ASBESTOS & LEAD-BASED PAINT ASSESSMENT REPORT U.S. HIGHWAY 701 BRIDGE REPLACEMENT PROJECT HORRY and GEORGETOWN COUNTIES, SOUTH CAROLINA

S&ME Project No. 1611-13-009

Prepared for:
South Carolina Department of Transportation
955 Park Street
Columbia, South Carolina 29201

Assessment Performed by and Report Prepared by:

Heyward M. Key — Date 2/7/13
(SCDHEC Accreditation #BI00490)

	Yes, Asbestos Was Found	X	Yes, Lead Paint Was Found
X	No Asbestos Was Found		No, Lead Paint Was Found

S&ME

1330 Highway 501 Business
Conway, South Carolina 29528
(843) 347-7800

February 7, 2013

February 7, 2013

South Carolina Department of Transportation
955 Park Street
Columbia, South Carolina 29201

Attention: Mr. Michael Humphries, P.E.
Geotechnical Engineer

Reference: Asbestos and Lead-Based Paint Assessment Report
U.S. Highway 701 Bridge Replacement Project
SC File 22.124B
Horry and Georgetown Counties, South Carolina
S&ME Project No. 1611-13-009

Dear Mr. Humphries:

S&ME, Inc. (S&ME) is pleased to provide the enclosed report detailing our asbestos and lead-based paint assessment for three bridges scheduled to be replaced as part of the referenced project. Our services were performed in general accordance with the On-Call Basic Agreement for Geotechnical Services, between the SCDOT and S&ME, dated October 26, 2011. S&ME was provided with written authorization to proceed by Mr. Michael Humphries, P.E., with the SCDOT, on December 20, 2012. The report includes the executive summary, project background, assessment procedures, findings and results, and conclusions and recommendations regarding the structures as related to asbestos-containing materials and lead-based paint coatings.

This report is provided for the use of the South Carolina Department of Transportation and their assignees. Use of this report by any other parties will be at such party's sole risk and S&ME, Inc. disclaims liability for any such use or reliance by additional parties. The results presented in this report are indicative of conditions only during the time of the inspection and of the specific areas referenced.

We appreciate the opportunity to provide the South Carolina Department of Transportation with our industrial hygiene/environmental services, and we look forward to our continued association. If you have any questions concerning this report, please do not hesitate to call us at (843) 347-7800.

Sincerely,
S&ME, Inc.

Heyward M. Key
Environmental Professional
(SCDHEC Accreditation #BI00490)

Thomas Behnke, P.G., CHMM
Senior Reviewer

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EXECUTIVE SUMMARY

An asbestos and lead-based paint assessment was conducted on January 17, 2013, of three (3) bridges scheduled for replacement along U.S. Highway 701 in Horry and Georgetown Counties, South Carolina. The purpose of the assessment was to identify asbestos-containing materials (ACMs) and lead-based paint coatings associated with the structures prior to demolition actions.

The bridges cross the Pee Dee Overflow (northern most of the three), the Great Pee Dee River and Lake Yauhannah (southern most of the three). Please see the attached Site Vicinity Map (Appendix C, Figure 1) and Aerial Photographs (Appendix C, Figures 2, 3 and 4) for bridge locations.

The bridges are two-lane concrete structures with size descriptions as follows:

- The Lake Yauhannah Bridge is approximately 1,500-feet long and 24-feet wide.
- The Great Pee Dee River Bridge is approximately 1,500-feet long and 24-feet wide.
- The Pee Dee Overflow Bridge is approximately 1,300-feet long and 24-feet wide.

Asbestos

Suspect ACMs observed, sampled and analyzed as part of this assessment included reflector mastic, elastomeric bearing pad, and expansion joint from each bridge. Additionally, a suspect surface coating was observed on the metal girders located on a portion of the Great Pee Dee River bridge. The Environmental Protection Agency (EPA) and South Carolina Department of Health & Environmental Control (SCDHEC) define materials as asbestos-containing if an asbestos content greater than one percent (>1%) is detected in a representative sample. Of the representative materials sampled and analyzed, no asbestos in concentrations >1% was identified. A copy of this report should also be provided to the contractor(s) to assist with compliance with applicable State and Federal regulations.

Lead-Based Paint

The bridge components and associated asphalt pavements contained several visible suspect coatings including:

- Green over orange painted steel beams and associated brackets that span the Great Pee Dee River.
- Green Painted guard rails
- Silver painted guard rail bracket
- Yellow asphalt striping
- White asphalt striping

For the purpose of this assessment, painted surfaces exceeding the SCDHEC disposal limit of 0.7 mg/cm^2 are considered lead-based paint and are applicable to OSHA regulation. Based on the lead testing performed, lead concentrations applicable to SCDHEC and EPA disposal standards were identified on the yellow painted asphalt striping and the green painted beams and associated brackets on the Great Pee Dee River Bridge

There were also detectable levels of lead in the green painted guard rails and silver painted guard rail brackets. Disturbance of these materials are regulated by the OSHA regulation 29 CFR 1926.62 (Lead in Construction). XRF testing data and photos are included in Appendix D.

1.0 BACKGROUND

S&ME was contracted to perform an asbestos and lead-based paint assessment of three (3) bridges along U.S. Highway 701 in Horry and Georgetown Counties, South Carolina. The bridges are located along an approximately 1.7 mile span of U.S. Highway 701 that begins just north of the intersection of U.S. Highway 701 and Yauhannah Lake Drive. The work was requested and authorized by the South Carolina Department of Transportation (SCDOT), and was performed to facilitate demolition and replacement of the subject bridges.

The bridges cross the Pee Dee Overflow (northern most of the three), the Great Pee Dee River and Lake Yauhannah (southern most of the three). Please see the attached Site Vicinity Map (Appendix C, Figure 1) and Aerial Photographs (Appendix C, Figures 2, 3 and 4) for bridge locations.

The bridges are two-lane concrete structures with size descriptions as follows:

- The Lake Yauhannah Bridge is approximately 1,500-feet long and 24-feet wide.
- The Great Pee Dee River Bridge is approximately 1,500-feet long and 24-feet wide.
- The Pee Dee Overflow Bridge is approximately 1,300-feet long and 24-feet wide.

The identification of ACMs will aid in the prevention of occupational exposures and/or environmental releases of airborne asbestos during destructive activities. Identification of ACMs also complies with Title 40 Code of the Federal Regulations, part 61, and State regulation 61-86.1 enforced by the SCDHEC, along with Title 29 Code of Federal Regulations, part 1926 enforced by OSHA. The following report describes the assessment procedures used, results of the suspect ACMs sampled and analyzed, and conclusions and recommendations regarding the subject structures as related to ACMs.

The lead-based paint assessment was performed to identify existing lead-based paint finishes associated with the subject structures. The identification of these materials will aid in the prevention of occupational exposure (OSHA) and/or environmental releases of airborne lead dust in accordance with 29 CFR 1926.62 (Lead in Construction) and provide information to facilitate proper disposal of lead-based paint waste in accordance with the SCDHEC and EPA during destructive activities.

2.0 ASBESTOS ASSESSMENT

2.1 Assessment Procedures

The assessment was performed by observing and sampling suspect asbestos-containing materials. Significant destructive testing was not performed; therefore the possibility exists that additional suspect asbestos-containing materials may be present in inaccessible areas. If additional suspect materials are discovered during the planned demolition activities, destructive actions to the suspect ACM should not proceed until bulk samples are collected and analyzed for asbestos content.

A sampling strategy was developed to provide representative samples in accordance with OSHA, SCDHEC and EPA. Bulk samples were then extracted from suspect ACMs and recorded on a chain of custody record and submitted to CEI Labs in Cary, North Carolina for Polarized Light Microscopy (PLM) and confirmation of negative results for non-friable organically bound materials. CEI Labs is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP), which is administered by the National Institute of Standards and Technology.

Polarized Light Microscopy (PLM)
The suspect materials were analyzed by trained microscopists using PLM techniques coupled with dispersion staining in accordance with EPA Test Method Title 40 Code of Federal Regulations, Chapter I (1-1-87 edition), Part 763, Subpart F-APPENDIX A. This method identifies asbestos mineral fibers based on six optical characteristics: morphology, birefringence, refractive index, extinction angle, sign of elongation and dispersion staining colors. The laboratory analysis reports the specific type of asbestos identified (there are six asbestos minerals) and the percentage of asbestos present.

Transmission Electron Microscopy (TEM)
Suspect non-friable organically bound materials, exhibiting negative results via PLM analysis, were analyzed by trained microscopists by TEM using EPA 600 Method in accordance with ASTM E2356.

2.2 Findings and Results

The asbestos assessment performed on the three (3) bridges located along U.S. Highway 701 in Horry and Georgetown Counties, South Carolina, included the assessment and bulk sampling of suspect ACMs to include reflector mastic, elastomeric bearing pad, and

expansion joint from each bridge, as well as a surface coating located on the metal girder of the Great Pee Dee River Bridge. Of the bulk samples collected and analyzed from the subject bridges, no asbestos in concentrations >1% was detected. The EPA and SCDHEC define materials as asbestos-containing if an asbestos content >1% is detected in a representative sample.

In accordance with SCDHEC Regulation 61-86.1, TEM analysis was performed on one sample of each of the following non-friable, organically-bound (NOB) materials from each bridge that displayed a result of no asbestos detected via PLM analysis:

- Expansion joint
- Reflector mastic
- Elastomeric bearing pad
- Green/orange paint (Great Pee Dee River bridge only)

The TEM analysis confirmed that no asbestos is present at concentrations > 1% in the confirmation samples that were analyzed. No additional TEM analysis was warranted in this assessment.

A copy of the inspector's SCDHEC license is provided in Appendix A, and the laboratory analyses and chain-of-custody records are provided in Appendix B. A diagram exhibiting the bulk sample locations and photographs are provided in Appendix C.

The following table summarizes the sample number, location, type of material tested, approximate quantity of the material sampled, condition of the material, and corresponding result for each sample.

TABLE I: SUMMARY OF ASBESTOS BULK SAMPLE ANALYSIS

Polarized Light Microscopy								
Sample Number	**Location**	**Material**	**[2]Approx. Quantity**	**Asbestos Type**	**[1]Percent**	**Condition**	**Potential for Disturbance**	**Hazard Assessment**
Pee Dee Overflow Bridge								
B1-EJ1-01	Bridge Deck	Expansion Joint (black)	1,200 LF	ND	NA	NA	NA	NA
B1-EJ1-02	Bridge Deck			ND	NA	NA	NA	NA
[3]B1-EJ1-03	Bridge Deck			ND	NA	NA	NA	NA
B1-RM1-01	Center line of bridge deck	Reflector Mastic (black)	20 SF	ND	NA	NA	NA	NA
B1-RM1-02	Center line of bridge deck			ND	NA	NA	NA	NA
[3]B1-RM1-03	Center line of bridge deck			ND	NA	NA	NA	NA
B1-EP1-01	Between bridge girder and pier cap	Elastomeric Bearing Pad (black)	150 SF	ND	NA	NA	NA	NA
B1-EP1-02	Between bridge girder and pier cap			ND	NA	NA	NA	NA
[3]B1-EP1-03	Between bridge girder and pier cap			ND	NA	NA	NA	NA

TABLE 1 CONT.

Polarized Light Microscopy								
Sample Number	**Location**	**Material**	**[2]Approx. Quantity**	**Asbestos Type**	**[1]Percent**	**Condition**	**Potential for Disturbance**	**Hazard Assessment**
Great Pee Dee River Bridge								
B2-RM1-01	Center line of bridge deck	Reflector Mastic (black)	25 SF	ND	NA	NA	NA	NA
B2-RM1-02	Center line of bridge deck			ND	NA	NA	NA	NA
[3]B2-RM1-03	Center line of bridge deck			ND	NA	NA	NA	NA
B2-EJ1-01	Bridge Deck	Expansion Joint (black)	1,500 LF	ND	NA	NA	NA	NA
B2-EJ1-02	Bridge Deck			ND	NA	NA	NA	NA
[3]B2-EJ1-03	Bridge Deck			ND	NA	NA	NA	NA
B2-EP1-01	Between bridge girder and pier cap	Elastomeric Bearing Pad (black)	2,000 SF	ND	NA	NA	NA	NA
B2-EP1-02	Between bridge girder and pier cap			ND	NA	NA	NA	NA
[3]B2-EP1-03	Between bridge girder and pier cap			ND	NA	NA	NA	NA
B2-GC1-01	Metal Girders over river	Girder Coating (Green/Orange)	5,000 SF	ND	NA	NA	NA	NA
B2-GC1-02	Metal Girders over river			ND	NA	NA	NA	NA
B2-GC1-03	Metal Girders over river			ND	NA	NA	NA	NA
B2-GC1-04	Metal Girders over river			ND	NA	NA	NA	NA
B2-GC1-05	Metal Girders over river			ND	NA	NA	NA	NA
B2-GC1-06	Metal Girders over river			ND	NA	NA	NA	NA
[3]B2-GC1-07	Metal Girders over river			ND	NA	NA	NA	NA

TABLE 1 CONT.

Polarized Light Microscopy								
Sample Number	**Location**	**Material**	**[2]Approx. Quantity**	**Asbestos Type**	**[1]Percent**	**Condition**	**Potential for Disturbance**	**Hazard Assessment**
Lake Yauhannah Bridge								
B3-EJ1-01	Bridge Deck	Expansion Joint (black)	1,500 LF	ND	NA	NA	NA	NA
B3-EJ1-02	Bridge Deck			ND	NA	NA	NA	NA
[3]B3-EJ1-03	Bridge Deck			ND	NA	NA	NA	NA
B3-RM1-01	Center line of bridge deck	Reflector Mastic (black)	25 SF	ND	NA	NA	NA	NA
B3-RM1-02	Center line of bridge deck			ND	NA	NA	NA	NA
[3]B3-RM1-03	Center line of bridge deck			ND	NA	NA	NA	NA
B3-EP1-01	Between bridge girder and pier cap	Elastomeric Bearing Pad (black)	150 SF	ND	NA	NA	NA	NA
B3-EP1-02	Between bridge girder and pier cap			ND	NA	NA	NA	NA
[3]B3-EP1-03	Between bridge girder and pier cap			ND	NA	NA	NA	NA

ND = No Asbestos Detected NA = Not Applicable SF = square feet LF = linear feet

[1]The EPA, SCDHEC and OSHA defines a material as asbestos containing if an asbestos content greater than one percent (>1%) is detected in a representative sample.
[2]The quantities are estimated, and should not be used for bidding purposes, as field conditions should be verified.
[3]Samples analyzed by TEM to confirm negative results reported by PLM analysis.

2.3 Abbreviations and Hazard Assessment Key

In accordance with the EPA and SCDHEC, a confirmed ACM is assigned a hazard assessment based on its present condition and potential for disturbance. The hazard assessment is used as a tool for prioritization in remedial actions regarding the identified ACM(s). The following key exhibits the criteria that compose the hazard assessment. No asbestos in concentrations >1% were identified in the bulk samples collected and analyzed; therefore, this hazard assessment key is not applicable.

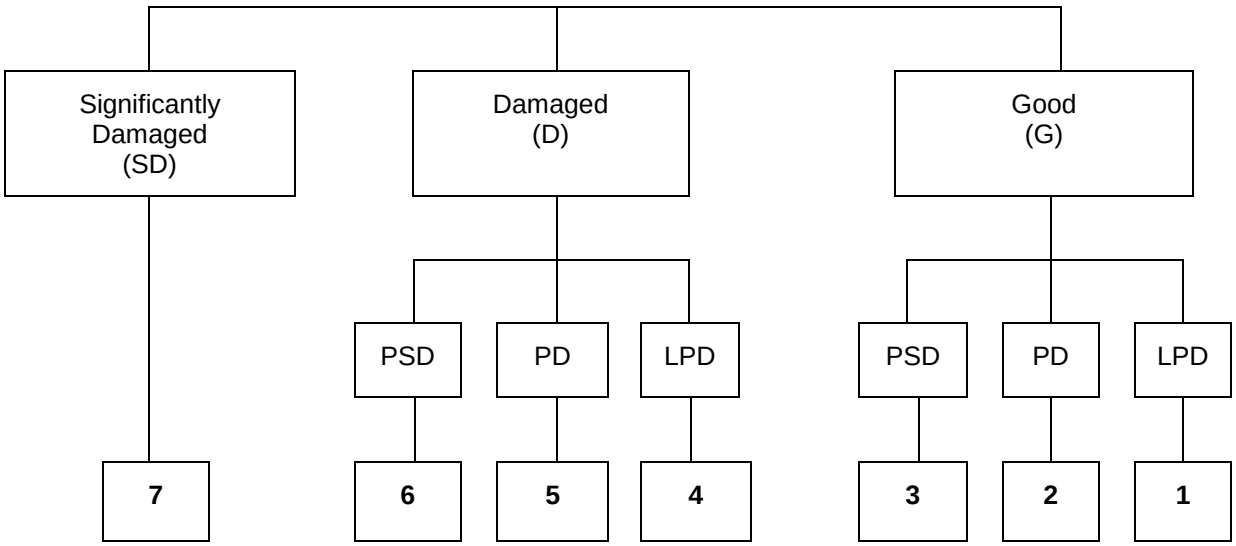
Present Condition

F = Friable
NF = Non-friable
G = Good (Very localized limited damage)
D = Damaged (Damage of less than 10% distributed and less than 25% localized)
SD = Significantly Damaged (Damage equal to or greater than 10% distributed, 25% localized)

Potential for Future Disturbance

LPD = Low Potential for Disturbance (Contact, Vibration, and Air Erosion all of Low Concern)
PD = Potential for Damage (Contact, Vibration, or Air Erosion of Moderate Concern)
PSD = Potential for Significant Damage (Contact, Vibration, or Air Erosion of High Concern)

Hazard Assessment



3.0 LEAD-BASED PAINT ASSESSMENT

3.1 Assessment Procedures

Lead content in a paint coating was measured with a Niton XL-300 X-Ray Fluorescence (XRF) spectrum analyzer (serial #U3826TR0578). Suspect painted finishes are selected based on the color of the topcoat and the underlying paint layers and/or the substrate on which it was applied. The possibility exists that lead-based paint finishes are present in inaccessible areas.

SCDHEC defines a lead-based paint as any paint containing lead at concentrations of 0.7 milligrams per square centimeter (0.7 mg/cm^2) or greater by XRF testing. For the purpose of this assessment, paint containing 0.7 mg/cm^2 or greater was considered a lead-based paint finish due to the planned destructive activities. Components painted with lead-based paint ($\geq$ 0.7 mg/cm^2) must be disposed in a permitted Class Two (C&D) or Class Three Subtitle D, Municipal Solid Waste (MSW) landfill.

OSHA does not recognize a threshold level of lead for definition purposes, only the presence or absence of lead. The current OSHA regulations recognize an airborne action level of thirty micrograms per cubic meter (30 $\mu g/m^3$) during an eight-hour day and a permissible exposure limit of fifty micrograms per cubic meter (50 $\mu g/m^3$).

3.2 Findings and Results

The bridge components and associated asphalt pavements contained several visible suspect coatings including:

- Green over orange painted steel beams and associated brackets that span the Great Pee Dee River.
- Green Painted guard rails
- Silver painted guard rail bracket
- Yellow asphalt striping
- White asphalt striping

For the purpose of this assessment, painted surfaces exceeding the SCDHEC disposal limit of 0.7 mg/cm^2 are considered lead-based paint and are applicable to OSHA regulation. Based on the lead testing performed, lead concentrations applicable to SCDHEC and EPA disposal standards were identified on the yellow painted asphalt striping and the green painted beams and associated brackets.

There were also detectable levels of lead in the green painted guard rails and silver painted guard rail brackets. Disturbance of these materials are regulated by the OSHA

regulation 29 CFR 1926.62 (Lead in Construction). XRF testing data and photos are included in Appendix D.

4.0 CONCLUSIONS AND RECOMMENDATIONS

The asbestos and lead-based paint assessment conducted of the three (3) bridges along U.S. Highway 701 in Horry and Georgetown Counties, South Carolina, did not identify asbestos in the bulk samples collected and analyzed; however, painted surfaces exceeding the SCDHEC disposal limit of 0.7 mg/cm^2 were detected. Additionally, painted components coated with lead containing paint applicable to OSHA regulation 29 CFR 1926.62 (Lead in Construction) were also detected.

Asbestos

The asbestos assessment of the referenced structures did not identify the presence of ACMs. If additional suspect materials are discovered during the planned demolition activities, bulk samples must be collected and analyzed for asbestos content prior to continuation of work. A copy of this report should be provided to the contractor(s) to assist with compliance with applicable State and Federal regulations, and to submit to SCDHEC with a demolition notification 10 days prior to demolition.

Lead-Based Paint

Destructive actions (sanding, burning, demolition, component removal, paint preparation) to the lead-containing paint surfaces will require the contractor comply with the standards of SCDHEC and OSHA, including but not limited to proper disposal, initial exposure monitoring, the use of personal protective equipment, and medical surveillance. If additional painted components are discovered during demolition activities, the paint should be tested prior to any destructive actions (sanding, burning, demolition, component removal, paint preparation) or disposal.

SCDHEC Regulation 61-107.19 permits demolition materials painted with lead-based paint (≥ 0.7 mg/cm^2) to be disposed in a permitted Class Two (C&D) or Class Three Subtitle D, Municipal Solid Waste (MSW) landfill. However, accumulations of paint waste (chips, dust, or flakes) from the identified areas of lead-based paint may be classified as hazardous waste, which requires disposal in a Subtitle C (hazardous waste) landfill. The hazardous waste regulations include Title 40 Code of Federal Regulations parts 260 through 272. A sample of accumulated paint waste should be collected for analysis via Toxicity Characteristic Leaching Procedure (TCLP) to determine the waste's lead content and hazardous waste characteristics.

APPENDIX A

COPY OF SCDHEC INSPECTOR LICENSES

SCDHEC ISSUED
Asbestos ID Card

Heyward M Key

Expires

CONSULTBI BI-00490 10/30/13

APPENDIX B

ASBESTOS BULK SAMPLE ANALYSIS SHEETS AND CHAIN OF CUSTODY RECORDS

ASBESTOS LABORATORY REPORT

Prepared for

S&ME

PROJECT: Hwy. 701 Bridge Replacement; 1611-13-009

CEI LAB CODE: A13-0612

DATE ANALYZED: 01/23/13

DATE REPORTED: 01/23/13

TOTAL SAMPLES ANALYZED: 25

 # SAMPLES >1% ASBESTOS:

TEL: 866-481-1412

www.ceilabs.com

Asbestos Report Summary

By: POLARIZING LIGHT MICROSCOPY

PROJECT: Hwy. 701 Bridge Replacement; 1611-13 -009 **CEI LAB CODE:** A13-0612

METHOD: EPA 600 / R93 / 116 and EPA 600 / M4-82 / 020

Client ID	Layer	Lab ID	Color	Sample Description	ASBESTOS %
B1-EJ1-01		A1403339	Black	Expansion Joint Tar	None Detected
B1-EJ1-02		A1403340	Black	Expansion Joint Tar	None Detected
B1-EJ1-03		A1403341		Sample Submitted for TEM Analysis	
B1-EP1-01		A1403342	Black	Elastameric Pad	None Detected
B1-EP1-02		A1403343	Black	Elastameric Pad	None Detected
B1-EP1-03		A1403344		Sample Submitted for TEM Analysis	
B1-RM1-01		A1403345	Black	Reflector Mastic	None Detected
B1-RM1-02		A1403346	Black	Reflector Mastic	None Detected
B1-RM1-03		A1403347		Sample Submitted for TEM Analysis	
B2-EJ1-01		A1403348	Black	Expansion Joint Tar	None Detected
B2-EJ1-02		A1403349	Black	Expansion Joint Tar	None Detected
B2-EJ1-03		A1403350		Sample Submitted for TEM Analysis	
B2-EP1-01		A1403351	Black	Elastameric Pad	None Detected
B2-EP1-02		A1403352	Black	Elastameric Pad	None Detected
B2-EP1-03		A1403353		Sample Submitted for TEM Analysis	
B2-RM1-01		A1403354	Black	Reflector Mastic	None Detected
B2-RM1-02		A1403355	Black	Reflector Mastic	None Detected
B2-RM1-03		A1403356		Sample Submitted for TEM Analysis	
B2-GC1-01		A1403357	Green,Orange	Gutter Coating	
B2-GC1-01		A1403357	Green,Orange	Gutter Coating	None Detected
B2-GC1-02		A1403358	Green,Orange	Gutter Coating	None Detected
B2-GC1-03		A1403359	Green,Orange	Gutter Coating	None Detected
B2-GC1-04		A1403360	Green,Orange	Gutter Coating	None Detected
B2-GC1-05		A1403361	Green,Orange	Gutter Coating	None Detected
B2-GC1-06		A1403362	Green,Orange	Gutter Coating	None Detected
B2-GC1-07		A1403363	Green,Orange	Gutter Coating	None Detected
B3-EJ1-01		A1403364	Black	Expansion Joint Tar	None Detected

Asbestos Report Summary

By: POLARIZING LIGHT MICROSCOPY

PROJECT: Hwy. 701 Bridge Replacement; 1611-13-009 **CEI LAB CODE:** A13-0612

METHOD: EPA 600 / R93 / 116 and EPA 600 / M4-82 / 020

Client ID	Layer	Lab ID	Color	Sample Description	ASBESTOS %
B3-EJ1-02		A1403365	Black	Expansion Joint Tar	None Detected
B3-EJ1-03		A1403366		Sample Submitted for TEM Analysis	
B3-EP1-01		A1403367	Black	Elastameric Pad	None Detected
B3-EP1-02		A1403368	Black	Elastameric Pad	None Detected
B3-EP1-03		A1403369		Sample Submitted for TEM Analysis	
B3-RM1-01		A1403370	Black	Reflector Mastic	None Detected
B3-RM1-02		A1403371	Black	Reflector Mastic	None Detected
B3-RM1-03		A1403372		Sample Submitted for TEM Analysis	

ASBESTOS BULK ANALYSIS

By: POLARIZING LIGHT MICROSCOPY

Client: S&ME
1330 Highway 501 Business
Conway, SC 29526

CEI Lab Code: A13-0612
Date Received: 01-18-13
Date Analyzed: 01-23-13
Date Reported: 01-23-13

Project: Hwy. 701 Bridge Replacement; 1611-13-009

ASBESTOS BULK PLM, EPA 600 METHOD

Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS Fibrous	Non-Fibrous		ASBESTOS %
B1-EJ1-01 A1403339	Expansion Joint Tar	Homogeneous Black Non-fibrous Bound		100%	Tar	**None Detected**
B1-EJ1-02 A1403340	Expansion Joint Tar	Homogeneous Black Non-fibrous Bound		100%	Tar	**None Detected**
B1-EJ1-03 A1403341	Sample Submitted for TEM Analysis					
B1-EP1-01 A1403342	Elastameric Pad	Homogeneous Black Non-fibrous Bound		100%	Rubber	**None Detected**
B1-EP1-02 A1403343	Elastameric Pad	Homogeneous Black Non-fibrous Bound		100%	Rubber	**None Detected**
B1-EP1-03 A1403344	Sample Submitted for TEM Analysis					
B1-RM1-01 A1403345	Reflector Mastic	Homogeneous Black Non-fibrous Bound		100%	Mastic	**None Detected**
B1-RM1-02 A1403346	Reflector Mastic	Homogeneous Black Non-fibrous Bound		100%	Mastic	**None Detected**
B1-RM1-03 A1403347	Sample Submitted for TEM Analysis					

ASBESTOS BULK ANALYSIS

By: POLARIZING LIGHT MICROSCOPY

Client: S&ME
1330 Highway 501 Business
Conway, SC 29526

CEI Lab Code: A13-0612
Date Received: 01-18-13
Date Analyzed: 01-23-13
Date Reported: 01-23-13

Project: Hwy. 701 Bridge Replacement; 1611-13-009

ASBESTOS BULK PLM, EPA 600 METHOD

Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS Fibrous	Non-Fibrous		ASBESTOS %
B2-EJ1-01 A1403348	Expansion Joint Tar	Homogeneous Black Non-fibrous Bound		100%	Tar	**None Detected**
B2-EJ1-02 A1403349	Expansion Joint Tar	Homogeneous Black Non-fibrous Bound		100%	Tar	**None Detected**
B2-EJ1-03 A1403350	Sample Submitted for TEM Analysis					
B2-EP1-01 A1403351	Elastameric Pad	Homogeneous Black Non-fibrous Bound		100%	Rubber	**None Detected**
B2-EP1-02 A1403352	Elastameric Pad	Homogeneous Black Non-fibrous Bound		100%	Rubber	**None Detected**
B2-EP1-03 A1403353	Sample Submitted for TEM Analysis					
B2-RM1-01 A1403354	Reflector Mastic	Homogeneous Black Non-fibrous Bound		100%	Mastic	**None Detected**
B2-RM1-02 A1403355	Reflector Mastic	Homogeneous Black Non-fibrous Bound		100%	Mastic	**None Detected**
B2-RM1-03 A1403356	Sample Submitted for TEM Analysis					

ASBESTOS BULK ANALYSIS

By: POLARIZING LIGHT MICROSCOPY

Client: S&ME
1330 Highway 501 Business
Conway, SC 29526

CEI Lab Code: A13-0612
Date Received: 01-18-13
Date Analyzed: 01-23-13
Date Reported: 01-23-13

Project: Hwy. 701 Bridge Replacement; 1611-13-009

ASBESTOS BULK PLM, EPA 600 METHOD

Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS Fibrous	Non-Fibrous		ASBESTOS %
B2-GC1-01 A1403357	Gutter Coating	Heterogeneous Green,Orange Non-fibrous Bound				
B2-GC1-01 A1403357	Gutter Coating	Heterogeneous Green,Orange Non-fibrous Bound		100%	Binder	**None Detected**
B2-GC1-02 A1403358	Gutter Coating	Heterogeneous Green,Orange Non-fibrous Bound		100%	Binder	**None Detected**
B2-GC1-03 A1403359	Gutter Coating	Heterogeneous Green,Orange Non-fibrous Bound		100%	Binder	**None Detected**
B2-GC1-04 A1403360	Gutter Coating	Heterogeneous Green,Orange Non-fibrous Bound		100%	Binder	**None Detected**
B2-GC1-05 A1403361	Gutter Coating	Heterogeneous Green,Orange Non-fibrous Bound		100%	Binder	**None Detected**
B2-GC1-06 A1403362	Gutter Coating	Heterogeneous Green,Orange Non-fibrous Bound		100%	Binder	**None Detected**
B2-GC1-07 A1403363	Gutter Coating	Heterogeneous Green,Orange Non-fibrous Bound		100%	Binder	**None Detected**

ASBESTOS BULK ANALYSIS

By: POLARIZING LIGHT MICROSCOPY

Client: S&ME
1330 Highway 501 Business
Conway, SC 29526

CEI Lab Code: A13-0612
Date Received: 01-18-13
Date Analyzed: 01-23-13
Date Reported: 01-23-13

Project: Hwy. 701 Bridge Replacement; 1611-13-009

ASBESTOS BULK PLM, EPA 600 METHOD

Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS Fibrous	Non-Fibrous		ASBESTOS %
B3-EJ1-01 A1403364	Expansion Joint Tar	Homogeneous Black Non-fibrous Bound		100%	Tar	**None Detected**
B3-EJ1-02 A1403365	Expansion Joint Tar	Homogeneous Black Non-fibrous Bound		100%	Tar	**None Detected**
B3-EJ1-03 A1403366	Sample Submitted for TEM Analysis					
B3-EP1-01 A1403367	Elastameric Pad	Homogeneous Black Non-fibrous Bound		100%	Rubber	**None Detected**
B3-EP1-02 A1403368	Elastameric Pad	Homogeneous Black Non-fibrous Bound		100%	Rubber	**None Detected**
B3-EP1-03 A1403369	Sample Submitted for TEM Analysis					
B3-RM1-01 A1403370	Reflector Mastic	Homogeneous Black Non-fibrous Bound		100%	Mastic	**None Detected**
B3-RM1-02 A1403371	Reflector Mastic	Homogeneous Black Non-fibrous Bound		100%	Mastic	**None Detected**
B3-RM1-03 A1403372	Sample Submitted for TEM Analysis					

LEGEND: Non-Anth = Non-Asbestiform Anthophylite
Non-Trem = Non-Asbestiform Tremolite
Calc Carb = Calcium Carbonate

METHOD: **EPA 600 / R93 / 116 and EPA 600 / M4-82 / 020**

The detection limit for the method is <1% by visual estimation and 0.25% by 400 point counts or 0.1% by 1,000 point counts.

Due to the limitations of the EPA 600 Method, nonfriable organically bound materials (NOBs) such as vinyl floor tiles can be difficult to analyze via polarizing light microscopy (PLM). EPA recommends that all NOBs analyzed by PLM, and found not to contain asbestos, be further analyzed by Transmission Electron Microscopy (TEM). Please note that PLM analysis of dust and soil samples for asbestos is not covered under NVLAP accreditation.

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ANALYST: Lynn Burkholder

Lynn Burkholder

APPROVED BY: Tianbao Bai

Tianbao Bai, Ph.D.
Laboratory Director

NVLAP Lab Code 101768-0

CEI LABS

107 New Edition Court, Cary, NC 27511
Tel: 866-481-1412; Fax: 919-481-1442

CHAIN OF CUSTODY

LAB USE ONLY:	
CEI Lab Code:	A13. 0612 (34)
CEI Lab I.D. Range:	A1403339. A1403372

COMPANY CONTACT INFORMATION	
Company: S.C. ME	Client #:
Address: 1330 Hwy. 501 Business	Job Contact: Dawn Schoolcraft
Conway, SC 29526	Email: dschoolcraft@esmeinc.com
	Tel: 843-347-7800
Project Name: Hwy. 701 Bridge Replacement	Fax: 843-347-7848
Project ID #: 1611-13-009	P.O. #:

ASBESTOS	METHOD	4 HR*	8 HR*	24 HR	2 DAY	3 DAY	5 DAY
PLM BULK	EPA 600	☐	☐	☐	☐	☐	☒
TEM BULK	CHATFIELD		☐	☐	☐	☐	☒
PLM POINT COUNT (400)	EPA 600	☐	☐	☐	☐	☐	☐
PLM POINT COUNT (1000)	EPA 600	☐	☐	☐	☐	☐	☐
PLM GRAVIMETRIC	EPA 600		☐	☐	☐	☐	☐
PLM GRAV w POINT COUNT	EPA 600		☐	☐	☐	☐	☐
OTHER:		☐	☐	☐	☐	☐	☐

POSITIVE STOP ANALYSIS	☒
SOUTH CAROLINA SAMPLES	☒

TEM INSTRUCTIONS	
BEGIN TEM ANALYSIS AFTER NEGATIVE PLM	☒
ANALYZE TEM SAMPLES SIMULTANEOUSLY WITH PLM	☐

REMARKS: If needed, combine samples from the same group to achieve sufficient weight for TEM analysis.

☒ Accept Samples
☐ Reject Samples

Relinquished By:	Date/Time	Received By:	Date/Time
Dawn Schlt	1/17/13 14:00	Kim Pitt	01/18/13 9:45 am

*Call to confirm RUSH analysis.

Samples will be disposed of 30 days after analysis

A13. 06 12

CEI LABS

SAMPLING FORM

COMPANY CONTACT INFORMATION	
Company: S.ME	Job Contact: D. Schoolcraft
Project Name: Hwy. 701 Bridge Replacement	
Project ID #: 1611-13-009	Tel: 843-347-7800

SAMPLE ID#	DESCRIPTION / LOCATION	TEST	
B1-EJ1-01	Expansion Joint Tar	PLM ☒	TEM ☐
-02	"	PLM ☒	TEM ☐
-03	"	PLM ☐	TEM ☒
B1-EP1-01	Elastomeric Pad	PLM ☒	TEM ☐
-02	"	PLM ☒	TEM ☐
-03	"	PLM ☐	TEM ☒
B1-RM1-01	Reflector Mastic	PLM ☒	TEM ☐
-02	"	PLM ☒	TEM ☐
-03	"	PLM ☐	TEM ☒
B2-EJ1-01	Expansion Joint Tar	PLM ☒	TEM ☐
-02	"	PLM ☒	TEM ☐
-03	"	PLM ☐	TEM ☒
B2-EP1-01	Elastomeric Pad	PLM ☒	TEM ☐
-02	"	PLM ☒	TEM ☐
-03	"	PLM ☐	TEM ☒
B2-RM1-01	Reflector Mastic	PLM ☒	TEM ☐
-02	"	PLM ☒	TEM ☐
-03	"	PLM ☐	TEM ☒
B2-GC1-01	Gunter Coating	PLM ☒	TEM ☐
-02	"	PLM ☒	TEM ☐
-03	"	PLM ☒	TEM ☐
-04	"	PLM ☒	TEM ☐
-05	"	PLM ☒	TEM ☐
-06	"	PLM ☒	TEM ☐
-07	"	PLM ☒	TEM ☐
~~B2~~ B3-EJ1-01	Expansion Joint Tar	PLM ☒	TEM ☐
-02	"	PLM ☒	TEM ☐
-03	"	PLM ☐	TEM ☒
		PLM ☐	TEM ☐
		PLM ☐	TEM ☐

A13.062

CEI LABS

SAMPLING FORM

COMPANY CONTACT INFORMATION	
Company: S&ME	Job Contact: D. Schoolcraft
Project Name: Hwy. 701 Bridge Replacement	
Project ID #: 1611-13-009	Tel: 843-347-7800

SAMPLE ID#	DESCRIPTION / LOCATION	TEST	
B3-EPI-01	Elastomeric Pad	PLM ☒	TEM ☐
-02	"	PLM ☒	TEM ☐
-03	"	PLM ☐	TEM ☒
B3-RMI-01	Reflector Mastic	PLM ☒	TEM ☐
-02	"	PLM ☒	TEM ☐
-03	"	PLM ☐	TEM ☒
		PLM ☐	TEM ☐
		PLM ☐	TEM ☐
		PLM ☐	TEM ☐
		PLM ☐	TEM ☐
		PLM ☐	TEM ☐
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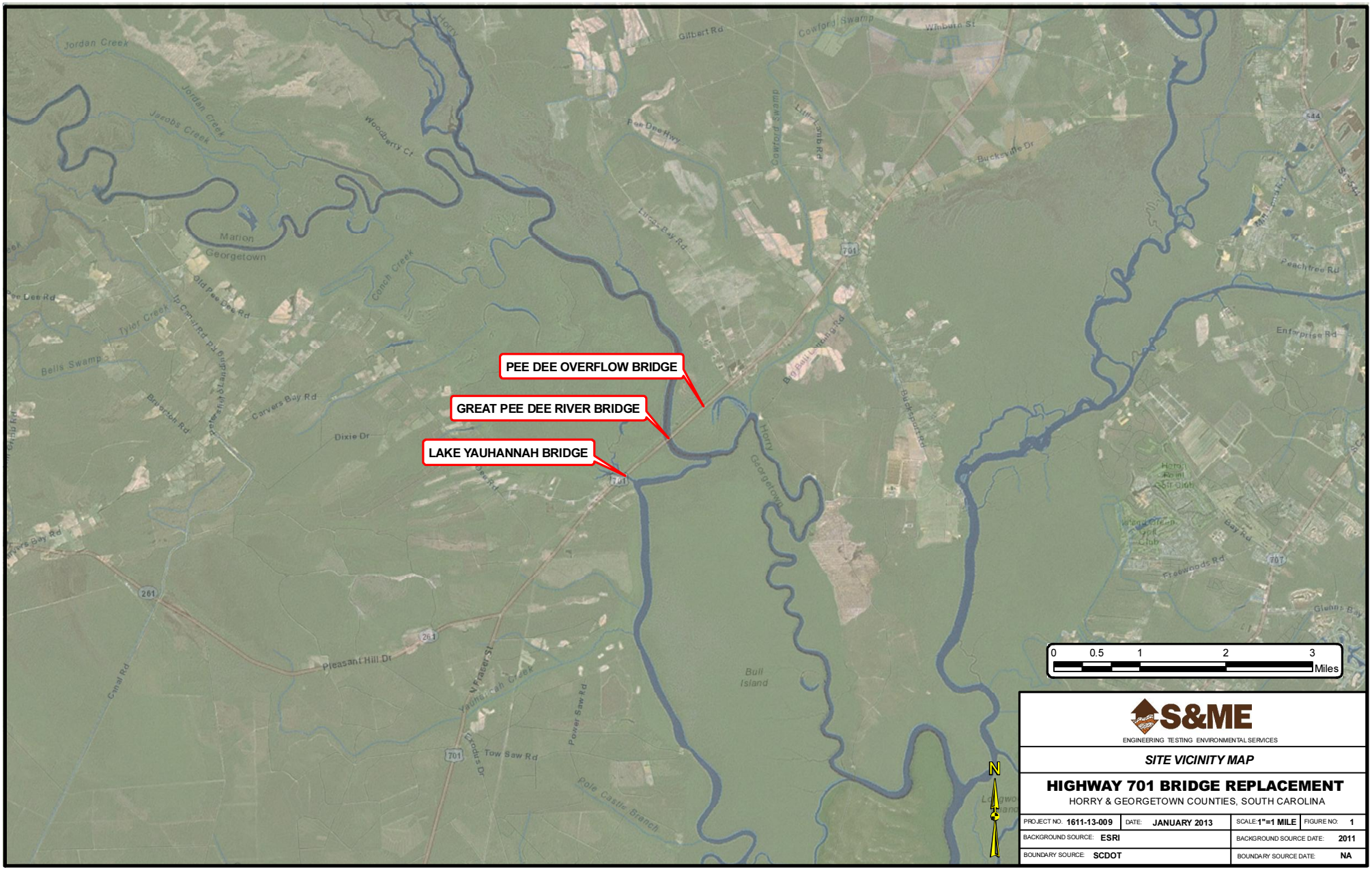
		PLM ☐	TEM ☐
		PLM ☐	TEM ☐

APPENDIX C

DIAGRAMS OF BULK SAMPLE LOCATIONS



S&ME
ENGINEERING TESTING ENVIRONMENTAL SERVICES

SITE VICINITY MAP

HIGHWAY 701 BRIDGE REPLACEMENT
HORRY & GEORGETOWN COUNTIES, SOUTH CAROLINA

PROJECT NO. 1611-13-009	DATE: JANUARY 2013	SCALE: 1"=1 MILE	FIGURE NO: 1
BACKGROUND SOURCE: ESRI		BACKGROUND SOURCE DATE: 2011	
BOUNDARY SOURCE: SCDOT		BOUNDARY SOURCE DATE: NA	

BRIDGE OVER LAKE YAUHANNAH

S&ME

ENGINEERING TESTING ENVIRONMENTAL SERVICES

AERIAL PHOTOGRAPH

HIGHWAY 701 BRIDGE REPLACEMENT

HORRY & GEORGETOWN COUNTIES, SOUTH CAROLINA

PROJECT NO. 1611-13-009	DATE: JANUARY 2013	SCALE: NTS	FIGURE NO: 2
BACKGROUND SOURCE: ESRI		BACKGROUND SOURCE DATE: 2011	
BOUNDARY SOURCE: SCDOT		BOUNDARY SOURCE DATE: NA	

BRIDGE OVER GREAT PEE DEE RIVER

S&ME

ENGINEERING TESTING ENVIRONMENTAL SERVICES

AERIAL PHOTOGRAPH

HIGHWAY 701 BRIDGE REPLACEMENT

HORRY & GEORGETOWN COUNTIES, SOUTH CAROLINA

PROJECT NO. 1611-13-009	DATE: JANUARY 2013	SCALE: NTS	FIGURE NO: 3
BACKGROUND SOURCE: ESRI		BACKGROUND SOURCE DATE: 2011	
BOUNDARY SOURCE: SCDOT		BOUNDARY SOURCE DATE: NA	

BRIDGE OVER PEE DEE OVERFLOW

S&ME

ENGINEERING TESTING ENVIRONMENTAL SERVICES

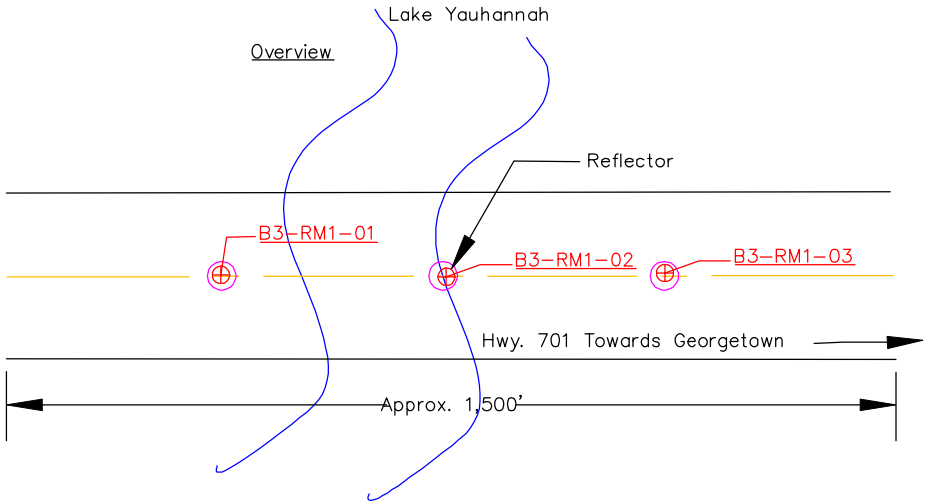
AERIAL PHOTOGRAPH

HIGHWAY 701 BRIDGE REPLACEMENT

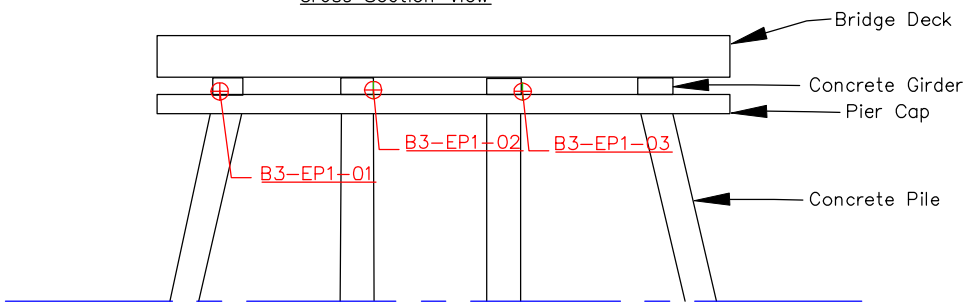
HORRY & GEORGETOWN COUNTIES, SOUTH CAROLINA

PROJECT NO. 1611-13-009	DATE: JANUARY 2013	SCALE: NTS	FIGURE NO: 4
BACKGROUND SOURCE: ESRI		BACKGROUND SOURCE DATE: 2011	
BOUNDARY SOURCE: SCDOT		BOUNDARY SOURCE DATE: NA	

Overview



Cross Section View



Photograph of Bridge Components (Topside)

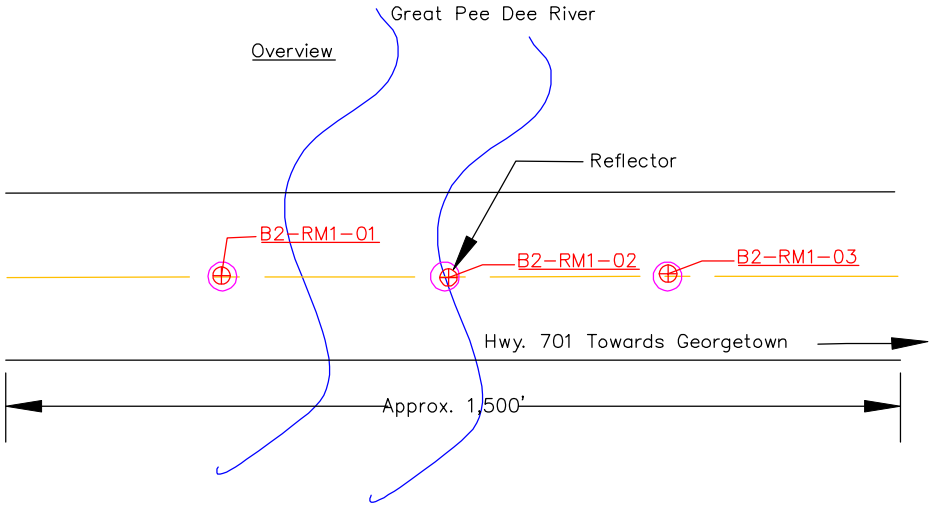
Photograph of Bridge Components (Underneath)

LEGEND

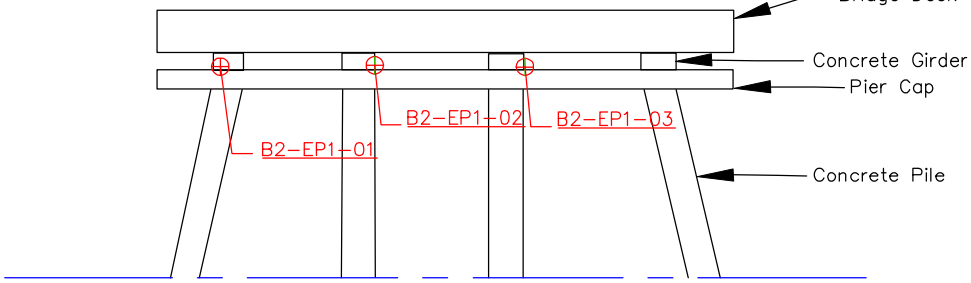
X-XX Bulk Sample Location

Scale: NTS Checked By: TB Source: N/A Source Date: January, 2013	S&ME	Asbestos Sample Location Plan Lake Yauhannah Bridge Georgetown County, South Carolina S&ME Job No. 1611-13-009	FIGURE NO 5

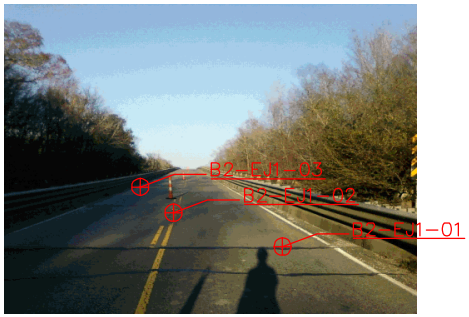
Overview



Cross Section View



Photograph of Bridge Components (Topside)

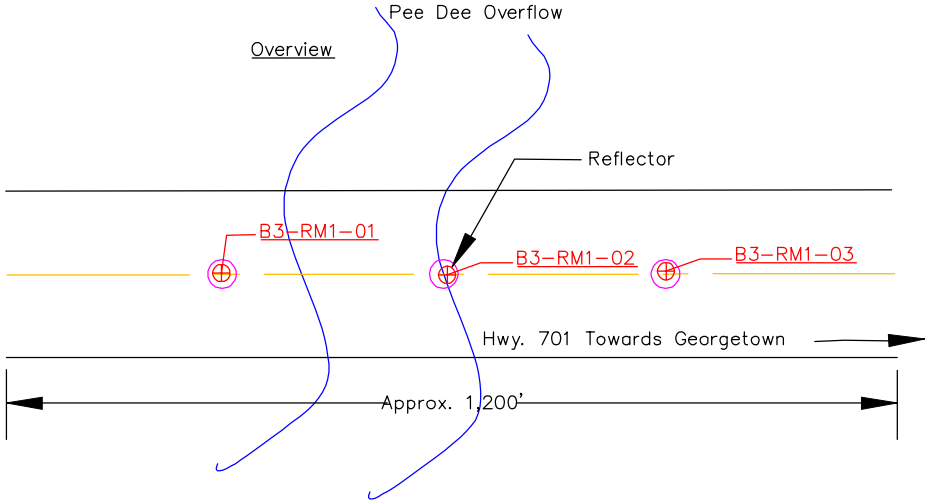


Photograph of Bridge Components (Underneath)

LEGEND

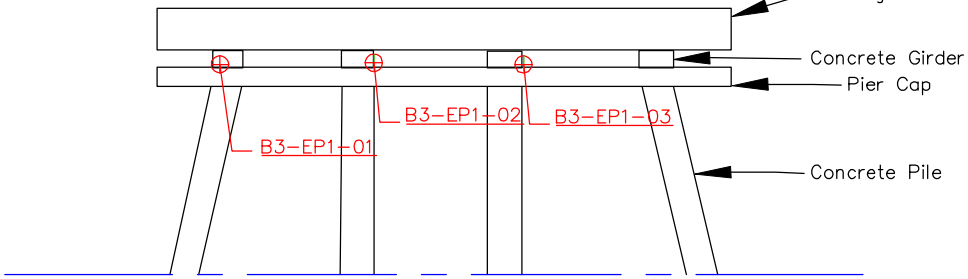
X-XX Bulk Sample Location

Scale: NTS	S&ME	Asbestos Sample Location Plan Great Pee Dee River Bridge Georgetown County, South Carolina S&ME Job No. 1611-13-009	FIGURE NO 6
Checked By: TB			
Source: N/A			
Source Date: January, 2013			



Photograph of Bridge Components (Topside)

Cross Section View



Photograph of Bridge Components (Underneath)

LEGEND

X-XX Bulk Sample Location

Scale: NTS Checked By: TB Source: N/A Source Date: January, 2013	S&ME	Asbestos Sample Location Plan Pee Dee Overflow Bridge Horry County, South Carolina S&ME Job No. 1611-13-009	FIGURE NO 7

APPENDIX D

SUMMARY OF XRF LEAD SPECTRUM ANALYZER READINGS

Serial #: XL300-U3826TR0578
PAINT
Project No.: 1611-13-009
Site: U.S. Highway 701 - near Yauhannah, SC
Date: January 16, 2013
Ranges (NEG<INC<POS): Device PCS

Reading Number	Bridge	Substrate	Feature	Color	Condition	Result	XRF Reading (mg/cm²)
1	Shutter Calibrate					...	NA
2	Calibrate					POS	1.38
3	Calibrate					POS	1.31
4	Calibrate					POS	1.34
5	Central	Metal	Support bent reinforcement frame	Gray	Fair	NEG	0
6	Central	Metal	Support bent reinforcement frame	Gray	Fair	NEG	0
7	Central	Metal	Support bent reinforcement frame	Gray	Fair	NEG	0
8	Central	Metal	Guard rail, bracket base	Silver	Poor	NEG	0.28
9	Central	Metal	Guard rail, railing	Green	Poor	NEG	0.69
10	**Central**	**Metal**	**Beam, support bracket to guard rail**	**Green**	**Fair**	**POS**	**21.77**
11	**Central**	**Metal**	**Beam**	**Green**	**Fair**	**POS**	**18.06**
12	**Central**	**Metal**	**Bracket side**	**Green**	**Fair**	**POS**	**26.83**
13	**Central**	**Metal**	**Beam, bottom**	**Green**	**Fair**	**POS**	**28.36**
14	**Central**	**Metal**	**Inner beam**	**Green**	**Fair**	**POS**	**5.1**
15	**Central**	**Metal**	**Inner beam**	**Green**	**Fair**	**POS**	**16.33**
16	**Central**	**Metal**	**Brace between beams**	**Green**	**Fair**	**POS**	**18.52**
17	**Central**	**Metal**	**Brace bracket**	**Green**	**Fair**	**POS**	**24.27**
18	Northern	Asphalt	Striping	White	Good	NEG	0
19	Northern	Asphalt	Striping	White	Good	NEG	0
20	**Central**	**Asphalt**	**Striping, under bridge**	**Yellow**	**Good**	**POS**	**1**
21	Post Calibrate					POS	1.43
22	Post Calibrate					POS	1.7
23	Post Calibrate					POS	1.46

1. Lead-based paint on support associated with a beam spanning the Great Pee Dee River.

2. Lead-based paint on support associated with a beam spanning the Great Pee Dee River.

3. Lead-based paint on a beam spanning the Great Pee Dee River.

4. Lead-based paint on a beam spanning the Great Pee Dee River.

S&ME	**Site Photographs – Lead-Based Paint Assessment** **Highway 701 Bridge Replacement**	S&ME Project No.: 1611-13-009
		Taken by: OA / Checked by: TB