

LEAD-BASED PAINT INVESTIGATION REPORT

SC-49 (CROSS KEYS HWY.) RBO TYGER RIVER
SCDOT BRIDGE #444004900100
UNION COUNTY, SOUTH CAROLINA

PREPARED FOR:



C/O Ms. Lila Leon, PE PhD
SC Geotechnical Lead
1201 Main Street, Suite 800
Columbia, SC 29201

PREPARED BY:

F&ME Consultants
1825 Blanding Street
Columbia, South Carolina 29201

February 22, 2023

☒ Yes, LBP was found.
☐ No, LBP was not found.

FME Project No.: G6658.002

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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, Inc. (FME) has completed a Lead-Based Paint (LBP) investigation on the SC-49 (Cross Keys Hwy.) Bridge over Tyger River (Bridge), in Union County, South Carolina at the request of HDR (Client). The purpose of the investigation was to locate, identify and test components of the Bridge that are painted or coated with LBP. The field investigation was performed on February 8, 2023, in anticipation of the on-alignment replacement of the existing Bridge. Appendix A – Site Vicinity Map is provided to show the location of the Bridge. Appendix B – General Bridge Plan, is provided to show the lay-out of the Bridge and a reference for locations of XRF scans.

Per an agreed upon scope of work, this LBP Investigation was conducted to identify accessible Bridge components that have been painted or coated with lead-containing materials that have concentrations greater than or equal (\geq) to the regulatory limit of 0.7 mg/cm². This investigation includes both a visual evaluation of the physical condition of painted materials as well as quantitative testing of surfaces using an X-Ray Fluorescence (XRF) LBP analyzer. The XRF documents the concentration of lead, if any, in the overall paint or coating. Bridge components were scanned with a Viken XRF analyzer (Model # Pb200i, Serial #1888, Reference Date: 11/01/22) with a limit of detection (LOD) of 0.1 mg/cm².

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. Additionally, South Carolina Department of Health and Environmental Control (SCDHEC) requires some waste materials to be disposed of at specific disposal facilities that are able to manage this waste. Appendix C – XRF Data, is provided to present the XRF data in a user-friendly format. Items in red text contain lead in concentrations regulated by SCDHEC and these materials must be addressed upon disposal. Items in blue and red text contain lead in concentrations that must be considered a potential for worker exposure by OSHA.

The results from the XRF quantitative testing of the Bridge components indicate that lead is present in paint and/or coatings in concentrations greater than or equal to (\geq) 0.7 mg/cm² in the following Bridge components:

- **Beam Bearing Plates**
- **Tie-Rod Washers**

For more information regarding the specific descriptions and locations of the items that were scanned, refer to the Appendix C – Summary of XRF Data. On the XRF Data Table, items highlighted in **Red** are positive and contain lead in concentrations greater than or equal to (\geq) 0.7 mg/cm². Items in **Blue** text contain lead in concentrations that must be considered a potential for worker exposure by OSHA. See Appendix E – Site Photos for locations and pictures of the materials with concentrations greater than or equal to (\geq) 0.7 mg/cm². Appendix D includes the inspector's EPA lead-based paint inspector certification.

We appreciate the opportunity to assist you in this project. 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

SC Lead Based Paint Inspector

EPA Certification No. LBP-I-18721-2 (Exp. 7/29/24)



Glynn M. Ellen

Environmental Department Manager

2. LEAD-BASED PAINT 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^2) 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 residential settings.

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 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^3) averaged over an 8-hour period.

Additionally, SCDHEC requires the use of specific waste disposal sites if materials contain lead concentrations greater than or equal to (\geq) 0.7 mg/cm^2 . Due to the anticipated demolition of the structure, the SCDHEC lead disposal requirements were used as a threshold.

3. INTRODUCTION

The existing Bridge ($\sim 259'.0'' \text{L} \times 44'.7'' \text{W}$, inside curb to inside curb), is located on SC-72 (Cross Keys Rd.) and crosses over Tyger River in Union County, South Carolina. The original Bridge was constructed at an unknown date. The Bridge was widened approximately 15.0' along the southeast side of the Bridge in the early 1970's according to date engraved into concrete curbing on the corner of the Bridge. The structure is a two (2) lane, nine (9) span Bridge constructed with a poured-in-place (PIP) concrete bridge deck, curbing, and piers with a asphalt overlay. Each end bent is supported by three (3) PIP structural concrete piers (2 on original Bridge and 1 on addition) and PIP concrete



Photo 1: SC-49 (Cross Keys Hwy.) Bridge over Tyger River in Union County, South Carolina.

bent caps. Metal scuppers were noted along each side of the Bridge to allow for for water drainage. Galvanized metal guardrails are attached to the concrete curbing on each side of the Bridge. Two (2) utility conduits were noted on the southeast side of the Bridge attached to the concrete curbing and runs the entire length of the Bridge. See Appendix A – Site Vicinity Map, for the location of the Bridge. See Appendix B –General Bridge Plan, for a layout of the Bridge.

4. INVESTIGATION PROCEDURES AND RESULTS

FME's LBP Investigation sampling protocol consisted of randomly selecting bridge components and scanning them with a Viken X-Ray Fluorescence (XRF) Portable Analyzer (Model # Pb200i, Serial #1888). The following Bridge components tested positive for lead in concentrations greater than or equal to (\geq) 0.7 mg/cm²:

- **Beam Bearing Plates**
- **Tie-Rod Washers**

For more information regarding the specific descriptions and locations of the items that were scanned, refer to the Appendix C – Summary of XRF Data. On the XRF Data Table, items highlighted in **Red** are positive and contain lead in concentrations greater than or equal to (\geq) 0.7 mg/cm². Items in **Blue** text contain lead in concentrations that must be considered a potential for worker exposure by OSHA. See Appendix D – Site Photos for locations and pictures of the materials with concentrations greater than or equal to (\geq) 0.7 mg/cm². Appendix E includes the inspector's EPA lead-based paint inspector certification.

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 investigation. FME does not assume responsibility for any changes in conditions or circumstances that occur after the date of the field investigation. No other environmental issues were addressed as part of this report.

The results from the XRF quantitative testing of Bridge components scanned indicate that lead was found to be present in paint and/or coatings in concentrations greater than or equal to (\geq) 0.7 mg/cm² in the following Bridge components:

- **Beam Bearing Plates**
- **Tie-Rod Washers**

Therefore, OSHA regulations and procedures should be followed when impacting these components. If possible, they should be removed in whole and disposed of properly. Also, SCDHEC disposal requirements for lead containing materials should also be followed.

As stated previously, OSHA regulates any measurable level of lead, 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 $30\mu\text{g}/\text{cm}^3$, 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 ($50\mu\text{g}/\text{m}^3$) 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 or not 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 ($\geq 5\text{ mg/l}$) 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 ($< 5\text{ mg/l}$) lead is required to be disposed of in a Class 3 landfill.

We sincerely appreciate the opportunity to be of service to HDR on this project. If you have any questions regarding the information presented herein, please contact our office at (803) 254-4540.

6. APPENDICES

Appendix A – Site Vicinity Map

Appendix B – General Bridge Plan

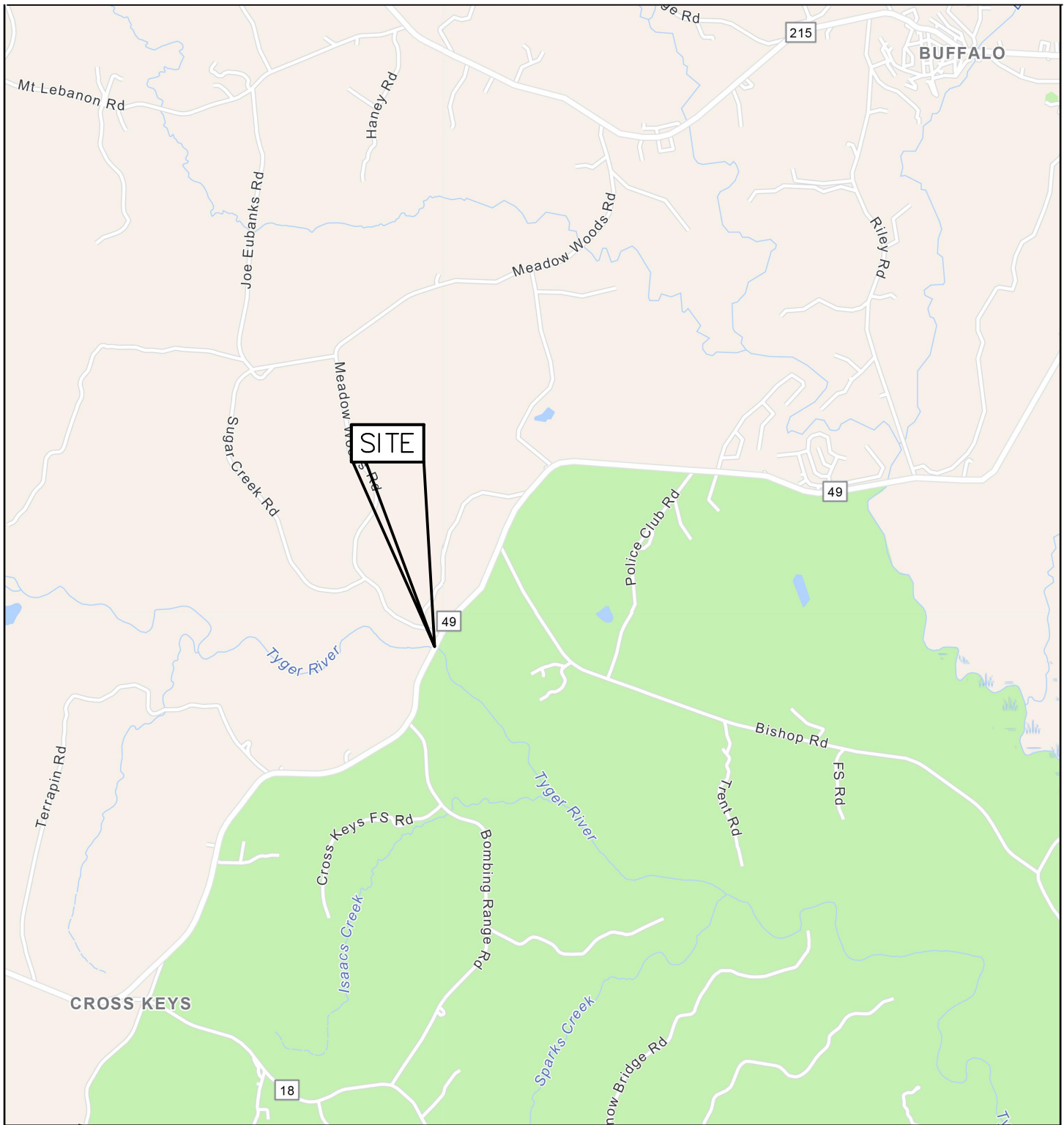
Appendix C – Summary of XRF Data Table

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Appendix A

Site Vicinity Map



1:72,000

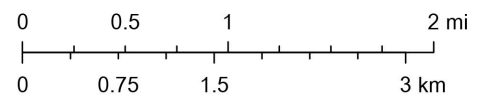


FIGURE
NUMBER:

1

F&ME CONSULTANTS
PROJECT NUMBER:

G6658.002

LEAD-BASED PAINT INVESTIGATION
SC-49 Bridge over Tyger River
Union County, SC
Site Vicinity Map
Prepared for: HDR, Inc.
1201 Main Street, Suite 800
Columbia, SC 29201



1825 BLANDING STREET
COLUMBIA, SC 29201

ORIGINAL:
February 21, 2023

REVISIONS:

1
2
3

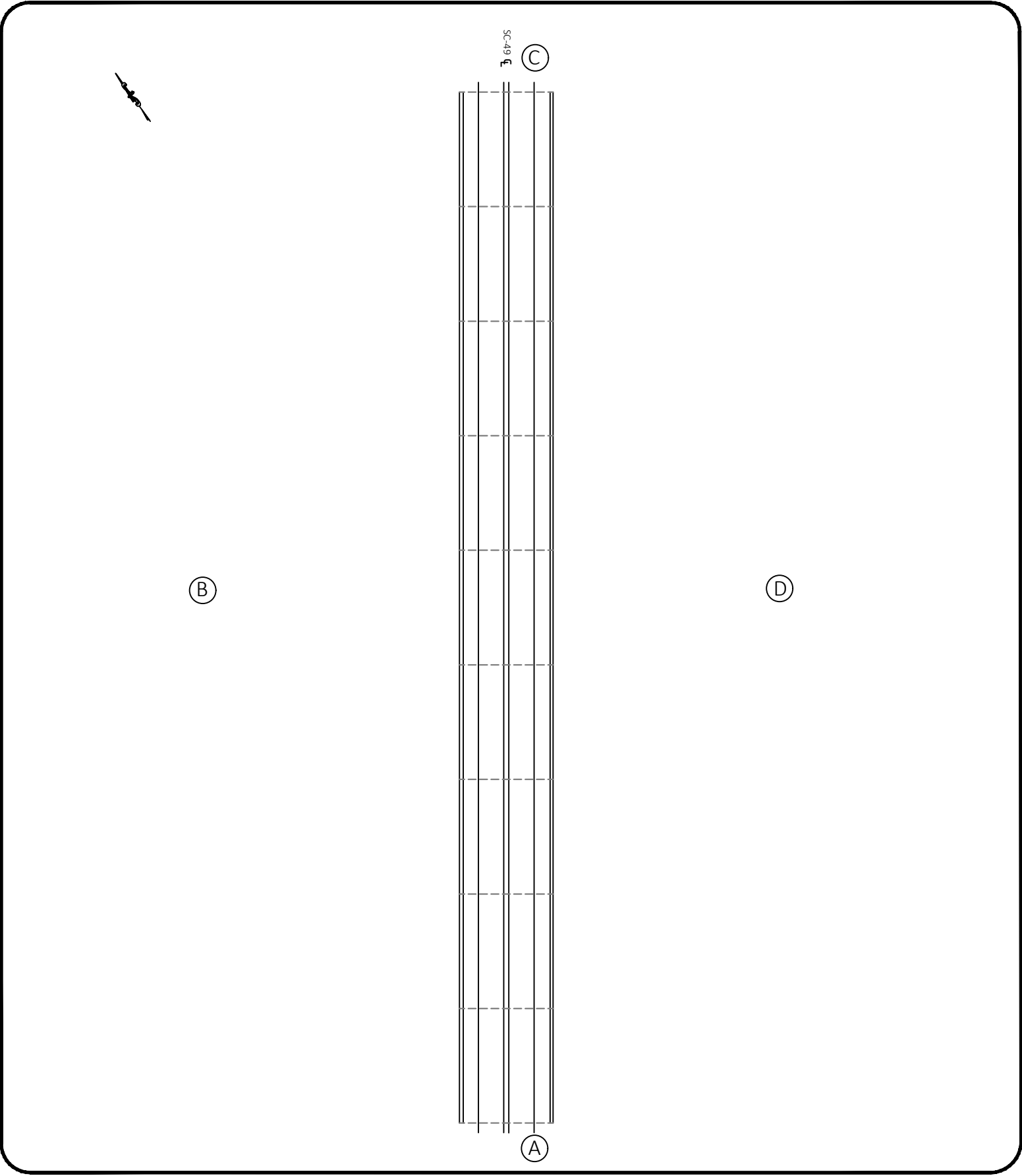
SCALE:
AS SHOWN

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

NOTES:

Appendix B

General Bridge Plan



<p>FIGURE NUMBER:</p> <p>2</p>	<p>F&ME CONSULTANTS PROJECT NUMBER:</p> <p>G6658.002</p>	<p>LEAD-BASED PAINT INVESTIGATION SC-49 Bridge over Tyger River Union County, SC <u>Sample Location Plan</u> Prepared for: HDR, Inc. 1201 Main Street, Suite 800 Columbia, SC 29201</p>	<div data-bbox="987 1850 1198 1959"> </div> <div data-bbox="987 1990 1198 2037"> <p>1825 BLANDING STREET COLUMBIA, SC 29201</p> </div>	<p>ORIGINAL: February 21, 2023</p> <p>REVISIONS:</p> <p>1 _____</p> <p>2 _____</p> <p>3 _____</p> <p>SCALE: _____</p> <p>N.T.S. _____</p>	<p>DRWN. BY: MSM</p> <p>CHKD. BY: JSL</p> <p>APPR. BY: GME</p> <p>NOTES:</p> <p>_____</p> <p>_____</p> <p>_____</p>
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Appendix C

Summary of XRF Data Table

Appendix C – XRF Data
Date Scanned: 02/08/2023
SC-49 (Cross Keys Hwy.) Bridge over Tyger River

Scan No.	Pbc (mg/cm ²)	Component	Substrate	Side	Condition	Color
1	0.87	calibrate				
2	0.88	calibrate				
3	0.88	calibrate				
4	38.0	bearing plate	Metal	C	Peeling	Silver
5	25.51	bearing plate	Metal	C	Peeling	Silver
6	17.92	bearing plate	Metal	C	Peeling	Silver
7	<LOD	utility pipe anchor	Metal	C	Deteriorated	Silver
8	<LOD	utility pipe anchor	Metal	C	Deteriorated	Silver
9	<LOD	small utility pipe	Metal	B	Fair	Galvanized
10	0.27	pipe hanger	Metal	B	Intact	Galvanized
11	34.0	bearing plate	Metal	A	Fair	Silver
12	0.24	guardrail	Metal	B	Intact	Galvanized
13	0.26	guardrail	Metal	B	Intact	Galvanized
14	0.28	guardrail	Metal	B	Intact	Galvanized
15	15.11	tie-rod washer	Metal	B	Intact	Gray
16	20.49	tie-rod washer	Metal	B	Intact	Gray
17	18.08	tie-rod washer	Metal	B	Intact	Gray
18	0.83	calibrate				
19	0.88	calibrate				
20	0.85	calibrate				

LOD (Limit of Detection) = 0.1 mg/cm²

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.

Side A = North, then go clockwise.

Appendix D

Site Photos



Photo 1. Top View of Bridge.



Photo 2. Original Bridge and Addition, Underside View.



Photo 3. Addition Underside View of Bridge.



Photo 4. Steel Bearing Plates Positive for LBP.



Photo 5. Northeast Side View of Bridge.



Photo 6. Bridge Tie-Rod Washers Positive for LBP.



Appendix E

EPA LBP Inspector 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, 2024

LBP-I-18721-2

Certification #

March 09, 2021

Issued On



Adrienne Priselac, Manager, Toxics Office

Land Division