



TENNESSEE DEPARTMENT OF TRANSPORTATION

ASBESTOS INSPECTION REPORT

I-440 From I-40 to I-24, Davidson County
PE-D Number 19014-1169-04
PIN Number 125325.00
Bridge ID Number 19I04400029



Prepared by:



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54 Lindsley Avenue
Nashville, Tennessee 37210

September 27, 2017

KSWA Project Number: 100-17-0050

James Dye
Tennessee Asbestos Inspector Accreditation A-I-99965-56894]

A handwritten signature in black ink that reads "James Dye". The signature is written in a cursive style and is positioned above a horizontal line.

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1.0 INTRODUCTION

This report presents the findings of an inspection for asbestos-containing materials (ACM) completed on the bridge identified in Section 1.1. The inspection was completed in accordance with the State of Tennessee, Department of Transportation Environmental Division, Hazardous Materials Section requirements.

1.1 TDOT BRIDGE IDENTIFICATION

The bridge is identified in the TDOT Project System/Bridge Management System as:

TDOT PE-D Number: 19014-1169-04
TDOT PIN Number: 125325.00
Bridge Inventory Number: 19I04400029
Termini: I-440 From I-40 to I-24
Log Mile Number: 4.36

1.2 GENERAL DESCRIPTION

The eastbound I-440 bridge over Craig Avenue at LM 4.36 (19-I0440-04.36R) is a 112-foot, 3-lane, single-span bridge constructed of pre-stressed concrete box beams with a concrete deck and wearing surface. The bridge was constructed in 1985. The K.S. Ware & Associates, LLC (KSWA) field crew encountered coatings during field survey and noted them on component descriptions where present. Additionally, the KSWA field crew observed PVC drains on the bridge beams. The general location of the bridge is shown in **Figure – 1**. Photographs of the subject Davidson County bridge are presented in **Appendix A**. The analytical results of all the samples collected from the bridge and the chain-of-custody records are included in **Appendix B**.

2.0 INSPECTION

The identification of ACM was performed by collecting bulk samples of suspect materials and having those samples analyzed by a laboratory. ACM are those materials found to contain greater than one percent asbestos by calibrated visual area estimation (CVAE) using Polarized Light Microscopy (PLM).

Bulk sampling is a procedure in which representative homogeneous sampling areas in a structure are identified and then sampled. A homogeneous sampling area is defined as an area that contains material of the same type (uniform in color and texture) and is applied during the same general time period. Once the homogeneous sampling areas are identified, bulk samples of suspect materials are obtained at the discretion of our inspectors, based on site conditions and past experience.

2.1 PERSONNEL AND DATE(S) OF INSPECTION

The sampling and field activities were performed on August 10, 2017 (underside of bridge) and September 14, 2017 (top of bridge) by KWSA representative Mr. James Dye. Mr. Dye is an accredited State of Tennessee Asbestos Inspector. A copy of Mr. Dye's current accreditation from the State of Tennessee is included in **Appendix C**. Field activities were conducted under a Health and Safety Plan (**Appendix D**) and an Activity Hazard Analysis (**Appendix E**) prepared prior to mobilizing to the site.

2.2 VISUAL SURVEY

The KSWA field crew began with a visual survey of the bridge. The visual survey consisted of:

- producing a sketch of the structure and/or verifying the plans provided;
- locating and identifying homogeneous areas of suspect materials that may contain asbestos minerals; and
- determining applicable sampling locations.

The homogeneous areas identified during the visual survey are listed in **Table – 1**. The general locations of the identified homogeneous areas are shown in **Figure – 2** and **Figure – 3**.

Table – 1: Bridge Component Descriptions

Homogeneous Area	Description	Sample Numbers
A	Concrete Abutments	CE-01, CE-02, CE-03
B	Concrete Beams	CE-04, CE-05, CE-06
C	Concrete Decking	CE-07, CE-08, CE-09
D	Inside Concrete Guardrails	CE-10, CE-11, CE-12
E	Inside Concrete Guardrail Coating	CE-13, CE-14, CE-15
F	Grey Joint Compound	CE-16, CE-17, CE-18
G	Black Asphaltic Patching	CE-19, CE-20, CE-21
H	White Joint Compound	CE-22, CE-23, CE-24
I	Black Joint Compound	CE-25, CE-26, CE-27
J	Outside Concrete Guardrails	CE-28, CE-29, CE-30

2.3 ACCESS TO BRIDGE COMPONENTS

Individual bridge components were accessed by the following methods.

2.3.1 Concrete Abutments – Homogeneous Area A

The concrete abutments were accessed and sampled from beneath the bridge.

2.3.2 Concrete Beams – Homogeneous Area B

The concrete beams were accessed and sampled from beneath the bridge.

2.3.3 Concrete Decking – Homogeneous Area C

The concrete decking was accessed and sampled from the top and shoulders of the bridge.

2.3.4 Inside Concrete Guardrails – Homogeneous Area D

The inside concrete guardrails were accessed and sampled from the top and shoulders of the bridge.

2.3.5 Inside Concrete Guardrail Coating – Homogeneous Area E

The inside concrete guardrail coating was accessed and sampled from the top and shoulders of the bridge.

2.3.6 Grey Joint Compound – Homogeneous Area F

The grey joint compound was accessed and sampled from the top and shoulders of the bridge.

2.3.7 Black Asphaltic Patching – Homogeneous Area G

The black asphaltic patching was accessed and sampled from the top and shoulders of the bridge.

2.3.8 White Joint Compound – Homogeneous Area H

The white joint compound was accessed and sampled from the top and shoulders of the bridge.

2.3.9 Black Joint Compound – Homogeneous Area I

The black joint compound was accessed and sampled from the top and shoulders of the bridge.

2.3.10 Outside Concrete Guardrails – Homogeneous Area J

The outside concrete guardrails were accessed and sampled from the top and shoulders of the bridge.

2.4 BRIDGE DRAINAGE SYSTEM

The KSWA field crew observed a bridge drainage system on the subject Davidson County bridge consisting of PVC drains within the beams. These drains do not appear to extend through the deck.

2.5 UTILITY CONDUITS

The KSWA field crew observed an electrical conduit attached to the western abutment. This conduit was apparently connected to nearby street lighting. The field crew assumed that the electrical conduit was live, and did not disturb it. The conduit was not obviously made of metal or plastic material, and would be a potentially suspect material that was not sampled during this survey.

3.0 ANALYTICAL PROCEDURES

3.1 ASBESTOS ANALYSIS PROCEDURES

The bulk samples collected from the subject bridge were analyzed in the laboratory using PLM coupled with dispersion staining. PLM is used as an analytical method to identify the specific asbestos minerals by their unique optical properties. The optical properties are a result of the chemical composition, physical atomic structure, and visual morphology specific to that mineral. PLM is the recommended method of analysis for asbestos identification in bulk samples specified in the Environmental Protection Agency Toxic Substances Control Act (appendix E, subpart E, 40 CFR part 763, section 1).

Materials that contain multiple layers or have associated mastic or adhesive backing are separated and analyzed as multiple samples. Standard procedure for samples that are reported to contain 1% or less asbestos minerals is to complete a quantitative point count analysis by the laboratory for confirmation.

3.2 LABORATORY NAME AND ACCREDITATION

The bulk samples collected for this inspection were analyzed by a laboratory that has received accreditation from the National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP). The name and accreditation number of the analytical laboratory that analyzed the samples for this inspection are indicated in **Table - 2**:

Table – 2: Analytical Laboratory

Laboratory	EMSL Analytical, Inc.
NVLAP Number	102104-0

4.0 REGULATORY OVERVIEW

4.1 NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS

The EPA's National Emission Standards for Hazardous Air Pollutants (NESHAP) regulations (40 CFR §61, Subpart M) require that all regulated asbestos-containing materials (RACM) be properly removed prior to any renovation or demolition activities that will disturb them. These regulations define RACM as:

- Friable ACM.
- Category I non-friable ACM that has become friable.
- Category I non-friable ACM that will be or has been subject to sanding, grinding, cutting, or abrading.
- Category II non-friable ACM that has a high probability of becoming, or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations.

4.1.1 Definitions

Significant definitions related to regulation of asbestos under NESHAP include:

Friable asbestos-containing material ACM is defined by the National Emissions Standard for Asbestos (subpart M, 40 CFR part 61) under NESHAP as “any material containing more than 1 percent asbestos as determined using the method specified in appendix E, subpart E, 40 CFR part 763, section 1, Polarizing Light Microscopy, that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure” (40 CFR §61.141).

Non-friable ACM is defined as “any materials containing more than 1 percent asbestos as determined using the method specified in appendix E, subpart E, 40 CFR part 763, section 1, Polarizing Light Microscopy, that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure” (40 CFR §61.141). The National Emission Standard for Asbestos (subpart M, 40 CFR part 61) also defines two categories of nonfriable ACM, Category I and Category II non-friable ACM, which are described as follows:

Category I non-friable ACM is defined as any “asbestos-containing packings, gaskets, resilient floor covering, and asphalt roofing products containing more than 1 percent asbestos as determined using the method specified in appendix E, subpart E, 40 CFR part 763, section 1, Polarizing Light Microscopy” (40 CFR §61.141).

Category II non-friable ACM is defined as “any material, excluding Category I nonfriable ACM, containing more than 1 percent asbestos as determined using the methods specified in appendix E, subpart E, 40 CFR part 763, section 1, Polarizing Light Microscopy, that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure” (40 CFR §61.141).

Regulated Asbestos-Containing Material (RACM) is defined as any “(a) Friable asbestos material, (b) Category I nonfriable ACM that has become friable, (c) Category I nonfriable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading, or (d) Category II nonfriable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations” (40 CFR §61.141).

Friable materials are defined as those that can be crumbled, pulverized, or reduced to powder by hand pressure when dry. The NESHAP regulations also establish specific notification and control requirements for renovation and demolition work.

5.0 RESULTS

The results of the asbestos inspection are presented in the following sections.

5.1 RESULTS OF ASBESTOS BULK SAMPLE ANALYSIS

The KSWA field crew collected thirty (30) samples from the eastbound I-440 bridge over Craig Avenue at LM 4.36. Multiple samples of each homogeneous area were collected in accordance with State of Tennessee, Department of Transportation Environmental Division, Hazardous Materials Section requirements and delivered to the laboratory for visual observation and microscopic analysis. The samples were selected based on the identified homogeneous areas of suspect materials, as described in Section 2.2. The coating on the inside concrete guardrails was submitted as a separate homogeneous area with three samples. The coating on the concrete abutments could not be sampled separately in the field, but the lab was able to separate the coating from the concrete and analyze each layer separately. Samples with multiple layers were analyzed separately from their respective homogeneous areas resulting in a total of thirty-two (32) analyzed samples.

Building material homogeneous areas sampled included: concrete abutments, concrete beams, concrete decking, inside concrete guardrails, inside concrete guardrail coating, grey joint compound, black asphaltic patching, white joint compound, black joint compound, and outside concrete guardrails.

No asbestos was found to be present in any of the materials sampled from the eastbound I-440 bridge over Craig Avenue at LM 4.36. Please note that the electrical conduit attached to the western abutment of the bridge was a potentially suspect material that could not be sampled during this survey due to safety concerns.

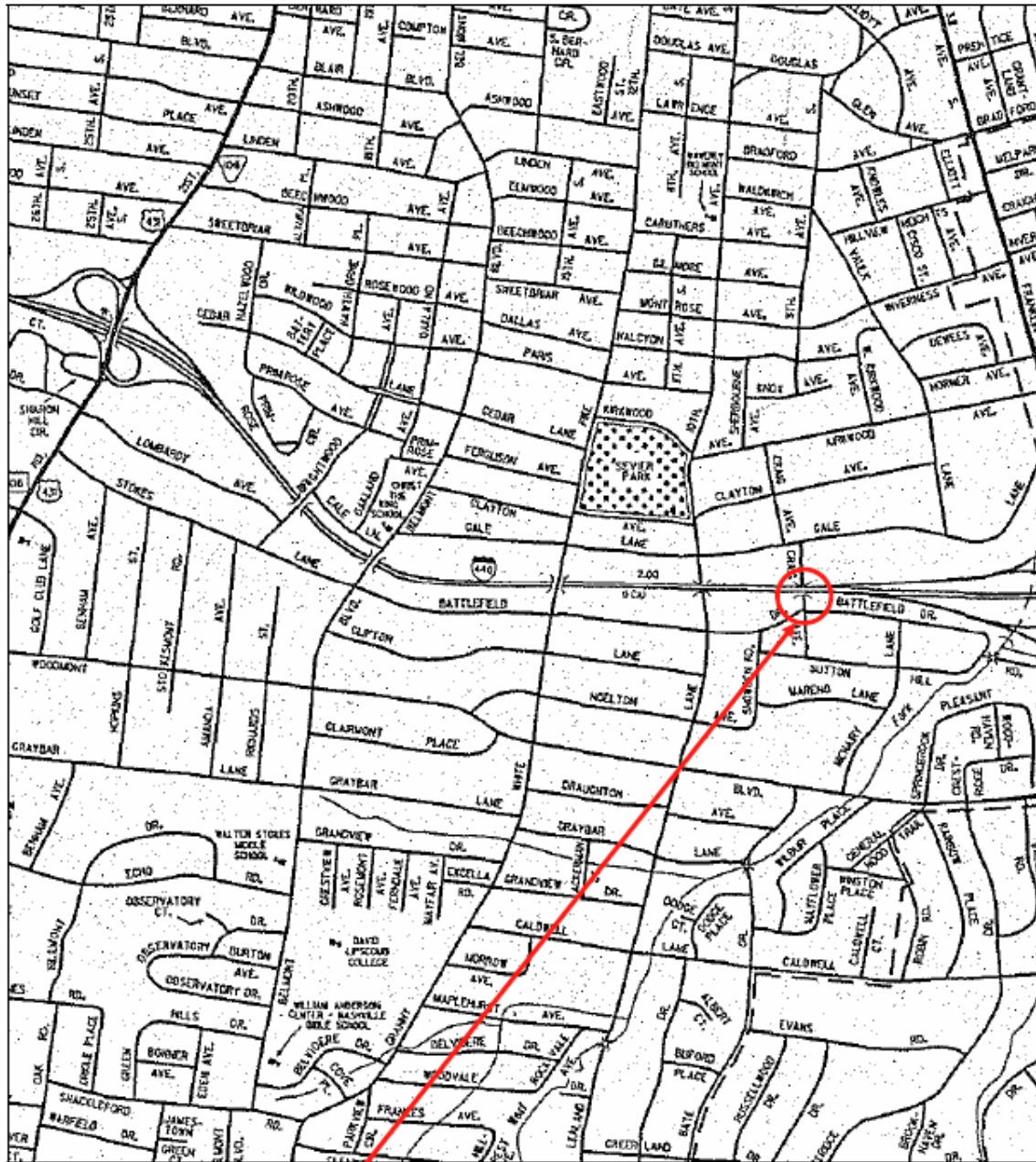
6.0 QUALIFICATIONS

The information presented herein is based on information obtained during the site visit and from previous experience. If additional information becomes available which might impact our conclusions or recommendations, K.S. Ware & Associates, L.L.C. requests the opportunity to review the information, reassess the potential concerns, and modify opinions, if warranted.

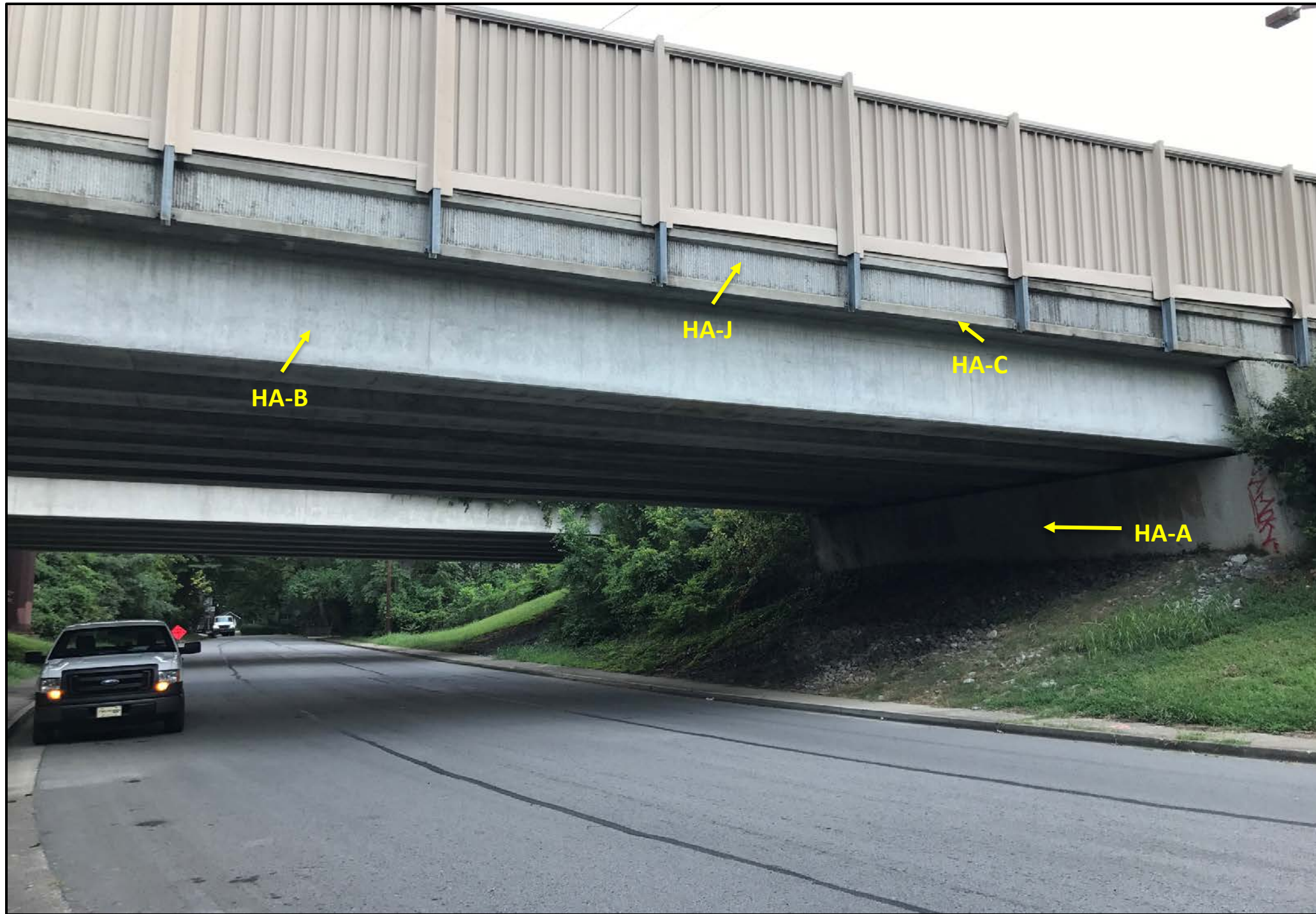
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Figure – 1: Site Vicinity Map Davidson County

DAVIDSON COUNTY



19I04400029
19-I0440-4.36 RT
I0440 RL/CRAIG AVE.



Homogeneous Areas:

- A - Concrete Abutments
- B - Concrete Beams
- C - Concrete Decking
- J - Outside Concrete Guardrails

*Homogeneous area locations are generalized and do not represent actual sample locations.

FIG. NO. 2



19I04400029 BRIDGE PROFILE HOMOGENEOUS AREAS (BOTTOM)

TERMINI:

I-440 From I-40 to I-24

COUNTY: Davidson

INSPECTOR: James Dye

ANALYTICAL LABORATORY: EMSL Kernersville, NC

DATES SAMPLED: 8/10/2017 and 9/14/2017

SCALE: NTS

TDOT CONSTRUCTION NO: 19014-1169-04

PIN: 125325.00

Source: FIELD PHOTOGRAPHS

KSWA PROJ.NO. 100-17-0050





Homogeneous Areas:

D - Inside Concrete Guardrail

E - Inside Concrete Guardrail Coating

F - Grey Joint Compound

G - Black Asphaltic Patching

H - White Joint Compound

I - Black Joint Compound

*Homogeneous area locations are generalized and do not represent actual sample locations.

FIG. NO. 3



19I04400029 BRIDGE PROFILE HOMOGENEOUS AREAS (TOP)

TERMINI:

I-440 From I-40 to I-24

COUNTY: Davidson

INSPECTOR: James Dye

ANALYTICAL LABORATORY: EMSL Kernersville, NC

DATES SAMPLED: 8/10/2017 and 9/14/2017

SCALE: NTS

TDOT CONSTRUCTION NO: 19014-1169-04

PIN: 125325.00

Source: FIELD PHOTOGRAPHS

KSWA PROJ.NO. 100-17-0050



APPENDIX A: PHOTOGRAPHS

Homogeneous areas that tested positive for asbestos are captioned in red.

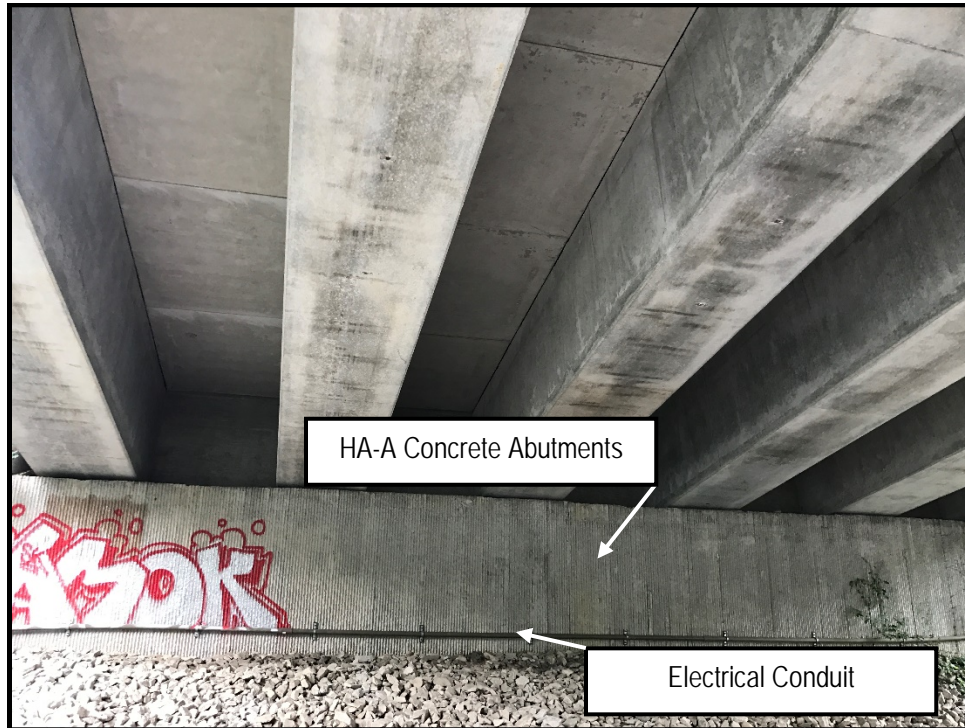


Photo 1: View of HA-A and electrical conduit on the eastbound I-440 bridge over Craig Avenue



Photo 2: View of HA-B on the eastbound I-440 bridge over Craig Avenue



Photo 3: View of HA-C on the eastbound I-440 bridge over Craig Avenue



Photo 4: View of HA-D on the eastbound I-440 bridge over Craig Avenue

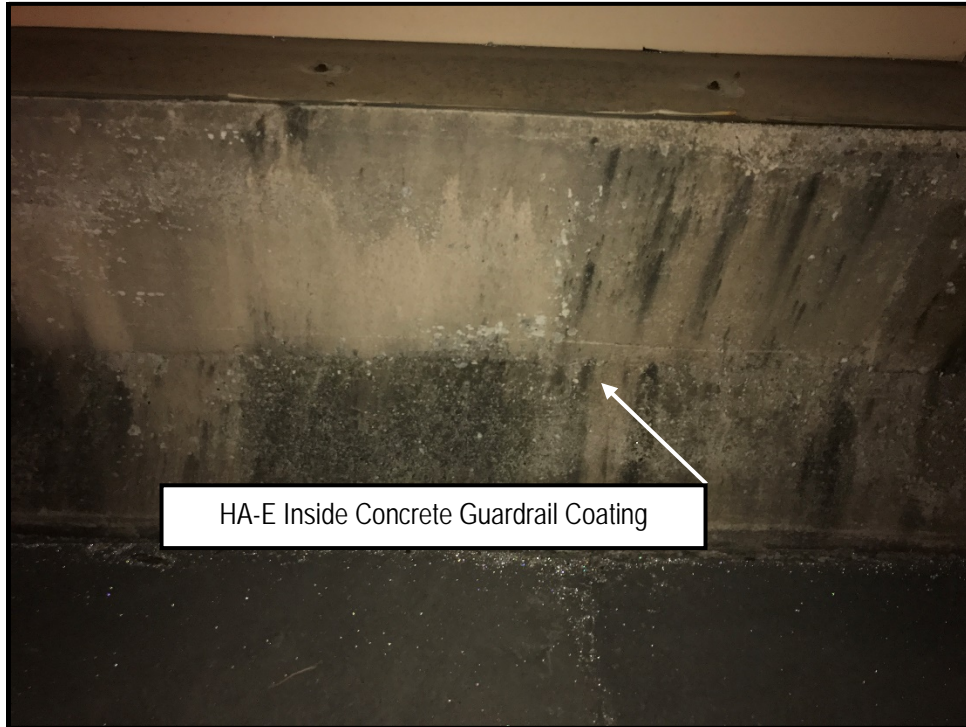


Photo 5: View of HA-E on the eastbound I-440 bridge over Craig Avenue



Photo 6: View of HA-F on the eastbound I-440 bridge over Craig Avenue

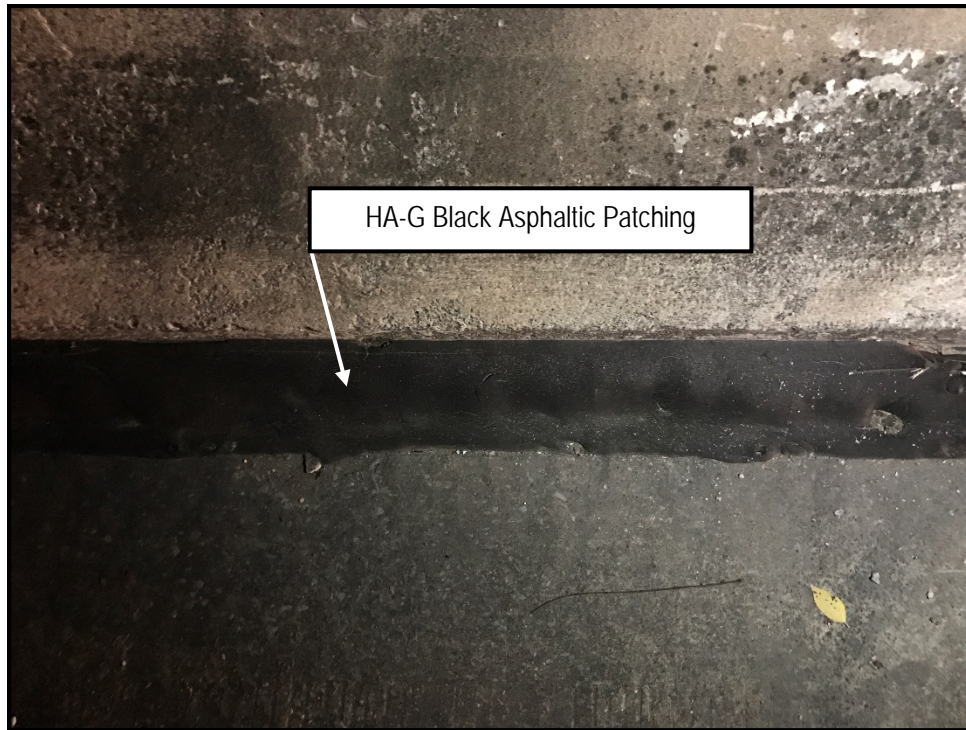


Photo 7: View of HA-G on the eastbound I-440 bridge over Craig Avenue

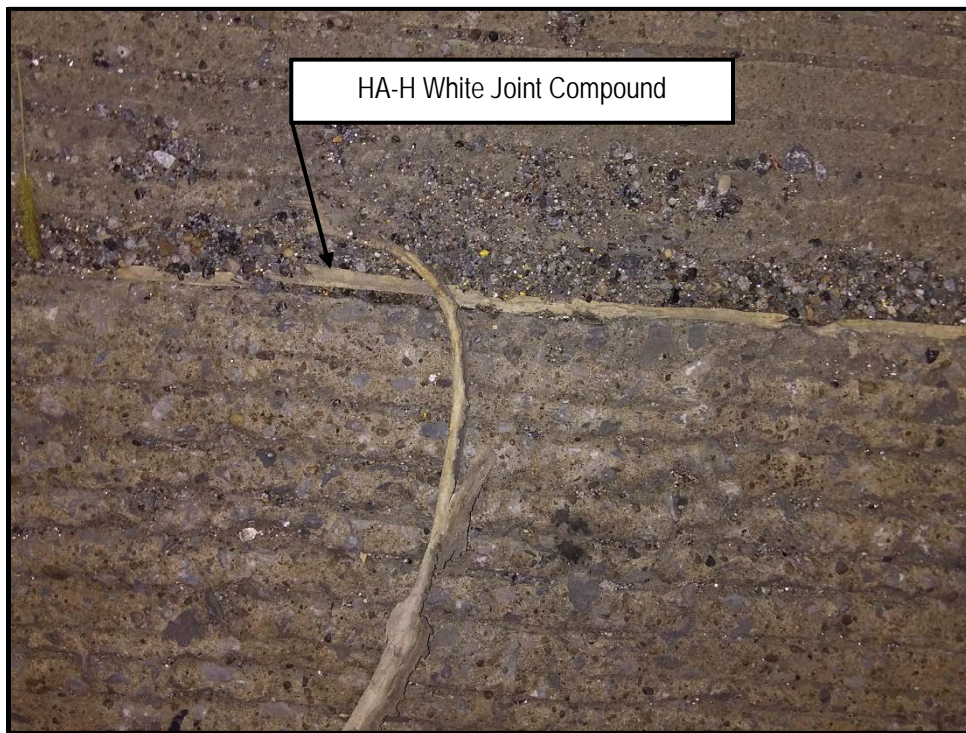
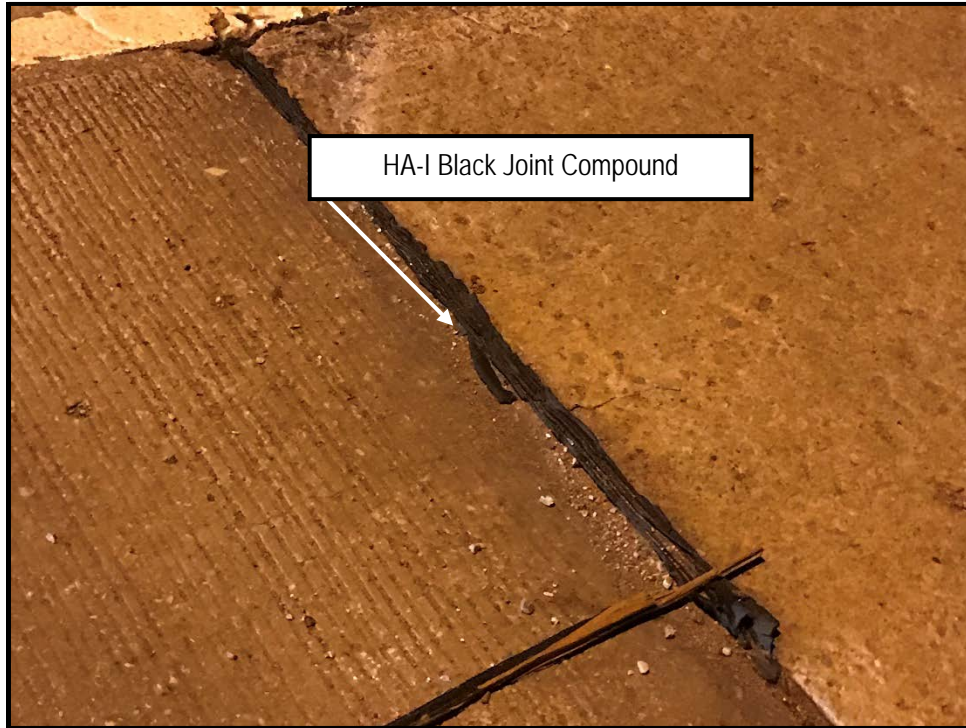
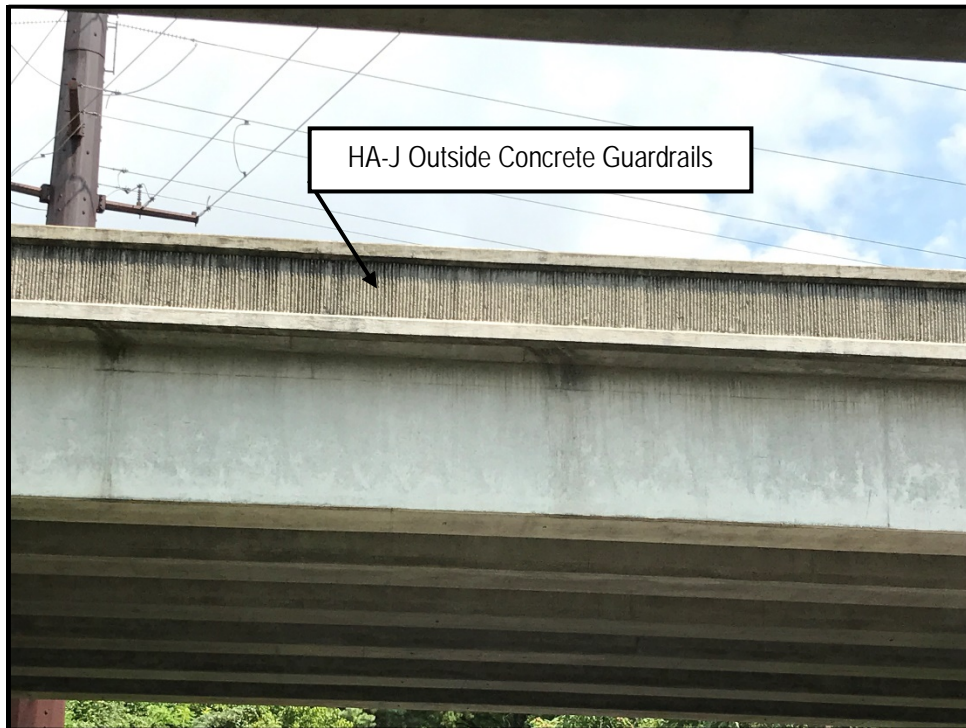


Photo 8: View of HA-H on the eastbound I-440 bridge over Craig Avenue



HA-I Black Joint Compound

Photo 9: View of HA-I on the eastbound I-440 bridge over Craig Avenue



HA-J Outside Concrete Guardrails

Photo 10: View of HA-J on the eastbound I-440 bridge over Craig Avenue

APPENDIX B: ASBESTOS SAMPLE LABORATORY ANALYSIS DATA



EMSL Analytical, Inc.

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<http://www.EMSL.com> / greensborolab@emsl.com

EMSL Order: 021705921

Customer ID: KSWA77

Customer PO:

Project ID:

Attention: James Dye
K.S. Ware LLC
54 Lindsley Avenue
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Phone: (615) 255-9702

Fax: (615) 256-5873

Received Date: 09/18/2017 8:30 AM

Analysis Date: 09/18/2017

Collected Date: 09/14/2017

Project: 100-17-0050 Craig EB

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
CE-01-Coating <small>021705921-0001</small>	Concrete Abutments	Gray Non-Fibrous Homogeneous	<1% Cellulose	5% Perlite 95% Non-fibrous (Other)	None Detected
CE-01-Concrete <small>021705921-0001A</small>	Concrete Abutments	Gray Non-Fibrous Homogeneous		20% Quartz 5% Ca Carbonate 75% Non-fibrous (Other)	None Detected
CE-02-Coating <small>021705921-0002</small>	Concrete Abutments	Gray Non-Fibrous Homogeneous	<1% Cellulose	5% Perlite 95% Non-fibrous (Other)	None Detected
CE-02-Concrete <small>021705921-0002A</small>	Concrete Abutments	Gray/Tan Non-Fibrous Homogeneous	<1% Cellulose	20% Quartz 5% Ca Carbonate 75% Non-fibrous (Other)	None Detected
CE-03 <small>021705921-0003</small> <i>No Coating Present.</i>	Concrete Abutments	Gray/Tan Non-Fibrous Heterogeneous	<1% Cellulose	25% Quartz 5% Ca Carbonate 70% Non-fibrous (Other)	None Detected
CE-04 <small>021705921-0004</small>	Concrete Beams	Gray/Tan Non-Fibrous Homogeneous	<1% Cellulose	20% Quartz 5% Ca Carbonate 75% Non-fibrous (Other)	None Detected
CE-05 <small>021705921-0005</small>	Concrete Beams	Gray Non-Fibrous Homogeneous		25% Quartz 5% Ca Carbonate 70% Non-fibrous (Other)	None Detected
CE-06 <small>021705921-0006</small>	Concrete Beams	Gray/Tan Non-Fibrous Heterogeneous		20% Quartz 5% Ca Carbonate 75% Non-fibrous (Other)	None Detected
CE-07 <small>021705921-0007</small>	Concrete Decking	Gray/Tan Non-Fibrous Homogeneous	<1% Cellulose	25% Quartz 5% Ca Carbonate 70% Non-fibrous (Other)	None Detected
CE-08 <small>021705921-0008</small>	Concrete Decking	Gray/Tan Non-Fibrous Homogeneous	<1% Cellulose	25% Quartz 5% Ca Carbonate 70% Non-fibrous (Other)	None Detected
CE-09 <small>021705921-0009</small>	Concrete Decking	Brown/Tan Non-Fibrous Heterogeneous		25% Quartz 5% Ca Carbonate 70% Non-fibrous (Other)	None Detected
CE-10 <small>021705921-0010</small>	Inside Concrete Guardrails	Gray/Tan Non-Fibrous Homogeneous	<1% Cellulose	25% Quartz 5% Ca Carbonate 70% Non-fibrous (Other)	None Detected
CE-11 <small>021705921-0011</small>	Inside Concrete Guardrails	Gray/Tan Non-Fibrous Homogeneous	<1% Cellulose	25% Quartz 5% Ca Carbonate 70% Non-fibrous (Other)	None Detected
CE-12 <small>021705921-0012</small>	Inside Concrete Guardrails	Brown/Gray/Tan Non-Fibrous Heterogeneous	<1% Cellulose	25% Quartz 5% Ca Carbonate 70% Non-fibrous (Other)	None Detected
CE-13 <small>021705921-0013</small>	Inside Concrete Guardrail Coaitng	Gray/Tan Non-Fibrous Homogeneous	<1% Cellulose	25% Quartz 5% Ca Carbonate 70% Non-fibrous (Other)	None Detected
CE-14 <small>021705921-0014</small>	Inside Concrete Guardrail Coaitng	Gray/Tan Non-Fibrous Homogeneous	<1% Cellulose	25% Quartz 5% Ca Carbonate 70% Non-fibrous (Other)	None Detected

Initial report from: 09/19/2017 08:16:39



EMSL Analytical, Inc.

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<http://www.EMSL.com> / greensborolab@emsl.com

EMSL Order: 021705921
Customer ID: KSWA77
Customer PO:
Project ID:

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
CE-15 021705921-0015	Inside Concrete Guardrail Coating	Brown/Gray/Tan Non-Fibrous Heterogeneous	<1% Cellulose	25% Quartz 5% Ca Carbonate 70% Non-fibrous (Other)	None Detected
CE-16 021705921-0016	Grey Joint Compound	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
CE-17 021705921-0017	Grey Joint Compound	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
CE-18 021705921-0018	Grey Joint Compound	Tan/White Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (Other)	None Detected
CE-19 021705921-0019	Black Asphaltic Patching	Brown/Black Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (Other)	None Detected
CE-20 021705921-0020	Black Asphaltic Patching	Black Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (Other)	None Detected
CE-21 021705921-0021	Black Asphaltic Patching	Black Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (Other)	None Detected
CE-22 021705921-0022	White Joint Compound	Gray/Beige Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (Other)	None Detected
CE-23 021705921-0023	White Joint Compound	Gray/Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
CE-24 021705921-0024	White Joint Compound	Gray/Tan/White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
CE-25 021705921-0025	Black Joint Compound	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
CE-26 021705921-0026	Black Joint Compound	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
CE-27 021705921-0027	Black Joint Compound	Brown/Black Fibrous Heterogeneous	<1% Cellulose	1% Quartz 99% Non-fibrous (Other)	None Detected
CE-28 021705921-0028	Outside Concrete Guardrails	Gray Non-Fibrous Homogeneous	<1% Cellulose	25% Quartz 5% Ca Carbonate 70% Non-fibrous (Other)	None Detected
CE-29 021705921-0029	Outside Concrete Guardrails	Gray/Tan Non-Fibrous Homogeneous	<1% Cellulose	25% Quartz 5% Ca Carbonate 70% Non-fibrous (Other)	None Detected
CE-30 021705921-0030	Outside Concrete Guardrails	Brown/Gray/Tan Non-Fibrous Heterogeneous	<1% Cellulose	20% Quartz 5% Ca Carbonate 75% Non-fibrous (Other)	None Detected



EMSL Analytical, Inc.

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<http://www.EMSL.com> / greensborolab@emsl.com

EMSL Order: 021705921

Customer ID: KSWA77

Customer PO:

Project ID:

Analyst(s)

Kristie Elliott (22)

Scott Combs (10)

Stephen Bennett, Laboratory Manager
or Other Approved Signatory

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Samples analyzed by EMSL Analytical, Inc. Kernersville, NC NVLAP Lab Code 102104-0, CA ELAP 2689, Virginia 3333-000228, West Virginia LT000321

Initial report from: 09/19/2017 08:16:39



Asbestos Bulk Building Material Chain of Custody

Kernersville, NC 27284

PHONE: (336) 992-1025

FAX: (336) 992-4175

EMSL ANALYTICAL, INC.
LABORATORY-PRODUCTS-TRAINING

EMSL Order Number (Lab Use Only):

5921

Company: K.S. Ware & Associates, LLC		EMSL-Bill to: <input type="checkbox"/> Same <input checked="" type="checkbox"/> Different <small>If Bill to is Different note instructions in Comments**</small>	
Street: 54 Lindsley Ave		<i>Third Party Billing requires written authorization from third party</i>	
City: Nashville	State/Province: TN	Zip/Postal Code: 37210	Country: US
Report To (Name): James Dye		Telephone #: (615)2559702	
Email Address: jdye@kswarellc.com		Fax #:	Purchase Order:
Project Name/Number: 100-17-0050 Craig EB		Please Provide Results: <input type="checkbox"/> Fax <input checked="" type="checkbox"/> Email <input type="checkbox"/> Mail	
U.S. State Samples Taken: TN		CT Samples: <input type="checkbox"/> Commercial/Taxable <input type="checkbox"/> Residential/Tax Exempt	

Turnaround Time (TAT) Options* - Please Check

3 Hour
 6 Hour
 24 Hour
 48 Hour
 72 Hour
 96 Hour
 1 Week
 2 Week

*For TEM Air 3 hr through 6 hr, please call ahead to schedule. *There is a premium charge for 3 Hour TEM AHERA or EPA Level II TAT. You will be asked to sign an authorization form for this service. Analysis completed in accordance with EMSL's Terms and Conditions located in the Analytical Price Guide.

PLM - Bulk (reporting limit)	TEM - Bulk
<input checked="" type="checkbox"/> PLM EPA 600/R-93/116 (<1%)	<input type="checkbox"/> TEM EPA NOB - EPA 600/R-93/116 Section 2.5.5.1
<input type="checkbox"/> PLM EPA NOB (<1%)	<input type="checkbox"/> NY ELAP Method 198.4 (TEM)
Point Count <input type="checkbox"/> 400 (<0.25%) <input type="checkbox"/> 1000 (<0.1%)	<input type="checkbox"/> Chatfield Protocol (semi-quantitative)
Point Count w/Gravimetric <input type="checkbox"/> 400 (<0.25%) <input type="checkbox"/> 1000 (<0.1%)	<input type="checkbox"/> TEM % by Mass - EPA 600/R-93/116 Section 2.5.5.2
<input type="checkbox"/> NIOSH 9002 (<1%)	<input type="checkbox"/> TEM Qualitative via Filtration Prep Technique
<input type="checkbox"/> NY ELAP Method 198.1 (friable in NY)	<input type="checkbox"/> TEM Qualitative via Drop Mount Prep Technique
<input type="checkbox"/> NY ELAP Method 198.6 NOB (non-friable-NY)	Other
<input type="checkbox"/> OSHA ID-191 Modified	<input type="checkbox"/>
<input type="checkbox"/> Standard Addition Method	

Check For Positive Stop - Clearly Identify Homogenous Group Date Sampled: 8/10/17 and 9/14/17

Samplers Name: James Dye

Samplers Signature: *James Dye*

Sample #	HA #	Sample Location	Material Description
CE-01	A	NW	Concrete Abutments
CE-02	A	SE	Concrete Abutments
CE-03	A	NE	Concrete Abutments
CE-04	B	North	Concrete Beams
CE-05	B	Middle	Concrete Beams
CE-06	B	South	Concrete Beams
CE-07	C	SW	Concrete Decking
CE-08	C	South	Concrete Decking
CE-09	C	SE	Concrete Decking
CE-10	D	SW	Inside Concrete Guardrails

Client Sample # (s): CE-01 - CE-30 Total # of Samples: 30

Relinquished (Client): *James Dye* Date: 9-15-17 Time: 12:30 am

Received (Lab): *JAH* Date: 9/18/17 Time: 8:30

Comments/Special Instructions:

BillTo: KS Ware & Associates, LLC, 54 Lindsley Ave, Nashville, TN, 37210, US
Attention: Jo-Ann Poharcyk Phone: (615)2559702 Email: jpoharcyk@kswarellc.com

APPENDIX C: ASBESTOS ACCREDITATIONS



THE STATE OF TENNESSEE

Department of Environment and Conservation Division of Solid Waste Management
Toxic Substances Program

William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue, 14th Floor Nashville TN 37243

By virtue of the authority vested by the Division of Solid Waste Management, the Company named below is hereby accredited to offer and/or conduct Asbestos activities pursuant to Rule 1200-01-20:

K. S. Ware and Associates, LLC

54 Lindsley Avenue Nashville TN, 37210

to conduct ASBESTOS ACTIVITIES in schools or public and commercial buildings in Tennessee.
This firm is responsible for compliance with the applicable requirements of Rule 1200-01-20.

Discipline	Type	Accreditation Number	Effective Date	Expiration Date
Accreditation	Re-Accreditation	A-F-620-53521	November 01, 2016	November 30, 2017



Given under the Seal of the State of Tennessee in Nashville.

This 29th Day of December 2016

Division of Solid Waste Management
Toxic Substance Program

CN-1324 (Rev 6/13)

RDA-3020

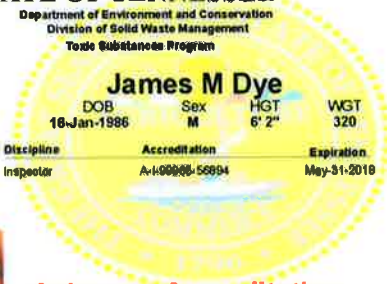
THE STATE OF TENNESSEE

Department of Environment and Conservation
Division of Solid Waste Management
Toxic Substances Program



Date Issued: 4/26/2017

Re-Accreditation



DOB	Sex	HGT	WGT
18-Jan-1986	M	6' 2"	320
Discipline	Accreditation	Expiration	
Inspector	A-400006-56994	May-31-2018	

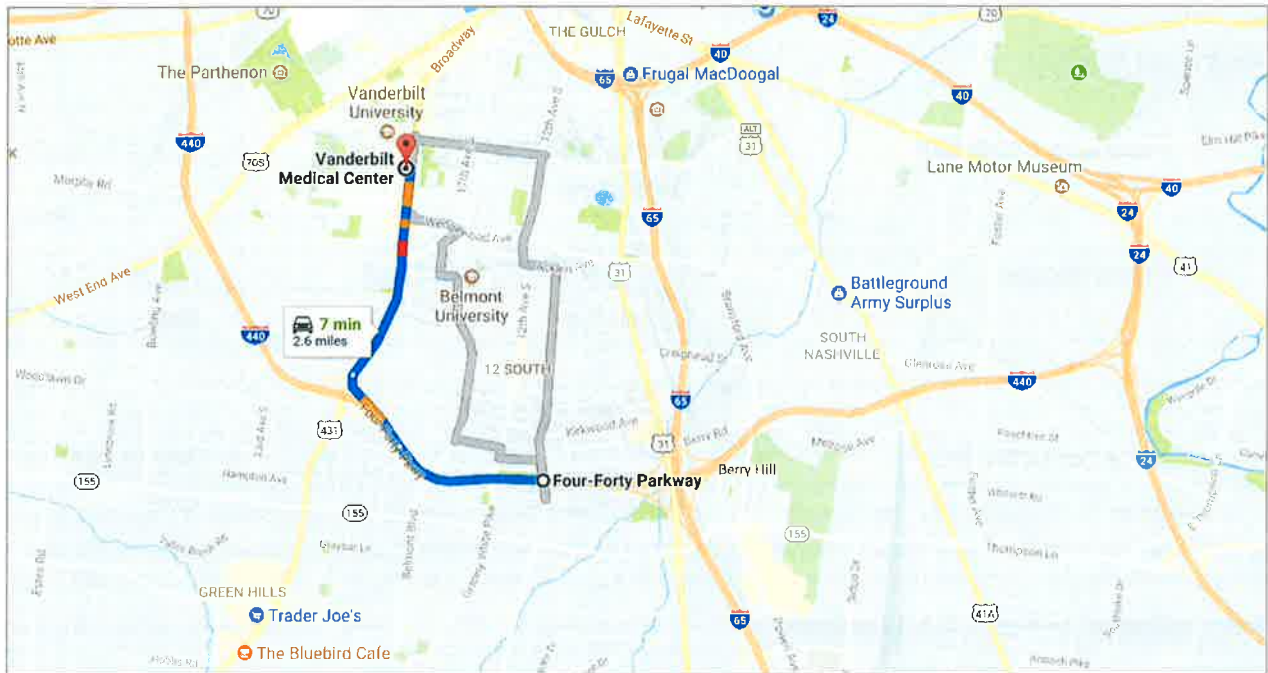
Asbestos Accreditation

APPENDIX D: HEALTH AND SAFETY PLAN

HEALTH AND SAFETY PLAN FOR ASBESTOS CONTAINING MATERIALS SURVEY SERVICES

K. S. WARE AND ASSOCIATES, L.L.C.

54 Lindsley Ave.
Nashville, Tennessee 37210



Directions to Hospital

Head west on I-440 (1.1 mile)
Take 21st Avenue exit (0.5 miles)
Turn right onto 21st Avenue (1.2 miles)
Hospital will be on the left

Hospital Address

Vanderbilt Medical Center
1215 21st Avenue South
Nashville, TN 37232
(615) 936-7846

This facility has been verified as mappable by phone (goo.gl/nXcocN):

Project Number: 100-17-0050
Name: I-440 From I-40 to I-24 (Leland, Craig, and Bransford)
Location: Davidson County, Tennessee
Client: Tennessee Department of Transportation
Client Contact : Kyle Kirschenmann
Phone No.: (615) 598-1522

KSWA Personnel Contact Information:

<u>Title</u>	<u>Name</u>	<u>Work</u>	<u>Mobile</u>
Field Safety Coordinator	James Dye	(615) 255-9702	(615) 956-0361
Project Manager	James Dye	(615) 255-9702	(615) 956-0361
Health and Safety QA	Ryan Elliott	(850) 530-9209	(850) 865-3056

Review and Approval:

Field Safety Coordinator


James Dye

August 1, 2017

Date

Project Manager


James Dye

August 1 2017

Date

Health and Safety QA


Ryan Elliott, PE

July 10, 2017

Date

Responsibilities for Field Safety Coordinator:

- Primary on-site contact for KSWA's health and safety procedures during field activities.
- Has the authority to stop KSWA operations if conditions are judged to be hazardous to on-site personnel or the public.
- Perform discretionary audits to determine compliance of Health and Safety Plan requirements.
- Responsible for providing access to the health and safety for all on-site employees.
- Responsible for instructing on-site personnel on the location of emergency communication equipment (i.e. phones and radios as necessary).
- Has no responsibility for health and safety procedures of any contractor, subcontractor, client personnel or others on the site.

Date of Plan Preparation

July 6, 2017

Dates of Planned Field Activities

July/August 2017

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1.0 PURPOSE

The purpose of this health and safety plan (HASP) is to provide standards for worker safety and protection during field activities conducted on a frequent or routine basis. The plan outlines standards and mandatory procedures relative to physical and chemical hazards encountered at sites, communication, training, worker health monitoring, decontamination procedures and levels of personal protection. Any questions concerning this information should be directed to the K.S. Ware and Associates, L.L.C. (KSWA) Project Manager identified at the beginning of this Health and Safety Plan, at 615-255-9702.

2.0 APPLICABILITY

This plan is applicable to all personnel working at the above referenced site, where mandatory worker health and safety training is required by State or Federal agencies. It is intended for use at the above referenced site where information regarding potential site hazards is available in the form of background research, personal communication with past or present property owners or workers, previous sampling results, etc.

A site specific hazard evaluation is included in Section 4. Available information should be provided to site workers as outlined in Section 5.

Sampling of items that may contain asbestos containing material (ACM) and other routine field activities are activities for which this plan is applicable. Activities involving contact with unknown substances and activities on sites where little background information is available will require more extensive and specific HASP development.

This plan does not cover procedures for entry into confined spaces. Project-specific attachments should be prepared and appended to this Health and Safety Plan if those activities are planned. Work of this nature shall be performed in accordance with 29 CFR 1926.250 subpart P "Excavation, Trenching and Shoring", 29 CFR 1910.146 "Permit Required Confined Space Entry" and the KSWA "Employee Confined Space Entry Program".

3.0 SITE DESCRIPTION AND HISTORY

The project consists of performing an asbestos bridge survey on five bridges located along I-440 between I-40 and I-24 in Davidson County, Tennessee.

The I-440 bridges to be surveyed include:

- 1.1 Bridge No. 19I04400027, EB I-440 over Leland Ave, LM 4.17. The bridge is a 111-foot, 3-lane, single-span bridge constructed of pre-stressed concrete box beams with a concrete deck and wearing surface. The bridge was constructed in 1985.
- 1.2 Bridge No. 19I04400028, WB I-440 over Leland Ave, LM 4.17. The bridge is a 111-foot, 3-lane, single-span bridge constructed of pre-stressed concrete box beams with a concrete deck and wearing surface. The bridge was constructed in 1985.
- 1.3 Bridge No. 19I04400029, EB I-440 over Craig Ave, LM 4.36. The bridge is a 112-foot, 3-lane, single-span bridge constructed of pre-stressed concrete box beams with a concrete deck and wearing surface. The bridge was constructed in 1985.
- 1.4 Bridge No. 19I04400030, WB I-440 over Craig Ave, LM 4.36. The bridge is a 112-foot, 3-lane, single-span bridge constructed of pre-stressed concrete box beams with a concrete deck and wearing surface. The bridge was constructed in 1985.
- 1.5 Bridge No. 19I04400041, I-440 over Bransford Ave, LM 5.44. The bridge is a 172-foot, 6-lane, single-span bridge constructed of pre-stressed concrete box beams with a concrete deck and wearing surface. The bridge was constructed in 1985.

3.1 INSPECTION EQUIPMENT

KSWA will be on site to perform asbestos surveys on the I-440 Bridges. Equipment to be used during these surveys will include asbestos sample collection equipment.

3.2 WORK PRECAUTIONS

- No eating, drinking, using tobacco products, chewing gum, or putting hands in mouth while on the site.
- Wear the TDOT required roadway safety gear (hard hat, Class III reflective vest, boots) at all times while on the project site.
- Wear gloves at applicable times while at the work site.
- Wear protective eyewear at applicable times while at the work site.
- Wash all exposed skin areas with soap and water before departing from the site.
- Remove and change any non-impervious clothing that becomes contaminated during site activities.
- Do not go anywhere on the site other than where directed by the Field Safety Coordinator.
- Use safe and legal procedures for sample storage and shipment.

3.3 DISPOSAL RESTRICTIONS

Treat disposable items as ordinary refuse except when gross contamination is expected. In the event that refuse including disposable personnel protective equipment is suspected of being contaminated, the refuse will be collected and stored on site for future disposal.

4.0 HAZARD EVALUATION

4.1 PHYSICAL HAZARDS

4.1.1 Operational Hazards

Prior to commencement of field activities, the Field Safety Coordinator will conduct a site reconnaissance to identify any visible or operational hazards.

Additionally, because there is a possibility that asbestos may be present at the site, the appropriate Personal Protective Equipment (PPE) will be worn at all times that work is being performed.

4.1.2 Fall Hazards

Field activities can have the potential for fall hazards. Be aware of any uneven terrain, clear paths of debris and materials that may be a hazard. While on the bridges, be aware of slick surfaces and gaps while accessing the different components.

4.1.3 Heat Stress

Field activities in hot climates create a potential for heat stress. The warning symptoms of heat stress include fatigue; loss of strength; reduced accuracy, comprehension and retention; and reduced alertness and mental capacity. To prevent heat stress, personnel shall drink adequate amounts of water and/or electrolyte replacement fluids, and maintain scheduled work/rest periods.

4.1.4 Cold Stress

Field activities in cold climates create a potential for cold stress. The warning symptoms of cold stress include fatigue; shivering; numbness; blue or pale skin; and reduced alertness and mental capacity. To prevent cold stress, personnel shall wear adequate clothing, and maintain scheduled work/rest periods.

4.1.5 Tools and Equipment

Tools and equipment used by KSWA shall be inspected and maintained to be safe and adequate for their designated use. Housekeeping of the site shall be maintained as to prevent tripping hazards.

4.1.6 Traffic Hazard

Field activities will encounter traffic on this project. Be aware of surroundings and watch for traffic. Traffic control will be utilized for field activities on and near the decks of the bridges.

4.1.7 Noise Hazard

Operation of equipment may present a noise hazard to workers. KSWA personnel will be provided with hearing protection to be utilized when noise levels are excessive.

4.1.8 Asbestos Containing Material

Collecting samples from library and fire station components may release asbestos fibers into the air. KSWA personnel will wear a respirator while sampling, and all sampling equipment will be properly decontaminated between sample collection and after field activities. KSWA personnel will limit exposure by adhering to this health and safety plan.

Precautions: In order to reduce the health and safety risk to workers due to physical hazards at the project site, the following precautions will be observed:

1. ANSI Class III High Visibility clothing will be worn by personnel at all times on the project site.
2. Hard hats shall include high visibility reflective tape.
3. Protective eyewear will be worn by personnel in the work area when appropriate.
4. Hearing protection will be worn by personnel as deemed necessary by the Field Safety Coordinator (typically noised levels greater than 85 dBA).
5. Safety toed boots with non-conductive soles will be worn by personnel at all times on the project site.
6. Hand protection (leather gloves) will be worn by personnel when moving and/or lifting equipment as well as when using large hand tools (machetes, sledges, shovels, etc.).
7. All equipment and related support equipment and vehicles shall have a daily safety inspection (29 CFR 1926.550). The inspections shall include, but are not limited to: all hydraulic lines and fittings for wear and damage, all cable systems and pull ropes for damage and proper installation, exhaust systems and drill controls, electrical lines for damage and/or contact with standing water, etc. Inspection schedules, the vehicle and equipment description, nomenclature, the license plate or ID number for the equipment, the findings of the inspections and the corrective action(s) taken shall be maintained.
8. Before beginning each work shift, the area will be checked for site hazards including overhead lines, underground lines, above ground obstructions, tripping hazards, etc.
9. All vehicles will be fitted with a cab-top rotating or strobe light bar. Light bar is to be active when vehicle is on site.

4.2 CHEMICAL HAZARDS

Chemical hazards are not anticipated at this site.

4.3 BIOLOGICAL HAZARDS

4.3.1 Stinging Insects

The most common stinging insects are bees, wasps, and ants. Few species of ants have medically significant stings. While most bees possess a defensive sting, and will sting if grasped or crushed, only a few social species sting often enough, or have sufficiently venomous stings to be of medical significance. These include the honeybees and the bumblebees. Most fatalities from bee and wasp stings occur in hypersensitive individuals; death is most often induced by a single sting, and occurs most often within 1 hour after the sting. The victim is typically over 40 years of age and stung on the head or neck. Most deaths are caused by respiratory dysfunction with the second most common cause being anaphylaxis; arteriosclerosis may be a compounding factor. If stung, seek medical attention immediately.

5.0 COMMUNICATIONS AND TRAINING

Workers at State and Federally listed or recognized sites must be provided with adequate information and training to recognize and evaluate potential hazards. Training shall comply with applicable regulations including 29 CFR 1910.1200 "Hazard Communication Standard".

5.1 COMMUNICATION

The Field Safety Coordinator shall supply all on site personnel with readily available access to this Health and Safety Plan. This plan shall cover, at a minimum, the following topics:

- A. A brief description of the history of the location with regard to health and environmental hazards.
- B. A description of the activities to which the hazard evaluation summary is applicable.
- C. A description of any hazards which may be encountered, including:
 - 1. Physical Hazards - terrain, traffic, equipment, severe weather (heat stress and frostbite), electrical hazards, noise, water hazards.
 - 2. Chemical Hazards - materials used and stored at the site, materials released at the site.
 - 3. Biological Hazards - insects, plants, animals, pathogens, and infectious materials.
- D. A description of the levels of protection selected for the operation.
- E. Equipment decontamination procedure if different from those specified herein.
- F. Summary of emergency contacts for use in the event of fire, explosion, medical emergency or other emergency, including the project address and phone number to provide to emergency personnel.
 - 1. Emergency 911
 - 2. Metro Nashville Non-emergency (615) 862-8600
 - 3. Metro Fire Department (615) 862-5421
- G. A map showing the route to the nearest hospital.

Prior to any employee or subcontractor beginning work on the site, the Field Safety Coordinator shall brief all KSWA employees as well as subcontractors on the contents of this plan. Personnel will have the opportunity to review the plan, and ask questions about the planned work or hazards. Also, the Field Safety Coordinator will conduct site reconnaissance in order to familiarize all personnel with site conditions, boundaries, and physical hazards.

By KSWA voluntarily sharing this information with subcontractors and contractors, those firms are not relieved of the responsibility to provide their personnel with adequate and proper supervision, safety information, instruction, and equipment.

5.2 HEALTH AND SAFETY TRAINING

All personnel will be provided with approved health and safety training as outlined in 29 CFR 1910.120(e). Documentation for KSWA employees should also be maintained at a central location at the KSWA office.

5.3 RESPIRATOR USAGE TRAINING AND FIT TESTING

Prior to assignment to a site where respirator use may be required, employees will be provided with respirator training as outlined in 29 CFR 1910.134(e)(5). Respirator fit tests are to be conducted at 6 to 10 month intervals, or at any time when a condition that may change the fit of a respirator has occurred, such as change in weight, change in facial structure, extensive dental work, etc. All use of respirators shall comply with KSWA's written respiratory program.

6.0 SITE CONTROL - WORK ZONES

It is anticipated that conditions will require special measures or restriction of normal site activities and access to achieve site security. The work area includes the I-440 bridges and adjacent areas. The work will be performed along the side and underneath the bridge. The work zone will be delineated in accordance with TDOT temporary lane closure guidelines. Work zones will be identified with flashing lights, illuminated and non-illuminated signage, traffic spotter, etc. Work taking place on and near the decks of the bridges will only occur after traffic control has at least partially closed the bridges.

7.0 PERSONAL PROTECTION

PPE and safety requirements must be appropriate to protect against the known or worst potential hazards on the site. Protective equipment should be selected based on the concentrations and possible routes of exposure to known or potential worst case substances. All KSWA engineering or assessment personnel engaged in work on site will be participants in the KSWA medical monitoring program described in Section 11, or a similar program.

KSWA anticipates that Level D protection and basic site safety measures will be sufficient at this project site. Level D PPE is described in Section 8. Any conditions warranting upgrading of the required level of protection to Level C, B, or A will be cause for all personnel to immediately leave the work site. The site will be re-evaluated and a new site Health and Safety Plan will be prepared which incorporates the additional site information.

8.0 LEVELS OF PROTECTION

This plan is not intended for use at sites where levels of protection above Level D is required. Levels D is described below.

8.1 LEVEL D

Level D is the basic work uniform for all site operations. Level D should be selected when performing environmental sampling involving dilute concentrations of contaminants on sites that have been characterized by previous analyses or research.

8.1.1 Personal Protective Equipment

The following equipment is necessary for Level D personal protection:

- Standard work clothing.
- Optional disposable chemical-resistant clothing appropriate for known or expected levels of contamination.
- Boots/Shoes - safety or chemical-resistant boots.
- Safety glasses or safety goggles.
- Gloves - disposable latex or nitrile.
- Optional moisture resistant outer gloves.
- Hardhat.

8.1.2 Criteria for Use of Level D

The following criteria indicate situations where Level D personal protection is adequate:

- No indication of airborne health hazards present.
- No gross indication, above background concentrations, on the photoionization detector and/or organic vapor analyzer.

Additionally, a half-face, full-face, or powered air purifying respirator will be used with appropriate particulate filter(s).

9.0 DECONTAMINATION PROCEDURES

9.1 PERSONNEL DECONTAMINATION

If Level D protection is used, any disposable inner gloves or protective clothing should be sealed in a plastic bag and disposed of properly. Moisture resistant outer gloves and outer boots should be scrubbed with a stiff brush in soapy water, then rinsed to remove possible residual contamination. Disposable equipment should be used whenever possible.

9.2 EQUIPMENT DECONTAMINATION

Proper decontamination of all equipment is necessary to avoid transferring contaminants from the site, thereby increasing potential for exposure of on site and off site personnel. The measures described below should be followed prior to leaving all sites, as applicable to the equipment being used. Any variations from the procedures described below for reasons of worker health or safety must be described by the Project Manager in the site-specific hazard summary.

These measures are separate from, and may not be substituted for, other decontamination procedures associated with proper sampling protocol.

- A. The equipment may be thoroughly rinsed with clean water or an appropriate cleaning solution and wiped dry with paper towels before leaving the work site. Alternatively, the equipment may be wrapped in absorbent material and/or stored in plastic bags sealed to prevent contact with workers, vehicles, etc.
- B. The rinse water from this operation will be allowed to percolate into the ground or as specified.

10.0 EMERGENCY PROCEDURES

10.1 INHALATION

If warning signals such as: dizziness, nausea, headache, shortness of breath, burning sensation in mouth, throat or lung or symptoms specific to hazard found at the site are apparent, the victim should leave the contaminated air space immediately. Have someone contact emergency services and obtain health and safety information about potential contaminants.

If unconscious, the victim should be pulled out of the contaminated area immediately if they do not have any injuries which would prohibit moving them (i.e. spinal injury). The rescuers should make sure that the area is safe to enter. If the area cannot be safely entered, attempt to ventilate this area. Do not attempt a rescue. Rescuers should make sure they are properly trained in First Aid and rescue and that they are wearing proper respiratory and protective equipment before attempting the rescue.

If the victim is no longer breathing, mouth-to-mouth resuscitation or some other form of artificial respiration should be administered by a person who is properly trained and certified in a location away from the contaminated area.

Medical attention should be obtained immediately.

10.2 SKIN EXPOSURE

The skin should be washed with copious amounts of soap and water. If clothing is contaminated, it should be removed immediately and the skin washed thoroughly with running water. If a shower is available, it should be used immediately. Clothes should be removed while showering. This procedure may be life-saving as certain highly toxic chemicals are rapidly absorbed through the skin.

All contaminated parts of the body, including the hair, should be thoroughly decontaminated. It may be necessary to wash repeatedly.

10.3 INGESTION

A poison control center or emergency service should be contacted immediately to determine an appropriate course of action. If possible, have health and safety information on the poison available when you call for help. Vomiting should be induced except when the substance presents an aspiration hazard, such as from a petroleum product; or when the substance is a strong acid or base. To induce vomiting, a tablespoon of salt or powdered mustard in a glass of warm water, or syrup of ipecac from the First Aid Kit, can be taken as an emetic.

Drinking plenty of water and placing a finger down the throat may also be effective in inducing vomiting. The treatment should be repeated until vomit is clear.

Medical attention should be obtained immediately.

10.4 EYES

If a toxicant should get in the eyes, they should be washed with plenty of water. The eye itself should be held open, rotated, and flooded with water so that all surfaces are washed thoroughly. Washing should be continued for at least 15 minutes.

Medical attention should be obtained immediately.

10.5 EXPOSURE TO HEAT OR COLD

When working under severe weather conditions, personnel should be aware of the signs of heat stress, hypothermia and frostbite as well as the appropriate response actions.

Heat Stress - If a worker shows signs of heat stroke (dry, hot, red skin, high body temperature) or heat exhaustion (cool, moist, pale or red skin, dilated pupils, nausea, dizziness), the worker must be removed from the work area and cooled. Loosen clothing, elevate feet, and provide cool liquids. Heat stroke can be life threatening and requires rapid action.

Hypothermia - If a worker shows signs of hypothermia (shivering, impaired judgement, drowsiness, clumsiness) the worker must be removed from the work area and warmed gradually.

Frostbite - If a worker shows signs of frostbite (skin color changes to white or grayish-yellow then grayish-blue), the worker must be moved to a warm place. The affected area should be placed in warm (100-105°F) water. Do not rub or massage.

10.6 STINGS AND BITES

If still present, remove stinger with fingernail. Wash the the location of the sting with soap and water, cover with bandage and apply ice. If severe allergic reactions appear (hives, itching, rash, nausea, vomiting, dizziness, swelling) seek medical attention immediately.

10.7 PERSONAL INJURY

A first aid kit shall be readily available in case of an injury. Administer first aid and/or seek medical help, if necessary. Medical emergencies take precedence over decontamination procedures. A map showing the route to the nearest hospital is provided at the end of this Health and Safety Plan. It is the responsibility of the field safety coordinator to ensure that a phone is readily available on-site, and to identify which personnel have phones and provide this information to all on site personnel.

10.8 SPILL OR RELEASE OF HAZARDOUS MATERIAL

Clean up, isolate or contain spill as appropriate. Contact emergency response personnel, project manager, and/or client company officials as appropriate.

10.9 POTENTIAL OR ACTUAL FIRE/EXPLOSION

If it is safe to do so, on site personnel may use available fire fighting equipment to control or extinguish the fire, and remove or isolate materials which may contribute to the fire. Contact the fire department project manager and/or client company officials as appropriate.

10.10 EVACUATION

In the event of an emergency that requires an evacuation of the site, verbal instruction will be given by the Field Safety Coordinator to evacuate the area. Personnel will immediately exit the site to the pre-designated upwind "clean" location. The Field Safety Coordinator will account for KSWA personnel, and will advise personnel of further instructions, if necessary. The Field Safety Coordinator will also advise responding off site emergency personnel, if necessary. Personnel shall not re-enter the site until the emergency conditions have been corrected and the Field Safety Coordinator has authorized re-entry.

11.0 MEDICAL MONITORING

All engineering and assessment personnel engaged in on site activities shall be participants in a medical monitoring program similar to the following. As participants in this program, these individuals will have had recent physical examinations.

The following personnel will be accessing the site during field activities and the dates at which their medical monitoring program was last updated:

1. James Dye (February 2017)
2. Benjamin Hooks (April 2017)

The primary goal of this medical monitoring program is to provide evaluation and ongoing surveillance of the health status of employees potentially exposed to toxic substances as a result of their work-related activities. An active health monitoring program for those employees potentially at risk is an important tool in evaluating the effects of chronic low-level exposures or acute exposures related to operations at hazardous waste sites. The effects of low-level exposures may not become apparent until years after the initial exposure.

This medical monitoring program includes laboratory testing, personnel medical history evaluation, physical examination and other specific testing.

Each participant in this medical monitoring program undergoes a complete occupational history evaluation and baseline physical examination including the following parameters:

- Pulmonary Function Studies
- Complete Blood Count
- Chemical Blood Profile
- Urinalysis
- Chest X-Ray
- Electrocardiogram
- Specific parameters as necessary dependent upon exposure

Following the establishment of each participant's baseline values for the above parameters, an annual re-evaluation is conducted to monitor potential changes due to work with hazardous materials.

In addition to this annual re-examination, provisions are made for specific post-exposure examinations in the event of a suspected exposure during a particular field event.

The program shall meet or exceed the minimum requirements established in OSHA standard 20 CFR 1910.120.

12.0 PERSONNEL AUTHORIZATION

All personnel engaged in on site activities must read this Health and Safety Plan. By signing and dating this form, the listed individual acknowledges that he/she has read, understands and will comply with the requirements of this Health and Safety Plan.

Personnel Authorized to Enter Site

Name	Signature	Date
Tori Gallagher		8/10/17
James Dye		8-10-17
James Dye		8-17-17
Elliott McGee		8-17-17
James Dye		8-14-17
Tori Gallagher		9/14/17

13.0 FIELD SAFETY COORDINATOR'S SUMMARY

(To be completed by Field Safety Coordinator after completion of each phase of field work, and returned to Project Manager.)

Project Summary

Project Name:	I-440 From I-40 to I-24 (Leland, Craig, Bransford)
Project Number:	100-17-0050
Activities Completed:	8-10-17 , 8-17-17, 9-14-17
Date of Activities:	8-10-17, 8-17-17, 9-14-17

During the execution of the activities covered by this Health and Safety Plan, there were:

- a) No violations of the Safety Plan provisions and no obvious contamination of KSWA employees or subcontractors.
- b) The following incidents, violations of the Safety Plan provisions, or obvious contamination of KSWA personnel or subcontractors. (Give details of who, when, type of contamination, circumstances, first aid or medical assistance administered in the space below.)

Time and Date of Incident	People Involved	Description of Incident

Signature  Date 9-15-17
Field Safety Coordinator

APPENDIX E: ACTIVITY HAZARD ANALYSIS

ACTIVITY HAZARD ANALYSIS

Asbestos Survey
I-440 From I-40 to I-24
Davidson County, Tennessee

PIN: 125325.00

TDOT Project No.: 19014-1169-04

Bridge Nos.: 19I04400027, 19I04400028, 19I04400029, 19I04400030, 19I04400041

KSWA Project Number: 100-17-0050

Prepared by:



K. S. WARE AND ASSOCIATES, L.L.C
54 Lindsley Avenue
Nashville, Tennessee 37210

July 6, 2017

ACTIVITY HAZARD ANALYSIS FOR ASBESTOS SURVEY

EM 385-1-1 Reference:

Hard hats and safety toe boots are mandatory. Eye and hearing protection are mandatory during sampling and as appropriate.

Principal Steps	Potential Hazards	Action to Minimize Hazard
1. Asbestos exposure	1. Inhalation, skin irritation	1. All personnel that will be present on the project must wear the proper PPE. Use all safety precautions to ensure that all state and federal guidelines are followed and to limit the exposure to asbestos. Asbestos samplers are to use a respirator when sampling.
2. Heat stress exposure	2. Heat stroke	2. Monitor all personnel for signs of fatigue, dizziness or other physical abnormalities. Personnel should wear clothing suited for the weather conditions and breaks will be given for intake of fluids, etc. Ensure that water or sports hydration fluid (Gatorade, PowerAde) is available on site.
3. Cold stress exposure	3. Hypothermia, frostbite, trench foot	3. Monitor all personnel for signs of shivering, loss of coordination, confusion, disorientation, slowed pulse and breathing, and loss of consciousness. Personnel should wear clothing suited for the weather conditions, including effects of wind and extreme cold. Ensure that a location shielded from the wind and with a heat source is available. If cold temperatures and wind chill conditions are present, warming breaks should be planned to avoid prolonged exposure.
4. Traffic Hazards	4. Moving vehicles	4. Field activities will encounter traffic on this project. Be aware of your surroundings, watch for traffic when performing in areas that have moving vehicles. Use a spotter or traffic control when sampling in the roadway or crossing the road. Maintain safe positioning. Use "Men Working" signs to delineate the work area and slow down drivers.
5. Site Maintenance	5. Slip, trip, and fall.	5. Prior to field activities, the Field Safety Coordinator should observe the terrain on site and monitor the conditions throughout the survey. Be aware of steep and/or rocky slopes. Also be aware of potholes around the bridge.
6. Overhead Utilities	6. Electrocutation, explosion, fire	6. Be aware of fallen or low hanging utility lines while on the ground level. Remain at least 10 feet from all utility lines with all equipment.
7. Biological Hazards	7. Small animals, insects	7. Be aware of animal habitat in and around the work area. Do not put hands into areas you cannot inspect for potential insects, mammals, and reptiles. Beware of waterborne snakes, colonies of stinging insects, and vector species that could transmit disease.
8. Noise	8. Damage to hearing	8. Operations that generate sound levels 85 dBA and above require hearing protection. Either muffs or plugs are acceptable. Heavy traffic can be a cause.

Principal Steps	Potential Hazards	Action to Minimize Hazard
9. Hand/Finger Protection	9. Physical injury to personnel	9. Wear gloves when there is exposure to potential hazards that could produce scrapes and cuts. Do not wear jewelry. Any jewelry can be dangerous. Handle sharp or pointed tools with extreme care. Be careful when using a hammer to not smash hand or fingers. Use the proper gloves for the job at hand.
10. Hand Tools and Equipment	10. Physical injury to personnel	10. Use the right tool or piece of equipment for the job. Use only tools in safe condition. Tools and equipment must be used properly and not abused. Take precautions to avoid injury by cutting tools by keeping them sheathed until use.
11. Ladders	11. Fall from excessive height	11. Use caution and maintain three points of contact when climbing a ladder. Always have other site personnel support the ladder while in use. Maintain a safe distance from overhead utilities and obstructions. Always place the ladder on stable, even ground.
12. Severe Weather	12. Thunderstorms, lightning hazard	12. Cease work immediately and take cover in a vehicle or structure until lightning has ceased.

This Activity Hazard Analysis has been prepared by K.S. Ware and Associates.

The KSWA field safety coordinator for this project will be Mr. James Dye. Mr. Dye's health and safety training and certifications include:

- Completed OSHA 10 Hour Construction Safety Course
- Completed OSHA 40 Hour HAZWOPER Course