

# Appendix L: Hazardous Materials Technical Report

## **State Route (SR) 170**

From SR-62 Interchange to SR-9 (US-25W)  
Anderson County, Tennessee

Tennessee Department of Transportation

TDOT PIN 124121.00

August 2025

TDOT Environmental Division  
James K. Polk Building, Suite 900  
505 Deaderick Street  
Nashville, Tennessee 37243  
(615) 741-3655

# Environmental Studies

## Hazardous Materials

# Environmental Studies Request

## Project Information

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**Route:** SR-170  
**Termini:** From SR-62 (Oak Ridge Highway) to SR-9 (US-25W, Clinton Highway)  
**County:** Anderson  
**PIN:** 124121.00

## Request

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**Request Type:** Initial Environmental Study  
**Project Plans:** Line and Grade  
**Date of Plans:** 03/05/2025 (124121.01) and 02/09/2025 (124121.02)  
**Location:** Link

## Certification

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**Requestor:** Ray Magsanoc  
**Title:** Senior Environmental Planner

**Signature:** Ray  
Magsanoc

Digitally signed by Ray  
Magsanoc  
Date: 2025.04.10  
12:38:27 -04'00'

# Environmental Study

## Technical Section

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**Section:** Hazardous Materials

## Study Results

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For PIN 124121.01, based on the Line and Grade Plans dated 5 March 2025, no known hazardous materials sites affect this project as it is currently planned, and no additional hazardous material studies are recommended at this time.

For PIN 124121.02, based on the Line and Grade Plans dated 9 February 2025, several known hazardous materials sites are adjacent to the project

Several UST facilities along the corridor including four current/former fuel stations.

1. Tract 22 is Facility #0010012, Bull Run Fossil Plant, Edgemoor Road. No proposed ROW, no anticipated impact to this facility.
2. Tract 51 is Facility #2010014, Edgemoor Marathon, 1060 Edgemoor Road. This facility appears to be negatively impacted by these plans. This is an active facility with four currently in use tanks. The dispensers and tank area are intersected by the ROW and proposed cut lines. Recommend additional take to clear this property of encroachments and conflicts.
3. Tract 56 is Facility #2010068, Foster's House of Bargains, 1002 Edgemoor Road. This is an inactive facility with three permanently out of use tanks that were removed from the ground in September 1996. No further action is recommended.
4. Tract 121 is Facility #2010011, Bread Box No. 33, 601 Edgemoor Road. This is an active facility with four currently in use and four permanently out of use tanks that were removed from the ground in March 2011. This site is listed by TDEC as a facility with an environmental related activity that occurred due to a tank closure, a suspected release, or a confirmed release. The case was closed when the tanks were removed from the ground. The proposed ROW impacts both the dispensers and tanks and this system will require complete removal and closure, as shown.

The Bull Run Fossil plant is listed in several EPA Envirofacts databases, but the proposed ROW adjacent to the current road is unlikely to be impacted. The SR-170 bridge over the Clinch River has already been surveyed for asbestos and asbestos was detected. Three culverts along the .02 corridor have been surveyed and no asbestos was detected. SR-162/SR-170 intersection bridges on the west end of the project are also positive but are outside the project corridor. The following project commitments have been submitted.

The Clinch River basin is listed with contaminated sediments by TDEC. This topic has been discussed during PDN meetings so that coordination with Geotech so that environmental samples can be collected during geotech drilling.

## Commitments

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**Did the study of this project result in any environmental commitments?**

**Yes**

PIN 124121.02

EDHZ001. An Asbestos Containing Material (ACM) survey was completed on Bridge No. 01S24740001, SR-170 over Clinch River, LM 2.58 (01-SR170-02.58). The bridge has asbestos in the vertical deck drains. There are approximately 576 transite deck drains (1152 linear feet) at 20% chrysotile and 2% crocidolite, Please see the report for further details and photographs.

EDHZ002. The State of Tennessee asbestos accreditation requirements (TDEC Rules Chapter 1200-01-20) mandates that ACM abatement work be performed by an accredited firm (contractor) using accredited abatement workers and supervisors. Abatement of this material should be accomplished per SP202ACM Special Provision Regarding Removal of Asbestos-Containing Materials. ACM abatement should be completed prior to any demolition activities if possible. Prior to the demolition or rehabilitation of any structure (bridge or building), the contractor is required to submit the National Emission Standards for Hazardous Air Pollutants standard 10-day notice of demolition to the TDEC Division of Air Pollution Control (per TDOT Standard Specifications for Road and Bridge Construction (January 1, 2021) Sections 107.08 D and 202.03).

EDHZ003. Asbestos Containing Material (ACM) surveys were completed on the following bridges and no ACM was detected. Please see the reports for further details and photographs. Bridge No. 01CULV08007 SR-170 over Branch LM 3.70 (01-SR170-03.70) Bridge No. 01CULV08011 SR-170 over Branch LM 4.60 (01-SR170-04.60) Bridge No. 01CULV08015 SR-170 over Branch LM 5.96 (01-SR170-05.98) No special accommodations for demolition and waste disposal are anticipated for these structures and the material can be deposited in a C&D landfill. Prior to the demolition or rehabilitation of any structure (bridge or building), the contractor is required to submit the National Emission Standards for Hazardous Air Pollutants standard 10-day notice of demolition to the TDEC Division of Air Pollution Control (per TDOT Standard Specifications for Road and Bridge Construction (January 1, 2021) Sections 107.08 D and 202.03).

## Additional Information

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Is there any additional information or material included with this study?

No

## Certification

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**Responder:** Kyle Kirschenmann

**Title:** Statewide Technical Specialist

**Signature:**



Digitally signed by Kyle Kirschenmann  
Date: 2025.04.14 08:56:33 -04'00'



## TENNESSEE DEPARTMENT OF TRANSPORTATION ASBESTOS SURVEY REPORT

SR-170 Over Branch, LM 3.70  
Bridge 01CULV08007 (01-SR170-03.70)  
Anderson County  
TDOT Project No.: 01024-0222-04, PIN: 124121.00



TriAD Project No. 18-TDOT74-01

Prepared by



ENVIRONMENTAL CONSULTANTS

09/01/20

*David Espy Mike Baker*

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David Espy and Mike Baker  
Tennessee Asbestos Inspector Accreditation No: A-I-55949-88102  
Tennessee Asbestos Inspector Accreditation No: A-I-119004-77823

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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 by TriAD Environmental Consultants, Inc., (TriAD) in accordance with the requirements of the State of Tennessee, Department of Transportation Environmental Division (TDOT), Hazardous Materials Section.

### **1.1 TDOT Bridge Identification**

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

Bridge Number: 01CULV08007

Termini: SR-170 from SR-62 (Oak Ridge Highway) to SR-9 (US-25W, Clinton Highway)

TDOT PE-N: 01024-0222-04

TDOT PIN: 124121.00

County: Anderson

### **1.2 Bridge Description**

Bridge Number 01CULV08007 is located on SR-170 over Branch at LM 3.70 in Anderson County, Tennessee. The bridge is a 7-foot, two-lane, single-span bridge constructed of a concrete frame culvert. The date the bridge was constructed is unknown. The location of the bridge is provided on the Bridge Vicinity Map in Figure 1.

## **2.0 ACM ASSESSMENT**

Observed suspect ACM were categorized by homogeneous areas (HA), which are materials that appear similar throughout in terms of color, texture, and application date. Suspect ACM for each HA were physically assessed for friability and condition of material. Random samples of suspect ACM were collected from designated HAs and submitted to an accredited laboratory for analysis. The laboratory results of the ACM sampling are

included in Appendix A. Photographs showing the locations of the HAs are provided in Figure 2. Photographs of the HAs that were sampled are included in Appendix B.

## **2.1 Inspection Personnel**

The sampling and field activities were performed on August 12, 2020, by Mr. David Espy and Mr. Mike Baker, Accredited State of Tennessee Asbestos Inspectors, with TriAD. Copies of Mr. Espy's, Mr. Baker's, and TriAD's current accreditation from the State of Tennessee are included in Appendix C. This work was completed in accordance with TriAD's Health and Safety Plan and Job Safety Analysis (JSA). A copy of the JSA and the cover page for the Health and Safety Plan is included in Appendix D.

## **2.2 Visual Survey**

The inspection began with a walk-through and visual survey of the bridge. The visual survey consisted of:

- Locating and confirming the structure to be sampled
- Sketching the structure and/or verifying the plans provided
- Taking general photos of the structure
- Locating and identifying suspect ACM to be sampled
- Determining accessible locations to collect samples

## **2.3 ACM Sampling of Bridge Components**

Suspect ACM was sampled in accordance with United States Environmental Protection Agency (USEPA) regulation 40 CFR 61, Subpart M, National Emission Standards for Hazardous Air Pollutants (NESHAP) and in general conformance with the protocols as outlined in USEPA regulation 40 CFR 763 Asbestos Hazard Emergency Response Act (AHERA). TriAD personnel made reasonable effort during the performance of this survey to identify suspect ACM which may be encountered during future demolition or renovation activities. Suspect ACM samples collected for analysis were obtained by minimal

destructive sampling techniques. Possible suspect ACM located in voids or concealed areas which were not accessible during the survey process are not included as part of this report. Should suspect materials other than those identified in this report be discovered during demolition or renovation activities, these materials should be assumed asbestos containing until laboratory confirmation of the presence or absence of asbestos content is made. Below is a list of the HAs that were sampled:

<b>Table 1: Homogeneous Areas</b>	
HA-01	Abutment
HA-02	Wing Wall
HA-03	Culvert Base
HA-04	Bottom of Decking
HA-05	Weep Hole Pipe
HA-06	Decking Header
HA-07	Wing Wall Header

Individual sample numbers show the HA number plus the unique sample designation. For example, sample HA-02-05 was collected from HA-02 and is the fifth sample of the total sample set from the bridge.

### **2.3.1 HA-01 Abutment**

The abutments are made of concrete. Three samples were collected from this HA. A hammer and chisel were used to collect these samples.

### **2.3.2 HA-02 Wing Wall**

The wing walls are made of concrete. Three samples were collected from this HA. A hammer and chisel were used to collect these samples.

### **2.3.3 HA-03 Culvert Base**

The culvert base is made of concrete. Three samples were collected from this HA. A hammer and chisel were used to collect these samples.

### **2.3.4 HA-04 Bottom of Decking**

The bottom of the decking is made of concrete. Three samples were collected from this HA. A hammer and chisel were used to collect these samples.

### **2.3.5 HA-05 Weep Hole Pipe**

The weep hole pipes are made of concrete. Three samples were collected from this HA. A hammer and chisel were used to collect these samples.

### **2.3.6 HA-06 Decking Header**

The decking headers are made of concrete. Three samples were collected from this HA. A hammer and chisel were used to collect these samples.

### **2.3.7 HA-07 Wing Wall Header**

The wing wall headers are made of concrete. Three samples were collected from this HA. A hammer and chisel were used to collect these samples.

### **2.3.8 Utility Components**

There were no utility conduits attached to this bridge.

### **2.3.9 Bridge Drainage System**

There are 24 approximate 4-inch diameter weep holes installed through the abutments of the bridge. The weep holes are lined with cementitious piping. The weep hole pipes were sampled and identified as HA-05.

### **3.0 ANALYTICAL PROCEDURES**

The bulk samples were analyzed in the laboratory using Polarized Light Microscopy (PLM) coupled with dispersion staining (USEPA Method 600/R-93/116). PLM is an asbestos analytical method which identifies the specific asbestos minerals by their unique optical properties. The optical properties are a result of the mineral's chemical composition, physical atomic structure, and visual morphology. This is the USEPA-recommended method of analysis for asbestos identification in bulk samples.

The bulk samples collected for this inspection were analyzed by Frost Environmental Services, LLC, a laboratory that has received certification from the American Industrial Hygiene Association Laboratory Accreditation Program (Laboratory identification number 198214).

### **4.0 REGULATORY OVERVIEW**

#### **4.1 National Emission Standards for Hazardous Air Pollutants**

The USEPA's NESHAP regulations 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.

## 4.2 Definitions

Significant definitions related to regulation of asbestos under NESHAP regulations include:

**Friable ACM** is defined by the Asbestos NESHAP, as any material containing more than one percent (1%) asbestos as determined using the method specified in Appendix A, Subpart F, 40 CFR Part 763, Section 1, PLM, that, when dry, can be crumbled, pulverized or reduced to powder by hand pressure. (40 CFR 61.141)

**Non-friable ACM** is any material containing more than one percent (1%) asbestos as determined using the method specified in Appendix A, Subpart F, 40 CFR Part 763, Section 1, PLM, that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure. USEPA also defines two categories of non-friable ACM, Category I and Category II non-friable ACM, which are described as follows:

**Category I non-friable ACM** is any asbestos-containing packing, gasket, resilient floor covering or asphalt roofing product which contains more than one percent (1%) asbestos as determined using PLM according to the method specified in Appendix A, Subpart F, 40 CFR Part 763. (40 CFR 61.141)

**Category II non-friable ACM** is any material, excluding Category I non-friable ACM, containing more than one percent (1%) asbestos as determined using PLM according to the methods specified in Appendix A, Subpart F, 40 CFR Part 763 that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure. (40 CFR 61.141)

**Regulated Asbestos-Containing Material (RACM)** is (a) friable asbestos material, (b) Category I non-friable ACM that has become friable, (c) Category I non-friable ACM that will be or has been subjected to sanding, grinding, cutting or abrading, or (d) 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.

**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 OF ASBESTOS BULK SAMPLE ANALYSIS**

A total of 21 samples were obtained from the bridge. Multiple samples of each HA were collected in accordance with TDOT requirements and delivered to the laboratory for visual observation and microscopic analysis. The samples were selected based on HAs of suspect materials, as described in Section 2.0.

Based on the analytical results, none of the sampled materials contained asbestos. The analytical results of all the samples collected, along with the chain-of-custody records, are included in Appendix A. Photographs of examples of the HAs are included in Appendix B. A Bridge Vicinity Map is provided as Figure 1. A profile of the bridge with homogenous area sample locations is depicted on Figure 2.

## **6.0 QUALIFICATIONS**

This report has been prepared on behalf of and exclusively for TDOT. The information presented in this report 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, TriAD requests the opportunity to review the information, reassess the potential concerns, and modify opinions, if warranted. 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. Any party, other than TDOT, 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.

## Figures



FIGURE 1  
BRIDGE VICINITY MAP

PIN NO.: 124121.00  
 SR-170 OVER BRANCH, LM 3.70  
 BRIDGE NO.: 01CULV08007  
 ANDERSON COUNTY, TENNESSEE

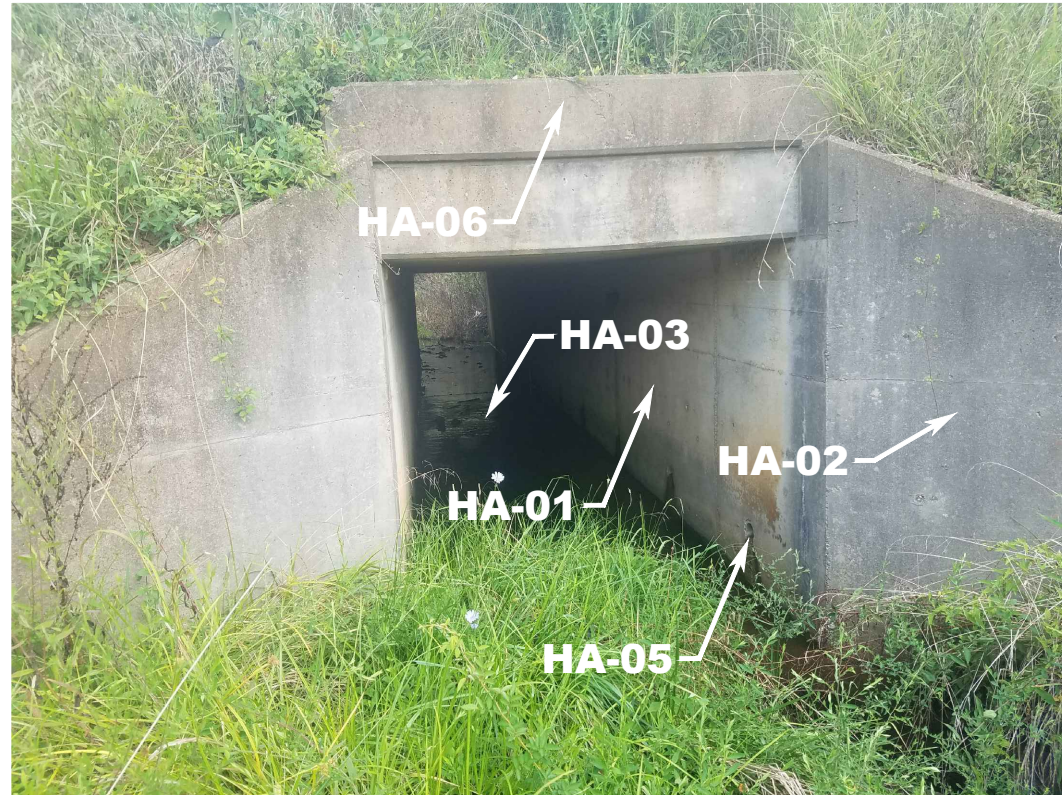
SCALE: N.T.S.	DR	CHK	REV
	ALW	DME	JMP

PREPARED BY:



PROJ: 18-TD074-01	DATE: 08/27/20	SHEET 1 OF 1
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C:\DRAWINGS\DAVID\18-TDOT74-01\CULVERT 8007.dwg ANDERSON-CO 8007.dwg SAVED: 8/28/2020 12:24 PM BY: AWATTS



HOMOGENEOUS AREAS

- HA-01 – ABUTMENT
- HA-02 – WING WALL
- HA-03 – CULVERT BASE
- HA-04 – BOTTOM OF DECKING
- HA-05 – WEEP HOLE PIPE
- HA-06 – DECKING HEADER
- HA-07 – WING WALL HEADER

NOTE

HOMOGENEOUS AREA SAMPLE LOCATIONS ARE GENERALIZED; ACTUAL SAMPLES WERE COLLECTED FROM RANDOM LOCATIONS ACROSS THE STRUCTURE.

**FIGURE 2**  
**HOMOGENEOUS AREAS**

PIN NO.: 124121.00  
SR-170 OVER BRANCH, LM 3.70  
BRIDGE NO.: 01CULV08007  
ANDERSON COUNTY, TENNESSEE

SCALE: N.T.S.	DR ALW	CHK DME	REV JMP
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PREPARED BY:



**Triad** ENVIRONMENTAL CONSULTANTS, INC.  
Suite 200, 207 Donelson Pike, Nashville, TN 37214  
615-889-6888 fax 615-889-4004

**Appendix A:**  
**Laboratory Analysis Report**

# FROST ENVIRONMENTAL SERVICES, LLC

339 ROCKLAND ROAD, SUITE E, HENDERSONVILLE, TENNESSEE 37075

(615) 562-2669 office - (615) 473-9047 cell - email: lab@frostenvironmental.com



## POLARIZED LIGHT MICROSCOPY (PLM) LABORATORY ANALYSIS REPORT (EPA/600/R-93/116 (JUNE 1993))

CLIENT: Triad

Date Received: 8/13/2020

PROJECT: Bridge#01CULV08007

Date Analyzed: 8/13/2020

LOCATION: Anderson Co.

Date Reported: 8/13/2020

ANALYST: Codi Maddox

*Codi Maddox*

Sample Number	Location	Material Description	Binder (Non-Fibrous) Material	Non-Asbestos Fiber	Asbestos Type & Percent
HA-01-01	Abutment	Tan Cementitious Material	100	None Detected	None Detected
HA-01-02	Abutment	Tan Cementitious Material	100	None Detected	None Detected
HA-01-03	Abutment	Tan Cementitious Material	100	None Detected	None Detected
HA-02-04	Wing Wall	Tan Cementitious Material	100	None Detected	None Detected
HA-02-05	Wing Wall	Tan Cementitious Material	100	None Detected	None Detected
HA-02-06	Wing Wall	Tan Cementitious Material	100	None Detected	None Detected
HA-03-07	Culvert Base	Grey & Tan Cementitious Material	100	None Detected	None Detected
HA-03-08	Culvert Base	Grey & Tan Cementitious Material	100	None Detected	None Detected
HA-03-09	Culvert Base	Grey & Tan Cementitious Material	100	None Detected	None Detected
HA-04-10	Bottom of Decking	Tan Cementitious Material	100	None Detected	None Detected
HA-04-11	Bottom of Decking	Tan Cementitious Material	100	None Detected	None Detected
HA-04-12	Bottom of Decking	Tan Cementitious Material	100	None Detected	None Detected
HA-05-13	Weep Hole Pipe	Tan Cementitious Material	100	None Detected	None Detected
HA-05-14	Weep Hole Pipe	Tan Cementitious Material	100	None Detected	None Detected
HA-05-15	Weep Hole Pipe	Tan Cementitious Material	100	None Detected	None Detected

Asbestos Containing Material (ACM) is defined as any material containing more than one percent asbestos.

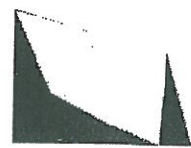
Analysis was performed using EPA/600/R-93/116 (June 1993)), Test Method for the Determination of Asebstos in Bulk Building Materials.



# FROST ENVIRONMENTAL SERVICES, LLC

339 Rockland Road Suite E, Hendersonville, Tennessee 37075

(615) 562-2669 office • (615)-473-9047 cell • email info@frostenvironmental.com



## CHAIN OF CUSTODY

Report To: David Espy

PROJECT: Anderson Co. Bridges R-TDOT 74-01

Company: TriAD Environmental Consultants

Address: 207 Doreen Pike

Nashville, TN 37214

Bridge No. 01CULV08007

PROJECT LOCATION: Anderson County

Phone: (615) 347-0516

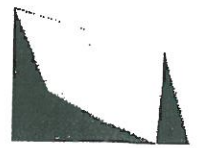
Email: despy@triadenv.com

Turnaround Time Requested:  2-3 Hour  Same Day  24 Hour  2-3 Day

Sample Number	Date Collected	Location	Analysis Requested	Volume
HA-01-01	08/12/2020	abutment	PLM	
HA-01-02	u	u	u	
HA-01-03	u	u	u	
HA-02-04	u	wing wall	u	
HA-02-05	u	u	u	
HA-02-06	u	u	u	
HA-03-07	u	culvert base	u	
HA-03-08	u	u	u	
HA-03-09	u	u	u	
HA-04-10	u	bottom of decking	u	
HA-04-11	u	u	u	
HA-04-12	u	u	u	
HA-05-13	u	weep hole pipe	u	
HA-05-14	u	u	u	
HA-05-15	u	u	u	

RELINQUISHED BY: David Espy  
DATE: 08/13/2020

RECEIVED AT LAB BY: Cardi Maddox  
DATE: 8-13-20



**CHAIN OF CUSTODY**

PROJECT: Anderson Co. Bridges 18-TDOT 74-01  
Bridge No. 01CULV08007

PROJECT LOCATION: Anderson County

Report To: David Espy  
 Company: TriAD Environmental Consultants  
 Address: 207 Danelson Pike  
Nashville, TN 37214  
 Phone: (615) 347-0516  
 Email: despy@triadenv.com

Turnaround Time Requested:  2-3 Hour  Same Day  24 Hour  2-3 Day

Sample Number	Date Collected	Location	Analysis Requested	Volume
HA-06-16	08/12/2020	decking header	PLM	
HA-06-17	"	"	"	
HA-06-18	"	"	"	
HA-07-19	"	wing wall header	"	
HA-07-20	"	"	"	
HA-07-21	"	"	"	
—	—	—	—	—
—	—	—	—	—
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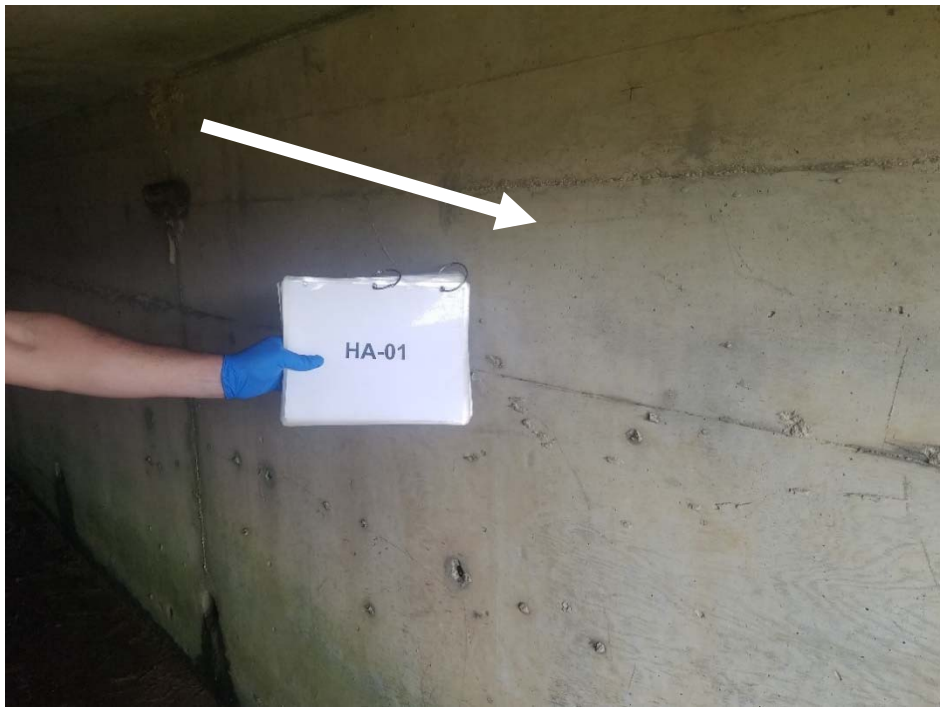
RELINQUISHED BY: David Espy  
 DATE: 08/13/2020

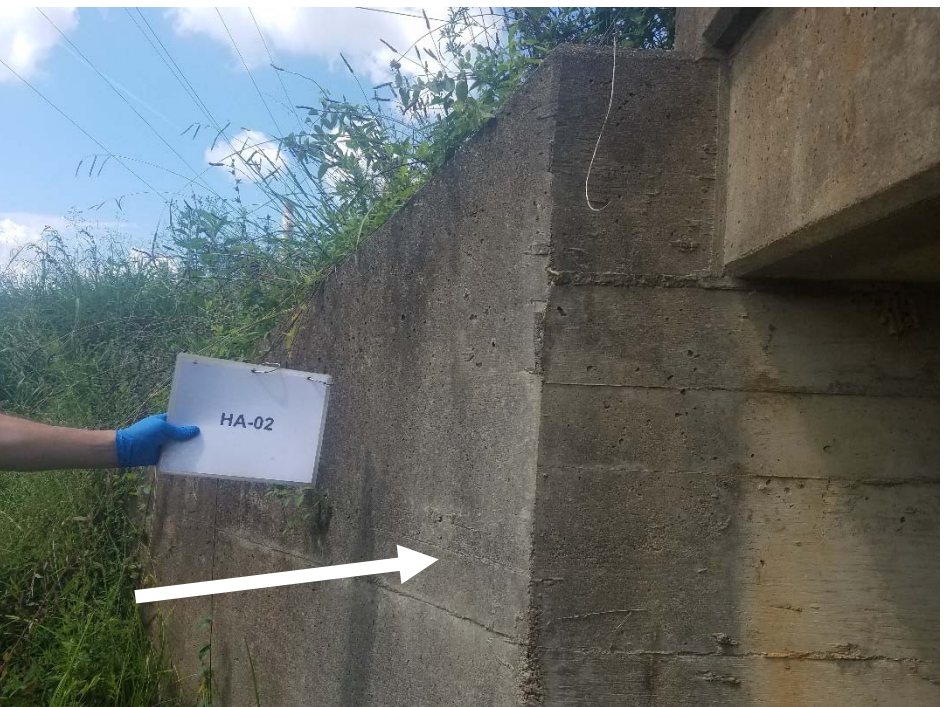
RECEIVED AT LAB BY: \_\_\_\_\_  
 DATE: \_\_\_\_\_


**Appendix B:**  
**Asbestos Sampling Photographs**


<p><b>Photographer:</b> Mike Baker</p>	
<p><b>Date:</b> 08/12/2020</p>	
<p><b>Description:</b> Photograph 1 – South Side of Culvert Facing North</p>	

<p><b>Photographer:</b> Mike Baker</p>	
<p><b>Date:</b> 08/12/2020</p>	
<p><b>Description:</b> Photograph 2 – Inside Culvert</p>	

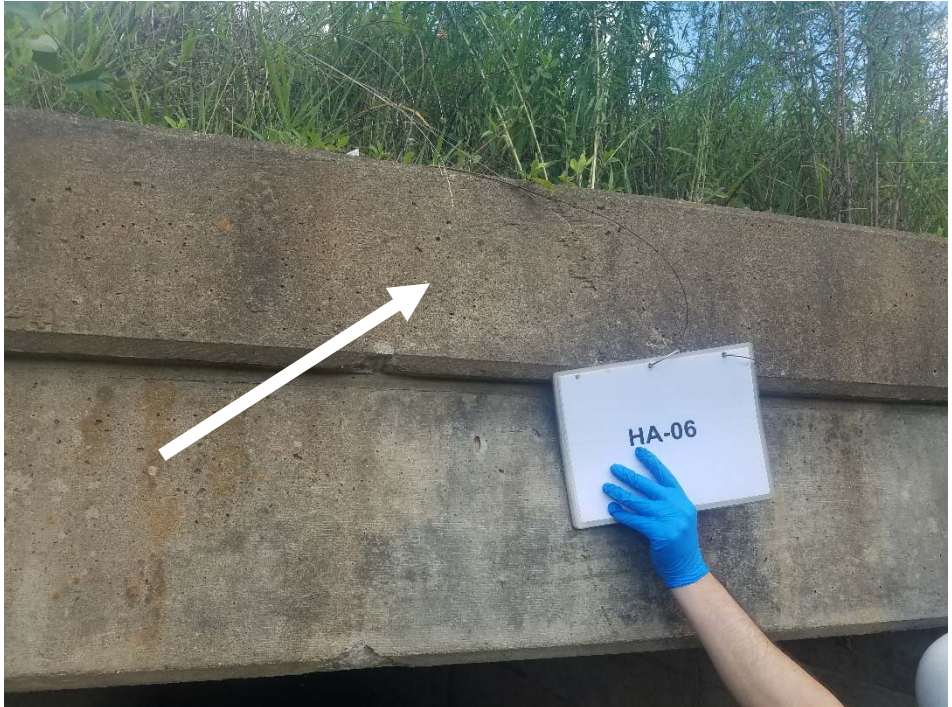
<b>Photographer:</b> Mike Baker	
<b>Date:</b> 08/12/2020	
<b>Description:</b> Photograph 3 – HA-01 Abutment	

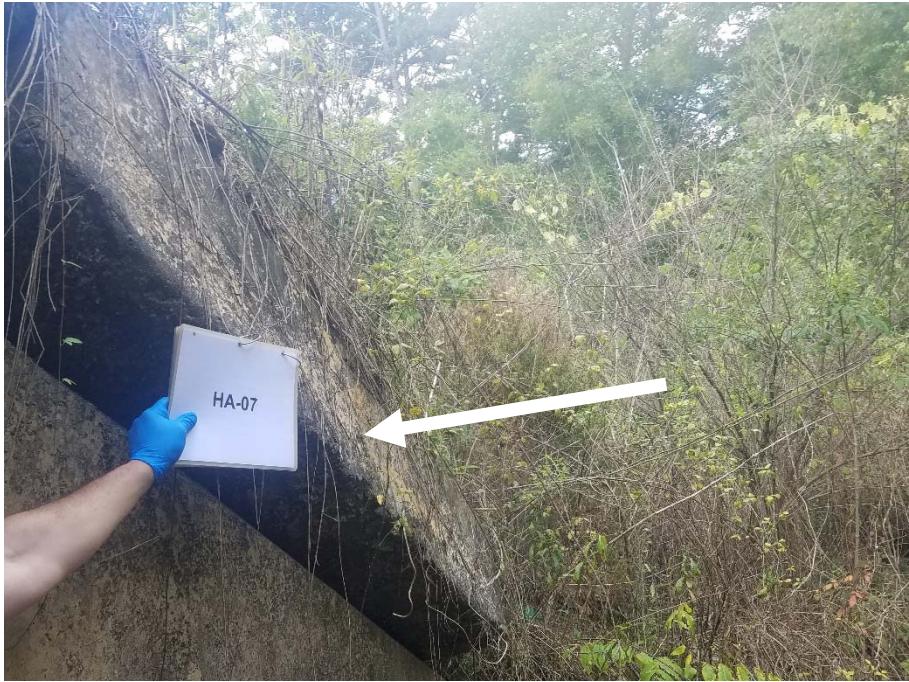
<b>Photographer:</b> Mike Baker	
<b>Date:</b> 08/12/2020	
<b>Description:</b> Photograph 4 – HA-02 Wing Wall	


<p><b>Photographer:</b> Mike Baker</p>	
<p><b>Date:</b> 08/12/2020</p>	
<p><b>Description:</b> Photograph 5 – HA-03 Culvert Base</p>	

<p><b>Photographer:</b> Mike Baker</p>	
<p><b>Date:</b> 08/12/2020</p>	
<p><b>Description:</b> Photograph 6 – HA-04 Bottom of Decking</p>	

<p><b>Photographer:</b> Mike Baker</p>	
<p><b>Date:</b> 08/12/2020</p>	
<p><b>Description:</b> Photograph 7 – HA-05 Weep Hole Pipe</p>	

<p><b>Photographer:</b> Mike Baker</p>	
<p><b>Date:</b> 08/12/2020</p>	
<p><b>Description:</b> Photograph 8 – HA-06 Decking Header</p>	

<p><b>Photographer:</b> Mike Baker</p>	
<p><b>Date:</b> 08/12/2020</p>	
<p><b>Description:</b> Photograph 9 – HA-07 Wing Wall Header</p>	

<p><b>Photographer:</b> Mike Baker</p>	
<p><b>Date:</b> 08/12/2020</p>	
<p><b>Description:</b> Photograph 10 – Weep Hole</p>	

**Appendix C:**  
**Asbestos Inspection Credentials**



# 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:**

## TriAD Environmental Consultants

207 Donelson Pike Ste. 200 Nashville TN, 37214

**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-5195-90837	July 01, 2020	July 31, 2021

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

This **7th** Day of **July 2020**

Division of Solid Waste Management  
Toxic Substance Program

CN-1324 (Rev 6/13)

RD A-3020

# THE STATE OF TENNESSEE

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

62777-57991



Date Issued: 6/24/2020

Re-Accreditation

## David M Espy

DOB Sex HGT WGT

Discipline	Accreditation	Expiration
Inspector	A-I-55949-88102	May-31-2021
Management Planner	A-MP-55949-88103	May-31-2021
Project Monitor	A-PM-55949-83274	Jan-31-2021

## Asbestos Accreditation

# THE STATE OF TENNESSEE

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

111273-49108

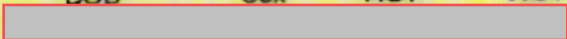


Date Issued: 8/27/19

Re-Accreditation

## Michael B Baker

DOB Sex HGT WGT



Discipline	Accreditation	Expiration
Inspector	A-I-119004-77823	Aug-31-2020

### Asbestos Accreditation

**Appendix D:**  
**Health and Safety Plan and JSA**

**HEALTH AND SAFETY PLAN**  
**TDOT PROJECT No. 01024-0222-04**

Project Locations: Bridge No.: 01CULV08007; 01CULV08011; 01CULV08015

Project Description: Asbestos Surveys

Project Date: 8/12/20

TDOT PIN: 124121.00

Project Personnel:

<b>Title</b>	<b>Organization</b>	<b>Name</b>	<b>Phone Number</b>
Project Manager – TDOT (TDOT PM)	Tennessee Dept. of Transportation	Kyle Kirschenmann	615-598-1522
Project Manager – TriAD (TriAD PM)	TriAD Environmental Consultants, Inc.	Jeff Postell	615-889-6888 615-417-8050
Project Safety and Health Manager (SHM)	TriAD Environmental Consultants, Inc.	Chris Scott	615-889-6888 615-417-6154
Site Safety and Health Officer (SSO)	TriAD Environmental Consultants, Inc.	David Espy	615-889-6888 229-347-0516
Emergency Coordinator (EC)	TriAD Environmental Consultants, Inc.	David Espy	615-889-6888 229-347-0516
OSHA Hotline			(800) 321-OSHA

Nearest Hospital: Methodist Medical Center Emergency Room, Oak Ridge, Tennessee

Hospital Phone Number: (865) 835-1000

Map to Hospital: See Attached Page

Health and Safety Plan: See Following Pages

# SAFE WORK PERMIT- JSA AND DAILY FIELD REPORT

Site Name/ Work: Anderson Co. Bridges 18-TDOT74-01

Date: 08/12/2020

Time Permit Issued/Work Started:

10:30 AM / PM

Permit Expires/work stopped:

1:00 AM PM

Issued To: David Espy

Job Description:

Asbestos Survey

Weather: Partly cloudy 80's

## Section: 2 EMERGENCY PLANNING: DISCUSSION AT JOB SITE OR SAFETY TAILGATE MEETING

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> Site Contact:  | <input checked="" type="checkbox"/> Emergency Phone: <b>911</b>                                |
| <input checked="" type="checkbox"/> Evacuation Routes  | <input checked="" type="checkbox"/> Alt. Site Emergency Phone: (865)835-1000 Methodist M.C. ER |
| <input checked="" type="checkbox"/> Staging Area   | <input checked="" type="checkbox"/> First Aid/ CPR Trained                                     |
| <input checked="" type="checkbox"/> Emergency Equipment Needed (Retrieval; SCBA; Radio; etc) | <input checked="" type="checkbox"/> Rescue Procedures Discussion                               |

Additional Comments: **See Map to Hospital and Health and Safety Plan**

## Section: 3 JOB SAFETY ANALYSIS

### JOB STEPS / WORK ACTIVITIES

### HAZARDS (LIST)

1. Asbestos Survey	3,5,6,8,11,12,13,15,17
2.	
3.	
4.	
5.	
6.	
7.	
8.	

SUPERVISOR SIGNATURE:

### POTENTIAL HAZARDS

- |                             |                              |                                     |                           |
|-----------------------------|------------------------------|-------------------------------------|---------------------------|
| 1. Fire / Explosion         | 5. Strain / Sprain           | 9. Thermal Burn                     | 13. Chemical Contact      |
| 2. Pinch Points / Caught In | 6. Struck By/Traffic Hazards | 10. Overhead Work                   | 14. Asphyxiation          |
| 3. Slip / Trip / Fall       | 7. Noise                     | 11. Temperature Extremes            | 15. Biological Contact    |
| 4. Electric Shock           | 8. Cut / Laceration          | 12. Inhalation (Dust/ Vapor/ Fumes) | 16. Key Procedure Applies |
| 17. Asbestos Exposure       | 18. Other: (Specify)         | 19. Other: (Specify)                |                           |

### HAZARD MITIGATION For Corresponding Job Step

- |  |   |
|--|---|
| 1. Wear proper PPE                           | 6. Ensure good footing and clear egress/ingress |
| 2. Understand the work plan                  | 7. Practice good housekeeping                   |
| 3. No solo lifting of greater than 50 pounds | 8. Use proper tools for the task                |
| 4. Maintain awareness of surroundings        | 9. No smoking                                   |
| 5. Place Warning Signs                       | 10. Other: (Specify)                            |

### JOB HAZARD REMINDERS (Check All That Apply)

Equipment Operation	Ergonomics/Exposures	Conditions	Other
<input checked="" type="checkbox"/> Motor Vehicle Operation	<input checked="" type="checkbox"/> Body Positioning	<input checked="" type="checkbox"/> Walking Surfaces	<input type="checkbox"/> Extension Cords / <b>GFCI</b>
<input type="checkbox"/> Ladders	<input checked="" type="checkbox"/> Cramped Conditions	<input type="checkbox"/> Water Hazards	<input type="checkbox"/> Housekeeping
<input type="checkbox"/> Heavy Equipment	<input type="checkbox"/> Elevated Work	<input checked="" type="checkbox"/> Sharp Edges	<input type="checkbox"/> Barricades
<input type="checkbox"/> Overhead Obstructions <u>mark</u>	<input type="checkbox"/> Heavy Lifting	<input type="checkbox"/> Lighting	<input type="checkbox"/> Adverse Weather
<input type="checkbox"/> Underground Utilities <u>mark</u>	<input checked="" type="checkbox"/> Heat Stress/Cold Stress	<input type="checkbox"/> Overhead Work	<input type="checkbox"/> Other
<input checked="" type="checkbox"/> Site Conditions (Slope, Stability)	<input checked="" type="checkbox"/> Physical Exertion	<input checked="" type="checkbox"/> Hand & Power Tools	<input type="checkbox"/>
<input type="checkbox"/> Equipment Fueling	<input checked="" type="checkbox"/> Repetitive Motion	<input type="checkbox"/> Hot / Cold Liquids / Surfaces	<input type="checkbox"/>
<input checked="" type="checkbox"/> Road Hazards <u>use spotters</u>	<input type="checkbox"/> Suitability for Work	<input type="checkbox"/> Other	<input type="checkbox"/>
<input type="checkbox"/> Man Lifts	<input checked="" type="checkbox"/> Communications	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Other (Specify)	<input checked="" type="checkbox"/> Training	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/> Other	<input type="checkbox"/>	<input type="checkbox"/>

### PPE REQUIREMENTS

Minimum: Hard Hat, Safety Vest, Safety Glasses, Steel Toed Shoes, Long Pants, Sleeved Shirt

Other PPE Req'd: **Gloves, Resp.**

### HES EQUIPMENT

Fire Extinguisher:	Y / N / <b>N/R</b>	Spill Response Mat'l.	Y / N / <b>N/R</b>
Eyewash/Shower	Y / N / <b>N/R</b>	Air Monitoring:	Y / N / <b>N/R</b>
First Aid Kit	<b>Y</b> / N / N/R	Other:	

SECTION 4

KEY PROCEDURES

CONTROL OF HAZARDOUS ENERGY (LOCKOUT/ TAGOUT) Needed  Not Needed

Individual Lockout  Group Lockout

Group Primary Authorized Employee: \_\_\_\_\_

Attach Lockout List or Machine Specific Procedure

HOT WORK PERMIT Needed  Not Needed

Type of Hot Work: Burning  Welding  Grinding  Fire Watch Req'd.?  YES  NO

Hot Work Permit Used: Client Permit  Contractor Permit

ELEVATED WORK OR EXCAVATION / TRENCH WORK

Personnel Working <3 Ft below ground level or > 6 Ft. Above Lower Level?  YES  NO

Protected By: Guardrail System:  Personal Fall Arrest System:  Other (Specify):

Section: 5

PERMIT-APPROVALS / EMPLOYEE SIGNATURES

Signatures approve only work conducted under the requirements of this permit

Supervisor: David Espy

Date: 08/12/2020

Employee(s) /Contractor(s) Names (print): I have reviewed and understand and will follow all conditions of this completed permit and its attachments. I will report hazardous conditions identified on this job site to my supervisor and/or designee for necessary corrections.

1) <u>David Espy</u>	6)
2) <u>Mike Baker</u>	7)
3)	8)
4)	9)
5)	10)

Section: 6

MEET and GREET Job Site Awareness

Visitors and Additional Personnel) Names (print): All employees, visitors and contractors entering the area affected by this permit must meet and exchange information on the scope of work, hazards involved and intentions for the day. All persons on job sites must be aware of all work and the presence of all other persons on the site. Those not authorized on this permit above must list their name below acknowledging awareness of the task authorized by this permit. A representative, such as a contractor foreman, may acknowledge for the group.

Print Name and Company/Organization

1)	
2)	
3)	
4)	
5)	
6)	
7)	
8)	
9)	
10)	

Section: 7

JOB COMPLETE OR PERMIT CLOSED

Signature verifies closure of permit and completion of items checked below.

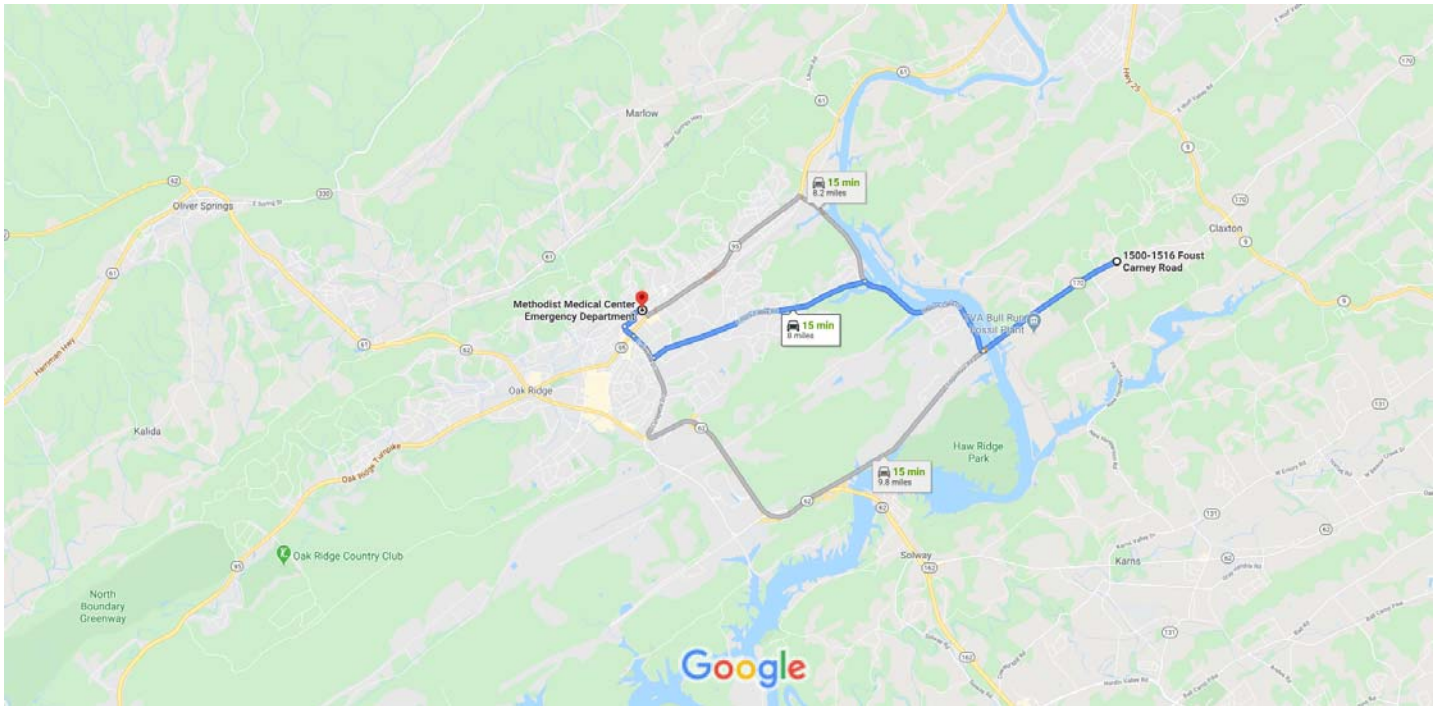
Job Complete

Job Not Complete

Review work area to verify job site clean-up and safe condition

Supervisor: David Espy

Time: 1:00 pm



Map data ©2020 Google 1 mi

### 1500-1516 Foust Carney Rd

Clinton, TN 37716

#### Follow TN-170 W/Edgemoor Rd, Melton Lake Dr and Emory Valley Rd to New York Ave in Oak Ridge

11 min (7.4 mi)

- ↑ 1. Head southwest on TN-170 W/Edgemoor Rd toward Royal St  
2.1 mi
- ↗ 2. Turn right onto Melton Lake Dr  
2.0 mi
- ↖ 3. Turn left onto Emory Valley Rd  
2.9 mi
- ↗ 4. Turn right onto Lafayette Dr  
0.4 mi

#### Continue on New York Ave to your destination

3 min (0.6 mi)

- ↑ 5. Continue onto New York Ave  
0.2 mi
- ↗ 6. Turn right onto E Vance Rd  
0.2 mi

- ↩ 7. Turn left onto Vermont Ave  
----- 331 ft
- ➡ 8. Turn right onto Tennenson Rd  
----- 0.1 mi
- ➡ 9. Turn right  
    *i* Destination will be on the right  
----- 89 ft

## Methodist Medical Center Emergency Department

990 Oak Ridge Turnpike, Oak Ridge, TN 37830

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.



## TENNESSEE DEPARTMENT OF TRANSPORTATION ASBESTOS SURVEY REPORT

SR-170 Over Branch, LM 4.60  
Bridge 01CULV08011 (01-SR170-04.60)  
Anderson County  
TDOT Project No.: 01024-0222-04, PIN: 124121.00



TriAD Project No. 18-TDOT74-01

Prepared by



ENVIRONMENTAL CONSULTANTS

09/01/20

*David Espy Mike Baker*

---

David Espy and Mike Baker  
Tennessee Asbestos Inspector Accreditation No: A-I-55949-88102  
Tennessee Asbestos Inspector Accreditation No: A-I-119004-77823

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Appendix B: Asbestos Sampling Photographs	
Appendix C: Asbestos Inspection Credentials	
Appendix D: Health and Safety Plan and JSA	

## **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 by TriAD Environmental Consultants, Inc., (TriAD) in accordance with the requirements of the State of Tennessee, Department of Transportation Environmental Division (TDOT), Hazardous Materials Section.

### **1.1 TDOT Bridge Identification**

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

Bridge Number: 01CULV08011

Termini: SR-170 from SR-62 (Oak Ridge Highway) to SR-9 (US-25W, Clinton Highway)

TDOT PE-N: 01024-0222-04

TDOT PIN: 124121.00

County: Anderson

### **1.2 Bridge Description**

Bridge Number 01CULV08011 is located on SR-170 over Branch at LM 4.60 in Anderson County, Tennessee. The bridge is a 9-foot, two-lane, single-span bridge constructed of a concrete frame culvert. The date the bridge was constructed is unknown. The location of the bridge is provided on the Bridge Vicinity Map in Figure 1.

## **2.0 ACM ASSESSMENT**

Observed suspect ACM were categorized by homogeneous areas (HA), which are materials that appear similar throughout in terms of color, texture, and application date. Suspect ACM for each HA were physically assessed for friability and condition of material. Random samples of suspect ACM were collected from designated HAs and submitted to an accredited laboratory for analysis. The laboratory results of the ACM sampling are

included in Appendix A. Photographs showing the locations of the HAs are provided in Figure 2. Photographs of the HAs that were sampled are included in Appendix B.

## **2.1 Inspection Personnel**

The sampling and field activities were performed on August 12, 2020, by Mr. David Espy and Mr. Mike Baker, Accredited State of Tennessee Asbestos Inspectors, with TriAD. Copies of Mr. Espy's, Mr. Baker's, and TriAD's current accreditation from the State of Tennessee are included in Appendix C. This work was completed in accordance with TriAD's Health and Safety Plan and Job Safety Analysis (JSA). A copy of the JSA and the cover page for the Health and Safety Plan is included in Appendix D.

## **2.2 Visual Survey**

The inspection began with a walk-through and visual survey of the bridge. The visual survey consisted of:

- Locating and confirming the structure to be sampled
- Sketching the structure and/or verifying the plans provided
- Taking general photos of the structure
- Locating and identifying suspect ACM to be sampled
- Determining accessible locations to collect samples

## **2.3 ACM Sampling of Bridge Components**

Suspect ACM was sampled in accordance with United States Environmental Protection Agency (USEPA) regulation 40 CFR 61, Subpart M, National Emission Standards for Hazardous Air Pollutants (NESHAP) and in general conformance with the protocols as outlined in USEPA regulation 40 CFR 763 Asbestos Hazard Emergency Response Act (AHERA). TriAD personnel made reasonable effort during the performance of this survey to identify suspect ACM which may be encountered during future demolition or renovation activities. Suspect ACM samples collected for analysis were obtained by minimal

destructive sampling techniques. Possible suspect ACM located in voids or concealed areas which were not accessible during the survey process are not included as part of this report. Should suspect materials other than those identified in this report be discovered during demolition or renovation activities, these materials should be assumed asbestos containing until laboratory confirmation of the presence or absence of asbestos content is made. Below is a list of the HAs that were sampled:

<b>Table 1: Homogeneous Areas</b>	
HA-01	Weep Hole Pipe
HA-02	Culvert Base
HA-03	Wing Wall
HA-04	Decking Header
HA-05	Abutment
HA-06	Bottom of Decking

Individual sample numbers show the HA number plus the unique sample designation. For example, sample HA-02-05 was collected from HA-02 and is the fifth sample of the total sample set from the bridge.

### **2.3.1 HA-01 Weep Hole Pipe**

The weep hole pipes are made of concrete. Three samples were collected from this HA. A hammer and chisel were used to collect these samples.

### **2.3.2 HA-02 Culvert Base**

The culvert base is made of concrete. Three samples were collected from this HA. A hammer and chisel were used to collect these samples.

### **2.3.3 HA-03 Wing Wall**

The wing walls are made of concrete. Three samples were collected from this HA. A hammer and chisel were used to collect these samples.

### **2.3.4 HA-04 Decking Header**

The decking headers are made of concrete. Three samples were collected from this HA. A hammer and chisel were used to collect these samples.

### **2.3.5 HA-05 Abutment**

The abutments are made of concrete. Three samples were collected from this HA. A hammer and chisel were used to collect these samples.

### **2.3.6 HA-06 Bottom of Decking**

The bottom of decking is made of concrete. Three samples were collected from this HA. A hammer and chisel were used to collect these samples.

### **2.3.7 Utility Components**

There was a steel conduit running along the bottom of the culvert. No suspect ACM was associated with the conduit.

### **2.3.8 Bridge Drainage System**

There are 24 approximate 4-inch diameter weep holes installed through the abutments of the bridge. The weep holes are lined with cementitious piping. The weep hole pipes were sampled and identified as HA-01.

## **3.0 ANALYTICAL PROCEDURES**

The bulk samples were analyzed in the laboratory using Polarized Light Microscopy (PLM) coupled with dispersion staining (USEPA Method 600/R-93/116). PLM is an asbestos analytical method which identifies the specific asbestos minerals by their unique

optical properties. The optical properties are a result of the mineral's chemical composition, physical atomic structure, and visual morphology. This is the USEPA-recommended method of analysis for asbestos identification in bulk samples.

The bulk samples collected for this inspection were analyzed by Frost Environmental Services, LLC, a laboratory that has received certification from the American Industrial Hygiene Association Laboratory Accreditation Program (Laboratory identification number 198214).

## **4.0 REGULATORY OVERVIEW**

### **4.1 National Emission Standards for Hazardous Air Pollutants**

The USEPA's NESHAP regulations 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.

### **4.2 Definitions**

Significant definitions related to regulation of asbestos under NESHAP regulations include:

**Friable ACM** is defined by the Asbestos NESHAP, as any material containing more than one percent (1%) asbestos as determined using the method specified in Appendix A, Subpart F, 40 CFR Part 763, Section 1, PLM, that, when dry, can be crumbled, pulverized or reduced to powder by hand pressure. (40 CFR 61.141)

**Non-friable ACM** is any material containing more than one percent (1%) asbestos as determined using the method specified in Appendix A, Subpart F, 40 CFR Part 763, Section 1, PLM, that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure. USEPA also defines two categories of non-friable ACM, Category I and Category II non-friable ACM, which are described as follows:

**Category I non-friable ACM** is any asbestos-containing packing, gasket, resilient floor covering or asphalt roofing product which contains more than one percent (1%) asbestos as determined using PLM according to the method specified in Appendix A, Subpart F, 40 CFR Part 763. (40 CFR 61.141)

**Category II non-friable ACM** is any material, excluding Category I non-friable ACM, containing more than one percent (1%) asbestos as determined using PLM according to the methods specified in Appendix A, Subpart F, 40 CFR Part 763 that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure. (40 CFR 61.141)

**Regulated Asbestos-Containing Material (RACM)** is (a) friable asbestos material, (b) Category I non-friable ACM that has become friable, (c) Category I non-friable ACM that will be or has been subjected to sanding, grinding, cutting or abrading, or (d) 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.

**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 OF ASBESTOS BULK SAMPLE ANALYSIS**

A total of 18 samples were obtained from the bridge. Multiple samples of each HA were collected in accordance with TDOT requirements and delivered to the laboratory for visual observation and microscopic analysis. The samples were selected based on HAs of suspect materials, as described in Section 2.0.

Based on the analytical results, none of the sampled materials contained asbestos. The analytical results of all the samples collected, along with the chain-of-custody records, are included in Appendix A. Photographs of examples of the HAs are included in Appendix B. A Bridge Vicinity Map is provided as Figure 1. A profile of the bridge with homogenous area sample locations is depicted on Figure 2.

## **6.0 QUALIFICATIONS**

This report has been prepared on behalf of and exclusively for TDOT. The information presented in this report 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, TriAD requests the opportunity to review the information, reassess the potential concerns, and modify opinions, if warranted. 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. Any party, other than TDOT, 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.

## Figures

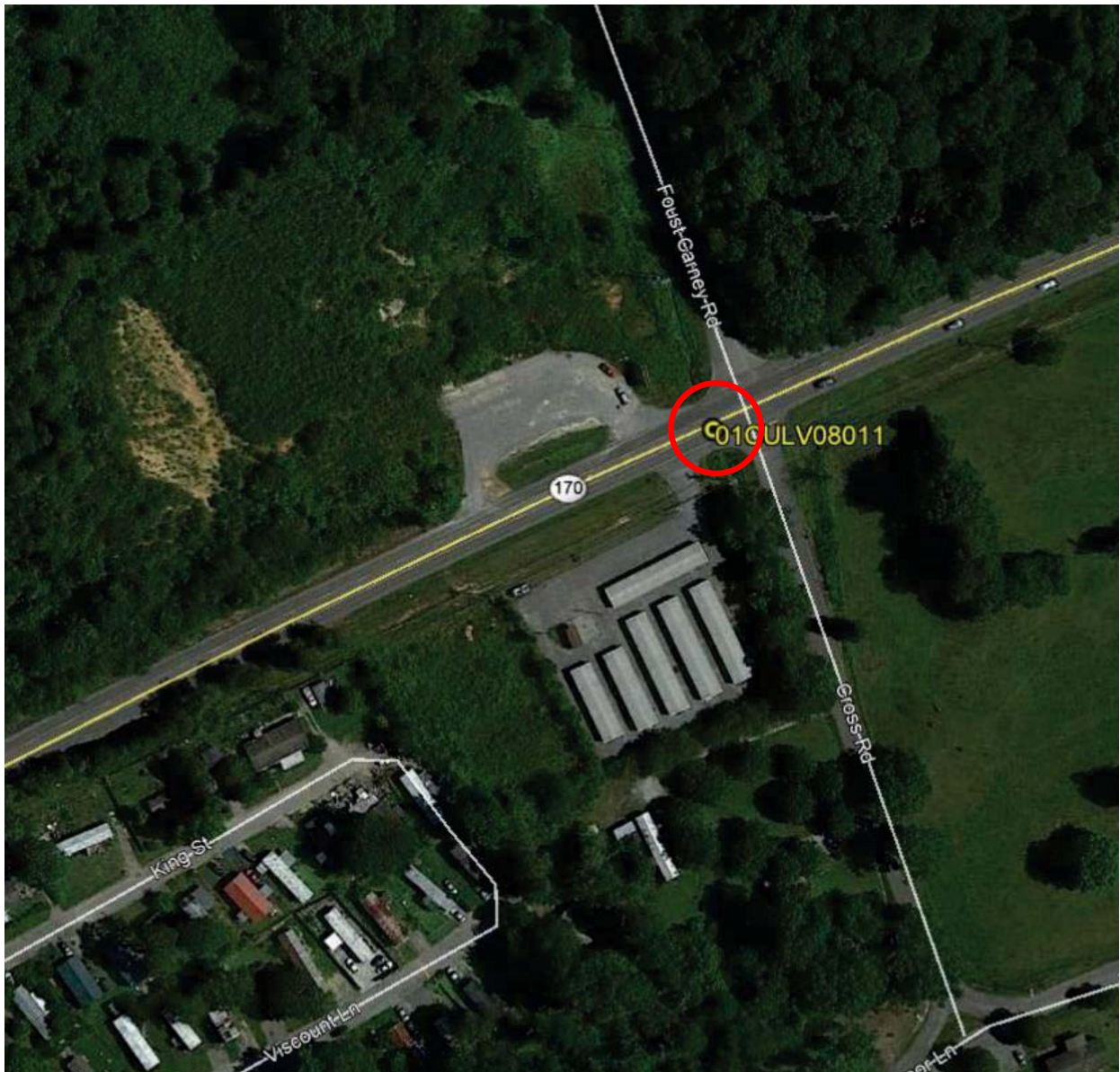


FIGURE 1  
BRIDGE VICINITY MAP

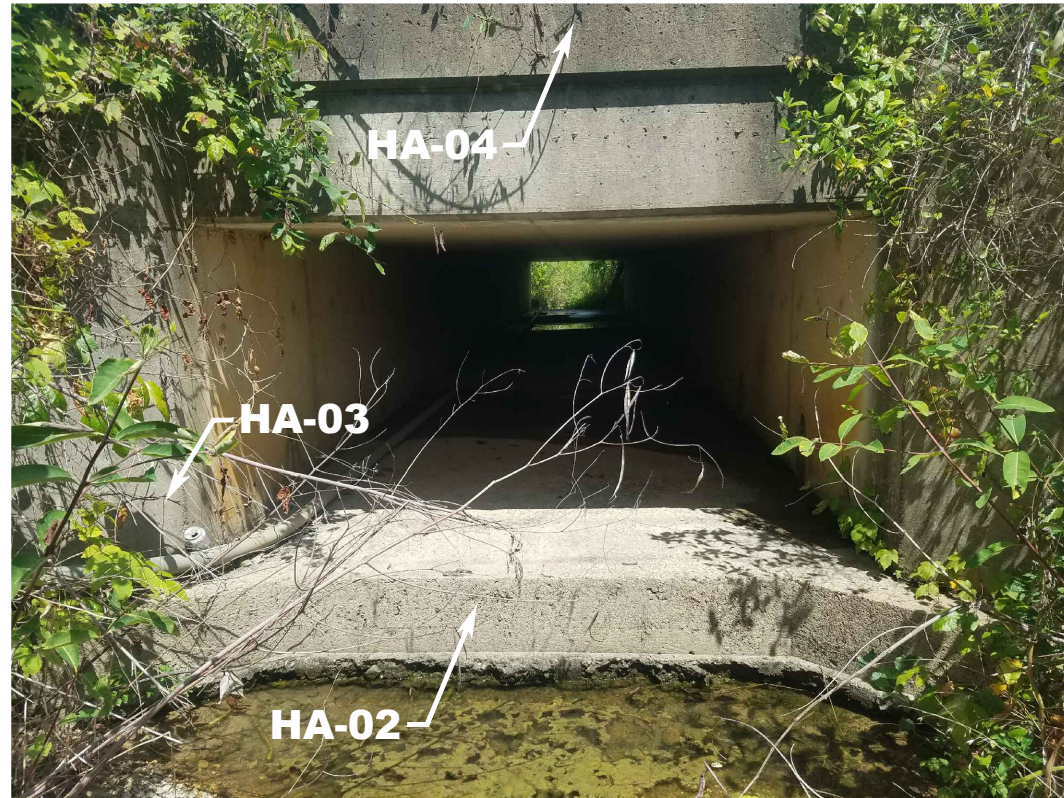
PIN NO.: 124121.00  
 SR-170 OVER BRANCH, LM 4.60  
 BRIDGE NO.: 01CULV08011  
 ANDERSON COUNTY, TENNESSEE

SCALE: N.T.S.	DR	ALW	CHK	DME	REV	JMP
---------------	----	-----	-----	-----	-----	-----

PREPARED BY:



PROJ: 18-TDOT74-01	DATE: 08/27/20	SHEET 1 OF 1
--------------------	----------------	--------------



HOMOGENEOUS AREAS

- HA-01 – WEEP HOLE PIPE
- HA-02 – CULVERT BASE
- HA-03 – WING WALL
- HA-04 – DECKING HEADER
- HA-05 – ABUTMENT
- HA-06 – BOTTOM OF DECKING

NOTE

HOMOGENEOUS AREA SAMPLE LOCATIONS ARE GENERALIZED; ACTUAL SAMPLES WERE COLLECTED FROM RANDOM LOCATIONS ACROSS THE STRUCTURE.

**FIGURE 2**  
**HOMOGENEOUS AREAS**

PIN NO.: 124121.00  
SR-170 OVER BRANCH, LM 4.60  
BRIDGE NO.: 01CULV08011  
ANDERSON COUNTY, TENNESSEE

SCALE: N.T.S.	DR ALW	CHK DME	REV JMP
---------------	--------	---------	---------

PREPARED BY:



PROJ: 18-TDOT74-01 | DATE: 08/27/20 | SHEET 1 OF 1

**Appendix A:**  
**Laboratory Analysis Report**

# FROST ENVIRONMENTAL SERVICES, LLC

339 ROCKLAND ROAD, SUITE E, HENDERSONVILLE, TENNESSEE 37075

(615) 562-2669 office - (615) 473-9047 cell - email: lab@frostenvironmental.com



## POLARIZED LIGHT MICROSCOPY (PLM) LABORATORY ANALYSIS REPORT (EPA/600/R-93/116 (JUNE 1993))

CLIENT: Triad

Date Received: 8/13/2020

PROJECT: Bridge#01CULV08011

Date Analyzed: 8/13/2020

LOCATION: Anderson Co.

Date Reported: 8/13/2020

ANALYST: Codi Maddox

*Codi Maddox*

Sample Number	Location	Material Description	Binder (Non-Fibrous) Material	Non-Asbestos Fiber	Asbestos Type & Percent
HA-01-01	Weep Hole Pipe	Grey Cementitious Material	100	None Detected	None Detected
HA-01-02	Weep Hole Pipe	Grey Cementitious Material	100	None Detected	None Detected
HA-01-03	Weep Hole Pipe	Grey Cementitious Material	100	None Detected	None Detected
HA-02-04	Culvert Base	Grey & Tan Cementitious Material	100	None Detected	None Detected
HA-02-05	Culvert Base	Grey & Tan Cementitious Material	100	None Detected	None Detected
HA-02-06	Culvert Base	Grey & Tan Cementitious Material	100	None Detected	None Detected
HA-03-07	Wing Wall	Grey & Tan Cementitious Material	100	None Detected	None Detected
HA-03-08	Wing Wall	Grey & Tan Cementitious Material	100	None Detected	None Detected
HA-03-09	Wing Wall	Grey & Tan Cementitious Material	100	None Detected	None Detected
HA-04-10	Decking Header	Grey & Tan Cementitious Material	100	None Detected	None Detected
HA-04-11	Bottom of Decking	Grey & Tan Cementitious Material	100	None Detected	None Detected
HA-04-12	Bottom of Decking	Grey & Tan Cementitious Material	100	None Detected	None Detected
HA-05-13	Abutment	Grey & Tan Cementitious Material	100	None Detected	None Detected
HA-05-14	Abutment	Grey & Tan Cementitious Material	100	None Detected	None Detected
HA-05-15	Abutment	Grey & Tan Cementitious Material	100	None Detected	None Detected

Asbestos Containing Material (ACM) is defined as any material containing more than one percent asbestos.

Analysis was performed using EPA/600/R-93/116 (June 1993)), Test Method for the Determination of Asebstos in Bulk Building Materials.

# FROST ENVIRONMENTAL SERVICES, LLC

339 ROCKLAND ROAD, SUITE E, HENDERSONVILLE, TENNESSEE 37075

(615) 562-2669 office - (615) 473-9047 cell - email: lab@frostenvironmental.com



## POLARIZED LIGHT MICROSCOPY (PLM) LABORATORY ANALYSIS REPORT (EPA/600/R-93/116 (JUNE 1993))

CLIENT: Triad

Date Received: 8/13/2020

PROJECT: Bridge#01CULV08011

Date Analyzed: 8/13/2020

LOCATION: Anderson Co.

Date Reported: 8/13/2020

ANALYST: Codi Maddox

*Codi Maddox*

Sample Number	Location	Material Description	Binder (Non-Fibrous) Material	Non-Asbestos Fiber	Asbestos Type & Percent
HA-06-16	Bottom of Decking	Grey & Tan Cementitious Material	100	None Detected	None Detected
HA-06-17	Bottom of Decking	Grey & Tan Cementitious Material	100	None Detected	None Detected
HA-06-18	Bottom of Decking	Grey & Tan Cementitious Material	100	None Detected	None Detected

Asbestos Containing Material (ACM) is defined as any material containing more than one percent asbestos. Analysis was performed using EPA/600/R-93/116 (June 1993)), Test Method for the Determination of Asebstos in Bulk Building Materials.



CHAIN OF CUSTODY

PROJECT: Anderson Co. Bridges 18-TDOT 74-01  
Bridge No. 01CULV08011  
 PROJECT LOCATION: Anderson County

Report To: David Espy  
 Company: Tri-AD Environmental Consultants  
 Address: 207 Donelson Pike  
Nashville, TN 37214  
 Phone: (629) 347-0516  
 Email: despy@triadenv.com

Turnaround Time Requested: \_\_\_ 2-3 Hour \_\_\_ Same Day \_\_\_ 24 Hour  2-3 Day

Sample Number	Date Collected	Location	Analysis Requested	Volume
HA-01-01	08/12/2020	weep hole pipe	PLM	
HA-01-02	"	"	"	
HA-01-03	"	"	"	
HA-02-04	"	culvert base	"	
HA-02-05	"	"	"	
HA-02-06	"	"	"	
HA-03-07	"	wing wall	"	
HA-03-08	"	"	"	
HA-03-09	"	"	"	
HA-04-10	"	decking header	"	
HA-04-11	"	"	"	
HA-04-12	"	"	"	
HA-05-13	"	abutment	"	
HA-05-14	"	"	"	
HA-05-15	"	"	"	

RELINQUISHED BY: David Espy  
 DATE: 08/13/2020

RECEIVED AT LAB BY: Cecili Maddox  
 DATE: 8-13-20



CHAIN OF CUSTODY

PROJECT: Anderson Co. Bridges 18-TDOT 74-01  
Bridge No. 01CULV08011  
 PROJECT LOCATION: Anderson County

Report To: David Espy  
 Company: TriAD Environmental Consultants  
 Address: 207 Donelson Pike  
Nashville, TN 37214  
 Phone: (629) 347-0516  
 Email: despy@triadenv.com

Turnaround Time Requested:  2-3 Hour  Same Day  24 Hour  2-3 Day

Sample Number	Date Collected	Location	Analysis Requested	Volume
HA-06-16	08/12/2020	bottom of decking	PLM	
HA-06-17	"	"	"	
HA-06-18	"	"	"	
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
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—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—
—	—	—	—	—

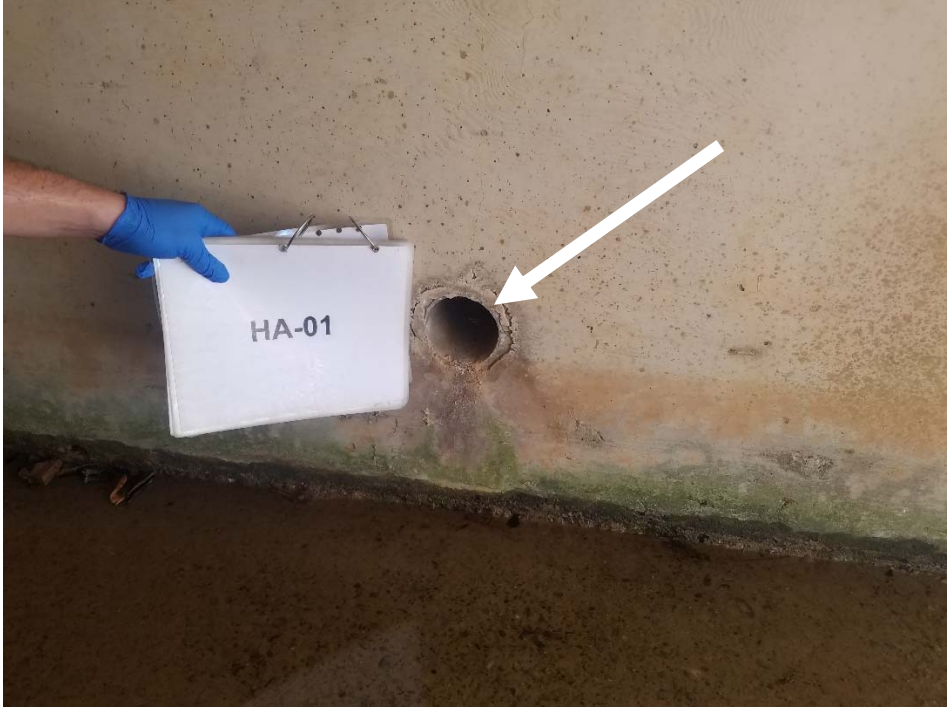
RELINQUISHED BY: David Espy  
 DATE: 08/13/2020


RECEIVED AT LAB BY: \_\_\_\_\_  
 DATE: \_\_\_\_\_

**Appendix B:**  
**Asbestos Sampling Photographs**

<p><b>Photographer:</b> Mike Baker</p>	
<p><b>Date:</b> 08/12/2020</p>	
<p><b>Description:</b> Photograph 1 – South Side of Culvert Facing North</p>	

<p><b>Photographer:</b> Mike Baker</p>	
<p><b>Date:</b> 08/12/2020</p>	
<p><b>Description:</b> Photograph 2 – Inside Culvert</p>	

<p><b>Photographer:</b> Mike Baker</p>	
<p><b>Date:</b> 08/12/2020</p>	
<p><b>Description:</b> Photograph 3 – HA-01 Weep Hole Pipe</p>	

<p><b>Photographer:</b> Mike Baker</p>	
<p><b>Date:</b> 08/12/2020</p>	
<p><b>Description:</b> Photograph 4 – HA-02 Culvert Base</p>	

**Photographer:**  
Mike Baker

**Date:**  
08/12/2020

**Description:**  
Photograph 5 –  
HA-03  
Wing Wall

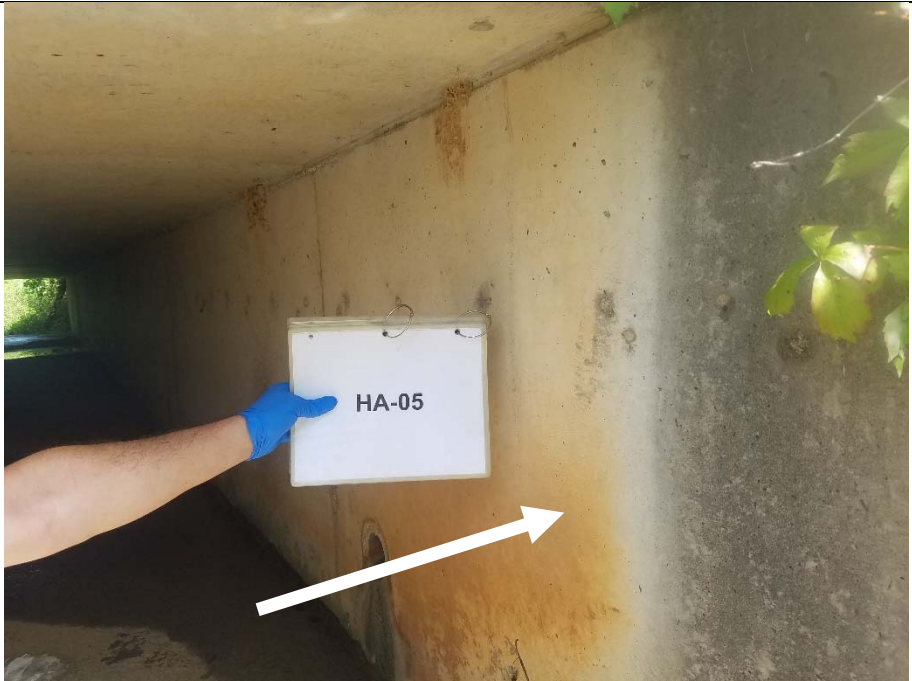


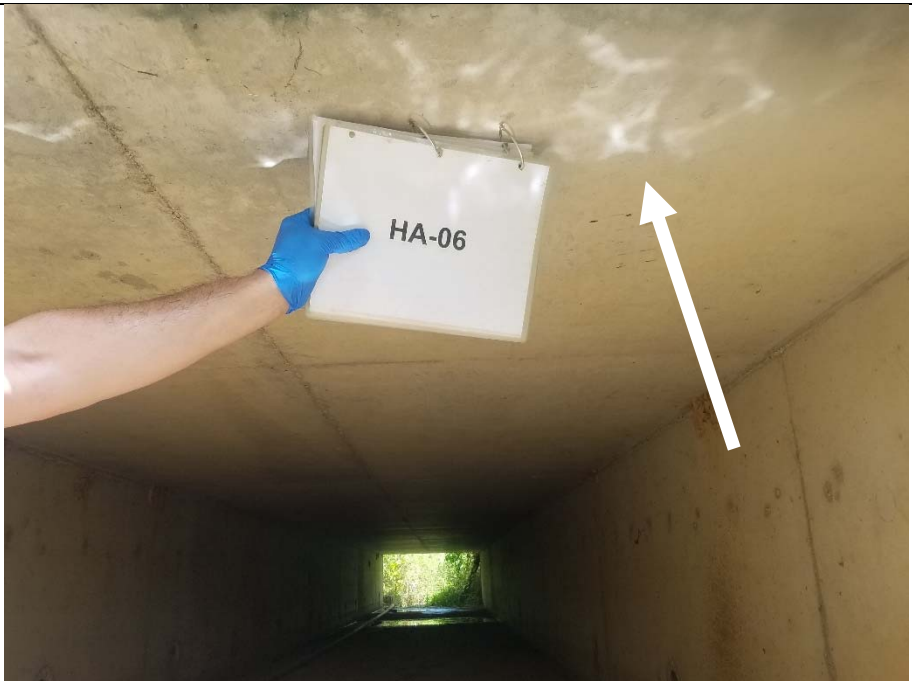
**Photographer:**  
Mike Baker

**Date:**  
08/12/2020

**Description:**  
Photograph 6 –  
HA-04  
Decking Header



<b>Photographer:</b> Mike Baker	
<b>Date:</b> 08/12/2020	
<b>Description:</b> Photograph 7 – HA-05 Abutment	

<b>Photographer:</b> Mike Baker	
<b>Date:</b> 08/12/2020	
<b>Description:</b> Photograph 8 – HA-06 Bottom of Decking	

**Appendix C:**  
**Asbestos Inspection Credentials**



# 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:**

## TriAD Environmental Consultants

207 Donelson Pike Ste. 200 Nashville TN, 37214

**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-5195-90837	July 01, 2020	July 31, 2021

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

This **7th** Day of **July 2020**

Division of Solid Waste Management  
Toxic Substance Program

CN-1324 (Rev 6/13)

RD A-3020

# THE STATE OF TENNESSEE

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

62777-57991



Date Issued: 6/24/2020

Re-Accreditation

## David M Espy

DOB Sex HGT WGT

Discipline	Accreditation	Expiration
Inspector	A-I-55949-88102	May-31-2021
Management Planner	A-MP-55949-88103	May-31-2021
Project Monitor	A-PM-55949-83274	Jan-31-2021

## Asbestos Accreditation

# THE STATE OF TENNESSEE

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

111273-49108

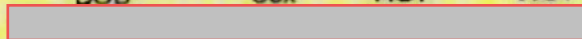


Date Issued: 8/27/19

Re-Accreditation

## Michael B Baker

DOB Sex HGT WGT



Discipline	Accreditation	Expiration
Inspector	A-I-119004-77823	Aug-31-2020

### Asbestos Accreditation

**Appendix D:**  
**Health and Safety Plan and JSA**

**HEALTH AND SAFETY PLAN**  
**TDOT PROJECT No. 01024-0222-04**

Project Locations: Bridge No.: 01CULV08007; 01CULV08011; 01CULV08015

Project Description: Asbestos Surveys

Project Date: 8/12/20

TDOT PIN: 124121.00

Project Personnel:

<b>Title</b>	<b>Organization</b>	<b>Name</b>	<b>Phone Number</b>
Project Manager – TDOT (TDOT PM)	Tennessee Dept. of Transportation	Kyle Kirschenmann	615-598-1522
Project Manager – TriAD (TriAD PM)	TriAD Environmental Consultants, Inc.	Jeff Postell	615-889-6888 615-417-8050
Project Safety and Health Manager (SHM)	TriAD Environmental Consultants, Inc.	Chris Scott	615-889-6888 615-417-6154
Site Safety and Health Officer (SSO)	TriAD Environmental Consultants, Inc.	David Espy	615-889-6888 229-347-0516
Emergency Coordinator (EC)	TriAD Environmental Consultants, Inc.	David Espy	615-889-6888 229-347-0516
OSHA Hotline			(800) 321-OSHA

Nearest Hospital: Methodist Medical Center Emergency Room, Oak Ridge, Tennessee

Hospital Phone Number: (865) 835-1000

Map to Hospital: See Attached Page

Health and Safety Plan: See Following Pages

# SAFE WORK PERMIT- JSA AND DAILY FIELD REPORT

Site Name/ Work: Anderson Co. Bridges 18-TDOT74-01

Date: 08/12/2020

Time Permit Issued/Work Started:

10:30 AM / PM

Permit Expires/work stopped:

1:00 AM PM

Issued To: David Espy

Job Description:

Asbestos Survey

Weather: Partly cloudy 80's

## Section: 2 EMERGENCY PLANNING: DISCUSSION AT JOB SITE OR SAFETY TAILGATE MEETING

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> Site Contact:  | <input checked="" type="checkbox"/> Emergency Phone: <b>911</b>                                |
| <input checked="" type="checkbox"/> Evacuation Routes  | <input checked="" type="checkbox"/> Alt. Site Emergency Phone: (865)835-1000 Methodist M.C. ER |
| <input checked="" type="checkbox"/> Staging Area   | <input checked="" type="checkbox"/> First Aid/ CPR Trained                                     |
| <input checked="" type="checkbox"/> Emergency Equipment Needed (Retrieval; SCBA; Radio; etc) | <input checked="" type="checkbox"/> Rescue Procedures Discussion                               |

Additional Comments: **See Map to Hospital and Health and Safety Plan**

## Section: 3 JOB SAFETY ANALYSIS

### JOB STEPS / WORK ACTIVITIES

### HAZARDS (LIST)

1. Asbestos Survey	3,5,6,8,11,12,13,15,17
2.	
3.	
4.	
5.	
6.	
7.	
8.	

SUPERVISOR SIGNATURE:

### POTENTIAL HAZARDS

- |                             |                              |                                     |                           |
|-----------------------------|------------------------------|-------------------------------------|---------------------------|
| 1. Fire / Explosion         | 5. Strain / Sprain           | 9. Thermal Burn                     | 13. Chemical Contact      |
| 2. Pinch Points / Caught In | 6. Struck By/Traffic Hazards | 10. Overhead Work                   | 14. Asphyxiation          |
| 3. Slip / Trip / Fall       | 7. Noise                     | 11. Temperature Extremes            | 15. Biological Contact    |
| 4. Electric Shock           | 8. Cut / Laceration          | 12. Inhalation (Dust/ Vapor/ Fumes) | 16. Key Procedure Applies |
| 17. Asbestos Exposure       | 18. Other: (Specify)         | 19. Other: (Specify)                |                           |

### HAZARD MITIGATION For Corresponding Job Step

- |  |   |
|--|---|
| 1. Wear proper PPE                           | 6. Ensure good footing and clear egress/ingress |
| 2. Understand the work plan                  | 7. Practice good housekeeping                   |
| 3. No solo lifting of greater than 50 pounds | 8. Use proper tools for the task                |
| 4. Maintain awareness of surroundings        | 9. No smoking                                   |
| 5. Place Warning Signs                       | 10. Other: (Specify)                            |

### JOB HAZARD REMINDERS (Check All That Apply)

Equipment Operation	Ergonomics/Exposures	Conditions	Other
<input checked="" type="checkbox"/> Motor Vehicle Operation	<input checked="" type="checkbox"/> Body Positioning	<input checked="" type="checkbox"/> Walking Surfaces	<input type="checkbox"/> Extension Cords / <b>GFCI</b>
<input type="checkbox"/> Ladders	<input checked="" type="checkbox"/> Cramped Conditions	<input type="checkbox"/> Water Hazards	<input type="checkbox"/> Housekeeping
<input type="checkbox"/> Heavy Equipment	<input type="checkbox"/> Elevated Work	<input checked="" type="checkbox"/> Sharp Edges	<input type="checkbox"/> Barricades
<input type="checkbox"/> Overhead Obstructions <u>mark</u>	<input type="checkbox"/> Heavy Lifting	<input type="checkbox"/> Lighting	<input type="checkbox"/> Adverse Weather
<input type="checkbox"/> Underground Utilities <u>mark</u>	<input checked="" type="checkbox"/> Heat Stress/Cold Stress	<input type="checkbox"/> Overhead Work	<input type="checkbox"/> Other
<input checked="" type="checkbox"/> Site Conditions (Slope, Stability)	<input checked="" type="checkbox"/> Physical Exertion	<input checked="" type="checkbox"/> Hand & Power Tools	<input type="checkbox"/>
<input type="checkbox"/> Equipment Fueling	<input checked="" type="checkbox"/> Repetitive Motion	<input type="checkbox"/> Hot / Cold Liquids / Surfaces	<input type="checkbox"/>
<input checked="" type="checkbox"/> Road Hazards <u>use spotters</u>	<input type="checkbox"/> Suitability for Work	<input type="checkbox"/> Other	<input type="checkbox"/>
<input type="checkbox"/> Man Lifts	<input checked="" type="checkbox"/> Communications	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Other (Specify)	<input checked="" type="checkbox"/> Training	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/> Other	<input type="checkbox"/>	<input type="checkbox"/>

### PPE REQUIREMENTS

Minimum: Hard Hat, Safety Vest, Safety Glasses, Steel Toed Shoes, Long Pants, Sleeved Shirt

Other PPE Req'd: **Gloves, Resp.**

### HES EQUIPMENT

Fire Extinguisher: Y / N / **N/R**      Spill Response Mat'l. Y / N / **N/R**

Eyewash/Shower Y / N / **N/R**      Air Monitoring: Y / N / **N/R**

First Aid Kit **Y** / N / N/R      Other:

SECTION 4

KEY PROCEDURES

CONTROL OF HAZARDOUS ENERGY (LOCKOUT/ TAGOUT) Needed  Not Needed

Individual Lockout  Group Lockout

Group Primary Authorized Employee: \_\_\_\_\_

Attach Lockout List or Machine Specific Procedure

HOT WORK PERMIT Needed  Not Needed

Type of Hot Work: Burning  Welding  Grinding  Fire Watch Req'd.?  YES  NO

Hot Work Permit Used: Client Permit  Contractor Permit

ELEVATED WORK OR EXCAVATION / TRENCH WORK

Personnel Working <3 Ft below ground level or > 6 Ft. Above Lower Level?  YES  NO

Protected By: Guardrail System:  Personal Fall Arrest System:  Other (Specify):

Section: 5

PERMIT-APPROVALS / EMPLOYEE SIGNATURES

Signatures approve only work conducted under the requirements of this permit

Supervisor: David Espy

Date: 08/12/2020

Employee(s) /Contractor(s) Names (print): I have reviewed and understand and will follow all conditions of this completed permit and its attachments. I will report hazardous conditions identified on this job site to my supervisor and/or designee for necessary corrections.

1) <u>David Espy</u>	6)
2) <u>Mike Baker</u>	7)
3)	8)
4)	9)
5)	10)

Section: 6

MEET and GREET Job Site Awareness

Visitors and Additional Personnel) Names (print): All employees, visitors and contractors entering the area affected by this permit must meet and exchange information on the scope of work, hazards involved and intentions for the day. All persons on job sites must be aware of all work and the presence of all other persons on the site. Those not authorized on this permit above must list their name below acknowledging awareness of the task authorized by this permit. A representative, such as a contractor foreman, may acknowledge for the group.

Print Name and Company/Organization

1)	
2)	
3)	
4)	
5)	
6)	
7)	
8)	
9)	
10)	

Section: 7

JOB COMPLETE OR PERMIT CLOSED

Signature verifies closure of permit and completion of items checked below.

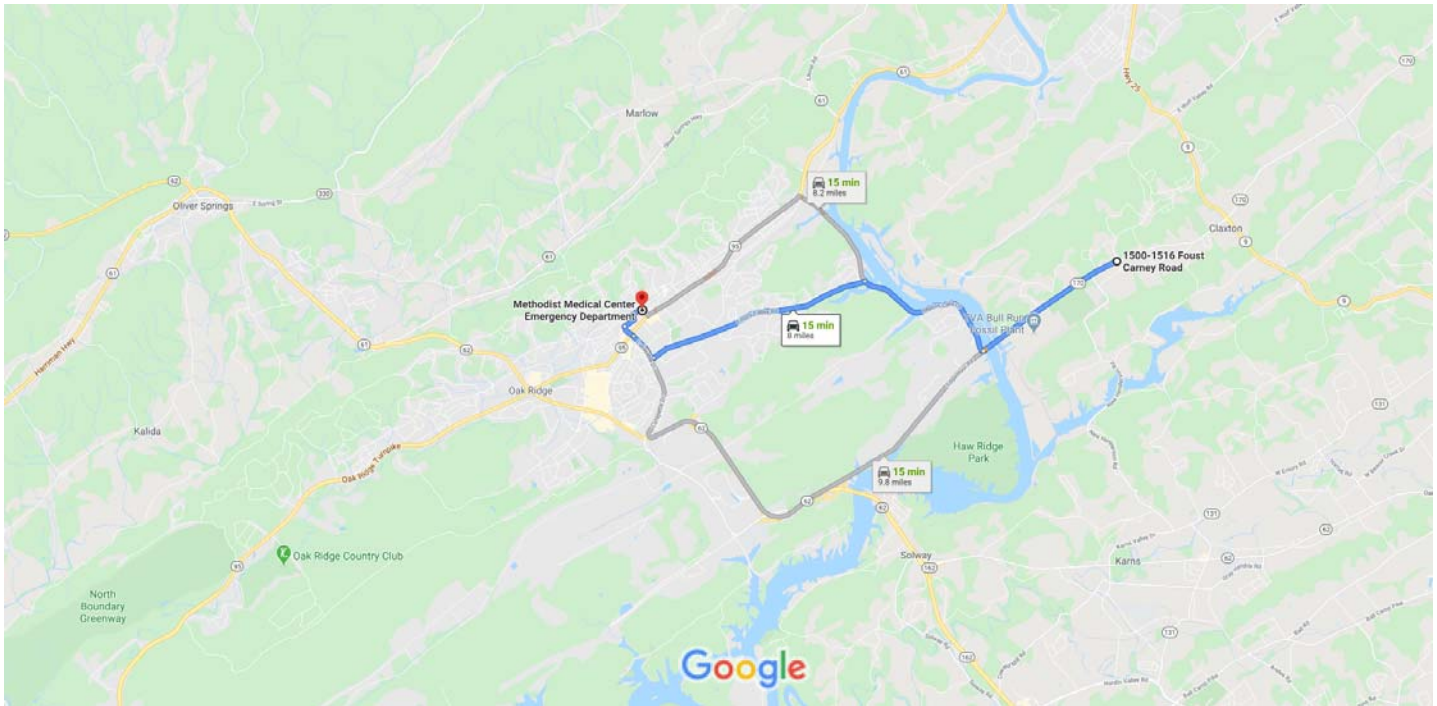
Job Complete

Job Not Complete

Review work area to verify job site clean-up and safe condition

Supervisor: David Espy

Time: 1:00 pm



Map data ©2020 Google 1 mi

### 1500-1516 Foust Carney Rd

Clinton, TN 37716

#### Follow TN-170 W/Edgemoor Rd, Melton Lake Dr and Emory Valley Rd to New York Ave in Oak Ridge

11 min (7.4 mi)

- ↑ 1. Head southwest on TN-170 W/Edgemoor Rd toward Royal St  
2.1 mi
- ↘ 2. Turn right onto Melton Lake Dr  
2.0 mi
- ↙ 3. Turn left onto Emory Valley Rd  
2.9 mi
- ↘ 4. Turn right onto Lafayette Dr  
0.4 mi

#### Continue on New York Ave to your destination

3 min (0.6 mi)

- ↑ 5. Continue onto New York Ave  
0.2 mi
- ↘ 6. Turn right onto E Vance Rd  
0.2 mi

- ↩ 7. Turn left onto Vermont Ave  
----- 331 ft
- ➡ 8. Turn right onto Tennenson Rd  
----- 0.1 mi
- ➡ 9. Turn right  
    *i* Destination will be on the right  
----- 89 ft

## Methodist Medical Center Emergency Department

990 Oak Ridge Turnpike, Oak Ridge, TN 37830

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.



## TENNESSEE DEPARTMENT OF TRANSPORTATION ASBESTOS SURVEY REPORT

SR-170 Over Branch, LM 5.96  
Bridge 01CULV08015 (01-SR170-05.98)  
Anderson County  
TDOT Project No.: 01024-0222-04, PIN: 124121.00



TriAD Project No. 18-TDOT74-01

Prepared by



ENVIRONMENTAL CONSULTANTS

09/01/20

*David Espy Mike Baker*

---

David Espy and Mike Baker  
Tennessee Asbestos Inspector Accreditation No: A-I-55949-88102  
Tennessee Asbestos Inspector Accreditation No: A-I-119004-77823

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Figure 2: Homogenous Area	

### APPENDICES

Appendix A: Laboratory Analysis Report	
Appendix B: Asbestos Sampling Photographs	
Appendix C: Asbestos Inspection Credentials	
Appendix D: Health and Safety Plan and JSA	

## **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 by TriAD Environmental Consultants, Inc., (TriAD) in accordance with the requirements of the State of Tennessee, Department of Transportation Environmental Division (TDOT), Hazardous Materials Section.

### **1.1 TDOT Bridge Identification**

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

Bridge Number: 01CULV08015

Termini: SR-170 from SR-62 (Oak Ridge Highway) to SR-9 (US-25W, Clinton Highway)

TDOT PE-N: 01024-0222-04

TDOT PIN: 124121.00

County: Anderson

### **1.2 Bridge Description**

Bridge Number 01CULV08015 is located on SR-170 over Branch at LM 5.96 in Anderson County, Tennessee. The bridge is a 12-foot, two-lane, single-span bridge constructed of a concrete frame culvert. The date the bridge was constructed is unknown. The location of the bridge is provided on the Bridge Vicinity Map in Figure 1.

## **2.0 ACM ASSESSMENT**

Observed suspect ACM were categorized by homogeneous areas (HA), which are materials that appear similar throughout in terms of color, texture, and application date. Suspect ACM for each HA were physically assessed for friability and condition of material. Random samples of suspect ACM were collected from designated HAs and submitted to an accredited laboratory for analysis. The laboratory results of the ACM sampling are

included in Appendix A. Photographs showing the locations of the HAs are provided in Figure 2. Photographs of the HAs that were sampled are included in Appendix B.

## **2.1 Inspection Personnel**

The sampling and field activities were performed on August 12, 2020, by Mr. David Espy and Mr. Mike Baker, Accredited State of Tennessee Asbestos Inspectors, with TriAD. Copies of Mr. Espy's, Mr. Baker's, and TriAD's current accreditation from the State of Tennessee are included in Appendix C. This work was completed in accordance with TriAD's Health and Safety Plan and Job Safety Analysis (JSA). A copy of the JSA and the cover page for the Health and Safety Plan is included in Appendix D.

## **2.2 Visual Survey**

The inspection began with a walk-through and visual survey of the bridge. The visual survey consisted of:

- Locating and confirming the structure to be sampled
- Sketching the structure and/or verifying the plans provided
- Taking general photos of the structure
- Locating and identifying suspect ACM to be sampled
- Determining accessible locations to collect samples

## **2.3 ACM Sampling of Bridge Components**

Suspect ACM was sampled in accordance with United States Environmental Protection Agency (USEPA) regulation 40 CFR 61, Subpart M, National Emission Standards for Hazardous Air Pollutants (NESHAP) and in general conformance with the protocols as outlined in USEPA regulation 40 CFR 763 Asbestos Hazard Emergency Response Act (AHERA). TriAD personnel made reasonable effort during the performance of this survey to identify suspect ACM which may be encountered during future demolition or renovation activities. Suspect ACM samples collected for analysis were obtained by minimal

destructive sampling techniques. Possible suspect ACM located in voids or concealed areas which were not accessible during the survey process are not included as part of this report. Should suspect materials other than those identified in this report be discovered during demolition or renovation activities, these materials should be assumed asbestos containing until laboratory confirmation of the presence or absence of asbestos content is made. Below is a list of the HAs that were sampled:

<b>Table 1: Homogeneous Areas</b>	
HA-01	Wing Wall
HA-02	Decking Header
HA-03	Bottom of Decking
HA-04	Weep Hole Pipe
HA-05	Abutment

Individual sample numbers show the HA number plus the unique sample designation. For example, sample HA-02-05 was collected from HA-02 and is the fifth sample of the total sample set from the bridge.

### **2.3.1 HA-01 Wing Wall**

The wing walls are made of concrete. Three samples were collected from this HA. A hammer and chisel were used to collect these samples.

### **2.3.2 HA-02 Decking Header**

The decking headers are made of concrete. Three samples were collected from this HA. A hammer and chisel were used to collect these samples.

### **2.3.3 HA-03 Bottom of Decking**

The bottom of the decking is made of concrete. Three samples were collected from this HA. A hammer and chisel were used to collect these samples.

### **2.3.4 HA-04 Weep Hole Pipe**

The weep hole pipes are made of concrete. Three samples were collected from this HA. A hammer and chisel were used to collect these samples.

### **2.3.5 HA-05 Abutment**

The abutments are made of concrete. Three samples were collected from this HA. A hammer and chisel were used to collect these samples.

### **2.3.6 Utility Components**

There were no utility conduits attached to this bridge.

### **2.3.7 Bridge Drainage System**

No built-in drainage system was observed on this bridge.

## **3.0 ANALYTICAL PROCEDURES**

The bulk samples were analyzed in the laboratory using Polarized Light Microscopy (PLM) coupled with dispersion staining (USEPA Method 600/R-93/116). PLM is an asbestos analytical method which identifies the specific asbestos minerals by their unique optical properties. The optical properties are a result of the mineral's chemical composition, physical atomic structure, and visual morphology. This is the USEPA-recommended method of analysis for asbestos identification in bulk samples.

The bulk samples collected for this inspection were analyzed by Frost Environmental Services, LLC, a laboratory that has received certification from the American Industrial Hygiene Association Laboratory Accreditation Program (Laboratory identification number 198214).

## 4.0 REGULATORY OVERVIEW

### 4.1 National Emission Standards for Hazardous Air Pollutants

The USEPA's NESHAP regulations 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.

### 4.2 Definitions

Significant definitions related to regulation of asbestos under NESHAP regulations include:

**Friable ACM** is defined by the Asbestos NESHAP, as any material containing more than one percent (1%) asbestos as determined using the method specified in Appendix A, Subpart F, 40 CFR Part 763, Section 1, PLM, that, when dry, can be crumbled, pulverized or reduced to powder by hand pressure. (40 CFR 61.141)

**Non-friable ACM** is any material containing more than one percent (1%) asbestos as determined using the method specified in Appendix A, Subpart F, 40 CFR Part 763, Section 1, PLM, that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure. USEPA also defines two categories of non-friable ACM, Category I and Category II non-friable ACM, which are described as follows:

**Category I non-friable ACM** is any asbestos-containing packing, gasket, resilient floor covering or asphalt roofing product which contains more than one percent (1%) asbestos as determined using PLM according to the method specified in Appendix A, Subpart F, 40 CFR Part 763. (40 CFR 61.141)

**Category II non-friable ACM** is any material, excluding Category I non-friable ACM, containing more than one percent (1%) asbestos as determined using PLM according to the methods specified in Appendix A, Subpart F, 40 CFR Part 763 that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure. (40 CFR 61.141)

**Regulated Asbestos-Containing Material (RACM)** is (a) friable asbestos material, (b) Category I non-friable ACM that has become friable, (c) Category I non-friable ACM that will be or has been subjected to sanding, grinding, cutting or abrading, or (d) 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.

**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 OF ASBESTOS BULK SAMPLE ANALYSIS**

A total of 15 samples were obtained from the bridge. Multiple samples of each HA were collected in accordance with TDOT requirements and delivered to the laboratory for visual observation and microscopic analysis. The samples were selected based on HAs of suspect materials, as described in Section 2.0.

Based on the analytical results, none of the sampled materials contained asbestos. The analytical results of all the samples collected, along with the chain-of-custody records, are included in Appendix A. Photographs of examples of the HAs are included in Appendix B. A Bridge Vicinity Map is provided as Figure 1. A profile of the bridge with homogenous area sample locations is depicted on Figure 2.

## **6.0 QUALIFICATIONS**

This report has been prepared on behalf of and exclusively for TDOT. The information presented in this report 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, TriAD requests the opportunity to review the information, reassess the potential concerns, and modify opinions, if warranted. 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. Any party, other than TDOT, 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.

## Figures

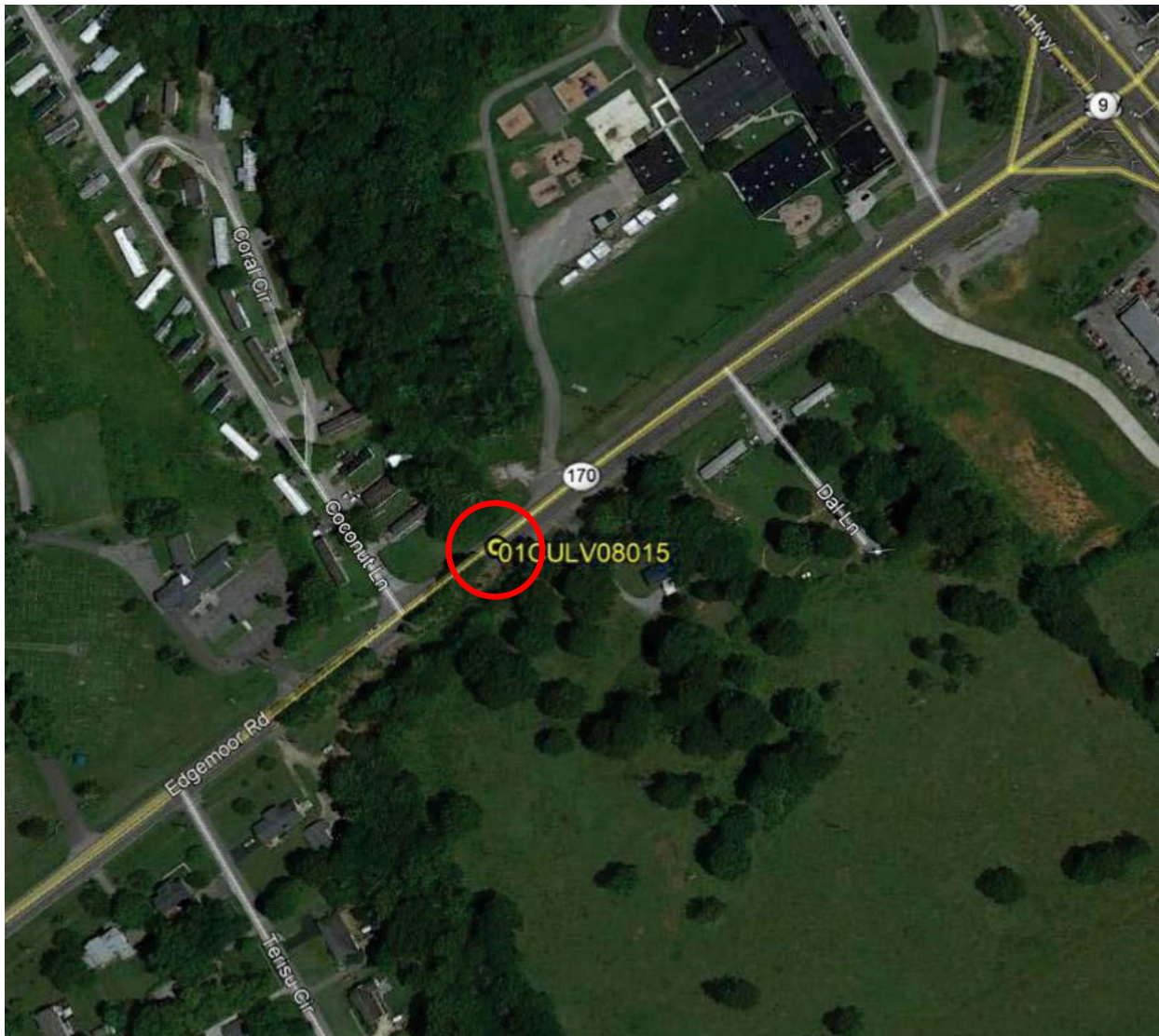


FIGURE 1  
BRIDGE VICINITY MAP

PIN NO.: 124121.00  
 SR-170 OVER BRANCH, LM 5.96  
 BRIDGE NO.: 01CULV08015  
 ANDERSON COUNTY, TENNESSEE

SCALE: N.T.S.	DR	ALW	CHK	DME	REV	JMP
---------------	----	-----	-----	-----	-----	-----

PREPARED BY:



PROJ: 18-TD0T74-01	DATE: 08/27/20	SHEET 1 OF 1
--------------------	----------------	--------------

C:\DRAWINGS\DAVID\18-TDOT74-01\CULVERT 8015\7401-2-ANDERSON-CO 8015.dwg SANED: 8/28/2020 12:29 PM BY: AWATTS



HOMOGENEOUS AREAS

- HA-01 – WING WALL
- HA-02 – DECKING HEADER
- HA-03 – BOTTOM OF DECKING
- HA-04 – WEEP HOLE PIPE
- HA-05 – ABUTMENT

NOTE

HOMOGENEOUS AREA SAMPLE LOCATIONS ARE GENERALIZED; ACTUAL SAMPLES WERE COLLECTED FROM RANDOM LOCATIONS ACROSS THE STRUCTURE.

FIGURE 2  
HOMOGENEOUS AREAS

PIN NO.: 124121.00  
SR-170 OVER BRANCH, LM 5.96  
BRIDGE NO.: 01CULV08015  
ANDERSON COUNTY, TENNESSEE

SCALE: N.T.S.	DR ALW	CHK DME	REV JMP
---------------	--------	---------	---------

PREPARED BY:



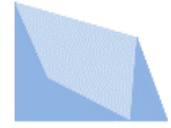
ENVIRONMENTAL CONSULTANTS, INC.  
Suite 200, 207 Donelson Pike, Nashville, TN 37214  
615-889-6888 fax 615-889-4004

**Appendix A:**  
**Laboratory Analysis Report**

# FROST ENVIRONMENTAL SERVICES, LLC

339 ROCKLAND ROAD, SUITE E, HENDERSONVILLE, TENNESSEE 37075

(615) 562-2669 office - (615) 473-9047 cell - email: lab@frostenvironmental.com



## POLARIZED LIGHT MICROSCOPY (PLM) LABORATORY ANALYSIS REPORT (EPA/600/R-93/116 (JUNE 1993))

CLIENT: Triad

Date Received: 8/13/2020

PROJECT: Bridge#01CULV08015

Date Analyzed: 8/13/2020

LOCATION: Anderson Co.

Date Reported: 8/13/2020

ANALYST: Codi Maddox

*Codi Maddox*

Sample Number	Location	Material Description	Binder (Non-Fibrous) Material	Non-Asbestos Fiber	Asbestos Type & Percent
HA-01-01	Wing Wall	Grey Cementitious Material	100	None Detected	None Detected
HA-01-02	Wing Wall	Grey Cementitious Material	100	None Detected	None Detected
HA-01-03	Wing Wall	Grey Cementitious Material	100	None Detected	None Detected
HA-02-04	Decking Header	Grey & Tan Cementitious Material	100	None Detected	None Detected
HA-02-05	Decking Header	Grey & Tan Cementitious Material	100	None Detected	None Detected
HA-02-06	Decking Header	Grey & Tan Cementitious Material	100	None Detected	None Detected
HA-03-07	Bottom of Decking	Grey Cementitious Material	100	None Detected	None Detected
HA-03-08	Bottom of Decking	Grey Cementitious Material	100	None Detected	None Detected
HA-03-09	Bottom of Decking	Grey Cementitious Material	100	None Detected	None Detected
HA-04-10	Weep Hole Pipe	Grey Cementitious Material	100	None Detected	None Detected
HA-04-11	Weep Hole Pipe	Grey Cementitious Material	100	None Detected	None Detected
HA-04-12	Weep Hole Pipe	Grey Cementitious Material	100	None Detected	None Detected
HA-05-13	Abutment	Grey & Tan Cementitious Material	100	None Detected	None Detected
HA-05-14	Abutment	Grey & Tan Cementitious Material	100	None Detected	None Detected
HA-05-15	Abutment	Grey & Tan Cementitious Material	100	None Detected	None Detected

Asbestos Containing Material (ACM) is defined as any material containing more than one percent asbestos.

Analysis was performed using EPA/600/R-93/116 (June 1993)), Test Method for the Determination of Asebstos in Bulk Building Materials.



CHAIN OF CUSTODY

PROJECT: Anderson Co. Bridges 18-TDOT 74-01  
Bridge No. 01CULV08015

PROJECT LOCATION: Anderson County

Report To: David Espy  
 Company: TriAD Environmental Consultants  
 Address: 207 Donelson Pike  
Nashville, TN 37214  
 Phone: (629) 347-0516  
 Email: despy@triadenv.com

Turnaround Time Requested:  2-3 Hour  Same Day  24 Hour  2-3 Day

Sample Number	Date Collected	Location	Analysis Requested	Volume
HA-01-01	08/12/2020	wing wall	PLM	
HA-01-02	"	"	"	
HA-01-03	"	"	"	
HA-02-04	"	decking header	"	
HA-02-05	"	"	"	
HA-02-06	"	"	"	
HA-03-07	"	bottom of decking	"	
HA-03-08	"	"	"	
HA-03-09	"	"	"	
HA-04-10	"	weep hole pipe	"	
HA-04-11	"	"	"	
HA-04-12	"	"	"	
HA-05-13	"	abutment	"	
HA-05-14	"	"	"	
HA-05-15	"	"	"	

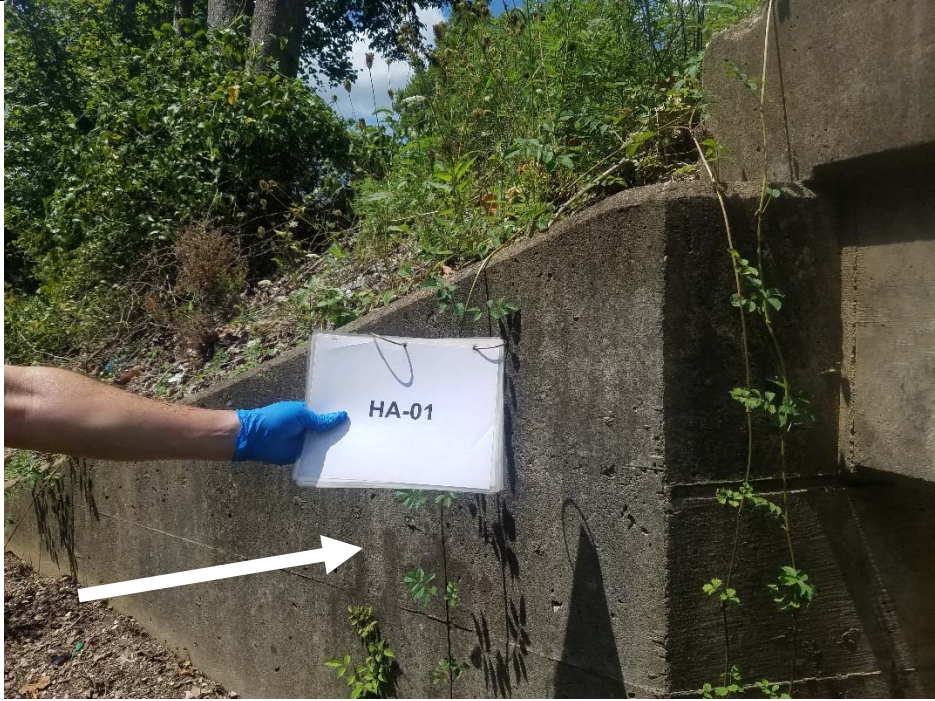
RELINQUISHED BY: David Espy  
 DATE: 08/13/2020

RECEIVED AT LAB BY: Cordi Maddox  
 DATE: 8-13-20

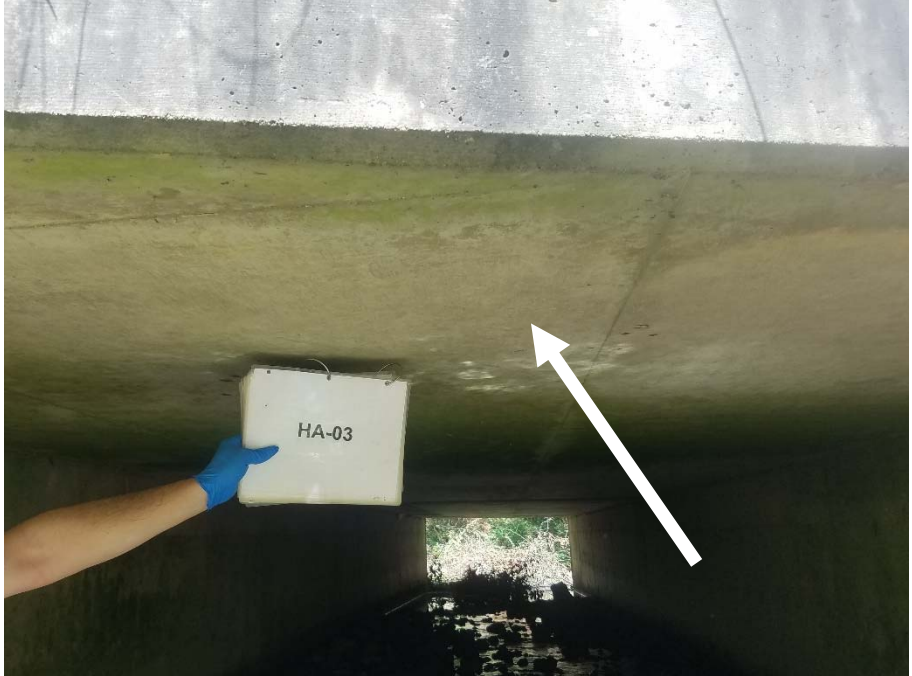
**Appendix B:**  
**Asbestos Sampling Photographs**

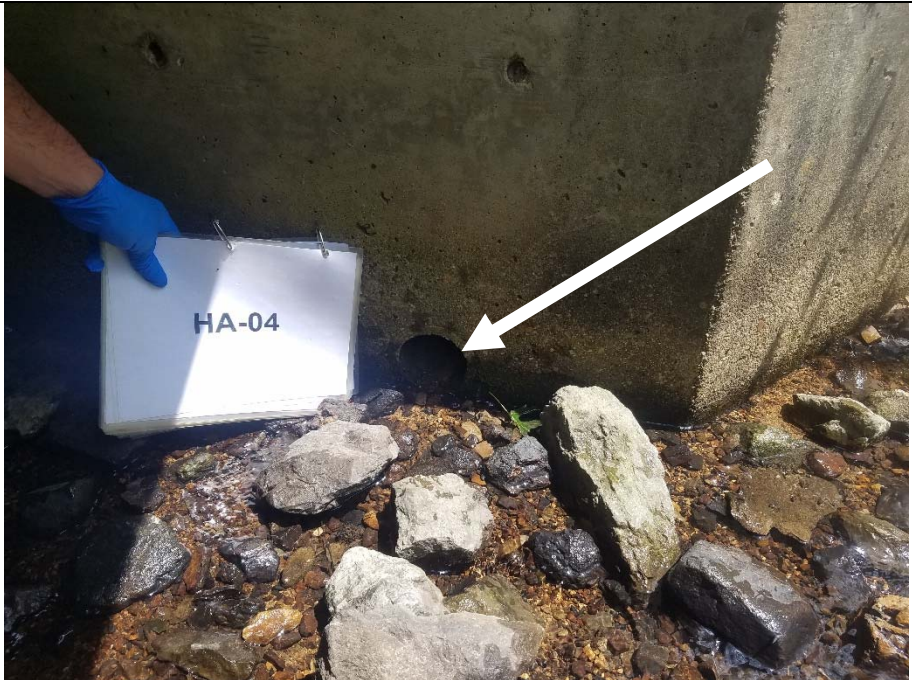
<p><b>Photographer:</b> Mike Baker</p>	
<p><b>Date:</b> 08/12/2020</p>	
<p><b>Description:</b> Photograph 1 – South Side of Culvert Facing Northwest</p>	

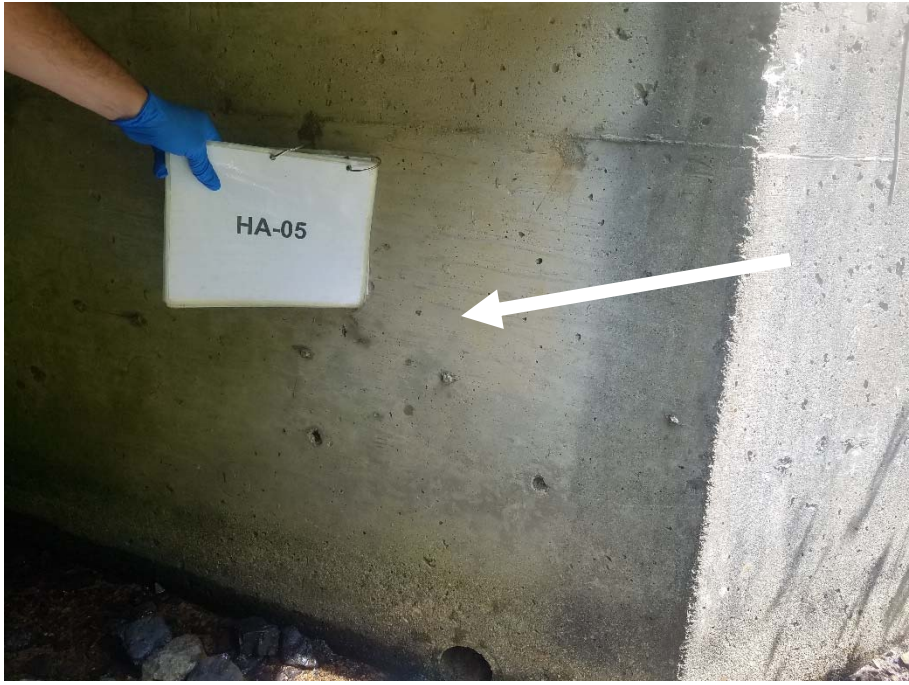
<p><b>Photographer:</b> Mike Baker</p>	
<p><b>Date:</b> 08/12/2020</p>	
<p><b>Description:</b> Photograph 2 – Inside Culvert</p>	

<b>Photographer:</b> Mike Baker	
<b>Date:</b> 08/12/2020	
<b>Description:</b> Photograph 3 – HA-01 Wing Wall	

<b>Photographer:</b> Mike Baker	
<b>Date:</b> 08/12/2020	
<b>Description:</b> Photograph 4 – HA-02 Decking Header	

<p><b>Photographer:</b> Mike Baker</p>	
<p><b>Date:</b> 08/12/2020</p>	
<p><b>Description:</b> Photograph 5 – HA-03 Bottom of Decking</p>	

<p><b>Photographer:</b> Mike Baker</p>	
<p><b>Date:</b> 08/12/2020</p>	
<p><b>Description:</b> Photograph 6 – HA-04 Weep Hole Pipe</p>	

<b>Photographer:</b> Mike Baker	
<b>Date:</b> 08/12/2020	
<b>Description:</b> Photograph 7 – HA-05 Abutment	

<b>Photographer:</b> Mike Baker	
<b>Date:</b> 08/12/2020	
<b>Description:</b> Photograph 8 – South Side of Culvert Facing Northwest	

**Appendix C:**  
**Asbestos Inspection Credentials**



# 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:**

## TriAD Environmental Consultants

207 Donelson Pike Ste. 200 Nashville TN, 37214

**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-5195-90837	July 01, 2020	July 31, 2021

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

This **7th** Day of **July 2020**

Division of Solid Waste Management  
Toxic Substance Program

CN-1324 (Rev 6/13)

RD A-3020

# THE STATE OF TENNESSEE

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

62777-57991



Date Issued: 6/24/2020

Re-Accreditation

## David M Espy

DOB Sex HGT WGT

Discipline	Accreditation	Expiration
Inspector	A-I-55949-88102	May-31-2021
Management Planner	A-MP-55949-88103	May-31-2021
Project Monitor	A-PM-55949-83274	Jan-31-2021

## Asbestos Accreditation

# THE STATE OF TENNESSEE

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

111273-49108

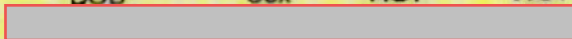


Date Issued: 8/27/19

Re-Accreditation

## Michael B Baker

DOB Sex HGT WGT



Discipline	Accreditation	Expiration
Inspector	A-I-119004-77823	Aug-31-2020

### Asbestos Accreditation

**Appendix D:**  
**Health and Safety Plan and JSA**

**HEALTH AND SAFETY PLAN**  
**TDOT PROJECT No. 01024-0222-04**

Project Locations: Bridge No.: 01CULV08007; 01CULV08011; 01CULV08015

Project Description: Asbestos Surveys

Project Date: 8/12/20

TDOT PIN: 124121.00

Project Personnel:

<b>Title</b>	<b>Organization</b>	<b>Name</b>	<b>Phone Number</b>
Project Manager – TDOT (TDOT PM)	Tennessee Dept. of Transportation	Kyle Kirschenmann	615-598-1522
Project Manager – TriAD (TriAD PM)	TriAD Environmental Consultants, Inc.	Jeff Postell	615-889-6888 615-417-8050
Project Safety and Health Manager (SHM)	TriAD Environmental Consultants, Inc.	Chris Scott	615-889-6888 615-417-6154
Site Safety and Health Officer (SSO)	TriAD Environmental Consultants, Inc.	David Espy	615-889-6888 229-347-0516
Emergency Coordinator (EC)	TriAD Environmental Consultants, Inc.	David Espy	615-889-6888 229-347-0516
OSHA Hotline			(800) 321-OSHA

Nearest Hospital: Methodist Medical Center Emergency Room, Oak Ridge, Tennessee

Hospital Phone Number: (865) 835-1000

Map to Hospital: See Attached Page

Health and Safety Plan: See Following Pages

# SAFE WORK PERMIT- JSA AND DAILY FIELD REPORT

Site Name/ Work: Anderson Co. Bridges 18-TDOT74-01

Date: 08/12/2020

Time Permit Issued/Work Started:

10:30 AM / PM

Permit Expires/work stopped:

1:00 AM PM

Issued To: David Espy

Job Description:

Asbestos Survey

Weather: Partly cloudy 80's

## Section: 2 EMERGENCY PLANNING: DISCUSSION AT JOB SITE OR SAFETY TAILGATE MEETING

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> Site Contact:  | <input checked="" type="checkbox"/> Emergency Phone: <b>911</b>                                |
| <input checked="" type="checkbox"/> Evacuation Routes  | <input checked="" type="checkbox"/> Alt. Site Emergency Phone: (865)835-1000 Methodist M.C. ER |
| <input checked="" type="checkbox"/> Staging Area   | <input checked="" type="checkbox"/> First Aid/ CPR Trained                                     |
| <input checked="" type="checkbox"/> Emergency Equipment Needed (Retrieval; SCBA; Radio; etc) | <input checked="" type="checkbox"/> Rescue Procedures Discussion                               |

Additional Comments: **See Map to Hospital and Health and Safety Plan**

## Section: 3 JOB SAFETY ANALYSIS

### JOB STEPS / WORK ACTIVITIES

### HAZARDS (LIST)

JOB STEPS / WORK ACTIVITIES	HAZARDS (LIST)
1. Asbestos Survey	3,5,6,8,11,12,13,15, 17
2.	
3.	
4.	
5.	
6.	
7.	
8.	

SUPERVISOR SIGNATURE:

### POTENTIAL HAZARDS

- |                             |                              |                                     |                           |
|-----------------------------|------------------------------|-------------------------------------|---------------------------|
| 1. Fire / Explosion         | 5. Strain / Sprain           | 9. Thermal Burn                     | 13. Chemical Contact      |
| 2. Pinch Points / Caught In | 6. Struck By/Traffic Hazards | 10. Overhead Work                   | 14. Asphyxiation          |
| 3. Slip / Trip / Fall       | 7. Noise                     | 11. Temperature Extremes            | 15. Biological Contact    |
| 4. Electric Shock           | 8. Cut / Laceration          | 12. Inhalation (Dust/ Vapor/ Fumes) | 16. Key Procedure Applies |
| 17. Asbestos Exposure       | 18. Other: (Specify)         | 19. Other: (Specify)                |                           |

### HAZARD MITIGATION For Corresponding Job Step

- |  |   |
|--|---|
| 1. Wear proper PPE                           | 6. Ensure good footing and clear egress/ingress |
| 2. Understand the work plan                  | 7. Practice good housekeeping                   |
| 3. No solo lifting of greater than 50 pounds | 8. Use proper tools for the task                |
| 4. Maintain awareness of surroundings        | 9. No smoking                                   |
| 5. Place Warning Signs                       | 10. Other: (Specify)                            |

### JOB HAZARD REMINDERS (Check All That Apply)

Equipment Operation	Ergonomics/Exposures	Conditions	Other
<input checked="" type="checkbox"/> Motor Vehicle Operation	<input checked="" type="checkbox"/> Body Positioning	<input checked="" type="checkbox"/> Walking Surfaces	<input type="checkbox"/> Extension Cords / <b>GFCI</b>
<input type="checkbox"/> Ladders	<input checked="" type="checkbox"/> Cramped Conditions	<input type="checkbox"/> Water Hazards	<input type="checkbox"/> Housekeeping
<input type="checkbox"/> Heavy Equipment	<input type="checkbox"/> Elevated Work	<input checked="" type="checkbox"/> Sharp Edges	<input type="checkbox"/> Barricades
<input type="checkbox"/> Overhead Obstructions <u>mark</u>	<input type="checkbox"/> Heavy Lifting	<input type="checkbox"/> Lighting	<input type="checkbox"/> Adverse Weather
<input type="checkbox"/> Underground Utilities <u>mark</u>	<input checked="" type="checkbox"/> Heat Stress/Cold Stress	<input type="checkbox"/> Overhead Work	<input type="checkbox"/> Other
<input checked="" type="checkbox"/> Site Conditions (Slope, Stability)	<input checked="" type="checkbox"/> Physical Exertion	<input checked="" type="checkbox"/> Hand & Power Tools	<input type="checkbox"/>
<input type="checkbox"/> Equipment Fueling	<input checked="" type="checkbox"/> Repetitive Motion	<input type="checkbox"/> Hot / Cold Liquids / Surfaces	<input type="checkbox"/>
<input checked="" type="checkbox"/> Road Hazards <u>use spotters</u>	<input type="checkbox"/> Suitability for Work	<input type="checkbox"/> Other	<input type="checkbox"/>
<input type="checkbox"/> Man Lifts	<input checked="" type="checkbox"/> Communications	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Other (Specify)	<input checked="" type="checkbox"/> Training	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/> Other	<input type="checkbox"/>	<input type="checkbox"/>

### PPE REQUIREMENTS

Minimum: Hard Hat, Safety Vest, Safety Glasses, Steel Toed Shoes, Long Pants, Sleeved Shirt

Other PPE Req'd: **Gloves, Resp.**

### HES EQUIPMENT

Fire Extinguisher: Y / N / **N/R**      Spill Response Mat'l. Y / N / **N/R**

Eyewash/Shower Y / N / **N/R**      Air Monitoring: Y / N / **N/R**

First Aid Kit **Y** / N / N/R      Other:

SECTION 4

KEY PROCEDURES

CONTROL OF HAZARDOUS ENERGY (LOCKOUT/ TAGOUT) Needed  Not Needed

Individual Lockout  Group Lockout

Group Primary Authorized Employee: \_\_\_\_\_

Attach Lockout List or Machine Specific Procedure

HOT WORK PERMIT Needed  Not Needed

Type of Hot Work: Burning  Welding  Grinding  Fire Watch Req'd.?  YES  NO

Hot Work Permit Used: Client Permit  Contractor Permit

ELEVATED WORK OR EXCAVATION / TRENCH WORK

Personnel Working <3 Ft below ground level or > 6 Ft. Above Lower Level?  YES  NO

Protected By: Guardrail System:  Personal Fall Arrest System:  Other (Specify):

Section: 5

PERMIT-APPROVALS / EMPLOYEE SIGNATURES

Signatures approve only work conducted under the requirements of this permit

Supervisor: David Espy

Date: 08/12/2020

Employee(s) /Contractor(s) Names (print): I have reviewed and understand and will follow all conditions of this completed permit and its attachments. I will report hazardous conditions identified on this job site to my supervisor and/or designee for necessary corrections.

1) <u>David Espy</u>	6)
2) <u>Mike Baker</u>	7)
3)	8)
4)	9)
5)	10)

Section: 6

MEET and GREET Job Site Awareness

Visitors and Additional Personnel) Names (print): All employees, visitors and contractors entering the area affected by this permit must meet and exchange information on the scope of work, hazards involved and intentions for the day. All persons on job sites must be aware of all work and the presence of all other persons on the site. Those not authorized on this permit above must list their name below acknowledging awareness of the task authorized by this permit. A representative, such as a contractor foreman, may acknowledge for the group.

Print Name and Company/Organization

1)	
2)	
3)	
4)	
5)	
6)	
7)	
8)	
9)	
10)	

Section: 7

JOB COMPLETE OR PERMIT CLOSED

Signature verifies closure of permit and completion of items checked below.

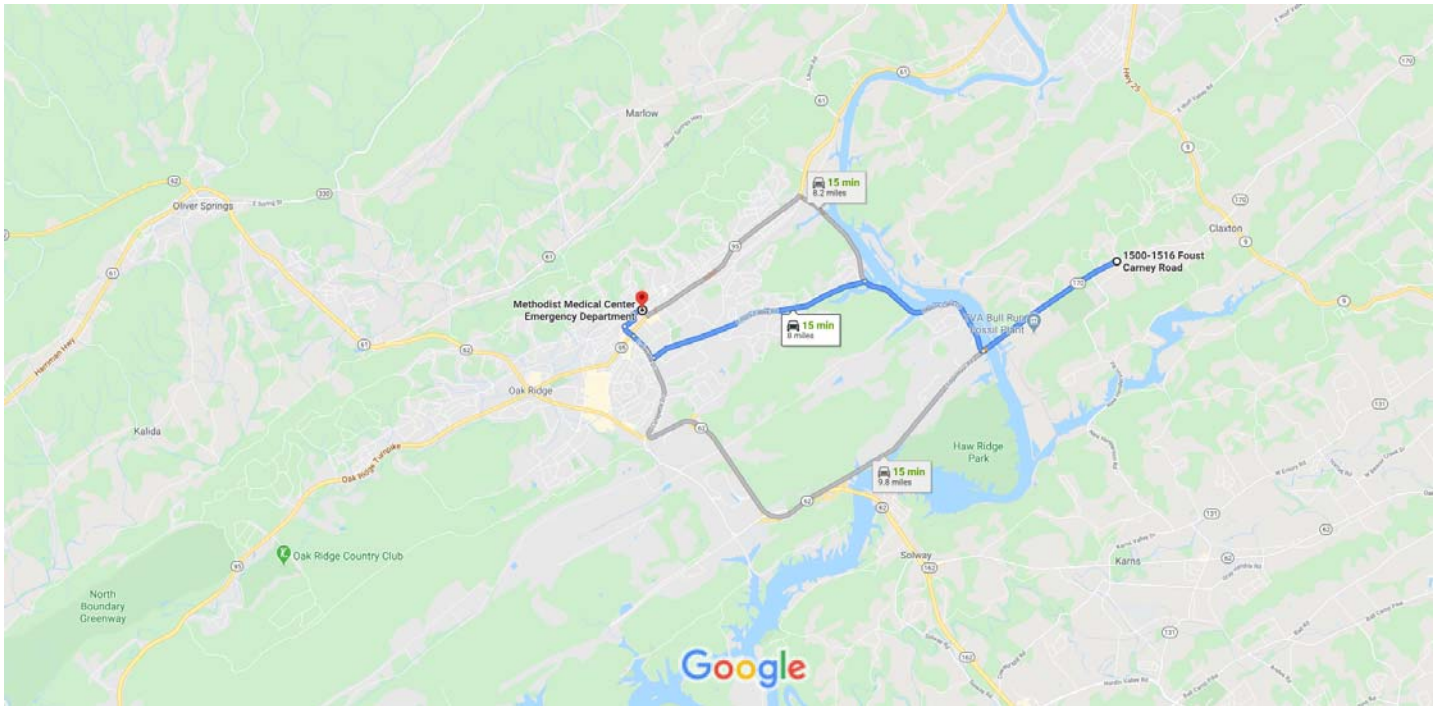
Job Complete

Job Not Complete

Review work area to verify job site clean-up and safe condition

Supervisor: David Espy

Time: 1:00 pm



Map data ©2020 Google 1 mi

### 1500-1516 Foust Carney Rd

Clinton, TN 37716

#### Follow TN-170 W/Edgemoor Rd, Melton Lake Dr and Emory Valley Rd to New York Ave in Oak Ridge

11 min (7.4 mi)

- ↑ 1. Head southwest on TN-170 W/Edgemoor Rd toward Royal St  
2.1 mi
- ↘ 2. Turn right onto Melton Lake Dr  
2.0 mi
- ↙ 3. Turn left onto Emory Valley Rd  
2.9 mi
- ↘ 4. Turn right onto Lafayette Dr  
0.4 mi

#### Continue on New York Ave to your destination

3 min (0.6 mi)

- ↑ 5. Continue onto New York Ave  
0.2 mi
- ↘ 6. Turn right onto E Vance Rd  
0.2 mi

- ↩ 7. Turn left onto Vermont Ave  
----- 331 ft
- ➡ 8. Turn right onto Tennenson Rd  
----- 0.1 mi
- ➡ 9. Turn right  
    *i* Destination will be on the right  
----- 89 ft

## Methodist Medical Center Emergency Department

990 Oak Ridge Turnpike, Oak Ridge, TN 37830

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.



## ASBESTOS SURVEY REPORT

Termini: SR-170 From SR-62 (Oak Ridge Highway) to SR-9  
(US-25W, Clinton Highway) (IA)

East of Oak Ridge, Anderson County, Tennessee

TDOT Project No. 01024-0222-04; PIN No. 124121.00

Bridge No. 01S24740001 (Over Clinch River)

May 2018

---

Zachary M. Mongan

Tennessee Accredited Asbestos Inspector A-I-97142-64514

ASBESTOS SURVEY REPORT

**ASBESTOS SURVEY REPORT**

Termini: SR-170 From SR-62 (Oak Ridge Highway) to SR-9 (US-25W, Clinton Highway) (IA)

East of Oak Ridge, Anderson County, Tennessee

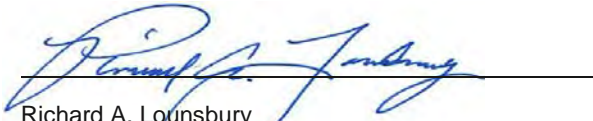
TDOT Project No. 01024-0222-04; PIN No. 124121.00

Bridge No. 01S24740001 (Over Clinch River)



Gregory Drelich  
Geological Specialist II

Prepared for:  
Tennessee Department of Transportation  
James K. Polk Building, Suite 900  
505 Deaderick Street  
Nashville, Tennessee 37243



Richard A. Lounsbury  
Certified Project Manager I

Prepared by:  
Arcadis U.S., Inc.  
114 Lovell Road  
Suite 202  
Knoxville  
Tennessee 37934  
Tel 865 675 6700  
Fax 865 675 6712



Peter C. Frederick, CIEC  
National Asbestos Leader

Our Ref.:  
TNDT1935.HZ55

Date:  
May 4, 2018

*This document is intended only for the use of the individual or entity for which it was prepared and may contain information that is privileged, confidential and exempt from disclosure under applicable law. Any dissemination, distribution or copying of this document is strictly prohibited.*

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Table 1 Summary of Materials Containing Greater Than 1% Asbestos

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## ACRONYMS AND ABBREVIATIONS

%	percent
ACM	asbestos-containing materials
AIHA	American Industrial Hygiene Association
COC	chain-of-custody
CSX	CSX Transportation, Inc.
EMSL	EMSL Analytical, Inc.
HA	homogeneous area
NESHAP	National Emission Standards for Hazardous Air Pollutants
NVLAP	National Voluntary Laboratory Accreditation Program
PLM	polarized light microscopy
PVC	polyvinyl chloride
RACM	regulated asbestos-containing materials
TDOT	Tennessee Department of Transportation
TVA	Tennessee Valley Authority
SR-9	State Route 9 (US-25W, Clinton Highway)
SR-62	State Route 62 (Oak Ridge Highway)
SR-170	State Route 170 (Edgemore Road)
USEPA	U.S. Environmental Protection Agency

# ASBESTOS SURVEY REPORT

Termini: SR-170 From SR-62 (Oak Ridge Highway) to SR-9 (US-25W, Clinton Highway) (IA)  
East of Oak Ridge, Anderson County, Tennessee  
TDOT Project No. 01024-0222-04; PIN No. 124121.00  
Bridge No. 01S24740001 (Over Clinch River)

## 1 INTRODUCTION

In accordance with Arcadis' current Tennessee Department of Transportation (TDOT) Hazardous Materials Contract E1935, a comprehensive inspection, including the collection of samples of suspect asbestos-containing materials (ACM), was recently conducted by Arcadis at the existing State Route 170 (SR-170) bridge structure over the Clinch River, east of Oak Ridge, in Anderson County, Tennessee. The purpose of this survey was to identify and quantify suspect ACM within the bridge components prior to future demolition and bridge replacement. The survey was conducted in a phased approach, including visual observations, suspect ACM sampling, laboratory analysis, and reporting. All work was conducted in accordance with the TDOT-approved proposal prepared by Arcadis on November 27, 2017.

### 1.1 Bridge Identification

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

TDOT Project Number: 01024-0222-04  
TDOT PIN Number: 124121.00  
Bridge Inventory Number: 01S24740001 (01-SR170-02.58)  
Route Number: SR-170

The structure evaluated is known as the SR-170 (Edgemore Road) bridge over the Clinch River at LM 2.58 in Anderson County, Tennessee.

### 1.2 Bridge Description

One two-lane, 10-span bridge structure was evaluated for this project. The existing 1,439-foot-long bridge, which was built in 1958 and rehabilitated in 2010, is constructed with five approach spans with steel I-beams and concrete deck girders with a concrete deck and asphalt wearing surface (Figures 1a and 1b). Details regarding stormwater drains and utilities are discussed below in Section 2.2.

## 2 INSPECTION AND SAMPLING

The identification of ACM is 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 1 percent (%) asbestos by calibrated visual area estimation by 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 ACM are obtained at the discretion of licensed inspectors, based on site conditions and professional judgment. It should be noted

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that it was necessary to minimally damage existing finishes to collect bulk samples; only those sample locations within the shoulders of the roadway wearing surface were patched with a high-strength urethane caulk.

### 2.1 Personnel Qualifications and Sampling Date

Mr. Zachary Mongan of Arcadis performed the inspection at the existing bridge structure for this project, along with Mr. Zack Dinkins and Mr. Greg Drelich. These three Arcadis staff are State of Tennessee-accredited asbestos inspectors (Appendix A). Arcadis is also accredited by the State of Tennessee (accreditation number A-F-710-63799) to conduct asbestos activities (Appendix A). The asbestos survey and associated bulk sample collection were conducted by Arcadis on April 23, 2018, with a subsequent return trip on April 25, 2018 to sample additional materials only accessible with a TDOT-operated "Reach-All" aerial bucket truck. Motorized boat support was also provided by an Arcadis subcontractor to comply with applicable safety regulations. Traffic control measures for temporary lane closures were requested for this project and deployed on April 25, 2018 by the local TDOT Maintenance Division.

### 2.2 Visual Survey

The inspection began with a visual survey of the structure to identify homogeneous areas (HAs) and to determine sampling locations for suspect ACM. Sample locations were sketched on a site drawing (Figures 1a and 1b). Based on the visual survey, approximately 576, 4-inch diameter, vertical cementitious stormwater deck drains were observed along the edges of the roadway wearing surface (Appendix B – Photographs 12 and 37).

Four polyvinyl chloride (PVC) utility pipes, along with several exposed electrical conduits, were observed attached to the southern overhang spanning the length of the bridge (Photograph 38). A suspected steam line, along with exposed electrical conduit and a small PVC utility pipe, were also observed along the northern overhang spanning the length of the bridge (Photograph 39). Upon further inspection, the suspected steam line was confirmed to be insulated with fiberglass under a metal jacket (Photograph 40). Three lights associated with river navigation and reportedly operated by the Coast Guard, are attached to the northern and southern overhangs on the western side of the bridge (Photograph 35).

One set of railroad tracks is located under the eastern portion of the bridge, operated by CSX Transportation, Inc. and associated with nearby Tennessee Valley Authority (TVA) Bull Run operations (Photograph 41). An elongated island with overhead powerlines and communications tower was observed under the eastern portion of the bridge, beyond which is suspected TVA outflow used for Bull Run plant discharge (Photograph 42). The TVA outflow area was inaccessible with boat support due to TVA restrictions; therefore, that area was considered inaccessible. No inaccessible materials were observed and no other stormwater drains or utilities were observed to be associated with the bridge.

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### 2.3 Sampling of Bridge Components

Individual bridge components were sampled as described in the following subsections. Materials such as metal, fiberglass, foam, and rubber (if present) were not considered suspect ACM and therefore not sampled. Materials associated with the upper bridge wearing surface (i.e., reflector mastic, asphalt, pavement marker mastic, etc.) were not sampled per TDOT's request. Arcadis collected bulk samples of homogeneous areas of suspect ACM in a random and representative manner, as determined by the inspector. Once sampling locations were determined, bulk concrete samples were collected by following these steps:

- The sample areas were thoroughly brushed and rinsed to remove surface debris and eliminate the possibility of sample contamination from asbestos-containing vehicular brake dust.
- A battery-powered hammer drill was used to cut away a thin layer of the concrete in order to make a dimple for sampling. This material was discarded.
- Additional drilling was continued after the asbestos inspector placed a new sample container near the drill bit to collect a concrete sample.
- The collected material was then bagged and labeled for transmittal to the laboratory.
- All equipment was cleaned and the operation repeated at subsequent locations.

Non-concrete material sampling methods are described below. Sampling included physically touching the material to determine friability, obtaining a representative bulk sample for laboratory analysis, and a detailed observation of condition and quantity. A total of 143 suspect ACM samples from 43 HAs were submitted for laboratory analysis; these HAs are discussed below. Additionally, three blind duplicate samples from one HA were sampled and analyzed. One hundred forty-six samples (inclusive of all layers) were analyzed and reported by the laboratory. Generalized sample locations are presented on Figures 1a and 1b. Representative photographs of each HA are also provided in Appendix B. The laboratory analytical data sheets and chain-of-custody (COC), which include detailed descriptions of sample locations, texture, quantities, and condition for each HA, are presented in Appendix C.

#### 2.3.1 Abutment Structure Skim Coating

Based on the estimated square footage of the coating, three bulk samples were collected from the grey abutment structure skim coating (HA-01). To facilitate collection, coating surfaces were first cleaned by brushing and rinsing, and then scraping the material into sample collection bags. Bags were sealed and labelled with pertinent information prior to shipment to the laboratory.

#### 2.3.2 Abutment Wingwall Concrete

Three bulk samples were collected from the grey abutment wingwall concrete (HA-02). Samples were collected from the corners of the bridge using methods outlined in Section 2.3.

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### **2.3.3 Abutment Wall Concrete**

Three bulk samples were collected from the grey abutment wall concrete (HA-03). Samples were collected using methods outlined in Section 2.3.

### **2.3.4 Abutment Backwall Concrete**

Three bulk samples were collected from the grey abutment backwall concrete (HA-04). Samples were collected using methods outlined in Section 2.3.

### **2.3.5 Abutment Outer Backwall Concrete**

Three bulk samples were collected from the grey abutment outer backwall concrete (HA-05) associated with the outer beams of the bridge. Samples were collected using methods outlined in Section 2.3.

### **2.3.6 Approach Overhang Concrete**

Three bulk samples were collected from the grey approach overhang concrete (HA-06). Samples were collected using methods outlined in Section 2.3.

### **2.3.7 Beam Concrete**

Three bulk samples were collected from the grey beam concrete (HA-07) associated with the concrete deck girder approach. Samples were collected using methods outlined in Section 2.3.

### **2.3.8 Approach Underside Concrete**

Three bulk samples were collected from the grey approach underside concrete (HA-08). Samples were collected using methods outlined in Section 2.3.

### **2.3.9 Seam Skim Patching**

Based on the estimated square footage of the patching, three bulk samples were collected from the white seam skim patching (HA-09) located along the seams between the abutment walls and the abutment backwalls/beams. Samples were collected using methods listed in Section 2.3.1.

### **2.3.10 Concrete Skim Patching**

Based on the estimated square footage and multiple components of the bridge containing the patching, six bulk samples were collected from the grey concrete skim patching (HA-10) located throughout the beams, abutment walls, backwalls, overhangs, deck underside, and bents. Samples were collected using methods listed in Section 2.3.1.

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### **2.3.11 Filler Material Between Abutment Wingwalls/Abutment Backwalls**

Three bulk samples were collected from the black filler material (HA-11) between abutment wingwalls and abutment backwalls. Samples were collected using cutting and tearing techniques.

### **2.3.12 Abutment Addition Skim Patching**

Based on the estimated square footage of the patching, three bulk samples were collected from the grey abutment addition skim patching (HA-12) located only along the western abutment wall. Samples were collected using methods listed in Section 2.3.1.

### **2.3.13 Bent Structure Skim Coating**

Based on the estimated square footage of the coating, seven bulk samples were collected from the grey bent column skim patching (HA-13) located under the approaches. Samples were collected using methods listed in Section 2.3.1.

### **2.3.14 Bent Structure Concrete**

Three bulk samples were collected from the grey bent structure concrete (HA-14). Samples were collected using methods outlined in Section 2.3.

### **2.3.15 Railroad Bent Wall Concrete**

Three bulk samples were collected from the grey railroad bent wall concrete (HA-15) located on the eastern side of the bridge on both sides of the railroad tracks. Samples were collected using methods outlined in Section 2.3.

### **2.3.16 Railroad Bent Wall Graffiti Patching**

Based on the estimated square footage of the patching, five bulk samples were collected from the grey railroad bent wall graffiti patching (HA-16) located on the eastern side of the bridge on both sides of the railroad tracks. Samples were collected using methods listed in Section 2.3.1.

### **2.3.17 Abutment Addition Wall Concrete**

Three bulk samples were collected from the grey abutment addition wall concrete (HA-17) located along the western abutment. Samples were collected using methods outlined in Section 2.3.

### **2.3.18 Abutment Addition Wall Skim Coating**

Based on the estimated square footage of the coating, three bulk samples were collected from the grey abutment addition wall skim coating (HA-18) located along the western abutment. Samples were collected using methods listed in Section 2.3.1.

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### **2.3.19 Vertical Cementitious Stormwater Deck Drains**

Three bulk samples were collected from the grey vertical cementitious stormwater deck drains (HA-19). An estimated total of 576 cementitious drains are located within the overhangs of the bridge. Samples were collected using a cold chisel and chipping techniques.

### **2.3.20 Railing System Post Concrete**

Three samples were collected from the grey railing system post concrete (HA-20). Samples were collected using methods outlined in Section 2.3.

### **2.3.21 Railing System Rail Concrete**

Three bulk samples were collected from the grey railing system rail concrete (HA-21). Samples were collected using methods outlined in Section 2.3.

### **2.3.22 Deck Concrete**

Three bulk samples were collected from the grey deck concrete (HA-22). Samples were collected from the top of the deck structure by drilling through the asphalt wearing surface until reaching concrete using methods outlined in Section 2.3.

### **2.3.23 Filler Material Between Railing System Rails and Posts**

Three bulk samples were collected from the black filler material (HA-23) between railing system rails and posts. Samples were collected using cutting and tearing techniques.

### **2.3.24 Curb Concrete**

Three bulk samples were collected from the grey curb concrete (HA-24) located on both sides of the bridge. Samples were collected using methods outlined in Section 2.3.

### **2.3.25 Joint Concrete**

Three bulk samples were collected from the grey joint concrete (HA-25) located between the deck spans. Samples were collected using methods outlined in Section 2.3.

### **2.3.26 Curb Concrete Patching**

Four bulk samples were collected from the grey curb concrete patching (HA-26) located in various locations on both sides of the bridge. Samples were collected using methods outlined in Section 2.3.

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### **2.3.27 Metal Guard Rail Footer Concrete**

Three bulk samples were collected from the grey metal guard rail footer concrete (HA-27) located on the southwestern corner of the bridge. Samples were collected using methods outlined in Section 2.3.

### **2.3.28 Railing System Interior Concrete Patching**

Four bulk samples were collected from the grey railing system interior concrete patching (HA-28) located in various locations on both sides of the bridge. Samples were collected using methods outlined in Section 2.3.

### **2.3.29 Railing System Exterior Concrete Patching**

Four bulk samples were collected from the grey railing system exterior concrete patching (HA-29) located in various locations on both sides of the bridge. Samples were collected using methods outlined in Section 2.3.

### **2.3.30 Concrete Patching Around Light Fixtures**

Three bulk samples were collected from the light grey concrete patching around light fixtures (HA-30) that are attached to the overhangs on both sides of the bridge. Samples were collected using methods outlined in Section 2.3.

### **2.3.31 Main Span Overhang Concrete**

Four bulk samples were collected from the grey main span overhang concrete (HA-31). Samples were collected using methods outlined in Section 2.3.

### **2.3.32 Main Span Deck Underside Concrete**

Four bulk samples were collected from the grey main span deck underside concrete (HA-32). Samples were collected using methods outlined in Section 2.3.

### **2.3.33 Westernmost Bent Cap Skim Coating**

Based on the estimated square footage of the coating, three bulk samples were collected from the white westernmost bent cap skim coating (HA-33). The skim coating was only located on the eastern side of the bent cap. Samples were collected using methods listed in Section 2.3.1.

### **2.3.34 Base of Pier Concrete**

Three bulk samples were collected from the grey base of pier concrete (HA-34). Samples were collected using methods outlined in Section 2.3.

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### **2.3.35 Main Span Overhang Joint Concrete Patching**

Three bulk samples were collected from the dark grey main span overhang joint concrete patching (HA-35) located in various locations. Samples were collected using methods outlined in Section 2.3.

### **2.3.36 Main Span Deck Underside Joint Concrete**

Three bulk samples were collected from the grey deck main span underside joint concrete (HA-36) located between spans. Samples were collected using methods outlined in Section 2.3.

### **2.3.37 Pier Concrete Patching**

Three bulk samples were collected from the dark grey pier concrete patching (HA-37) located on piers east of the island. Samples were collected using methods outlined in Section 2.3.

### **2.3.38 Pier Cap Concrete**

Three bulk samples were collected from the grey pier cap concrete (HA-38) located on piers west of the island. Samples were collected using methods outlined in Section 2.3.

### **2.3.39 Pier Cap Skim Coating**

Based on the estimated square footage of the coating, three bulk samples were collected from the grey pier cap skim coating (HA-39) located on piers west of the island. Samples were collected using methods listed in Section 2.3.1.

### **2.3.40 Eastern Pier Concrete**

Three bulk samples were collected from the grey eastern pier concrete (HA-40). Samples were collected using methods outlined in Section 2.3.

### **2.3.41 Fourth Pier Concrete**

Three bulk samples were collected from the grey fourth pier concrete (HA-41) from the west. Samples were collected using methods outlined in Section 2.3.

### **2.3.42 Western Pier Concrete**

Three bulk samples were collected from the grey western pier concrete (HA-42). Samples were collected using methods outlined in Section 2.3.

### **2.3.43 Western Pier Cap Concrete**

Three bulk samples were collected from the grey western pier cap concrete (HA-43). Samples were collected using methods outlined in Section 2.3.

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### 3 ANALYTICAL PROCEDURES

The suspect asbestos-containing bulk samples were submitted under proper COC protocol for analysis to EMSL Analytical, Inc. (EMSL) located in Cinnaminson, New Jersey. EMSL is a National Voluntary Laboratory Accreditation Program (NVLAP) accredited laboratory (NVLAP Lab Code 101048-0) and an American Industrial Hygiene Association (AIHA) accredited laboratory (AIHA Laboratory 100194), using procedures compliant with the guidelines established by the U.S. Environmental Protection Agency (USEPA).

The bulk samples are analyzed in the laboratory using PLM coupled with dispersion staining. PLM is an analytical method for asbestos identification, which identifies the specific asbestos minerals by their unique optical properties. The optical properties are a result of the mineral's chemical composition, physical atomic structure, and visual morphology. This is the USEPA-recommended method of analysis for asbestos identification in bulk samples. No other analytical methods (Point Counting, California Air Resource Board 435, or Transmission Electron Microscopy) were used or recommended per TDOT guidance.

### 4 REGULATORY CRITERIA

Applicable asbestos regulations define ACM as a material containing greater than 1% asbestos by weight and also distinguishing between friable and non-friable forms of ACM. Friable materials can be crumbled or reduced to powder by hand pressure. Non-friable materials cannot be crumbled, pulverized, or reduced to powder by hand pressure. The USEPA further classifies non-friable ACM as Category I and II.

#### 4.1 National Emission Standards for Hazardous Air Pollutants

The USEPA's National Emission Standards for Hazardous Air Pollutants (NESHAP) regulations (40 CFR 61, Subpart B) requires 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.

The NESHAP regulations also establish specific notification and control requirements for renovation and demolition work.

#### 4.2 Definitions

Significant definitions related to regulation of asbestos under NESHAP include:

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**Friable ACM** is defined by the Asbestos NESHAP as any material containing more than 1% asbestos, as determined using the method specified in Appendix A, Subpart F, 40 CFR Part 763, Section 1, Polarized Light Microscopy (PLM), that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure (Sec. 61.141).

**Non-friable ACM** is any material containing more than 1% asbestos, as determined using the method specified in Appendix A, Subpart F, 40 CFR Part 763, Section 1, Polarized Light Microscopy (PLM), that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure. USEPA also defines two categories of non-friable ACM, Category I non-friable ACM and Category II non-friable ACM, which are described as follows:

- **Category I non-friable ACM** is any asbestos-containing packing, gasket, resilient floor covering, or asphalt roofing product which contains more than 1% asbestos as determined using PLM according to the method specified in Appendix A, Subpart F, 40 CFR Part 763. (Sec. 61.141).
- **Category II non-friable ACM** is any material, excluding Category I non-friable ACM, containing more than 1% asbestos, as determined using PLM according to the methods specified in Appendix A, Subpart F, 40 CFR Part 763, that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure. (Sec. 61.141).

**RACM** is (a) friable asbestos material; (b) Category I non-friable ACM that has become friable; (c) Category I non-friable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading; or (d) 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.

## 5 RESULTS

One hundred forty-six bulk samples were collected and submitted for analysis from this bridge; 146 results were reported, inclusive of all material layers. Multiple samples of each HA were collected in accordance with State of Tennessee, Department of Transportation Environmental Division, Social and Cultural Resources Office, Hazardous Materials Section requirements and delivered to the laboratory for visual observation and microscopic analysis. The samples were selected based on HAs of suspect materials, as described in Section 2.

Based on the laboratory analytical results, asbestos was only detected in one of the 43 HAs identified and sampled at the SR-170 bridge over the Clinch River, east of Oak Ridge, in Anderson County, Tennessee. More specifically, samples from HA-19 (vertical cementitious stormwater deck drains) contained up to 15% Chrysotile and 3% Crocidolite asbestos (Table 1); this was confirmed in the duplicate samples, which contained up to 20% Chrysotile asbestos. The laboratory results confirm that the vertical cementitious stormwater deck drains contain USEPA-regulated levels of asbestos, which should be managed/handled accordingly during future demolition of the structure for bridge replacement. Photographs of the positive material are included in Appendix B. The laboratory analytical report for bulk samples obtained and analyzed by PLM is presented in Appendix C.

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## 6 LIMITATIONS

Arcadis performed services in a manner consistent with the level of care and expertise exercised by members of the asbestos inspection and assessment profession. Arcadis does not imply or guarantee that every suspect ACM on or in the structure has been identified or sampled. Historically, asbestos has been used extensively in the United States. This inspection is intended to identify those components that are reasonably suspect and are most likely to be ACM in quantities subject to regulation based on existing industry and regulatory standards. The inspector did not utilize extensive destructive sampling techniques to assess those materials potentially located in the structural components.

The information presented herein is based on information obtained during the site visit(s) and from professional judgment. If additional information becomes available which might impact this report, Arcadis requests the opportunity to review the information and re-assess the potential concerns and modify this report, if warranted.

There are no third-party rights or benefits conferred under this report. Use of this report is strictly limited to TDOT, the only party to whom Arcadis intends to confer any rights. Any reliance on the contents of this report by any third party is the sole responsibility of that party.

# TABLES



**Table 1**  
**Summary of Materials Containing Greater Than 1% Asbestos**

Tennessee Department of Transportation  
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Inspection Date	Sample Identification No.	Homogeneous Area	Location (Bridge Component)	Approximate Quantity	Friable (Y/N)	Type of Asbestos and Content (%)	Photograph No.
4/25/2018	HA-19A	Vertical Cementitious Stormwater Deck Drains	Full length of the bridge in each shoulder	1,152 LF; approximately 576 drains at 2 ft in length	N	13% Chrysotile, 2% Crocidolite	12, 37
	HA-19B					13% Chrysotile, 3% Crocidolite	
	HA-19C					15% Chrysotile, 2% Crocidolite	
	Dup-01A		Duplicate sample of HA-19			20% Chrysotile	
	Dup-01B					20% Chrysotile	
	Dup-01C					15% Chrysotile	

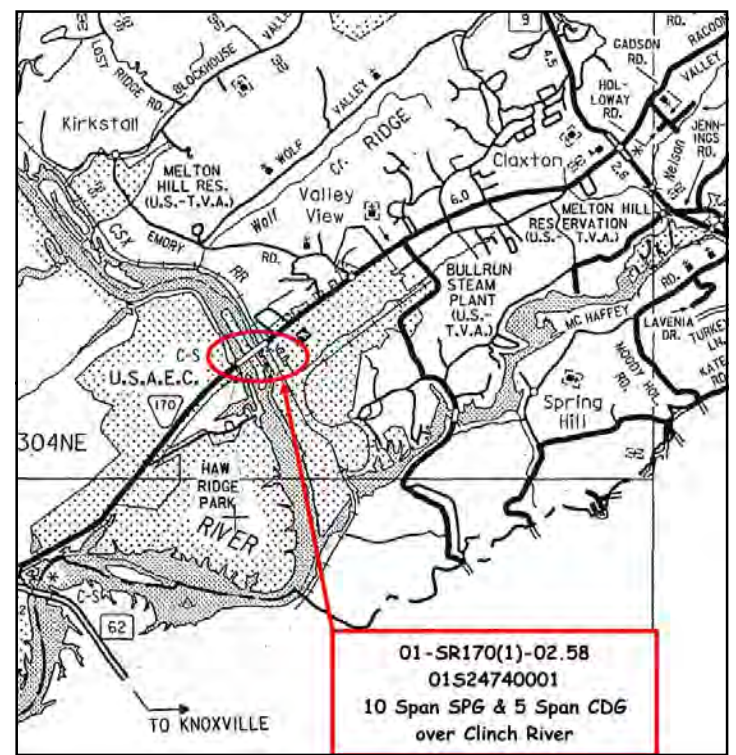
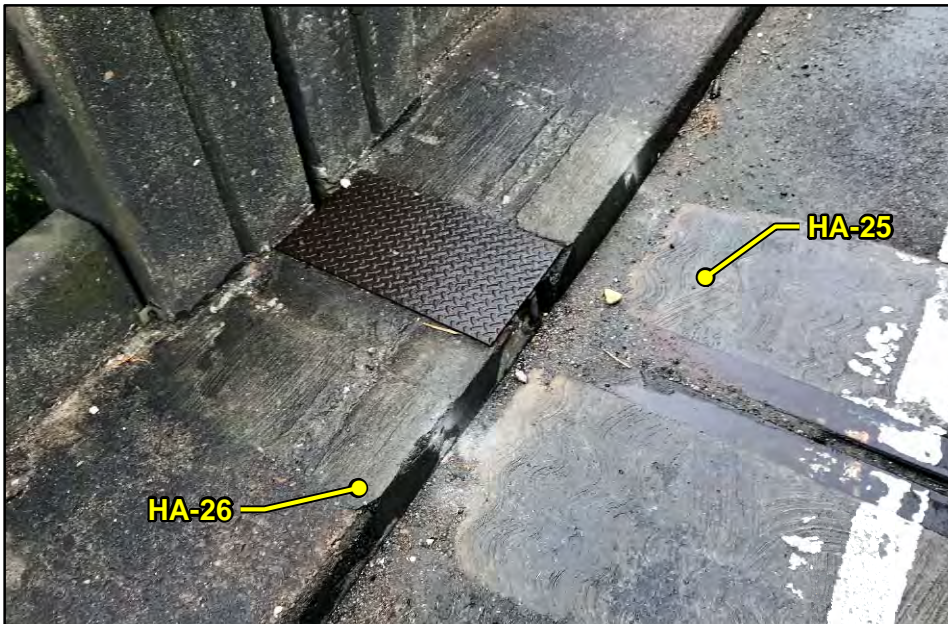
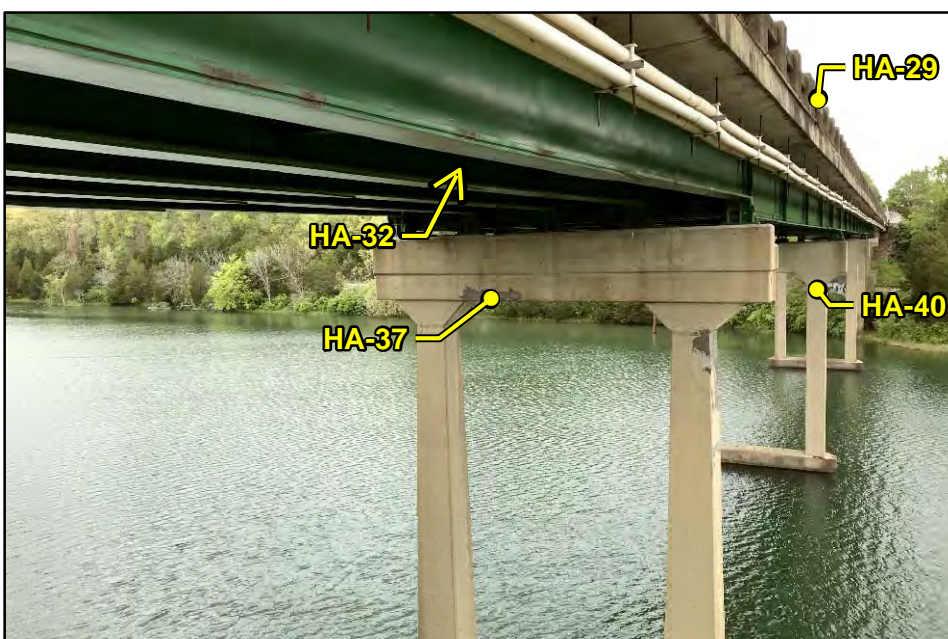
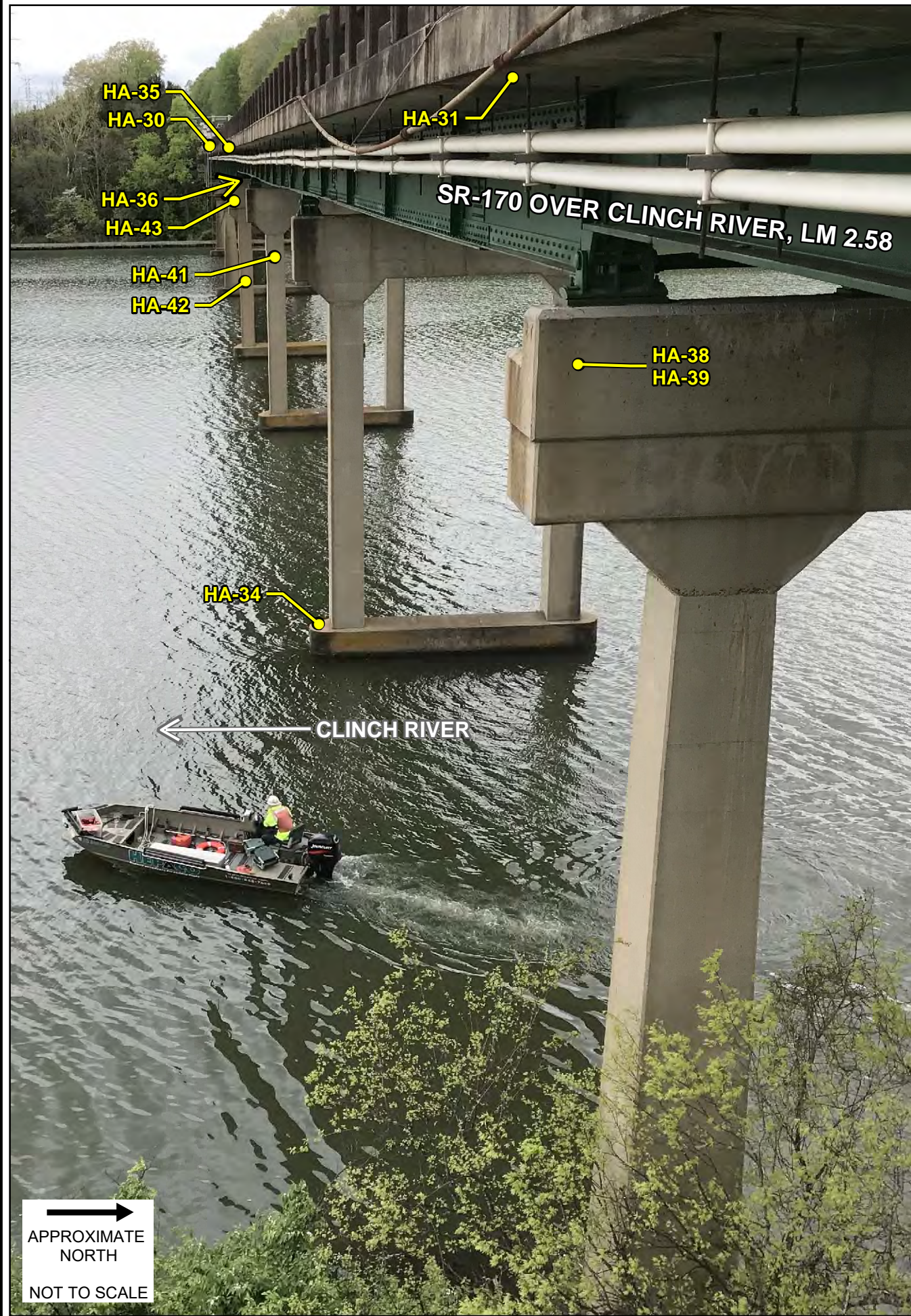
**Acronyms and Abbreviations:**

% = percent  
 ft = feet  
 HA = homogeneous area  
 LF = linear feet

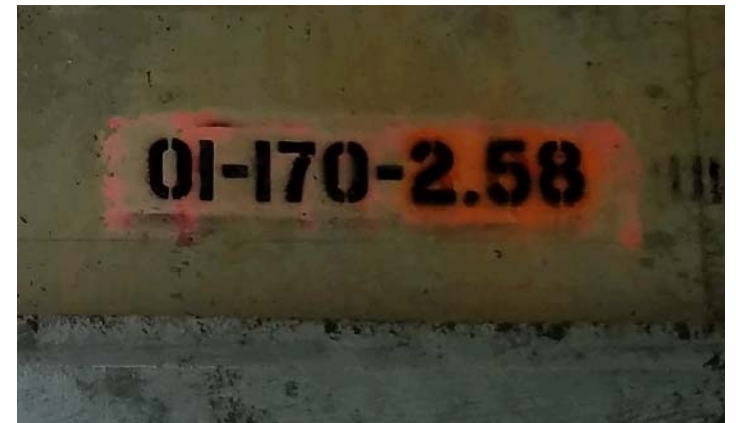
# FIGURES



CITY: (KNOXVILLE) DIV/GROUP: (ENV/GIS) DB: (A.CARLONE) PM: (R.LOUNSBURY) TM: (Z.MONGAM/G.DREILICH) BY: (A.CARLONE)  
 PROJECT: TNDT1935.HZ50 PATH: Z:\GIS\Projects\ENVTDOT\Bridg Inspection Locations\Anderson CO\HZ-55\Bridg\_01S24740001\_HZ-55\_AndersonCounty\_2018\_A.mxd SAVED: 5/4/2018



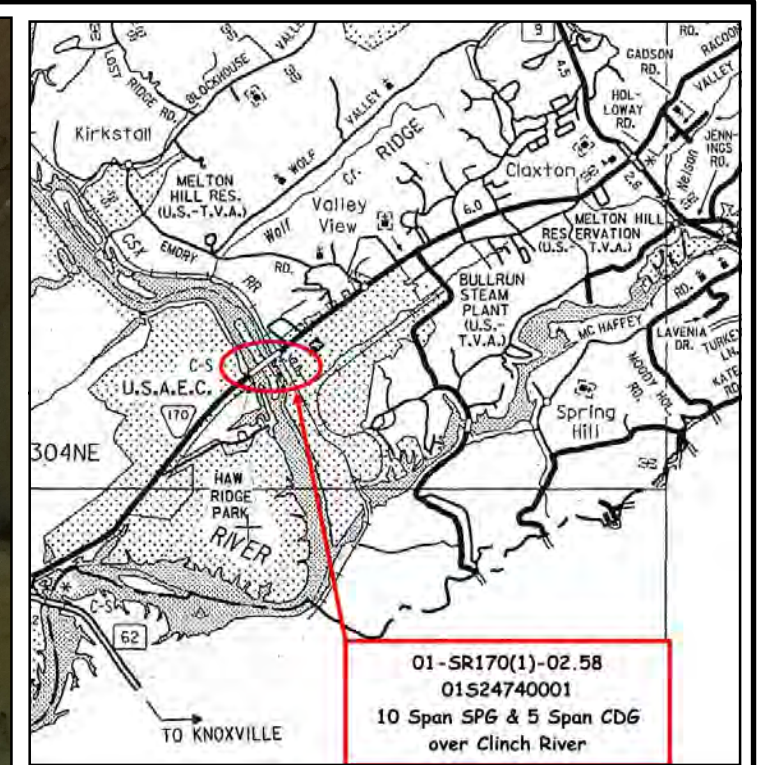
- Notes:
1. Homogeneous Area (HA) sample locations illustrated above are generalized; actual samples were collected from random locations across the structure.
  2. Samples were collected on April 23 and 25, 2018.
  3. Total bridge length is 1,439 feet.
  4. USEPA-regulated levels of asbestos (as shown in red) were detected in HA-19 (vertical cementitious stormwater deck drains) containing up to 15% Chrysotile and 3% Crocidolite asbestos. A duplicate sample collected from HA-19 confirmed ACM, containing up to 20% Chrysotile.
  5. Approximately 576 vertical cementitious stormwater drain pipes were observed (288 on each shoulder), which drain through the overhang.
  6. Several other stormwater drain pipes and utilities were also attached to the bridge structure, as detailed in Section 2.2 of report.



TERMINI: SR-170 FROM SR-62 (OAK RIDGE HIGHWAY) TO SR-9 (US-25W, CLINTON HIGHWAY) (IA)  
 EAST OF OAK RIDGE, ANDERSON COUNTY, TENNESSEE  
 TDOT PROJECT NO. 01024-0222-04; PIN NO. 124121.00  
 BRIDGE NO. 01S24740001 (OVER CLINCH RIVER)  
**ASBESTOS SURVEY REPORT**

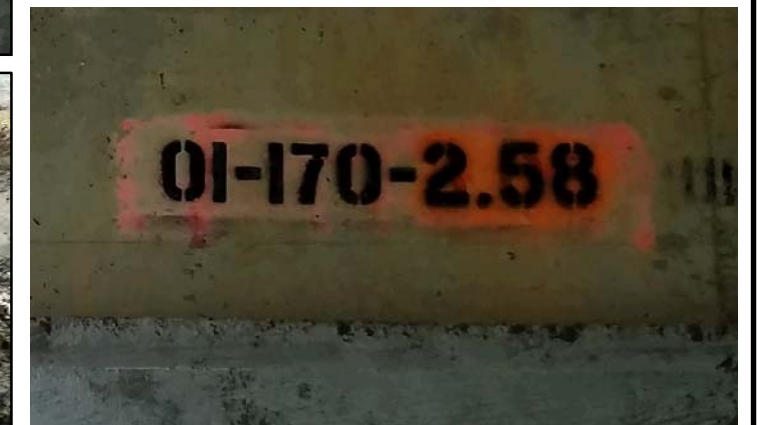
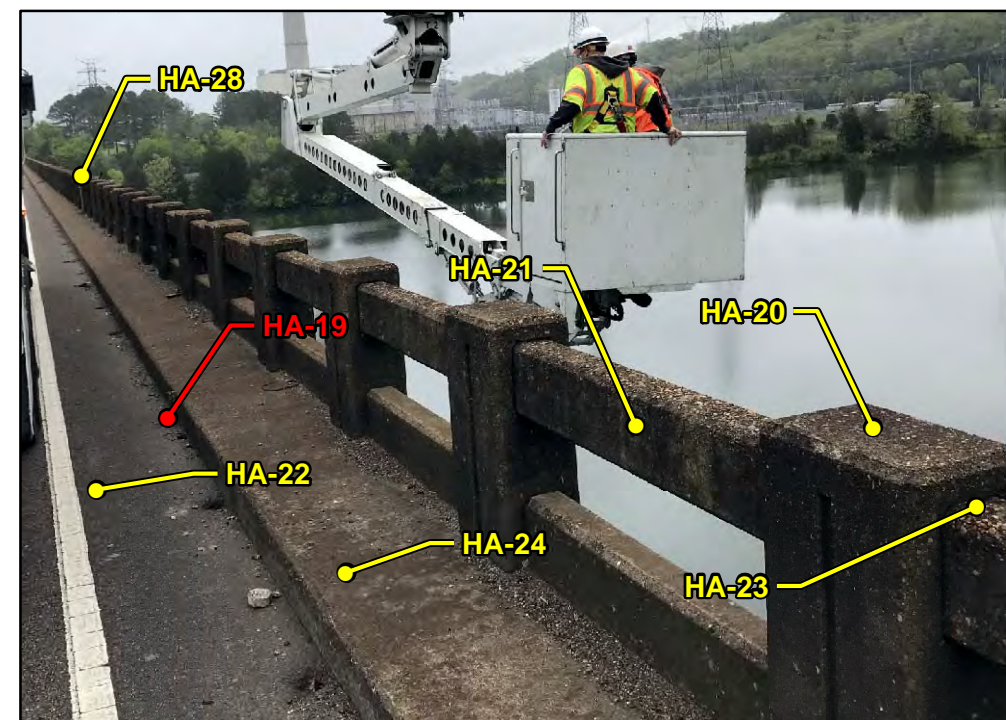
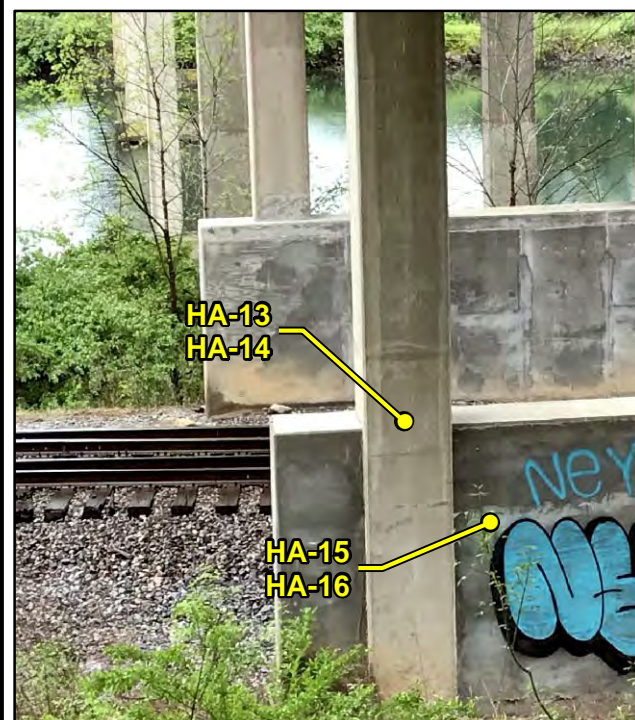
**BULK SAMPLE LOCATION MAP**

CITY: (KNOXVILLE) DIV/GROUP: (ENV/GIS) DB: (A.CARLONE) PM: (R. LOUNSBURY) TM: (Z. MONGAN/G. DREILICH) BY: ACARLONE  
 PROJECT: TNDT1935.HZ50 PATH: Z:\GIS\Projects\ENVTDOT\Bridges\Anderson\Anderson CO\HZ-55\Bridges\01S24740001\_HZ-55\_AndersonCounty\_2018\_B.mxd SAVED: 5/4/2018



Notes:

1. Homogeneous Area (HA) sample locations illustrated above are generalized; actual samples were collected from random locations across the structure.
2. Samples were collected on April 23 and 25, 2018.
3. Total bridge length is 1,439 feet.
4. USEPA-regulated levels of asbestos (as shown in red) were detected in HA-19 (vertical cementitious stormwater deck drains) containing up to 15% Chrysotile and 3% Crocidolite asbestos. A duplicate sample collected from HA-19 confirmed ACM, containing up to 20% Chrysotile.
5. Approximately 576 vertical cementitious stormwater drain pipes were observed (288 on each shoulder), which drain through the overhang.
6. Several other stormwater drain pipes and utilities were also attached to the bridge structure, as detailed in Section 2.2 of report.



TERMINI: SR-170 FROM SR-62 (OAK RIDGE HIGHWAY) TO SR-9 (US-25W, CLINTON HIGHWAY) (IA)  
 EAST OF OAK RIDGE, ANDERSON COUNTY, TENNESSEE  
 TDOT PROJECT NO. 01024-0222-04; PIN NO. 124121.00  
 BRIDGE NO. 01S24740001 (OVER CLINCH RIVER)  
**ASBESTOS SURVEY REPORT**

**BULK SAMPLE LOCATION MAP**

# APPENDIX A

## Accreditations



**THE STATE OF TENNESSEE**

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



Re-Accreditation

**Gregory M Drelich**

DOB Sex HGT WGT

Discipline	Accreditation	Expiration
Inspector	A-I-103690-63285	Nov-30-2018

**Asbestos Accreditation**

**THE STATE OF TENNESSEE**

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



Re-Accreditation

**Zachary M Mongan**

DOB Sex HGT WGT

Discipline	Accreditation	Expiration
Inspector	A-I-97142-64514	Feb-28-2019
Project Monitor	A-PM-97142-64515	Feb-28-2019

**Asbestos Accreditation**

**THE STATE OF TENNESSEE**

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



Initial

**Zack C Dinkins**

DOB Sex HGT WGT

Discipline	Accreditation	Expiration
Inspector	A-I-110168-65664	Oct-31-2018

**Asbestos Accreditation**



## 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:

### Arcadis U.S., Inc.

P O Box 66 Syracuse NY, 13214

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-710-63799	December 01, 2017	December 31, 2018



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

This 5th Day of December 2017

Division of Solid Waste Management  
Toxic Substance Program

CN-1324 (Rev 6/13)

RDA-3020

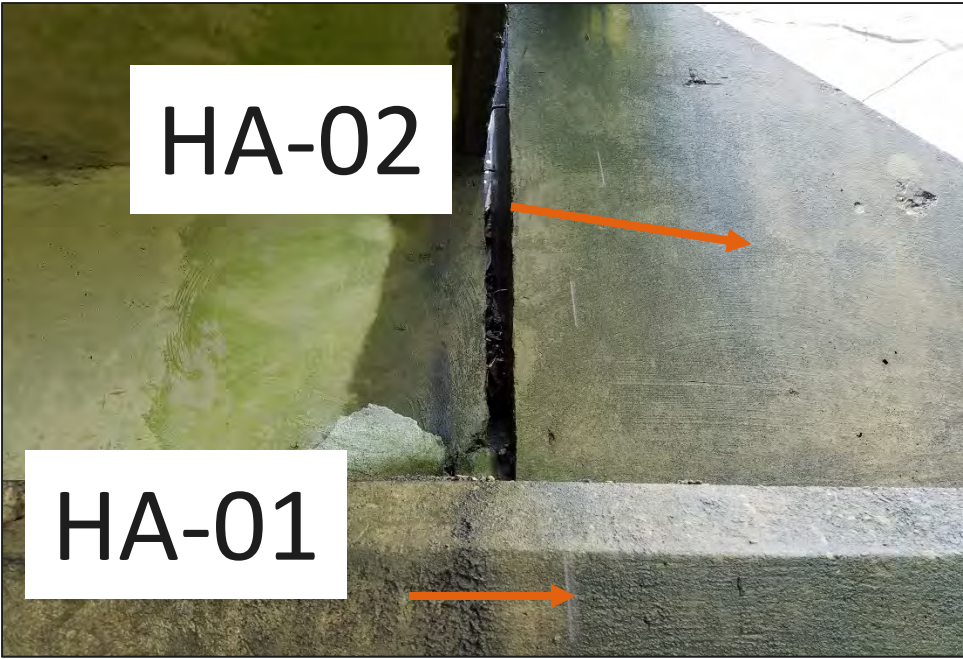
# APPENDIX B

Project Photographs



**Project Photographs**

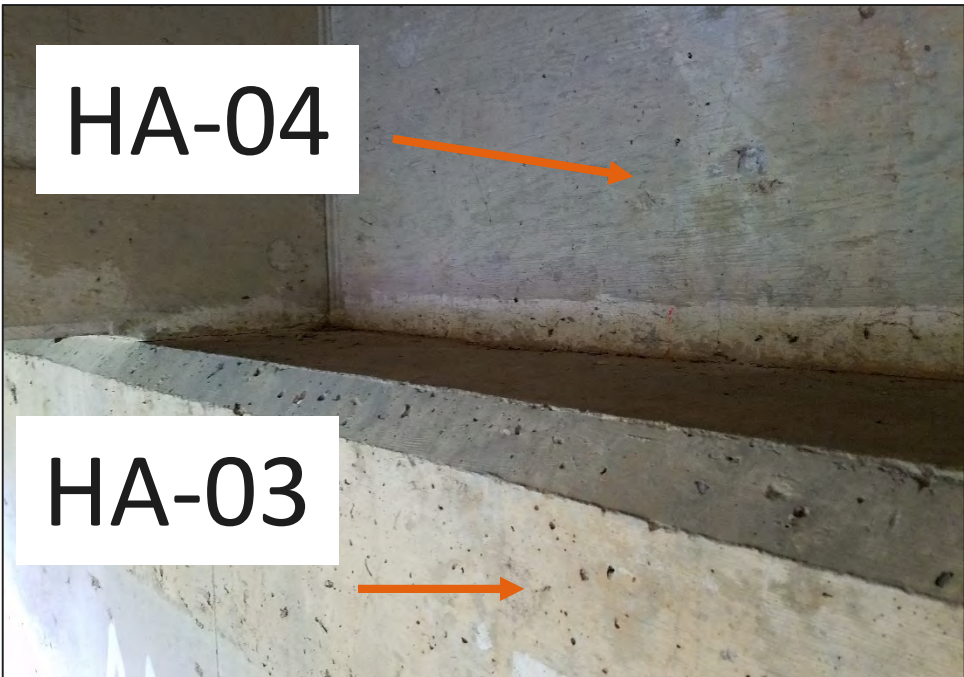
Termini: SR-170 From SR-62 (Oak Ridge Highway) to SR-9 (US-25W, Clinton Highway) (IA)  
East of Oak Ridge, Anderson County, Tennessee  
TDOT Project No. 01024-0222-04; PIN No. 124121.00  
Bridge No. 01S24740001 (Over Clinch River)



**Photo: 1**

**Date:**  
April 23, 2018

**Description:**  
View of the abutment structure skim coating (HA-01) and the abutment wingwall concrete (HA-02).



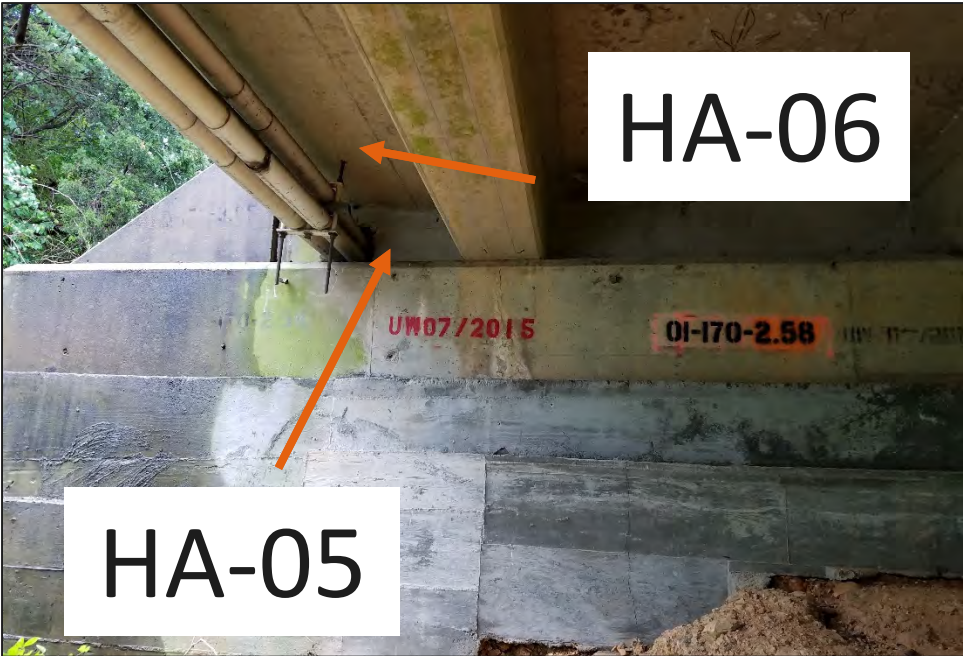
**Photo: 2**

**Date:**  
April 23, 2018

**Description:**  
View of the abutment wall concrete (HA-03) and the abutment backwall concrete (HA-04).

**Project Photographs**

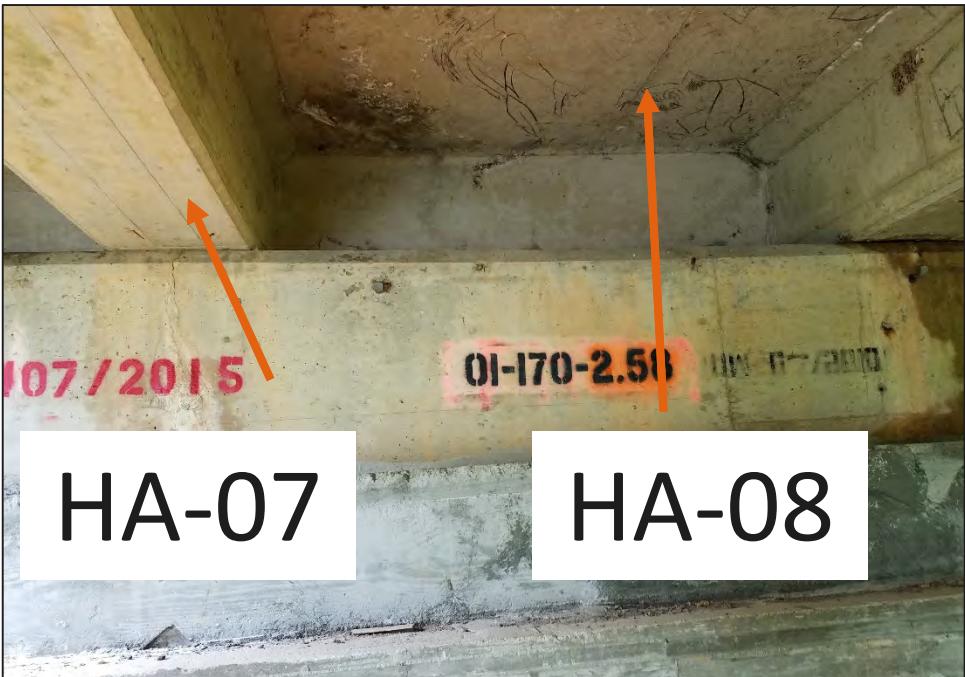
Termini: SR-170 From SR-62 (Oak Ridge Highway) to SR-9 (US-25W, Clinton Highway) (IA)  
East of Oak Ridge, Anderson County, Tennessee  
TDOT Project No. 01024-0222-04; PIN No. 124121.00  
Bridge No. 01S24740001 (Over Clinch River)



**Photo: 3**

**Date:**  
April 23, 2018

**Description:**  
View of the abutment outer backwall concrete (HA-05) and the approach overhang concrete (HA-06).



**Photo: 4**

**Date:**  
April 23, 2018

**Description:**  
View of the beam concrete (HA-07) and the approach underside concrete (HA-08).

**Project Photographs**

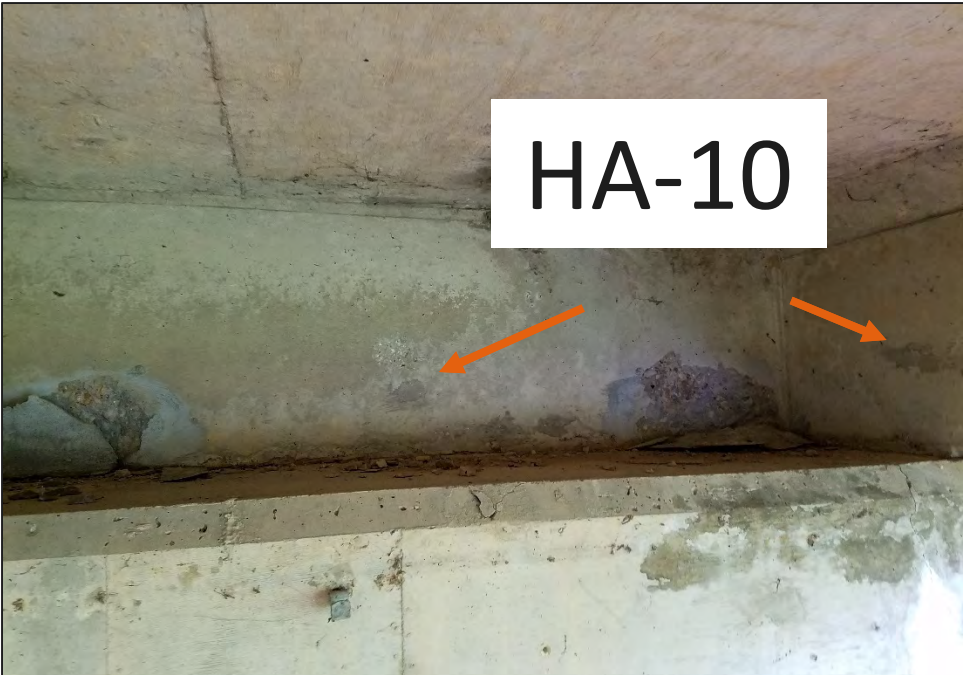
Termini: SR-170 From SR-62 (Oak Ridge Highway) to SR-9 (US-25W, Clinton Highway) (IA)  
East of Oak Ridge, Anderson County, Tennessee  
TDOT Project No. 01024-0222-04; PIN No. 124121.00  
Bridge No. 01S24740001 (Over Clinch River)



**Photo: 5**

**Date:**  
April 23, 2018

**Description:**  
View of the seam skim patching (HA-09).



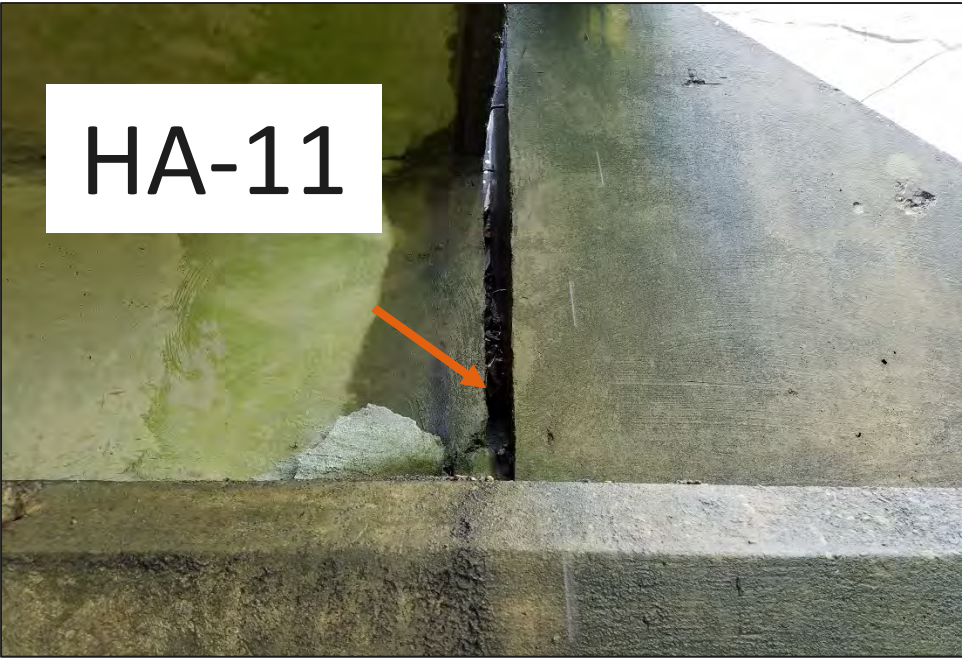
**Photo: 6**

**Date:**  
April 23, 2018

**Description:**  
View of the concrete skim patching (HA-10).

**Project Photographs**

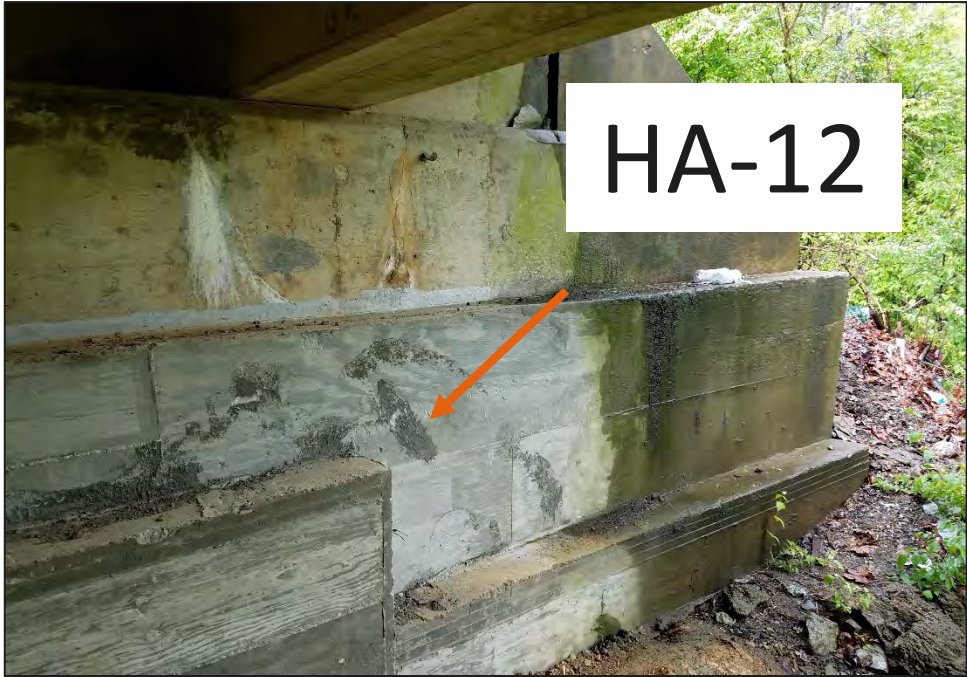
Termini: SR-170 From SR-62 (Oak Ridge Highway) to SR-9 (US-25W, Clinton Highway) (IA)  
East of Oak Ridge, Anderson County, Tennessee  
TDOT Project No. 01024-0222-04; PIN No. 124121.00  
Bridge No. 01S24740001 (Over Clinch River)



**Photo: 7**

**Date:**  
April 23, 2018

**Description:**  
View of the filler material between abutment wingwalls and abutment backwalls (HA-11).



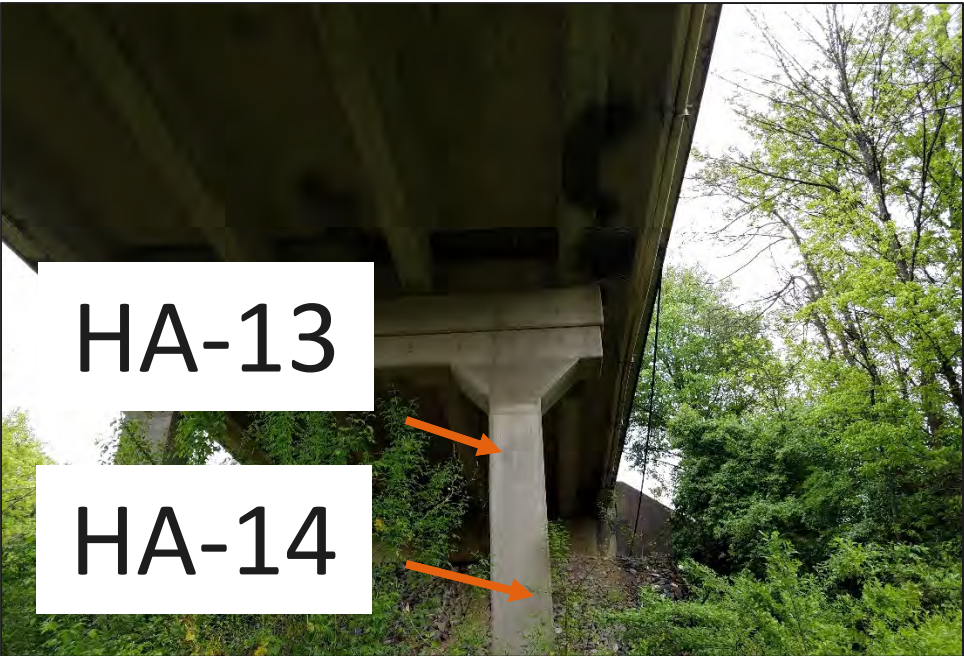
**Photo: 8**

**Date:**  
April 23, 2018

**Description:**  
View of the abutment addition skim patching (HA-12).

**Project Photographs**

Termini: SR-170 From SR-62 (Oak Ridge Highway) to SR-9 (US-25W, Clinton Highway) (IA)  
East of Oak Ridge, Anderson County, Tennessee  
TDOT Project No. 01024-0222-04; PIN No. 124121.00  
Bridge No. 01S24740001 (Over Clinch River)



**Photo: 9**

**Date:**  
April 23, 2018

**Description:**  
View of the bent structure skim coating (HA-13) and the bent structure concrete (HA-14).



**Photo: 10**

**Date:**  
April 23, 2018

**Description:**  
View of the railroad bent wall concrete (HA-15) and the railroad bent wall graffiti patching (HA-16).

### Project Photographs

Termini: SR-170 From SR-62 (Oak Ridge Highway) to SR-9 (US-25W, Clinton Highway) (IA)  
East of Oak Ridge, Anderson County, Tennessee  
TDOT Project No. 01024-0222-04; PIN No. 124121.00  
Bridge No. 01S24740001 (Over Clinch River)



**Photo: 11**

**Date:**  
April 23, 2018

**Description:**  
View of the abutment addition wall concrete (HA-17) and the abutment addition wall skim coating (HA-18).



**Photo: 12**

**Date:**  
April 25, 2018

**Description:**  
View of one of the numerous vertical cementitious stormwater deck drains (HA-19), which contain up to 15% Chrysotile and 3% Crocidolite asbestos.

**Project Photographs**

Termini: SR-170 From SR-62 (Oak Ridge Highway) to SR-9 (US-25W, Clinton Highway) (IA)  
East of Oak Ridge, Anderson County, Tennessee  
TDOT Project No. 01024-0222-04; PIN No. 124121.00  
Bridge No. 01S24740001 (Over Clinch River)



**Photo:** 13

**Date:**  
April 25, 2018

**Description:**  
View of railing system post concrete (HA-20).



**Photo:** 14

**Date:**  
April 25, 2018

**Description:**  
View of railing system rail concrete (HA-21).

**Project Photographs**

Termini: SR-170 From SR-62 (Oak Ridge Highway) to SR-9 (US-25W, Clinton Highway) (IA)  
East of Oak Ridge, Anderson County, Tennessee  
TDOT Project No. 01024-0222-04; PIN No. 124121.00  
Bridge No. 01S24740001 (Over Clinch River)



**Photo: 15**

**Date:**  
April 25, 2018

**Description:**  
View of the asphalt wearing surface above the deck concrete (HA-22).



**Photo: 16**

**Date:**  
April 25, 2018

**Description:**  
View of the filler material between railing system rails and posts (HA-23).

**Project Photographs**

Termini: SR-170 From SR-62 (Oak Ridge Highway) to SR-9 (US-25W, Clinton Highway) (IA)  
East of Oak Ridge, Anderson County, Tennessee  
TDOT Project No. 01024-0222-04; PIN No. 124121.00  
Bridge No. 01S24740001 (Over Clinch River)



**Photo: 17**

**Date:**  
April 25, 2018

**Description:**  
View of the curb concrete (HA-24).



**Photo: 18**

**Date:**  
April 25, 2018

**Description:**  
View of the joint concrete (HA-25).

**Project Photographs**

Termini: SR-170 From SR-62 (Oak Ridge Highway) to SR-9 (US-25W, Clinton Highway) (IA)  
East of Oak Ridge, Anderson County, Tennessee  
TDOT Project No. 01024-0222-04; PIN No. 124121.00  
Bridge No. 01S24740001 (Over Clinch River)



**Photo: 19**

**Date:**  
April 25, 2018

**Description:**  
View of the curb concrete patching (HA-26).



**Photo: 20**

**Date:**  
April 25, 2018

**Description:**  
View of the metal guard rail footer concrete (HA-27).

**Project Photographs**

Termini: SR-170 From SR-62 (Oak Ridge Highway) to SR-9 (US-25W, Clinton Highway) (IA)  
East of Oak Ridge, Anderson County, Tennessee  
TDOT Project No. 01024-0222-04; PIN No. 124121.00  
Bridge No. 01S24740001 (Over Clinch River)



**Photo: 21**

**Date:**  
April 11, 2018

**Description:**  
View of railing system  
interior concrete  
patching (HA-28).



**Photo: 22**

**Date:**  
April 25, 2018

**Description:**  
View of railing system  
exterior concrete  
patching (HA-29).

**Project Photographs**

Termini: SR-170 From SR-62 (Oak Ridge Highway) to SR-9 (US-25W, Clinton Highway) (IA)  
East of Oak Ridge, Anderson County, Tennessee  
TDOT Project No. 01024-0222-04; PIN No. 124121.00  
Bridge No. 01S24740001 (Over Clinch River)



**Photo: 23**

**Date:**  
April 25, 2018

**Description:**  
View of concrete  
patching around light  
fixtures (HA-30).



**Photo: 24**

**Date:**  
April 25, 2018

**Description:**  
View of main span  
overhang concrete  
(HA-31).

**Project Photographs**

Termini: SR-170 From SR-62 (Oak Ridge Highway) to SR-9 (US-25W, Clinton Highway) (IA)  
East of Oak Ridge, Anderson County, Tennessee  
TDOT Project No. 01024-0222-04; PIN No. 124121.00  
Bridge No. 01S24740001 (Over Clinch River)



**Photo:** 25

**Date:**  
April 25, 2018

**Description:**  
View of main span deck underside concrete (HA-32).



**Photo:** 26

**Date:**  
April 25, 2018

**Description:**  
View of westernmost bent cap skim coating (HA-33).

**Project Photographs**

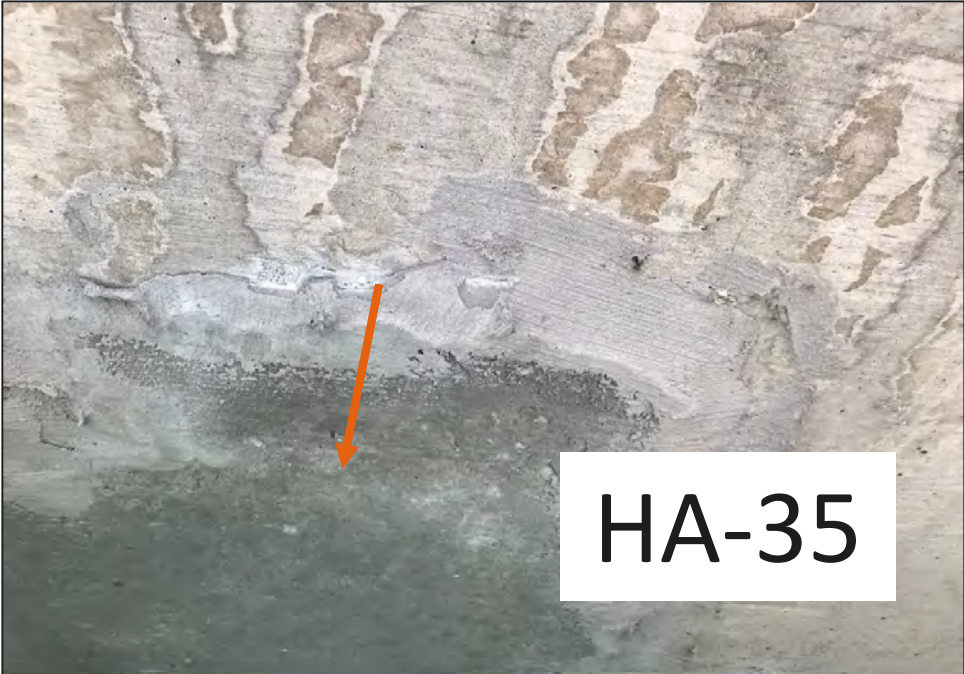
Termini: SR-170 From SR-62 (Oak Ridge Highway) to SR-9 (US-25W, Clinton Highway) (IA)  
East of Oak Ridge, Anderson County, Tennessee  
TDOT Project No. 01024-0222-04; PIN No. 124121.00  
Bridge No. 01S24740001 (Over Clinch River)



**Photo: 27**

**Date:**  
April 25, 2018

**Description:**  
View of base of pier  
concrete (HA-34).



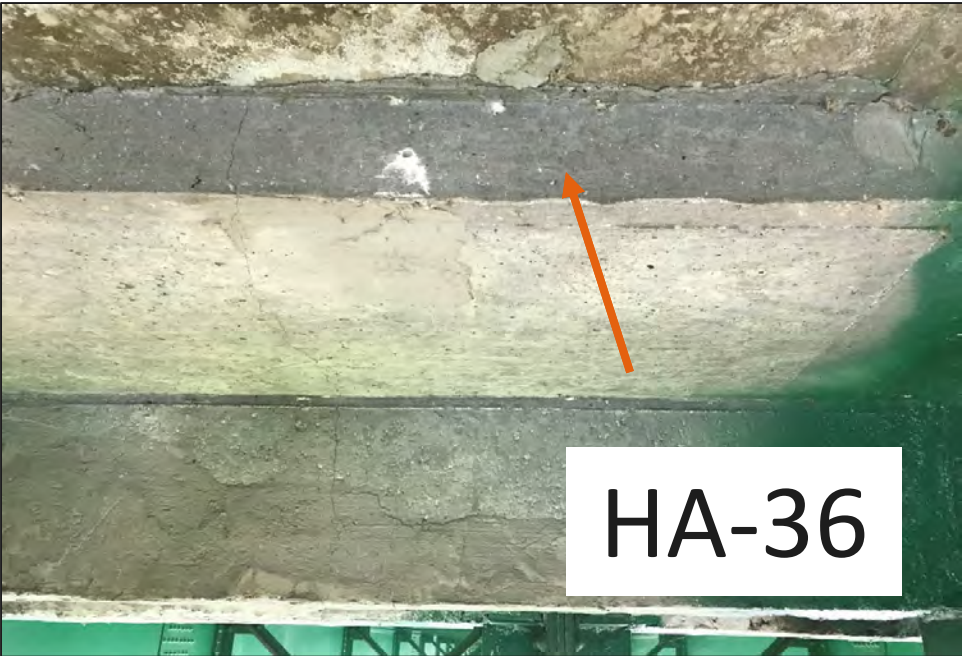
**Photo: 28**

**Date:**  
April 25, 2018

**Description:**  
View of main span  
overhang joint concrete  
patching (HA-35).

**Project Photographs**

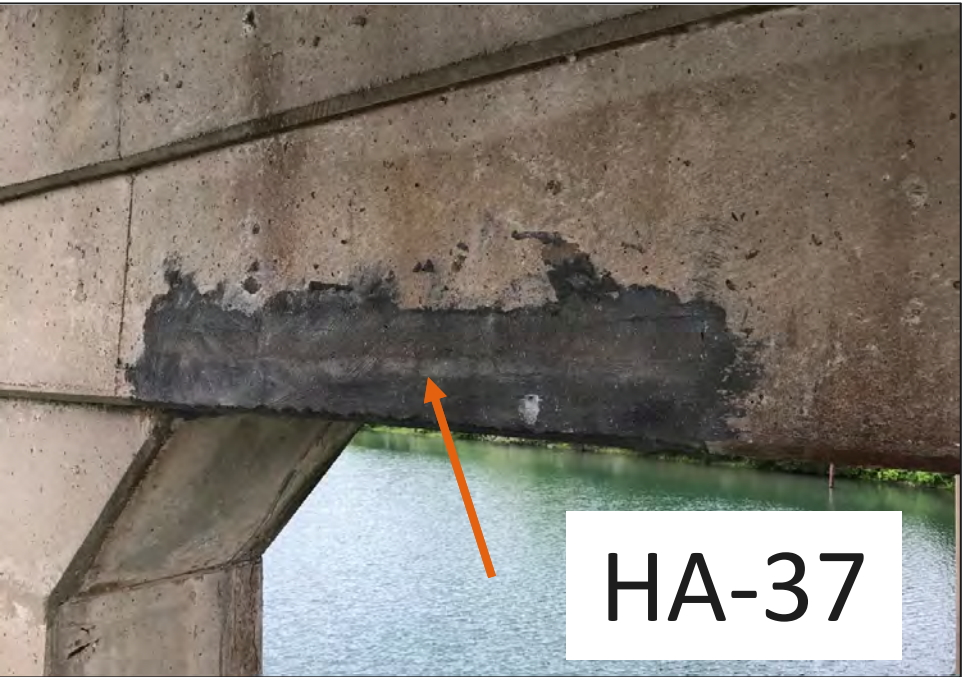
Termini: SR-170 From SR-62 (Oak Ridge Highway) to SR-9 (US-25W, Clinton Highway) (IA)  
East of Oak Ridge, Anderson County, Tennessee  
TDOT Project No. 01024-0222-04; PIN No. 124121.00  
Bridge No. 01S24740001 (Over Clinch River)



**Photo:** 29

**Date:**  
April 25, 2018

**Description:**  
View of main span deck underside joint concrete (HA-36).



**Photo:** 30

**Date:**  
April 25, 2018

**Description:**  
View of pier concrete patching (HA-37).

**Project Photographs**

Termini: SR-170 From SR-62 (Oak Ridge Highway) to SR-9 (US-25W, Clinton Highway) (IA)  
East of Oak Ridge, Anderson County, Tennessee  
TDOT Project No. 01024-0222-04; PIN No. 124121.00  
Bridge No. 01S24740001 (Over Clinch River)



**Photo: 31**

**Date:**  
April 25, 2018

**Description:**  
View of pier cap  
concrete (HA-38).



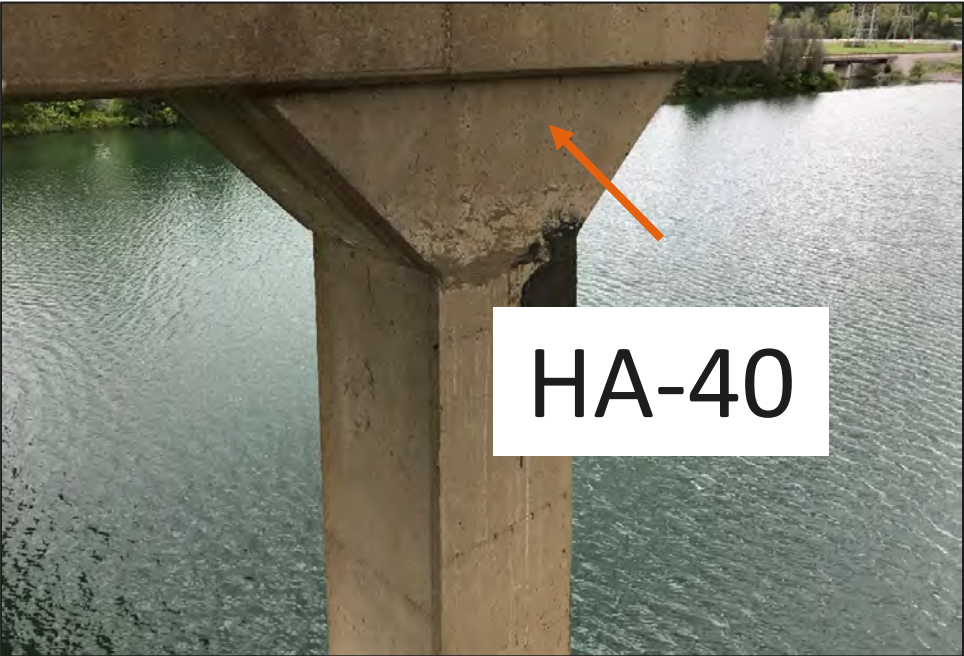
**Photo: 32**

**Date:**  
April 25, 2018

**Description:**  
View of pier cap  
skim coating (HA-39).

**Project Photographs**

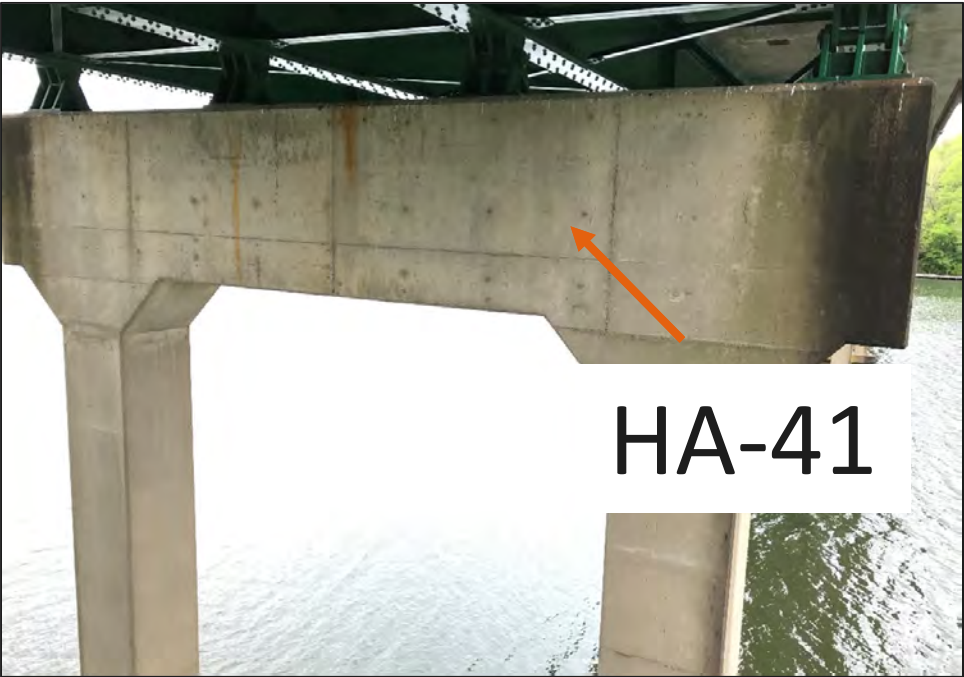
Termini: SR-170 From SR-62 (Oak Ridge Highway) to SR-9 (US-25W, Clinton Highway) (IA)  
East of Oak Ridge, Anderson County, Tennessee  
TDOT Project No. 01024-0222-04; PIN No. 124121.00  
Bridge No. 01S24740001 (Over Clinch River)



**Photo: 33**

**Date:**  
April 25, 2018

**Description:**  
View of eastern pier  
concrete (HA-40).



**Photo: 34**

**Date:**  
April 25, 2018

**Description:**  
View of fourth pier  
concrete (HA-41).

## Project Photographs

Termini: SR-170 From SR-62 (Oak Ridge Highway) to SR-9 (US-25W, Clinton Highway) (IA)

East of Oak Ridge, Anderson County, Tennessee

TDOT Project No. 01024-0222-04; PIN No. 124121.00

Bridge No. 01S24740001 (Over Clinch River)



**Photo:** 35

**Date:**

April 25, 2018

**Description:**

View of western pier concrete (HA-42) along with river navigation lighting.



**Photo:** 36

**Date:**

April 25, 2018

**Description:**

View of western pier cap concrete (HA-43).

## Project Photographs

Termini: SR-170 From SR-62 (Oak Ridge Highway) to SR-9 (US-25W, Clinton Highway) (IA)  
East of Oak Ridge, Anderson County, Tennessee  
TDOT Project No. 01024-0222-04; PIN No. 124121.00  
Bridge No. 01S24740001 (Over Clinch River)



**Photo: 37**

**Date:**  
April 25, 2018

**Description:**  
View of one of many vertical cementitious stormwater deck drains (HA-19) located in the overhang which contain up to 15% Chrysotile and 3% Crocidolite asbestos.



**Photo: 38**

**Date:**  
April 25, 2018

**Description:**  
View of four PVC utility pipes along with several exposed electrical conduits attached to the southern overhang.

**Project Photographs**

Termini: SR-170 From SR-62 (Oak Ridge Highway) to SR-9 (US-25W, Clinton Highway) (IA)  
East of Oak Ridge, Anderson County, Tennessee  
TDOT Project No. 01024-0222-04; PIN No. 124121.00  
Bridge No. 01S24740001 (Over Clinch River)



**Photo: 39**

**Date:**  
April 23, 2018

**Description:**  
View of suspected steam line along with exposed electrical conduit and a small PVC utility pipe attached to the northern overhang.



**Photo: 40**

**Date:**  
April 25, 2018

**Description:**  
View of non-suspect fiberglass insulation associated with the suspected steam line located attached to the northern overhang.

**Project Photographs**

Termini: SR-170 From SR-62 (Oak Ridge Highway) to SR-9 (US-25W, Clinton Highway) (IA)  
East of Oak Ridge, Anderson County, Tennessee  
TDOT Project No. 01024-0222-04; PIN No. 124121.00  
Bridge No. 01S24740001 (Over Clinch River)



**Photo: 41**

**Date:**  
April 11, 2018

**Description:**  
View of CSX railroad tracks located under the eastern portion of the bridge.



**Photo: 42**

**Date:**  
April 25, 2018

**Description:**  
View of island area located under the eastern half of the bridge.

# APPENDIX C

Laboratory Analytical Data





# EMSL Analytical, Inc.

200 Route 130 North Cinnaminson, NJ 08077

Tel/Fax: (800) 220-3675 / (856) 786-5974

<http://www.EMSL.com> / [cinnasblab@EMSL.com](mailto:cinnasblab@EMSL.com)

EMSL Order: 041812432

Customer ID: ACAD78E

Customer PO: TNDT1935.HZ55

Project ID:

**Attention:** Richard Lounsbury  
ARCADIS U.S., Inc.  
114 Lovell Road  
Suite 202  
Knoxville, TN 37934

**Phone:** (865) 481-3000

**Fax:**

**Received Date:** 04/26/2018 9:02 AM

**Analysis Date:** 04/27/2018 - 04/30/2018

**Collected Date:** 04/23/2018

**Project:** ARCADIS; TDOT BRIDGE #01S24740001 OVER CLINCH RIVER SR-170 FROM SR-62 OAK RIDGE HIGHWAY TO SR-9, EAST OAK RIDGE, ANDERSON COUNTY, TN - TNDT1935.HZ55.00EXP

## 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
01A <small>041812432-0001</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 01 HA Number: 01		
01B <small>041812432-0002</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 01 HA Number: 01		
01C <small>041812432-0003</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 01 HA Number: 01		
02A <small>041812432-0004</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 02 HA Number: 02		
02B <small>041812432-0005</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 02 HA Number: 02		
02C <small>041812432-0006</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 02 HA Number: 02		
03A <small>041812432-0007</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 03 HA Number: 03		
03B <small>041812432-0008</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 03 HA Number: 03		
03C <small>041812432-0009</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 03 HA Number: 03		
04A <small>041812432-0010</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 04 HA Number: 04		
04B <small>041812432-0011</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Initial report from: 05/01/2018 07:13:52



# EMSL Analytical, Inc.

200 Route 130 North Cinnaminson, NJ 08077

Tel/Fax: (800) 220-3675 / (856) 786-5974

<http://www.EMSL.com> / [cinnaslab@EMSL.com](mailto:cinnaslab@EMSL.com)

**EMSL Order:** 041812432  
**Customer ID:** ACAD78E  
**Customer PO:** TNDT1935.HZ55  
**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
			HA: 04 HA Number: 04		
04C 041812432-0012		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 04 HA Number: 04		
05A 041812432-0013		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 05 HA Number: 05		
05B 041812432-0014		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 05 HA Number: 05		
05C 041812432-0015		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 05 HA Number: 05		
06A 041812432-0016		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 06 HA Number: 06		
06B 041812432-0017		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 06 HA Number: 06		
06C 041812432-0018		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 06 HA Number: 06		
07A 041812432-0019		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 07 HA Number: 07		
07B 041812432-0020		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 07 HA Number: 07		
07C 041812432-0021		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 07 HA Number: 07		
08A 041812432-0022		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 08 HA Number: 08		
08B 041812432-0023		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 08 HA Number: 08		

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**EMSL Order:** 041812432  
**Customer ID:** ACAD78E  
**Customer PO:** TNDT1935.HZ55  
**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
08C <small>041812432-0024</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 08 HA Number: 08		
09A <small>041812432-0025</small>		White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 09 HA Number: 09		
09B <small>041812432-0026</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 09 HA Number: 09		
09C <small>041812432-0027</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 09 HA Number: 09		
10A <small>041812432-0028</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 10 HA Number: 10		
10B <small>041812432-0029</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 10 HA Number: 10		
10C <small>041812432-0030</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 10 HA Number: 10		
10D <small>041812432-0031</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 10 HA Number: 10		
10E <small>041812432-0032</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 10 HA Number: 10		
10F <small>041812432-0033</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 10 HA Number: 10		
11A <small>041812432-0034</small>		Black Non-Fibrous Homogeneous	40% Cellulose	60% Non-fibrous (Other)	None Detected
			HA: 11 HA Number: 11		
11B <small>041812432-0035</small>		Black Fibrous Homogeneous	40% Cellulose	60% Non-fibrous (Other)	None Detected
			HA: 11 HA Number: 11		
11C <small>041812432-0036</small>		Black Fibrous Homogeneous	45% Cellulose	55% Non-fibrous (Other)	None Detected

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Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
			HA: 11 HA Number: 11		
12A <small>041812432-0037</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 12 HA Number: 12		
12B <small>041812432-0038</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 12 HA Number: 12		
12C <small>041812432-0039</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 12 HA Number: 12		
13A <small>041812432-0040</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 13 HA Number: 13		
13B <small>041812432-0041</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 13 HA Number: 13		
13C <small>041812432-0042</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 13 HA Number: 13		
13D <small>041812432-0043</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 13 HA Number: 13		
13E <small>041812432-0044</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 13 HA Number: 13		
13F <small>041812432-0045</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 13 HA Number: 13		
13G <small>041812432-0046</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 13 HA Number: 13		
14A <small>041812432-0047</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 14 HA Number: 14		
14B <small>041812432-0048</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 14 HA Number: 14		

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Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
14C <small>041812432-0049</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 14 HA Number: 14		
15A <small>041812432-0050</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 15 HA Number: 15		
15B <small>041812432-0051</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 15 HA Number: 15		
15C <small>041812432-0052</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 15 HA Number: 15		
16A <small>041812432-0053</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 16 HA Number: 16		
16B <small>041812432-0054</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 16 HA Number: 16		
16C <small>041812432-0055</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 16 HA Number: 16		
16D <small>041812432-0056</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 16 HA Number: 16		
16E <small>041812432-0057</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 16 HA Number: 16		
17A <small>041812432-0058</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 17 HA Number: 17		
17B <small>041812432-0059</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 17 HA Number: 127		
17C <small>041812432-0060</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 17 HA Number: 17		
18A <small>041812432-0061</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

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Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
			HA: 18 HA Number: 18		
18B 041812432-0062		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 18 HA Number: 18		
18C 041812432-0063		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 18 HA Number: 18		
19A 041812432-0064		Gray Fibrous Homogeneous		85% Non-fibrous (Other)	13% Chrysotile 2% Crocidolite
			HA: 19 HA Number: 19		
19B 041812432-0065		Gray Non-Fibrous Homogeneous		84% Non-fibrous (Other)	13% Chrysotile 3% Crocidolite
			HA: 19 HA Number: 19		
19C 041812432-0066		Gray Fibrous Homogeneous		83% Non-fibrous (Other)	15% Chrysotile 2% Crocidolite
			HA: 19 HA Number: 19		
20A 041812432-0067		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 20 HA Number: 20		
20B 041812432-0068		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 20 HA Number: 20		
20C 041812432-0069		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 20 HA Number: 20		
21A 041812432-0070		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 21 HA Number: 21		
21B 041812432-0071		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 21 HA Number: 21		
21C 041812432-0072		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 21 HA Number: 21		
22A 041812432-0073		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 22 HA Number: 22		

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Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
22B <small>041812432-0074</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 22 HA Number: 22		
22C <small>041812432-0075</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 22 HA Number: 22		
23A <small>041812432-0076</small>		Black Fibrous Homogeneous	15% Cellulose	85% Non-fibrous (Other)	None Detected
			HA: 23 HA Number: 23		
23B <small>041812432-0077</small>		Black Fibrous Homogeneous	15% Cellulose	85% Non-fibrous (Other)	None Detected
			HA: 23 HA Number: 23		
23C <small>041812432-0078</small>		Black Fibrous Homogeneous	20% Cellulose	80% Non-fibrous (Other)	None Detected
			HA: 23 HA Number: 23		
24A <small>041812432-0079</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 24 HA Number: 24		
24B <small>041812432-0080</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 24 HA Number: 24		
24C <small>041812432-0081</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 24 HA Number: 24		
25A <small>041812432-0082</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 25 HA Number: 25		
25B <small>041812432-0083</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 25 HA Number: 25		
25C <small>041812432-0084</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 25 HA Number: 25		
26A <small>041812432-0085</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 26 HA Number: 26		
26B <small>041812432-0086</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

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**Customer ID:** ACAD78E  
**Customer PO:** TNDT1935.HZ55  
**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
			HA: 26 HA Number: 26		
26C <small>041812432-0087</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 26 HA Number: 26		
26D <small>041812432-0088</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 26 HA Number: 26		
27A <small>041812432-0089</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 27 HA Number: 27		
27B <small>041812432-0090</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 27 HA Number: 27		
27C <small>041812432-0091</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 27 HA Number: 27		
28A <small>041812432-0092</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 28 HA Number: 28		
28B <small>041812432-0093</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 28 HA Number: 28		
28C <small>041812432-0094</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 28 HA Number: 28		
28D <small>041812432-0095</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 28 HA Number: 28		
29A <small>041812432-0096</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 29 HA Number: 29		
29B <small>041812432-0097</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 29 HA Number: 29		
29C <small>041812432-0098</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 29 HA Number: 29		

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Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
29D 041812432-0099		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 29 HA Number: 29		
30A 041812432-0100		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 30 HA Number: 30		
30B 041812432-0101		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 30 HA Number: 30		
30C 041812432-0102		Gray Non-Fibrous Homogeneous	3% Cellulose	97% Non-fibrous (Other)	None Detected
			HA: 30 HA Number: 30		
31A 041812432-0103		Gray/Green Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 31 HA Number: 31		
31B 041812432-0104		Gray/Green Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 31 HA Number: 31		
31C 041812432-0105		Gray/Green Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 31 HA Number: 31		
31D 041812432-0106		Gray/Green Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 31 HA Number: 31		
32A 041812432-0107		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 32 HA Number: 32		
32B 041812432-0108		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 32 HA Number: 32		
32C 041812432-0109		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 32 HA Number: 32		
32D 041812432-0110		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 32 HA Number: 32		
33A 041812432-0111		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

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Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
			HA: 33 HA Number: 33		
33B 041812432-0112		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 33 HA Number: 33		
33C 041812432-0113		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 33 HA Number: 33		
34A 041812432-0114		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 34 HA Number: 34		
34B 041812432-0115		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 34 HA Number: 34		
34C 041812432-0116		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 34 HA Number: 34		
35A 041812432-0117		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 35 HA Number: 35		
35B 041812432-0118		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 35 HA Number: 35		
35C 041812432-0119		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 35 HA Number: 35		
36A 041812432-0120		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 36 HA Number: 36		
36B 041812432-0121		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 36 HA Number: 36		
36C 041812432-0122		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 36 HA Number: 36		
37A 041812432-0123		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 37 HA Number: 37		

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Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
37B <small>041812432-0124</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 37 HA Number: 37		
37C <small>041812432-0125</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 37 HA Number: 37		
38A <small>041812432-0126</small>		Gray/White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 38 HA Number: 38		
38B <small>041812432-0127</small>		Gray/White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 38 HA Number: 38		
38C <small>041812432-0128</small>		Gray/White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 38 HA Number: 38		
39A <small>041812432-0129</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 39 HA Number: 39		
39B <small>041812432-0130</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 39 HA Number: 39		
39C <small>041812432-0131</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 39 HA Number: 39		
40A <small>041812432-0132</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 40 HA Number: 40		
40B <small>041812432-0133</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 40 HA Number: 40		
40C <small>041812432-0134</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 40 HA Number: 40		
41A <small>041812432-0135</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 41 HA Number: 41		
41B <small>041812432-0136</small>		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Initial report from: 05/01/2018 07:13:52



# EMSL Analytical, Inc.

200 Route 130 North Cinnaminson, NJ 08077

Tel/Fax: (800) 220-3675 / (856) 786-5974

<http://www.EMSL.com> / [cinnasblab@EMSL.com](mailto:cinnasblab@EMSL.com)

**EMSL Order:** 041812432  
**Customer ID:** ACAD78E  
**Customer PO:** TNDT1935.HZ55  
**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
			HA: 41 HA Number: 41		
41C 041812432-0137		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 41 HA Number: 41		
42A 041812432-0138		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 42 HA Number: 42		
42B 041812432-0139		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 42 HA Number: 42		
42C 041812432-0140		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 42 HA Number: 42		
43A 041812432-0141		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 43 HA Number: 43		
43B 041812432-0142		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 43 HA Number: 43		
43C 041812432-0143		Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 43 HA Number: 43		
DUP01A 041812432-0144		Gray/Black Fibrous Homogeneous		80% Non-fibrous (Other)	20% Chrysotile
			HA: DUP01 HA Number: DUP01		
DUP01B 041812432-0145		Gray Fibrous Homogeneous		80% Non-fibrous (Other)	20% Chrysotile
			HA: DUP01 HA Number: DUP01		
DUP01C 041812432-0146		Gray/Black Fibrous Homogeneous		85% Non-fibrous (Other)	15% Chrysotile
			HA: DUP01 HA Number: DUP01		

Initial report from: 05/01/2018 07:13:52



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**EMSL Order:** 041812432

**Customer ID:** ACAD78E

**Customer PO:** TNDDT1935.HZ55

**Project ID:**

Analyst(s)

*Andrew Burke (16)*

*Christian Strey (38)*

*Jonathan Blanford (22)*

*Natalia Dispensa (41)*

*Nancy Stalter (10)*

*Olufunke Akintunde (19)*

Benjamin Ellis, Laboratory Manager  
or Other Approved Signatory

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Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ NVLAP Lab Code 101048-0, AIHA-LAP, LLC-IHLAP Lab 100194, NYS ELAP 10872, NJ DEP 03036, PA ID# 68-00367

Initial report from: 05/01/2018 07:13:52



Design & Consultancy  
for natural and  
built assets

Laboratory Job #:

041812432

**CHAIN-OF-CUSTODY FORM  
ASBESTOS BULK SAMPLES**

Client: TDOT

Arcadis Project No.: TNDT1935.HZ55.00EXP

Site Address: East of Oak Ridge, Anderson County, Tennessee

PAGE 1 OF 1

Bridge No.: 01S24740001 (Over Clinch River)

Property ID: Termini: SR-170 From SR-62 (Oak Ridge Highway) to SR-9

Results To:		Invoice To:	
Name:	Mr. Richard Lounsbury	Name:	Accounts Payable
Company:	ARCADIS U.S., Inc.	Company:	ARCADIS U.S., Inc.
Street:	114 Lovell Road Ste 202	Street:	630 Plaza Drive, Suite 100
City, State, Zip:	Knoxville, Tennessee 37934	City, State, Zip:	Highlands Ranch, CO 80129
Phone #:	865-675-6700	Email:	accountspayable.administration@arcadis-us.com

Email PDF Reports to:		Email EDD Reports to:	
<input checked="" type="checkbox"/> Richard.Lounsbury@arcadis.com	<input type="checkbox"/> Dakota.Guidry-Alegria@arcadis.com	<input checked="" type="checkbox"/> Richard.Lounsbury@arcadis.com	<input type="checkbox"/> Dakota.Guidry-Alegria@arcadis.com
<input checked="" type="checkbox"/> Zachary.Mongan@arcadis.com	<input type="checkbox"/> Zack.Dinkins@arcadis.com	<input checked="" type="checkbox"/> Zachary.Mongan@arcadis.com	<input type="checkbox"/> Zack.Dinkins@arcadis.com
<input type="checkbox"/> Greg.Drelich@arcadis.com		<input type="checkbox"/> Greg.Drelich@arcadis.com	
<input type="checkbox"/> Additional:		<input type="checkbox"/> Additional:	

Sample Number Sequence: HA-##A, B, C	Analysis Turnaround Time: <b>**SAME DAY / RUSH**</b>	<input type="checkbox"/> 3 Hours	<input type="checkbox"/> 6 Hours	
Samples Collect By: Zachary Mongan		<input type="checkbox"/> 24 Hours	<input checked="" type="checkbox"/> 48 Hours	<input type="checkbox"/> 72 Hours
Date(s) Collected: 4/23/2018, 4/25/2018	Date Emailed Results Required:			
Sample Type: Bulk PLM	Date Typed Results Required:			
<input checked="" type="checkbox"/> Analyze All Samples <input type="checkbox"/> Positive Stop <input type="checkbox"/> Automatic Point Count ≤ 2% (Friable materials only) <input type="checkbox"/> Other:				

	Printed Name	Signature	Company	Date & Time	# of Samples	Task for Person Handling COC
Remitted	Zachary Mongan		Arcadis	4/25/2018 17:00	146	
Received	C LaCerra		EMSL FX	4/26/18 9:20	146	
Remitted						
Received						APR 27 2018
Received						

Comments: Please call the ARCADIS employee named above in the "Result To" line if the laboratory has ANY questions about the samples, sample analysis, or chain-of-custody. Please note that the "Split Samples" option relates only to layers that are obvious to the technician.

Special Instructions:

PLEASE SEE ATTACHED FIELD FORMS FOR SAMPLE DETAIL AND DESCRIPTION

**Project/Client** Bridge No. 01S24740001 (SR-170 over Clinch River) **Sample Date** 4/23/2018 and 4/25/2018  
**Site Address** East of Oak Ridge, Anderson County, TN  
**Project Number** TNDT1935.HZ55.00EXP **Inspector** G. Drelich, Z. Mongan, Z. Dinkins

HA / Sample Number	Material Type	Color		Description	Sample Location	Condition	Friable Y / N	Quantity (square feet)
		Texture						
01	A	Surfacing	Grey/Rough	Abutment Structure Skim Coating	Southeast Corner - Abutment Wall	Good	N	800
	B		Grey/Rough		Northeast Corner - Abutment Wall	Good	N	800
	C		Grey/Rough		Southwest Corner - Abutment Wingwall	Good	N	800
<b>Notes:</b> The structure includes only the outer sides of the abutment walls, abutment wingwalls, outer abutment backwalls.								
02	A	Misc.	Grey/Rough	Abutment Wingwall Concrete	Southeast Corner	Good	N	640
	B		Grey/Rough		Northeast Corner	Good	N	640
	C		Grey/Rough		Northwest Corner	Good	N	640
<b>Notes:</b> Abutment wingwalls are located on all four corners of the bridge.								
03	A	Misc.	Grey/Rough	Abutment Wall Concrete	Southeast Corner	Good	N	670
	B		Grey/Rough		Northeast Corner	Good	N	670
	C		Grey/Rough		Northwest Corner	Good	N	670
<b>Notes:</b> Abutment walls are on the east and west sides of the bridge.								
04	A	Misc.	Grey/Rough	Abutment Backwall Concrete	Southeast Corner	Good	N	340
	B		Grey/Rough		Northeast Corner	Good	N	340
	C		Grey/Rough		Northwest Corner	Good	N	340
<b>Notes:</b> Abutment backwalls are on the east and west sides of the bridge, above the abutment walls and between the beams.								
05	A	Misc.	Grey/Rough	Abutment Outer Backwall Concrete	Southeast Corner	Good	Y	100
	B		Grey/Rough		Northwest Corner	Good	Y	100
	C		Grey/Rough		Southwest Corner	Good	Y	100
<b>Notes:</b> Abutment outer backwalls are outside the outer beams of the bridge.								
06	A	Misc.	Grey/Rough	Approach Overhang Concrete	Southeast Corner	Good	N	1300
	B		Grey/Rough		Northeast Corner	Good	N	1300
	C		Grey/Rough		Northwest Corner	Good	N	1300
<b>Notes:</b> The overhang concrete extends approximately 3 feet on the north and south sides of the bridge.								
07	A	Misc.	Grey/Rough	Beam Concrete	Southeast Corner - Beam 1	Good	N	12600
	B		Grey/Rough		Northeast Corner - Beam 3	Good	N	12600
	C		Grey/Rough		Northwest Corner - Beam 4	Good	N	12600
<b>Notes:</b> There are four beams associated with the bridge, only on the approaches.								
08	A	Misc.	Grey/Rough	Approach Underside Concrete	Southeast Corner	Good	N	8400
	B		Grey/Rough		Northeast Corner	Good	N	8400
	C		Grey/Rough		Southwest Corner	Good	N	8400
<b>Notes:</b> Extends to 4 spans from the concrete girder sections only under the approaches.								
09	A	Surfacing	White/Rough	Seam Skim Patching	Southeast Corner - Beam/Abutment Wall	Good	N	200
	B		White/Rough		East-Middle - Beam/Abutment Backwall	Good	N	200
	C		White/Rough		West-Middle - Beam/Abutment Wall	Good	N	200
<b>Notes:</b> The seam skim patching is located along the seam where the abutment walls meet the abutment backwalls/beams.								
10	A	Surfacing	Grey/Rough	Concrete Skim Patching	Southeast Corner - Beam 1	Good	N	400
	B		Grey/Rough		East-Middle - Abutment Backwall	Good	N	400
	C		Grey/Rough		Northeast Corner - Overhang	Good	N	400
	D		Grey/Rough		Bent 2 (from east) - Southeast Corner	Good	N	400
	E		Grey/Rough		Southwest Corner - Abutment Backwall	Good	N	400
	F		Grey/Rough		Bent 1 (from west) - Southwest Corner	Good	N	400
<b>Notes:</b> The concrete skim patching is located throughout the bridge underside on the beams, abutment walls, abutment backwalls, overhangs, deck underside, and bents.								

**Project/Client** Bridge No. 01S24740001 (SR-170 over Clinch River)      **Sample Date** 4/23/2018 and 4/25/2018  
**Site Address** East of Oak Ridge, Anderson County, TN  
**Project Number** TNDT1935.HZ55.00EXP      **Inspector** G. Drelich, Z. Mongan,  
Z. Dinkins

HA / Sample Number	Material Type	Color		Description	Sample Location	Condition	Friable Y / N	Quantity (square feet)
		Texture						
11	A	Misc.	Black/Rough	Filler Material Between Abutment Wingwalls/ Abutment Backwalls	Southeast Corner	Significantly Damaged	Y	40
	B		Black/Rough		Northeast Corner	Significantly Damaged	Y	40
	C		Black/Rough		Southwest Corner	Significantly Damaged	Y	40
<b>Notes:</b> The filler material is located on all four corners of the bridge, and is severely weathered.								
12	A	Surfacing	Grey/Rough	Abutment Addition Skim Patching	Northwest Corner	Good	N	30
	B		Grey/Rough		West-Middle	Good	N	30
	C		Grey/Rough		Southwest Corner	Good	N	30
<b>Notes:</b> The abutment addition is only located on against the west abutment wall. The skim patching is located throughout the abutment addition.								
13	A	Surfacing	Grey/Rough	Bent Structure Skim Patching	Bent 1 (from east) - Southeast Corner	Good	N	5600
	B		Grey/Rough		Bent 1 (from east) - Northeast Corner	Good	N	5600
	C		Grey/Rough		Bent 2 (from east) - South-Middle	Good	N	5600
	D		Grey/Rough		Bent 2 (from east) - North-Middle	Good	N	5600
	E		Grey/Rough		Bent 1 (from west) - Southwest Corner	Good	N	5600
	F		Grey/Rough		Bent 1 (from west) - Northwest Corner	Good	N	5600
	G		Grey/Rough		Bent 1 (from west) - Southwest Corner	Good	N	5600
<b>Notes:</b> There are four bent structures under the bridge, all along the approaches. One on the west, 3 on the east.								
14	A	Misc.	Grey/Rough	Bent Structure Concrete	Bent 1 (from east) - Northeast Corner	Good	N	2800
	B		Grey/Rough		Bent 2 (from east) - South-Middle	Good	N	2800
	C		Grey/Rough		Bent 1 (from west) - Southwest Corner	Good	N	2800
<b>Notes:</b> There are four bent structures under the bridge, all along the approaches. One on the west, 3 on the east.								
15	A	Misc.	Grey/Rough	Railroad Bent Wall Concrete	Bent 2 (from east) - Southeast Corner	Good	N	1200
	B		Grey/Rough		Bent 2 (from east) - East-Middle	Good	N	1200
	C		Grey/Rough		Bent 2 (from east) - Northeast Corner	Good	N	1200
<b>Notes:</b> There are two bent structures adjacent to the railroad. The bent structures have solid walls between the columns, which are not present in the other bent structures.								
16	A	Surfacing	Grey/Rough	Railroad Bent Wall Graffiti Patching	Bent 2 (from east) - Southeast Corner	Good	N	1200
	B		Grey/Rough		Bent 2 (from east) - East-Middle	Good	N	1200
	C		Grey/Rough		Bent 2 (from east) - Northeast Corner	Good	N	1200
	D		Grey/Rough		Bent 2 (from east) - Northwest Corner	Good	N	1200
	E		Grey/Rough		Bent 2 (from east) - Southwest Corner	Good	N	1200
<b>Notes:</b> The graffiti patching covers the bent walls entirely.								
17	A	Misc.	Grey/Rough	Abutment Addition Wall Concrete	Northwest Corner	Good	N	120
	B		Grey/Rough		West-Middle	Good	N	120
	C		Grey/Rough		Southwest Corner	Good	N	120
<b>Notes:</b> The abutment addition is only located on against the west abutment wall.								
18	A	Surfacing	Grey/Rough	Abutment Addition Wall Skim Coating	Northwest Corner	Good	N	120
	B		Grey/Rough		West-Middle	Good	N	120
	C		Grey/Rough		Southwest Corner	Good	N	120
<b>Notes:</b> The abutment addition is only located on against the west abutment wall.								
19	A	Misc.	Grey/Rough	Vertical Cementitious Stormwater Deck Drains	Southwest Corner	Sig Damaged	N	1152 LF
	B		Grey/Rough		Northwest Corner	Sig Damaged	N	1152 LF
	C		Grey/Rough		South Middle Above the 2nd from West Pier	Sig Damaged	N	1152 LF
<b>Notes:</b> Approximately 2-ft long drain from deck through the overhang. One drain located approximately every 5 ft on each side. Approximately 576 drains on both sides. Blind Duplicate Sample Taken. Samples obtained from the Reach All truck.								

**Project/Client** Bridge No. 01S24740001 (SR-170 over Clinch River) **Sample Date** 4/23/2018 and 4/25/2018  
**Site Address** East of Oak Ridge, Anderson County, TN  
**Project Number** TNDT1935.HZ55.00EXP **Inspector** G. Drelich, Z. Mongan,

Z. Dinkins

HA / Sample Number	Material Type	Color		Description	Sample Location	Condition	Friable Y / N	Quantity (square feet)
		Texture						
20	A	Misc.	Grey/Rough	Railing System Post Concrete	Southwest Corner	Damaged	N	8600
	B		Grey/Rough		South Middle	Damaged	N	8600
	C		Grey/Rough		Southeast Corner	Damaged	N	8600
<b>Notes:</b> The railing system on both sides of the bridge is constructed of rails and posts that are inset. South lane was the only lane that was closed during work, but materials are consistent across bridge.								
21	A	Misc.	Grey/Rough	Railing System Rail Concrete	Southwest Corner	Damaged	N	8600
	B		Grey/Rough		South Middle	Damaged	N	8600
	C		Grey/Rough		Southeast Corner	Damaged	N	8600
<b>Notes:</b> The railing system on both sides of the bridge is constructed of rails and posts that are inset. South lane was the only lane that was closed during work, but materials are consistent across bridge.								
22	A	Misc.	Grey/Rough	Deck Concrete	Southwest Corner	Good	N	43170
	B		Grey/Rough		South Middle	Good	N	43170
	C		Grey/Rough		Southeast Corner	Good	N	43170
<b>Notes:</b> Deck concrete is located under the asphalt wearing surface. Samples were collected by drilling through the asphalt until reaching the concrete with a 12" bit.								
23	A	Misc.	Black/Rough	Filler Material Between Railing System Rails and Posts	Southwest Corner	Damaged	Y	5756
	B		Black/Rough		South Middle	Damaged	Y	5756
	C		Black/Rough		Southeast Corner	Damaged	Y	5756
<b>Notes:</b> Filler material was located on both sides of the bridge. Only the eastbound lane was closed; therefore, samples were collected from that lane. Westbound lane materials are the same throughout .								
24	A	Misc.	Grey/Rough	Curb Concrete	Southwest Corner	Damaged	N	9000
	B		Grey/Rough		South Middle	Damaged	N	9000
	C		Grey/Rough		Southeast Corner	Damaged	N	9000
<b>Notes:</b> The curb concrete is located throughout the length of the bridge on both sides.								
25	A	Misc.	Grey/Rough	Joint Concrete	Southwest Corner	Good	N	120
	B		Grey/Rough		South Middle	Good	N	120
	C		Grey/Rough		Southeast Corner	Good	N	120
<b>Notes:</b> The joint concrete is located in various locations along the concrete wearing surface where joints exist in the								
26	A	Misc.	Grey/Rough	Curb Concrete Patching	Southwest corner	Good	N	10
	B		Grey/Rough		South Middle	Good	N	10
	C		Grey/Rough		South Middle	Good	N	10
	D		Grey/Rough		South Middle	Good	N	10
<b>Notes:</b> Several concrete patches exist along the curb concrete. All patches appear to have been applied at the same time.								
27	A	Misc.	Grey/Rough	Metal Guard Rail Footer Concrete	Southwest Corner	Good	N	20
	B		Grey/Rough		Southwest Corner	Good	N	20
	C		Grey/Rough		Southwest Corner	Good	N	20
<b>Notes:</b> The guardrails are set in a concrete in dirt separate from surrounding concretes. Southwestern corner is the only area observed.								
28	A	Misc.	Grey/Rough	Railing System Interior Concrete Patching	Southwest Corner	Good	N	5
	B		Grey/Rough		South Middle	Good	N	5
	C		Grey/Rough		Northwest Corner	Good	N	5
	D		Grey/Rough		Northwest Corner	Good	N	5
<b>Notes:</b> No skim coating is observed on the curb or railing system. Patches are sporadic and appear to have been applied at the same time.								
29	A	Misc.	Grey/Rough	Railing System Exterior Concrete Patching	Southwestern Corner Railing Post Patch	Good	N	20
	B		Grey/Rough		South Middle Railing Post Patch	Good	N	20
	C		Grey/Rough		South Middle Railing Post Patch	Good	N	20
	D		Grey/Rough		Southwestern Corner Railing Post Patch	Good	N	20
<b>Notes:</b> The railing system was patched with a different concrete material on the exterior. Samples were obtained from the Reach All truck.								

**Project/Client** Bridge No. 01S24740001 (SR-170 over Clinch River) **Sample Date** 4/23/2018 and 4/25/2018  
**Site Address** East of Oak Ridge, Anderson County, TN  
**Project Number** TNDT1935.HZ55.00EXP **Inspector** G. Drelich, Z. Mongan, Z. Dinkins

HA / Sample Number	Material Type	Color		Description	Sample Location	Condition	Friable Y / N	Quantity (square feet)
		Texture						
30	A	Misc.	Lt Grey/Rough	Concrete Patching around Light Fixtures	North Side of Bridge - Above the Western Pier	Good	N	15
	B		Lt Grey/Rough		North Side of Bridge - Above the Western Pier	Good	N	15
	C		Lt Grey/Rough		North Side of Bridge - Above the Western Pier	Good	N	15
<b>Notes:</b> Lighter grey concrete appears near the lighting fixtures are attached to the overhang. Total of three lights reportedly operated by the coast guard. Samples obtained from the Reach All truck.								
31	A	Misc.	Grey/Rough	Metal Span Overhang Concrete	Southwest Corner	Good	N	7134
	B		Grey/Rough		South Middle	Good	N	7134
	C		Grey/Rough		South Side of Bridge - West of Island	Good	N	7134
	D		Grey/Rough		North Side of Bridge - West of Island	Good	N	7134
<b>Notes:</b> The overhang over the section of the bridge with 2 and 4 metal beams/girders is different than the concrete beam section (or approach section). Samples obtained from the Reach All truck.								
32	A	Misc.	Grey/Smooth	Metal Span Deck Underside Concrete	South Side of Bridge Western Pier	Good	N	35700
	B		Grey/Smooth		North Middle	Good	N	35700
	C		Grey/Smooth		North Side of Bridge - West of Island	Good	N	35700
	D		Grey/Smooth		South Side of Bridge - West of Island	Good	N	35700
<b>Notes:</b> The deck underside concrete is different than the concrete beam section of the bridge. Samples obtained from the Reach All truck.								
33	A	Surfacing	White/Rough	Westernmost Bent Cap Skim Coating	East Side of the Western Bent Wall	Good	N	400
	B		White/Rough		East Side of the Western Bent Wall	Good	N	400
	C		White/Rough		East Side of the Western Bent Wall	Good	N	400
<b>Notes:</b> A white skim coating was only observed on the partially buried western most bent, which had a wall (exclusively). Samples obtained from the Reach All truck.								
34	A	Misc.	Grey/Rough	Base of Pier Concrete	2nd Pier from the West - South Side	Good	N	22400
	B		Grey/Rough		3rd Pier from the West - North Side	Good	N	22400
	C		Grey/Rough		4th Pier from the West - North Side	Good	N	22400
<b>Notes:</b> Each of the piers have a base constructed of a different concrete. This base is consistent throughout all piers. Eastern piers were inaccessible in Reach All truck due to boat access.								
35	A	Misc.	Dk Grey/Rough	Main Span Overhang Joint Concrete Patching	5th Pier from the West - South Side	Good	N	360
	B		Dk Grey/Rough		5th Pier from the West - South Side	Good	N	360
	C		Dk Grey/Rough		5th Pier from the West - South Side	Good	N	360
<b>Notes:</b> There are 4 joints located across the bridge. All joints are believed to be constructed with the same concrete patching. Samples obtained from the Reach All truck.								
36	A	Misc.	Grey/Rough	Main Span Deck Underside Joint Concrete	Joint - West Side of Island	Good	N	1080
	B		Grey/Rough		Joint - West Side of Island	Good	N	1080
	C		Grey/Rough		Joint - West Side of Island	Good	N	1080
<b>Notes:</b> There are 4 joints located across the bridge. This concrete is located on the deck underside right under the joint.								
37	A	Misc.	Dk Grey/Rough	Pier Concrete Patching	Pier East of Island	Good	N	40
	B		Dk Grey/Rough		Pier East of Island	Good	N	40
	C		Dk Grey/Rough		Pier East of Island	Good	N	40
<b>Notes:</b> Only pier patches were observed on the pier east of the island. Samples were obtained from the Reach All truck.								
38	A	Misc.	Grey/Rough	Pier Cap Concrete	Pier West of the Island - West Side	Good	N	500
	B		Grey/Rough		Pier West of the Island - West Side	Good	N	500
	C		Grey/Rough		Pier West of the Island - West Side	Good	N	500
<b>Notes:</b> This is the only pier that has a cap.								
39	A	Surfacing	Grey/Rough	Pier Cap Skim Coating	Pier West of the Island - West Side	Good	N	500
	B		Grey/Rough		Pier West of the Island - West Side	Good	N	500
	C		Grey/Rough		Pier West of the Island - West Side	Good	N	500
<b>Notes:</b> This is the only pier that has a cap.								

**Project/Client** Bridge No. 01S24740001 (SR-170 over Clinch River) **Sample Date** 4/23/2018 and 4/25/2018  
**Site Address** East of Oak Ridge, Anderson County, TN  
**Project Number** TNDT1935.HZ55.00EXP **Inspector** G. Drelich, Z. Mongan,  
Z. Dinkins

HA / Sample Number	Material Type	Color		Description	Sample Location	Condition	Friable Y / N	Quantity (square feet)
		Texture						
40	A	Misc.	Grey/Rough	Eastern Pier Concrete	West of Island Pier	Good	N	12000
	B		Grey/Rough		West of Island Pier	Good	N	12000
	C		Grey/Rough		West of Island Pier	Good	N	12000
<b>Notes:</b> Eastern piers are constructed of the same materials located on the eastern side of the bridge. The west of island pier was easily accessible with the Reach All truck.								
41	A	Misc.	Grey/Rough	Fourth Pier Concrete	4th Pier from the West - Column	Good	N	3000
	B		Grey/Rough		4th Pier from the West - Middle of the Top	Good	N	3000
	C		Grey/Rough		4th Pier from the West - Middle of the Top	Good	N	3000
<b>Notes:</b> The 4th pier from the west is constructed of stand alone materials. The base appears to be the same as other bases. Samples collected using the Reach All truck.								
42	A	Misc.	Grey/Rough	Western Pier Concrete	North Side of the First Pier from the West	Good	N	9000
	B		Grey/Rough		South Side of the Third Pier from the West	Good	N	9000
	C		Grey/Rough		N Side Column of the Third Pier from the West	Good	N	9000
<b>Notes:</b> Western piers are constructed of the same materials located on the west side of the bridge.								
43	A	Misc.	Grey/Rough	Western Pier Cap Concrete	First pier of from the West	Good	N	540
	B		Grey/Rough		Third pier from the West	Good	N	540
	C		Grey/Rough		Third pier from the West	Good	N	540
<b>Notes:</b> Pier caps are located on the western piers.								
Dup-01	A	Misc.		Duplicate Sample taken from HA-19				
	B							
	C							
<b>Notes:</b> Blind Duplicate sample taken from HA-19.								

114 Lovell Road  
Suite 202  
Knoxville, Tennessee 37934  
Tel 865 675 6700  
Fax 865 675 6712

[www.arcadis.com](http://www.arcadis.com)



## Site Specific Health and Safety Plan

Revision 14, 1/16/2017

Project Name: Asbestos-Containing Materials Bridge Survey  
Termini: SR-170 From SR-62 (Oak Ridge Highway) to SR-9 (US-25W, Clinton Highway) (IA)  
Bridge No. 01S24740001 (Over Clinch River)  
East of Oak Ridge, Anderson County, Tennessee

Project Number: TNDT1935.HZ55  
Client Name: Tennessee Department of Transportation  
Date: 4/9/2018  
HASP Expires: 4/9/2019  
Revision: 0

Approvals:

HASP Developer: Benita Ferrell

Project Manager: Richard Lounsbury

HASP Reviewer: 

# Emergency Information

**Site Address:** Termini: SR-170 From SR-62 (Oak Ridge Highway) to SR-9 (US-25W, Clinton Highway) (IA)  
Bridge No. 01S24740001 (Over Clinch River)  
East of Oak Ridge, Anderson County, Tennessee

## Emergency Phone Numbers:

Emergency (fire, police, ambulance)	_____	911
Emergency (facility specific, if applicable):	_____	NA
_____	_____	NA
Emergency Other (specify)	_____	_____
Client Contact	Kyle Kirschenmann	615.598.1522
WorkCare (non-life-threatening injury/illness)	_____	1.888.449.7787
Project H&S	Rich Lounsbury	865.621.2189
Task Manager	Zach Mongan	240.476.1315
Project Manager	Rich Lounsbury	865.621.2189
Corporate H&S Specialist	Greg Mason	859.253.9036
Corporate H&S Director	Denis Balcer	614.778.9171

**Hospital Name and Address:** Methodist Medical Center  
990 Oak Ridge Turnpike  
Oak Ridge, Tennessee 37830

**Hospital Phone Number:** 865.835.1000

## Incident Notification Process

- 1 Dial 911/Facility Emergency Number/WorkCare as applicable
- 2 Contact PM/Supervisor Rich Lounsbury / Nathan Officer (423.277.6333)
- 3 Contact Corporate H&S Greg Mason
- 4 Contact Client Kyle Kirschenmann

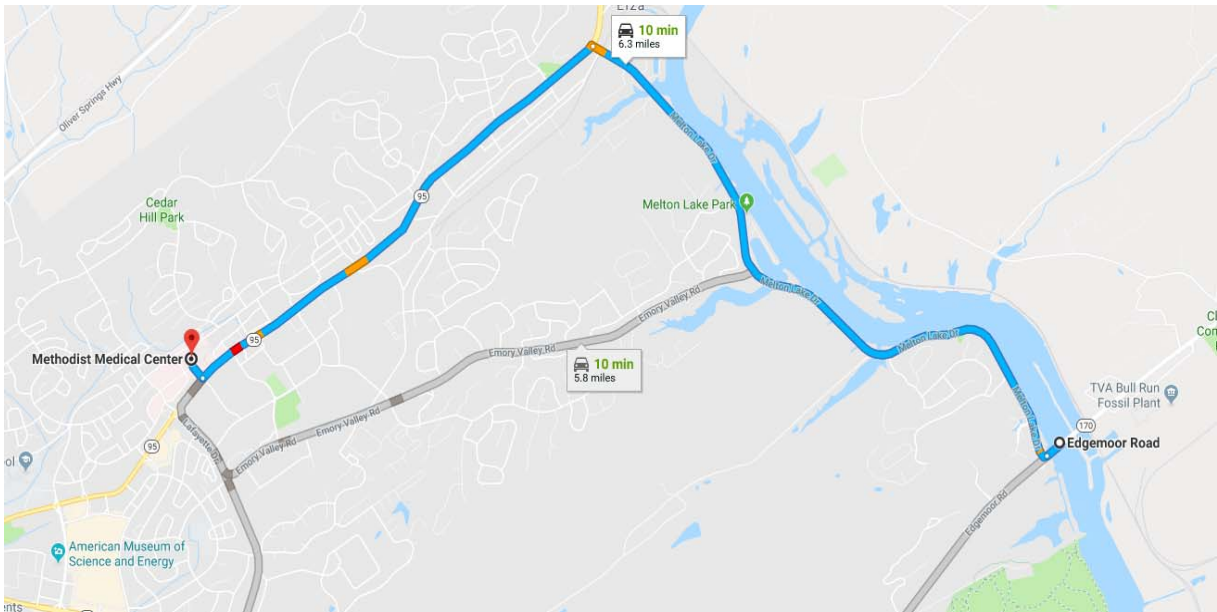
Complete below, as applicable, or clear cell contents:

Location of Assembly Area(s): To be determined during tailgate H&S meeting

Nearest AED location: N/A

Nearest Storm Shelter: To be determined during tailgate H&S meeting

## Route to the Hospital



Edgemoor Rd, Oak Ridge, TN 37830 to  
Methodist Medical Center

Drive 6.2 miles, 10 min

### Edgemoor Rd

Oak Ridge, TN 37830

- ↑ 1. Head southwest on Edgemoor Rd  
98 ft
- ↘ 2. Turn right onto Melton Lake Dr  
3.5 mi
- ↙ 3. Turn left onto Oak Ridge Turnpike  
① Pass by SUBWAY@Restaurants (on the right in 2.3 mi)  
2.6 mi
- ↘ 4. Turn right onto Tennyson Rd  
400 ft

### Methodist Medical Center

990 Oak Ridge Turnpike, Oak Ridge, TN 37830

**General Information**

**Site Type (select all applicable where work will be conducted):**

- |  |   |
|--|---|
| <input checked="" type="checkbox"/> Active           | <input checked="" type="checkbox"/> Railroad  |
| <input checked="" type="checkbox"/> Bridge           | <input type="checkbox"/> Remote Area  |
| <input type="checkbox"/> Buildings                   | <input type="checkbox"/> Residential  |
| <input checked="" type="checkbox"/> Commercial       | <input type="checkbox"/> Retail   |
| <input type="checkbox"/> Construction                | <input checked="" type="checkbox"/> Roadway (public, including right-of-way)              |
| <input type="checkbox"/> Military Installation       | <input type="checkbox"/> Water Treatment Plant  |
| <input type="checkbox"/> Inactive Industrial         | <input type="checkbox"/> Unknown  |
| <input type="checkbox"/> Active Industrial           | <input type="checkbox"/> Security Risk Site/Location                                      |
| <input type="checkbox"/> Landfill                    | <input type="checkbox"/> Utility  |
| <input type="checkbox"/> Marine                      | <input checked="" type="checkbox"/> Other (specify): <u>State route bridge over river</u> |
| <input type="checkbox"/> Mining                      |   |
| <input type="checkbox"/> Parking Lot/Private Roadway |   |

Temporary lane closure across the bridges and associated traffic control, if necessary, will be provided by the local TDOT Operations Personnel. Arcadis will coordinate closely with TDOT regarding the lane closure request and work scheduling as needed. Lane closures are estimated to take no more than 6 hours per day during non-peak travel times (i.e., 9:00 am to 3:00 pm). Traffic control measures for temporary shoulder closures will be self-executed by Arcadis, if necessary.

**Surrounding Area and Topography (select one):**

- Surrounding area and topography are presented in the project work plan
- Surrounding area and topography (*briefly describe*):

Bridge No. 01S24740001 is situated along SR-170 (Edgemore Road) east of Oak Ridge, Anderson County, Tennessee. Surrounding land use is commercial/residential and the topography is hilly to gently rolling.

**Simultaneous Operations (SimOps)**

- Not applicable
- SimOps will exist on this project

One Arcadis worker in TDOT-provided snoopier truck; Group of two Arcadis inspectors will survey the topside of the bridge.

**Site Background (select one):**

- Site background is presented in the project work plan
- Site background (*briefly describe*):

TDOT is evaluating this bridge for the potential presence of ACM within bridge components prior to future demolition and removal of the structure. It is situated over the Clinch River and consists of a 1,439-foot-long, two lane, 10-span structure (with five approach spans) constructed of steel I-beams and concrete deck girders with a concrete deck and asphalt wearing surface. This bridge was constructed in 1958, rehabilitated in 2010, and is in fair condition.

**Project Tasks**

The following tasks are identified for this project:

*Examples: "Drilling/soil sampling", "Surveying", "General Inspections", "Construction Management/Inspections"*

- 1 Bridge Material ACM Recon/Survey & Sampling
- 2 General Site Work
- 3 \_\_\_\_\_
- 4 \_\_\_\_\_
- 5 \_\_\_\_\_

- Subcontractor H&S information is attached
- Utility clearance required.
- Journey Management Plan attached
- State specific H&S required:
- The following H&S Standards are attached: *Not applicable*
- Not applicable*

Comments:

Arcadis Field H&S Handbook: I.D., II.H, II.M, III.A, III.F, III.H, III.I, III.K, III.M, III.N, III.R, III.U, III.T, III.BB, III.JJ, III.LL, V.F, V.G

**Roles and Responsibilities**

<i>Name</i>	<i>Role</i>	<i>Additional Responsibilities (Describe)</i>
1 <u>Richard Lounsbury</u>	<u>PM</u>	<u>Budgeting, SOW Planning, Client Comms</u>
2 <u>Zach Mongan</u>	<u>Field Lead</u>	<u>Field Task Planning, Lead ACM Inspector</u>
3 <u>Greg Drelich</u>	<u>SSO</u>	<u>General project support/resource</u>
4 <u>Zack Dinkins</u>	_____	<u>General project support/resource</u>
5 _____	_____	_____
6 _____	_____	_____

**Training**

<p><i>All Arcadis employees are required to have the following training to be on site:</i></p> <ul style="list-style-type: none"> <li>H&amp;S Program Orientation</li> <li>HAZCOM GHS/EAP</li> <li>Defensive Driving - Smith On-Line</li> <li>Hazwoper 40 Hour</li> <li>Asbestos Awareness</li> <li>BBP (Bloodborne Pathogens)</li> <li>First Aid/CPR</li> <li>DOT HazMat #1</li> <li>Fire Extinguisher</li> <li>Hazwoper 8-Hour Annual Refresher</li> <li>Hearing Conservation/Protection</li> <li>Respirator</li> <li>PPE</li> <li>Client specific:</li> <li><u>OSHA 10/30 Hr Construction Safety</u></li> <li>Other:</li> <li><u>#NA</u></li> </ul>	<p><i>Selected Arcadis employees are required to have the following additional training:</i></p> <p style="text-align: right;">Names or Numbers from above</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td>Construction Safety - 30 Hour</td> <td style="text-align: right;"><u>1,2,3</u></td> </tr> <tr> <td>Construction Safety - 10 Hour</td> <td style="text-align: right;"><u>2,3,4</u></td> </tr> <tr> <td>Electrical General Awareness</td> <td style="text-align: right;"><u>2,3,4</u></td> </tr> <tr> <td>Ladders</td> <td style="text-align: right;"><u>2,3,4</u></td> </tr> <tr> <td>Fall Protection General Awareness</td> <td style="text-align: right;"><u>2,3,4</u></td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>Other:</td> <td>_____</td> </tr> <tr> <td><u>TN Asbestos Inspector</u></td> <td style="text-align: right;"><u>2,3,4</u></td> </tr> </table>	Construction Safety - 30 Hour	<u>1,2,3</u>	Construction Safety - 10 Hour	<u>2,3,4</u>	Electrical General Awareness	<u>2,3,4</u>	Ladders	<u>2,3,4</u>	Fall Protection General Awareness	<u>2,3,4</u>	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	Other:	_____	<u>TN Asbestos Inspector</u>	<u>2,3,4</u>
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Other:	_____																								
<u>TN Asbestos Inspector</u>	<u>2,3,4</u>																								

Hazard Analysis

Risk Assessment Matrix		Likelihood Ratings** (likelihood that incident would occur)			
Consequences Ratings*		A	B	C	D
People	Property	0 Almost impossible	1 Possible but unlikely	2 Likely to happen	3 Almost certain to happen
1 - Slight or no health	Slight or no damage	0 - Low	1 - Low	2 - Low	3 - Low
2 - Minor health effect	Minor damage	0 - Low	2 - Low	4 - Medium	6 - Medium
3 - Major health effect	Local damage	0 - Low	3 - Low	6 - Medium	9 - High
4 - Fatalities	Major damage	0 - Low	4 - Medium	8 - High	12 - High

Business Line

All Categories

Business Unit

All Categories

**Task 1: Bridge Material ACM Recon/Survey & Sampling**

**Hazardous Activity #1**

Field-Tools, power- use of chain saws, power hand augers, generators, small power tools, etc

Hazard Types (unmitigated ranking H-High, M-Medium, L-Low):

Biological	-	Chemical	-	Driving	-	Electrical	M
Environmental	-	Gravity	L	Mechanical	M	Motion	M
Personal Safety	-	Pressure	-	Radiation	-	Sound	H

Suggested FHSBH Ref: III AD

Overall Unmitigated Risk:

Medium

Mitigated Risk:

Low

if utilizing:

Controls that should be Considered:

Primary: TRACK Operator Competency per Standard Engineering Controls (specify below) JSAs Secondary: HASP H&S Standards Job Briefing/Site Awareness Admin. Controls (specify below) Specialized Equipment (specify below) Inspections PPE (see HASP "PPE" section)

Enter Required Controls:

Use TRACK; Wear Level D PPE (including hearing protection and face shield if necessary); Follow applicable JSAs & SOPs; Conduct Tool & PPE inspections prior to use.

**Hazardous Activity #2**

Field-Equipment - work with or in the vicinity of energized equipment/components

Hazard Types (unmitigated ranking H-High, M-Medium, L-Low):

Biological	L	Chemical	-	Driving	-	Electrical	H
Environmental	-	Gravity	-	Mechanical	-	Motion	-
Personal Safety	-	Pressure	H	Radiation	-	Sound	-

Suggested FHSBH Ref: III AA, III AB

Overall Unmitigated Risk:

High

Mitigated Risk:

Medium

if utilizing:

Controls that should be Considered:

Primary: TRACK H&S Standards Electrical (NFPA 70E) Training Lockout/Tagout Training Secondary: JSAs HASP Job Briefing/Site Awareness Engineering Controls (specify below) PPE (see HASP "PPE" section) Housekeeping Competent Person Required (designated person)

Enter Required Controls:

Always use TRACK; Wear Level D PPE (including hearing protection); Review applicable JSAs & SOPs; Conduct Equipment & PPE inspections. Do not disturb utilities. Do not touch electrical lines. No metal ladders in vicinity of electrical lines.

**Hazardous Activity #3**

Field-Falls - work on elevated work surfaces including ladders, manlifts, platforms, scaffolding, etc.

Hazard Types (unmitigated ranking H-High, M-Medium, L-Low):

Biological	-	Chemical	-	Driving	-	Electrical	-
Environmental	-	Gravity	H	Mechanical	-	Motion	-
Personal Safety	H	Pressure	-	Radiation	-	Sound	-

Suggested FHSBH Ref: III AK, IV A, IV B, IV C

Overall Unmitigated Risk:

High

Mitigated Risk:

Medium

if utilizing:

Controls that should be Considered:

Primary: TRACK JSAs Fall Protection Awareness Training Competent Person Required (designated person) Engineering Controls (specify below) Secondary: Specialized Equipment (specify below) HASP H&S Standards Job Briefing/Site Awareness Housekeeping Inspections

Enter Required Controls:

Always use TRACK; Wear Level D PPE (including hearing protection); Review applicable JSAs & SOPs; Conduct Equipment & PPE inspections. Use a spotter when on ladder. Always maintain 3 points of contact when climbing. Never stand on the top step. Review Arcadis Ladder Safety Standard.

**Hazardous Activity #4**

Field-Survey - regulated materials

Hazard Types (unmitigated ranking H-High, M-Medium, L-Low):

Biological	-	Chemical	M	Driving	-	Electrical	-
Environmental	-	Gravity	M	Mechanical	-	Motion	M
Personal Safety	L	Pressure	-	Radiation	-	Sound	-

Suggested FHSBH Ref: III AA, III AB, III AD

Overall Unmitigated Risk:

Medium

Mitigated Risk:

Low

if utilizing:

Controls that should be Considered:

Primary: TRACK JSAs Work Plan Secondary: Job Briefing/Site Awareness Cont./Emerg. Planning Engineering Controls (specify below) PPE (see HASP "PPE" section)

Enter Required Controls:

Conduct inspection for ACM/RACM; Always use TRACK; Wear appropriate PPE; Review applicable JSAs & SOPs; Conduct Equipment & PPE inspections.

Risk Assessment Matrix		Likelihood Ratings** (likelihood that incident would occur)			
Consequences Ratings*		A	B	C	D
People	Property	0 Almost impossible	1 Possible but unlikely	2 Likely to happen	3 Almost certain to happen
1 - Slight or no health	Slight or no damage	0 - Low	1 - Low	2 - Low	3 - Low
2 - Minor health effect	Minor damage	0 - Low	2 - Low	4 - Medium	6 - Medium
3 - Major health effect	Local damage	0 - Low	3 - Low	6 - Medium	9 - High
4 - Fatalities	Major damage	0 - Low	4 - Medium	8 - High	12 - High

**Task 2: General Site Work**

**Hazardous Activity #1**

Field-Ambient environment - exposure heat, cold, sun, weather, etc

Hazard Types (unmitigated ranking H-High, M-Medium, L-Low):		Suggested FHSBH Ref:				III I, III M	
Biological	-	Chemical	-	Driving	M	Electrical	L
Environmental	L	Gravity	H	Mechanical	-	Motion	L
Personal Safety	M	Pressure	-	Radiation	-	Sound	-

Overall Unmitigated Risk: **Medium** Mitigated Risk: **Medium** if utilizing:  
**Controls that should be Considered:** Primary: TRACK Field H&S Handbook (see ref. above) Secondary: H&S Standards Engineering Controls (specify below) Admin. Controls (specify below) Specialized Equipment (specify below) PPE (see HASP "PPE" section)

**Enter Required Controls:** Use TRACK; Review Field H&S Guidebook & SOPs prior to starting work; Always monitor weather; Pay attention to your hydration levels, continue to drink plenty of cold water through out the day; Have good heat stress awareness; Wear sunscreen.

**Hazardous Activity #2**

Field-Biological - insects, spiders, snakes, etc

Hazard Types (unmitigated ranking H-High, M-Medium, L-Low):		Suggested FHSBH Ref:				III N	
Biological	M	Chemical	-	Driving	-	Electrical	-
Environmental	-	Gravity	-	Mechanical	-	Motion	-
Personal Safety	-	Pressure	-	Radiation	-	Sound	-

Overall Unmitigated Risk: **Medium** Mitigated Risk: **Medium** if utilizing:  
**Controls that should be Considered:** Primary: TRACK Engineering Controls (specify below) Secondary: JSAs HASP Job Briefing/Site Awareness PPE (see HASP "PPE" section) Housekeeping

**Enter Required Controls:** Always use TRACK; Review Field H&S Guidebook SOPs & JSAs prior to starting work; Wear PPE: Insect repellent, boots, and long pants.

**Hazardous Activity #3**

Field-Traffic - working on or adjacent to roadways

Hazard Types (unmitigated ranking H-High, M-Medium, L-Low):		Suggested FHSBH Ref:				III AM, V F	
Biological	-	Chemical	-	Driving	M	Electrical	-
Environmental	-	Gravity	-	Mechanical	-	Motion	H
Personal Safety	-	Pressure	-	Radiation	-	Sound	-

Overall Unmitigated Risk: **Medium** Mitigated Risk: **Medium** if utilizing:  
**Controls that should be Considered:** Primary: TRACK Traffic Control Plan (TCP) Engineering Controls (specify below) Engineering Judgement Employee Required Secondary: H&S Standards Job Briefing/Site Awareness Admin. Controls (specify below) Specialized Equipment (specify below) PPE (see HASP "PPE" section)

**Enter Required Controls:** Always use TRACK; Utilize TCP RWZ Signage & Safety Cones; Turn on truck flashers; Utilize vehicle shielding; Always wear a class III high visibility vest; Keep a keen awareness of your surroundings; Use the Smith System Keys.

**Hazardous Activity #4**

Field-Biological - vegetation, physically damaging, poisonous, heavily vegetated areas

Hazard Types (unmitigated ranking H-High, M-Medium, L-Low):		Suggested FHSBH Ref:				III AE	
Biological	M	Chemical	-	Driving	-	Electrical	-
Environmental	-	Gravity	L	Mechanical	-	Motion	-
Personal Safety	-	Pressure	-	Radiation	-	Sound	-

Overall Unmitigated Risk: **Medium** Mitigated Risk: **Low** if utilizing:  
**Controls that should be Considered:** Primary: TRACK JSAs Engineering Controls (specify below) Secondary: Field H&S Handbook (see ref. above) Job Briefing/Site Awareness PPE (see HASP "PPE" section)

**Enter Required Controls:** Always use TRACK; Conduct Job Briefing/Awareness, Wear modified Level D or C PPE (w/ inspection); Always decon with Tecnu if exposed; Read applicable poison ivy literature & procedures found in HASP Attachment 4.

**Hazard Communication (HazCom)/Global Harmonization System (GHS)**

HAZCOM/GHS for this project is managed by the client or general contractor

List the chemicals anticipated to be used by Arcadis on this project per HazCom/GHS requirements.  
(Modify quantities as needed)

<b>Preservatives</b>	Qty	<b>Decontamination</b>	Qty	<b>Calibration</b>	Qty.
<input checked="" type="checkbox"/> Not applicable		<input checked="" type="checkbox"/> Not applicable		<input checked="" type="checkbox"/> Not applicable	
<input type="checkbox"/> Hydrochloric acid	<500 ml	<input type="checkbox"/> Alconox	≤ 5 lbs	<input type="checkbox"/> Isobutylene/air	1 cyl
<input type="checkbox"/> Nitric acid	<500 ml	<input type="checkbox"/> Liquinox	≤ 1 gal	<input type="checkbox"/> Methane/air	1 cyl
<input type="checkbox"/> Sulfuric acid	<500 ml	<input type="checkbox"/> Acetone	≤ 1 gal	<input type="checkbox"/> Pentane/air	1 cyl
<input type="checkbox"/> Sodium hydroxide	<500 ml	<input type="checkbox"/> Methanol	≤ 1 gal	<input type="checkbox"/> Hydrogen/air	1 cyl
<input type="checkbox"/> Zinc acetate	<500 ml	<input type="checkbox"/> Hexane	≤ 1 gal	<input type="checkbox"/> Propane/air	1 cyl
<input type="checkbox"/> Ascorbic acid	<500 ml	<input type="checkbox"/> Isopropyl alcohol	≤ 4 gal	<input type="checkbox"/> Hydrogen sulfide/air	1 cyl
<input type="checkbox"/> Acetic acid	<500 ml	<input type="checkbox"/> Nitric acid	≤ 1 L	<input type="checkbox"/> Carbon monoxide/air	1 cyl
<input type="checkbox"/> Isopropyl alcohol	< 4 gal.	<input type="checkbox"/> Other:	_____	<input type="checkbox"/> pH standards (4,7,10)	≤ 1 gal
<input type="checkbox"/> Formalin (<10%)	< 4 gal.		_____	<input type="checkbox"/> Conductivity standards	≤ 1 gal
<input type="checkbox"/> Methanol	<500 ml		_____	<input type="checkbox"/> Other:	_____
<input type="checkbox"/> Sodium bisulfate	<500 ml		_____		

<b>Fuels</b>	Qty.	<b>Kits</b>	Qty.
<input checked="" type="checkbox"/> Not applicable		<input checked="" type="checkbox"/> Not applicable	
<input type="checkbox"/> Gasoline	≤ 5 gal	<input type="checkbox"/> Hach (specify):	_____ 1 kit
<input type="checkbox"/> Diesel	≤ 5 gal	<input type="checkbox"/> DTECH (specify):	_____ 1 kit
<input type="checkbox"/> Kerosene	≤ 5 gal	<input type="checkbox"/> Other:	_____ 1 kit
<input type="checkbox"/> Propane	1 cyl		_____
<input type="checkbox"/> Other:	_____		_____

<b>Remediation</b>	Qty.	<b>Hawkins County M</b>	Qty.	<b>DOT(1):</b>	Qty.
<input checked="" type="checkbox"/> Not applicable		<input checked="" type="checkbox"/> Not applicable		<input checked="" type="checkbox"/> Urethane caulk	2 tubes
<input type="checkbox"/> _____		<input type="checkbox"/> Spray paint	≤ 6 cans	_____	
<input type="checkbox"/> _____		<input type="checkbox"/> WD-40	≤ 1 can	_____	
<input type="checkbox"/> _____		<input type="checkbox"/> Pipe cement	≤ 1 can	_____	
<input type="checkbox"/> _____		<input type="checkbox"/> Pipe primer	≤ 1 can	_____	
<input type="checkbox"/> _____		<input type="checkbox"/> Mineral spirits	≤ 1 gal	_____	
<input type="checkbox"/> _____		<input type="checkbox"/> _____	_____	_____	

(1) Attach applicable Materials of Trade (MOT) generic shipping determination. SDS not generally applicable to this category. Safety Data Sheets (SDSs) must be available to field staff. Indicate below how SDS information will be provided:

- |   |   |
|---|---|
| <input type="checkbox"/> Not applicable                             | <input type="checkbox"/> Contractor SDSs are not applicable           |
| <input type="checkbox"/> Printed copy in company vehicle            | <input type="checkbox"/> Contractor SDSs are attached                 |
| <input type="checkbox"/> Printed copy in the project trailer/office | <input type="checkbox"/> Contractor SDSs will be on site and located: |
| <input checked="" type="checkbox"/> Printed copy attached           | _____   |
| <input type="checkbox"/> Electronic copy on field computer          | _____   |

Bulk quantities of the following materials will be stored: \_\_\_\_\_

Contact the project H&S contact for information in determining code and regulatory requirements associated with bulk storage of materials.

**Monitoring**

Chemical air monitoring is not required for this project or is the responsibility of contractor.

For projects requiring air monitoring, list the relevant constituents representing a hazard to site workers.

Constituent	Max. Conc. Units	TWA		STEL		IDLH		LEL/UEL	RGD	IP
		Units	Units	Units	Units	(%)	Air=1	(eV)		
Asbestos		0.1	f/cc	1	f/cc30 min	NA	-	NA/NA	NA	NA
None		9999	-	0	-	0	-	0	0	0
None		9999	-	0	-	0	-	0	0	0
None		9999	-	0	-	0	-	0	0	0
None		9999	-	0	-	0	-	0	0	0
None		9999	-	0	-	0	-	0	0	0

Notes: TWAs are ACGIH 8 hr.- TLVs unless noted.

p-ppm      m-mg/m3      c2- ceiling (2 hr.)      se-sensitizer      A - Arcadis specific TWA\*  
s- skin      c-ceiling      "9999" - NA      O-OSHA PEL      "#N/A"-Manually enter  
r- respirable      i-inhalable      N-NIOSH 10 hr. REL

See Special Instructions

**Monitoring Equipment and General Protocols**

Air monitoring is required for any task or activity where employees have potential exposure to vapors or particulates above the TWA. Action levels below are appropriate for most situations. Contact the project H&S contact for all stop work situations. Select monitoring frequency and instruments to be used.

Monitoring Frequency:   
Indicator Tube/Chip Frequency:

	Instrument	Action Levels	Actions
<input type="checkbox"/>	Photoionization Detector	< 0.000 0.000 - 0.0 > 0.0	Continue work Sustained >5 min. continuous monitor, review eng. controls and PPE, proceed with caution Sustained >5 min. stop work, contact SSO
	Lamp (eV):	> 0.0	Sustained >5 min. stop work, contact SSO
<input type="checkbox"/>	Flame Ionization Detector (FID)	< 0.0 0.0 - 0.0 > 0.0	Continue work Sustained >5 min. continuous monitor, review eng. controls and PPE, use caution Sustained >5 min. stop work, contact SSO
<input type="checkbox"/>	LEL/O2 Meter	0-5% LEL >5-10% LEL >10% LEL 19.5%-23.5% O2 <19.5% O2 >23.5% O2	Continue work Continuous monitor, review eng. controls, proceed with caution Stop work, evacuate, contact SSO Normal, continue work O2 deficient, stop work, evacuate, cont. SSO O2 enriched, stop work, evacuate, contact SSO
<input type="checkbox"/>	Indicator: <input type="checkbox"/> tube <input type="checkbox"/> chip	≤PEL/TLV >PEL/TLV	Continue work Stop work, review eng. controls and PPE, contact SSO
	Compound(s):		
<input type="checkbox"/>	Particulate Monitor (mists, aerosols, dusts in mg/m <sup>3</sup> )	< 1.5 1.5 - 3.000 > 3.000	Continue work Use engineering controls, monitor continuously Stop work, review controls, contact SSO
<input type="checkbox"/>	Other:	Specify:	Specify:

\* Arcadis administrative TWAs ensure mixture component TWAs are not exceeded that would require additional monitoring or medical surveillance.

One or more constituents listed above is a particulate hazard. Use wetting as the primary control to eliminate dust hazards.

**Personal Protective Equipment (PPE)**

See JSA or Permit for the task being performed for required PPE. If work is not conducted under a JSA or Permit, refer to the governing document for PPE requirements. At a minimum, the following checked PPE is required for all tasks during field work (outside of field office trailers and vehicles) not covered by a JSA or Permit on this project:

Minimum PPE required to be worn by all staff on project:			Specify Type:
<input checked="" type="checkbox"/> Hard hat	<input type="checkbox"/> Snake chaps/guards	<input type="checkbox"/> Coveralls:	_____
<input checked="" type="checkbox"/> Safety glasses	<input type="checkbox"/> Briar chaps	<input type="checkbox"/> Apron:	_____
<input checked="" type="checkbox"/> Safety goggles	<input type="checkbox"/> Chainsaw chaps	<input checked="" type="checkbox"/> Chem. resistant gloves:	Nitrile
<input type="checkbox"/> Face shield	<input type="checkbox"/> Sturdy boot	<input checked="" type="checkbox"/> Gloves other:	Leather/Level II cut/vibration resistant
<input checked="" type="checkbox"/> Hearing protection	<input checked="" type="checkbox"/> Steel or comp. toe boot	<input type="checkbox"/> Chemical boot:	_____
<input type="checkbox"/> Rain suit	<input type="checkbox"/> Metatarsal boot	<input type="checkbox"/> Boot other:	_____
<input type="checkbox"/> Other:	<input checked="" type="checkbox"/> Boot covers if needed	<input checked="" type="checkbox"/> Traffic vest, shirt or coat:	Class III
_____	_____	<input type="checkbox"/> Life vest:	_____

Task specific PPE: Hearing protection when using power tools/drill - ear muffs may be needed for noise over a particular decibel vs in the ear plugs. See Level C Supplement for half-face APR use for ACM sample collection. Full protection when working in Reach-All Truck; standby boat in water.

Comments: Also see various attached JSAs for task-specific PPE requirements, such as snake chaps or gaiters, PFDs or muck boot/hip waders if in and near water, or working in or near poisonous plants or venomous snake habitat. Fall protection harness required for aerial lift work.

**Medical Surveillance (check all that apply)**

- Medical Surveillance is not required for this project.
- HAZWOPER medical surveillance applies to all Arcadis site workers on the project.
- HAZWOPER medical surveillance applies to all subcontractors on the project.
- HAZWOPER medical surveillance applies to all site workers on the project except:
  
- Other medical surveillance required (describe type and who is required to participate):
  
- Client drug and/or alcohol testing required.

**Hazardous Materials Shipping and Transportation (check all that apply)**

- Not applicable, no materials requiring a Shipping Determination (SD) will be transported or shipped
- A SD has been reviewed and provided to field staff
- A SD is attached
- All HazMat will be transported under Materials of Trade by Arcadis (see generic MOT SD Form)
- Other (specify):

**Roadway Work Zone Safety (check all that apply)**

- Not applicable for this project
- All or portions of the work conducted under a TCP
- All or portions of the work conducted under a STAR Plan
- TCP or STAR Plan provided to field staff
- TCP or STAR Plan attached
- Other (specify):

**Arcadis Commercial Motor Vehicles (CMVs)**

This section is applicable to Arcadis operated vehicles only

- This project will **not** utilize CMV drivers
- This project will utilize CMV drivers

This project will NOT utilize vehicles (alone or in combination with a trailer) with a gross vehicle weight rating (GVWR) of 10,001 pounds or more. GVWR Truck + GVWR Trailer = <10,001 pounds

**Site Control** (check all that apply)

- Not applicable for this project.
- Site control protocols are addressed in JSA or other supporting document (attach)
- Maintain an exclusion zone of \_\_\_\_\_ ft. around the active work area
- Site control is integrated into the STAR Plan or TCP for the project
- Level C site control - refer to Level C Supplement attached
- Other (specify):

**Decontamination** (check all that apply)

- Not applicable for this project.
- Decontamination protocols are addressed in JSA or other governing document (attach)
- Wash hands and face prior to consuming food, drink or tobacco.
- Remove gloves and coveralls and contain, wash hands and face prior to consuming food, drink or tobacco. Ensure footwear is clean of site contaminants
- Respiratory protection - refer to the Level C supplement attached.
- Other (specify):

Level C work requires decontamination of the respirator prior to storage and transport.

**Sanitation** (check all that apply)

- Mobile operation with access to off-site restrooms and potable water
- Restroom facilities on site provided by client or other contractor
- Project to provide portable toilets (1 per 20 workers)
- Potable water available on site
- Project to provide potable water (assume 1 gal./person/day)
- Project requires running water (hot and cold, or tepid) with soap and paper towels

**Safety Briefings** (check all that apply)

- Safety briefing required daily
- Safety briefing required twice a day
- Safety briefings required at the following frequency: As conditions change
- Subcontractors to participate in Arcadis safety briefings
- Arcadis to participate in client/contractor safety briefings
- Other (specify):

TDOT to attend Arcadis briefings related to traffic control support, as necessary.

**Safety Equipment and Supplies**

Safety equipment/supply requirements are addressed in the JSA or Permit for the task being performed. If work is not performed under a JSA or Permit, the following safety equipment is required to be present on site in good condition (Check all that apply):

- |  |   |
|--|---|
| <input checked="" type="checkbox"/> First aid kit            | <input checked="" type="checkbox"/> Insect repellent/Permethrin |
| <input checked="" type="checkbox"/> Bloodborne pathogens kit | <input checked="" type="checkbox"/> Sunscreen                   |
| <input checked="" type="checkbox"/> Fire extinguisher        | <input type="checkbox"/> Air horn                               |
| <input type="checkbox"/> Eyewash (ANSI compliant)            | <input checked="" type="checkbox"/> Traffic cones               |
| <input checked="" type="checkbox"/> Eyewash (bottle)         | <input type="checkbox"/> 2-way radios                           |
| <input checked="" type="checkbox"/> Drinking water           | <input type="checkbox"/> Heat stress monitor                    |
| <input checked="" type="checkbox"/> Other:                   |   |

Truck strobe/worker ahead signage

Tech-NU

**International Travel**

- This project does not involve international travel
- This project involves international travel

**Behavior Based Safety Program** (*check all that apply*)

- TIP required at the following frequency on this project:  
*Select One:* \_\_\_\_\_ mhrs 1 time(s) \_\_\_\_\_ Define: per field mob
- H&S Field Assessment required at the following frequency on this project:  
*Select One:* \_\_\_\_\_ mhrs \_\_\_\_\_ time(s) \_\_\_\_\_ Define: \_\_\_\_\_
- Other (specify): \_\_\_\_\_

**Signatures**

I have read, understand and agree to abide by the requirements presented in this health and safety plan. I understand that I have the absolute right to stop work if I recognize an unsafe condition affecting my work until corrected.

Printed Name	Signature	Date
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Add additional sheets if necessary

**You have an absolute right to STOP WORK if unsafe conditions exist!**

## **Attachments**

1. Level C Supplement
2. Forms/Miscellaneous Documents
  - Tailgate Meeting Form
  - Task Improvement Process
  - If Not Me, Then Who?
  - Vehicle Inspection Form
  - Visitor Sign In Form
  - Shipping Determination
  - Take Care of Your Hands
  - Tick Bite Prevention
  - Lightning Awareness
3. JSAs
4. Poisonous Plants Awareness and Prevention
5. Traffic Control Plan/STAR
6. Safety Data Sheets
7. Aerial Work Platform HS Standard

Level C Supplement

**Level C Supplement for the Standard HASP (Revision 5, 4/9/2015)**

**Level C Scope of Work**

Describe the task(s) requiring Level C upgrade:  
Asbestos inspection with half-face or full-face respirator.

Verify the following (check box if condition **does not exist** for the task(s) listed above):

- NO IDLH atmospheres
- NO oxygen deficient atmospheres
- NO permit required confined spaces
- NO unknown contaminant atmospheres

If any of the above conditions exist, contact your project H&S contact for assistance.

**Roles and Responsibilities**

Identify project team members and Level C responsibilities for each member for this work:

<b>Employee Name</b>	<b>Responsibilities</b>
1 Zach Mongan	Field Task Planning/Lead ACM Inspector
2 Greg Drelich	Field Support/SSO
3 Zack Dinkins	Field Support/SSO
4	
5	
6	
7	
8	

**Training**

The following training is required beyond the training specified in the HASP:

- Respirator use and limitations
- Level C PPE specific to the project
- Site control specific to the project
- Decontamination specific to the project.
- Project air monitoring requirements under Level C
- Emergency Action Plan specific to this Level C project
- Other (specify): \_\_\_\_\_
- Other (specify): \_\_\_\_\_

Training will be provided on site prior to imitation of work and documented on:

- Tailgate Safety Briefing Form
- Field Logbook
- Other (specify): Internal ANA Training/Fit Test Records

**Medical Surveillance**

- All project team members have a current medical clearance to wear a respirator
- The following project team members are required to have a current medical clearance to wear a respirator

_____	_____
_____	_____
_____	_____

**Air Monitoring Supplement**

The following air monitoring requirements are in addition to the requirements in the HASP when work is performed under Level C conditions.

Constituent(s)	Odor Threshold (ppm)	MUC (ppm)	Comments
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Other air monitoring equipment required for Level C work not specified in the HASP:

- 1) PID
- 2) FID
- 3) LEL/O2 Meter
- 4) Particulate monitor
- 5) Colorimetric indicator tubes (specify type): \_\_\_\_\_
- 6) Other: \_\_\_\_\_
- 7) Weather
  - Temperature
  - Humidity
  - Precipitation
  - Wind direction
  - Wind speed
  - Other: \_\_\_\_\_

Air monitoring will be conducted at (check all that apply):

Location:	Frequency:	Type (instruments or numbers from above):
<input type="checkbox"/> Breathing zone	_____	_____
<input type="checkbox"/> Exclusion zone boundary	_____	_____
<input type="checkbox"/> Upwind	_____	_____
<input type="checkbox"/> Downwind	_____	_____
<input type="checkbox"/> Crosswind	_____	_____
<input type="checkbox"/> Site perimeter	_____	_____
<input type="checkbox"/> Other: _____	_____	_____
<input type="checkbox"/> A windsock is required.		

Comments:

**Respirator Selection and Fit Testing**

The following respirator is required for this project:

	APF	Permitted Fit Test
<input type="checkbox"/> Dust mask	10	QLFT
<input checked="" type="checkbox"/> Half facepiece air purifying respirator (dual cartridge) (required)	10	QLFT
<input checked="" type="checkbox"/> Full facepiece air purifying respirator (optional)	50	QLFT
<input type="checkbox"/> Loose fitting facepiece powered air purifying respirator	25	QLFT
<input type="checkbox"/> Half facepiece powered air purifying respirator	50	QLFT
<input type="checkbox"/> Full facepiece powered air purifying respirator	1000	QNFT

Required fit test for project:     Qualitative (QLFT)     Quantitative (QNFT)  
     QLFT fit test protocol attached

**Cartridge Selection**

The following cartridges are required for this project:

*Note: Consult the manufacturer's literature for specific constituents of interest to ensure correct cartridge is selected.*

<p>Chemical:</p> <input type="checkbox"/> Multigas <input type="checkbox"/> Organic vapor <input type="checkbox"/> Organic vapor/acid gas <input type="checkbox"/> Ammonia/methylamine <input type="checkbox"/> Mercury vapor/chlorine <input type="checkbox"/> Other (specify): _____	<p>Particulate/Dust/Mists:</p> <input checked="" type="checkbox"/> P-100 <input type="checkbox"/> N-95 <input type="checkbox"/> R-95 <input type="checkbox"/> Other (specify): _____	<p>Combination:</p> <input type="checkbox"/> Organic vapor/P-100 <input type="checkbox"/> Organic vapor/acid gas/P-100 <input type="checkbox"/> Ammonia/methylamine/P-100 <input type="checkbox"/> Mercury vapor/chlorine/P-100 <input type="checkbox"/> Other (specify): _____
--	--	--

**End of Service Life Indicators (ESLIs) (aka Respirator Cartridge Change Out)**

Respirator cartridge ESLIs shall be factored when selecting the appropriate cartridge. Use of warning properties such as odor and taste are not permissible practices. The ESLI shall be identified and a cartridge change out schedule established prior to start of work. Information used to establish the change out schedule will be computed using manufacturer's supplied guidance or software (see below). At a minimum, chemical cartridges will be changed out daily. For particulate filters and cartridges, replace when breathing becomes difficult or daily whichever comes first.

ESLI information is attached.

Comments:

There is no safe threshold for exposure to asbestos, therefore cartridges should be changed out daily or as needed.

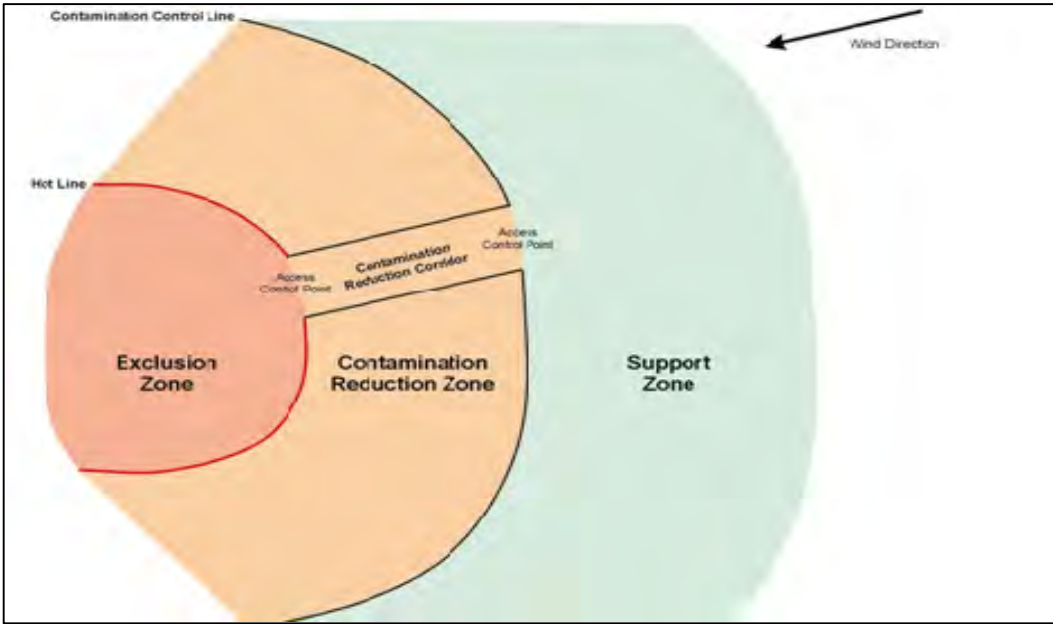
**Respirator Care and Maintenance**

Cleaning protocol attached

All respirators will be stored in a clean and sanitary condition at all times. Each respirator used will be cleaned prior to be stored for the day. Each respirator will be inspected by the user prior to use. Any defective or worn part will be promptly replaced.

**Site Control**

Example site control layout (check configurations to be used below):



The size and configuration used for site control is dependent on many variables. Based on the hazards and tasks being performed, identify site control requirements for this project:

Configuration?

- Exclusion zone (EZ)
- Contamination reduction zone (CRZ)
- Contamination reduction corridor (CRC)
- Access control points (ACPs)
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

How delineated?

- Cones
- Channelizer cones
- Caution tape
- Safety fencing
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

Site control is integrated into the STAR Plan or TCP for the project

Additional Level C PPE specific for each zone (excluding respirator):

EZ and ACP at EZ

- Coveralls: \_\_\_\_\_
- Boot covers: \_\_\_\_\_
- Outer gloves: \_\_\_\_\_
- Inner gloves: \_\_\_\_\_
- Taping \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

CRZ/CRC/ACP at Support Zone

- Coveralls: \_\_\_\_\_
- Boot covers: \_\_\_\_\_
- Outer gloves: \_\_\_\_\_
- Inner gloves: \_\_\_\_\_
- Taping \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

Support Zone

- See applicable JSA
- See HASP
- Other: \_\_\_\_\_

Comments:

### **Level C. Supplement - Respirator Cleaning Protocol**

Remove cartridges/canisters/filters. Disassemble facepiece by removing speaking diaphragm, demand and pressure-demand valve assemblies, hoses, or any components recommended by the manufacturer.

Wash components with warm (<110° F) water with a mild detergent or with a cleaner approved by the manufacturer. A soft, non-wire bristle brush may be used to facilitate dirt removal.

Rinse with warm (<110° F) clean water, preferably running water.

If the cleaner used does not contain a disinfecting agent, respirator components should be immersed in one of the following for two minutes:

1. Hypochlorite solution (50 ppm of chlorine) made by adding approximately one milliliter of laundry bleach to one liter of water at 43° C (110° F); or,
2. Aqueous solution of iodine (50 ppm iodine) made by adding approximately 0.8 milliliters of tincture of iodine (6-8 grams ammonium and/or potassium iodide/100 cc of 45% alcohol) to one liter of water at 43° C (110° F); or,
3. Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer.

Rinse components thoroughly in clean, warm (43° C [110° F] maximum), preferably running water. Drain. The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on facepieces may result in dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts if not completely removed.

Components should be hand-dried with a clean lint-free cloth or air-dried.

Reassemble facepiece, replacing filters, cartridges, and canisters where necessary.

Test the respirator to ensure that all components work properly.

Forms/Miscellaneous Documents

## TAILGATE HEALTH & SAFETY MEETING FORM

<b>Project Name:</b>			<b>Project Location:</b>		
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<b>Date:</b>	<b>Time:</b>	<b>Conducted by:</b>	<b>Signature/Title:</b>
--------------	--------------	----------------------	-------------------------

**Issues or concerns from previous day's activities:**

---

**Task anticipated to be performed today:**

Additional permits/checklists attached

**USE TRACK! Evaluate the hazards (h) for the tasks being performed today and rank as Low (L), Medium (M) or High (H). Use relevant JSAs, FHSB, permit or other work standard to communicate controls (c) to be used to eliminate or mitigate identified hazards.**

<input type="checkbox"/> Gravity (i.e., ladder, scaffold, trips) (L M H) h: _____ c: _____	<input type="checkbox"/> Motion (i.e., traffic, moving water) (L M H) h: _____ c: _____	<input type="checkbox"/> Mechanical (i.e., augers, motors) (L M H) h: _____ c: _____
<input type="checkbox"/> Electrical (i.e., utilities, lightning) (L M H) h: _____ c: _____	<input type="checkbox"/> Pressure (i.e., gas cyl., wells) (L M H) h: _____ c: _____	<input type="checkbox"/> Environment (i.e., heat, cold, ice) (L M H) h: _____ c: _____
<input type="checkbox"/> Chemical (i.e., fuel, acid, paint) (L M H) h: _____ c: _____	<input type="checkbox"/> Biological (i.e., ticks, poison ivy) (L M H) h: _____ c: _____	<input type="checkbox"/> Radiation (i.e., alpha, sun, laser) (L M H) h: _____ c: _____
<input type="checkbox"/> Sound (i.e., machinery) (L M H) h: _____ c: _____	<input type="checkbox"/> Personal (i.e. alone, night) (L M H) h: _____ c: _____	<input type="checkbox"/> Driving (i.e. car, ATV, boat, dozer) (L M H) h: _____ c: _____

**Comments:**

Refer to the attached Hazard Analysis Sheet(s) or JSA

**Signature and Certification: I have read and understand the project specific HASP for this project.**

Printed Name/Signature/Company	Sign In Time	Sign Out Time	
			<p><b>I will STOP</b> the job any time anyone is concerned or uncertain about health &amp; safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.</p> <p><b>I will be</b> alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments.</p> <p>If it is necessary to <b>STOP THE JOB</b>, I will perform <b>TRACK</b>; and then amend the hazard assessments or the HASP as needed.</p> <p><b>I will not assist</b> a subcontractor or other party with their work unless it is absolutely necessary and then only after I have done TRACK and I have thoroughly controlled the hazard.</p> <p>All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns.</p> <p>In the event of an injury, employees will call <b>WorkCare at 1.800.455.6155</b> and then notify the field supervisor.</p> <p>Utility strike, motor vehicle accident or 3rd party property damage - field supervisor will immediately notify the Project or Task Manager</p>

## Task Improvement Process

General	
Observed Company:	
Observation Type:	
TIP Form:	H&S Field Multi-Task (General)
Task Observed:	
Observee Name:	
Observer Name:	
Observation Date:	
Project Number:	TNDT1935.HZxx
Project Name:	
Supervisor:	
Equipment On Site:	
Pertinent Information:	

Observation			
Task	Correct	Questionable	Comments
<b>General</b>			
PPE worn according to HASP/JLA specifications and inspected before use?			
STOP work authority used where appropriate?			
<b>Body Use/Positioning</b>			
Proper lifting/pushing/pulling techniques used (no awkward positions/posture; no twisting or excessive reaching; no straining; no excessive weight; load under control/stable; etc.)?			
Body parts away from pinch points (clear or protected from being caught between objects/equipment or from contacting sharp objects/edges, etc.)?			
Body parts not in the Line of Fire (protected from being struck by traffic, equipment, falling/flying objects, etc.)?			
<b>Work Procedures/Environment</b>			
Correct type and number of barricades/warning devices/cones?			
Communication with others when necessary (hand signals, flags, etc.)?			
Right tools and equipment selected for the job and inspected before use?			
Tools and equipment used properly?			

Housekeeping performed (work areas and pathways clear of hazards, uneven surfaces addressed, etc.)?			
Slip/trip/fall hazards addressed (path selected and cleared, eyes on path, speed footing, etc.)?			
Proper energy control (electrical systems grounded, lock out/tag out performed, isolated, cords/fixtures in good condition, GFCI inspected and utilized when appropriate and used properly, etc.)?			
Protected from overhead/underground utilities (proper clearance, properly marked, spotters as necessary, etc.)?			
Safe work on/near water (appropriate flotation device, appropriate boat for body of water and operation of boat, etc.)?			
Chemical/Radiation protection (decontamination zones set up properly, air monitoring, completed, and logged, etc.)?			
Fall from elevated height prevention (maintains 3-points of contact, appropriate ladder, mounting/dismounting vehicle/equipment, fall arrest system, etc.)?			
Any additional safety issues identified:			

**Tip Summary** Enter details of the TIP and follow up discussion provide details on how any

Discussion following the TIP led by: \_\_\_\_\_

Date of follow-up discussion: \_\_\_\_\_

Positive Comments:

Discussion Summary Completed:

- Supervisor Led
- Peer to Peer
- Arcadis Employee to Subcontractor

Summary of Questionable Items

--

**Action Items (Optional)** Assign appropriate action items based on the observations made. You can

Item #	Action Item	Responsible Person	Due Date	Comp. Date
1				
2				
3				

**Standard Review**

Reviews to be performed after entry of this TIP into 4-Sight.

**Quality Review**

Quality Reviews to be performed after entry of this TIP into 4-Sight.

**Field Validation and Verification**

Use the 4-Sight generated copy of this TIP to perform field V&V activities.

## IF NOT ME, THEN WHO?

### - H&S SITUATIONS WHERE NO ARCADIS EMPLOYEES ARE INVOLVED OR WHEN ARCADIS DOES NOT HAVE HEALTH & SAFETY RESPONSIBILITY-

Effective: 1 March 2013

This document addresses the “If Not Me, Then Who?” concept in perceived or actual H&S situations (unsafe acts or behaviors, unsafe conditions, etc.) which do not involve our employees or partners and where we are not contractually or statutorily responsible for H&S<sup>1</sup>.

*For example, what does an ARCADIS employee do, when ARCADIS has no construction site responsibility but they see that a fence that was erected by a general contractor and is supposed to be protecting this site, has a gap that may allow an unauthorized person to enter the site where they could be injured?*

The ARCADIS H&S Vision and Policy, and our culture using TRACK to 0 concept put H&S first in all things. Yet we also have the need to protect ourselves from injury and the company from undue risk and liability:

1. Take a minute to think through the situation, related risks, and risks that would result from corrective action (TRACK).
2. Act immediately to save lives if in your best judgment delay would cost lives or severe injuries (imminent danger).
3. If we see unsafe acts/behavior or conditions that are not imminent dangers: speak up and promptly notify the appropriate party. In a project: liaise with project manager about best person to address (consider H&S responsible person - contractor and client). In other situations, attempt to identify the person with H&S or overall responsibility for the activities.
4. Re-confirm the formal H&S responsibilities (law & contract) with H&S and legal department before doing anything else, or, if action could not be postponed for risk of losing lives/severe injuries, immediately after the action.
5. When having pointed out, or about to point out, areas of concern outside of our scope of responsibilities, accompany with a specific disclaimer<sup>2</sup>.
6. Refrain from taking H&S responsibility through further action (actual corrections, audits, reviews or other)<sup>3</sup>.

*It is noted that the above example actually occurred involving an ARCADIS employee. Instead of notifying the appropriate parties of the situation, our employee attempted to fix the contractor fence and got seriously injured in doing so. This resulted in lost time to our employee and a recordable injury against the company.*

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<sup>1</sup> The ARCADIS Stop Work Authority covers H&S situations that do involve our employees or where we are statutorily or contractually responsible for H&S.

<sup>2</sup> *In this activity, it is not our role to monitor H&S, but as a company we are very committed to a safe work environment and based on our previous experiences we believe [\*\*] to create an imminent threat to [\*\*].* If providing a disclaimer at the time is “too much”, we can do a clear short one in writing immediately after.

<sup>3</sup> This is to avoid our employees running safety risks through corrective actions. We also wish to avoid being held responsible, and possibly liable, for work outside scope.

## Weekly Vehicle Inspection Form

Vehicle # / License Plate #

Wheels # / Last 6 of Vin #

Inspection Date													
Odometer reading													
Driver / Inspector Name													
<i>Check the appropriate box and enter repair date for identified repairs:</i>		OK	Needs Repair	Repair Date	OK	Needs Repair	Repair Date	OK	Needs Repair	Repair Date	OK	Needs Repair	Repair Date
<b>Interior<sup>1</sup></b>	Horn operational												
	Door Locks operational												
	Seat Belts in good repair & operational												
	Seats and Seating Controls operational												
	Steering Wheel - No Excessive Play												
	Interior Lights and Light Controls												
	Instrument Panel/Gauges												
	Wiper Controls operational												
	Heat/Defrost/Air Conditioning operational												
	Rear View Mirror present												
<b>Exterior<sup>1</sup></b>	Backup Camera/Sensors working												
	Jack and Lug Wrench present												
	Lights and Signals operational												
	Tires and Spare Tire properly inflated												
	Tires have proper tread depth (Page 2)												
	Doors operational												
<b>Engine &amp; Brakes</b>	Windows Cracked/Damaged												
	Side View Mirrors operational												
	Damaged Body Panels and Bumpers												
	Engine Start & Running Smoothly												
<b>Emergency Equipment<sup>2</sup></b>	Fluid Levels-OK?, No Noticeable Leaks												
	Belts tight, no cracks												
	Parking Brake & Brakes operational												
	First Aid Kit, inspected monthly												
	Fire Extinguisher properly secured												
<b>Cargo</b>	Fire Extinguisher inspected monthly												
	Amber emergency warning light present												
<b>Registration</b>	Roadside Assistance Information												
	Recommend spotter cones available												
	Cargo Secure and Properly Distributed												
<b>Registration</b>	Securing Devices in Good Condition												
	Valid License Plate /Tags												
	Valid Registration and Insurance												
	Valid City/State Inspection Decal												
	Lease Plan information/Fuel Card												

<sup>1</sup> Note all damages to the vehicle on the back of this page

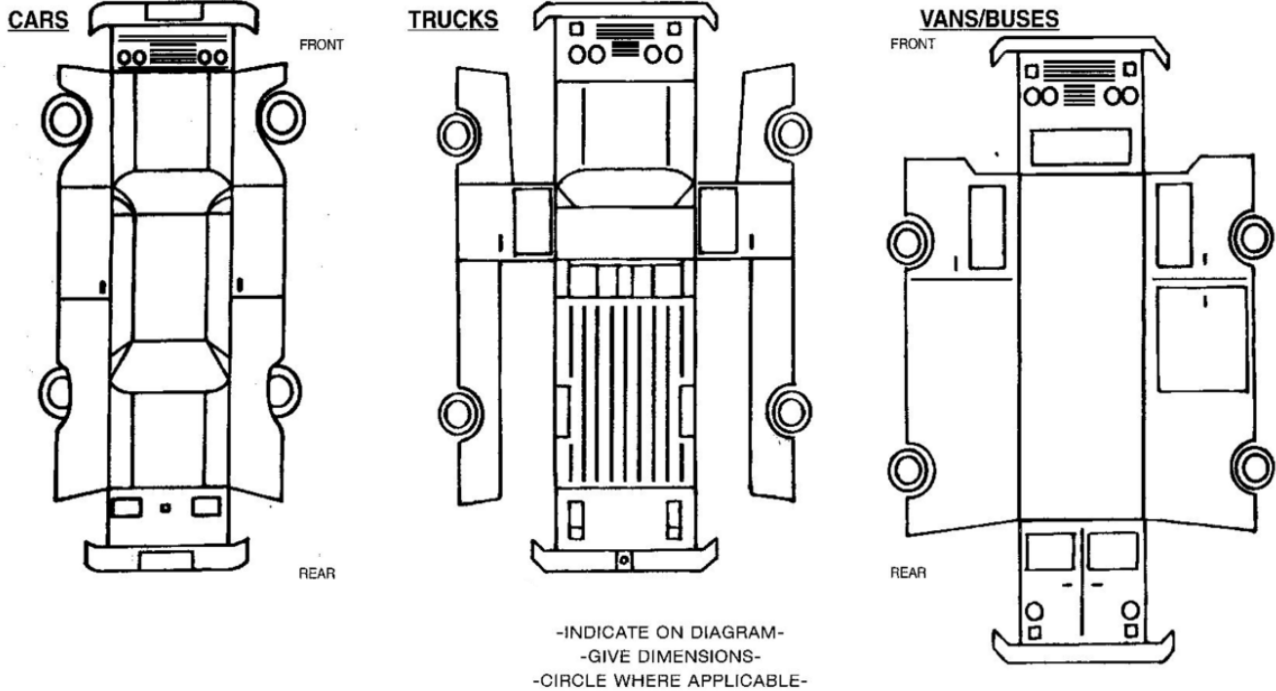
<sup>2</sup> Emergency Equipment required per Motor Vehicle Standard ARC HSGE024



**Note All Vehicle Damage Below**

**All Vehicle Damage must be reported to Anthony Cline (Corporate Fleet Manager) and Susan Berndt (Corporate Legal)**

- CODES:**
- B-BENT
  - BR-BROKEN
  - BU-BULGE
  - C-CHAFED
  - CH-CHIPPED
  - CPM-COVERED WITH PROTECTIVE MATERIAL-UNABLE TO DETERMINE DEFECTS IF ANY
  - CSA-CHAFED AND SCRATCHED ALL OVER
  - CR-CRACKED
  - D-DENTED
  - DMC-DUST AND MUD COVERED UNABLE TO DETERMINE OTHER DEFECTS IF ANY
  - G-GOUGED OR CUT
  - GC-GLASS CRACKED
  - HS-HAIRLINE SCRATCH
  - M-MISSING
  - P-PUNCTURED
  - R-RUSTY
  - S-SCRATCHED
  - SC-SCRAPED
  - SM-SMASHED
  - ST-STAINED AND/OR SOILED
  - T-TORN



Notes:

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Tread Depth Guide: If a tread gauge is not available coins may be used to determine remaining tread. 2/32" is the minimum by law in most states (top of Lincoln's head on penny), 4/32" is minimum recommended for wet surfaces (top of Washington's head on quarter), 6/32" is minimum recommended for snowy surfaces (top of Lincoln Memorial on penny). Vehicle tires should be replaced if the tread depth is less than 6/32".



**Reference JSA 10907 For Weekly Vehicle Inspection**







# SHIPPING/TRANSPORTATION DETERMINATION FORM

Revision 9a

Date:	9/26/2017
Project Name:	TDOT Bridge ACM Surveys
Project Number:	TNDT1935.HZxx
Supplemental Information:	None

## 1) Description of the Material to be Transported or Shipped

1a Select a description category ==> Samples

1b *Asbestos containing material*

1c Potential Asbestos Containing Material, Friable/Non-Friable

- This material is mixed with water, soil or other inert material
- This material will be shipped on wet or blue ice
- Consignment contains dry ice
- Consignment contains containers with acid/base preservatives prepared by an analytical laboratory.

## 2) Classification and Identification

This material is: Hazardous Material  
Complete sections 2a and 2b below

Complete for Hazardous Materials ONLY:

2a UN/NA/ID# : UN2590      2b PG: III      Primary Hazard Class: 9  
Subsidiary Hazard Class: NA      NA

PSN: Asbestos, chrysotile

See Section 7a

2c This material is a: No additional criteria applies to this material

## 3) Packaging, Exceptions and Shipping Information

Consider entering your desired bottle set in section 3f prior to completing 3a-3c to see if exceptions can be used.

This material will be shipped (mode of transport and type of shipment):

3a Air using an IATA/ICAO exception/limitation

If using an exception/exemption, list the exception/exemption below

3b IATA/ICAO - Excepted Quantity

Carrier/Transporter information:

3c None

**Complete 3d-3f for all Shipments HazMat and Not Regulated/Not Restricted:**

3d Packaging Type: Combination Package - Non-Bulk

3e Inner Container Category: Bag- plastic

3f Inner Container Specific/Pkg:

Container type	Number	Container type		Net Qty. Each Container		=< Select units here TIP: Do not place units in the yellow column.
Container type #1	50	1 pint	Plastic Bag	20	grams	
Container type #2	0	None	None		None	
Container type #3	0	None	None		None	
Container type #4	0	None	None		None	
Container type #5	0	None	None		None	
Container type #6	0	None	None		None	

3g Intermediate Packaging: Plastic bag/liner

3h Outer Packaging: Non-specification box - fibreboard

3i Other: All packed in one (air only) Type: None

Auth. Air Limits for EQ, LQ and Fully Reg. Shipments and Selected Ground LQ and SQE:  
 Inner Container Limit (NA- Not Applicable; F- Forbidden; mg, g, or kg for solids; ml or L for liquids):

Glass	0.03	kg	Plastic Bag	NA	NA	Outer Package Limit
Metal	0.03	kg	Paper Bag	NA	NA	
Plastic	0.03	kg	Fibre	NA	NA	

1	kg
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**Air Shipping Specification Package Requirements (NA-Not Available or Not Applicable):**

Combination Packages						
Drums:	Steel	Aluminum	Plywood	Fibre	Plastic	
	NA	NA	NA	NA	NA	
Jerricans:	Steel	Aluminum	Plastic			
	NA	NA	NA			
Boxes:	Steel	Aluminum	Plywood	Fibreboard	Plastic	
	NA	NA	NA	NA	NA	
Single Packages						
Drums:	Steel	Aluminum	Fibre	Wood	Plastic	
	NA	NA	NA	NA	NA	
Jerricans:	Steel	Aluminum	Plastic			
	NA	NA	NA			
Boxes:	Steel	Aluminum	Plywood	Fibreboard	Plastic	
	NA	NA	NA	NA	NA	
Bags:	Textile	Plastic	Paper			
	NA	NA	NA			

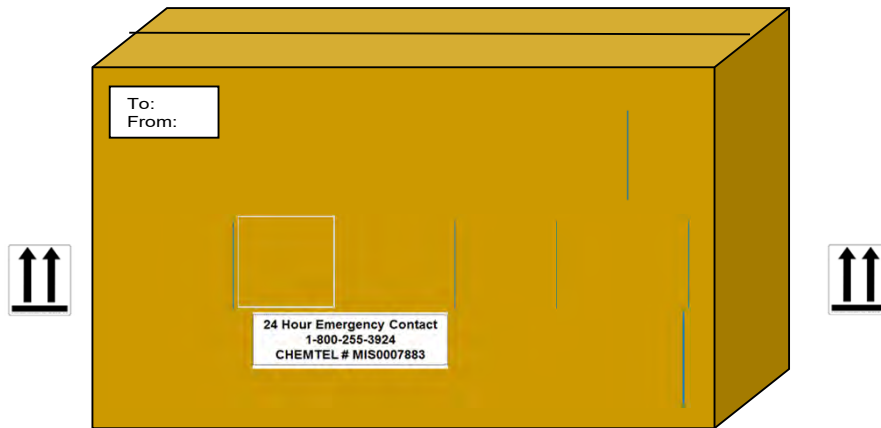
Specification packages are not required when using the selected exception or exemption.

- Arcadis Shipping Guide US-001 attached
- Specific package closure instructions are attached
- Arcadis Shipping Guide or HSSP is available for this shipment:

HSSP-012

**4) Marks and Labels for Non-Bulk Packages**

Orientation arrows, if shown, may be red or black in color.



Place all marks and labels checked in this section on same side of package (excludes orientation arrows, if shown).

**5) Documentation**

- No special documentation required
- Requires a Shipper's Declaration (air) prepared using : None
- Requires HazMat ground shipping papers prepared using: None
- Requires a Bill of Lading or Manifest (>MOT, Freight, Trucking Co., Waste Hauler, etc.)
- Requires Special Permit DOT-Special Permit #: \_\_\_\_\_
- Other: \_\_\_\_\_

**6) Emergency Response**

- Use ChemTel 24/7 Emergency Phone and Contract Number or approved equivalent (authorized client or vendor) for this shipment:  
 1-800-255-3924 (ChemTel #MIS0007883) Register this shipment with ChemTel:  
 Have carrier tracking number available. <http://Arcadis.chemtel.net/>
- Ensure current edition of North American Emergency Response Guidebook in vehicle (this applies to Arcadis Transport requiring a shipping paper)

**7) Special Instructions (Specify any "See Section 7" details in 7a)**

Gross package weight must not exceed 64 pounds.

Standard Ziploc type plastic bags used as inner packaging's must double bagged. Tape secure bag closure.

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7a

**8) References and Rationale for the Determination** (add additional sheets, if required. See cell B178 for guidance)

IATA section 2.6	HSSP-012
ICAO/IATA Special Provisions:	A61
Various suspect bulk material samples will be collected for TDOT for PLM analyses from the following bridge construction materials, or as determined by the TN-Licensed Asbestos Inspector: concrete, concrete skim coatings, stormwater drains/pipes, utility conduit(s), expansion joint filler/pre-formed expansion material between concrete sections, or other miscellaneous materials (such as tar paper, sealant/caulking, tar flashing, felt, fiberboard, vibration damperer pads, etc.). Historical sampling for TDOT at similar bridge structures has determined that some construction materials contain USEPA regulated amounts of asbestos in a limited number of sampled materials from any given structure. Bulk material samples are collected in a plastic sample bag (provided by the analytical lab), consolidated into a larger bag and finally placed within the outer container for overnight shipment to the lab.	
<input type="checkbox"/> See attached for rationale (IF CHECKED, DETERMINATION IS VOID IF RATIONALE NOT ATTACHED)	

**9) Signatures**

Determination performed by: Patrick Kontovich

Phone (XXX-XXX-XXXX): 865.777.3518

Determination QA/QC performed by: 

### HSSP-012: Air Shipment, Friable Asbestos

Proper Shipping Names that may apply to this HSSP:

- ✓ .UN2590, Asbestos, Chrysotile

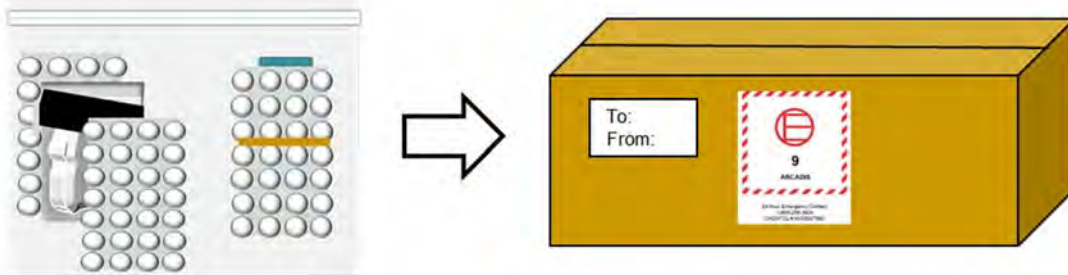
1) ≤ 30 grams of material per container:



Seal in bag    Tape bag seal  
(plastic thickness ≥4 mil)

Seal in vial    Tape vial lid    Protect vial

2) ≤ 1 Kg of material per package:



Secure samples in self sealing bag and protect with cushioning material

Place samples in box and secure against movement mark box as shown above



3) Mark shipping document or air waybill “*Dangerous Goods in Excepted Quantities, 1 Package*”:

Does this shipment contain dangerous goods?  
 No     Yes As per attached Shipper's Declaration     Yes Shipper's Declaration not required.  
 Dangerous goods (including Dry Ice) cannot be shipped in FedEx packaging.



## Take Care of Your Hands

### Think through the task

- The materials being used or the job process itself might be hazardous
- Use the correct tool for the job
- The most common causes of hand injuries are:
  - Not understanding or recognizing the hazards
  - Being in the "line of fire"
  - Using the wrong tool
  - Not using the correct glove
  - Disregard for safety procedures
  - Distractions, carelessness, lack of awareness
  - Repetitive motion strain



### Recognize the hazards that could hurt hands

- Sharp surfaces (i.e., cutting tools, etc.)
- Pinch points
- Sharp and/or pointy edges that can cause puncture wounds
- Chemicals
- Rotating equipment
- Bee stings/insect bites
- Bloodborne pathogens
- Extreme temperatures
- Vibrating equipment
- Struck by hazards – things falling on the hand or striking the hand

### Assess the risks

- Cuts and wounds
- Heat burn
- Frostbite
- Crushing of hand or fingers
- Amputation



### Control the hazards

#### Preventing injury:

- Always use the right glove for the job
- Use the correct cutting tool for the job and tools that have guarded or protected edges
- Be aware of pinch points
- Stay out of the "line of fire" of moving or falling equipment
- Be aware of hot and cold surfaces and weather conditions
- Be aware of rotating or moving surfaces
- Automated machinery may be controlled by remote control, or delayed timing devices that cause the machine to start automatically
- Use lockout/tagout procedures for de-energized equipment
- Loose clothing (including gloves) and jewelry may be caught in moving machinery (remove jewelry when it could be caught)
- Never remove machine safeguards or operate machinery with safeguards removed

#### Preventing strain:

- Doing a few simple exercises before work and between tasks will build hand strength and provide a rest from repetitive motions
  1. Stretch fingers by spreading them wide apart for a few seconds (repeat 3 times with each hand)
  2. Stretch your thumb by holding it down gently for five seconds (repeat 3 times with each hand)
  3. Stretch your wrist by making circles with your hands (repeat 10 times for each hand)

#### Which glove is best?

- **Cotton** - Light duty material handling and cleanup work (these do not provide puncture protection)
- **Leather** - Equipment handling, general construction, heavy cleanup, welding, moderately hot or cold material handling
- **Shock absorbing** - Operating rotary hammers and other vibrating equipment
- **Kevlar or wire mesh** - Work with sheet metal, glass, or heavy cutting (these do not provide puncture protection)
- **Rubber, nitrile, and other synthetics** - Chemical gloves must be chosen for the specific chemical being used (found in the MSDS or site safety plan)
- **Insulated** - extreme high and low temperatures

### Keep health and safety first in all things

- Plan ahead on projects to obtain proper hand protection before work starts
- Stop work authority
- Ask for help from H&S!



Safety – a winning hand.

To order hand protection or any other PPE:  
<https://www.reisenv.com/reisweb/webcode/welcome.asp>  
 username: ARCADIS  
 password: track



**Wise Safety  
& Environmental**  
 Products and Services for a Safe Workplace



# TICK BITE PREVENTION

## Health & Safety Fact Sheet

### Administrative/Engineering Controls

- Consider mowing work area and paths prior to job if heavily tick infested.
- Consider time of year when planning work. Schedule work to avoid high tick activity season – avoid warmer months.
- Is pesticide application a possibility for highly infested areas?
- Avoid walking/working in wooded, overgrown/brushy/tall grass areas.
- Walk in the middle of clearings and trails to avoid brush and tall grass.
- Plan and schedule “buddy checks” throughout day for ticks that may be present on clothing or along the hairline.
- Complete personal body checks in morning and evening.

### Personal Prevention Measures

- Wear light-colored clothing to detect ticks more easily.
- Wear long pants and long-sleeved shirts.
- Button up shirt near collar and end of sleeves.
- Wear light-colored hat.
- Wear boots with a high cuff (> 6-in.) for tucking in pants. Gaiters may be worn but still need to tuck pants into socks.
- Consider wearing mesh head and/or body netting in infested areas.
- Tuck shirt into pants. Tuck pant legs into socks or inside boot cuffs.
- Tape pants near boots and sleeves near wrists to seal openings.
- Wear coveralls in highly tick-infested areas. Use of coveralls may require additional hazard assessment for high heat conditions. Evaluate the use of disposable breathable white coveralls.
- Using double-sided tape or duct tape (sticky-side out) around forearms and calves to capture ticks on outside of clothing. Note: tape may be a trip hazard or collect debris.
- Use 0.5% permethrin insecticide on clothes. **DO NOT APPLY TO SKIN! DO NOT APPLY DAY OF USE! FOLLOW PRODUCT USE AND SAFETY INSTRUCTIONS.**
- Use insect repellent containing 20 - 40% DEET on exposed skin, clothes, hats, & boots. When applying to face, avoid mouth and eyes, and do not apply to any exposed skin that is irritated or abraded. **FOLLOW PRODUCT SAFETY INSTRUCTIONS.**
- Consider, for purchase, clothing pre-impregnated with permethrin.



**CALL WORK CARE IF BITTEN BY TICK**

**WORKCARE**<sup>®</sup>  
Making Health Count

**800 455 6155 (US) 888 449 7787 (Canada)**



NOAA Knows...

# Lightning

**L**ightning is one of the most underrated severe weather hazards, yet ranks as one of the top weather killers in the United States. Lightning strikes in America kill about 50 people and injure hundreds of others each year.

Unlike other weather hazards that often involve sophisticated watches and warnings from NOAA's National Weather Service, lightning can occur anywhere there is a thunderstorm. That's why the National Weather Service conducts an on-going campaign to educate people about lightning risks.

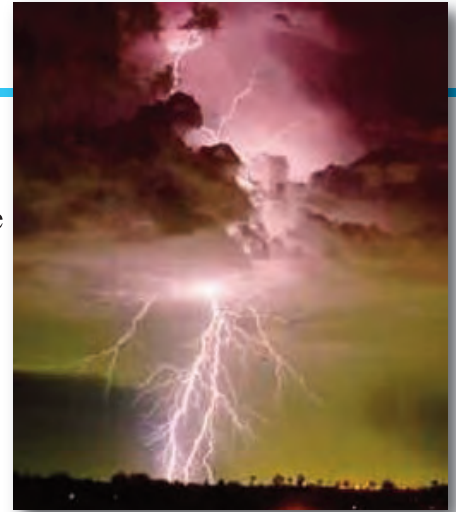
## The Shocking Truth

Lightning is a rapid discharge of electrical energy in the atmosphere. The resulting clap of thunder is the result of a shock wave created by the rapid heating and cooling of the air in the lightning channel.

During a thunderstorm, winds within the thunderstorm cloud cause collision between the various precipitation particles within the storm cloud. These collisions cause very small ice crystals to lose electrons while larger particles of soft hail gain electrons.

Upward winds within the cloud redistribute these particles and the charges

they carry. The soft hail causes a negative charge build up near the middle and lower part of the storm cloud which, in turn, causes a positive charge to build up on the ground beneath the storm cloud.



Eventually, when the charge difference between the negative charge in the cloud and the positive charge on the ground become large, the negative charge starts moving toward the ground. As it moves, it creates a conductive path toward the ground.

This path follows a zigzag shape as the negative charge jumps through segments in the air. When the

negative charge from the cloud makes a connection with the positive charge on the ground, current surges through the jagged path, creating a visible flash of lightning.


Thunder, high winds, darkening skies, rainfall and brilliant flashes of light are warning signs for lightning strikes.

## Lightning Quick Facts

- ▶ Lightning often strikes the **same place repeatedly** if it is a tall, isolated object.
- ▶ Most lightning victims are **in open areas or near a tree**.
- ▶ Lightning strikes the U.S. about 25 million times each year.
- ▶ Lightning can heat its path through the air to **five times hotter** than the surface of the sun.

*(continued on back)*





While most lightning casualties occur at the beginning of an approaching storm, a significant number of lightning deaths occur after the thunderstorm has passed. If thunder is heard, then the storm is close enough for a lightning strike. It is very important to seek safe shelter immediately.

### When Thunder Roars, Go Indoors

When you hear thunder or see lightning, you should immediately seek safe shelter — a building with electricity and/or plumbing or a metal-topped vehicle with the windows closed. Picnic shelters, dugouts, small buildings without plumbing or electricity are **not** safe. Once inside, follow these important safety tips:

- **Stay off corded phones.** You can use cellular or cordless phones.
- **Don't touch electrical equipment or cords.**
- **Avoid plumbing.** Do not wash your hands, take a shower or wash dishes.
- **Stay away from windows and doors, and stay off porches.**
- **Do not lie on concrete floors or lean against concrete walls.**



Nowhere outside is safe when thunderstorms are in the area. Run to a safe building or vehicle when you first hear thunder, see lightning or observe dark threatening clouds developing overhead. Stay inside until 30 minutes after you hear the last clap of thunder.

Organizers of outdoor events should monitor the weather and evacuate participants as soon as they hear thunder. It's a good idea to post lightning safety rules in programs, flyers or signs so participants know what to do. Most importantly, keep an eye on the sky, listen for thunder, and keep up to date with the latest NWS forecasts.

For more lightning information and safety tips, visit <http://www.lightningsafety.noaa.gov>.

To learn more about NOAA, visit <http://www.noaa.gov>. 



**When Thunder Roars, Go Indoors!**

**STOP all activities.**

Seek shelter in a substantial building or hard-topped vehicle.

Wait 30 minutes after the storm to resume activities.

 [www.lightningsafety.noaa.gov](http://www.lightningsafety.noaa.gov) 



JSA's

## Job Safety Analysis

### General

JSA ID	HASP 1	Status	Complete
Job Name	General Industry-Driving - passenger vehicles	Created Date	1/12/2015
Task Description	Driving a car, van, or truck on public roadways.	Completed Date	01/12/2015

### Client / Project

Client	Tennessee Department of Transportation
Project Number	TNDT1810.HZxx
Project Name	ACM Bridge Survey
Project Manager	Rich Lounsbury

### User Roles

Role	Employee	Due Date	Completed Date
Developer	Josh Ferry	1/12/2015	1/12/2015
HASP Reviewer	Lueke, Clair	1/12/2015	1/12/2015
Quality Reviewer			

### Job Steps

Job Step No.	Job Step Description	Potential Hazard	Critical Action	H&S Reference	
1	Pre-Trip Inspection	1	Failing to perform pre-trip inspections may cause mechanical failure, accident or injury	Perform walk around of vehicle with particular attention to tire inflation and condition. Check lights, wipers, seatbelts for proper operating condition. Properly adjust seat and mirrors prior to vehicle operation. Use or review vehicle inspection checklist as required under the MVSP.	ARC HSGE024 Motor Vehicle Safety Standard (MVSP)
		2	Scrapes, cuts, burns to hand if inspecting engine fluids and/or tires. Eye splash hazard if inspecting engine fluids. Pinch or crush hazards when opening or closing hood, trunk or tailgate.	Wear protective gloves and safety glasses as described below when checking under hood or tires. Use TRACK and keep hands clear when opening/closing hood, trunk, or tailgate to avoid crush or pinch hazard.	
		3	Struck by other vehicles while walking around vehicle performing inspections	Wear high visibility vest, shirt, or coat while performing inspections in parking lots or other areas with a traffic hazard. Remain vigilant of moving vehicles or equipment in area, face oncoming vehicles to extent practical.	
		4	Improperly secured cargo may dislodge creating injury, property damage or road hazard.	Ensure all cargo is properly secured to prevent movement while the vehicle is in operation. This includes cargo in the cab of the vehicle.	

2	Driving a motor vehicle on public streets	1	Failing to observe traffic flow ahead increases risk of hard braking resulting in potential impact of vehicle ahead, being struck by another vehicle from behind and decreases decision making time.	Use Smith System Key #1, "Aim High in Steering". <b>Look ahead (15 seconds if possible) to observe traffic flow and traffic signals.</b> Adjust speed accordingly to keep vehicle moving and avoid frequent braking. Select lane of least traffic and adjust speed based on observed signal timing when possible. Avoid following directly behind large vehicles that obscure view ahead.	Smith System "5-Keys" is a registered trademark of Smith System Driver Improvement Institute, Inc.
		2	Failing to observe vehicles, pedestrians, bicyclists and other relevant objects in vicinity of your vehicle increases risk of side swipes, rear ending, and third party injury.	Use Smith System Key #2, "Get the Big Picture". <b>Maintain 360 degrees of awareness around vehicle.</b> Check a mirror every 6-8 seconds, maintain space around the vehicle, choose a lane that avoids being boxed in. Look for pedestrian activity ahead in crosswalks or sidewalks. Watch for construction zone approach signs and act early by executing lane changes and reducing speed.	
		3	Failing to keep your eyes moving increases risk of not seeing relevant vehicles, pedestrians and objects in your vicinity that may impair your ability to make timely and appropriate driving decisions and also increases risk of accident.	Use Smith System Key #3, "Keep Your Eyes Moving". <b>Move your eyes every 2 seconds and avoid staring while evaluating relevant objects.</b> Scan major and minor intersections prior to entering them. Check mirrors.	
		4	Failing to maintain space around and in front of your vehicle increases risk of striking another vehicle or being struck by another vehicle. Insufficient space shortens time for effective driving decision making resulting in increased accident risk.	Use Smith System #4, "Leave Yourself an Out". <b>Use 4 second rule when following a vehicle.</b> Avoid driving in vehicle clusters by adjusting speed and using lanes that permit maximum space and visibility. When stopped, keep one car length space in front of vehicle ahead or white line.	
		5	Failing to communicate with other drivers and pedestrians increases risk of striking vehicles, pedestrians, or being struck by other vehicles, especially from the rear.	Use Smith System Key #5, "Make Sure They See You". <b>Brake early and gradually when stopping to reduce potential of being rear ended.</b> Keep foot on brake while stopped. Use turn signals and horn effectively. Establish eye contact with other drivers and pedestrians to extent practical. Use vehicle positioning that promotes being seen.	
		6	Distractions within the vehicle takes focus off driving, increases risk of accident decreases time for making effective driving decisions.	<b>Cell phone use (any type or configuration) is prohibited while the vehicle is in motion.</b> Familiarize yourself with vehicle layout and controls (radio, temperature controls, etc.) prior to operating unfamiliar vehicles. Set controls prior to operating vehicle. Use GPS in unfamiliar areas to avoid use of paper maps/directions while driving. Set GPS prior to vehicle operation. Pull over and stop to modify GPS functions. Avoid consuming food or drink while driving.	

3	Parking	1	Parking vehicle in areas of clustered parked vehicles or near facility entrance may impair visibility to oncoming traffic in lot and increase exposure to pedestrian traffic.	<b>Use pull through parking or back into parking space when permitted or practical.</b> When practical and safe to do so, park away from other vehicles and avoid parking near the facility entrance or loading docks. If available, use a spotter to aid in backing activity. Back no further than necessary and back slowly. Get out and look (GOAL) if uncertain of immediate surroundings. Tap horn prior to backing.	
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**PPE Personal Protective Equipment**

Type	Personal Protective Equipment	Description	Required
Eye Protection	safety glasses	While checking engine or tires	Required
Hand Protection	work gloves (specify type)	Leather or equivalent checking engine or	Required

**Supplies**

Type	Supply	Description	Required
Communication Devices	mobile phone		Required
	other	Vehicle kit (applies to company trucks)	Required
Miscellaneous	fire extinguisher	Applies to company trucks	Required
	first aid kit	Applies to company trucks	Required

## Job Safety Analysis

General			
JSA ID	NONE	Status	(3) Completed
Job Name	TN Bridge Surveys	Created Date	3/16/2012
Task Description	Bridge Asbestos Surveys	Completed Date	03/19/2012
Template	FALSE	Auto Closed	FALSE

Client / Project	
Client	TDOT Hazmat Contract
Project Number	TNDT1810.HZxx
Project Name	Bridge Asbestos-Containing Material Surveys
PIC	Whitaker, Brian
Project Manager	Lounsbury, Richard

User Roles					
Role	Employee	Due Date	Completed Date	Supervisor	Active
Developer	Hodges, Greg	3/16/2012	3/16/2012	Padron, Eduardo	<input checked="" type="checkbox"/>
HASP Reviewer	Padron, Eduardo	3/19/2012	3/19/2012		<input checked="" type="checkbox"/>
Quality Reviewer	Allman, John	3/19/2012	3/19/2012	Walter, Lee	<input type="checkbox"/>

Job Steps				
Job Step No.	Job Step Description	Potential Hazard	Critical Action	H&S Reference
1	Preparation & Planning	1 Not completing the Task Hazard Analysis Checklist could result in field staff being unprepared for site work.	Coordinate completion of Task Hazard Analysis Checklist with PM/TM. Determine need for ladders, lifts, fall protection, confined space entry, unsafe areas, etc. Identify age of bridges and potential to encounter friable ACM. Review information supplied by client. Ensure that any personnel that will be required to wear respiratory protection is medically cleared and annual fit testing requirements are satisfied. Coordinate traffic flow/control activities will be properly established at the time of survey.	ARC HSIH002, ARC HSFS003, ARC HSFS007, ARC HSFS015
2	Mobilization	1 Driving early/late to jobsite that is a good distance from office	Driving times should be planned ahead. Driving should not be done when driver is tired. Do not use cell phones while driving. Practice Smith Defensive Driving System.	
3	Tailgate Safety Meeting	1 Poor Communication	Communicate site-specific health & safety information to entire sampling team and traffic control providers. Confirm all team members have site-specific training, as required. Review site-specific hazards and procedures, including coordination with other work on-going at site. These may include lock-out/tag-out of utilities, confined space entry, using ladders, working on lifts, additional lighting to work in dark areas, etc.	Field HS Handbook III.A; ARCADIS Tailgate Meeting Standard (ARC HSGE001)
4	Evaluate site upon arrival for personal safety and security	1 Bridge could have structural issues creating fall hazards or debris could cause slip/trip/fall hazards	Assess bridge and make sure that hazards were similar as what was scoped in the project or reported by the client. Additional hazards that could impact safety of personnel should be called into the project manager. A qualified and licensed engineer should perform an assessment on any bridge/building that appears structurally unsafe.	
		2 Personal Security	Assess potential personal security issues prior to starting work. Verify cell phone reception. In high risk areas, have a security escort or a buddy as needed. Notify PM/TM or supervisor at time of entry and anticipated time of exit. Inform that person of anticipated walking route. Assess presence of other individuals unrelated to the work, such as general public, temporary bridge dwellers, onlookers, etc and determine control measures. Seek advice from client and traffic control staff as needed; do not confront these individuals.	

Job Steps				
Job Step No.	Job Step Description	Potential Hazard	Critical Action	H&S Reference
5	Visual inspection of areas to be sampled	1 Trip, slip or fall in dark areas or over clutter.	Inspect walking surface before proceeding. Use temporary lighting or flashlight if area lighting is not adequate. Use a headlamp to keep hands free. Cover or demarcate openings in walking surfaces. Have replacement flashlight batteries handy; use work lights if possible for work in dark areas under the bridge structure.	Refer to Field Handbook, ARC HSIH008, HSIS015, Elevated Heights JSA.
		2 Heat Stress from working in an unventilated facility or in direct sunlight; or Cold Stress from working in an unheated facility or outdoors	Dress for weather accordingly. Keep hydrated in hot environments.	

6	Collect potential asbestos-containing building material samples	3	Noise exposure >85dBA from site conditions.	Use engineering and administrative controls to minimize noise exposure; Use hearing protection to reduce exposure below 85 dBA action level.
		4	Fall from elevated heights during inspection.	Select appropriate ladder/lift for work activity, do not overextend or lean out; use a spotter to stabilize extension ladders. Use 3-points of contact when climbing ladders; keep belt buckle within the limits of the side rails; use a tool belt to bring equipment up the ladder. use two people to carry ladders, keep a clear line of sight. Wear proper fall arresting equipment as dictated by the activity being performed.
		5	Limited access and egress to/from active work area.	Confirm that everyone entering the area where samples are being collected is aware of the escape route and periodically discuss where the escape route is in relation to the current work area as you move throughout the bridge.
		6	Stray animals, mice, rats	Be mindful of wildlife residing in the structure. Make noise to scare away wildlife and carry repellent spray in the event of encountering stray animals. If a dangerous or aggravated animal is spotted, leave the area immediately.
		1	Ergonomic - using excessive force or repetitive motion to obtain samples could result in injury to musculoskeletal system.	Work slowly, use appropriate sample tool, don't overextend, stretch exercises for hands/fingers.
		2	Insufficient Lighting	Ensure suitable permanent or temporary lighting in work area and access/egress locations.
		3	Trip, slip and fall	All cords, equipment, supplies and debris should be cleared and/or organized within the work area.
		4	Electric shock from cords while working in wet or difficult to access area.	Require the use of GFCI interrupters for any/all electrical equipment. Lock Out/Tag Out power to utilities that may be contacted during sampling work.
		5	Heat/Cold Stress or Inclement Weather	Dress for the weather accordingly. Take breaks as necessary. Keep hydrated in hot environments.
		6	Biological Hazards: Insects, Snakes, Wildlife, Vegetation	Inspect work areas upon arrival at site to identify hazards. Where possible, landscape site to reduce high grass and stagnant water that create habitats attractive to wildlife and remove hazardous flora. Where needed, wear long pants and snake chaps in areas with grass higher than 4 inches. If moving through vegetated areas, use a long handled tool to disturb vegetation prior to stepping through. Use insect repellent when in areas with grass higher than 4 inches or standing water where insects are observed. Prior to beginning work in vegetated areas, survey employees to determine whether they have known sensitivities to hazardous flora and fauna. Reassign sensitive employees to tasks in non-vegetated areas or provide Tyvek to reduce potential for dermal contact.

### Job Steps

Job Step No.	Job Step Description	Potential Hazard	Critical Action	H&S Reference
7		Lifting hazards (heavy or bulky equipment, ladders).	Use TRACK to plan lifts and routes to work location. Use proper lifting techniques.	
8		Awkward body positions and twisting.	Plan activity to avoid twisting of body or awkward body positions. Use buddy system or job rotation to reduce exposure to conditions that can not be avoided.	
9		Noise exposure >85 dBA from sample collection with power tools.	Use engineering and administrative controls to minimize noise exposure; Use hearing protection to reduce exposure below 85 dBA action level.	
10		Fall from ladder when attempting to obtain samples.	Maintain three points of contact with ladder at all times.	
11		Exposure to asbestos could cause lung cancer, mesothelioma, or asbestosis	Use wet methods when sampling suspect ACM. Wear air purifying respirator with P100 (HEPA) filters. Conduct personal air monitoring (PEL and STEL) on a routine basis to verify and validate respiratory protection requirements. Wash hands thoroughly after collection activities. Clean any generated debris using appropriate wet-wiping techniques.	
12		Coring through roadway for sampling.	If sampling >1.0", verify through TDOT/811 & AUS policy that utilities are not present. Prevent debris from falling.	
13		Cuts or splinters from sample collection.	Wear cut resistant gloves and cut away from yourself when sampling.	
14		Site investigation might require entry into confined spaces which could present physical/health hazard.	Personnel must have confined space awareness training. Personnel must NOT enter a permit-required confined space unless specialized permit-required confined space training is received, rescue operations have been practiced/arranged, and employee is familiar with the permit required confined space program and hazard identification/testing requirements.	

7	Decontaminate sampling equipment	1	Exposure to potential asbestos fibers while decontaminating equipment	Wear all protective PPE as outlined in the HASP; including, gloves, eye protection, and respirator (if friable material).
		2	Cuts from handling sampling equipment	Use gloves to minimize potential contact with sharp edges.
8	Demobilization	1	Driving early/late to jobsite that is a long distance from office	Driving times should be planned ahead. Driving should not be done when driver is tired. Do not use cell phones while driving. Practice Smith Defensive Driving System.

### Personal Protective Equipment (PPE)

Type	Personal Protective Equipment	Description	Required
<b>Dermal Protection</b>	coveralls	Tyvek as necessary	Required
	long sleeve shirt/pants		Required
<b>Eye Protection</b>	safety glasses		Required
<b>Foot Protection</b>	boots	non-slip, steel toe	Required
<b>Hand Protection</b>	chemical resistant gloves (specify type)	nitrile or latex	Required
	work gloves (specify type)	cut-resistant	Required
<b>Head Protection</b>	hard hat		Required
<b>Miscellaneous PPE</b>	traffic vest--Class II or III	as necessary	Required
<b>Respiratory Protection</b>	full face respirator	P100 cartridges	Required
	half face respirator	P100 cartridges	Required

### Supplies

Type	Supply	Description	Required
<b>Communication</b>	mobile phone		Required
<b>Decontamination</b>	Decon supplies (specify type)	Water	Recommeneded
<b>Miscellaneous</b>	fall protection (specify type)	as necessary	Required
	fire extinguisher		Required
	first aid kit		Required
	flashlight	with spare batteries	Required
<b>Personal</b>	eye wash (specify type)	personal bottles or equivalent	Required
	insect repellent	as necessary	Required
	sunscreen	as necessary	Required
	water/fluid replacement	as necessary	Required
<b>Traffic Control</b>	barricades	as necessary	Required
<b>By TDOT</b>	signage	as necessary	Required
	traffic cones	as necessary	Required

### Review Comments

Reviewer	Comments
Employee: Role Review Type Completed Date	
Employee: Role Review Type Completed Date	

# Job Safety Analysis

## General

Client Name	TDOT Hazmat Contract
JSA ID	3342 - Ladder Safety
Job Name	Environmental-Other
Task Description	Asbestos Survey
Project Number	Misc. TDOT Bridge Projects
Project Name	ACM Bridge Surveys
PIC Name	WHITAKER, BRIAN
Project Manager	LOUNSBURY, RICHARD
Status	(3) Completed
Creation Date	8/27/2010 01:55:08 PM
Auto Closed	True

## User Roles

Role	Employee	Due Date	Completed	Approve	Supervisor	Active
Created By	Powell, Jace'que	9/17/2010	8/27/2010		Mosher, Tyler	True
Developer (Primary Contact)	Powell, Jace'que	9/17/2010	8/27/2010		Mosher, Tyler	True
HASP Reviewer	Webster, Charles	9/10/2010			Insco, Ashly	True
Quality Reviewer	Rankin, William	9/29/2010	9/29/2010		Ulm, David	True
Reviewer	Wisbeck, Diane	9/10/2010	9/1/2010	True	Smith, Lee	True

## Reviewer Comments

Role	Employee	Approval Status	Completed Date	Comments
HASP Reviewer	Webster, Charles			
Reviewer	Wisbeck, Diane	Approve	09/01/2010	
Quality Reviewer	Rankin, William	Quality	09/29/2010	Good. Also, many ladders have an angle sticker affixed to the side of the ladder to help ensure the ladder is used at the appropriate angle. Suggest using when present.

## Job Steps

Job Step	Job Step Description	Potential Hazard	Critical Action	HSP Reference
1	Non-fixed Ladder Selection	1 Improper ladder selection could result in ladder failure	Select ladder with load rating appropriate for work being performed.	Field H&S Handbook section III JJ
		2 Improper ladder selection could result in electrocution	Select non-conductive ladders if working near electrical wiring or other electrical hazard	Field H&S Handbook section III JJ
		3 Use of ladders that are in unsound operational condition may result in injury or death	Inspect all ladders prior to use, do not use a ladder marked "out of service", check ladders for proper operation, good ropes, if equipped, good feet, and free of oil grease or other slick substance on rungs. Check wood ladders for signs of cracking or splitting. Inspect all ladders prior to use.	Field H&S Handbook section III JJ
2	Non-fixed Ladder transport to work area	1 Lifting and carrying ladders	Use TRACK. Use buddy system when moving heavy ladders or long extension ladders. Don't carry ladders that obstruct view of path forward or use awkward body twist picking up ladders. Use proper lifting techniques.	

		2 striking other workers or objects with ladder during carrying	Plan route with ladder, remember to check the rear when turning corners with ladder, use buddy system to carry longer ladders to maintain better control. Look up when moving shorter step ladders vertically.	
		3 Property damage, vehicle damage or injury from improperly secured ladders on vehicles during transport	Make sure ladders are adequately secured such that doors can be operated and driver views are not impaired. Secure in manner that prevents forward or rear movement of ladder if mounted on top of vehicle. Inspect securing devices prior to moving/driving the vehicle. if ladder extends >4 ft from rear of vehicle, attach 18 square inch fluorescent red or orange flag to end.	
3	Working on Non-fixed ladders	1 Muscle strain setting up or taking down ladders	Use buddy system to place/remove heavy or long ladders. Avoid awkward twisting or bending during this activity.	
		2 Falls from ladders	Always maintain 3 points of contact, over 6 ft from ground fall safety devices to be utilized by workers, only one worker on ladder at a time, ensure ladder extends at least 3 ft above level being accessed. Ensure extension ladder is at a 1ft horizontal to every 4 ft vertical rise to maintain proper angle. Follow all warning label requirements.	
		3 Tipping of ladders that are improperly secured	Ensure ladders are on level firm ground, tie off ladders at top,	
		4 Collapse of ladders that are over extended or over loaded.	Ensure ladder weight ratings are maintained, maintain at least 3 ft of overlap on extension ladders or other overlap length per ladder instructions.	
		5 Struck by objects or debris dropped from ladders	Keep ground workers away from work activities on ladders. Do not walk under occupied ladders.	
4	Fixed ladder work	1 Falls from height causing injury or death	Always maintain 3 points of contact. Utilize ladder fall safety devices if ladder is equipped. Do not hurry when climbing fixed ladders, rest at any landings provided by the ladder.	
		2 Slips on wet or icy rungs creating impact injuries	Inspect for presence of hazard, clear if possible, do not attempt to climb ladders with ice on rungs, use anti-slip footwear and gloves. Maintain 3 points of contact and climb in a slow methodical manner. Use Stop Work authority for any condition making climbing unsafe	

		3 Temperature stress contact stress to hands while climbing	Wear gloves with good dexterity and anti-slip coatings, wear footwear good tread and anti-slip soles. Rest at any landing provided by the ladder. Shift weight to other hand, leg periodically if at one position on the ladder for an extended period of time.	
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**Personal Protective Equipment**

Type	Personal Protective Equipment	Description	Required
Eye Protection	safety glasses		Required
Foot Protection	boots		Required
Hand Protection	work gloves (specify type)	leather	Required

**Supplies**

Type	Supply	Description	Required
Communication Devices	mobile phone		Required
Miscellaneous	fall protection (specify type)	if needed for task and ladder type	As Needed
Miscellaneous	first aid kit		Required
Miscellaneous	Other	securing devices for mounting on vehicle	Required
Miscellaneous	Other	flags for transport	Required

## Job Safety Analysis

### General

JSA ID	11315	Status	(3) Completed
Job Name	Environmental-Other	Created Date	7/8/2014
Task Description	Collect ACM samples from bridge components	Completed Date	07/09/2014
Template	FALSE	Auto Closed	FALSE

### Client / Project

Client	TDOT
Project Number	TNDT1810.HZxx
Project Name	ACM Bridge Surveys
PIC	Whittaker, Brian
Project Manager	Lounsbury, Richard

### User Roles

Role	Employee	Due Date	Completed Date	Supervisor	Active
Developer	MacKenzie, Marcia	7/30/2014	7/9/2014	Selger, David	<input checked="" type="checkbox"/>
Developer	Moore, Wendy	7/30/2014	7/9/2014	Benoit, Michael	<input checked="" type="checkbox"/>
Developer	Shivell, Michael	7/30/2014	7/9/2014	Scoville, Michael	<input checked="" type="checkbox"/>
HASP Reviewer	Whipple, Curtis	7/23/2014	7/9/2014	Nelson, Bruce	<input checked="" type="checkbox"/>

### Job Steps

Job Step No.	Job Step Description	Potential Hazard	Critical Action	H&S Reference
1	Approach sampling point.	1 Moving water. Possibility of tripping or slipping on rocks.	Wear flotation device, use buddy system, step carefully. Wear 3 mm neoprene waders for moderate temperatures, 5 mm neoprene waders for colder temps. Stop work if water is above the knee and have certified divers or a boat to carry out the tasks. The buddy must be certified in first aid and CPR. If working in remote area, contact an offsite party to let them know you will be working on/in water and when you expect to be off. Place a follow up call after completing water work. Keep a hand free when walking, consider using a bucket to carry multiple items. Use a walking stick to probe the bottom and add stability.	Emp Field H&S Handbook Sections III and V, Subsections H & G, respectively.
		2 Access bridge component.	Access near water can be challenging. Ensure stable footing and ask sampling partner to lower equipment from above, if appropriate.	
		3 Moving water.	Understand river conditions, water speed, flow rate, and depth of water. Do not proceed if footing is unstable. Research if water body is dam-controlled and if so, learn release schedule ahead of sampling event. Determine if water levels have the potential to rise due to dam release and reschedule event if the water body is affected.	
2	Sampling.	1 Moving/loose rocks, moving water, water depth. Slipping or tripping over rocks.	Wear flotation device, do not proceed if water is above the knee. Move carefully. Wear waders. Do not enter water unless you have a buddy certified in first aid and CPR on shore. If area is remote, contact on offsite party to let them know you will be working on/in water and when you expect the the task to be completed. Place a follow up call after completing water work.	PushPoint Method SOP, Emp Field H&S Handbook Section 1 Subsections D & E.
		2 Potential electrical shock or damage to pump and/or battery in or near water.	Use enough tubing to purge and collect data readings from a safe, dry distance. Keep hands dry when working with pump battery or cables.	
3	Decontaminate sampling equipment.	1 Exposure to decon rinse (hexane solution).	Provide and have staff review Safety Data Sheet (SDS). Provide single use nitrile gloves. Dispose of purge & rinse water in properly labeled drum for proper transport and disposal.	Emp Field H&S Handbook Section 3 Subsection F.

<b>PPE Personal Protective Equipment</b>			
Type	Personal Protective Equipment	Description	Required
<b>Dermal Protection</b>	coveralls	Neoprene waders-3 mm moderate, 5 mm	Required
<b>Eye Protection</b>	safety glasses		Required
<b>Foot Protection</b>	boots		Required
	outer boot covers	Waders	Required
	rubber boots		Required
<b>Hand Protection</b>	chemical resistant gloves (specify type)	Nitrile Gloves	Required
	work gloves (specify type)	Heavy duty work gloves	Required

<b>Supplies</b>			
Type	Supply	Description	Required
<b>Communication Devices</b>	mobile phone		Required
<b>Decontamination</b>	Decon supplies (specify type)	Alconx/liquinox & hexane solution & DI	Required
<b>Miscellaneous</b>	first aid kit		Required
<b>Personal</b>	insect repellent		Required
	sunscreen		Required
	water/fluid replacement	Drinking water or gatorade.	Required

<b>Review Comments</b>	
Reviewer	Comments
<b>Employee:</b> Whipple, Curtis <b>Role:</b> HASP Reviewer <b>Review Type:</b> Approve <b>Completed Date:</b> 7/9/2014	

Job Safety Analysis			
General			
JSA ID	2995	Status	(3) Completed
Job Name	Environmental-Other	Created Date	7/6/2010
Task Description	Hammer drilling	Completed Date	07/06/2010
Template	FALSE	Auto Closed	FALSE

Client / Project	
Client	ARCADIS-AGMI
Project Number	000000100000
Project Name	GENERAL OVERHEAD
PIC	
Project Manager	

User Roles					
Role	Employee	Due Date	Completed Date	Supervisor	Active
Developer	Bell, Caitlin	7/6/2010	7/6/2010	Phillips, Hollis	<input checked="" type="checkbox"/>
HASP Reviewer	Tremblay, Tony	7/20/2010	7/7/2010	Kundert, Brian	<input checked="" type="checkbox"/>

Job Steps				
Job Step No.	Job Step Description	Potential Hazard	Critical Action	H&S Reference
1	Prepare before mobilizing by completing utility clearance, completing site-specific health and safety requirements (training, notifications, approval of specific sample locations, scheduling), confirm lighting and power requirements.	1 Electrical shock, damage to utility lines, inadequate or unsafe power source.	Confirm no utilities in work area (in concrete or overhead) that could be impacted by coring or travel through work area. Confirm adequate power source.	Utility Location Policy & Procedure ARCHSF019
2	Conduct Tailgate Safety Meeting. Identify best travel routes within plant/on site, locate power source(s), establish order of sample locations, set up protection from traffic/equipment/other workers on site (cones, caution tape, etc).	1 High traffic in sampling area could cause collision with sampling crew or impact with tools, equipment.	Establish clear communication on site with sampling crew and others working on site. Mark work area clearly so it is visible to others working on site. Locate samples in lowest risk locations possible to achieve sampling objectives.	
3	Operate impact hammer drill to demolish concrete.	1 Exposure to dust, contaminants of concern. 2 Hand Injury from repetitive motion on vibrating equipment. 3 Noise	Operate dust monitor to measure dust levels, upgrade PPE as indicated (respirator). Wear all required PPE as specified in HASP.(half-face APR with P100 cartridges, tyvek suit, rubber booties) Wear heavy work gloves. Trade positions with sampling buddy to minimize impact (drill operation & sample collection). Wear earplugs	
4	Remove concrete	1 Exposure to concrete dust or constituents of concern. 2 Strains from moving heavy items repeatedly	Utilize dust monitor and PPE as dictated by HASP. Note action levels, and respond accordingly should dust levels in air reach action level. Be sure to remove in mangable sized bits	
5	Decontaminate tools/drill bits	1 Chemical exposure 2 Strains from moving heavy items repeatedly	Work upwind. Use specified decon products for constituents of concern. Collect and containerize decon fluids and wastes. Change gloves as frequently as necessary. Utilize the smallest containers of fluids and water as practical. Use vehicle or cart to move equipment, tools and decon fluids.	
6	Clean up work area. Gather tools/equipment.	1 Slips, trips, falls, strains from moving heavy equipment	Rest if fatigued. Utilize cart and/or vehicle to the extent possible to move heavy items. Remove and put away all cords, tools, bits.	

<b>PPE Personal Protective Equipment</b>			
Type	Personal Protective Equipment	Description	Required
<b>Dermal Protection</b>	chemical protective suit (specify type)	Tyvek	Required
	long sleeve shirt/pants		Required
<b>Eye Protection</b>	safety glasses		Required
<b>Foot Protection</b>	rubber boots	covers	Required
	steel-toe boots		Required
<b>Hand Protection</b>	chemical resistant gloves (specify type)	nitrile	Required
	work gloves (specify type)	leather	Recommended
<b>Head Protection</b>	hard hat		Required
<b>Hearing Protection</b>	ear muffs		Recommended
	ear plugs		Required
<b>Respiratory Protection</b>	half face respirator	half-face with P100 cartridges	Required

<b>Supplies</b>			
Type	Supply	Description	Required
<b>Communication Devices</b>	mobile phone		Required
<b>Decontamination</b>	Decon supplies (specify type)	alconox	Required
<b>Miscellaneous</b>	first aid kit		Required
<b>Personal</b>	eye wash (specify type)		Required
	water/fluid replacement		Required

<b>Review Comments</b>		
Reviewer	Comments	
<b>Employee:</b>	Tremblay, Tony	
<b>Role</b>	HASP Reviewer	
<b>Review Type</b>	Approve	
<b>Completed Date</b>	7/7/2010	

## Job Safety Analysis

### General

JSA ID	249	Status	(3) Completed
Job Name	General Industry-Elevated heights operations	Created Date	5/18/2009
Task Description	Working from elevated heights.	Completed Date	05/26/2009
Template	FALSE	Auto Closed	FALSE

### Client / Project

Client	STEELCASE INC.
Project Number	MI0005980017
Project Name	STEELCASE 2009 O&M SERVICE
PIC	JERIC, SEAN
Project Manager	FERREE, ROBERT

### User Roles

Role	Employee	Due Date	Completed Date	Supervisor	Active
Developer	Williams, Matthew R.	5/21/2009	5/21/2009	Herner, Holly A	<input checked="" type="checkbox"/>
HASP Reviewer	Zellmer, Gregory E	6/4/2009	5/23/2009	Herner, Holly A	<input checked="" type="checkbox"/>
Reviewer	Jeric, Sean	6/4/2009	5/26/2009	Herner, Holly A	<input type="checkbox"/>

### Job Steps

Job Step No.	Job Step Description	Potential Hazard	Critical Action	H&S Reference
1	Mobilization/demobilization of manlift to work area	1 Tip hazard on uneven or sloped surfaces	Plan route when moving manlift, do not operate on grades or surfaces for which manlift was not designed, familiarize yourself with operation manual and follow all warning information posted on the manlift. Never move with the platform or basket elevated. Ensure all stabilizers or outriggers are retracted during movement. Ensure proper tire inflation.	
		2 Striking other equipment, workers or utility lines during movement	Plan route and ensure other equipment, supplies and debris are removed from route, ensure manlift capable of navigating turns in route and can clear any overhead obstructions along route. Use spotters for all movement activity, regardless of type of manlift used. Wear required PPE for the task to be performed including hard hat. Check to ensure audible signal is functioning before moving.	
		3 Improper equipment selection	Use the correct piece of lifting equipment for the job. Inspect the work area for access and select lifting equipment capable of reaching the work area safely.	
2	Using manlift for elevated work activities	1 Falls from manlift platform or basket	Use of personal fall arrest system required in basket or platform, ensure all guard rails and gates are functional and in good condition. No leaning over edges of basket or platform. Always lower manlift to ground to access or egress, no climbing up the elevating structure.	
		2 Tipping from uneven weight distribution	Keep weight centered in the basket or platform, ensure stabilizers and outriggers are properly deployed and secured prior to elevating the manlift. Never elevate the manlift on a grade in excess of manufacturer specifications. Do not over extend lifting devices. Check tires for proper inflation. Review operators manual.	
		3 Trips and falls on platforms from equipment, tools or debris	Maintain good housekeeping, keep hand tools off of floor or platform, plan work and only carry equipment tools, supplies needed to perform task, for packaged items remove boxes and packaging prior to placing on manlift, when practical. Use multiple manlifts to safely lift or install bulk equipment (i.e. larger sections of pipe).	
		4 Manlift malfunction while working at elevated position	Never work alone on manlift, always have buddy on ground level.	
		5 Struck by objects falling from manlift.	Tether small tools to manlift or person, maintain any toeboards present, keep workers below clear of manlift work area.	

		6	Improper Personnel Use	Only trained workers shall operate manlifts or elevating platforms.	
3	Performing work on manlifts	1	Falls accessing or egressing the manlift	Use properly secured ladder or opening to manlift, maintain all guard rails, use personal fall arrest system as prescribed by Competent Person.	
		2	Trips and falls from equipment, tools, supplies, debris on manlift deck	Maintain good housekeeping, keep hand tools off of floor or platform, plan work and only carry equipment tools, supplies needed to perform task, for packaged items remove boxes and packaging prior to placing on platform, when practical.	
		3	Collapse from uneven weight distribution or exceeding manlift capacity	All manlift work activities to be overseen by a Competent Person. Keep weight on manlift platform centered and secured against shifting. Never exceed manlift weight ratings.	
		4	Struck by objects falling from manlift	Install and maintain toeboards if possible, keep planking gaps to minimum according to regulatory standards, keep workers from working directly below the manlift on the ground.	
4	Using personal fall arrest systems	1	Falls from improperly designed or used systems	All aspects of personal fall arrest systems are to be overseen and inspected by a Competent Person, all workers wearing personal fall arrest systems will be trained in the proper use and inspection of the system used. Never tie a safety lanyard to an adjacent structure.	
5	General inspection activities	1	Improper inspection results in injury, death or property damage from failure of the device or system used.	All inspections to be performed daily and more often as needed due to changes in site conditions or weather by a Competent Person	
		2	Slips trips and falls on wet, uneven, or sloped surfaces.	Wear proper foot protection with ankle support and good tread, don't walk while looking up, focus on task at hand which is walking.	

<b>PPE Personal Protective Equipment</b>			
Type	Personal Protective Equipment	Description	Required
<b>Dermal Protection</b>	long sleeve shirt/pants		Required
<b>Eye Protection</b>	safety glasses		Required
<b>Foot Protection</b>	steel-toe boots		Required
<b>Hand Protection</b>	chemical resistant gloves (specify type)	nitriles	Required
	work gloves (specify type)	leather	Required
<b>Head Protection</b>	hard hat		Required
<b>Miscellaneous PPE</b>	traffic vest--Class II or III		Required

<b>Supplies</b>			
Type	Supply	Description	Required
<b>Communication Devices</b>	mobile phone		Required
<b>Miscellaneous</b>	fall protection (specify type)		Required
	fire extinguisher		Required
	first aid kit		Required
<b>Traffic Control</b>	traffic cones		Required

<b>Review Comments</b>		
Reviewer		Comments
<b>Employee:</b> <b>Role</b> <b>Review Type</b> <b>Completed Date</b>	Zellmer, Gregory E HASP Reviewer Revise 5/20/2009	see comments on pdf
<b>Employee:</b> <b>Role</b> <b>Review Type</b> <b>Completed Date</b>	Zellmer, Gregory E HASP Reviewer Approve 5/23/2009	looks good
<b>Employee:</b> <b>Role</b> <b>Review Type</b> <b>Completed Date</b>	Jeric, Sean Reviewer Approve 5/26/2009	Looks good. I approve.

## Job Safety Analysis

### General

JSA ID	21	Status	(3) Completed
Job Name	General Industry-Roadway work	Created Date	1/29/2009
Task Description	Roadway work	Completed Date	01/29/2009
Template	TRUE	Auto Closed	FALSE

### Client / Project

Client	ARCADIS-AGMI
Project Number	000000100000
Project Name	GENERAL OVERHEAD
PIC	
Project Manager	

### User Roles

Role	Employee	Due Date	Completed Date	Supervisor	Active
Developer	Coppola, Mija A	5/21/2012	1/29/2009	Ebert, Joachim	<input type="checkbox"/>
HASP Reviewer	Coppola, Mija A	1/31/2009	1/29/2009	Ebert, Joachim	<input type="checkbox"/>
Quality Reviewer	Coppola, Mija A	1/30/2009	1/30/2009	Ebert, Joachim	<input type="checkbox"/>

### Job Steps

Job Step No.	Job Step Description	Potential Hazard	Critical Action	H&S Reference
1	Deployment and removal of traffic control devices	1 Lifting hazards and awkward body positions from moving warning signs and control devices	Avoid excessive force pushing or pulling devices from vehicle; use the buddy system for heavier items; lift with legs and not back; avoid lifting and twisting motions.	ARCADIS H&S Handbook section III LL
		2 Struck by vehicle during placement	Wear high visibility clothing and Class II (minimum) traffic vest. Choose lime green color to avoid motorist confusion with traffic barrels. Always face oncoming traffic, use spotter if performing work that keeps focus off traffic. Ensure vehicle equipped with light bars and/or other warning devices and ensure they are activated, including vehicle flashers.	
		3 Increased risk of injury (ergonomic from reacted moving or impact from increased vehicle exposure) from poor traffic control planning and implementation	Develop traffic control plan consistent with Manual of Uniform Traffic Control Devices, ensure lane closure tapers are computed properly, place devices in a manner that offers protection as other devices are deployed, place early warning devices first to warn drivers of pending work zone.	
2	Flagger activities	1 Struck by vehicle while performing activity	Always face oncoming traffic, wear high visibility clothing described in step 1 above. Flaggers to be properly trained in proper flagging technique, if using paddles, ensure correct paddle warning displayed.	
		2 Fatigue from standing in one position for extended periods of time.	Use job rotation when practical, shift weight from one leg to the other periodically, wear comfortable boots.	
		3 Dehydration, heat stress (summer months), cold stress (winter months), sunburn, windburn	Ensure drinking water is in immediate vicinity of the flagger, check with flagger periodically to evaluate signs of heat or cold stress, avoid caffeine or sugary drinks during hot or cold weather, schedule worker to eat at regular intervals, wear sun block.	
		4 Struck by debris off roadway from passing vehicles	Be aware of hazard and be vigilant for debris, wear eye protection at all times.	
3	Working in work zone	1 Struck by vehicle while performing work	Always stay behind protective barriers or channeling devices, never park vehicle that exposes workers to on coming traffic outside of barriers and channeling devices. Wear clothing and PPE described in step one above. Park vehicles within work zone to act as barriers to oncoming traffic when possible.	

		2	Struck by equipment in work area	Establish eye contact with all equipment operators when entering equipment operating radius, wear high visibility clothing and PPE as described in step one above. Park project vehicle away from active work area but still in work zone barriers or channeling devices.	
		3	Slips, trips and falls on wet or uneven surfaces in road right of way.	Wear proper footwear with good tread and ankle support. Plan route when walking on sloped surfaces. When walking along roadway stay as far off roadway as possible to avoid falling into traffic if tripped.	

<b>PPE Personal Protective Equipment</b>			
Type	Personal Protective Equipment	Description	Required
<b>Dermal Protection</b>	long sleeve shirt/pants		Required
<b>Eye Protection</b>	safety glasses		Required
	safety goggles		Recommended
<b>Foot Protection</b>	steel-toe boots		Required
<b>Hand Protection</b>	chemical resistant gloves (specify type)	Nitrile	Required
	work gloves (specify type)	Leather	Required
<b>Head Protection</b>	hard hat		Required
<b>Miscellaneous PPE</b>	traffic vest--Class II or III		Required
<b>Respiratory Protection</b>	half face respirator		Recommended

<b>Supplies</b>			
Type	Supply	Description	Required
<b>Communication Devices</b>	mobile phone		Recommended
	walkie talkie	if using flaggers	Required
<b>Miscellaneous</b>	fire extinguisher		Required
	first aid kit		Required
<b>Traffic Control</b>	traffic cones		Required

<b>Review Comments</b>		
Reviewer	Comments	
<b>Employee:</b> Coppola, Mija A <b>Role</b> HASP Reviewer <b>Review Type</b> Approve <b>Completed Date</b> 1/29/2009		
<b>Employee:</b> Coppola, Mija A <b>Role</b> Quality Reviewer <b>Review Type</b> NA <b>Completed Date</b> 1/30/2009	test	

## Poisonous Plants Awareness and Prevention

**Poisonous Plant Avoidance and Guidance Document  
TDOT Bridge ACM Sampling Program  
May 2017**

Prior to the start of work at each bridge, determine:

- **RECOGNITION:** Are poisonous plants (poison ivy/oak/sumac) present? If so, which ones and where?
- **AVOIDANCE:** Can these plants be safely avoided during work OR can sampling locations be adjusted to be away from the plants? (*Note: using TRACK for avoidance should be the primary control*).

If complete avoidance is not possible, implement additional controls & procedures and properly plan for poisonous plant contact through the use of:

1. Modified Level D/C PPE (with use of Tyvek, Ty-chem Sleeves, gauntlet nitrile style gloves), and/or barrier creams, as appropriate.
2. Where possible, avoid all skin contact with PPE/protective clothing/barriers; avoid contact of tools and equipment with the poisonous plants. **BUT, treat every surface that has contacted the poisonous plants as impacted.**
3. Following work or at appropriate interval, carefully remove and dispose of any impacted PPE.
4. Decontaminate all non-disposable items (skin, boots, vehicle, tools and equipment, etc.) with Technu or other appropriate decon solution.

**Please also see and read the attached supplemental information following this page, for additional details.**



### 10. Caterpillars

In general, caterpillars do not have good eyesight. Some caterpillars will regurgitate acidic digestive juices at attacking enemies.

More aggressive self-defense measures are taken by hairy caterpillars. The most aggressive defenses are those of the many caterpillars that have bristles associated with venom glands, called urticating hairs, and one of these is among the most potent defensive chemicals in any animal.

Some caterpillars eat the leaves of plants that are toxic to other animals. These toxic species, such as the Cinnabar moth (*Tyria jacobaeae*) caterpillars, are brightly striped or colored in black, red and yellow—the danger colors.

### 11. Physically Damaging Plants

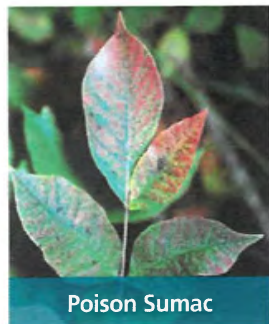
Plants like briars and thistles, which have thorns, can create a hazard to skin and can damage protective or personal clothing. Plants of this nature are common on project sites and can often be found along fence lines, abandoned

structures or equipment. If work will be conducted near these plants, they should be removed prior to implementing the work activity. Use of briar-resistant pants or chaps should be worn when working in dense thorny vegetation.

### Poisonous Plants

Poisonous plants may be present at the project site. Personnel should be alerted to their presence and instructed on methods to prevent exposure. Poison sumac grows as a shrub or small tree with large alternate, compound leaves having seven to 13 leaflets without teeth. All plant parts are poisonous. The lack of leaflet glands, “wings” between the leaflets and teeth on the leaves, in addition to this species’ red stems supporting the leaflets and leaves, help to distinguish this plant from similar-looking nonpoisonous species, such as other sumacs and tree-of-heaven. Flowers are shades of green, white and yellow and appear in late spring. Fruits are small white berries that mature in late summer and may last through winter, occasionally in moist or wet soils.

Poison ivy is a woody shrub or vine with hairy-looking aerial roots. It grows to 10 feet or more, climbing high on trees, walls and fences or trails along the ground. All parts of poison ivy, including the roots, are poisonous at all times of the year. Poison oak is usually found in relatively dry sunny sites in woodlands, thickets or fields. This species of poisonous plant generally prefers sandy soils. The following characteristics are applicable to poison oak: low shrubs that do not climb; leaves are dull green, densely hairy, are



Poison Sumac



Poison Ivy



Poison Oak



often lobed (3 to 7) and coarsely serrated; fruit is white and hairy.

The main control for poison ivy, sumac and oak is to avoid contact with the plant, cover arms and hands, and frequently wash potentially exposed skin. When working in an area known to have poisonous plants, employees should work in an area adjacent to the plant or wear modified Level D PPE and decontaminate appropriately.

Particular attention must be given to avoiding skin contact with objects or protective clothing that have touched the plants. Treat every surface that may have touched the plant as contaminated, and practice contamination avoidance.

If you come in contact with poison ivy, oak or sumac; an animal exposed to any of these plants; or tools, gear or clothing exposed to any of these plants, wash the affected area(s) with hot water (not so hot that it burns) and strong soap as soon as possible. Washing within the first 6 hours, before the first symptoms appear, will help to minimize the effects of an outbreak or even completely prevent an outbreak. Commercially available products, such as Technu, break down the oils that cause rashes, may also be used and should be used as soon as possible after exposure.

Rash symptoms can appear within a few hours but can take 2 to 5 days to appear. The rash starts as a red, annoyingly itchy area that starts to swell. The area then becomes inflamed and will get covered in clusters of tiny pimples; the pimples eventually merge and turn into blisters. The fluid in the blisters turns yellow, dries up and becomes crusty. Left completely untreated, this cycle can last as short as 5 days and in severe cases, as long as 5 to 6 weeks.



### 12. Bear Safety

Bears are curious, intelligent and potentially dangerous animals, but undue fear of bears can endanger both bears and people. Most bears tend to avoid people.

Bears feed on green grasses and on vegetation that grows in wet areas. They often rest in cool, dark, thick forests. Grizzly bears are typically, but not exclusively, active during the dawn, dusk and nighttime.

### Be Alert

Be alert where recent bear activity has been documented by park officials, Fish and Game, Forest Service and other public service people. Some common areas where bears like to frequent are avalanche chutes, stream beds, dense edge cover and, in late summer, berry patches.

- Use extreme caution when traveling on trails in the early morning, at dusk or at night.
- Always stay near and within communication distance of an armed guide.
- Always stay near your vehicle or other mode of transportation or permanent shelter.
- Be careful with food smells—never cook close to camp. Store all foods in plastic away from camp at night. When camp is unattended, store food at least 100 yards away and at least 14 feet up a tree hung 4 feet away from the trunk.
- Watch for fresh bear signs (scat or bear tracks) on the trail or near possible camp sites.
- If possible, make plenty of noise on the trail, especially on blind curves, in dense vegetation or areas with limited vision.

# POISONOUS PLANTS – RECOGNITION AND AVOIDANCE



MA1



- Poisonous or allergenic plants are **common!**
- Learn to recognize them and protect yourself
- Use **TRACK** to avoid poisonous plants in the field
- Contact the WorkCare Incident and Injury Hotline 888-449-7787 for 1<sup>st</sup> Aid support



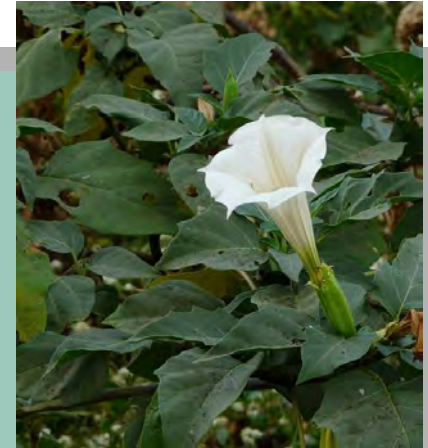
Western ragweed  
(*Ambrosia psilostachya*)

# T Think Through the Task

R  
A  
C  
K

## Where will the work be performed ?

- Woodlands and shrublands?
  - Look for poison-oak, death camas, plants with thorns,
- Creek banks and streams?
  - Look for poison-oak, giant nettle, poison-hemlock, water hemlock, castor-bean, ragweed, plants with thorns
- Grasslands, fields, lots
  - Look for poison-oak, common nettle, ragweed, poison-hemlock, jimsonweed, tree tobacco, fiddleneck (other Borage family)
- Landscaping and areas around structures
  - Look for oleander, jimsonweed, tree tobacco, belladonna, other poisonous garden plantings



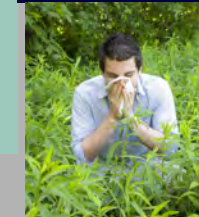
Jimson weed  
(*Datura wrightii*)

# Recognize the Hazard

Is pollen being released from plants that may give you hay fever?

## In All Situations

- **Recognize** the types of threats poisonous and allergenic plants pose
- **Recognize** the plants that might cause problems for your and your team
- **Recognize** the habitats where each poisonous plant might occur

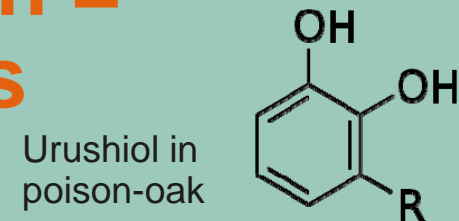


# Recognize the Hazardous Plants!

**Allergic contact dermatitis:**  
**plant chemical + human protein =**  
**allergic reaction and dermatitis**



Poison-oak (*Toxicodendron diversilobum*)



- Leaf blade divided into 3 leaflets
- Leaves often shiny, no surface hairs
- Flowers hang in clusters

**Rash often persists for days, can spread.**

**Contact the WorkCare Incident Hotline 888-449-7797 for 1st aid and self-care support.**

# Recognize the Hazardous Plants!

## Poison-oak



**Poison oak can have different seasonal looks**

- **Fruits hang in clusters**
- **Stems can be smooth, brown**
- **Drought-deciduous**
- **Can climb trees or be small and leafless and hidden among other vegetation**

# Assess the Risks

## Are we working around poisonous or allergenic plants?

- Have a knowledgeable person survey access routes and work areas for poisonous or allergenic plants prior to field team and equipment entering area
- Walk the access routes with subcontractors and field teams to point out any poisonous or allergic plants
- Identify biological hazards in HASP and JSAs as they relate to specific tasks or work areas.



# Assess the Risks

Are there ways to access work/sampling areas without contacting hazardous plants?

- If avoidance is not possible, what best practices can be implemented?
  - Administrative Controls
  - Safe Work Behaviors
  - Engineering Controls
  - PPE and topical treatments



Poison-oak  
(*Toxicodendron diversilobum*)

# Control the Hazards

## Use Engineering Controls when possible.

- Clear or prune brush or mow grass in work areas.
- Wear appropriate PPE such as disposable coveralls
  - (verify if rare shrubs or vegetation are present prior to clearing)

## Emphasize safe work behaviors to reduce exposure.

- Avoid skin contact with any plants if possible. Use PPE!
- Poisonous plant identification and flagging
- Walk in the middle of clearings or trails
- Keep mouth closed when walking through tall plants to avoid accidental ingestion
- Prior to eating and drinking wash hands and face to remove potential plant toxins

# Control the Hazards

- Wear appropriate **PPE** and appropriate clothing
  - Keep skin covered (long-sleeved shirt, pants, gloves with gauntlets to avoid exposing wrists, neck scarf)
  - Wear Tyvek coveralls if especially sensitive to poison-oak or other plants, and tape legs to prevent vegetation from slipping under
  - Wear disposable dust mask if severely allergic to pollen
  - Cover face and head with headgear appropriate to the area and as hazards allow
  - While still wearing PPE, clean all equipment with alcohol spray and paper towels and place in sealed plastic bag for disposal
  - Remove clothing inside out to avoid touching after exposure; place coveralls in sealed plastic bag and dispose
  - Wash all clothing immediately in hot water, keep separate from other PPE and field clothes

## Control the Hazards

- Wash exposed areas of skin after exposure using soap such as Tecnu to remove urushiol or other oils / toxins
- Take a hot shower as soon as practical for additional removal of residual toxins
- Make sure you assess all of the risks



# Keep Health and Safety First in All Things

- Read and understand the HASP and JSAs
- Know the scope of work and where the work will be performed
- Plan and prepare for exposure to poisonous and allergenic plant hazards
- Know the avoidance and control methods and communicate with subcontractors prior to field work

## Tecnu Extreme Label

*shane!*

Tecnu Extreme<sup>®</sup> Poison Ivy & Oak Scrub

### Warnings:

#### CAUTION: KEEP OUT OF REACH OF CHILDREN

For external use only. Do not use on raw or oozing areas of skin. If redness or irritation occurs, discontinue use and consult a doctor. Keep out of eyes.

### Directions for use:

Wet affected area with cool water. Squeeze desired amount of product into hand. Apply to exposed areas and gently rub for 15 seconds; if hypersensitive, wash entire body with Tecnu Extreme. Rinse with cool running water and towel dry. Repeat as needed.

### Ingredients:

Water, polyoxyethylene (4) lauryl ether, polysorbate 20, alcohol, silicon dioxide, carbomer, grindelia robusta extract, benzethonium chloride, aminomethyl propanol, fragrance

### Questions? Call 1-800-ITCHING™

100% Guarantee: If you are not satisfied with Tecnu Extreme<sup>®</sup>, you may return the unused portion along with your original store receipt to Tec Labs, 7100 Tec Labs Way SW, Albany, OR 97321 for a full refund of your purchase price. Before sending, contact us for a prepaid shipping label at [info@teclabsinc.com](mailto:info@teclabsinc.com) (<mailto:info@teclabsinc.com>) or call 1-800-482-4464.



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## PRODUCT LABELS

[10 Hour Repellent \(/tips-info/product-labels/10-hour-repellent-label\)](#)

[Calagel \(/tips-info/product-labels/calagel-label\)](#)

[Tecnu Original \(/tips-info/product-labels/tecnu-original-label\)](#)

[Tecnu Extreme \(/tips-info/product-labels/tecnu-extreme-label\)](#)

[Tecnu Rash Relief \(/tips-info/product-labels/tecnu-rash-relief-spray-label\)](#)

## WEBSITE

[Sitemap \(/sitemap\)](#)

[Privacy Policy \(/policies\)](#)

## RESOURCES

## How to use Tecnu Original Outdoor Skin Cleanser on pets, clothing, tools, equipment and more.

share!



**SKIN:** Use within a few hours of exposure to help remove poison oak and ivy oil (urushiol) before rash begins. Once the rash has started, wash with Tecnu to help remove oils on skin allowing the healing process to begin without recontamination.



**TOOLS:** Urushiol oils clinging to tools and equipment can cause rash. Clean equipment with a cloth saturated with Tecnu (check an inconspicuous corner of the equipment for possible surface damage before use). Wash thoroughly with soap and water.



**CLOTHING:** Saturate contaminated, unwetted clothing with Tecnu in a bucket or dishpan (First check for color fastness by testing a concealed corner of the fabric). Let soak for several minutes. Launder clothing by itself as usual with detergent and hot water.



**PETS:** Dogs, cats, horses and other furry pets can become contaminated by urushiol oil and can transfer poison oil to owners without being affected themselves. Saturate a cloth with Tecnu and wipe down the pet's coat. Then follow with a pet shampoo and water bath.



**SKUNK:** If your pet is sprayed by a skunk, saturate a cloth with Tecnu and wipe down the pet's coat. Then follow with a pet shampoo and warm water rinse.  
**DO NOT LEAVE TECNU ON FUR. IT MUST BE COMPLETELY WASHED OFF WITH SHAMPOO AND WATER**



**TREE SAP/PITCH:** Tecnu can be used to clean pitch, tree sap, road tar, grass stains and many other difficult to remove nuisances from skin, clothing and tools. Apply Tecnu directly and rub until the stain dissolves. Rinse off with soap and water.



### PRODUCT LABELS

[10 Hour Repellent \(/tips-info/product-labels/10-hour-repellent-label\)](#)

[Calagel \(/tips-info/product-labels/calagel-label\)](#)

[Tecnu Original \(/tips-info/product-labels/tecnu-original-label\)](#)

[Tecnu Extreme \(/tips-info/product-labels/tecnu-extreme-label\)](#)

[Tecnu Rash Relief \(/tips-info/product-labels/tecnu-rash-relief-spray-label\)](#)

### WEBSITE

[Sitemap \(/sitemap\)](#)

[Privacy Policy \(/policies\)](#)

### RESOURCES

Traffic Control Plan/STAR



**Traffic Control Plan/Site Traffic Awareness and Response Plan**  
Revision 8, 7/13/2015

**1.0 General**

Plan type	TCP
Project Name:	TDOT Bridge Asbestos Surveys
Project Number:	TNDT1935.HZxx
Developer Name:	R. Lounsbury
Engineering Judgement (EJ) Review By:	
Duration of Work (hours or days):	<1 hr per HA; <1 day total for bridge
Roadway Work Zone Start Point	
Roadway Work Zone End Point	
Posted Speed Limit (roadway)	
Number of Lanes (each direction)	Variable Depending on Bridge Size
Time Restrictions (describe below) <sup>2</sup>	If TC is required, 9 am to 3 pm (see below)

Comments:

Temporary lane closures across the bridge and associated traffic control, if necessary, will be provided by the local TDOT Maintenance Division. Arcadis will coordinate closely with TDOT regarding any lane closure requests and work scheduling, as needed. Lane closures are estimated to take no more than 6 hours per day during non-peak travel times (i.e., 9:00 am to 3:00 pm).

**2.0 Work Description**

Provide a brief description of scope of work:

Collection of bulk concrete samples from bridge components using hand tools and power hammer drill. Most work is performed from underneath the bridge deck using ladders. Inspector discretion may require collection of samples from the bridge shoulder. If required after pre-inspection, TDOT will provide and implement traffic control measures and brief the field team on all signage and barrier systems.

**3.0 Type and Duration**

Work locations on this project will be: Short term work (<1 hour per location)

Roadway work will be performed: On & off shoulders, sidewalk, mobile operation

Special traffic conditions may include (select most prevalent): Not applicable

**4.0 Traffic Control Layout, Number of Devices Required and Phasing**

The following traffic control configuration in the Field Guide to RWZ Safety applies:

Section 6.1 Work Beyond the Shoulder (DOT Facts-301i)

Section 6.2 Work on the Shoulder (DOT Facts-301j)

All Arcadis vehicles in a RWZ will, at a minimum, have a functioning high intensity strobe or rotating orange light. All Arcadis employees in the RWZ will wear, at a minimum, a retroreflective high visibility vest meeting Class II or III requirements and other PPE required by JSA or HASP. Don't leave vehicle doors open.

Select the traffic control devices to be used and enter number each required:

Check all that apply:	Wording or Pictogram	Number:	TCP Phasing:
<input checked="" type="checkbox"/> Warning signs	<u>Roadway Work Ahead</u>	<u>2 - 6</u>	1) Deploy warning signs at first approach, if required 2) Deploy subsequent approach warning signs, if required 3) Deploy channeling devices, if required, starting with first approach 4) Deploy "End Road Work" signs, if required 5) Position vehicle as shield to the extent practical 6) Commence work, SSO or designated contractor to maintain devices 7) Remove devices in reverse order
<input type="checkbox"/> Warning signs	_____	_____	
<input type="checkbox"/> Warning signs	_____	_____	
<input type="checkbox"/> Stop/Slow paddle	_____	_____	
<input type="checkbox"/> Red flag	_____	_____	
<input type="checkbox"/> Drums	_____	_____	
<input checked="" type="checkbox"/> Channelizer cone (42 inch height, 10 lb base)	_____	<u>6 - 10</u>	
<input type="checkbox"/> Channelizer cone (42 inch height, 30 lb base)	_____	_____	
<input type="checkbox"/> Traffic cones (≥ 18 inches tall)	_____	_____	
<input type="checkbox"/> Barricade <input type="checkbox"/> Type I <input type="checkbox"/> Type II	_____	_____	
<input type="checkbox"/> Flags for cones	_____	_____	
<input type="checkbox"/> Lights (for night work)	_____	_____	
<input type="checkbox"/> Plastic fencing (rolls)	_____	_____	
<input type="checkbox"/> Caution tape (rolls)	_____	_____	
<input checked="" type="checkbox"/> Other (specify):	_____	_____	
	<u>flashing strobe</u>	<u>1</u>	
	_____	_____	
	_____	_____	
	_____	_____	
	_____	_____	
	_____	_____	

**5.0 Approvals**

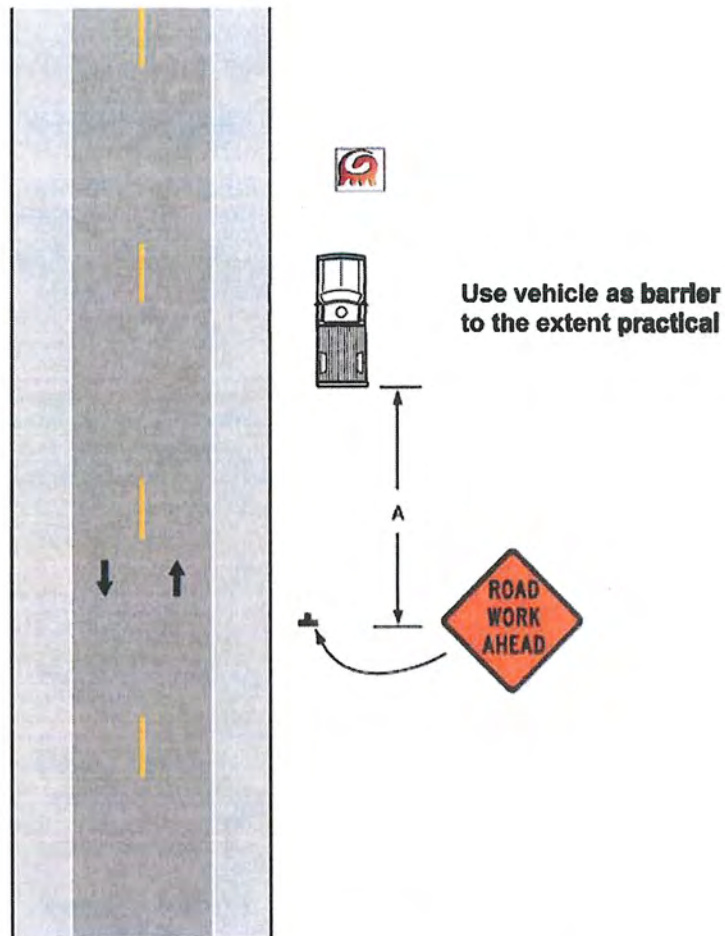
Plan Developer: Richard Lounsbury 5/11/2017

HASP Reviewer 

Engineering Judgment Review By:

## DOT Facts-301i Work Beyond the Shoulder

The following configuration may be used for work conducted beyond the shoulder of the roadway:



Road Type	"A" (m/ft)
Urban (Low Speed)	30/100
Urban (High Speed)	100/350
Rural	150/500

**Mandatory:**

M1. Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.

**Guidance:**

G1. If the work space is in the median of a divided highway, an advance warning sign should also be placed on the left side of the directional roadway.

G2. The ROAD WORK AHEAD sign may be replaced with other appropriate signs such as the SHOULDER WORK sign. The SHOULDER WORK sign may be used for work adjacent to the shoulder.

G3. The ROAD WORK AHEAD sign may be omitted where the work space is behind a barrier, more than 600 mm (24 in) behind the curb, or 4.6 m (15 ft) or more from the edge of any roadway.

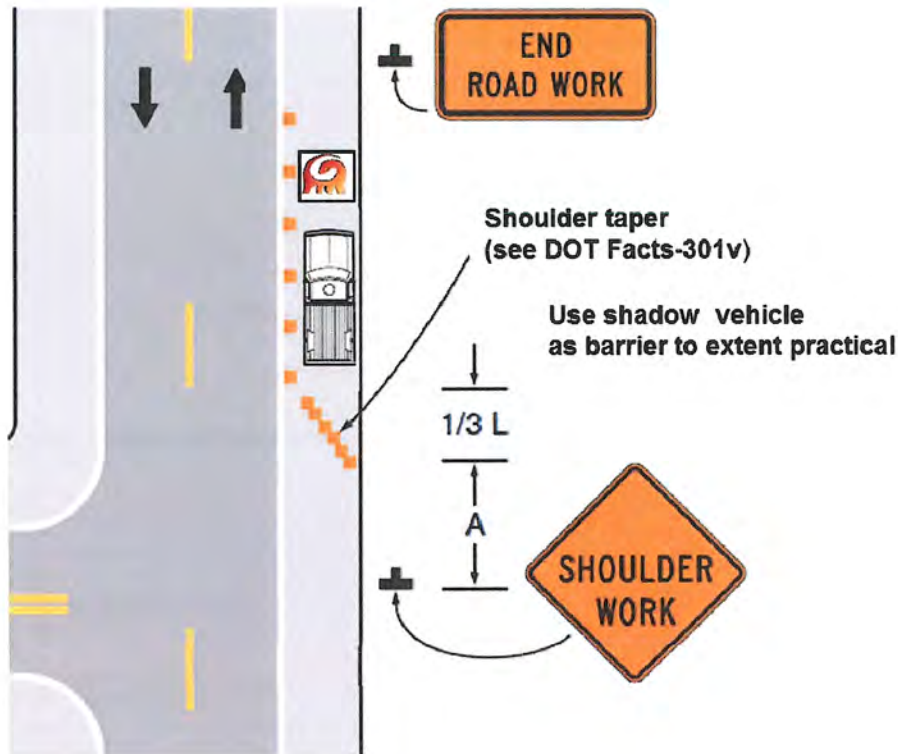
G4. For short-term, short-duration or mobile operation, all signs and channelizing devices may be eliminated if a vehicle with activated high-intensity rotating, flashing, oscillating, or strobe lights is used.

G5. Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights.



## DOT Facts-301j Work on the Shoulder

The following configuration may be used for work conducted on the shoulder of the roadway:



Road Type	"A" (m/ft)
Urban (Low Speed)	30/100
Urban (High Speed) <sup>1</sup>	100/350
Rural	150/500

1 – Excludes freeway, expressway, and interstate highway scenarios

This fact sheet is not a substitute for ARCADIS Transportation Safety Program procedures or applicable MUTCD guidance. The user should review the actual procedure or regulation for compliance issues. Procedures, fact sheets, and training/education materials may be revised without notice. Always refer to the current copy on the Source for accurate information.

The ARCADIS Transportation Safety Program is committed to continuous improvement. Report all errors or omissions to Sam Moyers in the Knoxville, TN office. [sam.moyers@arcadis-us.com](mailto:sam.moyers@arcadis-us.com).

**Mandatory:**

M1. Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.

M2. When paved shoulders having a width of 2.4 m (8 ft) or more are closed, at least one advance warning sign shall be used. In addition, channelizing devices shall be used to close the shoulder in advance to delineate the beginning of the work space and direct vehicular traffic to remain within the traveled way.

**Guidance:**

G1. A SHOULDER WORK sign should be placed on the left side of the roadway for a divided or one-way street only if the left shoulder is affected.

G2. The Workers symbol signs may be used instead of SHOULDER WORK signs.

G3. The SHOULDER WORK AHEAD sign on an intersecting roadway may be omitted where drivers emerging from that roadway will encounter another advance warning sign prior to this activity area.

G4. For short-duration operations of 60 minutes or less, all signs and channelizing devices may be eliminated if a vehicle with activated high-intensity rotating, flashing, oscillating, or strobe lights is used.

G5. Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights.



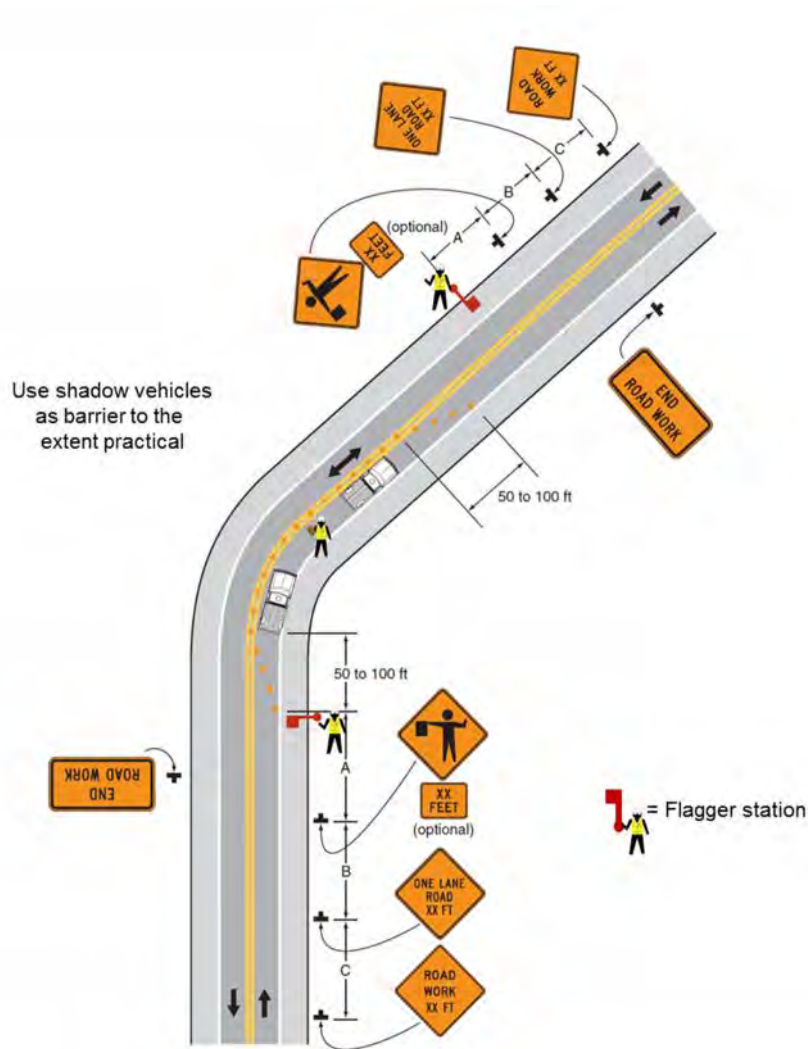
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## 6.6 Lane Closure on Two-Lane Road Using Flaggers (DOT Facts-301n)

Figure 21 may be used for lane closure on two-lane roads using flaggers.

Figure 21. Example TTC for Lane Closure on Two-Lane Roads Using Flaggers



Note: The TSP Template will automatically calculate sign spacing distances for "A", "B" and "C". The template will also compute oncoming site distance for flagger station placement. See section 2.3 for sign distance information and section 4.5 for site distance information for flagger stations if using an alternate TSP format.

### **6.6.1 Mandatory Requirements for Lane Closure on Two-Lane Roads Using Flaggers**

M1. Work on a high speed (>45 mph) rural highway and/or configurations that deviate from figure 21 (except as permitted in section 6.6.2) requires EJE review and approval.

M2. At night, flagger stations shall be illuminated, except in emergencies.

### **6.6.2 Guidance for Lane Closure on Two-Lane Roads Using Flaggers**

G1. For low-volume situations with short work zones on straight roadways where the flagger is visible to road users approaching from both directions, a single flagger, positioned to be visible to road users approaching from both directions, may be used.

G2. The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short-duration operations.

G3. Flashing warning lights and/or flags may be used to call attention to the warning signs. A BE PREPARED TO STOP sign may be added to the sign series.

G4. The buffer space should be extended so that the two-way traffic taper is placed before a horizontal (or crest vertical) curve to provide adequate sight distance for the flagger and a queue of stopped vehicles.

G5. When used, the BE PREPARED TO STOP sign should be located between the Flagger sign and the ONE LANE ROAD sign.

G6. When a highway-rail grade crossing exists within or upstream of the transition area and it is anticipated that queues resulting from the lane closure might extend through the highway-rail grade crossing, the RWZ should be extended so that the transition area precedes the highway-rail grade crossing.

G7. When a highway-rail grade crossing equipped with active warning devices exists within the activity area, provisions should be made for keeping flaggers informed as to the activation status of these warning devices.

G8. When a highway-rail grade crossing exists within the activity area, drivers operating on the left side of the normal centerline should be provided with comparable warning devices as for drivers operating on the right side of the normal centerline.

G9. Early coordination with the railroad company should occur before work starts.

G10. A flagger or a uniformed law enforcement officer may be used at the highway-rail grade crossing to minimize the probability that vehicles are stopped within 4.6 m (15 ft) of the highway-rail grade crossing, measured from both sides of the outside rails.

Safety Data Sheets



Revision Number: 004.0

Issue date: 08/03/2015

**1. PRODUCT AND COMPANY IDENTIFICATION**

**Product name:** Loctite® PL® Polyurethane Concrete Crack and Masonry Sealant **IDH number:** 1618522  
**Product type:** Sealant  
**Restriction of Use:** None identified **Region:** United States  
**Company address:** Henkel Corporation **Contact information:** Telephone: +1 (800) 624-7767  
 One Henkel Way MEDICAL EMERGENCY Phone: Poison Control Center 1-877-671-4608 (toll free) or 1-303-592-1711 TRANSPORT EMERGENCY  
 Rocky Hill, Connecticut 06067 Phone: CHEMTREC 1-800-424-9300 (toll free) or 1-703-527-3887

**2. HAZARDS IDENTIFICATION**

**EMERGENCY OVERVIEW**

**DANGER:** CAUSES SKIN IRRITATION.  
 MAY CAUSE AN ALLERGIC SKIN REACTION.  
 CAUSES SERIOUS EYE IRRITATION.  
 MAY CAUSE ALLERGY OR ASTHMA SYMPTOMS OR BREATHING DIFFICULTIES IF INHALED.

HAZARD CLASS	HAZARD CATEGORY
SKIN IRRITATION	2
EYE IRRITATION	2A
RESPIRATORY SENSITIZATION	1
SKIN SENSITIZATION	1

**PICTOGRAM(S)**



**Precautionary Statements**

**Prevention:** Avoid breathing dust or fumes. Wash thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace. Wear eye and face protection. Wear protective gloves. In case of inadequate ventilation wear respiratory protection.  
**Response:** IF ON SKIN: Wash with plenty of water. IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If skin irritation or rash occurs: Get medical attention. If eye irritation persists: Get medical attention. If experiencing respiratory symptoms: Call a poison center or physician. Take off contaminated clothing.  
**Storage:** Not prescribed  
**Disposal:** Dispose of contents and/or container according to Federal, State/Provincial and local governmental regulations.

Classification complies with OSHA Hazard Communication Standard (29 CFR 1910.1200) and is consistent with the provisions of the United Nations Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

See Section 11 for additional toxicological information.

### 3. COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous Component(s)	CAS Number	Percentage*
Limestone	1317-65-3	10 - 30
Stoddard solvent, <0.1% Benzene	8052-41-3	1 - 5
Talc	14807-96-6	1 - 5
Calcium oxide	1305-78-8	1 - 5
Toluene-2,4-diisocyanate	584-84-9	0 - 0.1
Unknown components~		60 - 100
Titanium dioxide	13463-67-7	1 - 5
Toluene-2,6-diisocyanate	91-08-7	0.1 - 1
Gamma-glycidoxypropyl trimethoxysilane	2530-83-8	0.1 - 1

\* Exact percentage is a trade secret. Concentration range is provided to assist users in providing appropriate protections.

### 4. FIRST AID MEASURES

<b>Inhalation:</b>	If inhaled, immediately remove the affected person to fresh air. Immediate medical treatment necessary.
<b>Skin contact:</b>	Wash affected area immediately with soap and water. If symptoms develop and persist, get medical attention. Remove contaminated clothes.
<b>Eye contact:</b>	In case of contact with the eyes, rinse immediately with plenty of water for 15 minutes, and seek immediate medical attention.
<b>Ingestion:</b>	Do not induce vomiting, seek medical advice immediately.
<b>Symptoms:</b>	See Section 11.
<b>Notes to physician:</b>	An individual having a dermal or pulmonary sensitization reaction to this material should be removed from further exposure to any diisocyanate. Treatment based on judgement of the physician in response to reactions of the patient.

### 5. FIRE FIGHTING MEASURES

<b>Extinguishing media:</b>	Water fog. Foam Carbon dioxide.
<b>Special firefighting procedures:</b>	Wear self-contained breathing apparatus and full protective clothing, such as turn-out gear. In case of fire, keep containers cool with water spray.
<b>Unusual fire or explosion hazards:</b>	None known.
<b>Hazardous combustion products:</b>	Nitrous gases Irritating fumes. Isocyanate vapors.

### 6. ACCIDENTAL RELEASE MEASURES

Use personal protection recommended in Section 8, isolate the hazard area and deny entry to unnecessary and unprotected personnel.

<b>Environmental precautions:</b>	Do not empty into drains / surface water / ground water.
<b>Clean-up methods:</b>	Ensure adequate ventilation. Scrape up spilled material and place in a closed container for disposal. Wear suitable protective clothing, gloves and eye/face protection.

## 7. HANDLING AND STORAGE

**Handling:** Avoid contact with eyes, skin and clothing. Avoid extreme temperatures. Wash thoroughly after handling. Protect from moisture. Use only with adequate ventilation.

**Storage:** For safe storage, store between 18.3 °C (64.9 °F) and 40 °C (104°F) Avoid moisture. Keep in a cool, well ventilated area away from heat, sparks and open flame. Keep container tightly closed until ready for use.

For information on product shelf life, please review labels on container or check the Technical Data Sheet.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Employers should complete an assessment of all workplaces to determine the need for, and selection of, proper exposure controls and protective equipment for each task performed.

Hazardous Component(s)	ACGIH TLV	OSHA PEL	AIHA WEEL	OTHER
Limestone	10 mg/m3 TWA Total dust.	5 mg/m3 PEL Respirable fraction. 15 mg/m3 PEL Total dust.	None	None
Stoddard solvent, <0.1% Benzene	100 ppm TWA	500 ppm (2,900 mg/m3) PEL	None	None
Talc	2 mg/m3 TWA Respirable fraction.	20 MPPCF TWA 2.4 MPPCF TWA Respirable. 0.1 mg/m3 TWA Respirable. 0.3 mg/m3 TWA Total dust.	None	50 ppm
Calcium oxide	2 mg/m3 TWA	5 mg/m3 PEL	None	None
Toluene-2,4-diisocyanate	0.005 ppm TWA 0.02 ppm STEL (Sensitizer.)	0.02 ppm (0.14 mg/m3) Ceiling	None	None
Unknown components~	None	None	None	None
Titanium dioxide	10 mg/m3 TWA	15 mg/m3 PEL Total dust.	None	None
Toluene-2,6-diisocyanate	0.005 ppm TWA 0.02 ppm STEL (Sensitizer.)	None	None	None
Gamma-glycidoxypropyl trimethoxysilane	None	None	None	None

**Engineering controls:** Local exhaust ventilation is recommended when general ventilation is not sufficient to control airborne contamination below occupational exposure limits.

**Respiratory protection:** Observe OSHA regulations for respirator use (29 CFR 1910.134). Use a NIOSH approved air-purifying respirator if the potential to exceed established exposure limits exists. Respirator with combination filter for vapor/particulate.

**Eye/face protection:** Safety glasses with side-shields. Full face protection should be used if the potential for splashing or spraying of product exists.

**Skin protection:** Use impermeable gloves and protective clothing as necessary to prevent skin contact.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Physical state:** Solid  
**Color:** Tan  
**Odor:** Slight  
**Odor threshold:** Not available.  
**pH:** Neutral

<b>Vapor pressure:</b>	Not available.
<b>Boiling point/range:</b>	Not available.
<b>Melting point/ range:</b>	Not applicable
<b>Specific gravity:</b>	1.15
<b>Vapor density:</b>	Not available.
<b>Flash point:</b>	Does not flash.
<b>Flammable/Explosive limits - lower:</b>	Not available.
<b>Flammable/Explosive limits - upper:</b>	Not available.
<b>Autoignition temperature:</b>	None expected.
<b>Evaporation rate:</b>	Not available.
<b>Solubility in water:</b>	Insoluble
<b>Partition coefficient (n-octanol/water):</b>	Not available.
<b>VOC content:</b>	2.89 %; 33 g/l
<b>Viscosity:</b>	Not available.
<b>Decomposition temperature:</b>	Not available.

## 10. STABILITY AND REACTIVITY

<b>Stability:</b>	Stable under normal conditions of storage and use.
<b>Hazardous reactions:</b>	Contact with moisture, other materials that react with isocyanates, or temperatures above 350° F (177° C), may cause polymerization.
<b>Hazardous decomposition products:</b>	Irritating and/or toxic fumes and gases may be emitted upon the product's decomposition. nitrogen oxides Aromatic isocyanates. carbon oxides. carbon monoxide Hydrogen cyanide.
<b>Incompatible materials:</b>	Oxidizing agents. Alcohols. Water. Strong bases.
<b>Reactivity:</b>	Not available.
<b>Conditions to avoid:</b>	Avoid moisture. Prolonged exposure to heat.

## 11. TOXICOLOGICAL INFORMATION

<b>Relevant routes of exposure:</b>	Inhalation, Skin, Eyes, Ingestion
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**Potential Health Effects/Symptoms**

**Inhalation:** As a result of previous repeated overexposures or a single large dose, certain individuals will develop isocyanate sensitization (chemical asthma) which will cause them to react to a later exposure to isocyanate at levels well below the TLV. Chronic overexposure to isocyanates has been reported to cause lung damage. Dryness of nasal passages, sore throat, cough, tightness of chest, shortness of breath. Persons suffering from allergic reactions to isocyanates should avoid contact with the product. This product may cause sensitization by inhalation and skin contact. Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage. May cause respiratory tract irritation.

**Skin contact:** Contact with skin can cause irritation and allergic reaction (sensitization) in some individuals. This product may discolor the skin.

**Eye contact:** Contact with eyes will cause irritation.

**Ingestion:** Ingestion of this product may cause nausea, vomiting and diarrhea.

Hazardous Component(s)	LD50s and LC50s	Immediate and Delayed Health Effects
Limestone	None	Nuisance dust
Stoddard solvent, <0.1% Benzene	None	Central nervous system, Irritant
Talc	None	Irritant, Lung, Some evidence of carcinogenicity
Calcium oxide	None	Irritant, Corrosive, Eyes
Toluene-2,4-diisocyanate	Oral LD50 (RAT) = 5,800 mg/kg Inhalation LC50 (RAT, 4 h) = 14 mg/l Inhalation LC50 (RABBIT) = 11 mg/l	Allergen, Eyes, Irritant, Lung, Respiratory, Some evidence of carcinogenicity
Unknown components~	None	No Data
Titanium dioxide	None	Irritant, Respiratory, Some evidence of carcinogenicity
Toluene-2,6-diisocyanate	None	Allergen, Bone Marrow, Corrosive, Eyes, Irritant, Mutagen, Respiratory, Some evidence of carcinogenicity
Gamma-glycidoxypropyl trimethoxysilane	None	Allergen, Irritant

Hazardous Component(s)	NTP Carcinogen	IARC Carcinogen	OSHA Carcinogen (Specifically Regulated)
Limestone	No	No	No
Stoddard solvent, <0.1% Benzene	No	No	No
Talc	No	Group 2B	No
Calcium oxide	No	No	No
Toluene-2,4-diisocyanate	Reasonably Anticipated to be a Human Carcinogen.	Group 2B	No
Unknown components~	No	No	No
Titanium dioxide	No	Group 2B	No
Toluene-2,6-diisocyanate	Reasonably Anticipated to be a Human Carcinogen.	Group 2B	No
Gamma-glycidoxypropyl trimethoxysilane	No	No	No

**12. ECOLOGICAL INFORMATION**

**Ecological information:** Not available.

## 13. DISPOSAL CONSIDERATIONS

Information provided is for unused product only.

<b>Recommended method of disposal:</b>	Dispose of according to Federal, State and local governmental regulations.
<b>Hazardous waste number:</b>	It is the responsibility of the user to determine if an item is hazardous as defined in the Resource Conservation and Recovery Act (RCRA) at the time of disposal. Product uses, transformations, mixtures, processes, etc., may render the resulting material hazardous, under the criteria of ignitability, corrosivity, reactivity and toxicity characteristics of the Toxicity Characteristics Leaching Procedure (TCLP) 40 CFR 261.20-24.

## 14. TRANSPORT INFORMATION

The transport information provided in this section only applies to the material/formulation itself, and is not specific to any package/configuration.

### U.S. Department of Transportation Ground (49 CFR)

<b>Proper shipping name:</b>	Not regulated
<b>Hazard class or division:</b>	None
<b>Identification number:</b>	None
<b>Packing group:</b>	None

### International Air Transportation (ICAO/IATA)

<b>Proper shipping name:</b>	Not regulated
<b>Hazard class or division:</b>	None
<b>Identification number:</b>	None
<b>Packing group:</b>	None

### Water Transportation (IMO/IMDG)

<b>Proper shipping name:</b>	Not regulated
<b>Hazard class or division:</b>	None
<b>Identification number:</b>	None
<b>Packing group:</b>	None

## 15. REGULATORY INFORMATION

### United States Regulatory Information

<b>TSCA 8 (b) Inventory Status:</b>	All components are listed or are exempt from listing on the Toxic Substances Control Act Inventory.
<b>TSCA 12 (b) Export Notification:</b>	Toluene-2,6-diisocyanate (CAS# 91-08-7).
<b>CERCLA/SARA Section 302 EHS:</b>	Toluene-2,6-diisocyanate (CAS# 91-08-7).
<b>CERCLA/SARA Section 311/312:</b>	Immediate Health, Delayed Health
<b>CERCLA/SARA Section 313:</b>	This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (40 CFR 372). Toluene-2,6-diisocyanate (CAS# 91-08-7).
<b>California Proposition 65:</b>	This product contains a chemical known in the State of California to cause cancer. This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

### Canada Regulatory Information

<b>CEPA DSL/NDSL Status:</b>	All components are listed on or are exempt from listing on the Canadian Domestic Substances List.
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## 16. OTHER INFORMATION


**This safety data sheet contains changes from the previous version in sections:** This Safety Data Sheet contains changes from the previous version in Section(s):  
2, 3, 8, 9, 15

**Prepared by:** Mary Ellen Roddy, Sr. Regulatory Affairs Specialist

**Issue date:** 08/03/2015

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Aerial Work Platform HS Standard


	<u>ARCADIS HS Standard Name</u> Aerial Work Platform HS Standard	<u>Revision Number</u> 03
<u>Implementation Date</u> 15 March 2011	<u>ARCADIS HS Standard No.</u> ARC HSFS017	<u>Revision Date</u> 21 January 2015

## EXECUTIVE SUMMARY

This Health and Safety Standard (HSS) sets forth minimum requirements for ARCADIS personnel to conduct work safely with the use of aerial work platforms (AWPs). There are many types and varieties of aerial work platforms that can be used to efficiently and safely conduct work. Examples of these are Extensible Boom Platforms, Aerial Ladders, Articulating (Jointed) Boom Platforms, Vertical Towers, or any combination of these. These types of AWP's are also known as "Aerial Lifts", "Cherry Pickers", "Ladder Trucks", "Telescopic Boom Lifts" and "Personnel Lifts".

This standard includes the practices to adequately protect ARCADIS personnel from accident and injury when using an AWP.

- The TRACK process and Stop Work Authority shall be used to prevent the following most common types of accidents associated with AWPs: Overturning, Uncontrolled Descents and Movements, Crushing, Collisions, and Electrocution.
- A copy of the manufacturer's operations manual must be provided with the work platform and stored in the weather-resistant storage compartment on the aerial platform.
- The aerial platform shall be used in accordance with the manufacturer's instructions and requirements.
- Aerial work platforms shall be inspected and maintained in accordance with the manufacturer's recommendations.
- Only trained and qualified operators who hold a current Equipment Operator Permit will operate an AWP. See section 5.3 of this standard for the Equipment Operator Permit requirements and Exhibit 3 for a copy of this permit.
- Controls on the AWP shall be plainly marked as to their function and tested before use.
- The boom and basket loads, maximum platform height, and maximum travel height for each AWP shall not be exceeded.
- Under all travel conditions the travel speed shall be limited according to the conditions of the ground surface, congestion, slope, location of personnel, and other factors causing a hazard of collision or injury to personnel.
- Guardrails shall be in place around the perimeter of the platform.
- Personnel occupying a boom-supported aerial platform shall wear approved fall restraint systems, including safety harnesses and a lanyard that restrains the worker from exiting the platform.
- The operator shall maintain adequate clearance from overhead obstructions such as building structures or energized electrical lines.
- The equipment shall be inspected daily and before each use by the operator for any defects or hazards that can be seen visually. See Exhibit 4 for the AWP Inspection Checklist.
- Aerial platforms that are not in proper operating condition shall be immediately removed from service until repaired.

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## 1. POLICY

It is ARCADIS policy to minimize and control the hazards involved with the use of AWP's. ARCADIS recognizes that our work will at times require the use of these AWP's to complete our work. In those cases, this work will be conducted using the TRACK process. Use of all AWP's will only be by trained and qualified operators who hold a current Equipment Operator Permit to use a specific type of AWP.

## 2. PURPOSE AND SCOPE

### 2.1 Purpose

The basic purpose of the ARCADIS Aerial Work Platform HSS is to prevent accidents, injuries and equipment damage. AWP's are useful machines in providing access to locations where scaffolding is not present and, in many cases, are more effective to use than scaffolding. This HSS provides the minimum safety requirements for operation, inspection, maintenance, and training for AWP's. In addition to these safety requirements, the manufacturer's instructions for the specific aerial work platform used shall be followed.

### 2.2 Scope

This HSS applies to all ARCADIS US work in the use of aerial work platforms. Examples of these are Extensible Boom Platforms, Aerial Ladders, Articulating (Jointed) Boom Platforms, Vertical Towers, or any combination of these. These types of AWP's are also known as "Aerial Lifts", "Cherry Pickers", "Ladder Trucks", "Telescopic Boom Lifts" and "Personnel Lifts". [Exhibit 2](#) of this Standard contains some Typical Examples of these Aerial Work Platforms.

Note: A scissor-lift or lift cart is considered by OSHA to be a mobile scaffold. Therefore, it must be used in accordance with the OSHA standards for mobile scaffolds used in construction work. Refer to the Scaffold Standard (ARC HSFS015).


## 3. DEFINITIONS

There are several definitions associated with this standard and associated procedures. These definitions are presented in [Exhibit 1](#) of this document.

## 4. RESPONSIBILITIES

### 4.1 PICs, Project Managers, and Task Managers

Are responsible for implementing this HSS on any project in which ARCADIS employees and/or subcontractors use aerial work platforms. These individuals are responsible for communicating and appropriately managing subcontractors, ensuring that employees and subcontractors, as applicable, have appropriate training and authorization to use an AWP as specified in this standard. These individuals are responsible for involving the appropriate ARCADIS H&S Staff and for ensuring that all subcontractors have been informed of the minimum H&S requirements for activities involving the use of AWP's.

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#### 4.2 Division H&S Directors

Are responsible for communicating with all PICs, PMs, APMs, within ARCADIS and ensuring that they are aware of this HSS and for ensuring that it is being implemented effectively.

#### 4.3 Operations Managers and Supervisors

Are responsible for ensuring that all ARCADIS personnel are knowledgeable of the aerial work platform requirements and comply with the procedures, including inspection, maintenance, training, and permitting.


#### 4.4 ARCADIS Employees

ARCADIS employees are responsible for implementing the TRACK (Think through the task, Recognize the hazard, Assess the risk, Control the risk, Keep H&S first in all things) process before any and all work involving aerial work platforms. Employees are responsible for adhering to the aerial work platform policies and procedures set forth in this HSS. They should communicate H&S concerns, issues and questions to their supervisor or their respective H&S contact prior to initiating work.

### 5. PROCEDURE

#### 5.1 General Requirements for AWP

- The TRACK process and Stop Work Authority shall be used to prevent the following most common types of accidents associated with AWP: Overturning, Uncontrolled Descents and Movements, Crushing, Collisions, and Electrocution.
- A copy of the manufacturer's operations manual must be provided with the work platform and stored in the weather-resistant storage compartment on the aerial platform.
- The aerial platform shall be used in accordance with the manufacturer's instructions and requirements.
- Aerial work platforms shall be inspected and maintained in accordance with manufacturer's recommendations. See Exhibit 4 for the AWP Inspection Checklist.
- Only trained and qualified operators who hold a current Equipment Operator Permit will operate an AWP. See section 5.3 of this standard for the Equipment Operator Permit requirements.
- Before the aerial platform is used and during use, the operator shall use TRACK and check the area in which the aerial platform is to be used for possible workplace hazards.
- Controls shall be plainly marked as to their function.
- The boom and basket loads, maximum platform height, and maximum travel height for each AWP shall not be exceeded.

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- Brakes shall be set before use, if the lift comes equipped with them.
- Trash and debris shall not be allowed to accumulate on the work platform.
- All body parts shall be kept inside the confines of the basket while the platform is in motion.
- Do not operate in storms (high winds, thunderstorms) that compromise the safety of personnel. Employees must refer to the operation and safety manual for each AWP to determine the maximum wind speed use. AWP operators must also factor in whether or not additional surface area has been added to the platform when considering maximum wind speed use.
- Except in case of emergency, the lower level controls of a lift shall not be operated unless permission has been given by the person in the lift.
- Before ladder trucks and tower trucks are moved, the aerial ladders shall be secured in the lower traveling position by the locking device above the truck cab, and the manually operated device at the base of the ladder, or by other equally effective means.

## 5.2 Operation of AWP

### 5.2.1 Workplace Inspections

Before the aerial platform is used and during use, the operator shall use TRACK and check the area in which the aerial platform is to be used for possible hazards such as, but not limited to:

- Drop-offs or holes, including those concealed by water, ice, mud, etc.
- Slopes
- Bumps and floor obstructions
- Debris
- Overhead obstructions and electrical conductors
- Hazardous locations and flammable atmospheres
- Inadequate surfaces and supports
- Wind and weather conditions
- Presence of unauthorized persons
- Other possible unsafe conditions

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### 5.2.2 Travel Speeds/ Movement

Under all travel conditions the travel speed shall be limited according to the conditions of the ground surface, congestion, slope, location of personnel, and other factors causing a hazard of collision or injury to personnel.

An aerial work platform shall not be moved when the platform is in the elevated position except for equipment that is specifically designed for that purpose.

The area surrounding the aerial work platform shall be cleared of personnel and equipment before lowering the platform.

### 5.2.3 Adequate Support Requirements

The support surface shall be adequate for the aerial work platform and the load carried. The AWP shall not be operated from a position on trailers, railway cars, floating vessels, or similar equipment unless the application is an approved use by the AWP manufacturer


For those AWP that are approved for use on floating vessels, the AWP shall be positioned as close to the center of the platform or barge, as feasible. A controlled access zone or perimeter guarding must be in place and the AWP must be securely anchored/tethered, as required by the manufacturer.

When using an AWP on floating work platforms, the site specific Health & Safety Plan (HASP) and/or Job Safety Analysis (JSA) must be developed to address the following:

- Operator specific training/competency requirements
- AWP load rating capacity
- Design consideration to eliminate risk of capsize
- Motorized equipment capabilities and use limitations
- Fall Protection Requirements and other water safety PPE/rescue equipment requirements
- Controlled Access Zone or perimeter guarding requirements
- Method of anchoring or tethering the AWP equipment
- Define lighting requirements
- Access to the barge/platform
- Communication method
- Emergency response/notification procedures

### 5.2.4 Leveling the Aerial Platform

Aerial work platforms should be used on a firm and level surface. The aerial platform shall not be operated in any manner on grades, side slopes, or ramps exceeding those

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for which the aerial platform is rated by the manufacturer. Outriggers, stabilizers, extendible axles, oscillating axles, or other stability enhancing means shall be deployed and locked into place as required by the manufacturer. Outriggers, when used, shall be positioned on pads or a solid surface. Wheel chocks shall be installed before using a lift on an incline.

#### 5.2.5 Fall Protection

Guardrails shall be in place around the perimeter of the platform, and access gates or openings shall be properly closed per the manufacturer' instructions. Personnel shall maintain a firm footing on the platform floor. Climbing by occupants on the mid-rail or top-rail of the AWP is prohibited. The use of planks, ladders, or any other device in or on the AWP for achieving additional height or reach is prohibited.

Personnel occupying a boom-supported aerial platform shall wear approved fall restraint system, including safety harnesses and lanyards that restrains the worker from exiting the platform. The lanyard shall be secured to the manufacturer's specified anchorage point inside the basket. Lanyards shall not be attached to any adjacent structure, pole, or equipment while working from an aerial work platform. Refer to the ARCADIS Elevated Work and Fall Protection Standard (ARC HSFS007) for the requirements associated with using fall protection equipment in aerial work platforms. Personnel using fall protection equipment must comply with those requirements and be trained prior to the use of the equipment.

#### 5.2.6 Platform Access

The platform shall only be accessed through the designated access point. Personnel shall only vacate or enter a raised platform by following guidelines and instructions provided by the manufacturer.

#### 5.2.7 Overhead Clearance


The operator shall maintain adequate clearance from overhead obstructions such as building structures or energized electrical lines. Refer to the ARCADIS Utility Clearance Standard for additional clearance information.

#### 5.2.8 Tools/ Materials on the Work Platform

Only properly secured tools and materials, which are evenly distributed and can be safely handled by a person working from the platform, shall be on the platform while it is being moved. Consider tethering or tying off tools and materials to the platform when they create a hazard of falling to surfaces below. Ropes, electric cords, and hoses should be positioned to prevent them from becoming entangled when it is being elevated, lowered, or moved.

#### 5.2.9 Fueling

The engine shall be shut down while fuel tanks are being filled. Fueling shall be done in a well-ventilated area free of flame, sparks, or other hazards that may cause fire or explosion. A fire extinguisher is to be available during refueling.

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### 5.3 Equipment Operator Permit

ARCADIS or Subcontractor shall provide a trained and qualified operator with an Equipment Operator Permit prior to using the AWP. A copy of this permit shall be kept at the jobsite, and the permit shall be carried by the operator when using the AWP. The permit shall indicate the specific type of AWP's an operator has been trained on and is authorized to operate. See [Exhibit 3](#) for a copy of this permit.

### 5.4 Inspections and Maintenance

Aerial work platforms shall be inspected and maintained in accordance with the manufacturer's recommendations.

The equipment shall be inspected daily and before each use by the operator for any defects or hazards. See Exhibit 4 for the AWP Inspection Checklist. Frequent and annual inspections shall also be performed by a qualified person, such as a mechanic experienced on the specific type of aerial platform (or one having similar design characteristics).


Aerial platforms that are not in proper operating condition shall be immediately removed from service until repaired. Any repair must be performed by a qualified person and in accordance with the manufacturer's recommendations. No modifications can be made to this equipment without written permission from the manufacturer.

#### 5.4.1 Pre-Start Inspections

Before use or at the beginning of each shift, the AWP shall be given a visual inspection and functional test including, but not limited to, the following:

- Test lift controls
- Safety devices
- Personal protective devices
- Air, hydraulic and fuel systems
- Cables and wiring
- Loose or missing parts
- Tires and wheels
- Placards, warnings, control markings and operating manuals
- Outriggers, stabilizers, extendable axles and other structures
- Guardrail system
- Items specified by the manufacturer

The aerial platform shall not be placed into service until all missing components, malfunctions and problems have been corrected.

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#### 5.4.2 Frequent and Annual Inspections

Frequent and annual inspections of the AWP shall be performed in accordance with the manufacturer's instructions and following these circumstances:

- Upon arrival to a job site
- When the AWP has been in service for three months or every 200 hours
- If the AWP has been out of service for a period of three months

The inspection shall be made by a person qualified on the specific type of aerial platform or one having similar design characteristics. The inspection shall include the items from a pre-start inspection and those specified by the manufacturer. The aerial platform shall not be placed into service until all malfunctions and problems have been corrected.

## 6. TRAINING


### 6.1 Aerial Work Platform Operators

Only personnel who have received instructions and training regarding the inspection, application and operation of a specific aerial work platform, shall operate that AWP. Training will be under the direction of a qualified, competent individual capable of determining an employee's proficiency in knowledge and actual operation of the AWP. This training shall include the recognition and avoidance of hazards associated with operation of the specific AWP. Such training shall include, but are not limited to the following:

- The purpose and use of operating manuals
- Pre-start inspections
- Responsibilities associated with problems or malfunctions affecting the operation of the aerial work platform
- Factors affecting stability
- The purpose of placards and decals
- Safety rules and regulations
- Operator warnings and instructions
- The purpose and function of all controls
- Actual operation of the aerial work platform

### 6.2 Training Documentation

All training shall be documented. The document evidencing operator training shall be provided by the vendor or person who conducts the training. The employee receiving that

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training shall ensure that a copy of the training document is submitted to the ARCADIS Training Team.

### 6.3 Retraining

The operator shall be retrained, when so directed by ARCADIS supervisor and/or management, based on observation and evaluation of the operator.

## 7. REFERENCES

29 CFR 1910.67 - Vehicle Mounted Elevated and Rotating Work Platforms

29 CFR 1910.68 - Manlifts

29 CFR 1926.453 - Aerial Lifts

29 CFR 1910.333(c)(3) – Electrical, Selection and Use of Work Practices.

ANSI ZA92.2 Vehicle Mounted Elevating and Rotating Work Platforms.


ANSI A92.3-2006 - Manually-Propelled Elevating Aerial Platforms

ANSI A92.5-2006 - Boom-Supported Elevating Work Platforms

ANSI A92.6-2006 - Self-Propelled Elevating Work Platforms

## 8. RECORDS

All records regarding aerial work platform inspections and maintenance must be maintained in the project files. Employee training records will be maintained by the ARCADIS Training Department.

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## 9. APPROVALS AND HISTORY OF CHANGE

Approved by: Tony Tremblay, CSP – Director of H&S, Infrastructure Division



### History of Change

Revision Date	Revision Number	Standard Developed/Reviewed By or Revised By	Reason for change
15 March 2011	01	Brent Oakeson / Tony Tremblay	Original document
17 Feb 2012	02	Brent Oakeson / Tony Tremblay	Removed references to Scissor Lifts (moved to Scaffolding Standard). Updated examples and definitions of AWP's.
21 January 2015	03	Sharon Lingle / Tony Tremblay	Revised Section 5.2.5 to clarify use of an approved fall restraint system; Header format and History of Change table format updated

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### EXHIBIT 1 – DEFINITIONS

**Aerial work platform:** A mobile device that has an adjustable position platform, supported from ground level by a structure.

**Anchorage(s):** A secure point of attachment to be used with personal fall protection equipment.

**Articulating boom:** A means used to support the personnel platform with two or more hinged boom sections.

**Base:** The relevant contact points of the aerial platform that form the stability fulcrum (e.g., wheels, casters, outriggers, stabilizers, etc.).

**Boom-supported elevating work platform:** An aerial work platform supported by a boom that telescopes, articulates, rotates, or extends beyond the base dimensions to position personnel, along with their tools and materials. These devices are power operated with primary functions controlled from the platform.

**Elevating assembly:** The mechanisms used to position the platform relative to the aerial platform chassis.

**Elevating work platforms, (self-propelled or manually propelled):** An aerial work platform that has an adjustable platform position, supported from ground level by a structure. The platform cannot be positioned completely beyond its base.

**Guardrail system:** A vertical barrier primarily intended to protect against personnel falling to lower levels.

**Maximum Platform Height:** The maximum elevation measured from the floor of the platform to the surface upon which the machine is being supported.

**Maximum Travel Height:** The maximum platform height or the most adverse configuration(s)

**Outriggers:** Devices that increase the stability of the aerial platform and that are capable of lifting and leveling the aerial platform.


**Platform:** The portion of an aerial platform intended for occupation by personnel with their necessary tools and materials.

**Platform height:** The vertical distance measured from the floor of the platform to the surface upon which the aerial platform is being supported.

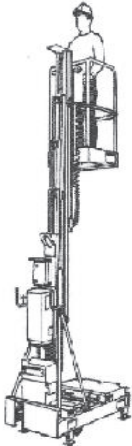
**Qualified operator:** A person who has received training on the specific elevating work platform device has demonstrated knowledge and skill in operating the equipment, and is authorized to operate the specific AWP.

**Rated work load:** The designed carrying capacity of the aerial platform, as specified by the manufacturer.

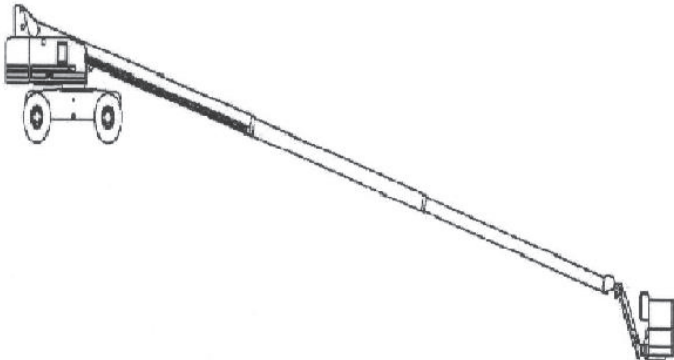
**Stability/stable:** A condition of an aerial platform in which the sum of the moments which tend to overturn the unit is less than the sum of the moments tending to resist overturning.

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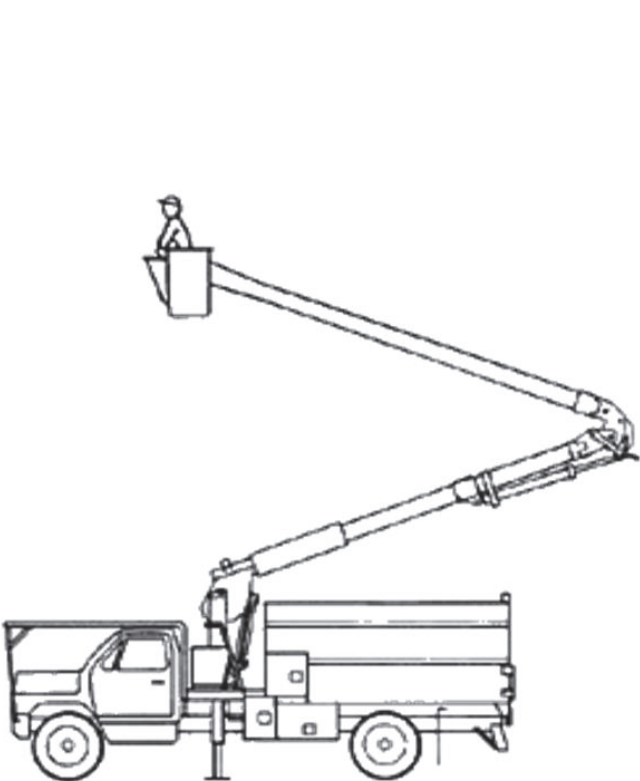
**EXHIBIT 2 – TYPICAL EXAMPLES OF AERIAL WORK PLATFORMS**



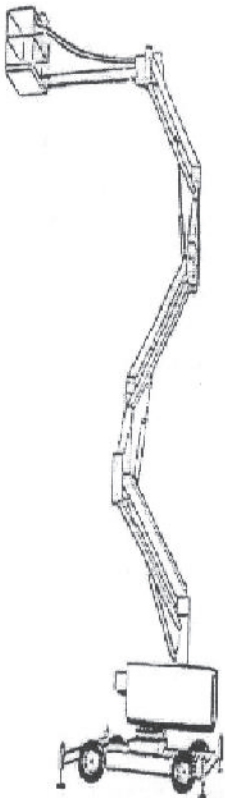
**Vertical Tower**




**Extensible Boom Platforms**



**Extendable Boom Truck**



**Articulating Boom Platforms**

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**EXHIBIT 3 – EQUIPMENT OPERATOR PERMIT**

Operator Name:
Operator Company:

***This Operator is authorized to operate the following designated equipment:***

<b>Aerial Work Platforms</b>	<b>Manufacturer(s) / Type(s) / Model #'s</b>	<b>Trainer/ Vendor</b>	<b>Date of Training</b>
<input type="checkbox"/> Personnel Lift			
<input type="checkbox"/> Telescopic Boom Lift			
<input type="checkbox"/> Articulated Boom Lift			
<input type="checkbox"/> Vehicle Mounted Lift			
<b>Mobile Scaffold</b>			
<input type="checkbox"/> Scissor Lift			
<b>Other</b>			
<input type="checkbox"/>			
<input type="checkbox"/>			
<input type="checkbox"/>			

**Notes:**

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Date Issued: \_\_\_\_\_ Date Expires: \_\_\_\_\_

Authorized by: \_\_\_\_\_ Signature: \_\_\_\_\_  
(Supervisor or PM)

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**EXHIBIT 4 – AERIAL WORK PLATFORM INSPECTION CHECKLIST**



**AERIAL WORK PLATFORM INSPECTION CHECKLIST**

<b>Equipment Type:</b>	<b>Equipment #:</b>
<b>Manufacturer:</b>	<b>Model #:</b>
<b>Project / Location:</b>	
<b>Inspected by:</b>	<b>Date:</b>

*Indicate if the items below have been checked and are adequate for operational and safe use.*

<b>ITEMS TO BE CHECKED</b>			
<b>Equipment Conditions:</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>
a) Fuel level	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Engine oil level	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Air, hydraulic and fuel systems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Cables and wiring	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Battery, water level, condition, state of charge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) Tires, proper inflation, no damage, wheels	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g) Platform structure, cleanliness, physical condition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h) Guardrail system, safety chains, fall protection anchorage points	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i) Instruction labels, placards, markings in place and legible	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j) No loose or missing parts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k) Locking pins	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l) Operating manual	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
m) Fire extinguisher	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Controls:</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>
a) All controls marked as to their function	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Test all lift controls, switches, buttons	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Raise and lower platform/boom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Raise platform/boom and lower with auxiliary power	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Telescope out and in	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) Swing platform right and left	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g) Extend and level outriggers / stabilizers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h) Drive machine forward and reverse, right and left	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i) Personal protective devices, Horn, backup alarm, warning lights	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j) Brakes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Other Items / Specific to Model / Manufacturer:</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>
a)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*Note: Defects found must be repaired prior to equipment use. Retain this form with the equipment until the end of the workday, then keep this form in the project files.*

**Notes:**


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\_\_\_\_\_  
Signature of Person Completing Repairs

\_\_\_\_\_  
Date/ Time Repaired

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**EXHIBIT 5 – STATE SPECIFIC AERIAL WORK PLATFORM STANDARDS**

The following states have standards that may exceed those of the federal standard for Aerial Work Platforms. If your office or work location is in one of these states, please review the regulations and modify accordingly:

- California – General Industry Safety Orders, Subchapter 7. Group 4, Article 24.
- Hawaii – General Industry Standards, Title 12, Subtitle 8, Part 2.
- Michigan – Health Standards for General Industry, Part 58. Aerial Work Platforms.
- Utah – General Industry Standard Supplement, R614-6-8
- Washington – Chapter 296 - 869, WAC. Elevating Work Platforms.