

## **LEAD-BASED PAINT INVESTIGATION REPORT**

**S-32-273 – BUSH RIVER ROAD BRIDGE  
OVER I-20 (EAST & WEST BOUND LANES)  
SCDOT BRIDGE #3327027300200  
LEXINGTON COUNTY, SOUTH CAROLINA**

### **PREPARED FOR:**



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

### **PREPARED BY:**

F&ME Consultants  
3112 Devine Street  
Columbia, South Carolina 29205

**May 4, 2018**

Yes, lead was found.  
 No, lead was not found.

F&ME Project No.: G5662.010

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# 1. EXECUTIVE SUMMARY

This executive summary is intended as an overview for the convenience of the reader. This report should be reviewed in its entirety prior to making any decisions regarding this project.

F&ME Consultants has completed a Lead-Based Paint (LBP) Investigation on the S-32-273 (Bush River Rd.) Bridge Over I-20 in Lexington County, South Carolina, for HDR, Inc (David Kinard, P.E. - Project Manager), on April 26, 2018. Appendix A – Site Vicinity Map is provided to show the location of the bridge. Appendix B – Bridge Plan, is provided to show the bridge lay-out and locations of XRF scans taken on the bridge.

Per an agreed upon scope of work, this LBP Investigation was conducted to identify, analyze, and assess the condition of any LBP or coated bridge components which may be affected by the planned demolition activities. Additionally, F&ME agreed to make recommendations regarding proper handling and/or disposal methods if any LBP or coatings were identified. This investigation includes both a visual evaluation of the physical condition of painted materials as well as quantitative testing of random surfaces using a Thermo Scientific Niton X-Ray Fluorescence (XRF) Portable Analyzer. The XRF documents the concentration of lead, if any, in the overall paint or coating. Bridge components were scanned with a Niton XRF analyzer (Model #XLp 300A, Serial #18185) with a limit of detection (LOD) of 0.01 mg/cm<sup>2</sup>.

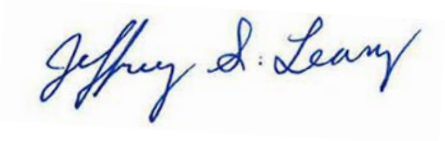
LBP is regulated by multiple government agencies, and each requires different response actions when the concentration of lead exceeds specified thresholds. The Occupational Safety and Health Administration (OSHA) regulates worker exposure to lead dust, and as a result considers materials with any lead content to be a potential hazard. Furthermore, the South Carolina Department of Health and Environmental Control (SCDHEC) requires some materials found to contain greater than or equal to ( $\geq$ ) 0.7 mg/cm<sup>2</sup> lead to be disposed of at specialized waste facilities. Appendix C – XRF Data, is provided to present the data in a user-friendly format. The XRF results have been highlighted to show which threshold has been exceeded. Items in red text exceed the SCDHEC threshold, while items in blue text contain lead in concentrations between 0.01 to <0.7 mg/cm<sup>2</sup> and would therefore be subject to OSHA's regulations.

The results from the XRF quantitative testing indicate that lead is present in paint and/or coatings at levels that equal to or exceed the SCDHEC threshold for lead (0.7 mg/cm<sup>2</sup>) in the following bridge components associated within the areas of this LBP investigation: bridge beams, diaphragms, and beam plates.

We appreciate the opportunity to assist you in this matter. If you have any questions or require additional information, please feel free to contact our office at (803) 254-4540.

Sincerely,

F&ME CONSULTANTS



**Jeffrey S. Leary**  
S.C. Lead-Based Paint Inspector  
EPA Certification No. SC-I-18721-3 (Exp. 07/29/18)



**Glynn M. Ellen**  
Environmental Manager

## 2. LBP BACKGROUND INFORMATION

Housing and Urban Development (HUD) defines “LBP” as any coating that has a lead concentration of 1.0 milligrams of lead per square centimeter (1.0 mg/cm<sup>2</sup>) or greater, or if the lead concentration is greater than one half of a percent (> 0.5%) by weight. The Consumer Product Safety Commission (CPSC) currently considers paint to be lead-containing if the concentration of lead exceeds 90 ppm (0.009% by weight). In 1978, the CPSC banned the sale of LBP to consumers, and banned its application in areas where consumers have direct access to painted surfaces. Both the CPSC and HUD definitions of lead-containing paint are aimed at protecting the general population from exposure to lead in the residential setting.

In contrast, the mission of OSHA with respect to lead-containing paint is to protect workers during construction activities that may generate elevated airborne lead concentrations. OSHA states that construction work (including renovation, maintenance, and demolition) carried-out on structures coated with paint having lead concentrations lower than the HUD or CPSC can still result in airborne lead concentrations in excess of regulatory limits. For this reason, OSHA has not defined lead-containing paint, but states that paint having any measurable level of lead (> 0.01 mg/cm<sup>2</sup>) may pose a substantial exposure hazard during construction work, depending upon the work performed. Therefore, in these situations, OSHA guidelines and safety procedures should be followed. By OSHA standards and regulations, the employer shall ensure that no employee is exposed to lead at concentrations greater than fifty micrograms per cubic meter of air (50 ug/m<sup>3</sup>) averaged over an 8-hour period.

Additionally, the SCDHEC requires the use of specialized waste disposal sites if materials contain lead concentrations greater than or equal to (>) 0.7 mg/cm<sup>2</sup>. It is imperative that these regulations be considered if any present or future demolition activities will impact LBP-containing bridge components.

## 3. INTRODUCTION

F&ME Consultants has completed a Lead-Based Paint (LBP) Investigation on the S-32-273 (Bush River Rd.) Bridge Over I-20 in Lexington County, South Carolina. This investigation was performed on April 26, 2018.

It is our understanding that the existing bridge structure is scheduled for demolition as part of the Carolina Crossroads project. The scope of this LBP Investigation was to identify, analyze, and assess the condition of LBP or coated bridge components that may be affected by the demolition activities.

The results, conclusions and recommendations from this investigation are representative of the conditions observed at the site on the date of the field inspection. F&ME does not assume responsibility for any changes in conditions or circumstances that occur after the inspection. Use of this document for bidding purposes is not recommended without prior consultation with F&ME. No other environmental issues are addressed in this report.

## 4. INVESTIGATION RESULTS

The existing bridge structure (~249.0'L x 79.5'W, inside curb to inside curb), is located on S-32-273 (Bush River Rd.) and crosses over I-20 in Lexington County, South Carolina. The bridge (SCDOT Bridge #327027300200) was constructed in the late 1970's according to the date on the original construction drawings provided. The bridge is a four-lane, four (4) span bridge constructed with poured-in-place concrete bridge deck spans, with concrete curb and gutters, and sidewalks, and galvanized guardrails. Each span is supported by eleven (11) steel beams with steel diaphragms. The steel beams are supported by two (2) end bents and three (3) interior bents. According to the SCDOT bridge drawings provided,



*Photo 1 – S-32-273 (Bush River Rd.) Bridge over I-20 in Lexington County, SC.*

and through onsite observations made in the field, the beam supports for both the end bents and interior bents are constructed with a concrete bent caps that are supported by five (5) concrete columns on each bent. The end bents have soil and concrete covering the piles with only the top of the concrete bent cap exposed. Galvanized guardrails and posts are attached to both ends of the bridge. The bridge approaches on each end of the bridge consist of a four-lane asphalt paved roadway.

Our LBP Investigation sampling protocol consisted of randomly selecting bridge components on the subject bridge and scanning them with our Thermo Scientific Niton X-Ray Fluorescence (XRF) Portable Analyzer (Model XLp300A, Serial #18185, Isotope 1: Cd109, 40mCi, source date 09/01/2015) using the threshold of 0.7 mg/cm<sup>2</sup>. The components that were tested with the XRF include the following: horizontal support beams, diaphragms, beam plates, and metal barrier railing.

The results from the XRF quantitative testing indicate that lead is present in paint and/or coatings at levels that equal to or exceed the SCDHEC threshold for lead (0.7 mg/cm<sup>2</sup>) in the following bridge component associated within the areas of this LBP investigation: bridge beams, diaphragms, and beam plates. For more information regarding the specific descriptions and locations of the items that were scanned, refer to the Appendix C – XRF Data. Also, Appendix D – Site Photographs, shows top and underside views of the bridge along with photos of the bridge components that tested positive for lead. Appendix E - Personnel Certification, is included to show F&ME qualifications with regards to LBP Investigations.

## 5. RECOMMENDATIONS

The results, conclusions and recommendations from this investigation are representative of the conditions observed at the site on the date of the field inspection. F&ME does not assume responsibility for any changes in conditions or circumstances that occur after the inspection. This report has been prepared exclusively for HDR, Inc. and shall not be disseminated in whole or part to

other parties without prior consent from HDR, Inc. or F&ME Consultants, Inc. No other environmental issues were addressed as part of this report.

The results from this Lead-Based Paint Investigation indicate that lead is present in paint and/or coatings at levels that equal to or exceed the SCHEC threshold limit for lead (0.7 mg/cm<sup>2</sup>) and OSHA limits on the bridge beams, diaphragms, and beam plates.

It is important to ensure that the debris generated from the demolition activities is handled and disposed of appropriately. The proper handling and disposal procedures depend on the type of substrate (e.g., metal, wood, masonry block, etc.). To reduce and/or eliminate the generation of lead-containing dust, and residue, it is recommended that cutting, sanding and grinding be kept to a minimum, and to the extent practicable, the substrate materials should be removed intact. Metal components painted with and/or containing lead, such as the beams, diaphragms, and beam plates may be recycled, if they are taken to a recycling facility that accepts lead painted and/or lead-containing material. It was noted during the field investigation that the LBP on the beam plates was peeling. The paint chips should be HEPA vacuumed up and containerized as LBP *residue*. Proper OSHA procedures and PPE's should be implemented for handling the LBP *residue*. Also, proper SCDHEC disposal regulations should also be implemented. Further discussion of SCDHEC disposal requirements are explained below.

Components found to contain lead should be handled appropriately. It is recommended that work tasks which require grinding, sanding, cutting torch, or other disturbance of the LBP surfaces identified herein be performed in accordance with federal regulations pertaining to worker protection from exposure to LBP. When lead containing items are disturbed or begin to decay they become a concern regarding human health and the environmental. The typical routes of exposure to lead are through the inhalation or ingestion of lead-contaminated materials. Minimal risk of exposure exists where the lead-containing paint and coating are intact (e.g., has not been aerosolized, free of chipping or flaking, etc.).

As stated previously, OSHA regulates any measurable level of lead ( $\geq 0.01$  mg/cm<sup>2</sup>), as it may pose a substantial exposure hazard to workers. Therefore, in these situations, OSHA regulations and safety procedures should be followed. These regulations also list the proper personal protective equipment to be used by the workers disturbing the LBP items and the requirements for personal air monitoring. OSHA's exposure action level (AL) for lead, regardless of respirator use, is an airborne concentration of 30µg/cm<sup>3</sup>, averaged over an eight-hour period. The action level (AL) is the level at which an employer must begin specific compliance activities as outlined in OSHA's lead standards. By OSHA standards and regulations, the employer shall ensure that no employee is exposed to lead at concentrations greater than fifty micrograms per cubic meter of air (50 µg/m<sup>3</sup>) averaged over an 8-hour period which is the permissible exposure level (PEL).

SCDHEC regulates the proper disposal of LBP and associated debris. SCDHEC defines two types of LBP debris. The first is LBP *waste*, which is defined as material such as wood, brick and metal that is painted with LBP. The other is LBP *residue* which is defined as residue that is generated from the removal (e.g., scraped, chipped, sandblasted, or chemical) of LBP from a structure. LBP *waste* that comes from a commercial or residential facility may be disposed of in either a class 2 or 3 landfill,

while LBP *residue* from a commercial facility must have a toxicity characteristic leaching procedure (TCLP) analysis to determine the lead content. TCLP analysis is used to determine whether a waste is a characteristic hazardous waste due to leachability under the South Carolina Hazardous Waste Management Regulations. LBP *residue* with a TCLP analysis result greater than or equal to five milligrams per liter ( $\geq 5$  mg/l) lead must be disposed of in a Subtitle C landfill (Hazardous Waste). However, LBP *residue* from a commercial facility with a TCLP analysis result less than five milligrams per liter ( $< 5$  mg/l) lead is required to be disposed of in a Class 3 landfill.

Should any hidden and/or inaccessible components suspected to have LBP be encountered during demolition activities, the contractor performing the work is advised to stop work, follow proper procedures and precautions relating to LBP, and contact F&ME Consultants at (803) 254-4540 for an immediate response action.



## APPENDICES

Appendix A – Site Vicinity Map

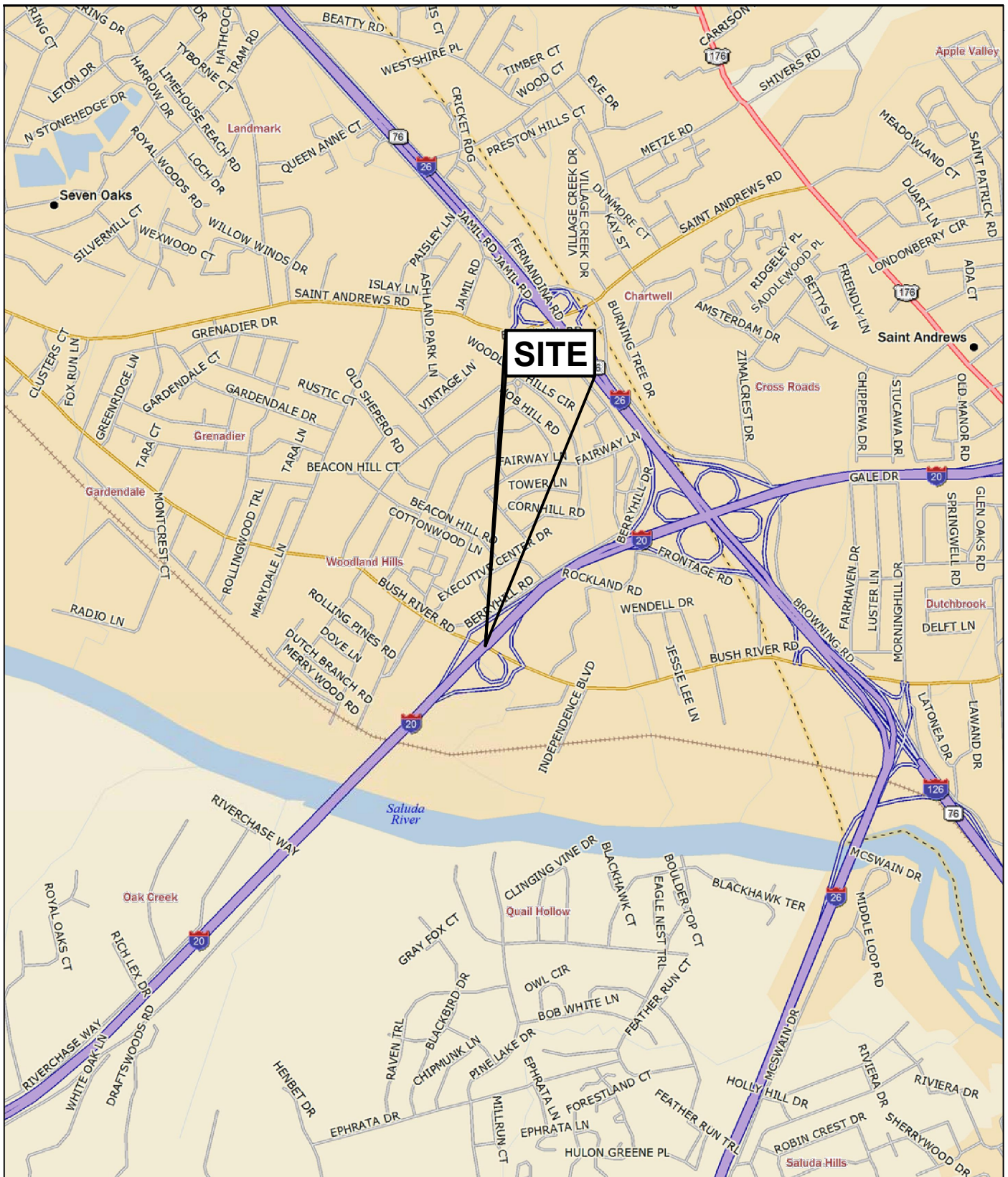
Appendix B – Bridge Plan

Appendix C – XRF Data

Appendix D – Site Photographs

Appendix E – Personnel Certification

**Appendix A**  
**Site Vicinity Map**



Data use subject to license.

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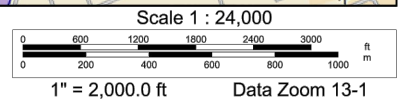


FIGURE NUMBER:	F&ME CONSULTANTS PROJECT NUMBER:
1	G5662.010

**LEAD-BASED PAINT INVESTIGATION**  
**S-32-273 (Bush River Rd.) OVER I-20**  
 Lexington County, SC

**Site Vicinity Map**  
 Prepared for: HDR, Inc.  
 3955 Faber Place Drive, Suite 300  
 North Charleston, SC 29405

**F&ME CONSULTANTS**  
 1825 Blanding Street  
 Columbia, SC 29201

ORIGINAL:	DRWN. BY: CTC
April 27, 2018	CHKD. BY: JSL
REVISIONS:	APPR. BY: GME
1	NOTES:
2	
3	
SCALE:	
AS SHOWN	

## **Appendix B**

### **Bridge Plan**

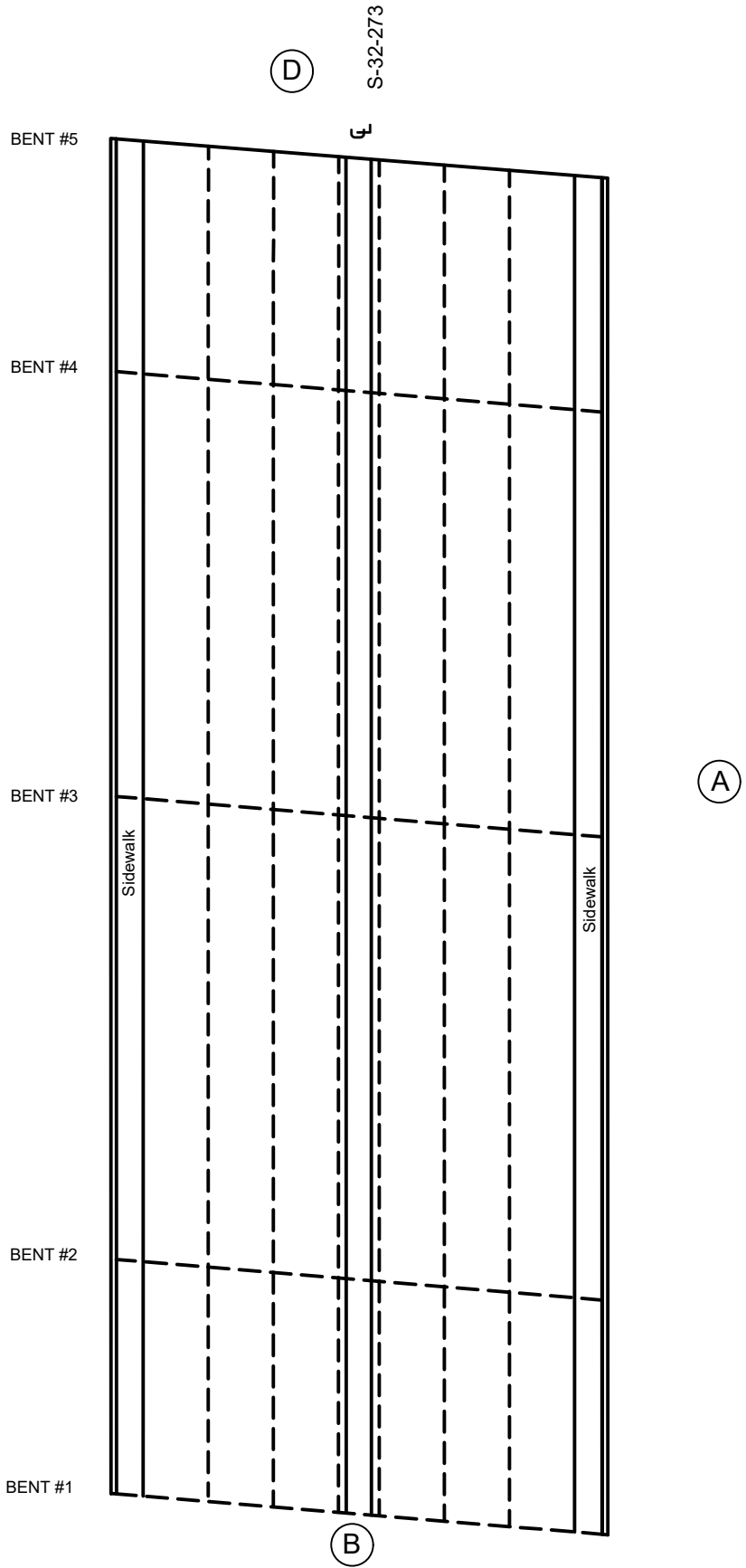


FIGURE NUMBER:

2

F&ME CONSULTANTS PROJECT NUMBER:

G5662.010

**LEAD-BASED PAINT INVESTIGATION  
S-32-273 (Bush River Rd.) OVER I-20**  
Lexington County, SC

**General Site Plan**  
Prepared for: HDR, Inc.  
3955 Faber Place Drive, Suite 300  
North Charleston, SC 29405

**F&ME  
CONSULTANTS**

1825 Blanding Street  
Columbia, SC 29201

ORIGINAL:  
April 27, 2018

REVISIONS:  
1 \_\_\_\_\_  
2 \_\_\_\_\_  
3 \_\_\_\_\_

SCALE:  
N.T.S.

DRWN. BY: MSM  
CHKD. BY: JSL  
APPR. BY: GME

NOTES:  
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## Appendix C

### XRF Data

## Appendix C – XRF Data

Date Scanned: 04/26/2018

Scan No.	Component	Substrate	Side	Condition	Color	Pbc (mg/cm <sup>2</sup> )
1	Shutter Calibrate					NA
2	Calibrate					0.70
3	Calibrate					1.00
4	Calibrate					1.00
5	Calibrate					0.80
6	Beam	Metal	B	Intact	Green	6.90
7	Beam	Metal	B	Intact	Green	6.20
8	Beam Plate	Metal	B	Peeling	Green	0.80
9	Diaphragm	Metal	B	Intact	Green	7.50
10	Diaphragm	Metal	B	Intact	Green	6.90
11	Beam Plate	Metal	B	Peeling	Green	1.00
12	Guardrail	Metal	A	Intact	Galvanized	<LOD
13	Guardrail	Metal	A	Intact	Galvanized	<LOD
14	Guardrail	Metal	A	Intact	Galvanized	<LOD
15	Guardrail	Metal	A	Intact	Galvanized	<LOD
16	Diaphragm	Metal	D	Intact	Green	8.00
17	Beam	Metal	D	Intact	Green	6.40
18	Beam Plate	Metal	D	Peeling	Green	1.50
19	Shutter Calibrate					NA
20	Calibrate					1.10
21	Calibrate					0.70
22	Calibrate					1.00
23	Calibrate					0.60

LOD (Limit of Detection) = 0.01 mg/cm<sup>2</sup>

Blue text indicates any concentrations of LBP which OSHA considers a potential exposure risk when removed.

Red text indicates concentrations of LBP that have specific disposal requirements regulated by SCDHEC.

## Appendix D

### Site Photographs



# Photograph 1



Top view of the subject bridge looking up station with a view of the top deck of the bridge.

# Photograph 2



Side view of the bridge.

# Photograph 3



View from underside of bridge with view of the beams and diaphragms that tested positive for LBP.

# Photograph 4



Another underside view of the beams and diaphragms that tested positive for LBP.

# Photograph 5



Underside view of the beam plates that tested positive for LBP and are peeling.

## Appendix E

### Personnel Certification

# United States Environmental Protection Agency

This is to certify that



Jeffrey S Leary

has fulfilled the requirements of the Toxic Substances Control Act (TSCA) Section 402, and has received certification to conduct lead-based paint activities pursuant to 40 CFR Part 745.226 as:

Inspector

## In the Jurisdiction of:

All EPA Administered Lead-based Paint Activities Program States, Tribes and Territories

This certification is valid from the date of issuance and expires July 29, 2021

LBP-I-18721-1

Certification #

April 17, 2018

Issued On

A handwritten signature in black ink, appearing to read 'Adrienne Priselac', written over a horizontal line.

Adrienne Priselac, Manager, Toxics Office  
Land Division

