ASBESTOS INVESTIGATION TECHNICAL MEMORANDUM
ASBESTOS ASSESSMENT SURVEY

Prepared for

New York State Department of Transportation
PIN 9806.82.101
Route 97 over Pea Brook
Bridge Replacement
BINs 1035450, 1035460, and 1035470
Town of Long Eddy, Delaware County, New York

SCE Project No. R13125.28

By

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1.0 BACKGROUND

The New York State Department of Transportation (NYSDOT), Region 9 is in the design phase of the Bridge Replacement of Three (3) Bridges over Pea Brook. The project includes three (3) bridge replacements on Route 97 over Pea Brook in the Town of Long Eddy, Delaware County, New York (PIN 9806.82.101) identified as BINs 1035450, 1035460, and 1035470.

Shumaker Consulting Engineering & Land Surveying, D.P.C. (SCE) was contracted by the NYSDOT to complete an Asbestos Assessment Survey for the identification of asbestos-containing material (ACM) at the bridges and to recommend asbestos removal measures, if needed, prior to demolition, reconstruction, and replacement activities.

This “Asbestos Assessment Investigation Technical Memorandum” identifies materials that were determined to be ACM from sampling and testing performed. This report describes the work performed and the analytical results obtained. The survey was limited to materials that were exposed or accessible. SCE was granted access to the structures for the purpose of bulk sample collection by NYSDOT. SCE maintained safety standard policies as set forth by NYSDOT.
2.0 SAMPLING METHODOLOGY

ASBESTOS SURVEY REQUIREMENT: New York State Department of Labor (NYSDOL) Industrial Code Rule 56 (ICR 56) requires an asbestos survey to be completed by a licensed asbestos contractor using inspectors certified in compliance with Section 56-3.2(d), to determine whether or not the building or structure, or portion(s) thereof to be demolished, renovated, remodeled, or have repair work, contains ACM, presumed ACM (PACM), or suspect ACM (SACM).

The asbestos survey includes a thorough inspection for and identification of all PACM, SACM, or known asbestos material throughout the building/structure or portion thereof to be demolished, renovated, remodeled, or to have repair work. The required inspection must be performed by a certified asbestos inspector and include identification of materials by the following methods:

1. Review of building/structure plans and records, if available, for references to asbestos, ACM, PACM, or miscellaneous SACM used in construction, renovation or repair.

2. Visual inspection for PACM and miscellaneous SACM throughout the building/structure or portion thereof to be demolished, renovated, remodeled, or repaired. All PACM and miscellaneous SACM observed is assumed to be ACM and must be treated and handled as ACM, unless bulk sampling is conducted as per standard United States Environmental Protection Agency (USEPA) and Occupational Safety and Health Administration (OSHA) accepted methods (including multi-layered systems sampling protocols); the subsequent analyses are performed by a laboratory that meets the requirements of ICR 56; and the analyses satisfies both New York State and Federal requirements, to document the material as non-ACM.
Prior Department bulk sample analysis records generated by either in-house or consultant inspection staff are considered in the inspector’s review, but not exclusively accepted as evidence of negative results. Materials shall be additionally sampled when plans, records, contributing uses/locations, or visual observations identify a material as SACM. Similarly, if the prior documentation is not sufficient to definitively indicate the material is asbestos, or the prior sampling and/or analysis does not meet currently accepted protocols (such as New York State Department of Health (NYSDOH) requirements), then additional sampling is warranted.

If additional sampling is not deemed necessary, an inspector’s narrative will discuss reasoning behind decision. All narrative discussions are broken down by bridge.

All asbestos sampling services were performed by NYSDOL-certified/EPA-accredited Asbestos inspectors. Sample locations were randomly chosen from each homogeneous sample area so as not to bias sample results. However, samples were preferentially collected from damaged areas and/or easily accessible locations. Following sample extraction, a thin coat of encapsulant was applied to prevent future fiber release. The sample was then placed in a referenced numbered vial or sample bag. The chain-of-custody information was completed, including the location, material type, and analyses to be performed. Samples obtained by SCE were sent to Paradigm Environmental Services, Inc. of Rochester, New York, for analyses.

All asbestos sampling services were performed by NYSDOL-certified/EPA-accredited Asbestos Inspectors. Sample locations were randomly chosen from each homogeneous sample area so as not to bias sample results. However, samples were preferentially collected from damaged areas and/or easily accessible locations. Following sample extraction, a thin coat of encapsulant was applied to prevent future fiber release. The sample was then placed in a referenced numbered vial or sample bag. The chain-of-custody information was completed, including the location, material type, and analyses to be performed. Samples obtained by SCE were sent Paradigm Environmental Services, Inc. of Rochester, New York, for analyses.
3.0 ANALYTICAL PROTOCOL

A material is considered to be asbestos-containing under OSHA regulation 29 CFR 1926.1101, if it is demonstrated by approved laboratory techniques that bulk samples from a homogeneous sampling area contain greater than one percent (>1%) asbestos by weight or if it is a PACM. A PACM is defined as thermal system insulations and surfacing material in a structure constructed no later than 1981. The designation of PACM may be refuted by the collection and analysis (<1% asbestos) of bulk samples in accordance with the triple-sampling and the 3-5-7 Rule protocol established in the Asbestos Hazard Emergency Response Act (AHERA).

In New York State, bulk samples are divided into three (3) categories: 1) friable materials, 2) non-friable materials, and 3) non-friable organically bound materials (NOB). Asbestos bulk samples can be analyzed by Polarized Light Microscopy (PLM). PLM utilizes a light microscope to identify asbestos fibers based on visual properties of the sample. Each is divided into sub-samples and mounted on four (4) slides in the same refractive index oil. Viewing of each slide is begun in a corner and progresses up, down, and across the scanning area. A stratified point count method is then performed to determine asbestos content. This enables the analyst to determine accurately the percentage of asbestos and non-asbestos components. This method is effective in determining asbestos content for friable and many non-friable materials.

NOB materials encompass a wide range of building materials that have an embedded flexible to rigid asphalt or vinyl matrix such as floor tiles, mastics, and roofing. The matrix composition of these materials limits the effectiveness of PLM analysis. In order to more accurately determine asbestos content, NOB samples are first Gravimetrically Reduced (GR) in accordance with NYS ELAP 198.4 protocol. After an initial sample weight is determined, the sample is reduced organically in a muffle furnace and then digested in acid. The sample is weighed again and compared to its initial weight. If the post-reduction (residue) weight is less than one percent (<1%) of the initial weight, it cannot be defined as an ACM.
If the post-reduction (residue) weight is greater than one percent (>1%) of the original sample weight, the sample is analyzed by PLM analysis. If the PLM analysis results in asbestos concentrations greater than one percent (>1%), the sample is identified as an ACM. If the analysis indicates asbestos concentrations less than one percent (<1%), the sample then must be analyzed by Transmission Electron Microscopy (TEM) in order to finally determine if the NOB sample is an ACM.

Any one (1) positive sample from a homogeneous sampling area determines the material to be classified as asbestos-containing. In accordance with NYSDOT protocol, a “positive stop approach” is utilized. The laboratory is instructed to not analyze remaining samples from a given homogeneous sampling area following the first positive result. Any NOB homogeneous sampling area that yields all negative results by PLM after GR must have all samples undergo TEM analyses on a first positive basis. The material is determined not to be asbestos-containing if all samples are analyzed by TEM and found to be less than one percent (<1%) asbestos. The sampling and analytical protocols are depicted in Figure 3.1.
4.0 RESULTS

4.1 ROUTE 97 OVER PEA BROOK, BIN 1035450, TOWN OF LONG EDDY, DELAWARE COUNTY, NY

ACM was not identified at this bridge structure located on Route 97 over Pea Brook (BIN 1035450) in the Town of Long Eddy, Delaware County, New York. The bridge is a concrete tee beam structure, with two (2) concrete abutments spanning Pea Brook.

SCE reviewed record plans dated 1933 and identified suspect ACMs are summarized in the following table:

<table>
<thead>
<tr>
<th>RECORD PLAN DATE</th>
<th>SUSPECT ACM</th>
<th>LOCATION/COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1933</td>
<td>Premoulded Joint</td>
<td>Placed on the North Abutment, Between Top of Backwall and Bearings</td>
</tr>
<tr>
<td>1933</td>
<td>Vitrified Tile Drain (4” Diameter)</td>
<td>Drainage Pipes within Abutments</td>
</tr>
</tbody>
</table>

Premoulded Joint material was indicated to exist at the north abutment between top of backwall and bearings. A similar material was observed during the field assessment on the north abutment at the top of backwall, and identified as suspect Bridge Seat Pad and sampled during the field assessment. Vitrified Tile Drains were indicated to be present within the north and south abutment. This material was observed, and identified as suspect Clay Pipe and sampled during the field assessment.

SCE performed asbestos assessment and sample collection on July 21, 2014. A total of 12 samples were collected of four (4) homogeneous materials for the bridge structure. Copies of the chain-of-custody and analytical results are included in Appendix B.
Samples were analyzed in accordance with NYS ELAP 198.4 Methodology. GR/PLM/TEM analyses were performed on samples utilizing NYSDOT Protocol. Analytical results determined that Bridge Seat Pad, Clay Pipe, Masonry Coating, and Underlayment are not ACM. Detailed information including location, suspect materials, approximate quantities, determination of condition, removal options, and NYSDOT specification numbers can be found in Appendix A. The laboratory reports for the bridge are attached in Appendix B. Refer to these appendices for more detailed information.

4.2 ROUTE 97 OVER PEA BROOK, BIN 1035460, TOWN OF LONG EDDY, DELAWARE COUNTY, NY

ACM was not identified at this bridge structure located on Route 97 over Pea Brook (BIN 1035460) in the Town of Long Eddy, Delaware County, New York. The bridge is a concrete tee beam structure, with two (2) concrete abutments spanning Pea Brook.

SCE reviewed record plans dated 1933 and identified suspect ACMs are summarized in the following table:

<table>
<thead>
<tr>
<th>RECORD PLAN DATE</th>
<th>SUSPECT ACM</th>
<th>LOCATION/COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1933</td>
<td>Premoulded Felt</td>
<td>Placed on the North Abutment, Between Top of Backwall and Bearings</td>
</tr>
<tr>
<td>1933</td>
<td>Vitrified Tile Drain (4” Diameter)</td>
<td>Drainage Pipes within Abutments</td>
</tr>
</tbody>
</table>

Premoulded Joint material was indicated to exist at the north abutment between top of backwall and bearings. A similar material was observed during the field assessment on the north abutment at the top of backwall, and identified as suspect Bridge Seat Pad and sampled during the field assessment. Vitrified Tile Drains were indicated to be present within the north and south abutment. This material was observed, and identified as suspect Clay Pipe and sampled during the field assessment.
SCE performed asbestos assessment and sample collection on July 21, 2014. A total of 15 samples were collected of five (5) homogeneous materials for the bridge structure. Copies of the chain-of-custody and analytical results are included in Appendix B.

Samples were analyzed in accordance with NYS ELAP 198.4 Methodology. GR/PLM/TEM analyses were performed on samples utilizing NYSDOT Protocol. Analytical results determined that Masonry Coating, Clay Pipe, Seam Sealer, Bridge Seat Pad, and Underlayment are not ACM. Detailed information including location, suspect materials, approximate quantities, determination of condition, removal options, and NYSDOT specification numbers can be found in Appendix A. The laboratory reports for the bridge are attached in Appendix B. Refer to these appendices for more detailed information.

**4.3  ROUTE 97 OVER PEA BROOK, BIN 1035470, TOWN OF LONG EDDY, DELAWARE COUNTY, NY**

ACM was identified at this bridge structure located on Route 97 over Pea Brook (BIN 1035470) in the Town of Long Eddy, Delaware County, New York. The bridge is a concrete slab structure, with two (2) concrete abutments spanning Pea Brook.

SCE reviewed record plans dated 1933 and identified suspect ACMs are summarized in the following table:

<table>
<thead>
<tr>
<th>RECORD PLAN DATE</th>
<th>SUSPECT ACM</th>
<th>LOCATION/COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1933</td>
<td>Vitrified Tile Drain (4” Diameter)</td>
<td>Drainage Pipes within Abutments</td>
</tr>
</tbody>
</table>
Vitrified Tile Drains were indicated to be present within the north and south abutment. This material was observed, and identified as suspect Clay Pipe and sampled during the field assessment.

SCE performed asbestos assessment and sample collection on July 21, 2014. A total of six (6) samples were collected of two (2) homogeneous materials for the bridge structure. Copies of the chain-of-custody and analytical results are included in Appendix B.

Samples were analyzed in accordance with NYS ELAP 198.4 Methodology. GR/PLM/TEM analyses were performed on samples utilizing NYSDOT Protocol. Analytical results determined that Masonry Coating is not ACM. Analytical results determined that Seam Sealer (Gray) is ACM. Detailed information including location, suspect materials, approximate quantities, determination of condition, removal options, and NYSDOT specification numbers can be found in Appendix A. The laboratory reports for the bridge are attached in Appendix B. Refer to these appendices for more detailed information.
5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 ROUTE 97 OVER PEA BROOK, BIN 1035450, TOWN OF LONG EDDY, DELAWARE COUNTY, NY

ACMs were not identified at the bridge structure located in the Town of Long Eddy, Delaware County, New York. Neither NYSDOT asbestos specification item numbers nor New York State Department of Labor (NYSDOL) asbestos variances are needed.

5.2 ROUTE 97 OVER PEA BROOK, BIN 1035460, TOWN OF LONG EDDY, DELAWARE COUNTY, NY

ACMs were not identified at the bridge structure located in the Town of Long Eddy, Delaware County, New York. Neither NYSDOT asbestos specification item numbers nor NYSDOL asbestos variances are needed.

5.3 ROUTE 97 OVER PEA BROOK, BIN 1035470, TOWN OF LONG EDDY, DELAWARE COUNTY, NY

ACM was identified at this bridge structure as Seam Sealer (Gray). The proposed work consisting of bridge demolition as reported by Region 9, is anticipated to impact the Seam Sealer (Gray). Remove all Seam Sealer (Gray) prior to demolition activities.

Removal, transport, and disposal of ACM shall be performed in accordance with Federal, State, and Local regulations, including, but not limited to, those of the USEPA, OSHA, NYSDEC, and NYSDOL. Applicable regulations include National Emission Standards for Hazardous Air Pollutants (NESHAP) promulgated by USEPA and NYSDOL Industrial Code Rule 56 (ICR 56).
6.0 LIMITATIONS

The services described in this report were performed consistent with generally accepted professional principles and practices and with our agreement with our client. This report is for the use and information of our client, unless otherwise noted. Reliance on this report by another must be at their risk, unless, of course, we are consulted on the use or limitations.

Opinions and recommendations contained in this report apply to conditions existing when services were performed and are intended for our client, within the purposes, locations, timeframes, and project parameters indicated. We cannot be responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services without our further consultation. We can neither vouch for the accuracy of information supplied by others, nor accept consequences for unconsulted use of segregated portions of this report.

The Asbestos Assessment Survey performed, assessed the presence of accessible and/or exposed suspect ACMs. Although due diligence was given during the assessment, suspect ACMs may exist behind or beneath inaccessible spaces.
APPENDIX A

ASBESTOS ASSESSMENT SPREADSHEET
## ASBESTOS ASSESSMENT INVESTIGATION

**Project:** Bridge Replacement of Three Bridges over Pea Brook  
**County:** Delaware  
**PIN:** 9806.82.101  
**SCE No:** R13125.28

**Bridge Address:** Route 97 over Pea Brook  
Town of Long Eddy  
B1N 1035450  

**Inspected By:** A. Marsden  
T. Brown  
**Inspection Date:** 21-Jul-14

<table>
<thead>
<tr>
<th>AREA</th>
<th>LOCATION</th>
<th>TYPE OF MATERIAL</th>
<th>APPROXIMATE QUANTITY</th>
<th>CONDITION</th>
<th>ACM Y/N ASSUMED</th>
<th>FRIABLE F/NF</th>
<th>REMOVAL OPTIONS</th>
<th>SPECIFICATION ITEM NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underside</td>
<td>North Abutment, Between Bridge Seat and Concrete Tee Beams</td>
<td>Bridge Seat Pad</td>
<td>-</td>
<td>Fair</td>
<td>N</td>
<td>NF</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Underside</td>
<td>North and South Abutments at Lower Backwall Underdrains (2 per Abutment)</td>
<td>Clay Pipe (4&quot; Drain Pipe-Orange)</td>
<td>-</td>
<td>Fair</td>
<td>N</td>
<td>NF</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Underside</td>
<td>Throughout Exposed Concrete Surfaces</td>
<td>Masonry Coating</td>
<td>-</td>
<td>Fair</td>
<td>N</td>
<td>NF</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Topside</td>
<td>Applied to Bridge Deck Before Wearing Surface</td>
<td>Underlayment (Wearing Surface)</td>
<td>-</td>
<td>Fair</td>
<td>N</td>
<td>NF</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
# ASBESTOS ASSESSMENT INVESTIGATION

**Project:** Bridge Replacement of Three Bridges  
over Pea Brook  

**County:** Delaware  

**PIN:** 9806.82.101  

**SCE No:** R13125.28  

**Address:** Utica, New York 13502  

**Inspected By:** A. Marsden  

**Classification:**  

<table>
<thead>
<tr>
<th>AREA</th>
<th>LOCATION</th>
<th>TYPE OF MATERIAL</th>
<th>APPROXIMATE QUANTITY</th>
<th>CONDITION</th>
<th>ACM Y/N ASSUMED</th>
<th>FRIABLE F/NF</th>
<th>REMOVAL OPTIONS</th>
<th>SPECIFICATION ITEM NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underside</td>
<td>Throughout Exposed Concrete Surfaces</td>
<td>Masonry Coating</td>
<td>-</td>
<td>Fair</td>
<td>N</td>
<td>NF</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Underside</td>
<td>North and South Abutments at Lower Backwall Underdrains (2 per Abutment)</td>
<td>Clay Pipe (4&quot; Drain Pipe-Orange)</td>
<td>-</td>
<td>Fair</td>
<td>N</td>
<td>NF</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Underside</td>
<td>North and South Abutments at Backwall Concrete Repairs</td>
<td>Seam Sealer (Gray)</td>
<td>-</td>
<td>Fair</td>
<td>N</td>
<td>NF</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Underside</td>
<td>North Abutment, Between Bridge Seat and Concrete Tee Beams</td>
<td>Bridge Seat Pad</td>
<td>-</td>
<td>Fair</td>
<td>N</td>
<td>NF</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Topside</td>
<td>Applied to Bridge Deck Before Wearing Surface</td>
<td>Underlayment (Wearing Surface)</td>
<td>-</td>
<td>Fair</td>
<td>N</td>
<td>NF</td>
<td>-</td>
<td>-</td>
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</tbody>
</table>
## ASBESTOS ASSESSMENT INVESTIGATION

**Project:** Bridge Replacement of Three Bridges over Pea Brook  
**Bridge Address:** Route 97 over Pea Brook  
**County:** Delaware  
**PIN:** 9806.82.101  
**SCE No:** R13125.28  
**Inspected By:** A. Marsden  
**Inspection Date:** 21-Jul-14

<table>
<thead>
<tr>
<th>AREA</th>
<th>LOCATION</th>
<th>TYPE OF MATERIAL</th>
<th>APPROXIMATE QUANTITY</th>
<th>CONDITION</th>
<th>ACM Y/N ASSUMED</th>
<th>FRIABLE F/NF</th>
<th>REMOVAL OPTIONS</th>
<th>SPECIFICATION ITEM NUMBER</th>
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</thead>
<tbody>
<tr>
<td>Underside</td>
<td>Throughout Exposed Concrete Surfaces</td>
<td>Masonry Coating</td>
<td>-</td>
<td>Fair</td>
<td>N</td>
<td>NF</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Underside</td>
<td>North and South Abutments at Backwall Concrete Crack Repairs</td>
<td>Seam Sealer (Gray) - Caulk</td>
<td>30 Ln.Ft.</td>
<td>Fair</td>
<td>Y</td>
<td>NF</td>
<td>B.V. 14</td>
<td>210.3411</td>
</tr>
</tbody>
</table>
APPENDIX B

ANALYTICAL LABORATORY RESULTS
### PLM & TEM BULK ASBESTOS REPORT

**Client:** Shumaker Consulting Engineering & Lead Surveying, D.P.C.  
**Location:** Route 97 over Pea Brook  
**BIN:** 1035450  
**Sample Date:** 7/21/2014

<table>
<thead>
<tr>
<th>Client ID</th>
<th>Lab ID</th>
<th>Sampling Location</th>
<th>Description</th>
<th>PLM Asbestos Fibers Type &amp; Percentage</th>
<th>PLM Total Asbestos</th>
<th>TEM Asbestos Fibers Type &amp; Percentage</th>
<th>TEM Total Asbestos</th>
<th>PLM Non-Asbestos Fibers Type &amp; Percentage</th>
<th>Non-Fibrous Matrix Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>01-01</td>
<td>S3830</td>
<td>Under Side North</td>
<td>Black Bridge Seat Pad</td>
<td>Inconclusive No Asbestos Detected</td>
<td>0% None Detected</td>
<td>&lt;1.0% Synthetic 2%</td>
<td>99%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01-02</td>
<td>S3831</td>
<td>Abutment Top Back</td>
<td>Black Bridge Seat Pad</td>
<td>Inconclusive No Asbestos Detected</td>
<td>0% None Detected</td>
<td>&lt;1.0% Synthetic 2%</td>
<td>99%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01-03</td>
<td>S3832</td>
<td>Abutment Top Back</td>
<td>Black Bridge Seat Pad</td>
<td>Inconclusive No Asbestos Detected</td>
<td>0% None Detected</td>
<td>&lt;1.0% Synthetic 2%</td>
<td>99%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>02-04</td>
<td>S3833</td>
<td>Abutment Lower Back Wall W. Pipe</td>
<td>Orange Clay Pipe</td>
<td>None Detected</td>
<td>0% Not Required</td>
<td>N/A None Detected</td>
<td>100%</td>
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<tr>
<td>02-05</td>
<td>S3834</td>
<td>Abutment Lower Back Wall W. Pipe</td>
<td>Orange Clay Pipe</td>
<td>None Detected</td>
<td>0% Not Required</td>
<td>N/A None Detected</td>
<td>100%</td>
<td></td>
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<td>02-06</td>
<td>S3835</td>
<td>Abutment Lower Back Wall W. Pipe</td>
<td>Orange Clay Pipe</td>
<td>None Detected</td>
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<td>N/A None Detected</td>
<td>100%</td>
<td></td>
<td></td>
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<tr>
<td>03-07</td>
<td>S3836</td>
<td>West Face I Beam 1</td>
<td>White Masonry Coating</td>
<td>Inconclusive No Asbestos Detected</td>
<td>0% None Detected</td>
<td>&lt;1.0% None Detected</td>
<td>100%</td>
<td></td>
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</tr>
<tr>
<td>03-08</td>
<td>S3837</td>
<td>Towards South End</td>
<td>White Masonry Coating</td>
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<td>&lt;1.0% None Detected</td>
<td>100%</td>
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<tr>
<td>03-09</td>
<td>S3838</td>
<td>Towards South End</td>
<td>White Masonry Coating</td>
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<td>0% None Detected</td>
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<td>100%</td>
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<td></td>
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<td>S3839</td>
<td>East Face T Beam 1</td>
<td>Black Underlayerement</td>
<td>Inconclusive No Asbestos Detected</td>
<td>0% None Detected</td>
<td>&lt;1.0% None Detected</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NVTAD**  
Lab Code 200530-0  
for PLM Analysis

- This Method does not remove vermiculite and may underestimate the level of asbestos present in a sample containing greater than 10% vermiculite.

PLM Bulk Asbestos Analysis by EPA 600/M4-82-020 per 40 CFR 763 and/or EPA 600/R-93/116 (NVTAD Lab Code 2000530-0). New York State Department of Health, ELAP Method 198.1, 198.4 and 198.6 ("Polarized Light Microscopy and Transmission Electron Microscopy Methods for Identifying and Quantifying Asbestos in Bulk Samples and in Non-Friable Organically Bound Bulk Samples.").

- NOB (non-friable organically bound) Classified for Analytical Purposes Only.

**denotes material analyzed by ELAP Method 198.4 and 198.6 per NYSDOH.**

- Polarized-light microscopy is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials. Quantitative transmission electron microscopy is currently the only method that can be used to determine if this material can be considered or treated as non-asbestos containing.

**PLM Date Analyzed:** 7/29/2014  
**Microscope:** Olympus BH-2 823173  
**Analyst:** F. Weisman

**Laboratory Results Approved By:**  
Asbestos Technical Director  
Mary Dohr

Paradigm Environmental Services, Inc. is not responsible for the data supplied by or an independent inspector. National Institute of Standards and Technology Accreditation requirements mandate that this report must not be reproduced except in full without the approval of the laboratory. This PLM report relates ONLY to the items tested. This report must not be used to claim product endorsement by NVTAD or any agency of the U.S. Government. Quality control data (including 99% confidence limits and laboratory and analyst's precision) is available upon request.
# Chain of Custody for PLM/TEM Bulk Asbestos Analysis

*First Positive Stop on All Homogeneous Materials. Analyze only materials on chain; other analyses at lab cost.*

<table>
<thead>
<tr>
<th>Client: Shumaker Consulting Engineering</th>
<th>Contact: Sam Syrotynski</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phone Number: 518-452-5730</td>
<td>Fax Number: 518-452-9230</td>
</tr>
</tbody>
</table>

## Results To: Andrew Marsden

**Project Location:** Park St. over Pea Brook

**P.I.N.:** 9806.82.101

**SCE #:** R13125.28

<table>
<thead>
<tr>
<th>Job #: 3945-14</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date Sampled: 7-21-14</td>
<td></td>
</tr>
</tbody>
</table>

**Material Type/Quantity:** Friable

**Material Size:** NOB TEM

## Table

<table>
<thead>
<tr>
<th>Client ID</th>
<th>Lab ID</th>
<th>Sampling Location</th>
<th>Color</th>
<th>Material Size</th>
<th>Type of Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>01-01</td>
<td>53830</td>
<td>Underside North Abutment Top</td>
<td>Black</td>
<td>3</td>
<td>Pigeon Seal Box</td>
</tr>
<tr>
<td>01-02</td>
<td>831</td>
<td>Under T-Beam 4</td>
<td></td>
<td></td>
<td>Clay Pipe</td>
</tr>
<tr>
<td>01-03</td>
<td>832</td>
<td>Under T-Beam 3</td>
<td></td>
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<td>Clay Pipe</td>
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<tr>
<td>02-04</td>
<td>833</td>
<td>Underside North Abutment Top</td>
<td>Orange</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>02-05</td>
<td>834</td>
<td>East Face T-Beam 4</td>
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<tr>
<td>02-06</td>
<td>835</td>
<td>Underside South Abutment Top</td>
<td>White</td>
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<td>Under Side T-Beam 1</td>
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<tr>
<td>02-09</td>
<td>838</td>
<td>East Face T-Beam 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>04-10</td>
<td>839</td>
<td>Top Side, East corner South End</td>
<td>Black</td>
<td></td>
<td></td>
</tr>
<tr>
<td>04-11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>04-12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Sampled By:** AJM  
**Date:** 7-21-14

**Transported to Paradigm By:**  
**Date:**

**Received By:** KS  
**Date:** 7/23/14

---

All samples will be analyzed by the appropriate New York State Department of Health methods (198.1, 198.4 and 198.6) unless other methods are requested.

- Stop first positive per homogenous group (PLM)
- 3 of 3 samples GR/PLM
  - 3 of 3 samples to TEM to confirm inconclusive
- Stop first positive per homogenous group (TEM)

**TOTAL NUMBER OF SAMPLES ON ALL CHAINS OF CUSTODY:** 12
### PLM & TEM Bulk Asbestos Report

**Client:** Shumaker Consulting Engineering & Lead Surveying, D.P.C.  
**Location:** Route 97 over Pea Brook  
**BIN:** 1035450  
**Sample Date:** 7/21/2014

<table>
<thead>
<tr>
<th>Client ID</th>
<th>Lab ID</th>
<th>Sampling Location</th>
<th>Description</th>
<th>PLM Asbestos Fibers Type &amp; Percentage</th>
<th>PLM Total Asbestos</th>
<th>TEM Asbestos Fibers Type &amp; Percentage</th>
<th>TEM Total Asbestos</th>
<th>PLM Non-Asbestos Fibers Type &amp; Percentage</th>
<th>TEM Non-Asbestos Fibers Type &amp; Percentage</th>
<th>Non-Fibrinous Matrix Material %</th>
</tr>
</thead>
<tbody>
<tr>
<td>04-11</td>
<td>S3840</td>
<td>Top Side East Carb Middle</td>
<td>Black Underlayment</td>
<td>Inconclusive No Asbestos Detected</td>
<td>0%</td>
<td>None Detected</td>
<td>&lt;1.0%</td>
<td>None Detected</td>
<td>&lt;1.0%</td>
<td>100%</td>
</tr>
<tr>
<td>04-12</td>
<td>S3841</td>
<td>Top Side East Carb North End</td>
<td>Black Underlayment</td>
<td>Inconclusive No Asbestos Detected</td>
<td>0%</td>
<td>None Detected</td>
<td>&lt;1.0%</td>
<td>None Detected</td>
<td>&lt;1.0%</td>
<td>100%</td>
</tr>
</tbody>
</table>

---

**ELAP ID No.: 10958**

- **Notes:**
  - This Method does not remove vermiculite and may underestimate the level of asbestos present in a sample containing greater than 10% vermiculite.
  - PLM Bulk Asbestos Analysis by EPA 600/M4-02-020 per 40 CFR 763 and/or EPA 600/R-93/116 (NVLAP Lab Code 2000530-0), New York State Department of Health, ELAP Method 198.1, 198.4 and 198.6 ("Polarized Light Microscopy and Transmission Electron Microscopy Methods for Identifying and Quantitating Asbestos in Bulk Samples and in Non-Friable Organically Bound Bulk Samples.").
  - √ NOB (non-friable organically bound) Classified for Analytical Purposes Only.
  - # denotes material analyzed by ELAP Method 198.4 and 198.6 per NYSDOH.

- **Remarks:**
  - Polarized-light microscopy is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials. Quantitative transmission electron microscopy is currently the only method that can be used to determine if this material can be considered or treated as non-asbestos containing.

**PLM Date Analyzed:** 7/29/2014  
**Microscope:** Olympus BH-2 #233173  
**Analyser:** F. Wehman  
**TEM Date Analyzed:** 7/31/2014  
**TEM Analyst:** J. Peter Donato

---

**Laboratory Results Approved By:**  
Asbestos Technical Director  
Mary Dohr
# Chain of Custody for PLM/TEM Bulk Asbestos Analysis

*First Positive Stop on All Homogeneous Materials. Analyze only materials on chain; other analyses at lab cost.*

**Client:** Shumaker Consulting Engineering  
**Contact:** Sam Syrotynski  
**Phone Number:** 518-452-5730  
**Fax Number:** 518-452-9230  
**Results To:** Andrew Maraden  
**Date Sampled:** 7-21-14  
**Project Location:** 97 over Pea Brook  
**BIN:** 1035460  
**Material Type/Quantity:** Friable NOB TEM

<table>
<thead>
<tr>
<th>Client ID</th>
<th>Lab ID</th>
<th>Sampling Location</th>
<th>Color</th>
<th>Material Size</th>
<th>Type of Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A4.11</td>
<td>Topside, East curb, Middle</td>
<td>Black</td>
<td></td>
<td>Underpaint</td>
</tr>
<tr>
<td>2</td>
<td>A4.12</td>
<td>Topside, East curb, North end</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Sampled By:**  
**Transported to Paradigm By:**  
**Received By:**

All samples will be analyzed by the appropriate New York State Department of Health methods (198.1, 198.4 and 198.6) unless other methods are requested:

- Stop first positive per homogenous group (PLM)
- 3 of 3 samples GR/PLM
- 3 of 3 samples to TEM to confirm inconclusive
- Stop first positive per homogenous group (TEM)

**Total Number of Samples on All Chains of Custody:** 12
## PLM & TEM BULK ASBESTOS REPORT

**Client:** Shumaker Consulting Engineering & Lead Surveying, D.P.C.  
**Location:** Route 97 over Pep Brook  
**BIN:** 1035460  
**Sample Date:** 7/21/2014

<table>
<thead>
<tr>
<th>Client ID</th>
<th>Lab ID</th>
<th>Sampling Location</th>
<th>Description</th>
<th>PLM Asbestos Fibers Type &amp; Percentage</th>
<th>PLM Total Asbestos</th>
<th>TEM Asbestos Fibers Type &amp; Percentage</th>
<th>TEM Total Asbestos</th>
<th>PLM Non-Asbestos Fibers Type &amp; Percentage</th>
<th>TEM Non-Asbestos Fibers Type &amp; Percentage</th>
<th>Non-Fibrous Matrix Material %</th>
</tr>
</thead>
<tbody>
<tr>
<td>01-01</td>
<td>S3842</td>
<td>Under Side South Abutment Wing Wall East Middle</td>
<td>Gray Masonry Coating</td>
<td>Inconclusive No Asbestos Detected</td>
<td>0%</td>
<td>None Detected</td>
<td>&lt;1.0%</td>
<td>None Detected</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>01-02</td>
<td>S3843</td>
<td>Under Side South Abutment Lower Back Wall East</td>
<td>Gray Masonry Coating</td>
<td>Inconclusive No Asbestos Detected</td>
<td>0%</td>
<td>None Detected</td>
<td>&lt;1.0%</td>
<td>None Detected</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>01-03</td>
<td>S3844</td>
<td>Under Side North Abutment Back Wall Lower West</td>
<td>Gray Masonry Coating</td>
<td>Inconclusive No Asbestos Detected</td>
<td>0%</td>
<td>None Detected</td>
<td>&lt;1.0%</td>
<td>None Detected</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>02-04</td>
<td>S3845</td>
<td>Under Side South Abutment Lower Back Wall East</td>
<td>Orange Clay Pipe</td>
<td>None Detected</td>
<td>0%</td>
<td>Not Required</td>
<td>N/A</td>
<td>None Detected</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>02-05</td>
<td>S3846</td>
<td>Under Side South Abutment Lower Back Wall East</td>
<td>Orange Clay Pipe</td>
<td>None Detected</td>
<td>0%</td>
<td>Not Required</td>
<td>N/A</td>
<td>None Detected</td>
<td>100%</td>
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</tr>
<tr>
<td>02-06</td>
<td>S3847</td>
<td>Under Side North Abutment Back Wall Lower East</td>
<td>Orange Clay Pipe</td>
<td>None Detected</td>
<td>0%</td>
<td>Not Required</td>
<td>N/A</td>
<td>None Detected</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>03-07</td>
<td>S3848</td>
<td>Under Side South Abutment Upper Back Wall Rear T Beam 2</td>
<td>Gray Seam Sealer</td>
<td>Inconclusive No Asbestos Detected</td>
<td>0%</td>
<td>None Detected</td>
<td>&lt;1.0%</td>
<td>None Detected</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>03-08</td>
<td>S3849</td>
<td>Under Side South Abutment Upper Back Wall Rear T Beam 2</td>
<td>Gray Seam Sealer</td>
<td>Inconclusive No Asbestos Detected</td>
<td>0%</td>
<td>None Detected</td>
<td>&lt;1.0%</td>
<td>None Detected</td>
<td>100%</td>
<td></td>
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<tr>
<td>03-09</td>
<td>S3850</td>
<td>Under Side South Abutment East Side Middle</td>
<td>Gray Seam Sealer</td>
<td>Inconclusive No Asbestos Detected</td>
<td>0%</td>
<td>None Detected</td>
<td>&lt;1.0%</td>
<td>None Detected</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>04-10</td>
<td>S3851</td>
<td>Under Side North Abutment Under T Beam 2</td>
<td>Black Bridge Seat Pad</td>
<td>Inconclusive No Asbestos Detected</td>
<td>0%</td>
<td>None Detected</td>
<td>&lt;1.0%</td>
<td>None Detected</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

**ELAP ID No.: 10958**

This Method does not remove vermiculite and may underestimate the level of asbestos present in a sample containing greater than 10% vermiculite.

PLM Bulk Asbestos Analysis by EPA 600/M4-82-020 per 40 CFR 763 and/or EPA 600/R-93/116 (NVLAP Lab Code 2000530-0), New York State Department of Health, ELAP Method 198.1, 198.4 and 198.6 ("Polarized Light Microscopy and Transmission Electron Microscopy Methods for Identifying and Quantitating Asbestos in Bulk Samples and in Non-Friable Organically Bound Bulk Samples").

NOB (non-friable organically bound) Classified for Analytical Purposes Only.

# denotes material analyzed by ELAP Method 198.4 and 198.6 per NYSDOH.

**Polarized-light microscopy is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials. Quantitative transmission electron microscopy is currently the only method that can be used to determine if this material can be considered or treated as non-asbestos containing.**

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7947-14 7/31/2014
### Chain of Custody for PLM/TEM Bulk Asbestos Analysis

*First Positive Stop on All Homogeneous Materials. Analyze only materials on chain; other analyses at lab cost.*

<table>
<thead>
<tr>
<th>Client ID</th>
<th>Lab ID</th>
<th>Sampling Location</th>
<th>Color</th>
<th>Material Size</th>
<th>Type of Material</th>
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</thead>
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<tr>
<td>01-01</td>
<td>538420</td>
<td>Under Side, South Abutment, West Side, Back Wall East</td>
<td>Gray</td>
<td></td>
<td>Marsalt Coating</td>
</tr>
<tr>
<td>01-02</td>
<td>843</td>
<td>Under Side, South Abutment, South Side</td>
<td></td>
<td></td>
<td>Clay Pipe</td>
</tr>
<tr>
<td>01-03</td>
<td>844</td>
<td>Under Side, North Abutment, Backwall West</td>
<td>Orange</td>
<td></td>
<td></td>
</tr>
<tr>
<td>02-04</td>
<td>845</td>
<td>Under Side, South Abutment, Backwall East</td>
<td>Orange</td>
<td></td>
<td>Seam Sealer</td>
</tr>
<tr>
<td>02-05</td>
<td>846</td>
<td>Under Side, South Abutment, Backwall West</td>
<td>Orange</td>
<td></td>
<td></td>
</tr>
<tr>
<td>02-06</td>
<td>847</td>
<td>Under Side, North Abutment, Backwall East</td>
<td>Orange</td>
<td></td>
<td></td>
</tr>
<tr>
<td>03-07</td>
<td>848</td>
<td>Under Side, South Abutment, Other Beam 5</td>
<td>Gray</td>
<td></td>
<td></td>
</tr>
<tr>
<td>03-08</td>
<td>849</td>
<td>Under Side, South Abutment, Other Beam 5</td>
<td>Gray</td>
<td></td>
<td></td>
</tr>
<tr>
<td>03-04</td>
<td>850</td>
<td>Under Side, North Abutment, East Side Middle</td>
<td>Black</td>
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<tr>
<td>#6A-10</td>
<td>851</td>
<td>Under Side, South Abutment, Inside Beam 2</td>
<td>Black</td>
<td></td>
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</tr>
</tbody>
</table>

All samples will be analyzed by the appropriate New York State Department of Health methods (198.1, 198.4 and 198.6) unless other methods are requested.

- Stop first positive per homogenous group (PLM)
- 3 of 3 samples GR/PLM
- 3 of 3 samples to TEM to confirm inconclusive
- Stop first positive per homogenous group (TEM)

**Total Number of Samples on All Chains of Custody:**

---

**Client:** Shumaker Consulting Engineering

**Contact:** Sam Syrotyszki

**Phone Number:** 518-452-5730

**Fax Number:** 518-452-9230

**Results To:** Andrew Marsden

**Date Sampled:** 7/21/14

**Material Type/Quantity:** Friable

**Bridge Replacement of Three Bridges over Pea Brook**

**P.I.N:** 9806.82.101

**SCE#** R13125.28

---

**Commissioning Use Only**

**Job #:** 794714

**Page:** [Image]

**Date Logged In:** 7/23/14

**Logged In By:** KS

---

**Sampled By:** AJM

**Date:** 7/21/14

**Transported to Paradigm By:**

**Date:**

**Received By:** KS

**Date:** 7/23/14
## PLM & TEM BULK ASBESTOS REPORT

**Client:** Shumaker Consulting Engineering & Lead Surveying, D.P.C.  
**Location:** Route 97 over Pea Brook  
**BIN:** 1035460  
**Sample Date:** 7/21/2014  
**Job No.:** 7948-14  
**Page:** 1 of 2

<table>
<thead>
<tr>
<th>Client ID</th>
<th>Lab ID</th>
<th>Sampling Location</th>
<th>Description</th>
<th>PLM Asbestos Fibers Type &amp; Percentage</th>
<th>PLM Total Asbestos</th>
<th>TEM Asbestos</th>
<th>TEM Total Asbestos</th>
<th>TEM Non-Asbestos Fibers Type &amp; Percentage</th>
<th>PLM Non-Fibrous Matrix Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>04-11</td>
<td>S3842</td>
<td>Under Side Under T Beam 3 North Abutment</td>
<td>Black Bridge Seat Pad</td>
<td>Inconclusive (No Asbestos Detected)</td>
<td>0%</td>
<td>None Detected</td>
<td>&lt;1.0%</td>
<td>None Detected</td>
<td>100%</td>
</tr>
<tr>
<td>04-12</td>
<td>S3843</td>
<td>Under Side North Abutment Under T Beam 5</td>
<td>Black Bridge Seat Pad</td>
<td>Inconclusive (No Asbestos Detected)</td>
<td>0%</td>
<td>None Detected</td>
<td>&lt;1.0%</td>
<td>None Detected</td>
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</tr>
<tr>
<td>05-13</td>
<td>S3844</td>
<td>Top Side South End at Curbing Middle</td>
<td>Black Underlayment</td>
<td>Inconclusive (No Asbestos Detected)</td>
<td>0%</td>
<td>None Detected</td>
<td>&lt;1.0%</td>
<td>None Detected</td>
<td>100%</td>
</tr>
<tr>
<td>05-14</td>
<td>S3845</td>
<td>Top Side South End at Curbing Middle</td>
<td>Black Underlayment</td>
<td>Inconclusive (No Asbestos Detected)</td>
<td>0%</td>
<td>None Detected</td>
<td>&lt;1.0%</td>
<td>None Detected</td>
<td>100%</td>
</tr>
<tr>
<td>05-15</td>
<td>S3846</td>
<td>Top Side South End at Curbing Middle</td>
<td>Black Underlayment</td>
<td>Inconclusive (No Asbestos Detected)</td>
<td>0%</td>
<td>None Detected</td>
<td>&lt;1.0%</td>
<td>None Detected</td>
<td>100%</td>
</tr>
</tbody>
</table>

### ELAP ID No.: 10958

- **For Laboratory Analyses:**
  - **Methodology:** PLM Bulk Asbestos Analysis by EPA 600/M4-82-020 per 40 CFR 763 and/or EPA 600/R-93/116 (NVLAP Lab Code 2000530-0), New York State Department of Health, ELAP Method 198.1, 198.4 and 198.6 ("Polarized Light Microscopy and Transmission Electron Microscopy Methods for Identifying and Quantitating Asbestos in Bulk Samples and in Non-Friable Organically Bound Bulk Samples").
  - **Sample Collection:** NOB (non-friable organically bound) classified for analytical purposes only.
  - **Sample Material:** # denotes material analyzed by ELAP Method 198.4 and 198.6 per NYSDOH.
  - **Sample Identification:** **Polarized-light microscopy** is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials. **Quantitative Transmission Electron Microscopy** is currently the only method that can be used to determine if this material can be considered or treated as non-asbestos containing.
  - **Sample Dates:**
    - **PLM Date Analyzed:** 7/29/2014
    - **TEM Date Analyzed:** 7/31/2014
  - **Sampling Equipment:** Olympus BH-2 #233173
  - **Analyst:** F. Wehman

---

**NVLAP**  
Lab Code 2000530-0 for PLM Analyses  

**This Method does not remove vermiculite and may underestimate the level of asbestos present in a sample containing greater than 10% vermiculite.**

**Note:** The report is approved and signed by the laboratory technical director. It is recommended that the report be reviewed by a professional inspecting the site to determine the appropriate course of action.

Paradigm Environmental Services, Inc. is not responsible for the data supplied by an independent inspector. National Institute of Standards and Technology Accreditation requirements mandate that this report must not be reproduced except in full without the approval of the laboratory. This PLM report is used solely for the purposes as outlined.
**CHAIN OF CUSTODY FOR PLM/TEM BULK ASBESTOS ANALYSIS**

*First Positive Stop on All Homogeneous Materials. Analyze only materials on chain; other analyses at lab cost.*

<table>
<thead>
<tr>
<th>Client Mailing Address:</th>
<th>Bridge Replacement of Three Bridges 97 over Pea Brook</th>
</tr>
</thead>
<tbody>
<tr>
<td>1510 Central Ave. Albany NY 12205</td>
<td>P.I.N. 9806.82.101 SCE# R13125.28</td>
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<tr>
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<th>Lab ID</th>
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<td>53852</td>
<td>UNDERSIDE, UNDER T &quot;BRAH 3, NORTH ABUT.&quot;</td>
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<td>BRIDGE SEAT PAD</td>
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Sampled By: A.Marsden
Date: 7-21-14

Transported to Paradigm By:  
Date: 

Received By: KS  
Date: 7/23/14

All samples will be analyzed by the appropriate New York State Department of Health methods (198.1, 198.4 and 198.6) unless other methods are requested.

- Stop first positive per homogenous group (PLM) 
- 3 of 3 samples GR/PLM 
- 3 of 3 samples to TEM to confirm inconclusive 
- Stop first positive per homogenous group (TEM)

**TOTAL NUMBER OF SAMPLES ON ALL CHAINS OF CUSTODY:**
# PLM & TEM Bulk Asbestos Report

**Client:** Shumaker Consulting Engineering & Lead Surveying, P.C.  
**Location:** Route 97 over PeaBrook,  
**BIN:** 1035470  
**Sample Date:** 7/21/2014

<table>
<thead>
<tr>
<th>Client ID</th>
<th>Lab ID</th>
<th>Sampling Location</th>
<th>Description</th>
<th>PLM Asbestos Fibers Type &amp; Percentage</th>
<th>PLM Total Asbestos</th>
<th>TEM Asbestos Fibers Type &amp; Percentage</th>
<th>TEM Total Asbestos</th>
<th>PLM Non-Asbestos Fibers Type &amp; Percentage</th>
<th>PLM Non-Asbestos Material Percent</th>
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<tr>
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<td>53824</td>
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<td>Gray Masonry Coating</td>
<td>Inconclusive No Asbestos Detected</td>
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<td>&lt;1.0%</td>
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<td>100%</td>
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<td>Gray Masonry Coating</td>
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<td>&lt;1.0%</td>
<td>None Detected</td>
<td>100%</td>
</tr>
<tr>
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<td>53826</td>
<td>Under Side Cheek Wall SE Middle</td>
<td>Gray Masonry Coating</td>
<td>Inconclusive No Asbestos Detected</td>
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<td>&lt;1.0%</td>
<td>None Detected</td>
<td>100%</td>
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<tr>
<td>02-04</td>
<td>53827</td>
<td>Under Side North Back Wall East End</td>
<td>Gray Seam Sealer</td>
<td>Inconclusive No Asbestos Detected</td>
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<td>Actinolite/Tremolite 3.2%</td>
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<td>96.8%</td>
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<tr>
<td>02-05</td>
<td>53828</td>
<td>Under Side South Back Wall Lower East Side</td>
<td>Gray Seam Sealer</td>
<td>Inconclusive No Asbestos Detected</td>
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<td>None Detected</td>
<td>100%</td>
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<tr>
<td>02-06</td>
<td>53829</td>
<td>Under Side South Back Wall Lower West Side</td>
<td>Gray Seam Sealer</td>
<td>Inconclusive No Asbestos Detected</td>
<td>0%</td>
<td>Stop Positive ** No TEM</td>
<td>N/A</td>
<td>None Detected</td>
<td>100%</td>
</tr>
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</table>

**NVLAP**  
Lab Code 290930-0  
for PLM Analysis

![This Method does not remove vermiculite and may underestimate the level of asbestos present in a sample containing greater than 10% vermiculite. PLM Bulk Asbestos Analysis by EPA 600/M4-82-020 per 40 CFR 763 and/or EPA 600/R-93/116 (NVLAP Lab Code 290930-0), New York State Department of Health, ELAP Method 198.1, 198.4 and 198.6 ("Polarized Light Microscopy and Transmission Electron Microscopy Methods for Identifying and Quantitating Asbestos in Bulk Samples and in Non-Friable Organically Bound Bulk Samples.").  

**N** NON (non-friable organically bound) Classified for Analytical Purposes Only.  
**#** denotes material analyzed by ELAP Method 198.4 and 198.6 per NYSDOH.  
**||** Polarized-light microscopy is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials. Quantitative transmission electron microscopy is currently the only method that can be used to determine if this material can be considered or treated as non-asbestos containing.

**PLM Date Analyzed:** 7/29/2014  
**Microscope:** Olympus BH-2 #233173  
**Analyst:** F. Weinman  
**Laboratory Results Approved By:** Asbestos Technical Director Mary Dohr

**TEM Date Analyzed:** 7/30/2014  
**TEM Analyst:** F. Weinman

Paradigm Environmental Services, Inc. is not responsible for the data supplied by an independent inspector. National Institute of Standards and Technology Accreditation requirements mandate that this report must not be reproduced except in full without the approval of the laboratory. This PLM report relates to the items tested. This report must not be used to claim product endorsement by NVLAP or any agency of the U.S. Government. Quality control data (including 95% confidence limits and laboratory and analysts' precision) is available upon request.

7944-14 7/31/2014
# CHAIN OF CUSTODY FOR PLM/TEM BULK ASBESTOS ANALYSIS

*First Positive Stop on All Homogeneous Materials. Analyze only materials on chain; other analyses at lab cost.

<table>
<thead>
<tr>
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</tr>
</thead>
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<tr>
<td>01-01</td>
<td>53824</td>
<td>Underside, Check Wall, North East, Middle</td>
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<td></td>
<td>Masonry Gritty</td>
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<td>01-02</td>
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<td>02-04</td>
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<td>829</td>
<td>Underside, South Backwall, Lower Eastside</td>
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**Sampled By:** ASM
**Date:** 7-21-14

**Transported to Paradigm By:**
**Date:**

**Received By:** KS
**Date:** 7/23/14

All samples will be analyzed by the appropriate New York State Department of Health methods (198.1, 198.4 and 198.6) unless other methods are requested.

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- Stop first positive per homogenous group (TEM)

**TOTAL NUMBER OF SAMPLES ON ALL CHAINS OF CUSTODY:** 6
APPENDIX C

BLANKET VARIANCE 14 (BV 14)
STATE OF NEW YORK
DEPARTMENT OF LABOR
STATE OFFICE BUILDING CAMPUS
ALBANY, NEW YORK 12240-0100

Variance Petition
of
New York State Department of Transportation
Petitioner
in re
Premises: NYSDOT, NYSTA, NYSCC
NYS Bridges, Right of Ways and Highways
STATEWIDE (Blanket Variance #14)

File No. 12-0577
STATEWIDE DECISION
Cases 1-2
ICR 56

The Petitioner, pursuant to Section 30 of the Labor Law, having filed Petition No. 12-0577 on May 18, 2012 with the Commissioner of Labor for a variance from the provisions of Industrial Code Rule 56 as hereinafter cited on the grounds that there are practical difficulties or unnecessary hardship in carrying out the provisions of said Rule; and the Commissioner of Labor having reviewed the submission of the petitioner dated May 10, 2012; and

Upon considering the merits of the alleged practical difficulties or unnecessary hardship and upon the record herein, the Commissioner of Labor does hereby take the following actions:

Case No. 1 ICR 56-11.6(b)(1)
Case No. 2 ICR 56-11.6(b)(3)

VARIANCE GRANTED. The Petitioner's proposal to follow the procedures delineated in the attached 18 page submittal to remove various non-friable ACM materials from surfaces and substrates on Bridges, Highways and Right of Ways statewide is accepted; subject to the Conditions noted below:

THE CONDITIONS

1. As written with modifications noted.
In addition to the conditions required by the above specific variances, the Petitioner shall also comply with the following general conditions:

**GENERAL CONDITIONS**

1. A copy of this DECISION and the Petitioner's proposals shall be conspicuously displayed at the entrance to the personal decontamination enclosure.

2. This DECISION shall apply only to the removal of asbestos-containing materials from the aforementioned areas of the subject premises.

3. The Petitioner shall comply with all other applicable provisions of Industrial Code Rule 56-1 through 56-12.

4. The NYS Department of Labor Engineering Service Unit retains full authority to interpret this variance for compliance herewith and for compliance with Labor Law Article 30. Any deviation to the conditions leading to this variance shall render this variance Null and Void pursuant to 12NYCRR 56-12.2. Any questions regarding the conditions supporting the need for this variance and/or regarding compliance hereto must be directed to the Engineering Services Unit for clarification.

5. This DECISION shall terminate on June 30, 2015.

Date: June 5, 2012

By

COLLEEN C. GARDNER
COMMISSIONER OF LABOR

Christopher G. Alonge, P.E.
Associate Safety and Health Engineer

PREPARED BY: Edward A. Smith, P.E.
Senior Safety and Health Engineer

REVIEWED BY: Christopher G. Alonge, P.E.
Associate Safety and Health Engineer
Petition for Variance or Other Relief

Description of Work:
Demolition, renovation and maintenance of bridges and highways

Affected Structures:
State and County owned bridges and highways throughout New York State

Affected Agencies:
New York State Department of Transportation (NYSDOT)
New York State Thruway Authority (NYSTA)
New York State Canal Corporation (NYSCC)
County Highway Departments Statewide

Nature of Work:
Removal of nonfriable asbestos-containing materials from surfaces and substrates on bridges and highways

Reason for Request for Variance

NYSDOT, NYSTA, NYSCC and County Highway Departments Statewide encounter a wide variety of nonfriable asbestos-containing materials as part of maintenance and construction programs and demolition, renovation and maintenance of bridge and highway facilities. These include various bond breakers, joint fillers, caulks, grouts, sealers, coatings, utility conduits and similar type applications, and make up greater than 90% of asbestos abatement work associated with bridge and highway work each year.

In 1997, 2000, 2003, 2006 and 2009 NYSDOT petitioned and received approval for Blanket Variances (File Numbers 9701065, 001228, 030708, 060339 and 090440) which have been greatly successful in simplifying bridge and highway asbestos project design and facilitating abatement associated with construction and maintenance work. These variances have been necessary due to both infeasible engineering controls required in 12 NYCRR 56 and associated economic burden in applying the asbestos regulation to exterior abatement on active bridge and highway projects.

This new blanket variance petition is proposed as a means to continue to incorporate safe, effective abatement methods for the multiple nonfriable asbestos applications NYSDOT, NYSTA, NYSCC and County Highway Departments Statewide encounter during bridge and highway work.

It is the intention of NYSDOT, NYSTA, NYSCC and County Highway Departments Statewide to provide an equivalent, if not higher, level of protection for removal workers and the general public, while permitting the proper removal of the nonfriable asbestos materials in a cost effective manner. The proposed procedures will not expose removal workers or the general public to unacceptable levels of asbestos fibers, and are a reasonable approach for the careful and controlled removal of nonfriable asbestos-containing materials from bridges and highway right-of-way.

Proposal

The following work procedures for small and large projects shall always apply during abatement of any nonfriable asbestos-containing transite, tars, bond breakers, joint fillers, caulks, grouts, sealers, coatings, utility conduits or similar type applications from bridges and highway right-of-way:
1. Regulatory relief is requested from provisions of ICR 56 Subpart 56-11.6 (b) (1). The portion(s) of the bridge or highway right-of-way actively being worked on shall be considered to be the asbestos work area(s). Delineation of the asbestos work area(s) shall consist of construction fencing a minimum of 4 feet in height. For bridge work, this delineation shall apply to either the above or below deck portion of the bridge, depending on where the actual abatement is taking place. Asbestos work area(s) shall be internal to any and all necessary traffic control. All traffic control shall conform to the NYSDOT Standard Specifications, the Manual of Uniform Traffic Control Devices (MUTCD) and the project contract documents. Traffic control not including concrete safety shape barrier shall include use of stationary shadow vehicle(s) in accordance with §619-1.02 Basic Maintenance and Protection of Traffic of NYSDOT Standard Specifications. In areas where it is possible to access the nonfriable materials from the ground when working below a bridge deck, or from equipment on the ground (scaffold or mechanical lift), the work area will be considered that which is delineated by the construction fence. In areas where a work platform must be suspended from the bridge, the work area will be considered to be the area between the platform and the underside of the bridge deck. The area inside the construction fence shall be considered to be the asbestos work area. The asbestos work area shall be accessible through only one entrance/exit. The vacation of the asbestos work area(s) and use of warning signs shall comply with Industrial Code Rule 56 -7.4 (a, b & c). Work area access shall be limited to NYSDOL certified personnel during abatement activities.

2. Regulatory relief is requested from provisions of ICR 56 Subpart 56-11.6 (b) (3). A remote personal decontamination enclosure system, sited as close as practicable to the asbestos work area and otherwise complies with ICR 56 Subpart 56-7.5, shall be utilized.

3. During non-shift periods when abatement activities are not taking place, the designated pathway to the remote personal decontamination enclosure system, as defined in ICR 56 Subpart 56-7.5 (d)(4), may be temporarily taken down.

4. A waste decontamination enclosure system shall be utilized in conformance with ICR 56 Subpart 56-7.5 (f).

5. Where high volume traffic conditions do not allow partial or entire bridge or highway closure for the entire duration of the asbestos removal involving nonfriable asbestos materials located within or directly below the bridge deck, approach or highway, procedures including plasticizing with 2 layers of 6 mil polyethylene under steel plating may be used to temporarily isolate the work area prior to re-opening the affected travel lane(s) to traffic. Thereafter, when traffic volume decreases and asbestos removal operations can resume, work area isolation of the bridge will again be in accordance with methods in place prior to temporary isolation.
6. All nonfriable asbestos-containing waste shall not be mixed with other non-asbestos construction and demolition debris for purposes of onsite storage and transport. In addition, facilities accepting nonfriable asbestos-containing waste shall not pulverize the waste as defined in Subpart 360-7, Section 7.1(c)(2) of 6 NYCRR Part 360. All waste disposal shall be by appropriate legal method.

The additional following procedures/requirements shall apply to the removal of concrete-encased, nonfriable bond breaker material:

1. Sawcutting or removal of asphalt and or concrete to within 6 inches of the non-friable bond breaker material shall involve no contact with the bond breaker and be performed prior to establishment of the regulated work area. Equipment operators performing saw cut(s) or asphalt/concrete removal that does not impact or disturb asbestos-containing bond breaker material shall have a minimum of documented and current 2 hour OSHA asbestos awareness training. All subsequent abatement activities, including but not limited to, regulated work area establishment, bond breaker exposure and abatement/clean-up work shall be performed by NYSDOL certified handlers, including mechanical equipment operators used under condition 4 below.

2. During all regulated abatement activities, a full-time certified project monitor is required to be present onsite to ensure that no visible emissions and no friable asbestos debris occurs.

3. Due to removal techniques requiring partial demolition of the bridge deck and abutments in order to access the bond breaker material, plasticizing of the affected bridge deck, median or sidewalk, as determined by the project monitor, will be limited to critical coverage (i.e., drains, grates, etc.) with four layers of 6 mil fire retardant polyethylene.

4. Due to hardships incurred in manual demolition of asphalt/concrete in order to access the encased bond breaker material, it is proposed that mechanical equipment be utilized to turn over sections of the asphalt/concrete and isolate the area surrounding the bond breaker using wet methods.

5. Nonfriable bond breaker material shall be physically removed as intact as possible from the area of initial mechanical access either using manual methods or removed and disposed of as a whole or partial concrete component. All waste disposal shall be by appropriate legal method.

6. Cleaning methods shall include HEPA vacuuming and wet wiping of the entire impacted area and any debris and/or contamination shall be disposed of as asbestos-containing waste.
7. Excess water generated from the removal or cleaning process shall be disposed of as asbestos-containing waste or filtered through a 5 micron filtration system prior to discharge to a sanitary sewer, as permitted per applicable codes.

The additional following procedures/requirements shall apply to the removal of concrete-encased, nonfriable utility conduits:

1. All regulated work area establishment and abatement work shall be performed by NYSDOL certified handlers.

2. Construction fence will be placed along both sides of the work area where utility conduits are being removed from medians and bridge sidewalks.

3. Due to removal techniques requiring partial demolition of the concrete in order to access the utility conduit(s), plasticizing of the affected median or sidewalk will be limited to critical coverage (i.e., drains, grates, etc.) with four layers of 6 mil fire retardant polyethylene.

4. Due to hardships incurred in manual demolition of concrete in order to access the encased utility conduit(s), it is proposed that jack-hammers and/or concrete saws be utilized to initially break up or section the concrete and isolate the area surrounding the conduits using wet methods.

5. Nonfriable utility conduits will be physically removed as intact as possible from the area of initial mechanical access using manual means and wet methods and wrapped in two (2) layers of 6 mil polyethylene and sealed with duct tape.

6. Cleaning methods shall include HEPA vacuuming and wet wiping of the entire access area and any debris and/or contamination shall be disposed of as asbestos contaminated waste.

7. Excess water generated from the removal or cleaning process will be disposed of as asbestos waste or filtered through a 5 micron filtration system prior to discharge to a sanitary sewer, per applicable codes.

The additional following procedures/requirements shall apply to the removal of nonfriable utility conduits buried in bridge approaches, highway right-of-way or similar feature:
1. Removal of asphalt and/or soil overburden to within 6 inches of the nonfriable buried utility conduit(s) shall involve no contact with the utility and be performed by power shovel or similar mechanical means prior to establishment of the regulated work area. Equipment operators performing asphalt and/or soil overburden removal shall have a minimum of 2 hours of documented and current OSHA asbestos awareness training. All subsequent regulated work area establishment, utility exposure and abatement work shall be performed by NYSDOL certified supervisor(s) and handlers.

2. Hand tools or other manual methods shall be used to expose the conduit(s) on all sides in the area designated for removal.

3. Areas of utility conduit at locations of proposed cuts/disconnections shall be removed within commercially available glovebags and negative pressure tent enclosures. Intact lengths of conduits shall be wrapped in 2 layers of 6 mil polyethylene and sealed with duct tape.

4. Earth surfaces within the removal area shall be scraped clean of any residual asbestos debris and/or contamination and be disposed of as asbestos contaminated waste.

5. A project monitor visual inspection, performed in accordance with ICR 56 Subpart 56-9.2 (e) (1), shall be conducted for each glovebag/tent operation and for each entire asbestos abatement regulated work area prior to tent or general work area tear down.

The additional following procedures/requirements shall apply to the removal of nonfriable suspended utility conduit(s) from bridge components or similar features:

1. All regulated work area establishment and abatement work shall be performed by NYSDOL certified handlers.

2. Areas of transite, nonfriable coated utility conduit at locations of proposed cuts/disconnections shall be removed within commercially available glovebags and negative pressure tent enclosures. Intact lengths of conduits shall be wrapped in 2 layers of 6 mil polyethylene and sealed with duct tape.

3. Removal of non-friable tarpaper shall be performed within a scaffold or platform supported 6-mil polyethylene shroud. A single layer of of 6-mil polyethylene sheeting will be provided on the walls and floor of the scaffold or platform to ensure proper ground and water protection. The contractor shall provide proper traction surfaces to ensure safety of the workers during work on the scaffold or platform. The polyethylene sheeting shall be wet wiped or HEPA-vacuumed at the end of each shift or before tear-down and movement to a new poly-shrouded work area.

4. A project monitor visual inspection, performed in accordance with ICR 56 Subpart 56-9.2 (e) (1), shall be conducted for each glovebag/tent operation and for each entire asbestos abatement regulated work area prior to tent or general work area tear down.
The additional following procedures/requirements shall apply to the removal, renovation, repair or minor painting of structural steel components having nonfriable asbestos-containing coatings:

1. All regulated work area establishment and abatement work shall be performed by NYSDOL certified handlers. Equipment operators performing steel component transfer onsite where the cab of the equipment is within the regulated work area shall possess a minimum of a Restricted Asbestos Handler Certificate. Equipment operators performing steel component transfer onsite where the cab of the equipment is outside the regulated work area and the operated equipment causes no disturbance of the asbestos-containing coating(s) shall have a minimum of documented and current 2 hour OSHA asbestos awareness training. Steel workers performing work associated with rigging steel components for transfer and onsite or transport placement shall possess a minimum of an Operations and Maintenance Certificate.

2. Prior to any steel removal, renovation, repair or painting work, coatings which are loose and susceptible to falling off during the work shall be removed from the entire work area using manual methods. Coatings shall also be removed in localized areas where work requires steel cutting, welding, etc. This shall include an approximate 12 inch removal swath, spanning the entire length of each cut or repair. For re-painting, removal areas shall include the entire area to be repainted. Any mechanical removal methods used for this localized work shall include use of HEPA shrouded tools.

3. Removal of nonfriable coated structural members shall be performed without disturbance of the coatings and all dismemberment shall be directed by a licensed asbestos abatement contractor.

4. Any onsite storage of non-friable coated steel members shall include wrapping in two (2) layers of 6 mil polyethylene and sealed with duct tape.

5. Any visible coating debris generated during the dismemberment, cutting or loading activities shall be cleaned up by the licensed asbestos abatement contractor. Earth surfaces within the removal area shall be scraped clean of any residual asbestos debris and/or contamination.

6. Personnel air samples, collected and analyzed for OSHA personal worker protection purposes, shall be collected every day during abatement activities. All results shall be included in the daily project log for the project.

7. A project monitor visual inspection, performed in accordance with ICR 56 Subpart 56-9.2 (e) (1), shall be conducted for each asbestos abatement regulated work area prior to work area tear down.

8. All loose asbestos and lead coating waste, accumulated during the steel removal activities, shall be packaged, transported and disposed of in accordance with Attachment A - Treatment and Disposal of Asbestos and Lead-Based Coating Waste.
9. Steel members with intact lead/asbestos coatings qualify for scrap metal exclusion under 6NYCRR Part 371.1 (g)(1)(iii)(b), if recycled. For all steel beam recycling, New York State Department of Environmental Conservation (NYSDEC) notifications, required under NYCRR Part 371.1 (c)(7), shall be made and copies posted onsite prior to any steel member removal from the site.

The additional following procedures/requirements shall apply to the removal of nonfriable asbestos-containing coatings from concrete surfaces using manual or HEPA Shrouded Tools:

1. Any necessary platform and containment rigging shall involve no asbestos coating disturbance and be performed prior to establishment of the regulated work area. Platform and containment riggers shall have a minimum of 2 hours of current OSHA asbestos awareness training. All subsequent regulated work area establishment and abatement work shall be performed by NYSDOL certified handlers.

2. Polyethylene tent/poly shrouds shall be used at the active work area where masonry coatings are being removed and a single layer of 6-mil polyethylene sheeting will be provided on the walls and floor of the scaffold or platform to ensure ground and water protection. The tent/poly shroud shall be adequately supported for the duration of the abatement activities. The contractor shall also provide proper traction on poly surfaces to ensure the safety of the abatement workers while performing work on the scaffold or platform.

3. The area inside the polyethylene sheeting shall be considered to be the asbestos work area.

4. Prior to any gross removal work, masonry coatings which are loose and susceptible to falling off during the work shall be removed from the entire work area using manual methods. Gross removal shall include use of HEPA exhausted shrouded tools.

5. Personnel air samples, collected and analyzed for OSHA personal worker protection purposes, shall be collected every day during abatement activities. All results shall be included in the daily project log for the project.

6. A project monitor visual inspection, performed in accordance with ICR 56 Subpart 56-9.2 (e)(1), shall be conducted for each asbestos abatement regulated work area prior to work area tear down.

7. All asbestos waste shall be removed from the enclosure utilizing flex tubing directly to exterior enclosed containers by vacuum equipment equipped with HEPA filtration. All bulk waste material shall be suctioned into an enclosed, lined container by vacuum methods. All other waste not able to be vacuumed up and contaminated tools/equipment shall pass through the waste decontamination enclosure system.

The additional following procedures/requirements shall apply to the removal of nonfriable structural steel or masonry coatings by wet-blast method:
1. Any necessary platform and lead containment rigging shall involve no asbestos coating disturbance and be performed prior to establishment of the regulated work area. Platform and lead containment riggers shall have a minimum of documented and current 2 hour OSHA asbestos awareness training. All subsequent regulated work area establishment and abatement work shall be performed by NYSDOL certified handlers.

2. Enclosure and ventilation filtration of the asbestos work area shall conform with construction details as provided in the NYSDOT Class A Containment System For Paint Removal (See Attachment B.).

3. An internal single layer of at least 9 mil impermeable, fire-retardant sheeting will also be provided on the walls and floor of the enclosure and sealed in accordance with 56-7.11 (e). This sheeting can be cleaned and reused for multiple phases of a single project, but must be disposed of at the end of the project. Any temporary onsite storage of this sheeting between phases of the project shall be in accordance with the manufacturers recommendations.

4. The enclosure shall apply to either the above or below deck portion of the bridge, depending on where the abatement is taking place. The area inside the enclosure shall be considered to be the asbestos work area.

5. The personal and waste decontamination enclosure system(s) shall be attached to the work area unless physical restrictions prevent attachment. Any necessary remote decontamination enclosure systems shall be sited as close as practicable to the asbestos work area.

6. Coating removal methodology shall include use of pneumatically delivered blast abrasive that includes water injection. The volume of water will be controlled at the nozzle and will include a maximum percentage ratio of abrasive to water of 75:25. Percentages will be adjusted accordingly in order to eliminate any abrasive emissions inside the enclosure. All nozzle delivery technology shall be proposed by the contractor and approved by the facility owner’s Project Engineer.

7. Personnel air samples, collected and analyzed for OSHA personal worker protection purposes, shall be collected every day during abatement activities. All results shall be included in the daily project log for the project.

8. A project monitor visual inspection, performed in accordance with ICR 56 Subpart 56-9.2 (e) (1), shall be conducted for each asbestos abatement regulated work area prior to work area tear down.

9. All asbestos or asbestos/lead waste shall be removed from the enclosure utilizing PVC flex tubing directly to exterior enclosed containers by vacuum equipment equipped with HEPA filtration. All bulk waste material will be suctioned into an enclosed, lined container by vacuum methods. All other waste not able to be vacuumed up and contaminated tools/equipment shall pass through the waste decontamination enclosure system.

10. All asbestos/lead waste shall be packaged, transported and disposed of in accordance with Attachment A. - Treatment and Disposal of Asbestos and Lead-Based Coating Waste.
COATING WASTE

DESCRIPTION

The work shall consist of accumulating, packaging, labeling, loading, transporting, treating, and disposing of lead-based paint and asbestos coating waste declared to be a hazardous waste containing lead and asbestos.

Paint/Asbestos Coating Removal Waste. For purposes of this item, paint removal waste is defined as removed paint and coating materials combined with any materials used to remove the waste. The paint and asbestos coating removal waste will be referred to throughout the item text as "waste". The waste contains the following:

- Asbestos Coating: Asbestos fibers, titanium dioxide, chromium oxide, yellow iron oxide, lampblack, dried tung oil, fillers, driers, and other miscellaneous materials.
- Paint: Lead based paint containing basic lead silicate, chromate, titanium dioxide, chromium dioxide, magnesium silicate, linseed oil, alkyd resin, fillers, driers, and other miscellaneous materials.
- Moisture: Water added during packaging to ensure wetting of asbestos.

Testing of the typical sample indicates asbestos fibers at approximately 10-20% by weight, thereby requiring handling and disposal as an asbestos containing material and adherence to 40 CFR Part 61. Also, based on testing of a typical waste sample by the Toxicity Characteristic Leaching Procedure (TCLP), the waste is considered a lead characteristic hazardous waste of EPA waste code number, D008. Although chromium is present in the waste, the results of the TCLP procedure indicated concentrations of chromium well below TCLP criteria for hazardous waste due to chromium. TCLP semi-volatiles and non-volatiles were all non-detectable. The analysis results are attached.

The waste is a DOT Hazardous Material; proper shipping description is as follows: Hazardous waste, solid, n.o.s., 9, NA3077, PG III, RQ (D008, Asbestos). Note: The RQ (reportable quantity) description is required for any containers containing more than the reportable quantity of 10 pounds listed on the hazardous substance list for hazardous waste code D008.

The waste does not contain PCB's, pesticides, cyanides, or greater than 1000 ppm halogenated organic compounds. The waste is not a RCRA reactive, corrosive or ignitable, or a source-listed or chemical product-listed waste. It is not radiological or etiological.

The waste shall be handled and disposed of following all of the requirements for both a RCRA hazardous waste of code D008 and an asbestos containing waste. All testing of the waste necessary to satisfy the requirements of the chosen Disposal Facility or Transporter shall be the responsibility of the Contractor.

Hazardous Waste Disposal Facility. Prior to generating any waste, the Contractor shall supply the Engineer with a letter from a legally permitted Hazardous Waste Disposal Facility, stating that the facility has agreed to accept the waste, containing both lead and asbestos, generated by the work requirements of this project; is authorized to accept the waste under the requirements of the State of residence; has the required capacity to treat and dispose of the material; and will provide, or assure the ultimate disposal method indicated on the Uniform Hazardous Waste Manifest and Asbestos Waste Shipping Record. The letter shall be signed by a representative of the Disposal Facility who is legally authorized to sign such an agreement. The Engineer shall be given the original signed letter; facsimile copies will not be acceptable.

Waste Transport. All waste resulting from paint/coating removal operations shall be in transit to the disposal site no later than 45 calendar days subsequent to 1000 kilograms of waste accumulated at the site, or two weeks following demobilization of the site, whichever occurs first.
TREATMENT AND DISPOSAL OF ASBESTOS AND LEAD-BASED

COATING WASTE

Waste shall be accumulated, handled, packaged, loaded, transported, treated and disposed in accordance with all applicable Federal, State and local laws, rules, regulations, and codes. The Contractor's failure to comply with the aforementioned deadlines may result in actions described under Basis of Payment of this item.

Waste Transporter. Waste shall be transported by only permitted waste transporters holding current 6NYCRR Part 364 Waste Transporter Permits for transport of hazardous or industrial wastes to the selected facility. The Contractor must show evidence that they or their contracted hauler have current permits to remove the waste to the selected facility.

Minimum Work Requirements. The Contractor is hereby notified that this work requires the following as a minimum:

A. Waste transporter identification number issued by USEPA.
B. Disposal facility identification number issued by USEPA. (This will be supplied by the disposal facility).
C. Generator site identification number issued by USEPA. (This will be supplied by the Department through the Engineer).
D. Conformance to 6NYCRR364. Part 364 governs waste transporters. The Contractor shall furnish a copy of the Part 364 permit to the Engineer.
E. Conformance to 6NYCRR372. Part 372 governs manifest requirements.
F. Conformance to 6NYCRR373. Part 373 governs treatment, storage and disposal facilities and contains specific generator requirements.
G. Conformance to 40 CFR 268. Part 268 includes the Federal prohibitions for land disposal of untreated hazardous wastes. The disposal facilities must first treat the waste to meet uniform treatment standards.
H. Conformance to 40 CFR 61. Part 61 includes asbestos waste shipment records, marking, labeling, packaging and disposal requirements.
I. Conformance to 49 CFR 172-173. Parts 172-173 govern the transportation of hazardous materials.
J. Conformance to 12NYCRR56 or approved variance for the project. Part 56 governs asbestos handling requirements.

NOTE: 6NYCRR regulations are administered by the N.Y.S. Department of Environmental Conservation, Albany, NY. 12NYCRR regulations are administered by the N.Y.S. Department of Labor. Title 40 of the Code of Federal Regulations (CFR) are administered by the US Environmental Protection Agency, Region II, N.Y., N.Y. Title 49 of the CFR is administered by the US Dept of Transportation, Washington, D.C.

MATERIALS

Waste containerization and onsite storage shall comply with the requirements of 12NCRR56 and/or approved asbestos variances for the project as applicable and by the applicable sections of 6NYCRR Parts 372 and 373 for on site accumulation of hazardous wastes. The Contractor shall supply all containers, equipment and supplies for storage and disposal. Off-site transport of the wastes shall be in double-bagged 150 micron polyethylene bags that are placed within USDOT approved drums or rolloffs. The Contractor shall furnish the Engineer with a signed statement from the Disposal Facility that the containers proposed for use by the Contractor are acceptable to the Facility. All equipment and containers or rolloffs must meet the requirements for transport of both asbestos and hazardous wastes and shall be approved by the Engineer prior to use. The dry volume capacity of the containers, in cubic meters, shall be clearly marked upon each container, in a location easily readable by the Engineer.
COATING WASTE - TREATMENT AND DISPOSAL OF ASBESTOS AND LEAD-BASED

CONSTRUCTION DETAILS

Containers. All generated waste shall be collected and sealed concurrent with generation. Containerization shall be double-bagged within two 150 micron polyethylene bags placed within containers or rolloffs that meets the requirements of 49 CFR 172-173 for transport on public roadways. Measures must be taken to prevent the blowing or dispersion of the waste during loading operations and while being transported. Drums and rolloffs shall be closed during storage and transport. Contractor shall inspect drums and rolloffs in storage, correct any deterioration, and document at least weekly inspection. No waste shall be left exposed to the elements at the end of the working day.

All containers and rolloffs shall be located in a place secured from traffic and in a manner acceptable to the Engineer.

Each container and rolloffs shall be labeled in accordance with US Department of Transportation regulations.

Each container or rolloff shall be permanently labeled as a hazardous waste in the following manner:

HAZARDOUS WASTE: Federal law prohibits improper disposal. If found, contact the nearest police, or public safety authority, or the US Environmental Protection Agency.

Generator's Name: NYSDOT

Manifest Document No

Date:

BIN:

Note: The date shall be the generation date. It shall be entered by the Engineer using permanent marking material supplied by the Contractor.

In addition, containers shall be permanently labeled as an asbestos dust hazard as required by 40 CFR Part 61.

Labeling. All labeling, marking (except mark date), and placarding shall be the responsibility of the Contractor and shall be done under the supervision of the Engineer. This work shall be completed to the Engineer's satisfaction prior to the filling or transportation of any particular container or rolloff. All label markings shall be permanent, printed in English, displayed on a background of contrasting color unobscured by other labels, or attachments. Labeling shall be located away from other markings that could substantially reduce its effectiveness.

Document Preparation. All document preparation and distribution, including any Uniform Hazardous Waste Manifests, Asbestos Waste Shipment Records, Land Disposal Restriction Notifications, and Shipping Emergency Response Information shall be the responsibility of the Contractor. The Engineer will sign the Generator's Certification on the Hazardous Waste Manifest. The LDR (Land Disposal Restricted) certifications shall be completed and attached to the manifest, as required by 40 CFR
COATING WASTE

TREATMENT AND DISPOSAL OF ASBESTOS AND LEAD-BASED

Part 268 "Land Disposal Restrictions". All waste shall be documented, transported, treated, and disposed as required by Federal, State, and local laws, regulations, and codes.

Multiple Collection. It is permissible for the transporting vehicle to pick up containerized paint waste debris from one or more bridge sites for delivery to an authorized treatment, storage and disposal facility (TSDF) if the following conditions are met:

1. The materials picked up at each site must be essentially identical in physical and chemical characteristics. No materials other than the NYSDOT paint and asbestos coating waste debris may be included if wastes from several individual sites are combined on the same vehicle.
2. All of the component shipment are presumed to be both a D008 hazardous waste and an asbestos waste and shall be disposed of as such.
3. A hazardous waste manifest and asbestos waste shipment record are prepared for each generating bridge site. Each manifest and record must reflect the quantity in cubic meters shipped from each bridge. In sum total, the manifests and records accompanying the shipment must account for the entire volume transported.
4. All component shipments are intended to be conveyed to the same TSDF, and the TSDF has agreed to accept the consolidated load.

Paint and Asbestos Coating Waste Stabilization.
For the purposes of this item, treatment of the lead in paint/coating waste as required by the Federal land disposal restriction regulations (40 CFR 268) is presumed to require stabilization of the waste such as mixing it with Portland cement and water as necessary at the permitted hazardous waste Treatment or Disposal facility. The stabilized waste shall meet the uniform treatment standards prior to disposal in a permitted hazardous waste landfill.
If the Department is fined or penalized as a result of the Contractor's performance or lack thereof on this item, in addition to other remedies the Department may possess, said fine or penalty will be deducted from monies due the Contractor.

The extent of the Contractor's compliance with the provisions under timeliness of disposal will be considered as relevant in any future determination of an award to the Contractor as the lowest responsible bidder for any project under the supervision of the Department.
ATTACHMENT B.
visible discharge the Contractor shall immediately stop work and perform necessary repairs to the containment enclosure or modifications to cleaning operations to the Engineer's satisfaction.

The Engineer may direct the Contractor to stop all work activities and immediately clean up all waste materials within the enclosure when threatening weather conditions exist or are predicted. This measure may be exercised when an apparent threat exists that could cause the release of waste material to the surrounding environment, such as high winds or heavy rain.

If the wind velocity causes the containment enclosure to billow, or to emit dust, or to otherwise be a hazard in the opinion of the Engineer, the Contractor shall immediately cease work and clean up all the debris. Under severe conditions the Contractor shall disassemble the containment enclosure.

G. Releases From the Containment. For structures that are located over or adjacent to water, if floating waste materials form on the water surface, they shall be contained from moving upstream or downstream by the use of floating water booms. Floating waste material shall be collected daily, or more frequently.

Any waste material that is released outside the containment enclosure shall be immediately cleaned up using vacuums. Care shall be taken on pavement and other surfaces to collect all waste material so as to prevent it from being redistributed into the air and environment by traffic or other means.

All used filters from dust collectors, vacuums, and straw and screening from dam devices, shall be disposed of in accordance with all applicable Local, State, and Federal Laws, regulations and codes. The cost for disposing of these materials shall be included in the lump sum price bid for this item.

570-3.08 Class A Containment. Fifteen (15) days prior to the start of any abrasive-blast cleaning or paint removal work, the Contractor shall submit for approval detailed working drawing(s) of the Class A containment system that is to be supplied for each structure. The drawings shall be prepared and stamped by a Professional Engineer. Six (6) complete copies of the working drawings shall be submitted for approval.

The working drawings shall detail the proposed containment enclosure and include the following information at a minimum:

- Plan and elevation of the containment enclosure in relation to the structure.
- The type of solid or rigid floor and working platform with appropriate safety and fall protection measures. A description of worker access to the enclosure and the procedures and equipment that will be used to provide fall-protection. If a barge or another type of floating platform is used, include details regarding its construction, such as materials and dimensions, how the platform will be tied-off, how the debris will be collected and off-loaded, etc.
- A description of how the existing drainage will be routed through the enclosure.
- A description of the type of material(s) for the containment walls, floor, and ceiling.
- The type of support structure that will be used for the floor, walls, and ceiling, including the attachment of the enclosure materials to the support structure.
- The method by which the enclosure will be supported or attached to the bridge, i.e., rollers, clamps. Welding, bolting, or similar connections will not be allowed.
- The method that will be used to seal the joints (seams) formed when fabricating the containment enclosure, and the method that will be used to seal the mating joints between the containment enclosure and the bridge structure.
- The method that will be used to seal the entryway. At a minimum, the use of multiple overlapping door tarps shall be provided to minimize dust escape through the entryway.
- The ventilation system including open-air make-up points, dust collector and exhaust fan(s), location, type of equipment, manufacturer's data sheets, and airflow capacities.
- The type, size, and configuration of auxiliary lighting provided inside the containment enclosure. All lighting must be explosion proof.
- A design analysis of the loads on the structure due to the containment enclosure including: maximum dead and live loads of the enclosure, the workers, blast abrasive, and equipment; maximum allowable load for the floor and working platform; wind loads imposed on the structure by the enclosure; and maximum wind velocity that the containment enclosure is designed to withstand.
• If the containment system is supported by the structure, the working drawing submittal shall include certification by the Professional Engineer that the loads imposed do not cause the overall stress level of any element of the bridge to exceed the Operating Rating Allowable Stresses defined in AASHTO Manual for Maintenance Inspection of Bridges.

• The analysis shall account for all loads on the structure, including the enclosure dead load, worker live load, blast-abrasive load, equipment load, wind load, structure dead load, and highway live load using H20 loading unless otherwise specified plus impact. The highway live load used for analysis purposes shall be either an HS20 truck or equivalent lane loading, whichever is greater, unless a different highway live load is shown in the contract documents. Except as noted, the analysis shall use the loadings and design assumptions in the NYSDOT Standard Specifications for Highway Bridges.

• Details on how the enclosure is assembled, disassembled and moved to a new location on the structure as surface preparation work progresses. Indicate how the dust collector will be included in the containment enclosure. All other pertinent details relating to the containment enclosure shall be included with the working drawings as notes or as written narrative.

• Details on how the use of the enclosure will be coordinated with the maintenance and protection of traffic. Encroachments onto roadways and clearances over waterways and railroads shall be clearly identified.

**A. General.** The containment system includes the cover panels, screens, tarps, scaffolds, supports, and shrouds used to enclose an entire work area. The purpose of the containment is to prevent all debris generated during surface preparation from entering the environment and to facilitate the controlled collection of the debris for disposal.

The containment shall meet the requirements of SSPC-Guide 6, Class 1A. The containment shall have air impenetrable-walls, rigid or flexible framing, fully sealed joints, and resealable entry ways. Negative air shall be achieved by forced air flow. Exhaust air shall be filtered.

Flexible covers for flooring shall be impermeable and will be allowed only if the ground or paved surfaces are smooth enough to vacuum debris. If a smooth surface is not available, rigid materials shall be used for the floor of the enclosure.

**B. Containment Operations.** All abrasive-blast cleaning and paint removal work, and all work associated with the collection of paint waste debris, including the subsequent air blow-down or vacuuming of debris from the steel surfaces on the structure in preparation for painting and inspection, shall be performed inside the containment enclosure.

The Contractor shall attempt to limit workers from entering or exiting the containment enclosure when blast cleaning and paint removal operations are being performed.

**C. Waste Collection.** All waste material that results from abrasive blasting and paint removal operations shall be cleaned up and collected from the floor, walls, and other surfaces inside of the containment enclosure by vacuuming. Sweeping, shoveling, or other mechanical means to remove the waste materials will not be allowed unless the containment is intact and the vacuuming system is operating. Clean up operations shall be performed daily, prior to inspection, before new paint is applied or before a prolonged work stoppage, such as for weather interruptions.

Prior to disassembly or moving of the paint enclosure, the inside surfaces of the enclosure (walls, floors, ceiling, etc.) shall be cleaned of dust and other spent material by vacuuming. The Contractor shall take all measures necessary to prevent the release of waste material during moving or removal of the containment.

All vacuum equipment that is used for collection and cleanup work shall be equipped with HEPA filters. All used filters from dust collectors, vacuums, and straw and screening from dam devices, shall be disposed of in accordance with all applicable local, State, and Federal Laws, regulations, and codes. The cost for disposing of these materials shall be included in the lump sum price bid for this item.

**D. Ventilation.** The size of the exhaust-fan system supplied shall be designed to produce an average minimum cross-draft air velocity or an average minimum downdraft air velocity inside the containment enclosure. For enclosures designed with horizontal air flow, the exhaust fan shall have
§570

the capacity to produce an average minimum cross-draft velocity of 100 fpm, based on theoretical calculations. For enclosures designed with vertical air flow, the exhaust fan shall have the capacity to produce an average minimum downdraft velocity of 50 fpm, based on theoretical calculations. Forced exhaust air shall flow into dust collectors. The dust collectors shall be used and appropriately sized for the type, size of particulate matter, volume, and velocity of air moved through the containment. All air exhausted from the containment enclosure shall pass through the dust collection system.

Proper operation of the ventilation system shall be maintained after each assembly of the containment and during all phases of work.

E. Lighting. Light intensity by natural or artificial means inside the containment enclosure shall be maintained at a minimum of 50 foot-candles on the steel surface. During inspection activities, light shall be maintained at a minimum of 100 foot-candles. Auxiliary lighting shall be provided as necessary. The Contractor shall provide the Engineer with one portable light meter with a scale of 0 to 100 foot-candles. This meter will be returned to the Contractor at the completion of work. All lighting used in the containment shall be explosion-proof.

F. Containment Performance. NYSDOT will perform air quality monitoring (AQM) for ambient particulate and lead during abrasive blasting/cleanup. Real-time AQM will be used for all Class A containments. High-volume AQM may be used in addition to real-time AQM. The effectiveness of the containment and accessory equipment in preventing unacceptable levels of particulate and lead emissions will be assessed based on established AQM criteria for both the real-time and high-volume monitoring. Throughout the duration of work, there shall be no visible discharges. If the Engineer observes a visible discharge, the Contractor shall immediately stop work and perform necessary repairs to the containment enclosure or modifications to blast cleaning operations to the Engineer’s satisfaction.

The Engineer may direct the Contractor to stop all work activities and require the Contractor to immediately clean up all waste materials within the enclosure when severe weather conditions exist or are predicted. This measure may be exercised when an apparent threat exists that could cause the release of waste material to the surrounding environment, such as high winds or heavy rain.

If the wind velocity causes the containment enclosure to billow or to emit dust, or to otherwise be a hazard in the opinion of the Engineer, the Contractor shall immediately cease work and cleanup all the debris. If severe conditions are predicted, the Contractor shall disassemble the containment enclosure.

G. Releases From the Containment. For structures that are located over or adjacent to water, if floating waste materials form on the water surface, they shall be contained from moving upstream or downstream by the use of floating water booms. Floating waste material shall be collected daily, or more frequently.

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All used filters from dust collectors, vacuums, and straw and screening from dam devices, shall be disposed of in accordance with all applicable Local, State, and Federal Laws, regulations and codes. The cost for disposing of these materials shall be included in the lump sum price bid for this item.

570-4 METHOD OF MEASUREMENT.

570-4.01 Lead-Exposure Control Plan (LECP). The work under the Lead Exposure Control Plan will be measured for payment on a lump sum basis.

570-4.02 Medical Testing. The work under medical testing will be measured for payment on a dollars-cents basis.
APPENDIX D

CERTIFICATIONS
New York State – Department of Labor
Division of Safety and Health
License and Certificate Unit
State Campus, Building 12
Albany, NY 12240

ASBESTOS HANDLING LICENSE

FILE NUMBER: 00-0828
LICENSE NUMBER: 29368
LICENSE CLASS: RESTRICTED
DATE OF ISSUE: 12/19/2013
EXPIRATION DATE: 12/31/2014

Shumaker Consulting, Engineering and Land Surveying, P.C.
143 Court Street
Binghamton, NY 13901

Duly Authorized Representative – Linda M Shumaker PE

This license has been issued in accordance with applicable provisions of Article 30 of the Labor Law of New York State and of the New York State Codes, Rules and Regulations (12 NYCRR Part 56). It is subject to suspension or revocation for a (1) serious violation of state, federal or local laws with regard to the conduct of an asbestos project, or (2) demonstrated lack of responsibility in the conduct of any job involving asbestos or asbestos material.

This license is valid only for the contractor named above and this license or a photocopy must be prominently displayed at the asbestos project worksite. This license verifies that all persons employed by the licensee on an asbestos project in New York State have been issued an Asbestos Certificate, appropriate for the type of work they perform, by the New York State Department of Labor.

Eileen M. Franko, Acting Director
For the Commissioner of Labor
CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State

MR. BRUCE HOOGESTEGER
PARADIGM ENVIRONMENTAL SERVICES INC
179 LAKE AVENUE
ROCHESTER, NY 14608

NY Lab Id No: 10958

is hereby APPROVED as an Environmental Laboratory for the category
ENVIRONMENTAL ANALYSES SOLID AND HAZARDOUS WASTE

All approved subcategories and/or analytes are listed below:

Miscellaneous
- Asbestos in Friable Material: Item 198.1 of Manual
- Asbestos in Non-Friable Material-PLM: Item 198.6 of Manual (NOB by PLM)
- Asbestos in Non-Friable Material-TEM: Item 198.4 of Manual
- Lead in Dust Wipes: EPA 6010C
- Lead in Paint: EPA 6010C

Sample Preparation Methods
- EPA 3050B
- APP. 14.2, HUD JUNE 1995

Serial No.: 50447

Property of the New York State Department of Health. Certificates are valid only at the address shown, must be conspicuously posted, and are printed on secure paper. Continued accreditation depends on successful ongoing participation in the Program. Consumers are urged to call (518) 455-5570 to verify the laboratory's accreditation status.

Page 1 of 1
CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

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MR. BRUCE HOOGESTEGER  NY Lab Id No: 10958
PARADIGM ENVIRONMENTAL SERVICES INC
179 LAKE AVENUE
ROCHESTER, NY 14608

is hereby APPROVED as an Environmental Laboratory for the category
ENVIRONMENTAL ANALYSES AIR AND EMISSIONS
All approved subcategories and/or analytes are listed below:

Metals I
  Lead, Total  NIOSH 7300
  Asbestos

Miscellaneous Air
  40 CFR 763 APX A No. III

Fibers
  NIOSH 7402
  NIOSH 7400 A RULES

Serial No.: 50449

Property of the New York State Department of Health. Certificates are valid only at the address shown, must be conspicuously posted, and are printed on secure paper. Continued accreditation depends on successful ongoing participation in the Program. Consumers are urged to call (518) 485-5570 to verify the laboratory's accreditation status.
SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

Paradigm Environmental Services, Inc.
179 Lake Avenue
Rochester, NY 14608
Ms. Rebecca Roztocil
Phone: 585-647-2530  Fax: 585-647-3311
E-Mail: RRoztocil@paradigmenv.com
URL: http://www.paradigmenv.com

BULK ASBESTOS FIBER ANALYSIS (PLM)  NVLAP LAB CODE  200530-0

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2013-07-01 through 2014-06-30

Effective dates

For the National Institute of Standards and Technology
Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 200530-0

Paradigm Environmental Services, Inc.
Rochester, NY

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 Communiqué dated January 2009).

2013-07-01 through 2014-06-30

Effective dates

For the National Institute of Standards and Technology
STATE OF NEW YORK - DEPARTMENT OF LABOR
ASBESTOS CERTIFICATE

SAMUEL D SYROTYNISKI
CLASS (EXPIRES)
C A T E C (10/14) D I N S P (10/14)
H P M (10/14) I P D (10/14)

MUST BE CARRIED ON ASBESTOS PROJECTS

IF FOUND RETURN TO:
EYES BRO
NYSDOL - L&G UNIT
HAIR BRO
ROOM 161A BUILDING 12
HEIGHT 6' 02"
STATE OFFICE CAMPUS
ALBANY, NY 12240