

# INVITATION FOR BID # 21-06

**COUNTY OF MONTGOMERY**  
**PURCHASING DEPARTMENT**  
 755 ROANOKE STREET, SUITE 2C  
 CHRISTIANSBURG, VA 24073-3179

DATE		BID OPENING DATE AND HOUR	SEALED BID
August 14, 2020		September 1, 2020 3:00 PM	YES

ADDRESS ALL INQUIRES AND  
 CORRESPONDENCE TO:  
 Montgomery County Purchasing Department  
 755 Roanoke Street, Suite 2C  
 Christiansburg, VA 24073-3179  
 Heather M. Hall, C.P.M.  
 Telephone Number: (540) 382-5784  
 Fax Number: (540) 382-5783  
 e-mail address:  
[hallhm@montgomerycountyva.gov](mailto:hallhm@montgomerycountyva.gov)

### SPECIAL INSTRUCTIONS

1. **Sealed Bid** responses should be returned in an envelope with the bid number and opening date indicated on the outside of the envelope.
2. Faxed responses to Sealed Bids cannot be sent directly to the Purchasing Department.
3. Responses must be submitted on this form and the attachment provided.
4. Responses should be signed below.
5. Responses will be received in the Montgomery County Purchasing Department, at the address listed above, until the bid opening date and hour or, if specified, the bid return date and hour shown above.
6. Contact the Purchasing Department for bid award information. Enclose a self-addressed stamped envelope if you wish to obtain price information.
7. DELIVERY IS F.O.B. DESTINATION UNLESS OTHERWISE NOTED BY MONOTGOMERY COUNTY IN THE BODY OF THE BID.
8. Attachment A is incorporated by reference into this invitation for bid and any resulting contract.

### COMMODITY: Building Demolition (Multiple Locations)

NO	Description	Quantity	Unit	Price
1.	Demolition of the former Montgomery County General Services "Buildings and Grounds Shop" located at 325 Reading Road, Christiansburg, VA, per attached specifications.	1	Lump Sum	\$ _____
2.	Demolition of the former Montgomery County Phlegar Building located at 4 South Franklin Street, Christiansburg, VA, per attached specifications.  A non-mandatory site visit will be held on Thursday, August 20, 2020 at 10:00 am beginning at the 1 <sup>st</sup> site. Please call 540-382-5784 if you plan to attend	1	Lump Sum	\$ _____

IN ACCORDANCE WITH THIS INVITATION FOR BID AND SUBJECT OT ALL TERMS AND CONDITIONS IMPOSED HERIN  
 AND IN ATTACHMENTS, THE UNDERSIGNED OFFERS AND AGREES TO FURNISH THE ITEM(S) FOR THE PRICES  
 OFFERED.

FULL LEGAL NAME (PRINT)	FEDERAL TAXPAYER NUMBER (ID#)	DELIVERY DATE
PURCHASE ORDER ADDRESS	PAYMENT ADDRESS	TERMS <b>NET 30</b>
CONTACT NAME/TITLE (PRINT)	SIGNATURE (INK)	DATE
E-MAIL ADDRESS	TELEPHONE NUMBER	TOLL FREE NUMBER
		FAX NUMBER

Montgomery County General Services  
Building Demolition – Various Locations

1. Former Montgomery County General Services “Buildings and Grounds Shop”
  - I. Location: 325 Reading Road, Christiansburg, VA 24073.
  - II. Scope: To demolish and remove from premises, entire wood frame building and all associated materials hereafter referred to as the Buildings and Grounds Shop. The successful contractor shall be responsible for all permits, licenses, disposal cost and fees associated with the demolition including hazardous materials testing, removal, and approved disposal.
    - A. Utilities:
      1. Locate all utilities, including horizontal and vertical locations as necessary to complete the work in accordance with state and local codes.
      2. Disconnect and terminate all utilities; aerial and underground. Disconnects, terminations and stub-offs shall be in compliance with all state and local codes.
      3. Coordinate all disconnects with the owner and respective utility providers and ensure terminations and stub-offs are marked in the field.
    - B. Demolition:
      1. Provide protection and stabilization to all exposed utilities during demolition.
      2. Provide security to the site with construction fencing, barricades or approved barriers.
      3. Remove and dispose all existing building materials, including remaining contents within the building.
      4. Floor slab and footings may remain in place.
      5. Provide manifest of material disposal from an approved disposal facility.
    - C. Asbestos Removal: The County had an asbestos inspection report prepared for the Buildings and Grounds Shop. The report is included as part of this invitation as attachment #B for informational purposes only. It is the responsibility of the successful contractor to confirm this data, as well as identify, properly abate, and dispose of this and all other hazardous materials or substances in an approved disposal facility. All associated manifests indicating proper disposal of the material shall be submitted to the County Engineer.
    - D. Site Work:
      1. Demolished material shall be removed from the site daily. Stockpiling of demolished materials will not be permitted. The concrete slab and perimeter footing may remain in place. Once the work is complete, all equipment shall be removed and the areas around perimeter of the building footprint shall be restored to previous conditions.
    - E. Schedule:
      1. A non-mandatory site visit will be held on Thursday, August 20, 2020 at 10:00 am beginning at the site. Please call 540-382-5784 if you plan to attend.
      2. All work shall be completed on or before Friday, October 2, 2020.

2. Montgomery County Phlegar Building

I. Location: 4 South Franklin Street, Christiansburg, VA 24073.

II. Scope: To demolish and remove from premises, entire masonry and wood frame building and associated materials hereafter referred to as the Phlegar Building. The successful contractor shall be responsible for all permits, licenses, disposal cost and fees associated with the demolition as described below. The successful contractor shall be responsible for all hazardous materials testing, removal, and approved disposal. The successful contractor shall be responsible for all temporary traffic control of adjacent roadways and sidewalks, including any required maintenance of traffic plans required to secure the appropriate permits and/or inspections from the Town of Christiansburg.

A. Utilities:

1. Locate all utilities, including horizontal and vertical locations as necessary to complete the work in accordance with state and local codes.
2. Disconnect and terminate all utilities; aerial and underground. Disconnects, terminations and stub-offs shall be in compliance with all state and local codes.
3. Coordinate all disconnects with owner and respective utility providers and ensure terminations and stub-offs are marked in the field.

B. Demolition:

1. Provide protection and stabilization to all exposed utilities during demolition.
2. Provide security to the site with construction fencing, barricades or approved barriers.
3. Remove all building materials, including all contents within the building and basement, including boiler and all associated appurtenances.
4. Foundation walls along the perimeter of the building shall be removed to a minimum of 18 inches below the grade of the adjacent sidewalk.
5. Demolished material shall be removed from the site daily. Stockpiling of demolished materials will not be permitted on site or on adjacent County owned parcels.
6. Loose block, brick, and wooden members including those acting as structural supports such as piers and interior foundation walls shall be removed prior to placing backfill.
7. Steps, stairways, handrails and porch elements consisting of concrete, masonry block, brick, metal, and wood shall be removed from the site.
8. Concrete sidewalks around the perimeter of the building shall remain in place and are not to be disturbed. Protective measures shall be implemented to prevent damage to adjacent sidewalk, curb & gutter, asphalt pavement and landscaping.
9. Provide manifest of material from the disposal facility.

C. Asbestos Removal: The County had an asbestos inspection report prepared for the Building. The report is included as part of this invitation as attachment #C for informational purposes only. It is the responsibility of the successful contractor to confirm this data, as well as identify, properly abate, and dispose of this and all other hazardous materials or substances in an approved disposal facility. All associated manifests indicating proper disposal of the material shall be submitted to the County Engineer.

D. Site Work:

1. The foundation wall along the perimeter footing shall be removed to a minimum of 18 inches below the adjacent sidewalk elevation.
2. Debris, trash, and loose building materials shall be removed prior to placing backfill.
3. Fill operations and materials shall meet specifications as outlined in Attachment D.

4. Final grade shall be achieved once the finished backfill is a smooth and has constant slope from the south side of the site to the north side of the site up to the elevation of the adjacent edge of sidewalk. The top six (6) inches of finished backfill across the site shall consist of topsoil. All topsoil shall have the physical, chemical, and biological characteristics consistent with the "A" horizon soil profile as defined by USDA-NRCS Soil Survey Division.
5. Seed shall be applied across the entire surface of topsoil and consist of tall fescue applied at the rate according to the manufacturer recommendations.
6. Polypropylene single net straw erosion control blankets shall be applied across the entire surface of topsoil.
7. Seed and blankets shall be applied within seven (7) calendar days after application of topsoil is completed.
8. Once the work is complete, all equipment shall be removed and the areas around perimeter of the building footprint shall be cleaned of any debris and restored to previous conditions as deemed necessary by the County Engineer.

### III. Schedule:

1. A non-mandatory site visit will be held on Thursday, August 20, 2020 immediately following the previous site visit on Reading Road described in Location 1 above. Please call 540-382-5784 if you plan to attend.
2. All work shall be completed on or before Friday, October 30, 2020.



## ATTACHMENT A

## TERMS AND CONDITIONS

**GENERAL TERMS AND CONDITIONS**

[https://montva.com/docs/default-source/purchasing-solicitations/ifb\\_terms\\_and\\_conditions.pdf?sfvrsn=97ffdc9c\\_2](https://montva.com/docs/default-source/purchasing-solicitations/ifb_terms_and_conditions.pdf?sfvrsn=97ffdc9c_2)

**SPECIAL TERMS AND CONDITIONS**

1. **AWARD OF CONTRACT:** Awards are made to the lowest responsive and responsible Bidder. Evaluation will be based on net prices per line. Unit prices, extensions and grand total must be shown. In case of arithmetic errors, the unit price will govern. If cash discount for prompt payment is offered, it must be clearly shown in the space provided. Discounts for prompt payment will not be considered in making awards. Montgomery County reserves the right to reject any and all bids in whole or in part, to waive any informality, and to delete items prior to making an award.

2. **AUDIT:** The Contractor hereby agrees to retain all books, records, and other documents relative to this contract for five (5) years after final payment, or until audited by the Commonwealth of Virginia, whichever is sooner. Montgomery County, its authorized agents, and/or State auditors shall have full access to and the right to examine any of said materials during said period.

3. **AVAILABILITY OF FUNDS:** It is understood and agreed between the parties herein that Montgomery County shall be bound hereunder only to the extent of the funds available or which may hereafter become available for the purpose of this agreement.

4. **CONTRACTOR/SUBCONTRACTOR LICENSE REQUIREMENT:** By my signature on this solicitation, I certify that this firm/individual and/or subcontractor is properly licensed for providing the goods/services specified

Contractor Name: \_\_\_\_\_

Subcontractor Name: \_\_\_\_\_

License #: \_\_\_\_\_

Type: \_\_\_\_\_

5. **FINAL INSPECTION:** At the conclusion of the work, the Contractor shall demonstrate to the authorized owner's representatives that the work is fully operational and in compliance with contract specifications and codes. Any deficiencies shall be promptly and permanently corrected by the Contractor at the Contractor's sole expense prior to final acceptance of the work.

6. **INDEPENDENT CONTRACTOR:** The contractor shall not be an employee of Montgomery County, but shall be an independent contractor.

Nothing in this agreement shall be construed as authority for the contractor to make commitments which shall bind Montgomery County, or to otherwise act on behalf of Montgomery County, except as Montgomery County may expressly authorize in writing.

7. **INSPECTION OF JOB SITE:** My signature on this solicitation constitutes certification that I have inspected the job site and am aware of the conditions under which the work must be accomplished. Claims, as a result of failure to inspect the job site, will not be considered by Montgomery County.

8. **INSURANCE:**

By signing and submitting a bid under this solicitation, the Bidder certifies that if awarded the contract, it will have the following insurance coverages at the time the work commences. Additionally, it will maintain these during the entire term of the contract and that all insurance coverages will be provided by insurance companies authorized to sell insurance in Virginia by the Virginia State Corporation Commission.

During the period of the contract, Montgomery County reserves the right to require the Contractor to furnish certificates of insurance for the coverage required.

**INSURANCE COVERAGES AND LIMITS REQUIRED:**

A. Worker's Compensation - Statutory requirements and benefits.

B. Employers Liability - \$100,000.00

C. General Liability - \$500,000.00 combined single limit. Montgomery County and the Commonwealth of Virginia shall be named as an additional insured with respect to goods/services being procured. This coverage is to include Premises/Operations Liability, Products and Completed Operations Coverage, Independent Contractor's Liability, Owner's and Contractor's Protective Liability and Personal Injury Liability.

D. Automobile Liability - \$500,000.00

The contractor agrees to be responsible for, indemnify, defend and hold harmless Montgomery County, its officers, agents and employees from the payment of all sums of money by reason of any claim against them arising out of any and all occurrences resulting in bodily or mental injury or property damage that may happen to occur in connection with and during the performance of the contract, including but not limited to claims under the Worker's Compensation Act. The contractor agrees that it will, at all times, after the completion of the work, be responsible for, indemnify, defend and hold harmless Montgomery County, its officers, agents and employees from all liabilities resulting from bodily or mental injury or property damage directly or indirectly arising out of the performance or nonperformance of the contract.

9. **PRIME CONTRACTOR RESPONSIBILITIES:** The Contractor shall be responsible for completely supervising and directing the work under this contract and all subcontractors that he may utilize, using his best skill and attention. Subcontractors who perform work under this contract shall be responsible to the prime Contractor. The Contractor agrees that he is as fully responsible for the acts and omissions of his subcontractors and of persons employed by them as he is for the acts and omissions of his own employees.

10. **SAFETY:** All contractors working on projects for Montgomery County must maintain an adequate safety program to insure the safety of contractor employees, subcontractor employees, and all other individuals working under this contract. The Virginia Occupational Health Act (VOSHA) provides for safety and health protection for employees on the job. The contractor is required to comply with the VOSHA standards. In addition, the contractor must also provide Montgomery County with a written safety program that he intends to follow in pursuing work under this contract. In lieu of providing such

a program, the contractor may elect to comply with the "Montgomery County Safety Guide for Contractors and Subcontractors" and advise Montgomery County in writing of his election to do so. No work under this contract will be permitted until Montgomery County is assured that the contractor has an adequate safety program in effect.

11. SUBCONTRACTS: No portion of the work shall be subcontracted without prior written consent of Montgomery County. In the event that the Contractor desires to subcontract some part of the work specified herein, the Contractor shall furnish Montgomery County the names, qualifications and experience of their proposed subcontractors. The Contractor shall, however, remain fully liable and responsible for the work to be done by his subcontractor(s) and shall assure compliance with all requirements of the contract.

12. WORK SITE DAMAGES: Any damage to existing utilities, equipment or finished surfaces resulting from the performance of this contract shall be repaired to the Owner's satisfaction at the Contractor's expense.



**Solutions for all your Environmental and OSHA Concerns**

**April 2, 2020**

## Asbestos Inspection Report

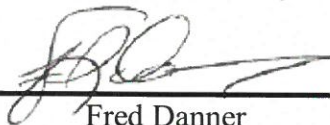
### **Project Location:**

Town Shop  
Reading Road  
Christiansburg, Virginia

### **Prepared For:**

Montgomery County, Virginia  
John D. Brown, PE, PMP  
755 Roanoke St, Suite 1C  
Christiansburg, VA 24073

### **Prepared By:**



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Fred Danner  
Asbestos Inspector

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## **SCOPE OF WORK**

### **ASBESTOS INSPECTION**

- SAMPLE SUMMARY
- LABORATORY REPORT
- PHOTOS
- APPLICABLE LICENSES

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## SCOPE OF WORK

HDH Technical, Inc. was contracted by The County of Montgomery, Virginia to provide an asbestos inspection of the town shop structure located on Reading Road in Christiansburg, Virginia. The inspection was conducted by personnel trained and licensed in accordance with the regulations of the Environmental Protection Agency (EPA) and the Commonwealth of Virginia. This inspection was performed using current EPA AHERA standards. This protocol was used for the determination, sampling and analysis of suspected Asbestos Containing Materials (ACM).

## ASBESTOS INSPECTION

An inspection of the structure on Reading Road was performed March 31, 2020 by representatives of HDHT. The objective of this inspection was to determine the location of suspect asbestos-containing materials (ACM) currently located on the interior or exterior of this structure that may be disturbed by upcoming demolition activities.

As the sample summary indicates, the following suspect materials sampled were reported to be asbestos containing by the laboratory:

- **Interior Door Framing**
- **Interior Window Framing**
- **Transite Siding on Gables**

These NON-Friable asbestos containing materials should be removed prior to demolition activities at this location. Removal should be performed by licensed, contract personnel using approved methods.

*Friable Asbestos Material:* Material when dry, may be crumbled, pulverized or reduced to powder by hand pressure and includes previously non-friable material after such previously non-friable material becomes damaged to the extent that when dry is may be crumbled, pulverized, or reduced to powder by hand pressure.

*Non-friable Asbestos Material:* Material that contains asbestos in which the fibers have been locked in by a bonding agent, coating, binder, or other material so that the asbestos is well bound and will not release fibers during any appropriate use, handling, demolition, storage, transportation, processing or disposal.

This information should be provided to all contract personnel for their use in meeting current OSHA requirements. Every attempt was made to gain access to all areas or to assess representative materials entering or leaving the area. HDH Technical, Inc. accepts no liability nor makes any claims regarding ACBM which was not accessible during the inspection process if such material was located behind or within walls, concrete decks, subfloors, or was generally inaccessible without destructive sampling. If any additional suspect materials are identified during the course of the project, the contractor is to immediately stop work and contact the Owner for further direction.

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## **Sample Summary**

# Town Shop

LAB #	SAMPLE ID	SAMPLE DESCRIPTION	RESULT	%
20014847 -001	DF 1.1	Door Framing - Interior	■	3%
20014847 -002	DF 1.2	Door Framing - Interior	NA	PS
20014847 -003	FP 2.1	Felt Paper - Floor - Upstairs	ND	-
20014847 -004	FP 2.2	Felt Paper - Floor - Upstairs	ND	-
20014847 -005	LN 3.1	Linoleum - Brick Pattern - Upstairs	ND	-
20014847 -006	LN 3.2	Linoleum - Brick Pattern - Upstairs	ND	-
20014847 -007	RM 4.1	Roof Material	ND	-
20014847 -008	RM 4.2	Roof Material	ND	-
20014847 -009	TS 5.1	Transite Siding	■	20%
20014847 -010	FT 6.1	Floor Tile - 12X 12 - Blue/Gray	ND	-
20014847 -011	FT 6.2	Floor Tile - 12X 12 - Blue/Gray	ND	-
20014847 -012	BM 7.1	Baseboard Mastic	ND	-
20014847 -013	BM 7.2	Baseboard Mastic	ND	-
20014847 -014	CT 8.1	Ceiling Tile	ND	-
20014847 -015	CT 8.2	Ceiling Tile	ND	-
20014847 -016	CT 8.3	Ceiling Tile	ND	-
20014847 -017	FM 9.1	Floor Material - Bathroom	ND	-
20014847 -018	FM 9.2	Floor Material - Bathroom	ND	-
20014847 -019	WF 10.1	Window Framing - Interior Windows	■	3%
20014847 -020	WF 10.2	Window Framing - Interior Windows	NA	PS
20014847 -021	BF 11.1	Block Fill - Vermiculite	ND	-
20014847 -022	BF 11.2	Block Fill - Vermiculite	ND	-
20014847 -023	BF 11.3	Block Fill - Vermiculite	ND	-
20014847 -024	SR 12.1	Sheetrock	ND	-
20014847 -024	SR 12.2	Sheetrock	ND	-
20014847 -026	SR 12.3	Sheetrock	ND	-
20014847 -027	JC 13.1	Joint Compound	ND	-
20014847 -028	JC 13.2	Joint Compound	ND	-
20014847 -029	JC 13.3	Joint Compound	ND	-
20014847 -030	DF 14.1	Door Framing - Exterior	ND	-
20014847 -031	DF 14.2	Door Framing - Exterior	ND	-

**ND = NONE DETECTED**

**NA = NOT ANALYZED  
POSITIVE STOP**



= CHRYSOTILE



= AMOSITE



= OTHER

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# Laboratory Report





1551 Oakbridge Drive Suite B  
 Powhatan, VA 23139  
 804-807-1177 / 888-895-1175  
 Fax 804-897-0070  
 www.sanair.com

**Asbestos  
 Chain of Custody**

SanAir ID Number  
 20014847

Company: <b>HDH Technical, Inc</b>	Project #: <b>Town of Christiansburg</b>	Collected by: <b>Danner</b>
Address: <b>400 West Main Street</b>	Project Name: <b>Town Shop Building</b>	Phone #: <b>540-381-7999</b>
City, St, Zip: <b>Christiansburg, VA 24073</b>	Date Collected: <b>3/31/2020</b>	Email: <b>rriebal@hdhassociates.com</b>
State of Collection: <b>VA</b> Account #: <b>1769</b>	P.O. Number: <b>John Brown</b>	Email: <b>fdanner@hdhassociates.com</b>

<b>Bulk</b>		<b>Air</b>		<b>Soil/Vermiculite</b>	
ABB	PLM EPA 600/R 93/116 <input checked="" type="checkbox"/>	ABA	PCM NIOSH 7400 <input type="checkbox"/>	ABSE	PLM EPA 600/R-93/116 (Qual) <input type="checkbox"/>
ABEPA	Positive Stop <input checked="" type="checkbox"/> PLM EPA 400 Point Count <input type="checkbox"/>	ABA-2	OSHA w/ TWA <input type="checkbox"/>	ABSP	PLM CARB 435 (LOD ~ 1%) <input type="checkbox"/>
ABB1K	PLM EPA 1000 Point Count <input type="checkbox"/>	ABTEM	TEM AHERA <input type="checkbox"/>	ABSP1	PLM CARB 435 (LOD 0.25%) <input type="checkbox"/>
ABBEN	PLM EPA NOB <input type="checkbox"/>	ABATN	TEM NIOSH 7402 <input type="checkbox"/>	ABSP2	PLM CARB 435 (LOD 0.1%) <input type="checkbox"/>
ABBCH	TEM Chatfield <input type="checkbox"/>	ABT2	TEM Level II <input type="checkbox"/>		
ABBTM	TEM EPA NOB <input type="checkbox"/>				
<b>Water</b>		<b>New York ELAP</b>		<b>Dust</b>	
ABHE	EPA 100.2 <input type="checkbox"/>	PLM NY	PLM EPA 600/M4-82-020 <input type="checkbox"/>	ABWA	TEM Wipe ASTM D-6480 <input type="checkbox"/>
		ABEPA2	NY ELAP 198.1 <input type="checkbox"/>	ABDMV	TEM Microvac ASTM D-5755 <input type="checkbox"/>
		ABENY	NY ELAP 198.6 PLM NOB <input type="checkbox"/>		
		ABBNY	NY ELAP 198.4 TEM NOB <input type="checkbox"/>	<b>Matrix</b>	<b>Other</b>

Turn Around Times	3 HR (4 HR TEM) <input type="checkbox"/>	6 HR (8HR TEM) <input type="checkbox"/>	12 HR <input type="checkbox"/>	24 HR <input checked="" type="checkbox"/>
	2 Days <input type="checkbox"/>	3 Days <input type="checkbox"/>	4 Days <input type="checkbox"/>	5 Days <input type="checkbox"/>

Special Instructions: \_\_\_\_\_

SAMPLE ID	SAMPLE DESCRIPTION
DF 1.1	Door Framing - Interior
DF 1.2	Door Framing - Interior
FP 2.1	Felt Paper - Floor - Upstairs
FP 2.2	Felt Paper - Floor - Upstairs
LN 3.1	Linoleum - Brick Pattern - Upstairs
LN 3.2	Linoleum - Brick Pattern - Upstairs
RM 4.1	Roof Material
RM 4.2	Roof Material
TS 5.1	Transite Siding
FT 6.1	Floor Tile - 12X 12 - Blue/Gray
FT 6.2	Floor Tile - 12X 12 - Blue/Gray

Special Instructions \_\_\_\_\_

Relinquished by	Date	Time	Received by	Date	Time
Danner	3/31/2020	2:34 PM	FedEx	3/31/2020	2:34 PM
			CA	4/1/20	9:30am

Unless scheduled, the turn around time for all samples received after 3 pm EST Friday will begin at 8 am Monday morning. Weekend or Holiday work must be scheduled ahead of time and is charged for rush turn around time. Work with standard turn around time sent Priority Overnight and Billed to Recipient will be charged a \$10 shipping fee.

20014847

SAMPLE ID	SAMPLE DESCRIPTION
BM 7.1	Baseboard Mastic
BM 7.2	Baseboard Mastic
CT 8.1	Ceiling Tile
CT 8.2	Ceiling Tile
CT 8.3	Ceiling Tile
FM 9.1	Floor Material - Bathroom
FM 9.2	Floor Material - Bathroom
WF 10.1	Window Framing - Interior Windows
WF 10.2	Window Framing - Interior Windows
BF 11.1	Block Fill - Vermiculite
BF 11.2	Block Fill - Vermiculite
BF 11.3	Block Fill - Vermiculite
SR 12.1	Sheetrock
SR 12.2	Sheetrock
SR 12.3	Sheetrock
JC 13.1	Joint Compound
JC 13.2	Joint Compound
JC 13.3	Joint Compound
DF 14.1	Door Framing - Exterior
DF 14.2	Door Framing - Exterior

Special Instructions	
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Relinquished by	Date	Time	Received by	Date	Time
Danner	3/31/2020	2:34 PM	FedEx	3/31/2020	2:34 PM
			<i>cb</i>	4/1/20	9:30am

Unless scheduled, the turn around time for all samples received after 3 pm EST Friday will begin at 8 am Monday morning. Weekend or Holiday work must be scheduled ahead of time and is charged for rush turn around time. Work with standard turn around time sent Priority Overnight and Billed to Recipient will be charged a \$10 shipping fee.



SanAir ID Number  
**20014847**  
 FINAL REPORT  
 4/2/2020 9:30:03 AM

**Name:** HDH Technical, Inc.  
**Address:** P.O. Box 6158  
 Christiansburg, VA 24073  
**Phone:** 540-381-7999

**Project Number:** Town Of Christiansbu  
**P.O. Number:** John Brown  
**Project Name:** Town Shop Building  
**Collected Date:** 3/31/2020  
**Received Date:** 4/1/2020 9:30:00 AM

Analyst: Cameron, Dennis

### Asbestos Bulk PLM EPA 600/R-93/116

SanAir ID / Description	Stereoscopic Appearance	Components		Asbestos Fibers
		% Fibrous	% Non-fibrous	
DF 1.1 / 20014847-001 Door Framing-Interior	White Non-Fibrous Homogeneous		100% Other	None Detected
DF 1.2 / 20014847-002 Door Framing-Interior	Beige Non-Fibrous Homogeneous		97% Other	3% Chrysotile
FP 2.1 / 20014847-003 Felt Paper-Floor-Upstairs	Black Fibrous Homogeneous	50% Cellulose	50% Other	None Detected
FP 2.2 / 20014847-004 Felt Paper-Floor-Upstairs	Black Fibrous Homogeneous	50% Cellulose	50% Other	None Detected
LN 3.1 / 20014847-005 Linoleum-Upstairs, Linoleum	Various Non-Fibrous Heterogeneous	20% Cellulose 5% Synthetic	75% Other	None Detected
LN 3.1 / 20014847-005 Linoleum-Upstairs, Mastic	Various Non-Fibrous Homogeneous		100% Other	None Detected
LN 3.2 / 20014847-006 Linoleum-Upstairs, Linoleum	Various Non-Fibrous Heterogeneous	20% Cellulose 5% Synthetic	75% Other	None Detected
LN 3.2 / 20014847-006 Linoleum-Upstairs, Mastic	Various Non-Fibrous Homogeneous		100% Other	None Detected
RM 4.1 / 20014847-007 Roof Material, Shingle	Various Non-Fibrous Heterogeneous	15% Cellulose	85% Other	None Detected
RM 4.1 / 20014847-007 Roof Material, Shingle	Various Non-Fibrous Heterogeneous	15% Glass	85% Other	None Detected

Analyst: *Dennis Cameron*

Approved Signatory: *[Signature]*

Analysis Date: 4/1/2020

Date: 4/2/2020





SanAir ID Number  
**20014847**  
 FINAL REPORT  
 4/2/2020 9:30:03 AM

**Name:** HDH Technical, Inc.  
**Address:** P.O. Box 6158  
 Christiansburg, VA 24073  
**Phone:** 540-381-7999

**Project Number:** Town Of Christiansbu  
**P.O. Number:** John Brown  
**Project Name:** Town Shop Building  
**Collected Date:** 3/31/2020  
**Received Date:** 4/1/2020 9:30:00 AM

Analyst: Cameron, Dennis

### Asbestos Bulk PLM EPA 600/R-93/116

SanAir ID / Description	Stereoscopic Appearance	Components		Asbestos Fibers
		% Fibrous	% Non-fibrous	
RM 4.2 / 20014847-008 Roof Material	Various Non-Fibrous Heterogeneous	15% Cellulose	85% Other	None Detected
TS 5.1 / 20014847-009 Transite Siding	White Non-Fibrous Homogeneous		80% Other	20% Chrysotile
FT 6.1 / 20014847-010 Floor Tile-12 X 12, Floor Tile	Various Non-Fibrous Homogeneous		100% Other	None Detected
FT 6.1 / 20014847-010 Floor Tile-12 X 12, Mastic	Various Non-Fibrous Homogeneous		100% Other	None Detected
FT 6.2 / 20014847-011 Floor Tile-12 X 12, Floor Tile	Various Non-Fibrous Homogeneous		100% Other	None Detected
FT 6.2 / 20014847-011 Floor Tile-12 X 12, Mastic	Yellow Non-Fibrous Homogeneous		100% Other	None Detected
BM 7.1 / 20014847-012 Baseboard Mastic	Cream Non-Fibrous Homogeneous		100% Other	None Detected
BM 7.2 / 20014847-013 Baseboard Mastic	Cream Non-Fibrous Homogeneous		100% Other	None Detected
CT 8.1 / 20014847-014 Ceiling Tile	Various Fibrous Homogeneous	40% Cellulose 10% Glass	50% Other	None Detected
CT 8.2 / 20014847-015 Ceiling Tile	Various Fibrous Homogeneous	40% Cellulose 10% Glass	50% Other	None Detected

Analyst: *Dennis Cameron*

Approved Signatory: *[Signature]*

Analysis Date: 4/1/2020

Date: 4/2/2020



SanAir ID Number  
**20014847**  
 FINAL REPORT  
 4/2/2020 9:30:03 AM

**Name:** HDH Technical, Inc.  
**Address:** P.O. Box 6158  
 Christiansburg, VA 24073  
**Phone:** 540-381-7999

**Project Number:** Town Of Christiansbu  
**P.O. Number:** John Brown  
**Project Name:** Town Shop Building  
**Collected Date:** 3/31/2020  
**Received Date:** 4/1/2020 9:30:00 AM

Analyst: Cameron, Dennis

### Asbestos Bulk PLM EPA 600/R-93/116

SanAir ID / Description	Stereoscopic	Components		Asbestos Fibers
	Appearance	% Fibrous	% Non-fibrous	
CT 8.3 / 20014847-016 Ceiling Tile	Various Fibrous Homogeneous	40% Cellulose 10% Glass	50% Other	None Detected
FM 9.1 / 20014847-017 Floor Material-Bathroom	Various Non-Fibrous Homogeneous	2% Glass	98% Other	None Detected
FM 9.2 / 20014847-018 Floor Material-Bathroom	Various Non-Fibrous Homogeneous	2% Glass	98% Other	None Detected
WF 10.1 / 20014847-019 Window Framing-Interior Windows	Various Non-Fibrous Homogeneous		97% Other	3% Chrysotile
WF 10.2 / 20014847-020 Window Framing-Interior Windows				Not Analyzed
BF 11.1 / 20014847-021 Block Fill-Vermiculite	Various Non-Fibrous Homogeneous		100% Other	None Detected
BF 11.2 / 20014847-022 Block Fill-Vermiculite	Various Non-Fibrous Homogeneous		100% Other	None Detected
BF 11.3 / 20014847-023 Block Fill-Vermiculite	Various Non-Fibrous Homogeneous		100% Other	None Detected
SR 12.1 / 20014847-024 Sheetrock	Off-White Non-Fibrous Homogeneous	5% Cellulose	95% Other	None Detected
SR 12.2 / 20014847-025 Sheetrock	Off-White Non-Fibrous Homogeneous	5% Cellulose	95% Other	None Detected

Analyst: *Dennis Cameron*

Approved Signatory: *[Signature]*

Analysis Date: 4/1/2020

Date: 4/2/2020





SanAir ID Number  
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**Collected Date:** 3/31/2020  
**Received Date:** 4/1/2020 9:30:00 AM

Analyst: Cameron, Dennis

### Asbestos Bulk PLM EPA 600/R-93/116

SanAir ID / Description	Stereoscopic	Components		Asbestos Fibers
	Appearance	% Fibrous	% Non-fibrous	
SR 12.3 / 20014847-026 Sheetrock	Off-White Non-Fibrous Homogeneous	5% Cellulose	95% Other	None Detected
JC 13.1 / 20014847-027 Joint Compound	White Non-Fibrous Homogeneous		100% Other	None Detected
JC 13.2 / 20014847-028 Joint Compound	White Non-Fibrous Homogeneous		100% Other	None Detected
JC 13.3 / 20014847-029 Joint Compound	White Non-Fibrous Homogeneous		100% Other	None Detected
DF 14.1 / 20014847-030 Door Framing-Exterior	Various Non-Fibrous Homogeneous		100% Other	None Detected
DF 14.2 / 20014847-031 Door Framing-Exterior	Various Non-Fibrous Homogeneous		100% Other	None Detected

Analyst: *Dennis Cameron*

Approved Signatory: *[Signature]*

Analysis Date: 4/1/2020

Date: 4/2/2020

## Disclaimer

The final report cannot be reproduced, except in full, without written authorization from SanAir. Fibers smaller than 5 microns cannot be seen with this method due to scope limitations. The accuracy of the results is dependent upon the client's sampling procedure and information provided to the laboratory by the client. SanAir assumes no responsibility for the sampling procedure and will provide evaluation reports based solely on the sample and information provided by the client. This report may not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. government. Samples are held for a period of 60 days.

For NY state samples, method EPA 600/M4-82-020 is performed.

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

### Asbestos Certifications

NVLAP lab code 200870

City of Philadelphia: ALL-460

PA Department of Environmental Protection Number: 68-05397

California License Number: 2915

Colorado License Number: AL-23143

Connecticut License Number: PH-0105

Massachusetts License Number: AA000222

Maine License Number: LB-0075

New York ELAP lab ID: 11983

Rhode Island License Number: AAL-126

Texas Department of State Health Services License Number: 300440

Commonwealth of Virginia 3333000323

Washington State License Number: C989

West Virginia License Number: LT000566

Vermont License: AL166318

Revision Date: 11/30/2017



SanAir ID Number  
**20014847**  
FINAL REPORT  
4/2/2020 9:30:03 AM

**Name:** HDH Technical, Inc.  
**Address:** P.O. Box 6158  
Christiansburg, VA 24073  
**Phone:** 540-381-7999

**Project Number:** Town Of Christiansbu  
**P.O. Number:** John Brown  
**Project Name:** Town Shop Building  
**Collected Date:** 3/31/2020  
**Received Date:** 4/1/2020 9:30:00 AM

Dear Fred Danner,

We at SanAir would like to thank you for the work you recently submitted. The 31 sample(s) were received on Wednesday, April 01, 2020 via FedEx. The final report(s) is enclosed for the following sample(s): DF 1.1, DF 1.2, FP 2.1, FP 2.2, LN 3.1, LN 3.2, RM 4.1, RM 4.2, TS 5.1, FT 6.1, FT 6.2, BM 7.1, BM 7.2, CT 8.1, CT 8.2, CT 8.3, FM 9.1, FM 9.2, WF 10.1, WF 10.2, BF 11.1, BF 11.2, BF 11.3, SR 12.1, SR 12.2, SR 12.3, JC 13.1, JC 13.2, JC 13.3, DF 14.1, DF 14.2.

These results only pertain to this job and should not be used in the interpretation of any other job. This report is only complete in its entirety. Refer to the listing below of the pages included in a complete final report.

Sincerely,

Sandra Sobrino  
Asbestos & Materials Laboratory Manager  
SanAir Technologies Laboratory

Final Report Includes:

- Cover Letter
- Analysis Pages
- Disclaimers and Additional Information

Sample conditions:

- 31 samples in Good condition.



---

## Photos

## Town Shop Reading Road



**The interior window framing was found to be Asbestos  
Containing by the laboratory.**

## Town Shop Reading Road



**The interior door framing was found to be Asbestos Containing by the laboratory.**



**The transite siding located on the building gables was found to be Asbestos Containing by the laboratory.**

---

## **Applicable Licenses**

COMMONWEALTH of VIRGINIA

Department of Professional and Occupational Regulation

9960 Mayland Drive, Suite 400, Richmond, VA 23233

Telephone: (804) 367-8500

EXPIRES ON  
05-31-2020

NUMBER  
3303004166

BOARD FOR ASBESTOS, LEAD, AND HOME INSPECTORS  
ASBESTOS INSPECTOR LICENSE



FREDERICK REED DANNER  
400 WEST MAIN ST  
CHRISTIANSBURG, VA 24073-0000



  
Mary Brock-Vaughan, Acting Director

Status can be verified at <http://www.dpor.virginia.gov>

(SEE REVERSE SIDE FOR PRIVILEGES AND INSTRUCTIONS)

DPOR-LIC (02/2017)





## LIMITED REGULATED MATERIALS AND INDOOR AIR QUALITY SURVEY REPORT

**Historic Phlegar Building**  
4 South Franklin Street  
Christiansburg, Virginia 24073



**Prepared For:**

Montgomery County  
755 Roanoke Street  
Christiansburg, Virginia 24073  
Phone: 540.394.2090  
Attention: Scott A. Woodrum  
Email: [woodrumsa@montgomerycountyva.gov](mailto:woodrumsa@montgomerycountyva.gov)

**Issue Date:** February 22, 2019

**F&R Project Number:** 62X-0045

Conducted/Prepared By:

Conducted/Reviewed By:

Jonathan E. Spence  
Industrial Hygienist

E. Glenn Hargrove, CIH  
Director of Industrial Hygiene



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**APPENDICES**

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**Appendix A**

F&R Personnel and Laboratory Accreditations

**Appendix B**

Facility Sketch:

*Interior*

*Asbestos Containing Sample Locations*

**Appendix C**

Laboratory Certificates of Analysis

Bulk Sample Chain of Custody Forms

*Section 1*

Asbestos-Containing Materials

*Section 2*

Microbial

**Appendix D**

Photographic Documentation

**Appendix E**

Explanation of XRF Data Table

XRF Data Table

XRF Performance Characteristic Sheet





## **1.0 INTRODUCTION**

Froehling & Robertson, Inc. (F&R) conducted limited regulated materials and indoor air quality survey services on February 4, 2019 at the Historic Phlegar Building located at 4 South Franklin Street in Christiansburg, Virginia. It is F&R's understanding that the structure is the subject of a planned renovation which may impact building materials. The following sections document the survey procedures and results. Refer to Appendix A for Personnel Accreditation documentation of F&R personnel associated with this survey.

### **1.1. Purpose**

The purpose of the Limited Asbestos, Lead, and Mold Survey is to identify Asbestos-Containing Materials (ACMs), Lead-Based Paint (LBP) coatings, and Microbial impact which may require appropriate removal, handling, and disposal procedures prior to scheduled activities at the subject property.

### **1.2. Site Description**

The structure consists of an approximately 5,400 square foot two-story concrete masonry unit vacant facility with a built up metal roof and a partial unfinished basement. The first floor of the structure was constructed approximately 1812-1813 with the second floor being added in 1898. Interior finishes gypsum board, plaster, and wood panel walls, vinyl floor tile, sheet vinyl flooring, hardwood floors, and carpeting, among others. Refer to Appendix B for site sketches of the facility.

Note that F&R utilizes Housing and Urban Development methodology for location identification modifiers: Side A is always the address side or the main entry side of the building. Then, proceeding in a clockwise direction the adjacent sides are labeled B, C and D; for example, the wall on the left side as one enters the building would be denoted as side B. Rooms with similar use patterns are numbered sequentially, generally with the first being the one that is encountered as one moves clockwise through the building from the main entry; unless room numbers are clearly identified on-site or on provided architectural/mechanical drawings which are expected to persist throughout the project. Consequently, in an office building, for example, the first office encountered moving clockwise around the interior from the main entry or stairwell, would be called Office 1; the next Office 2, and so on. Architectural/Mechanical drawings were not provided. Refer to Appendix B for facility sketches created by F&R based upon site conditions observed at the time this survey was conducted.

It should be noted that material and color descriptions are subjective and that, due to the nature of the environment, identical materials and colors may have been labeled as different depending on the lighting, other colors in the area, and other factors.



## 2.0 SCOPE OF SERVICES

As outlined in F&R proposal number 1962-00509, the survey included the following services with respect to the proposed renovation activities:

- Identification and sampling, as necessary, of suspect ACMs.
- Testing, as necessary, of surface coatings for the presence of Lead.
- And direct and air sampling for mold presence and concentration.

F&R was unable to safely access the roof due to the height of the building and current condition of the roof. As such, this survey as performed does not constitute a comprehensive building survey and this report shall not be utilized for the determination of presence or absence of Asbestos Materials outside of the accessible areas.

## 3.0 LIMITED ASBESTOS-CONTAINING MATERIALS SURVEY

F&R's Virginia Licensed Asbestos Building Inspectors, Jonathan E. Spence (Virginia Asbestos License #3303 004439) and E. Glenn Hargrove (Virginia Asbestos License #3303 001281), conducted the Asbestos Survey of the current site structure located at 4 South Franklin Street in Christiansburg, Virginia on February 4, 2019.

Federal Regulations (40 CFR Part 61, Subpart M – National Emission Standard for Asbestos (NESHAP)), as well as Virginia Department of Labor and Industry regulations require a thorough asbestos inspection of the structure to be conducted prior to the commencement of renovation activities. An ACM is defined by the Occupational Safety & Health Administration (OSHA) and the Environmental Protection Agency (EPA) as material containing greater than one percent (1%) asbestos.

### 3.1. Asbestos-Containing Materials (ACM) Methodology

This survey was conducted in general accordance with the Federal NESHAP and applicable State regulations for the presence of ACMs. The survey was characterized by a visual inspection and sampling of suspect building components at the subject property to be impacted by the proposed renovation/demolition activities.

Guidelines utilized in the asbestos survey were established by the EPA, ASTM International (ASTM), and The Environmental Information Association, Inc. (EIA). Utilized guidelines included: the Asbestos Hazard Emergency Response Act (40 CFR Part 763, Subpart E – Asbestos-Containing Materials in Schools (cited as AHERA)), ASTM Standard E2356-14 *Standard Practice for Comprehensive Building Asbestos Surveys*, and the EIA publication *Managing Asbestos in Buildings: A Guide for Owners and Managers – A Revision to the United States Environmental*



Protection Agency's 1985 document *Guidance for Controlling Asbestos-Containing Materials in Buildings (EPA 560/5-85-024) Known as the Purple Book*.

F&R's aforementioned Industrial Hygienist(s) collected and submitted suspect asbestos-containing bulk samples to the laboratory, of which, a total of seventy eight (78) suspect asbestos-containing bulk samples with discernable layers were analyzed following positive stop direction to the Laboratory. Due to multiple layers, a total of one hundred and fifty one (151) samples were analyzed.

Samples of suspect ACMs were organized as per the AHERA concept of Homogeneous Area (HA), collected, and transported to the Environmental Hazards Services, L.L.C. (EHS) testing laboratory. EHS is a National Institute for Standards and Technology (NIST) NVLAP accredited laboratory (NVLAP Lab Code: 101882-0) and Virginia licensed asbestos laboratory, in Richmond, Virginia, for analysis by Polarized Light Microscopy (PLM) following EPA Method 600/R-93/116. Refer to Appendix A for Laboratory Certificates of Accreditations. Refer to Appendix C for Laboratory Certificates of Analysis and Bulk Sample Chain of Custody Forms for further description of sampled materials/analytical results.

### 3.2. Asbestos-Containing Materials Findings

The following material types were identified, sampled, and accordingly homogenized based upon similar construction discovered during bulk sampling:

- Floor Materials
- Vapor Barriers
- Fiberboard and associated Coatings
- Floor Materials
- Pipe Insulation Components/Gaskets
- Caulking/Sealants – Various Applications
- Plaster – Two-Coat
- Mastics – Various Applications
- Ceramic Tile Mortar Base/Grout
- Cove Base

The following table presents a summary of survey results from sampling events performed on February 4, 2019. Refer to Appendix B for illustration of the locations of collected bulk samples. Positive asbestos samples (samples containing >1% asbestos) are in **BOLD** type.

**SUSPECT ASBESTOS-CONTAINING MATERIALS SAMPLE INFORMATION**

HA #	Sample #	Situation <sup>1</sup>	Sample Location(s)	Material Description	Laboratory Description	Percent Asbestos
1	JS-1	<b>B</b>	<b>C Side Basement Ceiling</b>	<b>Vapor Barrier</b>	<b>Off-White Fibrous; Homogeneous</b>	<b>70% Chrysotile</b>
1	JS-2	<b>B</b>	<b>C Side Basement Ceiling</b>	<b>Vapor Barrier</b>	<b>Off-White Fibrous; Homogeneous</b>	<b>65% Chrysotile</b>



HA #	Sample #	Situation <sup>1</sup>	Sample Location(s)	Material Description	Laboratory Description	Percent Asbestos
2	JS-3	B	C Side Basement Ceiling	Air Cell TSI	Off-White Fibrous; Homogeneous	60% Chrysotile
2	JS-4	B	C Side Basement	Air Cell TSI	Off-White Fibrous; Homogeneous	2% Amosite 70% Chrysotile
2	JS-5	B	A Side Basement Ceiling	Air Cell TSI	Off-White Fibrous; Homogeneous	70% Chrysotile
3	JS-6	B	C Side Basement	TSI Elbow	Off-White Fibrous; Homogeneous	60% Chrysotile
3	JS-7	B	Center Basement Ceiling	TSI Elbow	Off-White Fibrous; Homogeneous	60% Chrysotile
4	JS-8A	2	Plaster Ceiling-Kitchen	Base Coat	Pale Tan-Gray Cementitious; Homogeneous	NAD
5	JS-8B			Skim Coat	Pale Beige Cementitious; White/Off-White Brittle; Inhomogeneous	NAD
4	JS-9A	2	Plaster-Office 1 on Floor	Base Coat	Pale Tan-Gray Cementitious; Homogeneous	NAD
5	JS-9B			Skim Coat	Pale Beige Cementitious; Homogeneous	NAD
4	JS-10A	2	Plaster Wall-Office 2 Above Drop Ceiling	Base Coat	Pale Tan-Gray Cementitious; Homogeneous	NAD
5	JS-10B			Skim Coat	Pale Beige Cementitious; Pale Blue-Green Brittle; Inhomogeneous	NAD
4	JS-11A	2	Plaster Wall-Office 2 Above Drop Ceiling	Base Coat	Pale Tan-Gray Cementitious; Homogeneous	NAD
5	JS-11B			Skim Coat	Pale Beige Cementitious; Tan Fibrous; Inhomogeneous	NAD
4	JS-12A	2	Plaster Wall -Lobby Ceiling B/C Corner	Base Coat	Pale Tan-Gray Cementitious; Homogeneous	NAD



HA #	Sample #	Situation <sup>1</sup>	Sample Location(s)	Material Description	Laboratory Description	Percent Asbestos
5	JS-12B			Skim Coat	Pale Beige Cementitious; Pale Blue-Green Brittle; Tan Fibrous; Inhomogeneous	NAD
4	JS-13A	2	Plaster-Office 4 B Side Wall	Base Coat	Pale Gray Cementitious; Homogeneous	NAD
5	JS-13B			Skim Coat	White Brittle; Off-White Pliable to Brittle; Inhomogeneous	NAD
4	JS-14A	2	Plaster-Office 4 D Side Wall	Base Coat	Pale Gray Cementitious; Homogeneous	NAD
5	JS-14B			Skim Coat	White Brittle; Off-White Pliable to Brittle; Inhomogeneous	NAD
6	JS-15A	2	C Side Lobby Above Drop Ceiling	Gypsum Board	Off-White Brittle; Tan Fibrous; Off-White Pliable to Brittle; Inhomogeneous	NAD
7	JS-15B			Joint Compound	White Brittle; Homogeneous	NAD
6	JS-16A	2	D Side Office 3 Above Drop Ceiling	Gypsum Board	Off-White Brittle; Tan Fibrous; Off-White Pliable to Brittle; Inhomogeneous	NAD
7	JS-16B			Joint Compound	White Brittle; Homogeneous	NAD
6	JS-17A	2	Office 1 A Side Above Drop Ceiling	Gypsum Board	Off-White Brittle; Tan Fibrous; Off-White Pliable to Brittle; Inhomogeneous	NAD
7	JS-17B			Joint Compound	White Brittle; Homogeneous	NAD



HA #	Sample #	Situation <sup>1</sup>	Sample Location(s)	Material Description	Laboratory Description	Percent Asbestos
6	JS-18A	2	Lobby A Side Above Drop Ceiling	Gypsum Board	Off-White Brittle; Tan Fibrous; Off-White Pliable to Brittle; Inhomogeneous	NAD
7	JS-18B			Joint Compound	White Brittle; Homogeneous	NAD
8	JS-19	2	Under Kitchen Sink	Black Sink Adhesive	Black Pliable to Brittle; Homogeneous	NAD
9	JS-20	2	Residual piece laying on top of drop ceiling	Ceiling Tile	Tan Fibrous; Off-White Brittle; Inhomogeneous	NAD
10	JS-21	2	C Side Lobby	Yellow Insulation Ceiling Tile	Yellow Fibrous; White Vinyl-Like; Translucent Adhesive; Inhomogeneous	NAD
10	JS-22	2	Office 2 D Side	Yellow Insulation Ceiling Tile	Yellow Fibrous; White Vinyl-Like; translucent Adhesive; Inhomogeneous	NAD
11	JS-23A	2	Lobby A Side	Black 4 Inch Cove Base	Black Vinyl-Like; Homogeneous	NAD
12	JS-23B			Yellow Mastic	Pale Yellow Adhesive; Homogeneous	NAD
11	JS-24A	2	Office 5 D Side	Black 4 Inch Cove Base	Black Vinyl-Like; Homogeneous	NAD
12	JS-24B			Yellow Mastic	Pale Yellow Adhesive; Homogeneous	NAD
11	JS-25A	2	Office 4 A Side	Black 4 Inch Cove Base	Black Vinyl-Like; Homogeneous	NAD
12	JS-25B			Yellow Mastic	Pale Yellow Adhesive; Homogeneous	NAD
13	JS-26	2	Office 4 B Side	Window Sash Cord	Beige Fibrous; White/Pale Blue-Green Brittle; Inhomogeneous	NAD
13	JS-27	2	Office 3 A Side	Window Sash Cord	Beige Fibrous; White/Pale Yellow Brittle; Inhomogeneous	NAD



HA #	Sample #	Situation <sup>1</sup>	Sample Location(s)	Material Description	Laboratory Description	Percent Asbestos
14	JS-28A	2	Lobby C Side Under Carpet	Fiberboard	Tan Fibrous; Homogeneous	NAD
15	JS-28B			Yellow-Beige Mastic	Yellow-Beige Adhesive; Homogeneous	NAD
16	JS-28C			Off White Sheet Vinyl Flooring Backing	Off-White Fibrous; Homogeneous	60% Chrysotile
14	JS-29A	2	B Side Lobby Under Carpet	Fiberboard	Tan Fibrous; Homogeneous	NAD
15	JS-29B			Yellow-Beige Mastic	Yellow-Beige Adhesive; Homogeneous	NAD
16	JS-29C			Off White Sheet Vinyl Flooring Backing -28C	Off-White Fibrous; Homogeneous	55% Chrysotile
14	JS-30A	2	Office 1 D Side	Fiberboard	Tan Fibrous; Homogeneous	NAD
15	JS-30B			Yellow-Beige Mastic	Yellow-Beige Adhesive; Homogeneous	NAD
4	JS-31A	2	Hallway A Side	Base Coat	Pale Tan-Gray Cementitious; Homogeneous	NAD
17	JS-31B			Surface Finish and Wallpaper	Off-White/Green Brittle; Tan Fibrous; Green Pliable to Brittle: Inhomogeneous	NAD
4	JS-32A	2	Lobby B/C Corner	Base Coat	Pale Brown-Gray Cementitious; Homogeneous	NAD
17	JS-32B			Surface Finish	Off-White/Green Brittle; Inhomogeneous	NAD
4	JS33A	2	Office 5 C Side	Base Coat	Pale Brown-Gray Cementitious; Homogeneous	NAD
17	JS33B			Surface Finish	Off-White/Green Brittle; Inhomogeneous	NAD
4	JS34A	2	Stairwell Ceiling	Base Coat	Pale Tan-Gray Cementitious; Homogeneous	NAD
17	JS34B			Surface Finish	Off-White Brittle; Inhomogeneous	NAD



HA #	Sample #	Situation <sup>1</sup>	Sample Location(s)	Material Description	Laboratory Description	Percent Asbestos
4	JS35A	2	Office 5	Base Coat	Pale Tan-Gray Cementitious; Homogeneous	NAD
17	JS35B			Surface Finish	Pale Blue- Green/Pale Pink Brittle; Inhomogeneous	NAD
18	JS36A	2	Hallway Center	Yellow Mastic	Yellow Adhesive; Homogeneous	NAD
19	JS36B			9x9 Tan Vinyl Floor Tile	Tan Granular; Homogeneous	4% Chrysotile
20	JS36C			Black Mastic	Black Adhesive; Homogeneous	4% Chrysotile
18	JS37A	2	Hallway C Side	Yellow Mastic	Yellow Adhesive; Homogeneous	NAD
19	JS37B			9x9 Tan Vinyl Floor Tile	Tan Granular; Homogeneous	4% Chrysotile
20	JS37C			Black Mastic	Black Adhesive; Homogeneous	3% Chrysotile
21	JS38A	R	C Side Roof	Gray Caulking	Gray Pliable; Homogeneous	NAD
22	JS38B			Aluminized Coating	Silver Brittle; Homogeneous	NAD
21	JS39A	R	C Side Roof	Gray Caulking	Gray Pliable; Homogeneous	NAD
22	JS39B			Aluminized Coating	Silver Brittle; Homogeneous	NAD
23	JS-40	2	C Side Hallway	Leveling Compound	Off-White Brittle; Homogeneous	NAD
23	JS-41	2	C Side Hallway	Leveling Compound	Off-White Brittle; Homogeneous	NAD
24	JS-42	2	Office 15 C/D Corner	Ceiling Tile- Pin Dot Medium Fissures	Pale Gray to Tan Fibrous; White Brittle; Inhomogeneous	NAD
24	JS-43	2	Office 11 A/B Corner	Ceiling Tile- Pin Dot Medium Fissures	Pale Gray to Tan Fibrous; White Brittle; Inhomogeneous	NAD
25	JS-44A	2	Stairwell Bathroom 5	Multicolored SVF	Beige/Pale Gray/White Vinyl-Like; Pale Gray Fibrous; Inhomogeneous	NAD





HA #	Sample #	Situation <sup>1</sup>	Sample Location(s)	Material Description	Laboratory Description	Percent Asbestos
26	JS-44B			Yellow Mastic	Yellow Adhesive; Homogeneous	NAD
25	JS-45A	2	Stairwell Bathroom 5	Multicolored SVF	Beige/Pale Gray/White Vinyl-Like; Pale Gray Fibrous; Inhomogeneous	NAD
26	JS-45B			Yellow Mastic	Yellow Adhesive; Homogeneous	NAD
27	JS-46A	2	Stairwell Bathroom 4	Off-White SVF	Off-White Vinyl; Beige Fibrous; Inhomogeneous	NAD
28	JS-46B			Tan Mastic	Tan Adhesive; Homogeneous	NAD
27	JS-47A	2	Stairwell Bathroom 4	Off White SVF	Off-White Vinyl; Beige Fibrous; Inhomogeneous	NAD
28	JS-47B			Tan Mastic	Tan Adhesive; Homogeneous	NAD
13	JS-48	2	C Side Lobby Window	Window Sash Cord	White Fibrous; Tan Paint-Like; Inhomogeneous	NAD
4	JS-49A	1	Office 11 A Side	Base Coat	Tan Granular; Homogeneous	NAD
5	JS-49B			Skim Coat	White Granular; Tan Fibrous; Inhomogeneous	NAD
29	JS-50A	1	Bathroom 1	9x9 Gray Vinyl Floor Tile	Gray Vinyl; Homogeneous	3% Chrysotile
20	JS-50B			Black Mastic	Black Tar-Like; Homogeneous	6% Chrysotile
30	JS-50C			Black Felt	Black Tar-Like; Fibrous; Inhomogeneous	NAD
31	JS-50D			Brown Mastic	Brown Adhesive; Homogeneous	NAD
29	JS-51A	1	Office 3	9x9 Gray Vinyl Floor Tile	Gray Vinyl; Homogeneous	3% Chrysotile
20	JS-51B			Black Mastic	Black Tar-Like; Homogeneous	5% Chrysotile
30	JS-51C			Black Felt	Black Tar-Like; Fibrous; Inhomogeneous	NAD
31	JS-51D			Brown Mastic	Brown Adhesive; Homogeneous	NAD
32	JS52A	1	Office 4	9x9 Dark Gray Vinyl Floor Tile	Dark Gray Vinyl; Homogeneous	3% Chrysotile



HA #	Sample #	Situation <sup>1</sup>	Sample Location(s)	Material Description	Laboratory Description	Percent Asbestos
28	JS-52B			Tan Mastic	Tan Adhesive; Homogeneous	NAD
<b>32</b>	<b>JS-53A</b>	<b>1</b>	<b>Office 4</b>	<b>Dark Gray 9x9 Vinyl Floor Tile</b>	<b>Dark Gray Vinyl; Homogeneous</b>	<b>3% Chrysotile</b>
28	JS-53B			Tan Mastic	Tan Adhesive; Homogeneous	NAD
33	JS-54A	1	Stairwell	White Sheet Vinyl Flooring	White Vinyl; Fibrous; Inhomogeneous	NAD
28	JS-54B			Tan Mastic	Tan Adhesive; Homogeneous	NAD
33	JS-55A	1	Stairwell	White Sheet Vinyl Flooring	White Vinyl; Fibrous; Inhomogeneous	NAD
34	JS-55B			Beige Mastic	Beige Adhesive; Homogeneous	NAD
26	JS-56A	1	Office 6	Yellow Mastic	Yellow Adhesive; Homogeneous	NAD
35	JS-56B			12x12 Black Vinyl Floor Tile	Black Vinyl; Tan Fibrous; Inhomogeneous	NAD
28	JS-56C			Tan Mastic	Tan Adhesive; Homogeneous	NAD
36	JS-56D			12x12 Yellow Vinyl Floor Tile	Yellow Vinyl; Tan Fibrous; Inhomogeneous	NAD
37	JS-56E			Gray Mastic	Gray Adhesive; Homogeneous	NAD
26	JS-57A	1	Office 8	Yellow Mastic	Yellow Adhesive; Homogeneous	NAD
35	JS-57B			12x12 Black Vinyl Floor Tile	Black Vinyl; Tan Fibrous; Inhomogeneous	NAD
28	JS-57C			Tan Mastic	Tan Adhesive; Homogeneous	NAD
37	JS-57D			Gray Mastic	Gray Adhesive; Homogeneous	NAD
26	JS-58A	1	Office 1	Yellow Mastic	Yellow Adhesive; Homogeneous	NAD
38	JS-58B			Green 12x12 Inch Vinyl Floor Tile	Green Vinyl; Tan Fibrous; Inhomogeneous	NAD
28	JS-58C			Tan Mastic	Tan Adhesive; Homogeneous	NAD
37	JS-58D			Gray Mastic	Gray Adhesive; Homogeneous	NAD



HA #	Sample #	Situation <sup>1</sup>	Sample Location(s)	Material Description	Laboratory Description	Percent Asbestos
26	JS-59A	1	Office 1	Yellow Mastic	Yellow Adhesive; Homogeneous	NAD
38	JS-59B			Green 12x12 Inch Vinyl Floor Tile	Green Vinyl; Tan Fibrous; Inhomogeneous	NAD
28	JS-59C			Tan Mastic	Tan Adhesive; Homogeneous	NAD
37	JS-59D			Gray Mastic	Gray Adhesive; Homogeneous	NAD
39	JS-60A	1	Front Foyer	Brown Sheet Vinyl Flooring	Brown Vinyl; Black Fibrous; Inhomogeneous	NAD
40	JS-60B			Brown Mastic	Brown Brittle Adhesive; Homogeneous	NAD
39	JS-61A	1	Front Foyer	Brown Sheet Vinyl Flooring	Brown Vinyl; Black Fibrous; Inhomogeneous	NAD
40	JS-61B			Brown Mastic	Brown Adhesive; Homogeneous	NAD
24	JS-62	1	Magistrate Office	2x4 Ceiling Tile- Pin Dot Medium Fissure	Beige/White Fibrous; Inhomogeneous	NAD
24	JS-63	1	Magistrate Office	2x4 Ceiling Tile- Pin Dot Medium Fissure	Beige/White Fibrous; Inhomogeneous	NAD
41	JS-64A	1	Magistrate Office	4 Inch Gray Cove Base	Gray Vinyl; Homogeneous	NAD
42	JS-64B			Beige Mastic	Beige Adhesive; Homogeneous	NAD
41	JS-65A	1	Magistrate Office	4 Inch Gray Cove Base	Gray Vinyl; Homogeneous	NAD
42	JS-65B			Beige Mastic	Beige Adhesive; Homogeneous	NAD
43	JS-66A	1	Magistrate Office	12x12 White/Gray Vinyl Floor Tile	White/Gray Vinyl; Homogeneous	NAD
26	JS-66B			Yellow Mastic	Yellow Adhesive; Homogeneous	NAD
44	JS-66C			Tan Sheet Vinyl Flooring	Tan Vinyl; Homogeneous	NAD
26	JS-66D			Yellow Mastic	Yellow Adhesive; Homogeneous	NAD
43	JS-67A	1	Magistrate Office	12x12 White/Gray Vinyl Floor Tile	White/Gray Vinyl; Homogeneous	NAD



HA #	Sample #	Situation <sup>1</sup>	Sample Location(s)	Material Description	Laboratory Description	Percent Asbestos
26	JS-67B			Yellow Mastic	Yellow Adhesive; Homogeneous	NAD
44	JS-67C			Tan Sheet Vinyl Flooring	Tan Vinyl; Homogeneous	NAD
26	JS-67D			Yellow Mastic	Yellow Adhesive; Homogeneous	NAD
<b>29</b>	<b>JS-68A</b>	<b>1</b>	<b>Magistrate Closet</b>	<b>9x9 Gray Vinyl Floor Tile</b>	<b>Gray Vinyl; Homogeneous</b>	<b>3% Chrysotile</b>
<b>20</b>	<b>JS-68B</b>			<b>Black Mastic</b>	<b>Black Adhesive; Homogeneous</b>	<b>5% Chrysotile</b>
44	JS-69A	1	Bathroom 2	Tan Sheet Vinyl Flooring	Tan Vinyl; Tan Fibrous; Inhomogeneous	NAD
28	JS-69B			Tan Mastic	Tan Adhesive; Homogeneous	NAD
44	JS-70A	1	Bathroom 2	Tan Sheet Vinyl Flooring	Tan Vinyl; Tan Fibrous; Inhomogeneous	NAD
28	JS-70B			Tan Mastic	Tan Adhesive; Homogeneous	NAD
45	JS-71	1	Stairwell	Stair Tread Yellow Mastic	Yellow Adhesive; Homogeneous	NAD
46	JS-72	E	Exterior B Side	Window Glazing	Tan Granular; White Paint-Like; Inhomogeneous	NAD
47	JS-73	E	Exterior A Side	White Caulking	White Pliable; Homogeneous	NAD
47	JS-74	E	Exterior B Side	White Caulking	White Pliable; Homogeneous	NAD
47	JS-75	E	Exterior C Side	White Caulking	White Pliable; Homogeneous	NAD
46	JS-76	E	Exterior D Side	Window Glazing	Tan Granular; Homogeneous	NAD
6	JS-77A	1	Rear Foyer	Drywall	White Chalky; Brown Fibrous; Inhomogeneous	NAD
7	JS-77B			Joint Compound	Beige Chalky; Homogeneous	NAD
6	JS-78A	1	Office 5	Drywall	White Chalky; Brown Fibrous; Inhomogeneous	NAD
7	JS-78B			Joint Compound	Beige Chalky; Homogeneous	NAD

<sup>1</sup>Situation: 1 –First; 2 – Second; B – Basement; R - Roof; E – Exterior

<sup>2</sup>NAD: No Asbestos Detected

<sup>3</sup>**Bold:** Asbestos Containing Material or Trace (<1%) Asbestos Present



### 3.3. Asbestos-Containing Materials Inventory

F&R conducted a survey of the reasonably and safely accessible portions of the building. The building roof was excluded due to inaccessibility and safety concerns; suspect ACM in this space which were not represented during this survey should be presumed positive.

The following table presents identified materials containing greater than 1% asbestos. Comprehensive delineation was not performed; therefore, the table below may not completely represent locations of identified ACMs. It is the responsibility of the client or contractor to verify material locations. Photographic documentation of ACMs for reference is provided as Appendix D.

**ASBESTOS-CONTAINING MATERIALS INVENTORY**

HA #	Material Description	Material Location(s)	Result (Percent ACM)
1	Air Cell TSI	Basement	60-70% Chrysotile 2% Amosite
2	Vapor Barrier	Basement	65-70% Chrysotile
3	TSI Elbow	Basement	60% Chrysotile
16	Off White Sheet Vinyl Flooring Backing	Second Floor Lobby 1 Office Spaces 9-13 Second Floor Kitchen Second Floor Closet 2	55-60% Chrysotile
19	9x9 Tan Vinyl Floor Tile	Second Floor Hallway Office 15 Closet 3	4% Chrysotile
20	Black Mastic	Second Floor C Side Office Spaces First Floor B Side Offices and Bathroom Magistrate B/C Corner Closet	3-6% Chrysotile
29	9x9 Gray Vinyl Floor Tile	First Floor B Side Office and Bathroom Magistrate B/C Corner Closet	3% Chrysotile
32	9x9 Dark Gray Vinyl Floor Tile	First Floor Office adjacent to Stairwell	3% Chrysotile

SF = Square Feet | LF = Linear Feet | CF = Cubic Feet | TBD = To Be Determined

Due to ACM sheet vinyl flooring backing material (HA # 16) being present in the second floor lobby area underlying carpet and fiberboard, it cannot be precluded that ACM sheet vinyl flooring backing is not present under homogenous carpet and fiberboard without additional sampling being performed to delineate the location(s).

F&R presumes that, where materials have been documented to be ACMs and where those materials are similar to other materials which have not been found to be positive, those similar materials will be considered to be ACMs (i.e. where one material was analyzed and found to be



positive, it is prudent to consider other similar materials positive, despite potential analytical data to the contrary).

### **3.3.1. Presumed Asbestos-Containing Materials**

During the conduct of this survey, sampling was limited to those materials which were within the areas designated by the client, which were safely accessible, and which were able to be sampled without damaging systems or structures. As such, some materials should be presumed to be positive, unless sampling is conducted and shown to be negative. Such presumed asbestos containing materials (PACMS) include, but are not limited to:

- Electrical panel backing/arc deflectors/spark arresters,
- Vermiculite within masonry cells,
- Roofing materials,
- Wiring insulation or other live electrical system components,
- Chimneys and flues or other cementitious pipes or panels.

Note that asbestos was used in over 3,000 known products and was used extensively in construction materials including in insulation and finish materials such as drywall-based systems, acoustical tiles, caulks and mastics, vinyl-based materials, and specialty products. Asbestos also continues to be used in new construction because, as stated by the EPA, "the manufacture, importation, processing, and distribution in commerce of [various] products [...] are not banned."

### **3.4. Asbestos-Containing Materials Recommendations**

As detailed above, several materials were identified as asbestos-containing, utilized in various instances throughout the structure.

Prior to any activities that will impact the ACM, F&R recommends that the identified ACMs be appropriately removed, handled, and disposed of by an appropriately licensed/accredited Abatement Contractor utilizing appropriately licensed/accredited personnel.

F&R notes that the Contractor may leave Category I non-friable materials in the building during demolition/renovation with the following constraints:

- a. The landfill receiving these materials (Category I non-friable) must be notified in writing and must be willing to receive these materials.
- b. The Contractor cannot cause these materials to become friable during demolition by demolition methods including, but not limited to, compaction of the debris. The Contractor cannot salvage the mixed debris following demolition.
- c. During demolition, no visible emissions of dust are allowed. The Contractor must use dust control measures (i.e., water) during demolition.



F&R further recommends that the third party Asbestos Professional be present for the duration of the abatement project and authorized to provide guidance to the Asbestos Abatement Contractor during the Project to confirm complete and proper removal/disposal of ACMs in accordance with applicable federal, state, and local regulations. This recommendation is made as a best practice to reduce potential exposure to workers as well as occupants upon re-occupancy, and limit liability.

The Client should note that F&R has encountered instances in which materials were analyzed by Polarized Light Microscopy (PLM) (following EPA Method 600/R-93/116) for the presence of asbestos with a result of “None Detected”, but when analyzed by Transmission Electron Microscopy (TEM) for Non-friable Organically Bound (NOB) bulk material, analytical results have indicated that asbestos is present in quantities greater than 1%. The client should be aware that F&R has samples analyzed by the PLM method for a number of reasons (including financial and time considerations) and that this method is considered acceptable in Virginia; however, some firms employ the more stringent TEM method which is required in some states. Therefore, it is possible that some materials identified as containing no asbestos within this report may, if subjected to a more stringent analytical method, reveal the presence of asbestos at concentrations of 1% or greater.

In addition, it should be noted that through NESHAP Applicability Determinations, asbestos bulk samples analyzed via PLM which indicate a result of asbestos content to be less than ten (10) percent, including trace amounts (<1%), the material in question shall either be assumed to be an ACM or further analyzed via PLM Point Count or TEM to verify asbestos content. Results obtained via PLM Point Count or TEM analysis shall supersede previous results obtained by standard PLM analysis. Samples with analytical results via PLM which indicate that no asbestos was detected are not required to be further analyzed via PLM Point Count or TEM.

Should additional suspect ACMs be discovered during renovation and/or demolition activities that have not been sampled and will be disturbed, F&R recommends the work be temporarily halted. Samples of suspect materials should be collected, analyzed, and handled accordingly prior to the resumption of renovation and/or demolition activities.

### **3.5. Applicable Regulations**

#### **3.5.1. EPA/NESHAP Regulations for Asbestos-Containing 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.

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

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

Category II Non-friable ACM – Material, excluding Category I Non-friable ACM, which contains more than 1% asbestos.

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

1. Friable ACM
2. Category I Non-friable ACM that has become friable.
3. Category I Non-friable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading.
4. Category II Non-friable 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 RACM from the facility before activities begin that would break up, dislodge, or similarly disturb the material or preclude access for subsequent removal.
3. RACM need not be removed if:
  - a) It is Category I non-friable ACM that is not in poor condition.
  - b) It is on a facility component that is encased in concrete or other similar material and is adequately wet whenever exposed.
  - c) It was not accessible for testing and was therefore not discovered until after demolition began and because of the demolition the material cannot be safely removed.
  - d) It is Category II non-friable ACM and the probability is low that the material will become crumbled, pulverized, or reduced to powder during demolition.





### **3.5.2. Virginia Asbestos Regulations**

The Virginia Department of Labor and Industry (DOLI) regulates asbestos through enforcement of the Virginia Occupational Safety and Health (VOSH) regulations, enforcement of the Environmental Protection Agency's National Emission Standards for Hazardous Air Pollutants (NESHAP), and enforcement of the Asbestos Notification regulations found in the Labor Laws of Virginia (§40.1-51.20). Agency locations and regulations can be found on the agency Web site <http://www.doli.virginia.gov>.

The Virginia Department of Professional and Occupational Regulation (DPOR) is responsible for company and individual licensure in Virginia. Licensure and regulatory information can be found on DPOR's Web site <http://www.dpor.virginia.gov/>

The Virginia Department of Environmental Quality (DEQ) is responsible for the regulation of landfills in Virginia. Information on the disposal of asbestos in Virginia landfills can be obtained from the DEQ Web site <http://www.deq.state.va.us/>.

### **3.5.3. OSHA Asbestos Regulations**

The Occupational Safety and Health Administration (OSHA) regulates employee exposure to asbestos under 29 CFR 1926.1101 and 29 CFR 1910.1001. Work associated with known or suspect ACMs must be conducted according to these regulations in addition to the noted EPA regulations.

## **4.0 LIMITED LEAD-BASED PAINT SURVEY**

F&R's Virginia Licensed Lead-Based Paint Inspector/Risk Assessor, Jonathan E. Spence (Virginia Risk Assessor License #3356 001168), performed the testing of surface coatings for lead on February 4, 2019. Refer to Appendix A for F&R Personnel Accreditation Documentation.

For definitions of terms used in this document with regard to Lead-Based Paint, please reference the Glossary of the [U.S. Department of Housing and Urban Development \(HUD\) Guidelines for the Evaluation and Control of Lead-Based paint Hazards in Housing \(Second Edition, July 2012\)](#).

Based on the nature of this survey, when one component tests positive for the presence of lead similar painted/coated components shall be assumed to be lead-containing, unless additional testing is performed.

### **4.1. Lead-Based Paint Survey Methodology**

The survey was conducted in general accordance with EPA's work practice standards for conducting LBP activities (40 CFR 745.227), and the HUD Guidelines for the Evaluation and



Control of Lead-Based Paint Hazards in Housing (Second Edition, July 2012); however, this was not a comprehensive surface-by-surface investigation for LBP, but rather a screening survey of major coated surfaces where the presence of LBP is suspected.

F&R conducted a visual assessment of the Property in order to characterize the condition of various painted surfaces with the intent to determine location of deteriorated surfaces. As noted in Chapter 5 of the *HUD Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (Second Edition, July 2012)* “EPA regulations define deteriorated paint as “any interior or exterior paint or other coating that is peeling, chipping, chalking or cracking, or any paint or coating located on an interior or exterior surface or fixture that is otherwise damaged or separated from the substrate” (40 CFR 745.63).” Intact surfaces are those which do not exhibit the conditions noted in the definition for deteriorated paint.

Paint that is deteriorated but is less than the “de minimis” amount is noted as *de minimis* in the lead data sheets. As noted in Chapter 5, “Specifically, the de minimis amounts of paint are amounts that do not exceed: (a) 20 square feet on exterior surfaces, (b) 2 square feet in any one interior room or space, or (c) 10 percent of the total surface area on an interior or exterior component type with a small surface area.”

Several components, particularly window components were not safely accessible for testing or required invasive sampling techniques during the survey. Therefore, F&R has employed professional judgment in making determinations about the homogeneity of components determined to be “positive.”

#### **4.1.1. XRF Testing**

Sampling of surface coatings was conducted utilizing a Heuresis Pb200i X-Ray Fluorescence (XRF) Lead Paint Analyzer (Serial Number 1504). Only accessible painted, coated, and/or varnished surfaces were tested using the XRF.

The XRF contains a small radioisotopic source and operates on the principle of x-ray fluorescence, whereby lead atoms in a surface coating are stimulated to emit characteristic x-rays, which are then detected by the instrument. Levels of lead are reported in units of milligrams per square centimeter ( $\text{mg}/\text{cm}^2$ ). The XRF can measure surface or non-surface concentrations of lead with 95% accuracy at the HUD action level of  $1.0 \text{ mg}/\text{cm}^2$ . The XRF is able to accurately detect a concentration as low as  $0.1 \text{ mg}/\text{cm}^2$  of lead. The XRF classifies coated surfaces as “positive”, “negative”, or “null” for lead content based on the action level ( $1.0 \text{ mg}/\text{cm}^2$ ) and the performance characteristics of the XRF. The XRF was checked for calibration before and after the survey. The calibration was checked against a standard reference material ( $1.04 \text{ mg}/\text{cm}^2$  NIST Standard) supplied by the XRF manufacturer. A copy of the XRF Performance Characteristic sheet is included as an attachment to this report.



Positive: Lead is present at or above the action level of 1.0 mg/cm<sup>2</sup> on *one or more* of the components tested.

Negative: Lead is not present at or above the action level of 1.0 mg/cm<sup>2</sup> on any of the components tested.

Null: Insufficient data was collected by the XRF during the sample time to determine if the surface is positive or negative (i.e. – premature removal or instrument slippage, terminating the test).

## 4.2. Lead-Based Paint Survey Findings

### 4.2.1. XRF Survey Results

A total of one hundred and seventy four (174) XRF readings, excluding calibration readings, were collected from the interior and exterior of the building. Fifty eight (58) of the readings collected at the Project site were positive for LBP when compared to the action level of 1.0 mg/cm<sup>2</sup>. Refer to [Appendix F](#), XRF Data Table for a listing of the readings and respective information as well as an explanation of the data table and the Performance Characteristic Sheet. The following table presents the positive readings collected.

**XRF READINGS FOR LEAD-BASED PAINT**

Reading Number	Component	Substrate	Side	Color	Room	Floor
14	Window Casing	Wood	A	Blue	Front Foyer	First
17	Window Casing	Wood	A	Blue	Office 1	First
18	Window Sash	Wood	A	Blue	Office 1	First
19	Window Muntin	Wood	A	Blue	Office 1	First
22	Window Casing	Wood	B	Blue	Office 2	First
23	Window Sash	Wood	B	Blue	Office 2	First
24	Window Muntin	Wood	B	Blue	Office 2	First
25	Window Casing	Wood	A	Blue	Office 2	First
26	Window Muntin	Wood	A	Blue	Office 2	First
27	Window Sash	Wood	A	Blue	Office 2	First
35	Window Casing	Wood	D	Blue	Office 2	First
50	Window Casing	Wood	B	Blue	Office 3	First
51	Window Sill	Wood	B	Blue	Office 3	First
52	Window Sash	Wood	B	Blue	Office 3	First
53	Window Casing	Wood	B	Blue	Office 3	First
54	Window Sill	Wood	B	Blue	Office 3	First
55	Window Sash	Wood	B	Blue	Office 3	First
67	Window Casing	Wood	C	Blue	Hallway	First
69	Window Sash	Wood	C	Blue	Hallway	First
72	Window Casing	Wood	A	White	Office 9	Second



Reading Number	Component	Substrate	Side	Color	Room	Floor
73	Window Muntin	Wood	A	White	Office 9	Second
74	Window Sash	Wood	A	White	Office 9	Second
84	Window Casing	Wood	A	White	Office 10	Second
85	Window Muntin	Wood	A	White	Office 10	Second
86	Window Sash	Wood	A	White	Office 10	Second
89	Window Casing	Wood	B	White	Office 11	Second
90	Window Muntin	Wood	B	White	Office 11	Second
91	Window Sash	Wood	B	White	Office 11	Second
95	Window Casing	Wood	B	White	Office 12	Second
96	Window Muntin	Wood	B	White	Stairwell	Second
99	Door Casing	Wood	B	White	Lobby	Second
114	Window Casing	Wood	C	White	Office	Second
127	Window Muntin	Wood	B	White	Office	Second
128	Window Casing	Wood	B	White	Office	Second
129	Window Sash	Wood	B	White	Office	Second
130	Window Casing	Wood	B	White	Office	Second
131	Window Muntin	Wood	B	White	Office	Second
132	Window Sash	Wood	B	White	Office	Second
141	Window Well	Wood	A	Blue	Exterior	Exterior
142	Window Casing	Wood	A	Blue	Exterior	Exterior
144	Window Sash	Wood	A	Blue	Exterior	Exterior
145	Door Casing	Wood	A	Blue	Exterior	Exterior
147	Threshold	Wood	A	Blue	Exterior	Exterior
148	Window Casing	Wood	A	Blue	Exterior	Exterior
149	Window Well	Wood	A	Blue	Exterior	Exterior
150	Door	Wood	A	Blue	Exterior	Exterior
151	Door Casing	Wood	A	Blue	Exterior	Exterior
153	Foundation	Concrete	B	Blue	Exterior	Exterior
155	Window Well	Wood	B	Blue	Exterior	Exterior
160	Door Casing	Wood	B	Blue	Exterior	Exterior
165	Window Casing	Wood	C	Blue	Exterior	Exterior
166	Window Casing	Wood	C	Blue	Exterior	Exterior
167	Window Sash	Wood	C	Blue	Exterior	Exterior
168	Window Muntin	Wood	C	Blue	Exterior	Exterior
172	Window Casing	Wood	D	Blue	Exterior	Exterior
173	Window Well	Wood	D	Blue	Exterior	Exterior
174	Window Casing	Wood	D	Blue	Exterior	Exterior
175	Window Well	Wood	D	Blue	Exterior	Exterior
177	Fascia	Wood	D	Blue	Exterior	Exterior

**4.2.1.1. Locations of Detected Lead-Based Paint**



Based on the detection of LBP on specific component types and our observation of an apparent homogenous painting history, the following building components should be considered to be coated with LBP:

LEAD-BASED PAINT MATERIALS INVENTORY			
Material Description	Color	Substrate	Material Location(s)
<b>Interior</b>			
Window Components	Blue and White	Wood	Throughout
Door Casing	White	Wood	Second Floor B Side Door to Exterior of Lobby
<b>Exterior</b>			
Window Components	Blue	Wood	Throughout
Door and Door Casings	Blue	Wood	A and B Side Exterior
Fascia	Blue	Wood	Throughout
Threshold	Blue	Wood	A Side Exterior
Foundation	Blue	Concrete	Throughout

The above table details only those building materials with painted and/or coated surfaces with a reported lead concentration greater than or equal to 1.0 mg/cm<sup>2</sup>. However, readings of the majority of painted or coated surfaces indicated a lead content between 0.1 mg/cm<sup>2</sup> and 0.9 mg/cm<sup>2</sup>.

#### 4.2.1.2. Inaccessible or Presumed Lead-Based Paint

During the conduct of this survey, testing was limited to those materials which were safely accessible and readily visible. As such, some materials should be presumed to be positive, unless sampling is conducted and shown to be negative. Such presumed LBP coated components include, but are not limited to:

- Painted components within the attic;
- The roof, which was not safely accessible;
- Several window sashes which were inaccessible due to nonfunctioning sashes or storm window coverage; and
- Original soffit and fascia components.

#### 4.3. Lead-Based Paint Conclusions & Recommendations



This survey concludes that building components located on both the exterior and interior of the structure contain lead-based paint/coatings.

F&R recommends that activities which may disturb such coatings be conducted following appropriate Federal and State regulations. Federal regulations with regard to worker safety and disposal requirements are summarized in the following Section – Applicable Regulations; this is not an exhaustive list.

In addition to the above, F&R recommends that routine maintenance of the building be conducted to prevent or reduce risk associated with extant lead based paint. These measures should correspond to Chapter 6 of the HUD *Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (Second Edition, July 2012)* which notes the following components of ongoing lead-safe maintenance:

- Periodic Visual Assessments
- Correction of problems found in the visual assessments
- Using lead-safe work practices
- Conducting a clearance examination
- In rental housing, asking residents to report to management various lead based paint related items

#### **4.4. Applicable Regulations**

##### **4.4.1. OSHA Regulations for Lead-Based Paint**

While the majority of materials tested at the site were negative for lead based paint and/or surface coatings, other painted and/or coated surfaces or materials containing lead may contain sufficient concentrations of lead, which when disturbed, may generate lead dust greater than the “Action Level” concentration of 30 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) or greater than the “Permissible Exposure Limit” of 50 micrograms per cubic meter established by the OSHA “Lead Exposure in Construction Rule” (29 CFR 1926.62). The OSHA standard does not define acceptable levels of lead in paint at which no exposure to airborne lead (above the action level) would be expected; however, guidance is available for work practices which present the highest risk for lead exposure to workers. Rather, OSHA defines airborne concentrations and references specific types of work practices and operations from which a lead hazard may be generated (reference 29 CFR 1926.62, section d). Environmental and personnel monitoring should be conducted during removal or demolition processes (as applicable) to determine actual personal exposure. This monitoring information can be used to determine the levels of personnel protection and environmental controls required for work involving specific removal/demolition processes on specific structures. Under OSHA requirements, the Contractor performing the work will be required to conduct this monitoring. It is important to note that environmental controls will vary



dependent upon the content of lead in paint, the process used to remove it, duration of the work, and the amount of paint to be removed.

F&R recommends that workers disturbing painted (or coated) surfaces as part of this project receive OSHA Lead in Construction Awareness training and that engineering controls and hygiene practices described in 29 CFR 1926.62 be followed during the disturbance of painted (or coated) surfaces.

#### **4.4.2. EPA Regulations for Lead-Based Paint**

For disposal of construction/demolition debris that has LBP, testing may be required as specified by the Environmental Protection Agency (EPA) for lead content to determine proper disposal. EPA regulations require that a generator of waste determine if that waste is hazardous by performing testing in accordance with the requirements of 40 CFR 261.11 or for wastes that may be RCRA hazardous (such as items with high lead content), the generator may assume that the waste is hazardous and comply with the hazardous waste regulation. The need for determination of disposal may be additionally subject to the disposal and/or recycling facility utilized.

### **5.0 MOLD EVALUATION**

#### **5.1. Procedure**

F&R's scope of services included visual observations and both direct surface and air sampling for indications of mold growth. The results of our evaluation are presented below. The analytical reports are included in Appendix C to this report. The following sections summarize the assessment procedures utilized at the site; findings, conclusions, and recommendations follow. Photographs of select items are included as an attachment to the report. Note: This was not a comprehensive building mold survey and only select areas of the building were tested using non-intrusive techniques.

##### **5.1.1. Visual Review**

F&R reviewed the first floor and second floor of the structure in order to evaluate the spaces for the presence of visible suspect mold growth and discernable impact to ambient air.

##### **5.1.2. Air Sampling**

F&R performed air sampling for mold spores to profile the air with regard to mold air quality on the first and second floor of the structure; two outdoor comparative samples were also collected. Elevation of fungal spore air counts can be used as an indicator of the possible presence of fungal growth within a building. We note, however, that the absence of elevated counts does not necessarily suggest the absence of moisture damage or lack of fungal growth. Air sample total



spore counts and detected mold genera should be comparable with outside values and should show no significant elevations of individual mold genera, especially indicator genera. Note: Interpretation of air samples is somewhat subjective; F&R has used our professional judgement in reviewing results based on our understanding of current accepted industry standards.

For analysis of airborne fungal spores samples were collected onto Allergenco-D disposable Indoor Air Quality (IAQ) Air Monitoring Cassettes. The samples were collected at a flow rate of 15 liters per minute (lpm) for a ten (10) minute period. Flow was determined using a calibrated field flowmeter that has been calibrated to a primary calibration device. Analytical data was requested for the total number of spores per cubic meter of air (count/m<sup>3</sup>). Results are presented below, in Table III.

### **5.1.3. Direct Sampling**

F&R collected two direct lift tape sample from the magistrate office wall where visible suspect mold growth and water damage was noted. The tape samples were collected by pressing a clean, prepared slide with a transparent adhesive collection area across the surface where suspect microbial growth was observed. The entire slide was then identified with a unique sample number and placed in a sealed container. It is important to note that this is a qualitative test and is only indicative of the location sampled. Results are presented below, in Table IV.

## **5.2. Findings and Results**

### **5.2.1. Site Observations**

Heavy visible suspect mold growth was present on walls and ceiling materials throughout the first floor magistrate office. Mold growth is likely attributed to an increase in moisture content from a past water leak. The source of the water intrusion was not readily apparent during the assessment.





## 5.2.2. Sampling Results

**TABLE III – Mold and Biological Contaminants Testing Results**

Sample Number	Sample Location	Analytical Results, (count/m <sup>3</sup> ) <sup>1, 3</sup>										
		Background/ Fragments <sup>2</sup>	Total	Alternaria	Ascospores	Aspergillus/ Penicillium	Cladosporium	Chaetomium	Myxomycetes	Stachybotrys	Spegazzinia	Torula
2630589	Outside	2/7/M3	253	---	33	200	13	---	7	---	---	---
2630584	First Floor at Stairs	2/13/M3	6734	7	27	<b>6533</b>	13	<b>147</b>	---	<b>7</b>	---	---
2630580	First Floor A Side	2/13/M#	2973	---	20	<b>2893</b>	20	<b>13</b>	7	<b>13</b>	---	---
2630571	First Floor C Side	2/7/M3	2773	---	27	<b>2660</b>	13	<b>40</b>	20	<b>13</b>	---	---
2630570	Second Floor A Side	2/ND	4186	---	13	<b>4107</b>	13	<b>27</b>	13	---	13	---
2630574	Second Floor C Side	2/20/M3	8514	---	20	<b>8400</b>	20	<b>40</b>	20	---	---	---
2630579	Outside	2/7/M3	280	---	13	253	---	---	---	---	---	7

**Key:**

<sup>1</sup>Count/m<sup>3</sup> = spores per cubic meter of air

<sup>2</sup>Background/Fragments = The Background is the amount of debris that is present in the sample. This debris consists of skin cells, dirt, dust, pollen, drywall dust and other organic and non-organic matter. As the background density increases, the likelihood of spores, especially small spores such as those of Aspergillus and Penicillium may be obscured. The background is rated on a scale of 1 to 4 and each level is determined as follows:

**ND** : No background detected. (Pump or cassette malfunction.) Recollect sample.

**1** : <5% of field occluded. No spores will be uncountable.

**2** : 5-25% of field occluded.

**3** : 25-75% of field occluded.

**4** : 75-90% of field occluded.

**5** : >90% of field occluded. Suggest recollection of sample.

Fragments are small pieces of fungal mycelium or spores. They are not identifiable as to type and when present in very large numbers, may indicate the presence of mold amplification

<sup>3</sup> Where detections of a particular mold genus was not identified, the cell remains blank

<sup>4</sup> **Bolded** values exceed comparison value

If left blank, spores were not detected.



**TABLE IV – Tape Lift Testing Results**

Sample Number	Sample Type	Sample Location	Analytical Results - spore estimate		Analytical Results – Mycelial Estimate
GH204-T1	Tape	Magistrate Office Wall	<i>Alternaria</i>	Very Heavy	Many
			<i>Epicoccum</i>	Very Heavy	
GH204-T2	Tape	C Side Magistrate Office Wall	<i>Alternaria</i>	Very Heavy	Many
			<i>Epicoccum</i>	Very Heavy	Many

Key:

Spore Estimate

ND = None Detected  
 Rare = Less than 10 spores; <1%  
 Light = 10-99 spores; 1-10%  
 Moderate = 100-999 spores; 11-25%  
 Heavy = 1,000-9,999 spores; 26-50%  
 Very Heavy = 10,000 or greater spores; 51-100%

Mycelial Estimate

ND = None Detected, No Active Growth  
 Trace = Very Small Amount; Probably No Active Growth  
 Few = Some Mycelium; Possible Active Growth  
 Many = Large Amount of Mycelium; Probable Active Growth

**Note: There are currently no regulatory standards or guidelines with respect to acceptable microbial action levels inside buildings. This data has been interpreted qualitatively using general industry standards and previous experience. In general, industry standards call for inside microbial levels to be less than outdoor levels with no individual mold genera elevated above background concentrations. It should be noted that mold and mold spores are present in nearly all indoor environments. Surface and/or air samples will normally identify the presence of some indoor mold spores.**

**5.3. Observations and Conclusions**

The following details our observations and conclusions based on the January 8, 2019 site visit, discussions with the client contact, and laboratory analytical data.

1. As noted, significant mold growth was identified in the first floor magistrate office of the structure. While significant visible mold growth was not noted in other locations of the structure, high mold spore count in the ambient air was identified in air samples on the first and second floor.

Surface sampling from walls in the magistrate office confirmed the presence of a “Very Heavy” *Alternaria* and *Epicoccum* spore estimates with “Many” mycelia. A mycelial estimate of “many” indicates “probable active growth.”



2. F&R did not observe significant evidence of water intrusion during the site visit.
3. Laboratory results from analysis of air samples collected during the site visit indicate that significant impact to indoor air is resulting from the obvious mold growth. Based on the concentrations present, mold may be present in settled dust throughout the building.
4. Generally, humidity values of >60% are considered problematic and can allow mold to establish and proliferate with higher values allowing more rapid growth.

#### **5.4. Recommendations**

Based upon data obtained from this review, interviews with the site contact, and visual observations, F&R recommends the following.

1. Based on the extent of mold growth, F&R recommends that remediation efforts be performed. Remediation should be performed in general accordance with the guidelines described in EPA's September 2008 document "[Mold Remediation in Schools and Commercial Buildings](#)" and the attached General Remediation Procedures Guidelines. Based on the amount of mold present, maintaining a negative pressure environment in the work area is warranted and response actions should accord with the recommendations for large areas of growth noted in Table 2 of the referenced document. These efforts should be concentrated on materials where visible mold growth is apparent.

Cleaning of belongings may be conducted outdoors in order to limit release of mold-related structures inside. F&R recommends phasing the work in a way that will reduce the potential of exposing previously cleaned areas to release. Cleaning of belongings should also be conducted per the recommended approach. Some materials or items may need to be discarded.

Following all work, F&R recommends "air washing" (aka "air scrubbing") in the spaces with HEPA filtration units coupled with agitating settled dust using an electric leaf blower. Filtration should be sufficient to allow 4-6 air changes per hour for a period of approximately 24-72 hours prior to allowing the space to be static (no air washing, not under negative pressure for at least 24 hours).

Due to the concentrations of mold on non-porous surfaces, cleaning should be conducted using HEPA vacuuming and wet wiping. As noted above, cleanup of porous materials may not be possible; in this case, such materials may be considered for disposal. Cleaning of fabrics may be conducted to the extent feasible.

Stored items may be covered with plastic with seams sealed to the floor during remediation efforts. Obvious mold growth on items should be addressed using the above



noted guidance documents. If possible, removal of items from the residence may be considered during active remediation.

A variety of cleanup methods are available for remediating building materials. The specific method or group of methods used will depend on the type of material affected. The methods to be used for this project should be consistent with the methods described in this report (EPA, IICRC, New York, etc.) and should include HEPA vacuuming, damp wiping with detergents, and, where concentrated mold growth is present, light sanding or other aggressive means of removal such as soda or dry ice blasting.

F&R recommends use of appropriate Personal Protective Equipment (PPE) by those conducting cleanup efforts in order to reduce exposure or migration of mold-related structures.

2. As noted, in general, F&R recommends that the temperature and relative humidity levels inside the occupied portion of the building be maintained within the acceptable indoor guidelines as outlined by OSHA. Recommended indoor relative humidity and temperature ranges are 30-60% RH and 68-78°F, respectively, per OSHA Indoor Air Quality Guidance Document, [Indoor Air Quality in Commercial and Institutional Buildings](#).

### **5.5. Other Notes**

1. It should be noted that the purpose of mold remediation is to correct the moisture problem and to remove or clean moldy and contaminated materials to prevent human exposure and further damage to building materials and furnishings. As a general rule, simply killing the mold, for example, with biocide, is not enough. The mold must be physically removed, since the chemicals and proteins, which can cause a reaction in humans, are present even in dead mold. Additionally, efforts should be made to minimize the environment that is conducive to mold amplification. Note that without proper controls and maintenance mold growth can recur.
2. Complete remediation of all microbial organisms within a building cannot be guaranteed and a “mold free” building cannot be expected. It is important to note that the reported mold levels are only reflective of conditions at the time of this test and that mold populations can vary over time, depending upon a number of conditions, including environmental factors (i.e., temperature and relative humidity). Because of the nature of mold growth, complete remediation is difficult. If significant mold growth reappears, or if the occupants experience prolonged allergic-type health complaints, they should seek further investigation of the problem.



## 5.6. General Remediation Procedures Guidelines

The following sections detail general guidance for mold remediation and should be considered best practice methods in addition to the referenced guidance document(s).

### 5.6.1. Scope of Work

This work plan outlines the methods and procedures to be used for the treatment of mold-impacted and water-damaged building materials.

1. Building materials involved may include, but are not limited to, porous items (i.e., gypsum wallboard, pressed-wood products, plaster, insulation, carpeting/pad, and similar), semi-porous items (i.e., hard woods, plywood, and similar), and non-porous materials (i.e., concrete, coated metals, plastics, and similar).
2. Any work conducted within the building that will require electrical, plumbing, HVAC or other contractor services will be conducted in accordance with Commonwealth of Virginia and local municipality requirements and/or building codes.
3. The contractor shall obtain all permits for the work to be performed, where required.
4. Disposal of all materials removed from structure(s) as part of this work shall be in accordance with all applicable Federal, State, and local laws and regulations.
5. A Qualified Mold Remediation Contractor should be retained to perform remediation in general accordance with the guidelines described in EPA's September 2008 document ["Mold Remediation in Schools and Commercial Buildings."](#)

### 5.6.2. Personal Protective Equipment

1. The remediation contractor is responsible for providing sufficient means, methods, and equipment to protect workers from any hazards associated with the work.
  - a. For all remediation work areas involving greater than 10 square feet (sf) of confirmed mold growth within the facility, all persons performing remediation activities and/or entering a work area during active remediation activities shall wear protective disposable coveralls, protective disposable gloves, non-skid footwear or coverings, eye protection and respiratory protection.
  - b. At a minimum, a half-face air purifying respirator equipped with dual high-efficiency particulate air (HEPA) filters shall be used when performing tasks requiring respiratory protection.



- c. Each worker must perform positive and negative air pressure fit test each time the respirator is used. All proper medical clearance and monitoring and fit testing must be completed prior to using a respirator.

### **5.6.3. Work Area Preparation**

1. Work area preparation procedures will be provided based on the extent of remediation to be performed. The general work area preparation requirements are listed below.
  - a. The mold remediation contractor (the “contractor”) shall isolate the work areas from the remainder of the unit and/or structure, if the work areas are within a facility that includes non-work areas. At a minimum, critical barriers will be installed at locations within each unit that sufficiently separate affected/potentially-affected building materials from unaffected areas. Critical barriers shall consist of a minimum 6-mil, polyethylene sheeting or equivalent. The contractor shall construct barriers in a fashion to minimize damage to walls, ceilings, and floors.
  - b. Any wall or ceiling openings at non-affected locations shall be sealed with tape and/or sheeting. Heating, ventilating, and air-conditioning (HVAC) equipment including supply diffusers, return registers, and mechanical closets shall be sealed if present in the work area when not a part of the work area during the mold remediation work.
  - c. A minimum 2 feet of buffer area from adjacent water damage or mold affected building materials (i.e., wallboard) shall be provided, unless infeasible (for example, prohibited by room configuration).
  - d. All contents and furnishings, if present, in the work areas that will be excluded from the mold remediation methods shall be removed and/or sealed in the same type of sheeting used for critical barriers.
  - e. All remediation shall be conducted within the facility (the interior of the facility will be defined as all areas within the outer building envelope including crawl spaces and attics).
  - f. Engineering controls should be used to prevent fugitive dust and mold spore emissions. In order to minimize the spread of contamination during remediation, F&R recommends obtaining a minimum of -0.020 inches of water pressure differential in the work area, using HEPA-filtered local exhaust ventilation (negative air machine) directly adjacent to the area(s) being cleaned unless



prohibited by unit configuration. Maintain HEPA filtration continuously during remediation activities and prior to clearance sampling.

- g. At all times during the work, the contractor shall maintain relative humidity levels below 50 percent.

#### **5.6.4. General Remediation/Cleaning Procedures**

1. The cleaning procedures to be employed for mold-impacted and water-damaged building materials that will not be removed, sanded, and/or encapsulated will vary based on the type of surface or material affected.
2. Non-porous materials: Surfaces shall be cleaned by HEPA vacuuming, wiping/cleaning with a surfactant/detergent, followed by a final HEPA vacuuming. Additional cleaning/wiping may be required for heavily affected surfaces.
3. Porous materials: Unless removed for replacement and with the exception of personal belongings, cleaning of porous surfaces such as carpeting, pads, rugs, and draperies shall be performed by thoroughly HEPA vacuuming of all surfaces followed by steam cleaning. Building materials that exhibit elevated levels of moisture and/or visible mold growth shall be cleaned and dried. Minimize breaking and disturbance of mold affected materials.
4. Semi-porous materials: Wood support members, plywood, and similar building materials are considered semi-porous materials. These items shall be cleaned by HEPA vacuuming, wiping/cleaning with a surfactant/detergent, followed by a final HEPA vacuuming. If staining remains in surface of material, additional surface treatment, including but not limited to wire brushing and/or sanding and/or dry ice or soda blasting, among other methods, may be warranted. Additional cleaning/wiping may be required for heavily impacted surfaces. HEPA vacuuming shall be performed following any removal activities. Semi-porous materials that exhibit rot shall be removed as specified by the owner or owner's representative.
5. All removed materials shall be double bagged using minimum 6-mil opaque trash bags. All bags will be sealed with tape within containment (i.e., before being removed from the unit), and all removed materials will be removed from the facility at the end of each work day.
6. After all affected building materials have been properly remediated; a qualified person may perform a final visual clearance inspection.
7. In the event that biocides or other chemical product may be used by the contractor to affect remediation of materials or items, such chemicals shall be used in accordance with



manufacturer's instructions and only after review and approval by the owner or owner's representative.

8. F&R recommends that the mold be remediated in general accordance with the guidelines described in EPA's September 2008 document "[Mold Remediation in Schools and Commercial Buildings](#)." Due to the potential visible fungal growth and/or moisture damage in the affected areas, F&R generally recommends following the procedures given in Table 2: "Guidelines for Remediating Building Materials with Mold Growth Caused by Clean Water" (for large areas greater than 100 ft<sup>2</sup>).





## 5.7. References

U.S. Environmental Protection Agency. Office of Air and Radiation. [Mold Remediation in Schools and Commercial Buildings](#). Washington, D.C.: Government Printing Office, March 2001, reprinted September 2008.

## 6.0 LIMITATIONS

This report has been prepared for the exclusive use of Montgomery County and/or their agents. This service was performed in accordance with generally accepted environmental practices. No other warranty, expressed or implied, is made. Conclusions and recommendations are based, in part, upon information provided to us by others and site observations. We have not verified the completeness or accuracy of the information provided by others, unless otherwise noted. Observations and recommendations are based upon conditions readily visible at the site at the time of the site visit, and upon current industry standards.

During this study, suspect asbestos samples were submitted for analysis at a NVLAP-accredited laboratory via polarized light microscopy; suspect LBP was field characterized using industry standard methods and practices. Inaccessible areas, such as behind solid ceilings or behind solid walls were not surveyed; therefore, some target materials may not have been identified. As with similar surveys of this nature, actual conditions exist only at the precise locations from which samples were collected or tested. Areas inspected were limited to those designated by the scope of services by the Client. 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. Unless otherwise noted, F&R does not claim to have performed exhaustive delineation and/or quantification of identified materials; it is the responsibility of the client or abatement contractor to verify locations and quantities of regulated materials. Visual evaluation of other materials of concern conducted comprised a cursory visual review of the building materials and, to a limited extent, contents of the facility. It is also understood that this is a non-invasive survey so that it is possible that concealed materials may be present that were not accessible during the original survey. No other warranty, expressed or implied, is made. Reasonable effort was made by inspection personnel to locate and sample suspect materials within the structure with regard to the scope of services. However, for a facility, the existence of unique or concealed ACMs or LBP and debris is a possibility. F&R does not warrant, guarantee or profess to have the ability to locate or identify all ACMs, LBP, or other chemicals of concern in a facility.

Under this scope of services, F&R assumes no responsibility regarding response actions (e.g. O&M Plans, Encapsulation, Abatement, Removal, Tenant Notification, etc.) initiated as a result of these findings. F&R assumes no liability for the duties and responsibilities of the Client with respect to compliance with appropriate regulations. Compliance with regulations and response actions are the sole responsibility of the Client and should be conducted in accordance with local,



state, and/or federal requirements and should be performed by appropriately qualified and licensed/accredited personnel, as warranted.

Froehling & Robertson, Inc. 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 local, state, or federal public agencies conditions at the site that may present a potential danger to public health, safety, or the environment. The Client agrees to notify the appropriate local, state, or federal public agencies as required by law, or otherwise to disclose, in a timely manner, information that may be necessary to prevent danger to public health, safety, or the environment. The contents of the report should not be construed in any way as a recommendation to purchase, sell, or develop the project site. F&R retains the right to revise this report if new information is later discovered or made available. The report must be presented in its entirety.

**Appendix A**

F&R Personnel and Laboratory Accreditations

# DPOR License Lookup License Number 3356001168

## License Details

<b>Name</b>	SPENCE, JONATHAN ELI
<b>License Number</b>	3356001168
<b>License Description</b>	Lead Risk Assessor License
<b>Rank</b>	Lead Abatement Risk Assessor
<b>Address</b>	CHRISTIANSBURG, VA 24073
<b>Initial Certification Date</b>	2019-01-16
<b>Expiration Date</b>	2020-01-31

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# DPOR License Lookup License Number 3303004439

## License Details

<b>Name</b>	SPENCE, JONATHAN ELI
<b>License Number</b>	3303004439
<b>License Description</b>	Asbestos Inspector License
<b>Rank</b>	Asbestos Inspector
<b>Address</b>	CHRISTIANSBURG, VA 24073
<b>Initial Certification Date</b>	2018-10-02
<b>Expiration Date</b>	2019-10-31

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# DPOR License Lookup License Number 3303001281

## License Details

<b>Name</b>	HARGROVE, ERNEST GLENN
<b>License Number</b>	3303001281
<b>License Description</b>	Asbestos Inspector License
<b>Rank</b>	Asbestos Inspector
<b>Address</b>	ROANOKE, VA 24019
<b>Initial Certification Date</b>	1990-12-27
<b>Expiration Date</b>	2019-03-31

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COMMONWEALTH of VIRGINIA

Department of Professional and Occupational Regulation

9960 Mayland Drive, Suite 400, Richmond, VA 23233

Telephone: (804) 367-8500

EXPIRES ON  
12-31-2018

NUMBER  
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ASBESTOS ANALYTICAL LABORATORY LICENSE  
PCM PLM



ENVIRONMENTAL HAZARDS SERVICES LLC  
7469 WHITEPINE ROAD  
RICHMOND, VA 23237-0000



*Jay W. DeBoer*  
Jay W. DeBoer, Director

Status can be verified at <http://www.dpor.virginia.gov>

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COMMONWEALTH of VIRGINIA  
Department of Professional and Occupational Regulation

BOARD FOR ASBESTOS, LEAD, AND HOME INSPECTORS  
ASBESTOS ANALYTICAL LABORATORY LICENSE

PCM PLM

NUMBER: 3333000340 EXPIRES: 12-31-2018

ENVIRONMENTAL HAZARDS SERVICES LLC  
7469 WHITEPINE ROAD  
RICHMOND, VA 23237-0000



(FOLD)

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DPOR-PC (02/2017)

**Appendix B**

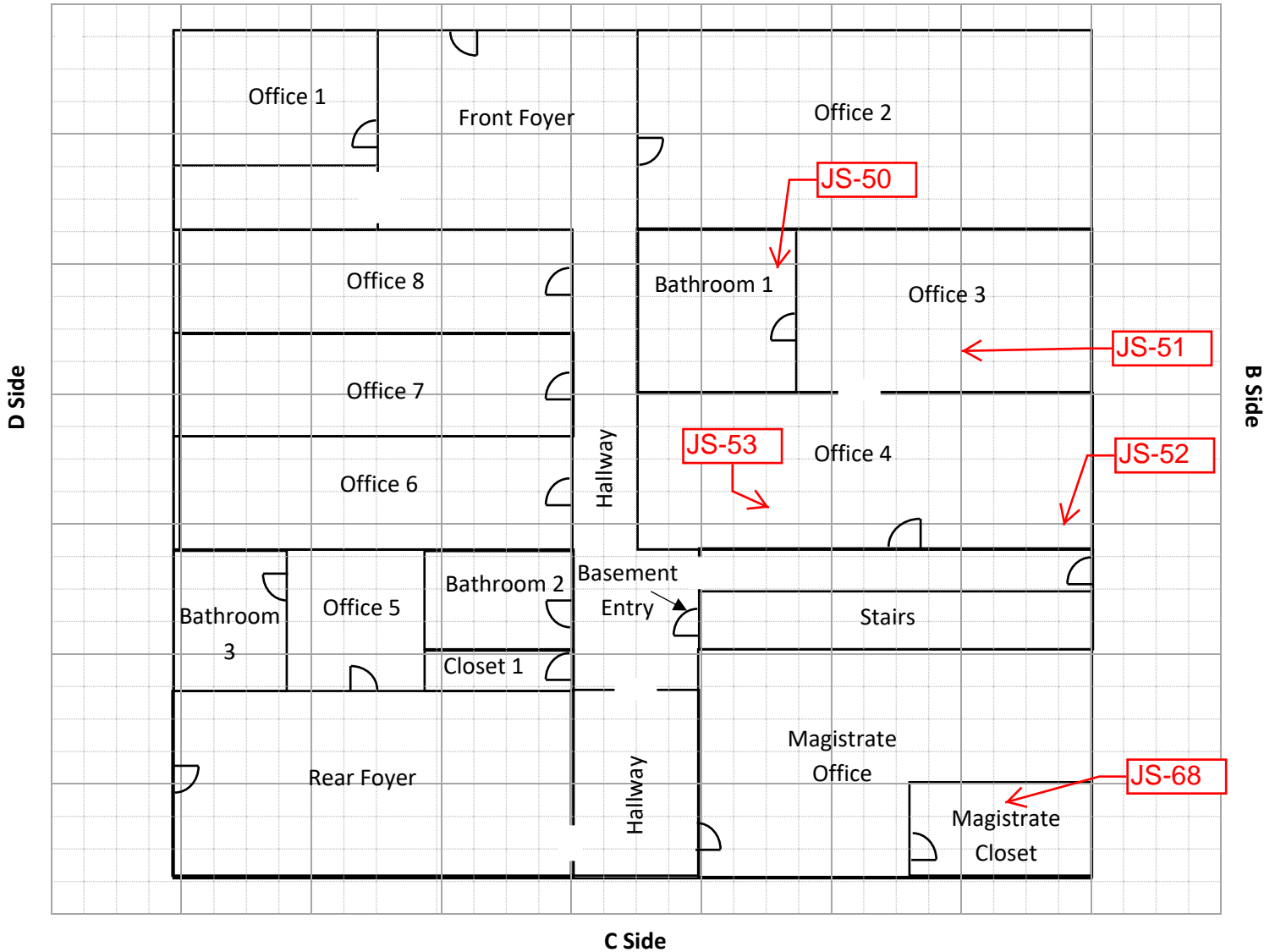
Facility Sketch:

*Interior/ Positive Asbestos Sample Locations*



Address: 4 South Franklin Street Floor: First Date: 2-14-19

A Side



Note: Not to Scale

**FROEHLING & ROBERTSON, INC.**

1734 Seibel Drive NE Roanoke, Virginia 24012 T 540.344.7939 F 540.344.3657

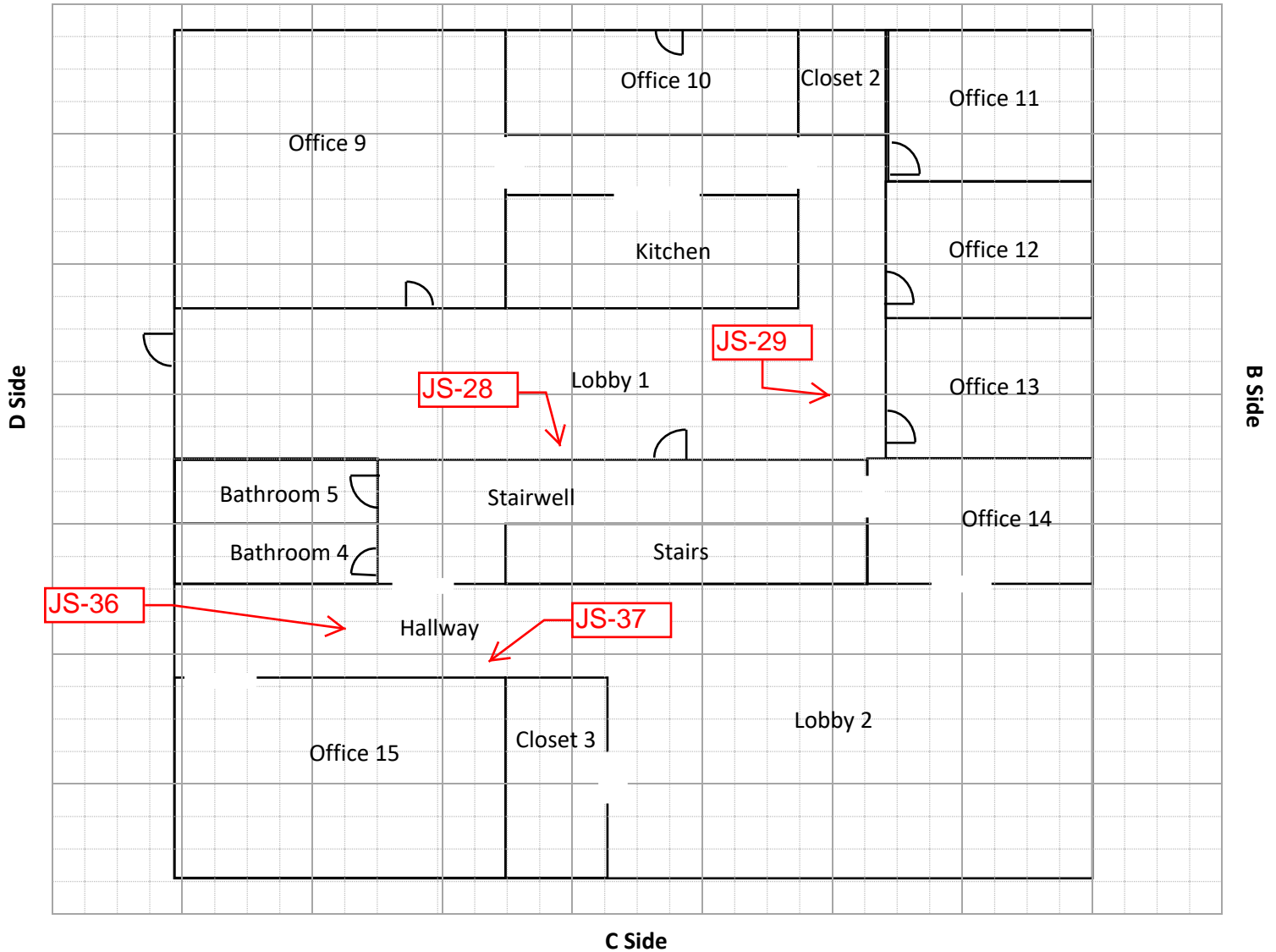
**Roanoke, Virginia Environmental Services**





Address: 4 South Franklin Street Floor: Second Date: 2-14-19

A Side



Note: Not to Scale

**FROEHLING & ROBERTSON, INC.**

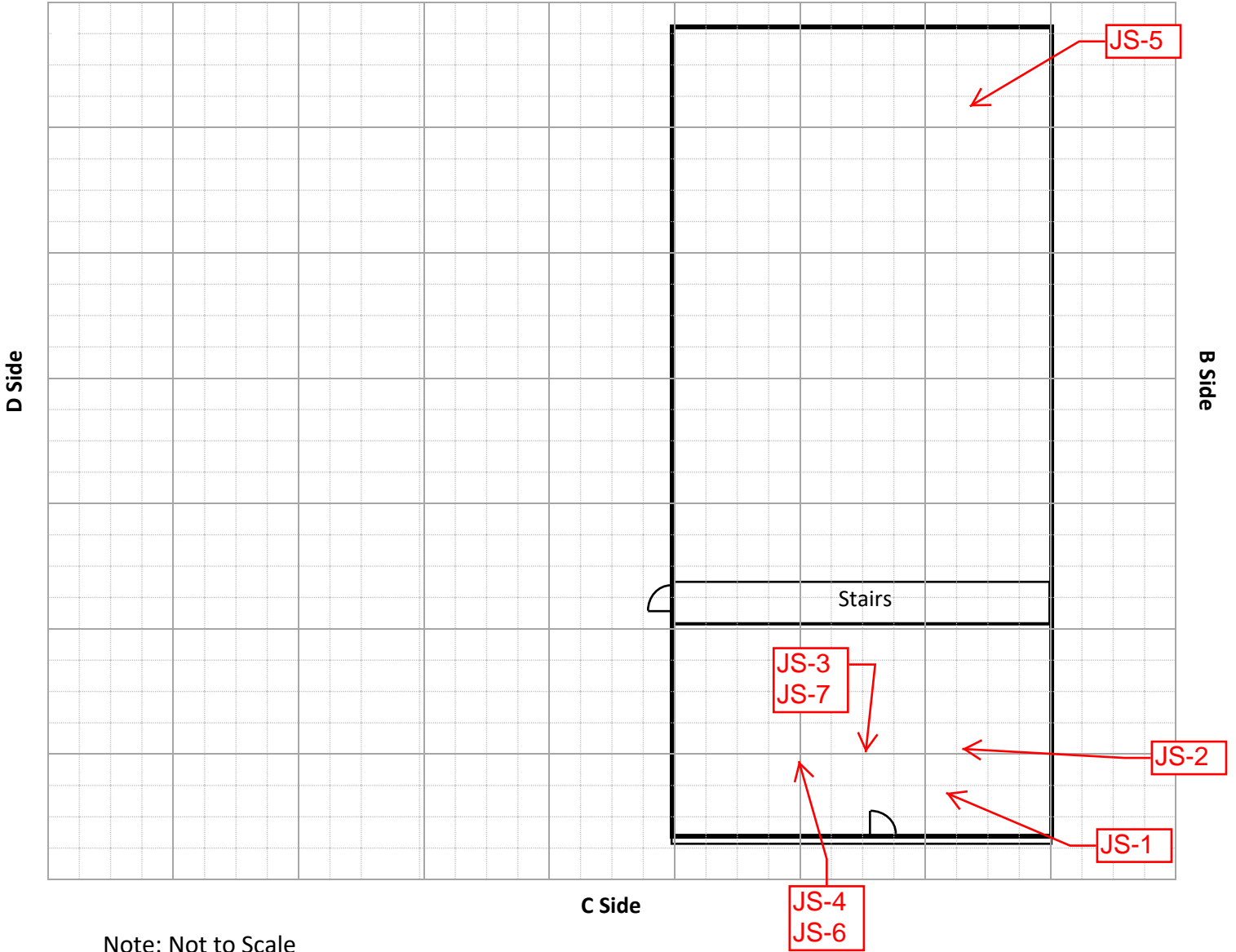
1734 Seibel Drive NE Roanoke, Virginia 24012 T 540.344.7939 F 540.344.3657

**Roanoke, Virginia Environmental Services**



Address: 4 South Franklin Street Floor: Basement Date: 2-14-19

A Side



Note: Not to Scale

**FROEHLING & ROBERTSON, INC.**

1734 Seibel Drive NE Roanoke, Virginia 24012 T 540.344.7939 F 540.344.3657

**Roanoke, Virginia Environmental Services**

**Appendix C**

Laboratory Certificates of Analysis  
Bulk Sample Chain of Custody Forms

*Section 1*  
*Asbestos-Containing Materials*





Environmental Hazards Services, L.L.C.  
 7469 Whitepine Rd  
 Richmond, VA 23237  
 Telephone: 800.347.4010

## Asbestos Bulk Analysis Report

Report Number: 19-02-00869

Client: Froehling & Robertson Inc. - Roanoke  
 1734 Seibel Drive, N.E.  
 Roanoke, VA 24012

Received Date: 02/07/2019  
 Analyzed Date: 02/09/2019, 02/10/2019, 02/11/2019  
 Reported Date: 02/12/2019

Project/Test Address: 62X-0045; Old Annex Building

Client Number:  
 48-4628

Fax Number:  
 540-344-3657

# Laboratory Results

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials
19-02-00869-001	JS-1		Off-White Fibrous; Homogeneous	70% Chrysotile	10% Cellulose 20% Non-Fibrous
				Total Asbestos: 70%	
19-02-00869-002	JS-2		Off-White Fibrous; Homogeneous	65% Chrysotile	15% Cellulose 20% Non-Fibrous
				Total Asbestos: 65%	
19-02-00869-003	JS-3		Off-White Fibrous; Homogeneous	60% Chrysotile	25% Cellulose 15% Non-Fibrous
				Total Asbestos: 60%	
19-02-00869-004	JS-4		Off-White Fibrous; Homogeneous	70% Chrysotile 2% Amosite	8% Cellulose 20% Non-Fibrous
				Total Asbestos: 72%	
19-02-00869-005	JS-5		Off-White Fibrous; Homogeneous	70% Chrysotile	10% Cellulose 20% Non-Fibrous
				Total Asbestos: 70%	

# Environmental Hazards Services, L.L.C

Client Number: 48-4628

Report Number: 19-02-00869

Project/Test Address: 62X-0045; Old Annex Building

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials
19-02-00869-006	JS-6		Off-White Fibrous; Homogeneous	60% Chrysotile	40% Non-Fibrous
				Total Asbestos: 60%	
19-02-00869-007	JS-7		Off-White Fibrous; Homogeneous	60% Chrysotile	40% Non-Fibrous
				Total Asbestos: 60%	
19-02-00869-008A	JS-8	Base Coat	Pale Tan-Gray Cementitious; Homogeneous	NAD	3% Hair 97% Non-Fibrous
19-02-00869-008B	JS-8	Skim Coat	Pale Beige Cementitious; White/Off-White Brittle; Inhomogeneous	NAD	1% Cellulose 99% Non-Fibrous
19-02-00869-009A	JS-9	Base Coat	Pale Tan-Gray Cementitious; Homogeneous	NAD	2% Hair 98% Non-Fibrous
19-02-00869-009B	JS-9	Skim Coat	Pale Beige Cementitious; Homogeneous	NAD	1% Cellulose 99% Non-Fibrous
19-02-00869-010A	JS-10	Base Coat	Pale Tan-Gray Cementitious; Homogeneous	NAD	1% Cellulose 2% Hair 97% Non-Fibrous

## Environmental Hazards Services, L.L.C

Client Number: 48-4628  
 Project/Test Address: 62X-0045; Old Annex Building

Report Number: 19-02-00869

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials
19-02-00869-010B	JS-10	Skim Coat	Pale Beige Cementitious; Pale Blue-Green Brittle; Inhomogeneous	NAD	100% Non-Fibrous
19-02-00869-011A	JS-11	Base Coat	Pale Tan-Gray Cementitious; Homogeneous	NAD	1% Cellulose 2% Hair 97% Non-Fibrous
19-02-00869-011B	JS-11	Skim Coat	Pale Beige Cementitious; Tan Fibrous; Inhomogeneous	NAD	3% Cellulose 97% Non-Fibrous
19-02-00869-012A	JS-12	Base Coat	Pale Tan-Gray Cementitious; Homogeneous	NAD	3% Hair 97% Non-Fibrous
19-02-00869-012B	JS-12	Skim Coat	Pale Beige Cementitious; Pale Blue-Green Brittle; Tan Fibrous; Inhomogeneous	NAD	5% Cellulose 95% Non-Fibrous
19-02-00869-013A	JS-13	Base Coat	Pale Gray Cementitious; Homogeneous	NAD	1% Cellulose 1% Hair 98% Non-Fibrous
19-02-00869-013B	JS-13	Skim Coat	White Brittle; Off-White Pliable to Brittle; Inhomogeneous	NAD	100% Non-Fibrous

## Environmental Hazards Services, L.L.C

Client Number: 48-4628

Report Number: 19-02-00869

Project/Test Address: 62X-0045; Old Annex Building

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials
19-02-00869-014A	JS-14	Base Coat	Pale Gray Cementitious; Homogeneous	NAD	1% Cellulose 99% Non-Fibrous
19-02-00869-014B	JS-14	Skim Coat	White Brittle; Off-White Pliable to Brittle; Inhomogeneous	NAD	100% Non-Fibrous
19-02-00869-015A	JS-15	Drywall	Off-White Brittle; Tan Fibrous; Off-White Pliable to Brittle; Inhomogeneous	NAD	18% Cellulose 82% Non-Fibrous
19-02-00869-015B	JS-15	Joint Comp.	White Brittle; Homogeneous	NAD	1% Cellulose 99% Non-Fibrous
19-02-00869-016A	JS-16	Drywall	Off-White Brittle; Tan Fibrous; Off-White Pliable to Brittle; Inhomogeneous	NAD	20% Cellulose 80% Non-Fibrous
19-02-00869-016B	JS-16	Joint Comp.	White Brittle; Homogeneous	NAD	100% Non-Fibrous
19-02-00869-017A	JS-17	Drywall	Off-White Brittle; Tan Fibrous; Off-White Pliable to Brittle; Inhomogeneous	NAD	18% Cellulose 82% Non-Fibrous
19-02-00869-017B	JS-17	Joint Comp.	White Brittle; Homogeneous	NAD	1% Cellulose 99% Non-Fibrous

## Environmental Hazards Services, L.L.C

Client Number: 48-4628  
 Project/Test Address: 62X-0045; Old Annex Building

Report Number: 19-02-00869

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials
19-02-00869-018A	JS-18	Drywall	Off-White Brittle; Tan Fibrous; Off-White Pliable to Brittle; Inhomogeneous	NAD	20% Cellulose 80% Non-Fibrous
19-02-00869-018B	JS-18	Joint Comp.	White Brittle; Homogeneous	NAD	1% Cellulose 99% Non-Fibrous
19-02-00869-019	JS-19		Black Pliable to Brittle; Homogeneous	NAD	8% Cellulose 92% Non-Fibrous
19-02-00869-020	JS-20		Tan Fibrous; Off-White Brittle; Inhomogeneous	NAD	92% Cellulose 8% Non-Fibrous
19-02-00869-021	JS-21		Yellow Fibrous; White Vinyl-Like; Translucent Adhesive; Inhomogeneous	NAD	1% Cellulose 85% Fibrous Glass 14% Non-Fibrous
19-02-00869-022	JS-22		Yellow Fibrous; White Vinyl-Like; Translucent Adhesive; Inhomogeneous	NAD	1% Cellulose 85% Fibrous Glass 14% Non-Fibrous
19-02-00869-023A	JS-23	Cove Base	Black Vinyl-Like; Homogeneous	NAD	100% Non-Fibrous
19-02-00869-023B	JS-23	Mastic	Pale Yellow Adhesive; Homogeneous	NAD	2% Cellulose 98% Non-Fibrous

# Environmental Hazards Services, L.L.C

Client Number: 48-4628

Report Number: 19-02-00869

Project/Test Address: 62X-0045; Old Annex Building

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials
19-02-00869-024A	JS-24	Cove Base	Black Vinyl-Like; Homogeneous	NAD	100% Non-Fibrous
19-02-00869-024B	JS-24	Mastic	Pale Yellow Adhesive; Homogeneous	NAD	2% Cellulose 98% Non-Fibrous
19-02-00869-025A	JS-25	Cove Base	Black Vinyl-Like; Homogeneous	NAD	100% Non-Fibrous
19-02-00869-025B	JS-25	Mastic	Pale Yellow Adhesive; Homogeneous	NAD	3% Cellulose 97% Non-Fibrous
19-02-00869-026	JS-26		Beige Fibrous; White/Pale Blue-Green Brittle; Inhomogeneous	NAD	80% Cellulose 20% Non-Fibrous
19-02-00869-027	JS-27		Beige Fibrous; White/Pale Yellow Brittle; Inhomogeneous	NAD	80% Cellulose 20% Non-Fibrous
19-02-00869-028A	JS-28	Other *	Tan Fibrous; Homogeneous	NAD	85% Cellulose 15% Non-Fibrous
* Fiberboard Surfacing Panel					
19-02-00869-028B	JS-28	Mastic	Yellow-Beige Adhesive; Homogeneous	NAD	3% Cellulose 4% Synthetic 93% Non-Fibrous



## Environmental Hazards Services, L.L.C

Client Number: 48-4628

Report Number: 19-02-00869

Project/Test Address: 62X-0045; Old Annex Building

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials
19-02-00869-028C	JS-28	Other *	Off-White Fibrous; Homogeneous	60% Chrysotile	25% Cellulose 15% Non-Fibrous
				Total Asbestos: 60%	
* Sheet Flooring Backing-Type Fibrous Substrate					
19-02-00869-029A	JS-29	Other *	Tan Fibrous; Homogeneous	NAD	85% Cellulose 15% Non-Fibrous
* Fiberboard Surfacing Panel					
19-02-00869-029B	JS-29	Mastic	Yellow-Beige Adhesive; Homogeneous	NAD	4% Cellulose 2% Synthetic 94% Non-Fibrous
19-02-00869-029C	JS-29	Other *	Off-White Fibrous; Homogeneous	55% Chrysotile	30% Cellulose 15% Non-Fibrous
				Total Asbestos: 55%	
* Sheet Flooring Backing-Type Fibrous Substrate					
19-02-00869-030A	JS-30	Other *	Tan Fibrous; Homogeneous	NAD	85% Cellulose 15% Non-Fibrous
* Fiberboard Surfacing Panel					
19-02-00869-030B	JS-30	Mastic	Yellow-Beige Adhesive; Homogeneous	NAD	5% Cellulose 2% Synthetic 93% Non-Fibrous
19-02-00869-031A	JS-31	Base Coat	Pale Tan-Gray Cementitious; Homogeneous	NAD	3% Hair 97% Non-Fibrous
19-02-00869-031B	JS-31	Other *	Off-White/Green Brittle; Tan Fibrous; Green Pliable to Brittle: Inhomogeneous	NAD	15% Cellulose 85% Non-Fibrous
* Surface Finish and Wallpaper					

# Environmental Hazards Services, L.L.C

Client Number: 48-4628  
 Project/Test Address: 62X-0045; Old Annex Building

Report Number: 19-02-00869

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials
19-02-00869-032A	JS-32	Base Coat	Pale Brown-Gray Cementitious; Homogeneous	NAD	2% Hair 98% Non-Fibrous
19-02-00869-032B	JS-32	Other *	Off-White/Green Brittle; Inhomogeneous	NAD	100% Non-Fibrous
* Surface Finish					
19-02-00869-033A	JS33	Base Coat	Pale Brown-Gray Cementitious; Homogeneous	NAD	1% Cellulose 2% Hair 97% Non-Fibrous
19-02-00869-033B	JS33	Other *	Off-White/Green Brittle; Inhomogeneous	NAD	1% Cellulose 99% Non-Fibrous
* Surface Finish					
19-02-00869-034A	JS34	Base Coat	Pale Tan-Gray Cementitious; Homogeneous	NAD	2% Hair 98% Non-Fibrous
19-02-00869-034B	JS34	Other *	Off-White Brittle; Inhomogeneous	NAD	100% Non-Fibrous
* Surface Finish					
19-02-00869-035A	JS35	Base Coat	Pale Tan-Gray Cementitious; Homogeneous	NAD	1% Cellulose 2% Hair 97% Non-Fibrous
19-02-00869-035B	JS35	Other *	Pale Blue-Green/Pale Pink Brittle; Inhomogeneous	NAD	100% Non-Fibrous
* Surface Finish					

## Environmental Hazards Services, L.L.C

Client Number: 48-4628  
 Project/Test Address: 62X-0045; Old Annex Building

Report Number: 19-02-00869

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials
19-02-00869-036A	JS36	Other *	Yellow Adhesive; Homogeneous	NAD	3% Cellulose 1% Talc 96% Non-Fibrous
* Mastic Atop Flooring					
19-02-00869-036B	JS36	Flooring	Tan Granular; Homogeneous	4% Chrysotile	96% Non-Fibrous
				Total Asbestos: 4%	
19-02-00869-036C	JS36	Other *	Black Adhesive; Homogeneous	4% Chrysotile	4% Cellulose 92% Non-Fibrous
				Total Asbestos: 4%	
* Mastic Beneath Flooring					
19-02-00869-037A	JS37	Other *	Yellow Adhesive; Homogeneous	NAD	3% Cellulose 1% Talc 96% Non-Fibrous
* Mastic Atop Flooring					
19-02-00869-037B	JS37	Flooring	Tan Granular; Homogeneous	4% Chrysotile	96% Non-Fibrous
				Total Asbestos: 4%	
19-02-00869-037C	JS37	Other *	Black Adhesive; Homogeneous	3% Chrysotile	4% Cellulose 93% Non-Fibrous
				Total Asbestos: 3%	
* Mastic Beneath Flooring					
19-02-00869-038A	JS38	Other *	Gray Pliable; Homogeneous	NAD	100% Non-Fibrous
* Acrylic Caulk-Type Material					
19-02-00869-038B	JS38	Other *	Silver Brittle; Homogeneous	NAD	5% Cellulose 95% Non-Fibrous
* Aluminized Coating-Type Material					

## Environmental Hazards Services, L.L.C

Client Number: 48-4628

Report Number: 19-02-00869

Project/Test Address: 62X-0045; Old Annex Building

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials
19-02-00869-039A	JS39	Other *	Gray Pliable; Homogeneous	NAD	100% Non-Fibrous
* Acrylic Caulk-Type Material					
19-02-00869-039B	JS39	Other *	Silver Brittle; Homogeneous	NAD	5% Cellulose 95% Non-Fibrous
* Aluminized Coating-Type Material					
19-02-00869-040	JS-40		Off-White Brittle; Homogeneous	NAD	2% Wollastonite 1% Talc 97% Non-Fibrous
19-02-00869-041	JS41		Off-White Brittle; Homogeneous	NAD	1% Wollastonite 1% Talc 98% Non-Fibrous
19-02-00869-042	JS-42		Pale Gray to Tan Fibrous; White Brittle; Inhomogeneous	NAD	40% Cellulose 35% Fibrous Glass 25% Non-Fibrous
19-02-00869-043	JS-43		Pale Gray to Tan Fibrous; White Brittle; Inhomogeneous	NAD	40% Cellulose 35% Fibrous Glass 25% Non-Fibrous
19-02-00869-044A	JS44	Flooring	Beige/Pale Gray/White Vinyl-Like; Pale Gray Fibrous; Inhomogeneous	NAD	18% Cellulose 5% Fibrous Glass 77% Non-Fibrous

## Environmental Hazards Services, L.L.C

Client Number: 48-4628

Report Number: 19-02-00869

Project/Test Address: 62X-0045; Old Annex Building

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials
19-02-00869-044B	JS44	Mastic	Yellow Adhesive; Homogeneous	NAD	5% Cellulose 2% Fibrous Glass 1% Synthetic 92% Non-Fibrous
19-02-00869-045A	JS45	Flooring	Beige/Pale Gray/White Vinyl-Like; Pale Gray Fibrous; Inhomogeneous	NAD	18% Cellulose 5% Fibrous Glass 77% Non-Fibrous
19-02-00869-045B	JS45	Mastic	Yellow Adhesive; Homogeneous	NAD	4% Cellulose 2% Fibrous Glass 1% Synthetic 93% Non-Fibrous
19-02-00869-046A	JS46	Linoleum	Off-White Vinyl; Beige Fibrous; Inhomogeneous	NAD	30% Cellulose 70% Non-Fibrous
19-02-00869-046B	JS46	Mastic	Tan Adhesive; Homogeneous	NAD	3% Cellulose 97% Non-Fibrous
19-02-00869-047A	JS47	Linoleum	Off-White Vinyl; Beige Fibrous; Inhomogeneous	NAD	30% Cellulose 70% Non-Fibrous
19-02-00869-047B	JS47	Mastic	Tan Adhesive; Homogeneous	NAD	3% Cellulose 97% Non-Fibrous
19-02-00869-048	JS48		White Fibrous; Tan Paint-Like; Inhomogeneous	NAD	90% Cellulose 10% Non-Fibrous

## Environmental Hazards Services, L.L.C

Client Number: 48-4628

Report Number: 19-02-00869

Project/Test Address: 62X-0045; Old Annex Building

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials
19-02-00869-049A	JS50	Base Coat	Tan Granular; Homogeneous	NAD	1% Hair 99% Non-Fibrous
19-02-00869-049B	JS50	Skim Coat	White Granular; Tan Fibrous; Inhomogeneous	NAD	10% Cellulose 90% Non-Fibrous
19-02-00869-050A	JS50	Tile	Gray Vinyl; Homogeneous	3% Chrysotile	97% Non-Fibrous
				Total Asbestos: 3%	
19-02-00869-050B	JS50	Mastic I	Black Tar-Like; Homogeneous	6% Chrysotile	1% Cellulose 93% Non-Fibrous
				Total Asbestos: 6%	
19-02-00869-050C	JS50	Felt	Black Tar-Like; Fibrous; Inhomogeneous	NAD	75% Cellulose 25% Non-Fibrous
19-02-00869-050D	JS50	Mastic II	Brown Adhesive; Homogeneous	NAD	2% Cellulose 98% Non-Fibrous
19-02-00869-051A	JS51	Tile	Gray Vinyl; Homogeneous	3% Chrysotile	97% Non-Fibrous
				Total Asbestos: 3%	
19-02-00869-051B	JS51	Mastic I	Black Tar-Like; Homogeneous	5% Chrysotile	1% Cellulose 94% Non-Fibrous
				Total Asbestos: 5%	
19-02-00869-051C	JS51	Felt	Black Tar-Like; Fibrous; Inhomogeneous	NAD	75% Cellulose 25% Non-Fibrous

## Environmental Hazards Services, L.L.C

Client Number: 48-4628

Report Number: 19-02-00869

Project/Test Address: 62X-0045; Old Annex Building

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials
19-02-00869-051D	JS51	Mastic II	Brown Adhesive; Homogeneous	NAD	3% Cellulose 97% Non-Fibrous
19-02-00869-052A	JS-52	Tile	Dark Gray Vinyl; Homogeneous	3% Chrysotile	97% Non-Fibrous
				Total Asbestos: 3%	
19-02-00869-052B	JS-52	Mastic	Tan Adhesive; Homogeneous	NAD	2% Cellulose 98% Non-Fibrous
19-02-00869-053A	JS53	Tile	Dark Gray Vinyl; Homogeneous	3% Chrysotile	97% Non-Fibrous
				Total Asbestos: 3%	
19-02-00869-053B	JS53	Mastic	Tan Adhesive; Homogeneous	NAD	1% Cellulose 99% Non-Fibrous
19-02-00869-054A	JS54	Linoleum	White Vinyl; Fibrous; Inhomogeneous	NAD	28% Cellulose 4% Fibrous Glass 68% Non-Fibrous
19-02-00869-054B	JS54	Mastic	Tan Adhesive; Homogeneous	NAD	2% Cellulose 98% Non-Fibrous
19-02-00869-055A	JS55	Linoleum	White Vinyl; Fibrous; Inhomogeneous	NAD	28% Cellulose 4% Fibrous Glass 68% Non-Fibrous



## Environmental Hazards Services, L.L.C

Client Number: 48-4628  
 Project/Test Address: 62X-0045; Old Annex Building

Report Number: 19-02-00869

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials
19-02-00869-055B	JS55	Mastic	Beige Adhesive; Homogeneous	NAD	1% Cellulose 99% Non-Fibrous
19-02-00869-056A	JS56	Mastic I	Yellow Adhesive; Homogeneous	NAD	2% Synthetic 98% Non-Fibrous
19-02-00869-056B	JS56	Other *	Black Vinyl; Tan Fibrous; Inhomogeneous	NAD	33% Cellulose 67% Non-Fibrous
* Linoleum I					
19-02-00869-056C	JS56	Mastic II	Tan Adhesive; Homogeneous	NAD	2% Cellulose 98% Non-Fibrous
19-02-00869-056D	JS56	Other *	Yellow Vinyl; Tan Fibrous; Inhomogeneous	NAD	33% Cellulose 67% Non-Fibrous
* Linoleum II					
19-02-00869-056E	JS56	Mastic III	Gray Adhesive; Homogeneous	NAD	2% Cellulose 98% Non-Fibrous
19-02-00869-057A	JS57	Mastic I	Yellow Adhesive; Homogeneous	NAD	2% Synthetic 98% Non-Fibrous
19-02-00869-057B	JS57	Linoleum	Black Vinyl; Tan Fibrous; Inhomogeneous	NAD	33% Cellulose 67% Non-Fibrous

## Environmental Hazards Services, L.L.C

Client Number: 48-4628

Report Number: 19-02-00869

Project/Test Address: 62X-0045; Old Annex Building

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials
19-02-00869-057C	JS57	Mastic II	Tan Adhesive; Homogeneous	NAD	2% Cellulose 98% Non-Fibrous
19-02-00869-057D	JS57	Mastic III	Gray Adhesive; Homogeneous	NAD	2% Cellulose 98% Non-Fibrous
19-02-00869-058A	JS58	Mastic I	Yellow Adhesive; Homogeneous	NAD	2% Synthetic 98% Non-Fibrous
19-02-00869-058B	JS58	Linoleum	Green Vinyl; Tan Fibrous; Inhomogeneous	NAD	34% Cellulose 66% Non-Fibrous
19-02-00869-058C	JS58	Mastic II	Tan Adhesive; Homogeneous	NAD	2% Cellulose 98% Non-Fibrous
19-02-00869-058D	JS58	Mastic III	Gray Adhesive; Homogeneous	NAD	3% Cellulose 97% Non-Fibrous
19-02-00869-059A	JS59	Mastic I	Yellow Adhesive; Homogeneous	NAD	3% Synthetic 97% Non-Fibrous
19-02-00869-059B	JS59	Linoleum	Green Vinyl; Tan Fibrous; Inhomogeneous	NAD	34% Cellulose 66% Non-Fibrous

## Environmental Hazards Services, L.L.C

Client Number: 48-4628

Report Number: 19-02-00869

Project/Test Address: 62X-0045; Old Annex Building

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials
19-02-00869-059C	JS59	Mastic II	Tan Adhesive; Homogeneous	NAD	2% Cellulose 98% Non-Fibrous
19-02-00869-059D	JS59	Mastic III	Gray Adhesive; Homogeneous	NAD	2% Cellulose 98% Non-Fibrous
19-02-00869-060A	JS60	Linoleum	Brown Vinyl; Black Fibrous; Inhomogeneous	NAD	65% Cellulose 10% Synthetic 25% Non-Fibrous
19-02-00869-060B	JS60	Mastic	Brown Brittle Adhesive; Homogeneous	NAD	3% Cellulose 97% Non-Fibrous
19-02-00869-061A	JS61	Linoleum	Brown Vinyl; Black Fibrous; Inhomogeneous	NAD	65% Cellulose 10% Synthetic 25% Non-Fibrous
19-02-00869-061B	JS61	Mastic	Brown Adhesive; Homogeneous	NAD	3% Cellulose 97% Non-Fibrous
19-02-00869-062	JS62		Beige/White Fibrous; Inhomogeneous	NAD	55% Cellulose 35% Fibrous Glass 10% Non-Fibrous
19-02-00869-063	JS63		Beige/White Fibrous; Inhomogeneous	NAD	55% Cellulose 35% Fibrous Glass 10% Non-Fibrous

## Environmental Hazards Services, L.L.C

Client Number: 48-4628

Report Number: 19-02-00869

Project/Test Address: 62X-0045; Old Annex Building

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials
19-02-00869-064A	JS64	Cove Base	Gray Vinyl; Homogeneous	NAD	100% Non-Fibrous
19-02-00869-064B	JS64	Mastic	Beige Adhesive; Homogeneous	NAD	100% Non-Fibrous
19-02-00869-065A	JS65	Cove Base	Gray Vinyl; Homogeneous	NAD	100% Non-Fibrous
19-02-00869-065B	JS65	Mastic	Beige Adhesive; Homogeneous	NAD	100% Non-Fibrous
19-02-00869-066A	JS66	Tile I	White/Gray Vinyl; Homogeneous	NAD	100% Non-Fibrous
19-02-00869-066B	JS66	Mastic I	Yellow Adhesive; Homogeneous	NAD	100% Non-Fibrous
19-02-00869-066C	JS66	Tile II	Tan Vinyl; Homogeneous	NAD	100% Non-Fibrous
19-02-00869-066D	JS66	Mastic II	Yellow Adhesive; Homogeneous	NAD	100% Non-Fibrous

## Environmental Hazards Services, L.L.C

Client Number: 48-4628

Report Number: 19-02-00869

Project/Test Address: 62X-0045; Old Annex Building

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials
19-02-00869-067A	JS67	Tile I	White/Gray Vinyl; Homogeneous	NAD	100% Non-Fibrous
19-02-00869-067B	JS67	Mastic I	Yellow Adhesive; Homogeneous	NAD	100% Non-Fibrous
19-02-00869-067C	JS67	Tile II	Tan Vinyl; Homogeneous	NAD	100% Non-Fibrous
19-02-00869-067D	JS67	Mastic II	Yellow Adhesive; Homogeneous	NAD	100% Non-Fibrous
19-02-00869-068A	JS68	Tile	Gray Vinyl; Homogeneous	3% Chrysotile Total Asbestos: 3%	97% Non-Fibrous
19-02-00869-068B	JS68	Mastic	Black Adhesive; Homogeneous	5% Chrysotile Total Asbestos: 5%	95% Non-Fibrous
19-02-00869-069A	JS69	Linoleum	Tan Vinyl; Tan Fibrous; Inhomogeneous	NAD	25% Cellulose 5% Synthetic 70% Non-Fibrous
19-02-00869-069B	JS69	Mastic	Tan Adhesive; Homogeneous	NAD	2% Cellulose 98% Non-Fibrous

## Environmental Hazards Services, L.L.C

Client Number: 48-4628

Report Number: 19-02-00869

Project/Test Address: 62X-0045; Old Annex Building

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials
19-02-00869-070A	JS70	Linoleum	Tan Vinyl; Tan Fibrous; Inhomogeneous	NAD	25% Cellulose 5% Synthetic 70% Non-Fibrous
19-02-00869-070B	JS70	Mastic	Tan Adhesive; Homogeneous	NAD	3% Cellulose 97% Non-Fibrous
19-02-00869-071	JS71		Yellow Adhesive; Homogeneous	NAD	100% Non-Fibrous
19-02-00869-072	JS72		Tan Granular; White Paint-Like; Inhomogeneous	NAD	100% Non-Fibrous
19-02-00869-073	JS73		White Pliable; Homogeneous	NAD	100% Non-Fibrous
19-02-00869-074	JS74		White Pliable; Homogeneous	NAD	100% Non-Fibrous
19-02-00869-075	JS75		White Pliable; Homogeneous	NAD	100% Non-Fibrous
19-02-00869-076	JS76		Tan Granular; Homogeneous	NAD	100% Non-Fibrous

# Environmental Hazards Services, L.L.C

Client Number: 48-4628

Report Number: 19-02-00869

Project/Test Address: 62X-0045; Old Annex Building

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials
19-02-00869-077A	JS77	Drywall	White Chalky; Brown Fibrous; Inhomogeneous	NAD	10% Cellulose 90% Non-Fibrous
19-02-00869-077B	JS77	Joint Comp.	Beige Chalky; Homogeneous	NAD	100% Non-Fibrous
19-02-00869-078A	JS78	Drywall	White Chalky; Brown Fibrous; Inhomogeneous	NAD	10% Cellulose 90% Non-Fibrous
19-02-00869-078B	JS78	Joint Comp.	Beige Chalky; Homogeneous	NAD	100% Non-Fibrous



# Environmental Hazards Services, L.L.C

Client Number: 48-4628  
Project/Test Address: 62X-0045; Old Annex Building

Report Number: 19-02-00869

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials
-------------------	----------------------	------------	-----------------------	----------	-----------------

QC Sample: 29-M22009-2, 21-M12011-4

QC Blank: SRM 1866 Fiberglass

Reporting Limit: 1% Asbestos

Method: EPA Method 600/R-93/116, EPA Method 600/M4-82-020

Analyst: Mark Case, Vickie Holmes,  
Kathy Fletcher

Reviewed By Authorized Signatory:



Tasha Eaddy  
QA/QC Clerk

The condition of the samples analyzed was acceptable upon receipt per laboratory protocol unless otherwise noted on this report. Each distinct component in an inhomogeneous sample was analyzed separately and reported as a composite. Results represent the analysis of samples submitted by the client. Sample location, description, area, volume, etc., was provided by the client. This report cannot be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government. This report shall not be reproduced except in full, without the written consent of the Environmental Hazards Service, L.L.C. California Certification #2319 NY ELAP #11714 NVLAP #101882-0 VELAP 460172. All information concerning sampling location, date, and time can be found on Chain-of-Custody. Environmental Hazards Services, L.L.C. does not perform any sample collection.

Environmental Hazards Services, L.L.C. recommends reanalysis by point count (for more accurate quantification) or Transmission Electron Microscopy (TEM), (for enhanced detection capabilities) for materials regulated by EPA NESHAP (National Emission Standards for Hazardous Air Pollutants) and found to contain less than ten percent (<10%) asbestos by polarized light microscopy (PLM). Both services are available for an additional fee.

400 Point Count Analysis, where noted, performed per EPA Method 600/R-93/116 with a Reporting Limit of 0.25%.

\* All California samples analyzed by Polarized Light Microscopy, EPA Method 600/M4-82-020, Dec. 1982.

LEGEND: NAD = no asbestos detected





ENVIRONMENTAL HAZARDS SERVICES, L.L.C.  
 7469 Whitepine Road Richmond, Virginia 23237 Phone (804) 275-4788 Fax (804) 275-4907

**CHAIN OF CUSTODY FORM**

Company Name: FROEHLING & ROBERTSON INC. Date: 6-Feb-19  
 Address: 1734 Seibel Drive, NE Contact Name: Jonathan Spence  
 City, State, Zip: Roanoke, VA 24012 Sampler Name: Jonathan Spence  
 EHS Client Account #: 48-4628 S Project #: 62X-0045 Old Annex Building  
 Phone #: (540) 537-8232 Fax #: (540) 344-3657  
 P.O. #: 62X-0045 E-mail to: ispence@landr.com

Sample Number	Sample Date & Time	Asbestos					Lead					Other Metals <small>(Specify metals below)</small>			Indoor Air Quality				Air Volume (L) OR Wipe Area (ft <sup>2</sup> ) OR Scrape Area (cm <sup>2</sup> )	Comments				
		Bulk ID by PLM (PCM) Fiber Count	PLM Point Coun	PLM	TEM AHERA (Air)	TEM Chatfield (Bulk)	Air	Paint (%)	Paint (PPM)	Paint (mg/cm <sup>2</sup> )	Soil	Wine * (See Note)	TCLP (Pb)	Waste Water	TCLP RCRA 8	Welding Fume	Toxic Metal	Biocassette			Slide	Surface Swab	Surface Tape	Bulk
JS-21	2/6/2019	X																						
JS-22	2/6/2019	X																						
JS-23	2/6/2019	X																						
JS-24	2/6/2019	X																						
JS-25	2/6/2019	X																						
JS-26	2/6/2019	X																						
JS-27	2/6/2019	X																						
JS-28	2/6/2019	X																						
JS-29	2/6/2019	X																						
JS-30	2/6/2019	X																						

\* Do wipe samples submitted meet ASTM E1792 requirements? Yes  No

Released by: Jonathan E. Spence Signature: [Signature] Date/Time: 2/6/2019  
 Released by: [Signature] Signature: [Signature] Date/Time: 2/7/19 12:45  
 Received by: [Signature] Signature: [Signature] Date/Time: [Blank]


ENVIRONMENTAL HAZARDS SERVICES, L.L.C.  
 7469 Whitepine Road Richmond, Virginia 23237 Phone (804) 275-4788 Fax (804) 275-4907  
**CHAIN OF CUSTODY FORM**


**Company Name:** FROEHLING & ROBERTSON INC.  
**Address:** 1734 Seibel Drive, NE  
**City, State, Zip:** Roanoke, VA 24012  
**EHS Client Account #:** 48-4628 S  
**Phone # :** (540) 537-8232  
**P.O. #:** 62X-0045  
**Fax #:** (540) 344-3657  
**E-mail to:** [ispeence@landr.com](mailto:ispeence@landr.com)

**Date:** 6-Feb-19  
**Contact Name:** Jonathan Spence  
**Sampler Name:** Jonathan Spence  
**Project #:** 62X-0045 Old Annex Building

Sample Number	Sample Date & Time	Asbestos					Lead					Other Metals			Indoor Air Quality				Air Volume (L) OR Wipe Area (ft <sup>2</sup> ) OR Scrape Area (cm <sup>2</sup> )	Comments					
		Bulk ID by PLM	(PCM) Fiber Count	PLM Point Coun	PLM	TEM AHERA (Air)	TEM Chatfield (Bulk)	Air	Paint (%)	Paint (PPM)	Paint (mg/cm <sup>2</sup> )	Soil	Wine * (See Note)	TCLP (Pb)	Waste Water	TCLP RCRA 8	Welding Fume	Toxic Metal			Biocassette	Slide	Surface Swab	Surface Tape	Bulk
JS-31	2/6/2019	X																							
JS-32	2/6/2019	X																							
JS-33	2/6/2019	X																							
JS-34	2/6/2019	X																							
JS-35	2/6/2019	X																							
JS-36	2/6/2019	X																							
JS-37	2/6/2019	X																							
JS-38	2/6/2019	X																							
JS-39	2/6/2019	X																							
JS-40	2/6/2019	X																							

\* Do wipe samples submitted meet ASTM E1792 requirements? Yes  No

**Released by:** Jonathan E. Spence  
**Signature:**   
**Date/Time:** 2/6/2019

**Released by:** T. Spence  
**Signature:**   
**Date/Time:** 2/7/19 12:45p

**Received by:** \_\_\_\_\_  
**Signature:** \_\_\_\_\_  
**Date/Time:** \_\_\_\_\_





ENVIRONMENTAL HAZARDS SERVICES, L.L.C.  
7469 Whitepine Road Richmond, Virginia 23237 Phone (804) 275-4788 Fax (804) 275-4907  
**CHAIN OF CUSTODY FORM**

<b>Company Name:</b> FROEHLING & ROBERTSON INC.		<b>Date:</b> 6-Feb-19	
<b>Address:</b> 1734 Seibel Drive, NE		<b>Contact Name:</b> Jonathan Spence	
<b>City, State, Zip:</b> Roanoke, VA 24012		<b>Sampler Name:</b> Jonathan Spence	
<b>EHS Client Account #:</b> 48-4628 S		<b>Project #:</b> 62X-0045 Old Annex Building	
<b>Phone # :</b> (540) 537-8232		<b>Fax #:</b> (540) 344-3657	
<b>P.O. #:</b> 62X-0045		<b>E-mail to:</b> jspence@landr.com	

Sample Number	Sample Date & Time	Asbestos					Lead					Other Metals <small>(Specify metals below)</small>			Indoor Air Quality				Air Volume (L) OR Wipe Area (ft <sup>2</sup> ) OR Scrape Area (cm <sup>2</sup> )	Comments						
		Bulk ID by PLM	(PCM) Fiber Count	PLM Point Coun	PLM	TEM AHERA (Air)	TEM Chatfield (Bulk)	Air	Paint (%)	Paint (PPM)	Paint (mg/cm <sup>2</sup> )	Soil	Wipe * (See Note)	TCLP (Pb)	Waste Water	TCLP RCRA 8	Welding Fume	Toxic Metal			Biocassette	Slide	Surface Swab	Surface Tape	Bulk	
JS-51	2/6/2019	X																								
JS-52	2/6/2019	X																								
JS-53	2/6/2019	X																								
JS-54	2/6/2019	X																								
JS-55	2/6/2019	X																								
JS-56	2/6/2019	X																								
JS-57	2/6/2019	X																								
JS-58	2/6/2019	X																								
JS-59	2/6/2019	X																								
JS-60	2/6/2019	X																								

\* Do wipe samples submitted meet ASTM E1792 requirements? Yes  No

<b>Released by:</b> Jonathan E. Spence	<b>Signature:</b> 	<b>Date/Time:</b> 2/6/2019
<b>Released by:</b> T. Dehgan	<b>Signature:</b> 	<b>Date/Time:</b> 2/7/19 12:33
<b>Received by:</b>	<b>Signature:</b>	<b>Date/Time:</b>

ENVIRONMENTAL HAZARDS SERVICES, L.L.C.  
7469 Whitepine Road Richmond, Virginia 23237 Phone (804) 275-4788 Fax (804) 275-4907  
**CHAIN OF CUSTODY FORM**

**Company Name:** FROEHLING & ROBERTSON INC.  
**Address:** 1734 Seibel Drive, NE  
 Roanoke, VA 24012  
**EHS Client Account #:** 48-4628 S  
**Phone #:** (540) 537-8232 **Fax #:** (540) 344-3657  
**P.O. #:** 62X-0045 **E-mail to:** jspence@landr.com  
**Date:** 6-Feb-19  
**Contact Name:** Jonathan Spence  
**Sampler Name:** Jonathan Spence  
**Project #:** 62X-0045 Old Annex Building

Sample Number	Sample Date & Time	Asbestos					Lead					Other Metals <small>(Specify metals below)</small>			Indoor Air Quality				Air Volume (L) OR Wipe Area (ft <sup>2</sup> ) OR Scrape Area (cm <sup>2</sup> )	Comments				
		Bulk ID by PLM (PCM) Fiber Count	PLM Point Coun	PLM	TEM AHERA (Air)	TEM Chatfield (Bulk)	Air	Paint (%)	Paint (PPM)	Paint (mg/cm <sup>2</sup> )	Soil	Wine * (See Note)	TCLP (Pb)	Waste Water	TCLP RCRA 8	Welding Fume	Toxic Metal	Biocassette			Slide	Surface Swab	Surface Tape	Bulk
JS-61	2/6/2019	X																						
JS-62	2/6/2019	X																						
JS-63	2/6/2019	X																						
JS-64	2/6/2019	X																						
JS-65	2/6/2019	X																						
JS-66	2/6/2019	X																						
JS-67	2/6/2019	X																						
JS-68	2/6/2019	X																						
JS-69	2/6/2019	X																						
JS-70	2/6/2019	X																						

\* Do wipe samples submitted meet ASTM E1792 requirements? Yes  No

**Released by:** Jonathan E. Spence  
**Signature:** *[Signature]*  
**Date/Time:** 2/6/2019  
**Released by:** *[Signature]*  
**Signature:** *[Signature]*  
**Date/Time:** 2/7/19 12:30  
**Received by:** *[Signature]*  
**Signature:** *[Signature]*  
**Date/Time:**



ENVIRONMENTAL HAZARDS SERVICES, L.L.C.  
7469 Whitepine Road Richmond, Virginia 23237 Phone (804) 275-4788 Fax (804) 275-4907  
**CHAIN OF CUSTODY FORM**

<b>Company Name:</b> FROEHLING & ROBERTSON INC.		<b>Date:</b> 6-Feb-19	
<b>Address:</b> 1734 Seibel Drive, NE		<b>Contact Name:</b> Jonathan Spence	
<b>City, State, Zip:</b> Roanoke, VA 24012		<b>Sampler Name:</b> Jonathan Spence	
<b>EHS Client Account #:</b> 48-4628 S		<b>Project #:</b> 62X-0045 Old Annex Building	
<b>Phone #:</b> (540) 537-8232		<b>Fax #:</b> (540) 344-3657	
<b>P.O. #:</b> 62X-0045		<b>E-mail to:</b> jspence@iandr.com	

Sample Number	Sample Date & Time	Asbestos					Lead					Other Metals <small>(Specify metals below)</small>			Indoor Air Quality				Air Volume (L) OR Wipe Area (ft <sup>2</sup> ) OR Scrape Area (cm <sup>2</sup> )	Comments					
		Bulk ID by PLM (PCM) Fiber Count	PLM Point Coun	PLM	TEM AHERA (Air)	TEM Chatfield (Bulk)	Air	Paint (%)	Paint (PPM)	Paint (mg/cm <sup>2</sup> )	Soil	Wine * (See Note)	TCLP (Pb)	Waste Water	TCLP RCRA 8	Welding Fume	Toxic Metal	Biocassette			Slide	Surface Swab	Surface Tape	Bulk	
JS-71	2/6/2019	X																							
JS-72	2/6/2019	X																							
JS-73	2/6/2019	X																							
JS-74	2/6/2019	X																							
JS-75	2/6/2019	X																							
JS-76	2/6/2019	X																							
JS-77	2/6/2019	X																							
JS-78	2/6/2019	X																							

\* Do wipe samples submitted meet ASTM E1792 requirements? Yes  No



<b>Released by:</b> Jonathan E. Spence	<b>Signature:</b> 	<b>Date/Time:</b> 2/6/2019
<b>Released by:</b> T. Spence	<b>Signature:</b> 	<b>Date/Time:</b> 2/7/19 12:40
<b>Received by:</b>	<b>Signature:</b>	<b>Date/Time:</b>



TABLE NO. 1  
ASBESTOS BULK SAMPLING RECORD

F&R Project No.: 62X-6045  
 Inspector: Suzanne Spive  
 Inspection Date: \_\_\_\_\_  
 Client: \_\_\_\_\_  
 Location: \_\_\_\_\_

Key  
 M: Miscellaneous Material  
 S: Surfacing Material  
 TSI: Thermal Systems Insulation  
 NAD: No Asbestos Detected

SF: Square Feet  
 LF: Linear Feet  
 EA: Each

Sample #	Material Type	Sample Location (Room, Side, Modifiers)	Quantity <sup>2</sup>	Friable	ACM Type
33-1	Vapor Barrier	Center of C side Basement			
33-2	Vapor Barrier	Center of C side Basement			
33-3	Acceell	C side Basement Ceiling			
33-4	Acceell	A side Basement Ceiling			
33-5	Acceell	A side Basement Ceiling			
33-6	Acceall	C side Basement Ceiling			
33-7	Acceall	Center Basement Ceiling			
33-8	Acceall	Kitchen Ceiling 2nd Floor			
33-9	Plaster	A/B Corner Room on Floor			
33-10	Plaster	A/B corner - next Room from corner room Ceiling			
33-11	Plaster	On floor ceiling			
33-12	Plaster	Ceiling above drop ceiling of lobby B/C room			
33-13	Plaster	B side cell of Bedroom 4			
33-14	Plaster				
33-15	Wool/Bonded	C side Lobby above drop ceiling			
33-16	Wool/Bonded	D side Office above drop ceiling			
33-17	Wool/Bonded	A side Bed 1 above drop ceiling			
33-18	Wool/Bonded	A side Bed 2 above drop ceiling			
33-19	Adhesive	Back Sink adhesive			
33-20	T	Old ceiling tile above drop ceiling			

<sup>1</sup> - (G) Good (No damage); (D) Damaged (<10% distributed or <25% localized); (SD) Significantly Damaged (>10% distributed or >25% localized)  
<sup>2</sup> - All volumes and areas of ACMs cited in this report are estimates based on visible and inferred site conditions; actual quantities may vary.



**TABLE NO. 1  
ASBESTOS BULK SAMPLING RECORD**

F&R Project No.: \_\_\_\_\_  
 Inspector: \_\_\_\_\_  
 Inspection Date: \_\_\_\_\_  
 Client: \_\_\_\_\_  
 Location: \_\_\_\_\_

Key  
 M: Miscellaneous Material  
 S: Surfacing Material  
 TSI: Thermal Systems Insulation  
 NAD: No Asbestos Detected

SF: Square Feet  
 LF: Linear Feet  
 EA: Each

Sample #	Material Type	Sample Location (Room, Side, Modifiers)	Quantity?	Friable	ACM Type
3321	CT	Fiberglass insulation CT Lobby east			
3322	CT	Plaster ceiling lobby			
3323	Car Base	Lin Block with yellow mesh side lobby			
3324	Car Base	side office			
3325	Car Base	A side Bed 4			
3326	Car Base	lindas Bed 13 side Bed 4			
3327	Car Base	A side Office lindas			
3328	Car Base	C side lobby under carpet			
3329	Fiberglass				
3330	Fiberglass				
3331	Plaster	side of office			
3332	Plaster	side lobby of office			
3333	Plaster	Bed 5			
3334	Plaster	Stewart city			
3335	Plaster	Bed 5			
3336	Plaster	Bed 5			
3337	Plaster	Bed 5			
3338	Car Base	car in block mesh and carpet mesh			
3339	Car Base	roof carls of wall hole - C side			
3340	Car Base	A side lobby			

1 - (G) Good (No damage); (D) Damaged (<10% distributed or <25% localized); (SD) Significantly Damaged (>10% distributed or >25% localized)  
 2- All volumes and areas of ACMs cited in this report are estimates based on visible and inferred site conditions; actual quantities may vary.



TABLE NO. 1  
ASBESTOS BULK SAMPLING RECORD

F&R Project No.: \_\_\_\_\_  
 Inspector: \_\_\_\_\_  
 Inspection Date: \_\_\_\_\_  
 Client: \_\_\_\_\_  
 Location: \_\_\_\_\_

Key  
 M: Miscellaneous Material  
 S: Surfacing Material  
 TSI: Thermal Systems Insulation  
 NAD: No Asbestos Detected

SF: Square Feet  
 LF: Linear Feet  
 EA: Each

Sample#	Material Type	Sample Location (Room, Side, Modifiers)	Quantity <sup>2</sup>	Friable	ACM Type
3541	Levy Corp	A side Hallway			
3542	CT	Photo medium fessure D side / C side			
3543	CT	Stairwell towards A side			
3544	SVE	Stairwell towards A side			
3545	SVE	Stairwell towards A side			
3546	SVE	Stairwell towards A side			
3547	SVE	Stairwell towards A side			
3548	Popc	Stairwell towards A side			
3549	Popc	Stairwell towards A side			
3550	Popc	Stairwell towards A side			
3551	FT	Stairwell towards A side			
3552	FT	Stairwell towards A side			
3553	FT	Stairwell towards A side			
3554	SUE	Stairwell towards A side			
3555	SVE	Stairwell towards A side			
3556	FT	Stairwell towards A side			
3557	FT	Stairwell towards A side			
3558	FT	Stairwell towards A side			
3559	FT	Stairwell towards A side			
3560	SVE	Stairwell towards A side			

<sup>1</sup> - (G) Good (No damage); (D) Damaged (<10% distributed or <25% localized); (SD) Significantly Damaged (>10% distributed or >25% localized)  
<sup>2</sup> - All volumes and areas of ACMs cited in this report are estimates based on visible and inferred site conditions; actual quantities may vary.



**TABLE NO. 1  
ASBESTOS BULK SAMPLING RECORD**

F&R Project No.: \_\_\_\_\_  
 Inspector: \_\_\_\_\_  
 Inspection Date: \_\_\_\_\_  
 Client: \_\_\_\_\_  
 Location: \_\_\_\_\_

Key  
 M: Miscellaneous Material  
 S: Surfacing Material  
 TSI: Thermal Systems Insulation  
 NAD: No Asbestos Detected

SF: Square Feet  
 LF: Linear Feet  
 EA: Each

Sample#	Material Type	Sample Location (Room, Side, Modifiers)	Quantity?	Friable	ACM Type
3361	SUF	A/D Rom of the			
3362	CT	Product Medium Fusion			
3363	CT	Product Medium Fusion			
3364	Carbon	Window Blinds			
3365	Carbon	Window Blinds			
3366	FT	14x12x13/4 com with			
3367	FT	14x12x13/4 com with			
3368	FT	14x12x13/4 com with			
3369	SUF	Back of the Deck			
3370	SUF	P side Stairwell 13th fl			
3371	Plasma	Yellow Spar Street Mesh			
3372	Plasma	Window			
3373	Carbon	Window			
3374	Carbon	Window			
3375	Carbon	Window			
3376	Carbon	13th floor			
3377	Carbon	13th floor			
3378	Carbon	13th floor			
3379	Carbon	13th floor			

1 - (G) Good (No damage); (D) Damaged (<10% distributed or <25% localized); (SD) Significantly Damaged (>10% distributed or >25% localized)  
 2- All volumes and areas of ACMs cited in this report are estimates based on visible and inferred site conditions; actual quantities may vary.

**Appendix C**

Laboratory Certificates of Analysis  
Bulk Sample Chain of Custody Forms

*Section 2*  
*Microbial*



contact@hayesmicrobial.com  
http://hayesmicrobial.com/

Analysis Report prepared for

**Froehling & Robertson, Inc.**

1734 Seibel Drive, NE  
Roanoke, VA. 24012  
Phone: (540) 344-7939

**Job Number: 62X-0045**  
**Job Name: Rhlegar Building**  
**4 South Franklin Street**  
**Christianburg, VA**  
**Date Sampled: 02-04-2019**  
**Date Analyzed: 02-06-2019**  
**Report Date: 02-06-2019**

EPA Laboratory ID# VA01419



AIHA EMPAT Lab ID# 188863



Mold License: LAB1021



License: #PH-0198



# HAYES

MICROBIAL CONSULTING  
3005 East Boundary Terrace, #F  
Midlothian, VA 23112, USA  
804.562.3435 Fax: 804.447.5562

HMC #19005040

**Froehling & Robertson, Inc.**  
**1734 Seibel Drive, NE**  
**Roanoke, VA 24012**

February 6, 2019

Client Job Number: 62X-0045  
Client Job Name: Rhlegar Building  
4 South Franklin Street  
Christianburg, VA

Dear Froehling & Robertson, Inc.,

We would like to thank you for trusting Hayes Microbial for your analytical needs. On February 6, 2019 we received 9 samples by FedEx for the job referenced above. 9 samples were received in good condition.

The results in this analysis pertain only to this job, collected on the stated date and should not be used in the interpretation of any other job. This report may not be duplicated, except in full, without the written consent of Hayes Microbial Consulting, LLC.

This laboratory bears no responsibility for sample collection activities, analytical method limitations, or your use of the test results. Interpretation and use of test results are your responsibility. Any reference to health effects or interpretation of mold levels is strictly the opinion of Hayes Microbial Consulting. In no event, shall Hayes Microbial Consulting or any of its employees be liable for lost profits or any special, incidental or consequential damages arising out of your use of the test results.

Steve Hayes, BSMT(ASCP)  
Laboratory Director  
Hayes Microbial Consulting, LLC





# HAYES

MICROBIAL CONSULTING  
 3005 East Boundary Terrace, #F  
 Midlothian, VA 23112, USA  
 804.562.3435 Fax: 804.447.5562

Froehling & Robertson, Inc.  
 1734 Seibel Drive, NE  
 Roanoke, VA 24012  
 Phone: (540) 344-7939

Spore Trap Analysis  
 SOP #HMC101

**HMC #19005040**

Job Number: <b>62X-0045</b>	Job Name: <b>Rhlegr Building</b>	Date Collected: <b>02/04/2019</b>
Collected by: <b>Glenn Hargrove</b>	<b>4 South Franklin Street</b>	Date Received: <b>02/06/2019</b>
Email: <b>ghargrove@fandr.com</b>	<b>Christianburg, VA</b>	Date Reported: <b>02/06/2019</b>

HMC ID Number	19005040 - 1	19005040 - 2	19005040 - 3	19005040 - 4
Sample ID#	2630589	2630584	2630580	2630571
Sample Name	Outside	1st Floor At Stairs	1st Floor Older Section	1st Floor Newer Section
Sample Volume	150 liters	150 liters	150 liters	150 liters
Reporting Limit	7 spores/M3	7 spores/M3	7 spores/M3	7 spores/M3
Background	2	2	2	2
Fragments	7/M3	13/M3	13/M3	7/M3

Organism	19005040 - 1			19005040 - 2			19005040 - 3			19005040 - 4		
	Raw Count	Count / M3	% of Total	Raw Count	Count / M3	% of Total	Raw Count	Count / M3	% of Total	Raw Count	Count / M3	% of Total
Alternaria				1	7	< 1%						
Ascospores	5	33	13.0%	4	27	< 1%	3	20	< 1%	4	27	1.0%
Aspergillus Penicillium	30	200	79.1%	980	6533	97.0%	434	2893	97.3%	399	2660	95.9%
Basidiospores												
Bipolaris Drechslera												
Chaetomium				22	147	2.2%	2	13	< 1%	6	40	1.4%
Cladosporium	2	13	5.1%	2	13	< 1%	3	20	< 1%	2	13	< 1%
Curvularia												
Epicoccum							1	7	< 1%			
Fusarium												
Memnoniella												
Myxomycetes	1	7	2.8%				1	7	< 1%	3	20	< 1%
Pithomyces												
Spegazzinia												
Stachybotrys				1	7	< 1%	2	13	< 1%	2	13	< 1%
Stemphylium												
Torula												
Ulocladium												
Total	38	253		1010	6734		446	2973		416	2773	

Water Damage Indicator	Common Allergen	Slightly Higher than Outside Air	Significantly Higher than Outside Air	Ratio Abnormality
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Signature: Shareef Abdalqader

Date: 02/06/2019

Reviewed by: P. Rameez

Date: 02/06/2019



# HAYES

MICROBIAL CONSULTING  
3005 East Boundary Terrace, #F  
Midlothian, VA 23112, USA  
804.562.3435 Fax: 804.447.5562

Froehling & Robertson, Inc.  
1734 Seibel Drive, NE  
Roanoke, VA 24012  
Phone: (540) 344-7939

Spore Trap Analysis  
SOP #HMC101

HMC #19005040

Job Number: <b>62X-0045</b>	Job Name: <b>Rhlegar Building</b>	Date Collected: <b>02/04/2019</b>
Collected by: <b>Glenn Hargrove</b>	<b>4 South Franklin Street</b>	Date Received: <b>02/06/2019</b>
Email: <b>ghargrove@fandr.com</b>	<b>Christianburg, VA</b>	Date Reported: <b>02/06/2019</b>

HMC ID Number	19005040 - 5	19005040 - 6	19005040 - 7
Sample ID#	2630570	2630574	2630579
Sample Name	2nd Floor Older Section	2nd Floor Newer Section	Outside
Sample Volume	150 liters	150 liters	150 liters
Reporting Limit	7 spores/M3	7 spores/M3	7 spores/M3
Background	2	2	2
Fragments	ND	20/M3	7/M3

Organism	19005040 - 5			19005040 - 6			19005040 - 7		
	Raw Count	Count / M3	% of Total	Raw Count	Count / M3	% of Total	Raw Count	Count / M3	% of Total
Alternaria									
Ascospores	2	13	< 1%	3	20	< 1%	2	13	4.6%
Aspergillus Penicillium	616	4107	98.1%	1260	8400	98.7%	38	253	90.4%
Basidiospores				1	7	< 1%			
Bipolaris Drechslera									
Chaetomium	4	27	< 1%	6	40	< 1%			
Cladosporium	2	13	< 1%	3	20	< 1%			
Curvularia									
Epicoccum				1	7	< 1%	1	7	2.5%
Fusarium									
Memnoniella									
Myxomycetes	2	13	< 1%	3	20	< 1%			
Pithomyces									
Spegazzinia	2	13	< 1%						
Stachybotrys									
Stemphylium									
Torula							1	7	2.5%
Ulocladium									
Total	628	4186		1277	8514		42	280	

Water Damage Indicator    Common Allergen    Slightly Higher than Outside Air    Significantly Higher than Outside Air    Ratio Abnormality

Signature: Shareef Abdalqadir

Date: 02/06/2019

Reviewed by: P. Ramez

Date: 02/06/2019



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Phone: (540) 344-7939

Direct ID Analysis  
SOP #HMC102

**HMC #19005040**

Job Number: <b>62X-0045</b>	Job Name: <b>Rhlegar Building</b>	Date Collected: <b>02/04/2019</b>
Collected by: <b>Glenn Hargrove</b>	<b>4 South Franklin Street</b>	Date Received: <b>02/06/2019</b>
Email: <b>ghargrove@fandr.com</b>	<b>Christianburg, VA</b>	Date Reported: <b>02/06/2019</b>

<b>HMC ID Number: 19005040 - 8</b>		<b>Sample Media: Bio-Tape</b>	
<b>Sample ID Number: GH204-T1</b>		<b>Sample Name: Magistrate Office Wall</b>	
<b>Organism</b>	<b>Spore Estimate</b>	<b>Mycelial Estimate</b>	<b>Note</b>
Alternaria	Very Heavy	Many	
Epicoccum	Very Heavy	Many	

<b>HMC ID Number: 19005040 - 9</b>		<b>Sample Media: Bio-Tape</b>	
<b>Sample ID Number: GH204-T2</b>		<b>Sample Name: Back Magistrate Office Wall</b>	
<b>Organism</b>	<b>Spore Estimate</b>	<b>Mycelial Estimate</b>	<b>Note</b>
Alternaria	Very Heavy	Many	
Epicoccum	Very Heavy	Many	

Signature: Shareef Abdalgadir

Date: 02/06/2019

Reviewed by: P. Ramesh

Date: 02/06/2019



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## Spore Trap Information

HMC #19005040

<b>Reporting Limit</b>	The Reporting Limit is the lowest number of spores that can be detected based on the total volume of the sample collected and the percentage of the slide that is counted. At Hayes Microbial, 100% of the slide is read so the LOD is based solely on the total volume. Raw spore counts that exceed 500 spores will be estimated.
<b>Blanks</b>	Results have not been corrected for field or laboratory blanks.
<b>Background</b>	<p>The Background is the amount of debris that is present in the sample. This debris consists of skin cells, dirt, dust, pollen, drywall dust and other organic and non-organic matter. As the background density increases, the likelihood of spores, especially small spores such as those of Aspergillus and Penicillium may be obscured. The background is rated on a scale of 1 to 4 and each level is determined as follows:</p> <p><b>ND</b> : No background detected. (Pump or cassette malfunction.) Recollect sample.</p> <p><b>1</b> : &lt;5% of field occluded. No spores will be uncountable.</p> <p><b>2</b> : 5-25% of field occluded.</p> <p><b>3</b> : 25-75% of field occluded.</p> <p><b>4</b> : 75-90% of field occluded.</p> <p><b>5</b> : &gt;90% of field occluded. Suggest recollection of sample.</p>
<b>Fragments</b>	Fragments are small pieces of fungal mycelium or spores. They are not identifiable as to type and when present in very large numbers, may indicate the presence of mold amplification.
<b>Indoor/Outdoor Comparisons</b>	There are no national standards for the numbers of fungal spores that may be present in the indoor environment. As a general rule and guideline that is widely accepted in the indoor air quality field, the numbers and types of spores that are present in the indoor environment should not exceed those that are present outdoors at any given time. There will always be some mold spores present in "normal" indoor environments. The purpose of sampling and counting spores is to help determine whether an abnormal condition exists within the indoor environment and if it does, to help pinpoint the area of contamination. Spore counts should not be used as the sole determining factor of mold contamination. There are many factors that can cause anomalies in the comparison of indoor and outdoor samples due to the dynamic nature of both of those environments.
<b>Water Damage Indicators</b>	These molds are commonly seen in conditions of prolonged water intrusion and usually indicate a problem.
<b>Common Allergens</b>	Although all molds are potential allergens, these are the most common allergens that may be found indoors.
<b>Slightly Higher than Outside Air</b>	The spore count is slightly higher than the outside count and may or may not indicate a source of contamination.
<b>Significantly Higher than Outside Air</b>	The spore count is significantly higher than the outdoor count and probably indicates a source of contamination.
<b>Ratio Abnormality</b>	The types of spores found indoors should be similar to the ones that were identified in the outdoor sample. Significant increases (more than 25%) in the ratio of a particular spore type may indicate the presence of abnormal levels of mold, even if the total number of spores of that type is lower in the indoor environment than it was outdoors.
<b>Color Note</b>	Fungi that are present in indoor samples at levels lower than 200 per cubic meter are not color coded on the report, unless they are one of the water damage indicators.



### Additional Information for Direct Identification Analysis

Spore Estimate		Percentages
ND	None Detected	0%
Rare	Less than 10 spores	< 1%
Light	10 - 99 spores	1-10%
Moderate	100 - 999 spores	11-25%
Heavy	1000 - 9999 spores	26-50%
Very Heavy	10000 or greater spores	51-100%

Mycelial Estimate		
ND	None Detected	No active growth at site
Trace	Very small amount of Mycelium	Probably no active growth at site
Few	Some Mycelium	Possible active growth at site
Many	Large amount of Mycelium	Probable active growth at site



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#### Alternaria

**Habitat:** Commonly found outdoors in soil and decaying plants. Indoors, it is commonly found on window sills and other horizontal surfaces.

**Health Effects:** A common allergen and has been associated with hypersensitivity pneumonitis. Alternaria is capable of producing toxic metabolites which may be associated with disease in humans or animals. Occasionally an agent of onychomycosis, ulcerated cutaneous infection and chronic sinusitis, principally in the immunocompromised patient.

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#### Ascospores

**Habitat:** A large group consisting of more than 3000 species of fungi. Common plant pathogens and outdoor numbers become very high following rain. Most of the genera are indistinguishable by spore trap analysis and are combined on the report.

**Health Effects:** Health affects are poorly studied, but many are likely to be allergenic.

---

#### Aspergillus|Penicillium

**Habitat:** The most common fungi isolated from the environment. Very common in soil and on decaying plant material. Are able to grow well indoors on a wide variety of substrates.

**Health Effects:** This group contains common allergens and many can cause hypersensitivity pneumonitis. They may cause extrinsic asthma, and many are opportunistic pathogens. Many species produce mycotoxins which may be associated with disease in humans and other animals. Toxin production is dependent on the species, the food source, competition with other organisms, and other environmental conditions.

---

#### Basidiospores

**Habitat:** A common group of Fungi that includes the mushrooms and bracket fungi. They are saprophytes and plant pathogens. In wet conditions they can cause structural damage to buildings.

**Health Effects:** Common allergens and are also associated with hypersensitivity pneumonitis.

---

#### Chaetomium

**Habitat:** Ascomycete fungus, commonly isolated from soil and decaying plant materials. It is cellulolytic and grows well indoors on damp sheetrock and other paper substrates. It is often found growing with Stachybotrys.

**Health Effects:** It is reported to be allergenic and may produce toxins.

---

#### Cladosporium

**Habitat:** One of the most common genera worldwide. Found in soil and plant debris and on the leaf surfaces of living plants. The outdoor numbers are lower in the winter and often relatively high in the summer, especially in high humidity. The outdoor numbers often spike in the late afternoon and evening. Indoors, it can be found growing on textiles, wood, sheetrock, moist window sills and in HVAC supply ducts.

**Health Effects:** A common allergen, producing more than 10 allergenic antigens and a common cause of hypersensitivity pneumonitis.

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Organism Descriptions

HMC #19005040

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## Epicoccum

**Habitat:** It is found in soil and plant litter and is a plant pathogen. It can grow indoors on a variety of substrates, including paper and textiles and is commonly found on wet drywall.

**Health Effects:** It is a common allergen. No cases of infection have been reported in humans.

---

## Myxomycetes

**Habitat:** Found on decaying plant material and as a plant pathogen.

**Health Effects:** Some allergenic properties reported, but generally pose no health concerns to humans.

---

## Spegazzinia

**Habitat:** Found in soil and occasionally on plants.

**Health Effects:** No known health effects. Allergenic properties are poorly studied.

---

## Stachybotrys

**Habitat:** Commonly found in soil and on decaying plant material. It is cellulolytic, and can be found indoors on wet materials containing cellulose, such as wallboard, ceiling tile, and other paper-based materials. It is found outdoors on decaying plant material although it is rarely detected on outdoor air samples.

**Health Effects:** Allergenic properties are poorly studied and no cases of infection have been reported in humans. They are capable of producing potent tricothecene mycotoxins. The toxins produced by this fungus can suppress the immune system affecting the lymphoid tissue and the bone marrow. The mycotoxin is also reported to be a liver and kidney carcinogen.

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## Torula

**Habitat:** Found in soil and on wood and grasses. Occasionally found growing indoors on cellulose containing materials.

**Health Effects:** A known allergen. No known cases of human infection.

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804.562.3435 Fax: 804.447.5562

Company: Froehling & Robertson  
Roanoke office

### Chain of Custody

Form v.2101208.1

HMC #

**005040**

Job Number: <u>62X-0045</u>	Job Name: <u>Phlegar Building</u>	Collector: <u>Glenn Hargrove</u>	Email: <u>ghargrove@fandr.com</u>
Date Collected: <u>02-04-2019</u>	<u>4 South Franklin Street</u>	Notes: <u>copy jspence@fandr.com</u>	
Mobile: <u>5405205610</u>	<u>Christiansburg, VA</u>	Sub-Contract No. <u>62X0045-00002</u>	

AD  
↓

BT  
BT

Sample #	Sample Name	Analysis Type	Volume	TAT	Notes
2630589	Outside	S	150	24 hour	Serial # is sample # for all
2630584	1st Floor-at stairs	S	150	24 hour	
2630580	1st Floor-older section	S	150	24 hour	
2630571	1st Floor-newer section	S	150	24 hour	
2630570	2nd Floor-older section	S	150	24 hour	
2630574	2nd Floor-newer section	S	150	24 hour	
2630579	Outside	S	150	24 hour	
				24 hour	
GH204-T1	Magistrate Office Wall	D		24 hour	
GH204-T2	Back Magistrate Office Wall	D		24 hour	
				24 hour	
				24 hour	

Analysis Type	Description	TAT	Acceptable Sample Types
Spore Trap S	Identification & Enumeration of Fungal Spores	24 Hour	Spore Trap cassettes, Impact slides
S+	I & E of Fungal Spores + total dander, fiber and pollen count	24 Hour	Spore Trap cassettes, Impact slides
Direct ID D	ID and Semi-quantative enumeration of spores and mycelium	24 Hour	Tape, Bio-tape, swab, bulk, agar plate for ID only
D+	ID and Enumeration with spores count	24 Hour	Tape, Bio-tape, swab, bulk, agar plate for ID only
Culture C1	Identification & Enumeration of Mold only	7 Day	Anderson Air Plate, Swab, Bulk
C2	Identification & Enumeration of Bacteria only	4 Day	Anderson Air Plate, Swab, Bulk
C3	Identification & Enumeration of Mold and Bacteria	7 Day	Anderson Air Plate, Swab, Bulk
C5	Coliform Screen for Sewage Bacteria	2 Day	Anderson Air Plate, Swab, Bulk
Dust Mite A1	Semi-quantative analysis of dust mite allergen	24 Hour	Bulk Dust
Particle P	Total Particulate Analysis	24 Hour	Spore Trap cassettes, Impact slides, Bio-Tape

Relinquished by: <u>[Signature]</u>	Date: <u>02-05-2019</u>	Rcvd By: <u>[Signature]</u>	Date: <u>02/06/19</u>	Time:
-------------------------------------	-------------------------	-----------------------------	-----------------------	-------



## **Appendix D**

### Photographic Documentation

**4 South Franklin Street Christiansburg, Virginia**



View of A side of structure



View of B side of structure

**4 South Franklin Street Christiansburg, Virginia**



View of C side of structure



View of D side of structure



**4 South Franklin Street Christiansburg, Virginia**



View of asbestos containing air cell pipe insulation located in the basement of the structure



View of asbestos containing 9x9 Floor Tile in the first floor bathroom 1

## 4 South Franklin Street Christiansburg, Virginia



View of asbestos containing 9x9 vinyl floor tile located in the hallway of the second floor underlying carpet



View of the second floor lobby. Note that asbestos containing sheet vinyl backing was identified underlying carpet and fiber board



**4 South Franklin Street Christiansburg, Virginia**



View of asbestos containing 9x9 vinyl floor tile in the magistrate office



View of asbestos containing vinyl floor tile which underlies carpet in office 4 of the first floor

4 South Franklin Street Christiansburg, Virginia



View of mold growth on wall of magistrate office



View of mold growth on ceiling tile of magistrate office

## **Appendix E**

Explanation of XRF Data Table  
XRF Data Table  
XRF Performance Characteristic Sheet



## EXPLANATION OF XRF DATA TABLES for HEURESIS

<b>Column</b>	<b>Description</b>
<b>Reading No</b>	Sample numbers.
<b>Date &amp; Time</b>	Date and Time of the reading.
<b>Concentration</b>	XRF reading of lead level (in milligrams per square centimeter (mg/cm <sup>2</sup> )).
<b>Units</b>	Unit of measure that the XRF uses to report readings: mg/cm <sup>2</sup> .
<b>Result</b>	Result of the reading:        NEG    = negative POS    = positive
<b>Site</b>	Location of the Project.
<b>Floor</b>	Building Floor the reading was collected on.
<b>Room</b>	Identified Room on the corresponding Floor.
<b>Side</b>	Side within the corresponding Room where the specific reading was collected.
<b>Substrate</b>	The type of material underlying the paint or coating.
<b>Component</b>	Structural or design element the reading was collected from.
<b>Color</b>	Color of the coated surface.

0  
 Company Heuresis Corp.  
 Model Pb200i  
 Type XRF Lead Paint Analyzer  
 Serial Num. 1504  
 Software Ver. 3.0.11

Reading #	Concentration	Units	+/-	Result	DateTime	Component	Substrate	Side	Color	Room	Floor	Project Name or Number	Inspector
1	1	mg/cm2	0.2	Positive	2/4/2019 15:46	Calibration						Old Annex Building	Jonathan Spence
2	1	mg/cm2	0.2	Positive	2/4/2019 15:47	Calibration						Old Annex Building	Jonathan Spence
3	1	mg/cm2	0.2	Positive	2/4/2019 15:47	Calibration						Old Annex Building	Jonathan Spence
4	-0.1	mg/cm2	0.4	Negative	2/4/2019 15:49	Wall	Wood	A	White	Foyer	First	Old Annex Building	Jonathan Spence
5	0.1	mg/cm2	0.4	Negative	2/4/2019 15:49	Wall	Wood	C	White	Foyer	First	Old Annex Building	Jonathan Spence
6	0	mg/cm2	0.4	Negative	2/4/2019 15:50	Door	Wood	A	Blue	Foyer	First	Old Annex Building	Jonathan Spence
7	0.8	mg/cm2	0.2	Negative	2/4/2019 15:50	Door Casing	Wood	A	White	Foyer	First	Old Annex Building	Jonathan Spence
8	0.1	mg/cm2	0.4	Negative	2/4/2019 15:51	Door	Wood	B	Blue	Foyer	First	Old Annex Building	Jonathan Spence
9	0.6	mg/cm2	0.3	Negative	2/4/2019 15:51	Door Casing	Wood	B	Blue	Foyer	First	Old Annex Building	Jonathan Spence
10	-0.1	mg/cm2	0.4	Negative	2/4/2019 15:52	Door Casing	Wood	C	Blue	Foyer	First	Old Annex Building	Jonathan Spence
11	0	mg/cm2	0.4	Negative	2/4/2019 15:52	Door	Wood	C	Blue	Foyer	First	Old Annex Building	Jonathan Spence
12	-0.1	mg/cm2	0.4	Negative	2/4/2019 15:52	Door	Wood	D	Blue	Foyer	First	Old Annex Building	Jonathan Spence
13	-0.1	mg/cm2	0.4	Negative	2/4/2019 15:52	Door Casing	Wood	D	Blue	Foyer	First	Old Annex Building	Jonathan Spence
14	1.3	mg/cm2	0.2	Positive	2/4/2019 15:53	Window Casing	Wood	A	Blue	Foyer	First	Old Annex Building	Jonathan Spence
15	0.8	mg/cm2	0.2	Negative	2/4/2019 15:54	Window Sash	Wood	A	Blue	Foyer	First	Old Annex Building	Jonathan Spence
16	0.9	mg/cm2	0.2	Negative	2/4/2019 15:54	Window Muntin	Wood	A	Blue	Foyer	First	Old Annex Building	Jonathan Spence
17	3.5	mg/cm2	0.4	Positive	2/4/2019 15:55	Window Casing	Wood	A	Blue	Office	First	Old Annex Building	Jonathan Spence
18	1.7	mg/cm2	0.4	Positive	2/4/2019 15:56	Window Sash	Wood	A	Blue	Office	First	Old Annex Building	Jonathan Spence
19	1.2	mg/cm2	0.2	Positive	2/4/2019 15:56	Window Muntin	Wood	A	Blue	Office	First	Old Annex Building	Jonathan Spence
20	-0.1	mg/cm2	0.4	Negative	2/4/2019 15:57	Wall	Wood	A	White	Office	First	Old Annex Building	Jonathan Spence
21	-0.1	mg/cm2	0.4	Negative	2/4/2019 15:58	Wall	Wood	A	White	Office	First	Old Annex Building	Jonathan Spence
22	3	mg/cm2	0.4	Positive	2/4/2019 15:58	Window Casing	Wood	B	Blue	Office	First	Old Annex Building	Jonathan Spence
23	4.5	mg/cm2	0.4	Positive	2/4/2019 15:58	Window Sash	Wood	B	Blue	Office	First	Old Annex Building	Jonathan Spence
24	4.8	mg/cm2	0.4	Positive	2/4/2019 15:58	Window Muntin	Wood	B	Blue	Office	First	Old Annex Building	Jonathan Spence
25	1.4	mg/cm2	0.3	Positive	2/4/2019 15:59	Window Casing	Wood	A	Blue	Office	First	Old Annex Building	Jonathan Spence
26	4.4	mg/cm2	0.4	Positive	2/4/2019 15:59	Window Muntin	Wood	A	Blue	Office	First	Old Annex Building	Jonathan Spence
27	5	mg/cm2	0.4	Positive	2/4/2019 16:00	Window Sash	Wood	A	Blue	Office	First	Old Annex Building	Jonathan Spence
28	0.4	mg/cm2	0.4	Negative	2/4/2019 16:00	Window Sill	Wood	A	White	Office	First	Old Annex Building	Jonathan Spence
29	-0.2	mg/cm2	0.4	Negative	2/4/2019 16:01	Door Casing	Wood	C	Blue	Hallway	First	Old Annex Building	Jonathan Spence
30	0	mg/cm2	0.4	Negative	2/4/2019 16:01	Door	Wood	C	Blue	Hallway	First	Old Annex Building	Jonathan Spence
31	0	mg/cm2	0.4	Negative	2/4/2019 16:02	Wall	Wood	B	White	Hallway	First	Old Annex Building	Jonathan Spence
32	0.5	mg/cm2	0.3	Negative	2/4/2019 16:03	Window Sash	Wood	D	Blue	Office	First	Old Annex Building	Jonathan Spence
33	0.1	mg/cm2	0.4	Negative	2/4/2019 16:03	Window Sash	Wood	D	Blue	Office	First	Old Annex Building	Jonathan Spence
34	-0.1	mg/cm2	0.4	Negative	2/4/2019 16:03	Window Sill	Wood	D	Blue	Office	First	Old Annex Building	Jonathan Spence
35	1.8	mg/cm2	0.4	Positive	2/4/2019 16:04	Window Casing	Wood	D	Blue	Office	First	Old Annex Building	Jonathan Spence
36	0	mg/cm2	0.4	Negative	2/4/2019 16:05	Wall	Plaster	A	White	Stairwell	First	Old Annex Building	Jonathan Spence
37	0.6	mg/cm2	0.3	Negative	2/4/2019 16:05	Wall	Plaster	B	White	Stairwell	First	Old Annex Building	Jonathan Spence
38	0.7	mg/cm2	0.2	Negative	2/4/2019 16:06	Wall	Plaster	C	White	Stairwell	First	Old Annex Building	Jonathan Spence
39	-0.1	mg/cm2	0.4	Negative	2/4/2019 16:07	Door	Wood	B	Blue	Stairwell	First	Old Annex Building	Jonathan Spence
40	-0.1	mg/cm2	0.4	Negative	2/4/2019 16:07	Door Casing	Wood	B	Blue	Stairwell	First	Old Annex Building	Jonathan Spence
41	0	mg/cm2	0.4	Negative	2/4/2019 16:07	Door Casing	Wood	C	Blue	Stairwell	First	Old Annex Building	Jonathan Spence
42	0.2	mg/cm2	0.4	Negative	2/4/2019 16:08	Door Casing	Wood	A	White	Stairwell	First	Old Annex Building	Jonathan Spence
43	0	mg/cm2	0.4	Negative	2/4/2019 16:08	Baseboard Molding	Wood	A	Blue	Stairwell	First	Old Annex Building	Jonathan Spence
44	0.1	mg/cm2	0.4	Negative	2/4/2019 16:08	Stair Tread	Wood	A	Blue	Stairwell	First	Old Annex Building	Jonathan Spence
45	-0.1	mg/cm2	0.4	Negative	2/4/2019 16:09	Stair Stringer	Wood	A	Blue	Stairwell	First	Old Annex Building	Jonathan Spence
46	0	mg/cm2	0.4	Negative	2/4/2019 16:09	Stair Newel Post	Wood	A	Blue	Stairwell	First	Old Annex Building	Jonathan Spence
47	0.2	mg/cm2	0.4	Negative	2/4/2019 16:09	Stair Railing	Wood	A	Blue	Stairwell	First	Old Annex Building	Jonathan Spence
48	-0.2	mg/cm2	0.4	Negative	2/4/2019 16:09	Stair Railing	Wood	A	Blue	Stairwell	First	Old Annex Building	Jonathan Spence
49	0.5	mg/cm2	0.3	Negative	2/4/2019 16:10	Baseboard Molding	Wood	A	Blue	Office	First	Old Annex Building	Jonathan Spence
50	8.3	mg/cm2	0.4	Positive	2/4/2019 16:11	Window Casing	Wood	B	Blue	Office	First	Old Annex Building	Jonathan Spence
51	6.9	mg/cm2	0.4	Positive	2/4/2019 16:11	Window Sill	Wood	B	Blue	Office	First	Old Annex Building	Jonathan Spence
52	7.8	mg/cm2	0.4	Positive	2/4/2019 16:11	Window Sash	Wood	B	Blue	Office	First	Old Annex Building	Jonathan Spence
53	8	mg/cm2	0.4	Positive	2/4/2019 16:12	Window Casing	Wood	B	Blue	Office	First	Old Annex Building	Jonathan Spence
54	8.3	mg/cm2	0.4	Positive	2/4/2019 16:12	Window Sill	Wood	B	Blue	Office	First	Old Annex Building	Jonathan Spence
55	10.1	mg/cm2	0.4	Positive	2/4/2019 16:12	Window Sash	Wood	B	Blue	Office	First	Old Annex Building	Jonathan Spence

Reading #	Concentration	Units	+/-	Result	DateTime	Component	Substrate	Side	Color	Room	Floor	Project Name or Number	Inspector
56	0.2	mg/cm2	0.4	Negative	2/4/2019 16:13	Door	Wood	B	White	Stairwell	First	Old Annex Building	Jonathan Spence
57	0.4	mg/cm2	0.4	Negative	2/4/2019 16:14	Door	Wood	B	White	Stairwell	First	Old Annex Building	Jonathan Spence
58	0.2	mg/cm2	0.4	Negative	2/4/2019 16:17	Door	Wood	B	White	Stairwell	First	Old Annex Building	Jonathan Spence
59	0.1	mg/cm2	0.4	Negative	2/4/2019 16:17	Door	Wood	B	White	Stairwell	First	Old Annex Building	Jonathan Spence
60	0.1	mg/cm2	0.4	Negative	2/4/2019 16:17	Door	Wood	B	White	Stairwell	First	Old Annex Building	Jonathan Spence
61	0.1	mg/cm2	0.4	Negative	2/4/2019 16:17	Door Casing	Wood	D	Blue	Magistrate	First	Old Annex Building	Jonathan Spence
62	0.1	mg/cm2	0.4	Negative	2/4/2019 16:18	Wall	Gypsum Board	D	White	Hallway	First	Old Annex Building	Jonathan Spence
63	0.1	mg/cm2	0.4	Negative	2/4/2019 16:18	Halfwall	Wood	C	Blue	Stairwell	First	Old Annex Building	Jonathan Spence
64	0	mg/cm2	0.4	Negative	2/4/2019 16:18	Baseboard Molding	Wood	C	Blue	Magistrate	First	Old Annex Building	Jonathan Spence
65	-0.2	mg/cm2	0.4	Negative	2/4/2019 16:18	Door Casing	Wood	D	Blue	Stairwell	First	Old Annex Building	Jonathan Spence
66	0.1	mg/cm2	0.4	Negative	2/4/2019 16:19	Window Sill	Wood	C	Blue	Stairwell	First	Old Annex Building	Jonathan Spence
67	1	mg/cm2	0.2	Positive	2/4/2019 16:19	Window Casing	Wood	C	Blue	Hallway	First	Old Annex Building	Jonathan Spence
68	0.9	mg/cm2	0.2	Negative	2/4/2019 16:19	Window Muntin	Wood	C	Blue	Hallway	First	Old Annex Building	Jonathan Spence
69	1.3	mg/cm2	0.2	Positive	2/4/2019 16:20	Window Sash	Wood	C	Blue	Hallway	First	Old Annex Building	Jonathan Spence
70	0.2	mg/cm2	0.4	Negative	2/4/2019 16:20	Wall	Wood	D	White	Foyer	First	Old Annex Building	Jonathan Spence
71	-0.1	mg/cm2	0.4	Negative	2/4/2019 16:21	Door	Metal	D	Blue	Foyer	First	Old Annex Building	Jonathan Spence
72	4.3	mg/cm2	0.4	Positive	2/4/2019 16:22	Window Casing	Wood	A	White	Office	Second	Old Annex Building	Jonathan Spence
73	3.1	mg/cm2	0.4	Positive	2/4/2019 16:22	Window Muntin	Wood	A	White	Office	Second	Old Annex Building	Jonathan Spence
74	1.8	mg/cm2	0.4	Positive	2/4/2019 16:22	Window Sash	Wood	A	White	Office	Second	Old Annex Building	Jonathan Spence
75	0.7	mg/cm2	0.2	Negative	2/4/2019 16:22	Window Sill	Wood	A	White	Office	Second	Old Annex Building	Jonathan Spence
76	0.1	mg/cm2	0.4	Negative	2/4/2019 16:23	Wall	Gypsum Board	B	White	Office	Second	Old Annex Building	Jonathan Spence
77	0.3	mg/cm2	0.4	Negative	2/4/2019 16:23	Wall	Plaster	D	White	Stairwell	Second	Old Annex Building	Jonathan Spence
78	-0.2	mg/cm2	0.4	Negative	2/4/2019 16:23	Door Casing	Wood	B	White	Stairwell	Second	Old Annex Building	Jonathan Spence
79	0.1	mg/cm2	0.4	Negative	2/4/2019 16:23	Door	Wood	B	White	Stairwell	Second	Old Annex Building	Jonathan Spence
80	-0.2	mg/cm2	0.4	Negative	2/4/2019 16:24	Door	Wood	C	White	Office	Second	Old Annex Building	Jonathan Spence
81	-0.2	mg/cm2	0.4	Negative	2/4/2019 16:24	Door	Wood	B	White	Stairwell	Second	Old Annex Building	Jonathan Spence
82	0.1	mg/cm2	0.4	Negative	2/4/2019 16:24	Door	Metal	A	White	Office	Second	Old Annex Building	Jonathan Spence
83	0	mg/cm2	0.4	Negative	2/4/2019 16:24	Door Casing	Wood	A	White	Office	Second	Old Annex Building	Jonathan Spence
84	8.9	mg/cm2	0.4	Positive	2/4/2019 16:25	Window Casing	Wood	A	White	Office	Second	Old Annex Building	Jonathan Spence
85	7.1	mg/cm2	0.4	Positive	2/4/2019 16:25	Window Muntin	Wood	A	White	Office	Second	Old Annex Building	Jonathan Spence
86	8.5	mg/cm2	0.4	Positive	2/4/2019 16:25	Window Sash	Wood	A	White	Office	Second	Old Annex Building	Jonathan Spence
87	0.2	mg/cm2	0.4	Negative	2/4/2019 16:25	Wall	Plaster	B	White	Office	Second	Old Annex Building	Jonathan Spence
88	0.1	mg/cm2	0.4	Negative	2/4/2019 16:25	Wall	Plaster	C	White	Office	Second	Old Annex Building	Jonathan Spence
89	10.1	mg/cm2	0.4	Positive	2/4/2019 16:26	Window Casing	Wood	B	White	Office	Second	Old Annex Building	Jonathan Spence
90	9.4	mg/cm2	0.4	Positive	2/4/2019 16:26	Window Muntin	Wood	B	White	Office	Second	Old Annex Building	Jonathan Spence
91	11.5	mg/cm2	0.4	Positive	2/4/2019 16:26	Window Sash	Wood	B	White	Office	Second	Old Annex Building	Jonathan Spence
92	-0.1	mg/cm2	0.4	Negative	2/4/2019 16:26	Door Casing	Wood	D	White	Office	Second	Old Annex Building	Jonathan Spence
93	-0.3	mg/cm2	0.4	Negative	2/4/2019 16:27	Door Casing	Wood	D	White	Office	Second	Old Annex Building	Jonathan Spence
94	0.1	mg/cm2	0.4	Negative	2/4/2019 16:27	Wall	Plaster	B	White	Office	Second	Old Annex Building	Jonathan Spence
95	1.6	mg/cm2	0.4	Positive	2/4/2019 16:27	Window Casing	Wood	B	White	Office	Second	Old Annex Building	Jonathan Spence
96	1.2	mg/cm2	0.2	Positive	2/4/2019 16:27	Window Muntin	Wood	B	White	Stairwell	Second	Old Annex Building	Jonathan Spence
97	0	mg/cm2	0.4	Negative	2/4/2019 16:28	Wall	Plaster	C	White	Lobby	Second	Old Annex Building	Jonathan Spence
98	0.1	mg/cm2	0.4	Negative	2/4/2019 16:28	Door	Wood	B	White	Lobby	Second	Old Annex Building	Jonathan Spence
99	12	mg/cm2	0.4	Positive	2/4/2019 16:28	Door Casing	Wood	B	White	Lobby	Second	Old Annex Building	Jonathan Spence
100	0.1	mg/cm2	0.4	Negative	2/4/2019 16:29	Door Casing	Wood	B	White	Lobby	Second	Old Annex Building	Jonathan Spence
101	0.2	mg/cm2	0.4	Negative	2/4/2019 16:29	Threshold	Wood	B	White	Lobby	Second	Old Annex Building	Jonathan Spence
102	0.1	mg/cm2	0.4	Negative	2/4/2019 16:29	Cabinet Door	Wood	A	White	Lobby	Second	Old Annex Building	Jonathan Spence
103	0	mg/cm2	0.4	Negative	2/4/2019 16:29	Cabinet Housing	Wood	A	White	Lobby	Second	Old Annex Building	Jonathan Spence
104	0.1	mg/cm2	0.4	Negative	2/4/2019 16:29	Heater	Metal	A	White	Lobby	Second	Old Annex Building	Jonathan Spence
105	0	mg/cm2	0.4	Negative	2/4/2019 16:30	Door Casing	Wood	C	White	Lobby	Second	Old Annex Building	Jonathan Spence
106	0.1	mg/cm2	0.4	Negative	2/4/2019 16:30	Door Casing	Wood	C	White	Lobby	Second	Old Annex Building	Jonathan Spence
107	0.2	mg/cm2	0.4	Negative	2/4/2019 16:30	Door Casing	Wood	A	Blue	Stairwell	Second	Old Annex Building	Jonathan Spence
108	0.1	mg/cm2	0.4	Negative	2/4/2019 16:30	Railing	Wood	C	Blue	Stairwell	Second	Old Annex Building	Jonathan Spence
109	0.6	mg/cm2	0.3	Negative	2/4/2019 16:30	Wall	Plaster	C	White	Stairwell	Second	Old Annex Building	Jonathan Spence
110	0	mg/cm2	0.4	Negative	2/4/2019 16:31	Door Casing	Wood	C	Blue	Stairwell	Second	Old Annex Building	Jonathan Spence
111	0.1	mg/cm2	0.4	Negative	2/4/2019 16:31	Door	Wood	C	White	Stairwell	Second	Old Annex Building	Jonathan Spence
112	-0.2	mg/cm2	0.4	Negative	2/4/2019 16:31	Radiator	Metal	D	White	Hallway	Second	Old Annex Building	Jonathan Spence
113	0.1	mg/cm2	0.4	Negative	2/4/2019 16:31	Wall	Wood	C	White	Hallway	Second	Old Annex Building	Jonathan Spence
114	1.1	mg/cm2	0.2	Positive	2/4/2019 16:32	Window Casing	Wood	C	White	Office	Second	Old Annex Building	Jonathan Spence
115	0.6	mg/cm2	0.3	NULL	2/4/2019 16:32	Window Muntin	Wood	C	White	Stairwell	Second	Old Annex Building	Jonathan Spence
116	0	mg/cm2	0.4	Negative	2/4/2019 16:32	Radiator	Metal	C	White	Office	Second	Old Annex Building	Jonathan Spence
117	0.7	mg/cm2	0.2	Negative	2/4/2019 16:33	Window Casing	Wood	D	White	Office	Second	Old Annex Building	Jonathan Spence

Reading #	Concentration	Units	+/-	Result	DateTime	Component	Substrate	Side	Color	Room	Floor	Project Name or Number	Inspector
118	0.6	mg/cm2	0.3	Negative	2/4/2019 16:33	Window Sash	Wood	D	White	Office	Second	Old Annex Building	Jonathan Spence
119	0.4	mg/cm2	0.4	Negative	2/4/2019 16:33	Window Muntin	Wood	D	White	Office	Second	Old Annex Building	Jonathan Spence
120	0.1	mg/cm2	0.4	Negative	2/4/2019 16:34	Door Casing	Wood	D	White	Office	Second	Old Annex Building	Jonathan Spence
121	0.5	mg/cm2	0.3	Negative	2/4/2019 16:34	Window Well	Wood	C	White	Office	Second	Old Annex Building	Jonathan Spence
122	0.5	mg/cm2	0.3	Negative	2/4/2019 16:34	Window Casing	Wood	C	White	Office	Second	Old Annex Building	Jonathan Spence
123	0.8	mg/cm2	0.2	Negative	2/4/2019 16:34	Window Muntin	Wood	C	White	Office	Second	Old Annex Building	Jonathan Spence
124	0	mg/cm2	0.4	Negative	2/4/2019 16:35	Door Casing	Wood	A	White	Office	Second	Old Annex Building	Jonathan Spence
125	0	mg/cm2	0.4	Negative	2/4/2019 16:35	Door	Wood	A	White	Office	Second	Old Annex Building	Jonathan Spence
126	0.4	mg/cm2	0.4	Negative	2/4/2019 16:35	Window Sill	Wood	B	White	Office	Second	Old Annex Building	Jonathan Spence
127	5.1	mg/cm2	0.4	Positive	2/4/2019 16:36	Window Muntin	Wood	B	White	Office	Second	Old Annex Building	Jonathan Spence
128	4.1	mg/cm2	0.4	Positive	2/4/2019 16:36	Window Casing	Wood	B	White	Office	Second	Old Annex Building	Jonathan Spence
129	5.1	mg/cm2	0.4	Positive	2/4/2019 16:36	Window Sash	Wood	B	White	Office	Second	Old Annex Building	Jonathan Spence
130	1.2	mg/cm2	0.2	Positive	2/4/2019 16:36	Window Casing	Wood	B	White	Office	Second	Old Annex Building	Jonathan Spence
131	1.1	mg/cm2	0.3	Positive	2/4/2019 16:37	Window Muntin	Wood	B	White	Office	Second	Old Annex Building	Jonathan Spence
132	1	mg/cm2	0.3	Positive	2/4/2019 16:37	Window Sash	Wood	B	White	Office	Second	Old Annex Building	Jonathan Spence
133	-0.1	mg/cm2	0.4	Negative	2/4/2019 16:38	Wall	Wood	A	White	Office	Second	Old Annex Building	Jonathan Spence
134	0	mg/cm2	0.4	Negative	2/4/2019 16:38	Heater	Metal	A	White	Office	Second	Old Annex Building	Jonathan Spence
135	0.3	mg/cm2	0.4	Negative	2/4/2019 16:38	Baseboard Molding	Wood	A	White	Office	Second	Old Annex Building	Jonathan Spence
136	0.1	mg/cm2	0.4	Negative	2/4/2019 16:38	Floor Tile	Vinyl	N/A	White	Office	Second	Old Annex Building	Jonathan Spence
137	0.2	mg/cm2	0.4	Negative	2/4/2019 16:39	Threshold	Wood	A	Blue	Stairwell	Second	Old Annex Building	Jonathan Spence
138	0.2	mg/cm2	0.4	Negative	2/4/2019 16:39	Shelf	Wood	A	White	Lobby	Second	Old Annex Building	Jonathan Spence
139	0.6	mg/cm2	0.3	Negative	2/4/2019 16:39	Wall	Plaster	C	Green	Stairwell	Second	Old Annex Building	Jonathan Spence
140	-0.1	mg/cm2	0.4	Negative	2/4/2019 16:41	Wall	Brick	A	White	Exterior	Exterior	Old Annex Building	Jonathan Spence
141	2.3	mg/cm2	0.4	Positive	2/4/2019 16:41	Window Well	Wood	A	Blue	Exterior	Exterior	Old Annex Building	Jonathan Spence
142	16.6	mg/cm2	0.4	Positive	2/4/2019 16:42	Window Casing	Wood	A	Blue	Exterior	Exterior	Old Annex Building	Jonathan Spence
143	0.2	mg/cm2	0.4	Negative	2/4/2019 16:42	Window Sash	Wood	A	Blue	Exterior	Exterior	Old Annex Building	Jonathan Spence
144	13.8	mg/cm2	0.4	Positive	2/4/2019 16:42	Window Sash	Wood	A	Blue	Exterior	Exterior	Old Annex Building	Jonathan Spence
145	15.2	mg/cm2	0.4	Positive	2/4/2019 16:43	Door Casing	Wood	A	Blue	Exterior	Exterior	Old Annex Building	Jonathan Spence
146	0	mg/cm2	0.4	Negative	2/4/2019 16:43	Door	Wood	A	Blue	Exterior	Exterior	Old Annex Building	Jonathan Spence
147	9.2	mg/cm2	0.4	Positive	2/4/2019 16:43	Threshold	Wood	A	Blue	Exterior	Exterior	Old Annex Building	Jonathan Spence
148	15.8	mg/cm2	0.4	Positive	2/4/2019 16:44	Window Casing	Wood	A	Blue	Exterior	Exterior	Old Annex Building	Jonathan Spence
149	2.8	mg/cm2	0.4	Positive	2/4/2019 16:44	Window Well	Wood	A	Blue	Exterior	Exterior	Old Annex Building	Jonathan Spence
150	9.4	mg/cm2	0.4	Positive	2/4/2019 16:44	Door	Wood	A	Blue	Exterior	Exterior	Old Annex Building	Jonathan Spence
151	6.5	mg/cm2	0.4	Positive	2/4/2019 16:45	Door Casing	Wood	A	Blue	Exterior	Exterior	Old Annex Building	Jonathan Spence
152	0	mg/cm2	0.4	Negative	2/4/2019 16:45	Door Lintel	Other	A	Blue	Exterior	Exterior	Old Annex Building	Jonathan Spence
153	1	mg/cm2	0.2	Positive	2/4/2019 16:46	Foundation	Concrete	B	Blue	Exterior	Exterior	Old Annex Building	Jonathan Spence
154	0.8	mg/cm2	0.3	NULL	2/4/2019 16:47	Window Well	Wood	B	Blue	Exterior	Exterior	Old Annex Building	Jonathan Spence
155	2.9	mg/cm2	0.4	Positive	2/4/2019 16:47	Window Well	Wood	B	Blue	Exterior	Exterior	Old Annex Building	Jonathan Spence
156	0.4	mg/cm2	0.4	Negative	2/4/2019 16:47	Window Casing	Wood	B	Blue	Exterior	Exterior	Old Annex Building	Jonathan Spence
157	0.6	mg/cm2	0.2	Negative	2/4/2019 16:48	Window Casing	Wood	B	Blue	Exterior	Exterior	Old Annex Building	Jonathan Spence
158	0	mg/cm2	0.4	Negative	2/4/2019 16:49	Wall	Brick	B	White	Exterior	Exterior	Old Annex Building	Jonathan Spence
159	0.3	mg/cm2	0.4	Negative	2/4/2019 16:49	Door Casing	Wood	B	Blue	Exterior	Exterior	Old Annex Building	Jonathan Spence
160	15.2	mg/cm2	0.4	Positive	2/4/2019 16:50	Door Casing	Wood	B	Blue	Exterior	Exterior	Old Annex Building	Jonathan Spence
161	0	mg/cm2	0.4	Negative	2/4/2019 16:50	Door	Metal	B	Blue	Exterior	Exterior	Old Annex Building	Jonathan Spence
162	0	mg/cm2	0.4	Negative	2/4/2019 16:50	Door Casing	Metal	B	Blue	Exterior	Exterior	Old Annex Building	Jonathan Spence
163	-0.1	mg/cm2	0.4	Negative	2/4/2019 16:51	Door	Metal	B	Blue	Exterior	Exterior	Old Annex Building	Jonathan Spence
164	0.5	mg/cm2	0.3	Negative	2/4/2019 16:51	Window	Wood	C	Blue	Exterior	Exterior	Old Annex Building	Jonathan Spence
165	4.6	mg/cm2	0.4	Positive	2/4/2019 16:52	Window Casing	Wood	C	Blue	Exterior	Exterior	Old Annex Building	Jonathan Spence
166	13.7	mg/cm2	0.4	Positive	2/4/2019 16:52	Window Casing	Wood	C	Blue	Exterior	Exterior	Old Annex Building	Jonathan Spence
167	10.1	mg/cm2	0.4	Positive	2/4/2019 16:52	Window Sash	Wood	C	Blue	Exterior	Exterior	Old Annex Building	Jonathan Spence
168	13.7	mg/cm2	0.4	Positive	2/4/2019 16:53	Window Muntin	Wood	C	Blue	Exterior	Exterior	Old Annex Building	Jonathan Spence
169	0	mg/cm2	0.4	Negative	2/4/2019 16:53	Door	Metal	D	Blue	Exterior	Exterior	Old Annex Building	Jonathan Spence
170	-0.2	mg/cm2	0.4	Negative	2/4/2019 16:53	Door Casing	Metal	D	Blue	Exterior	Exterior	Old Annex Building	Jonathan Spence
171	0	mg/cm2	0.4	Negative	2/4/2019 16:54	Door Casing	Metal	D	Blue	Exterior	Exterior	Old Annex Building	Jonathan Spence
172	10.5	mg/cm2	0.4	Positive	2/4/2019 16:54	Window Casing	Wood	D	Blue	Exterior	Exterior	Old Annex Building	Jonathan Spence
173	1.4	mg/cm2	0.3	Positive	2/4/2019 16:54	Window Well	Wood	D	Blue	Exterior	Exterior	Old Annex Building	Jonathan Spence
174	25.4	mg/cm2	0.4	Positive	2/4/2019 16:55	Window Casing	Wood	D	Blue	Exterior	Exterior	Old Annex Building	Jonathan Spence
175	3.5	mg/cm2	0.4	Positive	2/4/2019 16:55	Window Well	Wood	D	Blue	Exterior	Exterior	Old Annex Building	Jonathan Spence
176	0.3	mg/cm2	0.4	Negative	2/4/2019 16:56	Fascia	Wood	D	Blue	Exterior	Exterior	Old Annex Building	Jonathan Spence
177	8.5	mg/cm2	0.4	Positive	2/4/2019 16:56	Fascia	Wood	D	Blue	Exterior	Exterior	Old Annex Building	Jonathan Spence
178	1.1	mg/cm2	0.2	Positive	2/4/2019 16:58	Calibration						Old Annex Building	Jonathan Spence
179	1.1	mg/cm2	0.2	Positive	2/4/2019 16:59	Calibration						Old Annex Building	Jonathan Spence

Reading #	Concentration	Units	+/-	Result	DateTime	Component	Substrate	Side	Color	Room	Floor	Project Name or Number	Inspector
180	1	mg/cm2	0.2	Positive	2/4/2019 16:59	Calibration						Old Annex Building	Jonathan Spence

## Performance Characteristic Sheet

EFFECTIVE DATE: September 24, 2004

EDITION NO.: 1

### MANUFACTURER AND MODEL:

Make: Niton LLC

Tested Model: XLp 300

Source:  $^{109}\text{Cd}$ 

Note: This PCS is also applicable to the equivalent model variations indicated below, for the Lead-in-Paint K+L variable reading time mode, in the XLi and XLp series:

XLi 300A, XLi 301A, XLi 302A and XLi 303A.

XLp 300A, XLp 301A, XLp 302A and XLp 303A.

XLi 700A, XLi 701A, XLi 702A and XLi 703A.

XLp 700A, XLp 701A, XLp 702A, and XLp 703A.

Note: The XLi and XLp versions refer to the shape of the handle part of the instrument. The differences in the model numbers reflect other modes available, in addition to Lead-in-Paint modes. The manufacturer states that specifications for these instruments are identical for the source, detector, and detector electronics relative to the Lead-in-Paint mode.

## FIELD OPERATION GUIDANCE

### OPERATING PARAMETERS:

Lead-in-Paint K+L variable reading time mode.

### XRF CALIBRATION CHECK LIMITS:

0.8 to 1.2 mg/cm<sup>2</sup> (inclusive)

The calibration of the XRF instrument should be checked using the paint film nearest 1.0 mg/cm<sup>2</sup> in the NIST Standard Reference Material (SRM) used (e.g., for NIST SRM 2579, use the 1.02 mg/cm<sup>2</sup> film).

If readings are outside the acceptable calibration check range, follow the manufacturer's instructions to bring the instruments into control before XRF testing proceeds.

### SUBSTRATE CORRECTION:

For XRF results using Lead-in-Paint K+L variable reading time mode, substrate correction is not needed for:

Brick, Concrete, Drywall, Metal, Plaster, and Wood

### INCONCLUSIVE RANGE OR THRESHOLD:

K+L MODE READING DESCRIPTION	SUBSTRATE	THRESHOLD (mg/cm <sup>2</sup> )
Results not corrected for substrate bias on any substrate	Brick	1.0
	Concrete	1.0
	Drywall	1.0
	Metal	1.0
	Plaster	1.0
	Wood	1.0

## BACKGROUND INFORMATION

### EVALUATION DATA SOURCE AND DATE:

This sheet is supplemental information to be used in conjunction with Chapter 7 of the HUD *Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing* ("HUD Guidelines"). Performance parameters shown on this sheet are calculated from the EPA/HUD evaluation using archived building components. Testing was conducted in August 2004 on 133 testing combinations. The instruments that were used to perform the testing had new sources; one instrument's was installed in November 2003 with 40 mCi initial strength, and the other's was installed June 2004 with 40 mCi initial strength.

### OPERATING PARAMETERS:

Performance parameters shown in this sheet are applicable only when properly operating the instrument using the manufacturer's instructions and procedures described in Chapter 7 of the HUD Guidelines.

### SUBSTRATE CORRECTION VALUE COMPUTATION:

Substrate correction is not needed for brick, concrete, drywall, metal, plaster or wood when using Lead-in-Paint K+L variable reading time mode, the normal operating mode for these instruments. If substrate correction is desired, refer to Chapter 7 of the HUD Guidelines for guidance on correcting XRF results for substrate bias.

### EVALUATING THE QUALITY OF XRF TESTING:

Randomly select ten testing combinations for retesting from each house or from two randomly selected units in multifamily housing. Use the K+L variable time mode readings.

Conduct XRF retesting at the ten testing combinations selected for retesting.

Determine if the XRF testing in the units or house passed or failed the test by applying the steps below.

Compute the Retest Tolerance Limit by the following steps:

Determine XRF results for the original and retest XRF readings. Do not correct the original or retest results for substrate bias. In single-family housing a result is defined as the average of three readings. In multifamily housing, a result is a single reading. Therefore, there will be ten original and ten retest XRF results for each house or for the two selected units.

Calculate the average of the original XRF result and retest XRF result for each testing combination.

Square the average for each testing combination.

Add the ten squared averages together. Call this quantity C.

Multiply the number C by 0.0072. Call this quantity D.

Add the number 0.032 to D. Call this quantity E.

Take the square root of E. Call this quantity F.

Multiply F by 1.645. The result is the Retest Tolerance Limit.

Compute the average of all ten original XRF results.

Compute the average of all ten re-test XRF results.

Find the absolute difference of the two averages.

If the difference is less than the Retest Tolerance Limit, the inspection has passed the retest. If the difference of the overall averages equals or exceeds the Retest Tolerance Limit, this procedure should be repeated with ten new testing combinations. If the difference of the overall averages is equal to or greater than the Retest Tolerance Limit a second time, then the inspection should be considered deficient.

Use of this procedure is estimated to produce a spurious result approximately 1% of the time. That is, results of this procedure will call for further examination when no examination is warranted in approximately 1 out of 100 dwelling units tested.

#### TESTING TIMES:

For the Lead-in-Paint K+L variable reading time mode, the instrument continues to read until it is moved away from the testing surface, terminated by the user, or the instrument software indicates the reading is complete. The following table provides testing time information for this testing mode. The times have been adjusted for source decay, normalized to the initial source strengths as noted above. Source strength and type of substrate will affect actual testing times. At the time of testing, the instruments had source strengths of 26.6 and 36.6 mCi.

Testing Times Using K+L Reading Mode (Seconds)						
Substrate	All Data			Median for laboratory-measured lead levels (mg/cm <sup>2</sup> )		
	25 <sup>th</sup> Percentile	Median	75 <sup>th</sup> Percentile	Pb < 0.25	0.25 ≤ Pb < 1.0	1.0 ≤ Pb
Wood Drywall	4	11	19	11	15	11
Metal	4	12	18	9	12	14
Brick Concrete Plaster	8	16	22	15	18	16

#### CLASSIFICATION RESULTS:

XRF results are classified as positive if they are greater than or equal to the threshold, and negative if they are less than the threshold.

#### DOCUMENTATION:

A document titled *Methodology for XRF Performance Characteristic Sheets* provides an explanation of the statistical methodology used to construct the data in the sheets, and provides empirical results from using the recommended inconclusive ranges or thresholds for specific XRF instruments. For a copy of this document call the National Lead Information Center Clearinghouse at 1-800-424-LEAD.

This XRF Performance Characteristic Sheet was developed by the Midwest Research Institute (MRI) and QuanTech, Inc., under a contract between MRI and the XRF manufacturer. HUD has determined that the information provided here is acceptable when used as guidance in conjunction with Chapter 7, Lead-Based Paint Inspection, of HUD's *Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing*.



## Attachment D

**SECTION 31 2323 - FILL****PART 1 GENERAL****1.1 SECTION INCLUDES**

- A. Filling holes, pits, and excavations generated as a result of demolition operations.

**1.2 REFERENCE STANDARDS**

- A. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System) 2017, with Editorial Revision.
- B. ASTM D4318 - Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils 2017, with Editorial Revision (2018).
- C. ASTM D6938 - Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth) 2017.
- D. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>)) 2012, with Editorial Revision (2015).

**1.3 SUBMITTALS**

- A. Materials Sources: Submit name of imported materials source and provide sample to Owner's Testing Lab.

**1.4 COMPACTION TESTING**

- A. Owner will retain the services of a third party testing laboratory to perform compaction testing.

**PART 2 PRODUCTS****2.1 FILL MATERIALS**

- A. Structural fill shall be free of debris, roots, frozen materials, organic matter, rock or gravel larger than 1 inch in any dimension. Submit sample to Owner's testing lab for approval.

**PART 3 EXECUTION****3.1 EXAMINATION**

- A. Verify that survey bench marks and intended elevations for the Work are as indicated.

**3.2 PREPARATION**

- A. Where existing concrete slabs on grade are encountered, the slabs shall be broken by penetrating through the slab on a maximum 12-inch square grid pattern. Following breaking, concrete shall be covered with a non-woven drainage geotextile such as Mirafi 140N or approved equivalent prior to fill placement. Alternately, concrete may be removed. If concrete is removed, drainage geotextile shall not be required prior to fill placement.
- B. Proofroll to identify soft spots.
- C. Cut out soft areas of subgrade not capable of compaction in place. Backfill with structural fill.
- D. Until ready to fill, maintain excavations and prevent loose soil from falling into excavation.

**3.3 FILLING AND COMPACTION**

- A. Fill to contours and elevations indicated using unfrozen materials.
- B. Employ a placement method that does not disturb or damage adjacent sidewalks.
- C. Do not fill over porous, wet, frozen or spongy subgrade surfaces.
- D. Maintain optimum moisture content of fill materials to attain required compaction density.

## Attachment D

- E. Obtain fill from approved source. Soil used as fill shall classify as CH, MH, CL, ML, SC, SM, SP, SW, GC, GM, GP or GW according to ASTM D2487. Crushed stone shall not be permitted. Maximum rock size shall be 75 percent of compacted layer thickness or maximum of 6 inches diameter. Prevent nesting of large rocks and compact fill to prevent voids. Maximum rock size within 12 inches of final ground surface shall be 2-inch diameter.
- F. Fill shall be placed in controlled lifts with a maximum loose thickness of 10 inches.
- G. Fill shall be compacted with appropriate compaction equipment to at least 95 percent of maximum dry density per ASTM D-698, Standard Proctor. Use power-driven hand tampers for compacting materials adjacent to structures.
- H. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified percentage of maximum density.
- I. Place backfill and fill materials evenly adjacent to structures. Prevent wedging action of the backfill against structures by carrying the material uniformly around the structure to approximately the same elevation in each lift.
- J. Place earth fill to within 6 inches of final grade. Final 6 inches shall consist of topsoil.
- K. Remove surplus backfill materials from site.

**3.4 TOLERANCES**

- A. Top Surface of General Filling: Plus or minus 1 inch from required elevations.

**3.5 FIELD QUALITY CONTROL**

- A. Owner's testing laboratory shall perform laboratory proctor tests in accordance with ASTM D698
- B. Owner's testing laboratory shall perform in place compaction tests in accordance with the following:
  - 3.5.B.1.1.1.1 Density Tests: ASTM D1556/D1556M, ASTM D2167, or ASTM D6938.
  - 3.5.B.1.1.1.2 Moisture Tests: ASTM D6938.
- C. If tests indicate Work does not meet specified requirements, remove Work, replace and retest.
- D. Frequency of Tests: Tests shall be performed on each lift of fill placed at the rates of one (1) test per 10,000 square feet of fill area, but not less than two (2) sets per lift, regardless of size of fill.

**3.6 PROTECTION OF FINISHED WORK**

- A. Reshape and re-compact fills subjected to vehicular traffic and erosion.
- B. Where compacted areas are disturbed by subsequent construction or adverse weather, scarify the surface, reshape, and compact to the required density. Use hand tamper for recompaction over underground utilities and underfloor subdrains. Protect graded areas from the action of the elements. Settlement or other damage that occurs prior to acceptance of the Work shall be repaired and grades satisfactorily re-established.
- C. Repair after cleanup. Upon completion of construction work and after spoil and debris have been removed, regrade any areas disturbed by the operations.

**END OF SECTION**