



PRE-DEMOLITION ASBESTOS & LEAD-BASED PAINT INSPECTION REPORT

F&R PROJECT NUMBER: 65U-0065

Regarding:

SPARTANBURG AIRPORT ASBESTOS AND LEAD INSPECTIONS
101 VERMONT AVENUE, SPARTANBURG, SC 29304

Prepared for:

CITY OF SPARTANBURG
PO Box 1749
SPARTANBURG, SC 29304

Prepared by:

Froehling & Robertson Inc.
18 Woods Lake Road
Greenville, South Carolina 29607
(864) 271-2840

Date of Inspection: June 23, 2016

Date of Report: June 27, 2016



SIGNATURE PAGE

INSPECTOR NAME

Anthony J. Herrmann

SC LICENSE No.

BI-01452

EXP. DATE

August 2016

REPORT PREPARED BY:

A handwritten signature in cursive script that reads 'Anthony Herrmann'.

Anthony J. Herrmann, GIT
Environmental Scientist

REPORT REVIEWED BY:

A handwritten signature in cursive script that reads 'Jesse Phillips'.

Jesse Phillips
Senior Environmental Professional



1.0	EXECUTIVE SUMMARY	1
1.1	Asbestos and Lead-Based Paint Inspection.....	1
1.2	Report Preparation.....	1
1.3	Building Description	1
1.4	Suspect Asbestos Containing Building Material Description	2
1.5	Suspect Lead-based Paint Material Description	2
2.0	GENERAL BACKGROUND INFORMATION.....	2
2.1	Asbestos Background & Regulatory Information.....	2
2.2	Lead-based Paint Background & Regulatory Information.....	4
3.0	PROCEDURES	5
3.1	Asbestos Sample Collection.....	5
3.2	Lead-Based Paint Chip Sample Collection.....	8
4.0	FINDINGS	9
4.1	Asbestos Containing Materials – Findings	9
4.2	Lead in Paint	9
5.0	LIMITATIONS	9

Appendix I

Photo Log, Sample Location Diagram

Appendix II

Analytical Results and Chain of Custody



1.0 EXECUTIVE SUMMARY

1.1 Asbestos and Lead-Based Paint Inspection

Froehling & Robertson (F&R) conducted a pre-demolition asbestos and lead-based paint inspection for the City of Spartanburg (the **Client**) at 101 Vermont Avenue in Spartanburg County, South Carolina on May 26, 2016. The purpose of the inspection was to sample the suspect materials in the building for asbestos containing materials (ACMs) and select areas of suspect lead-based paint prior to demolition. F&R understands that this inspection is for environmental risk purposes and for the purposes of demolition.

Mr. Anthony J. Herrmann, who holds South Carolina Asbestos Inspector License #BI-01452, conducted the inspection activities at the project site on June 23, 2016.

Suspect samples were shipped via overnight delivery under Chain of Custody to EMSL Analytical, Inc. (EMSL) in Charlotte, North Carolina for analysis. EMSL is accredited by the American Industrial Hygiene Association under their NVLAP quality control program for bulk asbestos analysis (Certificate 200841-0) and is accredited by the American Industrial Hygiene Association for analysis of bulk lead samples under their NLLAP quality control program (Certificate 102564).

Based on the analytical results of F&R's sampling of accessible suspect materials, asbestos containing materials (ACM) were identified as the joint compound on all drywall-based finishing components of the house. Ceiling texture was not identified as ACM.

Based on the analytical results of F&R's sampling of suspect lead-based paint, lead-based paint (LBP) was not identified at the house. Lead was detected below the regulatory threshold constituting LBP in the gray, blue, and red paint on the concrete floor of the front (south-facing) porch and the beige paint on the wooden exterior siding of the house.

1.2 Report Preparation

This report was prepared by Mr. Anthony J. Herrmann to detail the findings of the inspection after analyses of the bulk asbestos and lead-based paint samples were completed by EMSL.

1.3 Building Description

The building is a residential dwelling located at 101 Vermont Avenue, Spartanburg County, South Carolina. According the Spartanburg County Assessor's office, the structure is approximately 1356 square feet in size and was built in 1968. The building is constructed of wooden framed walls on a concrete slab foundation with exterior brick façade and wooden siding. The building contains a metal roof and the interior is finished with drywall ceilings and walls, hardwood, and



tile/linoleum floors. The ceilings of the living area are finished with ceiling texture. A photographic log is included as Appendix I.

1.4 Suspect Asbestos Containing Building Material Description

The suspect material observed at the site includes drywall and joint compound, ceiling texture, floor tile/linoleum in the kitchen and bathrooms, and window glazing.

1.5 Suspect Lead-based Paint Material Description

Suspect lead-based paint observed at the site includes paint on the exterior wood siding and the exterior porch floor. Other potentially lead-based paint coated surfaces were excluded from the survey due to familiarity.

2.0 GENERAL BACKGROUND INFORMATION

2.1 Asbestos Background & Regulatory Information

The term “asbestos” refers to a group of naturally-occurring, fibrous minerals that are commercially mined throughout the world, primarily in Canada, Russia, and South Africa. Asbestos has been used in hundreds of products. Collectively, these products are referred to as asbestos-containing materials (ACMs). Asbestos gained wide use because it is plentiful, readily available, low in cost, and because of its unique properties - it does not burn, is strong, conducts heat and electricity poorly, and is resistant to chemical corrosion. As an insulator, asbestos received wide spread use for thermal insulation and condensation control. Asbestos is added to a variety of building materials to enhance strength. It is found in concrete and concrete-like products. Asbestos cement products are used as siding and roofing shingles, wallboard, as corrugated or flat sheets for roofing and partition walls, and as piping. Asbestos has also been added to asphalt, vinyl, and other materials to make products like roofing cements, felts and shingles, exterior siding materials, floor tiles, joint compounds, and mastics/adhesives. Asbestos also proved valuable as a component of acoustical plaster. This material was troweled on or sprayed on to ceilings or walls. As a decorative product, frequently referred to as textured ceiling or wall paint, asbestos was also mixed with other materials and sprayed on to walls and ceilings to produce a soft textured appearance. Asbestos is still mined commercially and used in many common products, including brake shoes, roofing materials, and flooring products. It is important to realize that commercially available products containing asbestos can still be purchased. It is a common misconception that asbestos is no longer used.

The three most commonly encountered types of asbestos are sometimes referred to by their predominant color: Chrysotile (white) is by far the most frequently used asbestos mineral, constituting approximately 95% of all commercial and industrial applications. Chrysotile fibers are long and flexible and can be spun or woven into cloth. Amosite (brown) and Crocidolite (blue)



are used in approximately 4-5% of asbestos-containing products. Both types generally consist of shorter, more rigid fiber bundles that are highly resistant to heat, electricity, and chemicals. Three other types of asbestos – anthophyllite, tremolite, and actinolite – are only rarely used for commercial purposes, but they occasionally occur in small quantities (naturally) along with other raw materials.

The U.S. Environmental Protection Agency promulgated the National Emission Standards for Hazardous Air Pollutants (NESHAP) [40 CFR Part 61], which addresses the application, removal, and disposal of asbestos-containing materials (ACM). Under NESHAP the following categories are defined for asbestos-containing materials:

Friable - When dry, can be crumbled, pulverized, or reduced to powder by hand pressure.

Nonfriable - When dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

Category I Nonfriable ACM - Packings, gaskets, resilient floor coverings, and asphalt roofing products containing more than 1% asbestos.

Category II Nonfriable ACM – Any material, excluding Category I Non-friable ACM, containing more than 1% asbestos.

Regulated Asbestos Containing Material (RACM) – One of the following:

1. Friable ACM
2. Category I Nonfriable ACM that has become friable.
3. Category I Nonfriable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading.
4. Category II Nonfriable ACM that has a high probability of becoming, or has become, friable by the forces expected to act on the material in the course of demolition or renovation operations.

Under NESHAP, the following actions are required:

1. Prior to the commencement of demolition or renovation activities, the building owner must inspect the affected facility or part of the facility where the demolition or renovation activities will occur for the presence of asbestos.
2. Remove all RACM from the facility, before any activity begins, that would break up, dislodge, or similarly disturb the material or preclude access for subsequent removal.

The Occupational Safety and Health Administration (OSHA) has established three sets of regulatory standards pertaining to asbestos exposure:



29 CFR 1910.1001	General Industry
29 CFR 1926.1101	Construction Industry
29 CFR 1910.134	Respiratory Protection

The construction industry standard covers activities involving asbestos demolition, removal, alteration, repair, maintenance, installation, cleanup, transportation, disposal, and storage. The general industry standard covers other activities where asbestos exposure is possible.

Addressed under the OSHA standards are building owner/employer responsibilities regarding the identification of identified or presumed asbestos containing materials (PACM), notification to tenants/employees of the presence of asbestos, employee training, and work procedures.

2.2 Lead-Based Paint Background & Regulatory Information

Lead was used extensively as an additive in residential paints until banned by legislation on January 1, 1978. Painted surfaces in structures constructed before that date are suspected to contain lead and must by federal regulation be tested prior to disturbances that occur during renovation, repair and painting, and demolition. Paint found by analysis to contain more than 0.5% lead by weight is a regulated material under a variety of federal laws and is identified as “lead-based paint”.

Lead, when ingested or inhaled, is a neurological poison which can cause a wide range of negative health effects in humans including, but not limited to, high blood pressure, learning disabilities, central nervous system damage, hearing loss and many others.

Dust from lead-based paint disturbed during renovation or demolition is the principal source of lead exposure.

The amount of lead (the dose) required to poison a person is based largely on body weight, thus children are especially vulnerable. The brain and central nervous system in children under the age of 6 years are still developing rapidly and thus exposure to lead during this part of their development is especially damaging and may cause irreversible health issues.

Lead is regulated by the EPA, primarily through the Renovation, Repair and Painting (RRP) regulation which is part of Title X, the Residential Lead-Based Paint Hazard Reduction Act of 1992, 42 U.S.C. § 4852d and by OSHA, primarily through 29 CFR 1926.62, which is known as the Lead in Construction Rule.

Demolition of structures containing lead-based paint must include work practices which addresses and prevents exposure to lead by workers and prevents the spread of lead dust to the soil or to areas in the near vicinity of the demolition project. These work practices are contained within the regulations previously mentioned.



If lead-based paint on exterior surfaces is found to be flaking, peeling or otherwise damaged, lead contamination to the soil beneath the painted surfaces should be evaluated.

3.0 PROCEDURES

3.1 Asbestos Sample Collection

F&R personnel collected a total of thirty-nine (39) bulk samples of suspect asbestos containing materials (ACM) from the following materials:

- Ceiling texture,
- Drywall and joint compound,
- Vinyl flooring in the kitchen and bathrooms,
- Window glazing

Accordingly, the suspect ACM samples collected for analysis were submitted to EMSL Analytical, Inc. an NVLAP accredited and North Carolina licensed asbestos laboratory, in Charlotte, North Carolina for analysis by Polarized Light Microscopy (PLM) following EPA Method 600/R-93/116 and Method 600/M4-82-020. In addition, as required by South Carolina asbestos regulations, each non-friable organically bound (NOB) sample, which tested negative or non-detect by PLM was also analyzed via Transmission Electron Microscopy (TEM) using the EPA/600/R-93/116 Section 2.5.5.1 method. Four samples were analyzed by TEM.

The sample number, type of suspect ACM, detection of asbestos (1% or higher), estimated area of the ACM, locations for each sample collected, the condition for each sample collected, and description of friability is shown in Table 1 below. Additional information on the sampling effort is found in Sections 3 and 4 of this report.

TABLE 1 – SUMMARY OF ACM SAMPLES

SAMPLE NOS.	TYPE OF SUSPECT ACM	ASBESTOS DETECTED ABOVE 1%	Estimated Area (Square Feet)	LOCATION	Condition	Friable/Non-Friable
FT-1	Floor Tile	No	20	Hallway Bathroom	D	NF
FT-2	Floor Tile	No	20	Hallway Bathroom	D	NF
FT-3	Floor Tile	No	20	Hallway Bathroom	D	NF



SAMPLE NOS.	TYPE OF SUSPECT ACM	ASBESTOS DETECTED ABOVE 1%	Estimated Area (Square Feet)	LOCATION	Condition	Friable/Non-Friable
BFT-1	Floor Tile	No	24	Bedroom Bathroom	G	NF
BFT-2	Floor Tile	No	24	Bedroom Bathroom	G	NF
BFT-3	Floor Tile	No	24	Bedroom Bathroom	G	NF
KFT-1	Floor Tile	No	150	Kitchen/Laundry Room	G	NF
KFT-2	Floor Tile	No	150	Kitchen/Laundry Room	G	NF
KFT-3	Floor Tile	No	150	Kitchen/Laundry Room	G	NF
CT-1-Drywall	Drywall	No	100	Bedroom 1	G	F
CT-1-Texture	Texture	No	100	Bedroom 1	G	F
CT-2-Drywall	Drywall	No	100	Bedroom 2	G	F
CT-2-Joint Compound	Joint Compound	2% Chrysotile	100	Bedroom 2	G	F
CT-2-Texture	Texture	No	100	Bedroom 2	G	F
CT-3-Drywall	Drywall	No	380	Living Room	G	F
CT-3-Texture	Texture	No	380	Living Room	G	F
CT-4-Drywall	Drywall	No	30	Hallway Bathroom	G	F
CT-4-Texture	Texture	No	30	Hallway Bathroom	G	F
CT-5-Drywall	Drywall	No	30	Hallway Bathroom	G	F
CT-5-Texture	Texture	No	30	Hallway Bathroom	G	F



SAMPLE NOS.	TYPE OF SUSPECT ACM	ASBESTOS DETECTED ABOVE 1%	Estimated Area (Square Feet)	LOCATION	Condition	Friable/Non-Friable
CT-6-Drywall	Drywall	No	30	Hallway Bathroom	G	F
CT-6 Texture	Texture	No	30	Hallway Bathroom	G	F
DW-1-Drywall	Drywall	No	320	Bedroom 1	G	F
DW-1-Joint Compound	Joint Compound	2% Chrysotile	320	Bedroom 1	G	F
DW-2-Drywall	Drywall	No	320	Bedroom 2	G	F
DW-2-Joint Compound	Joint Compound	Positive Stop	320	Bedroom 2	G	F
DW-3-Drywall	Drywall	No	650	Garage	G	F
DW-3-Joint Compound	Joint Compound	Positive Stop	650	Garage	G	F
DW-4-Drywall	Drywall	No	900	Kitchen	G	F
DW-4-Joint Compound	Joint Compound	Positive Stop	900	Kitchen	G	F
DW-5-Drywall	Drywall	No	650	Garage	G	F
DW-5-Joint Compound	Joint Compound	Positive Stop	650	Garage	G	F
DW-6-Drywall	Drywall	No	900	Kitchen	G	F



SAMPLE NOS.	TYPE OF SUSPECT ACM	ASBESTOS DETECTED ABOVE 1%	Estimated Area (Square Feet)	LOCATION	Condition	Friable/Non-Friable
DW-6-Joint Compound	Joint Compound	Positive Stop	900	Kitchen	G	F
DW-7-Drywall	Drywall	No	650	Garage	G	F
DW-7-Joint Compound	Joint Compound	Positive Stop	650	Garage	G	F
WG-1	Window Glazing	No	120 Liner Feet	Exterior Window	D	NF
WG-2	Window Glazing	No	120 Liner Feet	Exterior Window	D	NF
WG-3	Window Glazing	No	120 Liner Feet	Exterior Window	D	NF

Key: F - Friable
 NF - Non Friable
 D - Damaged
 G - Good

3.2 Lead-Based Paint Chip Sample Collection

F&R personnel collected a total of two (2) paint chip samples of suspected lead-based paint (LBP) from the following materials:

- Beige painted wooden exterior siding
- Blue, red, and gray painted concrete slab floors on the southern porch

Other painted components were excluded from the survey based on familiarity.

Accordingly, the suspect LBP samples collected for analysis were submitted to EMSL Analytical, Inc. an NVLAP accredited and AIHA-LAP accredited for environmental lead (Laboratory ID: 102564) laboratory, in Kernersville, North Carolina for analysis by Flame Atomic Absorption Spectrophotometry following EPA SW-846 Test Method 7000B.

The sample number, detection of lead (0.01% or higher), locations for each sample collected, and estimated area of the sample are is shown in Table 2 below.



TABLE 2 – SUMMARY OF LBP SAMPLES

Sample Number	Lead Concentration Percent by Weight	Estimated Area (Square Feet)	Location	Regulatory Threshold of LBP	Constitutes Lead Based Paint
LP-1	0.082	75	Front Porch	0.5%	No
LP-2	0.16	336	Exterior	0.5%	No

4.0 FINDINGS

4.1 Asbestos Containing Materials

Based on the analytical results of F&R’s sampling of accessible suspect materials, asbestos containing materials were identified as the joint compound on all drywall components of the house. The texture finishes were found to be negative

The Analytical results and chain of custody forms from the PLM and TEM analysis are found in Appendix II.

4.2 Lead in Paint

Based on the analytical results of F&R’s sampling of suspect lead-based paint, lead was detected in paint on the gray, blue, and red paint concrete floor of the front (south-facing) porch at 0.082% by weight and in the beige paint on the wooden exterior siding of the house at 0.16% by weight. This concentration does not constitute Lead-Based Paint; however, it can be considered lead-containing.

The Analytical results and chain of custody forms from the Flame Atomic Absorption Spectrophotometry analysis are found in Appendix II.

5.0 LIMITATIONS

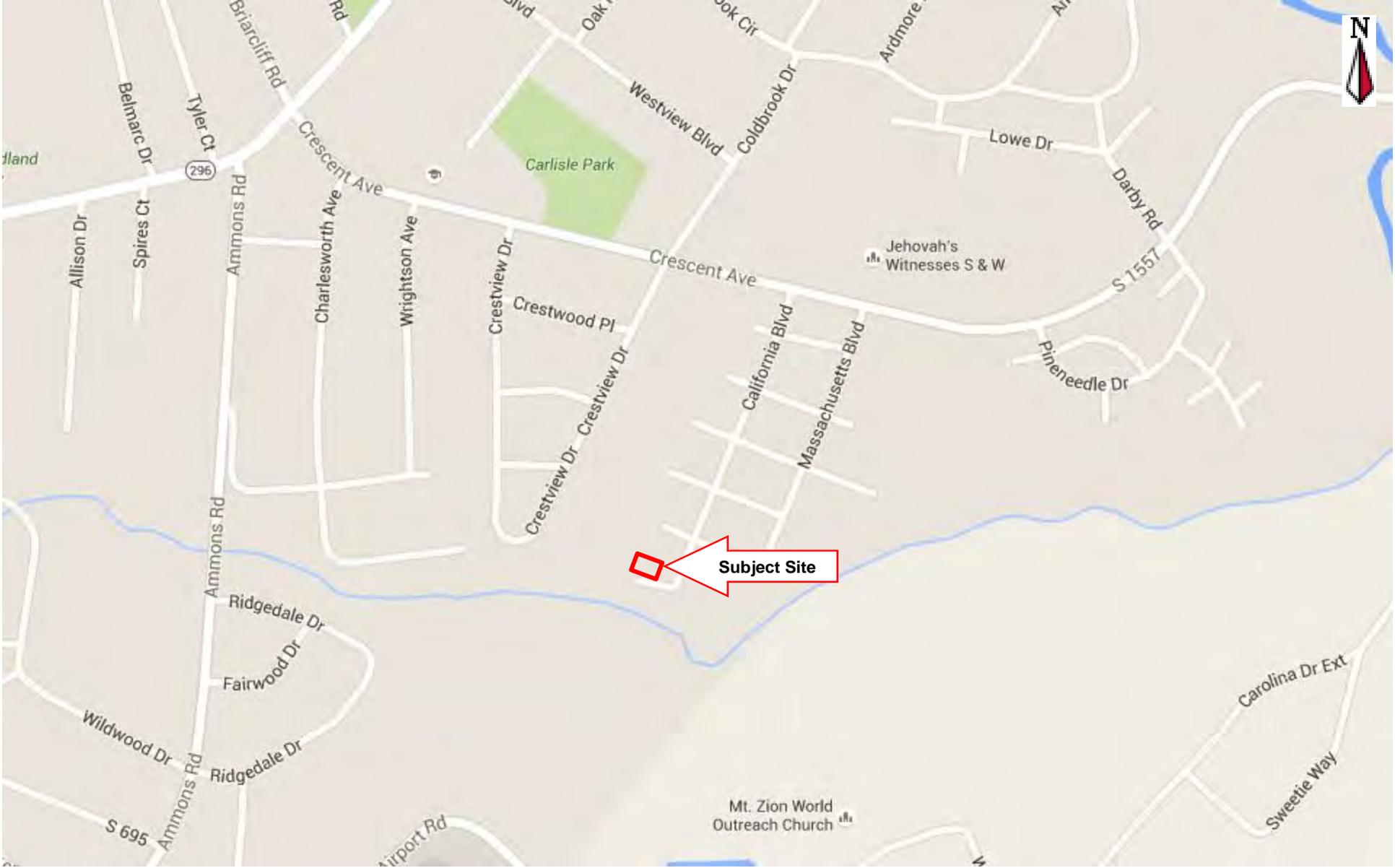
This report has been prepared for the exclusive use of the City of Spartanburg. This report has been prepared in accordance with generally accepted environmental practices. No other warranty, expressed or implied, is made. Our observations are based upon conditions readily visible at the time of our site visit. We have not verified the completeness or accuracy of the information provided by others.

During the site visit, accessible areas within the proposed demolition areas were visually surveyed for the presence of suspect asbestos containing materials (ACM) and lead-based paint.



Areas inspected were those designated by the scope of services. As with any similar survey of this nature, actual conditions exist only at the precise locations from which bulk samples were collected. Certain inferences are based on the results of this sampling and related testing to form a professional opinion of conditions in areas beyond those from which the samples were collected. No other warranty, expressed or implied, is made.

F&R, by virtue of providing the services described in this report, does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies nay conditions at the site that may present a potential danger to public health, safety, or the environment. It is the client's responsibility to notify the appropriate local, state, or federal public agencies as required by law, or otherwise to disclose, in a timely manner, any information that may be necessary to prevent any danger to public health, safety, or the environment. The contents of this report should not be construed in any way as a recommendation to purchase, sell, or further develop the project site.



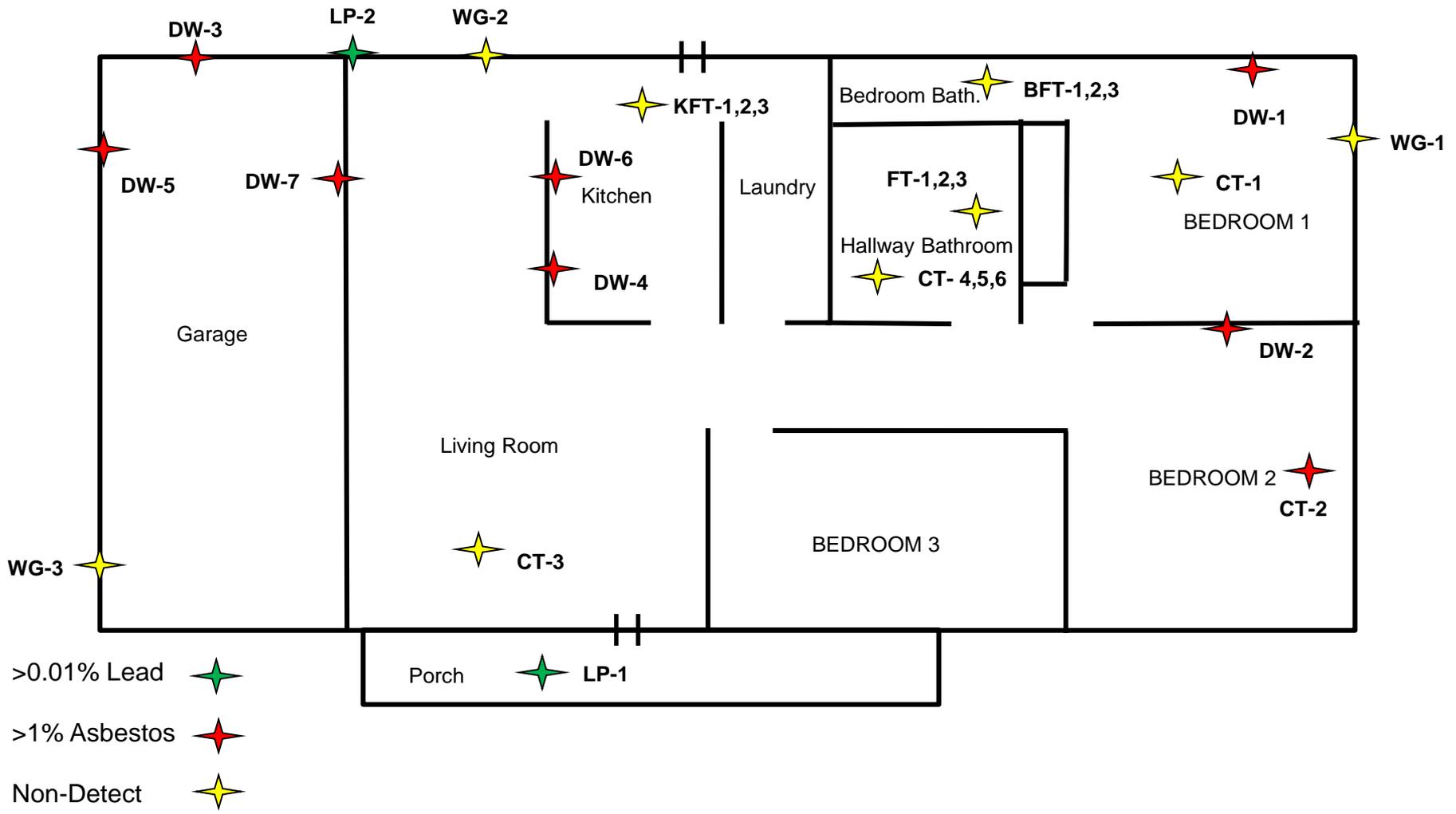
SITE VICINTY MAP

FROEHLING & ROBERTSON, INC.
 ENGINEERING • ENVIRONMENTAL • GEOTECHNICAL
 18 Woods Lake Road
 Greenville, South Carolina 29607 | USA
 T 864.271.2840 | F 864.271.8124

Client:	City of Spartanburg
Project:	101 Vermont Avenue ACM & LBP Inspection
Location:	Spartanburg, South Carolina
F&R Project No:	65U-0065
Source:	Google Maps
Date: June 27, 2016	Scale: Not Shown

Figure 1





SUSPECT ACM & LBP SAMPLE LOCATIONS



FROEHLING & ROBERTSON, INC.
 ENGINEERING • ENVIRONMENTAL • GEOTECHNICAL
 18 Woods Lake Road
 Greenville, South Carolina 29607 | USA
 T 864.271.2840 | F 864.271.8124

Client:	City of Spartanburg
Project:	101 Vermont Avenue ACM & LBP Inspection
Location:	Spartanburg, South Carolina
F&R Project No:	65U-0065
Source:	F&R
Date: June 27, 2016	Scale: Not Shown
	Figure 2



APPENDIX I

Photo Log



1. View of the ceiling texture sample in the bedroom.



2. View of the ceiling texture sample in the bathroom.



3. View of the floor tile sample in the bedroom bathroom.



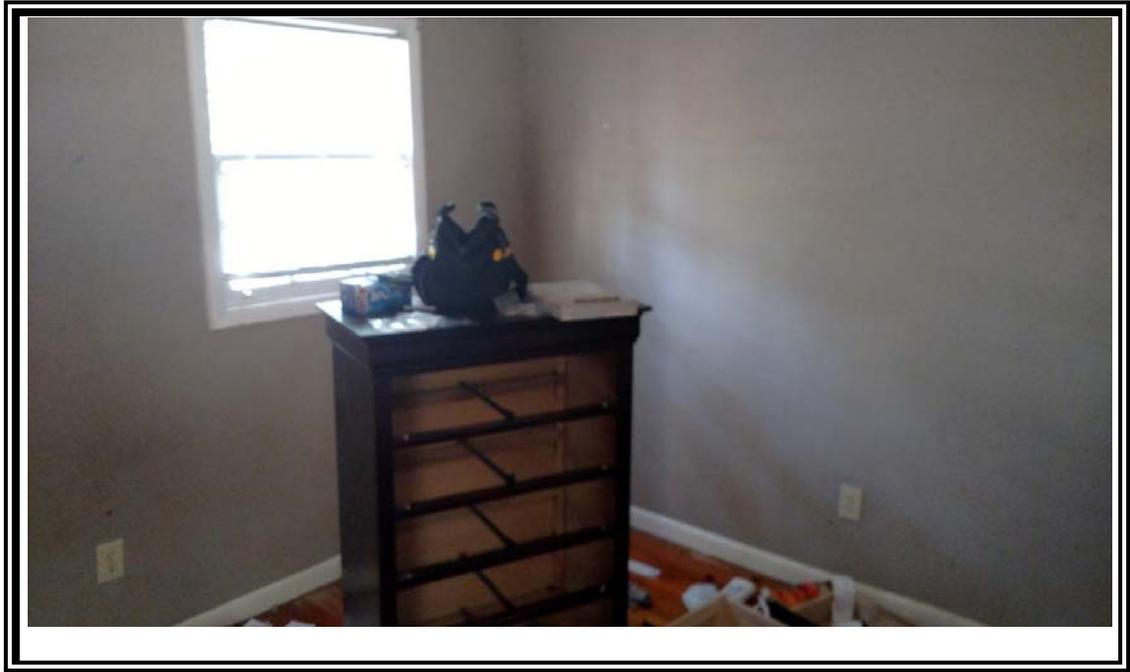
4. View of the floor tile sample in the hallway bathroom.



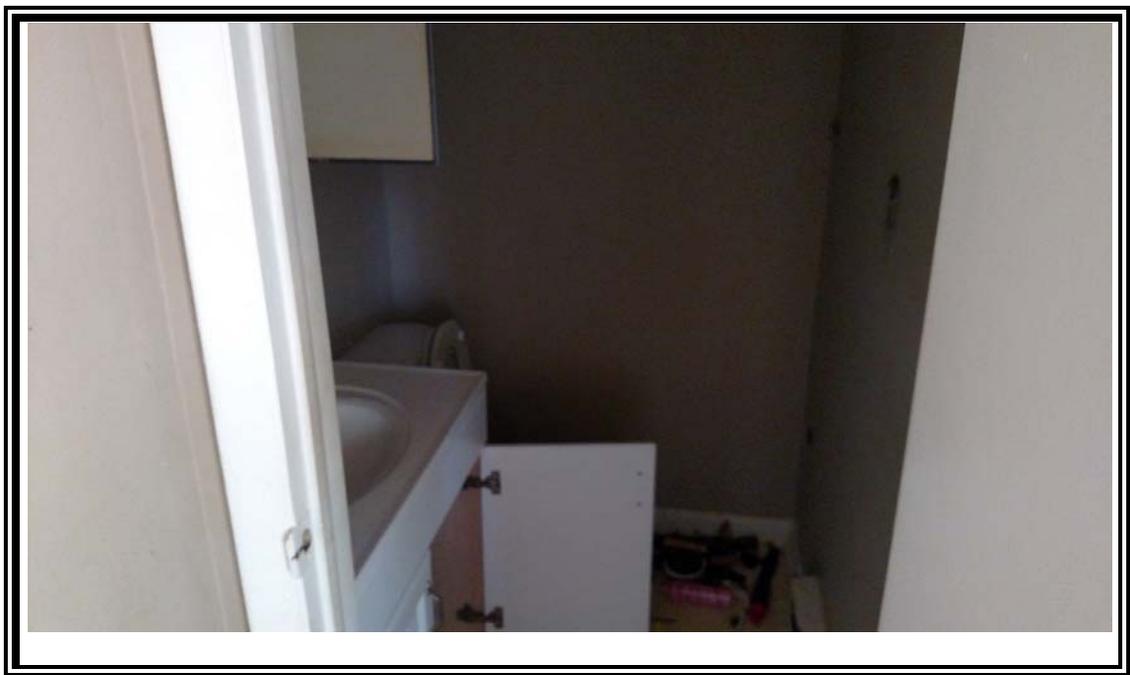
5. View of the floor tile sample in the kitchen and laundry room.



6. View of the drywall and joint compound sample in the bedroom.



7. View of the bedroom.



8. View of the bedroom bathroom.



9. View of the drywall and joint compound sample in the bedroom.



10. View of the drywall and joint compound sample in the kitchen.



11. View of the drywall and joint compound sample in the kitchen.



12. View of the drywall and joint compound sample in the garage.



13. View of the window glazing on the exterior window.



14. View of the window glazing on the exterior window.



14. View of south-facing side of the house.



APPENDIX II

Analytical Results and Chain of Custody



EMSL Analytical, Inc.

376 Crompton Street Charlotte, NC 28273
Tel/Fax: (704) 525-2205 / (704) 525-2382
<http://www.EMSL.com> / charlottelab@emsl.com

EMSL Order: 411604994
Customer ID: FROE22
Customer PO:
Project ID:

Attention: Kenneth Lauber
Froehling & Robertson
18 Woods Lake Road
Greenville, SC 29607
Phone: (864) 271-2840
Fax: (864) 271-8124
Received Date: 06/24/2016 8:45 AM
Analysis Date: 06/24/2016
Collected Date: 06/23/2016
Project: 65U-0065 - 101 Vermont Ave.

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
DW-1-Drywall <small>411604994-0001</small>	Bedroom - Drywall & Joint Compound	Brown/Gray Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected
DW-1-Joint Compound <small>411604994-0001A</small>	Bedroom - Drywall & Joint Compound	Tan Non-Fibrous Homogeneous		40% Ca Carbonate 58% Non-fibrous (Other)	2% Chrysotile
DW-2-Drywall <small>411604994-0002</small>	Bedroom - Drywall & Joint Compound	Brown/Gray Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected
DW-2-Joint Compound <small>411604994-0002A</small>	Bedroom - Drywall & Joint Compound				Positive Stop (Not Analyzed)
DW-3-Drywall <small>411604994-0003</small>	Garage - Drywall & Joint Compound	Brown/Gray Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected
DW-3-Joint Compound <small>411604994-0003A</small>	Garage - Drywall & Joint Compound				Positive Stop (Not Analyzed)
DW-4-Drywall <small>411604994-0004</small>	Kitchen - Drywall & Joint Compound	Brown/Gray Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected
DW-4-Joint Compound <small>411604994-0004A</small>	Kitchen - Drywall & Joint Compound				Positive Stop (Not Analyzed)
DW-5-Drywall <small>411604994-0005</small>	Garage - Drywall & Joint Compound	Gray Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected
DW-5-Joint Compound <small>411604994-0005A</small>	Garage - Drywall & Joint Compound				Positive Stop (Not Analyzed)
DW-6-Drywall <small>411604994-0006</small>	Kitchen - Drywall & Joint Compound	Gray Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected
DW-6-Joint Compound <small>411604994-0006A</small>	Kitchen - Drywall & Joint Compound				Positive Stop (Not Analyzed)
DW-7-Drywall <small>411604994-0007</small>	Garage - Drywall & Joint Compound	Gray Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected
DW-7-Joint Compound <small>411604994-0007A</small>	Garage - Drywall & Joint Compound				Positive Stop (Not Analyzed)
CT-1-Drywall <small>411604994-0008</small> <i>No joint compound present</i>	Bedroom - Ceiling Texture, Drywall & Joint Compound	Brown/Gray Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected
CT-1-Texture <small>411604994-0008A</small>	Bedroom - Ceiling Texture, Drywall & Joint Compound	White Non-Fibrous Homogeneous		40% Ca Carbonate 5% Mica 55% Non-fibrous (Other)	None Detected

Report amended: 06/27/2016 10:24:30 Replaces initial report from: 06/27/2016 07:24:58 Reason Code: Data Entry-Change to Project



EMSL Analytical, Inc.

376 Crompton Street Charlotte, NC 28273
Tel/Fax: (704) 525-2205 / (704) 525-2382
<http://www.EMSL.com> / charlottelab@emsl.com

EMSL Order: 411604994
Customer ID: FROE22
Customer PO:
Project ID:

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
CT-2-Drywall <i>411604994-0009</i>	Bedroom - Ceiling Texture, Drywall & Joint Compound	Brown/Gray Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected
CT-2-Joint Compound <i>411604994-0009A</i>	Bedroom - Ceiling Texture, Drywall & Joint Compound	Tan Non-Fibrous Homogeneous		30% Ca Carbonate 68% Non-fibrous (Other)	2% Chrysotile
CT-2-Texture <i>411604994-0009B</i>	Bedroom - Ceiling Texture, Drywall & Joint Compound	White Non-Fibrous Homogeneous		40% Ca Carbonate 5% Mica 55% Non-fibrous (Other)	None Detected
CT-3-Drywall <i>411604994-0010</i> <i>No joint compound present</i>	Living Room - Ceiling Texture, Drywall & Joint Compound	Brown/Gray Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected
CT-3-Texture <i>411604994-0010A</i>	Living Room - Ceiling Texture, Drywall & Joint Compound	White Non-Fibrous Homogeneous		40% Ca Carbonate 5% Mica 55% Non-fibrous (Other)	None Detected
CT-4-Drywall <i>411604994-0011</i> <i>No joint compound present</i>	Hallway Bathroom - Ceiling Texture, Drywall & Joint Compound	Brown/Gray Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected
CT-4-Texture <i>411604994-0011A</i>	Hallway Bathroom - Ceiling Texture, Drywall & Joint Compound	Beige Non-Fibrous Homogeneous		40% Ca Carbonate 60% Non-fibrous (Other)	None Detected
CT-5-Drywall <i>411604994-0012</i> <i>No joint compound present</i>	Hallway Bathroom - Ceiling Texture, Drywall & Joint Compound	Gray Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected
CT-5-Texture <i>411604994-0012A</i>	Hallway Bathroom - Ceiling Texture, Drywall & Joint Compound	White Non-Fibrous Homogeneous		35% Ca Carbonate 5% Mica 60% Non-fibrous (Other)	None Detected
CT-6-Drywall <i>411604994-0013</i> <i>No joint compound present</i>	Hallway Bathroom - Ceiling Texture, Drywall & Joint Compound	Gray Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected
CT-6-Texture <i>411604994-0013A</i>	Hallway Bathroom - Ceiling Texture, Drywall & Joint Compound	White Non-Fibrous Homogeneous		35% Ca Carbonate 5% Mica 60% Non-fibrous (Other)	None Detected
FT-1-Flooring <i>411604994-0014</i>	Hallway Bathroom - Floor Tile	Gray/Tan Fibrous Homogeneous	3% Cellulose <1% Glass	97% Non-fibrous (Other)	None Detected
FT-1-Mastic <i>411604994-0014A</i>	Hallway Bathroom - Floor Tile	Tan Non-Fibrous Homogeneous		5% Ca Carbonate 95% Non-fibrous (Other)	None Detected
FT-2-Flooring <i>411604994-0015</i>	Hallway Bathroom - Floor Tile	Tan Fibrous Homogeneous	5% Cellulose <1% Glass	95% Non-fibrous (Other)	None Detected
FT-2-Mastic <i>411604994-0015A</i>	Hallway Bathroom - Floor Tile	Brown Non-Fibrous Homogeneous		5% Ca Carbonate 95% Non-fibrous (Other)	None Detected
BFT-1-Top Flooring <i>411604994-0017</i>	Bedroom Bathroom - Floor Tile	Gray/Beige Fibrous Homogeneous	10% Cellulose 1% Glass	89% Non-fibrous (Other)	None Detected

Report amended: 06/27/2016 10:24:30 Replaces initial report from: 06/27/2016 07:24:58 Reason Code: Data Entry-Change to Project



EMSL Analytical, Inc.

376 Crompton Street Charlotte, NC 28273
Tel/Fax: (704) 525-2205 / (704) 525-2382
<http://www.EMSL.com> / charlottelab@emsl.com

EMSL Order: 411604994
Customer ID: FROE22
Customer PO:
Project ID:

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
BFT-1-Mastic <i>411604994-0017A</i>	Bedroom Bathroom - Floor Tile	Tan Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (Other)	None Detected
BFT-1-Bottom Flooring <i>411604994-0017B</i>	Bedroom Bathroom - Floor Tile	Gray/Beige Fibrous Homogeneous	10% Cellulose 1% Glass	89% Non-fibrous (Other)	None Detected
BFT-1-Mastic <i>411604994-0017C</i>	Bedroom Bathroom - Floor Tile	Tan Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (Other)	None Detected
BFT-2-Top Flooring <i>411604994-0018</i>	Bedroom Bathroom - Floor Tile	Tan Fibrous Homogeneous	10% Cellulose 2% Glass	88% Non-fibrous (Other)	None Detected
BFT-2-Mastic <i>411604994-0018A</i>	Bedroom Bathroom - Floor Tile	Tan Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (Other)	None Detected
BFT-2-Bottom Flooring <i>411604994-0018B</i>	Bedroom Bathroom - Floor Tile	Tan Fibrous Homogeneous	10% Cellulose 1% Glass	89% Non-fibrous (Other)	None Detected
BFT-2-Mastic <i>411604994-0018C</i>	Bedroom Bathroom - Floor Tile	Tan Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (Other)	None Detected
KFT-1-Flooring <i>411604994-0020</i>	Kitchen & Laundry Room - Floor Tile	Gray/Beige Fibrous Homogeneous	5% Cellulose <1% Glass	95% Non-fibrous (Other)	None Detected
KFT-1-Mastic <i>411604994-0020A</i>	Kitchen & Laundry Room - Floor Tile	Tan Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (Other)	None Detected
KFT-2-Flooring <i>411604994-0021</i>	Kitchen & Laundry Room - Floor Tile	Tan Fibrous Homogeneous	5% Cellulose <1% Glass	95% Non-fibrous (Other)	None Detected
KFT-2-Mastic <i>411604994-0021A</i>	Kitchen & Laundry Room - Floor Tile	Tan Non-Fibrous Homogeneous	<1% Cellulose	100% Non-fibrous (Other)	None Detected
WG-1 <i>411604994-0023</i>	Windows - Exterior - Window Glazing	Gray/White Non-Fibrous Homogeneous		30% Ca Carbonate 70% Non-fibrous (Other)	None Detected
WG-2 <i>411604994-0024</i>	Windows - Exterior - Window Glazing	Gray Non-Fibrous Homogeneous		30% Ca Carbonate 70% Non-fibrous (Other)	None Detected

Analyst(s)
Derrick Young (14)
Erin Guzowski (2)
Kyle Collins (23)

Lee Plumley, Laboratory Manager
or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Samples received in good condition unless otherwise noted. Estimated accuracy, precision and uncertainty data available upon request. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Reporting limit is 1%

Samples analyzed by EMSL Analytical, Inc. Charlotte, NC NVLAP Lab Code 200841-0, VA 3333 00312

Report amended: 06/27/2016 10:24:30 Replaces initial report from: 06/27/2016 07:24:58 Reason Code: Data Entry-Change to Project

**EMSL Analytical, Inc.**

376 Crompton Street, Charlotte, NC 28273
 Phone/Fax: (704) 525-2205 / (704) 525-2382
<http://www.EMSL.com> charlottelab@emsl.com

EMSL Order: 411604994
 CustomerID: FROE22
 CustomerPO:
 ProjectID:

Attn: **Kenneth Lauber**
Froehling & Robertson
18 Woods Lake Road
Greenville, SC 29607

Phone: (864) 271-2840
 Fax: (864) 271-8124
 Received: 06/24/16 8:45 AM
 Analysis Date: 6/24/2016
 Collected: 6/23/2016

Project: **65U-0065 - 101 Vermont Ave.**

Test Report: Asbestos Analysis of Non-Friable Organically Bound Materials by TEM
via EPA/600/R-93/116 Section 2.5.5.1

SAMPLE ID	DESCRIPTION	APPEARANCE	% MATRIX MATERIAL	% NON-ASBESTOS FIBERS	ASBESTOS TYPES
FT-3-Flooring 411604994-0016	Hallway Bathroom - Floor Tile	Gray Fibrous Heterogeneous	100	None	No Asbestos Detected
FT-3-Mastic 411604994-0016A	Hallway Bathroom - Floor Tile	Brown Non-Fibrous Homogeneous	100	None	No Asbestos Detected
BFT-3-Top Flooring 411604994-0019	Bedroom Bathroom - Floor Tile	Gray/Beige Fibrous Heterogeneous	100	None	No Asbestos Detected
BFT-3-Mastic 411604994-0019A	Bedroom Bathroom - Floor Tile	Tan Non-Fibrous Homogeneous	100	None	No Asbestos Detected
BFT-3-Bottom Flooring 411604994-0019B	Bedroom Bathroom - Floor Tile	Gray/Beige Fibrous Heterogeneous	100	None	No Asbestos Detected
BFT-3-Mastic 411604994-0019C	Bedroom Bathroom - Floor Tile	Tan Non-Fibrous Homogeneous	100	None	No Asbestos Detected
KFT-3-Flooring 411604994-0022	Kitchen & Laundry Room - Floor Tile	Gray Fibrous Heterogeneous	100	None	No Asbestos Detected
KFT-3-Mastic 411604994-0022A	Kitchen & Laundry Room - Floor Tile	Tan Non-Fibrous Homogeneous	100	None	No Asbestos Detected
WG-3 411604994-0025	Windows - Exterior - Window Glazing	Tan Non-Fibrous Homogeneous	100	None	No Asbestos Detected

Analyst(s)

Derrick Young (9)

Lee Plumley, Laboratory Manager
 or other approved signatory

This laboratory is not responsible for % asbestos in total sample when the residue only is submitted for analysis. The above report relates only to the items tested. This report may not be reproduced, except in full, without written approval by EMSL Analytical, Inc. Samples received in good condition unless otherwise noted. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample.
 Samples analyzed by EMSL Analytical, Inc. Charlotte, NC

Report Amended: 06/27/2016 10:24:30 Replaces the Initial Report 06/27/2016 07:24:52. Reason Code: Data Entry-Change to Project



EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

Asbestos Bulk Building Material Chain of Custody

EMSL Order Number (Lab Use Only):

411604994

Charlotte, NC 28273
PHONE: (704) 525-2205
FAX: (704) 525 2382

Company : Froehling & Robertson, Inc.		EMSL-Bill to: <input checked="" type="checkbox"/> Same <input type="checkbox"/> Different <small>If Bill to is Different note instructions in Comments**</small>	
Street: 18 Woods Lake Road		<i>Third Party Billing requires written authorization from third party</i>	
City: Greenville	State/Province: SC	Zip/Postal Code: 29607	Country: US
Report To (Name): Kenneth Lauber		Telephone #: 864-918-1513	
Email Address: klauber@fandr.com		Fax #:	Purchase Order:
Project Name/Number: 65U-0065		Please Provide Results: <input type="checkbox"/> Fax <input checked="" type="checkbox"/> Email <input type="checkbox"/> Mail	
U.S. State Samples Taken: SC		CT Samples: <input type="checkbox"/> Commercial/Taxable <input type="checkbox"/> Residential/Tax Exempt	

Turnaround Time (TAT) Options* - Please Check

3 Hour
 6 Hour
 24 Hour
 48 Hour
 72 Hour
 96 Hour
 1 Week
 2 Week

*For TEM Air 3 hr through 6 hr, please call ahead to schedule. *There is a premium charge for 3 Hour TEM AHERA or EPA Level II TAT. You will be asked to sign an authorization form for this service. Analysis completed in accordance with EMSL's Terms and Conditions located in the Analytical Price Guide.

PLM - Bulk (reporting limit)	TEM - Bulk
<input checked="" type="checkbox"/> PLM EPA 600/R-93/116 (<1%)	<input checked="" type="checkbox"/> TEM EPA NOB - EPA 600/R-93/116 Section 2.5.5.1
<input type="checkbox"/> PLM EPA NOB (<1%)	<input type="checkbox"/> NY ELAP Method 198.4 (TEM)
Point Count <input type="checkbox"/> 400 (<0.25%) <input type="checkbox"/> 1000 (<0.1%)	<input type="checkbox"/> Chatfield Protocol (semi-quantitative)
Point Count w/Gravimetric <input type="checkbox"/> 400 (<0.25%) <input type="checkbox"/> 1000 (<0.1%)	<input type="checkbox"/> TEM % by Mass - EPA 600/R-93/116 Section 2.5.5.2
<input type="checkbox"/> NIOSH 9002 (<1%)	<input type="checkbox"/> TEM Qualitative via Filtration Prep Technique
<input type="checkbox"/> NY ELAP Method 198.1 (friable in NY)	<input type="checkbox"/> TEM Qualitative via Drop Mount Prep Technique
<input type="checkbox"/> NY ELAP Method 198.6 NOB (non-friable-NY)	Other
<input type="checkbox"/> OSHA ID-191 Modified	<input type="checkbox"/>
<input type="checkbox"/> Standard Addition Method	

Check For Positive Stop - Clearly Identify Homogenous Group Date Sampled: 6/23/16

Samplers Name: **Anthony Herrmann** Samplers Signature: *Anthony Herrmann*

Sample #	HA #	Sample Location	Material Description
DW-1		Bedroom	Drywall + Joint compound
DW-2		Bedroom	
DW-3		Garage	
DW-4		Kitchen	
DW-5		Garage	
DW-6		Kitchen	
DW-7		Garage	
CT-1		Bedroom	
CT-2		Bedroom	
CT-3		Living Room	

Client Sample # (s): DW-1 - W6-3	Total # of Samples: 25
Relinquished (Client): Anthony Herrmann Date: 6/23/16	Time: 18:31
Received (Lab): Kyle Nelson Date: 6/24/16	Time: 8:45am EMSL Fk
Comments/Special Instructions: Run TEMS same time!	7950 9502 2210



EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

Asbestos Bulk Building Material Chain of Custody

EMSL Order Number (Lab Use Only):

411604994

Charlotte, NC 28273
PHONE: (704) 525-2205
FAX: (704) 525 2382

Additional Pages of the Chain of Custody are only necessary if needed for additional sample information

Sample #	HA #	Sample Location	Material Description
CT-4		Hallway Bathroom	Ceiling Texture, Drywall + Joint Compound
CT-5			
CT-6			
FT-1		Hallway Bathroom	Floor Tile
FT-2			
TEM FT-3			
BFT-1		Bedroom Bathroom	
BFT-2			
TEM BFT-3			
KFT-1		Kitchen + Laundry Room	
KFT-2			
TEM KFT-3			
WG-1		Windows - exterior	Window Glazing
WG-2			
TEM WG-3			
*Comments/Special Instructions:			



EMSL Analytical, Inc.

376 Crompton Street, Charlotte, NC 28273
Phone/Fax: (704) 525-2205 / (704) 525-2382
<http://www.EMSL.com> charlottelab@emsl.com

EMSL Order: 411604993
CustomerID: FROE22
CustomerPO:
ProjectID:

Attn: **Kenneth Lauber**
Froehling & Robertson
18 Woods Lake Road
Greenville, SC 29607

Phone: (864) 271-2840
Fax: (864) 271-8124
Received: 06/24/16 8:45 AM
Collected: 6/23/2016

Project: **65U-0065 - 101 Vermont Ave.**

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)*

<i>Client Sample Description</i>	<i>Lab ID</i>	<i>Collected</i>	<i>Analyzed</i>	<i>Lead Concentration</i>
LP-1	411604993-0001	6/23/2016	6/24/2016	0.082 % wt
	Site: Exterior Gray - Porch			
LP-2	411604993-0002	6/23/2016	6/24/2016	0.16 % wt
	Site: Exterior Tan - Siding			

Kyle Collins, Technical Manager
or other approved signatory

*Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.010 % wt based on the minimum sample weight per our SOP. Unless noted, results in this report are not blank corrected. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities. Samples received in good condition unless otherwise noted. "<" (less than) result signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. The QC data associated with the sample results included in this report meet the recovery and precision requirements unless specifically indicated otherwise.
Samples analyzed by EMSL Analytical, Inc. Charlotte, NC AIHA-LAP, LLC - ELLAP 192283

Report Amended: 06/27/2016 10:23:28 Replaces the Initial Report 06/24/2016 16:36:29. Reason Code: Data Entry-Change to Project



EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

Lead (Pb) Chain of Custody

EMSL Order ID (Lab Use Only):

411604993

Charlotte, NC 28273

PHONE: (704) 525-2205

FAX: (704) 525 2382

Company: Froehling & Robertson, Inc.		EMSL-Bill to: <input type="checkbox"/> Different <input checked="" type="checkbox"/> Same <small>If Bill to is Different note instructions in Comments *</small>	
Street: 18 Woods Lake Road		<i>Third Party Billing requires written authorization from third party</i>	
City: Greenville	State/Province: SC	Zip/Postal Code: 29607	Country: US
Report To (Name): Kenneth Lauber		Telephone #: 864-918-1513	
Email Address: klauber@fandr.com		Fax #:	Purchase Order:
Project Name/Number: 65U-0065		Please Provide Results: <input type="checkbox"/> FAX <input checked="" type="checkbox"/> E-mail <input type="checkbox"/> Mail	
U.S. State Samples Taken: SC		CT Samples: <input type="checkbox"/> Commercial/Taxable <input type="checkbox"/> Residential/Tax Exempt	

Turnaround Time (TAT) Options* - Please Check

3 Hour
 6 Hour
 24 Hour
 48 Hour
 72 Hour
 96 Hour
 1 Week
 2 Week

*Analysis completed in accordance with EMSL's Terms and Conditions located in the Price Guide

Matrix	Method	Instrument	Reporting Limit	Check
Chips <input checked="" type="checkbox"/> % by wt. <input type="checkbox"/> mg/cm ² <input type="checkbox"/> ppm	SW846-7000B	Flame Atomic Absorption	0.01%	<input checked="" type="checkbox"/>
Air	NIOSH 7082	Flame Atomic Absorption	4 µg/filter	<input type="checkbox"/>
	NIOSH 7105	Graphite Furnace AA	0.03 µg/filter	<input type="checkbox"/>
	NIOSH 7300 modified	ICP-AES/ICP-MS	0.5 µg/filter	<input type="checkbox"/>
Wipe* <small>ASTM <input type="checkbox"/> non ASTM <input type="checkbox"/> *if no box is checked, non-ASTM Wipe is assumed</small>	SW846-7000B	Flame Atomic Absorption	10 µg/wipe	<input type="checkbox"/>
	SW846-6010B or C	ICP-AES	1.0 µg/wipe	<input type="checkbox"/>
	SW846-7000B/7010	Graphite Furnace AA	0.075 µg/wipe	<input type="checkbox"/>
TCLP	SW846-1311/7000B/SM 3111B	Flame Atomic Absorption	0.4 mg/L (ppm)	<input type="checkbox"/>
	SW846-1131/SW846-6010B or C	ICP-AES	0.1 mg/L (ppm)	<input type="checkbox"/>
Soil	SW846-7000B	Flame Atomic Absorption	40 mg/kg (ppm)	<input type="checkbox"/>
	SW846-7010	Graphite Furnace AA	0.3 mg/kg (ppm)	<input type="checkbox"/>
	SW846-6010B or C	ICP-AES	2 mg/kg (ppm)	<input type="checkbox"/>
Wastewater Unpreserved <input type="checkbox"/> Preserved with HNO ₃ pH < 2 <input type="checkbox"/>	SM3111B/SW846-7000B	Flame Atomic Absorption	0.4 mg/L (ppm)	<input type="checkbox"/>
	EPA 200.9	Graphite Furnace AA	0.003 mg/L (ppm)	<input type="checkbox"/>
	EPA 200.7	ICP-AES	0.020 mg/L (ppm)	<input type="checkbox"/>
Drinking Water Unpreserved <input type="checkbox"/> Preserved with HNO ₃ pH < 2 <input type="checkbox"/>	EPA 200.9	Graphite Furnace AA	0.003 mg/L (ppm)	<input type="checkbox"/>
	EPA 200.8	ICP-MS	0.001 mg/L (ppm)	<input type="checkbox"/>
TSP/SPM Filter	40 CFR Part 50	ICP-AES	12 µg/filter	<input type="checkbox"/>
	40 CFR Part 50	Graphite Furnace AA	3.6 µg/filter	<input type="checkbox"/>
Other:				<input type="checkbox"/>

Name of Sampler: Anthony Herrmann Signature of Sampler:

Sample #	Location	Volume/Area	Date/Time Sampled
LP-1	Exterior GRAY - porch	80 ft ²	6-23-16 / 15:00
LP-2	Exterior TAN - Siding	150 ft ²	6-23-16 / 15:05

Client Sample #'s: LP-1 - LP-2 Total # of Samples: 2

Relinquished (Client): Anthony Herrmann Date: 6-23-16 Time: 18:30

Received (Lab): Kyle Nelson Date: 6/24/16 Time: 8:45AM EMSL FK

Comments: 7950 9502 2210