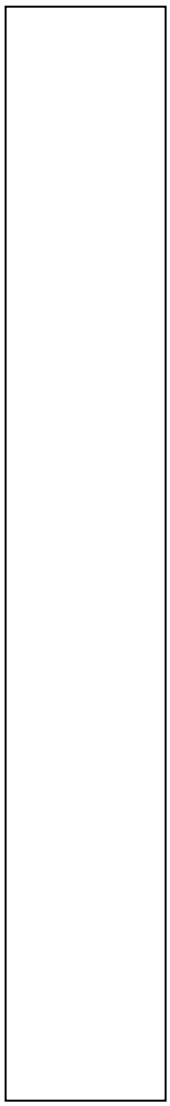
DRILLED SHAFT LOG (REV 06-03-02)

Project Name				Page 1 of 6	
File No.				Bent No.	
Contractor				Shaft No.	
Completed By Contractor	DS Foreman -	Date	/ /	Station	
Reviewed By SCDOT	Inspector -	Date	/ /	Offset	

Date Cased _____
Date Opened _____
Date Poured _____

Elevation (ft)



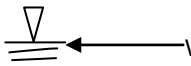
	Construction	Temporary
Casing Type:		
Casing Dimension (OD):		
Bottom of Casing Elevation (FT)		
Top of Casing Elevation (FT)		

Diameter of Rock Socket (IN) _____
Diameter of Shaft (IN) _____
Mud-line/Ground Surface Elevation (FT) _____
Wet & Dry Shaft Length (FT) _____
Rock Socket Length (FT) _____
Top of Shaft Elevation (FT) _____
Tip Elevation (FT) _____
Constructed Shaft Length (FT) _____
Testing/Other: _____

Volume of Concrete: Theoretical (VT) CY _____
OP = VP-VT = _____ UP = VT - VP= Actual (VP) CY _____
Reinforcement Cage Installed: Type _____
Duration of Pour (min) _____

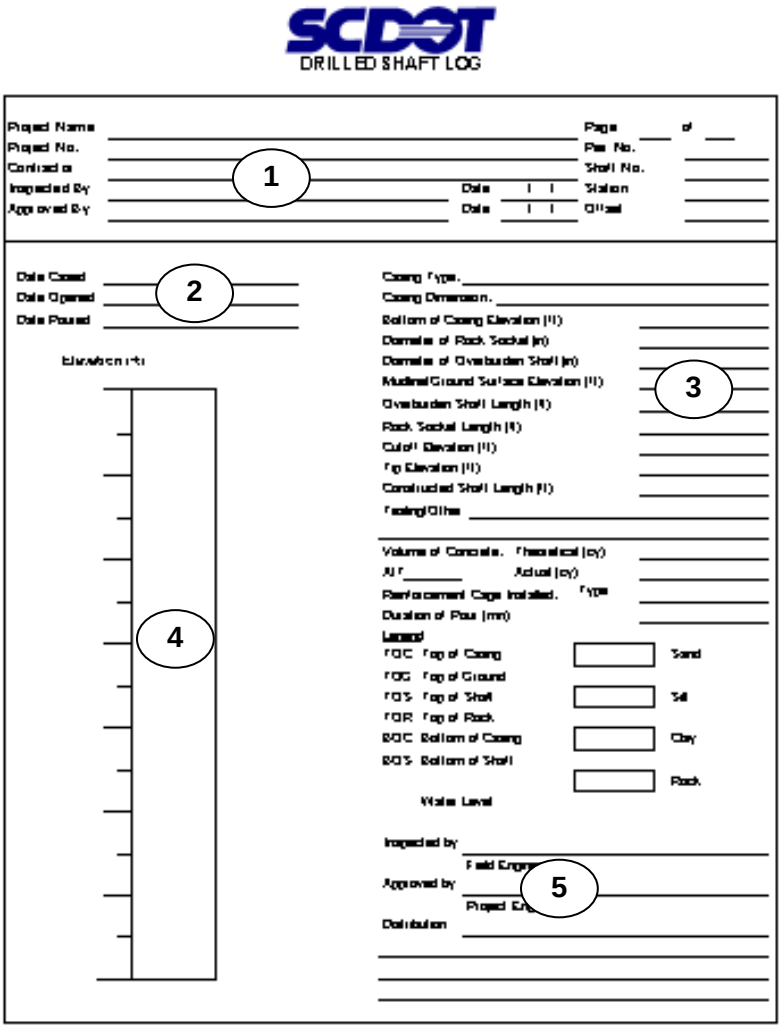
Legend

TOC	Top of Casing		Sand
TOG	Top of Ground		
TOS	Top of Shaft		Silt
TOR	Top of Rock		
BOC	Bottom of Casing		Clay
BOS	Bottom of Shaft		
BOR	Bottom of Rock		Rock



Completed by Contractor _____ DS Foreman/Engineer
Reviewed by SCDOT _____ Inspector/Engineer
Notes: _____
Shaft location variance at top: _____

HOW TO COMPLETE THE
DRILLED SHAFT LOG



Fill in every blank on the form. If it does not apply put an “N/A” or a long dash.

Use pencil – but never erase. If you need to change something, strike a single line through the item and insert the correct information above it. If there is insufficient room to make a note, footnote the item and go to the bottom of the page, or use a separate page.

1. Heading: - Fill in <u>before</u> drilling starts.
   - Be sure to print your name and the start date of drilling.
   - The Geotechnical Engineer will sign approval line.

2. Shaft Data: - Fill in appropriate dates, elevations, and diameters.

3. Concrete Data: Record data from the Concrete Volumes form.

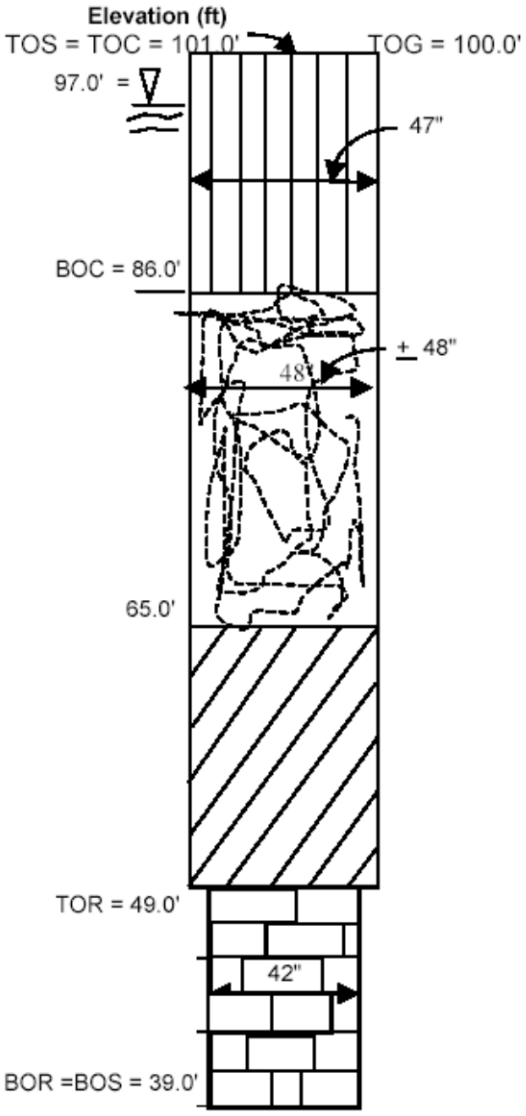
4. Construct Shaft Illustration using the symbols provided.

5. Fill in “Inspected by” and “Distribution”.

DRILLED SHAFT LOG (REV 06-03-02)
SAMPLE 1 Construction Casing

Project Name	Replace Bridge over Cooper Creek along US-322			Page 1 of 6	
File No.	4.995			Bent No.	3
Contractor	Drilled Shaft, Inc.			Shaft No.	3
Completed By Contractor	DS Foreman - John Q. Doe	Date	06/05/02	Station	508 + 36
Reviewed By SCDOT	Inspector - John Smith	Date	06/05/02	Offset	24 FT. Right

Date Cased	06/04/02
Date Opened	06/04/02
Date Poured	06/05/02



	Construction	Temporary
Casing Type:	Steel	
Casing Dimension (OD):	48.0 IN.	
Bottom of Casing Elevation (FT)	86.0 FT. msl	
Top of Casing Elevation (FT)	101.0 FT. msl	
Diameter of Rock Socket (IN)	42.0 IN.	
Diameter of Shaft (IN)	37 Ft. @ ±48.0 IN. & 15 FT. @ 47 IN.	
Mud-line/Ground Surface Elev. (FT)	100.0 FT. msl	
Wet & Dry Shaft Length (FT)	52.0 FT.	
Rock Socket Length (FT)	10.0 FT. @ 42IN.	
Top of Shaft Elevation (FT)	101.0 FT. msl	
Tip Elevation (FT)	39.0 FT. msl	
Constructed Shaft Length (FT)	62.0 FT.	

Testing/Other: Slurry, Slump, Air, Compression Cylinders, & CSL

Volume of Concrete: Theoretical (VT) CY 27.2

OP = VP-VT = 0.6 CY UP = VT - VP= Actual (VP) CY 27.8

Reinforcement Cage Installed: Type Spiral

Duration of Pour (min) 100 Min.

Legend

TOC	Top of Casing		Sand
TOG	Top of Ground		
TOS	Top of Shaft		Silt
TOR	Top of Rock		
BOC	Bottom of Casing		Clay
BOS	Bottom of Shaft		
BOR	Bottom of Rock		Rock

Water Level

Completed by Contractor: DS Foreman/Engineer - John Q Doe

Reviewed by SCDOT: Inspector/Engineer - John Smith

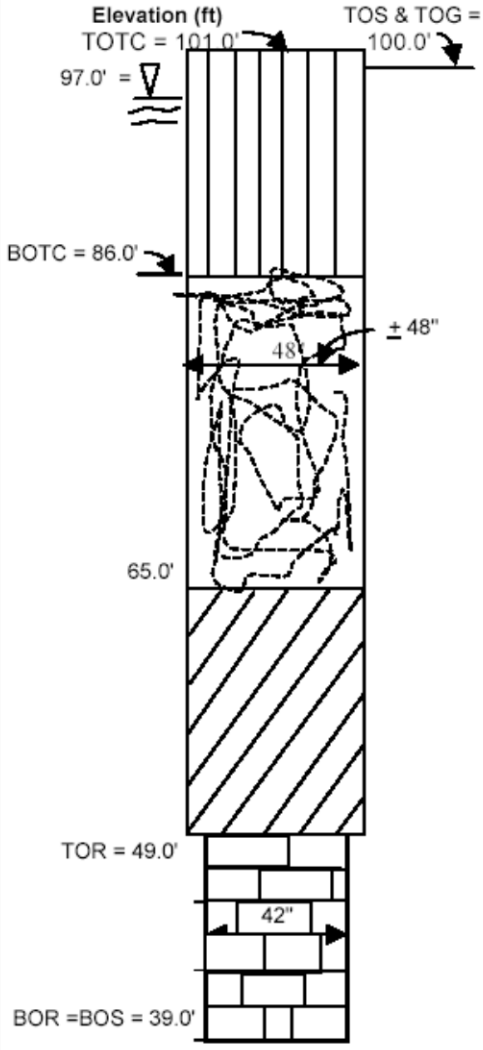
Notes:

Shaft location variance at top: 2" after plan station & 1" right.

DRILLED SHAFT LOG (REV 06-03-02)
SAMPLE 2 Temporary Casing

Project Name	Replace Bridge over Cooper Creek along US-322			Page 1 of 6	
File No.	4.995			Bent No.	6
Contractor	Drilled Shaft, Inc.			Shaft No.	3
Completed By Contractor	DS Foreman - John Q. Doe	Date	06/05/02	Station	508 + 36
Reviewed By SCDOT	Inspector - Jane Smith	Date	06/05/02	Offset	24 FT. Right

		Construction	Temporary
Date Cased	06/04/02	Casing Type:	Steel
Date Opened	06/04/02	Casing Dimension (OD):	48.0 IN.
Date Poured	06/05/02	Bottom of Casing Elevation (FT)	86.0 FT.
		Top of Casing Elevation (FT)	101.0 FT.



Diameter of Rock Socket (IN)	42.0 IN.
Diameter of Shaft (IN)	± 48.0 IN.
Mud-line/Ground Surface Elev. (FT)	100.0 FT. msl
Wet & Dry Shaft Length (FT)	51.0 FT.
Rock Socket Length (FT)	10.0 FT.
Top of Shaft Elevation (FT)	100.0 FT. msl
Tip Elevation (FT)	39.0 FT. msl
Constructed Shaft Length (FT)	61.0 FT.

Testing/Other: Slurry, Slump, Air, Compression Cylinders, & CSL

Volume of Concrete: Theoretical (VT) CY 27.3

OP = VP-VT = 0.5 CY UP = VT - VP= Actual (VP) CY 27.8

Reinforcement Cage Installed: Type: Welded Hoops

Duration of Pour (min) 100 Min.

Legend

TOC	Top of Casing		Sand
TOG	Top of Ground		
TOS	Top of Shaft		Silt
TOR	Top of Rock		
BOC	Bottom of Casing		Clay
BOS	Bottom of Shaft		
BOR	Bottom of Rock		Rock

Water Level

Completed by Contractor: DS Foreman/Engineer - John Q Doe

Reviewed by SCDOT: Inspector/Engineer - Jane Smith

Notes:

Shaft location variance at top: 1" after plan station & 4" left. Called Bridge Construction Engineer prior to pour. Received verbal approval to cast concrete from BCE. Contractor told to submit letter covering this shaft variance.

DRILLED SHAFT EXCAVATION LOG (REV 06-03-02)

Project Name _____ Page 2 of 6
File No. _____ Bent No. _____
Contractor _____ Shaft No. _____
Completed By Contractor DS Foreman - Date / / Station _____
Reviewed By SCDOT Inspector - Date / / Offset _____

Note: Preaugering not allowed when using construction casing.

Casing Information

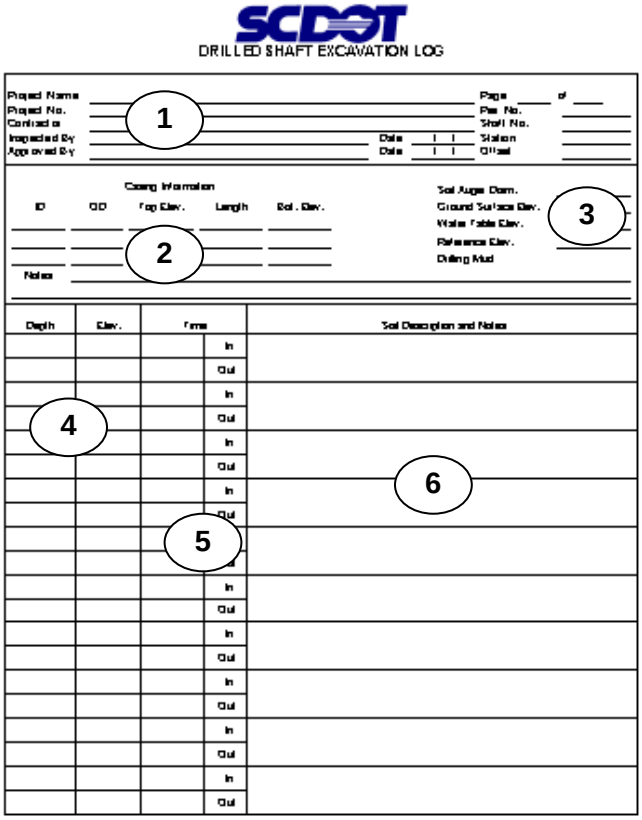
ID	OD	Top Elev.	Length	Bot. Elev.

Soil Auger Diam. _____
Rock Core Diam. _____
Ground Surface Elev. _____
Water Table Elev. _____
Reference Elev. _____
Drilling Mud _____

Notes _____

Depth ( )	Elev. ( )	Time		Soil Description and Notes
			In	
			Out	
			In	
			Out	
			In	
			Out	
			In	
			Out	
			In	
			Out	
			In	
			Out	
			In	
			Out	
			In	
			Out	
			In	
			Out	
			In	
			Out	

HOW TO COMPLETE THE
DRILLED SHAFT EXCAVATION LOG


SCDOT
DRILLED SHAFT EXCAVATION LOG

Project Name
Project No.
Contractor
Inspected By
Approved By
Page ____ of ____
Pile No.
Shaft No.
Date ___/___/___
Station
Date ___/___/___
Offset
1
Casing Information
ID OD Top Elev. Length Bot. Elev.
2
Notes
Soil Auger Diam.
Ground Surface Elev.
Water Table Elev.
Reference Elev.
Drilling Mud
3
Depth Elev. Time In/Out Soil Description and Notes
4
5
6

Fill in every blank on the form. If it does not apply put an "N/A" or a long dash.

Use pencil – but never erase. If you need to change something, strike a single line through the item and insert the correct information above it. If there is insufficient room to make a note, footnote the item and go to the bottom of the page, or use a separate page.

1. Heading:
   -Fill in <u>before</u> drilling starts.
   -Be sure to print your name and the start date for drilling.
   -The Geotechnical Engineer will sign approval line.

2. Casing:
   -Measure Length (L) in the field.
   -Surveyor provides Top of Casing elevation (TE).
   -Compute bottom elevation*(BE): TE-L=BE*

3. Site Data
   -Soil Auger diameter – measure and record in inches.
   -Ground surface elev. – provided by surveyor.
   -Water table elev. – measure w/tape in hole before slurry is introduced (if applicable).
   -Water table may need to be estimated from seepage in dry hole method.
   -Reference Elevation – provided by surveyor.
   -Drill mud – If used, complete the "**Slurry Inspection Log**"; compare to Installation Plan

4. Depth/Elevation:
   Depth (D) can be measured by:
   1) Contractor has kelly bar marked (spot checking only)
   2) Weighted tape (for accurate measurements)
   Reference elevation is always known; i.e., template, top of casing, or top of ground.

   Elevation (E) – compute *TE-D=E*
   Enter Depth/Elev. For EVERY change in the soil/rock condition.

5. Time:
   May use military or 24 hour clock. Be consistent and correct! Remember that shaft drilling can occur over several days, so be sure to <u>mark date changes</u>.

6. Material:
   Use this form to record all activity during shaft excavation. Label all major soil strata.

DRILLED SHAFT EXCAVATION LOG (REV 06-03-02)
SAMPLE 1 Construction Casing

Project Name	Replace Bridge over Cooper Creek along US-322			Page	2 of 6
File No.	4.995			Bent No.	3
Contractor	Drilled Shaft, Inc.			Shaft No.	3
Completed By Contractor	DS Foreman - John Q. Doe	Date	06/03/02	Station	508 + 36
Reviewed By SCDOT	Inspector - John Smith	Date	06/03/02	Offset	24 Ft. Right

Note: Preaugering not allowed when using construction casing.

Casing Information: Construction ___X___ Temporary _____

ID	OD	Top Elev.	Length	Bot. Elev.
47"	48"	101.0 MSL	15'	86.0 MSL

Soil Auger Diam.	46"
Rock Core Diam.	42"
Ground Surface Elev.	100.0 MSL
Water Table Elev.	97.0 MSL
Reference Elev.	101.0 MSL
Drilling Mud	Slurry

Notes: Switched to 42" Rock Core @ 52.0' (49.0 ' MSL) at 1:50 pm.

Depth (Feet)	Elev. (Ft. MSL)	Time		Soil Description and Notes
1.0	100.0	7:30 am	In	Tan Silty Sand
15.0	86.0	9:00 am	Out	Tan Silty Sand
15.0	86.0	9:10 am	In	Dark Tan Sand
36.0	65.0	11:30 am	Out	Dark Tan Sand
36.0	65.0	11:40 am	In	Dense Silty Sand (PWR) w/Mica
52.0	49.0	1:30 pm	Out	Dense Silty Sand (PWR) w/Mica
52.0	49.0	1:50 pm	In	Very Dense Rock (Granite)
61.0	40.0	4:50 pm	Out	Very Dense Rock (Granite)
61.0	40.0	7:15 am	In	Very Dense Rock (Granite) Continued drilling from previous day
62.0	39.0	7:30 am	Out	Very Dense Rock (Granite) Continued drilling from previous day
			In	
			Out	
			In	
			Out	
			In	
			Out	
			In	
			Out	
			In	
			Out	

DRILLED SHAFT EXCAVATION LOG (REV 06-03-02)
SAMPLE 2 Temporary Casing

Project Name	Replace Bridge over Cooper Creek along US-322			Page	2 of 6
File No.	4.995			Bent No.	6
Contractor	Drilled Shaft, Inc.			Shaft No.	3
Completed By Contractor	DS Foreman - John Q. Doe	Date	06/03/02	Station	508 + 36
Reviewed By SCDOT	Inspector - Jane Smith	Date	06/03/02	Offset	24 Ft. Right

Note: Preaugering not allowed when using construction casing.

Casing Information: Construction ____ Temporary ___X___

ID	OD	Top Elev.	Length	Bot. Elev.
47"	48"	101.0 MSL	15'	86.0 MSL

Soil Auger Diam.	46"
Rock Core Diam.	42"
Ground Surface Elev.	100.0 MSL
Water Table Elev.	97.0 MSL
Reference Elev.	101.0 MSL
Drilling Mud	Slurry

Notes: Switched to 42" Rock Core @ 52.0' (49.0 ' MSL) at 1:50 pm.

Depth (Feet)	Elev. (Ft. MSL)	Time		Soil Description and Notes
1	100.0	7:30 am	In	Tan Silty Sand
15.0	86.0	9:00 am	Out	Tan Silty Sand
15.0	86.0	9:10 am	In	Dark Tan Sand
36.0	65.0	11:30 am	Out	Dark Tan Sand
36.0	65.0	11:40 am	In	Dense Silty Sand (PWR) w/Mica
52.0	49.0	1:30 pm	Out	Dense Silty Sand (PWR) w/Mica
52.0	49.0	1:50 pm	In	Very Dense Rock (Granite)
61.0	40.0	4:50 pm	Out	Very Dense Rock (Granite)
61.0	40.0	7:15 am	In	Very Dense Rock (Granite) Continued drilling from previous day
62.0	39.0	7:30 am	Out	Very Dense Rock (Granite) Continued drilling from previous day
			In	
			Out	
			In	
			Out	
			In	
			Out	
			In	
			Out	
			In	
			Out	

SCDOT

SLURRY INSPECTION LOG (REV 06-03-02)

Project Name _____

File Number _____

Bent No. _____ Shaft No. _____

Water Source: * _____

Date of Initial Hydration ___/___/___ Time _____

Composition:	Brand	Type	Proportions
Mineral Type			
Additives			

TEST PROPERTIES

Sampling	Before Introduction of Slurry	First 8 Hours During Construction **				Additional Testing		At End of Excavation	Before Concreting Test 1	Before Concreting Test 2
		Test 1	Test 2	Test 3	Test 4	Test 1	Test 2			
Date:										
Time:										
Test Depth at Levels:	Holding Tank							At Bottom	At Bottom	At Bottom
Density										
Viscosity										
% Sand										
pH										
Cake / Filtrate	N/A									

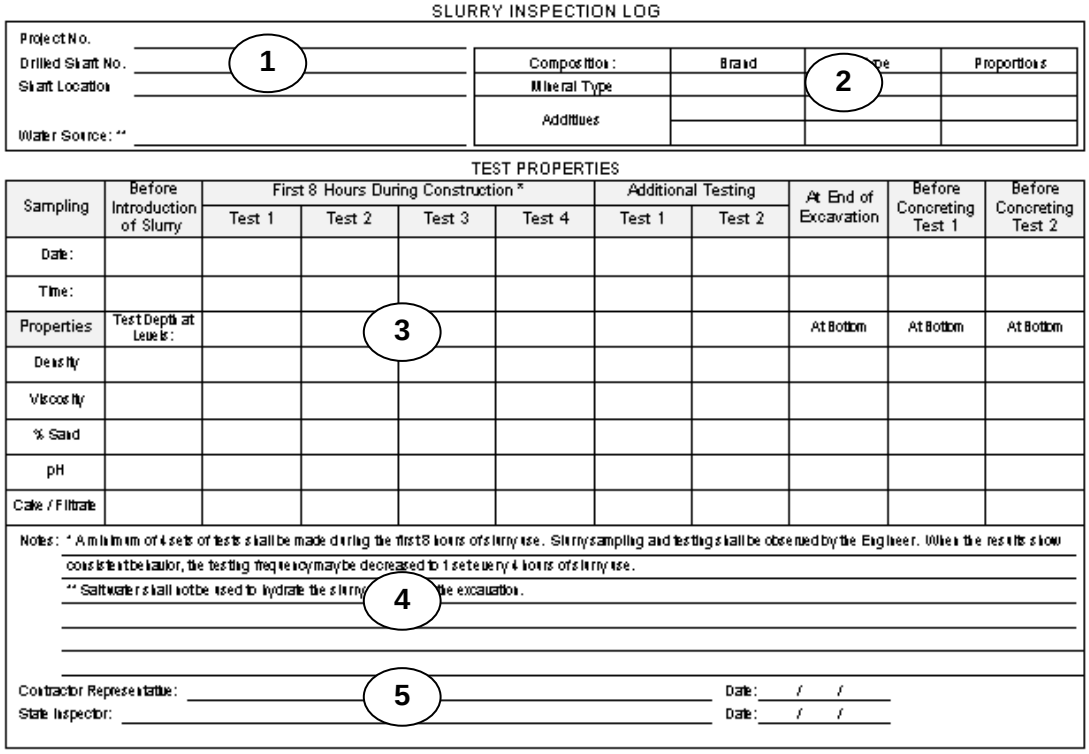
Notes: * **Salt water shall not be used to hydrate the slurry or stabilize the excavation.**

** **A minimum of 4 sets of tests shall be made during the first 8 hours of slurry use. Slurry sampling and testing shall be observed by the Engineer. When the results show consistent behavior, the testing frequency may be decreased to 1 set every 4 hours of slurry use.**

Contractor DS Foreman: _____ Date: ___/___/___

SCDOT Inspector: _____ Date: ___/___/___

HOW TO COMPLETE THE
SLURRY INSPECTION LOG



SLURRY INSPECTION LOG

Project No. _____
Drilled Shaft No. _____ (1)
Shaft Location _____
Water Source: ** _____

Composition:	Brand	Type	Proportions
Mineral Type			
Additives			

(2)

TEST PROPERTIES

Sampling	Before Introduction of Slurry	First 8 Hours During Construction *				Additional Testing		At End of Excavation	Before Concreting Test 1	Before Concreting Test 2
		Test 1	Test 2	Test 3	Test 4	Test 1	Test 2			
Date:										
Time:										
Properties	Test Depth at Levels:			(3)				At Bottom	At Bottom	At Bottom
Density										
Viscosity										
% Sand										
pH										
Cake / Filtrate										

Notes: * A minimum of 4 sets of tests shall be made during the first 8 hours of slurry use. Slurry sampling and testing shall be observed by the Engineer. When the results show consistent behavior, the testing frequency may be decreased to 1 set every 4 hours of slurry use.
** Saltwater shall not be used to hydrate the slurry (4) the excavation.

Contractor Representative: _____ (5) Date: ___/___/___
State Inspector: _____ Date: ___/___/___

1. Heading: - Fill in <u>before</u> drilling starts.
   - The Project Resident Engineer will sign approval line.

2. Slurry Data: - Fill in appropriate brands, types, and proportion.

3. Test Data: - Record test data as the testing Inspector performs the tests.
   - Note the depth at which the samples were obtained.
   - Make sure that a minimum of 4 tests are performed within the first 8 hours of slurry use.

4. Notes: Record any unusual events or results.

5. Fill in “Contractor Representative” and “State Inspector”.

Fill in every blank on the form. If it does not apply put an “N/A” or a long dash.

Use pencil – but never erase. If you need to change something, strike a single line through the item and insert the correct information above it. If there is insufficient room to make a note, footnote the item and go to the bottom of the page, or use a separate page.

SLURRY INSPECTION LOG (REV 06-03-02)
SAMPLE 1 Construction Casing

Project Name: Replace Bridge over Cooper Creek along US-322

File Number: 4.995

Bent No. 3 Shaft No. 3

Water Source: * Hydrant (City water)

Date of Initial Hydration 06/03/02 Time 9:00 am

Composition:	Brand	Type	Proportions
Mineral Type	Augua Gel	Bentonite	1400 LBS / 5000 GAL
Additives			

TEST PROPERTIES

Sampling	Before Introduction of Slurry	First 8 Hours During Construction **				Additional Testing		At End of Excavation	Before Concreting Test 1	Before Concreting Test 2
		Test 1	Test 2	Test 3	Test 4	Test 1	Test 2			
Date:	06/04/02	06/04/02	06/04/02	06/04/02	06/04/02			06/05/02	06/05/02	06/05/02
Time:	11:00 am	1:30 pm	2:30 pm	4:00 pm	5:00 pm			7:30 am	8:15 am	9:20 am
Test Depth at Levels:	Holding Tank	50 FT	53 FT	58 FT	60 FT			At Bottom	At Bottom	At Bottom
Density	65	67.1	67.3	65.8	66.3			69.1	66.1	66.3
Viscosity	33	37	38	36	37			42	38	37
% Sand	0%	3%	4%	2%	2.5%			10%	2%	2%
pH	10	9	9	9	9			9	10	10

Notes: * **Salt water shall not be used to hydrate the slurry or stabilize the excavation.**

** **A minimum of 4 sets of tests shall be made during the first 8 hours of slurry use. Slurry sampling and testing shall be observed by the Engineer. When the results show consistent behavior, the testing frequency may be decreased to 1 set every 4 hours of slurry use.**

Note: Side of shaft caked. Cleaned shaft sides.

Contractor DS Foreman: John Q. Doe Date: 06/05/02

SCDOT Inspector: John Smith Date: 06/05/02

SLURRY INSPECTION LOG (REV 06-03-02)
SAMPLE 2 Temporary Casing

Project Name: Replace Bridge over Cooper Creek along US-322

File Number: 4.995

Bent No. 6 Shaft No. 3

Water Source: * Hydrant (City water)

Date of Initial Hydration 06/03/02 Time 9:00 am

Composition:	Brand	Type	Proportions
Mineral Type	Augua Gel	Bentonite	1400 LBS / 5000 GAL
Additives			

TEST PROPERTIES

Sampling	Before Introduction of Slurry	First 8 Hours During Construction **				Additional Testing		At End of Excavation	Before Concreting Test 1	Before Concreting Test 2
		Test 1	Test 2	Test 3	Test 4	Test 1	Test 2			
Date:	06/04/02	06/04/02	06/04/02	06/04/02	06/04/02			06/05/02	06/05/02	06/05/02
Time:	11:00 am	1:30 pm	2:30 pm	4:00 pm	5:00 pm			7:30 am	8:15 am	9:20 am
Test Depth at Levels:	Holding Tank	50 FT	53 FT	58 FT	60 FT			At Bottom	At Bottom	At Bottom
Density	65	67.1	67.3	65.8	66.3			69.1	66.1	66.3
Viscosity	33	37	38	36	37			42	38	37
% Sand	0%	3%	4%	2%	2.5%			10%	2%	2%
pH	10	9	9	9	9			9	10	10

Notes: * **Salt water shall not be used to hydrate the slurry or stabilize the excavation.**

** **A minimum of 4 sets of tests shall be made during the first 8 hours of slurry use. Slurry sampling and testing shall be observed by the Engineer. When the results show consistent behavior, the testing frequency may be decreased to 1 set every 4 hours of slurry use.**

Note: Side of shaft caked. Cleaned shaft sides.

Contractor DS Foreman: John Q. Doe Date: 06/05/02

SCDOT Inspector: Jane Smith Date: 06/05/02

DRILLED SHAFT INSPECTION LOG (REV 06-03-02)

Project Name _____ Page 4 of 6
File No. _____ Bent No. _____
Contractor _____ Shaft No. _____
Completed By Contractor DS Foreman - _____ Date _____ Station _____
Reviewed By SCDOT Inspector - _____ Date _____ Offset _____

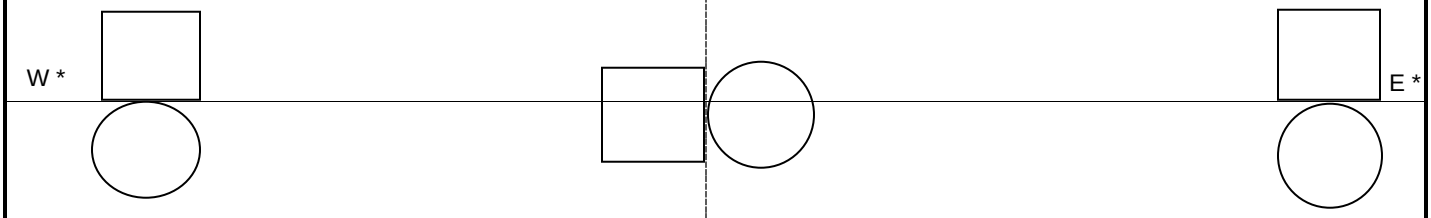
Type of Drilling Fluid _____
DS Location Variance at Top _____
Bottom Cleanout Method _____
Time/Date Final Cleanout _____
Shaft Bottom Elev. _____
Est. Shaft Bottom Dia. _____

Shaft Plumbness Check/4' _____
Rebar Cage: Proper # Vert. Bars _____
Proper # Horiz. Bars _____
Side Spacers _____
Bottom Spacers _____
Ties & Connections _____

Inspected By: _____ Visual____ Sounding ___
Time Test Started _____
Time Test Finished _____
Time Test Started _____
Time Test Finished _____

* Based on Compass Direction

Test just prior to placing Rebar cage ☐ (inches)
Test just prior to placing concrete ◯ **(inches)**
*** Direction**



Note: 50% of base shall have < 1/2 Inch of sediment.
No area of shaft bottom shall be more than 1 1/2 Inches.

Notes

_____
_____
_____

Comments/Recommendations

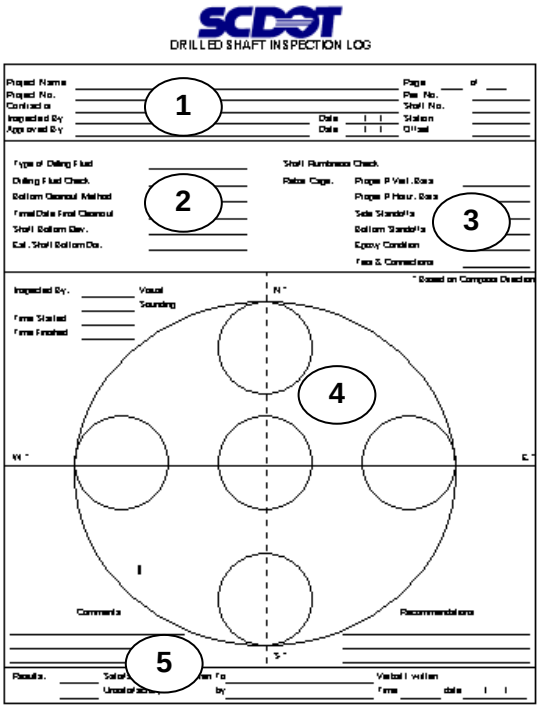
_____
_____
_____

Results: _____ Satisfactory DS Foreman _____
_____ Unsatisfactory SCDOT Inspector _____ Time _____ Date _____

NOTE**: Specification Tolerances - Location Variance at Top = 3 inches Max. Vertical (Plumbness) = 1 inch per 4 Ft. Max.**

HOW TO COMPLETE THE

DRILLED SHAFT INSPECTION LOG



Fill in every blank on the form. If it does not apply put an "N/A" or a long dash.

Use pencil – but never erase. If you need to change something, strike a single line through the item and insert the correct information above it. If there is insufficient room to make a note, footnote the item and go to the bottom of the page, or use a separate page.

1. Heading:
   - -Fill in <u>before</u> drilling starts.
   - -Be sure to print your name and the start date of drilling.
   - -The Project Resident Engineer or designated representative will sign approval line.

2. Shaft Status: Drill Fluid Check – Responsibility of Contractor. Record density check performed by Contractor or Inspector.

Type of Drill Fluid – record
a) Natural
b) Mineral (commercial)
c) Plain water
Remember: Polymer slurry not allowed

   - -Bottom Cleanout Method: Observe and record equipment type (i.e., cleanout bucket, air lift, submersible pump, etc.). Must match Installation Plan.
   - -Time/Date Final Cleanout: Record when last cleanout performed prior to rebar cage placement.
   - -Shaft Bottom Elevation – Use weighted tape to measure; record.
   - -Estimate Shaft Bottom Diameter – record auger diameter.

3. Cage Check:
   - -Reinforcing cage usually checked by others.
   - -Proper number of Vertical bars – count and record # of vertical bars in hole; compare to plan.
   - -Epoxy – you should <u>never</u> see coated rebar

4. Shaft Cleaniness: – check procedure being used, record
   1) Using S.I.D., visually inspect the shaft bottom in each of a minimum of 5 locations as shown on form.
   2) Using a weighted tape, sound the shaft in each of a minimum of 5 locations as shown on form. "Feel" for hard bottom – it translates to clean hole. Remember specifications.

5. Record Results:

DRILLED SHAFT INSPECTION LOG (REV 06-03-02)
SAMPLE 1 Construction Casing

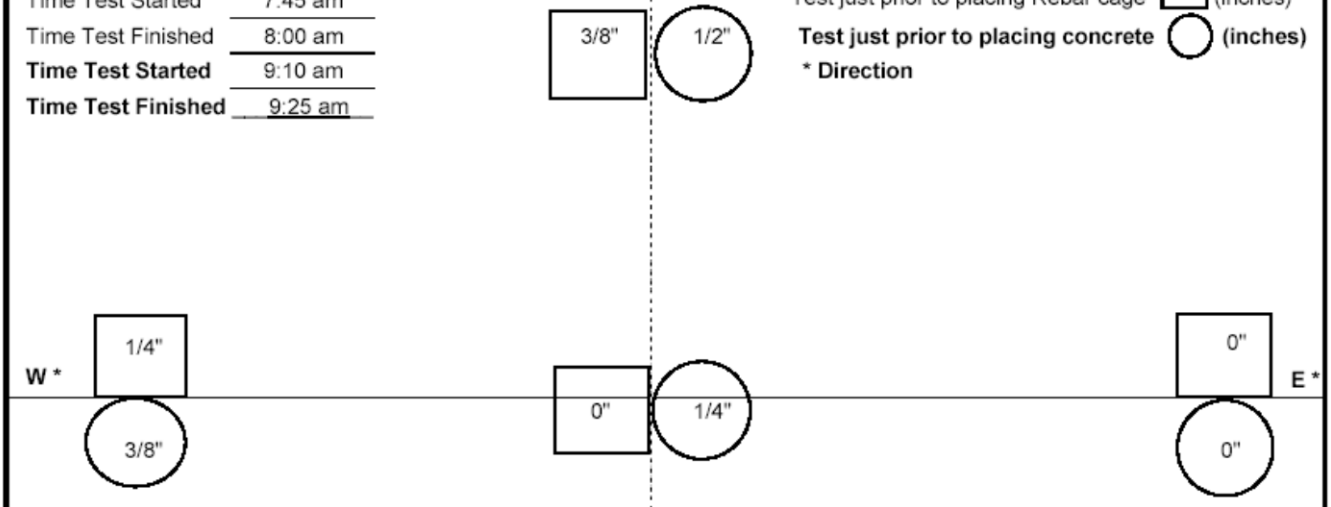
Project Name	Replace Bridge over Cooper Creek along US-322			Page	4 of 6
File No.	4.995			Bent No.	3
Contractor	Drilled Shaft, Inc.			Shaft No.	3
Completed By Contractor	DS Foreman - John Q. Doe	Date	06/05/02	Station	508 + 36
Reviewed By SCDOT	Inspector - John Smith	Date	06/05/02	Offset	24 FT. Right

Type of Drilling Fluid	Bentonite	Shaft Plumbness Check/4'	1/2 In. per 4 Ft.
DS Location Variance at Top	2" After Sta. & 1" Right	Rebar Cage: Proper # Vert. Bars	16 EA # 36 Bars
Bottom Cleanout Method	Airlift	Proper # Horiz. Bars	# 19 Bar @ 4 3/8 " Spiral
Time/Date Final Cleanout	7:45 am on 06/05/02	Side Spacers	4 EA every 10 Ft.
Shaft Bottom Elev.	39.0 msl	Bottom Spacers	16 EA @ 6" Length
Est. Shaft Bottom Dia.	42 Inches	Ties & Connections	Checked and okay.

* Based on Compass Direction

Inspected By: JQD Visual___ Sounding __X_

Time Test Started	7:45 am
Time Test Finished	8:00 am
Time Test Started	9:10 am
Time Test Finished	9:25 am



Note: 50% of base shall have < 1/2 Inch of sediment.
No area of shaft bottom shall be more than 1 1/2 Inches.

Notes	Comments/Recommendations
80% area < 1/2", first test okay.	Rebar cage placed & concrete ordered after first test.
60% area < 1/2", second test okay.	Concrete placed after second test was okay.

Results: X Satisfactory DS Foreman John Q Doe

Unsatisfactory SCDOT Inspector John Smith Time 9:25 am Date 06/05/02

NOTE: **Specification Tolerances - Location Variance at Top = 3 inches Max. Vertical (Plumbness) = 1 inch per 4 Ft. Max.**

DRILLED SHAFT INSPECTION LOG (REV 06-03-02)
SAMPLE 2 Temporary Casing

Project Name	Replace Bridge over Cooper Creek along US-322			Page 4 of 6	
File No.	4.995			Bent No.	6
Contractor	Drilled Shaft, Inc.			Shaft No.	3
Completed By Contractor	DS Foreman - John Q. Doe	Date	06/05/02	Station	508 + 36
Reviewed By SCDOT	Inspector - Jane Smith	Date	06/05/02	Offset	24 FT. Right

Type of Drilling Fluid	Bentonite	Shaft Plumbness Check/4'	1/2 In. per 4 Ft.
DS Location Variance at Top	1" Before Sta. & 4" Left**	Rebar Cage: Proper # Vert. Bars	16 EA # 36 Bars
Bottom Cleanout Method	Airlift	Proper # Horiz. Bars	# 19 W Hoops @ 7 IN.
Time/Date Final Cleanout	7:45 am on 06/05/02	Side Spacers	4 EA every 10 Ft.
Shaft Bottom Elev.	39.0 msl	Bottom Spacers	16 EA @ 6" Length
Est. Shaft Bottom Dia.	42 Inches	Ties & Connections	Checked and okay.

* Based on Compass Direction

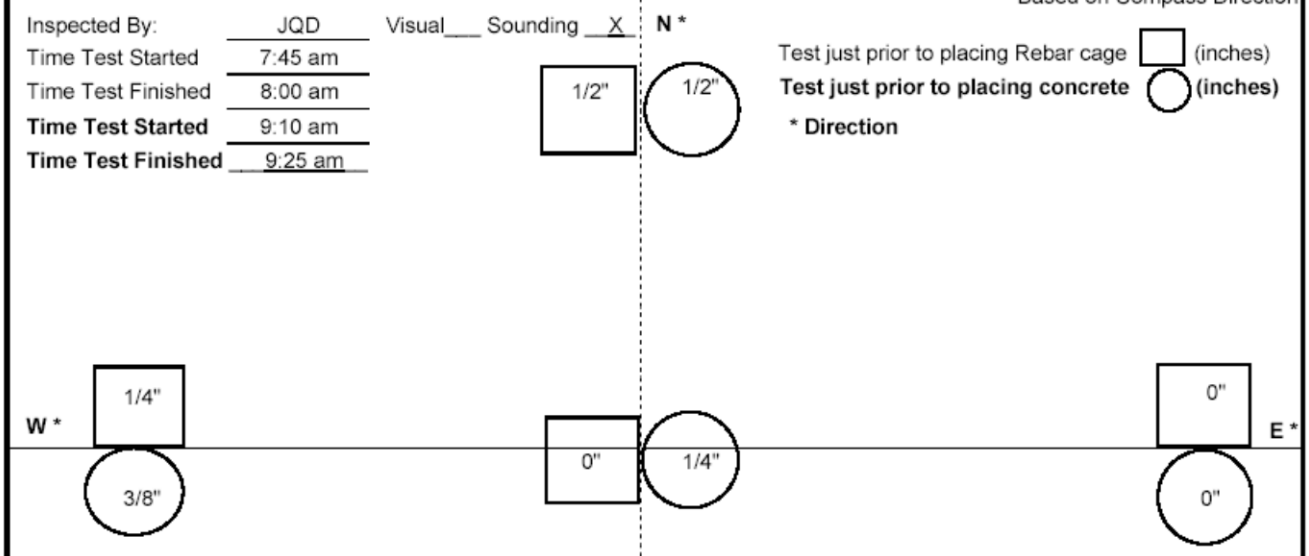
Inspected By: JQD Visual___ Sounding __X__

Time Test Started 7:45 am

Time Test Finished 8:00 am

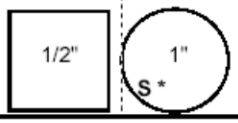
Time Test Started 9:10 am

Time Test Finished 9:25 am



Note: 50% of base shall have < 1/2 Inch of sediment.
No area of shaft bottom shall be more than 1 1/2 Inches.

Notes	Comments/Recommendations
60% area < 1/2", first test okay.	Rebar cage placed & concrete ordered after first test.
60% area < 1/2", second test okay.	Concrete placed after second test was okay.
	** - See note on Page 1.



Results: X Satisfactory DS Foreman John Q Doe

Unsatisfactory SCDOT Inspector Jane Smith Time 9:25 am Date 06/05/02

NOTE: **Specification Tolerances - Location Variance at Top = 3 inches Max. Vertical (Plumbness) = 1 inch per 4 Ft. Max.**

DRILLED SHAFT CONCRETE PLACEMENT LOG (REV 06-03-02)

Project Name _____ Page 5 of 6
File No. _____ Bent No. _____
Contractor _____ Shaft No. _____
Completed By Contractor DS Foreman - _____ Date _____ Station _____
Reviewed By SCDOT Inspector - _____ Date _____ Offset _____

Placement Method _____ Tremie
_____ Pumped
De-airing Method _____ Relief Valve
_____ Plug
_____ Cap

Volume in Pump Truck	#	ID	Length	Volume
Pump Truck Lines				
Pump Truck				

Total Volume in Lines + Pump Truck Σ = _____

Reference Elev. _____
Shaft Top Elev. _____
Top of Rock Elev. _____
Shaft Bottom Elev. _____

Time First Truck Batched: _____
Depth of Water Per Hr. Inside Shaft (Dry Hole Check) _____
Rebar Cage Top Elev. At Start - _____ At Finish _____

Truck No.	Concrete Volume	Arrival Time	Start Time	Finish Time	Tremie Depth	Depth To Concrete	Notes

_____ Concrete Volume Delivered

Total Placement Time (Temp. Casing Removed) _____

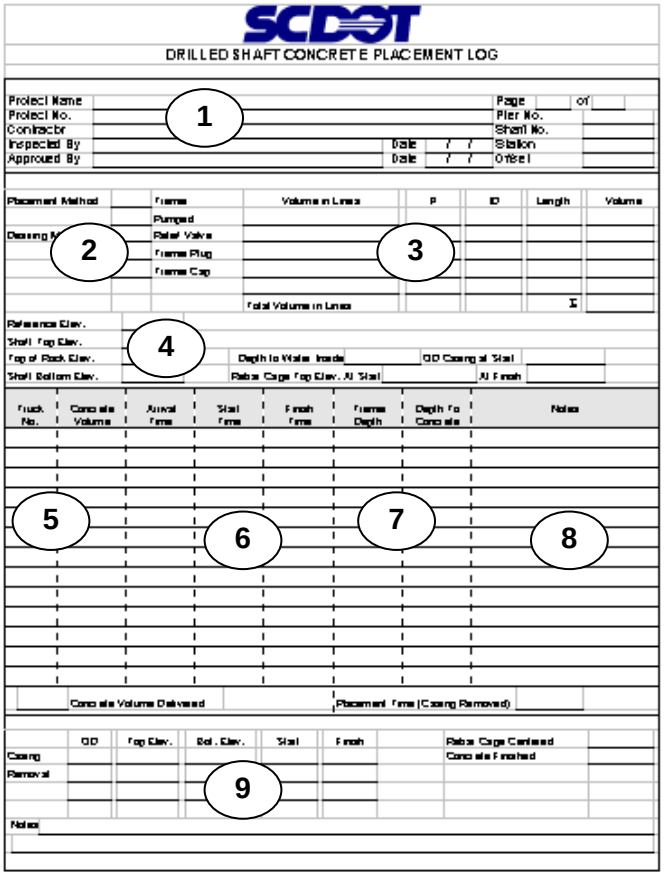
T Casing Removal**	OD	Top Elev.	Bot. Elev.	Start	Finish

YES NO
Rebar Cage Centered* _____
Rebar Cage Re-centered _____

Notes *** If no, then re-center rebar cage. ** If unable to remove temporary casing, then call Bridge Construction Office.**

HOW TO COMPLETE THE

DRILLED SHAFT CONCRETE PLACEMENT LOG



Fill in every blank on the form. If it does not apply put an "N/A" or a long dash.

Use pencil – but never erase. If you need to change something, strike a single line through the item and insert the correct information above it. If there is insufficient room to make a note, footnote the item and go to the bottom of the page, or use a separate page.

1. Heading: -Fill in <u>before</u> drilling starts.
   -Be sure to print your name and the start date of drilling.
   -The Project Resident Engineer or designated representative will sign approval line.
2. Indicate correct "Placement" and "Deairing" method.
3. Compute and fill in Concrete Volumes: $V = (\pi d^2/4) \times L$
4. Fill in as much as possible prior to pour.
5. Record Truck number and amount of concrete.
6. Time: -May be military or standard clock. Be consistent and correct.
   Watch for date changes on late night pours.
7. Depths: -Tremie embedment may be measured by markings on the tremie. Depth to concrete may be measured by weighted tape.
8. Notes: Record any unusual events or items.
9. Casing/Rebar Data: -The rebar cage fabrication will normally be performed on-site. Observe the lifting to make sure deformation or damage does not occur (especially to CSL tubes). Check that the correct cage is being used. Check reinforcing steel diagram against the actual cage to be sure cage is correct. When the cage is being placed, observe the spacing to assure the cage is set to the proper elevation.

DRILLED SHAFT CONCRETE PLACEMENT LOG (REV 06-03-02)

SAMPLE 1 Construction Casing

Project Name	Replace Bridge over Cooper Creek along US-322			Page	5	of 6
File No.	4.995			Bent No.		3
Contractor	Drilled Shaft, Inc.			Shaft No.		3
Completed By Contractor	DS Foreman - John Q. Doe	Date	06/05/02	Station		508 + 36
Reviewed By SCDOT	Inspector - John Smith	Date	06/05/02	Offset		24 FT. Right

			Volume in Pump Truck	#	ID	Total Length	Volume
Placement Method		Tremie					
	X	Pumped	Pump Truck Lines (6" x 10')	17	6"	170'	1.2 CY
De-airing Method		Relief Valve	Pump Truck				0.2 CY
	X	Plug					
			Total Volume in Lines + Pump Truck				Σ = 1.4 CY

Reference Elev. 101.0 msl

Shaft Top Elev. 101.0 msl

Top of Rock Elev. 49.0 msl

Shaft Bottom Elev. 39.0 msl

Time First Truck Batched: 9:10 am

Depth of Water Per Hr. Inside Shaft (Dry Hole Check): NA - Slurry used.

Rebar Cage Top Elev. At Start - 108.0 msl At Finish - 108.0 msl

Truck No.	Concrete Volume	Arrival Time	Start Time	Finish Time	Tremie/ Pump Lines Total Length	Depth To Concrete from Casing Top	Notes
17	9.0 CY	9:20 am	9:25 am	9:40 am	160 FT	41.0 FT	Removed 10' of pump line.
22	9.0 CY	9:30 am	9:45 am	10:00 am	160 FT	21.7 FT	Removed 20' of pump line.
8	9.0 CY	9:40 am	10:05 am	10:20 am	130 FT	2.4 FT	Removed 20' of pump line.
17	4.0 CY	10:30 am	10:35 am	10:50 am	120 FT	0	Waste 2.0 CY (Removing pump lines and overflow.)

31.0 CY Concrete Volume Delivered

Total Placement Time (Temp. Casing Removed) 100 Min.

	OD	Top Elev.	Bot. Elev.	Start	Finish
T Casing Removal**	NA				

	YES	NO
Rebar Cage Centered*	X	
Rebar Cage Re-centered		

Notes * **If no, then re-center rebar cage. ** If unable to remove temporary casing, then call Bridge Construction Office.**

DRILLED SHAFT CONCRETE PLACEMENT LOG (REV 06-03-02)
SAMPLE 2 Temporary Casing

Project Name	Replace Bridge over Cooper Creek along US-322			Page 5	of 6
File No.	4.995			Bent No.	6
Contractor	Drilled Shaft, Inc.			Shaft No.	3
Completed By Contractor	DS Foreman - John Q. Doe	Date	06/05/02	Station	508 + 36
Reviewed By SCDOT	Inspector - Jane Smith	Date	06/05/02	Offset	24 FT. Right

			Volume in Pump Truck	#	ID	Total Length	Volume
Placement Method		Tremie					
	X	Pumped	Pump Truck Lines (6" x 10')	17	6"	170'	1.2 CY
De-airing Method		Relief Valve	Pump Truck				0.2 CY
	X	Plug					
			Total Volume in Lines + Pump Truck				Σ = 1.4 CY

Reference Elev. 101.0 msl
Shaft Top Elev. 100.0 msl
Top of Rock Elev. 49.0 msl
Shaft Bottom Elev. 39.0 msl

Time First Truck Batched: 9:10 am
Depth of Water Per Hr. Inside Shaft (Dry Hole Check): NA - Slurry used.
Rebar Cage Top Elev. At Start - 108.0 msl At Finish - 108.0 msl

Truck No.	Concrete Volume	Arrival Time	Start Time	Finish Time	Tremie/ Pump Lines Total Length	Depth To Concrete from Casing Top	Notes
17	9.0 CY	9:20 am	9:25 am	9:40 am	160 FT	41.0 FT	Removed 10' of pump line.
22	9.0 CY	9:30 am	9:45 am	10:00 am	160 FT	21.7 FT	Removed 20' of pump line.
8	9.0 CY	9:40 am	10:05 am	10:20 am	130 FT	2.4 FT	Removed 20' of pump line.
17	4.0 CY	10:30 am	10:35 am	10:50 am	120 FT	0	Waste 2.0 CY (Removed the temporary casing, pump lines and concrete overflow.)

31.0 CY Concrete Volume Delivered

Total Placement Time (Temp. Casing Removed) 100 Min.

	OD	Top Elev.	Bot. Elev.	Start	Finish
T Casing Removal**	48"	101.0 msl	85.0 msl	10:25 am	10:35 am

Rebar Cage Centered*	YES	NO
Rebar Cage Re-centered	X	X

Notes * **If no, then re-center rebar cage. ** If unable to remove temporary casing, then call Bridge Construction Office.**

DRILLED SHAFT CONCRETE VOLUMES LOG (REV 06-03-02)

Project Name				Page 6 of 6	
File No.				Bent No.	
Contractor				Shaft No.	
Completed By Contractor	DS Foreman -	Date / /		Station	
Reviewed By SCDOT	Inspector -	Date / /		Offset	

Concreting Curve

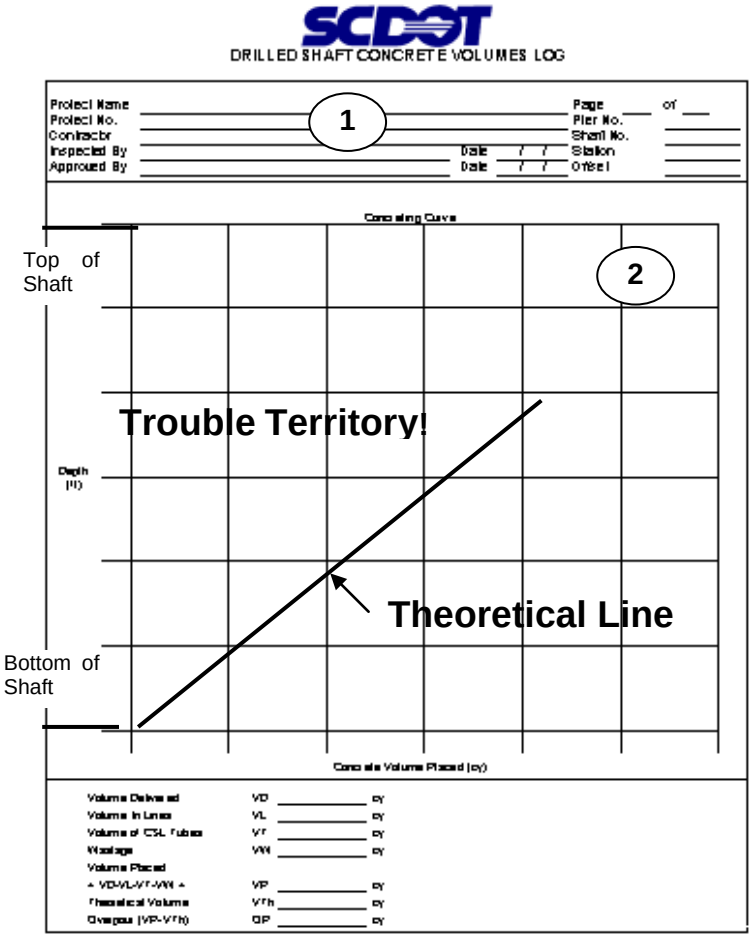
Depth (ft)

Concrete Volume Placed (cy)

Volume Delivered	VD		cy
Volume In Pump Truck + Lines	VPTL		cy
Volume of CSL Tubes	VCSLT		cy
Wastage	VW		cy
Volume Placed = VD-VPTL-VCSLT-VW =	VP		cy
Theoretical Volume	VTh		cy
Over Pour (VP-VTh =/> 1.00)	OP		cy
Under Pour (VP-VTh < 1.00)	UP		cy

HOW TO COMPLETE THE

DRILLED SHAFT CONCRETE VOLUMES LOG



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Use pencil – but never erase. If you need to change something, strike a single line through the item and insert the correct information above it. If there is insufficient room to make a note, footnote the item and go to the bottom of the page, or use a separate page.

1.	Heading:	-Fill in <u>before</u> drilling starts.
		-Be sure to print your name and the start date of drilling.
		-The Project Resident Engineer or designated representative will sign approval line.
2.	Concrete curve:	-compute Theoretical Volume of Concrete based on shaft size:
		$Vth = (\pi d^2/4) x\ L$
		-locate points based on known cubic yards of concrete placed at measured "bottom" depth.
		-must be plotted during concrete placement.

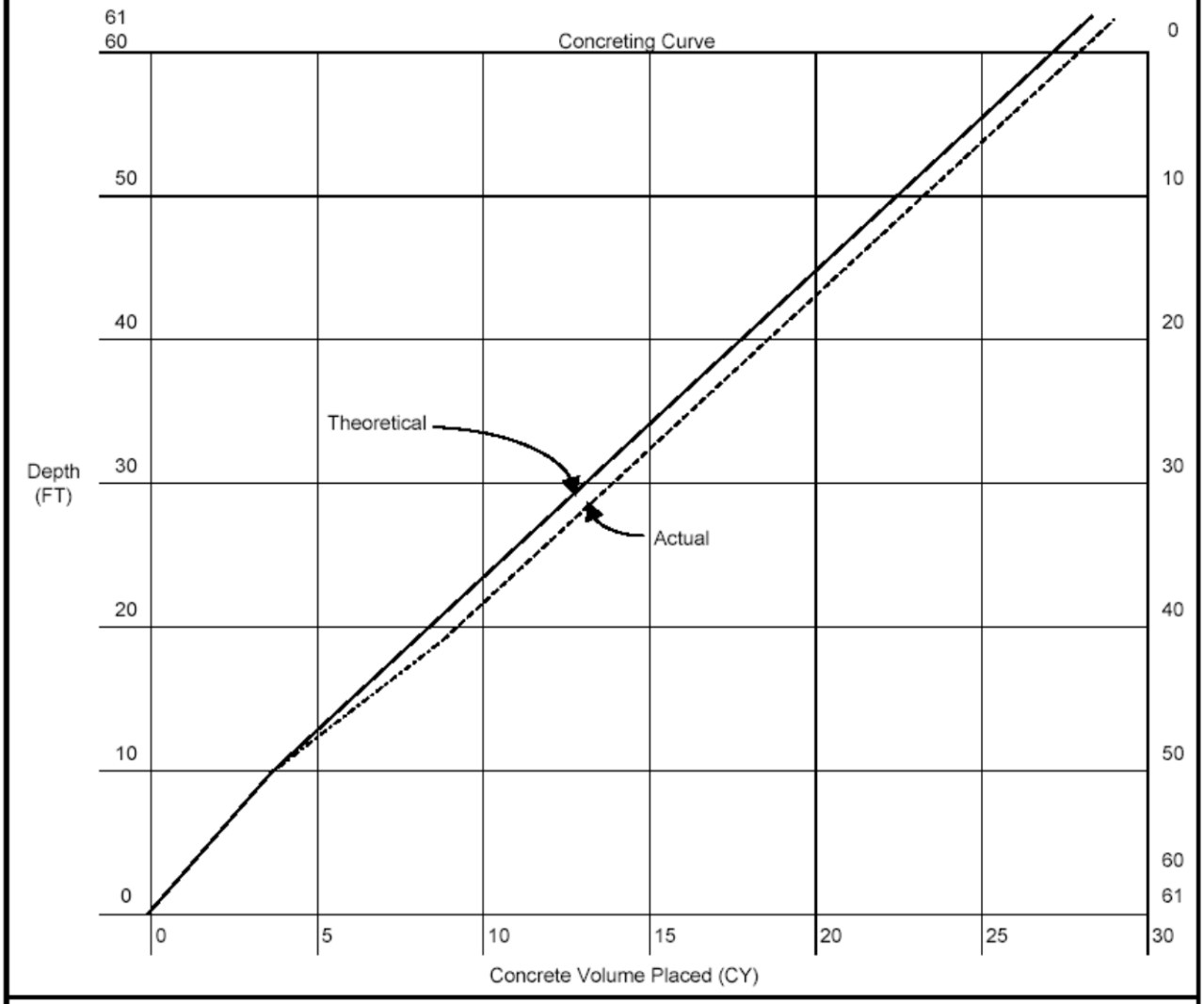
Note: Plotted line should closely parallel Theoretical line.
There is a problem if:

- a point plots way above or below the Theoretical line and/or
- there is a significant rise or fall in an otherwise straight line (change in slope of line).

DRILLED SHAFT CONCRETE VOLUMES LOG (REV 06-03-02)

SAMPLE 1 Construction Casing

Project Name	Replace Bridge over Cooper Creek along US-322			Page	6 of 6
File No.	4.995			Bent No.	3
Contractor	Drilled Shaft, Inc.			Shaft No.	3
Completed By Contractor	DS Foreman - John Q. Doe	Date	06/05/02	Station	508 + 36
Reviewed By SCDOT	Inspector - John Smith	Date	06/05/02	Offset	24 FT. Right

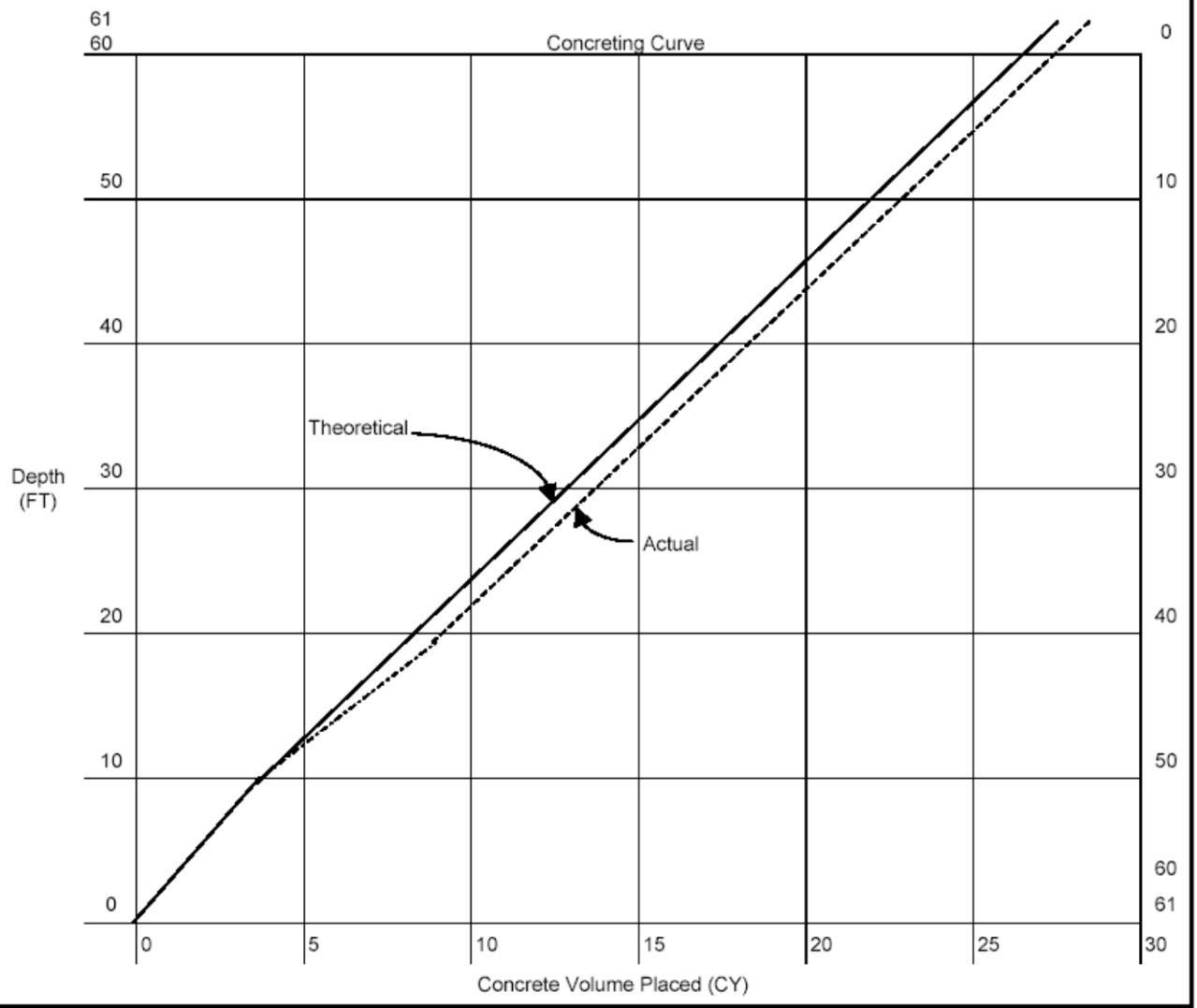


Volume Delivered	VD	31.0	CY
Volume In Pump Truck + Lines	VPTL	-1.4	CY - Volume left in pump truck and lines.
Volume of CSL Tubes	VCSLT	+0.2	CY
Wastage	VW	-2.0	CY - Removed pump lines and concrete overflow.
Volume Placed = VD-VPTL-VCSLT-VW =	VP	27.8	CY
Theoretical Volume	VTh	27.2	CY
Over Pour (VP-VTh =/> 1.00)	OP	0.6	CY
Under Pour (VP-VTh < 1.00)	UP	NA	CY

DRILLED SHAFT CONCRETE VOLUMES LOG (REV 06-03-02)

SAMPLE 2 Temporary Casing

Project Name	Replace Bridge over Cooper Creek along US-322			Page	6 of 6
File No.	4.995			Bent No.	6
Contractor	Drilled Shaft, Inc.			Shaft No.	3
Completed By Contractor	DS Foreman - John Q. Doe	Date	06/05/02	Station	508 + 36
Reviewed By SCDOT	Inspector - Jane Smith	Date	06/05/02	Offset	24 FT. Right



Volume Delivered	VD	31.0	CY
Volume In Pump Truck + Lines	VPTL	-1.4	CY - Volume left in pump truck and lines.
Volume of CSL Tubes	VCSLT	+0.2	CY
Wastage	VW	-2.0	CY - Removed pump lines and concrete overflow.
Volume Placed = VD-VPTL-VCSLT-VW =	VP	27.8	CY
Theoretical Volume	VTh	27.3	CY
Over Pour (VP-VTh =/> 1.00)	OP	0.5	CY
Under Pour (VP-VTh < 1.00)	UP	NA	CY