2018

Photographer: Ben Painter

9	**Location / Orientation**	B-52, RC-2 (75.4' – 76.4')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 3/12/2018

Photographer: Ben Painter

10	**Location / Orientation**	B-52, RC-5 (90.4' – 91.4')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 3/12/2018

Photographer: Ben Painter

11	**Location / Orientation**	B-42, RC-2 (70.8' – 71.7')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 3/12/2018

Photographer: Ben Painter

12	**Location / Orientation**	B-42, RC-4 (79.5' – 80.4')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 3/12/2018

Photographer: Ben Painter

13	**Location / Orientation**	W-23, RC-2 (20.7' – 21.5')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

UNCONFINED COMPRESSION
(ASTM D7012 Method C)

S&ME, Inc. - Knoxville 1413 Topside Road, Louisville, TN 37777

Project Name: Carolina Crossroads Project
Project Number: 1461-16-047 Phase 2B

Report Date: March 22, 2018
Reviewed By: Jason B. Burgess

Boring No.	Sample No.	Depth (ft)	Dimensions, in.		Shape (See Key)	Area (in^2)	Unit Weight (lbs/ft^3)	Loading Rate (psi/sec)	Maximum Load (lbs)	Strength (psi)	Moisture (%)
			Length	Diameter							
W-24	RC-1	27.2 - 28.2	4.47	1.99	A	3.11	165.0	73	67,834	21,812	0.4
B-31	RC-1	26.7 - 27.4	4.44	1.97	A	3.05	186.6	83	159,430	52,272	0.0
B-31	RC-4	41.3 - 42.0	4.42	1.97	B	3.05	187.0	80	92,296	30,261	0.1
B-33	RC-6	72.2 - 73.0	4.44	1.98	A	3.08	166.7	79	93,854	30,472	0.1
B-37	RC-4	52.6 - 53.3	4.44	1.99	A	3.11	176.0	76	46,382	14,914	0.1

NOTES: Effective (as received) unit weight as determined by RTH 109-93.
Loading rates were selected to target reaching failure between 2 and 15 minutes.
Test results for specimens not meeting the requirements of ASTM D4543 may differ from a test specimen that meets the requirements of ASTM D4543.

SHAPE KEY

ASTM D4543-08$^{\epsilon 1}$ *Standard Practice for Preparing Rock Core as Cylindrical Test Specimens and Verifying Conformance to Dimensional and Shape Tolerance* Section 1.2 - "Rock is a complex engineering material that can vary greatly as a function of lithology, stress history, weathering, moisture content and chemistry, and other natural geologic processes. As such, it is not always possible to obtain or prepare rock core specimens that satisfy the desirable tolerances given in this practice. Most commonly, this situation presents itself with weaker, more porous, and poorly cemented rock types and rock types containing significant or weak (or both) structural features. For these and other rock types which are difficult to prepare, all reasonable efforts shall be made to prepare a specimen in accordance with this practice and for the intended test procedure. However, when it has been determined by trial that this is not possible, prepare the rock specimen to the closest tolerances practicable and consider this to be the best effort and report it as such and if allowable or necessary for the intended test, capping the ends of the specimen as discussed in this practice is permitted."

A Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)

B Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism, and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness. Specimen prepared to closest tolerances practicable.

C Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism. Specimen did not meet the desired tolerances for side straightness and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

D Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness. Specimen did not meet the desired tolerances for side straightness, parallelism and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

E Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness and parallelism. Specimen prepared to closest tolerances practicable.

UNCONFINED COMPRESSION
(ASTM D7012 Method C)

S&ME, Inc. - Knoxville 1413 Topside Road, Louisville, TN 37777

Project Name: Carolina Crossroads Project
Project Number: 1461-16-047 Phase 2B

Report Date: March 22, 2018
Reviewed By: Jason B. Burgess

Boring No.	Sample No.	Depth (ft)	Dimensions, in.		Shape (See Key)	Area (in^2)	Unit Weight (lbs/ft^3)	Loading Rate (psi/sec)	Maximum Load (lbs)	Strength (psi)	Moisture (%)
			Length	Diameter							
B-37	RC-5	57.2 - 58.0	4.49	1.99	A	3.11	183.6	73	67,731	21,778	0.1
B-37	RC-6	63.2 - 63.8	4.47	1.99	A	3.11	176.9	72	32,195	10,352	0.2

NOTES: Effective (as received) unit weight as determined by RTH 109-93.
Loading rates were selected to target reaching failure between 2 and 15 minutes.
Test results for specimens not meeting the requirements of ASTM D4543 may differ from a test specimen that meets the requirements of ASTM D4543.

SHAPE KEY

ASTM D4543-08$^{\epsilon 1}$ *Standard Practice for Preparing Rock Core as Cylindrical Test Specimens and Verifying Conformance to Dimensional and Shape Tolerance* Section 1.2 - "Rock is a complex engineering material that can vary greatly as a function of lithology, stress history, weathering, moisture content and chemistry, and other natural geologic processes. As such, it is not always possible to obtain or prepare rock core specimens that satisfy the desirable tolerances given in this practice. Most commonly, this situation presents itself with weaker, more porous, and poorly cemented rock types and rock types containing significant or weak (or both) structural features. For these and other rock types which are difficult to prepare, all reasonable efforts shall be made to prepare a specimen in accordance with this practice and for the intended test procedure. However, when it has been determined by trial that this is not possible, prepare the rock specimen to the closest tolerances practicable and consider this to be the best effort and report it as such and if allowable or necessary for the intended test, capping the ends of the specimen as discussed in this practice is permitted."

A Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)

B Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism, and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness. Specimen prepared to closest tolerances practicable.

C Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism. Specimen did not meet the desired tolerances for side straightness and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

D Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness. Specimen did not meet the desired tolerances for side straightness, parallelism and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

E Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness and parallelism. Specimen prepared to closest tolerances practicable.

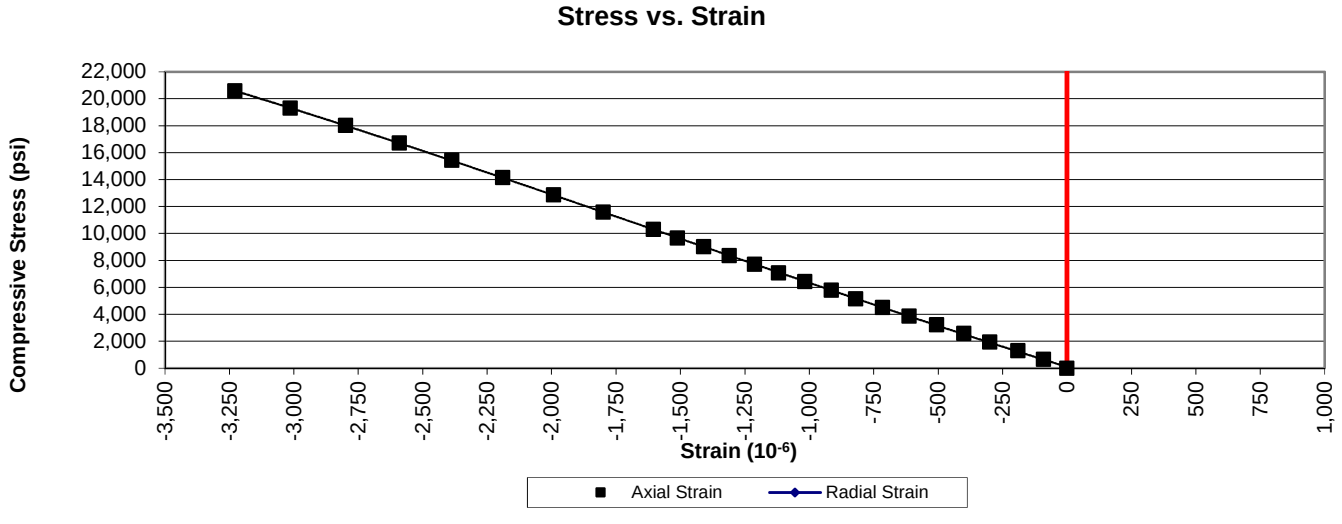
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.99	**Date:**	3/20/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.47	**Tested by:**	BKP / MG
Boring Id:	W-24	**Unit Weight, pcf:**	165.0	**Reviewed by:**	JBB
Sample No:	RC-1	**Moisture Content, %:**	0.4		
Depth (ft):	27.2 - 28.2	**Load Rate, psi/sec:**	73		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-91		2,000	643	7.07		
3	-190		4,000	1,286	6.77		
4	-299		6,000	1,929	6.45		
5	-400		8,000	2,572	6.43		
6	-506		10,000	3,215	6.35		
7	-613		12,000	3,859	6.30		
8	-715		14,000	4,502	6.30		
9	-820		16,000	5,145	6.27		
10	-914		18,000	5,788	6.33		
11	-1,017		20,000	6,431	6.32		
12	-1,119		22,000	7,074	6.32		
13	-1,212		24,000	7,717	6.37		
14	-1,310		26,000	8,360	6.38		
15	-1,410		28,000	9,003	6.39		
16	-1,511		30,000	9,646	6.38		
17	-1,604		32,000	10,289	6.41		
18	-1,800		36,000	11,576	6.43		
19	-1,992		40,000	12,862	6.46		
20	-2,189		44,000	14,148	6.46		
21	-2,387		48,000	15,434	6.47		
22	-2,590		52,000	16,720	6.46		
23	-2,799		56,000	18,006	6.43		
24	-3,014		60,000	19,293	6.40		
25	-3,229		64,000	20,579	6.37		
26			67,834	21,812			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

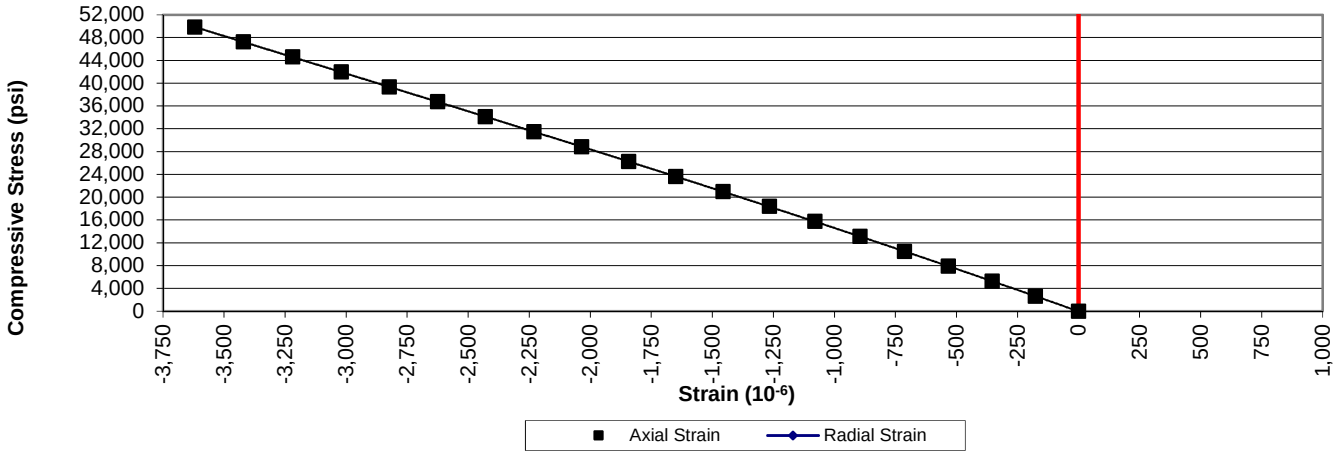
1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.97	**Date:**	3/20/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.44	**Tested by:**	BKP / MG
Boring Id:	B-31	**Unit Weight, pcf:**	186.6	**Reviewed by:**	JBB
Sample No:	RC-1	**Moisture Content, %:**	0.0		
Depth (ft):	26.7 - 27.4	**Load Rate, psi/sec:**	83		

Data Point	Strain (10^{-6}) axial	Strain (10^{-6}) radial	Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
1	0		0	0	0.00		
2	-177		8,000	2,623	14.82		
3	-354		16,000	5,246	14.82		
4	-533		24,000	7,869	14.76		
5	-712		32,000	10,492	14.74		
6	-895		40,000	13,115	14.65		
7	-1,080		48,000	15,738	14.57		
8	-1,266		56,000	18,361	14.50		
9	-1,456		64,000	20,984	14.41		
10	-1,649		72,000	23,607	14.32		
11	-1,842		80,000	26,230	14.24		
12	-2,035		88,000	28,852	14.18		
13	-2,230		96,000	31,475	14.11		
14	-2,430		104,000	34,098	14.03		
15	-2,625		112,000	36,721	13.99		
16	-2,822		120,000	39,344	13.94		
17	-3,019		128,000	41,967	13.90		
18	-3,219		136,000	44,590	13.85		
19	-3,420		144,000	47,213	13.80		
20	-3,619		152,000	49,836	13.77		
21			159,430	52,272			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)

Stress vs. Strain



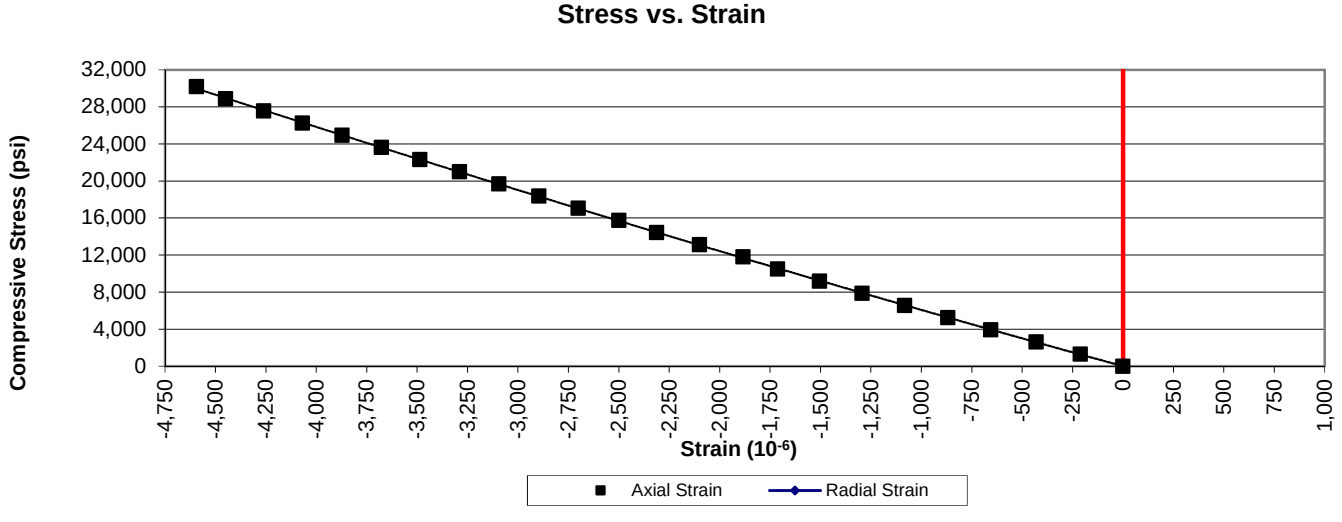
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.97	**Date:**	3/20/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.42	**Tested by:**	BKP / MG
Boring Id:	B-31	**Unit Weight, pcf:**	187.0	**Reviewed by:**	JBB
Sample No:	RC-4	**Moisture Content, %:**	0.1		
Depth (ft):	41.3 - 42.0	**Load Rate, psi/sec:**	80		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-211		4,000	1,311	6.21		
3	-430		8,000	2,623	6.10		
4	-655		12,000	3,934	6.01		
5	-869		16,000	5,246	6.04		
6	-1,083		20,000	6,557	6.05		
7	-1,293		24,000	7,869	6.09		
8	-1,504		28,000	9,180	6.10		
9	-1,712		32,000	10,492	6.13		
10	-1,884		36,000	11,803	6.26		
11	-2,100		40,000	13,115	6.25		
12	-2,312		44,000	14,426	6.24		
13	-2,499		48,000	15,738	6.30		
14	-2,701		52,000	17,049	6.31		
15	-2,896		56,000	18,361	6.34		
16	-3,094		60,000	19,672	6.36		
17	-3,290		64,000	20,984	6.38		
18	-3,486		68,000	22,295	6.40		
19	-3,677		72,000	23,607	6.42		
20	-3,871		76,000	24,918	6.44		
21	-4,069		80,000	26,230	6.45		
22	-4,261		84,000	27,541	6.46		
23	-4,449		88,000	28,852	6.49		
24	-4,594		92,000	30,164	6.57		
25			92,296	30,261			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism, and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness. Specimen prepared to closest tolerances practicable.



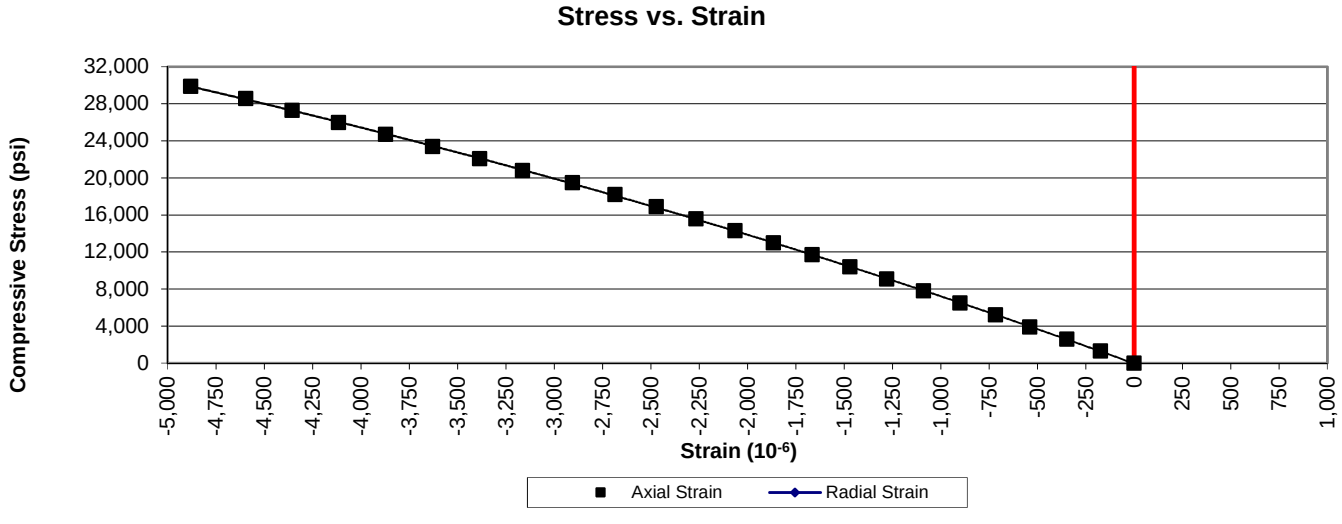
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	3/20/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.44	**Tested by:**	BKP / MG
Boring Id:	B-33	**Unit Weight, pcf:**	166.7	**Reviewed by:**	JBB
Sample No:	RC-6	**Moisture Content, %:**	0.1		
Depth (ft):	72.2 - 73.0	**Load Rate, psi/sec:**	79		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-173		4,000	1,299	7.51		
3	-348		8,000	2,597	7.46		
4	-540		12,000	3,896	7.21		
5	-716		16,000	5,195	7.26		
6	-900		20,000	6,494	7.22		
7	-1,089		24,000	7,792	7.16		
8	-1,279		28,000	9,091	7.11		
9	-1,470		32,000	10,390	7.07		
10	-1,665		36,000	11,688	7.02		
11	-1,866		40,000	12,987	6.96		
12	-2,064		44,000	14,286	6.92		
13	-2,266		48,000	15,584	6.88		
14	-2,472		52,000	16,883	6.83		
15	-2,685		56,000	18,182	6.77		
16	-2,905		60,000	19,481	6.71		
17	-3,164		64,000	20,779	6.57		
18	-3,386		68,000	22,078	6.52		
19	-3,628		72,000	23,377	6.44		
20	-3,872		76,000	24,675	6.37		
21	-4,116		80,000	25,974	6.31		
22	-4,356		84,000	27,273	6.26		
23	-4,595		88,000	28,571	6.22		
24	-4,880		92,000	29,870	6.12		
25			93,854	30,472			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

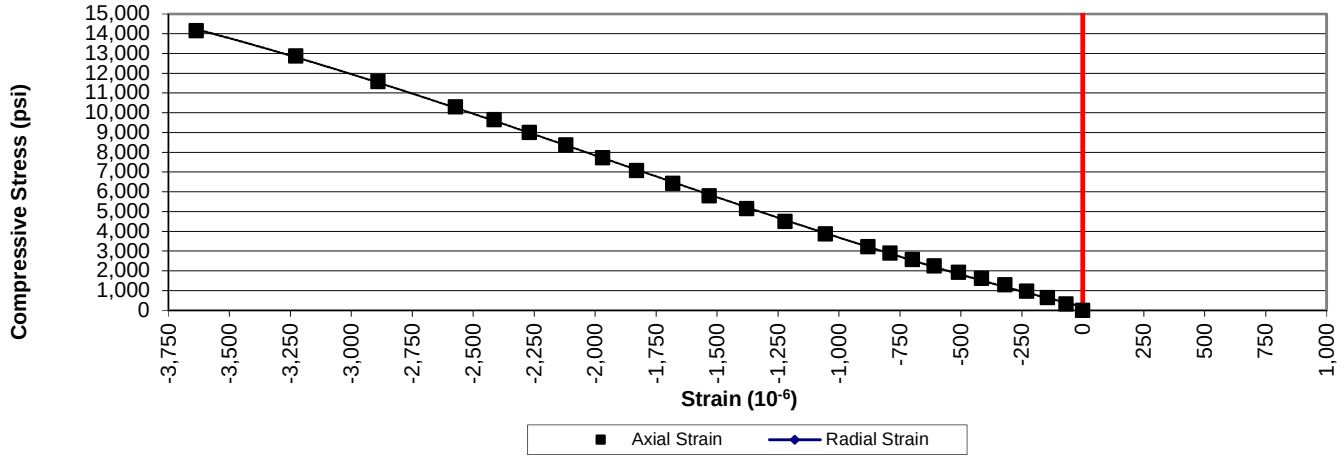
1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.99	**Date:**	3/20/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.44	**Tested by:**	BKP / MG
Boring Id:	B-37	**Unit Weight, pcf:**	176.0	**Reviewed by:**	JBB
Sample No:	RC-4	**Moisture Content, %:**	0.1		
Depth (ft):	52.6 - 53.3	**Load Rate, psi/sec:**	76		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-69		1,000	322	4.67		
3	-144		2,000	643	4.47		
4	-230		3,000	965	4.20		
5	-319		4,000	1,286	4.03		
6	-415		5,000	1,608	3.87		
7	-510		6,000	1,929	3.78		
8	-609		7,000	2,251	3.70		
9	-699		8,000	2,572	3.68		
10	-790		9,000	2,894	3.66		
11	-881		10,000	3,215	3.65		
12	-1,055		12,000	3,859	3.66		
13	-1,221		14,000	4,502	3.69		
14	-1,378		16,000	5,145	3.73		
15	-1,532		18,000	5,788	3.78		
16	-1,681		20,000	6,431	3.83		
17	-1,830		22,000	7,074	3.87		
18	-1,969		24,000	7,717	3.92		
19	-2,120		26,000	8,360	3.94		
20	-2,270		28,000	9,003	3.97		
21	-2,414		30,000	9,646	4.00		
22	-2,572		32,000	10,289	4.00		
23	-2,890		36,000	11,576	4.01		
24	-3,227		40,000	12,862	3.99		
25	-3,635		44,000	14,148	3.89		
26			46,382	14,914			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)

Stress vs. Strain



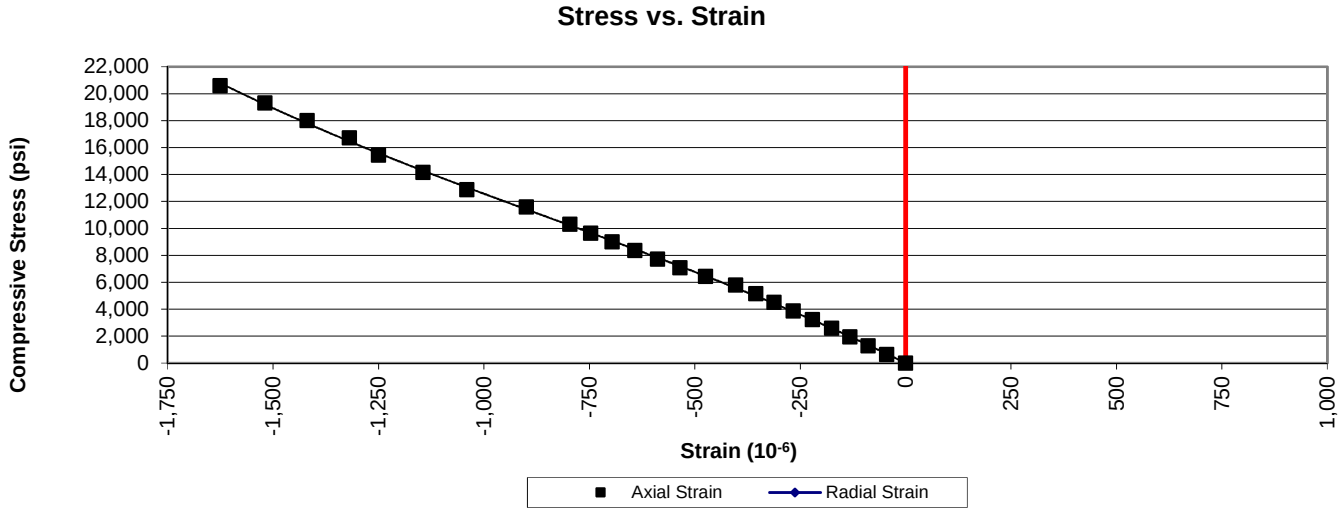
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.99	**Date:**	3/20/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.49	**Tested by:**	BKP / MG
Boring Id:	B-37	**Unit Weight, pcf:**	183.6	**Reviewed by:**	JBB
Sample No:	RC-5	**Moisture Content, %:**	0.1		
Depth (ft):	57.2 - 58.0	**Load Rate, psi/sec:**	73		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-45		2,000	643	14.29		
3	-89		4,000	1,286	14.45		
4	-132		6,000	1,929	14.61		
5	-175		8,000	2,572	14.70		
6	-221		10,000	3,215	14.55		
7	-266		12,000	3,859	14.51		
8	-312		14,000	4,502	14.43		
9	-355		16,000	5,145	14.49		
10	-403		18,000	5,788	14.36		
11	-474		20,000	6,431	13.57		
12	-535		22,000	7,074	13.22		
13	-588		24,000	7,717	13.12		
14	-642		26,000	8,360	13.02		
15	-696		28,000	9,003	12.94		
16	-747		30,000	9,646	12.91		
17	-796		32,000	10,289	12.93		
18	-899		36,000	11,576	12.88		
19	-1,040		40,000	12,862	12.37		
20	-1,144		44,000	14,148	12.37		
21	-1,250		48,000	15,434	12.35		
22	-1,319		52,000	16,720	12.68		
23	-1,419		56,000	18,006	12.69		
24	-1,519		60,000	19,293	12.70		
25	-1,625		64,000	20,579	12.66		
26			67,731	21,778			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



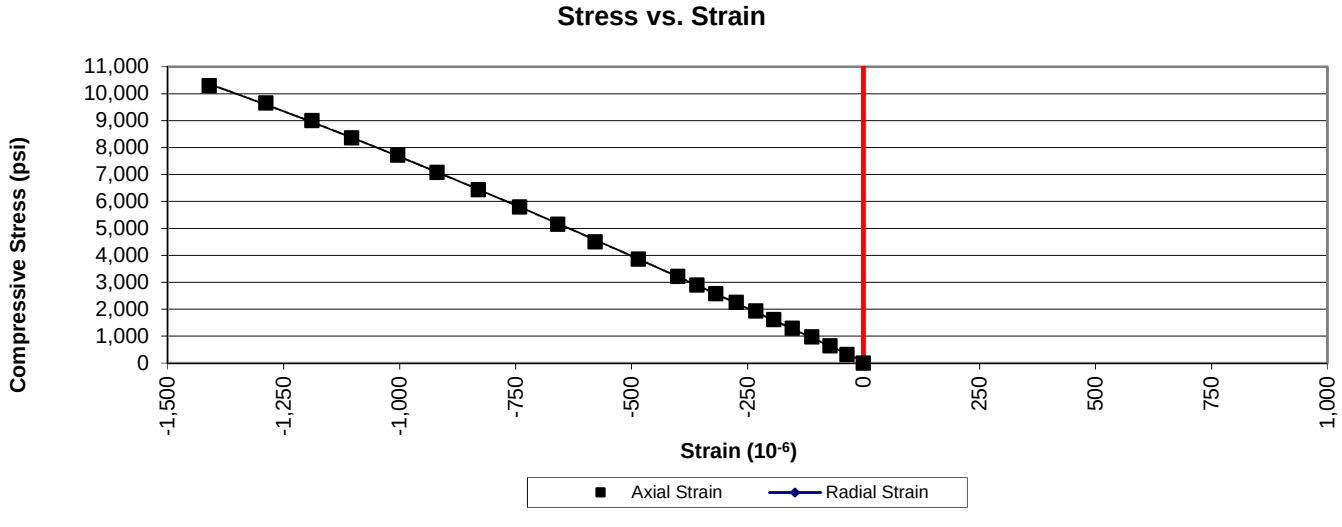
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.99	**Date:**	3/20/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.47	**Tested by:**	BKP / MG
Boring Id:	B-37	**Unit Weight, pcf:**	176.9	**Reviewed by:**	JBB
Sample No:	RC-6	**Moisture Content, %:**	0.2		
Depth (ft):	63.2 - 63.8	**Load Rate, psi/sec:**	72		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-35		1,000	322	9.20		
3	-72		2,000	643	8.93		
4	-111		3,000	965	8.69		
5	-153		4,000	1,286	8.41		
6	-193		5,000	1,608	8.33		
7	-232		6,000	1,929	8.31		
8	-274		7,000	2,251	8.22		
9	-318		8,000	2,572	8.09		
10	-359		9,000	2,894	8.06		
11	-400		10,000	3,215	8.04		
12	-485		12,000	3,859	7.96		
13	-578		14,000	4,502	7.79		
14	-659		16,000	5,145	7.81		
15	-741		18,000	5,788	7.81		
16	-830		20,000	6,431	7.75		
17	-919		22,000	7,074	7.70		
18	-1,004		24,000	7,717	7.69		
19	-1,103		26,000	8,360	7.58		
20	-1,189		28,000	9,003	7.57		
21	-1,288		30,000	9,646	7.49		
22	-1,410		32,000	10,289	7.30		
23			32,195	10,352			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

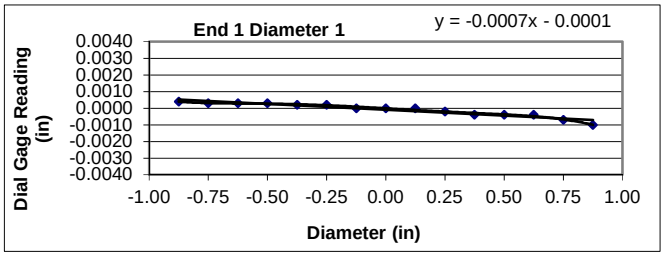
Project:	Carolina Crossroads Project	**Diameter (in):**	1.99	**Date:**	3/19/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.47	**Tested by:**	BKP
Boring Id:	W-24	**Unit Weight (pcf):**	165.0	**Reviewed by:**	JBB
Sample No.:	RC-1	**Moisture Content (%):**	0.4		
Depth (ft):	27.2 - 28.2				

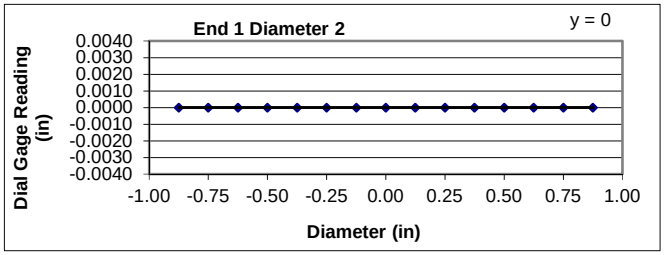
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

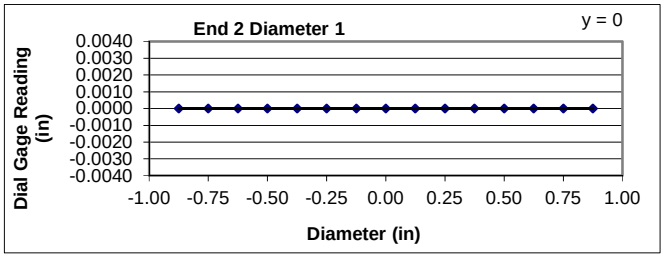
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0004	0.0000	0.0000	-0.0007
- 6/8	0.0003	0.0000	0.0000	-0.0005
- 5/8	0.0003	0.0000	0.0000	-0.0001
- 4/8	0.0003	0.0000	0.0000	0.0000
- 3/8	0.0002	0.0000	0.0000	0.0000
- 2/8	0.0002	0.0000	0.0000	0.0000
- 1/8	0.0000	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	0.0001
2/8	-0.0002	0.0000	0.0000	0.0001
3/8	-0.0004	0.0000	0.0000	0.0006
4/8	-0.0004	0.0000	0.0000	0.0010
5/8	-0.0004	0.0000	0.0000	0.0010
6/8	-0.0007	0.0000	0.0000	0.0010
7/8	-0.0010	0.0000	0.0000	0.0010

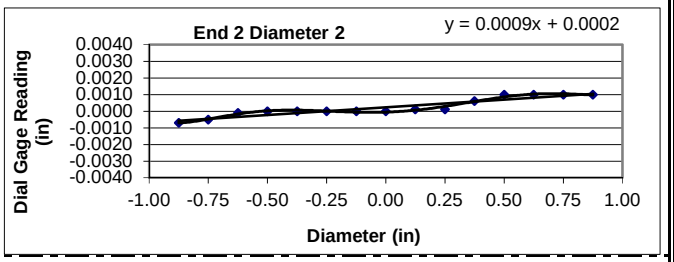




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00071
	Angle of Best Fit Line:	-0.04043
End 2:	Slope of Best Fit Line:	0.00000
	Angle of Best Fit Line:	0.00000
	Max Angular Difference:	**-0.04**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00000
	Angle of Best Fit Line:	0.00000
End 2:	Slope of Best Fit Line:	0.00093
	Angle of Best Fit Line:	0.05320
	Max Angular Difference:	**-0.05**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0014	0.0007	**YES**
End 1 Diam 2	0.0000	0.0000	**YES**
End 2 Diam 1	0.0000	0.0000	**YES**
End 2 Diam 2	0.0017	0.0009	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

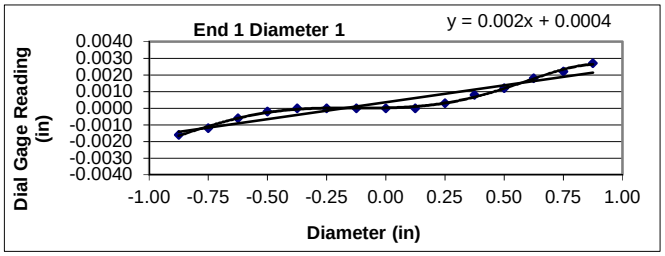
Project:	Carolina Crossroads Project	**Diameter (in):**	1.97	**Date:**	3/19/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.44	**Tested by:**	BKP
Boring Id:	B-31	**Unit Weight (pcf):**	186.6	**Reviewed by:**	JBB
Sample No.:	RC-1	**Moisture Content (%):**	0.0		
Depth (ft):	26.7 - 27.4				

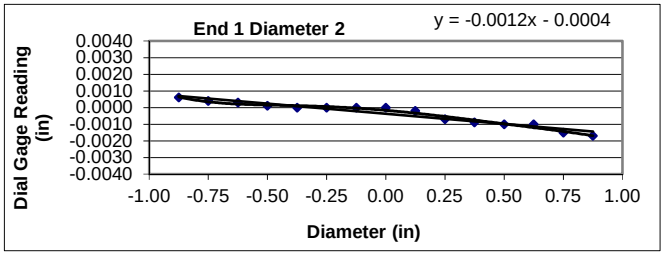
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

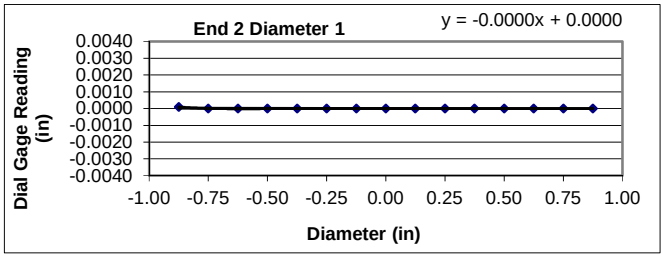
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	-0.0016	0.0006	0.0001	0.0011
- 6/8	-0.0012	0.0004	0.0000	0.0010
- 5/8	-0.0006	0.0003	0.0000	0.0009
- 4/8	-0.0002	0.0001	0.0000	0.0008
- 3/8	0.0000	0.0000	0.0000	0.0006
- 2/8	0.0000	0.0000	0.0000	0.0006
- 1/8	0.0000	0.0000	0.0000	0.0004
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	-0.0002	0.0000	0.0000
2/8	0.0003	-0.0007	0.0000	0.0000
3/8	0.0008	-0.0009	0.0000	0.0000
4/8	0.0012	-0.0010	0.0000	0.0000
5/8	0.0018	-0.0010	0.0000	-0.0004
6/8	0.0022	-0.0015	0.0000	-0.0005
7/8	0.0027	-0.0017	0.0000	-0.0006

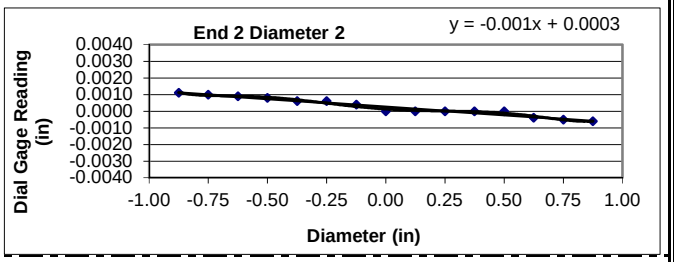




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	0.00203
	Angle of Best Fit Line:	0.11639
End 2:	Slope of Best Fit Line:	-0.00002
	Angle of Best Fit Line:	-0.00115
	Max Angular Difference:	**0.12**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00122
	Angle of Best Fit Line:	-0.06990
End 2:	Slope of Best Fit Line:	-0.00097
	Angle of Best Fit Line:	-0.05566
	Max Angular Difference:	**-0.01**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0043	0.0022	**YES**
End 1 Diam 2	0.0023	0.0012	**YES**
End 2 Diam 1	0.0001	0.0001	**YES**
End 2 Diam 2	0.0017	0.0009	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

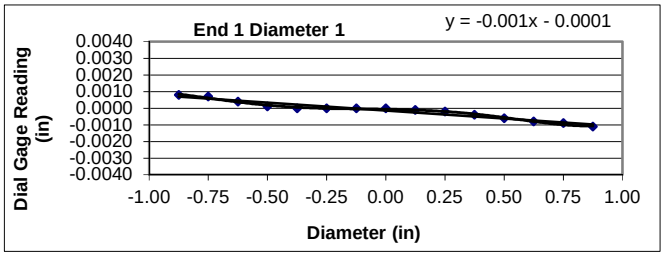
Project:	Carolina Crossroads Project	**Diameter (in):**	1.97	**Date:**	3/19/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.42	**Tested by:**	BKP
Boring Id:	B-31	**Unit Weight (pcf):**	187.0	**Reviewed by:**	JBB
Sample No.:	RC-4	**Moisture Content (%):**	0.1		
Depth (ft):	41.3 - 42.0				

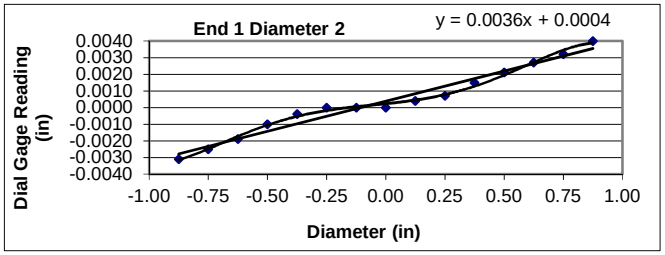
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **NO** Straightness Tolerance Met? **NO**

End Flatness and Parallelism Readings (Procedure FP1)

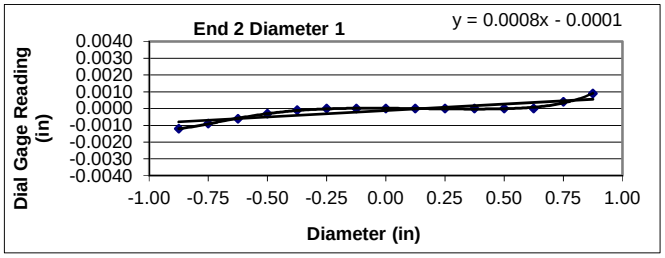
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0008	-0.0031	-0.0012	-0.0020
- 6/8	0.0007	-0.0025	-0.0009	-0.0016
- 5/8	0.0004	-0.0019	-0.0006	-0.0012
- 4/8	0.0001	-0.0010	-0.0003	-0.0008
- 3/8	0.0000	-0.0004	-0.0001	-0.0006
- 2/8	0.0000	0.0000	0.0000	-0.0002
- 1/8	0.0000	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	-0.0001	0.0004	0.0000	0.0000
2/8	-0.0002	0.0007	0.0000	0.0000
3/8	-0.0004	0.0015	0.0000	0.0000
4/8	-0.0006	0.0021	0.0000	0.0000
5/8	-0.0008	0.0027	0.0000	0.0002
6/8	-0.0009	0.0032	0.0004	0.0003
7/8	-0.0011	0.0040	0.0009	0.0008

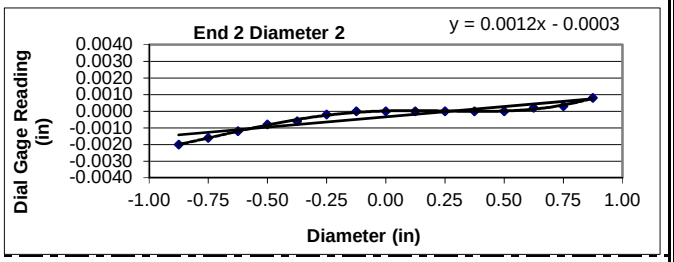




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00095
	Angle of Best Fit Line:	-0.05468
End 2:	Slope of Best Fit Line:	0.00077
	Angle of Best Fit Line:	0.04420
	Max Angular Difference:	**-0.10**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00362
	Angle of Best Fit Line:	0.20757
End 2:	Slope of Best Fit Line:	0.00124
	Angle of Best Fit Line:	0.07105
	Max Angular Difference:	**0.14**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0019	0.0010	**YES**
End 1 Diam 2	0.0071	0.0036	**YES**
End 2 Diam 1	0.0021	0.0011	**YES**
End 2 Diam 2	0.0028	0.0014	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

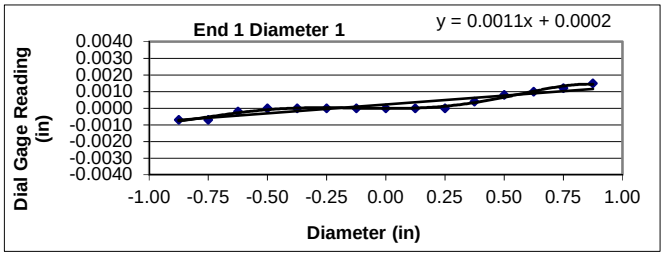
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	3/19/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.44	**Tested by:**	BKP
Boring Id:	B-33	**Unit Weight (pcf):**	166.7	**Reviewed by:**	JBB
Sample No.:	RC-6	**Moisture Content (%):**	0.1		
Depth (ft):	72.2 - 73.0				

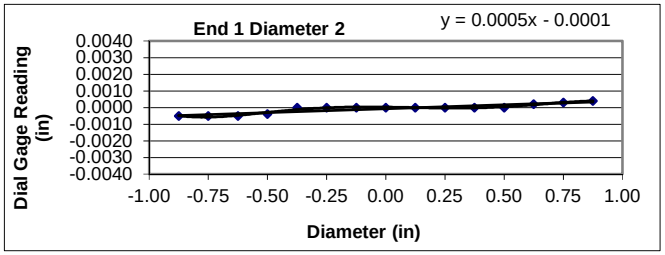
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

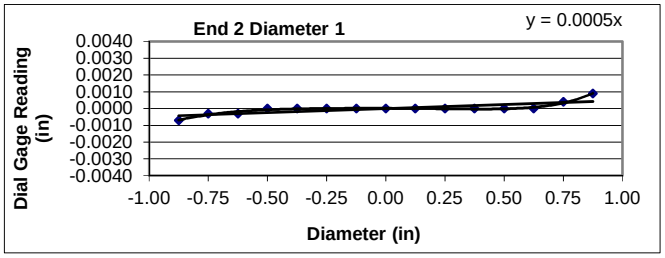
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	-0.0007	-0.0005	-0.0007	0.0002
- 6/8	-0.0007	-0.0005	-0.0003	0.0001
- 5/8	-0.0002	-0.0005	-0.0003	0.0000
- 4/8	0.0000	-0.0004	0.0000	0.0000
- 3/8	0.0000	0.0000	0.0000	0.0000
- 2/8	0.0000	0.0000	0.0000	0.0000
- 1/8	0.0000	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	0.0000
2/8	0.0000	0.0000	0.0000	0.0000
3/8	0.0004	0.0000	0.0000	0.0000
4/8	0.0008	0.0000	0.0000	0.0000
5/8	0.0010	0.0002	0.0000	-0.0001
6/8	0.0012	0.0003	0.0004	-0.0002
7/8	0.0015	0.0004	0.0009	-0.0002

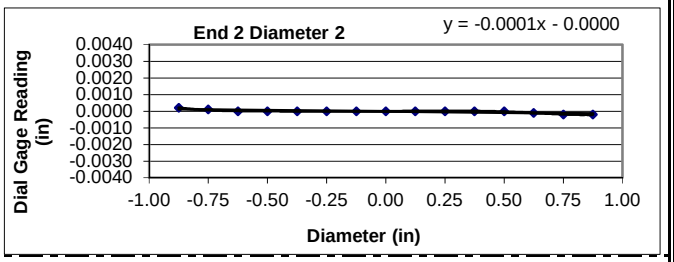




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	0.00106
	Angle of Best Fit Line:	0.06090
End 2:	Slope of Best Fit Line:	0.00048
	Angle of Best Fit Line:	0.02767
	Max Angular Difference:	**0.03**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00046
	Angle of Best Fit Line:	0.02652
End 2:	Slope of Best Fit Line:	-0.00015
	Angle of Best Fit Line:	-0.00835
	Max Angular Difference:	**0.03**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0022	0.0011	**YES**
End 1 Diam 2	0.0009	0.0005	**YES**
End 2 Diam 1	0.0016	0.0008	**YES**
End 2 Diam 2	0.0004	0.0002	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

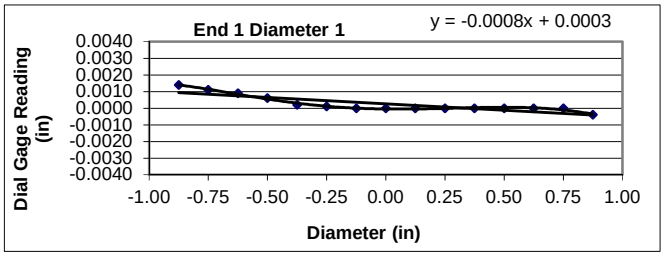
Project:	Carolina Crossroads Project	**Diameter (in):**	1.99	**Date:**	3/19/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.44	**Tested by:**	BKP
Boring Id:	B-37	**Unit Weight (pcf):**	176.0	**Reviewed by:**	JBB
Sample No.:	RC-4	**Moisture Content (%):**	0.1		
Depth (ft):	52.6 - 53.3				

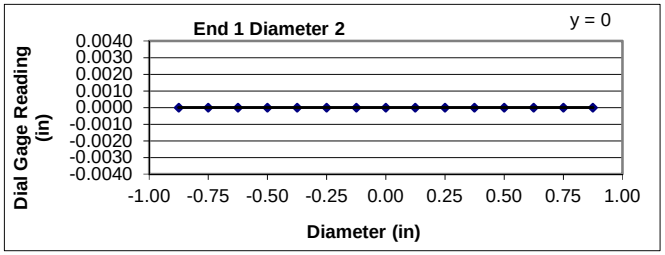
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

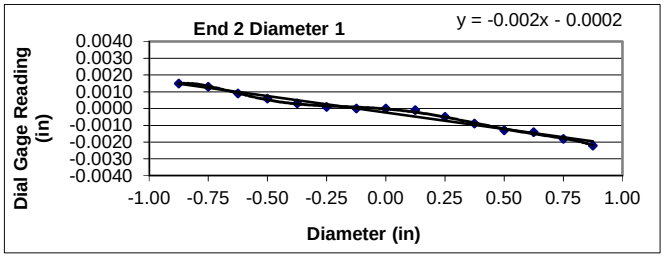
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0014	0.0000	0.0015	-0.0008
- 6/8	0.0011	0.0000	0.0013	-0.0006
- 5/8	0.0009	0.0000	0.0009	-0.0006
- 4/8	0.0006	0.0000	0.0006	-0.0001
- 3/8	0.0002	0.0000	0.0003	0.0000
- 2/8	0.0001	0.0000	0.0001	0.0000
- 1/8	0.0000	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	-0.0001	0.0000
2/8	0.0000	0.0000	-0.0005	0.0000
3/8	0.0000	0.0000	-0.0009	0.0000
4/8	0.0000	0.0000	-0.0013	0.0000
5/8	0.0000	0.0000	-0.0014	0.0004
6/8	0.0000	0.0000	-0.0018	0.0008
7/8	-0.0004	0.0000	-0.0022	0.0012

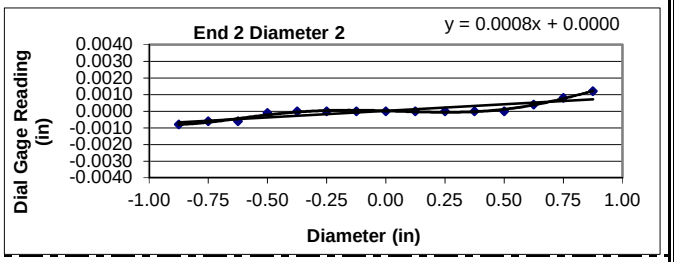




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00077
	Angle of Best Fit Line:	-0.04404
End 2:	Slope of Best Fit Line:	-0.00196
	Angle of Best Fit Line:	-0.11214
	Max Angular Difference:	**0.07**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00000
	Angle of Best Fit Line:	0.00000
End 2:	Slope of Best Fit Line:	0.00079
	Angle of Best Fit Line:	0.04551
	Max Angular Difference:	**-0.05**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0018	0.0009	**YES**
End 1 Diam 2	0.0000	0.0000	**YES**
End 2 Diam 1	0.0037	0.0019	**YES**
End 2 Diam 2	0.0020	0.0010	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

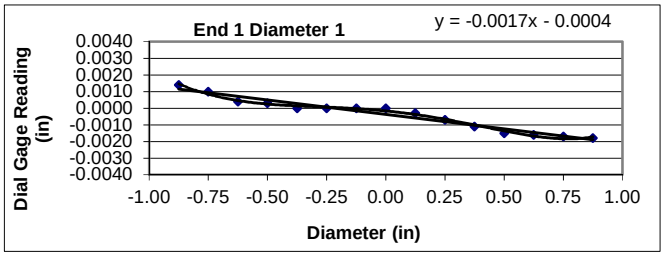
Project:	Carolina Crossroads Project	**Diameter (in):**	1.99	**Date:**	3/19/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.49	**Tested by:**	BKP
Boring Id:	B-37	**Unit Weight (pcf):**	183.6	**Reviewed by:**	JBB
Sample No.:	RC-5	**Moisture Content (%):**	0.1		
Depth (ft):	57.2 - 58.0				

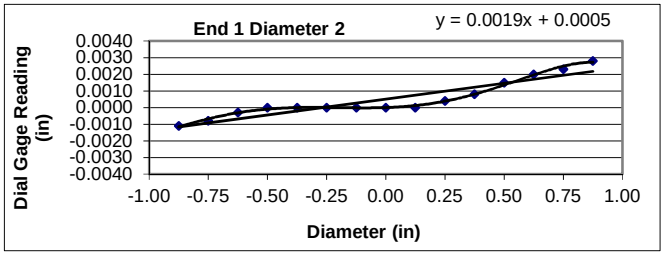
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

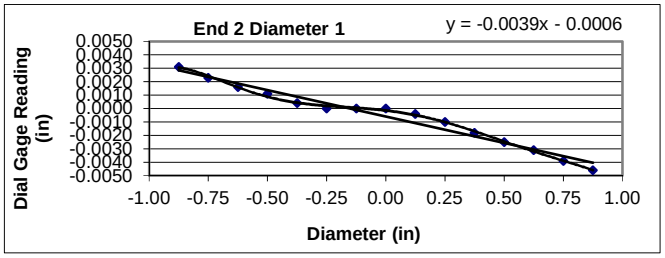
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0014	-0.0011	0.0031	0.0000
- 6/8	0.0010	-0.0008	0.0023	0.0000
- 5/8	0.0004	-0.0003	0.0016	0.0000
- 4/8	0.0003	0.0000	0.0011	0.0000
- 3/8	0.0000	0.0000	0.0004	0.0000
- 2/8	0.0000	0.0000	0.0000	0.0000
- 1/8	0.0000	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	-0.0003	0.0000	-0.0004	-0.0001
2/8	-0.0007	0.0004	-0.0010	-0.0006
3/8	-0.0011	0.0008	-0.0018	-0.0010
4/8	-0.0015	0.0015	-0.0025	-0.0010
5/8	-0.0016	0.0020	-0.0031	-0.0010
6/8	-0.0017	0.0023	-0.0039	-0.0012
7/8	-0.0018	0.0028	-0.0046	-0.0017

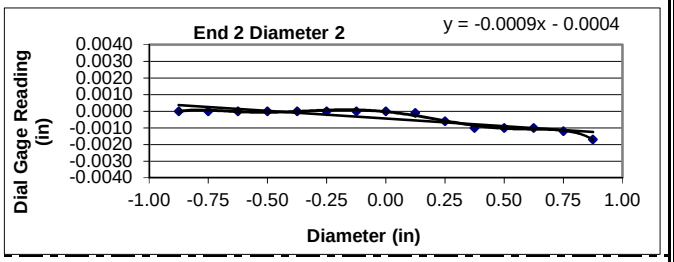




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00174
	Angle of Best Fit Line:	-0.09953
End 2:	Slope of Best Fit Line:	-0.00394
	Angle of Best Fit Line:	-0.22591
	Max Angular Difference:	**0.13**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00190
	Angle of Best Fit Line:	0.10903
End 2:	Slope of Best Fit Line:	-0.00093
	Angle of Best Fit Line:	-0.05304
	Max Angular Difference:	**0.16**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0032	0.0016	**YES**
End 1 Diam 2	0.0039	0.0020	**YES**
End 2 Diam 1	0.0077	0.0039	**YES**
End 2 Diam 2	0.0017	0.0009	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

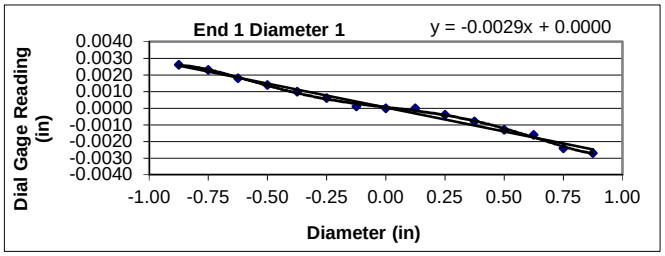
Project:	Carolina Crossroads Project	**Diameter (in):**	1.99	**Date:**	3/19/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.47	**Tested by:**	BKP
Boring Id:	B-37	**Unit Weight (pcf):**	176.9	**Reviewed by:**	JBB
Sample No.:	RC-6	**Moisture Content (%):**	0.2		
Depth (ft):	63.2 - 63.8				

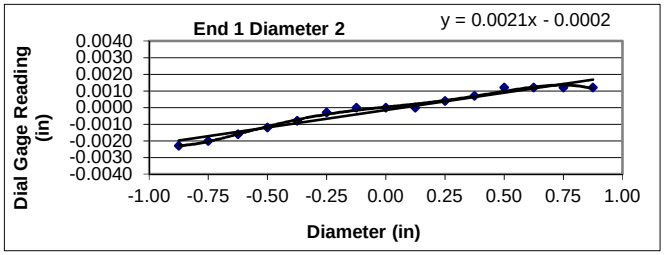
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

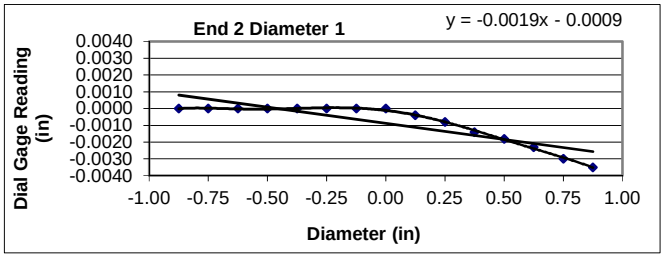
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0026	-0.0023	0.0000	-0.0002
- 6/8	0.0023	-0.0020	0.0000	0.0000
- 5/8	0.0018	-0.0016	0.0000	0.0000
- 4/8	0.0014	-0.0012	0.0000	0.0000
- 3/8	0.0010	-0.0008	0.0000	0.0000
- 2/8	0.0006	-0.0003	0.0000	0.0000
- 1/8	0.0001	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	-0.0004	0.0000
2/8	-0.0004	0.0004	-0.0008	0.0000
3/8	-0.0008	0.0007	-0.0014	0.0000
4/8	-0.0013	0.0012	-0.0018	0.0000
5/8	-0.0016	0.0012	-0.0023	0.0000
6/8	-0.0024	0.0012	-0.0030	0.0000
7/8	-0.0027	0.0012	-0.0035	0.0000

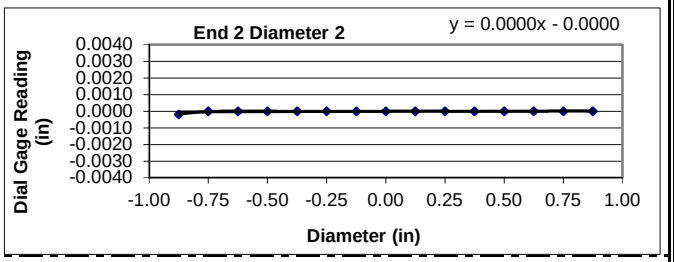




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00287
	Angle of Best Fit Line:	-0.16468
End 2:	Slope of Best Fit Line:	-0.00193
	Angle of Best Fit Line:	-0.11034
	Max Angular Difference:	**-0.05**

Parrallelism Diameter 2

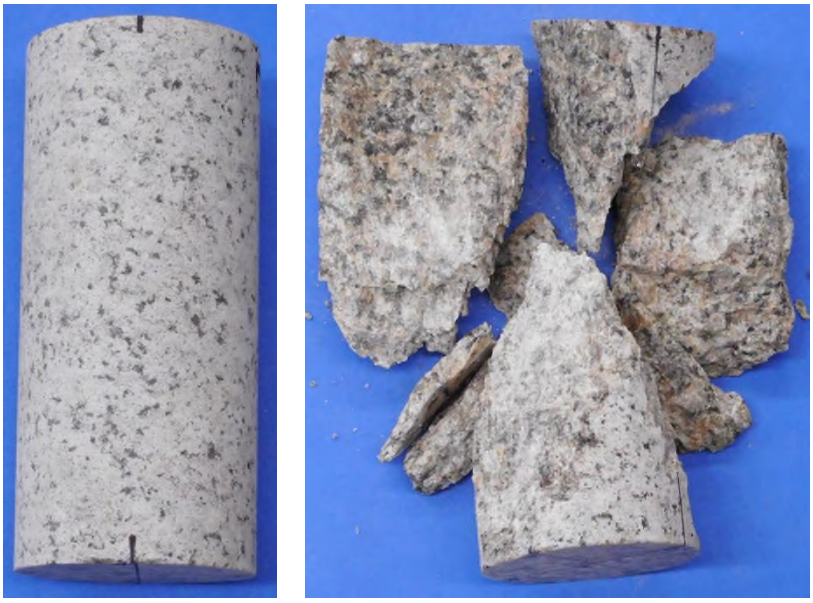
End 1:	Slope of Best Fit Line:	0.00209
	Angle of Best Fit Line:	0.11983
End 2:	Slope of Best Fit Line:	0.00004
	Angle of Best Fit Line:	0.00229
	Max Angular Difference:	**0.12**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0053	0.0027	**YES**
End 1 Diam 2	0.0035	0.0018	**YES**
End 2 Diam 1	0.0035	0.0018	**YES**
End 2 Diam 2	0.0002	0.0001	**YES**

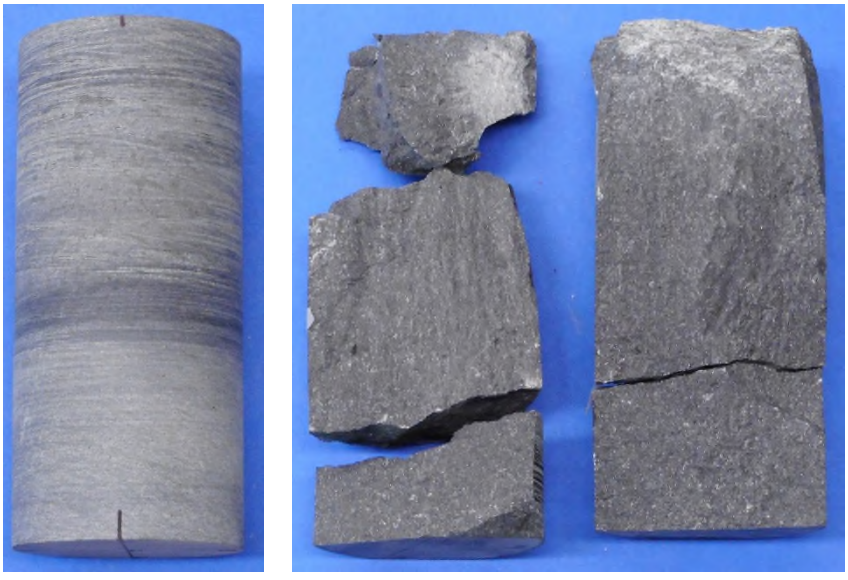
Perpendicularity Tolerance Met? **YES**



Date: 3/20/2018

Photographer: Ben Painter

1	**Location / Orientation**	W-24, RC-1 (27.2' – 28.2')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)



Date: 3/20/2018

Photographer: Ben Painter

2	**Location / Orientation**	B-31, RC-1 (26.7' – 27.4')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 3/20/2018

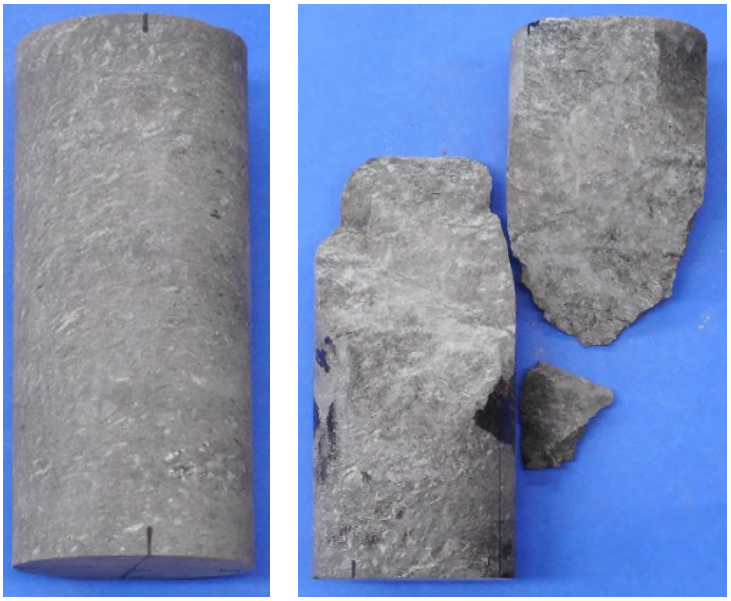
Photographer: Ben Painter

3	**Location / Orientation**	B-31, RC-4 (41.3' – 42.0')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 3/20/2018

Photographer: Ben Painter

4	**Location / Orientation**	B-33, RC-6 (72.2' – 73.0')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)



Date: 3/20/2018

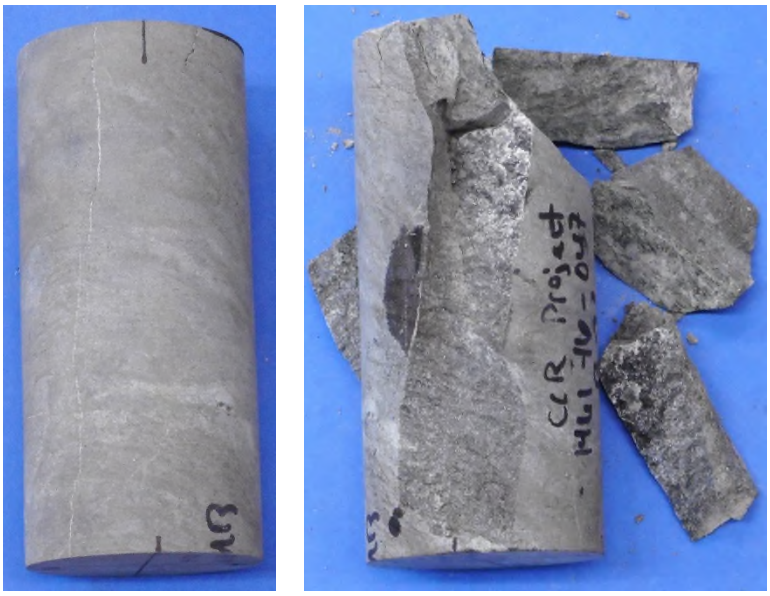
Photographer: Ben Painter

5	**Location / Orientation**	B-37, RC-4 (52.6' – 53.3')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 3/20/2018

Photographer: Ben Painter

6	**Location / Orientation**	B-37, RC-5 (57.2' – 58.0')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)



Date: 3/20/2018

Photographer: Ben Painter

7	**Location / Orientation**	B-37, RC-6 (63.2' – 63.8')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

UNCONFINED COMPRESSION
(ASTM D7012 Method C)

S&ME, Inc. - Knoxville 1413 Topside Road, Louisville, TN 37777

Project Name: Carolina Crossroads Project
Project Number: 1461-16-047 Phase 2B

Report Date: March 30, 2018
Reviewed By: Jason B. Burgess

Boring No.	Sample No.	Depth (ft)	Dimensions, in.		Shape (See Key)	Area (in^2)	Unit Weight (lbs/ft^3)	Loading Rate (psi/sec)	Maximum Load (lbs)	Strength (psi)	Moisture (%)
			Length	Diameter							
W-19	RC-3	53.5 - 54.1	4.26	1.97	A	3.05	151.6	21	3,166	1,038	0.8
B-32	RC-2	67.2 - 68.1	4.42	1.98	D	3.08	178.7	81	93,085	30,222	0.3
B-44	RC-1	9.2 - 9.9	4.50	1.98	A	3.08	163.5	83	101,124	32,832	0.2
B-44	RC-3	16.2 - 17.1	4.45	1.98	A	3.08	162.7	84	30,278	9,831	0.3
B-44	RC-4	23.2 - 23.9	4.46	1.98	A	3.08	162.4	37	10,251	3,328	0.4

NOTES: Effective (as received) unit weight as determined by RTH 109-93.
Loading rates were selected to target reaching failure between 2 and 15 minutes.
Test results for specimens not meeting the requirements of ASTM D4543 may differ from a test specimen that meets the requirements of ASTM D4543.

SHAPE KEY

ASTM D4543-08$^{\epsilon 1}$ *Standard Practice for Preparing Rock Core as Cylindrical Test Specimens and Verifying Conformance to Dimensional and Shape Tolerance* Section 1.2 - "Rock is a complex engineering material that can vary greatly as a function of lithology, stress history, weathering, moisture content and chemistry, and other natural geologic processes. As such, it is not always possible to obtain or prepare rock core specimens that satisfy the desirable tolerances given in this practice. Most commonly, this situation presents itself with weaker, more porous, and poorly cemented rock types and rock types containing significant or weak (or both) structural features. For these and other rock types which are difficult to prepare, all reasonable efforts shall be made to prepare a specimen in accordance with this practice and for the intended test procedure. However, when it has been determined by trial that this is not possible, prepare the rock specimen to the closest tolerances practicable and consider this to be the best effort and report it as such and if allowable or necessary for the intended test, capping the ends of the specimen as discussed in this practice is permitted."

A Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)

B Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism, and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness. Specimen prepared to closest tolerances practicable.

C Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism. Specimen did not meet the desired tolerances for side straightness and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

D Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness. Specimen did not meet the desired tolerances for side straightness, parallelism and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

E Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness and parallelism. Specimen prepared to closest tolerances practicable.

UNCONFINED COMPRESSION
(ASTM D7012 Method C)

S&ME, Inc. - Knoxville 1413 Topside Road, Louisville, TN 37777

Project Name: Carolina Crossroads Project
Project Number: 1461-16-047 Phase 2B

Report Date: March 30, 2018
Reviewed By: Jason B. Burgess

Boring No.	Sample No.	Depth (ft)	Dimensions, in.		Shape (See Key)	Area (in^2)	Unit Weight (lbs/ft^3)	Loading Rate (psi/sec)	Maximum Load (lbs)	Strength (psi)	Moisture (%)
			Length	Diameter							
B-56	RC-1	84.7 - 85.4	4.39	1.98	A	3.08	173.5	45	13,665	4,437	0.7
B-56	RC-3	94.4 - 95.3	4.42	1.98	A	3.08	169.3	59	14,481	4,702	0.5

NOTES: Effective (as received) unit weight as determined by RTH 109-93.
Loading rates were selected to target reaching failure between 2 and 15 minutes.
Test results for specimens not meeting the requirements of ASTM D4543 may differ from a test specimen that meets the requirements of ASTM D4543.

SHAPE KEY

ASTM D4543-08$^{\epsilon 1}$ *Standard Practice for Preparing Rock Core as Cylindrical Test Specimens and Verifying Conformance to Dimensional and Shape Tolerance* Section 1.2 - "Rock is a complex engineering material that can vary greatly as a function of lithology, stress history, weathering, moisture content and chemistry, and other natural geologic processes. As such, it is not always possible to obtain or prepare rock core specimens that satisfy the desirable tolerances given in this practice. Most commonly, this situation presents itself with weaker, more porous, and poorly cemented rock types and rock types containing significant or weak (or both) structural features. For these and other rock types which are difficult to prepare, all reasonable efforts shall be made to prepare a specimen in accordance with this practice and for the intended test procedure. However, when it has been determined by trial that this is not possible, prepare the rock specimen to the closest tolerances practicable and consider this to be the best effort and report it as such and if allowable or necessary for the intended test, capping the ends of the specimen as discussed in this practice is permitted."

A Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)

B Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism, and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness. Specimen prepared to closest tolerances practicable.

C Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism. Specimen did not meet the desired tolerances for side straightness and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

D Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness. Specimen did not meet the desired tolerances for side straightness, parallelism and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

E Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness and parallelism. Specimen prepared to closest tolerances practicable.

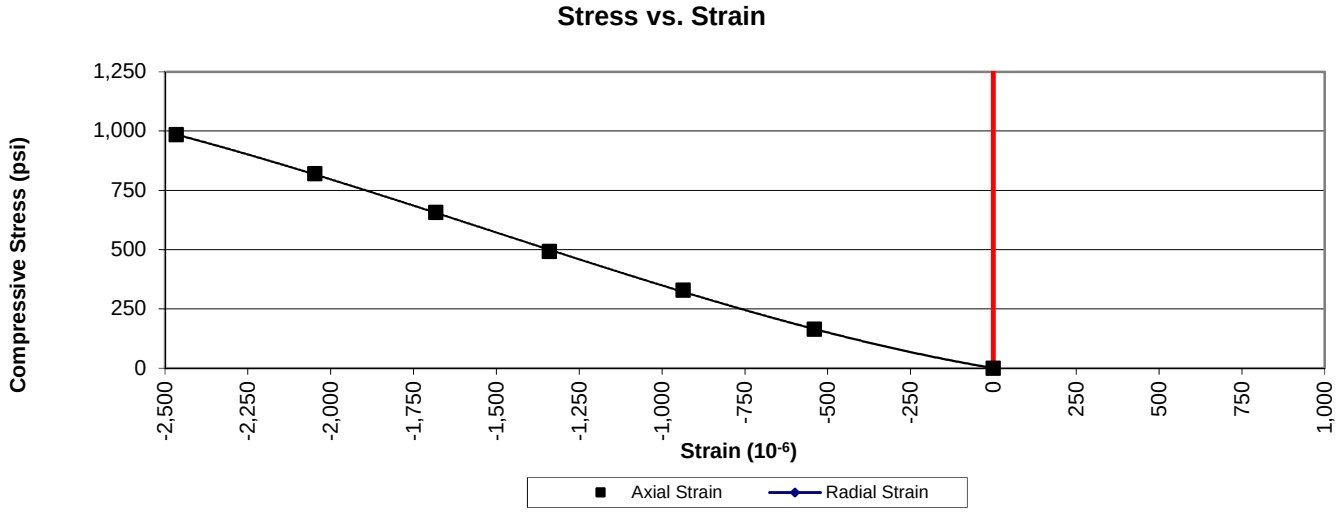
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.97	**Date:**	3/28/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.26	**Tested by:**	BKP / MG
Boring Id:	W-19	**Unit Weight, pcf:**	151.6	**Reviewed by:**	JBB
Sample No:	RC-3	**Moisture Content, %:**	0.8		
Depth (ft):	53.5 - 54.1	**Load Rate, psi/sec:**	21		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-540		500	164	0.30		
3	-936		1,000	328	0.35		
4	-1,340		1,500	492	0.37		
5	-1,682		2,000	656	0.39		
6	-2,047		2,500	820	0.40		
7	-2,466		3,000	984	0.40		
8			3,166	1,038			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Due to the low compressive strength of this specimen, readings of deformation at a minimum of ten evenly spaced load intervals were not able to be obtained.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

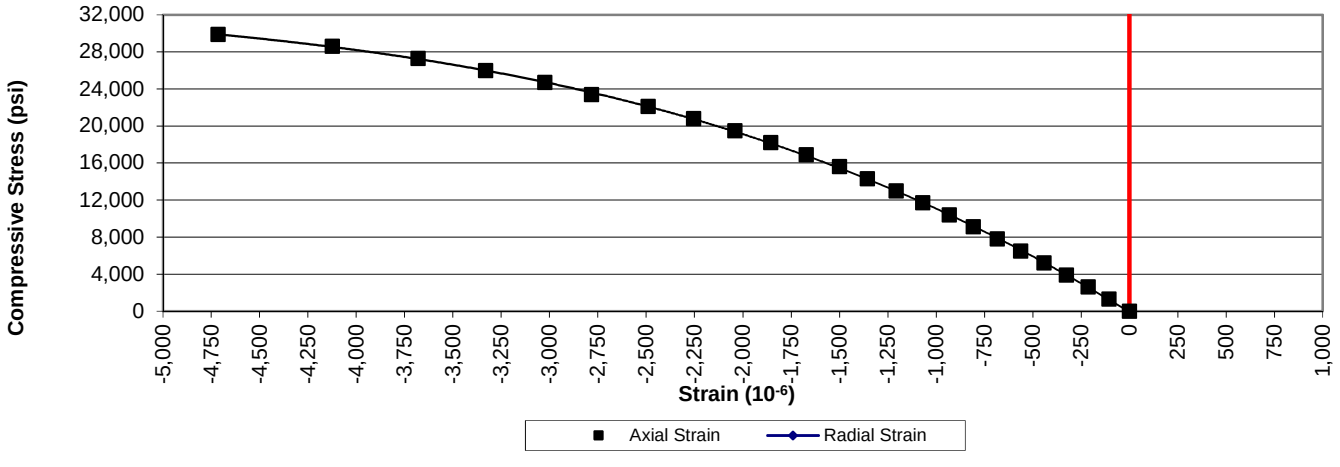
1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	3/28/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.42	**Tested by:**	BKP / MG
Boring Id:	B-32	**Unit Weight, pcf:**	178.7	**Reviewed by:**	JBB
Sample No:	RC-2	**Moisture Content, %:**	0.3		
Depth (ft):	67.2 - 68.1	**Load Rate, psi/sec:**	81		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-106		4,000	1,299	12.25		
3	-213		8,000	2,597	12.19		
4	-326		12,000	3,896	11.95		
5	-442		16,000	5,195	11.75		
6	-562		20,000	6,494	11.56		
7	-683		24,000	7,792	11.41		
8	-808		28,000	9,091	11.25		
9	-932		32,000	10,390	11.15		
10	-1,069		36,000	11,688	10.93		
11	-1,207		40,000	12,987	10.76		
12	-1,356		44,000	14,286	10.54		
13	-1,500		48,000	15,584	10.39		
14	-1,672		52,000	16,883	10.10		
15	-1,855		56,000	18,182	9.80		
16	-2,041		60,000	19,481	9.54		
17	-2,254		64,000	20,779	9.22		
18	-2,490		68,000	22,078	8.87		
19	-2,782		72,000	23,377	8.40		
20	-3,024		76,000	24,675	8.16		
21	-3,331		80,000	25,974	7.80		
22	-3,679		84,000	27,273	7.41		
23	-4,124		88,000	28,571	6.93		
24	-4,714		92,000	29,870	6.34		
25			93,085	30,222			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness. Specimen did not meet the desired tolerances for side straightness, parallelism and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

Stress vs. Strain



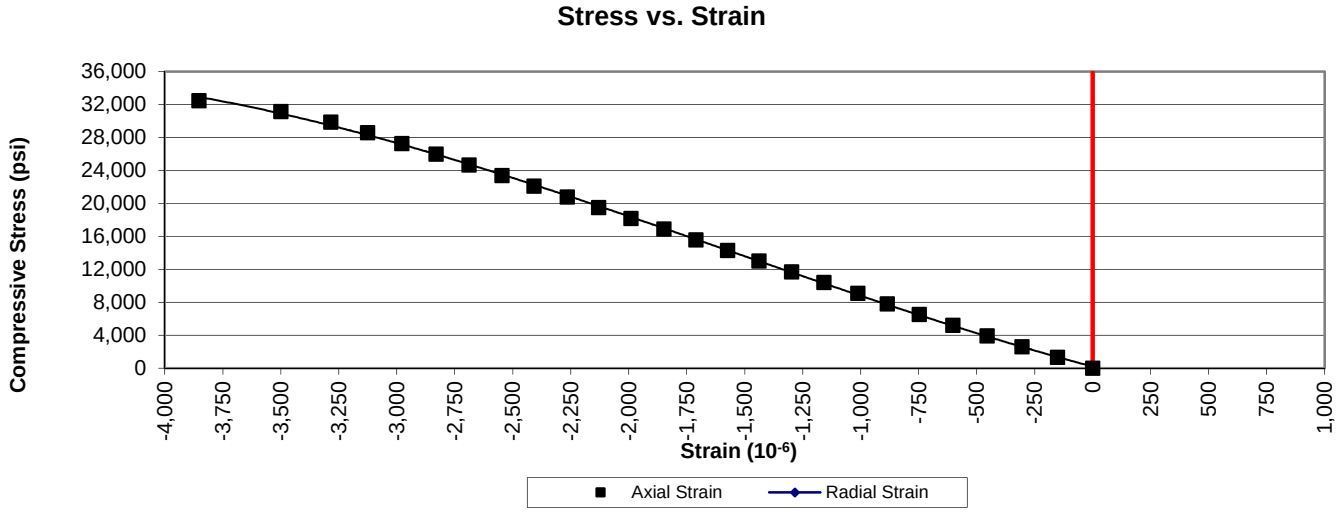
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	3/28/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.50	**Tested by:**	BKP / MG
Boring Id:	B-44	**Unit Weight, pcf:**	163.5	**Reviewed by:**	JBB
Sample No:	RC-1	**Moisture Content, %:**	0.2		
Depth (ft):	9.2 - 9.9	**Load Rate, psi/sec:**	83		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-152		4,000	1,299	8.55		
3	-304		8,000	2,597	8.54		
4	-455		12,000	3,896	8.56		
5	-603		16,000	5,195	8.62		
6	-747		20,000	6,494	8.69		
7	-886		24,000	7,792	8.79		
8	-1,013		28,000	9,091	8.97		
9	-1,158		32,000	10,390	8.97		
10	-1,298		36,000	11,688	9.00		
11	-1,438		40,000	12,987	9.03		
12	-1,574		44,000	14,286	9.08		
13	-1,710		48,000	15,584	9.11		
14	-1,848		52,000	16,883	9.14		
15	-1,990		56,000	18,182	9.14		
16	-2,130		60,000	19,481	9.15		
17	-2,265		64,000	20,779	9.17		
18	-2,408		68,000	22,078	9.17		
19	-2,547		72,000	23,377	9.18		
20	-2,689		76,000	24,675	9.18		
21	-2,831		80,000	25,974	9.17		
22	-2,978		84,000	27,273	9.16		
23	-3,126		88,000	28,571	9.14		
24	-3,285		92,000	29,870	9.09		
25	-3,500		96,000	31,169	8.91		
26	-3,853		100,000	32,468	8.43		
27			101,124	32,832			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



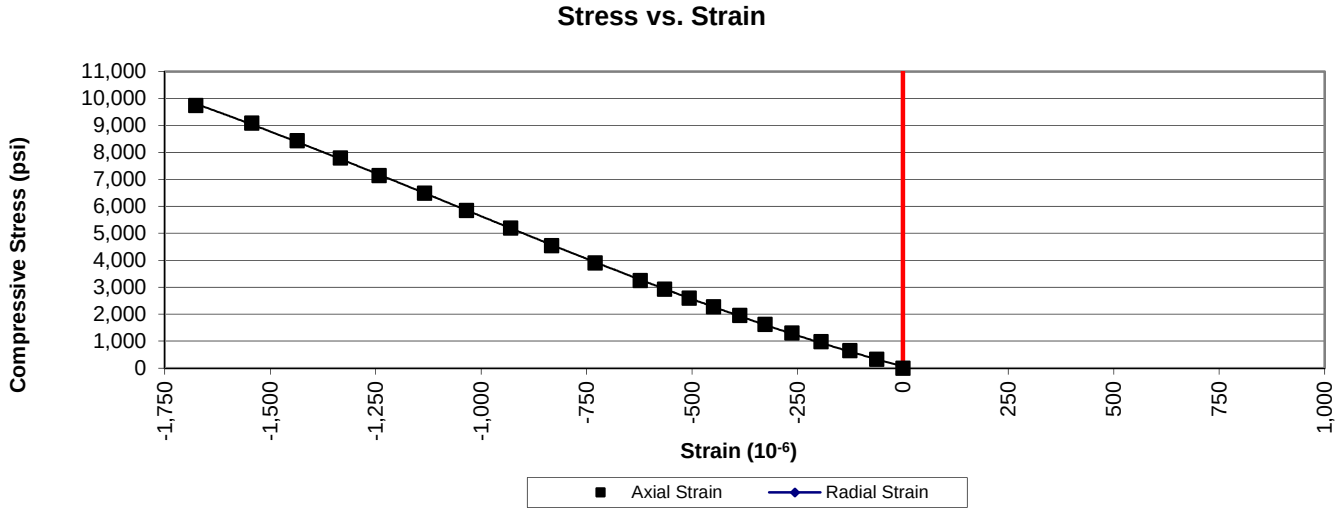
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	3/28/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.45	**Tested by:**	BKP / MG
Boring Id:	B-44	**Unit Weight, pcf:**	162.7	**Reviewed by:**	JBB
Sample No:	RC-3	**Moisture Content, %:**	0.3		
Depth (ft):	16.2 - 17.1	**Load Rate, psi/sec:**	84		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-62		1,000	325	5.24		
3	-126		2,000	649	5.15		
4	-194		3,000	974	5.02		
5	-263		4,000	1,299	4.94		
6	-327		5,000	1,623	4.96		
7	-387		6,000	1,948	5.03		
8	-449		7,000	2,273	5.06		
9	-507		8,000	2,597	5.12		
10	-565		9,000	2,922	5.17		
11	-623		10,000	3,247	5.21		
12	-730		12,000	3,896	5.34		
13	-833		14,000	4,545	5.46		
14	-930		16,000	5,195	5.59		
15	-1,035		18,000	5,844	5.65		
16	-1,134		20,000	6,494	5.73		
17	-1,242		22,000	7,143	5.75		
18	-1,334		24,000	7,792	5.84		
19	-1,436		26,000	8,442	5.88		
20	-1,544		28,000	9,091	5.89		
21	-1,677		30,000	9,740	5.81		
22			30,278	9,831			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



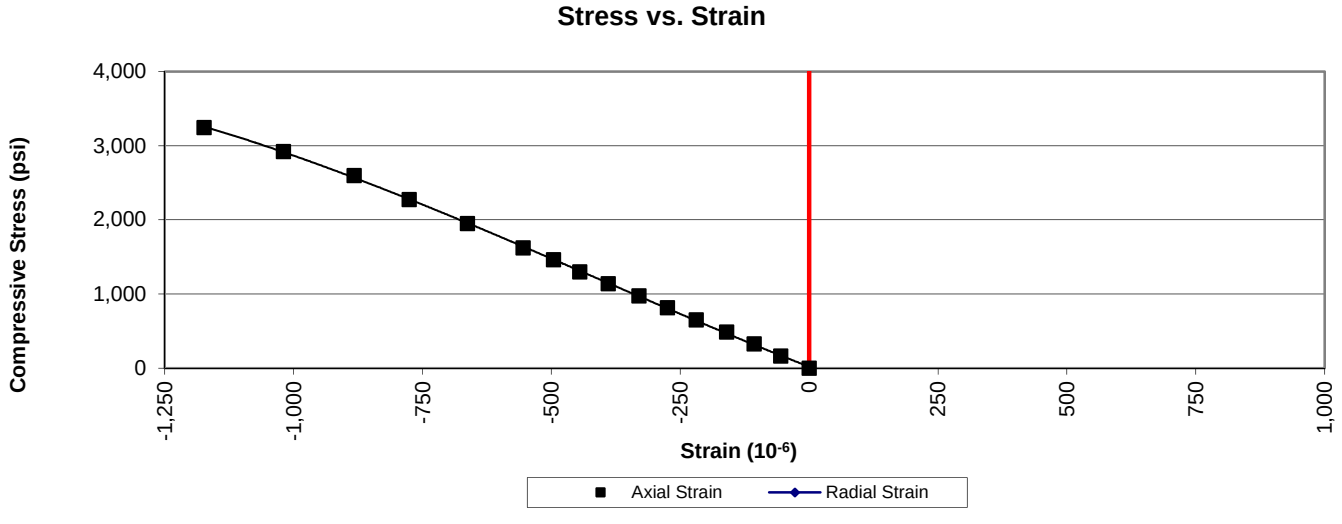
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	3/28/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.46	**Tested by:**	BKP / MG
Boring Id:	B-44	**Unit Weight, pcf:**	162.4	**Reviewed by:**	JBB
Sample No:	RC-4	**Moisture Content, %:**	0.4		
Depth (ft):	23.2 - 23.9	**Load Rate, psi/sec:**	37		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-55		500	162	2.95		
3	-107		1,000	325	3.04		
4	-160		1,500	487	3.04		
5	-219		2,000	649	2.96		
6	-275		2,500	812	2.95		
7	-330		3,000	974	2.95		
8	-390		3,500	1,136	2.91		
9	-445		4,000	1,299	2.92		
10	-496		4,500	1,461	2.95		
11	-555		5,000	1,623	2.92		
12	-663		6,000	1,948	2.94		
13	-776		7,000	2,273	2.93		
14	-883		8,000	2,597	2.94		
15	-1,020		9,000	2,922	2.86		
16	-1,174		10,000	3,247	2.77		
17			10,251	3,328			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



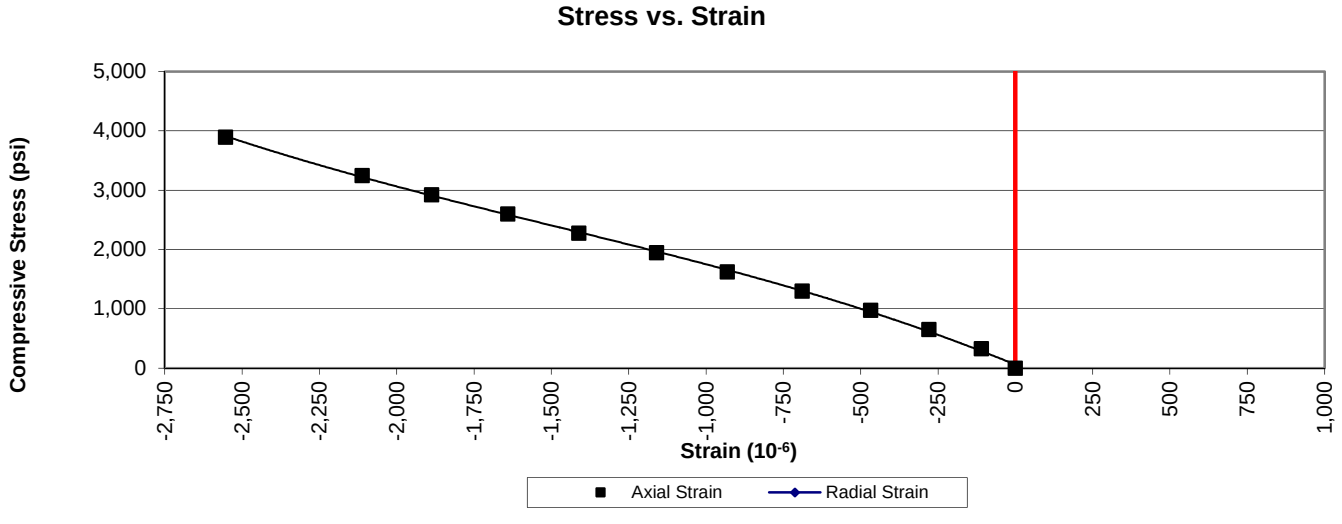
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	3/28/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.39	**Tested by:**	BKP / MG
Boring Id:	B-56	**Unit Weight, pcf:**	173.5	**Reviewed by:**	JBB
Sample No:	RC-1	**Moisture Content, %:**	0.7		
Depth (ft):	84.7 - 85.4	**Load Rate, psi/sec:**	45		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-110		1,000	325	2.95		
3	-280		2,000	649	2.32		
4	-468		3,000	974	2.08		
5	-689		4,000	1,299	1.89		
6	-931		5,000	1,623	1.74		
7	-1,160		6,000	1,948	1.68		
8	-1,412		7,000	2,273	1.61		
9	-1,641		8,000	2,597	1.58		
10	-1,887		9,000	2,922	1.55		
11	-2,112		10,000	3,247	1.54		
12	-2,554		12,000	3,896	1.53		
13			13,665	4,437			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



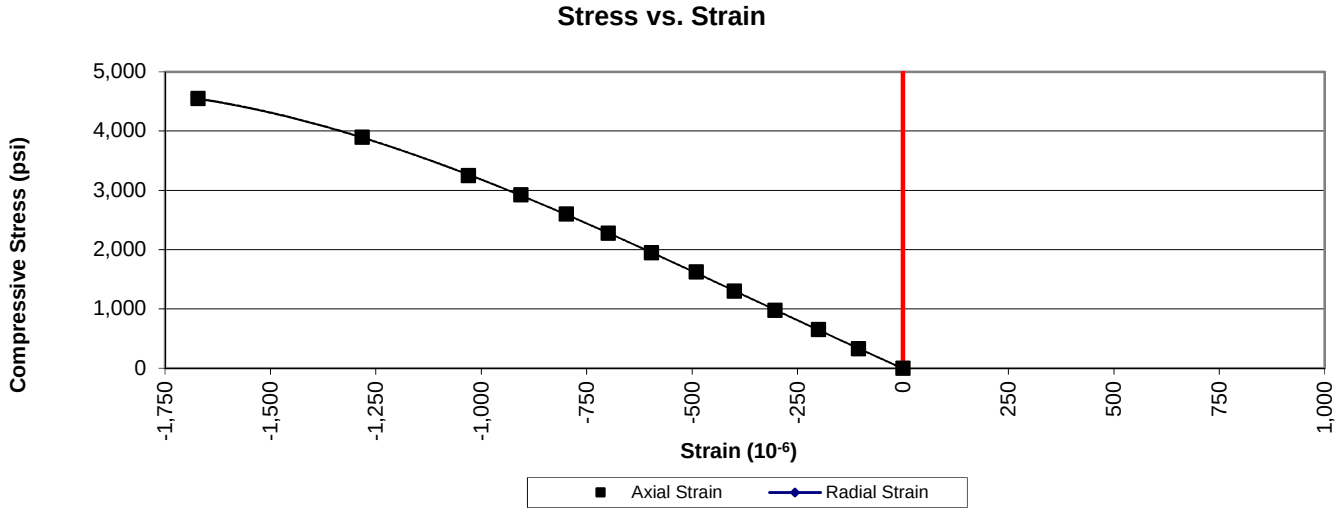
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	3/28/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.42	**Tested by:**	BKP / MG
Boring Id:	B-56	**Unit Weight, pcf:**	169.3	**Reviewed by:**	JBB
Sample No:	RC-3	**Moisture Content, %:**	0.5		
Depth (ft):	94.4 - 95.3	**Load Rate, psi/sec:**	59		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-105		1,000	325	3.10		
3	-200		2,000	649	3.25		
4	-303		3,000	974	3.21		
5	-400		4,000	1,299	3.25		
6	-490		5,000	1,623	3.31		
7	-596		6,000	1,948	3.27		
8	-699		7,000	2,273	3.25		
9	-798		8,000	2,597	3.25		
10	-906		9,000	2,922	3.23		
11	-1,030		10,000	3,247	3.15		
12	-1,282		12,000	3,896	3.04		
13	-1,671		14,000	4,545	2.72		
14			14,481	4,702			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)



PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

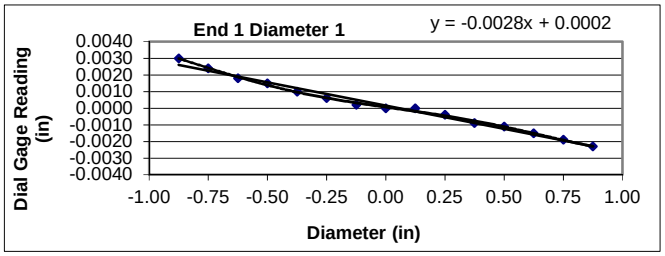
Project:	Carolina Crossroads Project	**Diameter (in):**	1.97	**Date:**	3/27/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.26	**Tested by:**	BKP
Boring Id:	W-19	**Unit Weight (pcf):**	151.6	**Reviewed by:**	JBB
Sample No.:	RC-3	**Moisture Content (%):**	0.8		
Depth (ft):	53.5 - 54.1				

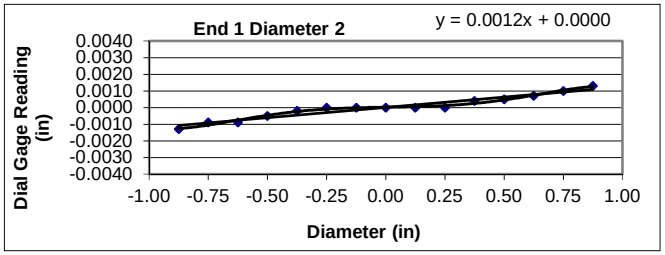
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

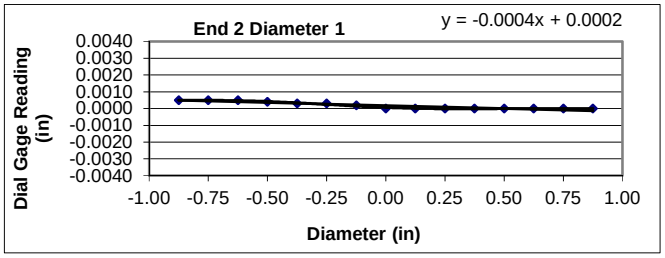
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0030	-0.0013	0.0005	0.0002
- 6/8	0.0024	-0.0009	0.0005	0.0002
- 5/8	0.0018	-0.0009	0.0005	0.0002
- 4/8	0.0015	-0.0005	0.0004	0.0002
- 3/8	0.0010	-0.0002	0.0003	0.0002
- 2/8	0.0006	0.0000	0.0003	0.0002
- 1/8	0.0002	0.0000	0.0002	0.0002
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	0.0000
2/8	-0.0004	0.0000	0.0000	0.0001
3/8	-0.0009	0.0004	0.0000	0.0001
4/8	-0.0011	0.0005	0.0000	0.0004
5/8	-0.0015	0.0007	0.0000	0.0005
6/8	-0.0019	0.0010	0.0000	0.0006
7/8	-0.0023	0.0013	0.0000	0.0008

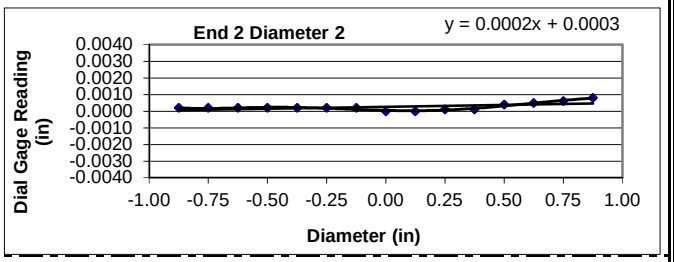




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00279
	Angle of Best Fit Line:	-0.15994
End 2:	Slope of Best Fit Line:	-0.00035
	Angle of Best Fit Line:	-0.02014
	Max Angular Difference:	**-0.14**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00124
	Angle of Best Fit Line:	0.07105
End 2:	Slope of Best Fit Line:	0.00023
	Angle of Best Fit Line:	0.01342
	Max Angular Difference:	**0.06**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0053	0.0027	**YES**
End 1 Diam 2	0.0026	0.0013	**YES**
End 2 Diam 1	0.0005	0.0003	**YES**
End 2 Diam 2	0.0008	0.0004	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

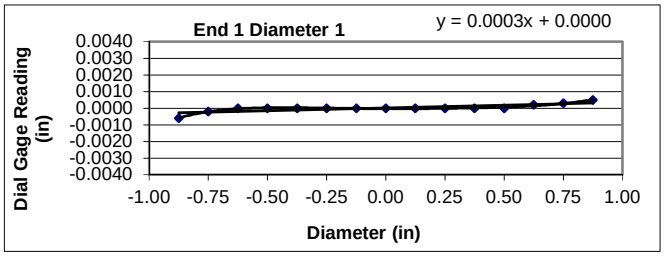
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	3/27/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.42	**Tested by:**	BKP
Boring Id:	B-32	**Unit Weight (pcf):**	178.7	**Reviewed by:**	JBB
Sample No.:	RC-2	**Moisture Content (%):**	0.3		
Depth (ft):	67.2 - 68.1				

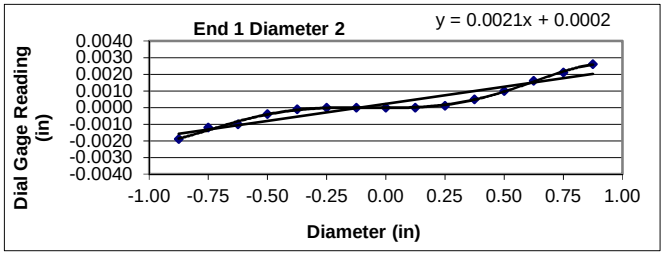
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **NO** Straightness Tolerance Met? **NO**

End Flatness and Parallelism Readings (Procedure FP1)

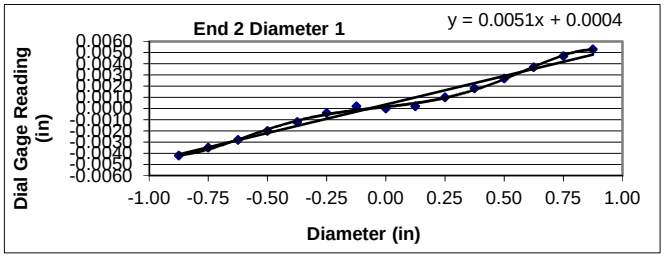
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	-0.0006	-0.0019	-0.0042	0.0024
- 6/8	-0.0002	-0.0012	-0.0035	0.0021
- 5/8	0.0000	-0.0010	-0.0028	0.0018
- 4/8	0.0000	-0.0004	-0.0020	0.0014
- 3/8	0.0000	-0.0001	-0.0012	0.0011
- 2/8	0.0000	0.0000	-0.0004	0.0006
- 1/8	0.0000	0.0000	0.0002	0.0003
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0002	0.0000
2/8	0.0000	0.0001	0.0010	-0.0004
3/8	0.0000	0.0005	0.0018	-0.0007
4/8	0.0000	0.0010	0.0027	-0.0011
5/8	0.0002	0.0016	0.0037	-0.0011
6/8	0.0003	0.0021	0.0047	-0.0016
7/8	0.0005	0.0026	0.0053	-0.0016

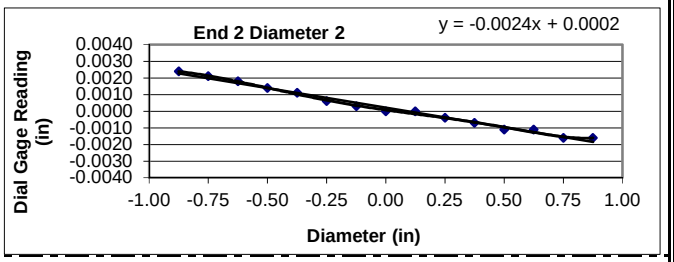




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	0.00033
	Angle of Best Fit Line:	0.01915
End 2:	Slope of Best Fit Line:	0.00511
	Angle of Best Fit Line:	0.29270
	Max Angular Difference:	**-0.27**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00205
	Angle of Best Fit Line:	0.11770
End 2:	Slope of Best Fit Line:	-0.00235
	Angle of Best Fit Line:	-0.13489
	Max Angular Difference:	**0.25**

Parallelism Tolerance Met? **NO**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0011	0.0006	**YES**
End 1 Diam 2	0.0045	0.0023	**YES**
End 2 Diam 1	0.0095	0.0048	**NO**
End 2 Diam 2	0.0040	0.0020	**YES**

Perpendicularity Tolerance Met? **NO**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

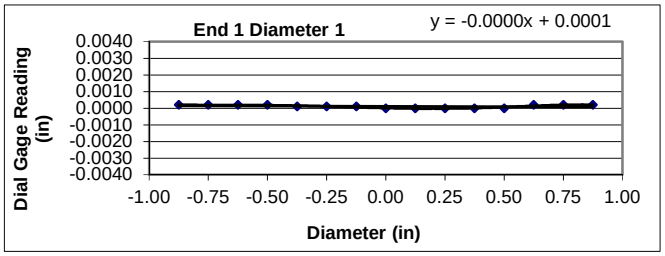
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	3/27/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.50	**Tested by:**	BKP
Boring Id:	B-44	**Unit Weight (pcf):**	163.5	**Reviewed by:**	JBB
Sample No.:	RC-1	**Moisture Content (%):**	0.2		
Depth (ft):	9.2 - 9.9				

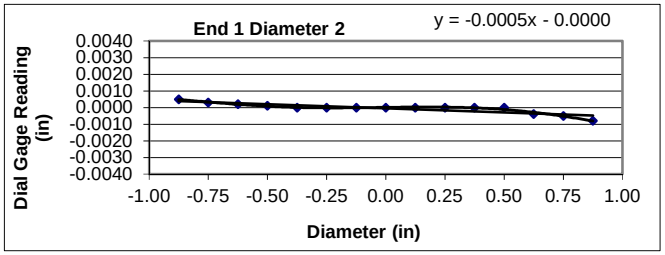
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

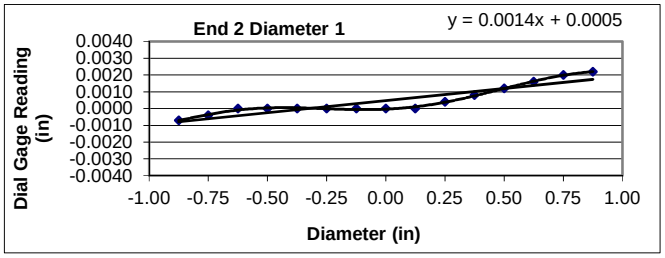
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0002	0.0005	-0.0007	0.0010
- 6/8	0.0002	0.0003	-0.0004	0.0009
- 5/8	0.0002	0.0002	0.0000	0.0004
- 4/8	0.0002	0.0001	0.0000	0.0003
- 3/8	0.0001	0.0000	0.0000	0.0003
- 2/8	0.0001	0.0000	0.0000	0.0001
- 1/8	0.0001	0.0000	0.0000	0.0001
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	0.0000
2/8	0.0000	0.0000	0.0004	0.0000
3/8	0.0000	0.0000	0.0008	0.0000
4/8	0.0000	0.0000	0.0012	0.0000
5/8	0.0002	-0.0004	0.0016	0.0000
6/8	0.0002	-0.0005	0.0020	0.0000
7/8	0.0002	-0.0008	0.0022	0.0000

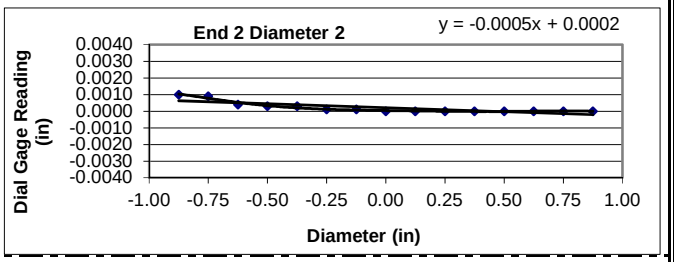




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00004
	Angle of Best Fit Line:	-0.00229
End 2:	Slope of Best Fit Line:	0.00145
	Angle of Best Fit Line:	0.08300
	Max Angular Difference:	**-0.09**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00049
	Angle of Best Fit Line:	-0.02832
End 2:	Slope of Best Fit Line:	-0.00048
	Angle of Best Fit Line:	-0.02750
	Max Angular Difference:	**0.00**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0002	0.0001	**YES**
End 1 Diam 2	0.0013	0.0007	**YES**
End 2 Diam 1	0.0029	0.0015	**YES**
End 2 Diam 2	0.0010	0.0005	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

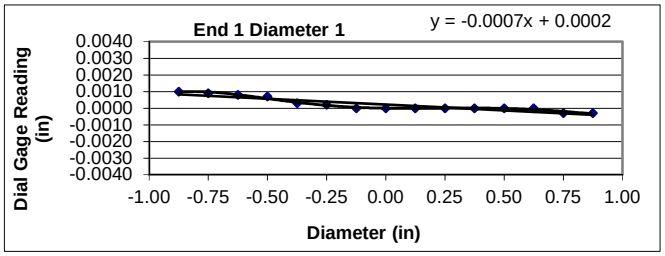
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	3/27/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.45	**Tested by:**	BKP
Boring Id:	B-44	**Unit Weight (pcf):**	162.7	**Reviewed by:**	JBB
Sample No.:	RC-3	**Moisture Content (%):**	0.3		
Depth (ft):	16.2 - 17.1				

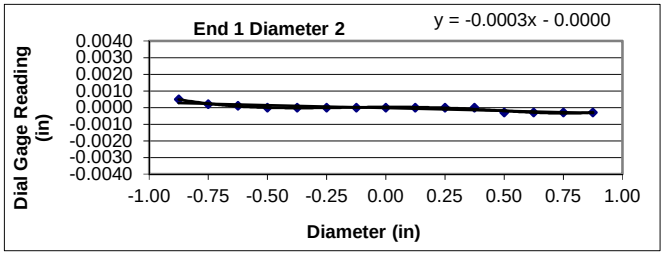
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

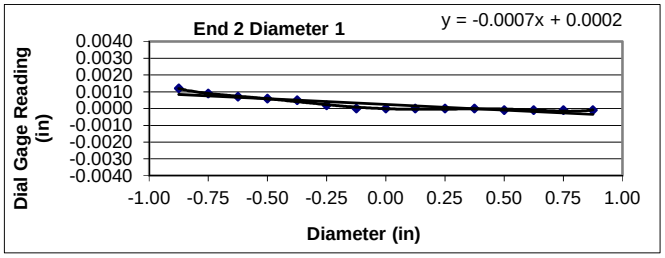
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0010	0.0005	0.0012	0.0009
- 6/8	0.0009	0.0002	0.0009	0.0009
- 5/8	0.0008	0.0001	0.0007	0.0009
- 4/8	0.0007	0.0000	0.0006	0.0006
- 3/8	0.0003	0.0000	0.0005	0.0005
- 2/8	0.0002	0.0000	0.0002	0.0004
- 1/8	0.0000	0.0000	0.0000	0.0003
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	0.0000
2/8	0.0000	0.0000	0.0000	0.0000
3/8	0.0000	0.0000	0.0000	0.0000
4/8	0.0000	-0.0003	-0.0001	0.0000
5/8	0.0000	-0.0003	-0.0001	0.0000
6/8	-0.0003	-0.0003	-0.0001	0.0001
7/8	-0.0003	-0.0003	-0.0001	0.0001

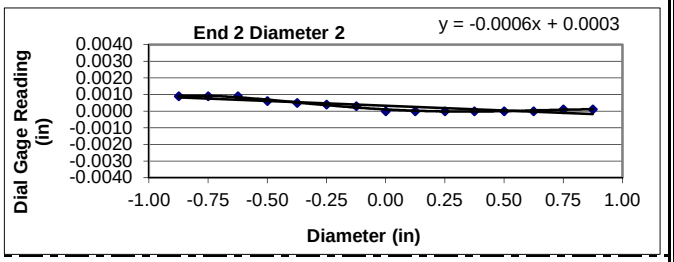




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00070
	Angle of Best Fit Line:	-0.03994
End 2:	Slope of Best Fit Line:	-0.00068
	Angle of Best Fit Line:	-0.03896
	Max Angular Difference:	**0.00**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00034
	Angle of Best Fit Line:	-0.01932
End 2:	Slope of Best Fit Line:	-0.00057
	Angle of Best Fit Line:	-0.03258
	Max Angular Difference:	**0.01**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0013	0.0007	**YES**
End 1 Diam 2	0.0008	0.0004	**YES**
End 2 Diam 1	0.0013	0.0007	**YES**
End 2 Diam 2	0.0009	0.0005	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

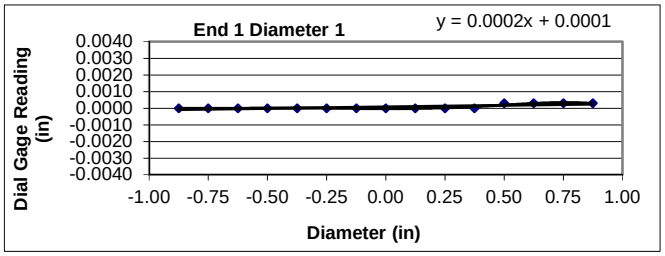
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	3/27/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.46	**Tested by:**	BKP
Boring Id:	B-44	**Unit Weight (pcf):**	162.4	**Reviewed by:**	JBB
Sample No.:	RC-4	**Moisture Content (%):**	0.4		
Depth (ft):	23.2 - 23.9				

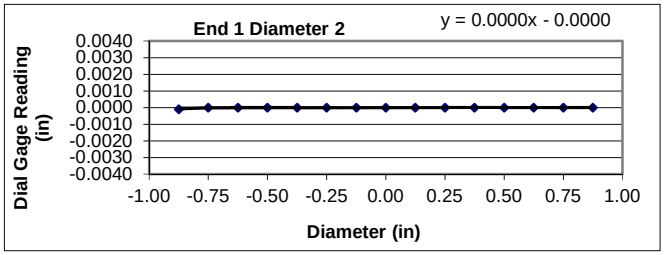
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

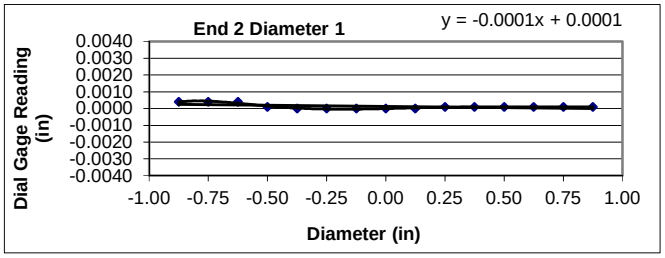
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0000	-0.0001	0.0004	0.0006
- 6/8	0.0000	0.0000	0.0004	0.0005
- 5/8	0.0000	0.0000	0.0004	0.0005
- 4/8	0.0000	0.0000	0.0001	0.0004
- 3/8	0.0000	0.0000	0.0000	0.0003
- 2/8	0.0000	0.0000	0.0000	0.0002
- 1/8	0.0000	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	0.0000
2/8	0.0000	0.0000	0.0001	0.0000
3/8	0.0000	0.0000	0.0001	0.0000
4/8	0.0003	0.0000	0.0001	0.0000
5/8	0.0003	0.0000	0.0001	0.0000
6/8	0.0003	0.0000	0.0001	0.0000
7/8	0.0003	0.0000	0.0001	0.0000

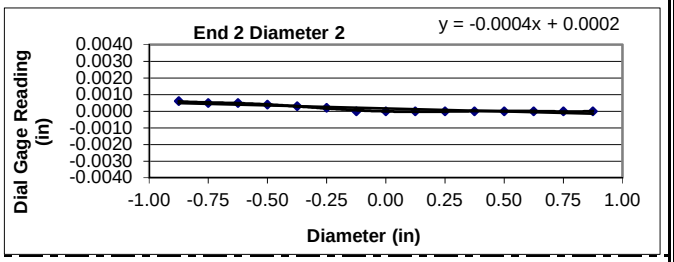




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	0.00019
	Angle of Best Fit Line:	0.01080
End 2:	Slope of Best Fit Line:	-0.00014
	Angle of Best Fit Line:	-0.00802
	Max Angular Difference:	**0.02**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00002
	Angle of Best Fit Line:	0.00115
End 2:	Slope of Best Fit Line:	-0.00036
	Angle of Best Fit Line:	-0.02063
	Max Angular Difference:	**0.02**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0003	0.0002	**YES**
End 1 Diam 2	0.0001	0.0001	**YES**
End 2 Diam 1	0.0004	0.0002	**YES**
End 2 Diam 2	0.0006	0.0003	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

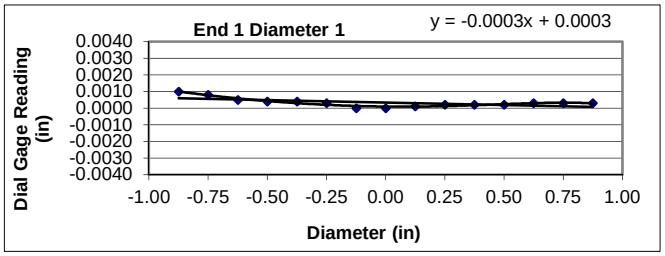
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	3/27/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.39	**Tested by:**	BKP
Boring Id:	B-56	**Unit Weight (pcf):**	173.5	**Reviewed by:**	JBB
Sample No.:	RC-1	**Moisture Content (%):**	0.7		
Depth (ft):	84.7 - 85.4				

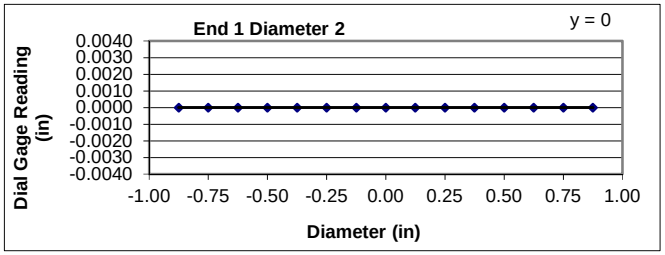
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

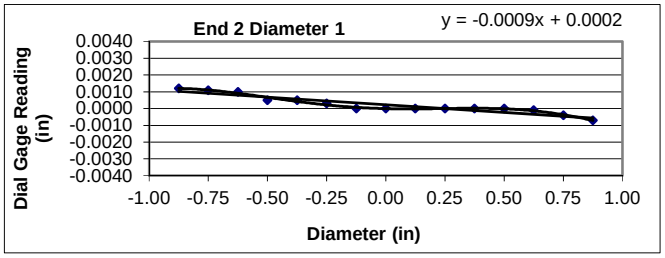
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0010	0.0000	0.0012	0.0006
- 6/8	0.0008	0.0000	0.0011	0.0006
- 5/8	0.0005	0.0000	0.0010	0.0006
- 4/8	0.0004	0.0000	0.0005	0.0006
- 3/8	0.0004	0.0000	0.0005	0.0004
- 2/8	0.0003	0.0000	0.0003	0.0000
- 1/8	0.0000	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0001	0.0000	0.0000	0.0000
2/8	0.0002	0.0000	0.0000	0.0000
3/8	0.0002	0.0000	0.0000	0.0000
4/8	0.0002	0.0000	0.0000	0.0000
5/8	0.0003	0.0000	-0.0001	0.0000
6/8	0.0003	0.0000	-0.0004	0.0000
7/8	0.0003	0.0000	-0.0007	0.0000

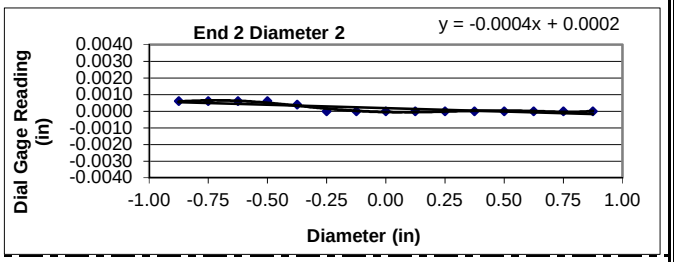




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00030
	Angle of Best Fit Line:	-0.01703
End 2:	Slope of Best Fit Line:	-0.00091
	Angle of Best Fit Line:	-0.05222
	Max Angular Difference:	**0.04**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00000
	Angle of Best Fit Line:	0.00000
End 2:	Slope of Best Fit Line:	-0.00041
	Angle of Best Fit Line:	-0.02357
	Max Angular Difference:	**0.02**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0010	0.0005	**YES**
End 1 Diam 2	0.0000	0.0000	**YES**
End 2 Diam 1	0.0019	0.0010	**YES**
End 2 Diam 2	0.0006	0.0003	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

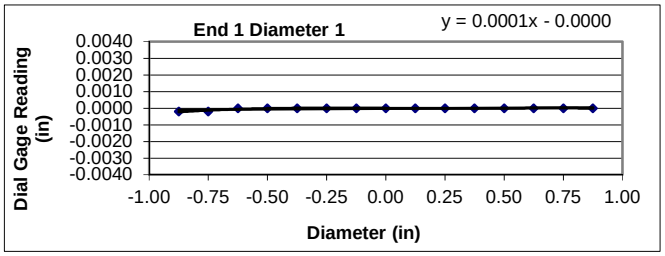
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	3/27/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.42	**Tested by:**	BKP
Boring Id:	B-56	**Unit Weight (pcf):**	169.3	**Reviewed by:**	JBB
Sample No.:	RC-3	**Moisture Content (%):**	0.5		
Depth (ft):	94.4 - 95.3				

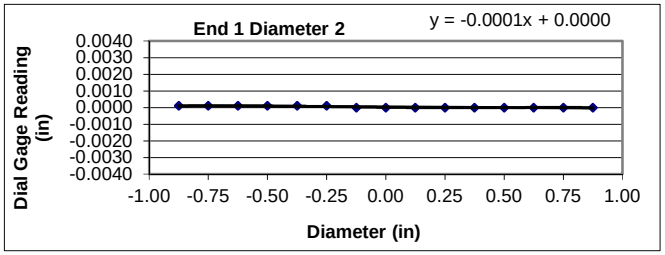
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

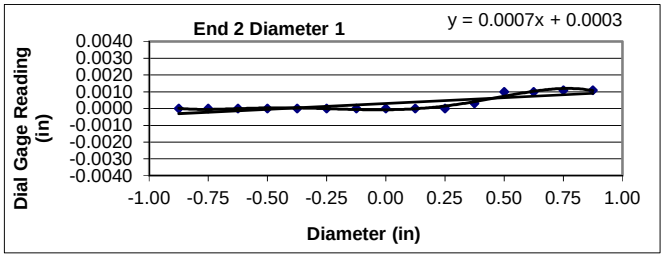
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	-0.0002	0.0001	0.0000	0.0002
- 6/8	-0.0002	0.0001	0.0000	0.0002
- 5/8	0.0000	0.0001	0.0000	0.0002
- 4/8	0.0000	0.0001	0.0000	0.0001
- 3/8	0.0000	0.0001	0.0000	0.0000
- 2/8	0.0000	0.0001	0.0000	0.0000
- 1/8	0.0000	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	0.0000
2/8	0.0000	0.0000	0.0000	0.0000
3/8	0.0000	0.0000	0.0003	0.0000
4/8	0.0000	0.0000	0.0010	0.0000
5/8	0.0000	0.0000	0.0010	0.0000
6/8	0.0000	0.0000	0.0011	0.0000
7/8	0.0000	0.0000	0.0011	0.0000

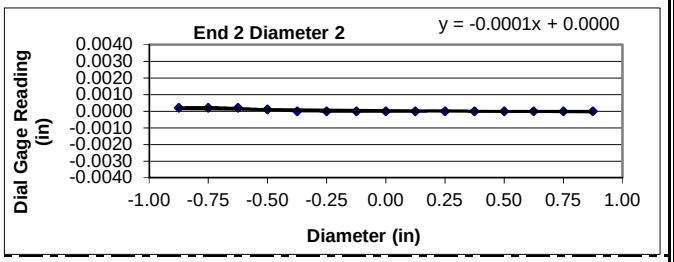




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	0.00007
	Angle of Best Fit Line:	0.00426
End 2:	Slope of Best Fit Line:	0.00069
	Angle of Best Fit Line:	0.03962
	Max Angular Difference:	**-0.04**

Parrallelism Diameter 2

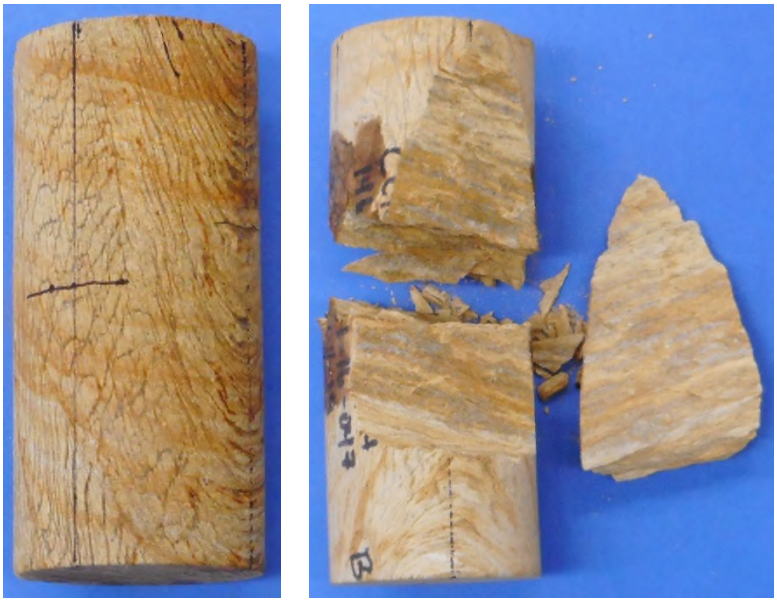
End 1:	Slope of Best Fit Line:	-0.00008
	Angle of Best Fit Line:	-0.00442
End 2:	Slope of Best Fit Line:	-0.00011
	Angle of Best Fit Line:	-0.00655
	Max Angular Difference:	**0.00**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0002	0.0001	**YES**
End 1 Diam 2	0.0001	0.0001	**YES**
End 2 Diam 1	0.0011	0.0006	**YES**
End 2 Diam 2	0.0002	0.0001	**YES**

Perpendicularity Tolerance Met? **YES**



Date: 3/28/2018

Photographer: Ben Painter

1	**Location / Orientation**	W-19, RC-3 (53.5' – 54.1')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 3/28/2018

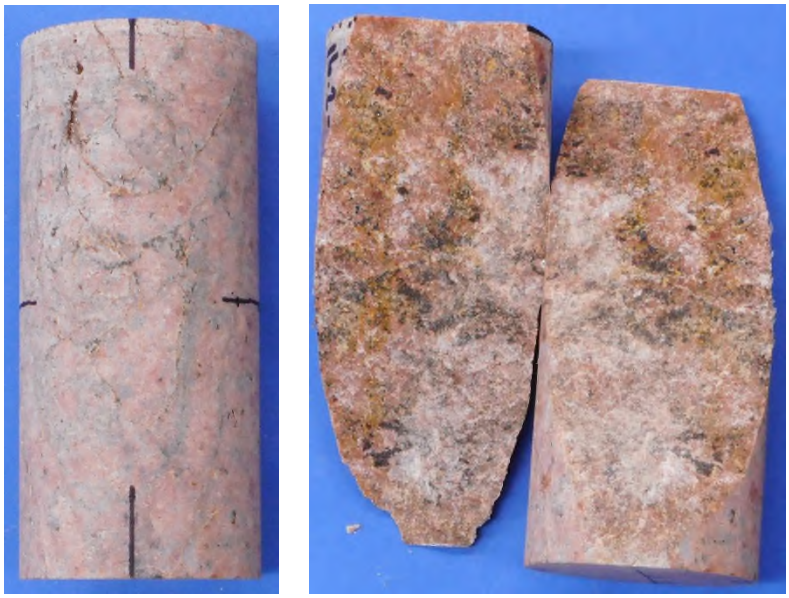
Photographer: Ben Painter

2	**Location / Orientation**	B-32, RC-2 (67.1' – 68.1')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 3/28/2018

Photographer: Ben Painter

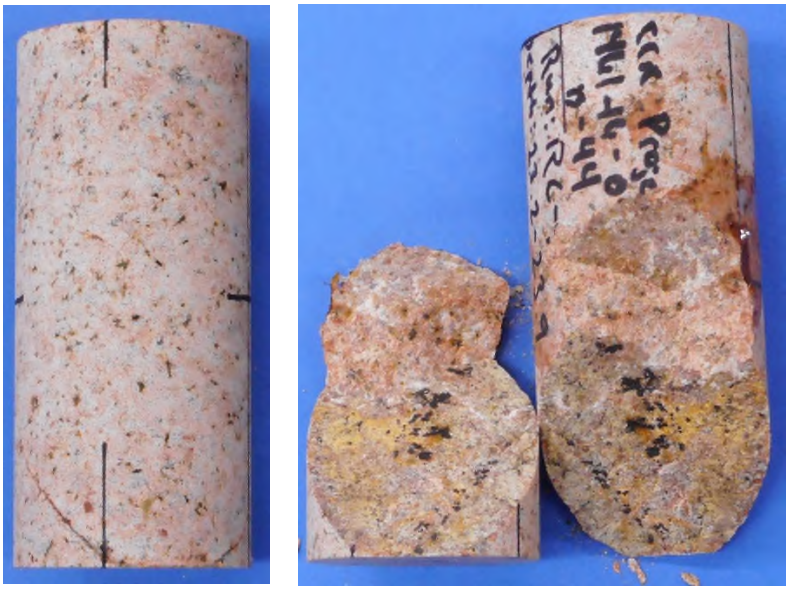
3	**Location / Orientation**	B-44, RC-1 (9.2' – 9.9')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)



Date: 3/28/2018

Photographer: Ben Painter

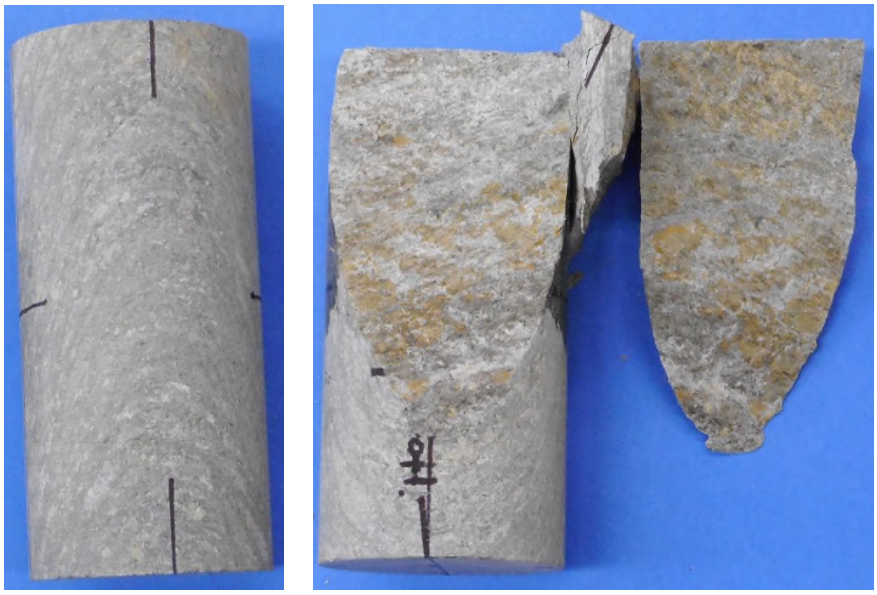
4	**Location / Orientation**	B-44, RC-3 (16.2' – 17.1')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)



Date: 3/28/2018

Photographer: Ben Painter

5	**Location / Orientation**	B-44, RC-4 (23.2' – 23.9')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)



Date: 3/28/2018

Photographer: Ben Painter

6	**Location / Orientation**	B-56, RC-1 (84.7' – 85.4')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 3/28/2018

Photographer: Ben Painter

7	**Location / Orientation**	B-56, RC-3 (94.4' – 95.3')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

UNCONFINED COMPRESSION
(ASTM D7012 Method C)

S&ME, Inc. - Knoxville 1413 Topside Road, Louisville, TN 37777

Project Name: Carolina Crossroads Project
Project Number: 1461-16-047 Phase 2B

Report Date: May 3, 2018
Reviewed By: Jason B. Burgess

Boring No.	Sample No.	Depth (ft)	Dimensions, in.		Shape (See Key)	Area (in^2)	Unit Weight (lbs/ft^3)	Loading Rate (psi/sec)	Maximum Load (lbs)	Strength (psi)	Moisture (%)
			Length	Diameter							
B-39	RC-2	15.8 - 16.8	4.41	1.98	A	3.08	165.5	83	114,313	37,115	0.2
B-39	RC-3	22.1 - 23.1	4.49	1.98	A	3.08	165.6	90	109,393	35,517	0.2
B-39	RC-5	29.1 - 30.1	4.45	1.98	A	3.08	166.5	82	106,987	34,736	0.2
B-48	RC-1	15.1 - 15.9	4.46	1.98	A	3.08	178.5	68	34,349	11,152	0.2
B-48	RC-2	19.7 - 20.6	4.45	1.98	A	3.08	175.9	73	32,993	10,712	0.5

NOTES: Effective (as received) unit weight as determined by RTH 109-93.
Loading rates were selected to target reaching failure between 2 and 15 minutes.
Test results for specimens not meeting the requirements of ASTM D4543 may differ from a test specimen that meets the requirements of ASTM D4543.

SHAPE KEY

ASTM D4543-08$^{\epsilon 1}$ *Standard Practice for Preparing Rock Core as Cylindrical Test Specimens and Verifying Conformance to Dimensional and Shape Tolerance* Section 1.2 - "Rock is a complex engineering material that can vary greatly as a function of lithology, stress history, weathering, moisture content and chemistry, and other natural geologic processes. As such, it is not always possible to obtain or prepare rock core specimens that satisfy the desirable tolerances given in this practice. Most commonly, this situation presents itself with weaker, more porous, and poorly cemented rock types and rock types containing significant or weak (or both) structural features. For these and other rock types which are difficult to prepare, all reasonable efforts shall be made to prepare a specimen in accordance with this practice and for the intended test procedure. However, when it has been determined by trial that this is not possible, prepare the rock specimen to the closest tolerances practicable and consider this to be the best effort and report it as such and if allowable or necessary for the intended test, capping the ends of the specimen as discussed in this practice is permitted."

A Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)

B Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism, and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness. Specimen prepared to closest tolerances practicable.

C Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism. Specimen did not meet the desired tolerances for side straightness and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

D Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness. Specimen did not meet the desired tolerances for side straightness, parallelism and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

E Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness and parallelism. Specimen prepared to closest tolerances practicable.

UNCONFINED COMPRESSION
(ASTM D7012 Method C)

S&ME, Inc. - Knoxville 1413 Topside Road, Louisville, TN 37777

Project Name: Carolina Crossroads Project
Project Number: 1461-16-047 Phase 2B

Report Date: May 3, 2018
Reviewed By: Jason B. Burgess

Boring No.	Sample No.	Depth (ft)	Dimensions, in.		Shape (See Key)	Area (in^2)	Unit Weight (lbs/ft^3)	Loading Rate (psi/sec)	Maximum Load (lbs)	Strength (psi)	Moisture (%)
			Length	Diameter							
B-48	RC-4	34.0 - 34.7	4.37	1.98	A	3.08	179.1	73	58,898	19,123	0.3
B-54	RC-1	74.6 - 75.3	4.44	1.98	A	3.08	167.0	41	8,313	2,699	0.3
B-54	RC-3	82.6 - 83.4	4.50	1.98	A	3.08	166.9	70	25,518	8,285	0.2
B-54	RC-4	86.2 - 86.9	4.52	1.98	A	3.08	165.4	80	70,751	22,971	0.2
B-60	RC-3	16.2 - 16.9	4.52	1.98	A	3.08	165.2	70	38,622	12,540	0.1

NOTES: Effective (as received) unit weight as determined by RTH 109-93.
Loading rates were selected to target reaching failure between 2 and 15 minutes.
Test results for specimens not meeting the requirements of ASTM D4543 may differ from a test specimen that meets the requirements of ASTM D4543.

SHAPE KEY

ASTM D4543-08$^{\epsilon 1}$ *Standard Practice for Preparing Rock Core as Cylindrical Test Specimens and Verifying Conformance to Dimensional and Shape Tolerance* Section 1.2 - "Rock is a complex engineering material that can vary greatly as a function of lithology, stress history, weathering, moisture content and chemistry, and other natural geologic processes. As such, it is not always possible to obtain or prepare rock core specimens that satisfy the desirable tolerances given in this practice. Most commonly, this situation presents itself with weaker, more porous, and poorly cemented rock types and rock types containing significant or weak (or both) structural features. For these and other rock types which are difficult to prepare, all reasonable efforts shall be made to prepare a specimen in accordance with this practice and for the intended test procedure. However, when it has been determined by trial that this is not possible, prepare the rock specimen to the closest tolerances practicable and consider this to be the best effort and report it as such and if allowable or necessary for the intended test, capping the ends of the specimen as discussed in this practice is permitted."

A Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)

B Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism, and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness. Specimen prepared to closest tolerances practicable.

C Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism. Specimen did not meet the desired tolerances for side straightness and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

D Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness. Specimen did not meet the desired tolerances for side straightness, parallelism and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

E Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness and parallelism. Specimen prepared to closest tolerances practicable.

UNCONFINED COMPRESSION
(ASTM D7012 Method C)

S&ME, Inc. - Knoxville 1413 Topside Road, Louisville, TN 37777

Project Name: Carolina Crossroads Project
Project Number: 1461-16-047 Phase 2B

Report Date: May 3, 2018
Reviewed By: Jason B. Burgess

Boring No.	Sample No.	Depth (ft)	Dimensions, in.		Shape (See Key)	Area (in^2)	Unit Weight (lbs/ft^3)	Loading Rate (psi/sec)	Maximum Load (lbs)	Strength (psi)	Moisture (%)
			Length	Diameter							
B-60	RC-4	23.3 - 24.3	4.50	1.98	A	3.08	165.8	83	125,130	40,627	0.2
B-60	RC-5	26.2 - 26.7	4.37	1.98	A	3.08	165.7	80	98,848	32,094	0.2
B-61	RC-4	38.7 - 39.4	4.38	1.97	A	3.05	176.3	83	47,491	15,571	0.2

NOTES: Effective (as received) unit weight as determined by RTH 109-93.
Loading rates were selected to target reaching failure between 2 and 15 minutes.
Test results for specimens not meeting the requirements of ASTM D4543 may differ from a test specimen that meets the requirements of ASTM D4543.

SHAPE KEY

ASTM D4543-08$^{\epsilon 1}$ *Standard Practice for Preparing Rock Core as Cylindrical Test Specimens and Verifying Conformance to Dimensional and Shape Tolerance* Section 1.2 - "Rock is a complex engineering material that can vary greatly as a function of lithology, stress history, weathering, moisture content and chemistry, and other natural geologic processes. As such, it is not always possible to obtain or prepare rock core specimens that satisfy the desirable tolerances given in this practice. Most commonly, this situation presents itself with weaker, more porous, and poorly cemented rock types and rock types containing significant or weak (or both) structural features. For these and other rock types which are difficult to prepare, all reasonable efforts shall be made to prepare a specimen in accordance with this practice and for the intended test procedure. However, when it has been determined by trial that this is not possible, prepare the rock specimen to the closest tolerances practicable and consider this to be the best effort and report it as such and if allowable or necessary for the intended test, capping the ends of the specimen as discussed in this practice is permitted."

A Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)

B Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism, and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness. Specimen prepared to closest tolerances practicable.

C Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness & parallelism. Specimen did not meet the desired tolerances for side straightness and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

D Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness. Specimen did not meet the desired tolerances for side straightness, parallelism and end perpendicularity to axis. Specimen prepared to closest tolerances practicable.

E Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ for end flatness and end perpendicularity to axis. Specimen did not meet the desired tolerance for side straightness and parallelism. Specimen prepared to closest tolerances practicable.

UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

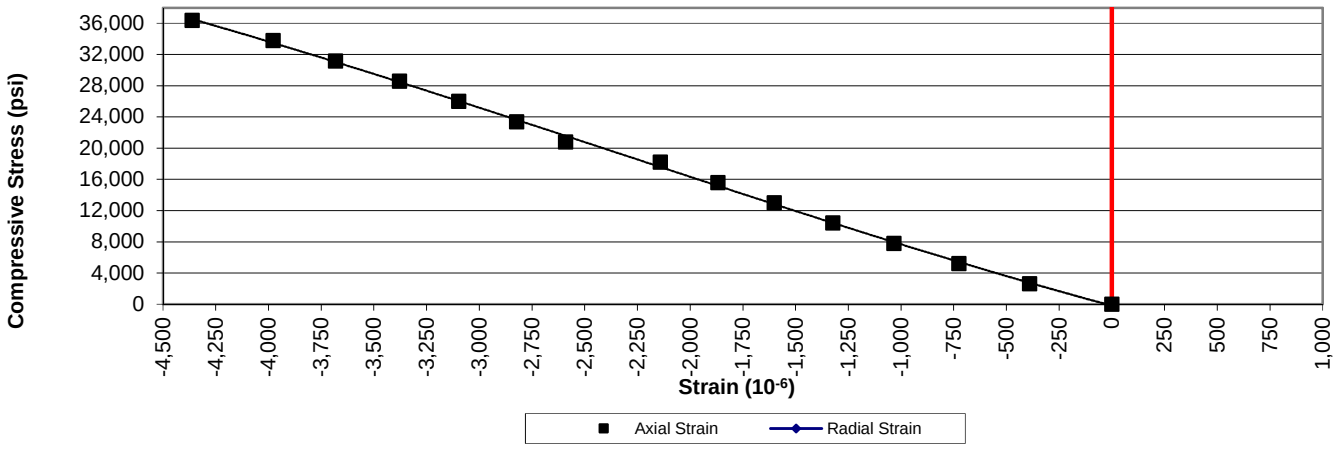
1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	5/2/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.41	**Tested by:**	BKP
Boring Id:	B-39	**Unit Weight, pcf:**	165.5	**Reviewed by:**	JBB
Sample No:	RC-2	**Moisture Content, %:**	0.2		
Depth (ft):	15.8 - 16.8	**Load Rate, psi/sec:**	83		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-390		8,000	2,597	6.66		
3	-725		16,000	5,195	7.17		
4	-1,033		24,000	7,792	7.54		
5	-1,323		32,000	10,390	7.85		
6	-1,601		40,000	12,987	8.11		
7	-1,868		48,000	15,584	8.34		
8	-2,141		56,000	18,182	8.49		
9	-2,590		64,000	20,779	8.02		
10	-2,822		72,000	23,377	8.28		
11	-3,097		80,000	25,974	8.39		
12	-3,377		88,000	28,571	8.46		
13	-3,681		96,000	31,169	8.47		
14	-3,977		104,000	33,766	8.49		
15	-4,361		112,000	36,364	8.34		
16			114,313	37,115			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)
tolerances practicable.

Stress vs. Strain



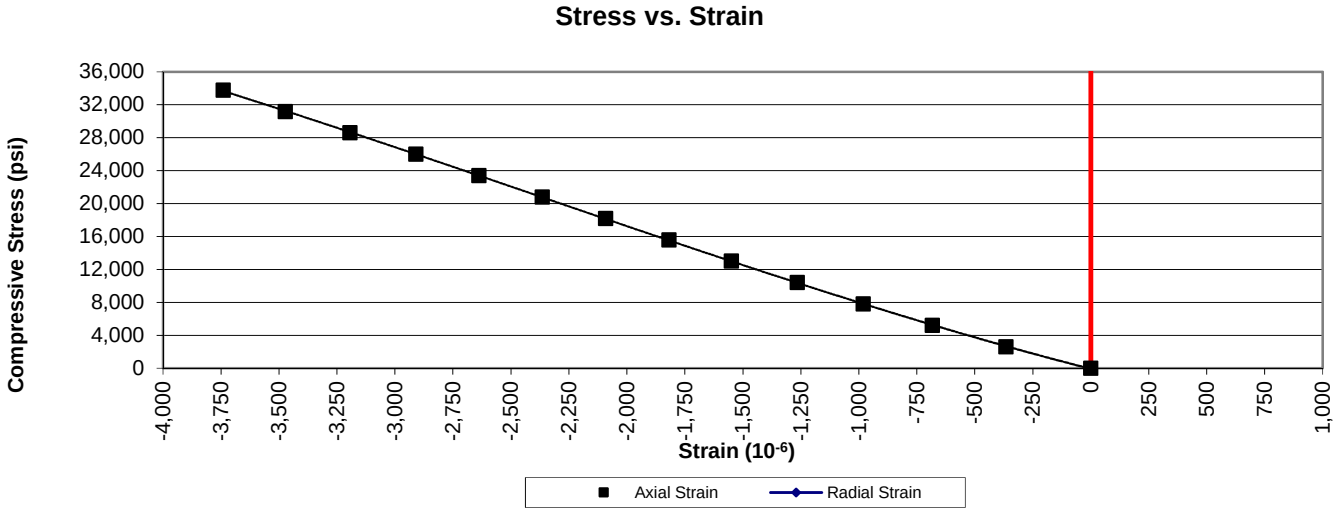
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	5/2/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.49	**Tested by:**	BKP
Boring Id:	B-39	**Unit Weight, pcf:**	165.6	**Reviewed by:**	JBB
Sample No:	RC-3	**Moisture Content, %:**	0.2		
Depth (ft):	22.1 - 23.1	**Load Rate, psi/sec:**	90		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-365		8,000	2,597	7.12		
3	-683		16,000	5,195	7.61		
4	-980		24,000	7,792	7.95		
5	-1,265		32,000	10,390	8.21		
6	-1,549		40,000	12,987	8.38		
7	-1,818		48,000	15,584	8.57		
8	-2,091		56,000	18,182	8.70		
9	-2,364		64,000	20,779	8.79		
10	-2,638		72,000	23,377	8.86		
11	-2,909		80,000	25,974	8.93		
12	-3,193		88,000	28,571	8.95		
13	-3,472		96,000	31,169	8.98		
14	-3,740		104,000	33,766	9.03		
15			109,393	35,517			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)
tolerances practicable.



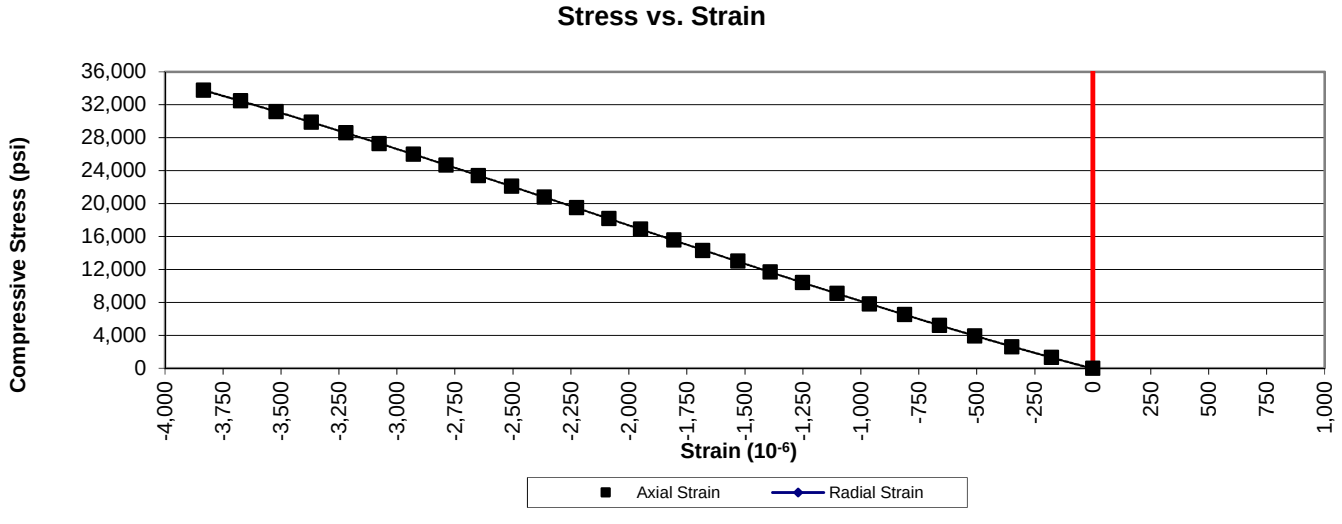
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	5/2/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.45	**Tested by:**	BKP
Boring Id:	B-39	**Unit Weight, pcf:**	166.5	**Reviewed by:**	JBB
Sample No:	RC-5	**Moisture Content, %:**	0.2		
Depth (ft):	29.1 - 30.1	**Load Rate, psi/sec:**	82		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-178		4,000	1,299	7.30		
3	-349		8,000	2,597	7.44		
4	-509		12,000	3,896	7.65		
5	-660		16,000	5,195	7.87		
6	-811		20,000	6,494	8.01		
7	-962		24,000	7,792	8.10		
8	-1,102		28,000	9,091	8.25		
9	-1,251		32,000	10,390	8.31		
10	-1,390		36,000	11,688	8.41		
11	-1,530		40,000	12,987	8.49		
12	-1,681		44,000	14,286	8.50		
13	-1,806		48,000	15,584	8.63		
14	-1,949		52,000	16,883	8.66		
15	-2,086		56,000	18,182	8.72		
16	-2,225		60,000	19,481	8.76		
17	-2,364		64,000	20,779	8.79		
18	-2,505		68,000	22,078	8.81		
19	-2,648		72,000	23,377	8.83		
20	-2,788		76,000	24,675	8.85		
21	-2,929		80,000	25,974	8.87		
22	-3,076		84,000	27,273	8.87		
23	-3,220		88,000	28,571	8.87		
24	-3,368		92,000	29,870	8.87		
25	-3,520		96,000	31,169	8.85		
26	-3,674		100,000	32,468	8.84		
27	-3,834		104,000	33,766	8.81		
28			106,987	34,736			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)
tolerances practicable.



UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

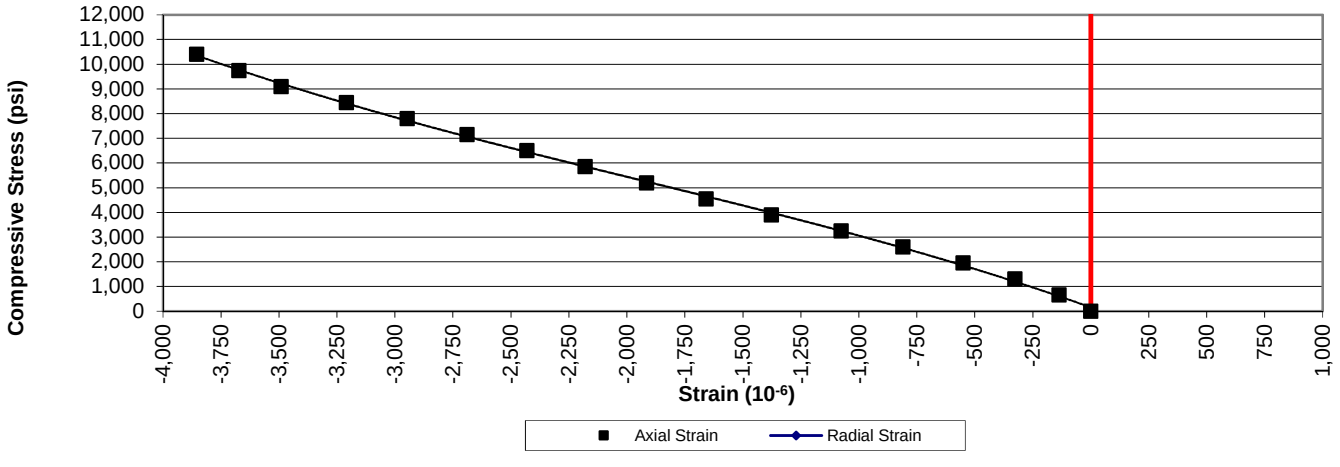
1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	5/2/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.46	**Tested by:**	BKP
Boring Id:	B-48	**Unit Weight, pcf:**	178.5	**Reviewed by:**	JBB
Sample No:	RC-1	**Moisture Content, %:**	0.2		
Depth (ft):	15.1 - 15.9	**Load Rate, psi/sec:**	68		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-136		2,000	649	4.77		
3	-326		4,000	1,299	3.98		
4	-550		6,000	1,948	3.54		
5	-809		8,000	2,597	3.21		
6	-1,076		10,000	3,247	3.02		
7	-1,376		12,000	3,896	2.83		
8	-1,658		14,000	4,545	2.74		
9	-1,915		16,000	5,195	2.71		
10	-2,180		18,000	5,844	2.68		
11	-2,430		20,000	6,494	2.67		
12	-2,688		22,000	7,143	2.66		
13	-2,946		24,000	7,792	2.64		
14	-3,208		26,000	8,442	2.63		
15	-3,490		28,000	9,091	2.60		
16	-3,672		30,000	9,740	2.65		
17	-3,854		32,000	10,390	2.70		
18			34,349	11,152			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)
tolerances practicable.

Stress vs. Strain



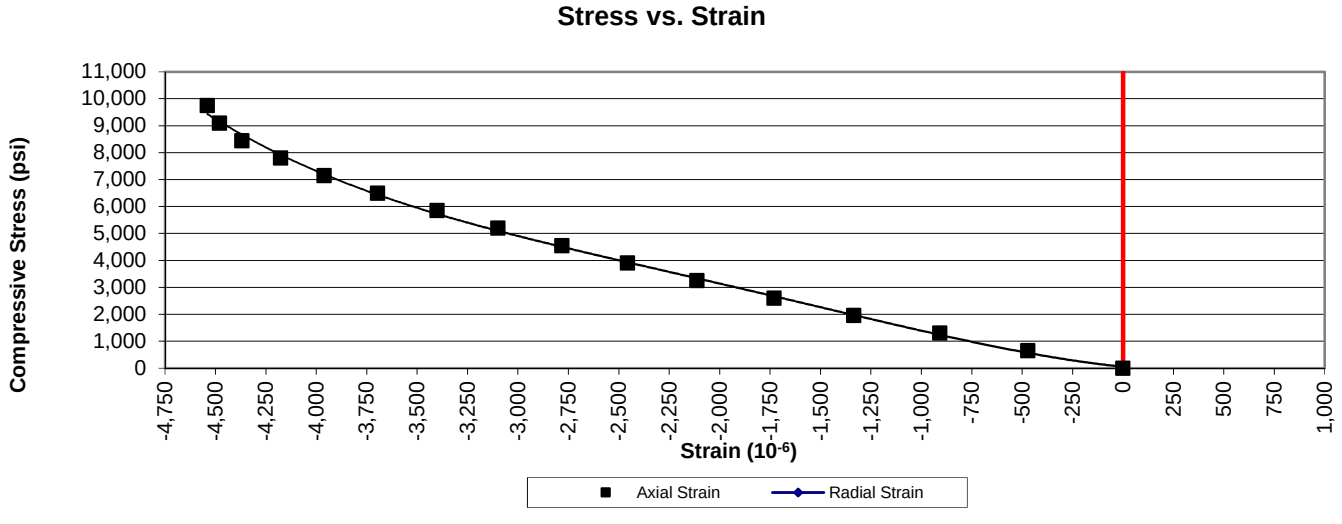
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	5/2/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.45	**Tested by:**	BKP
Boring Id:	B-48	**Unit Weight, pcf:**	175.9	**Reviewed by:**	JBB
Sample No:	RC-2	**Moisture Content, %:**	0.5		
Depth (ft):	19.7 - 20.6	**Load Rate, psi/sec:**	73		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-472		2,000	649	1.38		
3	-908		4,000	1,299	1.43		
4	-1,335		6,000	1,948	1.46		
5	-1,730		8,000	2,597	1.50		
6	-2,112		10,000	3,247	1.54		
7	-2,457		12,000	3,896	1.59		
8	-2,782		14,000	4,545	1.63		
9	-3,099		16,000	5,195	1.68		
10	-3,401		18,000	5,844	1.72		
11	-3,696		20,000	6,494	1.76		
12	-3,961		22,000	7,143	1.80		
13	-4,177		24,000	7,792	1.87		
14	-4,369		26,000	8,442	1.93		
15	-4,480		28,000	9,091	2.03		
16	-4,539		30,000	9,740	2.15		
17			32,993	10,712			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)
tolerances practicable.



UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

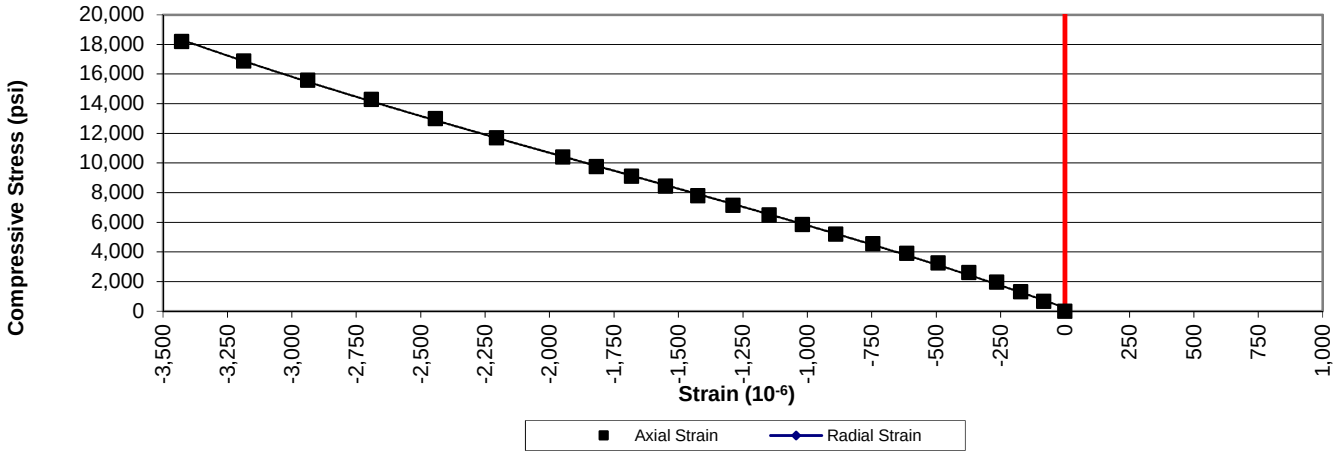
1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	5/2/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.37	**Tested by:**	BKP
Boring Id:	B-48	**Unit Weight, pcf:**	179.1	**Reviewed by:**	JBB
Sample No:	RC-4	**Moisture Content, %:**	0.3		
Depth (ft):	34.0 - 34.7	**Load Rate, psi/sec:**	73		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-82		2,000	649	7.91		
3	-172		4,000	1,299	7.55		
4	-265		6,000	1,948	7.35		
5	-373		8,000	2,597	6.96		
6	-492		10,000	3,247	6.60		
7	-614		12,000	3,896	6.35		
8	-745		14,000	4,545	6.10		
9	-889		16,000	5,195	5.84		
10	-1,019		18,000	5,844	5.74		
11	-1,147		20,000	6,494	5.66		
12	-1,288		22,000	7,143	5.55		
13	-1,424		24,000	7,792	5.47		
14	-1,550		26,000	8,442	5.45		
15	-1,681		28,000	9,091	5.41		
16	-1,818		30,000	9,740	5.36		
17	-1,948		32,000	10,390	5.33		
18	-2,205		36,000	11,688	5.30		
19	-2,443		40,000	12,987	5.32		
20	-2,691		44,000	14,286	5.31		
21	-2,938		48,000	15,584	5.30		
22	-3,186		52,000	16,883	5.30		
23	-3,427		56,000	18,182	5.31		
24			58,898	19,123			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)
tolerances practicable.

Stress vs. Strain



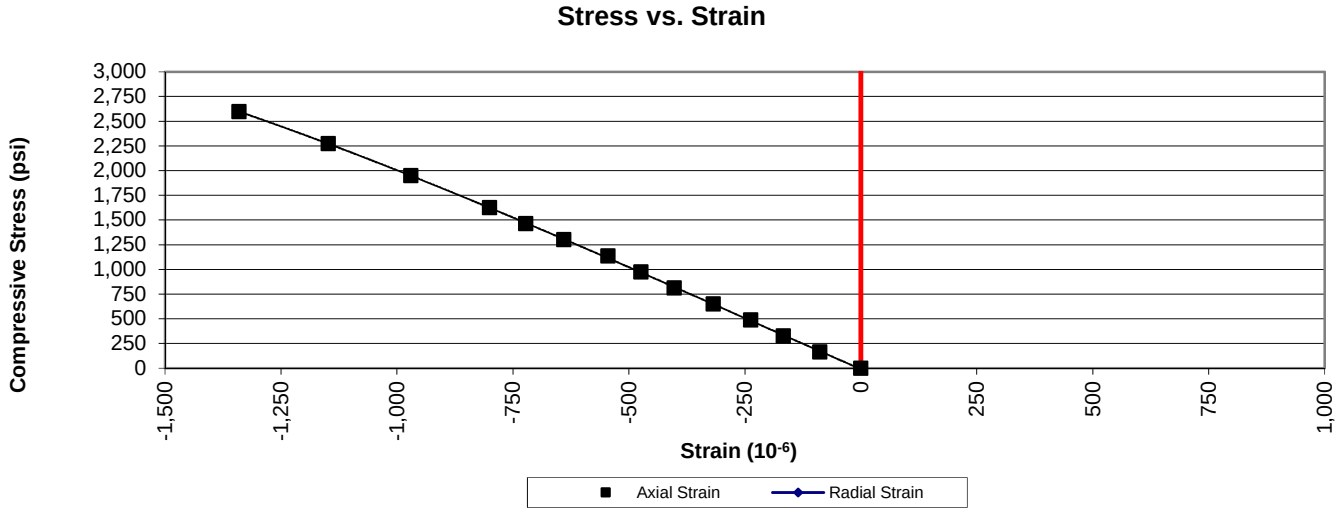
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	5/2/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.44	**Tested by:**	BKP
Boring Id:	B-54	**Unit Weight, pcf:**	167.0	**Reviewed by:**	JBB
Sample No:	RC-1	**Moisture Content, %:**	0.3		
Depth (ft):	74.6 - 75.3	**Load Rate, psi/sec:**	41		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-88		500	162	1.84		
3	-167		1,000	325	1.95		
4	-237		1,500	487	2.05		
5	-318		2,000	649	2.04		
6	-402		2,500	812	2.02		
7	-474		3,000	974	2.05		
8	-545		3,500	1,136	2.08		
9	-640		4,000	1,299	2.03		
10	-722		4,500	1,461	2.02		
11	-800		5,000	1,623	2.03		
12	-970		6,000	1,948	2.01		
13	-1,148		7,000	2,273	1.98		
14	-1,340		8,000	2,597	1.94		
15			8,313	2,699			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)
tolerances practicable.



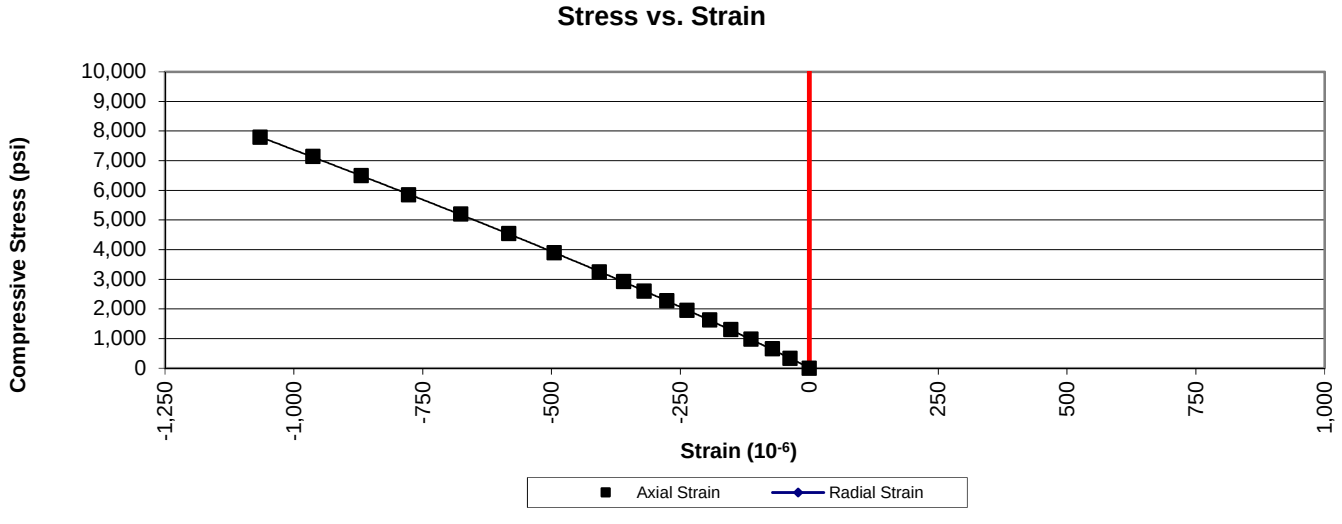
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	5/2/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.50	**Tested by:**	BKP
Boring Id:	B-54	**Unit Weight, pcf:**	166.9	**Reviewed by:**	JBB
Sample No:	RC-3	**Moisture Content, %:**	0.2		
Depth (ft):	82.6 - 83.4	**Load Rate, psi/sec:**	70		

Data Point	Strain (10^{-6}) axial	Strain (10^{-6}) radial	Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
1	0		0	0	0.00		
2	-37		1,000	325	8.78		
3	-71		2,000	649	9.14		
4	-113		3,000	974	8.62		
5	-152		4,000	1,299	8.55		
6	-193		5,000	1,623	8.41		
7	-237		6,000	1,948	8.22		
8	-276		7,000	2,273	8.24		
9	-320		8,000	2,597	8.12		
10	-360		9,000	2,922	8.12		
11	-407		10,000	3,247	7.98		
12	-495		12,000	3,896	7.87		
13	-583		14,000	4,545	7.80		
14	-676		16,000	5,195	7.68		
15	-777		18,000	5,844	7.52		
16	-869		20,000	6,494	7.47		
17	-963		22,000	7,143	7.42		
18	-1,065		24,000	7,792	7.32		
19			25,518	8,285			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)
tolerances practicable.



UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

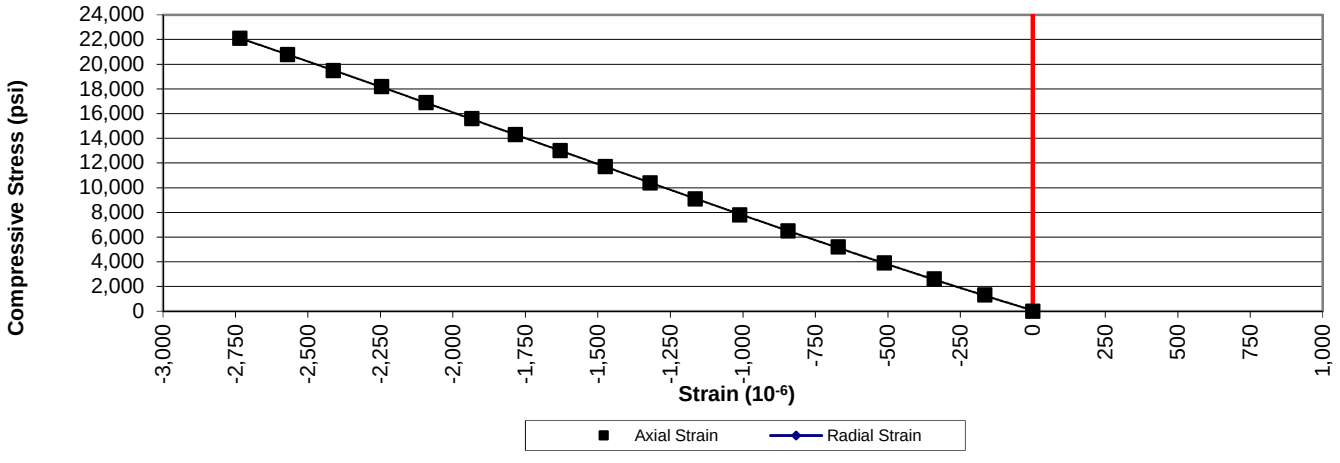
1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	5/2/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.52	**Tested by:**	BKP
Boring Id:	B-54	**Unit Weight, pcf:**	165.4	**Reviewed by:**	JBB
Sample No:	RC-4	**Moisture Content, %:**	0.2		
Depth (ft):	86.2 - 86.9	**Load Rate, psi/sec:**	80		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-165		4,000	1,299	7.87		
3	-340		8,000	2,597	7.64		
4	-512		12,000	3,896	7.61		
5	-671		16,000	5,195	7.74		
6	-844		20,000	6,494	7.69		
7	-1,010		24,000	7,792	7.71		
8	-1,164		28,000	9,091	7.81		
9	-1,320		32,000	10,390	7.87		
10	-1,474		36,000	11,688	7.93		
11	-1,630		40,000	12,987	7.97		
12	-1,784		44,000	14,286	8.01		
13	-1,934		48,000	15,584	8.06		
14	-2,092		52,000	16,883	8.07		
15	-2,245		56,000	18,182	8.10		
16	-2,412		60,000	19,481	8.08		
17	-2,570		64,000	20,779	8.09		
18	-2,734		68,000	22,078	8.08		
19			70,751	22,971			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)
tolerances practicable.

Stress vs. Strain



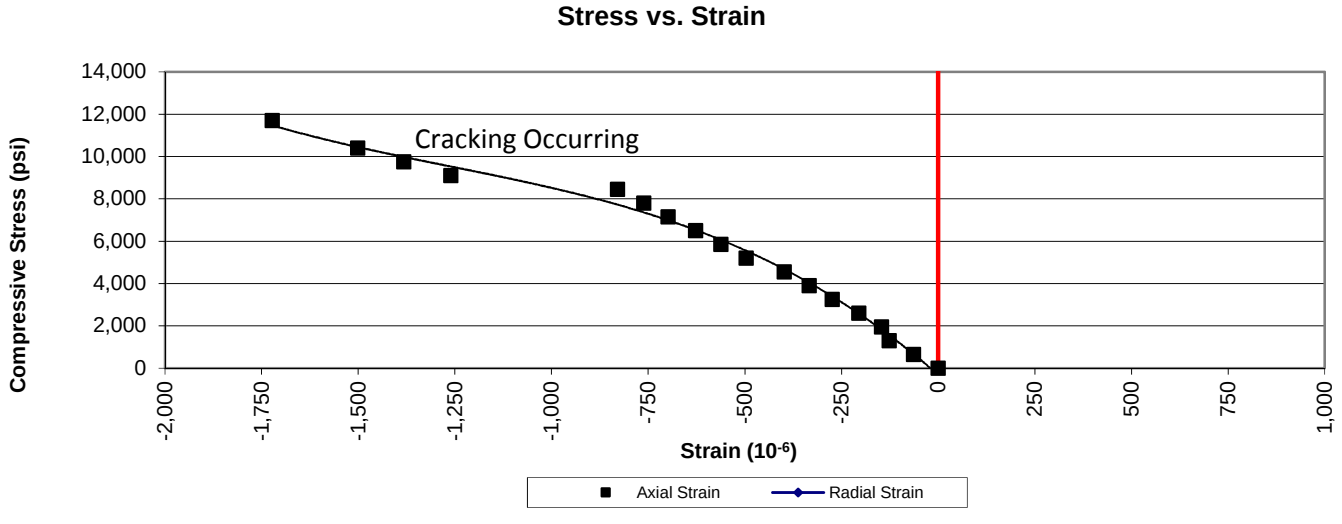
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	5/2/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.52	**Tested by:**	BKP
Boring Id:	B-60	**Unit Weight, pcf:**	165.2	**Reviewed by:**	JBB
Sample No:	RC-3	**Moisture Content, %:**	0.1		
Depth (ft):	16.2 - 16.9	**Load Rate, psi/sec:**	70		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-63		2,000	649	10.30		
3	-126		4,000	1,299	10.31		
4	-146		6,000	1,948	13.34		
5	-205		8,000	2,597	12.67		
6	-274		10,000	3,247	11.85		
7	-333		12,000	3,896	11.70		
8	-398		14,000	4,545	11.42		
9	-496		16,000	5,195	10.47		
10	-562		18,000	5,844	10.40		
11	-627		20,000	6,494	10.36		
12	-698		22,000	7,143	10.23		
13	-761		24,000	7,792	10.24		
14	-829		26,000	8,442	10.18		
15	-1,260		28,000	9,091	7.22		
16	-1,382		30,000	9,740	7.05		cracking
17	-1,501		32,000	10,390	6.92		occurring
18	-1,722		36,000	11,688	6.79		
19			38,622	12,540			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)
tolerances practicable.



UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

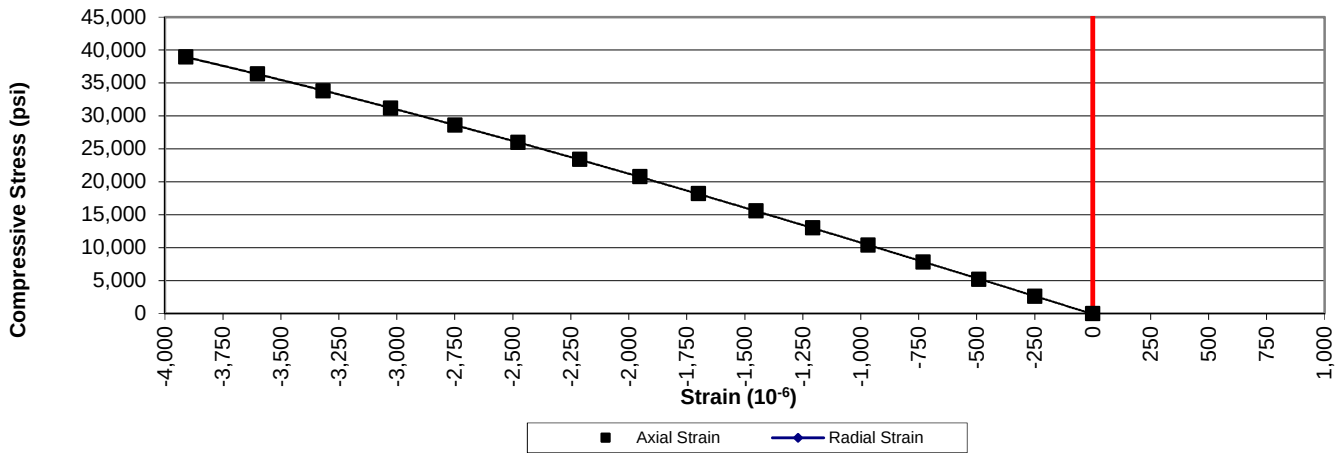
1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	5/2/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.50	**Tested by:**	BKP
Boring Id:	B-60	**Unit Weight, pcf:**	165.8	**Reviewed by:**	JBB
Sample No:	RC-4	**Moisture Content, %:**	0.2		
Depth (ft):	23.3 - 24.3	**Load Rate, psi/sec:**	83		

Data Point	Strain (10^{-6}) axial	Strain (10^{-6}) radial	Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
1	0		0	0	0.00		
2	-249		8,000	2,597	10.43		
3	-491		16,000	5,195	10.58		
4	-731		24,000	7,792	10.66		
5	-968		32,000	10,390	10.73		
6	-1,207		40,000	12,987	10.76		
7	-1,451		48,000	15,584	10.74		
8	-1,700		56,000	18,182	10.70		
9	-1,952		64,000	20,779	10.64		
10	-2,211		72,000	23,377	10.57		
11	-2,478		80,000	25,974	10.48		
12	-2,749		88,000	28,571	10.39		
13	-3,026		96,000	31,169	10.30		
14	-3,317		104,000	33,766	10.18		
15	-3,601		112,000	36,364	10.10		
16	-3,910		120,000	38,961	9.96		
17			125,130	40,627			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)
tolerances practicable.

Stress vs. Strain



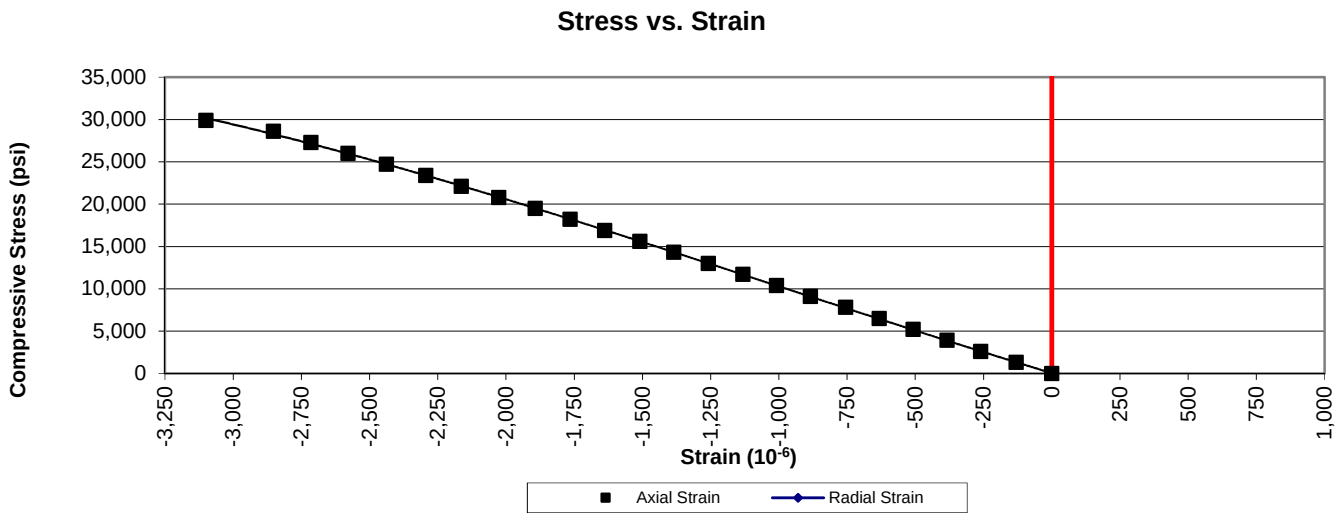
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.98	**Date:**	5/2/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.37	**Tested by:**	BKP
Boring Id:	B-60	**Unit Weight, pcf:**	165.7	**Reviewed by:**	JBB
Sample No:	RC-5	**Moisture Content, %:**	0.2		
Depth (ft):	26.2 - 26.7	**Load Rate, psi/sec:**	80		

Data Point	Strain (10^{-6})		Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
	axial	radial					
1	0		0	0	0.00		
2	-130		4,000	1,299	9.99		
3	-260		8,000	2,597	9.99		
4	-383		12,000	3,896	10.17		
5	-508		16,000	5,195	10.23		
6	-632		20,000	6,494	10.28		
7	-755		24,000	7,792	10.32		
8	-884		28,000	9,091	10.28		
9	-1,008		32,000	10,390	10.31		
10	-1,132		36,000	11,688	10.33		
11	-1,258		40,000	12,987	10.32		
12	-1,385		44,000	14,286	10.31		
13	-1,509		48,000	15,584	10.33		
14	-1,638		52,000	16,883	10.31		
15	-1,765		56,000	18,182	10.30		
16	-1,892		60,000	19,481	10.30		
17	-2,026		64,000	20,779	10.26		
18	-2,163		68,000	22,078	10.21		
19	-2,294		72,000	23,377	10.19		
20	-2,438		76,000	24,675	10.12		
21	-2,578		80,000	25,974	10.08		
22	-2,715		84,000	27,273	10.05		
23	-2,852		88,000	28,571	10.02		
24	-3,099		92,000	29,870	9.64		
25			98,848	32,094			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)
tolerances practicable.



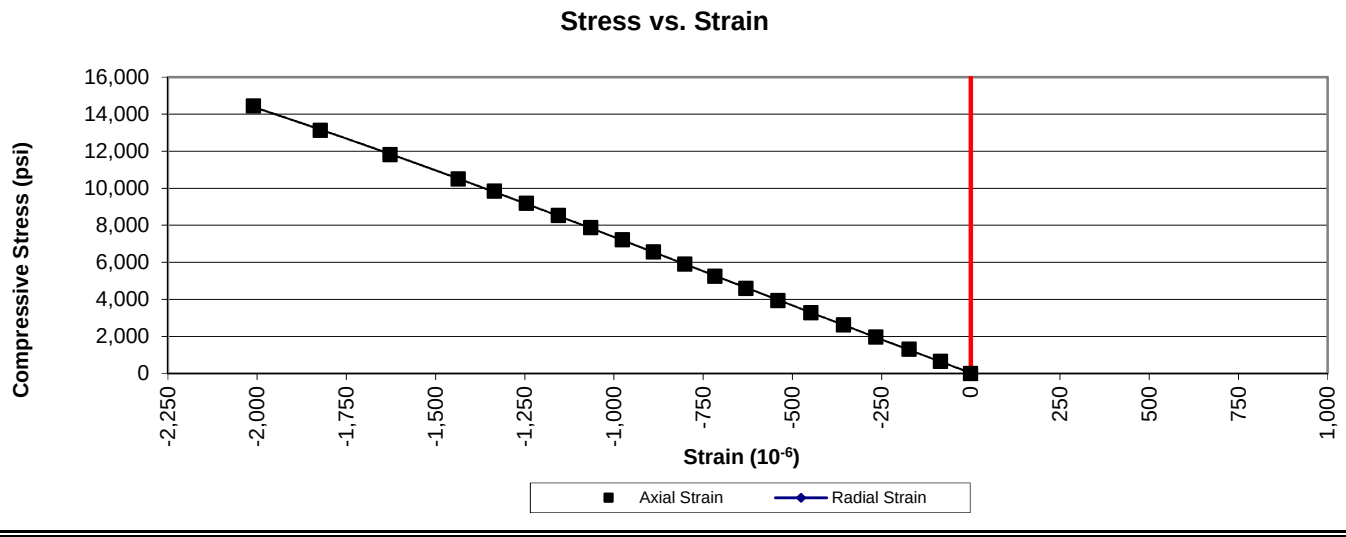
UNCONFINED COMPRESSION WITH YOUNG'S MODULUS
(ASTM D7012 Method C and D)

1413 Topside Road, Louisville, TN 37777

Project:	Carolina Crossroads Project	**Diameter, in.:**	1.97	**Date:**	5/2/2018
Project No.:	1461-16-047 Phase 2B	**Length, in.:**	4.38	**Tested by:**	BKP
Boring Id:	B-61	**Unit Weight, pcf:**	176.3	**Reviewed by:**	JBB
Sample No:	RC-4	**Moisture Content, %:**	0.2		
Depth (ft):	38.7 - 39.4	**Load Rate, psi/sec:**	83		

Data Point	Strain (10^{-6}) axial	Strain (10^{-6}) radial	Load (lb)	Compressive Stress (psi)	Secant Modulus x 10^6 (psi)	Poisson's Ratio	Remarks Failure
1	0		0	0	0.00		
2	-85		2,000	656	7.72		
3	-173		4,000	1,311	7.58		
4	-266		6,000	1,967	7.39		
5	-356		8,000	2,623	7.37		
6	-448		10,000	3,279	7.32		
7	-540		12,000	3,934	7.29		
8	-630		14,000	4,590	7.29		
9	-717		16,000	5,246	7.32		
10	-801		18,000	5,902	7.37		
11	-889		20,000	6,557	7.38		
12	-976		22,000	7,213	7.39		
13	-1,065		24,000	7,869	7.39		
14	-1,155		26,000	8,525	7.38		
15	-1,245		28,000	9,180	7.37		
16	-1,335		30,000	9,836	7.37		
17	-1,436		32,000	10,492	7.31		
18	-1,627		36,000	11,803	7.25		
19	-1,823		40,000	13,115	7.19		
20	-2,010		44,000	14,426	7.18		
21			47,491	15,571			Failure

Comments: Loading rate was selected to target reaching failure between 2 and 15 minutes.
Test specimen measurements met the desired shape tolerances of ASTM D4543-08$^{\epsilon 1}$ (side straightness, end flatness & parallelism, and end perpendicularity to axis)
tolerances practicable.



PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

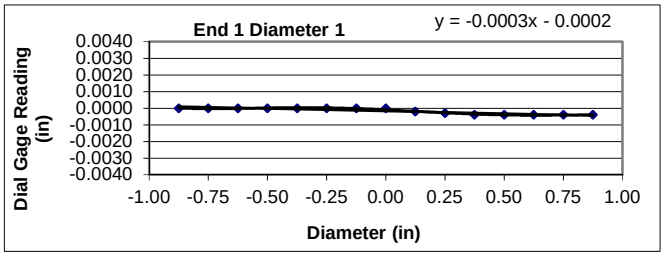
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	4/30/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.41	**Tested by:**	BKP
Boring Id:	B-39	**Unit Weight (pcf):**	165.5	**Reviewed by:**	JBB
Sample No.:	RC-2	**Moisture Content (%):**	0.2		
Depth (ft):	15.8 - 16.8				

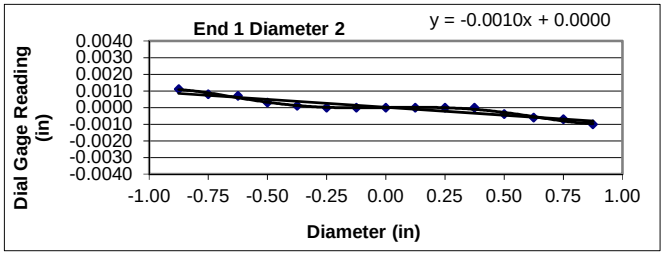
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

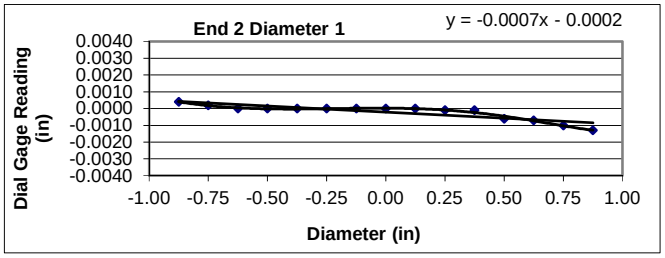
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0000	0.0011	0.0004	0.0000
- 6/8	0.0000	0.0008	0.0002	0.0000
- 5/8	0.0000	0.0007	0.0000	0.0000
- 4/8	0.0000	0.0003	0.0000	0.0000
- 3/8	0.0000	0.0001	0.0000	0.0000
- 2/8	0.0000	0.0000	0.0000	0.0000
- 1/8	0.0000	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	-0.0002	0.0000	0.0000	0.0001
2/8	-0.0003	0.0000	-0.0001	0.0001
3/8	-0.0004	0.0000	-0.0001	0.0001
4/8	-0.0004	-0.0004	-0.0006	0.0001
5/8	-0.0004	-0.0006	-0.0007	0.0001
6/8	-0.0004	-0.0007	-0.0010	0.0001
7/8	-0.0004	-0.0010	-0.0013	0.0003

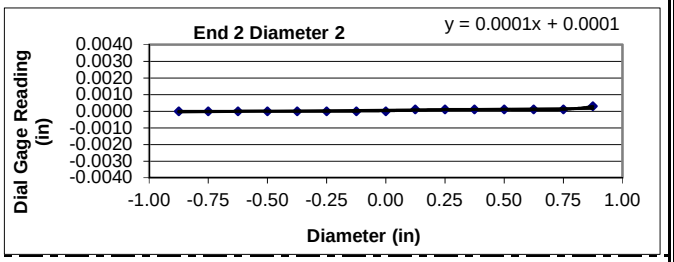




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00031
	Angle of Best Fit Line:	-0.01768
End 2:	Slope of Best Fit Line:	-0.00073
	Angle of Best Fit Line:	-0.04174
	Max Angular Difference:	**0.02**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00095
	Angle of Best Fit Line:	-0.05451
End 2:	Slope of Best Fit Line:	0.00012
	Angle of Best Fit Line:	0.00688
	Max Angular Difference:	**-0.06**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0004	0.0002	**YES**
End 1 Diam 2	0.0021	0.0011	**YES**
End 2 Diam 1	0.0017	0.0009	**YES**
End 2 Diam 2	0.0003	0.0002	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

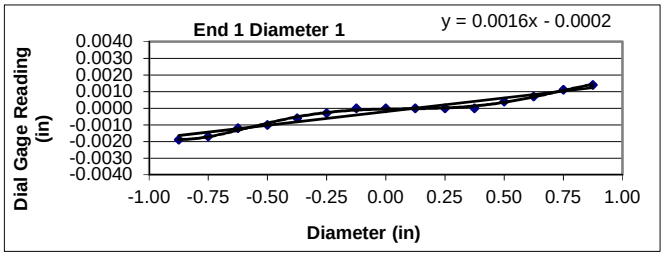
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	4/30/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.49	**Tested by:**	BKP
Boring Id:	B-39	**Unit Weight (pcf):**	165.6	**Reviewed by:**	JBB
Sample No.:	RC-3	**Moisture Content (%):**	0.2		
Depth (ft):	22.1 - 23.1				

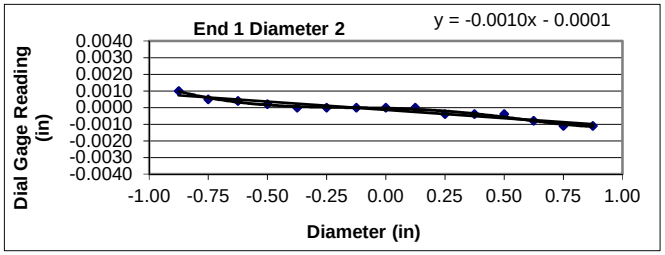
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

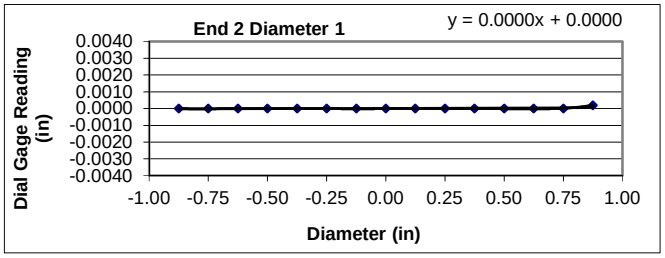
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	-0.0019	0.0010	0.0000	0.0006
- 6/8	-0.0017	0.0005	0.0000	0.0003
- 5/8	-0.0012	0.0004	0.0000	0.0003
- 4/8	-0.0010	0.0002	0.0000	0.0003
- 3/8	-0.0006	0.0000	0.0000	0.0000
- 2/8	-0.0003	0.0000	0.0000	0.0000
- 1/8	0.0000	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	-0.0001
2/8	0.0000	-0.0004	0.0000	-0.0003
3/8	0.0000	-0.0004	0.0000	-0.0003
4/8	0.0004	-0.0004	0.0000	-0.0008
5/8	0.0007	-0.0008	0.0000	-0.0011
6/8	0.0011	-0.0011	0.0000	-0.0011
7/8	0.0014	-0.0011	0.0002	-0.0012

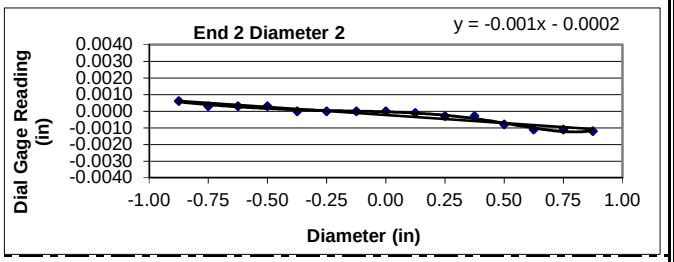




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	0.00164
	Angle of Best Fit Line:	0.09397
End 2:	Slope of Best Fit Line:	0.00004
	Angle of Best Fit Line:	0.00229
	Max Angular Difference:	**0.09**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00099
	Angle of Best Fit Line:	-0.05680
End 2:	Slope of Best Fit Line:	-0.00097
	Angle of Best Fit Line:	-0.05566
	Max Angular Difference:	**0.00**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0033	0.0017	**YES**
End 1 Diam 2	0.0021	0.0011	**YES**
End 2 Diam 1	0.0002	0.0001	**YES**
End 2 Diam 2	0.0018	0.0009	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

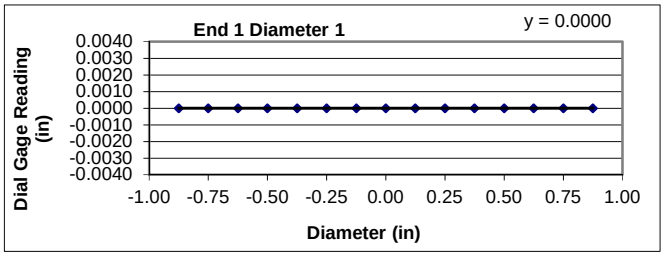
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	4/30/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.45	**Tested by:**	BKP
Boring Id:	B-39	**Unit Weight (pcf):**	166.5	**Reviewed by:**	JBB
Sample No.:	RC-5	**Moisture Content (%):**	0.2		
Depth (ft):	29.1 - 30.1				

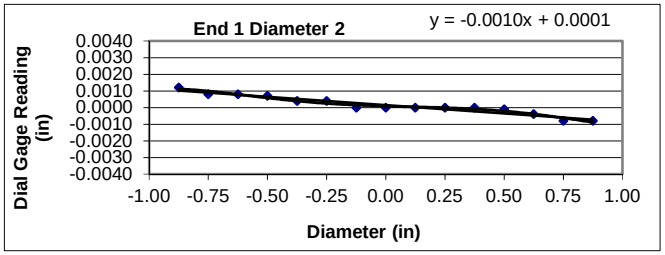
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

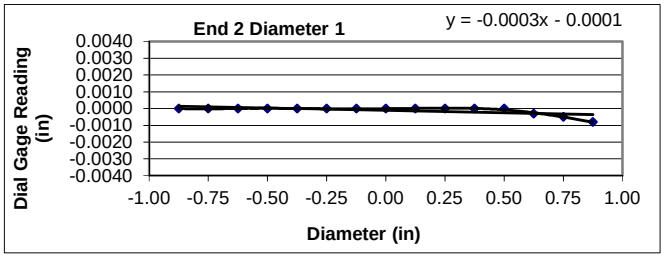
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0000	0.0012	0.0000	0.0002
- 6/8	0.0000	0.0008	0.0000	0.0002
- 5/8	0.0000	0.0008	0.0000	0.0002
- 4/8	0.0000	0.0007	0.0000	0.0002
- 3/8	0.0000	0.0004	0.0000	0.0001
- 2/8	0.0000	0.0004	0.0000	0.0001
- 1/8	0.0000	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	0.0000
2/8	0.0000	0.0000	0.0000	0.0000
3/8	0.0000	0.0000	0.0000	-0.0004
4/8	0.0000	-0.0001	0.0000	-0.0005
5/8	0.0000	-0.0004	-0.0003	-0.0005
6/8	0.0000	-0.0008	-0.0005	-0.0011
7/8	0.0000	-0.0008	-0.0008	-0.0011

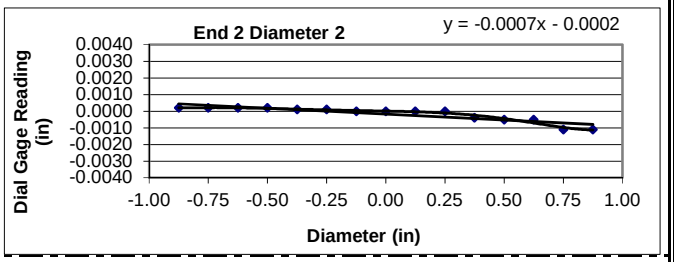




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	0.00000
	Angle of Best Fit Line:	0.00000
End 2:	Slope of Best Fit Line:	-0.00029
	Angle of Best Fit Line:	-0.01653
	Max Angular Difference:	**0.02**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00099
	Angle of Best Fit Line:	-0.05697
End 2:	Slope of Best Fit Line:	-0.00071
	Angle of Best Fit Line:	-0.04076
	Max Angular Difference:	**-0.02**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0000	0.0000	**YES**
End 1 Diam 2	0.0020	0.0010	**YES**
End 2 Diam 1	0.0008	0.0004	**YES**
End 2 Diam 2	0.0013	0.0007	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

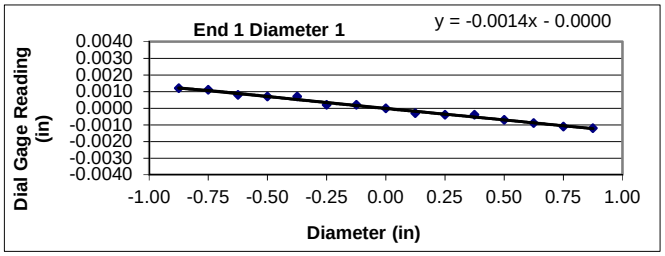
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	4/30/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.46	**Tested by:**	BKP
Boring Id:	B-48	**Unit Weight (pcf):**	178.5	**Reviewed by:**	JBB
Sample No.:	RC-1	**Moisture Content (%):**	0.2		
Depth (ft):	15.1 - 15.9				

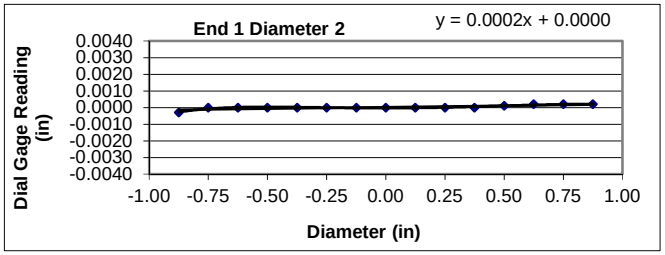
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

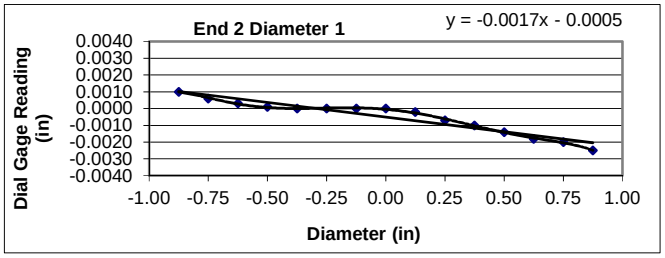
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0012	-0.0003	0.0010	0.0000
- 6/8	0.0011	0.0000	0.0006	0.0000
- 5/8	0.0008	0.0000	0.0003	0.0000
- 4/8	0.0007	0.0000	0.0001	0.0000
- 3/8	0.0007	0.0000	0.0000	0.0000
- 2/8	0.0002	0.0000	0.0000	0.0000
- 1/8	0.0002	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	-0.0003	0.0000	-0.0002	0.0000
2/8	-0.0004	0.0000	-0.0007	0.0000
3/8	-0.0004	0.0000	-0.0010	0.0000
4/8	-0.0007	0.0001	-0.0014	0.0000
5/8	-0.0009	0.0002	-0.0018	0.0000
6/8	-0.0011	0.0002	-0.0020	0.0000
7/8	-0.0012	0.0002	-0.0025	0.0000

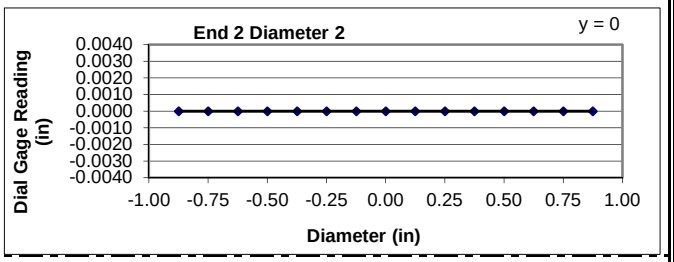




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00140
	Angle of Best Fit Line:	-0.08038
End 2:	Slope of Best Fit Line:	-0.00175
	Angle of Best Fit Line:	-0.10019
	Max Angular Difference:	**0.02**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00017
	Angle of Best Fit Line:	0.00999
End 2:	Slope of Best Fit Line:	0.00000
	Angle of Best Fit Line:	0.00000
	Max Angular Difference:	**0.01**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0024	0.0012	**YES**
End 1 Diam 2	0.0005	0.0003	**YES**
End 2 Diam 1	0.0035	0.0018	**YES**
End 2 Diam 2	0.0000	0.0000	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

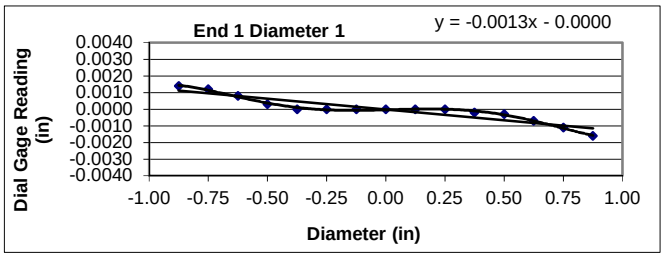
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	4/30/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.45	**Tested by:**	BKP
Boring Id:	B-48	**Unit Weight (pcf):**	175.9	**Reviewed by:**	JBB
Sample No.:	RC-2	**Moisture Content (%):**	0.5		
Depth (ft):	19.7 - 20.6				

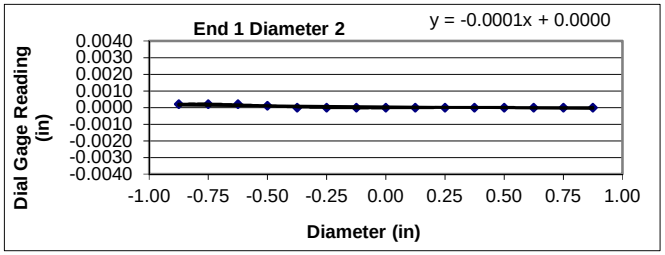
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

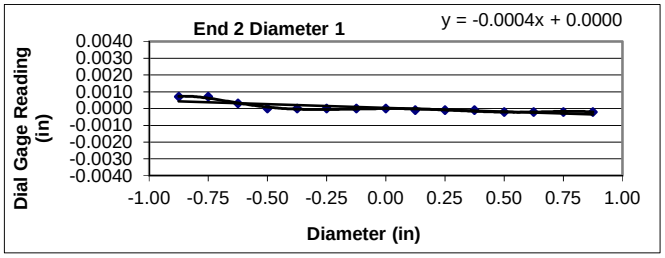
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0014	0.0002	0.0007	0.0000
- 6/8	0.0012	0.0002	0.0007	0.0000
- 5/8	0.0008	0.0002	0.0003	0.0000
- 4/8	0.0003	0.0001	0.0000	0.0000
- 3/8	0.0000	0.0000	0.0000	0.0000
- 2/8	0.0000	0.0000	0.0000	0.0000
- 1/8	0.0000	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	-0.0001	0.0000
2/8	0.0000	0.0000	-0.0001	0.0000
3/8	-0.0002	0.0000	-0.0001	0.0001
4/8	-0.0003	0.0000	-0.0002	0.0002
5/8	-0.0007	0.0000	-0.0002	0.0004
6/8	-0.0011	0.0000	-0.0002	0.0005
7/8	-0.0016	0.0000	-0.0002	0.0006

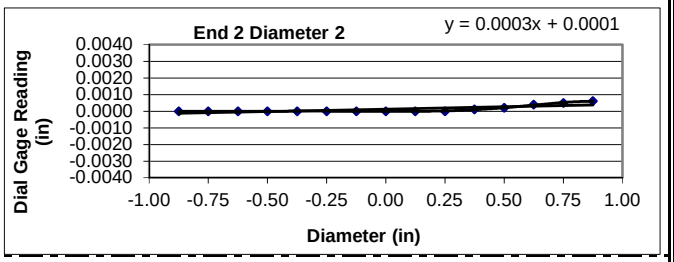




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00129
	Angle of Best Fit Line:	-0.07416
End 2:	Slope of Best Fit Line:	-0.00045
	Angle of Best Fit Line:	-0.02554
	Max Angular Difference:	**-0.05**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00011
	Angle of Best Fit Line:	-0.00655
End 2:	Slope of Best Fit Line:	0.00029
	Angle of Best Fit Line:	0.01686
	Max Angular Difference:	**-0.02**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0030	0.0015	**YES**
End 1 Diam 2	0.0002	0.0001	**YES**
End 2 Diam 1	0.0009	0.0005	**YES**
End 2 Diam 2	0.0006	0.0003	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

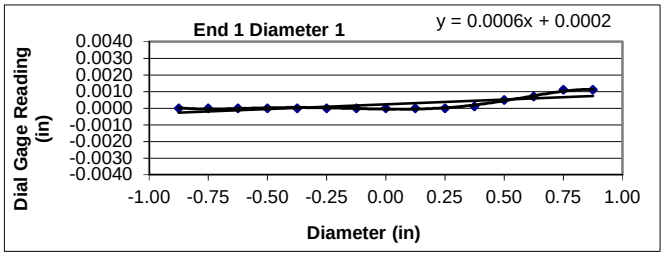
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	4/30/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.37	**Tested by:**	BKP
Boring Id:	B-48	**Unit Weight (pcf):**	179.1	**Reviewed by:**	JBB
Sample No.:	RC-4	**Moisture Content (%):**	0.3		
Depth (ft):	34.0 - 34.7				

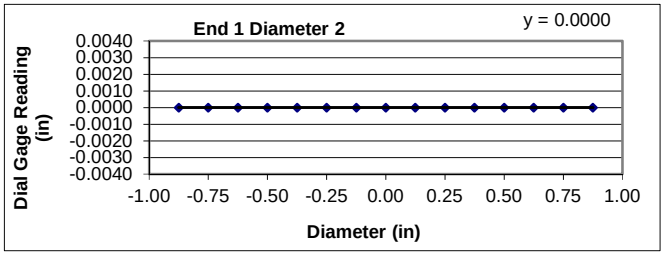
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

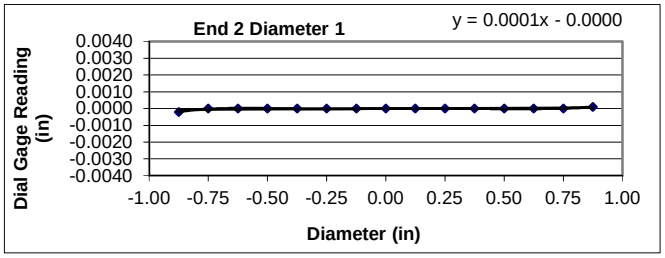
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0000	0.0000	-0.0002	0.0005
- 6/8	0.0000	0.0000	0.0000	0.0002
- 5/8	0.0000	0.0000	0.0000	0.0001
- 4/8	0.0000	0.0000	0.0000	0.0000
- 3/8	0.0000	0.0000	0.0000	0.0000
- 2/8	0.0000	0.0000	0.0000	0.0000
- 1/8	0.0000	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	0.0000
2/8	0.0000	0.0000	0.0000	0.0000
3/8	0.0001	0.0000	0.0000	-0.0002
4/8	0.0005	0.0000	0.0000	-0.0004
5/8	0.0007	0.0000	0.0000	-0.0004
6/8	0.0011	0.0000	0.0000	-0.0006
7/8	0.0011	0.0000	0.0001	-0.0008

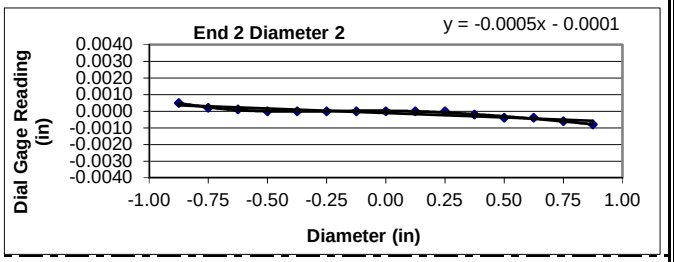




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	0.00057
	Angle of Best Fit Line:	0.03290
End 2:	Slope of Best Fit Line:	0.00006
	Angle of Best Fit Line:	0.00344
	Max Angular Difference:	**0.03**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00000
	Angle of Best Fit Line:	0.00000
End 2:	Slope of Best Fit Line:	-0.00053
	Angle of Best Fit Line:	-0.03045
	Max Angular Difference:	**0.03**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0011	0.0006	**YES**
End 1 Diam 2	0.0000	0.0000	**YES**
End 2 Diam 1	0.0003	0.0002	**YES**
End 2 Diam 2	0.0013	0.0007	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

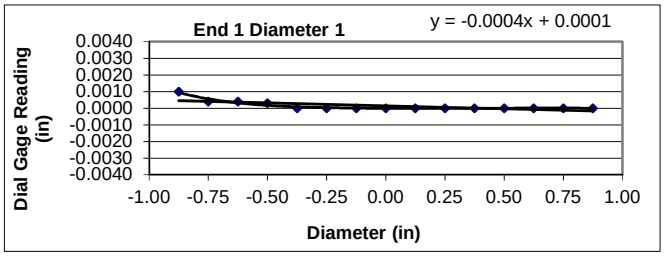
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	4/30/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.44	**Tested by:**	BKP
Boring Id:	B-54	**Unit Weight (pcf):**	167.0	**Reviewed by:**	JBB
Sample No.:	RC-1	**Moisture Content (%):**	0.3		
Depth (ft):	74.6 - 75.3				

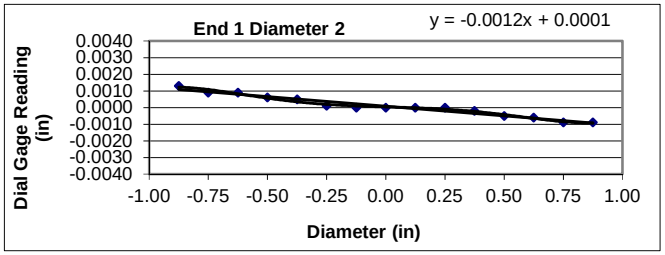
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

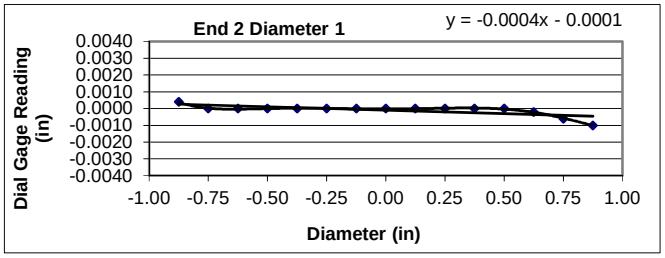
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0010	0.0013	0.0004	0.0000
- 6/8	0.0004	0.0009	0.0000	0.0000
- 5/8	0.0004	0.0009	0.0000	0.0000
- 4/8	0.0003	0.0006	0.0000	0.0000
- 3/8	0.0000	0.0005	0.0000	0.0000
- 2/8	0.0000	0.0001	0.0000	0.0000
- 1/8	0.0000	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	0.0000
2/8	0.0000	0.0000	0.0000	0.0000
3/8	0.0000	-0.0002	0.0000	0.0000
4/8	0.0000	-0.0005	0.0000	0.0000
5/8	0.0000	-0.0006	-0.0002	0.0000
6/8	0.0000	-0.0009	-0.0006	0.0000
7/8	0.0000	-0.0009	-0.0010	0.0001

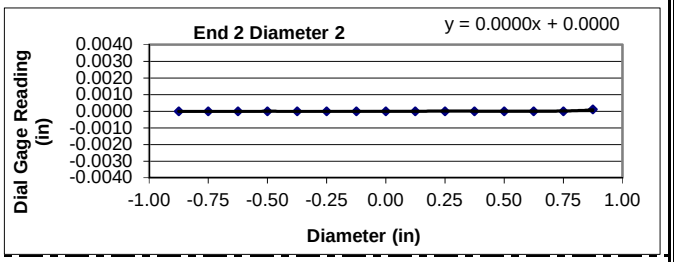




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00036
	Angle of Best Fit Line:	-0.02063
End 2:	Slope of Best Fit Line:	-0.00041
	Angle of Best Fit Line:	-0.02357
	Max Angular Difference:	**0.00**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00115
	Angle of Best Fit Line:	-0.06614
End 2:	Slope of Best Fit Line:	0.00002
	Angle of Best Fit Line:	0.00115
	Max Angular Difference:	**-0.07**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0010	0.0005	**YES**
End 1 Diam 2	0.0022	0.0011	**YES**
End 2 Diam 1	0.0014	0.0007	**YES**
End 2 Diam 2	0.0001	0.0001	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

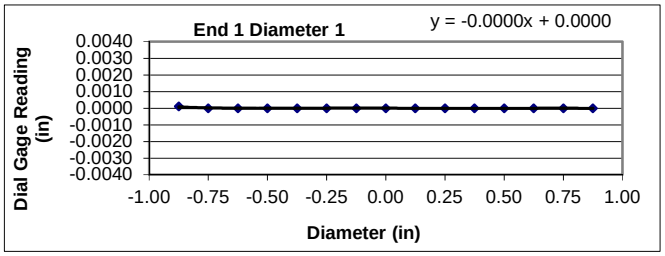
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	4/30/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.50	**Tested by:**	BKP
Boring Id:	B-54	**Unit Weight (pcf):**	166.9	**Reviewed by:**	JBB
Sample No.:	RC-3	**Moisture Content (%):**	0.2		
Depth (ft):	82.6 - 83.4				

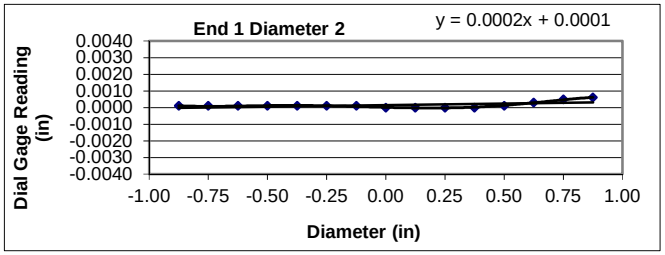
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

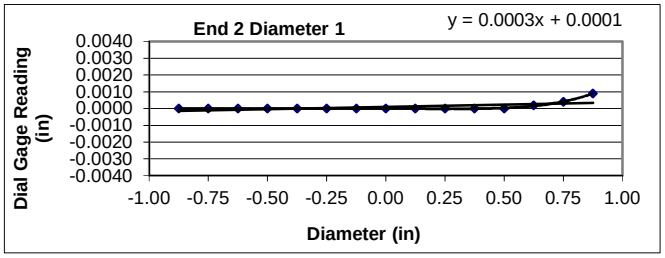
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0001	0.0001	0.0000	0.0000
- 6/8	0.0000	0.0001	0.0000	0.0000
- 5/8	0.0000	0.0001	0.0000	0.0000
- 4/8	0.0000	0.0001	0.0000	0.0000
- 3/8	0.0000	0.0001	0.0000	0.0000
- 2/8	0.0000	0.0001	0.0000	0.0000
- 1/8	0.0000	0.0001	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	0.0000
2/8	0.0000	0.0000	0.0000	0.0000
3/8	0.0000	0.0000	0.0000	0.0000
4/8	0.0000	0.0001	0.0000	0.0000
5/8	0.0000	0.0003	0.0002	0.0000
6/8	0.0000	0.0005	0.0004	0.0001
7/8	0.0000	0.0006	0.0009	0.0002

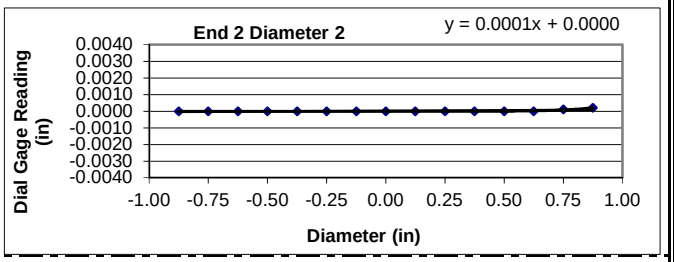




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00002
	Angle of Best Fit Line:	-0.00115
End 2:	Slope of Best Fit Line:	0.00028
	Angle of Best Fit Line:	0.01588
	Max Angular Difference:	**-0.02**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00018
	Angle of Best Fit Line:	0.01031
End 2:	Slope of Best Fit Line:	0.00006
	Angle of Best Fit Line:	0.00327
	Max Angular Difference:	**0.01**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0001	0.0001	**YES**
End 1 Diam 2	0.0006	0.0003	**YES**
End 2 Diam 1	0.0009	0.0005	**YES**
End 2 Diam 2	0.0002	0.0001	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

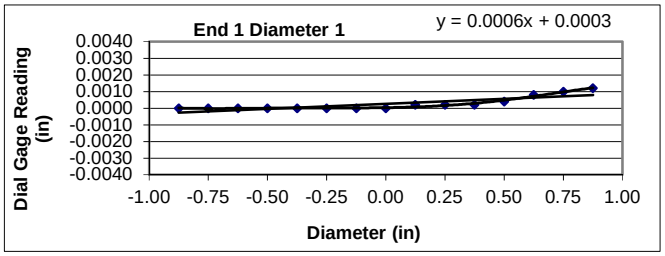
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	4/30/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.52	**Tested by:**	BKP
Boring Id:	B-54	**Unit Weight (pcf):**	165.4	**Reviewed by:**	JBB
Sample No.:	RC-4	**Moisture Content (%):**	0.2		
Depth (ft):	86.2 - 86.9				

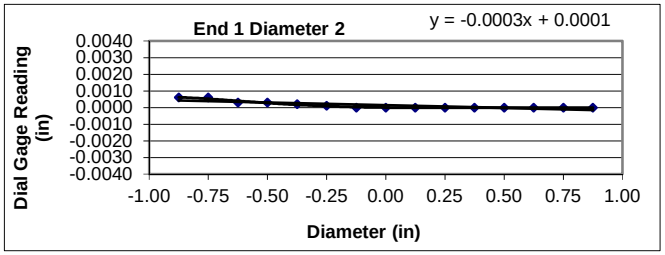
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

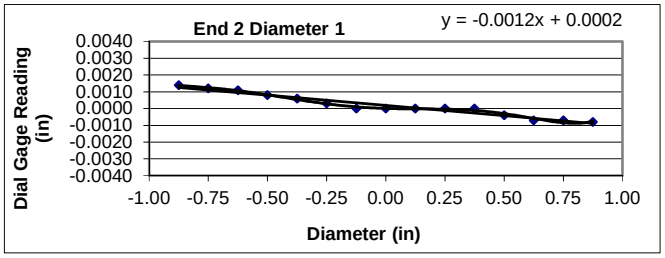
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0000	0.0006	0.0014	0.0007
- 6/8	0.0000	0.0006	0.0012	0.0007
- 5/8	0.0000	0.0003	0.0011	0.0007
- 4/8	0.0000	0.0003	0.0008	0.0003
- 3/8	0.0000	0.0002	0.0006	0.0001
- 2/8	0.0000	0.0001	0.0003	0.0000
- 1/8	0.0000	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0002	0.0000	0.0000	0.0000
2/8	0.0002	0.0000	0.0000	0.0000
3/8	0.0002	0.0000	0.0000	-0.0002
4/8	0.0004	0.0000	-0.0004	-0.0006
5/8	0.0008	0.0000	-0.0007	-0.0008
6/8	0.0010	0.0000	-0.0007	-0.0011
7/8	0.0012	0.0000	-0.0008	-0.0013

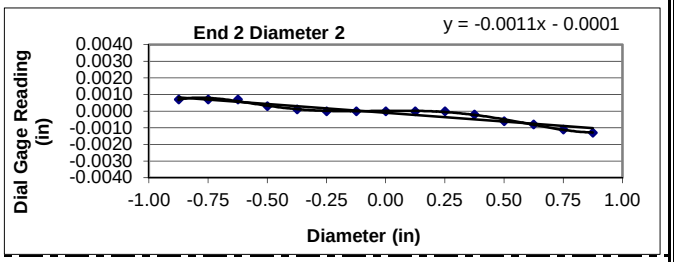




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	0.00061
	Angle of Best Fit Line:	0.03470
End 2:	Slope of Best Fit Line:	-0.00123
	Angle of Best Fit Line:	-0.07039
	Max Angular Difference:	**0.11**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00032
	Angle of Best Fit Line:	-0.01850
End 2:	Slope of Best Fit Line:	-0.00105
	Angle of Best Fit Line:	-0.06024
	Max Angular Difference:	**0.04**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0012	0.0006	**YES**
End 1 Diam 2	0.0006	0.0003	**YES**
End 2 Diam 1	0.0022	0.0011	**YES**
End 2 Diam 2	0.0020	0.0010	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

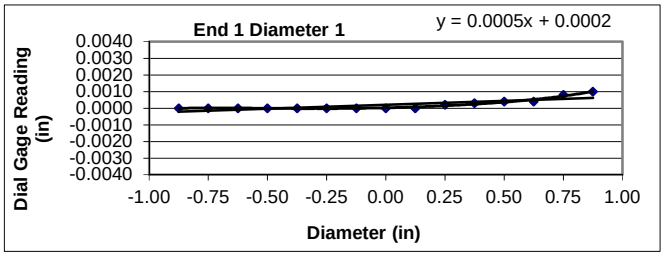
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	4/30/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.52	**Tested by:**	BKP
Boring Id:	B-60	**Unit Weight (pcf):**	165.2	**Reviewed by:**	JBB
Sample No.:	RC-3	**Moisture Content (%):**	0.1		
Depth (ft):	16.2 - 16.9				

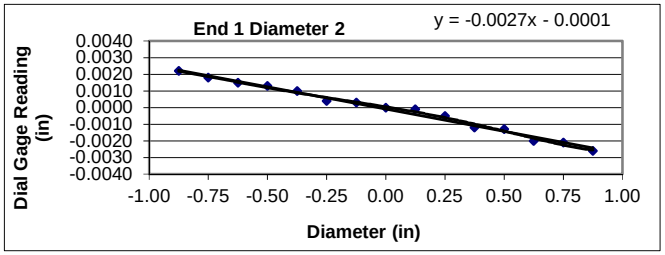
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

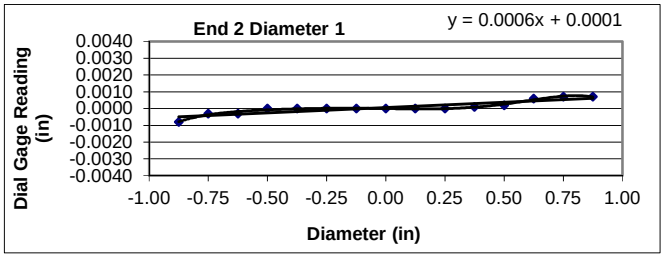
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0000	0.0022	-0.0008	0.0020
- 6/8	0.0000	0.0018	-0.0003	0.0017
- 5/8	0.0000	0.0015	-0.0003	0.0014
- 4/8	0.0000	0.0013	0.0000	0.0013
- 3/8	0.0000	0.0010	0.0000	0.0010
- 2/8	0.0000	0.0004	0.0000	0.0004
- 1/8	0.0000	0.0003	0.0000	0.0001
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	-0.0001	0.0000	0.0000
2/8	0.0002	-0.0005	0.0000	0.0000
3/8	0.0003	-0.0012	0.0001	-0.0001
4/8	0.0004	-0.0013	0.0002	-0.0005
5/8	0.0004	-0.0020	0.0006	-0.0009
6/8	0.0008	-0.0021	0.0007	-0.0013
7/8	0.0010	-0.0026	0.0007	-0.0014

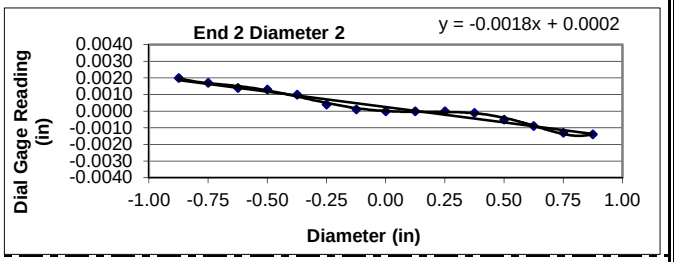




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	0.00048
	Angle of Best Fit Line:	0.02734
End 2:	Slope of Best Fit Line:	0.00063
	Angle of Best Fit Line:	0.03618
	Max Angular Difference:	**-0.01**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00268
	Angle of Best Fit Line:	-0.15339
End 2:	Slope of Best Fit Line:	-0.00185
	Angle of Best Fit Line:	-0.10592
	Max Angular Difference:	**-0.05**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0010	0.0005	**YES**
End 1 Diam 2	0.0048	0.0024	**YES**
End 2 Diam 1	0.0015	0.0008	**YES**
End 2 Diam 2	0.0034	0.0017	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

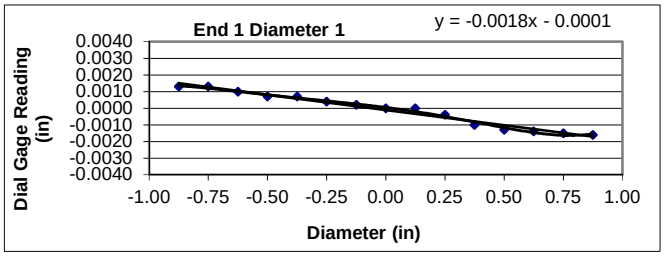
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	4/30/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.50	**Tested by:**	BKP
Boring Id:	B-60	**Unit Weight (pcf):**	165.8	**Reviewed by:**	JBB
Sample No.:	RC-4	**Moisture Content (%):**	0.2		
Depth (ft):	23.3 - 24.3				

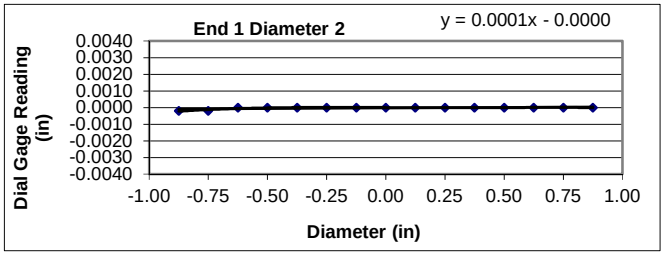
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

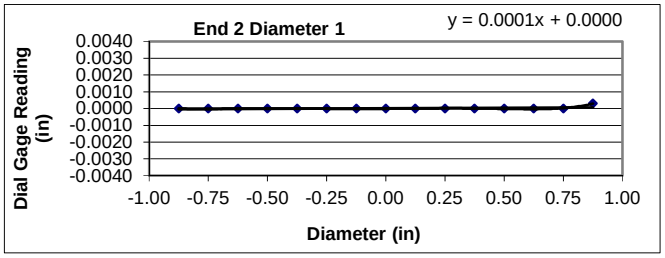
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0013	-0.0002	0.0000	0.0000
- 6/8	0.0013	-0.0002	0.0000	0.0000
- 5/8	0.0010	0.0000	0.0000	0.0000
- 4/8	0.0007	0.0000	0.0000	0.0000
- 3/8	0.0007	0.0000	0.0000	0.0000
- 2/8	0.0004	0.0000	0.0000	0.0000
- 1/8	0.0002	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	0.0000
2/8	-0.0004	0.0000	0.0000	0.0000
3/8	-0.0010	0.0000	0.0000	0.0000
4/8	-0.0013	0.0000	0.0000	0.0000
5/8	-0.0014	0.0000	0.0000	0.0000
6/8	-0.0015	0.0000	0.0000	0.0000
7/8	-0.0016	0.0000	0.0003	0.0000

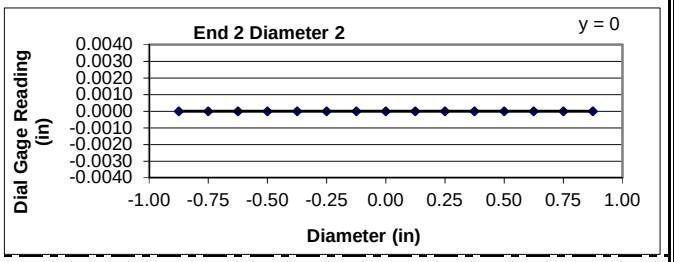




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00183
	Angle of Best Fit Line:	-0.10477
End 2:	Slope of Best Fit Line:	0.00006
	Angle of Best Fit Line:	0.00344
	Max Angular Difference:	**-0.11**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00007
	Angle of Best Fit Line:	0.00426
End 2:	Slope of Best Fit Line:	0.00000
	Angle of Best Fit Line:	0.00000
	Max Angular Difference:	**0.00**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0029	0.0015	**YES**
End 1 Diam 2	0.0002	0.0001	**YES**
End 2 Diam 1	0.0003	0.0002	**YES**
End 2 Diam 2	0.0000	0.0000	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

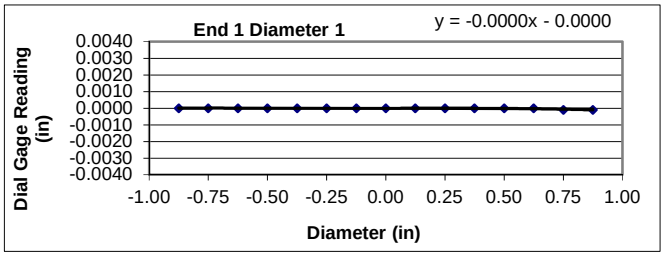
Project:	Carolina Crossroads Project	**Diameter (in):**	1.98	**Date:**	4/30/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.37	**Tested by:**	BKP
Boring Id:	B-60	**Unit Weight (pcf):**	165.7	**Reviewed by:**	JBB
Sample No.:	RC-5	**Moisture Content (%):**	0.2		
Depth (ft):	26.2 - 26.7				

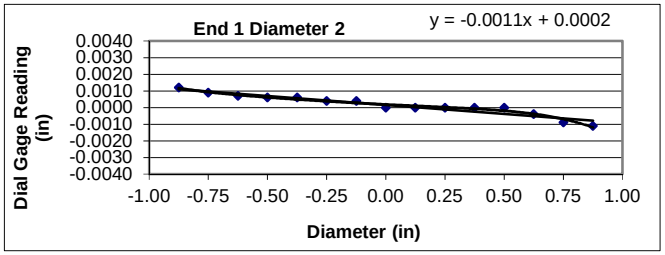
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

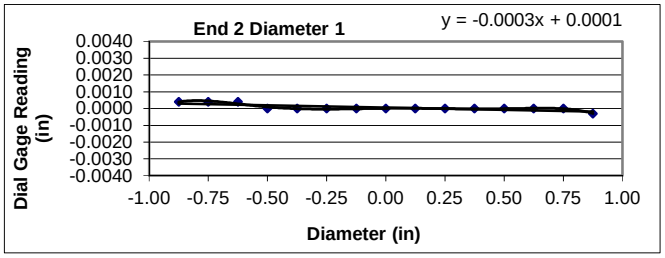
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0000	0.0012	0.0004	0.0002
- 6/8	0.0000	0.0009	0.0004	0.0001
- 5/8	0.0000	0.0007	0.0004	0.0001
- 4/8	0.0000	0.0006	0.0000	0.0001
- 3/8	0.0000	0.0006	0.0000	0.0000
- 2/8	0.0000	0.0004	0.0000	0.0000
- 1/8	0.0000	0.0004	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	0.0000
2/8	0.0000	0.0000	0.0000	0.0000
3/8	0.0000	0.0000	0.0000	0.0000
4/8	0.0000	0.0000	0.0000	0.0000
5/8	0.0000	-0.0004	0.0000	0.0000
6/8	-0.0001	-0.0009	0.0000	0.0000
7/8	-0.0001	-0.0011	-0.0003	-0.0001

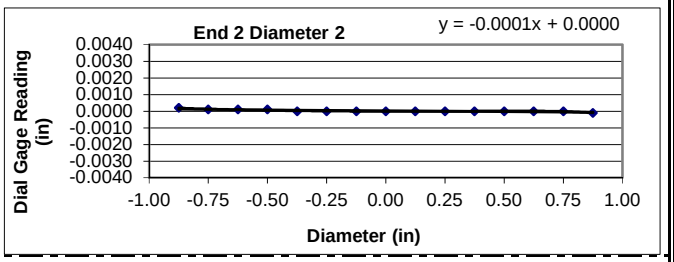




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	-0.00004
	Angle of Best Fit Line:	-0.00213
End 2:	Slope of Best Fit Line:	-0.00027
	Angle of Best Fit Line:	-0.01522
	Max Angular Difference:	**0.01**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	-0.00108
	Angle of Best Fit Line:	-0.06188
End 2:	Slope of Best Fit Line:	-0.00010
	Angle of Best Fit Line:	-0.00589
	Max Angular Difference:	**-0.06**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0001	0.0001	**YES**
End 1 Diam 2	0.0023	0.0012	**YES**
End 2 Diam 1	0.0007	0.0004	**YES**
End 2 Diam 2	0.0003	0.0002	**YES**

Perpendicularity Tolerance Met? **YES**

PREPARING ROCK CORES AS CYLINDRICAL TEST SPECIMENS AND VERIFY CONFORMANCE OF DIMENSIONAL AND SHAPE TOLERANCES (ASTM D4543)

1413 Topside Road, Louisville, TN 37777

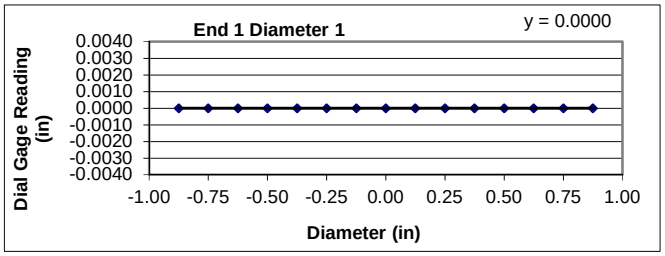
Project:	Carolina Crossroads Project	**Diameter (in):**	1.97	**Date:**	4/30/2018
Project No.:	1461-16-047 Phase B	**Length (in):**	4.38	**Tested by:**	BKP
Boring Id:	B-61	**Unit Weight (pcf):**	176.3	**Reviewed by:**	JBB
Sample No.:	RC-4	**Moisture Content (%):**	0.2		
Depth (ft):	38.7 - 39.4				

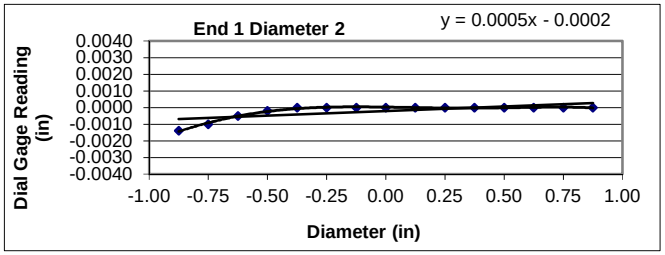
Deviation From Straightness (Procedure S1)

Is the maximum gap ≤ 0.02 in.? **YES** Straightness Tolerance Met? **YES**

End Flatness and Parallelism Readings (Procedure FP1)

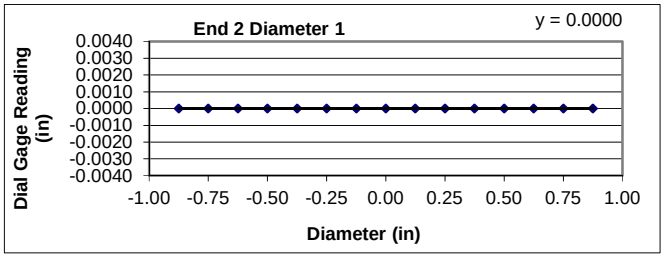
Position	End 1	End 1(90)	End 2	End 2(90)
- 7/8	0.0000	-0.0014	0.0000	-0.0020
- 6/8	0.0000	-0.0010	0.0000	-0.0016
- 5/8	0.0000	-0.0005	0.0000	-0.0012
- 4/8	0.0000	-0.0002	0.0000	-0.0008
- 3/8	0.0000	0.0000	0.0000	-0.0004
- 2/8	0.0000	0.0000	0.0000	0.0000
- 1/8	0.0000	0.0000	0.0000	0.0000
0	0.0000	0.0000	0.0000	0.0000
1/8	0.0000	0.0000	0.0000	0.0000
2/8	0.0000	0.0000	0.0000	0.0002
3/8	0.0000	0.0000	0.0000	0.0008
4/8	0.0000	0.0000	0.0000	0.0014
5/8	0.0000	0.0000	0.0000	0.0019
6/8	0.0000	0.0000	0.0000	0.0021
7/8	0.0000	0.0000	0.0000	0.0025

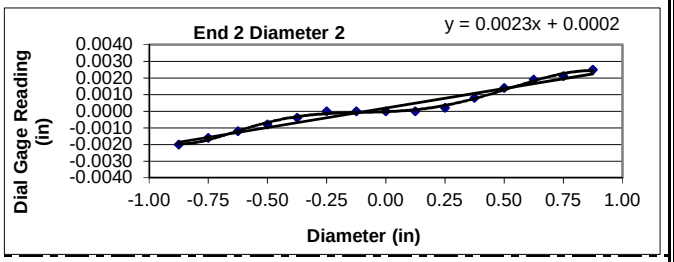




Flatness is met when the difference at any point between a smooth curve drawn through points and a visual best fit line is ≤ 0.001 in.

Flatness Tolerance Met? **YES**





Parallelism is met when the angular difference between best fit lines on opposing ends is ≤ 0.25°.

Parrallelism Diameter 1

End 1:	Slope of Best Fit Line:	0.00000
	Angle of Best Fit Line:	0.00000
End 2:	Slope of Best Fit Line:	0.00000
	Angle of Best Fit Line:	0.00000
	Max Angular Difference:	**0.00**

Parrallelism Diameter 2

End 1:	Slope of Best Fit Line:	0.00055
	Angle of Best Fit Line:	0.03127
End 2:	Slope of Best Fit Line:	0.00234
	Angle of Best Fit Line:	0.13424
	Max Angular Difference:	**-0.10**

Parallelism Tolerance Met? **YES**

Perpendicularity (Procedure P1) is met when the difference between max and min readings along each line divided by the diameter is ≤ 0.0043.

	Difference b/w max & min	Divide by Diameter	Meets Tolerance
End 1 Diam 1	0.0000	0.0000	**YES**
End 1 Diam 2	0.0014	0.0007	**YES**
End 2 Diam 1	0.0000	0.0000	**YES**
End 2 Diam 2	0.0045	0.0023	**YES**

Perpendicularity Tolerance Met? **YES**

Date: 5/1/2018

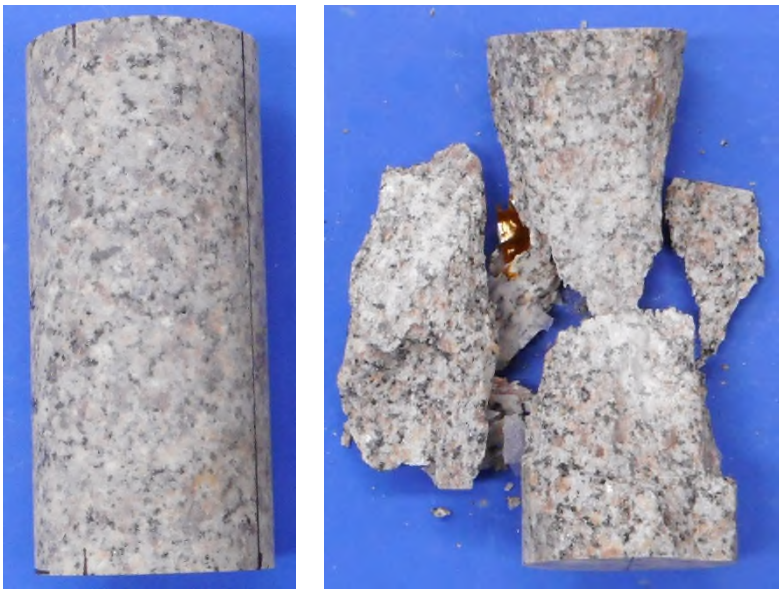
Photographer: Ben Painter

1	**Location / Orientation**	B-39, RC-2 (15.8' – 16.8')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 5/1/2018

Photographer: Ben Painter

2	**Location / Orientation**	B-39, RC-3 (22.1' – 23.1')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)



Date: 5/1/2018

Photographer: Ben Painter

3	**Location / Orientation**	B-39, RC-5 (29.1' – 30.1')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 5/1/2018

Photographer: Ben Painter

4	**Location / Orientation**	B-48, RC-1 (15.1' – 15.9')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 5/1/2018

Photographer: Ben Painter

5	**Location / Orientation**	B-48, RC-2 (19.7' – 20.6')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 5/1/2018

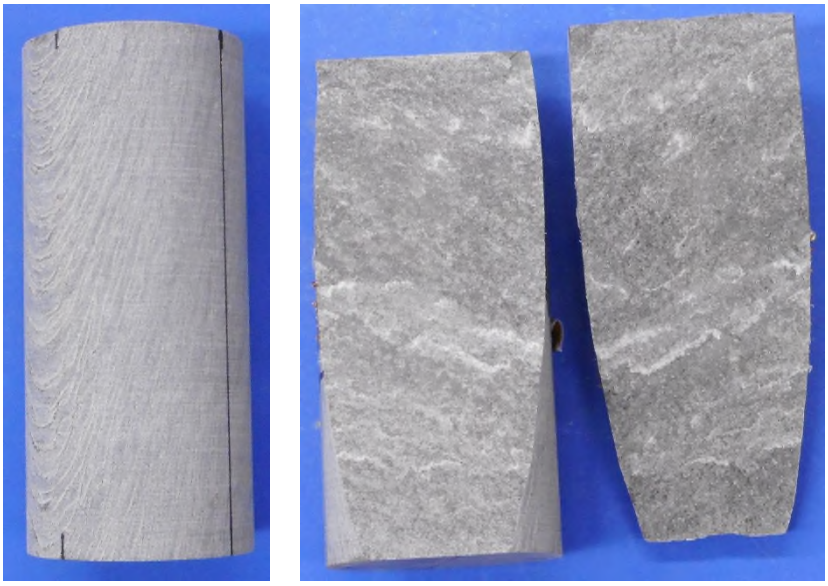
Photographer: Ben Painter

6	**Location / Orientation**	B-48, RC-4 (34.0' – 34.7')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 5/1/2018

Photographer: Ben Painter

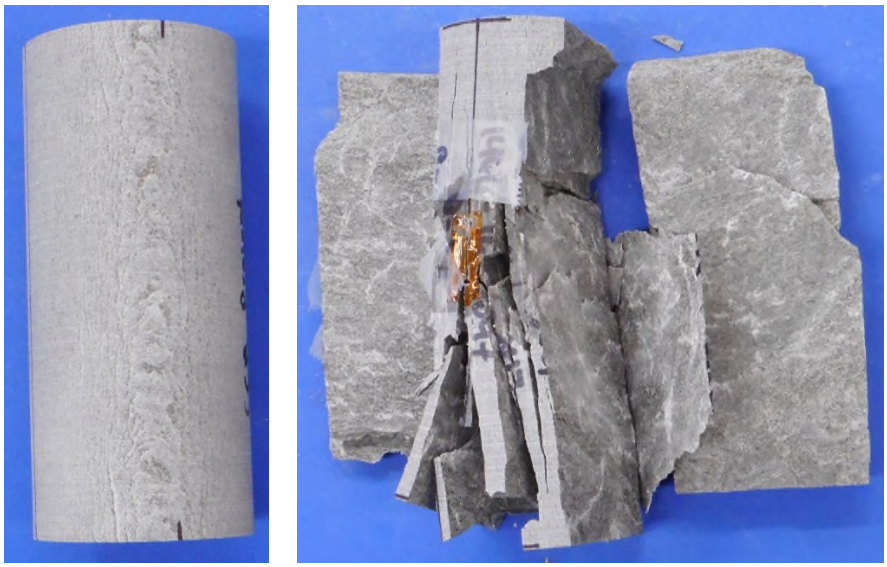
7	**Location / Orientation**	B-54, RC-1 (74.6' – 75.3')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)



Date: 5/1/2018

Photographer: Ben Painter

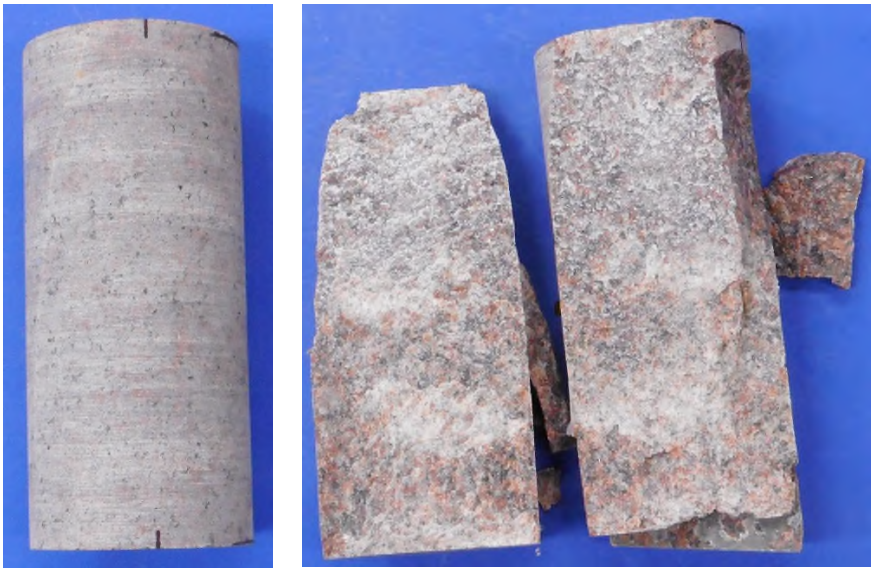
8	**Location / Orientation**	B-54, RC-3 (82.6' – 83.4')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)



Date: 5/1/2018

Photographer: Ben Painter

9	**Location / Orientation**	B-54, RC-4 (86.2' – 86.9')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)



Date: 5/1/2018

Photographer: Ben Painter

10	**Location / Orientation**	B-60, RC-3 (16.2' – 16.9')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 5/1/2018

Photographer: Ben Painter

11	**Location / Orientation**	B-60, RC-4 (23.3' – 24.3')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 5/1/2018

Photographer: Ben Painter

12	**Location / Orientation**	B-60, RC-5 (26.2' – 26.7')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Date: 5/1/2018

Photographer: Ben Painter

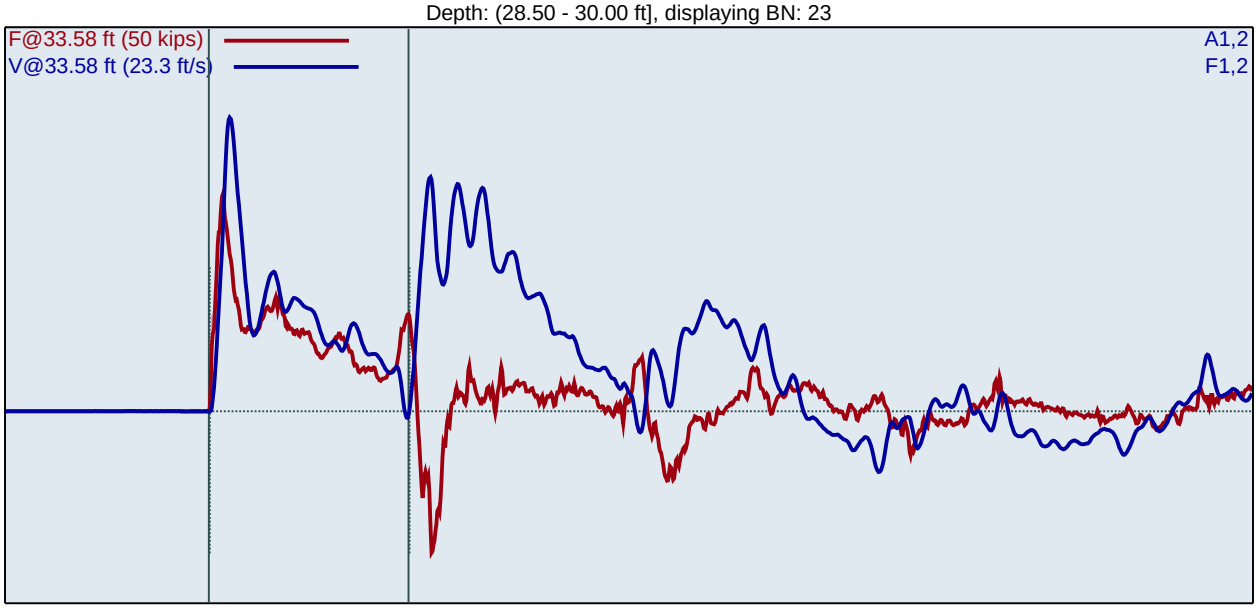
13	**Location / Orientation**	B-61, RC-4 (38.7' – 39.4')
	Remarks	Unconfined Compressive Strength of Rock Core Specimen Before/After (ASTM D7012)

Appendix XIII – SPT Energy Testing Results

CME 750X ATV - SN322938 (R-58)
H. Forbes
AR: 1.20 in^2
LE: 33.58 ft
WS: 16807.9 ft/s

S&ME Annual Testing
Test date: 8/7/2017
SP: 0.492 k/ft3
EM: 30000 ksi

Depth: (28.50 - 30.00 ft], displaying BN: 23



BPM: Blows/Minute
FMX: Maximum Force
VMX: Maximum Velocity
DMX: Maximum Displacement

CSX: Compression Stress Maximum
DFN: Final Displacement
EFV: Maximum Energy
ETR: Energy Transfer Ratio - Rated

BL#	LP ft	BC /6"	BPM bpm	FMX kips	VMX ft/s	DMX in	CSX ksi	DFN in	EFV ft-lb	ETR (%)
1	28.60	5	1.9	28	17.5	1.20	23.5	1.20	288.9	82.6
2	28.70	5	50.3	29	17.6	1.20	24.1	1.20	286.6	81.9
3	28.80	5	50.3	29	17.8	1.20	24.6	1.20	289.0	82.6
4	28.90	5	50.4	27	17.2	1.20	22.4	1.20	290.4	83.0
5	29.00	5	50.3	29	18.1	1.20	24.0	1.20	290.3	82.9
6	29.06	8	50.4	29	18.1	0.84	24.5	0.75	291.6	83.3
7	29.13	8	50.4	28	17.6	0.83	23.4	0.75	289.2	82.6
8	29.19	8	50.5	28	16.6	0.81	23.2	0.75	287.1	82.0
9	29.25	8	50.4	28	17.9	0.80	23.0	0.75	290.6	83.0
10	29.31	8	50.5	28	17.5	0.81	23.0	0.75	285.5	81.6
11	29.38	8	50.3	28	17.6	0.83	23.6	0.75	287.7	82.2
12	29.44	8	50.4	29	17.8	0.85	24.2	0.75	283.7	81.1
13	29.50	8	50.4	28	17.8	0.90	23.3	0.75	290.0	82.9
14	29.54	12	50.4	29	17.6	0.95	24.3	0.50	286.2	81.8
15	29.58	12	50.6	30	18.1	0.91	25.1	0.50	289.9	82.8
16	29.63	12	50.3	30	18.1	0.84	24.6	0.50	289.8	82.8
17	29.67	12	50.5	29	18.3	0.81	24.0	0.50	291.2	83.2
18	29.71	12	50.2	30	18.2	0.82	24.7	0.50	293.3	83.8
19	29.75	12	50.3	28	18.3	0.80	23.2	0.50	291.2	83.2
20	29.79	12	50.3	30	17.6	0.79	24.6	0.50	289.4	82.7
21	29.83	12	50.4	29	18.0	0.79	24.4	0.50	292.0	83.4
22	29.88	12	50.4	28	18.1	0.83	23.7	0.50	294.1	84.0
23	29.92	12	50.4	28	17.9	0.80	23.6	0.50	292.2	83.5
24	29.96	12	50.4	29	18.1	0.81	24.2	0.50	292.9	83.7
25	30.00	12	50.4	29	17.8	0.80	24.1	0.50	296.0	84.6

Average	50.4	29	17.8	0.83	23.9	0.60	290.2	82.9
Std Dev	0.1	1	0.4	0.04	0.6	0.12	3.0	0.8
Maximum	50.6	30	18.3	0.95	25.1	0.75	296.0	84.6
Minimum	50.2	28	16.6	0.79	23.0	0.50	283.7	81.1

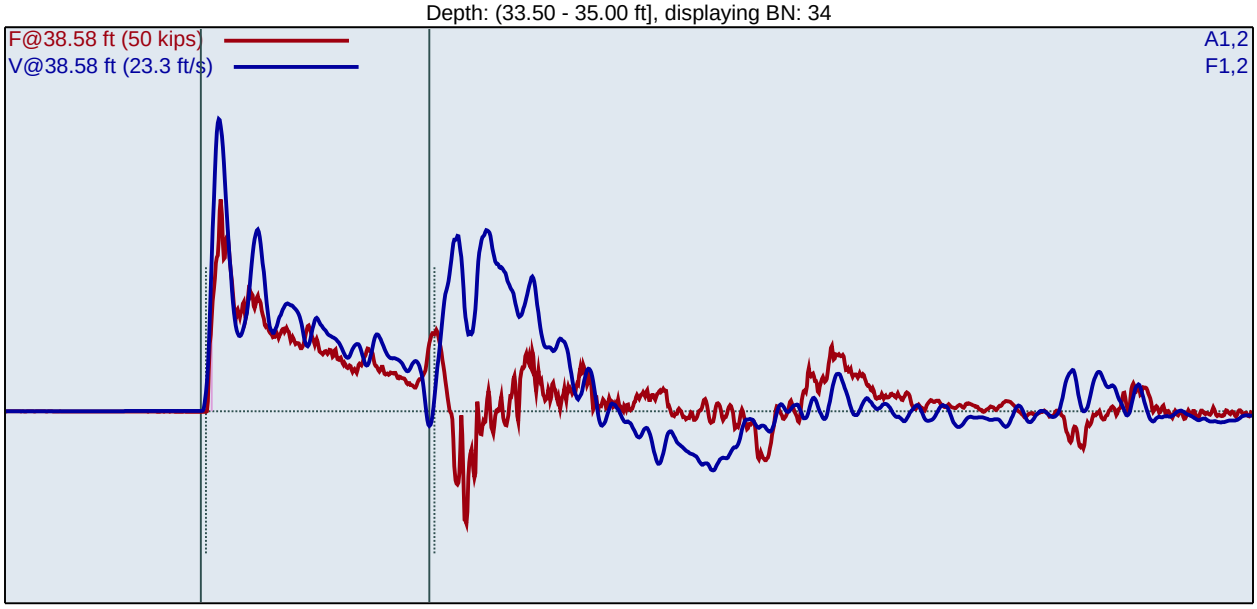
N-value: 20

Sample Interval Time: 28.54 seconds.

CME 750X ATV - SN322938 (R-58)
H. Forbes
AR: 1.20 in^2
LE: 38.58 ft
WS: 16807.9 ft/s

S&ME Annual Testing
Test date: 8/7/2017
SP: 0.492 k/ft3
EM: 30000 ksi

Depth: (33.50 - 35.00 ft], displaying BN: 34



BPM: Blows/Minute
FMX: Maximum Force
VMX: Maximum Velocity
DMX: Maximum Displacement

CSX: Compression Stress Maximum
DFN: Final Displacement
EFV: Maximum Energy
ETR: Energy Transfer Ratio - Rated

BL#	LP ft	BC /6"	BPM bpm	FMX kips	VMX ft/s	DMX in	CSX ksi	DFN in	EFV ft-lb	ETR (%)
1	33.55	11	56.3	29	16.4	1.09	23.9	0.55	296.5	84.7
2	33.59	11	51.7	29	16.8	0.77	24.4	0.55	303.4	86.7
3	33.64	11	52.0	28	17.1	0.68	23.7	0.55	302.0	86.3
4	33.68	11	51.7	28	17.6	0.66	23.7	0.55	304.4	87.0
5	33.73	11	52.0	29	17.0	0.64	23.8	0.55	301.2	86.1
6	33.77	11	51.6	29	17.7	0.63	24.3	0.55	307.0	87.7
7	33.82	11	51.8	27	17.0	0.61	22.8	0.55	295.1	84.3
8	33.86	11	51.9	28	16.6	0.61	23.5	0.55	302.0	86.3
9	33.91	11	51.9	29	17.2	0.61	24.3	0.55	304.6	87.0
10	33.95	11	51.9	29	17.5	0.60	23.8	0.55	302.9	86.6
11	34.00	11	51.8	28	16.7	0.59	23.5	0.55	300.3	85.8
12	34.04	12	51.9	28	17.5	0.57	23.3	0.50	297.2	84.9
13	34.08	12	51.7	28	17.3	0.58	23.1	0.50	304.7	87.1
14	34.13	12	52.1	28	17.7	0.59	23.1	0.50	304.3	87.0
15	34.17	12	51.7	29	17.4	0.57	23.8	0.50	304.2	86.9
16	34.21	12	51.9	29	17.3	0.56	24.0	0.50	304.2	86.9
17	34.25	12	51.9	28	16.6	0.54	23.6	0.50	298.8	85.4
18	34.29	12	51.8	29	16.7	0.53	23.8	0.50	298.8	85.4
19	34.33	12	51.9	28	17.0	0.54	23.4	0.50	300.8	85.9
20	34.38	12	51.8	28	17.0	0.52	23.7	0.50	299.1	85.5
21	34.42	12	51.8	28	17.3	0.52	23.1	0.50	299.0	85.4
22	34.46	12	51.7	28	17.5	0.53	23.7	0.50	301.5	86.1
23	34.50	12	52.0	28	17.6	0.53	23.5	0.50	301.1	86.0
24	34.54	13	51.6	28	17.7	0.53	23.1	0.46	304.2	86.9
25	34.58	13	52.0	29	17.6	0.53	23.8	0.46	301.4	86.1

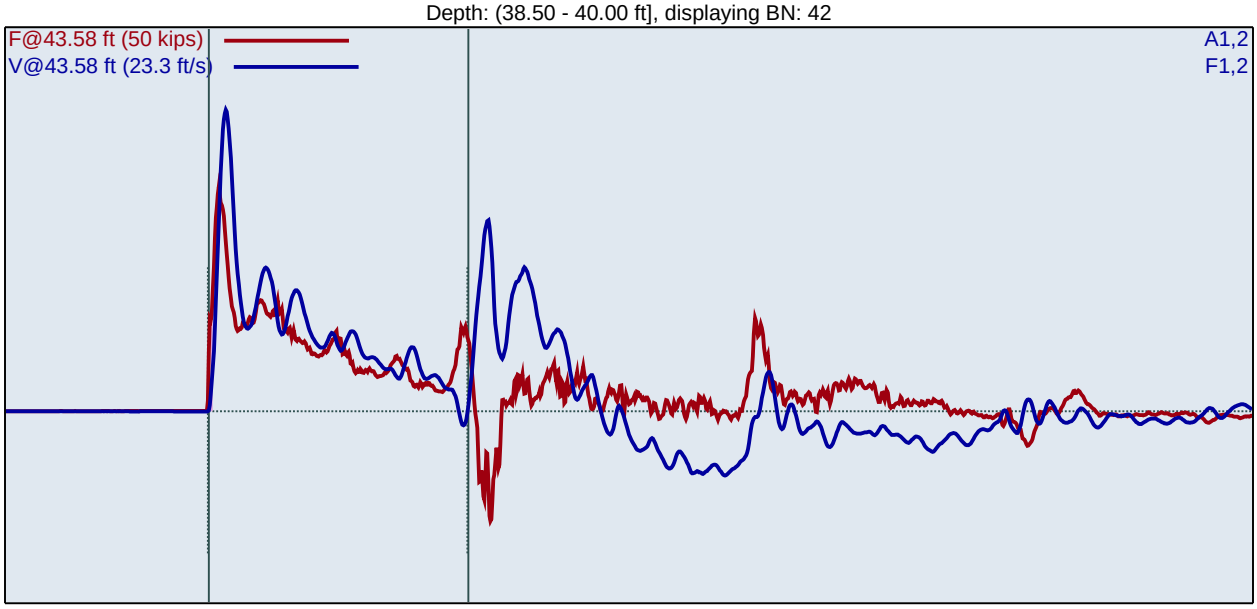
26	34.62	13	51.6	28	17.8	0.52	23.1	0.46	300.3	85.8
27	34.65	13	52.0	27	17.9	0.51	22.8	0.46	301.3	86.1
28	34.69	13	51.8	28	17.8	0.52	22.9	0.46	299.5	85.6
29	34.73	13	51.7	27	18.0	0.52	22.8	0.46	302.9	86.6
30	34.77	13	52.0	28	17.8	0.51	23.1	0.46	298.1	85.2
31	34.81	13	51.6	26	17.0	0.52	21.7	0.46	297.8	85.1
32	34.85	13	51.9	26	17.7	0.52	21.4	0.46	297.4	85.0
33	34.88	13	51.8	26	16.5	0.53	21.3	0.46	296.5	84.7
34	34.92	13	51.8	28	17.8	0.53	23.0	0.46	302.7	86.5
35	34.96	13	51.7	26	17.9	0.51	21.6	0.46	299.8	85.6
36	35.00	13	51.9	25	17.7	0.50	21.1	0.46	302.3	86.4
		Average	51.8	28	17.4	0.53	22.9	0.48	300.7	85.9
		Std Dev	0.1	1	0.4	0.02	0.8	0.02	2.5	0.7
		Maximum	52.1	29	18.0	0.59	24.0	0.50	304.7	87.1
		Minimum	51.6	25	16.5	0.50	21.1	0.46	296.5	84.7
				N-value: 25						

Sample Interval Time: 40.46 seconds.

CME 750X ATV - SN322938 (R-58)
H. Forbes
AR: 1.20 in^2
LE: 43.58 ft
WS: 16807.9 ft/s

S&ME Annual Testing
Test date: 8/7/2017
SP: 0.492 k/ft3
EM: 30000 ksi

Depth: (38.50 - 40.00 ft], displaying BN: 42



BPM: Blows/Minute
FMX: Maximum Force
VMX: Maximum Velocity
DMX: Maximum Displacement

CSX: Compression Stress Maximum
DFN: Final Displacement
EFV: Maximum Energy
ETR: Energy Transfer Ratio - Rated

BL#	LP ft	BC /6"	BPM bpm	FMX kips	VMX ft/s	DMX in	CSX ksi	DFN in	EFV ft-lb	ETR (%)
1	38.54	13	59.6	28	18.3	0.97	23.7	0.46	296.6	84.7
2	38.58	13	51.2	28	18.2	0.80	23.0	0.46	299.5	85.6
3	38.62	13	51.5	28	17.9	0.76	22.9	0.46	295.4	84.4
4	38.65	13	51.1	28	18.2	0.74	23.4	0.46	298.5	85.3
5	38.69	13	51.3	28	18.4	0.72	23.2	0.46	297.5	85.0
6	38.73	13	51.3	28	17.4	0.70	23.3	0.46	295.4	84.4
7	38.77	13	51.3	27	18.2	0.68	22.9	0.46	294.9	84.3
8	38.81	13	51.5	29	18.0	0.66	24.5	0.46	297.0	84.9
9	38.85	13	51.7	29	18.2	0.64	24.3	0.46	298.7	85.3
10	38.88	13	51.7	27	17.9	0.62	22.9	0.46	297.2	84.9
11	38.92	13	51.7	29	18.1	0.61	23.8	0.46	297.1	84.9
12	38.96	13	51.7	29	18.2	0.59	24.3	0.46	295.6	84.5
13	39.00	13	51.5	29	18.3	0.59	23.9	0.46	297.1	84.9
14	39.04	14	51.8	29	17.9	0.57	24.1	0.43	297.1	84.9
15	39.07	14	51.5	29	18.4	0.56	24.3	0.43	297.6	85.0
16	39.11	14	51.7	28	18.2	0.56	23.6	0.43	297.2	84.9
17	39.14	14	51.5	28	18.1	0.55	23.6	0.43	295.0	84.3
18	39.18	14	51.6	28	17.8	0.55	23.7	0.43	297.3	85.0
19	39.21	14	51.7	28	18.1	0.54	23.3	0.43	294.4	84.1
20	39.25	14	51.6	29	18.1	0.54	24.2	0.43	296.3	84.7
21	39.29	14	51.6	28	18.0	0.53	23.0	0.43	294.3	84.1
22	39.32	14	51.5	30	17.8	0.53	25.1	0.43	296.6	84.7
23	39.36	14	51.8	28	17.8	0.52	23.1	0.42	293.8	84.0
24	39.39	14	51.5	30	17.8	0.52	24.7	0.43	298.5	85.3
25	39.43	14	51.7	27	17.7	0.52	22.7	0.43	295.1	84.3

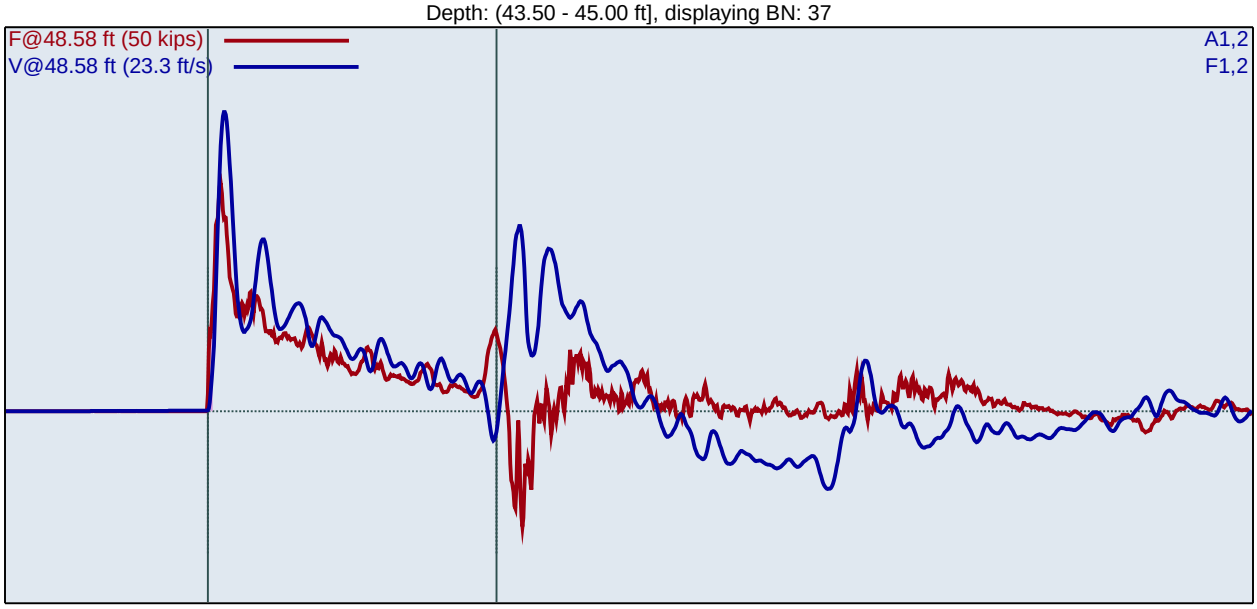
26	39.46	14	51.5	29	17.7	0.51	24.1	0.43	295.8	84.5
27	39.50	14	51.7	28	18.0	0.51	22.9	0.43	296.6	84.7
28	39.53	17	51.6	30	17.8	0.51	24.8	0.35	295.8	84.5
29	39.56	17	51.5	27	17.5	0.50	22.4	0.35	295.9	84.6
30	39.59	17	51.7	29	17.9	0.50	24.0	0.35	294.0	84.0
31	39.62	17	51.4	28	18.1	0.50	23.5	0.35	297.6	85.0
32	39.65	17	51.8	26	17.2	0.49	21.9	0.35	292.2	83.5
33	39.68	17	51.5	29	17.8	0.49	23.9	0.35	293.9	84.0
34	39.71	17	51.5	28	17.7	0.49	23.3	0.35	295.9	84.5
35	39.74	17	51.6	30	17.7	0.49	25.0	0.35	295.7	84.5
36	39.76	17	51.5	27	17.8	0.48	22.8	0.35	294.0	84.0
37	39.79	17	51.7	30	17.7	0.48	25.2	0.35	296.7	84.8
38	39.82	17	51.6	28	17.9	0.47	23.7	0.35	296.8	84.8
39	39.85	17	51.7	29	17.9	0.47	24.5	0.35	295.7	84.5
40	39.88	17	51.5	29	18.0	0.47	24.3	0.35	296.8	84.8
41	39.91	17	51.8	28	17.9	0.46	23.6	0.35	296.0	84.6
42	39.94	17	51.6	29	18.3	0.46	24.3	0.35	295.4	84.4
43	39.97	17	51.7	28	17.2	0.46	23.0	0.35	293.6	83.9
44	40.00	17	51.5	29	17.5	0.45	24.1	0.35	297.9	85.1
		Average	51.6	29	17.8	0.51	23.8	0.39	295.8	84.5
		Std Dev	0.1	1	0.3	0.03	0.8	0.04	1.5	0.4
		Maximum	51.8	30	18.4	0.57	25.2	0.43	298.5	85.3
		Minimum	51.4	26	17.2	0.45	21.9	0.35	292.2	83.5
				N-value: 31						

Sample Interval Time: 49.95 seconds.

CME 750X ATV - SN322938 (R-58)
H. Forbes
AR: 1.20 in^2
LE: 48.58 ft
WS: 16807.9 ft/s

S&ME Annual Testing
Test date: 8/7/2017
SP: 0.492 k/ft3
EM: 30000 ksi

Depth: (43.50 - 45.00 ft], displaying BN: 37



BPM: Blows/Minute
FMX: Maximum Force
VMX: Maximum Velocity
DMX: Maximum Displacement

CSX: Compression Stress Maximum
DFN: Final Displacement
EFV: Maximum Energy
ETR: Energy Transfer Ratio - Rated

BL#	LP ft	BC /6"	BPM bpm	FMX kips	VMX ft/s	DMX in	CSX ksi	DFN in	EFV ft-lb	ETR (%)
1	43.55	10	59.9	29	17.7	1.08	24.5	0.60	304.6	87.0
2	43.60	10	51.9	28	17.5	0.78	23.7	0.60	298.4	85.2
3	43.65	10	51.8	30	17.9	0.77	24.7	0.60	302.6	86.4
4	43.70	10	52.0	29	18.4	0.77	24.3	0.60	308.2	88.1
5	43.75	10	51.8	30	18.4	0.71	25.2	0.60	305.0	87.1
6	43.80	10	51.9	29	18.1	0.71	24.4	0.60	303.5	86.7
7	43.85	10	51.9	30	18.4	0.70	24.9	0.60	310.5	88.7
8	43.90	10	52.0	30	18.2	0.68	24.6	0.60	305.7	87.3
9	43.95	10	51.5	29	17.8	0.67	24.5	0.60	309.1	88.3
10	44.00	10	51.9	31	18.4	0.67	26.0	0.60	312.2	89.2
11	44.04	12	51.9	30	18.1	0.64	25.3	0.50	306.2	87.5
12	44.08	12	51.7	29	17.9	0.62	24.0	0.50	309.0	88.3
13	44.13	12	51.9	30	18.0	0.59	24.8	0.50	301.6	86.2
14	44.17	12	51.6	31	18.3	0.60	25.5	0.50	313.4	89.5
15	44.21	12	52.0	30	18.2	0.58	24.9	0.50	302.7	86.5
16	44.25	12	51.7	30	17.9	0.59	24.9	0.50	311.4	89.0
17	44.29	12	51.8	30	18.3	0.59	25.2	0.50	309.4	88.4
18	44.33	12	51.8	30	17.9	0.59	25.2	0.50	312.3	89.2
19	44.38	12	51.8	29	17.9	0.57	24.4	0.50	303.9	86.8
20	44.42	12	51.7	30	17.8	0.56	24.9	0.50	305.4	87.3
21	44.46	12	51.7	29	17.9	0.56	24.3	0.50	304.9	87.1
22	44.50	12	52.1	29	17.7	0.56	24.3	0.50	305.3	87.2
23	44.53	17	51.7	31	18.1	0.56	25.7	0.35	306.8	87.7
24	44.56	17	52.1	29	17.8	0.55	24.6	0.35	305.1	87.2
25	44.59	17	51.4	30	18.3	0.56	24.8	0.35	311.8	89.1

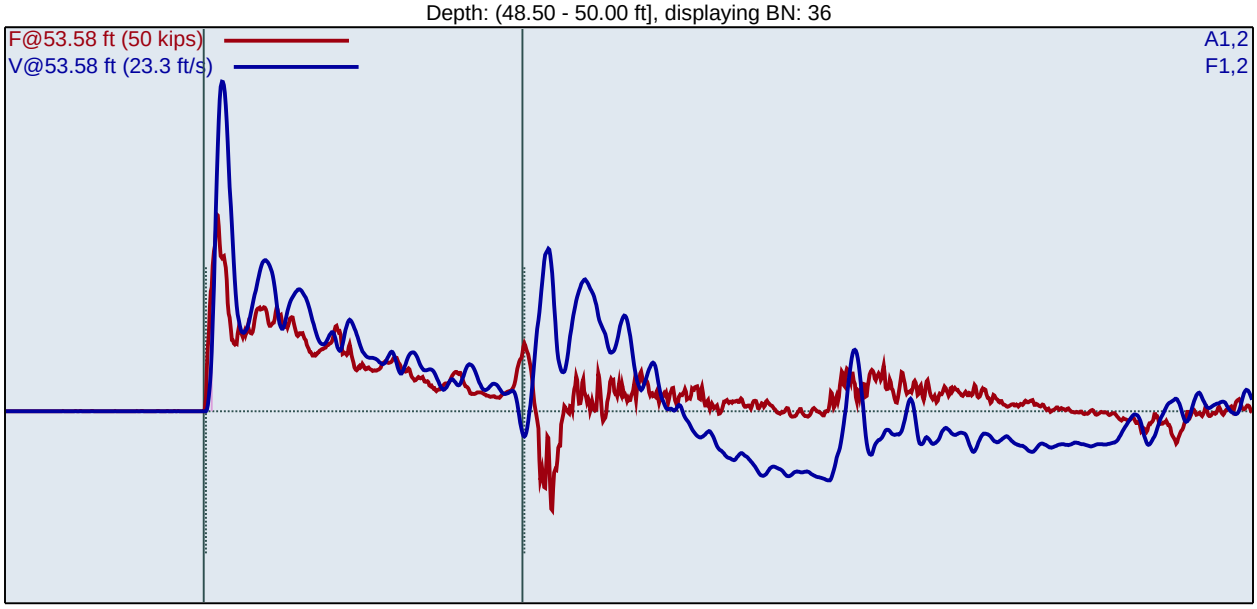
26	44.62	17	52.1	29	17.6	0.54	24.2	0.35	300.3	85.8
27	44.65	17	51.7	29	17.6	0.53	24.1	0.35	306.0	87.4
28	44.68	17	51.9	29	17.9	0.53	24.0	0.35	303.5	86.7
29	44.71	17	51.7	29	16.9	0.53	24.0	0.35	301.9	86.3
30	44.74	17	51.6	27	17.1	0.52	22.1	0.35	302.1	86.3
31	44.76	17	52.0	29	17.7	0.49	23.9	0.35	297.0	84.8
32	44.79	17	51.7	28	18.0	0.49	23.6	0.35	297.5	85.0
33	44.82	17	51.9	29	17.7	0.50	24.0	0.35	301.9	86.3
34	44.85	17	51.6	29	18.0	0.50	23.9	0.35	302.8	86.5
35	44.88	17	51.7	29	17.8	0.51	24.5	0.35	306.2	87.5
36	44.91	17	51.6	29	17.8	0.51	24.1	0.35	306.3	87.5
37	44.94	17	51.9	30	18.2	0.50	24.8	0.35	307.4	87.8
38	44.97	17	52.0	29	17.8	0.50	24.5	0.35	304.8	87.1
39	45.00	17	51.7	28	17.3	0.49	23.3	0.35	305.2	87.2
		Average	51.8	29	17.8	0.55	24.4	0.41	305.2	87.2
		Std Dev	0.2	1	0.3	0.04	0.7	0.07	4.0	1.1
		Maximum	52.1	31	18.3	0.64	25.7	0.50	313.4	89.5
		Minimum	51.4	27	16.9	0.49	22.1	0.35	297.0	84.8
					N-value: 29					

Sample Interval Time: 43.93 seconds.

CME 750X ATV - SN322938 (R-58)
H. Forbes
AR: 1.20 in^2
LE: 53.58 ft
WS: 16807.9 ft/s

S&ME Annual Testing
Test date: 8/7/2017
SP: 0.492 k/ft3
EM: 30000 ksi

Depth: (48.50 - 50.00 ft], displaying BN: 36



BPM: Blows/Minute
FMX: Maximum Force
VMX: Maximum Velocity
DMX: Maximum Displacement

CSX: Compression Stress Maximum
DFN: Final Displacement
EFV: Maximum Energy
ETR: Energy Transfer Ratio - Rated

BL#	LP ft	BC /6"	BPM bpm	FMX kips	VMX ft/s	DMX in	CSX ksi	DFN in	EFV ft-lb	ETR (%)
1	48.56	8	52.4	27	19.9	1.03	22.4	0.75	312.1	89.2
2	48.63	8	52.1	26	19.2	0.92	21.7	0.75	309.0	88.3
3	48.69	8	51.8	27	20.0	0.89	22.5	0.75	316.4	90.4
4	48.75	8	52.0	27	19.6	0.82	22.6	0.75	309.3	88.4
5	48.81	8	51.9	27	19.9	0.81	22.7	0.75	314.9	90.0
6	48.88	8	51.9	27	19.7	0.77	22.5	0.75	310.8	88.8
7	48.94	8	52.1	27	19.9	0.77	22.6	0.75	314.0	89.7
8	49.00	8	52.0	27	19.8	0.76	22.8	0.75	313.9	89.7
9	49.04	12	52.2	27	19.6	0.67	22.7	0.50	309.4	88.4
10	49.08	12	51.9	28	19.6	0.65	23.2	0.50	309.7	88.5
11	49.13	12	52.0	28	19.4	0.64	23.3	0.50	311.6	89.0
12	49.17	12	51.9	27	19.3	0.64	22.7	0.50	311.2	88.9
13	49.21	12	52.0	27	19.4	0.63	22.5	0.50	309.2	88.3
14	49.25	12	51.8	28	19.4	0.62	23.2	0.50	310.9	88.8
15	49.29	12	51.9	27	19.3	0.62	22.8	0.50	310.3	88.7
16	49.33	12	52.0	28	19.6	0.61	23.0	0.50	310.0	88.6
17	49.38	12	51.8	27	19.6	0.60	22.5	0.50	306.8	87.7
18	49.42	12	52.0	26	20.0	0.60	21.5	0.50	310.1	88.6
19	49.46	12	51.8	26	19.1	0.59	21.9	0.50	309.8	88.5
20	49.50	12	52.0	26	19.9	0.58	21.8	0.50	309.4	88.4
21	49.53	18	51.8	27	19.9	0.60	22.1	0.33	318.1	90.9
22	49.56	18	52.0	27	19.8	0.56	22.3	0.33	306.3	87.5
23	49.58	18	51.9	27	18.7	0.59	22.9	0.33	317.4	90.7
24	49.61	18	51.9	26	19.7	0.56	22.0	0.33	305.1	87.2
25	49.64	18	51.9	26	19.5	0.57	21.7	0.33	312.1	89.2

26	49.67	18	51.5	24	19.1	0.55	20.2	0.33	303.5	86.7
27	49.69	18	52.1	26	19.9	0.56	21.8	0.33	311.5	89.0
28	49.72	18	51.7	25	20.0	0.55	21.2	0.33	311.9	89.1
29	49.75	18	52.0	26	20.3	0.54	21.8	0.33	310.6	88.7
30	49.78	18	51.8	26	19.5	0.53	21.7	0.33	304.6	87.0
31	49.81	18	52.0	24	20.4	0.53	20.4	0.33	312.1	89.2
32	49.83	18	51.9	26	20.1	0.53	22.1	0.33	311.7	89.1
33	49.86	18	52.2	26	19.2	0.51	21.4	0.33	302.3	86.4
34	49.89	18	51.8	25	20.3	0.51	21.0	0.33	310.3	88.6
35	49.92	18	51.7	25	20.1	0.50	21.2	0.33	308.1	88.0
36	49.94	18	51.9	26	20.0	0.50	21.4	0.33	309.2	88.4
37	49.97	18	51.5	26	20.6	0.51	21.5	0.33	313.8	89.6
38	50.00	18	51.9	25	19.9	0.49	21.0	0.33	303.3	86.7
		Average	51.9	26	19.7	0.57	22.0	0.40	309.7	88.5
		Std Dev	0.2	1	0.4	0.05	0.8	0.08	3.6	1.0
		Maximum	52.2	28	20.6	0.67	23.3	0.50	318.1	90.9
		Minimum	51.5	24	18.7	0.49	20.2	0.33	302.3	86.4
					N-value: 30					

Sample Interval Time: 42.70 seconds.

Summary of SPT Test Results

Project: CME 750X ATV - SN322938 (R-58), Test Date: 8/7/2017

BPM: Blows/Minute
FMX: Maximum Force
VMX: Maximum Velocity
DMX: Maximum Displacement
CSX: Compression Stress Maximum
DFN: Final Displacement
EFV: Maximum Energy
ETR: Energy Transfer Ratio - Rated

Instr. Length ft	Start Depth ft	Final Depth ft	Blows Applied /6"	**N Value**	**N60 Value**	Average BPM bpm	Average FMX kips	Average VMX ft/s	Average DMX in	Average CSX ksi	Average DFN in	Average EFV ft-lb	Average ETR (%)
33.58	28.50	30.00	**5-8-12**	**20**	**28**	50.4	29	17.8	0.83	23.9	0.60	290.2	82.9
38.58	33.50	35.00	**11-12-13**	**25**	**35**	51.8	28	17.4	0.53	22.9	0.48	300.7	85.9
43.58	38.50	40.00	**13-14-17**	**31**	**44**	51.6	29	17.8	0.51	23.8	0.39	295.8	84.5
48.58	43.50	45.00	**10-12-17**	**29**	**41**	51.8	29	17.8	0.55	24.4	0.41	305.2	87.2
53.58	48.50	50.00	**8-12-18**	**30**	**42**	51.9	26	19.7	0.57	22.0	0.40	309.7	88.5
			Overall Average Values:			51.6	28	18.2	0.58	23.4	0.44	301.0	86.0
			Standard Deviation:			0.5	1	0.9	0.11	1.2	0.10	7.3	2.1
			Overall Maximum Value:			52.2	31	20.6	0.95	25.7	0.75	318.1	90.9
			Overall Minimum Value:			50.2	24	16.5	0.45	20.2	0.33	283.7	81.1

Report of SPT Energy Measurements
S&ME CME-55 Truck (SN 328245)
Fayetteville, North Carolina
S&ME Project No. 6235-17-009

Prepared for:

North Carolina Department of Transportation
Geotechnical Engineering Unit
1589 Mail Service Center
Raleigh, North Carolina 27699

Prepared by:

S&ME, Inc.
9751 Southern Pine Boulevard
Charlotte, NC 28273

May 1, 2017

May 1, 2017

North Carolina Department of Transportation
Geotechnical Engineering Unit
1589 Mail Service Center
Raleigh, North Carolina 27699

Attention: Mr. Shunyi (Chris) Chen, Ph.D., P.E.

cc: Ms. Cheryl A. Youngblood, L.G.

Reference: **Report of SPT Energy Measurements**
S&ME CME-55 Truck (SN 328245)
Fayetteville, North Carolina
S&ME Project No. 6235-17-009

Dear Mr. Chen:

We have completed the Standard Penetration Test (SPT) energy measurements on the automatic hammer mounted on our CME-55 Truck drill rig with a serial number of 328245. This service was performed by our Mr. Robert E. Kral on April 4, 2017 between the times of 11:39 AM and 12:40 PM. SPT energy testing was performed in general accordance with ASTM D4633 and the most recent revision of the North Carolina Department of Transportation, Geotechnical Engineering Unit's requirements. The testing procedures, equipment used during testing, and detailed results are presented in this report.

1.0 Dynamic Testing Methodology

Testing was performed using a model PAX (Serial No. 3733L) Pile Driving Analyzer™ (PDA) manufactured by Pile Dynamics, Inc. The PDA records and interprets data from two piezoresistive accelerometers (Serial Nos. K5641 and K5642) bolted to a 2-foot long AWJ drill rod (SN203) internally instrumented with two strain transducers. The instrumented AWJ drill rod has a cross-sectional area of 1.20 square inches, an outside diameter of approximately 1.75 inches, and an inside diameter of 1.375 inches at the gage location. Calibration sheets for the accelerometers and the instrumented rod are included in the Appendix. The accelerometers and strain gages, which are mounted on opposing axes near the middle of the instrumented rod, monitor acceleration and strain for each hammer blow. The analyzer converts the data to velocities and forces, computing the maximum transferred hammer energies with the "EFV" method described in ASTM D4633. All results are recorded and displayed in real time for each blow.

2.0 Testing and Observations

S&ME personnel were on site on April 4, 2017 to observe and perform testing during SPT sampling on the CME-55 truck mounted rig operated by Ted Miller of S&ME. The measurements were taken during drilling operations at the Fayetteville Outer Loop (TIP U-2519AA) project in Fayetteville, North Carolina. The measurements were obtained during the SPT sampling of Soil Test Boring Y2_2800. SPT energy measurements were recorded during four intervals at depths of approximately 57.6, 62.6, 67.6, and 72.6 ft below the existing ground surface. The information presented in the tables below summarizes the equipment tested and tooling used for this Report of SPT Energy Measurements.

Table 2-1: Drill Rig Information

Manufacturer	CME
Model	55
Serial Number	328245
Operator	Ted Miller
Carrier	Truck

Table 2-2: Hammer Information

Model / Type	CME / Auto
Serial Number	N/A
Anvil Height (inches)	11.5
Anvil Diameter (inches)	2.5
Drop Height (inches)	30
Ram Weight (pounds)	140
Ram Serial Number	N/A

Table 2-3: Drilling and Instrumented Rod Information

Drill Rod Type	AWJ
OD (inches)	1.75
ID (inches)	1.25
Cross-Sectional Area (in^2)	1.20
Typical Length (feet)	5 and 10
Instrumented Rod Type	AWJ (SN 203)
OD (inches)	1.75
ID (inches)	1.25
Cross-Sectional Area (in^2)	1.20
Total Instrumented Rod Length (feet)	2.0
Length Below Gages (feet)	0.88
Split Spoon Length (feet)	2.88

The reported blow counts, obtained by the drill rig personnel, are presented with the energy data in Table 3-1 and on the Field and Boring Logs in the Appendix. A representative graph of force and normalized velocity vs. time for a typical blow and the following list of plots and tables are incorporated into the Appendix.

3.0 Dynamic Testing Results

Based on the test data, the automatic hammer on the CME-55 truck mounted rig operated at a rate of about 51.6 to 52.2 blows per minute (bpm) during dynamic testing. The measured transferred hammer energy (EFV) was generally in the range of about 267.1 to 307.3 ft-lbs, which corresponds to Energy Transfer Ratio (ETR) values of about 76.3% to 87.8%, respectively. The SPT Energy Measurement Data Summary tables in the Appendix present the test data from every hammer blow at each sampling interval along with representative force and velocity traces for each test interval. The reported blow counts, obtained by the drill rig personnel, and a summary of the test data and average computed hammer energy and transfer ratio values are provided in Table 3-1. Plots and tables of the following are also included in the Appendix and present the test data with depth for each test interval:

- Penetration vs. BLC
- Penetration vs. FMX
- Penetration vs. EFV
- Penetration vs. CSX
- Penetration vs. VMX
- Penetration vs. ETR
- Average ETR vs. Rod Length
- ETR vs. Rod Length

Table 3-1: Summary of Dynamic Testing Results

Data Set ID	Instrumentation to Sampler Tip Length (ft)	Sample Depth (ft)	Blows per 6" Increment / N-value	Soil Sample Description (Residual)	Avg. BPM	Avg. EFV (ft-lbs)	Avg. ETR (percent)
1	63.76	57.6 - 59.1	7-10-9 / 19	SAND	51.9	286.9	82.0
2	68.76	62.6 - 64.1	9-10-12 / 22	SAND	52.0	298.6	85.3
3	73.76	67.6 - 69.1	6-13-17 / 30	SAND	51.9	295.9	84.5
4	78.76	72.6 - 74.1	6-11-10 / 21	SAND	51.9	294.8	84.2
				Overall Average	**51.9**	**294.4**	**84.1**

The average hammer rate, transferred energy, and transfer ratio were calculated for each depth interval. Per ASTM D4633, only the blows from the final foot of each sample interval (i.e. the blows that determine the N-value) were included when computing these average values. **The overall average transferred hammer energy for the automatic hammer on the CME-55 truck mounted rig (for all the depth intervals tested) was 294.4 foot-pounds, with an average ETR of 84.1%.**

4.0 Limitations of Report

This report has been prepared in accordance with generally accepted geotechnical engineering practice for specific application to this project. The conclusions contained in this report were based on the applicable standards of our profession in this geographic area at the time this report was prepared. No other warranty, express or implied, is made.

5.0 Closing

S&ME appreciates the opportunity to provide this report to the North Carolina Department of Transportation Geotechnical Engineering Unit. Please let us know if you have any questions concerning this report.

Sincerely,

S&ME, Inc.

R. Heath Forbes, P.E. (SC)
Geotechnical Project Manager

NORTH CAROLINA PROFESSIONAL SEAL 042642 ENGINEER ROBERT E. KRAL
rkral@sandmeinc.com
2017.05.01 17:16:49 -05'00'

Robert E. Kral, P.E.
Transportation Services Project Manager
N.C. Registration No. 042642

Senior Reviewed By: Kristen H. Hill, L.G., P.E.

Appendices:

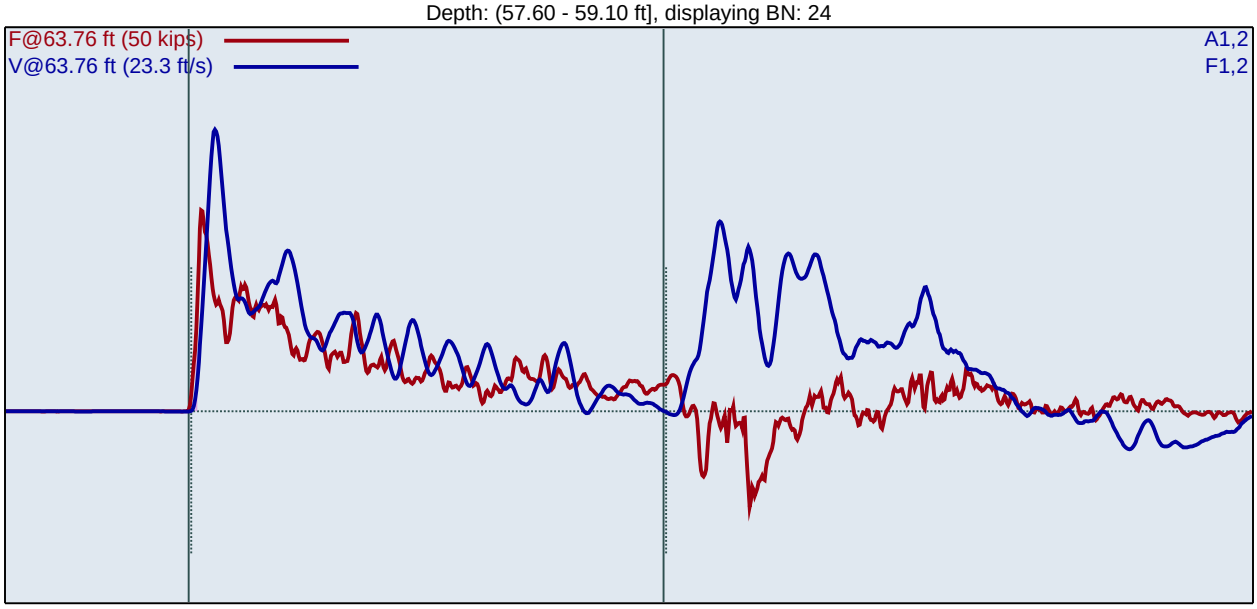
- Appendix I - CME 55 (SN 328245) SPT Energy Measurements Summary Plots and Tables
- Appendix II - Field Log and Boring Log
- Appendix III - Instrumented Rod and Accelerometer Calibration Sheets
- Appendix IV - Certificate of Proficiency

Appendix I

CME55 Truck (SN 328245)
R. Kral
AR: 1.20 in^2
LE: 63.76 ft
WS: 16807.9 ft/s

28+00, 20LT
Test date: 4/4/2017
SP: 0.492 k/ft3
EM: 30000 ksi

Depth: (57.60 - 59.10 ft], displaying BN: 24



BPM: Blows/Minute
FMX: Maximum Force
VMX: Maximum Velocity
DMX: Maximum Displacement

CSX: Compression Stress Maximum
DFN: Final Displacement
EFV: Maximum Energy
ETR: Energy Transfer Ratio - Rated

BL#	LP ft	BC /6"	BPM bpm	FMX kips	VMX ft/s	DMX in	CSX ksi	DFN in	EFV ft-lb	ETR (%)
1	57.67	7	60.7	27	14.5	1.02	22.9	0.78	247.9	70.8
2	57.74	7	52.7	27	14.5	1.03	22.2	0.82	266.7	76.2
3	57.81	7	52.0	27	14.5	0.84	22.7	0.81	255.9	73.1
4	57.89	7	51.8	27	14.6	0.82	22.7	0.81	266.4	76.1
5	57.96	7	52.2	27	14.9	0.81	22.6	0.81	264.2	75.5
6	58.03	7	52.0	27	15.1	0.83	22.8	0.82	275.9	78.8
7	58.10	7	52.1	27	15.5	0.86	22.7	0.83	286.6	81.9
8	58.15	10	51.9	27	15.9	0.70	22.9	0.57	280.6	80.2
9	58.20	10	51.9	27	15.8	0.67	22.5	0.56	275.1	78.6
10	58.25	10	52.0	27	15.9	0.67	22.6	0.56	273.4	78.1
11	58.30	10	51.9	28	16.0	0.68	23.0	0.57	275.0	78.6
12	58.35	10	52.0	28	16.3	0.78	23.2	0.56	290.9	83.1
13	58.40	10	51.7	28	16.5	0.69	23.1	0.57	279.9	80.0
14	58.45	10	52.2	28	16.5	0.67	23.5	0.57	274.3	78.4
15	58.50	10	51.7	27	16.6	0.77	22.8	0.57	292.7	83.6
16	58.55	10	52.1	27	16.5	0.75	22.5	0.57	290.2	82.9
17	58.60	10	52.2	27	16.3	0.74	22.6	0.57	287.9	82.3
18	58.66	9	51.7	27	16.3	0.76	22.2	0.63	294.5	84.2
19	58.71	9	52.0	27	16.3	0.73	22.2	0.65	289.5	82.7
20	58.77	9	51.9	25	16.5	0.74	20.8	0.64	292.3	83.5
21	58.82	9	51.9	27	16.2	0.72	22.3	0.64	290.6	83.0
22	58.88	9	51.9	26	17.3	0.71	21.9	0.64	295.6	84.5
23	58.93	9	52.2	27	16.8	0.71	22.3	0.64	290.4	83.0
24	58.99	9	51.9	26	17.1	0.71	21.8	0.64	291.7	83.4
25	59.04	9	52.0	25	16.9	0.71	21.1	0.64	293.0	83.7

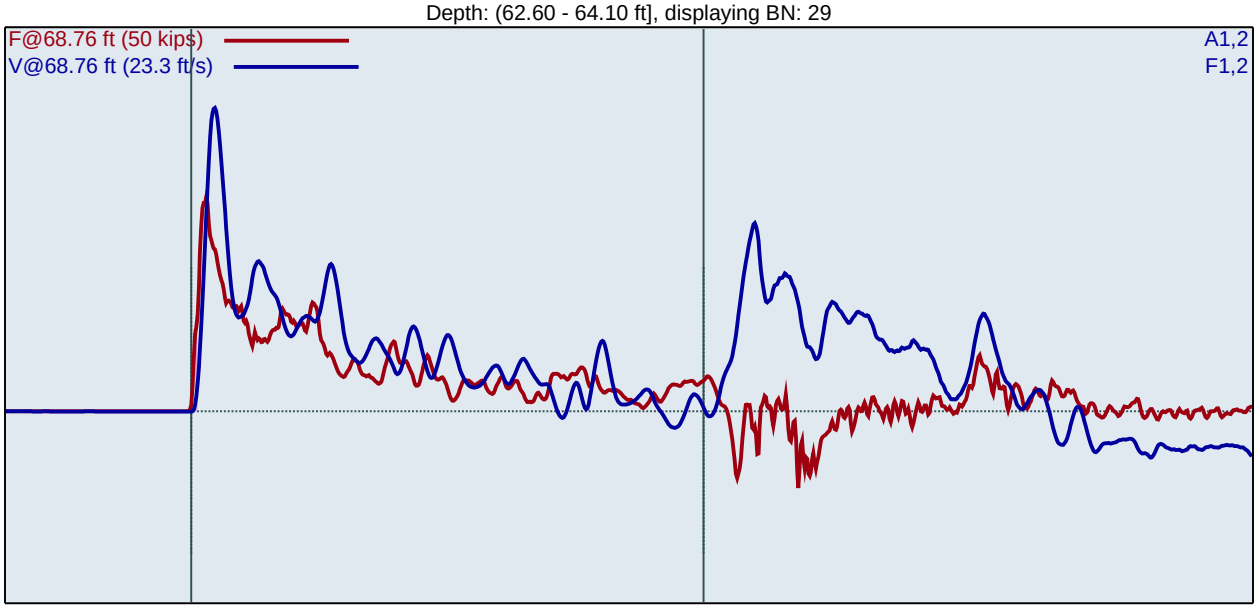
26	59.10	9	51.9	25	16.1	0.70	20.6	0.64	293.7	83.9
		Average	51.9	27	16.4	0.72	22.3	0.60	286.9	82.0
		Std Dev	0.1	1	0.4	0.03	0.8	0.04	7.5	2.1
		Maximum	52.2	28	17.3	0.78	23.5	0.65	295.6	84.5
		Minimum	51.7	25	15.8	0.67	20.6	0.56	273.4	78.1
					N-value: 19					

Sample Interval Time: 28.81 seconds.

CME55 Truck (SN 328245)
R. Kral
AR: 1.20 in^2
LE: 68.76 ft
WS: 16807.9 ft/s

28+00, 20LT
Test date: 4/4/2017
SP: 0.492 k/ft3
EM: 30000 ksi

Depth: (62.60 - 64.10 ft], displaying BN: 29



BPM: Blows/Minute
FMX: Maximum Force
VMX: Maximum Velocity
DMX: Maximum Displacement

CSX: Compression Stress Maximum
DFN: Final Displacement
EFV: Maximum Energy
ETR: Energy Transfer Ratio - Rated

BL#	LP ft	BC /6"	BPM bpm	FMX kips	VMX ft/s	DMX in	CSX ksi	DFN in	EFV ft-lb	ETR (%)
1	62.66	9	61.1	27	16.9	0.69	22.6	0.61	261.9	74.8
2	62.71	9	52.2	27	17.0	0.69	22.8	0.62	269.8	77.1
3	62.77	9	52.1	28	17.2	0.70	23.0	0.63	277.9	79.4
4	62.82	9	51.7	28	17.1	0.67	23.7	0.63	275.2	78.6
5	62.88	9	52.1	30	17.7	0.67	24.6	0.63	280.4	80.1
6	62.93	9	51.9	29	18.1	0.73	24.2	0.64	295.0	84.3
7	62.99	9	52.1	27	18.1	0.68	22.7	0.63	289.4	82.7
8	63.04	9	52.0	28	17.9	0.68	23.6	0.63	284.1	81.2
9	63.10	9	51.8	27	17.8	0.72	22.1	0.64	291.3	83.2
10	63.15	10	52.1	26	17.7	0.68	22.1	0.57	288.0	82.3
11	63.20	10	51.8	27	17.9	0.64	22.6	0.56	281.8	80.5
12	63.25	10	52.0	26	17.5	0.72	21.9	0.56	297.4	85.0
13	63.30	10	51.7	26	17.7	0.73	21.9	0.56	296.1	84.6
14	63.35	10	52.1	26	17.4	0.67	21.6	0.57	291.3	83.2
15	63.40	10	51.8	27	17.8	0.67	22.4	0.57	291.6	83.3
16	63.45	10	52.1	27	17.9	0.71	22.4	0.57	299.7	85.6
17	63.50	10	52.0	27	18.0	0.62	22.7	0.57	286.6	81.9
18	63.55	10	51.9	28	18.1	0.67	23.0	0.58	300.7	85.9
19	63.60	10	52.0	27	17.9	0.68	22.5	0.57	297.1	84.9
20	63.64	12	51.8	28	18.5	0.68	23.5	0.48	300.2	85.8
21	63.68	12	51.9	28	18.5	0.68	23.6	0.48	304.5	87.0
22	63.73	12	51.9	28	18.6	0.67	23.3	0.48	305.1	87.2
23	63.77	12	52.2	28	18.3	0.67	23.4	0.47	304.9	87.1
24	63.81	12	51.8	28	18.4	0.67	23.1	0.47	306.8	87.7
25	63.85	12	52.2	28	18.2	0.64	23.0	0.47	301.2	86.1

26	63.89	12	51.8	28	18.2	0.64	23.1	0.47	300.9	86.0
27	63.93	12	52.0	28	18.3	0.64	23.1	0.47	301.1	86.0
28	63.98	12	51.9	28	18.4	0.65	23.0	0.47	306.1	87.4
29	64.02	12	51.9	28	18.4	0.64	23.3	0.47	304.6	87.0
30	64.06	12	52.1	28	18.4	0.64	23.0	0.47	303.1	86.6
31	64.10	12	51.9	27	18.2	0.63	22.9	0.47	301.4	86.1
		Average	52.0	27	18.1	0.67	22.8	0.52	298.6	85.3
		Std Dev	0.1	1	0.3	0.03	0.5	0.05	6.7	1.9
		Maximum	52.2	28	18.6	0.73	23.6	0.58	306.8	87.7
		Minimum	51.7	26	17.4	0.62	21.6	0.47	281.8	80.5

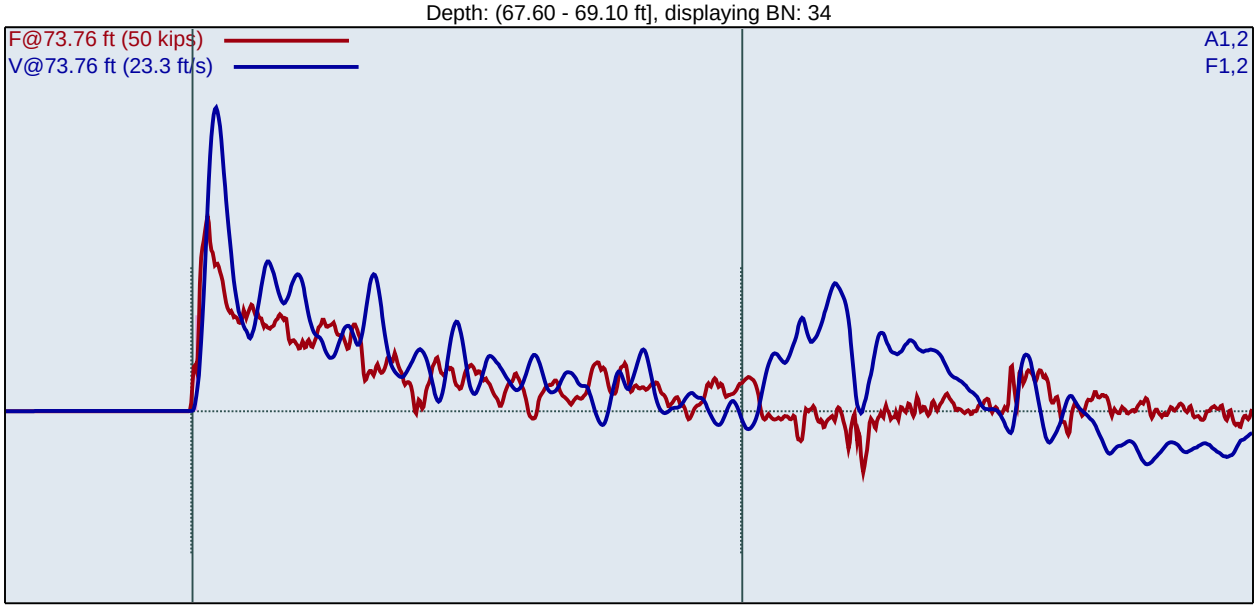
N-value: 22

Sample Interval Time: 34.59 seconds.

CME55 Truck (SN 328245)
R. Kral
AR: 1.20 in^2
LE: 73.76 ft
WS: 16807.9 ft/s

28+00, 20LT
Test date: 4/4/2017
SP: 0.492 k/ft3
EM: 30000 ksi

Depth: (67.60 - 69.10 ft], displaying BN: 34



BPM: Blows/Minute
FMX: Maximum Force
VMX: Maximum Velocity
DMX: Maximum Displacement

CSX: Compression Stress Maximum
DFN: Final Displacement
EFV: Maximum Energy
ETR: Energy Transfer Ratio - Rated

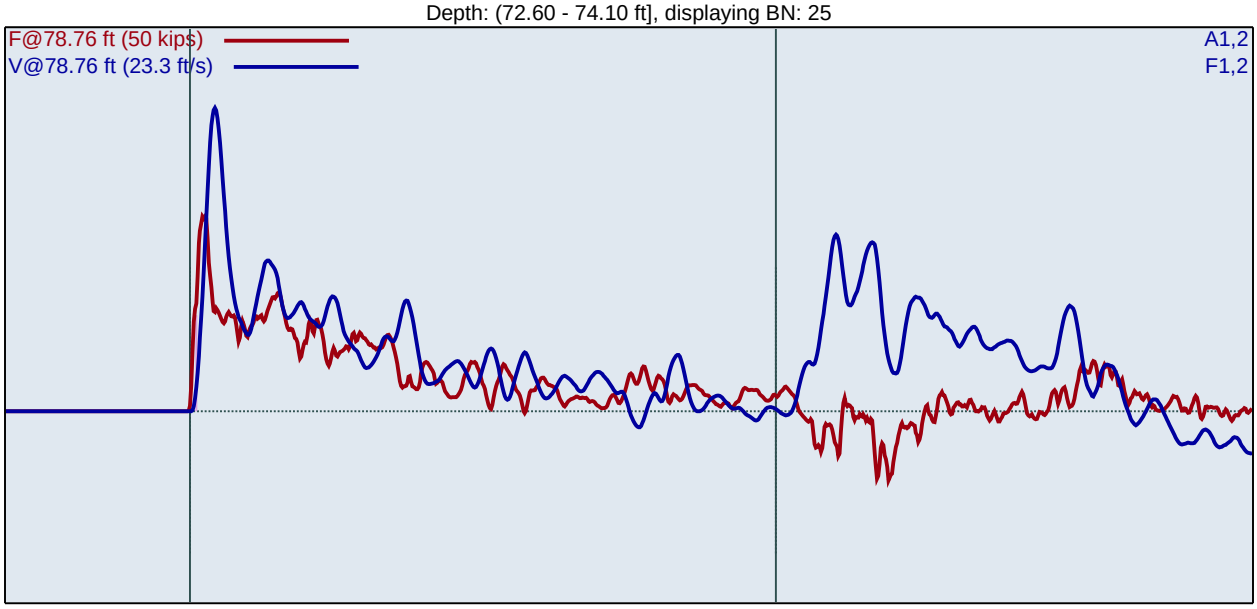
BL#	LP ft	BC /6"	BPM bpm	FMX kips	VMX ft/s	DMX in	CSX ksi	DFN in	EFV ft-lb	ETR (%)
1	67.68	6	107.6	26	17.9	1.46	22.0	0.93	302.9	86.5
2	67.77	6	52.5	27	18.4	1.25	22.6	0.94	298.6	85.3
3	67.85	6	51.6	26	17.8	1.10	22.0	0.95	295.1	84.3
4	67.93	6	52.1	27	18.0	1.00	22.3	0.97	297.0	84.8
5	68.02	6	52.0	27	18.1	0.96	22.3	0.96	298.5	85.3
6	68.10	6	51.7	27	18.2	0.97	22.3	0.97	297.2	84.9
7	68.14	13	52.0	26	17.9	0.81	21.8	0.43	296.1	84.6
8	68.18	13	52.0	26	18.3	0.62	21.4	0.42	274.8	78.5
9	68.22	13	51.8	26	18.2	0.59	22.1	0.42	274.6	78.5
10	68.25	13	52.2	25	18.2	0.55	20.8	0.42	267.1	76.3
11	68.29	13	52.0	25	18.3	0.57	21.0	0.42	271.7	77.6
12	68.33	13	51.9	26	18.1	0.59	21.4	0.43	282.2	80.6
13	68.37	13	51.8	25	17.7	0.61	20.6	0.44	291.8	83.4
14	68.41	13	51.7	25	17.5	0.54	20.8	0.44	289.3	82.7
15	68.45	13	52.1	26	18.2	0.53	21.4	0.44	298.8	85.4
16	68.48	13	51.9	24	17.6	0.53	19.7	0.44	294.4	84.1
17	68.52	13	51.9	25	18.0	0.52	20.5	0.44	296.4	84.7
18	68.56	13	51.6	24	17.8	0.52	20.2	0.44	300.1	85.7
19	68.60	13	52.1	24	17.4	0.51	20.3	0.44	298.5	85.3
20	68.63	17	51.8	24	17.3	0.51	19.7	0.33	299.4	85.5
21	68.66	17	52.1	24	17.5	0.52	20.1	0.34	298.9	85.4
22	68.69	17	51.8	26	18.3	0.49	21.3	0.33	296.4	84.7
23	68.72	17	51.9	24	17.7	0.53	20.2	0.33	302.2	86.3
24	68.75	17	51.9	25	17.7	0.54	20.7	0.33	302.7	86.5
25	68.78	17	51.9	23	17.3	0.54	19.5	0.33	300.3	85.8

26	68.81	17	51.8	25	17.6	0.54	20.7	0.33	302.2	86.3
27	68.84	17	52.0	26	18.3	0.53	21.8	0.33	305.8	87.4
28	68.86	17	52.1	24	17.8	0.55	20.0	0.33	302.1	86.3
29	68.89	17	51.9	26	18.4	0.54	21.5	0.33	305.1	87.2
30	68.92	17	52.1	26	17.8	0.54	21.5	0.33	298.9	85.4
31	68.95	17	51.8	26	18.6	0.53	21.6	0.33	301.3	86.1
32	68.98	17	51.8	25	18.2	0.54	21.2	0.33	301.2	86.1
33	69.01	17	51.6	25	18.1	0.54	20.8	0.33	304.1	86.9
34	69.04	17	51.9	25	18.5	0.54	21.2	0.33	305.7	87.3
35	69.07	17	51.6	25	17.9	0.55	20.8	0.33	306.3	87.5
36	69.10	17	51.7	26	18.1	0.54	21.3	0.33	307.3	87.8
		Average	51.9	25	17.9	0.55	20.9	0.38	295.9	84.5
		Std Dev	0.2	1	0.4	0.06	0.7	0.05	10.7	3.1
		Maximum	52.2	26	18.6	0.81	22.1	0.44	307.3	87.8
		Minimum	51.6	23	17.3	0.49	19.5	0.33	267.1	76.3
					N-value: 30					

Sample Interval Time: 40.39 seconds.

CME55 Truck (SN 328245) — 28+00, 20LT
R. Kral — Test date: 4/4/2017
AR: 1.20 in^2 — SP: 0.492 k/ft3
LE: 78.76 ft — EM: 30000 ksi
WS: 16807.9 ft/s

Depth: (72.60 - 74.10 ft], displaying BN: 25



BPM: Blows/Minute
FMX: Maximum Force
VMX: Maximum Velocity
DMX: Maximum Displacement
CSX: Compression Stress Maximum
DFN: Final Displacement
EFV: Maximum Energy
ETR: Energy Transfer Ratio - Rated

BL#	LP ft	BC /6"	BPM bpm	FMX kips	VMX ft/s	DMX in	CSX ksi	DFN in	EFV ft-lb	ETR (%)
1	72.68	6	60.7	26	18.7	1.34	21.6	0.94	303.1	86.6
2	72.77	6	52.6	25	17.9	1.18	20.9	0.95	297.0	84.9
3	72.85	6	52.2	27	17.8	1.01	22.1	0.96	292.2	83.5
4	72.93	6	52.0	24	17.9	1.00	19.9	0.96	290.9	83.1
5	73.02	6	51.9	23	18.0	0.96	19.2	0.96	297.6	85.0
6	73.10	6	52.1	24	18.4	0.96	20.0	0.96	296.8	84.8
7	73.15	11	51.8	23	18.1	0.76	19.4	0.50	296.0	84.6
8	73.19	11	52.1	24	18.6	0.76	20.2	0.50	297.6	85.0
9	73.24	11	51.7	25	18.9	0.74	20.8	0.51	298.2	85.2
10	73.28	11	52.2	24	18.3	0.72	19.8	0.51	297.6	85.0
11	73.33	11	52.0	24	19.1	0.71	20.1	0.51	297.5	85.0
12	73.37	11	52.2	25	19.4	0.71	21.1	0.51	296.2	84.6
13	73.42	11	51.7	23	18.5	0.72	19.5	0.51	295.7	84.5
14	73.46	11	51.9	26	18.9	0.72	21.9	0.51	298.1	85.2
15	73.51	11	52.1	25	19.6	0.72	20.8	0.51	297.2	84.9
16	73.55	11	51.8	26	19.0	0.71	21.7	0.51	294.0	84.0
17	73.60	11	52.0	26	20.0	0.72	21.8	0.51	299.1	85.5
18	73.65	10	52.0	26	19.3	0.71	21.4	0.57	294.4	84.1
19	73.70	10	52.1	25	19.1	0.70	20.6	0.57	290.9	83.1
20	73.75	10	51.7	25	20.2	0.70	21.0	0.57	297.5	85.0
21	73.80	10	52.0	27	19.1	0.69	22.3	0.58	290.9	83.1
22	73.85	10	52.0	25	18.9	0.70	21.2	0.58	293.6	83.9
23	73.90	10	52.0	26	18.8	0.69	21.4	0.58	292.7	83.6
24	73.95	10	52.1	25	18.9	0.68	20.9	0.58	288.9	82.5
25	74.00	10	51.6	25	18.4	0.68	21.1	0.58	288.7	82.5

26	74.05	10	52.1	25	18.9	0.69	21.0	0.57	294.1	84.0
27	74.10	10	51.8	25	19.2	0.68	20.7	0.58	291.6	83.3
		Average	51.9	25	19.0	0.71	20.9	0.54	294.8	84.2
		Std Dev	0.2	1	0.5	0.02	0.7	0.03	3.1	0.9
		Maximum	52.2	27	20.2	0.76	22.3	0.58	299.1	85.5
		Minimum	51.6	23	18.1	0.68	19.4	0.50	288.7	82.5
					N-value: 21					

Sample Interval Time: 29.95 seconds.

Summary of SPT Test Results

Project: CME55 Truck (SN 328245), Test Date: 4/4/2017

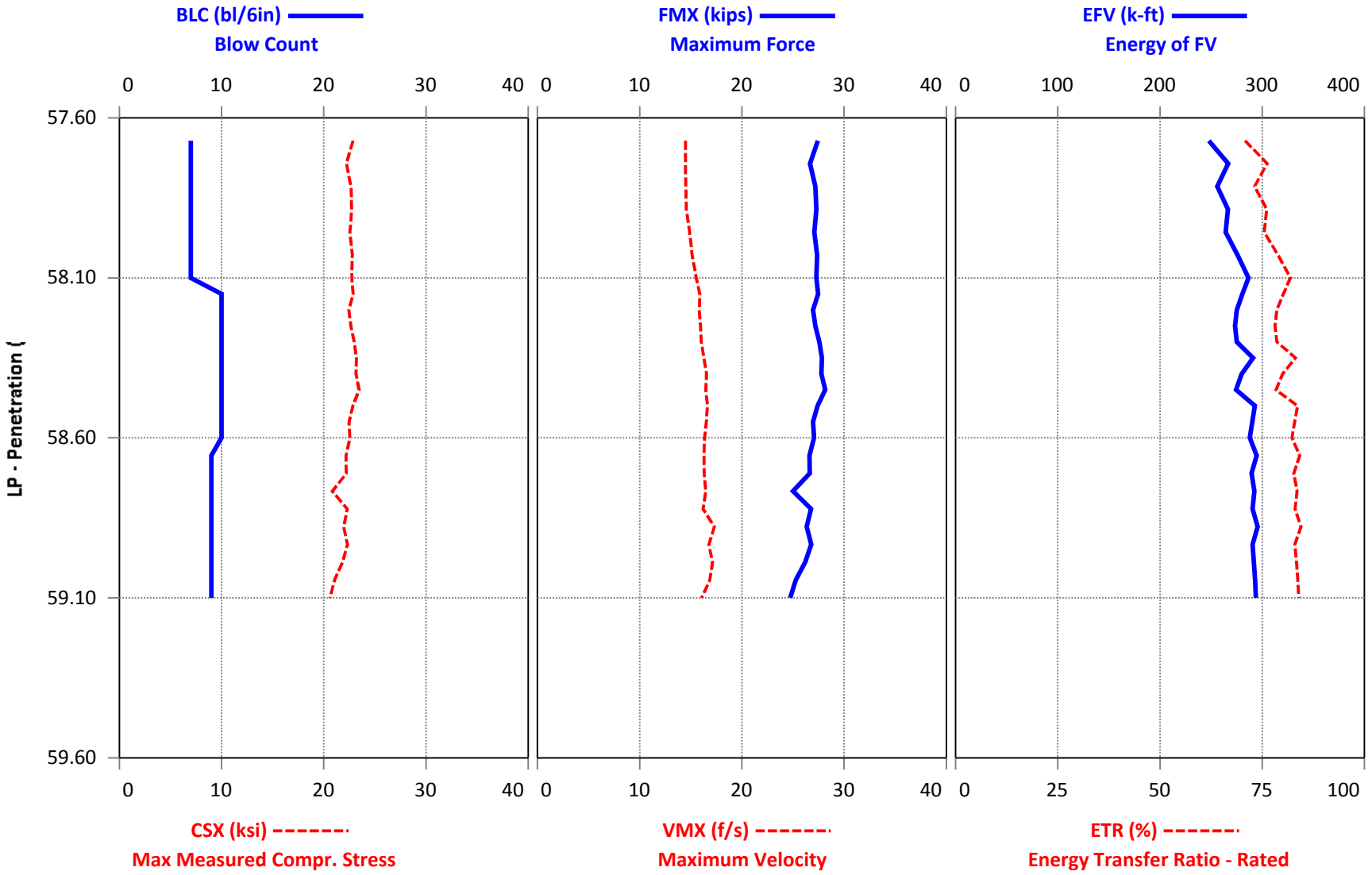
BPM: Blows/Minute
FMX: Maximum Force
VMX: Maximum Velocity
DMX: Maximum Displacement
CSX: Compression Stress Maximum
DFN: Final Displacement
EFV: Maximum Energy
ETR: Energy Transfer Ratio - Rated

Instr. Length ft	Start Depth ft	Final Depth ft	Blows Applied /6"	**N Value**	**N60 Value**	Average BPM bpm	Average FMX kips	Average VMX ft/s	Average DMX in	Average CSX ksi	Average DFN in	Average EFV ft-lb	Average ETR (%)
63.76	57.60	59.10	**7-10-9**	**19**	**26**	51.9	27	16.4	0.72	22.3	0.60	286.9	82.0
68.76	62.60	64.10	**9-10-12**	**22**	**30**	52.0	27	18.1	0.67	22.8	0.52	298.6	85.3
73.76	67.60	69.10	**6-13-17**	**30**	**42**	51.9	25	17.9	0.55	20.9	0.38	295.9	84.5
78.76	72.60	74.10	**6-11-10**	**21**	**29**	51.9	25	19.0	0.71	20.9	0.54	294.8	84.2
				Overall Average Values:		51.9	26	17.9	0.65	21.6	0.49	294.4	84.1
				Standard Deviation:		0.2	1	1.0	0.08	1.1	0.10	8.9	2.5
				Overall Maximum Value:		52.2	28	20.2	0.81	23.6	0.65	307.3	87.8
				Overall Minimum Value:		51.6	23	15.8	0.49	19.4	0.33	267.1	76.3

Pile Dynamics, Inc. - PDIPLOT2 Ver 2016.2.57.6 - Case Method & iCAP® Results

S&ME Printed: 25-April-2017 Test started: 04-April-2017

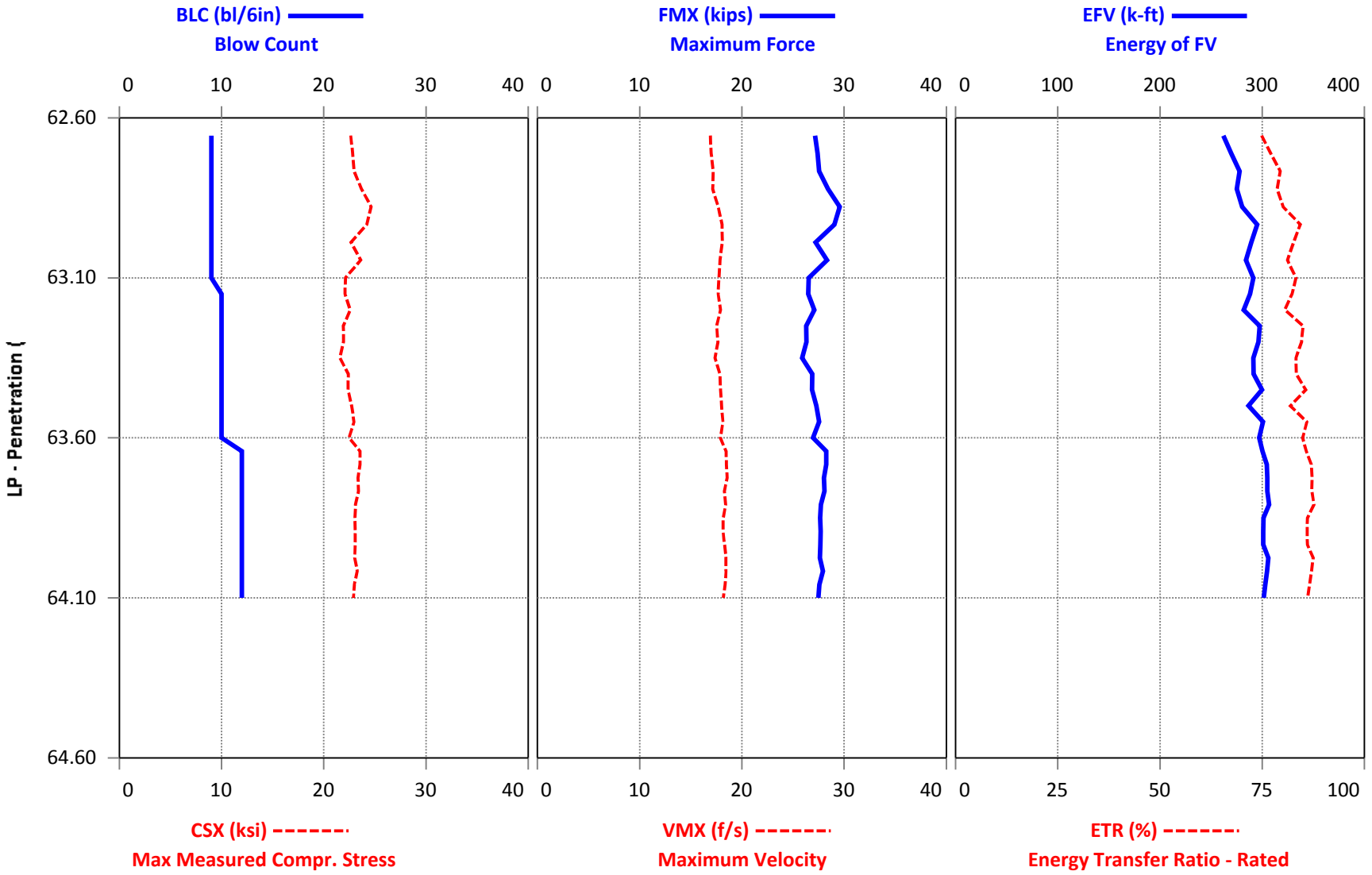
CME55 Truck (SN 328245) - 57.6 to 59.1 ft
28+00, 20LT



Pile Dynamics, Inc. - PDIPLOT2 Ver 2016.2.57.6 - Case Method & iCAP® Results

S&ME Printed: 25-April-2017 Test started: 04-April-2017

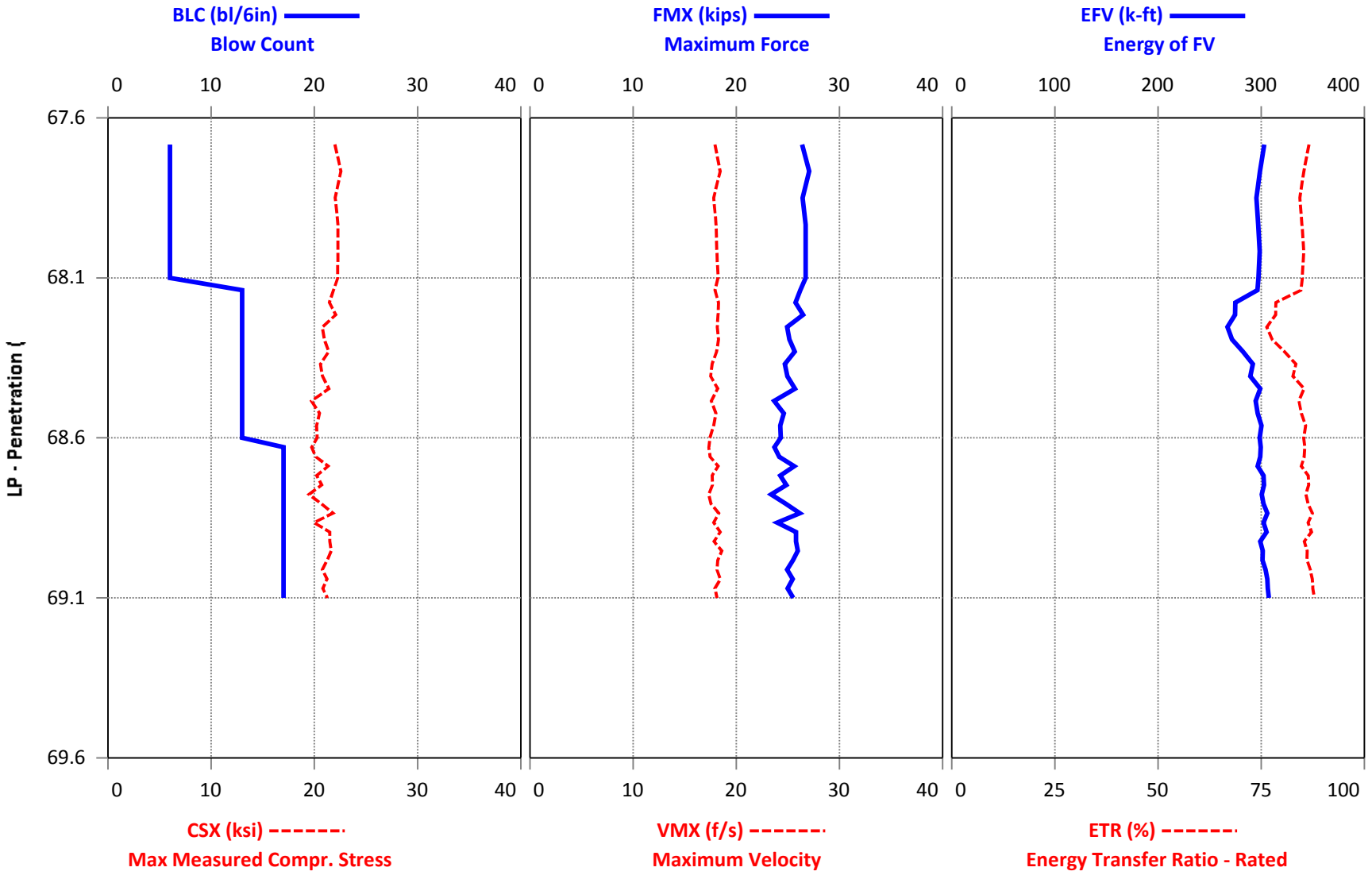
CME55 Truck (SN 328245) - 62.6 to 64.1 ft
28+00, 20LT



Pile Dynamics, Inc. - PDIPLOT2 Ver 2016.2.57.6 - Case Method & iCAP® Results

S&ME Printed: 25-April-2017 Test started: 04-April-2017

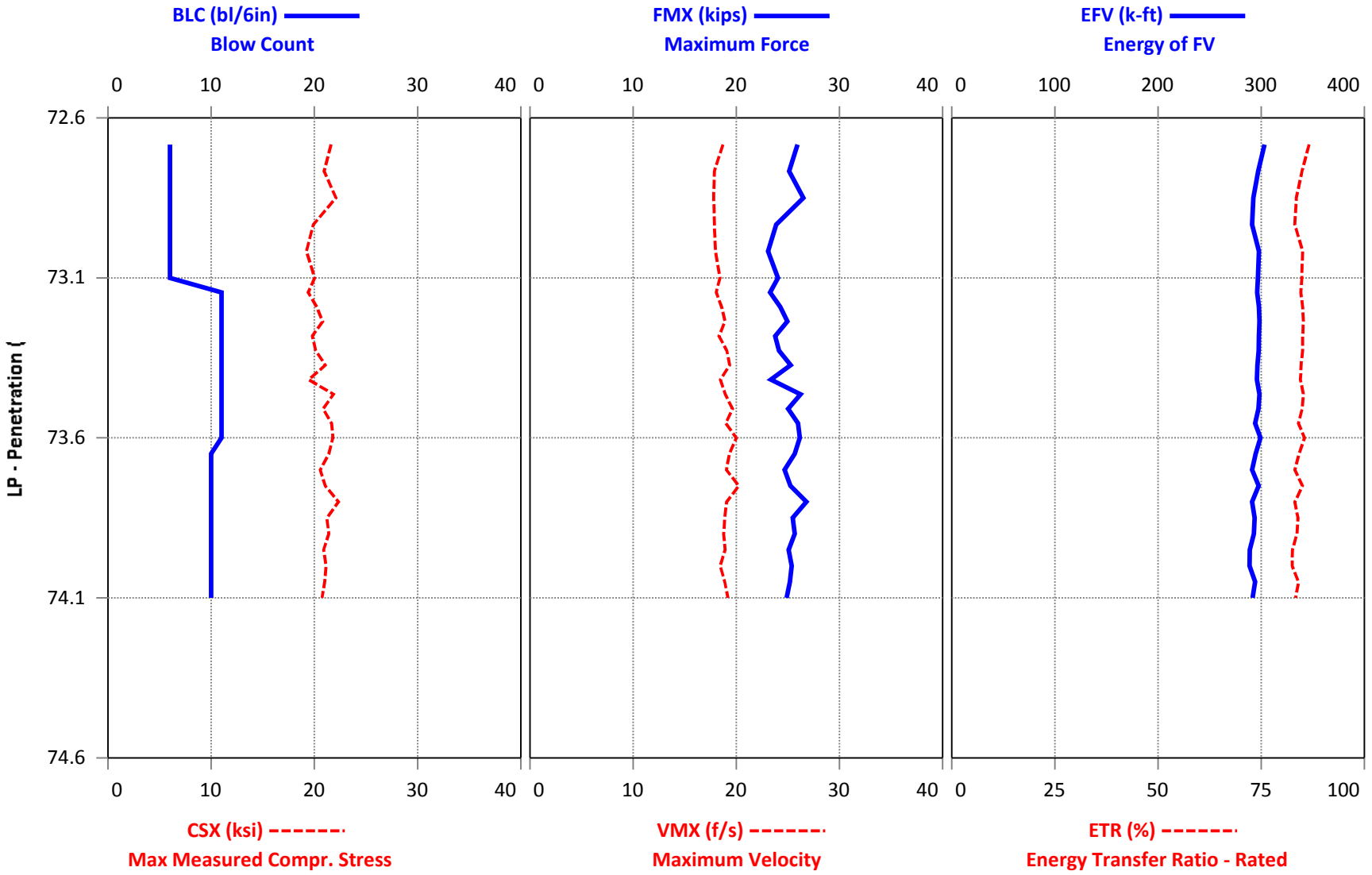
CME55 Truck (SN 328245) - 67.6 to 69.1 ft
28+00, 20LT

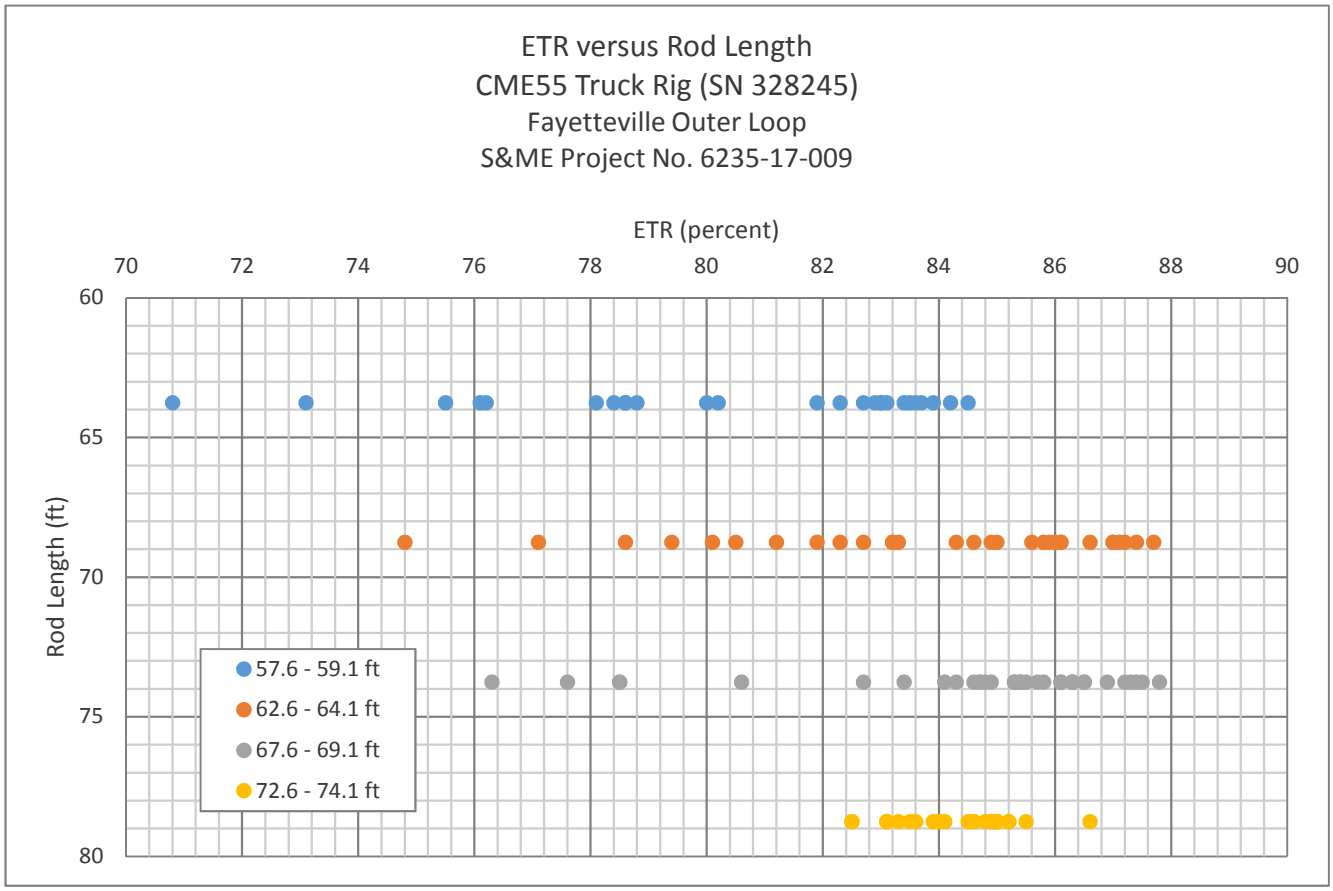


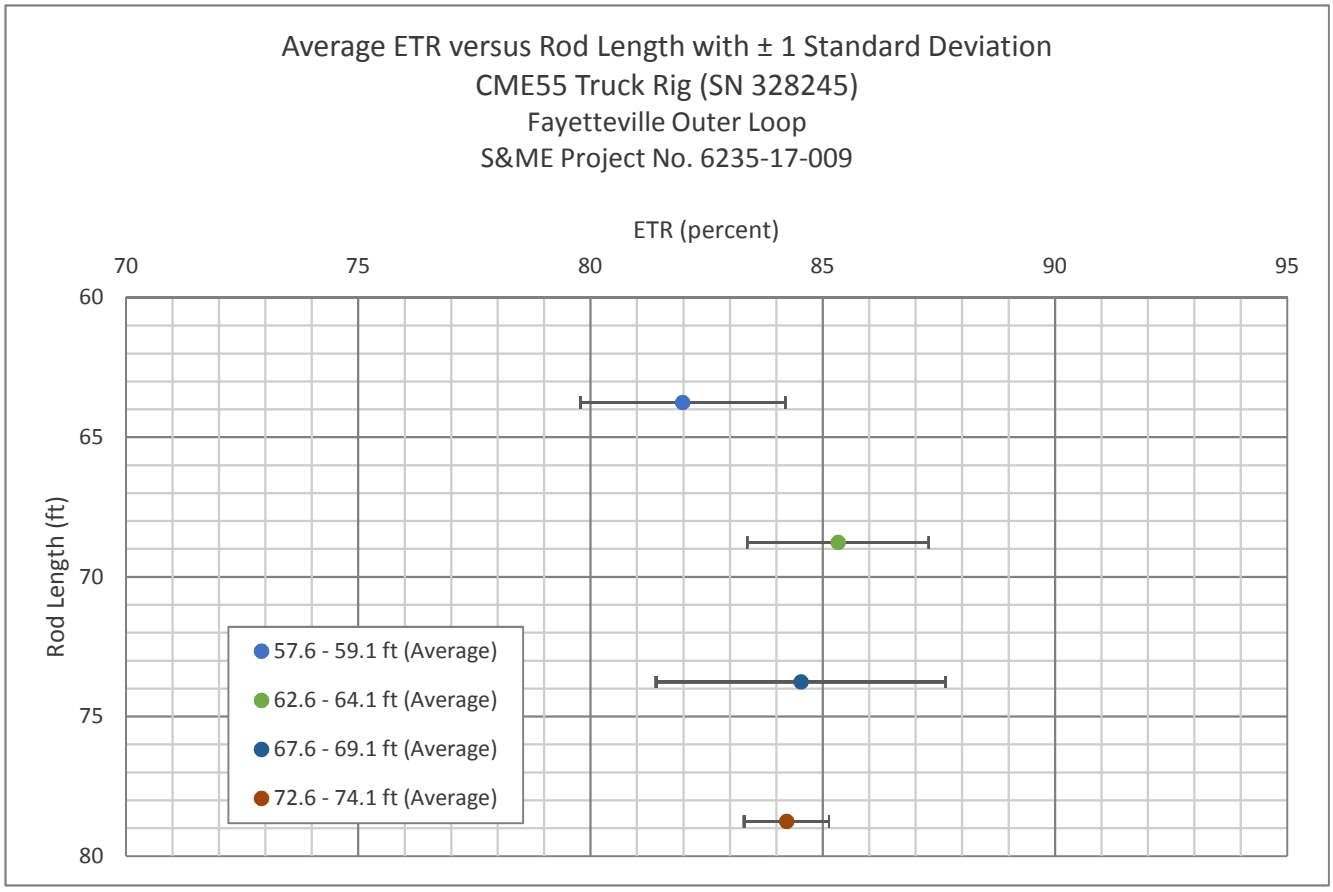
Pile Dynamics, Inc. - PDIPLOT2 Ver 2016.2.57.6 - Case Method & iCAP® Results

S&ME Printed: 25-April-2017 Test started: 04-April-2017

CME55 Truck (SN 328245) - 72.6 to 74.1 ft
28+00, 20LT




ETR versus Rod Length
CME55 Truck Rig (SN 328245)
Fayetteville Outer Loop
S&ME Project No. 6235-17-009
ETR (percent)
70
72
74
76
78
80
82
84
86
88
90
Rod Length (ft)
60
65
70
75
80
57.6 - 59.1 ft
62.6 - 64.1 ft
67.6 - 69.1 ft
72.6 - 74.1 ft


Average ETR versus Rod Length with ± 1 Standard Deviation
CME55 Truck Rig (SN 328245)
Fayetteville Outer Loop
S&ME Project No. 6235-17-009
ETR (percent)
70
75
80
85
90
95
Rod Length (ft)
60
65
70
75
80
57.6 - 59.1 ft (Average)
62.6 - 64.1 ft (Average)
67.6 - 69.1 ft (Average)
72.6 - 74.1 ft (Average)

Appendix II

Form No. QA-SPTEEVAL-01
Revision No. 2
Revision Date: 05-24-16

SPT Energy Evaluation Form

S&ME

Project: FAYETTEVILLE OUTER LOOP
Project No.: 6235-17-009
Boring No.: 28+00 20 LEFT -Y2-
Date (s): 4/4/17
Weather: PARTLY CLOUDY / 70°F
Drill Rod Type: AWJ

On-site Personnel

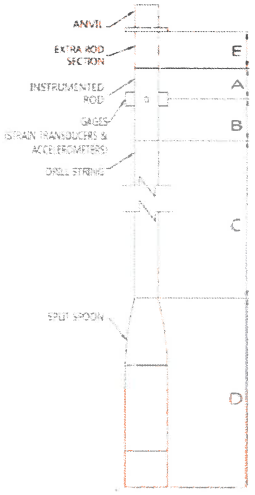
Drilling Company: S&ME
Rig Oper./Helper: T. MILLER / A. PLATTENBURG
Rig Engr/Geologist: J. SWARTLEY
Analyzer Oper.: R. KRAL

Rig/Hammer Info

Drill Rig Make/Model: CME 55
Carrier Type: TRUCK
Rig Serial No.: 328245
Hammer Type/Model: CME - AUTO
Hammer Serial No.: 328245
Hammer Drop System: AUTOMATIC
Lubrication Condition: PER. MANUFACTURER
Manufacturer Recommended Operation Rate (bpm): 50
Drop Height ~~from Calibration Record~~ (in.): 30
Hammer Weight ~~from Calibration Record~~ (lbs): 140
Anvil Dimension (in.): 11.5
Drilling Method: MUD ROTARY

Rod Info

(A + E) Impact Surface to Gages Length: 1.5 ft
(B) Instr. Rod Length below Gages: 0.88 ft
(A) + (B) Instr. Rod Length: 2 ft
(D) Spoon Length: 2.68 ft
(E) Rod Length Above Instr. Rod (if applicable): 0.38 ft
Instr. Rod S/N: 203 AWJ
Instr. Rod Outside Dia.: 1.75 in.
Instr. Rod Area: 1.20 in²
PDA Make/Model: PAX
PDA Serial No.: 3733L
Calib. Pulse Test (y/n): Y



Gage Information

Gage		Serial No.	Calibration No.	
Accel.	A3	K5641	~~358~~ 376	
	A4	K5642	~~314~~ 324	
Strain	F3	203 AWJ 1	~~211.46~~	212.63
	F4	203 AWJ 2	~~210.87~~	212.32

Date of Test	Test Depth Increment (ft to ft)	Test Time Start / Stop (Military)	Length of Drill String (ft) (C)	(LE) Length Below Gages (ft) (B)+(C)+(D)	Avg. Meas. Hammer Rate (BPM)	SPT Blow Counts 6"	12"	18"	N Value	Drop Height In Tolerance (y/n)
~~4/4~~	~~33.5 TO 35.0~~	~~1038/1041~~	~~35~~	~~38.76~~		~~WOH~~	~~WOH~~	~~WOH~~	~~0~~	~~N/A~~
~~4/4~~	~~38.5 TO 40.0~~	~~1050/1054~~	~~40~~	~~43.76~~		~~3~~	~~2~~	~~4~~	~~3~~	~~Y~~
	~~37.6 TO 39.1~~	~~1139~~								
4/4	57.6 TO 59.6	1139/1140	60	63.76	52	7	10	9	19	Y
4/4	62.6 TO 64.1	1157/1158	65	68.76	52	9	10	12	22	Y
4/4	67.6 TO 69.1	1218/1219	70	73.76	52	6	13	17	30	Y
4/4	72.6 TO 74.1	1239/1240	75	78.76	52	6	11	10	21	Y

Comments: (1) **If there are any nonconformances or deficiencies identified during the testing, immediately pause the drilling and testing activities and notify the Site Manager** and **describe them in the space below;** (2) **Note any unusual hammer operating conditions that affect the hammer performance, or changes in operating conditions** (e.g. verticality, weather, or lubrication between trials). Drop height tolerance is ± 1 inch. Drop height verified by Rig Geologist/Engineer at time of SPT Energy measurement for CME hammers and at the beginning of the day for Diedrich hammers; (3) Note any changes in rod diameter along drill string and record locations of short rod sections; (4) Prepare a sketch or take a picture of the instrumented drill rod assembly and indicate the approximate relative location and orientation of the strain gauges, accelerometers, and LE Datum; (5) Note: Identify all attached pages, including photographs, with the Project No., Boring No., and date.

ROB KRAL — Prepared By (print/signature), SPT Energy Lead
4/4/17 — Date
Reviewed By (print/signature), Site Manager
Date

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34817.1.S5	**TIP** U-2519AA	**COUNTY** CUMBERLAND	**GEOLOGIST** Contract Geologist
SITE DESCRIPTION FAYETTEVILLE OUTER LOOP FROM I-95 TO SOUTH OF SR 1118 (PARKTON RD.)			**GROUND WTR (ft)**
BORING NO. Y2_2800	**STATION** 28+00	**OFFSET** 20 ft LT	**ALIGNMENT** -Y2-	**0 HR.** N/A
COLLAR ELEV. 184.7 ft	**TOTAL DEPTH** 104.1 ft	**NORTHING** 421,505	**EASTING** 2,013,281	**24 HR.** 23.0
DRILL RIG/HAMMER EFF./DATE SME275 CME-55 89% 01/15/2016		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Contract Driller	**START DATE** 04/04/17	**COMP. DATE** 04/04/17	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
185											
	184.1	0.6	7	5	4	9		M		184.7 GROUND SURFACE	0.0
	182.1	2.6	3	4	4	8		M		184.1 **ROADWAY EMBANKMENT** (PAVEMENT) TAN, ORANGE AND GRAY, SILTY SAND	0.6
180											
	177.1	7.6	7	6	8	14		M			
175											
	172.1	12.6	6	3	5	8		M			
170											
	167.1	17.6	9	8	3	11		M			
165										164.7 **COASTAL PLAIN** ORANGE, RED AND GRAY, SANDY SILT (MIDDENDORF FORMATION)	20.0
	162.1	22.6	3	3	4	7	SS-78	W			
160										158.7 GRAY AND RED, SILTY SAND	26.0
	157.1	27.6	9	10	10	20		Sat.			
155										153.7 ORANGE AND TAN, SILTY CLAY	31.0
	152.1	32.6	WOR	WOR	WOH	0	SS-79	W			
150										148.7 ORANGE SAND	36.0
	147.1	37.6	3	2	1	3	SS-80	Sat.			
145											
	142.1	42.6	1	1	2	3		Sat.			
140										138.7 **COASTAL PLAIN** GRAY, SILTY CLAY (BLACK CREEK FORMATION)	46.0
	137.1	47.6	5	9	11	20		W			
135										133.7 GRAY, SILTY SAND	51.0
	132.1	52.6	7	8	17	25		Sat.		131.7 GRAY, SILTY CLAY	53.0
130										128.7 GRAY, SILTY SAND AND SAND	56.0
	127.1	57.6	7	10	9	19		Sat.			
125											
	122.1	62.6	9	10	12	22		Sat.			
120											
	117.1	67.6	6	13	17	30		Sat.			
115											
	112.1	72.6	6	11	10	21		Sat.			
110										108.7	76.0
	107.1	77.6	6	9	9	18		Sat.			
105											

DRAFT

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

SHEET

WBS 34817.1.S5	**TIP** U-2519AA	**COUNTY** CUMBERLAND	**GEOLOGIST** Contract Geologist	
SITE DESCRIPTION FAYETTEVILLE OUTER LOOP FROM I-95 TO SOUTH OF SR 1118 (PARKTON RD.)				**GROUND WTR (ft)**
BORING NO. Y2_2800	**STATION** 28+00	**OFFSET** 20 ft LT	**ALIGNMENT** -Y2-	**0 HR.** N/A
COLLAR ELEV. 184.7 ft	**TOTAL DEPTH** 104.1 ft	**NORTHING** 421,505	**EASTING** 2,013,281	**24 HR.** 23.0
DRILL RIG/HAMMER EFF./DATE SME275 CME-55 89% 01/15/2016		**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Automatic
DRILLER Contract Driller	**START DATE** 04/04/17	**COMP. DATE** 04/04/17	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
105						Match Line					
	102.1	82.6	6	10	10	20		Sat.			
100										98.7	86.0
	97.1	87.6	5	8	14	22		W		GRAY, SILTY CLAY	
95											
	92.1	92.6	5	12	14	26		W			
90											
	87.1	97.6	7	8	9	17		W			
85											
	82.1	102.6	8	13	15	28		W		80.6	104.1
										Boring Terminated at Elevation 80.6 ft IN VERY STIFF CLAY (COASTAL PLAIN)	

DRAFT

Appendix III

Pile Dynamics, Inc.

Quality Assurance for Deep Foundations

PDI Certificate of Calibration

PDI Accelerometer Calibration

Model PR-Kicher Serial # K5641

Cal Date: 27Feb17 Cal Due : 27Feb19

Temperature: 64.5 deg. F Humidity 30 %

Calibrated at
Pile Dynamics, Inc.
30725 Aurora Road
Cleveland, OH 44139

Manufactured by Pile Dynamics, Inc.

Procedure used: PDA Accelerometer Calibration Procedure 2016-6, Revision 20160422

Equipment was found to be

✓ in tolerance As Received _____ out of tolerance As Received

✓ in tolerance As Returned _____ out of tolerance As Returned

PDI Calibration: .0752 mv/5000g

Calibration Standards Utilized
Hopkinson Bar Force Calibration F2, verified on 25APR16

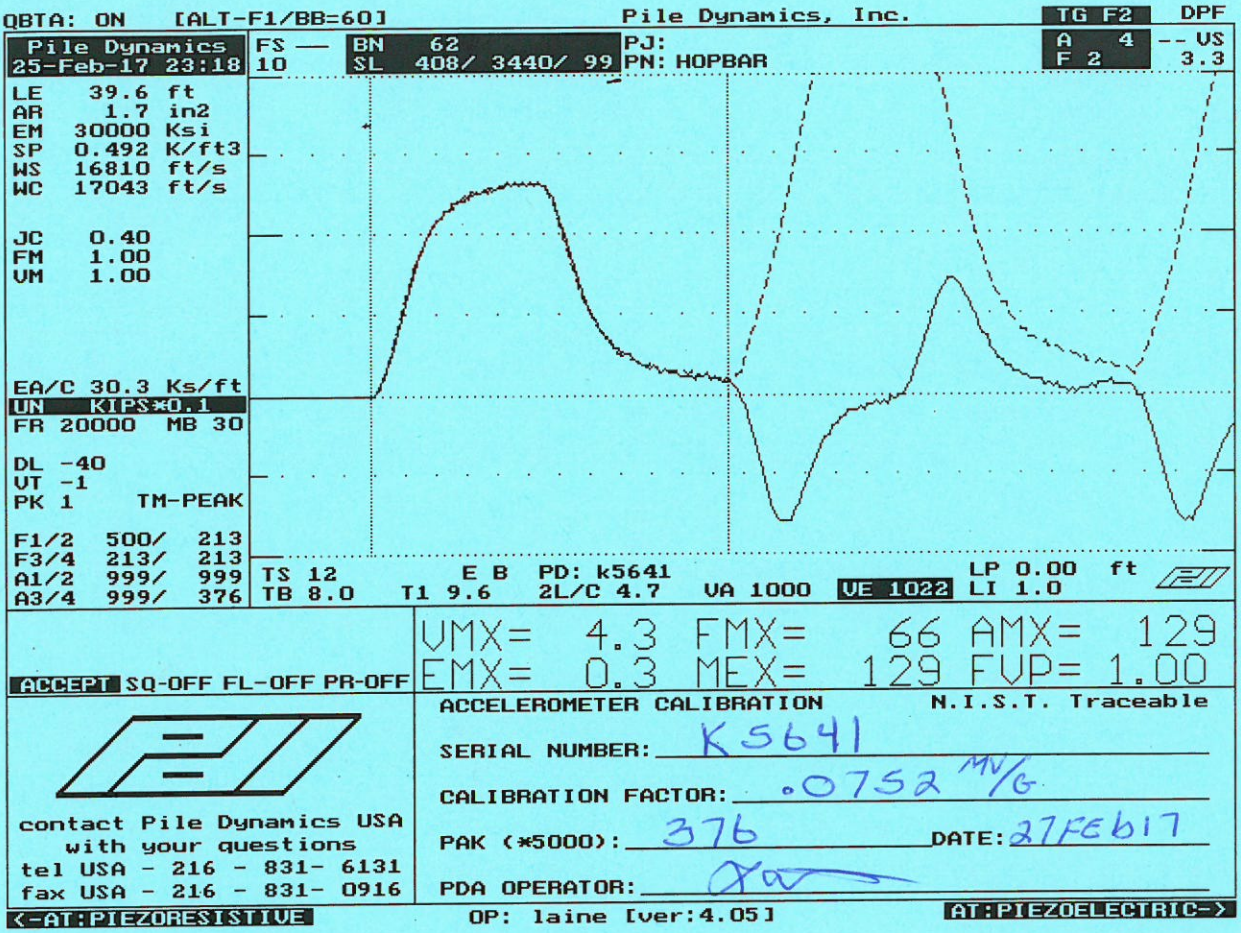
PDI HopBar DOS PAK, serial number 1273K, verified on 25 APR 16

Calibration performed by: L. M. Wright
Laine Wright, Technician

Reviewed by: Robert Sprenger
Robert Sprenger, Production Manager

Accelerometer CC-5 Issued 20160426

30725 Aurora Road • Cleveland, Ohio 44139 USA • +1-216-831-6131 • Fax +1-216-831-0916
E-mail: info@pile.com • www.pile.com



Smart Sensor

Smart Chip Programmed By RMW **on** 27FEB17 **CRC Value** 3C62

Pile Dynamics, Inc.

Quality Assurance for Deep Foundations

PDI Certificate of Calibration

PDI Accelerometer Calibration

Model PR-Kicher Serial # K5642

Cal Date: 27Feb17 Cal Due : 27Feb19

Temperature: 64.5 deg. F Humidity 30 %

Calibrated at
Pile Dynamics, Inc.
30725 Aurora Road
Cleveland, OH 44139

Manufactured by Pile Dynamics, Inc.

Procedure used: PDA Accelerometer Calibration Procedure 2016-6, Revision 20160422

Equipment was found to be

✓ in tolerance As Received _____ out of tolerance As Received

✓ in tolerance As Returned _____ out of tolerance As Returned

PDI Calibration: .0648 mv/5000g

Calibration Standards Utilized
Hopkinson Bar Force Calibration F2, verified on 25APRIL 16

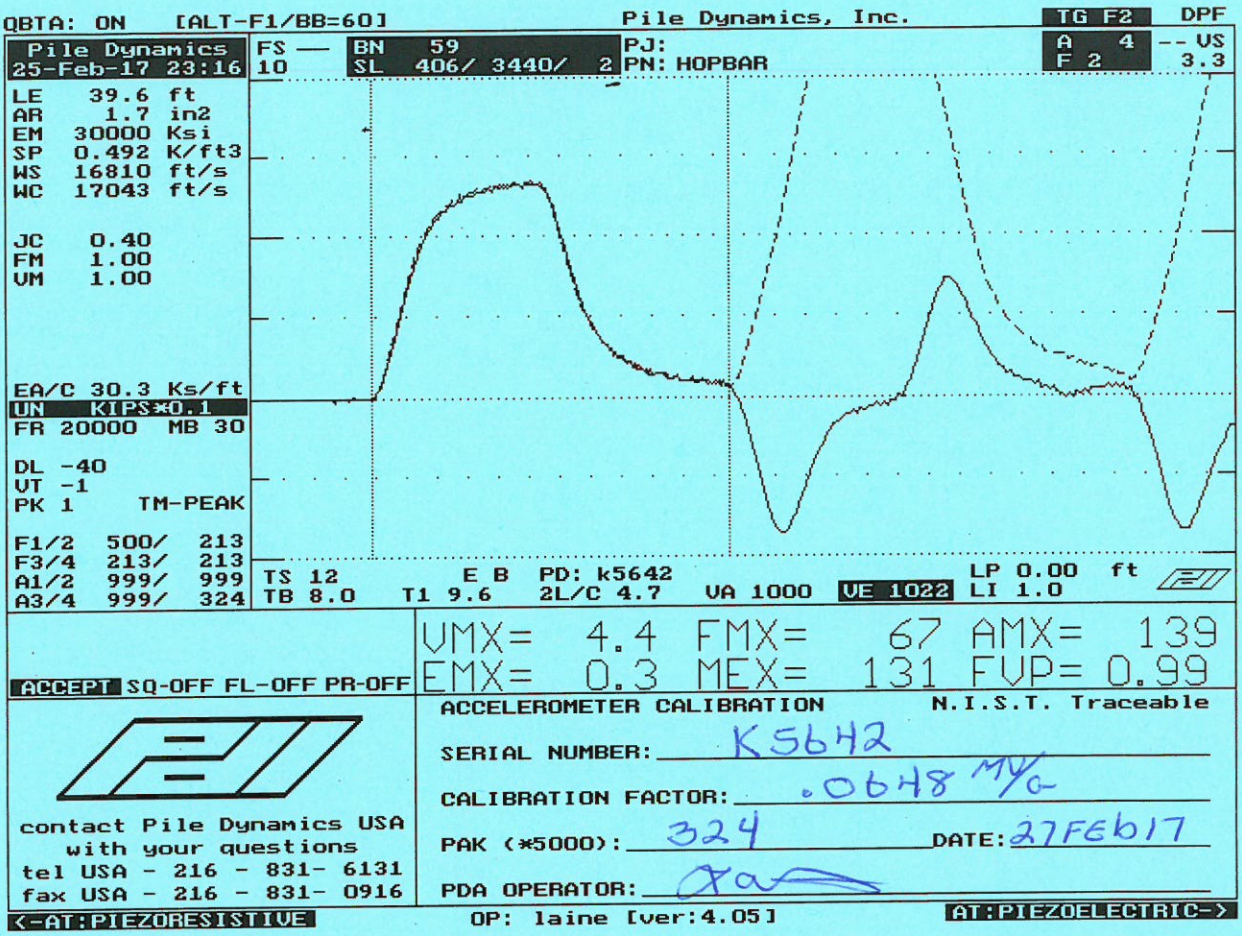
PDI HopBar DOS PAK, serial number 1273K, verified on 25April16

Calibration performed by: L. M. Wright
Laine Wright, Technician

Reviewed by: Robert Sprenger
Robert Sprenger, Production Manager

Accelerometer CC-5 Issued 20160426

30725 Aurora Road • Cleveland, Ohio 44139 USA • +1-216-831-6131 • Fax +1-216-831-0916
E-mail: info@pile.com • www.pile.com



Smart Sensor

Smart Chip Programmed By J.M.W. **on** 27 **CRC Value** 4A8A

Pile Dynamics, Inc.

Quality Assurance for Deep Foundations

PDI Certificate of Calibration

PDI SPT Drill Rod Serial # 203 AWJ

Cal Date: 3-6-17 Cal Due : 3-6-19

Temperature: 69.2 deg. F Humidity 42 %

Manufactured by Pile Dynamics, Inc.
Calibrated at: Pile Dynamics, Inc., 30725 Aurora Road, Cleveland, OH 44139
Procedure used: SPT Drill Rod Calibration Procedure 2016-4, Revision 20160422
Calibration Data: Attach SPT Rod Data Sheet DS-17

Equipment was found to be

✓ in tolerance As Received _____ out of tolerance As Received

✓ in tolerance As Returned _____ out of tolerance As Returned

Calibration Standards Utilized

1. PDI SPT Calibration Signal Conditioning Unit #000001, verified on 20160302
2. PDI Load Cell #75, Certificate #3482090006
3. Capacitec Displacement Sensor #2034, Certificate #3482090004
4. Capacitec Displacement Sensor #2040, Certificate #3482090004
5. Capacitec Displacement Mainframe #4004-671, Certificate #3482090004
6. Brown & Sharpe Digital Caliper #8G028506, Certificate #3482090001
7. National Instruments USB-6210 DAQ serial number 159AFDE, Certificate #3482090002

Calibration performed by:

David Burrell Technician

Reviewed by:

Robert Sprenger, Production Manager

SPT CC-16 Issued 20160425

30725 Aurora Road • Cleveland, Ohio 44139 USA • +1-216-831-6131 • Fax +1-216-831-0916
E-mail: info@pile.com • www.pile.com

Pile Dynamics, Inc.

Quality Assurance for Deep Foundations

SPT Calibration Data Sheet Revision number 20160426
Use Calibration Procedure Number 2016-8, Revision 20160422

SPT Drill Rod Data

Serial Number: 203 AWJ Calibration Date: 3-6-17

Temperature: 69.2 °F Humidity: 42 %

Calibration performed in accordance with PDI SPT Calibration Procedure 2016-4, Revision 20160422

As Received (circle one): (Operational) - Malfunctioning - Damaged

Calibration data
Pre-Load: 1. 8152 2. 8045 3. 8081

Total Load: 1. 18645 2. 17966 3. 9859

Common typical theoretical EA values based on SPT Rod Type:
AW: 35400 NW: 43100 or 68100 N3: 70800 BW:52344

EA Theoretical 35,400 EA Measured 36076.68 Error 1.91 %
Within 4% Tolerance: (Y) / N

Alternative EA verification: Measure wall thickness, calculate area and multiply by 30000. (use spreadsheet for calculation)

Calibration values
Channel 1: As Found: (last cal): 215.76 As Left: 212.63 Within 5% Tolerance: (Y) / N
Channel 2: As Found: (last cal): 215.53 As Left: 212.32 Within 5% Tolerance: (Y) / N
EA: As Found: (last cal): 35465 As Left: 36076.68 Difference: 1.7 %

Calibration performed by:

David Burrell, Technician

Reviewed by:

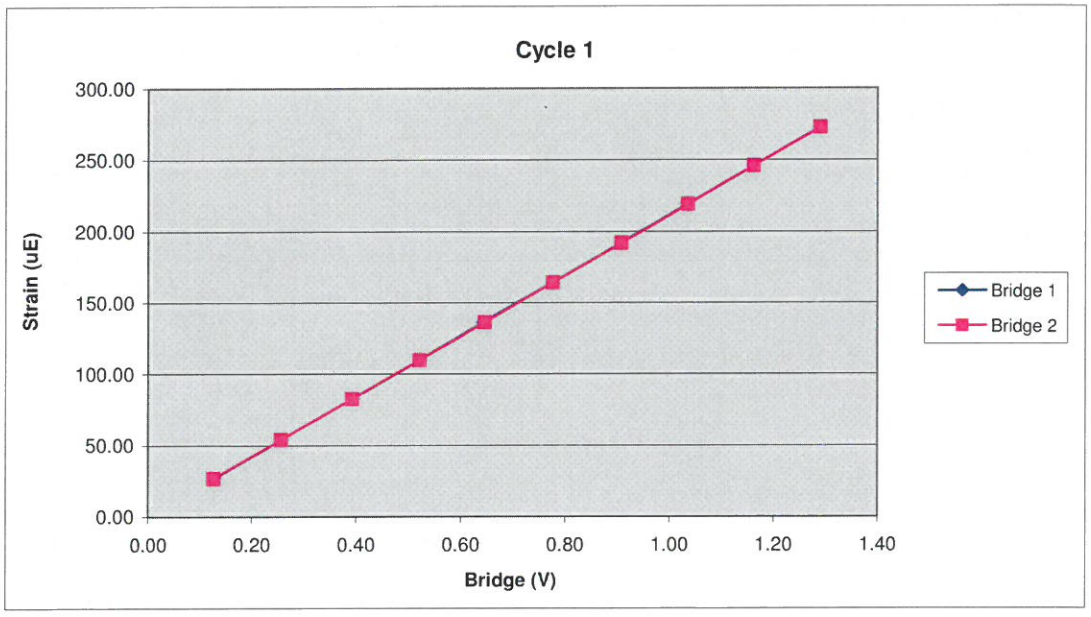
Robert Sprenger, Production Manager

30725 Aurora Road • Cleveland, Ohio 44139 USA • +1-216-831-6131 • Fax +1-216-831-0916
E-mail: info@pile.com • www.pile.com

203AWJ		Cycle 1		
Sample	**Force (lb)**	**Strain (µE)**	**Bridge 1 (V)**	**Bridge 2 (V)**
1	0.00	0.00	0.00	0.00
2	980.36	26.90	0.13	0.13
3	1968.60	54.22	0.26	0.26
4	3007.18	82.91	0.39	0.39
5	3992.07	109.88	0.52	0.52
6	4933.68	136.53	0.64	0.65
7	5952.40	164.15	0.78	0.78
8	6953.03	191.85	0.91	0.91
9	7927.29	218.90	1.04	1.04
10	8900.18	245.69	1.16	1.16
11	9893.92	272.74	1.29	1.29

Bridge 1		**Bridge 2**	
Force Calibration (lb/V)	**7662.50**	**Force Calibration (lb/V)**	**7652.99**
Offset	-1.78	Offset	1.71
Correlation	0.999999	Correlation	0.999997
Strain Calibration (µE/V)	**211.52**	**Strain Calibration (µE/V)**	**211.26**
Offset	-0.14	Offset	-0.05
Correlation	0.999998	Correlation	0.999999

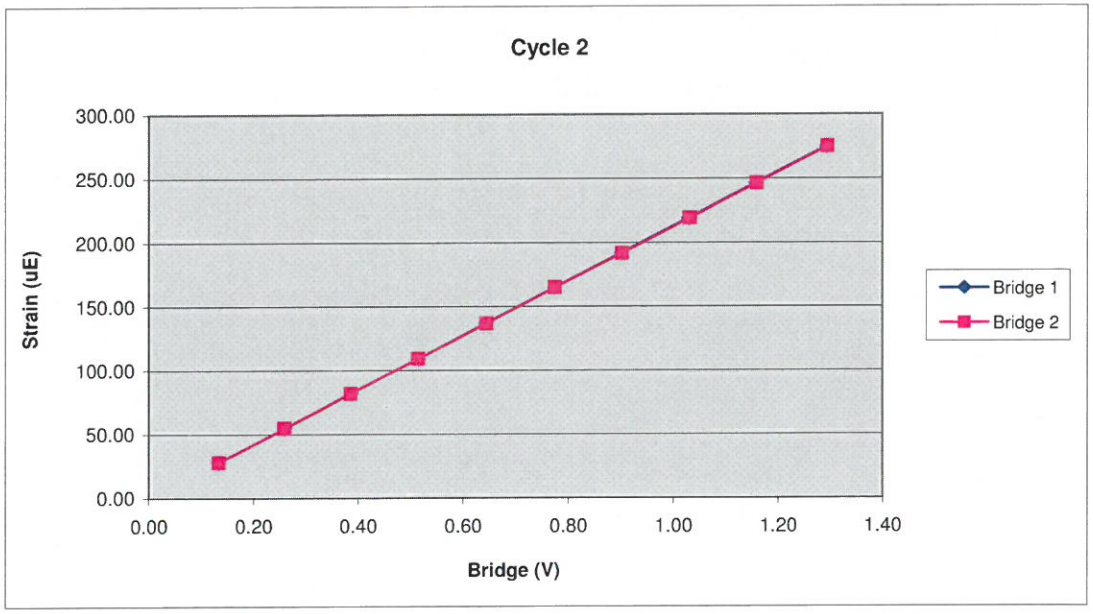
Force Strain Calibration	
EA (Kips)	**36225.50**
Offset	3.39
Correlation	0.999997



203AWJ		Cycle 2		
Sample	**Force (lb)**	**Strain (µE)**	**Bridge 1 (V)**	**Bridge 2 (V)**
1	0.00	0.00	0.00	0.00
2	1014.59	28.23	0.13	0.13
3	1983.94	54.87	0.26	0.26
4	2963.12	81.94	0.39	0.39
5	3939.16	109.15	0.51	0.51
6	4924.05	136.83	0.64	0.64
7	5932.34	164.92	0.77	0.78
8	6919.00	191.62	0.90	0.90
9	7908.80	219.00	1.03	1.03
10	8881.89	246.36	1.16	1.16
11	9921.85	274.90	1.29	1.29

Bridge 1		**Bridge 2**	
Force Calibration (lb/V)	**7681.97**	**Force Calibration (lb/V)**	**7665.41**
Offset	**-11.43**	Offset	**-6.15**
Correlation	**0.999999**	Correlation	**0.999998**
Strain Calibration (µE/V)	**212.92**	**Strain Calibration (µE/V)**	**212.46**
Offset	**-0.28**	Offset	**-0.14**
Correlation	**0.999998**	Correlation	**0.999998**

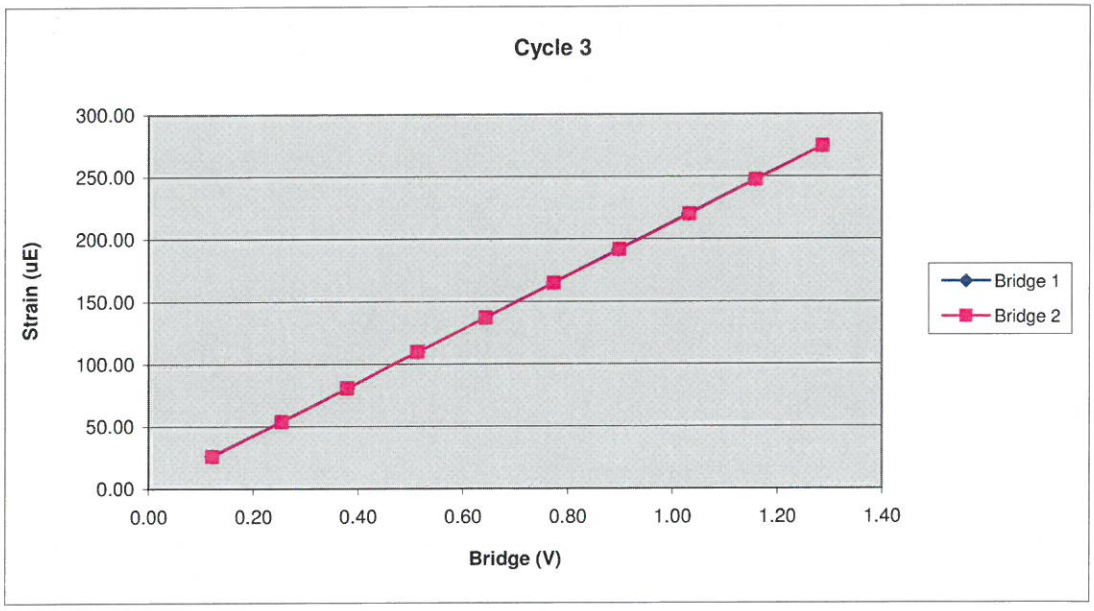
Force Strain Calibration	
EA (Kips)	**36079.71**
Offset	**-1.25**
Correlation	**0.999996**



203AWJ		Cycle 3		
Sample	**Force (lb)**	**Strain (µE)**	**Bridge 1 (V)**	**Bridge 2 (V)**
1	0.00	0.00	0.00	0.00
2	931.98	26.11	0.12	0.12
3	1944.40	53.79	0.25	0.25
4	2911.39	80.73	0.38	0.38
5	3940.93	109.71	0.51	0.51
6	4935.26	137.15	0.64	0.64
7	5929.39	164.84	0.77	0.77
8	6888.90	191.71	0.90	0.90
9	7914.90	219.99	1.03	1.03
10	8887.40	247.28	1.16	1.16
11	9859.30	274.46	1.29	1.29

Bridge 1		**Bridge 2**	
Force Calibration (lb/V)	**7667.78**	**Force Calibration (lb/V)**	**7660.59**
Offset	**2.72**	Offset	**1.09**
Correlation	**0.999999**	Correlation	**1.000000**
Strain Calibration (µE/V)	**213.44**	**Strain Calibration (µE/V)**	**213.24**
Offset	**-0.06**	Offset	**-0.11**
Correlation	**0.999998**	Correlation	**0.999997**

Force Strain Calibration	
EA (Kips)	**35924.82**
Offset	**4.97**
Correlation	**0.999998**



Bridge Excitation (V) 5
Shunt Resitor (ohm) 60.4k

Calibration Factors	203AWJ		
Bridge 1 (µE/V)	212.63	Bridge 2 (µE/V)	212.32
EA Factor (Kips)	36076.68	Area (in^2)	1.20

Calibrated by: David Hannah
Calibrated Date: 2/24/2017

Pile Dynamics Inc
30725 Aurora Rd
Solon, OH 44139

Traceable to N.I.S.T.

Appendix IV

PDCA
PILE DRIVING CONTRACTORS ASSOCIATION

Pile Dynamics, Inc.

This documents that

Robert E. Kral
AMEC Foster Wheeler

has on May 20, 2016 achieved the rank of

ADVANCED

on the **Dynamic Measurement and Analysis Proficiency Test.**

The individual identified on this document demonstrated to the degree granted above an understanding of theory, data quality evaluation, interpretation and signal matching for high strain dynamic testing of deep foundations. ***It is recommended*** **that Individuals at the Advanced level seek Master or Expert levels through additional study within four years of the date of this document.**

The ability of the individual named to provide appropriate knowledge and advice on a specific project is not implied or warranted by the Pile Driving Contractors Association or Pile Dynamics, Inc. **This certificate can be verified at www.PDAproficiencytest.com.** The Pile Driving Contractors Association or Pile Dynamics, Inc. assumes no liability for foundation testing and analysis work performed by the bearer of this certificate.

Steven A. Hall, Executive Director
Pile Driving Contractors Association

Garland Likins, Senior Partner
Pile Dynamics, Inc.

No. 2072

Report of SPT Energy Measurements
S&ME Diedrich D-50 Track (SN 382)
Winston-Salem, North Carolina
S&ME Project No. 6235-17-020

PREPARED FOR:

North Carolina Department of Transportation
Geotechnical Engineering Unit
1589 Mail Service Center
Raleigh, North Carolina 27699

PREPARED BY:

S&ME, Inc.
9751 Southern Pine Boulevard
Charlotte, NC 28273

September 1, 2017

September 1, 2017

North Carolina Department of Transportation
Geotechnical Engineering Unit
1589 Mail Service Center
Raleigh, North Carolina 27699

Attention: Dr. Shunyi (Chris) Chen, Ph.D., P.E.

Cc: Ms. Cheryl A. Youngblood, L.G.

Reference: **Report of SPT Energy Measurements**
S&ME Diedrich D-50 Track (SN 382)
Winston-Salem, North Carolina
S&ME Project No. 6235-17-020

Dear Dr. Chen:

We have completed the Standard Penetration Test (SPT) energy measurements on the automatic hammer mounted on our Diedrich D-50 track-mounted drill rig with a serial number of 382. This service was performed by our Mr. Robert E. Kral, P.E. on August 22, 2017. SPT energy testing was performed in general accordance with ASTM D4633 and the most recent revision of the North Carolina Department of Transportation, Geotechnical Engineering Unit's requirements. The testing procedures, equipment used during testing, and detailed results are presented in this report.

1.0 Dynamic Testing Methodology

Testing was performed using a model PAX (Serial No. 3733L) Pile Driving Analyzer™ (PDA) manufactured by Pile Dynamics, Inc. The PDA records and interprets data from two piezoresistive accelerometers (Serial Nos. K5641 and K5642) bolted to a 2.67-foot long BW drill rod (SN102) internally instrumented with two strain transducers. The BW instrumented drill rod length included one BW box to BWJ pin and one BWJ box to BW pin sub. The instrumented BW drill rod has a cross-sectional area of 1.80 square inches, an outside diameter of approximately 2.125 inches, and an inside diameter of 1.75 inches at the gage location. The accelerometers and strain gages, which are mounted on opposing axis near the middle of the instrumented rod, monitor acceleration and strain for each hammer blow. The analyzer converts the data to velocities and forces, computing the maximum transferred hammer energies with the "EFV" method described in ASTM D4633. All results are recorded and displayed in real-time for each blow. Calibration sheets for the accelerometers and the instrumented rod are included in the Appendix.

2.0 Testing and Observations

S&ME personnel were on site on August 22, 2017, to observe and perform testing during SPT sampling on the Diedrich D-50 track-mounted rig operated by Justin Millwood of S&ME. The measurements were taken during drilling operations for the NCDOT R-2247CD Winston-Salem Northern Beltway Design-Build project in Winston-Salem, North Carolina. The measurements were obtained during the SPT sampling of Soil Test Boring Y25ARPB_2200. SPT energy measurements were recorded during four intervals at depths of approximately 33½, 38½, 43½, and 48½ ft below the existing ground surface. The information presented in the tables below summarizes the equipment tested and tooling used during the SPT Energy Measurements.

Table 2-1: Drill Rig Information

Manufacturer	Diedrich
Model	D-50
Serial Number	382
Operator	Justin Millwood
Carrier	Track

Table 2-2: Hammer Information

Model / Type	CME / Auto
Serial Number	382
Anvil Height (inches)	11.5
Anvil Diameter (inches)	2.5
Drop Height (inches)	30
Ram Weight (pounds)	140
Ram Serial Number	N/A

Table 2-3: Drilling and Instrumented Rod Information

Drill Rod Type	BWJ
OD (inches)	2.125
ID (inches)	1.75
Cross-Sectional Area (in^2)	1.80
Typical Lengths (feet)	5 and 10
Instrumented Rod Type	BW (SN 102)
OD (inches)	2.125
ID (inches)	1.75
Cross-Sectional Area (in^2)	1.80
Total Instrumented Rod Length (feet)	2.67
Length Below Gages (feet)	1.42
Split-Spoon Length (feet)	2.95

3.0 Dynamic Testing Results

The total rod length from the instrumentation to the tip of the split-spoon sampler was determined by adding 4.62 ft to the required drill rod length at each sample depth. Based on the test data, the automatic hammer on the Diedrich D-50 track-mounted rig operated at a rate of about 41.1 to 41.9 blows per minute (bpm) during dynamic testing. The measured transferred hammer energy (EFV) was generally in the range of about 282.2 to 320.4 ft-lbs, which corresponds to Energy Transfer Ratio (ETR) values of about 80.6% to 91.5%, respectively. The SPT Energy Measurement Data Summary tables in the Appendix present the test data from every hammer blow at each sampling interval along with representative force and velocity traces for each test interval. The reported blow counts, obtained by the drill rig personnel, and a summary of the test data and average computed hammer energy and transfer ratio values are provided in Table 3-1. Plots and tables of the following are also included in the Appendix and present the test data with depth for each test interval:

- Penetration vs. BLC
- Penetration vs. FMX
- Penetration vs. EFV
- Penetration vs. CSX
- Penetration vs. VMX
- Penetration vs. ETR
- Average ETR vs. Rod Length
- ETR vs. Rod Length

Table 3-1: Summary of Dynamic Testing Results

Data Set ID	Sample Depth (ft)	Drill Rod Length (ft)	Instrumentation to Sampler Tip Length (ft)	Blows per 6" Increment / N-value	Soil Sample Description (Coastal Plain)	Avg. BPM	Avg. EFV (ft-lbs)	Avg. ETR (%)
1	33½ - 35	34	38.62	3-3-4 / 7	Sandy CLAY	41.5	297.2	84.9
2	38½ - 40	39	43.62	3-4-4 / 8	Sandy SILT	41.6	297.0	84.9
3	43½ - 45	44	48.62	4-6-11 / 17	Sandy SILT	41.5	303.8	86.8
4	48½ - 50	49	53.62	4-7-10 / 17	Sandy SILT	41.6	307.0	87.7
					Overall Average	**41.6**	**302.9**	**86.5**

The average hammer rate, transferred energy, and transfer ratio were calculated for each depth interval. Per ASTM D4633, only the blows from the final foot of each sample interval (i.e. the blows that determine the N-value) were included when computing the average values shown in Table 3-1. The overall average transferred hammer energy for the automatic hammer on the Diedrich D-50 track-mounted rig (for all the depth intervals tested) was 302.9 foot-pounds, with an average ETR of 86.5%.

4.0 Limitations of Report

This report has been prepared in accordance with generally accepted geotechnical engineering practice for specific application to this project. The conclusions contained in this report were based on the applicable standards of our profession in this geographic area at the time this report was prepared. No other warranty, express or implied, is made.

5.0 Closing

S&ME appreciates the opportunity to provide this report to the North Carolina Department of Transportation Geotechnical Engineering Unit. Please let us know if you have any questions concerning this report.

Sincerely,

S&ME, Inc.

Gregory J. Canivan, P.E.
Technical Principal

NORTH CAROLINA PROFESSIONAL SEAL 042642 ENGINEER ROBERT E. KRAL
rkral@smeinc.com
2017.09.01 16:37:43 -05'00'

Robert E. Kral, P.E.
Transportation Services Project Manager
N.C. Registration No. 042642

Appendices:

- Appendix I - Diedrich D-50 (SN 382) SPT Energy Measurements Summary Plots and Tables
- Appendix II - Field Log and Borelog Report
- Appendix III - Instrumented Rod and Accelerometer Calibration Sheets
- Appendix IV - Certificate of Proficiency

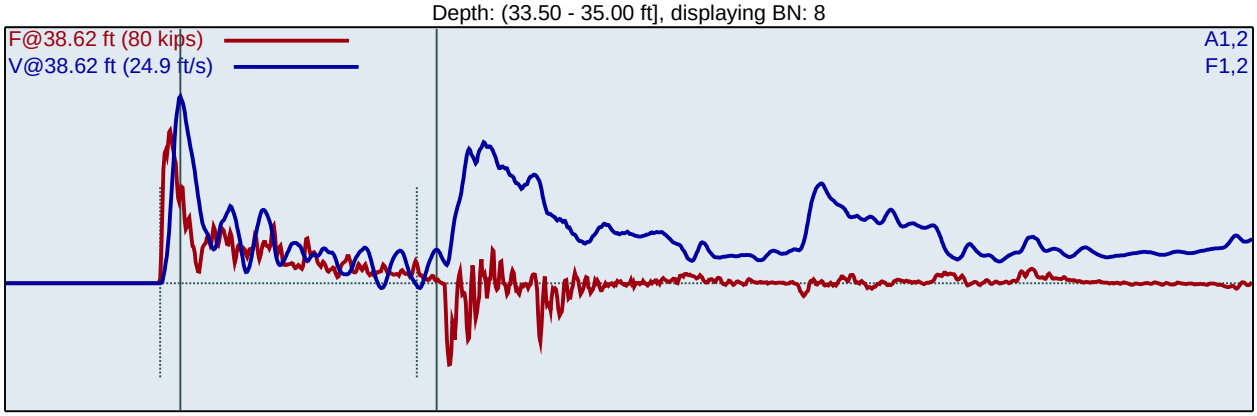
Appendices

Appendix I

DIEDRICH D50 (SN382)
R. KRAL
AR: 1.80 in^2
LE: 38.62 ft
WS: 16807.9 ft/s

Y25ARPB_2200
Test date: 8/22/2017
SP: 0.492 k/ft3
EM: 30000 ksi

Depth: (33.50 - 35.00 ft], displaying BN: 8



BPM: Blows/Minute
FMX: Maximum Force
VMX: Maximum Velocity
DMX: Maximum Displacement

CSX: Compression Stress Maximum
DFN: Final Displacement
EFV: Maximum Energy
ETR: Energy Transfer Ratio - Rated

BL#	LP ft	BC /6"	BPM bpm	FMX kips	VMX ft/s	DMX in	CSX ksi	DFN in	EFV ft-lb	ETR (%)
1	33.67	3	1.9	45	14.5	2.25	24.9	2.00	261.5	74.7
2	33.83	3	41.1	46	16.5	2.26	25.8	2.00	301.0	86.0
3	34.00	3	41.9	46	18.1	2.17	25.5	2.00	312.3	89.2
4	34.17	3	41.5	46	17.0	2.00	25.3	2.00	298.7	85.3
5	34.33	3	41.4	49	18.1	2.00	27.2	2.00	304.9	87.1
6	34.50	3	41.6	48	16.9	2.00	26.5	2.00	288.7	82.5
7	34.63	4	41.5	48	17.5	1.51	26.5	1.50	295.4	84.4
8	34.75	4	41.6	48	18.2	1.50	26.5	1.50	299.8	85.7
9	34.88	4	41.1	48	17.3	1.50	26.8	1.50	295.9	84.5
10	35.00	4	41.8	49	18.1	1.50	27.2	1.50	297.0	84.9
		Average	41.5	48	17.6	1.72	26.6	1.71	297.2	84.9
		Std Dev	0.2	1	0.5	0.25	0.6	0.25	4.5	1.3
		Maximum	41.8	49	18.2	2.00	27.2	2.00	304.9	87.1
		Minimum	41.1	46	16.9	1.50	25.3	1.50	288.7	82.5

N-value: 7

Sample Interval Time: 13.01 seconds.

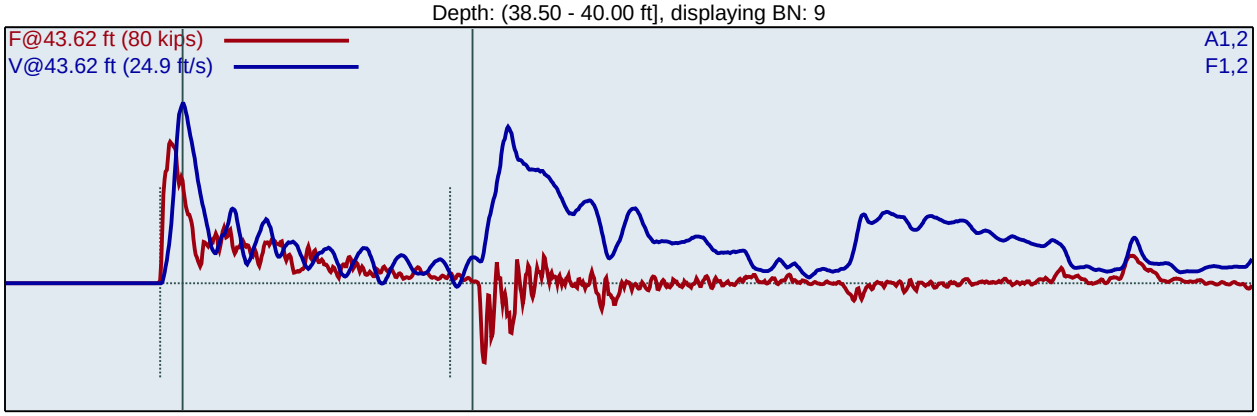
DIEDRICH D50 (SN382)
R. KRAL

Y25ARPB_2200
Test date: 8/22/2017

AR: 1.80 in^2
LE: 43.62 ft
WS: 16807.9 ft/s

SP: 0.492 k/ft3
EM: 30000 ksi

Depth: (38.50 - 40.00 ft], displaying BN: 9



BL#	LP ft	BC /6"	BPM bpm	FMX kips	VMX ft/s	DMX in	CSX ksi	DFN in	EFV ft-lb	ETR (%)
1	38.67	3	1.9	49	19.1	2.24	27.1	2.00	303.1	86.6
2	38.83	3	41.6	49	18.1	2.24	27.2	2.00	294.2	84.1
3	39.00	3	41.5	49	18.0	2.00	27.2	2.00	305.3	87.2
4	39.13	4	41.8	49	17.6	1.62	27.2	1.50	288.4	82.4
5	39.25	4	41.2	49	16.9	1.52	27.2	1.50	282.2	80.6
6	39.38	4	41.7	46	17.4	1.50	25.4	1.50	298.0	85.1
7	39.50	4	41.7	48	18.0	1.50	26.6	1.50	295.8	84.5
8	39.63	4	41.5	44	17.4	1.50	24.7	1.50	300.4	85.8
9	39.75	4	41.5	44	17.5	1.50	24.6	1.50	301.5	86.2
10	39.88	4	41.5	45	17.9	1.50	25.1	1.50	305.1	87.2
11	40.00	4	41.5	44	18.1	1.50	24.6	1.50	304.7	87.1
		Average	41.6	46	17.6	1.52	25.7	1.50	297.0	84.9
		Std Dev	0.2	2	0.4	0.04	1.1	0.00	7.5	2.1
		Maximum	41.8	49	18.1	1.62	27.2	1.50	305.1	87.2
		Minimum	41.2	44	16.9	1.50	24.6	1.50	282.2	80.6

N-value: 8

Sample Interval Time: 14.41 seconds.

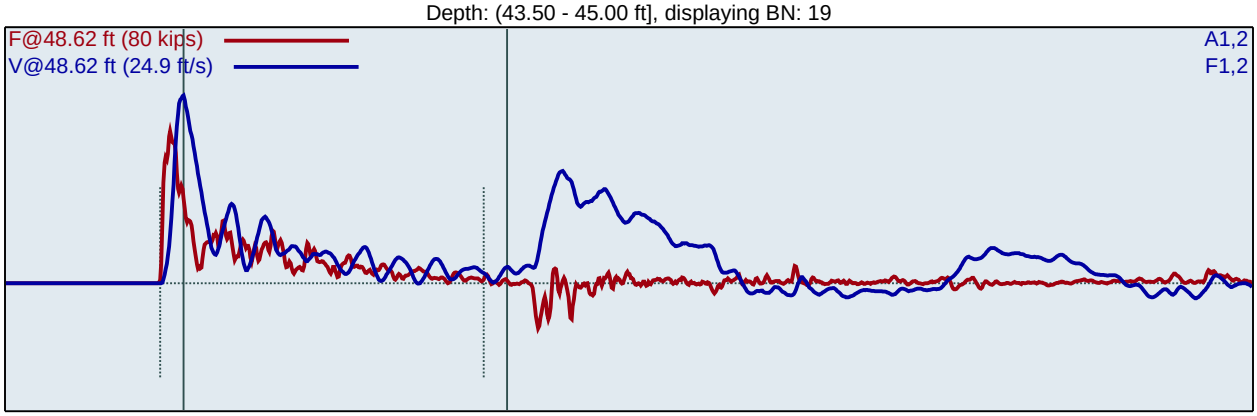
DIEDRICH D50 (SN382)
R. KRAL

Y25ARPB_2200
Test date: 8/22/2017

AR: 1.80 in^2
LE: 48.62 ft
WS: 16807.9 ft/s

SP: 0.492 k/ft3
EM: 30000 ksi

Depth: (43.50 - 45.00 ft], displaying BN: 19



BL#	LP ft	BC /6"	BPM bpm	FMX kips	VMX ft/s	DMX in	CSX ksi	DFN in	EFV ft-lb	ETR (%)
1	43.63	4	1.9	48	17.5	1.50	26.8	1.50	290.4	83.0
2	43.75	4	41.5	46	16.8	1.56	25.4	1.50	291.6	83.3
3	43.88	4	41.7	43	17.0	1.78	23.7	1.50	301.8	86.2
4	44.00	4	41.7	45	18.2	1.55	24.9	1.50	315.4	90.1
5	44.08	6	41.8	43	17.5	1.29	24.0	1.00	307.6	87.9
6	44.17	6	41.4	44	17.6	1.14	24.3	1.00	311.0	88.9
7	44.25	6	41.5	46	18.3	1.08	25.5	1.00	314.4	89.8
8	44.33	6	41.7	43	17.5	1.09	24.1	1.00	308.2	88.1
9	44.42	6	41.4	44	18.1	1.07	24.4	1.00	314.7	89.9
10	44.50	6	41.6	43	18.0	1.06	23.8	1.00	313.5	89.6
11	44.55	11	41.9	45	18.3	0.90	24.8	0.55	303.9	86.8
12	44.59	11	41.3	43	17.4	0.84	24.0	0.55	307.3	87.8
13	44.64	11	41.7	43	17.5	0.74	24.1	0.55	296.0	84.6
14	44.68	11	41.4	45	17.9	0.69	24.7	0.55	296.1	84.6
15	44.73	11	41.4	45	17.4	0.66	24.9	0.55	291.2	83.2
16	44.77	11	41.4	45	18.2	0.65	25.1	0.55	304.5	87.0
17	44.82	11	41.7	44	17.7	0.62	24.4	0.55	304.3	86.9
18	44.86	11	41.4	43	17.4	0.59	24.0	0.55	299.6	85.6
19	44.91	11	41.4	47	18.3	0.59	26.4	0.55	302.2	86.3
20	44.95	11	41.7	47	18.0	0.56	26.3	0.55	290.0	82.9
21	45.00	11	41.3	46	17.8	0.56	25.4	0.55	301.0	86.0
		Average	41.5	44	17.8	0.83	24.7	0.71	303.8	86.8
		Std Dev	0.2	1	0.3	0.24	0.8	0.22	7.4	2.1
		Maximum	41.9	47	18.3	1.29	26.4	1.00	314.7	89.9
		Minimum	41.3	43	17.4	0.56	23.8	0.55	290.0	82.9

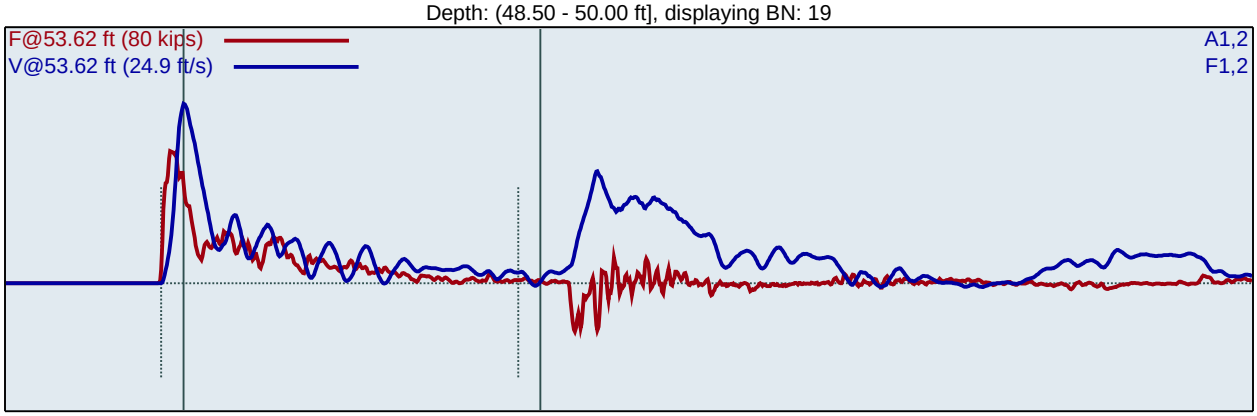
N-value: 17

Sample Interval Time: 28.83 seconds.

DIEDRICH D50 (SN382)
R. KRAL
AR: 1.80 in^2
LE: 53.62 ft
WS: 16807.9 ft/s

Y25ARPB_2200
Test date: 8/22/2017
SP: 0.492 k/ft3
EM: 30000 ksi

Depth: (48.50 - 50.00 ft], displaying BN: 19



BL#	LP ft	BC /6"	BPM bpm	FMX kips	VMX ft/s	DMX in	CSX ksi	DFN in	EFV ft-lb	ETR (%)
1	48.63	4	1.9	44	15.2	1.70	24.5	1.50	263.8	75.4
2	48.75	4	41.7	41	16.6	1.64	22.9	1.50	302.0	86.3
3	48.88	4	41.5	41	16.9	1.54	22.7	1.50	307.1	87.7
4	49.00	4	41.4	42	16.4	1.50	23.1	1.50	303.6	86.8
5	49.07	7	41.6	42	16.6	1.10	23.5	0.86	302.3	86.4
6	49.14	7	41.8	41	16.9	1.03	23.0	0.86	303.8	86.8
7	49.21	7	41.7	42	16.6	0.98	23.2	0.86	295.3	84.4
8	49.29	7	41.3	42	17.2	0.99	23.5	0.86	312.3	89.2
9	49.36	7	41.7	43	17.6	0.94	23.8	0.86	311.4	89.0
10	49.43	7	41.9	42	17.3	0.91	23.4	0.86	308.2	88.1
11	49.50	7	41.3	42	17.6	0.89	23.4	0.86	319.1	91.2
12	49.55	10	41.9	41	17.5	0.73	22.7	0.60	314.7	89.9
13	49.60	10	41.6	42	17.1	0.70	23.3	0.60	302.7	86.5
14	49.65	10	41.5	43	18.3	0.73	23.7	0.60	320.4	91.5
15	49.70	10	41.5	42	17.0	0.70	23.1	0.60	305.3	87.2
16	49.75	10	41.8	41	17.5	0.71	22.7	0.60	309.9	88.6
17	49.80	10	41.6	41	17.1	0.69	22.8	0.60	298.7	85.4
18	49.85	10	41.5	42	17.8	0.68	23.1	0.60	305.8	87.4
19	49.90	10	41.6	41	17.5	0.67	22.9	0.60	303.0	86.6
20	49.95	10	41.5	42	17.2	0.67	23.5	0.60	300.2	85.8
21	50.00	10	41.5	42	17.5	0.66	23.6	0.60	306.3	87.5
		Average	41.6	42	17.3	0.81	23.2	0.71	307.0	87.7
		Std Dev	0.2	1	0.4	0.15	0.3	0.13	6.7	1.9
		Maximum	41.9	43	18.3	1.10	23.8	0.86	320.4	91.5
		Minimum	41.3	41	16.6	0.66	22.7	0.60	295.3	84.4

N-value: 17

Sample Interval Time: 28.80 seconds.

Summary of SPT Test Results

Project: DIEDRICH D50 (SN382), Test Date: 8/22/2017

BPM: Blows/Minute
FMX: Maximum Force
VMX: Maximum Velocity
DMX: Maximum Displacement
CSX: Compression Stress Maximum
DFN: Final Displacement
EFV: Maximum Energy
ETR: Energy Transfer Ratio - Rated

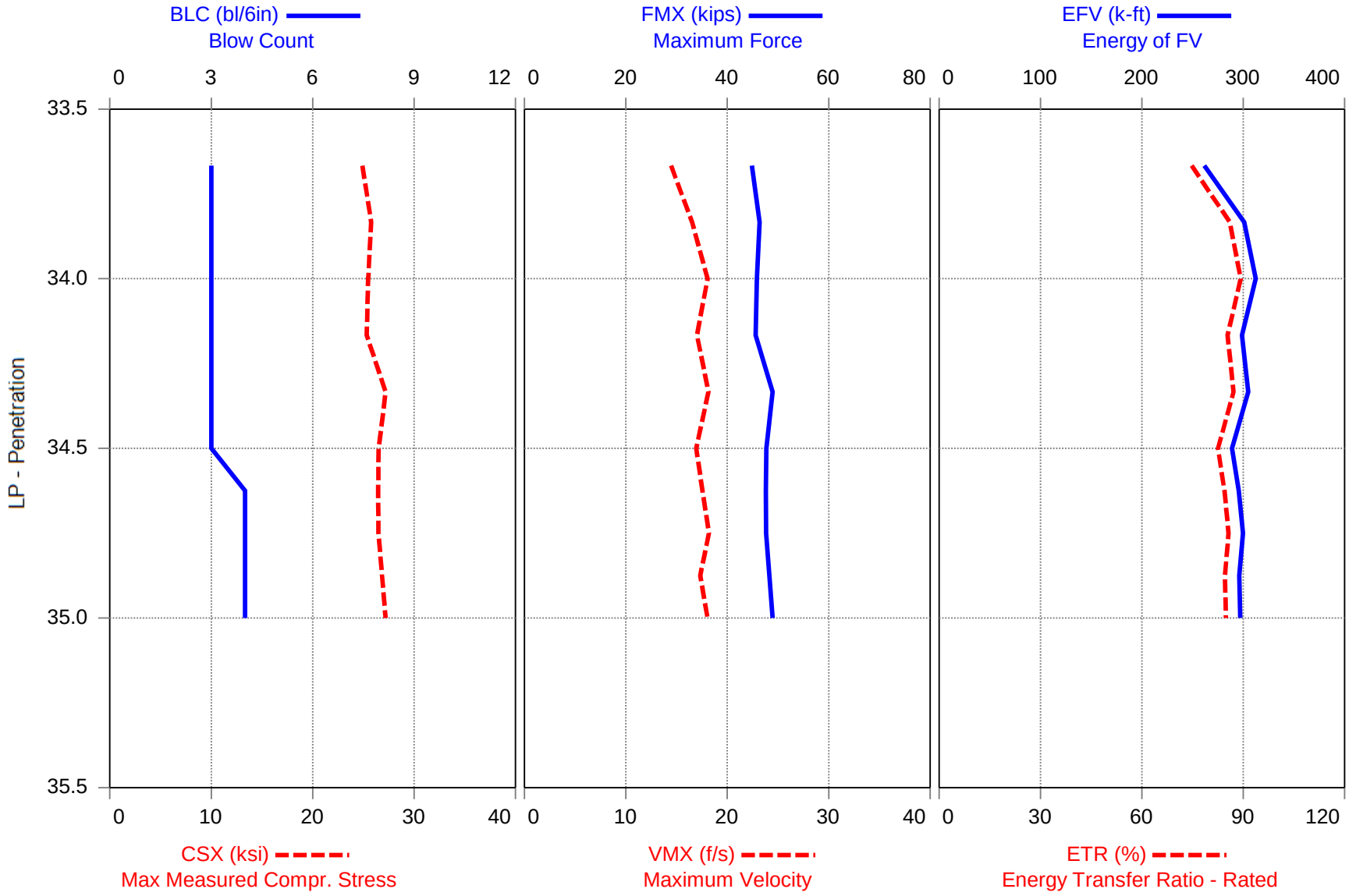
Instr. Length ft	Start Depth ft	Final Depth ft	Blows Applied /6"	**N Value**	**N60 Value**	Average BPM bpm	Average FMX kips	Average VMX ft/s	Average DMX in	Average CSX ksi	Average DFN in	Average EFV ft-lb	Average ETR (%)
38.62	33.50	35.00	**3-3-4**	**7**	**10**	41.5	48	17.6	1.72	26.6	1.71	297.2	84.9
43.62	38.50	40.00	**3-4-4**	**8**	**11**	41.6	46	17.6	1.52	25.7	1.50	297.0	84.9
48.62	43.50	45.00	**4-6-11**	**17**	**24**	41.5	44	17.8	0.83	24.7	0.71	303.8	86.8
53.62	48.50	50.00	**4-7-10**	**17**	**24**	41.6	42	17.3	0.81	23.2	0.71	307.0	87.7
				Overall Average Values:		41.6	44	17.6	1.06	24.6	0.98	302.9	86.5
				Standard Deviation:		0.2	2	0.4	0.41	1.4	0.45	7.9	2.3
				Overall Maximum Value:		41.9	49	18.3	2.00	27.2	2.00	320.4	91.5
				Overall Minimum Value:		41.1	41	16.6	0.56	22.7	0.55	282.2	80.6

Pile Dynamics, Inc. - PDIPLOT2 Ver 2016.2.57.6 - Case Method & iCAP® Results

Printed: 31-August-2017

Test started: 22-August-2017

DIEDRICH D50 (SN382) - Y25ARPB_2200, 33.5 to 35

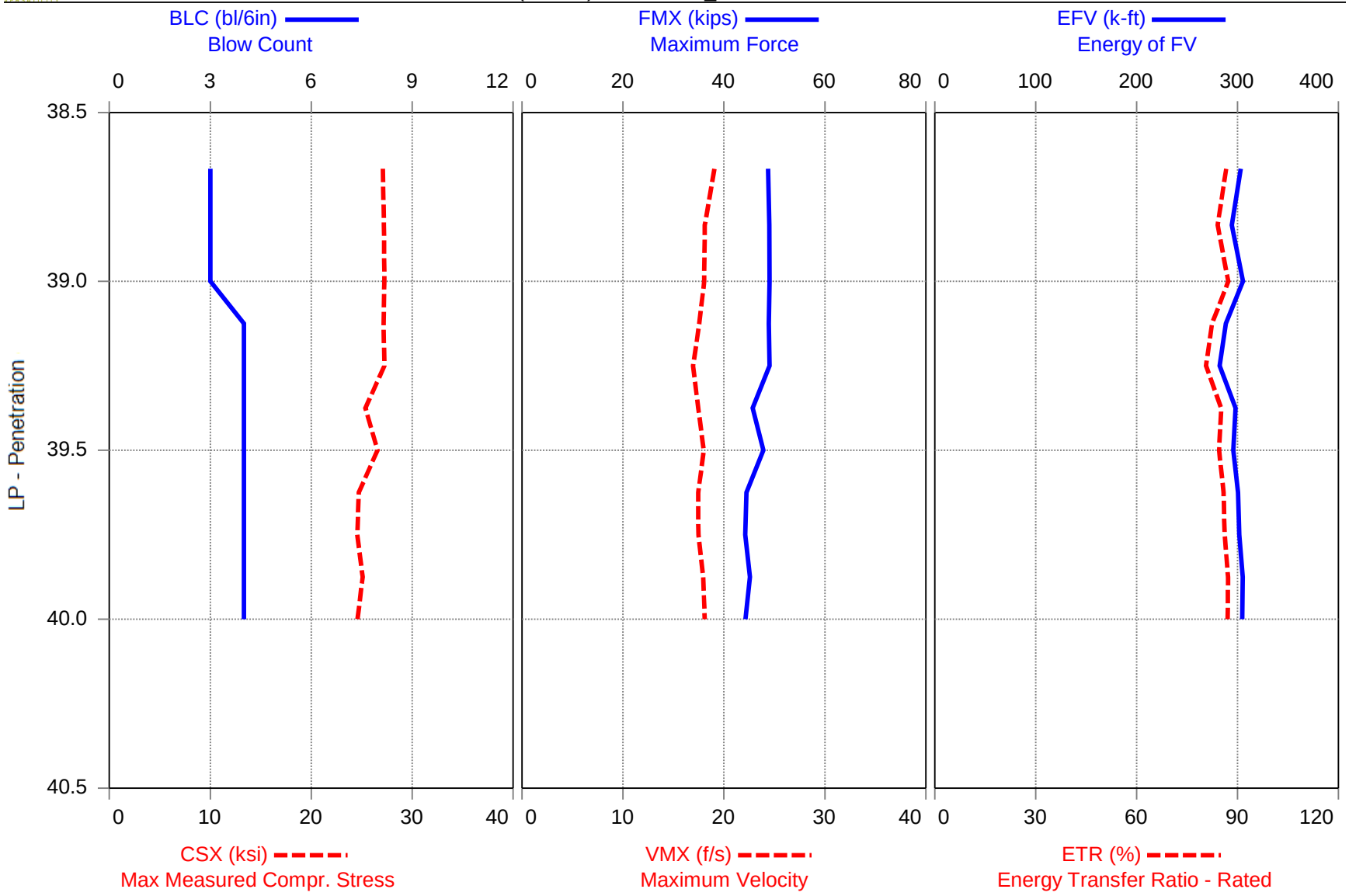


Pile Dynamics, Inc. - PDIPLOT2 Ver 2016.2.57.6 - Case Method & iCAP® Results

Printed: 31-August-2017

Test started: 22-August-2017

DIEDRICH D50 (SN382) - Y25ARPB_2200, 38.5 to 40

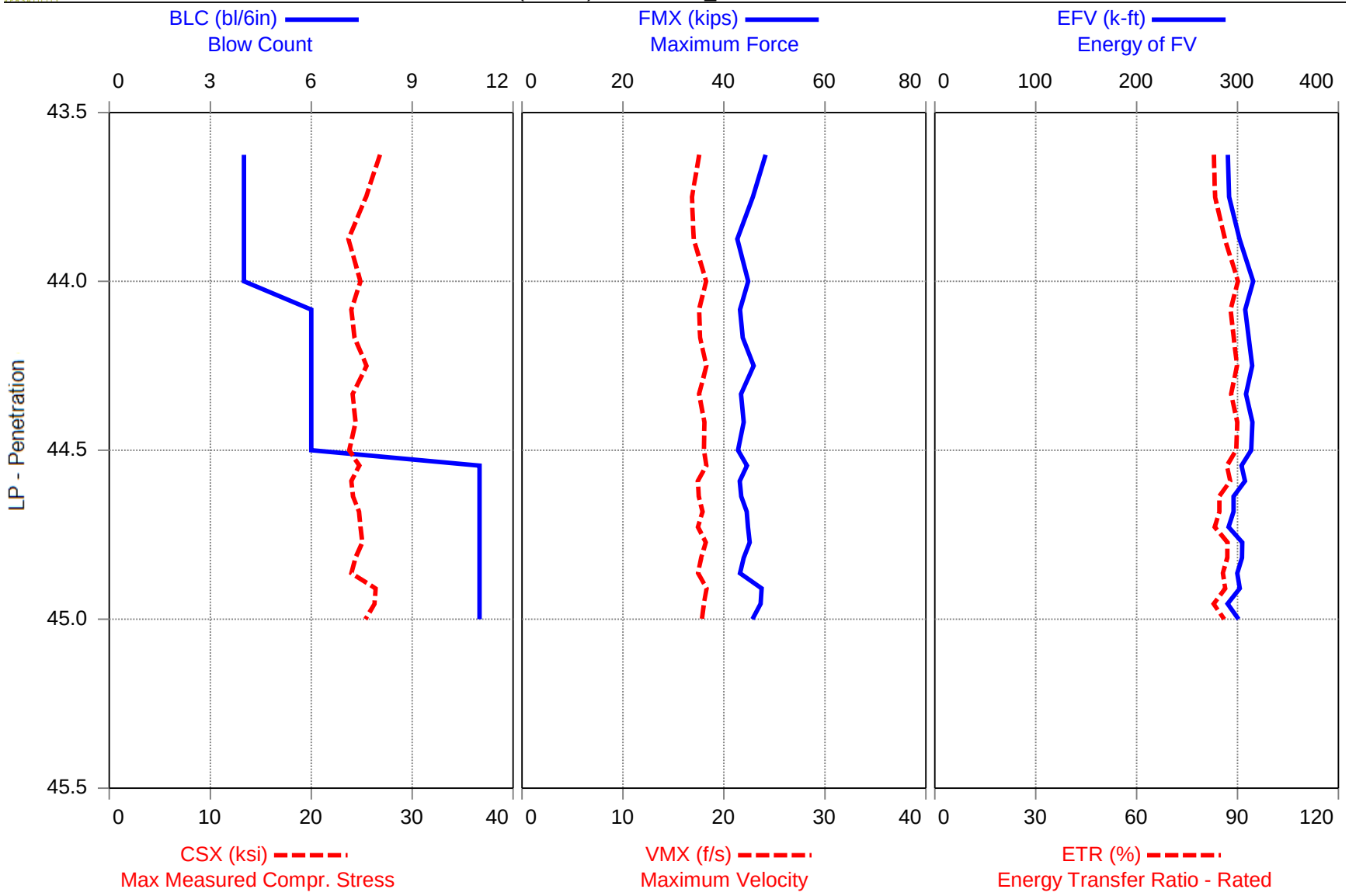


Pile Dynamics, Inc. - PDIPLOT2 Ver 2016.2.57.6 - Case Method & iCAP® Results

Printed: 31-August-2017

Test started: 22-August-2017

DIEDRICH D50 (SN382) - Y25ARPB_2200, 43.5 to 45

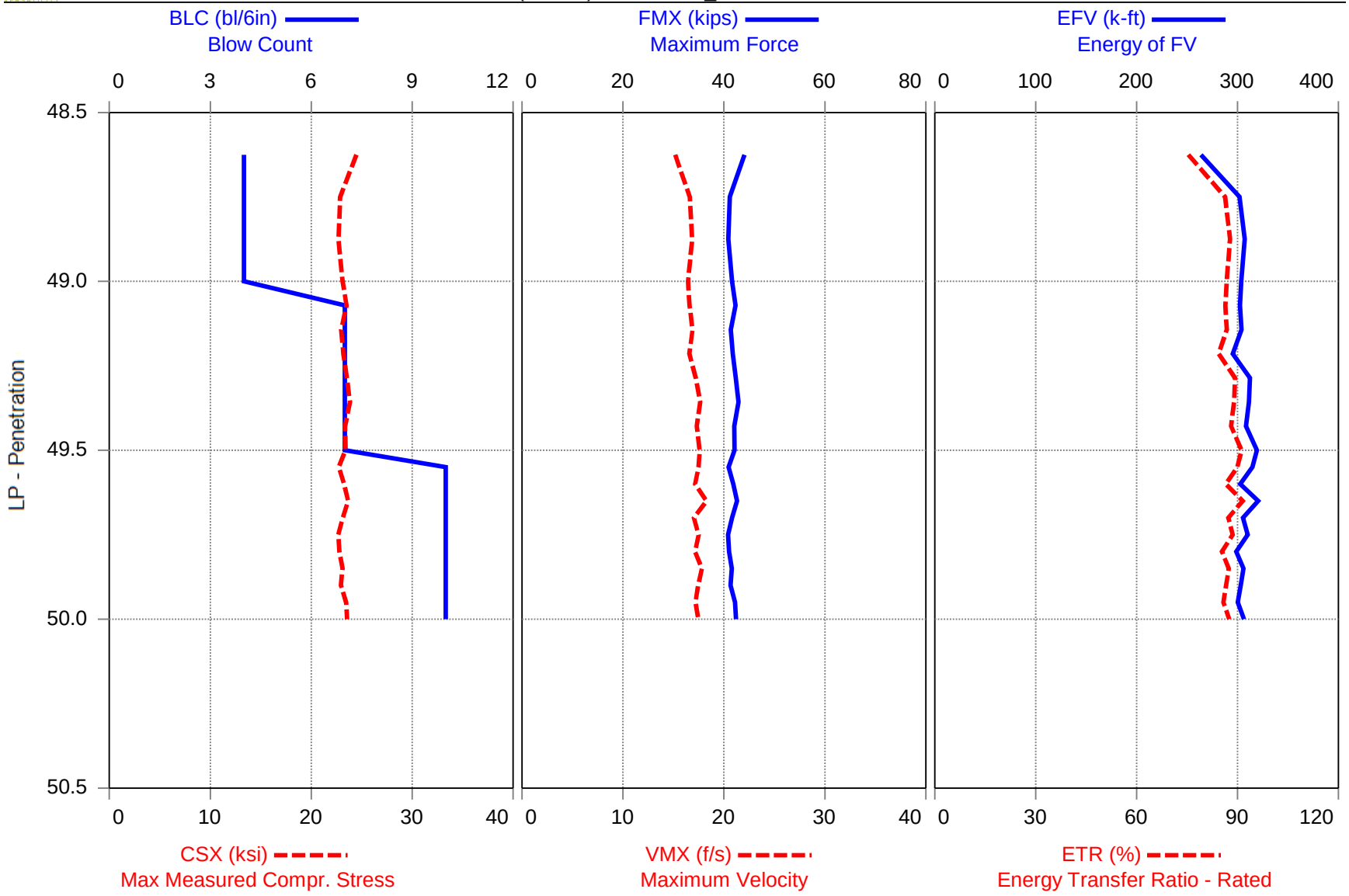


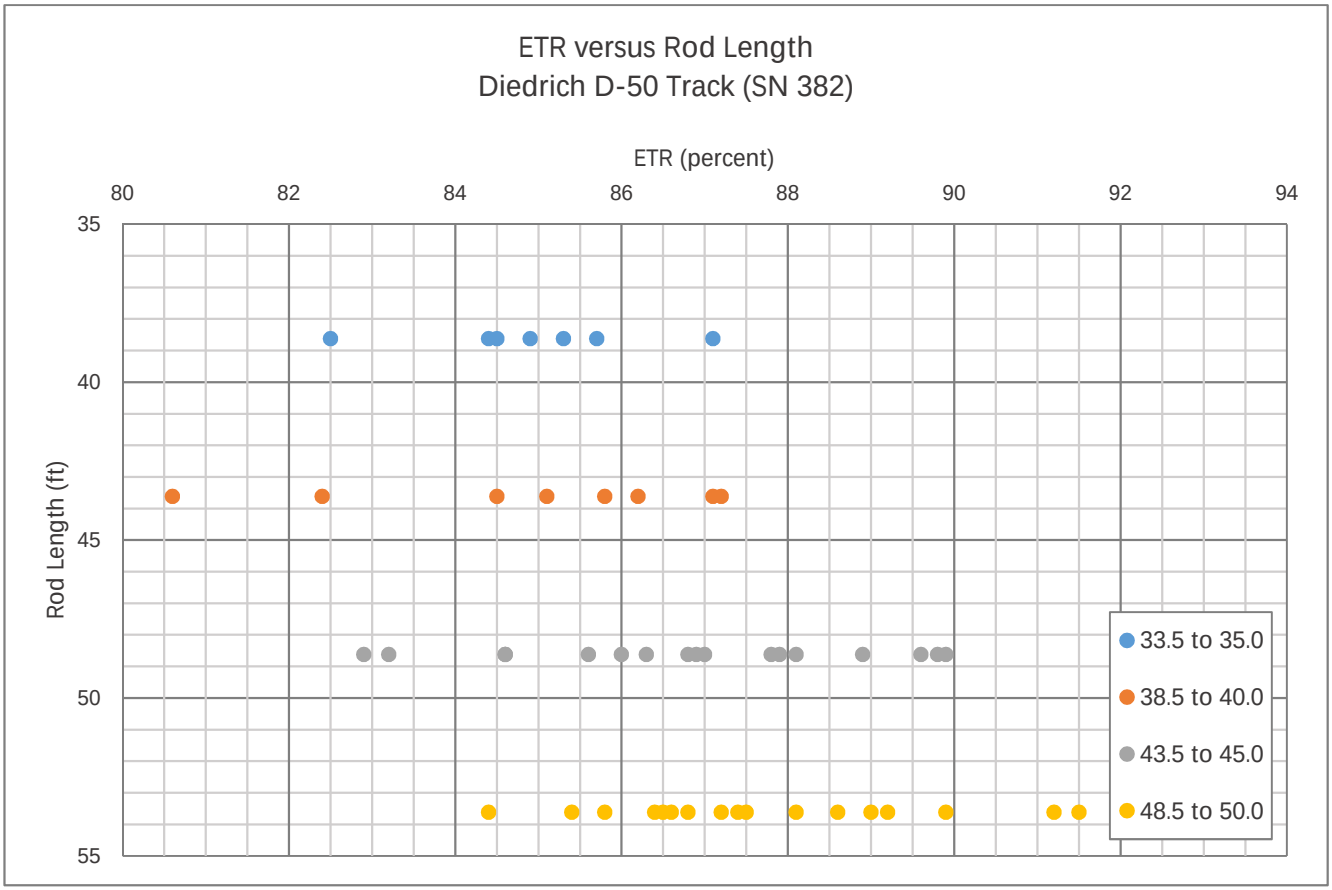
Pile Dynamics, Inc. - PDIPLOT2 Ver 2016.2.57.6 - Case Method & iCAP® Results

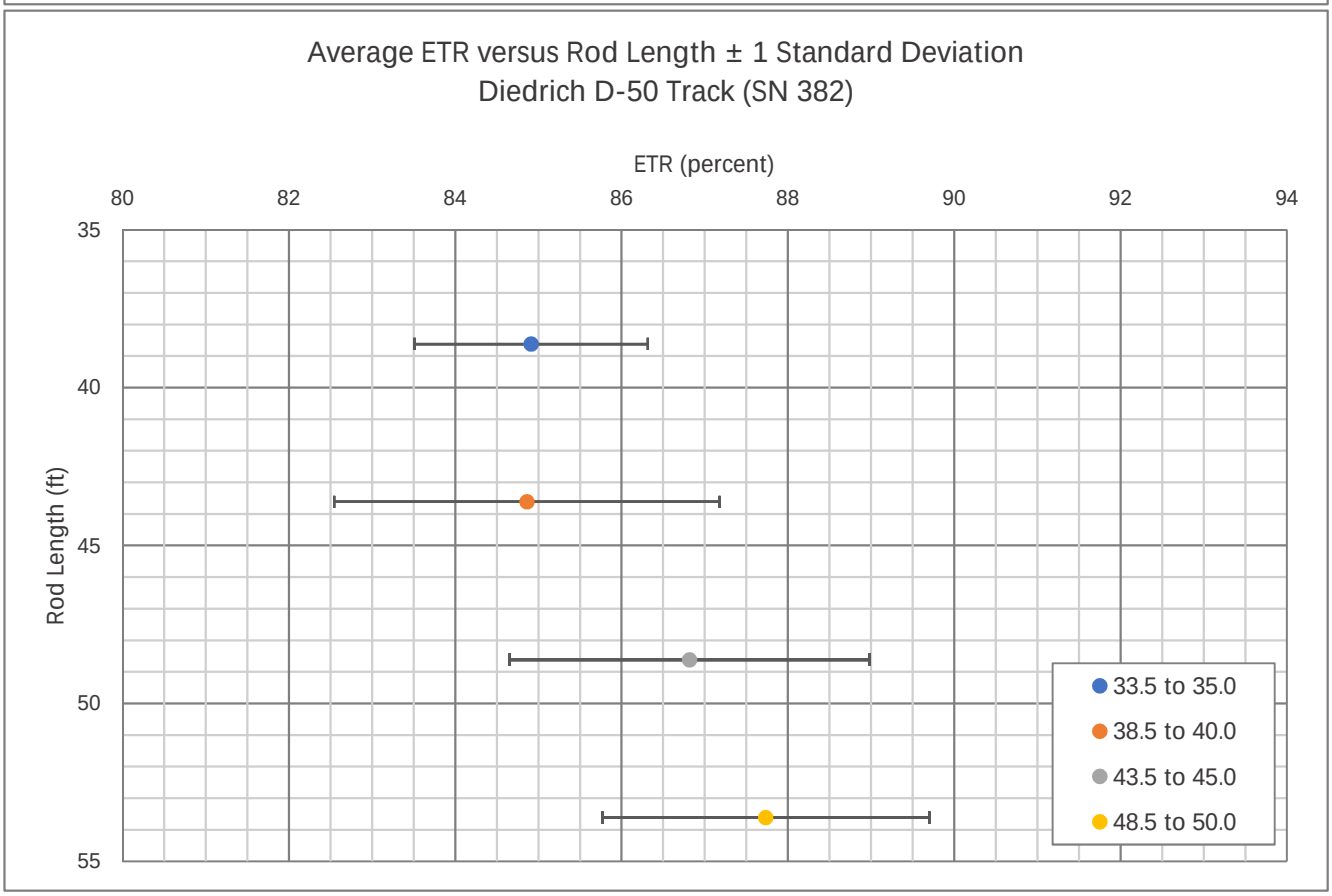
Printed: 31-August-2017

Test started: 22-August-2017

DIEDRICH D50 (SN382) - Y25ARPB_2200, 48.5 to 50




ETR versus Rod Length
Diedrich D-50 Track (SN 382)
ETR (percent)
80
82
84
86
88
90
92
94
Rod Length (ft)
35
40
45
50
55
33.5 to 35.0
38.5 to 40.0
43.5 to 45.0
48.5 to 50.0


Average ETR versus Rod Length ± 1 Standard Deviation
Diedrich D-50 Track (SN 382)
ETR (percent)
80
82
84
86
88
90
92
94
Rod Length (ft)
35
40
45
50
55
33.5 to 35.0
38.5 to 40.0
43.5 to 45.0
48.5 to 50.0

Appendix II

SPT Energy Evaluation Form

S&ME

Project: R-2247 **Date (s):** 8/22/17
Project No.: 6235-17-020 **Weather:** 90° SUNNY
Boring No.: Y25AR2B-2200 **Drill Rod Type:** BWJ

On-site Personnel

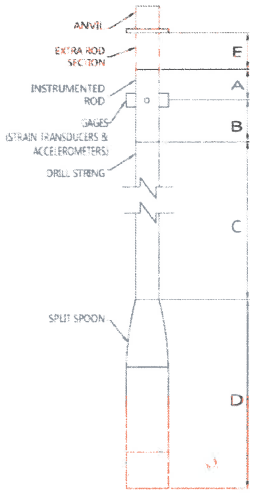
Drilling Company: S&ME, INC.
Rig Oper./Helper: JUSTIN MILLWOOD
Rig Engr/Geologist: FINLEY LLOYD
Analyzer Oper.: BOB KRAL

Rig/Hammer Info

Drill Rig Make/Model: DIEDRICH D-50
Carrier Type: TRACK (MST-8000)
Rig Serial No.: 382
Hammer Type/Model: DIEDRICH
Hammer Serial No.: 382
Hammer Drop System: AUTO
Lubrication Condition: PER MANUFACTURER
Manufacturer Recommended Operation Rate (bpm): 45
Drop Height ~~from Calibration Record~~ (in.): 30
Hammer Weight ~~from Calibration Record~~ (lbs): 140
Anvil Dimension (in.): 30
Drilling Method: HSA

Rod Info

(A + E) Impact Surface to Gages Length: 1.67 ft
(B) Instr. Rod Length below Gages: 1.42 ft
(A) + (B) Instr. Rod Length: 2.67 ft
(D) Spoon Length: 2.95 ft
(E) Rod Length Above Instr. Rod (if applicable): 0.42 ft
Instr. Rod S/N: 102BW-2
Instr. Rod Outside Dia.: 2.125 in.
Instr. Rod Area: 1.80 in^2
PDA Make/Model: PAX
PDA Serial No.: 3733L
Calib. Pulse Test (y/n): Y



Gage Information

Gage		Serial No.	Calibration No.
Accel.	A3	5641	376
	A4	5642	320
Strain	F3	102BW-1	211.49
	F4	102BW-2	211.97

Date of Test	Test Depth Increment (ft to ft)	Test Time Start / Stop (Military)	Length of Drill String (ft) (C)	(LE) Length Below Gages (ft) (B)+(C)+(D)	Avg. Meas. Hammer Rate (BPM)	SPT Blow Counts 6"	12"	18"	N Value	Drop Height In Tolerance (y/n)	
8/22	33.5 To 35.0	11:35 / 11:35	34	38.62	41	3	3	4	7	Y	SA. CL
8/22	38.5 To 40.0	11:44 / 11:44	39	43.62	41	3	4	4	8	Y	SA. SI
8/22	43.5 To 45.0	11:53 / 11:53	44	48.62	41	4	6	11	17	Y	SA. SI
8/22	48.5 To 50.0	12:00 / 12:01	49	53.62	41	4	7	10	17	Y	SA. SI

Comments: (1) **If there are any nonconformances or deficiencies identified during the testing, immediately pause the drilling and testing activities and notify the Site Manager** and describe them in the space below; (2) Note any unusual hammer operating conditions that affect the hammer performance, or changes in operating conditions (e.g. verticality, weather, or lubrication between trials). Drop height tolerance is ± 1 inch. Drop height verified by Rig Geologist/Engineer at time of SPT Energy measurement for CME hammers and at the beginning of the day for Diedrich hammers; (3) Note any changes in rod diameter along drill string and record locations of short rod sections; (4) Prepare a sketch or take a picture of the instrumented drill rod assembly and indicate the approximate relative location and orientation of the strain gauges, accelerometers, and LE Datum; (5) Note: Identify all attached pages, including photographs, with the Project No., Boring No., and date.

Prepared By (print/signature)
SPT Energy Lead

8/22/17
Date

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34409.3.23	**TIP** R-2247	**COUNTY** FORSYTH	**GEOLOGIST** Lloyd, F.	
SITE DESCRIPTION US 421 / Peace Haven Road - R-2247 CD				**GROUND WTR (ft)**
BORING NO. Y25ARPB_2200	**STATION** 22+00	**OFFSET** 10 ft LT	**ALIGNMENT** Y25ARPB	**0 HR.** 47.5 FIAD
COLLAR ELEV. N/A	**TOTAL DEPTH** 50.0 ft	**NORTHING** N/A	**EASTING** N/A	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE SME382 DIEDRICH D50 86.5% 8/22/2017		**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic
DRILLER Millwood, J.	**START DATE** 08/22/17	**COMP. DATE** 08/22/17	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
										GROUND SURFACE	0.0
		1.0								**ROADWAY EMBANKMENT**	
			5	4	5	9	SS-2032	M		Gray and Tan, Silty Fine to Medium SAND with Mica	3.0
		3.5	2	3	4	7	SS-2033	M		Orange and Tan, Fine Sandy SILT with Mica, with Some Clay, Sparse Organics, and Rock Fragments at 14', with 2" Seam of Fine to Coarse Sand at 19.5'	
		6.0	2	3	4	7	SS-2034	M			
		8.5	3	3	5	8	SS-2035	M		Only 6" Recovery at 3.5'-5'	
		13.5	4	3	5	8	SS-2036	M			
		18.5	4	4	5	9	SS-2037	M			
		23.5	2	2	4	6	SS-2038	M		Red, Clayey SILT with Sand	24.0 25.0
		28.5								Tan Red, Fine Sandy SILT with Mica	
			2	2	4	6	SS-2039	W		Red Gray to Gray Tan, CLAY, Trace Organics at 33.5'	29.0
		33.5	3	3	4	7	SS-2040	W			
		38.5								**RESIDUAL**	37.0
			3	4	4	8	SS-2041	W		Gray SILT, Highly Micaceous	39.0
		43.5								Light Green and Tan, Clayey SILT, with Sand	42.0
			4	6	11	17	SS-2042	W		Gray Tan, Fine Sandy SILT, Trace Mica, with 2" White Silt Seam at 44'	
		48.5									
			4	7	10	17	SS-2043	W			50.0
										Boring Terminated at Depth 50.0 ft in Very Stiff Sandy SILT	

DRAFT

Appendix III

Pile Dynamics, Inc.

Quality Assurance for Deep Foundations

PDI Certificate of Calibration

PDI Accelerometer Calibration

Model PR-Kicher Serial # K5641

Cal Date: 27Feb17 Cal Due : 27Feb19

Temperature: 64.5 deg. F Humidity 30 %

Calibrated at
Pile Dynamics, Inc.
30725 Aurora Road
Cleveland, OH 44139

Manufactured by Pile Dynamics, Inc.

Procedure used: PDA Accelerometer Calibration Procedure 2016-6, Revision 20160422

Equipment was found to be

✓ in tolerance As Received _____ out of tolerance As Received

✓ in tolerance As Returned _____ out of tolerance As Returned

PDI Calibration: .0752 mv/5000g

Calibration Standards Utilized
Hopkinson Bar Force Calibration F2, verified on 25APR16

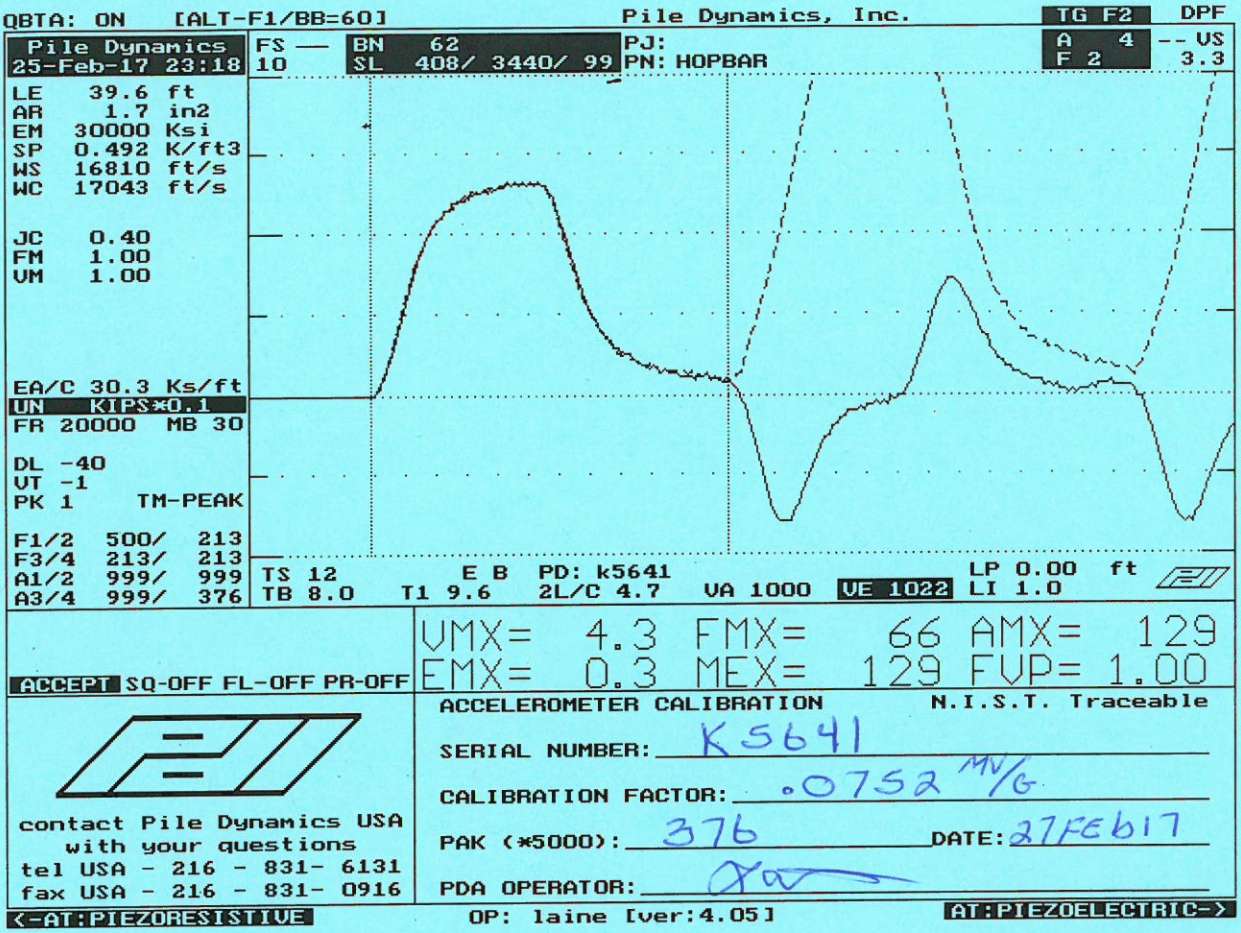
PDI HopBar DOS PAK, serial number 1273K, verified on 25 APR 16

Calibration performed by: L. M. Wright
Laine Wright, Technician

Reviewed by: Robert Sprenger
Robert Sprenger, Production Manager

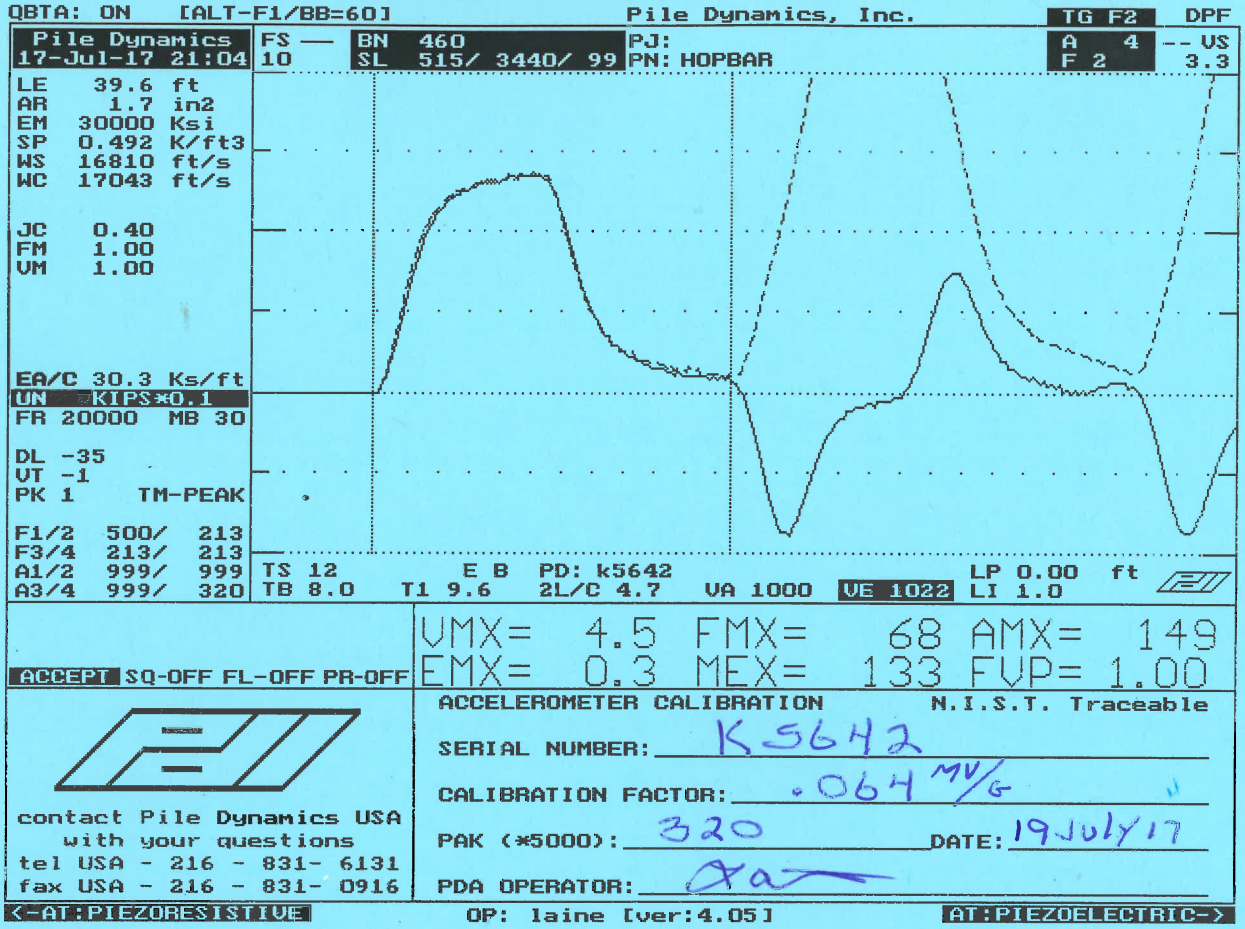
Accelerometer CC-5 Issued 20160426

30725 Aurora Road • Cleveland, Ohio 44139 USA • +1-216-831-6131 • Fax +1-216-831-0916
E-mail: info@pile.com • www.pile.com



Smart Sensor

Smart Chip Programmed By RMW **on** 27FEB17 **CRC Value** 3C62



Smart Sensor

Smart Chip Programmed By A.M.W. **on** 19July17 **CRC Value** 73CE

Pile Dynamics, Inc.

Quality Assurance for Deep Foundations

PDI Certificate of Calibration

PDI SPT Drill Rod Serial # 102 BW

Cal Date: 2-27-17 Cal Due : 2-27-19

Temperature: 69.2 deg. F Humidity 42 %

Manufactured by Pile Dynamics, Inc.
Calibrated at: Pile Dynamics, Inc., 30725 Aurora Road, Cleveland, OH 44139
Procedure used: SPT Drill Rod Calibration Procedure 2016-4, Revision 20160422
Calibration Data: Attach SPT Rod Data Sheet DS-17

Equipment was found to be
✓ in tolerance As Received _____ out of tolerance As Received

✓ in tolerance As Returned _____ out of tolerance As Returned

Calibration Standards Utilized

1. PDI SPT Calibration Signal Conditioning Unit #000001, verified on 20160302
2. PDI Load Cell #75, Certificate #3482090006
3. Capacitec Displacement Sensor #2034, Certificate #3482090004
4. Capacitec Displacement Sensor #2040, Certificate #3482090004
5. Capacitec Displacement Mainframe #4004-671, Certificate #3482090004
6. Brown & Sharpe Digital Caliper #8G028506, Certificate #3482090001
7. National Instruments USB-6210 DAQ serial number 159AFDE, Certificate #3482090002

Calibration performed by:

David Burrell Technician

Reviewed by:

Robert Sprenger, Production Manager

SPT CC-16 Issued 20160425

30725 Aurora Road • Cleveland, Ohio 44139 USA • +1-216-831-6131 • Fax +1-216-831-0916
E-mail: info@pile.com • www.pile.com

Pile Dynamics, Inc.

Quality Assurance for Deep Foundations

SPT Calibration Data Sheet Revision number 20160426
Use Calibration Procedure Number 2016-8, Revision 20160422

SPT Drill Rod Data

Serial Number: 102 BW Calibration Date: 2-27-17

Temperature: 69.2 °F Humidity: 42 %

Calibration performed in accordance with PDI SPT Calibration Procedure 2016-4, Revision 20160422

As Received (circle one) : Operational - Malfunctioning - Damaged

Calibration data
Pre-Load: 1. 8032 2. 8103 3. 8051

Total Load: 1. 17944 2. 18025 3. 17918

Common typical theoretical EA values based on SPT Rod Type:
AW: 35400 NW: 43100 or 68100 N3: 70800 BW:52344

EA Theoretical 52344 EA Measured 53973.2 Error 3.11 %
Within 4% Tolerance: Y / N

Alternative EA verification: Measure wall thickness, calculate area and multiply by 30000. (use spreadsheet for calculation)

Calibration values
Channel 1: As Found: (last cal): 218.03 As Left: 211.49 Within 5% Tolerance: Y / N
Channel 2: As Found: (last cal): 216.99 As Left: 211.97 Within 5% Tolerance: Y / N
EA: As Found: (last cal): 52603.8 As Left: 53973.2 Difference: 2.6 %

Calibration performed by:

David Burrell, Technician

Reviewed by:

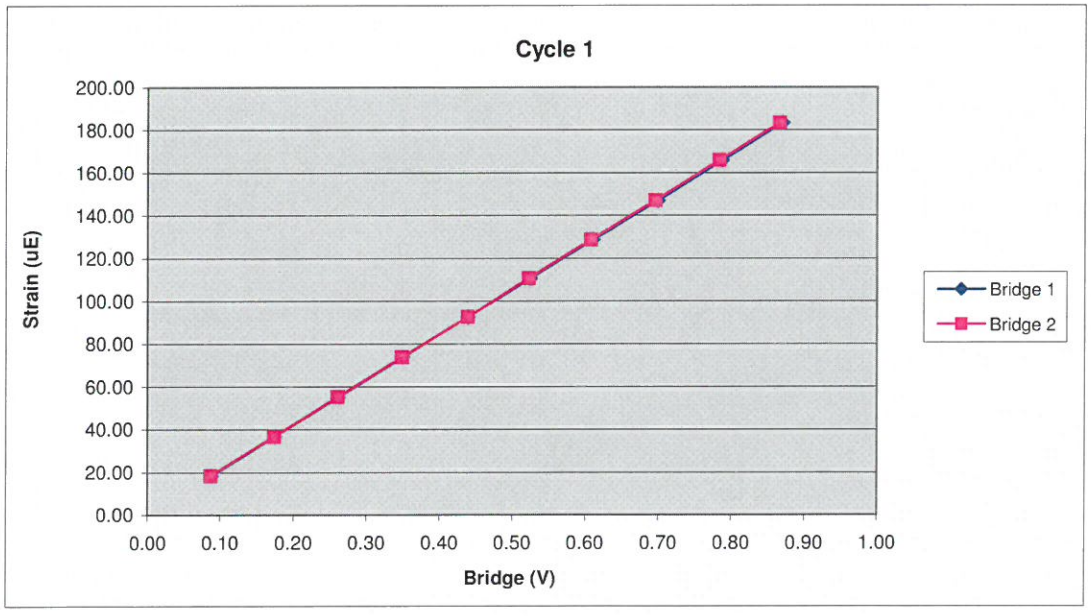
Robert Sprenger, Production Manager

30725 Aurora Road • Cleveland, Ohio 44139 USA • +1-216-831-6131 • Fax +1-216-831-0916
E-mail: info@pile.com • www.pile.com

102BW		Cycle 1		
Sample	**Force (lb)**	**Strain (µE)**	**Bridge 1 (V)**	**Bridge 2 (V)**
1	0.00	0.00	0.00	0.00
2	994.33	18.41	0.09	0.09
3	1984.92	36.66	0.17	0.17
4	2976.10	55.17	0.26	0.26
5	3978.50	73.79	0.35	0.35
6	4997.02	92.56	0.44	0.44
7	5967.75	110.67	0.52	0.52
8	6936.11	128.65	0.61	0.61
9	7949.72	147.12	0.70	0.70
10	8958.80	165.80	0.79	0.78
11	9912.81	183.41	0.87	0.87

Bridge 1		**Bridge 2**	
Force Calibration (lb/V)	**11383.56**	**Force Calibration (lb/V)**	**11443.76**
Offset	-3.84	Offset	-11.61
Correlation	0.999997	Correlation	0.999997
Strain Calibration (µE/V)	**210.68**	**Strain Calibration (µE/V)**	**211.79**
Offset	0.00	Offset	-0.14
Correlation	0.999996	Correlation	0.999998

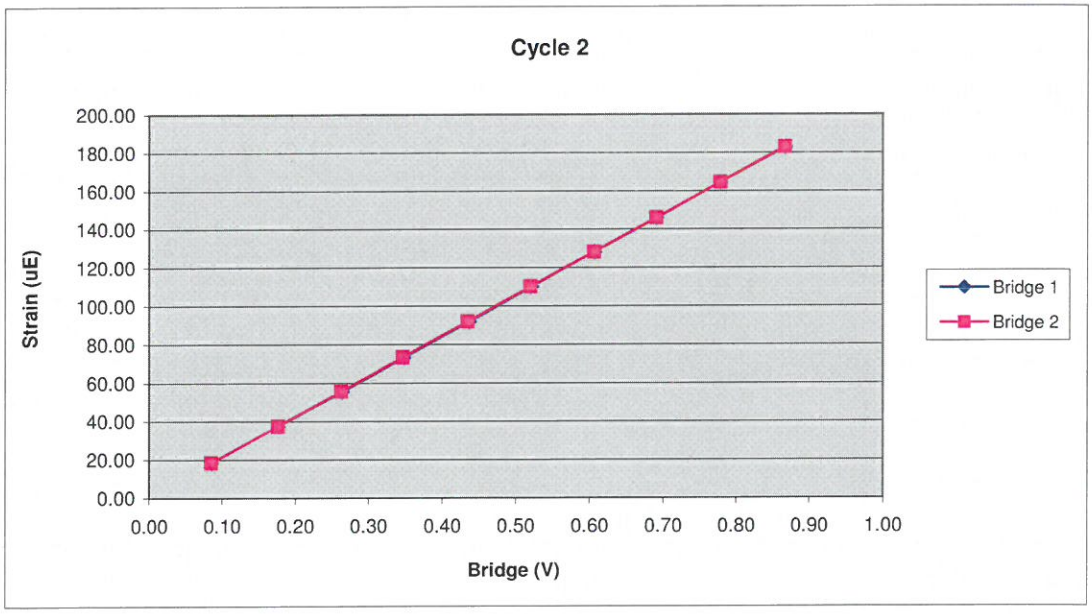
Force Strain Calibration	
EA (Kips)	**54033.05**
Offset	-3.88
Correlation	0.999998



102BW		Cycle 2		
Sample	**Force (lb)**	**Strain (µE)**	**Bridge 1 (V)**	**Bridge 2 (V)**
1	0.00	0.00	0.00	0.00
2	990.79	18.37	0.09	0.09
3	2024.07	37.45	0.18	0.18
4	3007.38	55.54	0.26	0.26
5	3968.86	73.37	0.35	0.35
6	4989.55	92.06	0.44	0.43
7	5960.67	110.16	0.52	0.52
8	6939.65	128.18	0.61	0.61
9	7913.13	145.93	0.69	0.69
10	8905.30	164.37	0.78	0.78
11	9922.44	182.88	0.87	0.87

Bridge 1		**Bridge 2**	
Force Calibration (lb/V)	**11435.73**	**Force Calibration (lb/V)**	**11435.98**
Offset	**0.17**	Offset	**9.08**
Correlation	**0.999999**	Correlation	**0.999999**
Strain Calibration (µE/V)	**210.77**	**Strain Calibration (µE/V)**	**210.77**
Offset	**0.16**	Offset	**0.33**
Correlation	**0.999997**	Correlation	**0.999998**

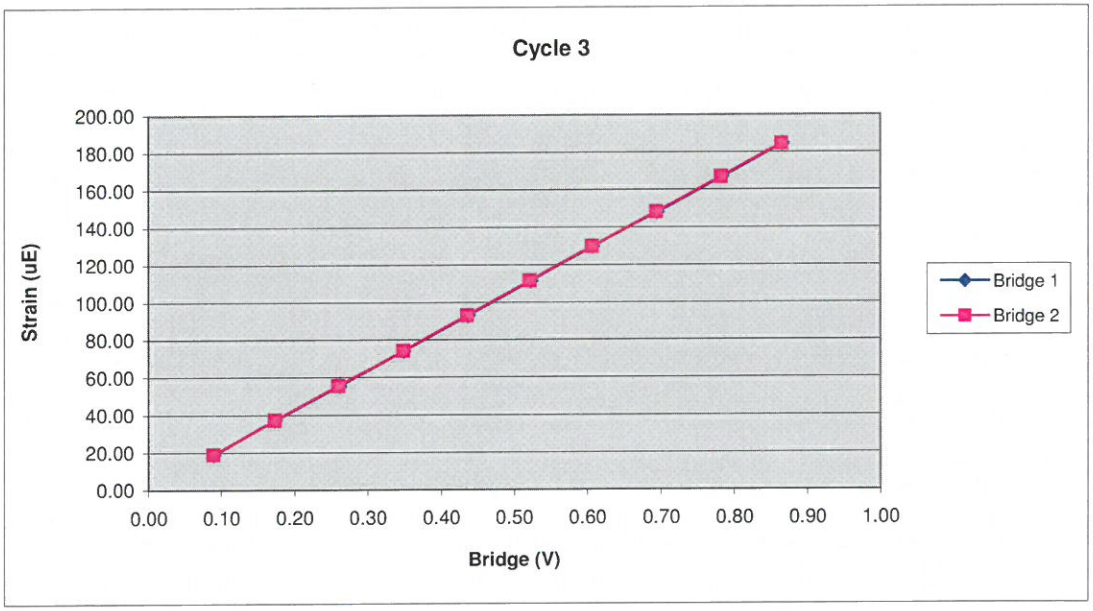
Force Strain Calibration	
EA (Kips)	**54256.99**
Offset	**-8.56**
Correlation	**0.999999**



102BW		Cycle 3		
Sample	**Force (lb)**	**Strain (µE)**	**Bridge 1 (V)**	**Bridge 2 (V)**
1	0.00	0.00	0.00	0.00
2	996.69	18.87	0.09	0.09
3	1961.32	37.18	0.17	0.17
4	2957.81	55.62	0.26	0.26
5	3966.89	74.24	0.35	0.35
6	4987.58	93.01	0.44	0.44
7	5947.49	111.39	0.52	0.52
8	6915.46	129.65	0.61	0.61
9	7914.71	148.00	0.70	0.69
10	8927.52	166.74	0.78	0.78
11	9867.37	184.37	0.87	0.86

Bridge 1		**Bridge 2**	
Force Calibration (lb/V)	**11424.35**	**Force Calibration (lb/V)**	**11442.09**
Offset	**-20.96**	Offset	**-14.35**
Correlation	**0.999998**	Correlation	**0.999997**
Strain Calibration (µE/V)	**213.02**	**Strain Calibration (µE/V)**	**213.35**
Offset	**0.00**	Offset	**0.12**
Correlation	**0.999995**	Correlation	**0.999996**

Force Strain Calibration	
EA (Kips)	**53629.74**
Offset	**-20.93**
Correlation	**0.999994**



Bridge Excitation (V) 5
Shunt Resitor (ohm) 60.4k

Calibration Factors	102BW		
Bridge 1 (µE/V)	211.49	Bridge 2 (µE/V)	211.97
EA Factor (Kips)	53973.26	Area (in^2)	1.80

Calibrated by: David Brunell
Calibrated Date: 2/27/2017

Pile Dynamics Inc
30725 Aurora Rd
Solon, OH 44139

Traceable to N.I.S.T.

Appendix IV

PDCA
PILE DRIVING CONTRACTORS ASSOCIATION

Pile Dynamics, Inc.

This documents that

Robert E. Kral
S&ME, Inc.

has on May 20, 2016 achieved the rank of

ADVANCED

on the **Dynamic Measurement and Analysis Proficiency Test.**

The individual identified on this document demonstrated to the degree granted above an understanding of theory, data quality evaluation, interpretation and signal matching for high strain dynamic testing of deep foundations. ***It is recommended*** **that Individuals at the Advanced level seek Master or Expert levels through additional study within six years of the date of this document.**

The ability of the individual named to provide appropriate knowledge and advice on a specific project is not implied or warranted by the Pile Driving Contractors Association or Pile Dynamics, Inc. **This certificate can be verified at www.PDAproficiencytest.com.** The Pile Driving Contractors Association or Pile Dynamics, Inc. assumes no liability for foundation testing and analysis work performed by the bearer of this certificate.

Steven A. Hall, Executive Director
Pile Driving Contractors Association

SEAL

Garland Likins, Senior Partner
Pile Dynamics, Inc.

No. 2072

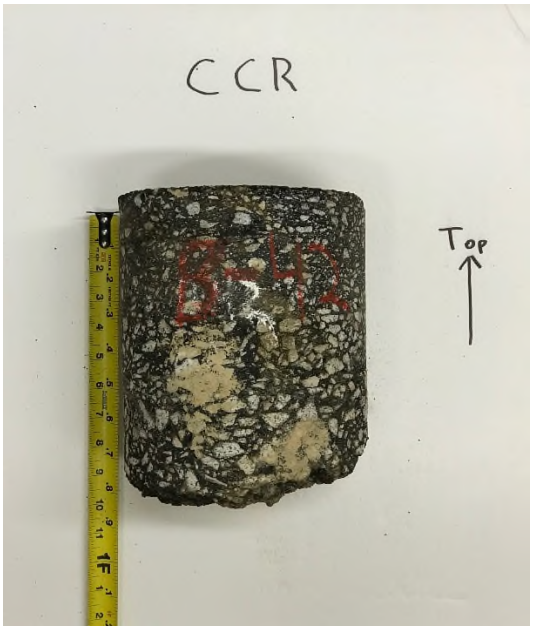
Appendix XIV – Pavement Core Photographs

1	**Remarks:**	**Boring B-29**

2	**Remarks:**	**Boring B-34**

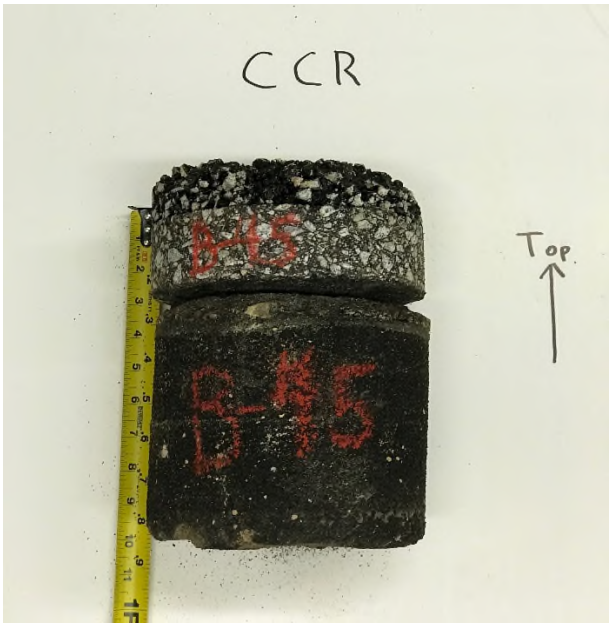
3	**Remarks:**	**Boring B-37**

4	**Remarks:**	**Boring B-40**

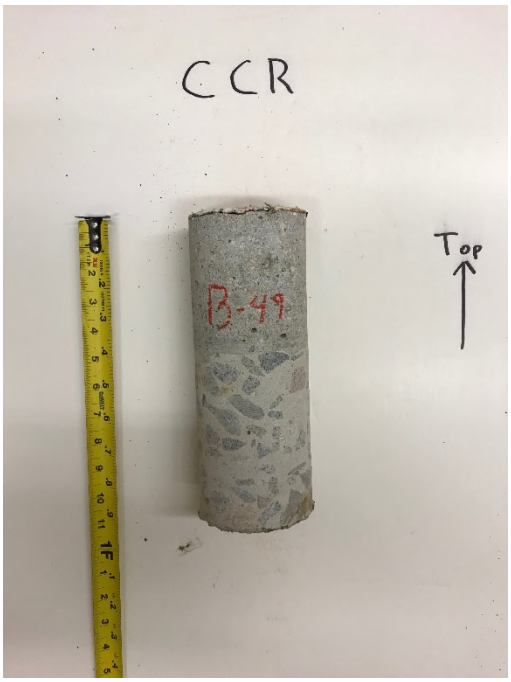


5	**Remarks:**	**Boring B-42**

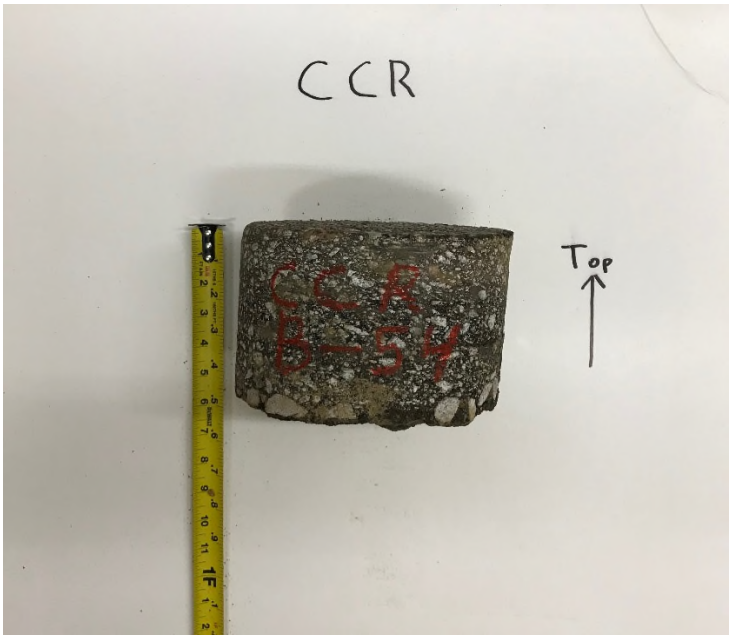
6	**Remarks:**	**Boring B-43**



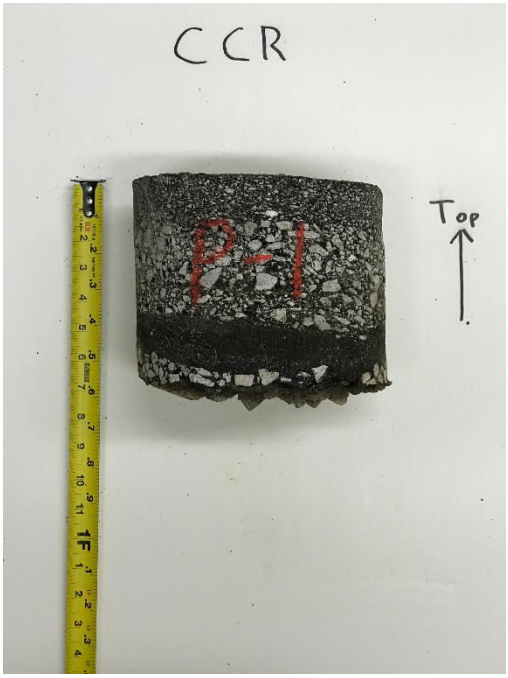
7	**Remarks:**	**Boring B-45**



8	**Remarks:**	**Boring B-49**



9	**Remarks:**	**Boring B-54**

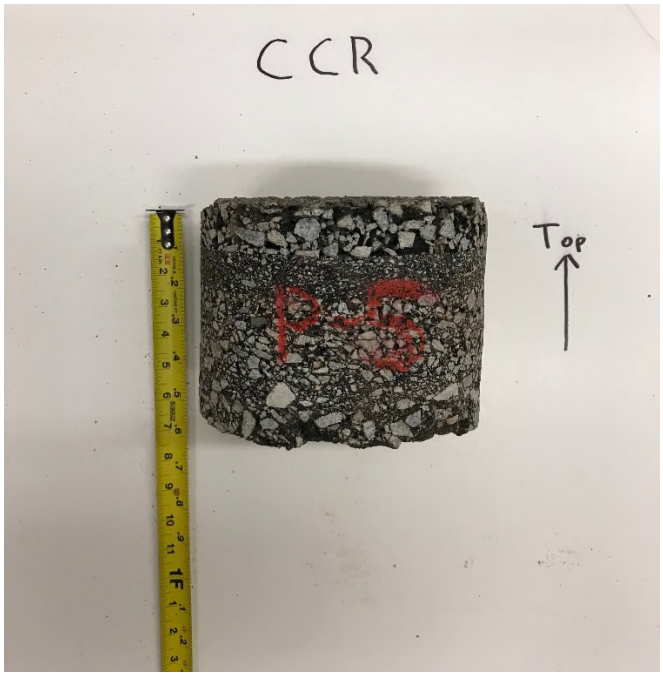


10	**Remarks:**	**Boring P-1**

11	**Remarks:**	**Boring P-2**

12	**Remarks:**	**Boring P-3**

13	**Remarks:**	**Boring P-4**



14	**Remarks:**	**Boring P-5**

15	**Remarks:**	**Boring P-6**

16	**Remarks:**	**Boring P-7**

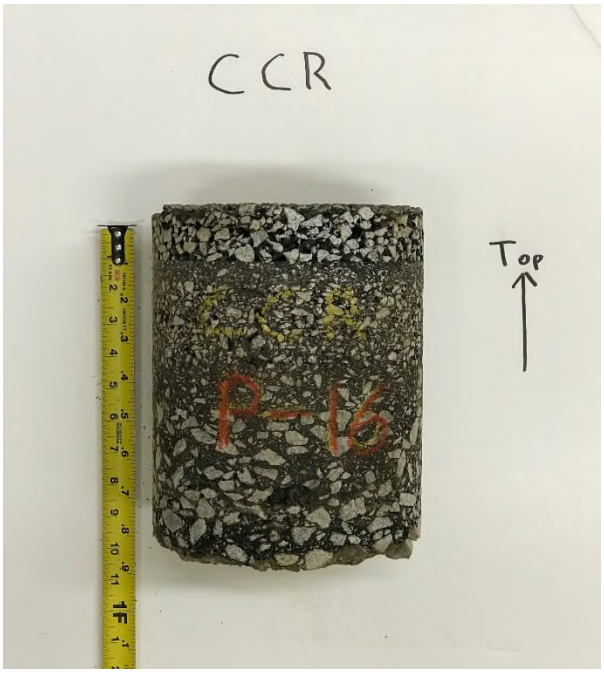
17	**Remarks:**	**Boring P-8**

18	**Remarks:**	**Boring P-9**

19	**Remarks:**	**Boring P-10**

20	**Remarks:**	**Boring P-12**

21	**Remarks:**	**Boring P-14**



22	**Remarks:**	**Boring P-16**

23	**Remarks:**	**Boring P-18**

24	**Remarks:**	**Boring P-20**

25	**Remarks:**	**Boring P-22**

26	**Remarks:**	**Boring P-23**

27	**Remarks:**	**Boring P-24**

28	**Remarks:**	**Boring P-26**

29	**Remarks:**	**Boring P-28**

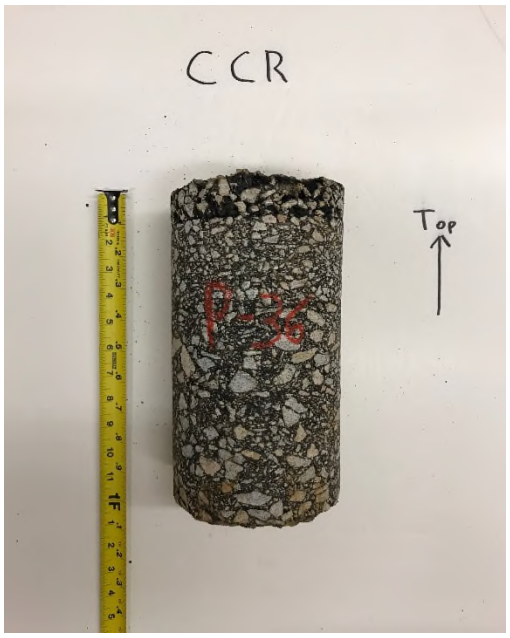
30	**Remarks:**	**Boring P-30**

31	**Remarks:**	**Boring P-32**

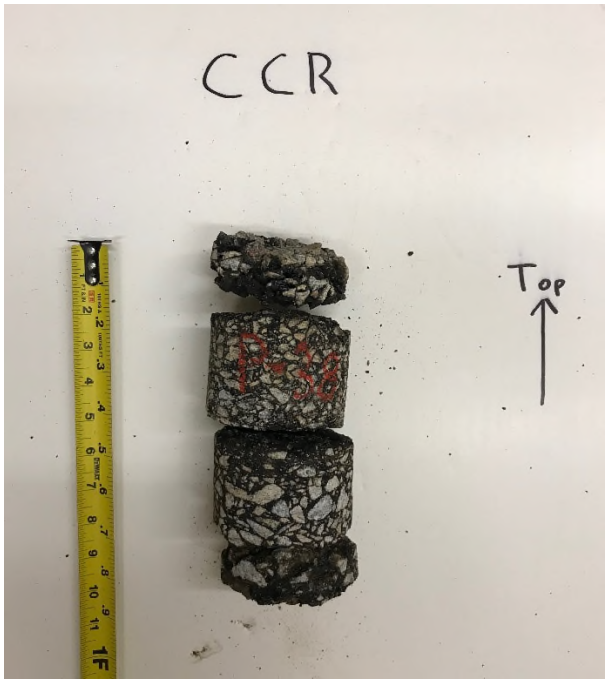
32	**Remarks:**	**Boring P-33**

33	**Remarks:**	**Boring P-34**

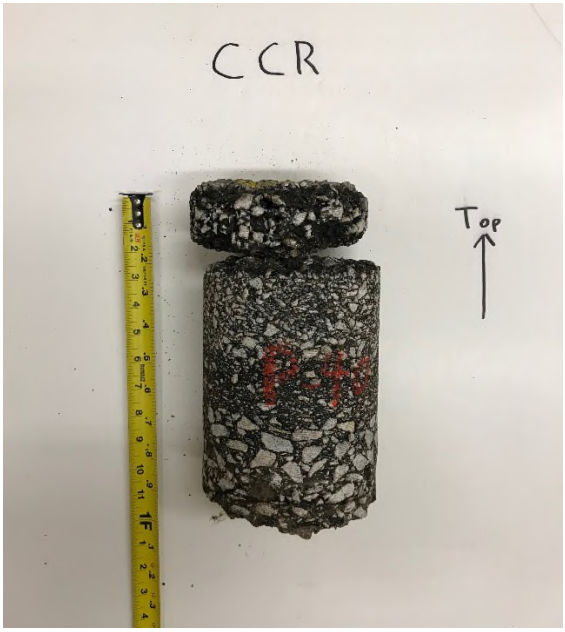
34	**Remarks:**	**Boring P-35**



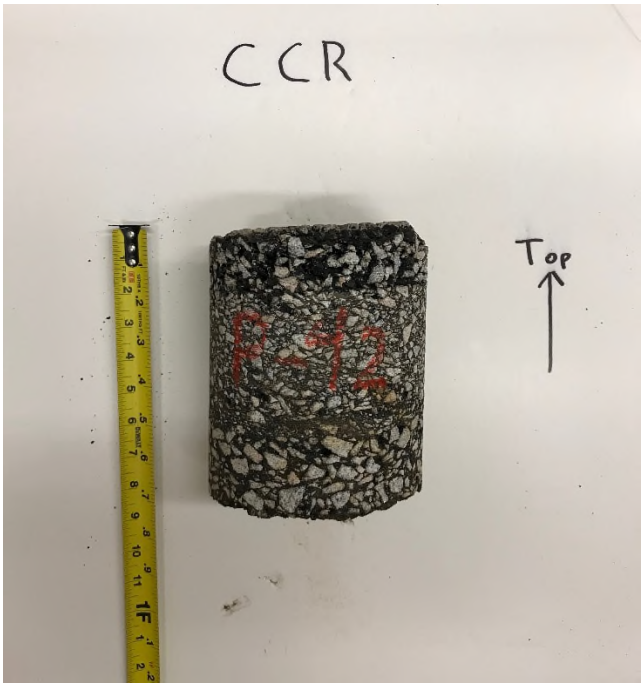
35	**Remarks:**	**Boring P-36**



36	**Remarks:**	**Boring P-38**



37	**Remarks:**	**Boring P-40**



38	**Remarks:**	**Boring P-42**

39	**Remarks:**	**Boring P-44**

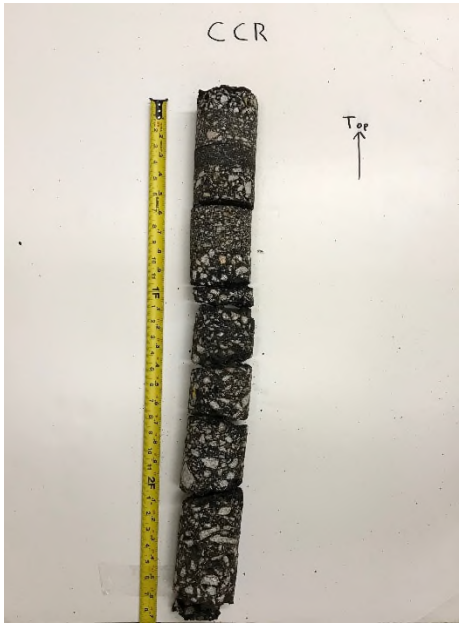
40	**Remarks:**	**Boring P-45**

41	**Remarks:**	**Boring P-47**

42	**Remarks:**	**Boring P-48**

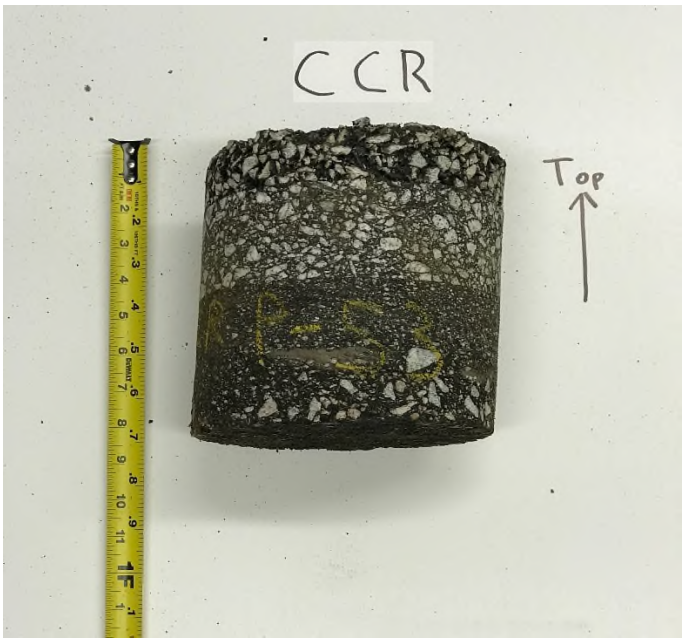
43	**Remarks:**	**Boring P-49**

44	**Remarks:**	**Boring P-50**



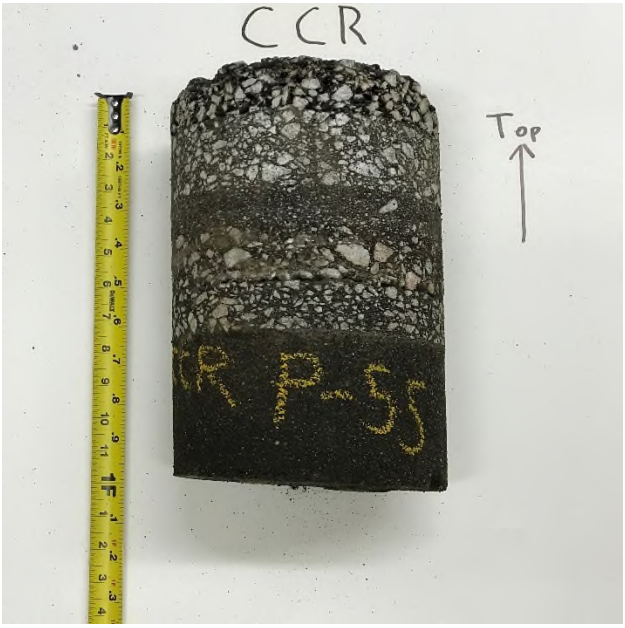
45	**Remarks:**	**Boring P-51**

46	**Remarks:**	**Boring P-52**

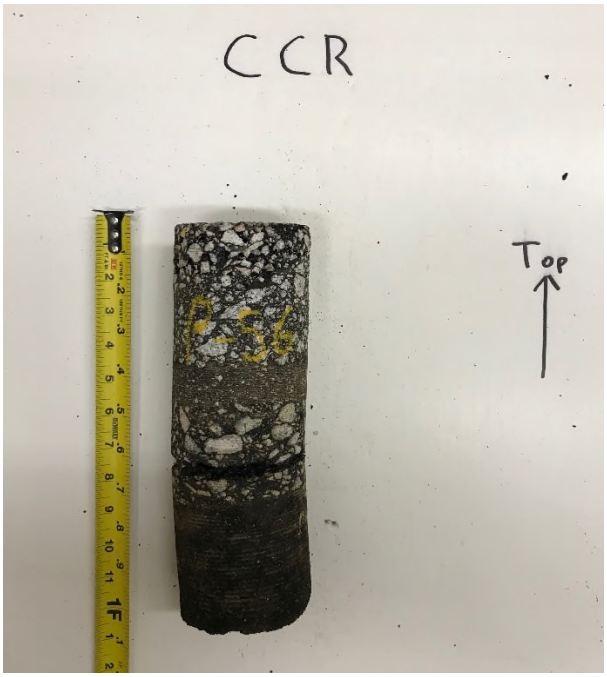


47	**Remarks:**	**Boring P-53**

48	**Remarks:**	**Boring P-54**



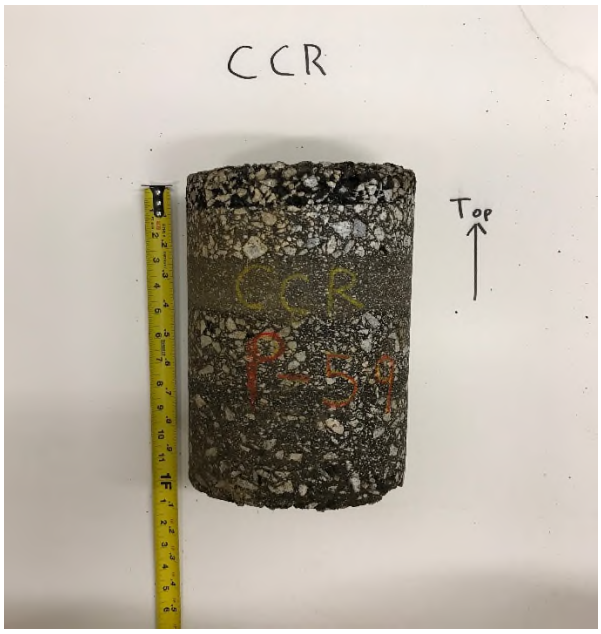
49	**Remarks:**	**Boring P-55**



50	**Remarks:**	**Boring P-56**

51	**Remarks:**	**Boring P-57**

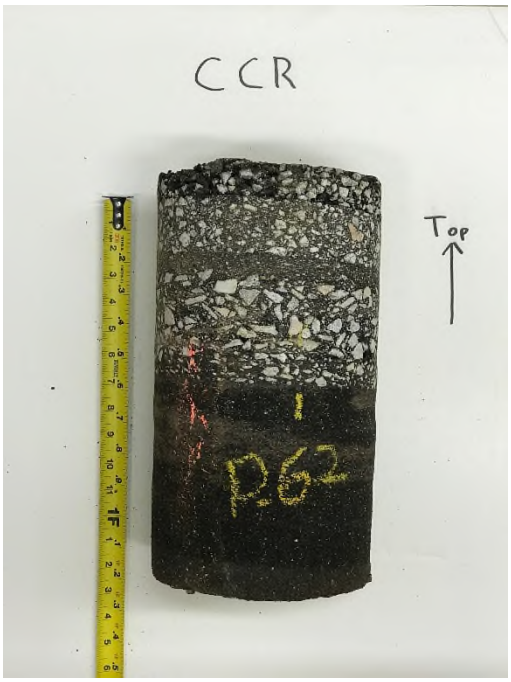
52	**Remarks:**	**Boring P-58**



53	**Remarks:**	**Boring P-59**

54	**Remarks:**	**Boring P-60**

55	**Remarks:**	**Boring P-61**



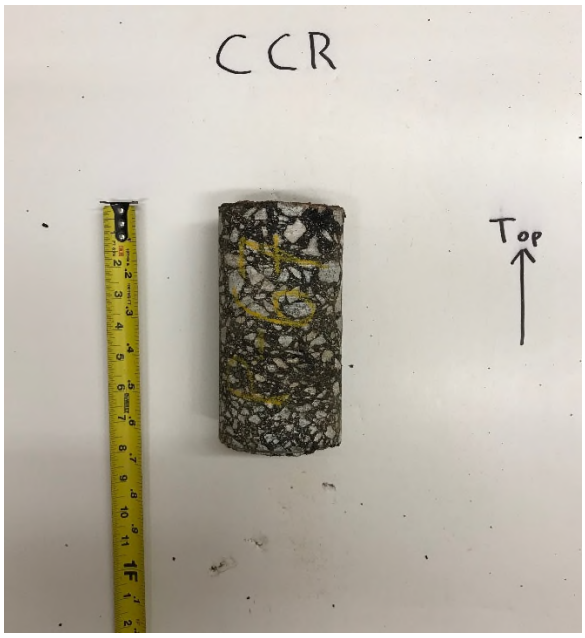
56	**Remarks:**	**Boring P-62**

57	**Remarks:**	**Boring P-63**

58	**Remarks:**	**Boring P-64**

59	**Remarks:**	**Boring P-65**

60	**Remarks:**	**Boring P-66**



61	**Remarks:**	**Boring P-67**

62	**Remarks:**	**Boring P-68**

63	Remarks:	Boring P-69

64	Remarks:	Boring P-70

65	**Remarks:**	**Boring P-71**

66	**Remarks:**	**Boring W-18**

67	**Remarks:**	**Boring W-23**