Asbestos & Lead Based Paint Assessment

City of Spartanburg
143 George 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

May 26, 2017

PEX
Environmental
Management

Environmental Management

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Mauldin, SC 29662
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Apex Project Number 0417-66

May 26, 2017

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

Reference: Asbestos and Lead-Based Paint Assessment Services
143 George Street
Spartanburg, South Carolina

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.

Ben Oliver
Project Manager

Tom Oliver
Director of Operations

Appendices

ASBESTOS AND LEAD BASED PAINT ASSESSMENT

CITY OF SPARTANBURG
143 GEORGE STREET
SPARTANBURG, SOUTH CAROLINA

APEX PROJECT NO. 0417-66

TABLE OF CONTENTS

SECTION

SECTION I

Asbestos & Lead Evaluation Report

ASBESTOS/LEAD EVALUATION REPORT
APEX PROJECT NUMBER: 0417-66

Date:	5/26/2017	Page Number:	1 of 4
Client:	City of Spartanburg	Client Contact:	Mr. Martin Livingston
Client Address:	440 South Church St, Suite B, Spartanburg, SC 29306-5234	Client Phone Number:	(864) 580-5323
Project:	Asbestos and Lead Evaluation		
Property Address:	143 George Street Spartanburg, SC		
Assessor:	Tom Oliver	Date of Assessment:	4/18/2017
Company:	Apex Environmental Management 7 Winchester Court Mauldin, SC 29662	Phone Number:	(864) 404-3210
Purpose of Assessment:	Demolition	Age of Structure:	Approximately 55 years
Building Type:	Residential	Number of Stories:	1
Foundation:	Crawlspace	Approximate Square Footage	725 SF

EXTERIOR BUILDING MATERIALS

- Pitched wooden roof with shingles and felt.
- Wooden windows with glazing and caulk.
- Vinyl window with caulk.
- Caulk on wooden door frames with metal doors.
- Wooden siding with no felt.
- One chimney and vent penetration with tar/mastic assumed positive.

INTERIOR BUILDING MATERIALS

- Wooden floors with no felt.
- Drywall walls and ceilings with coating and tape.
- Multiple types and layers of floor tile with mastic and adhesive.
- Mastic beneath shower stall area.

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. Thirty-two (32) 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). Sixteen (16) 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. Materials were analyzed to contain less than 1% asbestos and it should be noted that OSHA asbestos regulations will apply. A specific *PLM* and *TEM* table is located in Appendix II of this report and identifies positive materials and designates approximate quantities.

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

- Approximately 8 exterior wooden windows with glazing.
- Approximately 1,980 SF of tape and coating on drywall throughout.
- Approximately 110 SF of 12"x12" dark orange floor tile with mastic in the right rear bedroom.
- Approximately 10 LF of tar/mastic on one chimney and vent penetration assumed positive.

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 µg/m^3) during an eight-hour workday and a permissible exposure level of fifty micrograms per cubic meter (50 µg/m^3) for employees.

Currently, SCDHEC defines LBP as paint containing in excess of, or equal to, 1 mg/cm^3. The laboratory analytical results and chain-of-custody are included in the Lead Analysis Reports in Appendix A. The approximate locations of the paint samples collected and analytical results are presented in the Tables included with this report.

One surface in the building tested positive for lead in excess of the regulatory definition:

- Exterior purple wooden windows.

RECOMMENDATIONS AND DISCUSSION

Asbestos Containing Materials

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. Abate the asbestos containing materials in the structure prior to renovation or demolition.

2. 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.

Lead-Based Paint

Currently the South Carolina Department of Health and Environmental Control (SCDHEC) define LBP as paint containing greater than 1 milligram per square centimeter (mg/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 mg/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 ($\mu g/m^3$) 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

Project Name: COS 143 George Street ACM/LBP

Project Location: 143 George Street, Spartanburg, SC

Project Number: 0417-66

Sampled By: Tom Oliver

Project Manager: Ben Oliver

Date: 4/18/2017

Sample No.	Location	Sample Description	Analytical Results	Friable/Non Friable	Condition	Quantity
1	Roof	Roofing material (4 layers) and felt (1 layer)	PLM - NAD	Non-Friable	Good	800 SF
2						
3			TEM - NAD			
4	Exterior Vinyl Window	Window Caulk	PLM - NAD	Non-Friable	Good	1 EA
5						
6			TEM - NAD			
7	Exterior Wooden Windows	Window Caulk	PLM - NAD	Non-Friable	Good	8 EA
8						
9			TEM - NAD			
10	**Exterior Wooden Windows**	**Window Glazing**	**PLM - 2% Chrysotile**	**Non-Friable**	**Good**	**8 EA**
11						
12						
13	Exterior Door Frames	Caulk on Door Frames	PLM - NAD	Non-Friable	Good	2 EA
14						
15			TEM - NAD			
16	**Throughout Interior**	**Drywall with tape and coating**	**PLM - 2% Chrysotile; Drywall system with coating**	**Friable**	**Good**	**1,980 SF**
17						
18						
19						
20						
21	Bathroom	Wall mastic in shower stall area	PLM - NAD	Non-Friable	Good	35 SF
22						
23			TEM - NAD			

ASBESTOS SURVEY FIELD DATA SHEET

Project Name: COS 143 George Street ACM/LBP

Project Location: 143 George Street, Spartanburg, SC

Project Number: 0417-66

Sampled By: Tom Oliver

Project Manager: Ben Oliver

Date: 4/18/2017

Sample No.	Location	Sample Description	Analytical Results	Friable/Non Friable	Condition	Quantity
24	**Right Rear Bedroom**	**12"x12" dark orange floor tile with mastic**	**PLM - Floor tile 2% Chry,** mastic NAD	**Non-Friable**	**Good**	**110 SF**
25						
26			TEM - Mastic <1% Chry			
27	Kitchen and Bathroom	12"x12" wood pattern self-stick floor tile	PLM - NAD	Non-Friable	Good	160 SF
28						
29			TEM - NAD			
30	Kitchen 2nd Layer	12"x12" grey self-stick floor tile	PLM - NAD	Non-Friable	Good	135 SF
31						
32			TEM - NAD			
Assumed	**Chimney and Vent Penetration Mastic Assumed Positive**			**Non-Friable**	**Good**	**10 LF**

NAD = No Asbestos Detected
Bold = Positive For Asbestos
LF = Linear Feet
SF = Square Feet
EA = Each
Chry = Chrysotile

FIELD DATA SHEET
LBP ANALYSIS

Project Name: COS 143 George Street ACM/LBP

Project Location: 143 George Street, Spartanburg, SC

Project Number: 0417-66

Sampled By: Ben Oliver

Project Manager: Ben Oliver

Date: 4/21/2017

Sample No.	Sample Location	Component	Color	Substrate	Analytical Result (mg/m^3)
137	Exterior	Siding	Blue	Wood	0.79
138	Exterior	Door	White	Metal	0.00
139	Exterior	Door Frame	Blue	Wood	0.00
140	Exterior	Window Sill	Purple	Wood	0.57
141	**Exterior**	**Window**	**Purple**	**Wood**	**1.46**
142	Exterior	Porch Ceiling	Blue	Wood	0.89
143	Exterior	Foundation	Blue	CMU Block	0.01
144	Exterior	Door	Grey	Metal	0.00
145	Exterior	Door Frame	Grey	Wood	0.00
146	Exterior	Window	White	Vinyl	0.00
147	Interior	Wall	Cream	Drywall	0.00
148	Interior	Cabinet	Black	Wood	0.00
149	Interior	Cabinet	White	Wood	0.00
150	Interior	Window Frame	Brown	Wood	0.03
151	Interior	Window	Brown	Wood	0.07
152	Interior	Base Board	Cream	Wood	0.01
153	Interior	Chimney	Black	Brick	0.00
154	Interior	Door Frame	Black	Wood	0.02
155	Interior	Wall	Blue	Drywall	0.00
156	Interior	Floor	Brown	Wood	0.08
157	Interior	Wall	Pink	Drywall	0.00
160	Interior	Base Board	Black	Wood	0.00

Bold = Lead Based Paint

SECTION III

Laboratory Analytical Results

April 26, 2017

Apex Environmental Management
7 Winchester Court
Mauldin, SC 29662

CLIENT PROJECT: COS 143 George St. ACM & LBP; 0417-66
CEI LAB CODE: B17-0571

Dear Customer:

Enclosed are asbestos analysis results for PLM Bulk samples received at our laboratory on April 20, 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,

Tianbao Bai, Ph.D., CIH
Laboratory Director

NVLAP TESTING
NVLAP LAB CODE 101768-0

ASBESTOS ANALYTICAL REPORT
By: Polarized Light Microscopy

Prepared for

Apex Environmental Management

CLIENT PROJECT: COS 143 George St. ACM & LBP; 0417-66

CEI LAB CODE: B17-0571

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

REPORT DATE: 04/26/17

TOTAL SAMPLES ANALYZED: 19

SAMPLES >1% ASBESTOS: 3

TEL: 866-481-1412

www.ceilabs.com

Asbestos Report Summary

By: POLARIZING LIGHT MICROSCOPY

PROJECT: COS 143 George St. ACM & LBP; 0417-66 **CEI LAB CODE:** B17-0571

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

Client ID	Layer	Lab ID	Color	Sample Description	ASBESTOS %
1	Layer 1	B237644A	Black	Roofing Shingle	None Detected
	Layer 2	B237644A	Black	Roofing Shingle	None Detected
		B237644B	Black	Roofing Shingle	None Detected
		B237644C	Black	Roofing Shingle	None Detected
		B237644D	Black,Gray	Felt	None Detected
2	Layer 1	B237645A	Black	Roofing Shingle	None Detected
	Layer 2	B237645A	Black	Roofing Shingle	None Detected
		B237645B	Black	Roofing Shingle	None Detected
		B237645C	Black	Roofing Shingle	None Detected
		B237645D	Black,Gray	Felt	None Detected
3		B237646		Sample Submitted for TEM Analysis	
4		B237647	White,Gray	Window Caulk	None Detected
5		B237648	White,Gray	Window Caulk	None Detected
6		B237649		Sample Submitted for TEM Analysis	
7		B237650	White,Gray	Window Caulk	None Detected
8		B237651	White,Gray	Window Caulk	None Detected
9		B237652		Sample Submitted for TEM Analysis	
10		B237653	Gray,Tan	Window Glazing	Chrysotile 2%
11		B237654		Sample Not Analyzed per COC	
12		B237655		Sample Not Analyzed per COC	
13		B237656	White,Gray	Caulk	None Detected
14		B237657	White,Gray	Caulk	None Detected
15		B237658		Sample Submitted for TEM Analysis	
16	Layer 1	B237659	Off-white,Brown	Drywall	None Detected
	Layer 2	B237659	Pink	Tape & Coating	None Detected
17	Layer 1	B237660	Off-white	Drywall	None Detected
	Layer 2	B237660	Brown,Pink	Tape & Coating	Chrysotile 2%
18		B237661		Sample Not Analyzed per COC	

Asbestos Report Summary

By: POLARIZING LIGHT MICROSCOPY

PROJECT: COS 143 George St. ACM & LBP; 0417 -66 **CEI LAB CODE:** B17-0571

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

Client ID	Layer	Lab ID	Color	Sample Description	ASBESTOS %
19		B237662		Sample Not Analyzed per COC	
20		B237663		Sample Not Analyzed per COC	
21		B237664	Beige	Wall Mastic	None Detected
22		B237665	Beige	Wall Mastic	None Detected
23		B237666		Sample Submitted for TEM Analysis	
24		B237667A	Dark Orange	Floor Tile	Chrysotile 2%
		B237667B	Tan	Mastic	None Detected
25		B237668A		Sample Not Analyzed per COC	
		B237668B	Tan	Mastic	None Detected
26		B237669A		Sample Not Analyzed per COC	
		B237669B		Sample Submitted for TEM Analysis	
27		B237670A	Wood,Patterned	Self- Stick Floor Tile	None Detected
		B237670B	Clear	Mastic	None Detected
		B237670C	Off-white	Floor Tile	None Detected
		B237670D	Clear	Mastic	None Detected
28		B237671A	Wood,Patterned	Self- Stick Floor Tile	None Detected
		B237671B	Clear	Mastic	None Detected
29		B237672		Sample Submitted for TEM Analysis	
30		B237673A	Gray	Self- Stick Floor Tile	None Detected
		B237673B	Clear	Mastic	None Detected
31		B237674A	Gray	Self- Stick Floor Tile	None Detected
		B237674B	Clear	Mastic	None Detected
32		B237675		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: B17-0571
Date Received: 04-20-17
Date Analyzed: 04-24-17
Date Reported: 04-26-17

Project: COS 143 George St. ACM & LBP; 0417-66

ASBESTOS BULK PLM, EPA 600 METHOD

Client ID / Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS Fibrous		Non-Fibrous		ASBESTOS %
1 Layer 1 B237644A	Roofing Shingle	Heterogeneous Black Fibrous Bound	35%	Cellulose	60% 5%	Tar Gravel	None Detected
Layer 2 B237644A	Roofing Shingle	Heterogeneous Black Fibrous Bound	35%	Cellulose	60% 5%	Tar Gravel	None Detected
B237644B	Roofing Shingle	Heterogeneous Black Fibrous Bound	25%	Fiberglass	70% 5%	Tar Gravel	None Detected
B237644C	Roofing Shingle	Heterogeneous Black Fibrous Bound	25%	Fiberglass	70% 5%	Tar Gravel	None Detected
B237644D	Felt	Heterogeneous Black,Gray Fibrous Bound	70%	Cellulose	25% 5%	Tar Paint	None Detected
2 Layer 1 B237645A	Roofing Shingle	Heterogeneous Black Fibrous Bound	35%	Cellulose	60% 5%	Tar Gravel	None Detected
Layer 2 B237645A	Roofing Shingle	Heterogeneous Black Fibrous Bound	35%	Cellulose	60% 5%	Tar Gravel	None Detected

ASBESTOS BULK ANALYSIS

By: POLARIZING LIGHT MICROSCOPY

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7 Winchester Court
Mauldin, SC 29662

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ASBESTOS BULK PLM, EPA 600 METHOD

Client ID / Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS Fibrous		Non-Fibrous		ASBESTOS %
B237645B	Roofing Shingle	Heterogeneous Black Fibrous Bound	25%	Fiberglass	70% 5%	Tar Gravel	None Detected
B237645C	Roofing Shingle	Heterogeneous Black Fibrous Bound	25%	Fiberglass	70% 5%	Tar Gravel	None Detected
B237645D	Felt	Heterogeneous Black,Gray Fibrous Bound	70%	Cellulose	25% 5%	Tar Paint	None Detected
3 B237646	Sample Submitted for TEM Analysis						
4 B237647	Window Caulk	Heterogeneous White,Gray Fibrous Bound	<1%	Cellulose	85% 10% 5%	Caulk Binder Paint	None Detected
5 B237648	Window Caulk	Heterogeneous White,Gray Fibrous Bound	<1%	Cellulose	85% 10% 5%	Caulk Binder Paint	None Detected
6 B237649	Sample Submitted for TEM Analysis						
7 B237650	Window Caulk	Heterogeneous White,Gray Fibrous Bound	<1%	Cellulose	85% 10% 5%	Caulk Binder Paint	None Detected

ASBESTOS BULK ANALYSIS

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ASBESTOS BULK PLM, EPA 600 METHOD

Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS Fibrous		Non-Fibrous		ASBESTOS %
8 B237651	Window Caulk	Heterogeneous White,Gray Fibrous Bound	<1% 	Cellulose 	85% 10% 5%	Caulk Binder Paint	None Detected
9 B237652	Sample Submitted for TEM Analysis						
10 B237653	Window Glazing	Heterogeneous Gray,Tan Fibrous Bound	3% <1%	Talc Cellulose	80% 10% 5%	Calc Carb Binder Paint	**2% Chrysotile**
11 B237654	Sample Not Analyzed per COC						
12 B237655	Sample Not Analyzed per COC						
13 B237656	Caulk	Heterogeneous White,Gray Fibrous Bound	<1% 	Cellulose 	85% 10% 5%	Caulk Binder Paint	None Detected
14 B237657	Caulk	Heterogeneous White,Gray Fibrous Bound	<1% 	Cellulose 	85% 10% 5%	Caulk Binder Paint	None Detected
15 B237658	Sample Submitted for TEM Analysis						
16 Layer 1 B237659	Drywall	Heterogeneous Off-white,Brown Fibrous Bound	15% 	Cellulose 	75% 10% <1%	Gypsum Silicates Paint	None Detected

ASBESTOS BULK ANALYSIS

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Project: COS 143 George St. ACM & LBP; 0417-66

ASBESTOS BULK PLM, EPA 600 METHOD

Client ID / Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS Fibrous		Non-Fibrous		ASBESTOS %
Layer 2 B237659	Tape & Coating	Heterogeneous Pink Fibrous Bound	75%	Cellulose	20% 5%	Binder Paint	None Detected
17 Layer 1 B237660	Drywall	Heterogeneous Off-white Fibrous Bound	15%	Cellulose	75% 10% <1%	Gypsum Silicates Paint	None Detected
Layer 2 B237660	Tape & Coating	Heterogeneous Brown,Pink Fibrous Bound	25%	Cellulose	50% 20% 3%	Calc Carb Binder Paint	**2% Chrysotile**
18 B237661	Sample Not Analyzed per COC						
19 B237662	Sample Not Analyzed per COC						
20 B237663	Sample Not Analyzed per COC						
21 B237664	Wall Mastic	Heterogeneous Beige Fibrous Bound	<1%	Cellulose	90% 10%	Mastic Binder	None Detected
22 B237665	Wall Mastic	Heterogeneous Beige Fibrous Bound	<1%	Cellulose	90% 10%	Mastic Binder	None Detected
23 B237666	Sample Submitted for TEM Analysis						

ASBESTOS BULK ANALYSIS

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ASBESTOS BULK PLM, EPA 600 METHOD

Client ID / Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS Fibrous		Non-Fibrous		ASBESTOS %
24 B237667A	Floor Tile	Heterogeneous Dark Orange Fibrous Bound	<1%	Cellulose	78% 10% 10%	Vinyl Binder Silicates	**2% Chrysotile**
B237667B	Mastic	Heterogeneous Tan Fibrous Bound	5%	Cellulose	90% 5%	Mastic Non-Fibrous Debris	None Detected
25 B237668A	Sample Not Analyzed per COC						
B237668B	Mastic	Heterogeneous Tan Fibrous Bound	5%	Cellulose	90% 5%	Mastic Non-Fibrous Debris	None Detected
26 B237669A	Sample Not Analyzed per COC						
B237669B	Sample Submitted for TEM Analysis						
27 B237670A	Self- Stick Floor Tile	Heterogeneous Wood,Patterned Fibrous Bound	<1%	Cellulose	80% 15% 5%	Vinyl Binder Silicates	None Detected
B237670B	Mastic	Heterogeneous Clear Fibrous Bound	<1%	Cellulose	100% <1%	Mastic Non-Fibrous Debris	None Detected
B237670C	Floor Tile	Heterogeneous Off-white Fibrous Bound	<1%	Cellulose	80% 15% 5%	Vinyl Binder Silicates	None Detected

ASBESTOS BULK ANALYSIS

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ASBESTOS BULK PLM, EPA 600 METHOD

Client ID / Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS Fibrous		Non-Fibrous		ASBESTOS %
B237670D	Mastic	Heterogeneous Clear Fibrous Bound	5%	Cellulose	95% <1%	Mastic Non-Fibrous Debris	None Detected
28 B237671A	Self- Stick Floor Tile	Heterogeneous Wood,Patterned Fibrous Bound	<1%	Cellulose	80% 15% 5%	Vinyl Binder Silicates	None Detected
B237671B	Mastic	Heterogeneous Clear Fibrous Bound	<1%	Cellulose	100% <1%	Mastic Non-Fibrous Debris	None Detected
29 B237672	Sample Submitted for TEM Analysis						
30 B237673A	Self- Stick Floor Tile	Heterogeneous Gray Fibrous Bound	<1%	Cellulose	80% 15% 5%	Vinyl Binder Silicates	None Detected
B237673B	Mastic	Heterogeneous Clear Fibrous Bound	<1%	Cellulose	100% <1%	Mastic Non-Fibrous Debris	None Detected
31 B237674A	Self- Stick Floor Tile	Heterogeneous Gray Fibrous Bound	<1%	Cellulose	80% 15% 5%	Vinyl Binder Silicates	None Detected
B237674B	Mastic	Heterogeneous Clear Fibrous Bound	<1%	Cellulose	100% <1%	Mastic Non-Fibrous Debris	None Detected

ASBESTOS BULK ANALYSIS

By: POLARIZING LIGHT MICROSCOPY

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

CEI Lab Code: B17-0571
Date Received: 04-20-17
Date Analyzed: 04-24-17
Date Reported: 04-26-17

Project: COS 143 George St. ACM & LBP; 0417-66

ASBESTOS BULK PLM, EPA 600 METHOD

Client ID / Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS Fibrous	NON-ASBESTOS COMPONENTS Non-Fibrous	ASBESTOS %
32 B237675	Sample Submitted for TEM Analysis				

LEGEND:

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

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

REPORTING LIMIT: <1% by visual estimation

REGULATORY LIMIT: >1% by weight

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: Daniel Liguori

Daniel Liguori

APPROVED BY:

Tianbao Bai, Ph.D., CIH
Laboratory Director

NVLAP TESTING
NVLAP LAB CODE 101768-0

ASBESTOS CHAIN OF CUSTODY

(32) B17-0571 B2371644 - B2371675

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

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 143 George 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	☒	PLM DUE DATE: / /	
ANALYZE NOB'S BY TEM	☒	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	☐	☐	☐	☐	☐	☒
PLM POINT COUNT (400)	EPA 600	☐	☐	☐	☐	☐	☐
PLM POINT COUNT (1000)	EPA 600	☐	☐	☐	☐	☐	☐
PLM GRAV w POINT COUNT	EPA 600		☐	☐	☐	☐	☐
PCM AIR	NIOSH 7400	☐	☐	☐	☐	☐	☐
TEM AIR AHERA	EPA AHERA	☐	☐	☐	☐	☐	☐
TEM AIR NIOSH	NIOSH 7402	☐	☐	☐	☐	☐	☐
TEM BULK	CHATFIELD		☐	☐	☐	☐	☒
TEM DUST WIPE	ASTM D6480-05	☐	☐	☐	☐	☐	☐
TEM DUST MICROVAC	ASTM D5755-09	☐	☐	☐	☐	☐	☐
TEM SOIL	ASTM D7521-13			☐	☐	☐	☐
TEM VERMICULITE	CINCINNATI METHOD			☐	☐	☐	☐
OTHER:		☐	☐	☐	☐	☐	☐

REMARKS: Utilize Positive Stop During Analysis	☒ Accept Samples ☐ Reject Samples

Relinquished By:	Date/Time	Received By:	Date/Time
[signature]	4-19-17	DC	4-20-17 9:10

Samples will be disposed of 30 days after analysis

B17-0571

ASBESTOS SAMPLING FORM

CEI LABS

COMPANY CONTACT INFORMATION	
Company: Apex Environmental Management, Inc.	Job Contact: Ben Oliver
Project Name: COS 143 George St. ACM/LBP	
Project ID #: 0417-66	Tel: 864-640-1147

SAMPLE ID#	DESCRIPTION / LOCATION	VOLUME/ AREA	TEST	
1	Roofing shingles (4 layers) and felt (1 layer)		PLM ☒	TEM ☐
2			PLM ☒	TEM ☐
3			PLM ☐	TEM ☒
4	Window caulk on vinyl windows		PLM ☒	TEM ☐
5			PLM ☒	TEM ☐
6			PLM ☐	TEM ☒
7	Window caulk on wooden windows		PLM ☒	TEM ☐
8			PLM ☒	TEM ☐
9			PLM ☐	TEM ☒
10	Window glazing		PLM ☒	TEM ☐
11			PLM ☒	TEM ☐
12			PLM ☐	TEM ☒
13	Caulk on door frames		PLM ☒	TEM ☐
14			PLM ☒	TEM ☐
15			PLM ☐	TEM ☒
16	Drywall with tape and coating		PLM ☒	TEM ☐
17			PLM ☒	TEM ☐
18			PLM ☒	TEM ☐
19			PLM ☒	TEM ☐
20			PLM ☒	TEM ☐
21	Wall mastic in shower stall area		PLM ☒	TEM ☐
22			PLM ☒	TEM ☐
23			PLM ☐	TEM ☒
24	12"x12" Dark orange floor tile with mastic		PLM ☒	TEM ☐
25			PLM ☒	TEM ☐
26			PLM ☐	TEM ☒
27	12"x12" wood pattern self-stick floor tile.		PLM ☒	TEM ☐
28			PLM ☒	TEM ☐
29			PLM ☐	TEM ☒
30	12"x12" grey self-stick		PLM ☒	TEM ☐

B17-0571

ASBESTOS SAMPLING FORM

CEI LABS

COMPANY CONTACT INFORMATION	
Company: Apex Environmental Mgt.	Job Contact: Ben Oliver
Project Name: COS 143 George St. ACM/LBP	
Project ID #: 0417-66	Tel: 864-404-3210

SAMPLE ID#	DESCRIPTION / LOCATION	VOLUME/ AREA	TEST	
31	floor tile		PLM [X]	TEM [ ]
32			PLM [ ]	TEM [X]
			PLM [ ]	TEM [ ]
			PLM [ ]	TEM [ ]
			PLM [ ]	TEM [ ]
			PLM [ ]	TEM [ ]
			PLM [ ]	TEM [ ]
			PLM [ ]	TEM [ ]
			PLM [ ]	TEM [ ]
			PLM [ ]	TEM [ ]
			PLM [ ]	TEM [ ]
			PLM [ ]	TEM [ ]
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			PLM [ ]	TEM [ ]
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			PLM [ ]	TEM [ ]
			PLM [ ]	TEM [ ]
			PLM [ ]	TEM [ ]

VERSION CCOC.0214.2/2.LD
Customer COC Page 2

May 1, 2017

Apex Environmental Management
7 Winchester Court
Mauldin, SC 29662

CLIENT PROJECT: COS 143 George St. ACM & LBP; 0417-66
CEI LAB CODE: T17-0772

Dear Customer:

Enclosed are asbestos analysis results for TEM bulk samples received at our laboratory on April 24, 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,

Tianbao Bai, Ph.D., CIH
Laboratory Director

ASBESTOS ANALYTICAL REPORT
By: Transmission Electron Microscopy

Prepared for

Apex Environmental Management

CLIENT PROJECT: COS 143 George St. ACM & LBP; 0417-66

CEI LAB CODE: T17-0772

TEST METHOD: Bulk Chatfield
EPA 600 / R93 / 116

REPORT DATE: 05/01/17

TEL: 866-481-1412

www.ceilabs.com

ASBESTOS BULK ANALYSIS

By: TRANSMISSION ELECTRON MICROSCOPY

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

CEI Lab Code: T17-0772
Date Received: 04-24-17
Date Analyzed: 04-26-17
Date Reported: 05-01-17

Project: COS 143 George 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 T61566	Black Roof Shingle	0.298	85.9	5	9.1	**None Detected**
3 T61567	Black Roof Shingle	0.341	66	5	29	**None Detected**
3 T61568	Black Roof Shingle	0.324	28.7	38	33.3	**None Detected**
3 T61569	Black Roof Shingle	0.233	23.6	52.4	24	**None Detected**
3 T61570	Black,Gray Felt	0.51	90.6	4.7	4.7	**None Detected**
6 T61571	White,Gray Window Caulk	0.227	27.3	69.2	3.5	**None Detected**
9 T61572	White,Gray Window Caulk	0.246	30.5	64.2	5.3	**None Detected**
15 T61573	White,Gray Window Caulk	0.334	28.4	71.3	.3	**None Detected**
23 T61574	Beige Wall Mastic	0.171	31	68.4	.6	**None Detected**
26 T61575	Tan Mastic	0.104	59.6	26	14.4	**<1% Chrysotile**
27 T61576	Off-white Floor Tile	0.364	31.3	68.4	.3	**None Detected**
27 T61577	Clear Mastic	0.125	33.6	65.6	.8	**None Detected**

ASBESTOS BULK ANALYSIS

By: TRANSMISSION ELECTRON MICROSCOPY

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

CEI Lab Code: T17-0772
Date Received: 04-24-17
Date Analyzed: 04-26-17
Date Reported: 05-01-17

Project: COS 143 George 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 %
29 T61578	Wood Patterned Self-Stick Floor Tile	0.314	33.8	65.9	.3	**None Detected**
29 T61579	Clear Mastic	0.162	25.9	73.5	.6	**None Detected**
32 T61580	Gray Self-Stick Floor Tile	0.285	33.7	66	.3	**None Detected**
32 T61581	Clear Mastic	0.079	64.6	34.2	1.2	**None Detected**

LEGEND: None

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

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: Abigail Nails

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

B17-0571 (32) B237644 - B237675

ASBESTOS CHAIN OF CUSTODY

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

LAB USE ONLY: (16)
CEI Lab Code: T17-0772
CEI Lab I.D. Range: T61566 - T61581

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 143 George 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	☒	PLM DUE DATE: / /
ANALYZE NOB'S BY TEM	☒	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	☐	☐	☐	☐	☐	☒
PLM POINT COUNT (400)	EPA 600	☐	☐	☐	☐	☐	☐
PLM POINT COUNT (1000)	EPA 600	☐	☐	☐	☐	☐	☐
PLM GRAV w POINT COUNT	EPA 600		☐	☐	☐	☐	☐
PCM AIR	NIOSH 7400	☐	☐	☐	☐	☐	☐
TEM AIR AHERA	EPA AHERA	☐	☐	☐	☐	☐	☐
TEM AIR NIOSH	NIOSH 7402	☐	☐	☐	☐	☐	☐
TEM BULK	CHATFIELD		☐	☐	☐	☐	☒
TEM DUST WIPE	ASTM D6480-05	☐	☐	☐	☐	☐	☐
TEM DUST MICROVAC	ASTM D5755-09	☐	☐	☐	☐	☐	☐
TEM SOIL	ASTM D7521-13			☐	☐	☐	☐
TEM VERMICULITE	CINCINNATI METHOD			☐	☐	☐	☐
OTHER:		☐	☐	☐	☐	☐	☐

REMARKS: Utilize Positive Stop During Analysis	☑ Accept Samples ☐ Reject Samples

Relinquished By:	Date/Time	Received By:	Date/Time
	4-19-17	DC	4-20-17 9110
	4/24/17 12:25PM		

Samples will be disposed of 30 days after analysis

B17-0571
T17-0772

ASBESTOS SAMPLING FORM

CEI LABS

COMPANY CONTACT INFORMATION	
Company: Apex Environmental Management, Inc.	Job Contact: Ben Oliver
Project Name: COS 143 George St. ACM/LBP	
Project ID #: 0417-66	Tel: 864-640-1147

SAMPLE ID#	DESCRIPTION / LOCATION	VOLUME/ AREA	TEST	
1	Roofing shingles (4 layers) and felt (1 layer)		PLM ☒	TEM ☐
2			PLM ☒	TEM ☐
3			PLM ☐	TEM ☒
4	Window caulk on vinyl windows		PLM ☒	TEM ☐
5			PLM ☒	TEM ☐
6			PLM ☐	TEM ☒
7	Window caulk on wooden windows		PLM ☒	TEM ☐
8			PLM ☒	TEM ☐
9			PLM ☐	TEM ☒
10	Window glazing		PLM ☒	TEM ☐
11			PLM ☒	TEM ☐
12			PLM ☐	TEM ☒
13	Caulk on door frames		PLM ☒	TEM ☐
14			PLM ☒	TEM ☐
15			PLM ☐	TEM ☒
16	Drywall with tape and coating		PLM ☒	TEM ☐
17			PLM ☒	TEM ☐
18			PLM ☒	TEM ☐
19			PLM ☒	TEM ☐
20			PLM ☒	TEM ☐
21	Wall mastic in shower stall area		PLM ☒	TEM ☐
22			PLM ☒	TEM ☐
23			PLM ☐	TEM ☒
24	12"x12" Dark orange floor tile with mastic		PLM ☒	TEM ☐
25			PLM ☒	TEM ☐
26			PLM ☐	TEM ☒
27	12"x12" wood pattern self-stick floor tile.		PLM ☒	TEM ☐
28			PLM ☒	TEM ☐
29			PLM ☐	TEM ☒
30	12"x12" grey self-stick		PLM ☒	TEM ☐

T17-0272
B17-0571

ASBESTOS SAMPLING FORM

CEI LABS

COMPANY CONTACT INFORMATION	
Company: Apex Environmental Mgt.	Job Contact: Ben Oliver
Project Name: Cos 143 George St. ACM/LBP	
Project ID #: 0417-66	Tel: 864-404-3210

SAMPLE ID#	DESCRIPTION / LOCATION	VOLUME/ AREA	TEST	
31	floor tile		PLM ☒	TEM ☐
32			PLM ☐	TEM ☒
			PLM ☐	TEM ☐
			PLM ☐	TEM ☐
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Page 3 of 3

SECTION IV

Photographic Log

Photo 1 – 143 George Street in Spartanburg, South Carolina.

Photo 2 – Roofing material (4 layers) and felt (1 layer).

Photo 3 – Chimney and vent penetration with mastic assumed positive.

Photo 4 – Caulk on exterior vinyl window.

Photo 5 – Caulk and glazing on exterior wooden window.

Photo 6 – Caulk on exterior door frame.

Photo 7 – Drywall with tape and coating throughout interior.

Photo 8 – Wall mastic in shower stall area.

Photo 9 – 12”x12” dark orange floor tile with mastic in the right rear bedroom.

Photo 10 – 12”x12” wood pattern self-stick floor tile and 12”x12” grey self-stick floor tile.

SECTION V

SC DHEC Asbestos Inspector License

SCDHEC ISSUED
Asbestos ID Card

Thomas H Oliver

		Expiration Date
AIRSAMPLER	**AS-00202**	**03/17/18**
CONSULTBI	**BI-00680**	**01/18/18**