



## **Asbestos & Lead Based Paint Assessment**

City of Spartanburg  
356 Saint Andrews Street  
Spartanburg, South Carolina

### ***Prepared for:***

The City of Spartanburg  
440 South Church St., Suite B  
Spartanburg, SC 29306

### ***Prepared by:***

Apex Environmental Management, Inc.  
7 Winchester Court  
Mauldin, South Carolina 29662

Project Number: 0417-66

July 3, 2017





**Apex Project Number 0417-66**

July 3, 2017

7 Winchester Court  
Mauldin, SC 29662  
864.404.3210 office  
864.404.3213 fax  
[www.apex-ehs.com](http://www.apex-ehs.com)

Mr. Martin Livingston  
City of Spartanburg  
440 South Church Street, Suite B  
Spartanburg, SC 29306

Reference: Asbestos and Lead-Based Paint Assessment Services  
356 Saint Andrews Street  
Spartanburg, South Carolina

**SERVICES**

- Indoor Air Quality
- Mold Remediation
- Asbestos & Lead
- Industrial Hygiene
- Worker Health & Safety
- Mold Consulting
- Moisture Management Plans
- Safety Assessment
- Environmental Site Assessments
- Hazard Communication

Dear Mr. Livingston:

Apex Environmental Management, Inc. (Apex) is pleased to provide the results of our assessment services for the referenced property.

This report and the associated attachments summarize our evaluation of the conditions observed at the project site. The findings presented by Apex are based upon sampling performed in the subject building. There is a chance that undetected ACM may exist in the building between walls or in other areas that would only be exposed during demolition or structural renovations. Should material be discovered that could potentially contain asbestos during the demolition process, additional samples of the material should be collected by a licensed asbestos inspector and submitted to an accredited laboratory for analytical interpretation. Our recommendations are based on the guidelines presented in EPA and/or OSHA regulations.

Please note that this document is not a specification for asbestos removal. It does not contain means and methods for abatement. Quantities are estimates and contractors must verify amounts prior to bidding or removal. If you are planning an abatement project, please contact Apex to discuss the requirements. Use of this document without the express written consent of Apex is at the sole risk of the user and or/abatement contractor.

The conclusions and/or recommendations contained in this report are based on our understanding of the applicable standards at the time this report was prepared. No warranty, expressed or implied, is made. If you have any questions please feel free to contact us at (864) 404-3210.

Respectfully submitted,  
**APEX ENVIRONMENTAL MANAGEMENT, INC.**

A handwritten signature in blue ink, appearing to read 'Ben Oliver'.

Ben Oliver  
Project Manager

A handwritten signature in blue ink, appearing to read 'Tom Oliver'.

Tom Oliver  
Director of Operations

Appendices

**ASBESTOS AND LEAD BASED PAINT ASSESSMENT**

**CITY OF SPARTANBURG  
356 SAINT ANDREWS STREET  
SPARTANBURG, SOUTH CAROLINA**

**APEX PROJECT NO. 0417-66**

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**SECTION I**

**Asbestos & Lead Evaluation Report**

<b>ASBESTOS EVALUATION REPORT</b> <b>APEX PROJECT NUMBER: 0417-66</b>
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Date:	7/3/2017	Page Number:	1 of 4
Client:	City of Spartanburg	Client Contact:	Mr. Martin Livingston
Client Address:	440 South Church Street Suite B Spartanburg, SC 29306	Client Phone Number:	(864) 580-5323
Project:	Asbestos Evaluation and Lead Based Paint Assessment		
Property Address:	356 Saint Andrews Street Spartanburg, SC		
Assessor:	Tom Oliver	Date of Assessment:	6/15/2017
Company:	Apex Environmental Management 7 Winchester Court Mauldin, SC 29662	Phone Number:	(864) 404-3210
Purpose of Assessment:	Demolition	Age of Structure:	Approximately 60 years
Building Type:	Residential	Number of Stories:	1
Foundation:	Crawlspace	Approximate Square Footage:	1,400 SF

**EXTERIOR BUILDING MATERIALS**

- Pitched wooden roof with shingles & no felt.
- Wooden shingle siding over wooden studs and siding paper.
- Wooden windows with glazing and no caulk.
- Wooden doors with no caulk.
- Roof/chimney mastic assumed positive on 1 chimney.
- Exterior shed with addition: metal roof with no sealant; wooden walls, floors, ceiling & window with putty/caulk; roll roofing and roof shingles with no felt.

**INTERIOR BUILDING MATERIALS**

- Interior building materials were not observed due to fire & structural damage within the residence.
- Due to safety concerns no asbestos samples were collected from within the residence.
- Structure/debris pile is assumed to be positive for ACM (1,400 SF).
- No interior sampling was performed due to safety concerns.

## **SCOPE OF THE SURVEY**

The objectives of the asbestos and lead assessment included the following:

- Identification of suspect asbestos-containing material (ACM) and lead based paints (LBP) in readily observable locations. Limited demolition of building finishes was conducted.
- Asbestos survey with sample collection by a South Carolina accredited inspector.
- Suspect ACM analysis by polarized light microscopy (PLM) utilizing CEI Labs (CEI) as an NVLAP certified laboratory, their accreditation number is 101768-0.
- Transmission electron microscopy (TEM) analysis of non-friable organically bound materials suspected to contain asbestos and testing negatively by PLM analysis.
- Lead inspection by a lead inspector certified by the Environmental Protection Agency and licensed to conduct LBP surveys in South Carolina.
- In situ analysis of suspected lead based paints by X-ray fluorescence (XRF).
- Presenting the results in a report identifying confirmed ACMs and LBPs.

## **METHODS**

### **Asbestos Containing Materials**

In order to determine if the suspect materials observed during the visual survey contained asbestos, representative bulk samples were collected and placed in sealed packages. Eighteen (18) bulk samples were collected during the survey and submitted to CEI in Cary, North Carolina for analysis using the EPA recommended method of Polarized Light Microscopy (PLM) coupled with dispersion staining (Method No. EPA 600/M4-82-020, Dec. 1982). CEI participates in the National Voluntary Laboratory Accreditation Program (NVLAP). Their NVLAP accreditation number is 101768-0. EPA regulations require that multiple samples of each homogeneous material be collected for laboratory analysis. In accordance with South Carolina Regulation 61-86.1, non-friable organically bound materials that are reported to be non-asbestos containing by PLM analysis must also be analyzed by Transmission Electron Microscopy (TEM). Ten (10) samples were analyzed using TEM.

### **Lead-Based Paint**

Lead painted surfaces were analyzed in place using X-ray fluorescence. Painted surfaces were selected based on color of topcoat, underlying layers and substrate on which it was painted.

## **RESULTS**

### **Asbestos Results**

The EPA defines an asbestos-containing material (ACM) as a material containing more than 1% asbestos. OSHA defines ACM as a material containing detectable amounts of asbestos. A specific *PLM and TEM Data Table* is located in Appendix II of this report and identifies positive materials and designates approximate quantities.

The residence was inaccessible due to fire and structural damage and debris throughout the interior. Due to the inaccessible nature of the residence, the building materials and finishes not sampled during the survey should be assumed to be ACM. The remaining debris should be considered contaminated material. Apex recommends that the building be demolished in place

and materials be treated and disposed of as friable ACM.

Suspect asbestos containing materials that were identified to be asbestos containing include:

- Approximately 15 wooden windows with glazing.
- Approximately 1,400 SF of assumed potential suspect ACM and contaminated debris within the structure that was inaccessible during the survey.

### Lead Based Paint

OSHA does not recognize a threshold level of lead for definition purposes, only the presence or absence of lead. The current OSHA regulations recognize an airborne action level of thirty micrograms per cubic meter ( $30 \mu\text{g}/\text{m}^3$ ) during an eight-hour workday and a permissible exposure level of fifty micrograms per cubic meter ( $50 \mu\text{g}/\text{m}^3$ ) for employees.

Currently, SCDHEC defines LBP as paint containing in excess of, or equal to,  $1.0 \text{ mg}/\text{cm}^2$ . The laboratory analytical results and chain-of-custody are included in the Lead Analysis Reports in Appendix II. The approximate locations of the paint samples collected and analytical results are presented in the *LBP Data Table* included with this report.

Two surfaces in the building tested positive for lead in excess of the regulatory definition:

- Exterior white metal porch support columns.
- Interior white wooded fire place mantles.

### **RECOMMENDATIONS AND DISCUSSION**

If the above referenced asbestos materials are to be disturbed by renovations or demolition, the asbestos must be removed in accordance with EPA, State of South Carolina and OSHA asbestos regulations. The State of South Carolina, Department of Health and Environmental Control (DHEC) has specific regulations that must be adhered to during asbestos removal/abatement projects.

Apex recommends the following:

1. Demolish the residence with assumed ACM in place and dispose of the waste stream as friable Regulated Asbestos Containing Materials (RACM) and delivered to an asbestos approved hazardous waste landfill for disposal.
1. Follow applicable asbestos regulations during renovation or demolition of the structure. You should be aware that stringent requirements are imposed upon anyone renovating or demolishing a structure in which ACM will be disturbed. This work must be performed in accordance with OSHA asbestos regulations, 29 CFR 1910 & 1926, and NESHAP asbestos regulations 40 CFR 61, subpart M. South Carolina regulations require the accreditation of personnel who work in the asbestos field and notification and permitting fees for asbestos removal projects. There is a 10 working day notification period required prior to abatement of asbestos in a facility. Failure to take proper precautions and actions to protect human health and the environment can result in penalties, danger to personnel, and construction delays.

Please note that this document is not a specification for asbestos removal. It does not contain means and methods for asbestos abatement. If you are planning an asbestos abatement project, please contact Apex to discuss the requirements. Use of this document without the express written consent of Apex is at the sole risk of the user and/or abatement contractor. Quantities provided in this report are estimated. Contractors must verify material amounts prior to bidding or removal.

This report summarizes our evaluation of the conditions observed at the site. The findings prepared by Apex are based upon testing performed in the building space. Additional ACM may exist (undetected) in other areas due to their inaccessibility or due to the limited nature of our testing. Our assessment procedures and recommendations are based on the guidelines presented in EPA, State of South Carolina or OSHA asbestos regulations.

### Lead-Based Paint

Currently the South Carolina Department of Health and Environmental Control (SCDHEC) define LBP as paint containing greater than 1.0 milligram per square centimeter ( $\text{mg}/\text{cm}^2$ ) lead or in excess of, or equal to, 0.5 percent lead. Building materials identified as being painted with LBP should be segregated from the other building materials and recycled or disposed of in a municipal lined landfill. The removed wastes would need to be containerized and further tested by Toxic Characteristic Leaching procedures (TCLP) to determine if the waste is classified as hazardous. The remaining building materials that are not painted with LBP may be disposed of in a construction and demolition landfill. However, the landfills should be contacted to determine their specific disposal requirements.

Occupational Safety and Health Administration Lead Regulations apply to actions initiated on lead containing materials. This regulation applies to lead concentrations greater than the analytical limit of detection. This regulation sets exposure levels on airborne lead and does not reference the percent lead in paint. Therefore, initial personal air monitoring should be conducted on workers performing work on surfaces which have a lead concentration of  $0.1 \text{ mg}/\text{cm}^2$  or above to satisfy the OSHA requirements. If a baseline exposure lower than the OSHA Action Level of 30 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) is established, personal air monitoring may be terminated. The full OSHA lead standard should be referenced for compliance.

**A copy of this report must be submitted to SCDHEC at least ten (10) working days prior to demolition when applying for a demolition permit.**



**SECTION II**

**Asbestos & LBP Data Tables**

**ASBESTOS SURVEY FIELD DATA SHEET  
PLM & TEM ANALYSIS**

Project Name: COS 356 Saint Andrews Street ACM/LBP

Sampled By: Tom Oliver

Project Location: 356 Saint Andrews Street, Spartanburg, SC

Project Manager: Ben Oliver

Project Number: 0417-66

Date: 6/15/2016

Sample No.	Location	Sample Description	Analytical Results	Friable/Non Friable	Condition	Quantity
1	Exterior Shed Main Roof	Roofing shingles (2 layers) and no felt	PLM - NAD	Non-Friable	Good	250 SF
2			TEM - NAD			
3			TEM - NAD			
4	Exterior Shed Addition Roof	Roll roofing (1 layer) and no felt	PLM - NAD	Non-Friable	Damaged	340 SF
5			TEM - NAD			
6			TEM - NAD			
7	Exterior Shed Window	Putty/Caulk on window casing	PLM - NAD	Non-Friable	Good	1 EA
8			TEM - NAD			
9			TEM - NAD			
10	Main House Roof	Roofing shingles (5 layers ) and no felt	PLM - NAD	Friable	Significantly Damaged	1,800 SF
11			TEM - NAD			
12			TEM - NAD			
13	Siding Beneath Framing Studs	Siding Paper	PLM - NAD	Friable	Significantly Damaged	2,080 SF
14			TEM - NAD			
15			TEM - NAD			
16	Exterior Windows	Window Glazing	PLM - 5% Chrysotile	Friable	Significantly Damaged	15 EA
17						
18						
<b>Assumed</b>	<b>House/debris pile</b>	<b>Potential ACM within structure</b>	<b>Assumed</b>	<b>Friable</b>	<b>Significantly Damaged</b>	<b>1,400 SF</b>

NAD = No Asbestos Detected

LF = Linear Feet

EA = Each

Amos = Amosite

**Bold = Positive For Asbestos**

SF = Square Feet

Chry = Chrysotile

**FIELD DATA SHEET  
LBP ANALYSIS**

Project Name: COS 356 Saint Andrews Street ACM/LBP

Sampled By: Tom Oliver

Project Location: 356 Saint Andrews Street Spartanburg, SC

Project Manager: Ben Oliver

Project Number: 0417-66

Date: 6/15/2017

Sample No.	Sample Location	Component	Color	Substrate	Analytical Result (mg/m <sup>3</sup> )
1	Standardization Calibration				184.00
2	Calibration				1.08
3	Calibration				1.04
4	Calibration				1.09
5	Exterior	Door Frame	White	Wood	N/A
6	Exterior	Door Frame	White	Wood	0.56
7	Exterior	Door	White	Wood	0.79
8	Exterior	Siding	Red	Wood	0.01
9	Exterior	Front Porch Awning	White	Metal	0.06
10	Exterior	Trim	White	Wood	0.95
<b>11</b>	<b>Exterior</b>	<b>Porch Support Column</b>	<b>White</b>	<b>Metal</b>	<b>1.00</b>
12	Exterior	Shutter	White	Metal	0.21
13	Exterior	Window	White	Wood	0.15
14	Interior	Wall	Grey	Plaster	0.03
<b>15</b>	<b>Interior</b>	<b>Fire Place Mantle</b>	<b>White</b>	<b>Wood</b>	<b>1.55</b>
16	Calibration				1.15
17	Calibration				N/A
18	Calibration				1.09
19	Calibration				1.02

**Bold = LBP**

**SECTION III**

**Laboratory Analytical Results**



June 22, 2017

Apex Environmental Management  
7 Winchester Court  
Mauldin, SC 29662

**CLIENT PROJECT:** COS 356 St. Andrews St ACM & LBP; 0417-66  
**CEI LAB CODE:** A17-8555

Dear Customer:

Enclosed are asbestos analysis results for PLM Bulk samples received at our laboratory on June 16, 2017. The samples were analyzed for asbestos using polarizing light microscopy (PLM) per the EPA 600 Method.

Sample results containing >1% asbestos are considered asbestos-containing materials (ACMs) per EPA regulatory requirements. The detection limit for the EPA 600 Method is <1% asbestos by weight as determined by visual estimation.

Thank you for your business and we look forward to continuing good relations. If you have any questions, please feel free to call our office at 919-481-1413.

Kind Regards,

A handwritten signature in black ink, appearing to read "Tianbao Bai".

Tianbao Bai, Ph.D., CIH  
Laboratory Director





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**ASBESTOS ANALYTICAL REPORT**  
**By: Polarized Light Microscopy**

Prepared for

**Apex Environmental Management**

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CLIENT PROJECT: COS 356 St. Andrews St ACM & LBP; 0417-66

CEI LAB CODE: A17-8555

TEST METHOD: EPA 600 / R93 / 116 and EPA 600 / M4-82 / 020

REPORT DATE: 06/22/17

TOTAL SAMPLES ANALYZED: 11

# SAMPLES >1% ASBESTOS: 1

**TEL: 866-481-1412**

*[www.ceilabs.com](http://www.ceilabs.com)*



# Asbestos Report Summary

By: POLARIZING LIGHT MICROSCOPY

**PROJECT:** COS 356 St. Andrews St ACM & LBP;  
0417-66

**CEI LAB CODE:** A17-8555

**METHOD:** EPA 600 / R93 / 116 and EPA 600 / M4-82 / 020

Client ID	Layer	Lab ID	Color	Sample Description	ASBESTOS %
1	Layer 1	A2427145	Gray	Shingle	None Detected
	Layer 2	A2427145	Black	Shingle	None Detected
2	Layer 1	A2427146	Gray	Shingle	None Detected
	Layer 2	A2427146	Black	Shingle	None Detected
3		A2427147		Sample Submitted for TEM Analysis	
4		A2427148	Black	Roll Roofing	None Detected
5		A2427149	Black	Roll Roofing	None Detected
6		A2427150		Sample Submitted for TEM Analysis	
7		A2427151	Gray	Caulk	None Detected
8		A2427152	Gray	Caulk	None Detected
9		A2427153		Sample Submitted for TEM Analysis	
10	Layer 1	A2427154A	Brown,Gray	Shingle	None Detected
	Layer 2	A2427154A	Brown	Shingle	None Detected
		A2427154B	Black	Shingle	None Detected
		A2427154C	Black,Gray	Shingle	None Detected
		A2427154D	Brown,Black	Shingle	None Detected
11	Layer 1	A2427155A	Brown,Gray	Shingle	None Detected
	Layer 2	A2427155A	Brown	Shingle	None Detected
		A2427155B	Black	Shingle	None Detected
		A2427155C	Black,Gray	Shingle	None Detected
		A2427155D	Brown,Black	Shingle	None Detected
12		A2427156		Sample Submitted for TEM Analysis	
13		A2427157	Brown,Black	Siding Paper	None Detected
14		A2427158	Brown,Black	Siding Paper	None Detected
15		A2427159		Sample Submitted for TEM Analysis	
16		A2427160	White	Window Glazing	<b>Chrysotile 5%</b>
17		A2427161		Sample Not Analyzed per COC	



# Asbestos Report Summary

By: POLARIZING LIGHT MICROSCOPY

**PROJECT:** COS 356 St. Andrews St ACM & LBP;  
0417-66

**CEI LAB CODE:** A17-8555

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**METHOD:** EPA 600 / R93 / 116 and EPA 600 / M4-82 / 020

Client ID	Layer	Lab ID	Color	Sample Description	ASBESTOS %
18		A2427162		Sample Not Analyzed per COC	





# ASBESTOS BULK ANALYSIS

By: POLARIZING LIGHT MICROSCOPY

**Client:** Apex Environmental Management  
 7 Winchester Court  
 Mauldin, SC 29662

**CEI Lab Code:** A17-8555  
**Date Received:** 06-16-17  
**Date Analyzed:** 06-20-17  
**Date Reported:** 06-22-17

**Project:** COS 356 St. Andrews St ACM & LBP; 0417-66

## ASBESTOS BULK PLM, EPA 600 METHOD

Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS				ASBESTOS %
			Fibrous		Non-Fibrous		
1 Layer 1 A2427145	Shingle	Heterogeneous	20%	Fiberglass	45%	Tar	None Detected
		Gray Fibrous Bound			35%	Silicates	
Layer 2 A2427145	Shingle	Heterogeneous	20%	Fiberglass	45%	Tar	None Detected
		Black Fibrous Bound			35%	Silicates	
2 Layer 1 A2427146	Shingle	Heterogeneous	20%	Fiberglass	45%	Tar	None Detected
		Gray Fibrous Bound			35%	Silicates	
Layer 2 A2427146	Shingle	Heterogeneous	20%	Fiberglass	45%	Tar	None Detected
		Black Fibrous Bound			35%	Silicates	
3 A2427147	Sample Submitted for TEM Analysis						
4 A2427148	Roll Roofing	Heterogeneous	30%	Synthetic Fiber	60%	Tar	None Detected
		Black Fibrous Bound			10%	Silicates	
5 A2427149	Roll Roofing	Heterogeneous	30%	Synthetic Fiber	60%	Tar	None Detected
		Black Fibrous Bound			10%	Silicates	
6 A2427150	Sample Submitted for TEM Analysis						



# ASBESTOS BULK ANALYSIS

By: POLARIZING LIGHT MICROSCOPY

**Client:** Apex Environmental Management  
 7 Winchester Court  
 Mauldin, SC 29662

**CEI Lab Code:** A17-8555  
**Date Received:** 06-16-17  
**Date Analyzed:** 06-20-17  
**Date Reported:** 06-22-17

**Project:** COS 356 St. Andrews St ACM & LBP; 0417-66

## ASBESTOS BULK PLM, EPA 600 METHOD

Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS				ASBESTOS %
			Fibrous		Non-Fibrous		
7 A2427151	Caulk	Homogeneous Gray Non-fibrous Bound	100%		Caulk		None Detected
8 A2427152	Caulk	Homogeneous Gray Non-fibrous Bound	100%		Caulk		None Detected
9 A2427153	Sample Submitted for TEM Analysis						
10 Layer 1 A2427154A	Shingle	Heterogeneous Brown, Gray Fibrous Bound	35%	Cellulose	45%	Tar Silicates	None Detected
Layer 2 A2427154A	Shingle	Heterogeneous Brown Fibrous Bound	35%	Cellulose	45%	Tar Silicates	None Detected
A2427154B	Shingle	Heterogeneous Black Fibrous Bound	35%	Cellulose	45%	Tar Silicates	None Detected
A2427154C	Shingle	Heterogeneous Black, Gray Fibrous Bound	35%	Cellulose	45%	Tar Silicates	None Detected
A2427154D	Shingle	Heterogeneous Brown, Black Fibrous Bound	20%	Fiberglass	45%	Tar Silicates	None Detected



# ASBESTOS BULK ANALYSIS

By: POLARIZING LIGHT MICROSCOPY

**Client:** Apex Environmental Management  
 7 Winchester Court  
 Mauldin, SC 29662

**CEI Lab Code:** A17-8555  
**Date Received:** 06-16-17  
**Date Analyzed:** 06-20-17  
**Date Reported:** 06-22-17

**Project:** COS 356 St. Andrews St ACM & LBP; 0417-66

## ASBESTOS BULK PLM, EPA 600 METHOD

Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS				ASBESTOS %
			Fibrous		Non-Fibrous		
11 Layer 1 A2427155A	Shingle	Heterogeneous	35%	Cellulose	45%	Tar	None Detected
		Brown,Gray Fibrous Bound			20%	Silicates	
Layer 2 A2427155A	Shingle	Heterogeneous	35%	Cellulose	45%	Tar	None Detected
		Brown Fibrous Bound			20%	Silicates	
A2427155B	Shingle	Heterogeneous	35%	Cellulose	45%	Tar	None Detected
		Black Fibrous Bound			20%	Silicates	
A2427155C	Shingle	Heterogeneous	35%	Cellulose	45%	Tar	None Detected
		Black,Gray Fibrous Bound			20%	Silicates	
A2427155D	Shingle	Heterogeneous	20%	Fiberglass	45%	Tar	None Detected
		Brown,Black Fibrous Bound			35%	Silicates	
12 A2427156	Sample Submitted for TEM Analysis						
13 A2427157	Siding Paper	Heterogeneous	90%	Cellulose	10%	Tar	None Detected
		Brown,Black Fibrous Bound					
14 A2427158	Siding Paper	Heterogeneous	90%	Cellulose	10%	Tar	None Detected
		Brown,Black Fibrous Bound					



# ASBESTOS BULK ANALYSIS

By: POLARIZING LIGHT MICROSCOPY

**Client:** Apex Environmental Management  
7 Winchester Court  
Mauldin, SC 29662

**CEI Lab Code:** A17-8555  
**Date Received:** 06-16-17  
**Date Analyzed:** 06-20-17  
**Date Reported:** 06-22-17

**Project:** COS 356 St. Andrews St ACM & LBP; 0417-66

## ASBESTOS BULK PLM, EPA 600 METHOD

Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS		ASBESTOS %
			Fibrous	Non-Fibrous	
<b>15</b> A2427159	Sample Submitted for TEM Analysis				
<b>16</b> A2427160	Window Glazing	Heterogeneous White Non-fibrous Bound	5% 55% 35%	Paint Binder Calc Carb	<b>5% Chrysotile</b>
<b>17</b> A2427161	Sample Not Analyzed per COC				
<b>18</b> A2427162	Sample Not Analyzed per COC				



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**LEGEND:**    Non-Anth        = Non-Asbestiform Anthophyllite  
                 Non-Trem        = Non-Asbestiform Tremolite  
                 Calc Carb        = Calcium Carbonate

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**METHOD:** EPA 600 / R93 / 116 and EPA 600 / M4-82 / 020

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**REPORTING LIMIT:** <1% by visual estimation

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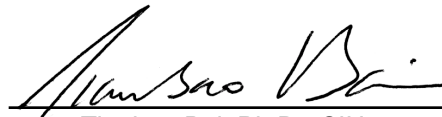
**REGULATORY LIMIT:** >1% by weight

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Due to the limitations of the EPA 600 method, nonfriable organically bound materials (NOBs) such as vinyl floor tiles can be difficult to analyze via polarized light microscopy (PLM). EPA recommends that all NOBs analyzed by PLM, and found not to contain asbestos, be further analyzed by Transmission Electron Microscopy (TEM). Please note that PLM analysis of dust and soil samples for asbestos is not covered under NVLAP accreditation. Estimated measurement of uncertainty is available on request.

This report relates only to the samples tested or analyzed and may not be reproduced, except in full, without written approval by CEI Labs, Inc. CEI Labs makes no warranty representation regarding the accuracy of client submitted information in preparing and presenting analytical results. Interpretation of the analytical results is the sole responsibility of the client. Samples were received in acceptable condition unless otherwise noted. This report may not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. Government.

**ANALYST:**   
Greg Ruff

**APPROVED BY:**   
Tianbao Bai, Ph.D., CIH  
Laboratory Director



18) A17, 8555  
A2427145-  
A2427162



107 New Edition Court, Cary, NC 27511  
Tel: 866-481-1412; Fax: 919-481-1442

# ASBESTOS CHAIN OF CUSTODY

LAB USE ONLY:
CEI Lab Code:
CEI Lab I.D. Range:

COMPANY INFORMATION	PROJECT INFORMATION
CEI CLIENT #:	Job Contact: Ben Oliver
Company: Apex Environmental Management, Inc.	Email / Tel: boliver@apex-ehs.com
Address: 7 Winchester Court	Project Name: COS 356 St. Andrews St ACM & LBP
Mauldin, South Carolina 29662	Project ID# 0417-66
Email: boliver@apex-ehs.com	PO #:
Tel: 864-404-3210 Fax: 864-404-3213	STATE SAMPLES COLLECTED IN: South Carolina

GENERAL INSTRUCTIONS		
POSITIVE STOP ANALYSIS	<input checked="" type="checkbox"/>	PLM DUE DATE: / /
ANALYZE NOB'S BY TEM	<input checked="" type="checkbox"/>	TEM DUE DATE: / /

IF TAT IS NOT MARKED STANDARD 3 DAY TAT APPLIES.

ASBESTOS	METHOD	TURN AROUND TIME					
		4 HR	8 HR	24 HR	2 DAY	3 DAY	5 DAY
PLM BULK	EPA 600	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
PLM POINT COUNT (400)	EPA 600	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PLM POINT COUNT (1000)	EPA 600	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PLM GRAV w POINT COUNT	EPA 600	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PCM AIR	NIOSH 7400	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEM AIR AHERA	EPA AHERA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEM AIR NIOSH	NIOSH 7402	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEM BULK	CHATFIELD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
TEM DUST WIPE	ASTM D6480-05	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEM DUST MICROVAC	ASTM D5755-09	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEM SOIL	ASTM D7521-13	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEM VERMICULITE	CINCINNATI METHOD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OTHER:		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

REMARKS: Utilize Positive Stop During Analysis			<input checked="" type="checkbox"/> Accept Samples
			<input type="checkbox"/> Reject Samples
Relinquished By:	Date/Time	Received By:	Date/Time
<i>[Signature]</i>	6-15-17	AA	6/16/17 8:50

Samples will be disposed of 30 days after analysis

# ASBESTOS SAMPLING FORM



COMPANY CONTACT INFORMATION	
Company: <i>Apex Environmental Mgt.</i>	Job Contact: <i>Ben Oliver</i>
Project Name: <i>0417-66 COS 356 St. Andrews St, ACM/LBP</i>	
Project ID #: <i>0417-66</i>	Tel: <i>864-404-3210</i>

SAMPLE ID#	DESCRIPTION / LOCATION	VOLUME/ AREA	TEST	
			PLM	TEM
1	<i>Ext. Main shed roof / shingles (2 layers and no felt)</i>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
2			<input checked="" type="checkbox"/>	<input type="checkbox"/>
3			<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	<i>Ext. Shed roof addition / roll roofing (1 layer with no felt)</i>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
5			<input checked="" type="checkbox"/>	<input type="checkbox"/>
6			<input type="checkbox"/>	<input checked="" type="checkbox"/>
7	<i>Exterior Shed window / Caulk / Putty</i>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
8			<input checked="" type="checkbox"/>	<input type="checkbox"/>
9			<input type="checkbox"/>	<input checked="" type="checkbox"/>
10	<i>Main House roof / shingles (5 layers and no felt)</i>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
11			<input checked="" type="checkbox"/>	<input type="checkbox"/>
12			<input type="checkbox"/>	<input checked="" type="checkbox"/>
13	<i>Ext. Siding beneath framing studs / Siding Paper</i>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
14			<input checked="" type="checkbox"/>	<input type="checkbox"/>
15			<input type="checkbox"/>	<input checked="" type="checkbox"/>
16	<i>Main house exterior windows / Window Glazing</i>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
17			<input checked="" type="checkbox"/>	<input type="checkbox"/>
18			<input type="checkbox"/>	<input checked="" type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>



June 29, 2017

Apex Environmental Management  
7 Winchester Court  
Mauldin, SC 29662

**CLIENT PROJECT:** COS 356 St. Andrews St ACM & LBP; 0417-66  
**CEI LAB CODE:** T17-1311

Dear Customer:

Enclosed are asbestos analysis results for TEM bulk samples received at our laboratory on June 22, 2017. The samples were analyzed for asbestos using transmission electron microscopy (TEM) per Chatfield Method.

Sample results containing > 1% asbestos are considered asbestos-containing materials (ACMs) per the EPA regulatory requirements. The detection limit for the TEM Chatfield method is <1% depending on the processed weight and constituents of the sample.

Thank you for your business and we look forward to continuing good relations. If you have any questions, please feel free to call our office at 919-481-1413.

Kind Regards,

A handwritten signature in black ink, appearing to read "Tianbao Bai".

Tianbao Bai, Ph.D., CIH  
Laboratory Director





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**ASBESTOS ANALYTICAL REPORT**  
**By: Transmission Electron Microscopy**

Prepared for

**Apex Environmental Management**

---

CLIENT PROJECT: COS 356 St. Andrews St ACM & LBP; 0417-66

CEI LAB CODE: T17-1311

TEST METHOD: Bulk Chatfield  
EPA 600 / R93 / 116

REPORT DATE: 06/29/17

**TEL: 866-481-1412**

*[www.ceilabs.com](http://www.ceilabs.com)*



# ASBESTOS BULK ANALYSIS

By: TRANSMISSION ELECTRON MICROSCOPY

**Client:** Apex Environmental Management  
7 Winchester Court  
Mauldin, SC 29662

**CEI Lab Code:** T17-1311  
**Date Received:** 06-22-17  
**Date Analyzed:** 06-29-17  
**Date Reported:** 06-29-17

**Project:** COS 356 St. Andrews St ACM & LBP; 0417-66

## TEM BULK CHATFIELD / EPA 600 / R93 / 116

Client ID Lab ID	Material Description	Sample Weight (g)	Organic Material %	Acid Soluble Material %	Acid Insoluble Material %	Asbestos %
3 T64489	Gray Shingle	0.432	23.4	37	39.6	None Detected
3 T64490	Black Shingle	0.492	19.5	34.6	45.9	None Detected
6 T64491	Black Rolled Roofing	0.384	74.5	17.2	8.3	None Detected
9 T64492	Gray Caulk	0.328	18.6	64.6	16.8	None Detected
12 T64493	Brown, Gray Shingle	0.322	49.4	4.3	46.3	None Detected
12 T64494	Brown Shingle	0.368	44	3.8	52.2	None Detected
12 T64495	Black Shingle	0.37	50.3	2.4	47.3	None Detected
12 T64496	Black, Gary Shingle	0.609	48.3	7.1	44.6	None Detected
12 T64497	Brown, Black Shingle	0.448	21.2	46.4	32.4	None Detected
15 T64498	Brown, Black Siding Paper	0.124	97.6	1.6	.8	None Detected



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**LEGEND:** None

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**METHOD:** CHATFIELD & EPA/600/R-93/116

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**LIMIT OF DETECTION:** Varies with the weight and constituents of the sample (<1%)

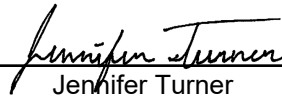
---

**REGULATORY LIMIT:** >1% by weight

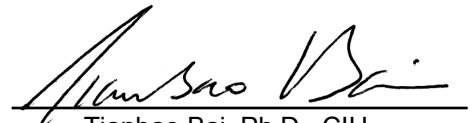
---

This report relates only to the samples tested or analyzed and may not be reproduced, except in full, without written approval by CEI Labs, Inc. CEI Labs makes no warranty representation regarding the accuracy of client submitted information in preparing and presenting analytical results. Interpretation of the analytical results is the sole responsibility of the client. Estimated measurement of uncertainty is available on request. Samples were received in acceptable condition unless otherwise noted.

**ANALYST:**

  
Jennifer Turner

**APPROVED BY:**

  
Tianbao Bai, Ph.D., CIH  
Laboratory Director

(18) A17 8555  
A242 7145-  
A242 7162



107 New Edition Court, Cary, NC 27511  
Tel: 866-481-1412; Fax: 919-481-1442

# ASBESTOS CHAIN OF CUSTODY

LAB USE ONLY: <span style="float: right;">(10)</span>	
CEI Lab Code:	T17-1311
CEI Lab I.D. Range:	T64489-498

COMPANY INFORMATION	PROJECT INFORMATION
CEI CLIENT #:	Job Contact: Ben Oliver
Company: Apex Environmental Management, Inc.	Email / Tel: boliver@apex-ehs.com
Address: 7 Winchester Court	Project Name: COS 356 St. Andrews St ACM & LBP
Mauldin, South Carolina 29662	Project ID# 0417-66
Email: boliver@apex-ehs.com	PO #:
Tel: 864-404-3210 Fax: 864-404-3213	STATE SAMPLES COLLECTED IN: South Carolina

GENERAL INSTRUCTIONS		
POSITIVE STOP ANALYSIS	<input checked="" type="checkbox"/>	PLM DUE DATE: / /
ANALYZE NOB'S BY TEM	<input checked="" type="checkbox"/>	TEM DUE DATE: / /

IF TAT IS NOT MARKED STANDARD 3 DAY TAT APPLIES.

ASBESTOS	METHOD	TURN AROUND TIME					
		4 HR	8 HR	24 HR	2 DAY	3 DAY	5 DAY
PLM BULK	EPA 600	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
PLM POINT COUNT (400)	EPA 600	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PLM POINT COUNT (1000)	EPA 600	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PLM GRAV w POINT COUNT	EPA 600	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PCM AIR	NIOSH 7400	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEM AIR AHERA	EPA AHERA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEM AIR NIOSH	NIOSH 7402	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEM BULK	CHATFIELD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
TEM DUST WIPE	ASTM D6480-05	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEM DUST MICROVAC	ASTM D5755-09	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEM SOIL	ASTM D7521-13	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEM VERMICULITE	CINCINNATI METHOD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OTHER:		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

REMARKS: Utilize Positive Stop During Analysis			<input checked="" type="checkbox"/> Accept Samples
			<input type="checkbox"/> Reject Samples
Relinquished By:	Date/Time	Received By:	Date/Time
<i>GR</i>	6-15-17	<i>AA</i>	6/16/17 8:50
<i>GR</i>	6/22/17 12:00		

Samples will be disposed of 30 days after analysis

11/1 8555  
T17-1311

# ASBESTOS SAMPLING FORM



COMPANY CONTACT INFORMATION	
Company: <u>Apex Environmental Mat.</u>	Job Contact: <u>Ben Oliver</u>
Project Name: <u>0417-66 COS 356 St. Andrews St, ACM / LBP</u>	
Project ID #: <u>0417-66</u>	Tel: <u>864-404-3210</u>

SAMPLE ID#	DESCRIPTION / LOCATION	VOLUME/ AREA	TEST			
			PLM	<input type="checkbox"/>	TEM	<input type="checkbox"/>
1	Ext. Main shed roof / shingles (2 layers and no felt)		PLM	<input checked="" type="checkbox"/>	TEM	<input type="checkbox"/>
2			PLM	<input checked="" type="checkbox"/>	TEM	<input type="checkbox"/>
3			PLM	<input type="checkbox"/>	TEM	<input checked="" type="checkbox"/>
4	Ext. Shed roof addition / roll roofing (1 layer with no felt)		PLM	<input checked="" type="checkbox"/>	TEM	<input type="checkbox"/>
5			PLM	<input checked="" type="checkbox"/>	TEM	<input type="checkbox"/>
6			PLM	<input type="checkbox"/>	TEM	<input checked="" type="checkbox"/>
7	Exterior Shed window / Caulk / Putty		PLM	<input checked="" type="checkbox"/>	TEM	<input type="checkbox"/>
8			PLM	<input checked="" type="checkbox"/>	TEM	<input type="checkbox"/>
9			PLM	<input type="checkbox"/>	TEM	<input checked="" type="checkbox"/>
10	Main House roof / Shingles (5 layers and no felt)		PLM	<input checked="" type="checkbox"/>	TEM	<input type="checkbox"/>
11			PLM	<input checked="" type="checkbox"/>	TEM	<input type="checkbox"/>
12			PLM	<input type="checkbox"/>	TEM	<input checked="" type="checkbox"/>
13	Ext. Siding beneath Framing studs / Siding Paper		PLM	<input checked="" type="checkbox"/>	TEM	<input type="checkbox"/>
14			PLM	<input checked="" type="checkbox"/>	TEM	<input type="checkbox"/>
15			PLM	<input type="checkbox"/>	TEM	<input checked="" type="checkbox"/>
16	Main house exterior windows / Window Glazing		PLM	<input checked="" type="checkbox"/>	TEM	<input type="checkbox"/>
17			PLM	<input checked="" type="checkbox"/>	TEM	<input type="checkbox"/>
18			PLM	<input type="checkbox"/>	TEM	<input checked="" type="checkbox"/>
			PLM	<input type="checkbox"/>	TEM	<input type="checkbox"/>
			PLM	<input type="checkbox"/>	TEM	<input type="checkbox"/>
			PLM	<input type="checkbox"/>	TEM	<input type="checkbox"/>
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			PLM	<input type="checkbox"/>	TEM	<input type="checkbox"/>
			PLM	<input type="checkbox"/>	TEM	<input type="checkbox"/>
			PLM	<input type="checkbox"/>	TEM	<input type="checkbox"/>
			PLM	<input type="checkbox"/>	TEM	<input type="checkbox"/>
			PLM	<input type="checkbox"/>	TEM	<input type="checkbox"/>

**SECTION IV**  
**Photographic Log**



Photo 1 – 356 Saint Andrews Street in Spartanburg, South Carolina.



Photo 2 – Exterior shed in back yard.



Photo 3 – Large amount of debris stacked in and around shed.



Photo 4 – Debris stacked behind shed.



Photo 5 – Roofing shingles (2 layers) and no felt on main exterior shed roof.



Photo 6 – Roll roofing (1 layer) and no felt on exterior shed roof addition.



Photo 7 – Putty/Caulk on exterior shed window casing.



Photo 8 – Roofing shingles (5 layers) and no felt on main house roof.



Photo 9 – Siding paper beneath framing studs.



Photo 10 – Glazing on exterior wooden windows.



Photo 11 – Fire/structural damaged interior of house and debris piles.



Photo 12 – Fire/structural damaged interior of house and debris piles.





Photo 13 – Fire/structural damaged interior of house and debris piles.



Photo 14 – Fire/structural damaged interior of house and debris piles.



Photo 15 – Fire/structural damaged interior of house and debris piles.



Photo 16 – Fire/structural damaged interior of house and debris piles.

**SECTION V**

**SC DHEC Asbestos Inspector License**

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**SCDHEC ISSUED**  
Asbestos ID Card

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**Thomas H Oliver**



Expiration Date

**AIR SAMPLER AS-00202 03/17/18**  
**CONSULT BI BI-00680 01/18/18**