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 19I04400027

Prepared by:

K. S. WARE & ASSOCIATES, L.L.C.
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]

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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: 19I04400027
Termini: I-440 From I-40 to I-24
Log Mile Number: 4.17

1.2 GENERAL DESCRIPTION

The eastbound I-440 bridge over Lealand Lane at LM 4.17 (19-I0440-04.17R) 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. 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 deck drains and PVC abutment drains on the bridge. 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 (underside of bridge) and August 17, 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 with Coating	LE-01, LE-02, LE-03
B	Concrete Box Beams	LE-04, LE-05, LE-06
C	Abutment Padding	LE-07, LE-08, LE-09
D	Concrete Decking	LE-10, LE-11, LE-12
E	Inside Concrete Guardrails	LE-13, LE-14, LE-15
F	Black Joint Compound	LE-16, LE-17, LE-18
G	Grey Joint Compound	LE-19, LE-20, LE-21
H	Metal Barrier Covering	LE-22, LE-23, LE-24
I	Inside Concrete Guardrail Coating	LE-25, LE-26, LE-27
J	Outside Concrete Guardrails	LE-28, LE-29, LE-30

2.3 ACCESS TO BRIDGE COMPONENTS

Individual bridge components were accessed by the following methods.

2.3.1 Concrete Abutments with Coating – Homogeneous Area A

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

2.3.2 Concrete Box Beams – Homogeneous Area B

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

2.3.3 Abutment Padding – Homogeneous Area C

The abutment padding was accessed and sampled from beneath the bridge.

2.3.4 Concrete Decking – Homogeneous Area D

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

2.3.5 Inside Concrete Guardrails – Homogeneous Area E

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

2.3.6 Black Joint Compound – Homogeneous Area F

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

2.3.7 Grey Joint Compound – Homogeneous Area G

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

2.3.8 Metal Barrier Covering – Homogeneous Area H

The metal barrier covering was accessed and sampled from the top and shoulders of the bridge.

2.3.9 Inside Concrete Guardrail Coating – Homogeneous Area I

The inside concrete guardrail coating 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 deck drains that do not extend through the bridge and PVC abutment drains.

2.5 UTILITY CONDUITS

The KSWA field crew observed an electrical conduit attached to the northern decking. 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 Lealand Lane at LM 4.17. 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 guardrail 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-three (33) analyzed samples.

Building material homogeneous areas sampled included: concrete abutments with coating, concrete box beams, abutment padding, concrete decking, inside concrete guardrails, black joint compound, grey joint compound, metal barrier covering, inside concrete guardrail coating, and outside concrete guardrails.

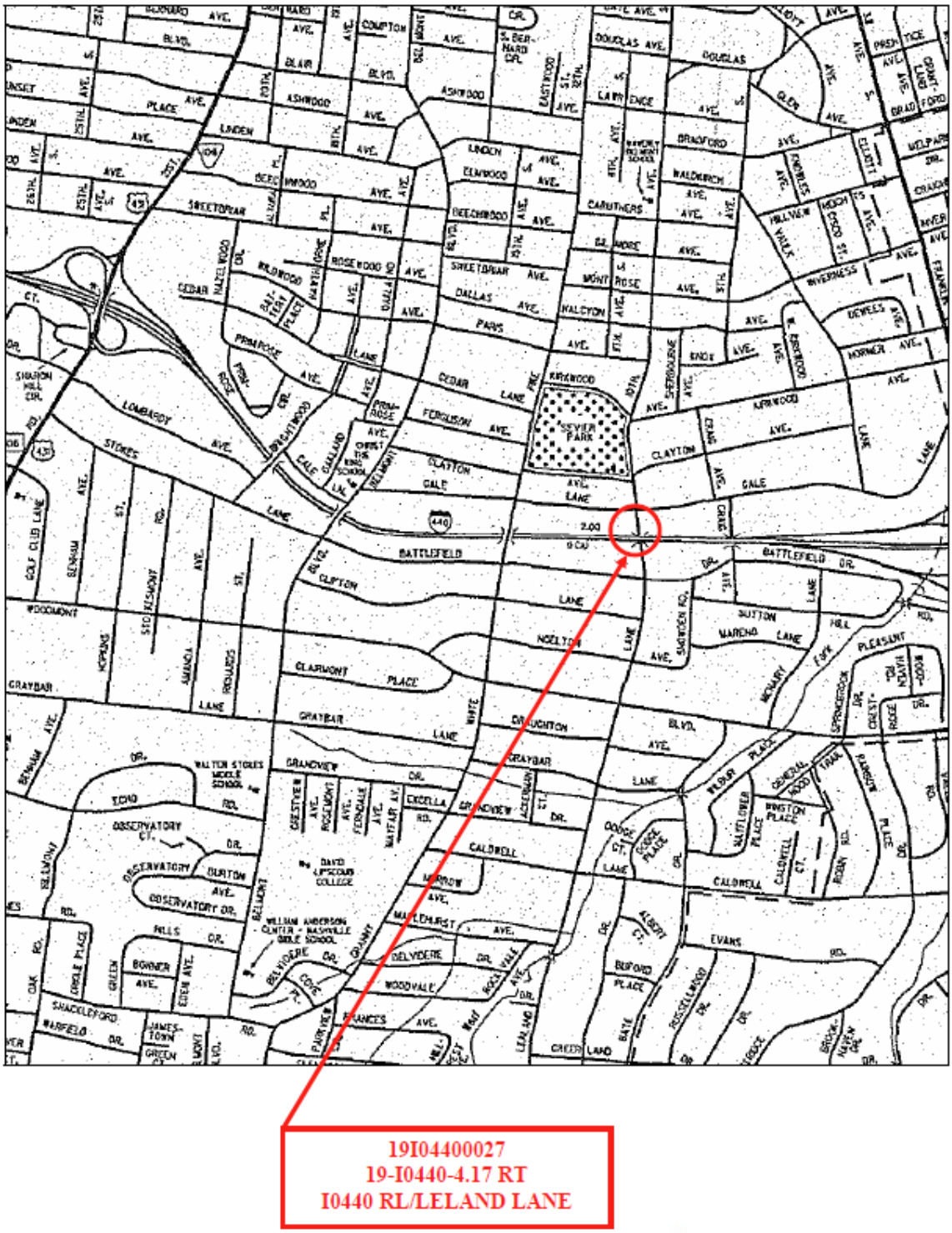
No asbestos was found to be present in any of the materials sampled from the eastbound I-440 bridge over Lealand Lane at LM 4.17. Please note that the electrical conduit on the northern decking of the bridge was a potentially suspect material that could not be sampled during this survey due to safety 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.

This report has been prepared on behalf of the Tennessee Department of Transportation. This document is not a Bid Document or a Contract Document. Use of this report or reliance upon information contained in this report by any other party implies an agreement by that party to the same terms and conditions under which service was provided. Furthermore, any party, other than our Client, relying on this document is cautioned that all conclusions made or decisions arrived at based on their review of this document are those solely of the third party, without warranty, guarantee or promise by the author. These findings are relevant to the dates of our services and should not be relied upon to represent conditions at substantially earlier or later dates.

Figure – 1: Site Vicinity Map
Davidson County



Homogeneous Areas:

A - Concrete Abutments
with Coating
B - Concrete Box Beams
C - Abutment Padding
D - Concrete Decking
J - Outside Concrete Guardrails

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

FIG. NO. 2

19I04400027 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 8/17/2017
SCALE: NTS	TDOT CONSTRUCTION NO: 19014-1169-04	PIN: 125325.00	Source: FIELD PHOTOGRAPHS	KSWA PROJ.NO. 100-17-0050

TN TDOT Department of Transportation

KSWA
K. S. Ware & Associates, L.L.C.
Geotechnical • CEI • Environmental

Homogeneous Areas:

E - Inside Concrete Guardrails
F - Black Joint Compound
G - Abutment Padding
H - Concrete Decking
I - Inside Concrete Guardrail Coating

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

FIG. NO. 3

19I04400027 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 8/17/2017
SCALE: NTS	TDOT CONSTRUCTION NO: 19014-1169-04	PIN: 125325.00	Source: FIELD PHOTOGRAPHS	KSWA PROJ.NO. 100-17-0050

TN TDOT Department of Transportation

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APPENDIX A:
PHOTOGRAPHS

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

Photo 1: View of HA-A on the eastbound I-440 bridge over Lealand Lane

Photo 2: View of HA-B on the eastbound I-440 bridge over Lealand Lane

Photo 3: View of HA-C and electrical conduit on the eastbound I-440 bridge over Lealand Lane

Photo 4: View of HA-D on the eastbound I-440 bridge over Lealand Lane

Photo 5: View of HA-E on the eastbound I-440 bridge over Lealand Lane

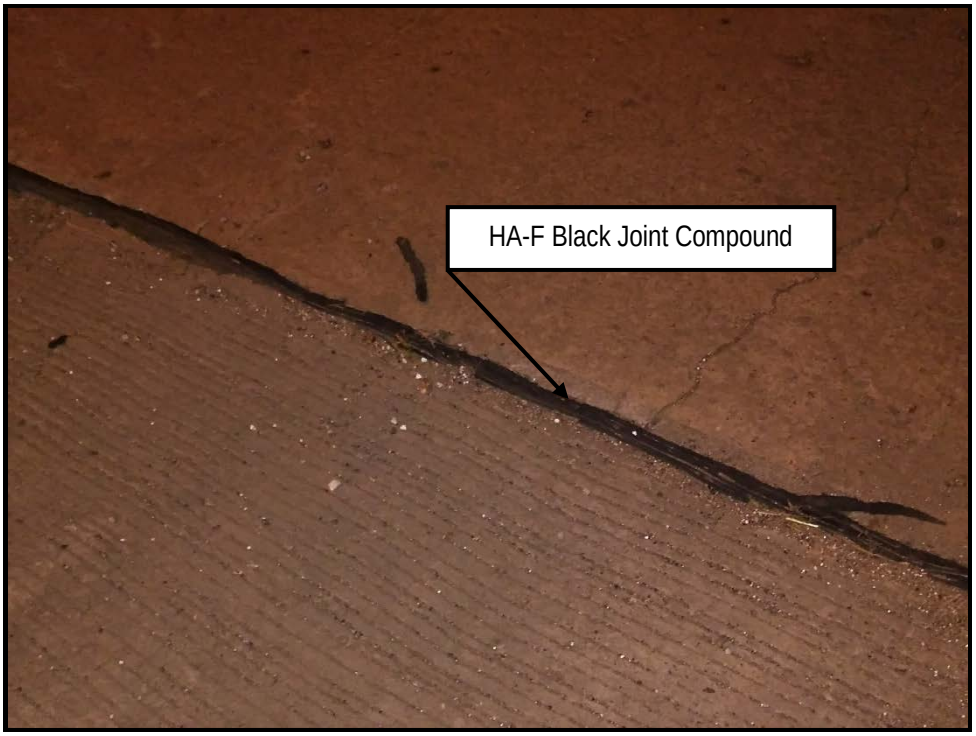


Photo 6: View of HA-F on the eastbound I-440 bridge over Lealand Lane

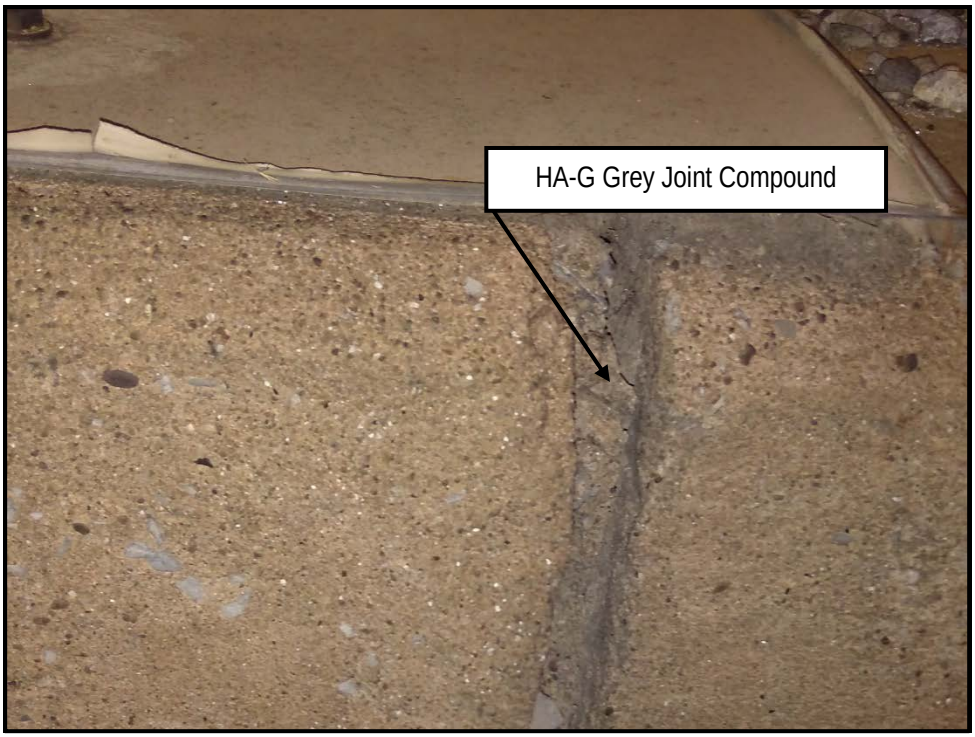


Photo 7: View of HA-G on the eastbound I-440 bridge over Lealand Lane

Photo 8: View of HA-H on the eastbound I-440 bridge over Lealand Lane

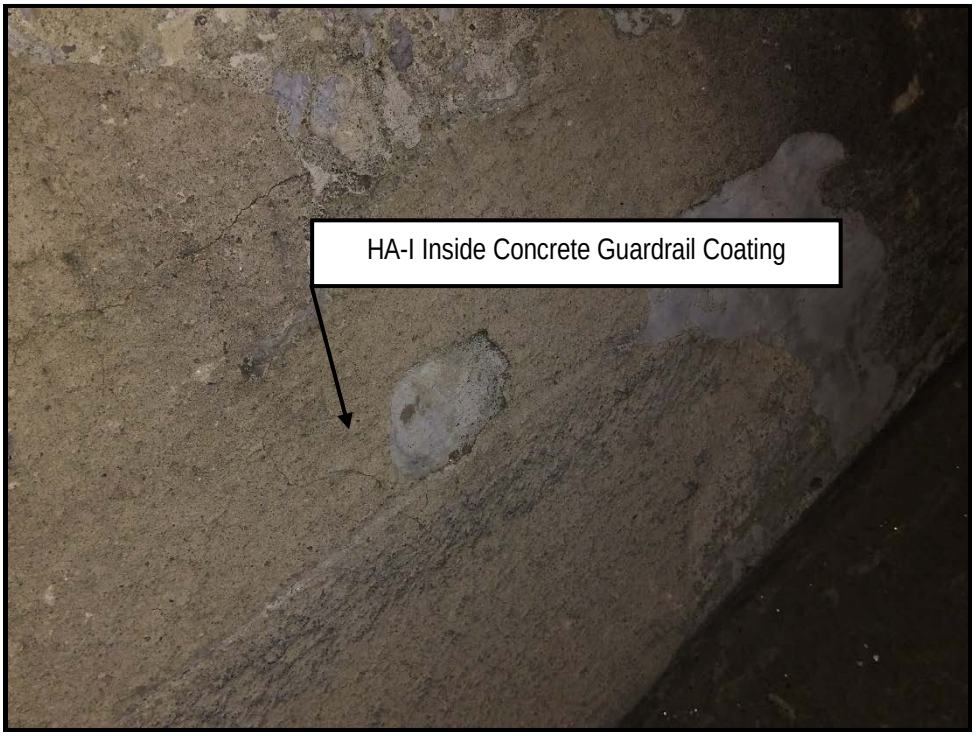


Photo 9: View of HA-I on the eastbound I-440 bridge over Lealand Lane

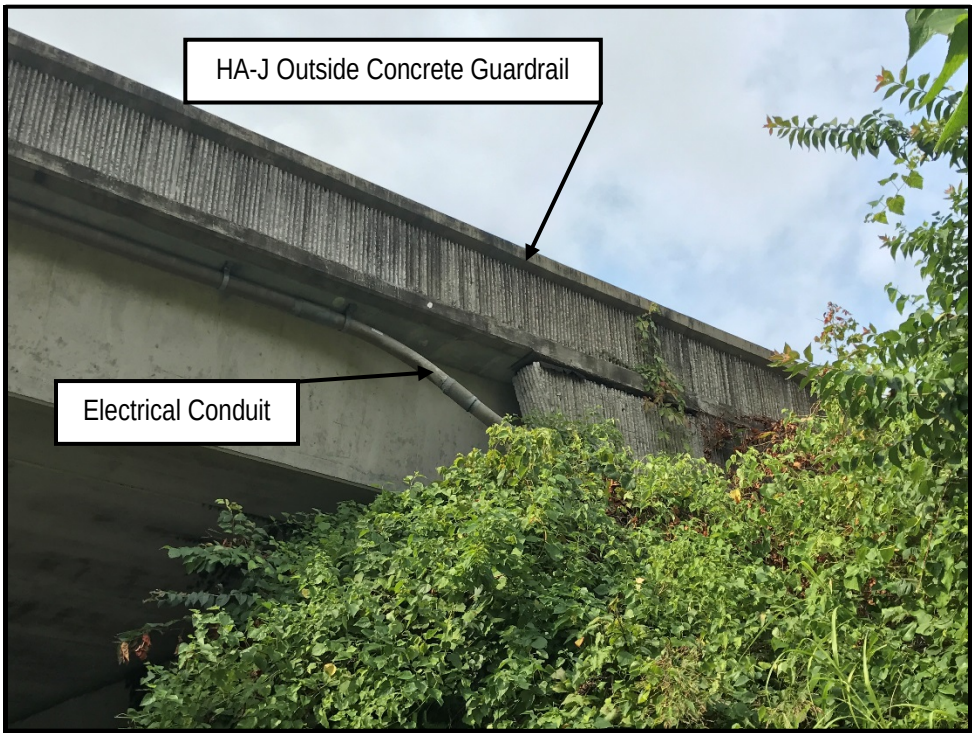


Photo 10: View of HA-J and electrical conduit on the eastbound I-440 bridge over Lealand Lane

APPENDIX B:
ASBESTOS SAMPLE LABORATORY ANALYSIS DATA

EMSL Analytical, Inc.

706 Gralin Street Kernersville, NC 27284

Tel/Fax: (336) 992-1025 / (336) 992-4175

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

EMSL Order:	021705922
Customer ID:	KSWA77
Customer PO:	
Project ID:	

Attention:	James Dye	**Phone:**	(615) 255-9702
	K.S. Ware LLC	**Fax:**	(615) 256-5873
	54 Lindsley Avenue	**Received Date:**	09/18/2017 8:30 AM
	Nashville, TN 37210	**Analysis Date:**	09/18/2017
		Collected Date:	08/17/2017
Project:	100-17-0050 Lealand EB		

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

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
LE-01-Coating *021705922-0001*	Concrete Abutments w/ Coating	Gray/Silver Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (Other)	None Detected
LE-01-Concrete *021705922-0001A*	Concrete Abutments w/ Coating	Gray/Tan Non-Fibrous Homogeneous	<1% Cellulose	25% Quartz 5% Ca Carbonate 70% Non-fibrous (Other)	None Detected
LE-02-Coating *021705922-0002*	Concrete Abutments w/ Coating	Gray Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (Other)	None Detected
LE-02-Concrete *021705922-0002A*	Concrete Abutments w/ Coating	Gray/Tan Non-Fibrous Homogeneous	<1% Cellulose	25% Quartz 5% Ca Carbonate 70% Non-fibrous (Other)	None Detected
LE-03-Coating *021705922-0003*	Concrete Abutments w/ Coating	Gray Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (Other)	None Detected
LE-03-Concrete *021705922-0003A*	Concrete Abutments w/ Coating	Brown/Gray/Tan Non-Fibrous Heterogeneous		20% Quartz 5% Ca Carbonate 75% Non-fibrous (Other)	None Detected
LE-04 *021705922-0004*	Concrete Box Beams	Gray/Tan Non-Fibrous Homogeneous		25% Quartz 5% Ca Carbonate 70% Non-fibrous (Other)	None Detected
LE-05 *021705922-0005*	Concrete Box Beams	Gray/Tan Non-Fibrous Homogeneous	<1% Cellulose	25% Quartz 5% Ca Carbonate 70% Non-fibrous (Other)	None Detected
LE-06 *021705922-0006*	Concrete Box Beams	Gray/Tan Non-Fibrous Homogeneous	<1% Cellulose	20% Quartz 5% Ca Carbonate 75% Non-fibrous (Other)	None Detected
LE-07 *021705922-0007*	Abutment Padding	Brown/Black Fibrous Homogeneous	60% Cellulose	40% Non-fibrous (Other)	None Detected
LE-08 *021705922-0008*	Abutment Padding	Black Fibrous Homogeneous	60% Cellulose	40% Non-fibrous (Other)	None Detected
LE-09 *021705922-0009*	Abutment Padding	Brown/Black Fibrous Homogeneous	60% Cellulose	40% Non-fibrous (Other)	None Detected
LE-10 *021705922-0010*	Concrete Decking	Gray/Tan Non-Fibrous Homogeneous	<1% Cellulose	25% Quartz 5% Ca Carbonate 70% Non-fibrous (Other)	None Detected
LE-11 *021705922-0011*	Concrete Decking	Gray Non-Fibrous Homogeneous		25% Quartz 5% Ca Carbonate 70% Non-fibrous (Other)	None Detected
LE-12 *021705922-0012*	Concrete Decking	Brown/Gray/Tan Non-Fibrous Heterogeneous	<1% Cellulose	20% Quartz 5% Ca Carbonate 75% Non-fibrous (Other)	None Detected
LE-13 *021705922-0013*	Inside Concrete Guardrails	Gray/Tan Non-Fibrous Homogeneous	<1% Cellulose	30% Quartz 5% Ca Carbonate 65% Non-fibrous (Other)	None Detected

Initial report from: 09/19/2017 08:15:26

EMSL Analytical, Inc.
706 Gralin Street Kernersville, NC 27284
Tel/Fax: (336) 992-1025 / (336) 992-4175
http://www.EMSL.com / greensborolab@emsl.com

EMSL Order: 021705922
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

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
LE-14 *021705922-0014*	Inside Concrete Guardrails	Gray Non-Fibrous Homogeneous		25% Quartz 5% Ca Carbonate 70% Non-fibrous (Other)	None Detected
LE-15 *021705922-0015*	Inside Concrete Guardrails	Brown/Gray/Tan Non-Fibrous Heterogeneous	<1% Cellulose	25% Quartz 5% Ca Carbonate 70% Non-fibrous (Other)	None Detected
LE-16 *021705922-0016*	Black Joint Compound	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
LE-17 *021705922-0017*	Black Joint Compound	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
LE-18 *021705922-0018*	Black Joint Compound	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
LE-19 *021705922-0019*	Grey Joint Compound	Gray/Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
LE-20 *021705922-0020*	Grey Joint Compound	Gray/Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
LE-21 *021705922-0021*	Grey Joint Compound	White/Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
LE-22 *021705922-0022*	Metal Barrier Covering	Gray/Tan Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (Other)	None Detected
LE-23 *021705922-0023*	Metal Barrier Covering	Gray/Tan/Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
LE-24 *021705922-0024*	Metal Barrier Covering	Tan/Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
LE-25 *021705922-0025*	Inside Concrete Guardrail Coating	Gray/Tan Non-Fibrous Homogeneous	<1% Cellulose	25% Quartz 5% Ca Carbonate 70% Non-fibrous (Other)	None Detected
LE-26 *021705922-0026*	Inside Concrete Guardrail Coating	Gray Non-Fibrous Homogeneous	<1% Cellulose	15% Quartz 5% Ca Carbonate 80% Non-fibrous (Other)	None Detected
LE-27 *021705922-0027*	Inside Concrete Guardrail Coating	Brown/Gray/Tan Non-Fibrous Heterogeneous	<1% Cellulose	25% Quartz 5% Ca Carbonate 70% Non-fibrous (Other)	None Detected
LE-28 *021705922-0028*	Outside Concrete Guardrails	Gray/Tan Non-Fibrous Homogeneous	<1% Cellulose	25% Quartz 5% Ca Carbonate 70% Non-fibrous (Other)	None Detected
LE-29 *021705922-0029*	Outside Concrete Guardrails	Gray/Tan Non-Fibrous Homogeneous	<1% Cellulose	25% Quartz 5% Ca Carbonate 70% Non-fibrous (Other)	None Detected
LE-30 *021705922-0030*	Outside Concrete Guardrails	Brown/Gray/Tan Non-Fibrous Heterogeneous	<1% Cellulose	20% Quartz 5% Ca Carbonate 75% Non-fibrous (Other)	None Detected

Initial report from: 09/19/2017 08:15:26

EMSL Analytical, Inc.
706 Gralin Street Kernersville, NC 27284
Tel/Fax: (336) 992-1025 / (336) 992-4175
http://www.EMSL.com / greensborolab@emsl.com

EMSL Order:	021705922
Customer ID:	KSWA77
Customer PO:	
Project ID:	

Analyst(s)

Kristie Elliott (22)
Scott Combs (11)

Stephen Bennett, Laboratory Manager
or Other Approved Signatory

Initial report from: 09/19/2017 08:15:26

OrderID: 021705922

EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

Asbestos Bulk Building Material Chain of Custody

EMSL Order Number *(Lab Use Only)*: 5922

706 Gralin Street
Kernersville, NC 27284
PHONE: (336) 992-1025
FAX: (336) 992-4175

Company : K.S. Ware & Associates, LLC	**EMSL-Bill to:** ☐ Same ☑ Different If Bill to is Different note instructions in Comments** *Third Party Billing requires written authorization from third party*
Street: 54 Lindsley Ave	
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 Lealand EB	**Please Provide Results:** ☐ Fax ☑ Email ☐ Mail
U.S. State Samples Taken: TN	**CT Samples:** ☐ Commercial/Taxable ☐ 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
■ PLM EPA 600/R-93/116 (<1%)	☐ TEM EPA NOB – EPA 600/R-93/116 Section 2.5.5.1
☐ PLM EPA NOB (<1%)	☐ NY ELAP Method 198.4 (TEM)
Point Count ☐ 400 (<0.25%) ☐ 1000 (<0.1%)	☐ Chatfield Protocol (semi-quantitative)
Point Count w/Gravimetric ☐ 400 (<0.25%) ☐ 1000 (<0.1%)	☐ TEM % by Mass – EPA 600/R-93/116 Section 2.5.5.2
☐ NIOSH 9002 (<1%)	☐ TEM Qualitative via Filtration Prep Technique
☐ NY ELAP Method 198.1 (friable in NY)	☐ TEM Qualitative via Drop Mount Prep Technique
☐ NY ELAP Method 198.6 NOB (non-friable-NY)	**Other**
☐ OSHA ID-191 Modified	☐
☐ Standard Addition Method	

☐ **Check For Positive Stop – Clearly Identify Homogenous Group** **Date Sampled:** 8/10/2017 and 8/17/2017

Samplers Name: James Dye **Samplers Signature:** Jo Dye

Sample #	HA #	Sample Location	Material Description
LE-01	A	SE	Concrete Abutments with Coating
LE-02	A	NE	Concrete Abutments with Coating
LE-03	A	SW	Concrete Abutments with Coating
LE-04	B	West	Concrete Box Beams
LE-05	B	West	Concrete Box Beams
LE-06	B	West	Concrete Box Beams
LE-07	C	West	Abutment Padding
LE-08	C	West	Abutment Padding
LE-09	C	West	Abutment Padding
LE-10	D	SE	Concrete Decking

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

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

Received (Lab): [signature] **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

Please analyze layers separately on HA-A

OrderID: 021705922

EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

Asbestos Bulk Building Material Chain of Custody

EMSL Order Number *(Lab Use Only)*: 5922

706 Gralin Street
Kernersville, NC 27284
PHONE: (336) 992-1025
FAX: (336) 992-4175

Additional Pages of the Chain of Custody are only necessary if needed for additional sample information

Sample #	HA #	Sample Location	Material Description
LE-11	D	South	Concrete Decking
LE-12	D	SW	Concrete Decking
LE-13	E	SE	Inside Concrete Guardrails
LE-14	E	South	Inside Concrete Guardrails
LE-15	E	SW	Inside Concrete Guardrails
LE-16	F	SE	Black Joint Compound
LE-17	F	SE	Black Joint Compound
LE-18	F	SE	Black Joint Compound
LE-19	G	SE	Grey Joint Compound
LE-20	G	SE	Grey Joint Compound
LE-21	G	SE	Grey Joint Compound
LE-22	H	South	Metal Barrier Covering
LE-23	H	South	Metal Barrier Covering
LE-24	H	South	Metal Barrier Covering
LE-25	I	SE	Inside Concrete Guardrail Coating
LE-26	I	South	Inside Concrete Guardrail Coating
LE-27	I	SW	Inside Concrete Guardrail Coating
LE-28	J	SE	Outside Concrete Guardrails
LE-29	J	South	Outside Concrete Guardrails
LE-30	J	SW	Outside Concrete Guardrails

***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

Please analyze layers separately on HA-A

Page 2 of 2 pages

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 accreditted 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

James M Dye

DOB	Sex	HGT	WGT
16-Jan-1986	M	6' 2"	320

Discipline	Accreditation	Expiration
Inspector	A-[illegible]-56894	May-31-2018

Date Issued: 4/25/2017

Re-Accreditation

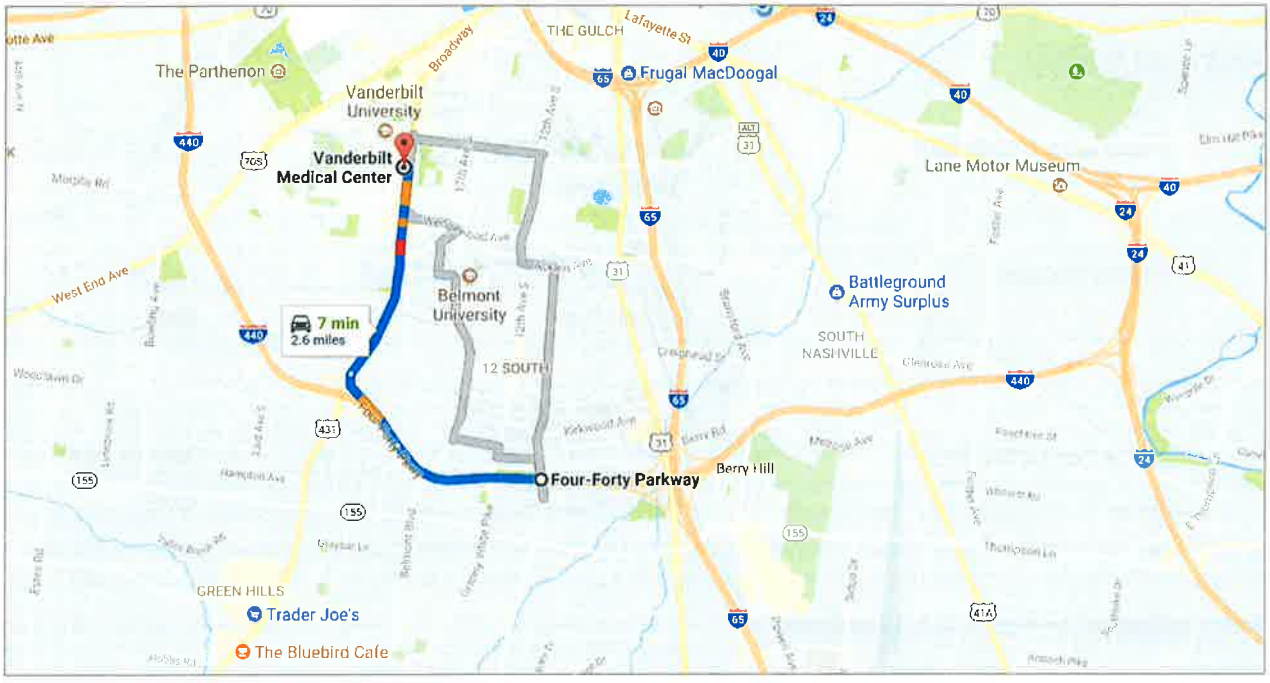
Asbestos Accreditation

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): James Dye

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:

Title	Name	Work	Mobile
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	Dates of Planned Field Activities
July 6, 2017	July/August 2017

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SECTION **PAGE**

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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 inlcude:

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 Nasvhille 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 Safey Coordinator will conduct site reconnaissance in order to 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 personal 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 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 McCrary		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. Electrocution, 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