



**RENOVATION SPECIFIC ASBESTOS
AND LEAD-BASED PAINT INSPECTION
REPORT FOR**

BRIDGE STRUCTURE ID E-17-JP

**INTERSTATE I-70 OVER HAVANA STREET
AT MILE POST 280.667**

April 4, 2012

Prepared for:

Colorado Department of Transportation
Hazardous Waste Unit
15285 South Golden Road, Bldg. 47
Golden, Colorado 80401



Environmental Scientists and Engineers, LLC

**RENOVATION SPECIFIC ASBESTOS AND LEAD-
BASED PAINT INSPECTION REPORT
FOR
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**INTERSTATE I-70 OVER HAVANA STREET AT
MILE POST 280.667**

April 4, 2012

Prepared for:
Colorado Department of Transportation

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Walsh Project # WA-000944-0062

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1. EXECUTIVE SUMMARY

1.1. Summary of Work

This report provides an overview of a pre-renovation asbestos and lead-based paint inspection of Bridge Structure ID E-17-JP located on Interstate I-70 over Havana Street at mile post 280.667 in Denver, Colorado also referred to as “the site”. Walsh Environmental Scientists and Engineers, LLC (Walsh) was contracted by the Colorado Department of Transportation (CDOT) to perform a pre-renovation inspection to locate asbestos-containing building materials (ACBM) and to conduct a limited screening for Lead-Based Paint (LBP).

1.2. Asbestos-Containing Building Material

The sampling and inspection process was conducted in accordance with standards of the EPA Asbestos Emergency Hazard Response Act (AHERA) and National Emission Standards for Hazardous Air Pollutants (NESHAPs), OSHA Construction and General Industry Standards for asbestos, CDPHE Regulation 8 (Reg. 8), and other applicable industry standards. Asbestos inspection activities were conducted by EPA AHERA accredited and State of Colorado certified asbestos inspector personnel. The inspection was performed on March 29, 2012.

The inspection identified **two (2)** suspect asbestos-containing homogeneous building materials. **Six (6)** bulk samples were collected during the inspection. A material is considered to be an asbestos-containing building material (ACBM) if the asbestos content is greater than 1%. **No ACBMs were identified during this inspection.**

Materials containing 1% or less asbestos are not subject to EPA and CDPHE regulations, but are subject to OSHA hazard communication and exposure assessment provisions, and would be subject to additional requirements, if air concentrations of asbestos are at or above the permissible exposure limit (PEL) of 0.1 f/cc or the excursion limit of 1.0 f/cc. The following materials contain trace to 1% asbestos. **No materials containing trace-1% asbestos were identified by this inspection.**

Special Conditions / Observations

In addition to general limitations described in Section 8, the following materials have the potential to be asbestos containing but cannot be accessed or inspected due to access limitations, or safety issues:

- Packing and gasket material associated with expansion joints within the bridge structure. These materials were not observed during the inspection, but may be present in spaces that were concealed with concrete and/or asphalt within the structure.

1.3. Lead-Based Paint

Walsh conducted a limited LBP screening at the site by collecting a limited number of representative paint bulk samples that were analyzed by flame atomic absorption

spectrophotometry analysis (AAS) for lead content. The limited LBP screen was conducted due to planned renovation of a structure and is solely for general disclosure purposes to provide contractors with information regarding those materials containing the highest levels of lead, to supplement presumption that all painted surfaces may contain some level of lead. This disclosure is provided to those employers that may impact painted materials about general conditions that may be encountered for a particular structure. The screening is also conducted to provide general information regarding waste characterization/disposition (proper disposal) provisions.

EPA, Housing and Urban Development (HUD) and CDPHE define lead-based paint as paint with a lead content greater than or equal to 1.0 mg/cm² using XRF analysis, or 0.5% by weight when analyzed by AAS.

The following **component types** were confirmed to contain LBP.

Bridge ID E-17-JP:

- Brown paint located on structural steel girders beneath the bridge deck (LBP01).

Renovation activities involving LBP are subject to the OSHA Construction Industry Standard for Lead (Title 29 CFR, Part 1926.62). This standard is similar to other OSHA standards in that it addresses such issues as worker training, medical evaluations, personal protective equipment, exposure assessment, air monitoring, hygiene facilities and work practices.

Paint that contains a reportable level of lead (above the reporting limit) and contains less than 0.5% lead by weight when analyzed by AAS is considered to be lead-containing paint (LCP).

The following **component types** were confirmed to contain LCP.

Bridge ID E-17-JP:

- No components were confirmed to contain LCP during this inspection.

OSHA regulations do not define a minimum concentration of lead as a threshold for action (as the threshold for action is based on exposure assessment levels). Thus, even concentrations below the LBP level established by EPA/HUD/CDPHE are subject to hazard communication and exposure assessment provisions of the OSHA regulation.

To comply with EPA and CDPHE air, solid waste and water quality standards, appropriate work practices, engineering controls, and other precautions should be taken to ensure lead containing materials are not introduced into surrounding roadway, soil, road drainage systems, and waterways.

Additionally, lead-containing materials with a total lead content equal to or exceeding 0.01% by weight may exceed the EPA Resource Conservation and Recovery Act (RCRA) standard, and are subject to hazardous waste determination under EPA and CDPHE regulations. Representative waste characterization should be performed using the Toxicity Characteristic Leaching Process (TCLP) analytical method. The Toxicity Characteristic (TC) limit for lead is 5ppm in the leachate. Materials that exceed this limit must be disposed of as hazardous waste. Materials that do not exceed this limit may be disposed of as a solid waste.

Lead-containing materials shown to have a total lead content below 0.01% by weight are not expected to reach or exceed the RCRA limit for leachable lead, and need not be analyzed by TCLP.

Materials that are recycled such as metal components are not subject to waste characterization provisions under EPA and CDPHE, but proper disclosure of lead-containing materials should be provided to the recycling facility for hazard communication purposes.

The types and locations of LBP/LCP paint, and regulatory requirements should be disclosed to the renovation contractor to avoid accidental disturbance, and for contractor compliance with applicable regulations (to ensure proper worker protection and material disposal).

See Section 7 (Recommendations) for requirements prior to renovation/demolition activities that may impact LBP and LCP.

2. SITE/STRUCTURE INFORMATION

A site map showing the location of the structure is provided in the appendices. The following summary provides specific structure, scope of inspection, areas inspected and functional space information relevant to the inspection.

Bridge Structure ID E-17-JP is located on Interstate I-70 over Havana Street at mile post 280.667 in Denver, Colorado. The bridge is approximately 218 feet long and 139 feet wide. The bridge was constructed in 1964 of concrete with steel girders and steel guard rails.



Photo 1 – View of Bridge Structure ID: E-17-JP

3. HOMOGENOUS AREA/MATERIAL INFORMATION

The following summary provides basic information for specific homogeneous areas/materials, including location, description, dimensions, and other observations. This summary also identifies those areas that were inaccessible and could not be inspected, which will require inspection prior to renovation activities.

Two (2) homogeneous materials were identified on the bridge as suspect asbestos-containing building materials and sampled during the inspection. These materials are summarized below and in Section 5 of this report.

Bridge ID E-17-JP:

- Asphalt road material, granular with black tar, fibrous tar impregnated water membrane at concrete (ARB01)
- Expansion joint material, brown, fibrous, located at the east and west seams beneath the bridge deck (EJM01)

4. INSPECTION METHODOLOGY

4.1. Asbestos-Containing Building Material

The sampling and asbestos investigation process was conducted in accordance with standards of the AHERA under Title 40 of the Federal Register, CDPHE Regulation 8, and other applicable industry standards (including EPA, NESHAP, OSHA asbestos regulations, and asbestos regulations.) Asbestos inspection activities were conducted by AHERA and State of Colorado accredited personnel.

The scope of the asbestos inspection was to identify ACBM and included the following steps:

- Visual inspection of all accessible areas of the structure to identify suspect materials.
- Visual inspection of all areas of suspect homogeneous and non-homogeneous ACBM.
- Determination of friability by touching all suspect ACBM.
- Development of a sampling plan for each material based on the homogeneous material type, friability, and accessibility and material locations. Homogeneous and non-homogeneous material samples were submitted for laboratory analysis by Polarized Light Microscopy (PLM).

A homogeneous area (material) is defined as an area containing a material that appears similar throughout with regard to color, texture, and date of application. Individual systems that were inspected, but not suspected to contain asbestos, are not included in this report. Such systems include concrete, carpet, fiberglass, plastic, and wood products.

Each type of suspect building material (homogeneous) was assigned an alpha material code, followed by a number to identify the different varieties of that building material. For example, ceiling tiles are designated by the material code of CT. Each type of ceiling tile was denoted by subsequent “type” number (CT-01, CT-02, etc). Material size, thickness, substrate, material friability, location, and quantity were recorded. Material information was recorded on a room-by-room (functional space) inventory form.

The homogeneous material was classified into one of three available types of homogeneous material descriptions.

- **Surfacing Material** refers to a wide range of trowel or spray-applied materials typically used for acoustical or fireproofing purposes. Examples include spray-applied fireproofing and acoustical texture ceilings.
- **Thermal System Insulation (TSI)** refers to insulation that is applied to heating or mechanical system components. Examples include pipe, tank and boiler insulation.
- **Miscellaneous Materials** refers to all other materials that do not fall into one of the above categories. Examples include floor tile, adhesives, and ceiling tiles.

Once the type of homogeneous material was determined it was then classified as friable or non-friable. The EPA distinguishes between friable and non-friable forms of ACBM. Friable materials can be crumbled or reduced to powder by hand pressure, whereas non-friable materials cannot. Friable materials are more likely to be released into the air, especially during renovation and renovation of the structure. Therefore, the distinction between friable and non-friable homogeneous material is important.

The following Bulk Sampling protocol was used to determine the number of samples to be collected for friable materials and non-friable materials deemed potential ACBM.

Bulk Sampling Strategy

Material	Homogeneous Area	Units	Minimum Number of Samples
Friable Surfacing	Less than 1000	SF	3
	1000 to 5000		5
	More than 5000		7
Non-friable Surfacing		SF	3
Friable and Non-Friable Thermal System Insulation		LF / SF / EA	3*
Friable and Non-Friable Miscellaneous Materials		LF / SF / EA	3*

* One sample was collected for limited quantity replacement or patch (salient) materials.

Quality control samples (QC) are collected with every 20th sample and submitted to a laboratory different from the one to which the primary samples are submitted. The primary and QC samples are collected side-by-side. The primary and QC sample results are reviewed and any discrepancies are noted.

4.2. Lead-Based Paint

Walsh conducted a limited LBP screening at the site by collecting a limited number of representative paint chip samples that were analyzed by AAS for lead content. The limited LBP screening was conducted due to planned renovation of the structure and is solely for general disclosure purposes to provide contractors with information regarding those materials containing the highest levels of lead, to supplement presumption that all painted surfaces contain some level of lead. This disclosure is provided to those employers that may impact painted materials about general conditions that may be encountered for a particular structure. The screening is also conducted to provide general information regarding renovation/renovation waste characterization/disposition (proper disposal).

The lead screening used bulk paint chip sampling methods adapted from the HUD Guidelines for the Evaluation and Control of Lead-Based paint in Housing, June, 1995.

5. BULK SAMPLING AND LABORATORY ANALYSIS

5.1. Asbestos-Containing Building Material

As part of the inspection, bulk samples of the homogeneous materials were collected by accredited asbestos inspectors in a random and representative manner as determined by each inspector. Samples were collected by taking a core sample that included all layers within the suspect material. Samples from soft friable materials were obtained by removing a small portion using wetting techniques. All samples were placed in sealed, labeled containers, and the sample descriptions and locations were recorded. Digital photographs were also taken to provide a visual reference for each material. At the time of collection, samples were labeled with an appropriate and unique number. This number (along with other information such as sample location, color, texture, and condition) was recorded in the Sample Log.

The inspector delivered the samples along with a completed chain-of-custody document to the laboratory. The laboratory then arranged the samples in numerical order. If a discrepancy between the samples exists, this is noted and initialed on the log sheet. The laboratory signed a copy of the sample log to acknowledge receipt. The inspector retained the signed copy for evidentiary purposes. Further, the laboratory assigned a laboratory number to each sample received. The laboratory labeled both the analytical report and the sample container with this laboratory number for cross-reference purposes.

The bulk samples were submitted to Reservoirs Environmental, Inc., a National Voluntary Laboratory Accreditation Program (NVLAP) accredited laboratory. Samples are typically submitted for progressive analysis (positive stop). Under progressive analysis, once a positive result is obtained within a sample set, all subsequent samples within that set are not analyzed (as a cost savings measure).

Analysis of the bulk samples was performed using PLM using procedures developed by McCrone Research Institute, and in compliance with the guidelines established by the Environmental Protection Agency (EPA-600/M4-82-020, Dec. 1982) to determine asbestos type and content. The PLM samples are reported as percent asbestos by weight. Percent asbestos for separate layers and total for the sample are delineated in the laboratory report. Unused portions of samples are archived for six months unless the client requests special handling.

As of November 20, 1990, the EPA NESHAP requires that friable materials containing less than 10 percent asbestos be analyzed by the point-count procedure, or must be assumed positive for asbestos. CDPHE regulations require that if the asbestos content of a sample of friable asbestos is estimated to be 1% asbestos or less, but greater than 0%, by a method other than point counting (such as visual estimation), the determination shall be repeated using the point counting technique with polarized light microscopy. If a result obtained by point count is different from a result obtained by visual estimation, the point count result must be used. Tar impregnated samples do not have to be point counted. The laboratory analytical reports are located in Appendix D of this report.

The following summary provides specific information for suspect homogeneous materials identified, bulk sampling, and analytical results.

TABLE 1 - SUMMARY OF ASBESTOS ANALYSIS

Sample IDs	Material Description	Material Condition	Analytical Result	Approximate Quantity
E-17-JP-ARB01-01 E-17-JP-ARB01-02 E-17-JP-ARB01-03	Asphalt road base, black/brown, granular, with tar, tar impregnated waterproofing membrane, deck of the bridge	Good	None Detect	30,302 Square Feet
E-17-JP-EJM01-01 E-17-JP-EJM01-02 E-17-JP-EJM01-03	Expansion joint material, brown, woven, fibrous, located at the east and west bridge seams beneath the bridge deck	Good	None Detect	~278 Linear Feet



Photo 2 – View of asphalt road material – ARB01



Photo 3 – View of brown expansion joint material – EJM01

5.2. Lead-Based Paint

Paint (chip) samples were collected by physically removing a small portion approximately 2 inches square using a cutting or coring tool. Each sample was placed into a sealed and labeled container, and sample locations and descriptions were recorded.

The inspector delivered the samples along with a completed chain-of-custody document to the laboratory. The laboratory then arranged the samples in numerical order. If a discrepancy between the samples exists, this is noted and initialed on the log sheet. The laboratory signed a copy of the sample log to acknowledge receipt. The inspector retained the signed copy for evidentiary purposes. Further, the laboratory assigned a laboratory number to each sample received. The laboratory labeled both the analytical report and the sample container with this laboratory number for cross-reference purposes.

The paint chip samples were submitted to Reservoirs Environmental, Inc. for analysis by AAS. The following summary provides the results of lead analysis by AAS.

TABLE 2 - SUMMARY OF PAINT ANALYSIS

Sample IDs	Paint Description – Sample Location	Material Condition	Analytical Result %	Status*
E-17-JP-LBP01	Brown paint located on structural steel girders beneath the bridge deck – S side of S girder, 10' f E	Good	7.745	LBP
E-17-JP-LBP02	Tan paint located on concrete foundation/wall – east wall, 65' f S, 3' up	Good	<0.004	ND

LBP – Lead-Based Paint

LCP – Lead-Containing Paint

ND – None Detected, Below Reporting Limit

The laboratory analytical reports are located in Appendix D of this report.



Photo 4 – View of brown paint on structural steel beam – LBP01



Photo 5 – View of tan paint on concrete wall – LBP02

6. FINDINGS

6.1. Asbestos-Containing Building Material

EPA and CDPHE define ACBM as any building material containing greater than 1% asbestos.

No ACBMs were identified by this inspection. No materials containing trace-1% asbestos were identified by this inspection.

6.2. Lead-Based Paint

EPA, Housing and Urban Development (HUD) and CDPHE define LBP as paint with a lead content greater than or equal to 1.0 mg/cm² using XRF analysis, or 0.5% weight when analyzed by AAS.

The following **component types** were confirmed to contain LBP.

Bridge ID E-17-JP:

- Brown paint located on structural steel girders beneath the bridge deck (LBP01).

Renovation activities involving LBP are subject to the OSHA Construction Industry Standard for Lead (Title 29 CFR, Part 1926.62). This standard is similar to other OSHA standards in that it addresses such issues as worker training, medical evaluations, personal protective equipment, exposure assessment, air monitoring, hygiene facilities and work practices.

Paint that contains a reportable level of lead (above the reporting limit) and contains less than 0.5% lead by weight when analyzed by AAS is considered to be lead-containing paint (LCP).

The following **component types** were confirmed to contain LCP.

Bridge ID E-17-JP:

- No components were confirmed to contain LCP during this inspection.

7. RECOMMENDATIONS

7.1. Asbestos-Containing Building Material

No ACBMs were identified during this inspection.

7.2. Lead-Based Paint

Renovation activities involving LBP are subject to the OSHA Construction Industry Standard for Lead (Title 29 CFR, Part 1926.62). This standard is similar to other OSHA standards in that it addresses such issues as worker training, medical evaluations, personal protective equipment, exposure assessment, air monitoring, hygiene facilities and work practices.

OSHA regulations do not define a minimum concentration of lead as a threshold for action (as the threshold for action is based on exposure assessment levels). Thus, even concentrations below the LBP level established by EPA/HUD/CDPHE are subject to hazard communication and exposure assessment provisions of the OSHA regulation.

To comply with EPA and CDPHE air, solid waste and water quality standards, appropriate work practices, engineering controls, and other precautions should be taken to ensure lead containing materials are not introduced into surrounding roadway, soil, road drainage systems, and waterways.

Additionally, lead containing materials with a total lead content equal to or exceeding 0.01% by weight may exceed the RCRA standard, and are subject to hazardous waste determination under EPA and CDPHE regulations. Representative waste characterization should be performed using the Toxicity Characteristic Leaching Process (TCLP) analytical method. The Toxicity Characteristic (TC) limit for lead is 5ppm in the leachate. Materials that exceed this limit must be disposed of as hazardous waste. Materials that do not exceed this limit may be disposed of as a solid waste.

Lead-containing materials shown to have a total lead content below 0.01% by weight are not expected to reach or exceed the EPA RCRA limit for leachable lead, and need not be analyzed by TCLP.

Materials that are recycled such as metal components are not subject to waster characterization provisions under EPA and CDPHE, but proper disclosure of lead containing materials should be provided to the recycling facility for hazard communication purposes.

The types and locations of LBP/LCP paint, and regulatory requirements should be disclosed to the renovation contractor to avoid accidental disturbance, and for contractor compliance with applicable regulations (to ensure proper worker protection and material disposal).

8. LIMITATIONS

No survey can completely eliminate the uncertainty regarding the presence of asbestos-containing materials, lead-based paint and other hazardous material. The level of diligence and investigative procedures utilized are intended to reduce, but not eliminate potential uncertainty regarding the presence of these materials. The procedures used for this survey attempted to establish a balance between the competing goals of inspection cost, time and aesthetic damage. The determinations of this report should not be construed as a guarantee that all such materials present in the subject property have been identified in the report.

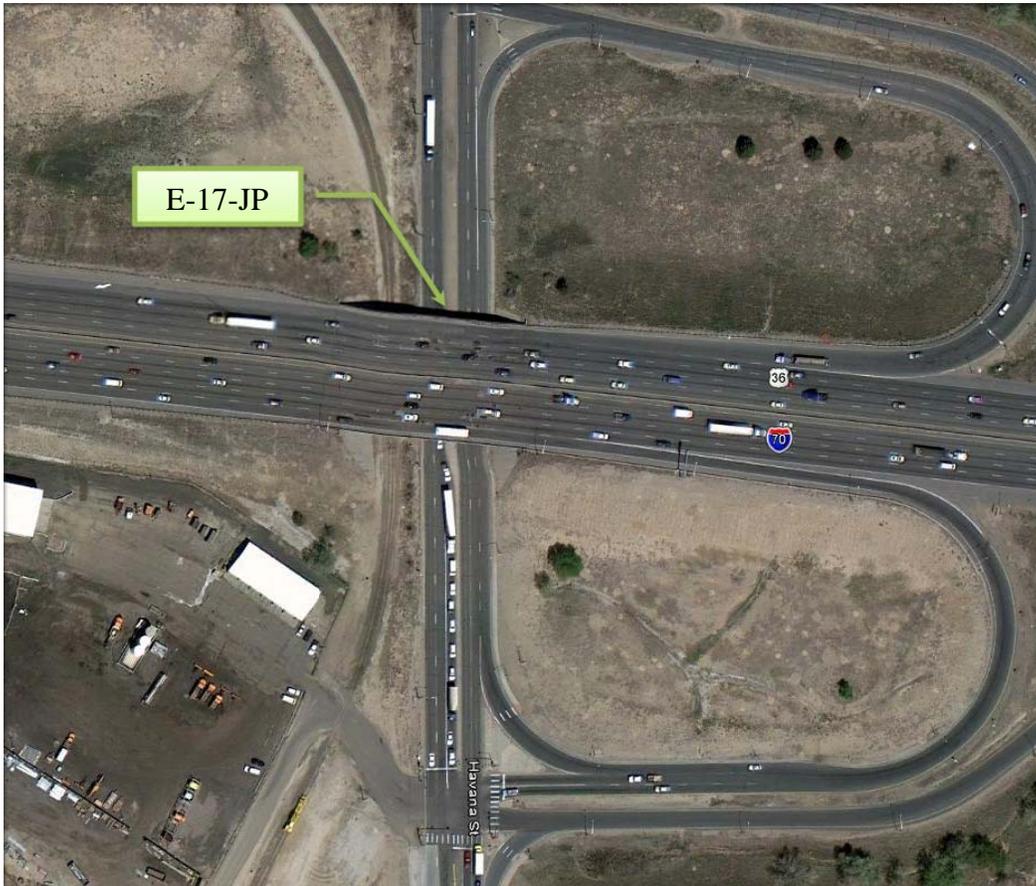
The inspection was performed in a manner consistent with the level of care and expertise exercised by members of the asbestos inspection and assessment profession. Those entities and persons involved with the inspection and generation of this report do not imply or guarantee that all potential asbestos-containing materials on or in the structure has been identified or sampled. Historically, asbestos has been added as a component to over 3,000 materials and products produced in the United States. The inspection was intended to identify those accessible materials that were reasonably suspect and that were most likely to contain asbestos in quantities subject to regulation, based on existing industry and regulatory standards.

This was a renovation specific inspection, and is not considered a pre-demolition survey, which may require additional destructive investigation activities prior to any planned structure demolition activities. However, pre-renovation inspections of bridge structures typically do not require additional investigations due to the nature of construction of the bridge.

Drawings and diagrams contained in this report are for informational purposes only, and proportion and scales are approximate.

APPENDIX A

SITE LOCATION FIGURE



Aerial view of bridge structure ID E-17-JP

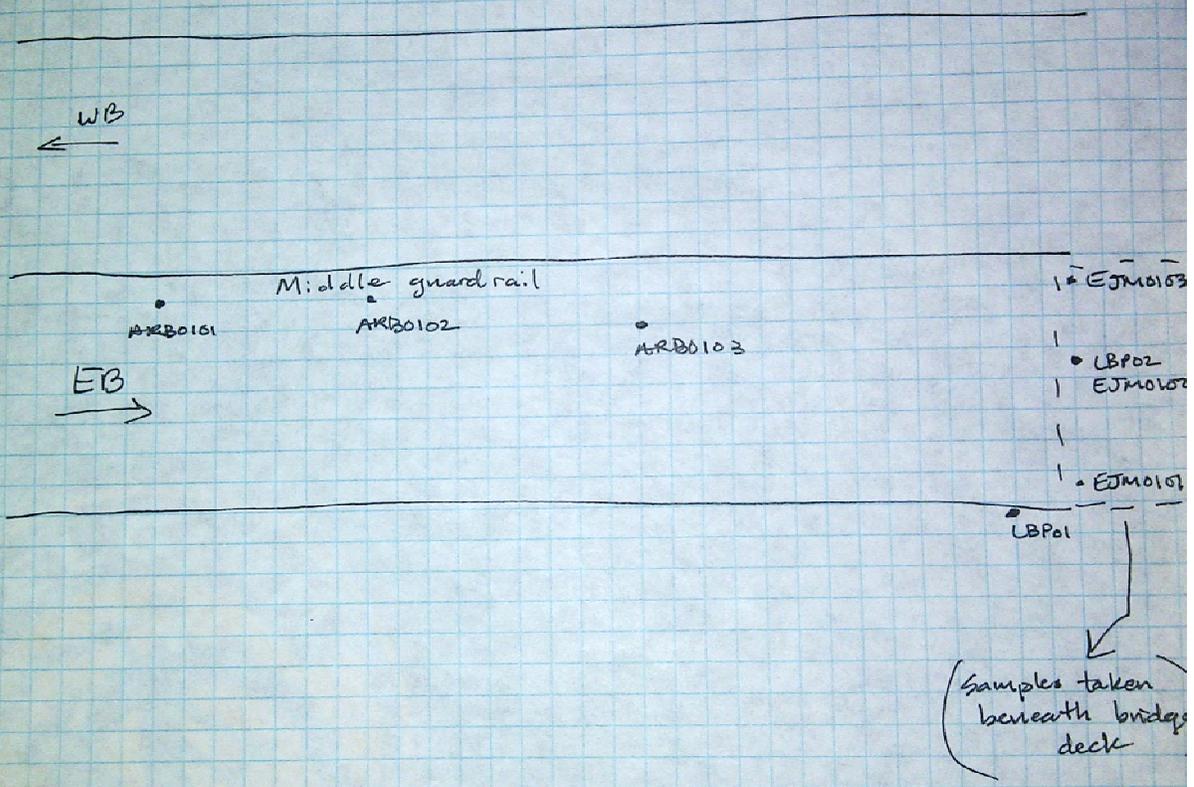
APPENDIX B

FIELD DRAWINGS

(ASBESTOS AND PAINT SAMPLE LOCATIONS)

E-17-JP

I-70 over Havana



↑
N

Not to scale)

APPENDIX C

FIELD INSPECTION WORKSHEETS

HOMOGENOUS MATERIAL SAMPLING FORM

HOMOGEN. MAT. ID

ARB01

To: Project File Project #: WA-000744-0062
 Date: 03/29/12 Inspector(s): Patrick

Building ID: E-17-JP
 Project/Facility: CDOT Bridge E-17-JP

Suspect Homogenous Material Information

Homogenous Material Description (Size, thickness, color, pattern, associated material etc.)	Type (circle)	Friability (circle)	Material Photograph
<u>Black / brown, granular, tar, fibrous tar impregnated felt waterproofing membrane at concrete</u>	<u>S</u> <u>T</u> <u>M</u>	<u>NFT(I)</u> <u>NFT(II)</u> <u>F</u>	<input checked="" type="checkbox"/> Photo Taken? Photo ID _____ Sample # _____

Suspect Homogenous Material Sampling Information

Sample # Prefix	Sample Location	Analytical Result* (See Codes Below)		
		Layer	% and Type	Method
<u>E-17-JP</u>	<u>45' FW, 10' S of mid guardrail</u>	<u>Asphalt</u>	<u>ND</u>	<u>PLM</u>
Room ID <u>E-17-JP</u> Mat'l Code <u>ARB01</u> Sequence #: <u>01</u>	<input checked="" type="checkbox"/> Location Noted on Drawing? <input type="checkbox"/> QC	<input type="checkbox"/> Composite (CDW)	<input type="checkbox"/> Composite (CDW) w/ ACM	<input type="checkbox"/> Prag
<u>E-17-JP</u>	<u>67' FW, 10' S of mid guardrail</u>	<u>Asphalt</u>	<u>ND</u>	<u>PLM</u>
Room ID <u>E-17-JP</u> Mat'l Code <u>ARB01</u> Sequence #: <u>02</u>	<input checked="" type="checkbox"/> Location Noted on Drawing? <input type="checkbox"/> QC	<input type="checkbox"/> Composite (CDW)	<input type="checkbox"/> Composite (CDW) w/ ACM	<input type="checkbox"/> Prag
<u>E-17-JP</u>	<u>130' FW, 20' S of mid guard rail</u>	<u>Asphalt</u>	<u>ND</u>	<u>PLM</u>
Room ID <u>E-17-JP</u> Mat'l Code <u>ARB01</u> Sequence #: <u>03</u>	<input checked="" type="checkbox"/> Location Noted on Drawing? <input type="checkbox"/> QC	<input type="checkbox"/> Composite (CDW)	<input type="checkbox"/> Composite (CDW) w/ ACM	<input type="checkbox"/> Prag
<u>E-17-JP</u>	<u>130' FW, 20' S of mid guard rail</u>	<u>Asphalt</u>	<u>ND</u>	<u>PLM</u>
Room ID <u>E-17-JP</u> Mat'l Code <u>ARB01</u> Sequence #: <u>03</u>	<input checked="" type="checkbox"/> Location Noted on Drawing? <input type="checkbox"/> QC	<input type="checkbox"/> Composite (CDW)	<input type="checkbox"/> Composite (CDW) w/ ACM	<input type="checkbox"/> Prag
<u>E-17-JP</u>	<u>130' FW, 20' S of mid guard rail</u>	<u>Asphalt</u>	<u>ND</u>	<u>PLM</u>
Room ID <u>E-17-JP</u> Mat'l Code <u>ARB01</u> Sequence #: <u>03</u>	<input checked="" type="checkbox"/> Location Noted on Drawing? <input type="checkbox"/> QC	<input type="checkbox"/> Composite (CDW)	<input type="checkbox"/> Composite (CDW) w/ ACM	<input type="checkbox"/> Prag
<u>E-17-JP</u>	<u>130' FW, 20' S of mid guard rail</u>	<u>Asphalt</u>	<u>ND</u>	<u>PLM</u>
Room ID <u>E-17-JP</u> Mat'l Code <u>ARB01</u> Sequence #: <u>03</u>	<input checked="" type="checkbox"/> Location Noted on Drawing? <input type="checkbox"/> QC	<input type="checkbox"/> Composite (CDW)	<input type="checkbox"/> Composite (CDW) w/ ACM	<input type="checkbox"/> Prag
<u>E-17-JP</u>	<u>130' FW, 20' S of mid guard rail</u>	<u>Asphalt</u>	<u>ND</u>	<u>PLM</u>
Room ID <u>E-17-JP</u> Mat'l Code <u>ARB01</u> Sequence #: <u>03</u>	<input checked="" type="checkbox"/> Location Noted on Drawing? <input type="checkbox"/> QC	<input type="checkbox"/> Composite (CDW)	<input type="checkbox"/> Composite (CDW) w/ ACM	<input type="checkbox"/> Prag
<u>E-17-JP</u>	<u>130' FW, 20' S of mid guard rail</u>	<u>Asphalt</u>	<u>ND</u>	<u>PLM</u>
Room ID <u>E-17-JP</u> Mat'l Code <u>ARB01</u> Sequence #: <u>03</u>	<input checked="" type="checkbox"/> Location Noted on Drawing? <input type="checkbox"/> QC	<input type="checkbox"/> Composite (CDW)	<input type="checkbox"/> Composite (CDW) w/ ACM	<input type="checkbox"/> Prag

Inspection Comments (CCOD Database if ACBM) LABELING: Needed Not Needed Present CLEANING: Needed Not Needed

QA/QC / Internal Comments (File) QA/QC by Non-ACM TR-1%? ACM ANALYTICAL SUMMARY All ND = Non Detect

Signature: [Signature] Date: 03/29/12

*VE = Visual Estimate Result, PC = Point Count Result, CMP = Composite, Chy=Chrysotile, Am=Amosite, Cro=Crocidolite, NAPS= Not Analyzed Phase Step, NAAA = Not Analyzed Assumed Asbestos, NAD=No Asbestos Detected

Date: 03-29-2012

WALSH ENVIRONMENTAL SCIENTISTS AND ENGINEERS, LLC

Bldg: E-17-JP

Project ID: WA-000944-0062

PAINT CHIP SAMPLING DATA SHEET

Page 1 of 1

Sample #	Room/ Location	Substrate	Component Description	Visible Color	Multiple Paint Layers?	Paint Condition	Sample Location	Analytical Result (%)	LBP/LCP?
LBP01	E-17-JP	B (C) D (M) P W O	Girder	Brown	(Y) N	(G) F P	S side of S girder W. EE	7.745	(LBP) LCP ND
Comments									
LBP02	E-17-JP	B (C) D (M) P W O	Foundation/wall	Tan	Y (N)	(G) F P	65' FS on E wall, 3' up	BRL	LBP LCP (ND)
Comments									

		B C D M P W O			Y N	G F P			LBP LCP ND
Comments									
		B C D M P W O			Y N	G F P			LBP LCP ND
Comments									
		B C D M P W O			Y N	G F P			LBP LCP ND
Comments									
		B C D M P W O			Y N	G F P			LBP LCP ND
Comments									
		B C D M P W O			Y N	G F P			LBP LCP ND
Comments									
		B C D M P W O			Y N	G F P			LBP LCP ND
Comments									

Substrate: B=Brick; C=Concrete; D=Drywall; M=Metal; P=Plaster; W=Wood; O=Other (note in Comments) Paint Condition: G=Good; F=Fair; P=Poor
 LBP: >or = 0.500%; LCP: <0.500% and >Reporting Limit; ND: BRL (Below Reporting Limit)

Inspector/Sampler Signature

APPENDIX D

LABORATORY REPORTS AND CHAIN-OF-CUSTODY FORMS

April 2, 2012

Laboratory Code: RES
Subcontract Number: NA
Laboratory Report: RES 232800-1
Project # / P.O. # WA-000944-0062-10TTO
Project Description: CDOT Bridge E-17-JP

Patrick Engels
Walsh Environmental - (Boulder)
4888 Pearl E. Circle Suite 108
Boulder CO 80301

Dear Customer,

Reservoirs Environmental, Inc. is an analytical laboratory accredited for the analysis of Industrial Hygiene and Environmental matrices by the National Voluntary Laboratory Accreditation Program (NVLAP), Lab Code 101896-0 for Transmission Electron Microscopy (TEM) and Polarized Light Microscopy (PLM) analysis and the American Industrial Hygiene Association (AIHA), Lab ID 101533 - Accreditation Certificate #480 for Phase Contrast Microscopy (PCM) analysis. This laboratory is currently proficient in both Proficiency Testing and PAT programs respectively.

Reservoirs Environmental, Inc. has analyzed the following samples for asbestos content as per your request. The analysis has been completed in general accordance with the appropriate methodology as stated in the attached analysis table. The results have been submitted to your office.

RES 232800-1 is the job number assigned to this study. This report is considered highly confidential and the sole property of the customer. Reservoirs Environmental, Inc. will not discuss any part of this study with personnel other than those of the client. The results described in this report only apply to the samples analyzed. This report must not be used to claim endorsement of products or analytical results by NVLAP or any agency of the U.S. Government. This report shall not be reproduced except in full, without written approval from Reservoirs Environmental, Inc. Samples will be disposed of after sixty days unless longer storage is requested. If you have any questions about this report, please feel free to call 303-964-1986.

Sincerely,



Jeanne Spencer Orr
President



Analyst(s): _____

Paul D. LoScalzo	Wenlong Liu
Michael Scales	Adam Humphreys
Anita Grigg	Robert R. Workman Jr.
Bethany Nichols	Anya Angst

RESERVOIRS ENVIRONMENTAL, INC.

NVLAP Lab Code 101896-0

TDH Licensed Laboratory # 30-0136

TABLE PLM BULK ANALYSIS, PERCENTAGE COMPOSITION BY VOLUME

RES Job Number: **RES 232800-1**
 Client: **Walsh Environmental - (Boulder)**
 Client Project Number / P.O.: **WA-000944-0062-10TTO**
 Client Project Description: **CDOT Bridge E-17-JP**
 Date Samples Received: **March 30, 2012**
 Analysis Type: **PLM, Short Report**
 Turnaround: **24 Hour**
 Date Analyzed: **March 30, 2012**

Client Sample Number	Lab ID Number	L A Y E R	Physical Description	Sub Part (%)	Asbestos Content		Non Asbestos Fibrous Components (%)	Non-Fibrous Components (%)
					Mineral	Visual Estimate (%)		
E-17-JP-ARB01-01	EM 112365	A	Brown fibrous material w/ black tar	100		ND	70	30
E-17-JP-ARB01-02	EM 112366	A	Brown fibrous material w/ black tar	100		ND	70	30
E-17-JP-ARB01-03	EM 112367	A	Tan resinous material	TR		ND	0	100
		B	Brown fibrous material w/ black tar	100		ND	70	30
E-17-JP-EJM01-01	EM 112368	A	Black fibrous tar	5		ND	35	65
		B	Brown soil	15		ND	TR	100
		C	Black granular tar	80		ND	0	100
E-17-JP-EJM01-02	EM 112369	A	Brown soil	10		ND	TR	100
		B	Black fibrous tar	15		ND	40	60
		C	Black granular tar	75		ND	TR	100
E-17-JP-EJM01-03	EM 112370	A	Brown soil	20		ND	TR	100
		B	Black granular tar	80		ND	TR	100

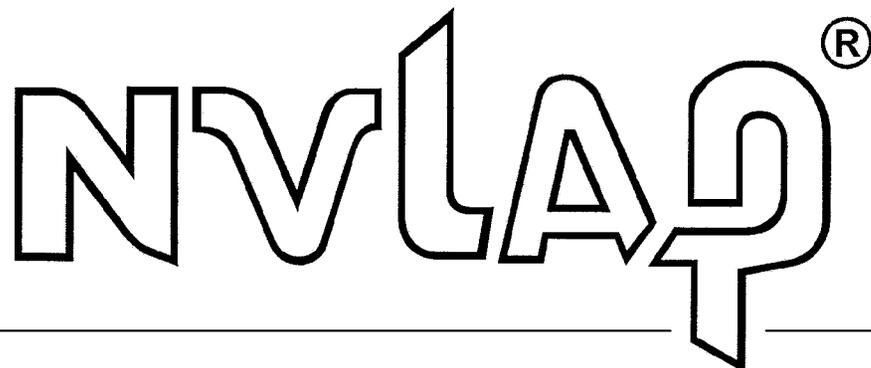
ND=None Detected

TR=Trace, <1% Visual Estimate

Trem-Act=Tremolite-Actinolite

Note: Further analysis by TEM is recommended for organically bound material (i.e. floor tile) if PLM results are ≤1%.

United States Department of Commerce
National Institute of Standards and Technology



Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 101896-0

Reservoirs Environmental, Inc.
Denver, CO

*is accredited by the National Voluntary Laboratory Accreditation Program for specific services,
listed on the Scope of Accreditation, for:*

BULK ASBESTOS FIBER ANALYSIS

*This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005.
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality
management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).*

2011-07-01 through 2012-06-30

Effective dates



Sally J. Bruce
For the National Institute of Standards and Technology



March 30, 2012

Laboratory Code: RES
Subcontract Number: NA
Laboratory Report: RES 232800-2
Project # / PO #: WA-000944-0062-10TTO
Project Description: CDOT Bridge E-17-JP

Patrick Engels
Walsh Environmental - (Boulder)
4888 Pearl E. Circle Suite 108
Boulder CO 80301

Dear Customer,

Reservoirs Environmental, Inc. is an analytical laboratory accredited for the analysis of Industrial Hygiene and Environmental matrices by the American Industrial Hygiene Association, Lab ID 101533 - Accreditation Certificate #480. The laboratory is currently proficient in both PAT & ELPAT programs respectively.

Reservoirs has analyzed the following sample(s) using Atomic Absorption Spectroscopy (AAS) / Atomic Emission Spectroscopy - Inductively Coupled Plasma (AES-ICP) per your request. Reported sample results were not blank corrected. The analysis has been completed in general accordance with the appropriate methodology as stated in the analysis table. Results have been sent to your office.

RES 232800-2 is the job number assigned to this study. This report is considered highly confidential and the sole property of the customer. Reservoirs Environmental, Inc. will not discuss any part of this study with personnel other than those authorized by the client. The results described in this report only apply to the samples analyzed. This report shall not be reproduced except in full, without written approval from Reservoirs Environmental, Inc. Samples will be disposed of after sixty days unless longer storage is requested. If you should have any questions about this report, please feel free to call me at 303-964-1986.

Sincerely,

A handwritten signature in blue ink, appearing to read "Jeanne Spencer Orr", is written over a light blue horizontal line.

Jeanne Spencer Orr
President

RESERVOIRS ENVIRONMENTAL, INC.

5801 Logan St., Suite 100

Denver CO 80216

TABLE ANALYSIS: LEAD IN PAINT

RES Job Number: **RES 232800-2**
Client: **Walsh Environmental - (Boulder)**
Client Project Number / P.O.: **WA-000944-0062-10TTO**
Client Project Description: **CDOT Bridge E-17-JP**
Date Samples Received: **March 30, 2012**
Analysis Type: **USEPA SW846 3050B / AA (7420)**
Turnaround: **24 Hour**
Date Samples Analyzed: **March 30, 2012**

Client ID Number	Lab ID Number	Reporting Limit (%)	LEAD CONCENTRATION (%)
E-17-JP-LBP01	EM 874865	0.005	7.745
E-17-JP-LBP02	EM 874866	0.004	BRL

*** Unless otherwise noted all quality control samples performed within specifications established by the laboratory.**

Due Date: 4-2-12
 Due Time: 8:52a

RES LAB Reservoirs Environmental, Inc.
 5801 Logan St. Denver, CO 80216 • Ph: 303 954-1986 • Fax 303-477-4275 • Toll Free :866 RESI-ENV
 Pager : 303-509-2098

RES 232800
 Dum - 1/Pb-2

INVOICE TO: (IF DIFFERENT)

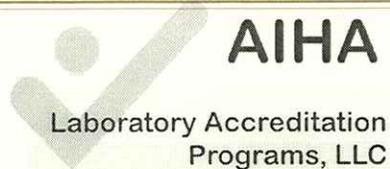
CONTACT INFORMATION:

Company: <u>Walsh Environmental</u>	Company:	Contact: <u>Patrick</u>	Contact:
Address:	Address:	Phone:	Phone:
		Fax:	Fax:
		Cell/pager: <u>303-570-5063</u>	Cell/pager:
Project Number and/or P.O. #: <u>WA-000944-0062-10 TTO</u>	Final Data Deliverable Email Address:		
Project Description/Location: <u>CDOT Bridge E-17-JP</u>	<u>penzels, dmilner, dhatcher @ walshenv.com</u>		

ASBESTOS LABORATORY HOURS: Weekdays: 7am - 7pm (PLM) PCM / TEM <u> </u> RUSH (Same Day) <u>X</u> PRIORITY (Next Day) <u> </u> STANDARD (Rush PCM = 2hr, TEM = 6hr.)	REQUESTED ANALYSIS												VALID MATRIX CODES		LAB NOTES: <u>-202</u> <u>339K</u>													
	CHEMISTRY LABORATORY HOURS: Weekdays: 8am - 5pm Metal(s) / Dust <u> </u> RUSH <u>X</u> 24 hr. <u> </u> 3-5 Day RCRA 8 / Metals & Welding <u> </u> RUSH <u> </u> 5 day <u> </u> 10 day Fume Scan / TCLP <u> </u> RUSH <u> </u> 5 day <u> </u> 10 day Organics <u> </u> 24 hr. <u> </u> 3 day <u> </u> 5 Day MICROBIOLOGY LABORATORY HOURS: Weekdays: 9am - 6pm E.coli O157:H7, Coliforms, S.aureus <u> </u> 24 hr. <u> </u> 2 Day <u> </u> 3-5 Day Salmonella, Listeria, E.coli, APC, Y & M <u> </u> 48 Hr. <u> </u> 3-5 Day Mold <u> </u> RUSH <u> </u> 24 Hr <u> </u> 48 Hr <u> </u> 3 Day <u> </u> 5 Day	Short report, Long report, Point Count	TEM - AHERA, Level II, 7402, ISO, +/-, Quant, Semi-quant, Micro-vac, ISO-Indirect Preps	PCM - 7400A, 7400B, OSHA	DUST - Total, Respirable	METALS Analyte(s) <u>Lead</u>	ORGANICS - METH	Salmonella: +/-	E.coli O157:H7: +/-	Listeria: +/-	Aerobic Plate Count: +/- or Quantification	E.coli: +/- or Quantification	Coliforms: +/- or Quantification	S.aureus: +/- or Quantification		Y & M: +/- or Quantification	Mold: +/-, Identification, Quantification	SAMPLER'S INITIALS OR OTHER NOTES	Air = A	Bulk = B	Dust = D	Paint = P	Soil = S	Wipe = W	Swab = SW	F = Food	Drinking Water = DW	Waste Water = WW
Special Instructions:	Client sample ID number (Sample ID's must be unique)	(PLM)															Sample Volume (L) / Area	Matrix Code	# Containers	Date Collected mm/dd/yy	Time Collected hh:mm a/p	EM Number (Laboratory Use Only)						
	1 <u>E-17-JP-ARB 01-01</u>	X															B	1		03-30-12		112365						
	2 <u>- ARB 01-02</u>	X																				66						
	3 <u>- ARB 01-03</u>	X																				67						
	4 <u>- EJM 01-01</u>	X																				68						
	5 <u>- EJM 01-02</u>	X																				69						
	6 <u>- EJM 01-03</u>	X																				70						
	7 <u>- LBP 01</u>	X				X											P					874865						
	8 <u>- LBP 02</u>	X				X											P					66						
	9																											
	10																											

Number of samples received: 5 (Additional samples shall be listed on attached long form.)
 NOTE: REI will analyze incoming samples based upon information received and will not be responsible for errors or omissions in calculations resulting from the inaccuracy of original data. By signing client/company representative agrees that submission of the following samples for requested analysis as indicated on this Chain of Custody shall constitute an analytical services agreement with payment terms of NET 30 days, failure to comply with payment terms may result in a 1.5% monthly interest surcharge.

Relinquished By: <u>[Signature]</u>	Date/Time: <u>03-30-12 @ 0850</u>	Sample Condition: On Ice <u> </u> Sealed <u> </u> Intact <u> </u>
Laboratory Use Only		Temp. (F°) <u> </u> Yes / No <u> </u> Yes / No <u> </u> Yes / No <u> </u>
Received By: <u>[Signature]</u>	Date/Time: <u>3/30/12 @ 8:52a</u> Carrier: <u>Frank</u>	
Results:	Contact Phone Email Fax Date Time Initials	Contact Phone Email Fax Date Time Initials
	Contact Phone Email Fax Date Time Initials	Contact Phone Email Fax Date Time Initials



AIHA

Laboratory Accreditation
Programs, LLC

AIHA Laboratory Accreditation Programs, LLC

acknowledges that

Reservoirs Environmental, Inc.

5801 Logan Street, Suite 100, Denver, CO 80216

Laboratory ID: 101533

has fulfilled the requirements of the AIHA Laboratory Accreditation Programs (AIHA-LAP), LLC thereby conforming to the ISO/IEC 17025:2005 international standard, *General Requirements for the Competence of Testing and Calibration Laboratories*. The above named laboratory, along with all premises from which key activities are performed, as listed above, have been accredited by AIHA-LAP, LLC in the following:

LABORATORY ACCREDITATION PROGRAMS

- | | |
|--|-----------------------------------|
| ✓ INDUSTRIAL HYGIENE | Accreditation Expires: 08/01/2012 |
| ✓ ENVIRONMENTAL LEAD | Accreditation Expires: 08/01/2012 |
| <input type="checkbox"/> ENVIRONMENTAL MICROBIOLOGY | Accreditation Expires: |
| ✓ FOOD | Accreditation Expires: 08/01/2012 |

Specific Field(s) of Testing (FoT)/Method(s) within each Accreditation Program for which the above named laboratory maintains accreditation is outlined on the attached **Scope of Accreditation**. Continued accreditation is contingent upon successful on-going compliance with AIHA-LAP, LLC requirements. This certificate is not valid without the attached **Scope of Accreditation**. Please review the AIHA-LAP, LLC website (www.aihaaccreditedlabs.org) for the most current scope of accreditation.

Dave Sandusky, CIH
Chairperson, Analytical Accreditation Board

Date Issued: 10/01/2010

APPENDIX E

REFERENCES

ACRONYMS AND ABBREVIATIONS

AAS	Atomic Absorption Spectrophotometry
ACM	Asbestos-Containing Materials
ACBM	Asbestos-Containing Building Materials
AHERA	EPA Asbestos Hazard Emergency Response Act
CDPHE	Colorado Department of Public Health and Environment
D/R	Demolition and/or Renovation
HUD	Housing and Urban Development
HVAC	Heating Ventilation and Air Conditioning
LBP	Lead-Based Paint
LCP	Lead-Containing Paint
NESHAPs	National Emission Standards for Hazardous Air Pollutants
NVLAP	National Voluntary Laboratory Accreditation Program
O&M	Asbestos Operations and Maintenance
OSHA	Occupational Safety and Health Administration
PACM	Presumed Asbestos-Containing Material
PEL	Permissible Exposure Limit
PLM	Polarized Light Microscopy
RACM	Regulated Asbestos-Containing Material
RCRA	Resource Conservation and Recovery Act
TCLP	Toxicity Characteristic Leaching Process
TSI	Thermal System Insulation
EPA	United States Environmental Protection Agency
WALSH	Walsh Environmental Scientists and Engineers, LLC

ASBESTOS REFERENCES

- United States Environmental Protection Agency, National Emission Standards for Hazardous Air Pollutants (NESHAP) 40 CFR 61.140-157.
- United States Environmental Protection Agency, Asbestos-Containing Materials in Schools; Final Rule and Notice (Asbestos Hazard Emergency Response Act - AHERA) 40 CFR 763.80-99, 1990.
- United States Environmental Protection Agency, Simplified Sampling Scheme for Surfacing Materials (“Pink Book”) EPA publication #560/5-85-030a, Washington DC, 1985.
- Occupational Safety and Health Administration, Asbestos Regulations for the Construction Industry 29 CFR 1926.1101, Washington DC, 1994.
- Occupational Safety and Health Administration, Asbestos Regulations for the General Industry 29 CFR 1910.1001, Washington DC, 1994.
- Colorado Department of Public Health and Environment, Regulation 8 - Emission Standards for Asbestos, 2008.

GLOSSARY

ASBESTOS – Asbestiform varieties of chrysotile, amosite (cumingtonitegrunerite), crocidolite, anthophyllite, tremolite, and actinolite.

ACBM (Asbestos-Containing Building Material) – A term that encompasses surfacing ACM, thermal system insulation ACM, or miscellaneous ACM that is found in or on interior structural members or other parts of a building. This definition also includes exterior hallways connecting buildings, porticos, and mechanical system insulation.

ACM (Asbestos-Containing Material) – Material with more than one percent (1%) asbestos.

BULK SAMPLE – A small portion (usually thumbnail size) of a suspect asbestos-containing building material collected by an asbestos inspector for laboratory analysis to determine asbestos content.

EPA (United States Environmental Protection Agency) – The EPA is the federal agency that governs environmental problems. In the case of ACBM in buildings, the EPA deals with regulations and their guidelines for application, renovation, removal, and disposal of ACBM in building structures.

FRIABLE – Material, when dry, may be crumbled, pulverized, or reduced to powder by hand pressure, and includes previously non-friable material after such previously non-friable material becomes damaged to the extent that when dry it may be crumbled, pulverized, or reduced to powder by hand pressure.

FUNCTIONAL SPACE – A room, group of rooms, or homogeneous area (including crawl spaces or the space between a dropped ceiling and the floor or roof deck above), such as a classroom(s), a cafeteria, gymnasium, hallways, designated by a person certified to prepare management plans, design abatement projects, or conduct response actions.

HOMOGENEOUS AREA – An area of surfacing material, thermal system insulation material, or miscellaneous material that is uniform in color and texture.

INACCESSIBLE AREA – Inaccessible areas are those areas which cannot be inspected due to physical barriers. Buildings may contain areas that are intrinsically inaccessible. These include gaps and spaces in walls, areas above fixed ceilings and below floors, and enclosed boiler breechings and ducts. Some buildings contain other inaccessible areas, such as very small pipe tunnels, sealed crawl spaces, unsafe attics, encased boilers, etc.

NON-FRIABLE – A material which, when dry, may not be crumbled, pulverized, or reduced to powder by hand pressure.

PLM (Polarized Light Microscopy) – An accepted method for analyzing bulk samples to determine asbestos content.

RACM – Regulated Asbestos-Containing Material. Any material with more than one percent (1%) asbestos and is required to be removed prior to renovation activities.

APPENDIX F

CONSULTANT CREDENTIALS

STATE OF COLORADO

ASBESTOS CERTIFICATION*

Colorado Department of Public Health
and Environment
Air Pollution Control Division

This certifies that

Patrick Engels

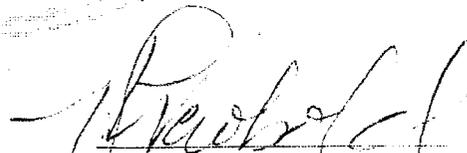
Certification No: 17384

has met the requirements of 25-7-507, C.R.S. and Air Quality Control
Commission Regulation No. 8, Part B, and is hereby certified by the
state of Colorado in the following discipline:

Building Inspector*

Issued: 6/18/2011

Expires on: 6/18/2012


Authorized APCD Representative

** This certificate is valid only with the possession of a current Division-approved training course
certification in the discipline specified above.*

SEAL

ACCLAIM ENVIRONMENTAL
S E R V I C E S I N C

14367 Lakeview Lane, Broomfield, Colorado 80023
Tel: 303.424.4647
Fax: 303.432.8669

CERTIFIES THAT

PATRICK ENGLES

Has successfully completed

The **EPA-Approved AHERA Annual Refresher Course** for INSPECTOR. This course is EPA-approved under Section 206 of the Toxic Substances Control Act (TSCA) and meets the requirements of Colorado Regulation No. 8.

Course Date: 06/15/11
Exam Date: N/A
Certificate No.: AE11-042-BI-R-04
Expiration Date: 06/15/12


K. Jay Gale, President

STATE OF COLORADO
ASBESTOS CONSULTING FIRM

Colorado Department of Public Health
and Environment
Air Pollution Control Division

This certifies that

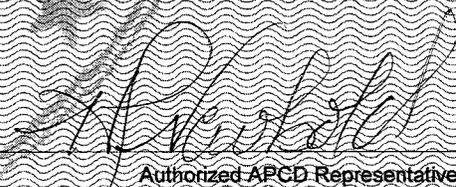
Walsh Environmental Scientists & Engineers

Registration No. ACF - 494

has met the registration requirements of 25-7-507, C.R.S. and the Air Quality Control Commission Regulation No. 8, Part B, and is hereby authorized to perform asbestos consulting activities as required under Regulation No 8, Part B, in the state of Colorado.

Issued: January 30, 2012

Expires: January 30, 2013



Authorized APCD Representative

SEAL