



## LEAD-BASED PAINT INVESTIGATION REPORT

US 301/15 TRAIL BRIDGE OVER LAKE MARION  
CLARENDON & ORANGEBURG COUNTIES, SOUTH CAROLINA

### PREPARED FOR:

The logo for TRANSYSTEMS. The word 'TRANSYSTEMS' is in a bold, blue, sans-serif font. The letter 'A' is stylized with a blue triangle pointing upwards and to the right, integrated into the letter's structure.

C/O Mr. Peter Strub  
Sr. Vice President/Principal  
1859 Summerville Avenue, Suite 600  
Charleston, SC 29405

### PREPARED BY:

F&ME Consultants, Inc.  
211 Business Park Blvd.  
Columbia, South Carolina 29203

**August 18, 2023**

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

FME Project No.: G6744.000

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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. This investigation report is one of seven (7) completed for the project. The investigations included the existing north and southbound I-95 bridge structures, the former US 301/15 Trail Bridges, and the older remnants of the US 301 bridge. The below Bridge numbering system utilized for the investigations and referenced in this report reflects the numbering system developed by F&ME Consultants, Inc. (FME) field personnel during the field investigation and does not reflect any Bridge numbering system used by The South Carolina Department of Transportation (SCDOT). This report is specifically for the northbound US 301/15 Trail Bridge only. Refer to other reports prepared by FME for the other bridges.

F&ME Consultants, Inc. (FME) has completed a Lead-Based Paint (LBP) investigation the existing US 301/15 Trail Bridge (Bridge #6) over Lake Marion (Bridge) in Clarendon and Orangeburg Counties in South Carolina, at the request of Transystems (Client). The purpose of the investigation was to locate, identify and test components of seven (7) Bridges that are painted or coated with LBP. The field investigations were performed on July 19<sup>th</sup> through 21<sup>st</sup>, 2023, along with the potential for a complete demolition of the US 301/15 Trail Bridge over Lake Marion. Refer to Appendix A, Site Vicinity Map is provided to show the locations of the Bridges. Appendix B, General Bridge Plans, 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/cm<sup>2</sup>. 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/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. 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/cm<sup>2</sup> in the following Bridge components:

**Bridge #6 (US 301/15 Trail Bridge over Lake Marion)**

- Green Steel Bridge Repair I-Beams
- Green Steel Bearing Plates
- Gray Steel Bridge Repair I-Beams

For more information regarding the specific descriptions and locations of the items that were scanned, refer to the Appendix C, Summary of XRF Data. Appendix E, Site Photos for locations and pictures of the materials with concentrations greater than or equal to ( $\geq$ ) 0.7 mg/cm<sup>2</sup>. 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



**Michael S. Mincey**

SC Lead Based Paint Inspector

EPA Certification No. LBP-I-1198708-2 (Exp. 2/21/25)



**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<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 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<sup>3</sup>) 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<sup>2</sup>. Due to the anticipated demolition of the Bridge structures, the SCDHEC lead disposal requirements were used as a threshold.

## 3 INTRODUCTION

The US 15/ 301 Trail Bridge over Lake Marion (Bridge #6) (~4,500.0' L x 31.0' W, inside curb to inside curb) were each two (2) lane, concrete and steel bridge structures with poured-in-place concrete bridge decking and concrete curbing with metal scuppers, with an asphalt overlay. The Bridges are constructed with a combination of poured-in-place (PIP) concrete beams, pre-cast prestressed beams, structural steel girders, steel diaphragms and crossbracing. The bentcaps were PIP concrete with PIP concrete piers. Multiple structural repairs to stabilize and to provide new supports for the concrete beams were noted along the underside of both of these Bridges, along with railing repairs

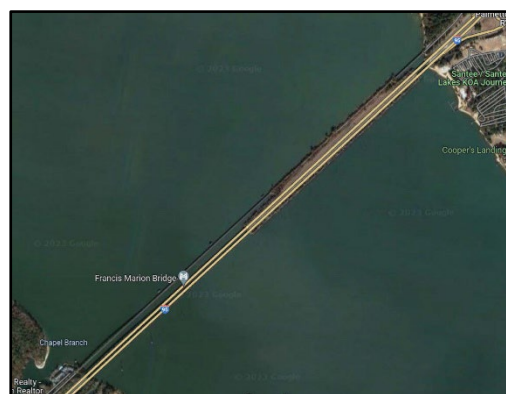


Photo 1: I-95 over Lake Marion Bridge Replacements in Clarendon & Orangeburg Counties, South Carolina.

on each side of the Bridge. The repairs consisted of steel I-Beams supporting multiple horizontal PIP concrete beams at the tops of several PIP concrete bent caps., with multiple steel bearing plates inserted at the location of each repair to stabilize and level the bridge supports. Refer to Appendix A, Site Vicinity Map, for the location of the Bridge. Appendix B, General Bridge Plan, for the scan locations associated with this 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/cm<sup>2</sup>:

### **Bridge #6 (US 301/15 Trail Bridge over Lake Marion)**

- Green Steel Bridge Repair I-Beams
- Green Steel Bearing Plates
- Gray Steel Bridge Repair I-Beams

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/cm<sup>2</sup>. Items in **Blue** text contain lead in concentrations that must be considered a potential for worker exposure by OSHA. Appendix D, Site Photos for locations and pictures of the materials with concentrations greater than or equal to ( $\geq$ ) 0.7 mg/cm<sup>2</sup>. 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 dates of the field investigations. 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/cm<sup>2</sup> in the following Bridge components:

## Bridge #6 (US 301/15 Trail Bridge over Lake Marion)

- Green Steel Bridge Repair I-Beams
- Green Steel Bearing Plates
- Gray Steel Bridge Repair I-Beams

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 Transystems on this project. If you have any questions regarding the information presented herein, please contact our office at (803) 254-4540.

## APPENDICES

Appendix A – Site Vicinity Map

Appendix B – General Bridge Plans

Appendix C – Summary of XRF Data Table

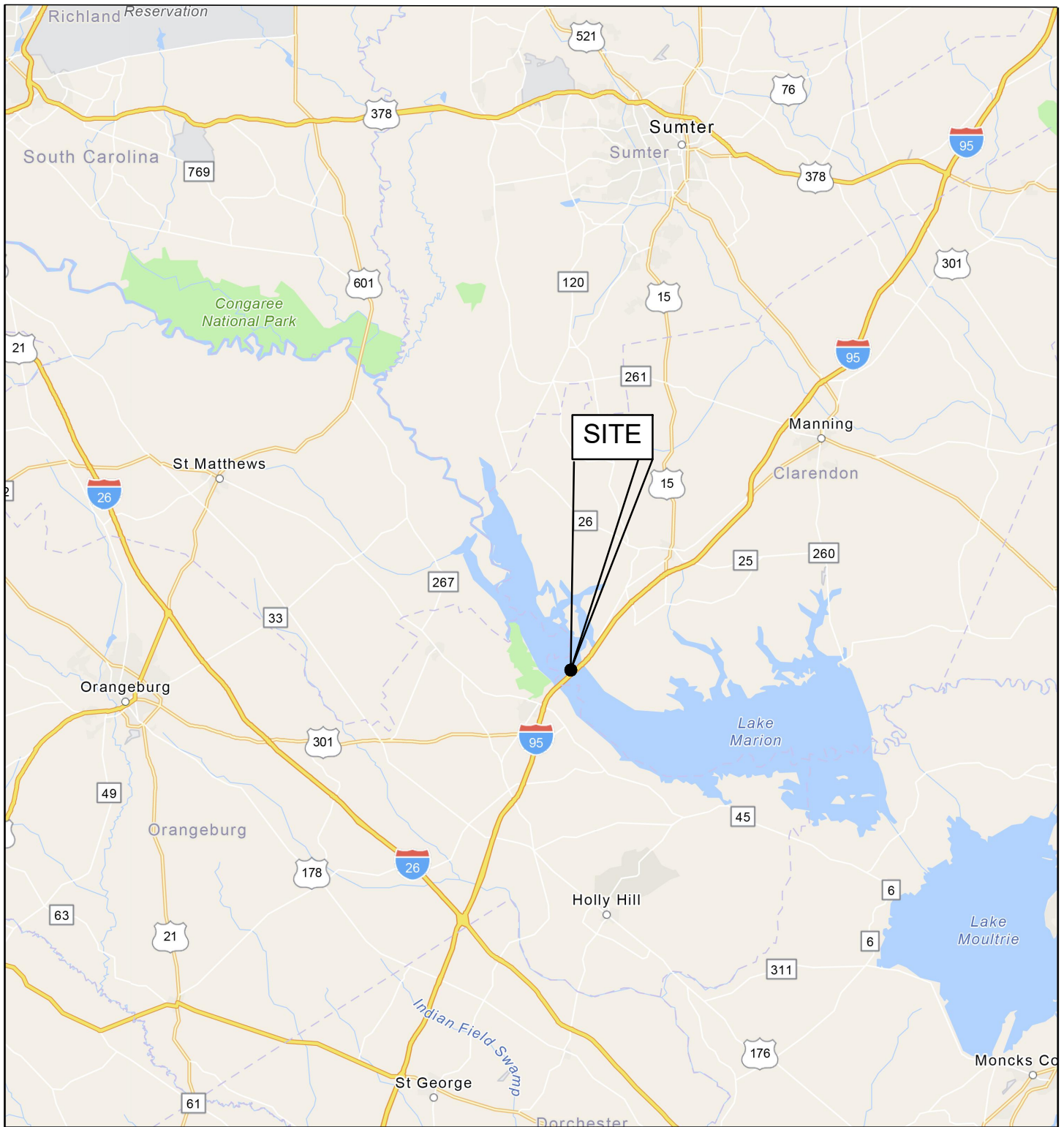
Appendix D – Site Photos

Appendix E – EPA LBP Inspector Certification



## Appendix A

### Site Vicinity Map



1:577,791

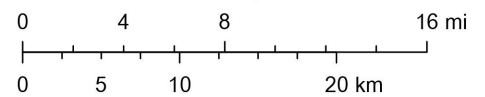


FIGURE  
NUMBER:

1

F&ME CONSULTANTS  
PROJECT NUMBER:

G6744.000

LEAD-BASED PAINT INVESTIGATION  
US 301/15 Trail Bridge over Lake Marion  
Clarendon & Orangeburg Counties, South Carolina

SITE VICINITY MAP

Prepared for:  
Transystems  
1859 Summerville Ave., Suite 600  
Charleston, SC 29405



211 BUSINESS PARK BLVD.  
COLUMBIA, SC 29203

ORIGINAL:  
August 11, 2023

REVISIONS:

1 \_\_\_\_\_  
2 \_\_\_\_\_  
3 \_\_\_\_\_

SCALE:  
Shown

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

NOTES:

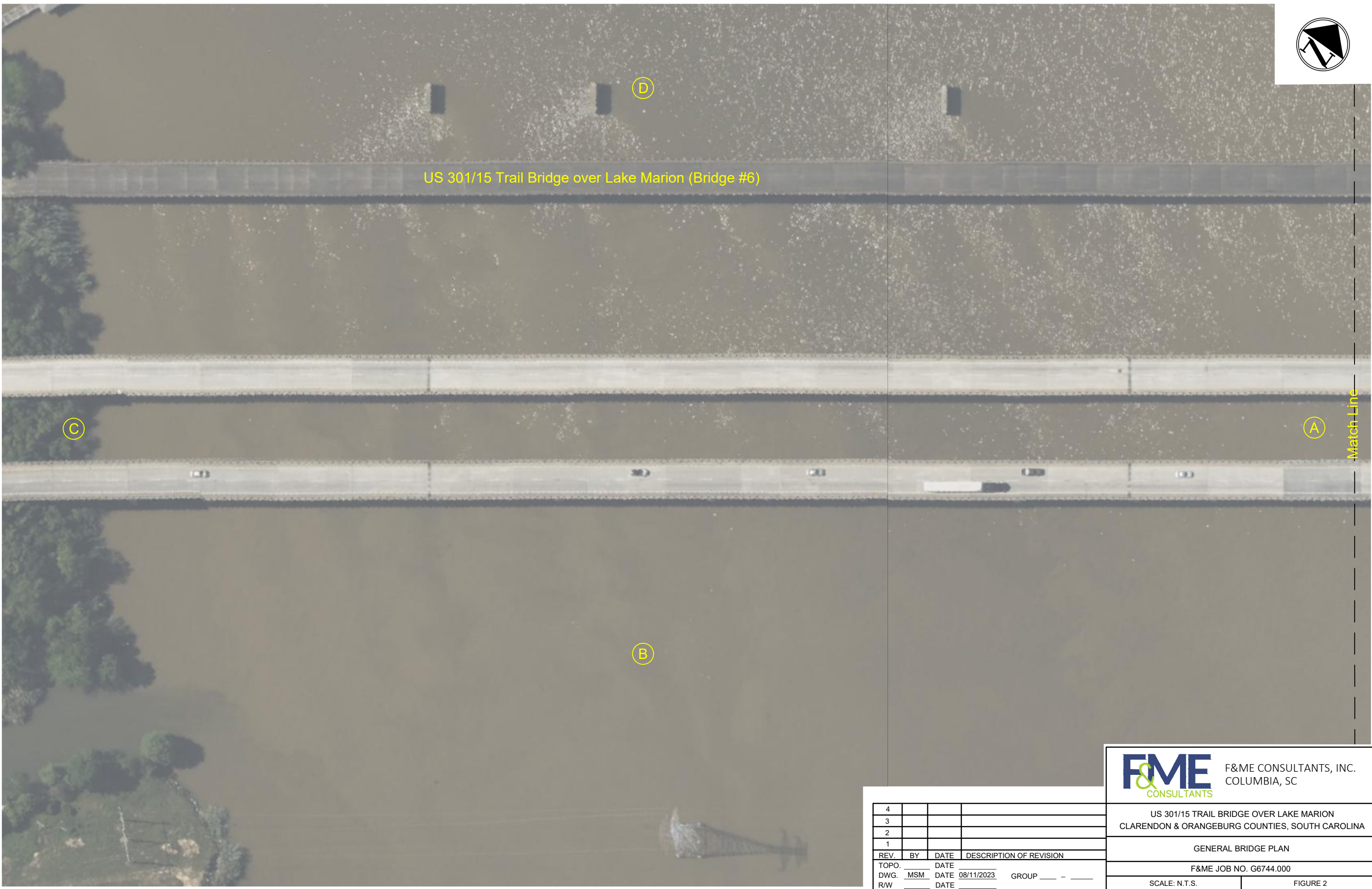
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## Appendix B

### General Bridge Plans



US 301/15 Trail Bridge over Lake Marion (Bridge #6)

Match Line



F&ME CONSULTANTS, INC.  
COLUMBIA, SC

US 301/15 TRAIL BRIDGE OVER LAKE MARION  
CLARENDON & ORANGEBURG COUNTIES, SOUTH CAROLINA

GENERAL BRIDGE PLAN

F&ME JOB NO. G6744.000

SCALE: N.T.S.

FIGURE 2

4			
3			
2			
1			
REV.	BY	DATE	DESCRIPTION OF REVISION
TOPO.		DATE	
DWG.	MSM	DATE 08/11/2023	GROUP ____ - ____
R/W		DATE	






US 301/15 Trail Bridge over Lake Marion (Bridge #6)

Match Line

Match Line



F&ME CONSULTANTS, INC.  
COLUMBIA, SC

US 301/15 TRAIL BRIDGE OVER LAKE MARION  
CLARENDON & ORANGEBURG COUNTIES, SOUTH CAROLINA

GENERAL BRIDGE PLAN

F&ME JOB NO. G6744.000

SCALE: N.T.S.

FIGURE 3

4			
3			
2			
1			
REV.	BY	DATE	DESCRIPTION OF REVISION
TOPO.		DATE	
DWG.	MSM	DATE 08/11/2023	GROUP ____ - ____
R/W		DATE	





US 301/15 Trail Bridge over Lake Marion (Bridge #6)

Match Line

Match Line

F

&

M

E

CONSULTANTS

F&ME CONSULTANTS, INC.  
COLUMBIA, SC

US 301/15 TRAIL BRIDGE OVER LAKE MARION  
CLARENDON & ORANGEBURG COUNTIES, SOUTH CAROLINA

GENERAL BRIDGE PLAN

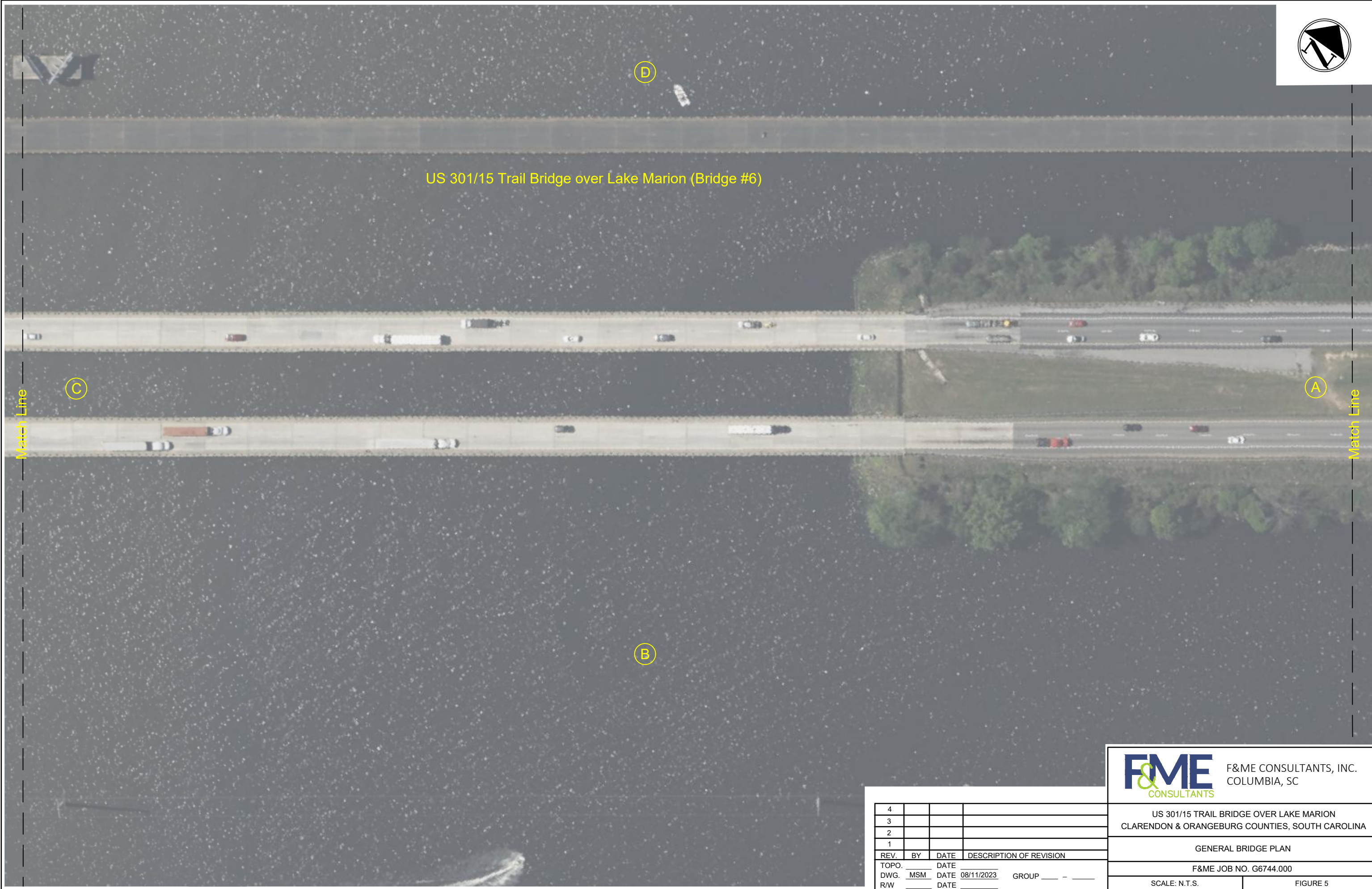
F&ME JOB NO. G6744.000

SCALE: N.T.S.

FIGURE 4

4			
3			
2			
1			
REV.	BY	DATE	DESCRIPTION OF REVISION
TOPO.		DATE	
DWG.	MSM	DATE 08/11/2023	GROUP ____ - ____
R/W		DATE	





US 301/15 Trail Bridge over Lake Marion (Bridge #6)

Match Line

Match Line



F&ME CONSULTANTS, INC.  
COLUMBIA, SC

US 301/15 TRAIL BRIDGE OVER LAKE MARION  
CLARENDON & ORANGEBURG COUNTIES, SOUTH CAROLINA

GENERAL BRIDGE PLAN

F&ME JOB NO. G6744.000

SCALE: N.T.S.

FIGURE 5

4			
3			
2			
1			
REV.	BY	DATE	DESCRIPTION OF REVISION
TOPO.		DATE	
DWG.	MSM	DATE 08/11/2023	GROUP ____ - ____
R/W		DATE	





US 301/15 Trail Bridge over Lake Marion

D

B

Match Line

C

Match Line

A



F&ME CONSULTANTS, INC.  
COLUMBIA, SC

US 301/15 TRAIL BRIDGE OVER LAKE MARION  
CLARENDON & ORANGEBURG COUNTIES, SOUTH CAROLINA

GENERAL BRIDGE PLAN

F&ME JOB NO. G6744.000

SCALE: N.T.S.

FIGURE 6

4			
3			
2			
1			
REV.	BY	DATE	DESCRIPTION OF REVISION
TOPO.		DATE	
DWG.	MSM	DATE 08/11/2023	GROUP ____ - ____
R/W		DATE	



## Appendix C

### Summary of XRF Data Table

Appendix C – XRF Data  
Date Scanned: 07/19 - 21/2023  
US 301/15 Trail Bridge over Lake Marion

Scan No.	Pbc (mg/cm <sup>2</sup> )	Component	Substrate	Side	Condition	Color
Bridge #6 (US 301/15 Trail Bridge over Lake Marion)						
1	0.87	Calibrate				
2	0.92	Calibrate				
3	0.92	Calibrate				
4	29.09	Repair I-Beam	Metal	B	Poor	Green
5	<LOD	Handrail	Metal	B	Intact	White
6	0.18	Handrail Plate	Metal	B	Intact	White
7	0.20	Handrail Plate	Metal	D	Intact	White
8	0.26	Handrail	Metal	D	Intact	White
9	6.52	Bearing Plate	Metal	B	Poor	Green
10	28.8	Repair I-Beam	Metal	B	Poor	Gray
11	38.0	Repair I-Beam	Metal	B	Poor	Green
12	0.18	Handrail Plate	Metal	B	Intact	White
13	<LOD	Handrail	Metal	B	Intact	White
14	0.11	Girder	Metal	B	Poor	Gray
15	0.34	Curb Support	Metal	B	Poor	Gray
16	0.12	Girder	Metal	B	Poor	Gray
17	0.19	Girder	Metal	B	Poor	Gray
18	0.21	Bracing	Metal	B	Poor	Gray
19	<LOD	Bearing Plate	Metal	B	Poor	Gray
20	0.17	Rocker Bearing Top Plate	Metal	B	Poor	Gray
21	<LOD	Bracing Plate	Metal	B	Poor	Gray
22	<LOD	Cross Bracing	Metal	B	Poor	Gray
23	0.49	Diaphragm	Metal	B	Poor	Gray
24	0.17	Bracing Support	Metal	B	Poor	Gray
25	0.29	Scupper	Metal	B	Poor	Gray
26	0.59	Scupper	Metal	B	Poor	Gray
27	0.41	Girder	Metal	B	Poor	Gray
28	<LOD	Girder	Metal	Center	Poor	Gray
29	0.13	Girder	Metal	Center	Poor	Gray
30	0.26	Bracing Plate	Metal	Center	Poor	Gray
31	0.11	Rocker Bearing Top Plate	Metal	B	Poor	Gray
32	0.42	Bracing	Metal	B	Poor	Gray
33	0.90	Bearing Plate	Metal	B	Poor	Gray
34	0.13	Girder	Metal	B	Poor	Gray

Appendix C – XRF Data  
Date Scanned: 07/19 - 21/2023  
US 301/15 Trail Bridge over Lake Marion

Scan No.	Pbc (mg/cm <sup>2</sup> )	Component	Substrate	Side	Condition	Color
35	0.26	Cross Bracing	Metal	B	Poor	Gray
36	0.11	Diaphragm	Metal	B	Poor	Gray
37	0.15	Bracing Support	Metal	B	Poor	Gray
38	0.23	Curb Support	Metal	B	Poor	Gray
39	0.85	Calibrate				
40	0.92	Calibrate				
41	1.01	Calibrate				

LOD (Limit of Detection) = 0.1 mg/cm<sup>2</sup>

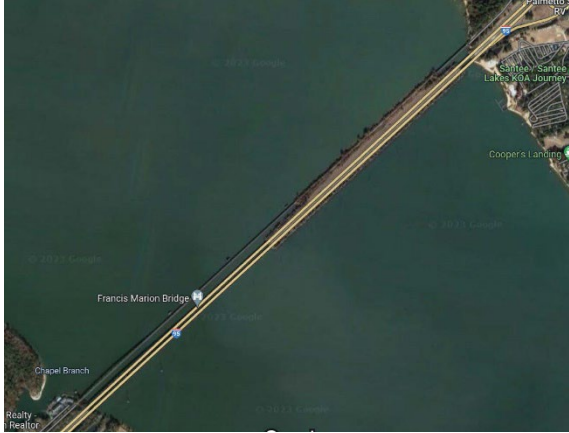
Blue text indicates any concentrations of LBP which OSHA considers a potential exposure risk when removed.

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

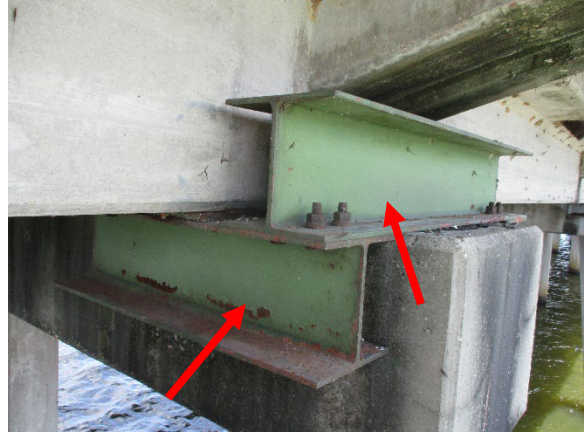
Side A = North, then go clockwise.

## Appendix D

### Site Photos



**Photo 1.** Top View of Bridges.



**Photo 2.** LBP on Green Repair I-Beams Associated with Bridge #6.



**Photo 3.** LBP on Gray Repair I Beam and Top Bearing Plate.



**Photo 4.** LBP on Gray Bearing Plate under Rocker Bearing on South End of Bridge #6.



**Photo 5.** Top Side View of Bridge Deck.



**Photo 6.** Underside View of Bridge #6.



## Appendix E

### EPA LBP Inspector Certification



# United States Environmental Protection Agency

This is to certify that



Michael S Mincey

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 February 21, 2025

LBP-I-1198708-2

Certification #

January 05, 2022

Issued On



A handwritten signature in black ink, appearing to read "Adrienne Priselac".

Adrienne Priselac, Manager, Toxics Office

Land Division