

Limited Asbestos Survey Report

**W.D. WILLIAMS ELEMENTARY SCHOOL
ROOF SURVEY
161 BEE TREE ROAD
SWANNANOVA, NORTH CAROLINA**

August 31, 2017

Terracon Project No. 86177171



Prepared for:

Buncombe County Schools
Asheville, North Carolina

Prepared by:

Terracon Consultants, Inc.
Greenville, South Carolina

Inspector:

Stephen N. Ellis
NC Accreditation No. 12905
Inspected on August 18, 2017

terracon.com

Terracon

Environmental



Facilities



Geotechnical



Materials



August 31, 2017

Ms. Mary Beth Kingston
Assistant Director
Buncombe County Schools
175 Bingham Road
Asheville, North Carolina 28806

Re: Limited Asbestos Roof Survey Report
W.D. Williams Elementary School
161 Bee Tree Road
Swannanoa, North Carolina 28778
Terracon Project No. 86177171

Dear Ms. Kingston:

Terracon Consultants, Inc. (Terracon) is pleased to present the results of the limited asbestos roof survey performed at W.D. Williams Elementary School at 161 Bee Tree Road in Swannanoa, North Carolina. We understand that this survey was requested due to the proposed roof replacement/repairs. Our services were performed in general accordance with our Proposal No. P86177171 dated August 15, 2017.

Asbestos-containing materials (ACM) were identified in samples of suspect materials collected during our survey; please refer to the report for details.

Terracon appreciates the opportunity to provide environmental consulting services to you on this project. If you should have any questions regarding this report, please contact the undersigned at (864) 292-2901.

Sincerely,

Terracon Consultants, Inc.

Stephen N. Ellis
Staff Industrial Hygienist

Jeffrey A. Gurrie
Senior Industrial Hygienist



Terracon Consultants, Inc. 72 Point Circle Greenville, South Carolina 29615

P [864] 292 2901 F [864] 292 6361 terracon.com

Environmental



Facilities



Geotechnical



Materials

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Asbestos Building Inspector Accreditation

LIMITED ASBESTOS ROOF SURVEY REPORT
W.D. WILLIAMS ELEMENTARY SCHOOL
161 BEE TREE ROAD
SWANNANOA, NORTH CAROLINA
Project No. 86177171

1.0 INTRODUCTION

Terracon Consultants, Inc. (Terracon) conducted a limited asbestos roof survey performed at W.D. Williams Elementary School at 161 Bee Tree Road in Swannanoa, North Carolina. Our survey was conducted on August 18, 2017, in advance of the proposed roof replacement/repairs. This Executive Summary is intended as an overview for the convenience of the reader. The complete report must be reviewed in its entirety prior to making decisions regarding this site.

EPA regulation 40 CFR 61, Subpart M, National Emission Standards for Hazardous Air Pollutants (NESHAP), prohibits the release of asbestos fibers to the atmosphere during renovation/demolition activities. NESHAP requires that potentially regulated asbestos-containing building materials be identified, classified and quantified prior to planned disturbances or demolition activities.

The asbestos-containing material (ACM) survey was performed by a State of North Carolina accredited asbestos building inspector in general accordance with the sampling protocols established in Environmental Protection Agency (EPA) 40 Code of Federal Regulations (CFR) 763 (Asbestos Hazard Emergency Response Act, AHERA) and the North Carolina Asbestos Hazard Management Program (NC AHMP) under NC General Statute §130A-444-452 - Asbestos Hazard Management which requires an asbestos evaluation of facilities scheduled for renovation or demolition; rules adopted by the NC Health Commission to implement the above statute are listed under 10A NCAC 41C.0600.

2.0 ROOFING DESCRIPTIONS

It was noted during our survey that multiple roof systems exist at the school, however our scope of work was limited to the locker room roof, eastern rubberized roof system, western rubberized roof system, and the high bay gym roof.

The locker room roof is a small roof section located at the south end of the school and covers approximately 1,450 square foot (SF). The locker room roof composition consists of a rubberized roof membrane over isocyanate foam board over a suspect built-up roof system with a wood fiber insulation board.

The eastern and western rubberized roof systems are typical of one another in their composition and square footages with each roof area covering approximately 23,875 SF. The composition of

Limited Asbestos Roof Survey Report

W.D. Williams Elementary School ■ Swannanoa, North Carolina

August 31, 2017 ■ Terracon Project No. 86177171



these roof systems include a rubber membrane over wood fiber board over suspect built-up roofing over fiberglass insulation board.

The high bay gym roof is a sloped roof with a rubber membrane over wood fiber board and a Tectum® backer board that covers approximately 5,100 SF. It was noted that no suspect materials were observed on the high bay gym roof at the time of this survey.

This survey was limited to the roof areas with a rubberized roof membranes only, Terracon cannot make any judgements or assumptions about the asbestos content of any other materials located in or on the school.

3.0 ASBESTOS SURVEY

The asbestos survey was conducted by Mr. Stephen N. Ellis, a NC DHHS accredited Asbestos Building Inspector (License No. 12905). A copy of his license is provided in Appendix E. The survey was conducted on August 18, 2017, in general accordance with the sampling protocols established by EPA Regulation 40 CFR 763, AHERA and SCDHEC R61-86.1. A summary of survey activities is provided below.

3.1 Regulatory Overview

An ACM is defined as any material containing asbestos of any type in an amount greater than one percent (1%). The asbestos NESHAP (40 CFR Part 61, Subpart M) regulates asbestos fiber emissions and asbestos waste disposal practices. It also requires the identification and classification of existing building materials prior to demolition or renovation activity. Under NESHAP, asbestos-containing building materials are classified as either friable, Category I non-friable or Category II non-friable ACM. Friable materials are those that, when dry, may be crumbled, pulverized or reduced to powder by hand pressure. Category I non friable ACM includes packing materials, gaskets, resilient floor coverings and asphalt roofing products containing more than 1 percent (%) asbestos. Category II non-friable ACM are non-friable materials other than Category I materials that contain more than 1% asbestos.

Friable ACM, Category I and Category II non-friable ACM which is in poor condition and has become friable or which will be subjected to drilling, sanding, grinding, cutting or abrading and which could be crushed or pulverized during anticipated renovation/demolition activities are considered regulated ACM (RACM). RACM must be removed prior to renovation or demolition activities.

In the state of North Carolina, asbestos activities are regulated by the North Carolina Administrative Code Chapter 10-A, Subchapter 41C, Section .0600 Asbestos Hazard Management Program (10A NCAC 41C.0600). The NC regulations require that any asbestos-related activity conducted in a public building be performed by personnel accredited by the State of North Carolina. The owner or operator must provide the NC Health Hazards Control Unit with written notification of planned removal activities at least 10 working days prior to the commencement of asbestos abatement

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activities. Asbestos abatement must be performed by NC accredited asbestos abatement contractors in accordance with 10A NCAC 41C.0600.

The Occupational Safety and Health Administration (OSHA) Asbestos Standard for Construction Industry (29 CFR 1926.1101) regulates workplace exposure to asbestos. The OSHA standard requires that employee exposure to airborne asbestos fibers be maintained below 0.1 asbestos fibers per cubic centimeter of air (0.1 f/cc) for an eight hour time weighted average. The OSHA standard classifies construction and maintenance activities, which could disturb ACM, and specifies work practices and precautions which employers must follow when engaging in each class of regulated work. A full copy of the OSHA asbestos standard for general industry may be found at OSHA's website (www.osha.gov) and should be referenced for specific information.

3.2 Visual Assessment

Our survey activities began with visual observation of roof systems that had a rubberized roof membrane and excluded those with a TPO style system, to identify apparent homogeneous areas of suspect ACM. A homogeneous area consists of building materials, which appear similar throughout in terms of color, texture and date of application. Building materials which were not identified as concrete, glass, wood, masonry, metal or rubber were considered suspect ACM.

This survey was limited to the roof areas with a rubberized roof membranes only, Terracon cannot make any judgements or assumptions about the asbestos content of any other materials located in or on the school.

3.3 Physical Assessment

A physical assessment of each homogeneous area of suspect ACM was conducted to assess the friability and condition of the materials. A friable material is defined by the EPA as a material, which can be crumbled, pulverized or reduced to powder by hand pressure when dry. Friability was assessed by physically touching suspect materials.

3.4 Sample Collection

Based on our visual observations, bulk samples of suspect ACM were collected in general accordance with NCDHHS sample collection protocols. Random samples of suspect materials were collected in each homogeneous area. Bulk samples were collected using wet methods as applicable to reduce the potential for fiber release. Samples were placed in sealable containers and labeled with unique sample numbers using an indelible marker.

Bulk samples were collected using wet methods, as applicable, to reduce the potential for fiber release. Samples were placed in sealable containers and labeled with unique sample numbers using an indelible marker. A summary of the suspect ACM samples collected during the survey is presented in Table 1 in Appendix B.

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3.5 Sample Analysis

Bulk samples were submitted using chain-of-custody procedures to Scientific Analytical Institute, Inc. (SAI) of Greensboro, North Carolina. SAI is accredited under the National Voluntary Laboratory Accreditation Program NVLAP (#200644-0). The samples were submitted for a “positive stop” analysis which means once a sample is detected with asbestos the remainder samples in the same homogenous set are not analyzed and are presumed to be of similar asbestos content.

Asbestos analysis was performed by PLM with dispersion staining techniques per EPA EPA/600/R-93/116. The percentage of asbestos, where applicable, was determined by microscopical visual estimation.

3.6 Findings and Recommendations

A total of sixteen (16) bulk samples were collected from the roof areas. A general layout of the roof systems with sample locations are included as Figure 1 in Appendix A. Sample descriptions, locations, analytical results, classification and estimated quantities are summarized in Table 1 in Appendix B. Asbestos laboratory analytical reports are included in Appendix C and photographs are provided in Appendix E.

Asbestos was detected (greater than 1%) in samples of the following materials:

- Built-up roofing (20% chrysotile) on the eastern rubberized roof sections;
- Wall Flashing (10% chrysotile) on the eastern rubberized roof sections;
- Built-up roofing (10% chrysotile) on the western rubberized roof sections; and,
- Wall Flashing (10% chrysotile) on the western rubberized roof sections.

Terracon recommends the identified ACM (materials containing greater than 1% asbestos) be removed prior to disturbance by a North Carolina licensed asbestos contractor in accordance with 10A NCAC 41C.0600 and applicable OSHA regulations.

Asbestos removal permits are required by NC DHHS and the Buncombe County Air Quality Department for all asbestos abatement activities.

It should be noted that suspect materials, other than those identified during the August 18, 2017, survey may exist within the switchyard. Should suspect materials other than those which were identified during this survey be uncovered prior to or during the abatement or demolition process, those materials should be assumed to be asbestos-containing until sampling and analysis demonstrates otherwise.

Limited Asbestos Roof Survey Report

W.D. Williams Elementary School ■ Swannanoa, North Carolina

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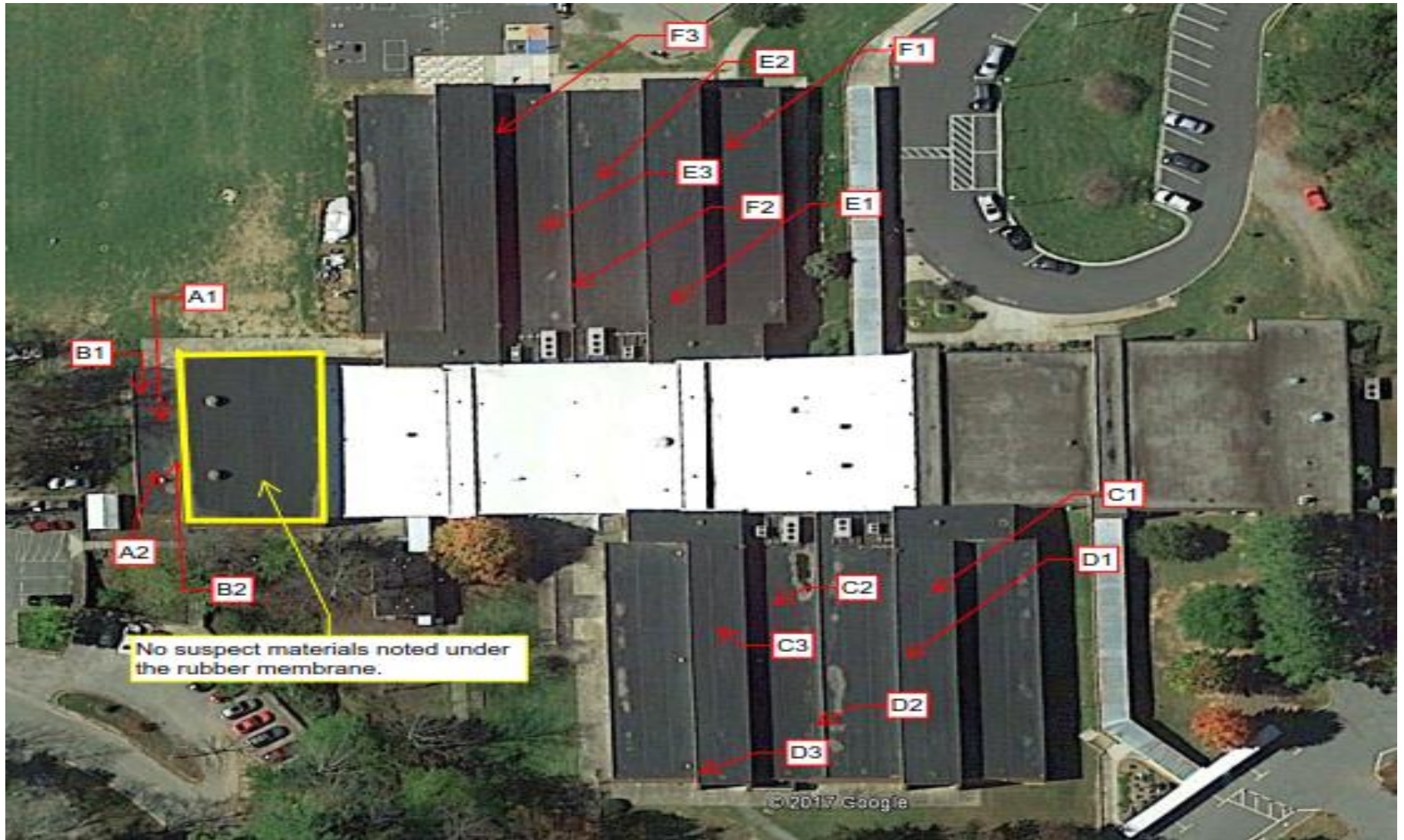
4.0 GENERAL COMMENTS

This survey was conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the same locale. The results, findings, conclusions and recommendations expressed in this report are based on conditions observed during our survey of the building. The information contained in this report is relevant to the date on which this survey was performed, and should not be relied upon to represent conditions at a later date.

This report has been prepared on behalf of and exclusively for use by Buncombe County Schools for specific application to their project as discussed. Terracon does not warrant the work of regulatory agencies, laboratories or other third parties supplying information, which may have been used in the preparation of this report. No warranty, express or implied is made.

This report is not a bidding document. Contractors or consultants reviewing this report must draw their own conclusions regarding further investigation or remediation deemed necessary.

APPENDIX A
FIGURE 1



Sample locations are approximated.

| | | | | | |
|-------------------------|-------------------------|--|--|--|-----------------|
| Project Manager: GKF | Project No. 86177171 | | General Layout / Sample Locations | | Figure 1 |
| Drawn By: SNE | Scale: N.T.S. | | W.D. Williams Elementary School | | |
| Checked By: JAG | File Name: | | Roof Sampling | | |
| Approved By: | Date: 8/29/2017 | | 161 Bee Tree Road Swannanoa, North Carolina | | |
| | | 72 Pointe Circle PH. (864) 292-2901 | Greenville, SC 29615 FAX. (864) 292-6361 | | |

APPENDIX B
TABLE 1

**TABLE 1
ASBESTOS RESULTS SAMPLE SUMMARY**

**W.D. WILLIAMS ELEMENTARY SCHOOL - ROOF SAMPLING
161 BEE TREE ROAD
SWANNANOVA, NORTH CAROLINA
TERRACON PROJECT NO. 86177171**

| Sample Number | Analysis Method | Analytical Results | Sample Description | Sample Description | Homogeneous Area | Classification | Friable / Non-Friable | Current Condition | Potential for Disturbance | Estimated Quantity |
|---------------|-----------------|--------------------|----------------------------------|--|------------------|----------------|------------------------|-------------------|---------------------------|--------------------|
| A1 | PLM | NAD | Locker Room Roof | Built-Up Roofing under a Rubber Membrane | A | Miscellaneous | Non-Friable | Good | LPD | 1,450 SF |
| A2 | PLM | | | | | | | | | |
| B1 | PLM | NAD | Locker Room Roof | Wall Flashing under a Rubber Membrane | B | Miscellaneous | Non-Friable | Good | LPD | 290 SF |
| B2 | PLM | | | | | | | | | |
| C1 | PLM | 20% Chrysotile | Eastern Rubberized Roof Sections | Built-Up Roofing under a Rubber Membrane | C | Miscellaneous | Category I Non-Friable | Good | LPD | 23,875 SF |
| C2 | NA | | | | | | | | | |
| C3 | NA | | | | | | | | | |
| D1 | PLM | 10% Chrysotile | Eastern Rubberized Roof Sections | Wall Flashing under a Rubber Membrane | D | Miscellaneous | Category I Non-Friable | Good | LPD | 3,150 SF |
| D2 | NA | | | | | | | | | |
| D3 | NA | | | | | | | | | |
| E1 | PLM | 10% Chrysotile | Western Rubberized Roof Sections | Built-Up Roofing under a Rubber Membrane | E | Miscellaneous | Category I Non-Friable | Good | LPD | 23,875 SF |
| E2 | NA | | | | | | | | | |
| E3 | NA | | | | | | | | | |
| F1 | PLM | 10% Chrysotile | Western Rubberized Roof Sections | Wall Flashing under a Rubber Membrane | F | Miscellaneous | Category I Non-Friable | Good | LPD | 3,150 SF |
| F2 | NA | | | | | | | | | |
| F3 | NA | | | | | | | | | |

Notes: 1) Quantities listed above are estimates to be used for inspection purposes only and should be field-verified for all other uses.
2) Approximate sampling locations are depicted on Figure 1.

NA - Not Analyzed
NAD - No Asbestos Detected
PLM - Polarized Light Microscopy
TEM - Transmission Electron Microscopy
PACM - Presumed Asbestos Containing Material

LPD - Low potential for disturbance
PD - Potential for disturbance
PSD - Potential of significant disturbance

SF - square feet
LF - linear feet
CF - cubic feet

APPENDIX C
LABORATORY REPORTS



Bulk Asbestos Analysis

By Polarized Light Microscopy
EPA Method: 600/R-93/116 and 600/M4-82-020



Customer: Terracon
72 Pointe Circle
Greenville, SC 29615

Attn: Stephen Ellis
George Flores

Lab Order ID: 1717891
Analysis ID: 1717891_PLM
Date Received: 8/21/2017
Date Reported: 8/24/2017

Project: WD Williams Roofing

| Sample ID | Description | Asbestos | Fibrous Components | Non-Fibrous Components | Attributes |
|---------------|------------------|----------------|----------------------------------|------------------------|--|
| Lab Sample ID | Lab Notes | | | | Treatment |
| A1 | Built-up Roofing | None Detected | 10% Cellulose 10% Fiber Glass | 80% Other | Black Non Fibrous Heterogeneous |
| 1717891PLM_1 | | | | | Dissolved |
| A2 | Built-up Roofing | None Detected | 20% Cellulose 10% Fiber Glass | 70% Other | Black Non Fibrous Heterogeneous |
| 1717891PLM_2 | | | | | Dissolved |
| B1 | Wall flashing | None Detected | 20% Cellulose 10% Fiber Glass | 70% Other | Black Non Fibrous Heterogeneous |
| 1717891PLM_3 | | | | | Dissolved |
| B2 | Wall flashing | None Detected | 40% Cellulose 10% Fiber Glass | 50% Other | Black Non Fibrous Heterogeneous |
| 1717891PLM_4 | | | | | Dissolved |
| C1 | Built-up roofing | 20% Chrysotile | 20% Cellulose | 60% Other | Black, Brown Fibrous Heterogeneous |
| 1717891PLM_5 | | | | | Teased, Dissolved |
| C2 | Built-up roofing | Not Analyzed | | | |
| 1717891PLM_6 | | | | | |
| C3 | Built-up roofing | Not Analyzed | | | |
| 1717891PLM_7 | | | | | |
| D1 | Wall flashing | 10% Chrysotile | 30% Cellulose | 60% Other | Black Fibrous Heterogeneous |
| 1717891PLM_8 | | | | | Teased, Dissolved |

Disclaimer: Due to the nature of the EPA 600 method, asbestos may not be detected in samples containing low levels of asbestos. We strongly recommend that analysis of floor tiles, vermiculite, and/or heterogeneous soil samples be conducted by TEM for confirmation of "None Detected" by PLM. This report relates only to the samples tested and may not be reproduced, except in full, without the written approval of SAL. This report may not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. government. Analytical uncertainty available upon request. Scientific Analytical Institute participates in the NVLAP Proficiency Testing program. Unless otherwise noted blank sample correction was not performed. Estimated MDL is 0.1%.

Bobby Wheatley (16)

Analyst

Approved Signatory



Bulk Asbestos Analysis

By Polarized Light Microscopy
EPA Method: 600/R-93/116 and 600/M4-82-020



Customer: Terracon
72 Pointe Circle
Greenville, SC 29615

Attn: Stephen Ellis
George Flores

Lab Order ID: 1717891
Analysis ID: 1717891_PLM
Date Received: 8/21/2017
Date Reported: 8/24/2017

Project: WD Williams Roofing

| Sample ID | Description | Asbestos | Fibrous Components | Non-Fibrous Components | Attributes |
|---------------|------------------|----------------|--------------------|------------------------|-----------------------------|
| Lab Sample ID | Lab Notes | | | | Treatment |
| D2 | Wall flashing | Not Analyzed | | | |
| 1717891PLM_9 | | | | | |
| D3 | Wall flashing | Not Analyzed | | | |
| 1717891PLM_10 | | | | | |
| E1 | Built-up roofing | 10% Chrysotile | 20% Cellulose | 70% Other | Black Fibrous Heterogeneous |
| 1717891PLM_11 | | | | | Teased, Dissolved |
| E2 | Built-up roofing | Not Analyzed | | | |
| 1717891PLM_12 | | | | | |
| E3 | Built-up roofing | Not Analyzed | | | |
| 1717891PLM_13 | | | | | |
| F1 | Wall flashing | 10% Chrysotile | 30% Cellulose | 60% Other | Black Fibrous Heterogeneous |
| 1717891PLM_14 | | | | | Teased, Dissolved |
| F2 | Wall flashing | Not Analyzed | | | |
| 1717891PLM_15 | | | | | |
| F3 | Wall flashing | Not Analyzed | | | |
| 1717891PLM_16 | | | | | |

Disclaimer: Due to the nature of the EPA 600 method, asbestos may not be detected in samples containing low levels of asbestos. We strongly recommend that analysis of floor tiles, vermiculite, and/or heterogeneous soil samples be conducted by TEM for confirmation of "None Detected" by PLM. This report relates only to the samples tested and may not be reproduced, except in full, without the written approval of SAL. This report may not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. government. Analytical uncertainty available upon request. Scientific Analytical Institute participates in the NVLAP Proficiency Testing program. Unless otherwise noted blank sample correction was not performed. Estimated MDL is 0.1%.

Bobby Wheatley (16)

Analyst

Approved Signatory

1717891

Version 1-15-2012

Client: Terracon
Contact: Stephen Ellis
Address: 72 Pointe Circle, Greenville, SC 29615
Phone: 423-426-2164
Fax:
Email: stephen.ellis@terracon.com
george.flores2@terracon.com
Project: WD Williams Roofing
Client Notes: Positive Stop
P.O. #:
Date Submitted: 8-18-17 1600
Analysis: PLM EPA 600
TurnAroundTime: 3 Day TAT

***Instructions:**
 Use Column "B" for your contact info

 To See an Example Click the
 bottom Example Tab.

 Enter samples between "<<" and ">>"
 Begin Samples with a "<<" above the first sample
 and end with a ">>" below the last sample.
 Only Enter your data on the first sheet "Sheet1"

 Relinquished by:
 Stephen Ellis

Accepted

Rejected

Scientific
 Analytical
 Institute



4604 Dundas Drive
 Greensboro, NC 27407
 Phone: 336.292.3888
 Fax: 336.292.3313
 Email: lab@sailab.com

[Handwritten Signature]
 Stephen Ellis

| Sample Number | Data 1 | Sample Description | Data 2 |
|---------------|--------|--------------------|--------|
| << | | | |
| A1 | | Built-Up Roofing | PLM |
| A2 | | Built-Up Roofing | PLM |
| B1 | | Wall Flashing | PLM |
| B2 | | Wall Flashing | PLM |
| C1 | | Built-Up Roofing | PLM |
| C2 | | Built-Up Roofing | PLM |
| C3 | | Built-Up Roofing | PLM |
| D1 | | Wall Flashing | PLM |
| D2 | | Wall Flashing | PLM |
| D3 | | Wall Flashing | PLM |
| E1 | | Built-Up Roofing | PLM |
| E2 | | Built-Up Roofing | PLM |
| E3 | | Built-Up Roofing | PLM |
| F1 | | Wall Flashing | PLM |
| F2 | | Wall Flashing | PLM |
| F3 | | Wall Flashing | PLM |
| >> | | | |

[Handwritten Signature] 8/21/17

APPENDIX D
PHOTODOCUMENTATION



Photo #1 View of the roof over the locker room.



Photo #2 View of the roof over the high bay gym.



Photo #3 View of the roof system over the eastern portion of the building.



Photo #4 View of the center roof section (not in scope) and the western roof sections.



Photo #5 View of built-up roofing (HA-A) on the locker room roof.



Photo #6 View of wall flashing (HA-B) on the locker room roof.



Photo #7 View of built-up roofing (HA-C, same as HA-E) on the eastern roof sections.



Photo #8 View of built-up roofing (HA-D, same as HA-F) on the eastern roof sections.



Photo #9 View of non-suspect roof materials (wood-fiber insulation and Tectum®) on the high-bay gym roof.

APPENDIX E
INSPECTOR'S CREDENTIALS



Stephen N Ellis
308 Belgray Court
Taylors, SC 29087

115474

North Carolina Asbestos Accreditation

| EXPIRATION | | | |
|-------------|-------|-------|-----|
| 02-28-2018 | | | |
| DOB | SEX | HT | WT |
| 08-22-1987 | M | 5'9" | 180 |
| CLASS | # | EXP | |
| AIR MONITOR | 80884 | 02-18 | |
| INSPECTOR | 12905 | 10-17 | |