

**ADDENDUM SIX
MULTIPLE BALLFIELD AND FACILITY IMPROVEMENTS
CONTRACT NO. R-19-006-201
CITY OF CHATTANOOGA, TENNESSEE**

The following changes shall be made to the Contract Documents, Specifications, and Drawings:

I. CLARIFICATIONS & RESPONSES TO QUESTIONS

Question: [No] asbestos report [was attached]. But based on the verbiage in the addendum, the City is going to handle and abatement required on items that contain asbestos, including lead-based paint?

Answer: The City will be addressing the required abatement prior to authorizing work to begin at the John A. Patten YFD Center.

II. JOHN A. PATTEN YFD CENTER EXISTING FINISHES STUDY

A. The study is included in this Addendum for reference.

April 30, 2019

/s/ Justin C. Holland, Administrator
City of Chattanooga
Department of Public Works



NESHAP REPORT

**John A. Patten Recreation Center- 2nd Floor
3202 Kelley's Ferry Road
Chattanooga, Tennessee 37402
AAI – 5251
March 5, 2019**

**Prepared for:
Mr. Andy Hamilton
Mr. Kadir Ameen
Engineering
Chattanooga Dept. of Public Works
1250 Market Street #2100
Chattanooga, Tennessee 37402**

**Prepared by:
Alternative Actions, Inc.
7505 Middle Valley Road, Suite 113
Hixson, Tennessee 37343
423-843-0773**

Alternative Actions is pleased to provide the enclosed report detailing our asbestos survey at the referenced location. The purpose of the survey was to identify asbestos containing materials (ACM) prior to the renovation of the 2nd floor at 3202 Kelley's Ferry Road, Chattanooga, Tennessee. Our services were performed as authorized by Mr. Andy Hamilton and Mr. Kadir Ameen. The following report includes an overview, sampling procedures, sampling summary, recommendations, and lab report.

Mr. Andy Hamilton
Mr. Kadir Ameen
Chattanooga Dept. of Public Works
1250 Market Street Suite 2100
Chattanooga, TN 37402

March 11, 2019

**Subject: NESHAP Inspection – John A. Patten Recreation Center- 2nd Floor
3202 Kelley's Ferry Road, Chattanooga, Tennessee**

Gentleman,

At your request, Alternative Actions, Inc. made a site visit to conduct an asbestos NESHAP inspection and collect samples of suspect materials which may be disturbed during the planned renovation of the 2nd floor at 3202 Kelley's Ferry Road, Chattanooga, Tennessee. The initial field inspection was conducted on February 27, 2019. The building was occupied at the time of the inspection.

The bulk samples collected were sent to a third-party laboratory for analysis and the results were e-mailed to our office. The report outlines the materials sampled, the general condition of said materials, special notes as well as recommendations on how to handle this material.

As required by EPA, all layered samples, such as adhesives and floor tiles were separated by the laboratory for analysis. This includes the separation of multi-layer floor coverings and their associated mastics.

A total of 21 samples were collected and submitted to an accredited laboratory using PLM analysis. Due to positive stop protocols, a total of 19 samples were analyzed by the accredited laboratory. Materials sampled are discussed in greater detail on the attached "Sample Spreadsheet".

OVERVIEW:

A full asbestos NESHAP inspection was conducted on the 2nd floor at 3202 Kelley's Ferry Road, Chattanooga, Tennessee. The building has a perimeter foundation covered by a concrete slab. The structure is a 2-story building that was a former elementary school with brick exterior walls. The building is being used as a recreation center with numerous offices and classrooms. The building was constructed in 1929 and the 2nd floor renovation area is approximately 6,300 square feet.

The walls are concrete block and wood framing covered in plaster. The floors are floor tile or terrazzo. All the floor tile is on hardwood or plywood. The ceilings are lay in ceiling tile.

The building has a flat built up roof system. Rubber roofing has been installed over some sections of the roof.

See the attached sample spreadsheets for materials sampled and associated laboratory findings. See attached drawings for sample locations and asbestos locations.

Sampling Procedures

Samples of homogenous materials located within the area were collected using a three-negative protocol. This is a "Baseline Survey" following recommended procedures contained in the ASTM Standard E 2356-04 known as the "Standard Practice for Comprehensive Building Asbestos Surveys". Multiple samples of each material are preferred by EPA/OSHA and help to prevent false negative readings. Sampling was performed by a State of Tennessee accredited asbestos inspector.

Sampling Summary

Asbestos fibers, greater than 1% by weight, were found to be present in the following materials and locations;

- 9" x 9" Green Floor Tile RM 200, RM 201, RM 202, RM 204,
RM 205, RM 206, RM 207

Recommendations

Asbestos Floor Tile/Adhesives - Asbestos floor tile and mastic adhesives are considered to be a Category I, non-friable, asbestos containing building material by Federal NESHAP Regulations. Adhesives, found in good condition, have the option of being left in place and maintained, covered by another type of flooring or removed.

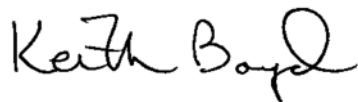
If removed, the asbestos floor tile and mastic adhesive should be removed by an asbestos contractor with accredited supervision and workers. All material and debris must be properly disposed of at an approved asbestos landfill. While EPA looks upon this material as non-friable, OSHA Regulations require special training and other requirements for anyone disturbing any asbestos material. OSHA also has procedural requirements pertaining to asbestos removal and handling. Contractor must comply with State of Tennessee Asbestos Program requirements and TOSHA.

No asbestos fibers, greater than 1% by weight, were found present in the sampled materials from the flooring adhesive according to EPA regulations. The black mastic is considered less than 1% by weight by EPA. However, OSHA has no limit, any amount is considered positive for asbestos fibers. The lab identified Trace <1% Chrysotile in the black mastic possibly due to contamination from the floor tile. If the black mastic is to be removed prior to disturbance resulting from renovation it must be done in a proper and controlled method and disposed of at an asbestos landfill. The removal crew as outlined by the Federal and State OSHA Regulations must use proper protection. Due to removal requirements, it is required that the black mastic removal be performed by an accredited abatement contractor.

- Black Mastic RM 200, RM 201, RM 202, RM 204,
RM 205, RM 206, RM 207

We appreciate your business. Should you have any questions or need additional information, please contact our office at (423) 843-0773.

Sincerely,



Keith Boyd
Environmental Inspector/Project Mgr.

Tennessee Certification
Certification No.: A-I-57513-70729
Expiration Date: November 30, 2019

*Attachments: Sample Spreadsheet
Asbestos Quantity Sheet
Sample Location Drawings
Asbestos Location Drawings
Independent Laboratory Report*

(423) 843-0773 Fax (423) 843-9526

Sample Spreadsheet
 John A. Patten Recreation Center
 3202 Kelly's Ferry Road
 Chattanooga, Tennessee 37419

Sample Number	Sample Description	Sample Location	Condition	Laboratory Results
5251-01A	White 2x4 P.T. Ceiling Tile #1	RM 200	Good	No Asbestos Detected
5251-01B	White 2x4 P.T. Ceiling Tile #1	RM 201	Good	No Asbestos Detected
5251-01C	White 2x4 P.T. Ceiling Tile #1	RM 206	Good	No Asbestos Detected
5251-02A	Green 9x9 Floor Tile	RM 200	Good	5% Chrysotile Asbestos
5251-02A	Black Mastic	RM 200	Good	Trace <1% Chrysotile Asbestos
5251-02B	Green 9x9 Floor Tile	RM 202	Good	Not Analyzed/Positive Stop
5251-02B	Black Mastic	RM 202	Good	Trace <1% Chrysotile Asbestos
5251-02C	Green 9x9 Floor Tile	RM 205	Good	Not Analyzed/Positive Stop
5251-02C	Black Mastic	RM 205	Good	No Asbestos Detected
5251-03A	Plaster	RM 200	Good	No Asbestos Detected
5251-03B	Plaster	RM 204	Good	No Asbestos Detected
5251-03C	Plaster	RM 207	Good	No Asbestos Detected
5251-04A	Green Chalkboard	RM 206	Good	No Asbestos Detected
5251-04A	Brown Glue Dots	RM 206	Good	No Asbestos Detected
5251-04B	Green Chalkboard	RM 202	Good	No Asbestos Detected
5251-04B	Brown Glue Dots	RM 202	Good	No Asbestos Detected
5251-04C	Green Chalkboard	RM 201	Good	No Asbestos Detected
5251-04C	Brown Glue Dots	RM 201	Good	No Asbestos Detected
5251-05A	White 2x4 P.T. Ceiling Tile #2	Hallway	Good	No Asbestos Detected
5251-05B	White 2x4 P.T. Ceiling Tile #2	Hallway	Good	No Asbestos Detected

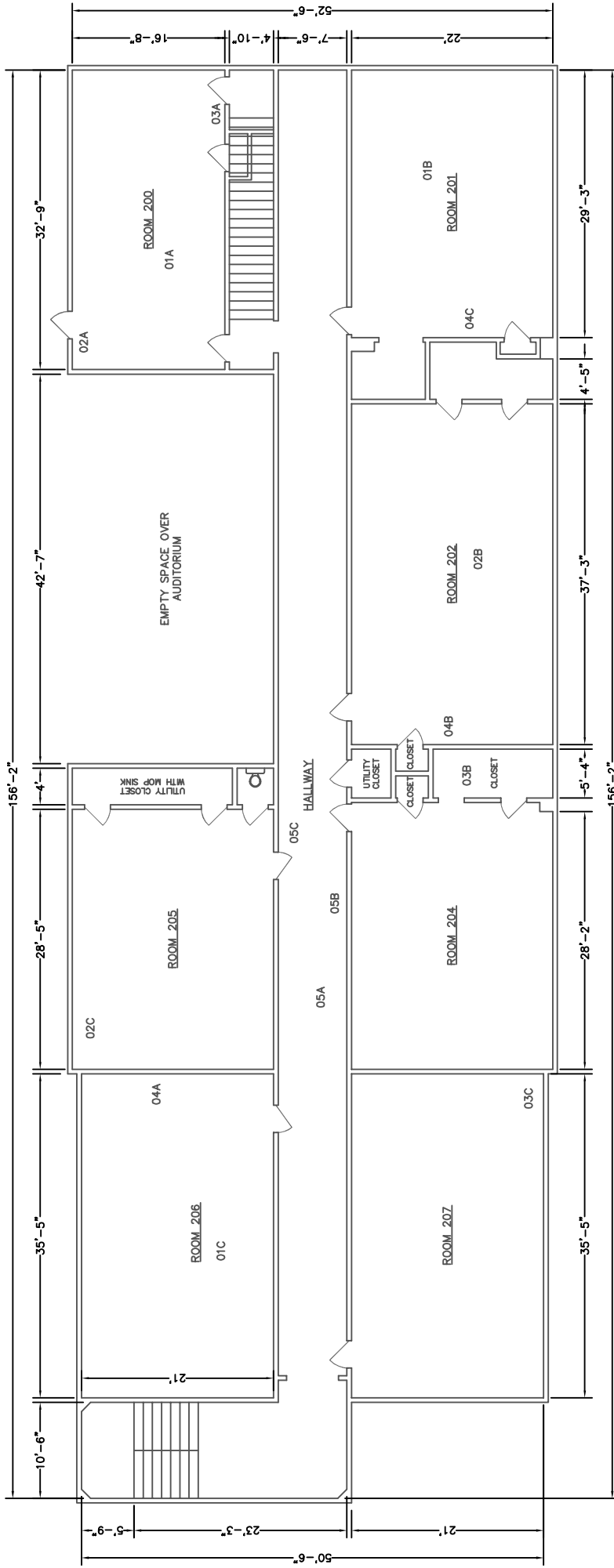
Sample Spreadsheet

John A. Patten Recreation Center
3202 Kelly's Ferry Road
Chattanooga, Tennessee 37419

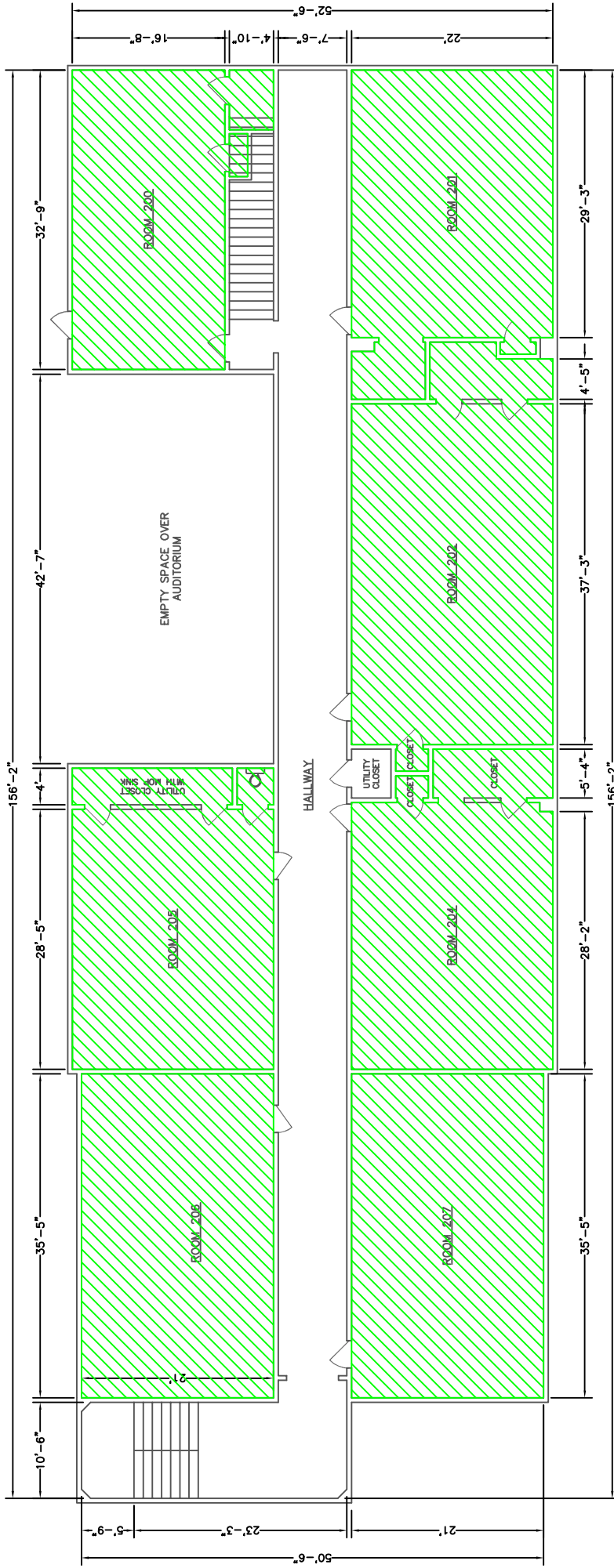
Sample Number	Sample Description	Sample Location	Condition	Laboratory Results
5251-05C	White 2x4 P.T. Ceiling Tile #2	Hallway	Good	No Asbestos Detected


ASBESTOS TAKEOFFS
125 Woodland Avenue
Chattanooga, Tennessee

Sample Number	Location	Asbestos Material	Quantity
5251-02	RM 200, RM 201, RM 202, RM 204, RM 205, RM 206, RM 207	Green 9x9 Floor Tile	5,190 S.F.



Sample Locations
 John A. Patten Recreation Center-- 2nd Floor
 3202 Kelly's Ferry Road
 Chattanooga, Tennessee 37419



 Asbestos Floor Tile

Asbestos Locations
 John A. Patten Recreation Center-- 2nd Floor
 3202 Kelly's Ferry Road
 Chattanooga, Tennessee 37419



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

Asbestos Bulk Analysis Report

Report Number: 19-02-03870

Client: Alternative Actions Inc.
 7505 Middle Valley Rd. Ste 113
 Hixson, TN 37343

Received Date: 02/28/2019
 Analyzed Date: 02/28/2019
 Reported Date: 03/04/2019

Project/Test Address: AAI-5251; Chattanooga, TN

Client Number:
 44-1169

Fax Number:
 423-843-9526

Laboratory Results

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials
19-02-03870-001	5251-01A		Brown Fibrous; White Paint-Like; Inhomogeneous	NAD	60% Cellulose 10% Fibrous Glass 30% Non-Fibrous
19-02-03870-002	5251-01B		Brown Fibrous; White Paint-Like; Inhomogeneous	NAD	60% Cellulose 10% Fibrous Glass 30% Non-Fibrous
19-02-03870-003	5251-01C		Brown Fibrous; White Paint-Like; Inhomogeneous	NAD	60% Cellulose 10% Fibrous Glass 30% Non-Fibrous
19-02-03870-004A	5251-02A	Tile	Green Vinyl; Homogeneous	5% Chrysotile	95% Non-Fibrous
				Total Asbestos: 5%	
19-02-03870-004B	5251-02A	Mastic	Black Adhesive; Homogeneous	Trace <1% Chrysotile	100% Non-Fibrous
				Total Asbestos: Trace <1%	

Possible contamination from tile.

Environmental Hazards Services, L.L.C

Client Number: 44-1169
 Project/Test Address: AAI-5251; Chattanooga, TN

Report Number: 19-02-03870

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials
19-02-03870-005A	5251-02B	Tile		Did Not Analyze (Positive Stop)	
19-02-03870-005B	5251-02B	Mastic	Black Adhesive; Homogeneous	Trace <1% Chrysotile	100% Non-Fibrous
				Total Asbestos: Trace <1%	
Possible contamination from tile.					
19-02-03870-006A	5251-02C	Tile		Did Not Analyze (Positive Stop)	
19-02-03870-006B	5251-02C	Mastic	Black Adhesive; Homogeneous	NAD	100% Non-Fibrous
19-02-03870-007	5251-03A		Tan Granular; Green Paint-Like; Inhomogeneous	NAD	100% Non-Fibrous
19-02-03870-008	5251-03B		Tan/White Granular; Green Paint-Like; Inhomogeneous	NAD	100% Non-Fibrous
19-02-03870-009	5251-03C		Gray/White Granular; Green Paint-Like; Inhomogeneous	NAD	100% Non-Fibrous
19-02-03870-010A	5251-04A	Ceiling Tile	Brown Fibrous; Green Paint-Like; Inhomogeneous	NAD	85% Cellulose 15% Non-Fibrous

Environmental Hazards Services, L.L.C

Client Number: 44-1169
 Project/Test Address: AAI-5251; Chattanooga, TN

Report Number: 19-02-03870

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials
19-02-03870-010B	5251-04A	Mastic	Brown Adhesive; Homogeneous	NAD	100% Non-Fibrous
19-02-03870-011A	5251-04B	Ceiling Tile	Brown Fibrous; Green Paint-Like; Inhomogeneous	NAD	85% Cellulose 15% Non-Fibrous
19-02-03870-011B	5251-04B	Mastic	Brown Adhesive; Homogeneous	NAD	100% Non-Fibrous
19-02-03870-012A	5251-04C	Ceiling Tile	Brown Fibrous; Green Paint-Like; Inhomogeneous	NAD	85% Cellulose 15% Non-Fibrous
19-02-03870-012B	5251-04C	Mastic	Brown Adhesive; Homogeneous	NAD	100% Non-Fibrous
19-02-03870-013	5251-05A		Gray Fibrous; White Paint- Like; Inhomogeneous	NAD	60% Cellulose 10% Fibrous Glass 30% Non-Fibrous
19-02-03870-014	5251-05B		Gray Fibrous; White Paint- Like; Inhomogeneous	NAD	60% Cellulose 10% Fibrous Glass 30% Non-Fibrous
19-02-03870-015	5251-05C		Gray Fibrous; White Paint- Like; Inhomogeneous	NAD	60% Cellulose 10% Fibrous Glass 30% Non-Fibrous

Environmental Hazards Services, L.L.C

Client Number: 44-1169
Project/Test Address: AAI-5251; Chattanooga, TN

Report Number: 19-02-03870

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

QC Sample: 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: Araceli Enzler

Reviewed By Authorized Signatory: Melissa Kanode

Missy Kanode
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

**TARGETED LEAD INSPECTION
REPORT**

**John A. Patten Recreation Center
3202 Kelley's Ferry Road
Chattanooga, Tennessee**

For

**Andy Hamilton & Kadir Ameen
Engineering
City of Chattanooga
Department of Public Works
1250 Market Street, Suite 2100
Chattanooga, Tennessee 37402**



by

Alternative Actions, Inc.
7505 Middle Valley Road, Suite 113
Hixson, Tennessee 37343
(423) 843-0773

March 8, 2019

TN Firm # FTN-2000-39-6698R
TN Risk Assessor # TNLBP2014-2880-6699R

AAI-5251

Table of Contents

Targeted LBP Inspection Report Summary

Inspection Forms – Chapter 7

AAI Form 7.1	Targeted LBP Testing Data Sheet(s)
AAI Form 7.2	Calibration Check Test Results
AAI Form 7.3	Substrate Correction Values

XRF Performance Specification

Targeted LBP Inspection Report Summary

DISCLOSURE RESPONSIBILITY: A copy of this summary report will need to be provided to the various contractors which will be performing work in the affected areas of the building. The report is required to be given to the contractors in its entirety that will have a possibility of coming in contact with any components found to be painted with Lead-Based Paint (LBP).

DISCLAIMER: This is our report of a visual survey and X-Ray Fluorescence (XRF) analysis of the readily accessible areas of this building and tested components. The presence or absence of lead based paint or lead based paint hazards applies only to tested or assessed surfaces on the date of the field visit and that conditions may change due to deterioration or maintenance. Ongoing monitoring by the owner is usually necessary.

This document is provided for informational purposes only. The information contained in this document and these references represents the current view of Alternative Actions, Inc. on the issues discussed as of the date of publication. Information provided in this document is provided "as is" without warranty of any kind, either expresses or implied, including but not limited to the implied warranties of merchantability, fitness for a particular purpose and freedom from infringement. The user assumes the entire risk as to the accuracy and the use of this document.

This document may be copied and distributed subject to the following conditions:

1. All text must be copied without modification and all pages must be included.
2. This document may not be distributed for profit.

Please review this report fully; including any REMARKS printed on each page and call us for an explanation of any aspect of this report, written or printed, which you do not fully understand.

IDENTIFYING INFORMATION: A targeted lead based paint (LBP) evaluation was conducted at the request of Mr. Andy Hamilton and Mr. Kadir Ameen, Engineering, City of Chattanooga, at the building located at 3202 Kelley's Ferry Road, Chattanooga, Tennessee. The building is known as the John A. Patten Recreation Center.

The purpose of the inspection was to determine if lead based paint has been used on any of the painted or stained surfaces. The inspection and sample collection was performed on Wednesday February 27, 2019. The inspection included conducting on-site testing of painted surfaces using an X-Ray Fluorescence (XRF) device. This was a targeted inspection only. No dust wipe samples or soil samples were collected. Dust wipe samples and soil samples are typically collected when performing a Risk Assessment. A combination of the State of Tennessee, EPA and HUD standards were used to determine the presence of lead and the appropriate recommendations.

RESULTS:

No lead based paint was found on any interior painted or stained components within the targeted area.

Additional information can be found on Form 7.1 (XRF Results).

SPECIFIC RECOMMENDATIONS:

There are no recommendations to be made since no LBP painted or stained components were found within the targeted area.

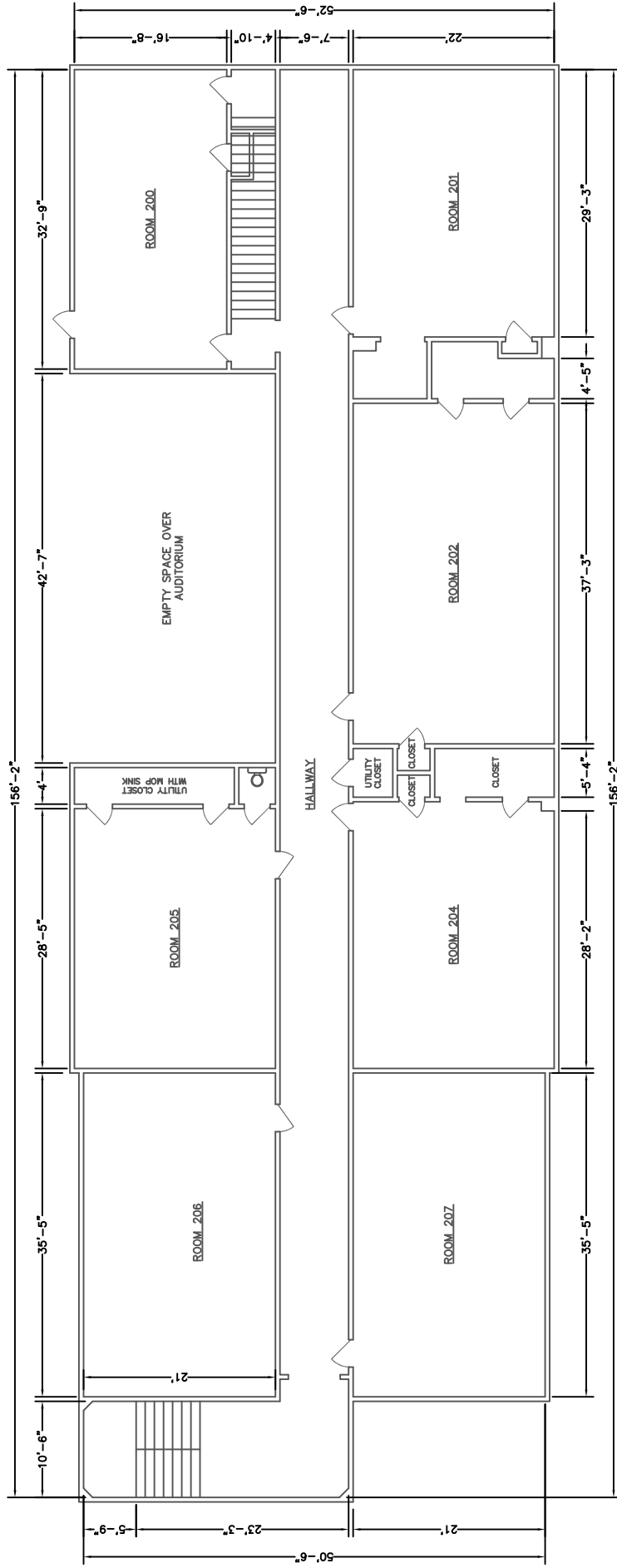
This report has been produced in accordance with accepted guidelines and standards as outlined by the State of Tennessee, EPA and HUD. Feel free to contact our office for any clarifications, etc. that you might need. Our office number is (423) 843-0773 and our fax number is (423) 843-9526.

Inspector/Risk Assessor:

A handwritten signature in black ink, appearing to read 'Mark Dempsey', written in a cursive style.

Mark Dempsey
Environmental Inspector/Project Mgr.

Date: March 8, 2019




John A. Patten Recreation Center— 2nd Floor
 3202 Kelly's Ferry Road
 Chattanooga, Tennessee 37419

**HUD Guidelines
Chapter 7 Forms for
Inspections**

Targeted LBP Testing Data Sheet

Address/Unit No. 3202 Kelley's Ferry Road, Chattanooga, Tennessee

Room Equivalent All

XRF Model No. Pb200i Inspector Name Mark Dempsey Signature 



Sample ID#	Substrate	Component	Color	Test Locations	XRF Reading	Correction Value	Result	Classification (POS, NEG or INC)	Laboratory Result	Units (mg/cm ² or ppm)	Final Classification
			SEE	ATTACHED	DATA						
			XRF	READINGS							

Reading #	Concentration	Units	Result	Date	Time	Room #	Side	Component	Substrate	Color	Condition
1	0.9	mg/cm2	Negative	2/27/2019	11:31:03			Calibrate		Green	
2	0.9	mg/cm2	Negative	2/27/2019	11:31:25			Calibrate		Green	
3	1	mg/cm2	Positive	2/27/2019	11:31:47			Calibrate		Green	
7	0	mg/cm2	Negative	2/27/2019	11:35:25	200	B	Wall	Plaster	Beige	Peeling
8	0.1	mg/cm2	Negative	2/27/2019	11:35:47	200	C	Wall	Plaster	Green	Peeling
9	0.4	mg/cm2	Negative	2/27/2019	11:36:12	200	C	Baseboard	Wood	Green	Peeling
10	0.1	mg/cm2	Negative	2/27/2019	11:36:40	200	A	Door casing	Wood	Green	Peeling
11	0.1	mg/cm2	Negative	2/27/2019	11:37:05	200	A	Door jamb	Wood	White	Peeling
12	0.2	mg/cm2	Negative	2/27/2019	11:37:32	200	C	Door casing	Wood	Green	Peeling
13	0.2	mg/cm2	Negative	2/27/2019	11:37:50	200	C	Door	Wood	Green	Peeling
14	0	mg/cm2	Negative	2/27/2019	11:38:08	200	C	Door jamb	Wood	Green	Peeling
15	0.3	mg/cm2	Negative	2/27/2019	11:38:29	200	C	Win. stool	Wood	Green	Peeling
16	0.2	mg/cm2	Negative	2/27/2019	11:38:46	200	C	Win. casing	Wood	Green	Peeling
17	0.1	mg/cm2	Negative	2/27/2019	11:39:03	200	C	Win. apron	Wood	Green	Peeling
18	0.3	mg/cm2	Negative	2/27/2019	11:40:28	200	C	Radiator	Metal	Green	Peeling
19	0.2	mg/cm2	Negative	2/27/2019	11:41:06	200	D	Black B. trim	Wood	Green	Peeling
20	0.1	mg/cm2	Negative	2/27/2019	11:42:29	200		Ceiling	Plaster	Beige	Peeling
21	0.1	mg/cm2	Negative	2/27/2019	11:44:05	201	A	Wall	Plaster	Blue	Intact
22	0.8	mg/cm2	Negative	2/27/2019	11:44:33	201	A	Wall	Plaster	Green	Peeling
23	0.4	mg/cm2	Negative	2/27/2019	11:45:15	201	A	Baseboard	Wood	Green	Peeling
24	0.2	mg/cm2	Negative	2/27/2019	11:45:35	201	A	Win. stool	Wood	Green	Peeling
25	0.3	mg/cm2	Negative	2/27/2019	11:45:54	201	A	Win. casing	Wood	Green	Peeling
26	0.2	mg/cm2	Negative	2/27/2019	11:46:10	201	A	Win. apron	Wood	Green	Peeling
27	0.2	mg/cm2	Negative	2/27/2019	11:46:54	201	A	Radiator	Metal	Green	Peeling
28	0.1	mg/cm2	Negative	2/27/2019	11:47:24	201	B	Door casing	Wood	Green	Peeling
29	0	mg/cm2	Negative	2/27/2019	11:47:40	201	B	Door	Wood	Green	Peeling
30	0.1	mg/cm2	Negative	2/27/2019	11:48:24	201	C	Win. casing	Wood	Green	Peeling
31	0.1	mg/cm2	Negative	2/27/2019	11:48:58	201	C	Black B. trim	Wood	Green	Peeling
32	0.4	mg/cm2	Negative	2/27/2019	11:50:11	201		Ceiling	Plaster	Beige	Peeling
33	0.2	mg/cm2	Negative	2/27/2019	11:51:35	202	A	Wall	Plaster	White	Peeling
34	0.4	mg/cm2	Negative	2/27/2019	11:51:55	202	A	Wall	Plaster	Green	Peeling
35	0.3	mg/cm2	Negative	2/27/2019	11:52:18	202	A	Win. stool	Wood	Green	Peeling
36	0.3	mg/cm2	Negative	2/27/2019	11:52:35	202	A	Win. casing	Wood	Green	Peeling
37	0.9	mg/cm2	Negative	2/27/2019	11:52:58	202	A	Baseboard	Wood	Green	Peeling
38	0.2	mg/cm2	Negative	2/27/2019	11:53:36	202	C	Door casing	Wood	Green	Peeling
39	0.1	mg/cm2	Negative	2/27/2019	11:53:53	202	C	Door jamb	Wood	Green	Peeling
40	0.1	mg/cm2	Negative	2/27/2019	11:54:30	202		Ceiling	Plaster	Beige	Peeling
41	-0.3	mg/cm2	Negative	2/27/2019	11:55:42	204	A	Wall	Plaster	Green	Peeling
42	0.3	mg/cm2	Negative	2/27/2019	11:56:08	204	A	Baseboard	Wood	White	Peeling
43	0.3	mg/cm2	Negative	2/27/2019	11:56:35	204	A	Win. stool	Wood	Blue	Peeling
44	0	mg/cm2	Negative	2/27/2019	11:56:51	204	A	Win. casing	Wood	Blue	Peeling
45	0.3	mg/cm2	Negative	2/27/2019	11:57:24	204	A	Radiator	Metal	Green	Peeling
46	0.1	mg/cm2	Negative	2/27/2019	11:58:02	204	D	Door casing	Wood	Pink	Peeling
47	0.1	mg/cm2	Negative	2/27/2019	11:58:31	204	D	Door	Wood	Green	Peeling
48	0.1	mg/cm2	Negative	2/27/2019	11:58:52	204	D	Door casing	Wood	Purple	Peeling
49	0.1	mg/cm2	Negative	2/27/2019	11:59:12	204	D	Door casing	Wood	Red	Peeling
50	0.2	mg/cm2	Negative	2/27/2019	12:01:02	204		Ceiling	Plaster	Beige	Peeling
51	0.2	mg/cm2	Negative	2/27/2019	12:02:19	205	C	Wall	Plaster	Blue	Peeling
52	0.3	mg/cm2	Negative	2/27/2019	12:02:37	205	C	Wall	Plaster	Purple	Peeling
53	0.7	mg/cm2	Negative	2/27/2019	12:02:59	205	C	Baseboard	Plaster	Purple	Peeling
54	0.5	mg/cm2	Negative	2/27/2019	12:05:49	205	C	Baseboard	Wood	Purple	Peeling
55	0.4	mg/cm2	Negative	2/27/2019	12:06:17	205	C	Win. stool	Wood	Brown	Peeling
56	0.2	mg/cm2	Negative	2/27/2019	12:06:40	205	C	Win. casing	Wood	Brown	Peeling
57	0.1	mg/cm2	Negative	2/27/2019	12:07:32	205	D	Black B. trim	Wood	Blue	Peeling
58	0	mg/cm2	Negative	2/27/2019	12:08:04	205	D	Door casing	Wood	Brown	Peeling
59	0.1	mg/cm2	Negative	2/27/2019	12:08:29	205	D	Door	Wood	Red	Peeling
60	0.1	mg/cm2	Negative	2/27/2019	12:09:33	206	A	Wall	Plaster	White	Peeling
61	0.2	mg/cm2	Negative	2/27/2019	12:09:54	206	A	Wall	Plaster	Beige	Peeling
62	0.4	mg/cm2	Negative	2/27/2019	12:10:18	206	A	Baseboard	Wood	Beige	Peeling
63	0.1	mg/cm2	Negative	2/27/2019	12:10:41	206	A	Door casing	Wood	Beige	Peeling
64	0.1	mg/cm2	Negative	2/27/2019	12:11:01	206	A	Door jamb	Wood	Beige	Peeling

Reading #	Concentration	Units	Result	Date	Time	Room #	Side	Component	Substrate	Color	Condition
65	0.4	mg/cm2	Negative	2/27/2019	12:11:50	206	B	Door	Metal	Beige	Peeling
66	0.1	mg/cm2	Negative	2/27/2019	12:12:27	206	C	Win. stool	Wood	Beige	Peeling
67	0.3	mg/cm2	Negative	2/27/2019	12:13:57	206		Ceiling	Plaster	Beige	Peeling
68	0.1	mg/cm2	Negative	2/27/2019	12:16:04	Hall	A	Wall	Brick	Beige	Intact
69	0.2	mg/cm2	Negative	2/27/2019	12:16:49	Hall	A	Door casing	Wood	White	Peeling
70	0.8	mg/cm2	Negative	2/27/2019	12:17:29	Hall	A	Wall	Plaster	Beige	Peeling
71	0.1	mg/cm2	Negative	2/27/2019	12:18:32	Hall	D	Win. stool	Wood	White	Peeling
72	0.2	mg/cm2	Negative	2/27/2019	12:18:53	Hall	D	Win. casing	Wood	White	Peeling
73	0.7	mg/cm2	Negative	2/27/2019	12:19:43	Hall		Ceiling	Plaster	White	Peeling
74	0.1	mg/cm2	Negative	2/27/2019	12:21:13	Hall		Railing top	Metal	Brown	Peeling
75	0.1	mg/cm2	Negative	2/27/2019	12:21:53	Hall		Floor	Concrete	Beige	Peeling
76	1	mg/cm2	Positive	2/27/2019	12:23:09			Calibrate		Green	
77	0.9	mg/cm2	Negative	2/27/2019	12:23:34			Calibrate		Green	
78	1	mg/cm2	Positive	2/27/2019	12:23:58			Calibrate		Green	

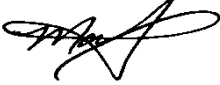
Calibration Check Test Results

Page 1 of 1

Inspector: Mark Dempsey
Company: Alternative Actions, Inc.
Address / Unit No.: 3202 Kelley's Ferry Road
Chattanooga, Tennessee



Device: Heuresis Pb200i XRF Serial Number: 1213

Inspector's Signature: 

Date: 2/27/2019

Calibration Check Tolerance Used Read Between 0.8 to 1.2 mg/cm²

First Calibration Check

Green NIST SRM 2579			First Average	Difference Between First Average and 1.0 mg/cm ²
First Reading	Second Reading	Third Reading		
0.90	0.90	1.00	0.93	0.07

Second Calibration Check

Green NIST SRM 2579			First Average	Difference Between First Average and 1.0 mg/cm ²
First Reading	Second Reading	Third Reading		
1.00	0.90	1.00	0.97	0.03

Third Calibration Check

Green NIST SRM 2579			First Average	Difference Between First Average and 1.0mg/cm ²
First Reading	Second Reading	Third Reading		

Fourth Calibration Check

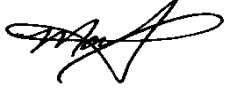
Green NIST SRM 2579			First Average	Difference Between First Average and 1.0 mg/cm ²
First Reading	Second Reading	Third Reading		

Fifth Calibration Check

Green NIST SRM 2579			First Average	Difference Between First Average and 1.0 mg/cm ²
First Reading	Second Reading	Third Reading		

* If the difference of the Calibration Check Average from the NIST SRM 2579 film value is greater than the specified Calibration Check Tolerance for this device, consult the manufacturer's recommendations to bring the instrument back into control. The reading should be 0.8 to 1.2 mg/cm². If average reading is outside the aforementioned limits, retest all testing combinations tested since last successful calibration check test.

Substrate Correction Values

Inspector: Mark Dempsey
 Company: Alternative Actions, Inc.
 Address / Unit No.: 3202 Kelley's Ferry Road
 Chattanooga, Tennessee
 Device: Heuresis Pb200i XRF Serial Number: 1213
 Inspector's Signature: 
 Date: 2/27/2019



Use this form when the XRF Performance Characteristics Sheet indicates that correction for substrate bias is needed

Substrate		Brick	Concrete	Drywall	Metal	Plaster	Wood
L o c a t i o n	1	First Reading					
		Second Reading					
		Third Reading					
	2	First Reading					
		Second Reading					
		Third Reading					
Correction Values (Average of the Six Readings)							

Transfer Correction Values to the "Correction Value" column of the LBP Testing Data Sheet form corresponding to each substrate.

Notes:

Based on the Heuresis "Performance Characteristic Sheet", December 2015 for Model Pb200i using operating software version 2.1-2, there are no inconclusive classifications. Substrate correction is not required.

**XRF
PERFORMANCE
SPECIFICATIONS**

Performance Characteristic Sheet

EFFECTIVE DATE: December 1, 2015

MANUFACTURER AND MODEL:

Make: *Heuresis*
Models: *Model Pb200i*
Source: *⁵⁷Co, 5 mCi (nominal – new source)*

FIELD OPERATION GUIDANCE

OPERATING PARAMETERS:

Action Level mode

XRF CALIBRATION CHECK LIMITS:

0.8 to 1.2 mg/cm ² (inclusive)

SUBSTRATE CORRECTION:

Not applicable

INCONCLUSIVE RANGE OR THRESHOLD:

ACTION LEVEL MODE READING DESCRIPTION	SUBSTRATE	THRESHOLD (mg/cm²)
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 using test results on building components in the HUD archive. Testing was conducted on 146 test samples in November 2015, with two separate instruments running software version 2.1-2 in Action Level test mode. The actual source strength of each instrument on the day of testing was approximately 2.0 mCi; source ages were approximately one year.

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.

XRF CALIBRATION CHECK:

The calibration of the XRF instrument should be checked using the paint film nearest 1.0 mg/cm² in the NIST Standard Reference Material (SRM) used (e.g., for NIST SRM 2579, use the 1.02 mg/cm² film).

If the average (rounded to 1 decimal place) of three readings is outside the acceptable calibration check range, follow the manufacturer's instructions to bring the instrument into control before XRF testing proceeds.

SUBSTRATE CORRECTION VALUE COMPUTATION:

Chapter 7 of the HUD Guidelines provides guidance on correcting XRF results for substrate bias. Supplemental guidance for using the paint film nearest 1.0 mg/cm² for substrate correction is provided:

XRF results are corrected for substrate bias by subtracting from each XRF result a correction value determined separately in each house for single-family housing or in each development for multifamily housing, for each substrate. The correction value is an average of XRF readings taken over the NIST SRM paint film nearest to 1.0 mg/cm² at test locations that have been scraped bare of their paint covering. Compute the correction values as follows:

Using the same XRF instrument, take three readings on a bare substrate area covered with the NIST SRM paint film nearest 1 mg/cm². Repeat this procedure by taking three more readings on a second bare substrate area of the same substrate covered with the NIST SRM.

Compute the correction value for each substrate type where XRF readings indicate substrate correction is needed by computing the average of all six readings as shown below.

For each substrate type (the 1.02 mg/cm² NIST SRM is shown in this example; use the actual lead loading of the NIST SRM used for substrate correction):

$$\text{Correction value} = (1\text{st} + 2\text{nd} + 3\text{rd} + 4\text{th} + 5\text{th} + 6\text{th Reading})/6 - 1.02 \text{ mg/cm}^2$$

Repeat this procedure for each substrate requiring substrate correction in the house or housing development.

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.

Conduct XRF re-testing 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 and multi-family housing, a result is defined as 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 the 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 readings.

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

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:

In the Action Level paint test mode, the instrument takes the longest time to complete readings close to the Federal standard of 1.0 mg/cm². The table below shows the mean and standard deviation of actual reading times by reading level for paint samples during the November 2015 archive testing. The tested instruments reported readings to one decimal place. No significant differences in reading times by substrate were observed. These times apply only to instruments with the same source strength as those tested (2.0 mCi). Instruments with stronger sources will have shorter reading times and those with weaker sources, longer reading times, than those in the table.

Mean and Standard Deviation of Reading Times in Action Level Mode by Reading Level		
Reading (mg/cm²)	Mean Reading Time (seconds)	Standard Deviation (seconds)
< 0.7	3.48	0.47
0.7	7.29	1.92
0.8	13.95	1.78
0.9 – 1.2	15.25	0.66
1.3 – 1.4	6.08	2.50
≥ 1.5	3.32	0.05

CLASSIFICATION OF RESULTS:

XRF results are classified as **positive** if they are **greater than or equal** to the stated threshold for the instrument (1.0 mg/cm²), and *negative* if they are *less than* the threshold.

DOCUMENTATION:

A report titled *Methodology for XRF Performance Characteristic Sheets* (EPA 747-R-95-008) 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. The report may be downloaded at <http://www2.epa.gov/lead/methodology-xrf-performance-characteristic-sheets-epa-747-r-95-008-september-1997>.

This XRF Performance Characteristic Sheet (PCS) was developed by QuanTech, Inc., under a contract with the XRF manufacturer.