

Limited Asbestos Survey Report

**Building 16 Roof Replacement Project
City Services Center
500 15th Avenue SW
Cedar Rapids, Iowa 52404**

July 19, 2016
Terracon Project No. F1166091



Prepared for:
The City of Cedar Rapids - Facilities Maintenance Services
Cedar Rapids, Iowa

Prepared by:
Terracon Consultants, Inc.
Cedar Rapids, Iowa

Attachment G - Building 16 Roof Replacement #PUR0217-183

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Terracon

Environmental ● Facilities ● Geotechnical ● Materials

July 19, 2016



City of Cedar Rapids – Facilities Maintenance Services
500 15th Avenue SW
Cedar Rapids, Iowa 52404

Attn: Mr. Brent Schlotfeldt, Facilities Maintenance Manager
P: 319-286-5809
E: b.schlotfeldt@cedar-rapids.org

Re: Limited Asbestos Survey Report
Building 16 Roof Replacement Project
City Services Center
500 15th Avenue SW
Cedar Rapids, Iowa 52404
Terracon Project No. F1166091

Dear Mr. Schlotfeldt:

Terracon Consultants, Inc. (Terracon) is pleased to submit the attached limited asbestos survey report to the City of Cedar Rapids Facilities Maintenance Services (the City) for the above referenced project. The purpose of this survey report is to present the results of a limited asbestos survey performed on July 6, 2016. This survey was conducted in general accordance with City of Cedar Rapids, Iowa Professional Services Agreement No. 085103-01. This survey was limited to the roof of Building 16 (the Solid Waste Building).

The analytical laboratory reported asbestos concentrations in bulk samples collected as part of the project. Please refer to this report for additional details.

Terracon appreciates the opportunity to provide this service to the City. If you have any questions regarding this report, or if you need assistance with development of asbestos abatement specifications, abatement project oversight, please contact Eric at 319-221-7315.

Sincerely,

Terracon Consultants, Inc.

A handwritten signature in blue ink that reads "Eric Harris".

Eric W. Harris
Project Scientist

A handwritten signature in blue ink that reads "Cindy Baldwin".

Cindy A. Baldwin, CIH, FAIHA
Senior Industrial Hygienist

EWH/CAB:\\cedar-rapids\1\Data\Projects\2016\F1166091\PROJECT DOCUMENTS (Reports-Letters-Drafts to Clients)\F1166091.71916.COCR.Building 16 Roof Limited Asbestos Survey Report.docx

Copies to: Addressee PDF

Terracon Consultants, Inc. 2640 12th Street SW Cedar Rapids, Iowa 52404
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Environmental



Facilities



Geotechnical



Materials

TABLE OF CONTENTS

1.0	INTRODUCTION	1
1.1	Project Objective	1
1.2	Reliance	2
2.0	FIELD ACTIVITIES	2
2.1	Asbestos Survey	2
2.1.1	Asbestos Visual Assessment	2
2.1.2	Asbestos Physical Assessment	2
2.1.3	Asbestos Sample Collection	2
2.1.4	Asbestos Sample Analysis	3
3.0	REGULATORY OVERVIEW	3
3.1	Asbestos	3
4.0	FINDINGS	4
4.1	Asbestos Survey Findings	4
5.0	LIMITATIONS/GENERAL COMMENTS	5

APPENDIX A ASBESTOS INSPECTOR LICENSE

APPENDIX B TABLES

TABLE 1 – IDENTIFIED ASBESTOS-CONTAINING MATERIALS BY HOMOGENEOUS AREA (HA)

TABLE 2 – ASBESTOS SAMPLE SUMMARY

APPENDIX C ANALYTICAL LABORATORY REPORT AND COC

APPENDIX D PHOTOGRAPHIC DOCUMENTATION

APPENDIX E EXHIBIT 1 – APPROXIMATE LOCATIONS OF ACMS

LIMITED ASBESTOS SURVEY REPORT

Building 16 Roof Replacement Project City Services Center Cedar Rapids, Iowa

Terracon Project No. F1166091
July 19, 2016

1.0 INTRODUCTION

Terracon Consultants, Inc. (Terracon) conducted a limited asbestos survey for Building 16 (Solid Waste building) roofing replacement project (the project) at the City Services Center located at 500 15th Avenue SW, Cedar Rapids, Iowa. Terracon's Facilities Division is currently preparing plans for the replacement of the roofing systems on Building 16. The survey was required to determine whether asbestos-containing materials (ACMs) were present in roofing materials prior to commencement of the roofing replacement activities.

The survey was conducted on July 6, 2016 by a state of Iowa licensed asbestos inspector in general accordance with City of Cedar Rapids Professional Services Agreement No 085103-01. This survey was limited to the Building 16 roof. The survey did not include sampling of the known cement asbestos board (Transite™) on the walls of Building 16. Roof system components were surveyed, and homogeneous areas of suspect asbestos-containing materials (ACM) were visually identified and documented.

Although reasonable effort was made to survey accessible suspect materials, additional suspect but unsampled materials could be located under the membrane(s) or in other concealed areas. It should be noted that survey activities were limited to above referenced areas. Suspect ACM samples were collected in general accordance with the sampling protocols outlined in United States Environmental Protection Agency (USEPA) 40 Code of Federal Regulations Part 763-Asbestos, Subpart E-Asbestos-Containing Materials in Schools (40 CFR 763). Samples were delivered to an accredited laboratory for analysis by polarized light microscopy (PLM).

1.1 Project Objective

Asbestos survey services were conducted at the site to satisfy requirements of the USEPA regulations under 40 CFR Part 61, Subpart M, National Emission Standards for Hazardous Air Pollutants (NESHAP), which apply when buildings are renovated or demolished.

1.2 Reliance

This report is for the exclusive use of the City of Cedar Rapids for the project being discussed. Reliance by any other party on this report is prohibited without written authorization of Terracon and the City of Cedar Rapids.

2.0 FIELD ACTIVITIES

2.1 Asbestos Survey

The survey was conducted by Mr. Eric W. Harris, state of Iowa licensed asbestos inspector (license #15-4988). A copy of his asbestos inspector license is attached as Appendix A. The survey was conducted in general accordance with the sample collection protocols established in USEPA 40 CFR 763.86, Sampling. A summary of survey activities is provided below.

2.1.1 Asbestos Visual Assessment

Survey activities were initiated with visual observation of the materials on the roof to identify homogeneous areas of suspect ACM. A homogeneous area (HA) consists of building materials that appear similar throughout in terms of color and texture with consideration given to the date of application. A sub-contractor was retained to core holes for inspection purposes and was also responsible for patching the holes in the roofing membrane.

2.1.2 Asbestos Physical Assessment

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

2.1.3 Asbestos Sample Collection

Based on results of the visual observation, bulk samples of suspect ACM were collected in general accordance with USEPA sampling protocols. Samples of suspect materials were collected from randomly selected locations 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.

The selection of sample locations and frequency of sampling were based on Terracon's observations and the assumption that like materials in the same area are homogeneous in

content. The Styrofoam, and insulation board were not considered suspect materials; therefore, were not sampled.

Terracon collected 22 bulk samples from 11 homogeneous areas of suspect ACM. A summary of suspect ACM samples collected during the survey is included as part of the chain of custody (COC) and is provided in Table 2 in Appendix B. The lab report and the COC are provided in Appendix C.

2.1.4 Asbestos Sample Analysis

Bulk samples were submitted under COC to EMSL Analytical, Inc. (EMSL) in Cinnaminson, New Jersey for analysis by PLM with dispersion staining techniques per USEPA's *Method for the Determination of Asbestos in Bulk Building Materials* (600/R-93-116). EMSL is accredited under the National Voluntary Laboratory Accreditation Program (NVLAP Accreditation No. 101048-0). The percentage of asbestos, if present, was determined by microscopic visual estimation. As a result of laboratory analysis, EMSL further separated out individual layers from the materials submitted; consequently, 2 additional layers were analyzed.

3.0 REGULATORY OVERVIEW

3.1 Asbestos

In Iowa, asbestos activities are regulated by the Iowa Department of Natural Resources (IDNR) and Iowa Workforce Development (IWD), Division of Labor. IDNR regulates asbestos fiber emissions under Iowa Administrative Code 567 Chapter 23 (IAC 567–23) and asbestos-containing waste disposal under IAC 567–109. IWD regulates occupational exposure to asbestos under IAC 875–10 and asbestos removal and encapsulation activities under IAC 875–155.

IAC 567–23.1(3) adopts EPA's asbestos NESHAP (40 CFR Part 61, Subpart M) by reference. 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 friable, Category I nonfriable, or Category II nonfriable ACM. Friable materials are those that, when dry, may be crumbled, pulverized, or reduced to powder by hand pressure. Category I nonfriable ACM includes packings, gaskets, resilient floor coverings, and asphalt roofing products containing more than 1% asbestos. Category II nonfriable ACM are any materials other than Category I materials that contain more than 1% asbestos.

Limited Asbestos Survey Report

Building 16 Roof Replacement Project ■ Cedar Rapids, Iowa

July 19, 2016 ■ Terracon Project No. F1166091



Regulated ACM (RACM) must be removed before renovation or demolition activities that will disturb the materials. RACM includes:

- Friable ACM;
- Category I nonfriable ACM that has become friable or will be subjected to drilling, sanding, grinding, cutting, or abrading; and
- Category II nonfriable ACM that could be crumbled, pulverized, or reduced to powder during renovation or demolition activities.

The owner or operator must provide the IDNR and IWD with written notification of planned removal activities at least 10 working days prior to the commencement of asbestos abatement activities. Removal of RACM must be conducted by an Iowa-permitted asbestos abatement contractor.

IAC 875–155 Asbestos Removal and Encapsulation requires that any asbestos-related activity conducted in a public building be performed by personnel licensed or permitted by the IWD. Inspections for ACM must be conducted by IWD-licensed inspectors. Asbestos abatement must be performed by IWD-permitted asbestos abatement contractors. Management plans developed for the in-place management of asbestos-containing materials must be developed by an IWD-licensed management planner. When an abatement project design is prepared, it must be prepared by an IWD-licensed project designer.

IAC 875–10 adopts the Occupational Safety and Health Administration (OSHA) Asbestos standard for construction (29 CFR 1926.1101) by reference. The OSHA standard requires that employee exposure to airborne asbestos fibers be maintained below the permissible exposure limits (PEL) of 0.1 asbestos fiber per cubic centimeter of air (0.1 f/cc) as an 8-hour time-weighted average and 1.0 f/cc as a 30-minute excursion. The OSHA standard classifies construction and maintenance activities that could disturb ACM and specifies work practices and precautions that employers must follow when engaging in each class of regulated work.

4.0 FINDINGS

4.1 Asbestos Survey Findings

Laboratory analysis of bulk samples confirmed the presence of asbestos in samples collected on July 6, 2016. Table 1 included in Appendix B identifies the confirmed asbestos-containing material, sample locations, and approximate quantity. Table 2 included in Appendix B summarizes the bulk asbestos samples collected as part of the project. EMSL's laboratory analytical report and a summary of the non-detect samples are included as part of the COC in Appendix C. Photographs of the confirmed asbestos materials are presented in Appendix D. Please refer to Exhibit 1 in Appendix E for the approximate location of confirmed ACMs.

Limited Asbestos Survey Report

Building 16 Roof Replacement Project ■ Cedar Rapids, Iowa

July 19, 2016 ■ Terracon Project No. F1166091



Asbestos-containing roofing flashing and bituminous coating were identified on the subject roof. These materials are considered Category I nonfriable ACM in damaged condition. Category I materials are unlikely to release fibers into the air and per USEPA guidance, hand methods (for removal) should not render roofing material friable. Based on our survey activities and understanding of the project, the ACMs on the roof drains are likely to be disturbed. ACMs on the vents may or may not be impacted as part of the project. If the ACMs are to be removed or disturbed, a State of Iowa licensed asbestos abatement firm should be retained to abate the materials. Abatement practices should not include the use of grinders or rotating blades with serrated edges or any other method that renders the material friable, unless the equipment is equipped with local exhaust ventilation and high efficiency particulate air filters. Additionally, the Category I ACM materials need not be disposed of as asbestos-containing waste material provided such Category I ACM remains nonfriable. However, Terracon recommends the landfill operator be notified that debris contains nonfriable asbestos-containing materials.

Asbestos-containing cement piping was identified on the southeastern corner of the lower roof and is a Category II nonfriable ACM in good condition; however, it was supported by a wire attached to the adjacent mechanical duct. A qualified asbestos abatement firm should remove and properly dispose of this material prior to the roof replacement activities.

Contractors should also be aware of the corrugated cement asbestos board (Transite™) siding on the building. As part of the Public Works demolition project, laboratory analysis of the corrugated Transite™ siding indicated concentrations of 19% chrysotile (Terracon Project No. 06117036).

Design drawings should clearly indicate the presence and locations of the ACMs. Upon request, Terracon can provide a proposal to assist with abatement oversight and conduct final visual clearance.

5.0 LIMITATIONS/GENERAL COMMENTS

Terracon did not perform sampling which required removal of the rubber roofing membrane or the termination bar on the parapet walls. Reasonable efforts to access suspect materials within known areas of restricted access (e.g. roof edges, under vents/penetrations) were made; however, were not always sampled.

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

Limited Asbestos Survey Report

Building 16 Roof Replacement Project ■ Cedar Rapids, Iowa

July 19, 2016 ■ Terracon Project No. F1166091



for use by the City of Cedar Rapids Facilities Maintenance Services for specific application to their project as discussed. 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. Terracon does not warrant the work of regulatory agencies, laboratories, or other third parties supplying information that may have been used in the preparation of this report. No warranty, express or implied is made.

APPENDIX A

ASBESTOS INSPECTOR LICENSE

ERIC HARRIS


DOB: 07/02/1986

Issued: 07/27/2015



This person is licensed to perform asbestos work in the State of Iowa. ID card is intended for official use only and must be present on jobsite.

License type	Number	Expires
SUPERVISOR	15-4988	05-04-2016
INSPECTOR	15-4989	07-20-2016

 *Michael A. Mauro*
Michael A. Mauro
Labor Commissioner

APPENDIX B

TABLES

**Table 1 – IDENTIFIED ASBESTOS-CONTAINING MATERIALS BY HOMOGENEOUS
AREA (HA)**

Table 2 – ASBESTOS SAMPLE SUMMARY

Limited Asbestos Survey Report

Building 16 Roof Replacement Project ■ Cedar Rapids, Iowa

July 19, 2016 ■ Terracon Project No. F1166091



Table 1 - IDENTIFIED ASBESTOS-CONTAINING MATERIALS BY HOMOGENEOUS AREA (HA)

The materials listed in this table have been sampled and determined to contain asbestos in concentrations greater than 1%. When disturbed, various federal, state, and local regulations will apply. See Appendix C for detailed analytical results and the sample sheets.

HA #	SAMPLE #	MATERIAL DESCRIPTION	GENERAL AREA PRESENT	SAMPLE LOCATIONS	LAB RESULTS	ESTIMATED QUANTITY ¹
07	07-RF1-013	Bituminous tar coating	Around roof drains	Southernmost roof drain on upper roof	4% Chrysotile	7 roof drains, assumed to be 3 SF ² each; may be more depending on how the drain is tied in to the surrounding decking. Material may have also dripped down inside of the cast piping. Full extent is unknown.
	07-RF1-014			Upper roof, 2 nd drain from the north	5% Chrysotile	
08	08-RF4-015	Black flashing with gray flecks	Round vent stacks with square bottoms on the upper roof, and the cast vent on the north side of the lower roof – material is spotty	East side of the round vent on the north side of the upper roof	8% Chrysotile	3 penetrations; approximately 8 LF ³ or 1.33 SF considering a 2-inch bead
	08-RF4-016			Base of round vent, center of west side upper roof	4% Chrysotile	
11	11-CP2-021	Cement vent pipe (Transite™)	Lower roof southeast corner	At flange, west face	15% Amosite, 25% Chrysotile	5 ½ LF above the roof deck, likely extends below the decking.
	11-CP2-022			4-foot above the roof surface, north side	3% Amosite, 15% Chrysotile	

Contractors should also be aware of the corrugated asbestos cement board siding (Transite™). Based on survey results from the Public Work demolition project (Terracon project no. 06117036), similar corrugated siding (HA A01) was reported to contain 19% chrysotile asbestos by the analytical laboratory.

¹ Estimated quantities are based on a cursory field evaluation, and actual quantities may vary significantly, especially since the materials are spotty and not always present on visible surfaces (i.e. below membranes).

² SF indicates square-feet

³ LF indicates linear-feet

Limited Asbestos Survey Report

Building 16 Roof Replacement Project ■ Cedar Rapids, Iowa

July 19, 2016 ■ Terracon Project No. F1166091



TABLE 2 - ASBESTOS SURVEY SAMPLE LOCATION SUMMARY

HA #	SAMPLE #	MATERIAL DESCRIPTION	GENERAL AREA PRESENT	SAMPLE LOCATION	LAB RESULTS
01	01-RF1-001	Bituminous tar coating	Lower roof, on steel deck (likely historical) and below the membrane/insulation matrix	Lower roof, south side, 10-foot south of chiller and 6-foot east of wall	None detected
	01-RF1-002			Lower roof, east side, south, 3-foot from edge	None detected
02 ⁴	02-RF5-003	¼-inch gypsum board	Lower roof	Same as sample #001	None detected
		Paper (on foam board)			None detected
		Rubber membrane			None detected
	02-RF5-004	¼-inch gypsum board		Same as sample #002	None detected
Rubber membrane		None detected			
03	03-SC7-005	Sealant, white	Flashing on screws in west wall – lower roof, around roof vents (both upper and lower roof), around chiller on lower roof and other penetrations	Upper roof, west side 2 nd vent south from north edge	None detected
	03-SC7-006			Lower roof, west wall below old fire hose reel on center of west wall	None detected
04	04-RF4-007	Black EPDM seam sealant	Lower and upper roof seams	North side of 2 nd most vent to the north, west side on upper roof	None detected
	04-RF4-008			West of the northernmost vent on the lower roof	None detected
05 ⁵	05-RF2-009	Paper on foam board, black	Upper roof, below rubber membrane and buffalo board, on closed cell foam board	35-foot north of the south upper roof edge, 10-foot east of the southernmost roof drain	None detected
	05-RF2-010			Directly east of sample #009, 8-foot west of the east edge to the lower roof	None detected
06 ⁶	06-RF1-011	Bituminous tar coating	Upper roof, under EPDM roofing matrix and on steel deck (likely historical)	Same as sample #010	None detected
	06-RF1-012			Southernmost roof vent – west side	None detected
07	07-RF1-013	Bituminous tar coating	Around roof drains	Southernmost roof drain on upper roof	4% Chrysotile
	07-RF1-014			Upper roof, 2nd drain from the north	5% Chrysotile

⁴ The lower roof EPDM matrix consisted of rubber membrane over ¼-inch gypsum over a layer (3-inch typical) of closed cell foam with a gray paper on the top and bottom of the foam, over polyethylene sheeting, over HA 01.

⁵ This material may be the same as the paper layer in HA 02.

⁶ Likely the same as HA 01

Limited Asbestos Survey Report

Building 16 Roof Replacement Project ■ Cedar Rapids, Iowa

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HA #	SAMPLE #	MATERIAL DESCRIPTION	GENERAL AREA PRESENT	SAMPLE LOCATION	LAB RESULTS
08	08-RF4-015	Black flashing with gray flecks	Round vent stacks with square bottoms on the upper roof, and the cast vent on the north side of the lower roof – material is spotty	East side of the round vent on the north side of the upper roof	8% Chrysotile
	08-RF4-016			Base of round vent, center of west side upper roof	4% Chrysotile
09	09-SC3-017	Grayish paint coating over cream paint	Roof vents	Northeastern most roof vent on upper roof, south face	None detected
	09-SC3-018			Lower roof, southern most vent, north face lower section	None detected
10	10-SC5-019	White rubbery coating with black underside, over yellow paint	Natural gas piping – sporadic	Lower roof, northern most penetration through roof on natural gas pipe	None detected
	10-SC5-020			Natural gas pipe, 10-foot north of sample #019	None detected
11	11-CP2-021	Cement vent pipe (Transite™)	Lower roof southeast corner	At flange, west face	15% Amosite, 25% Chrysotile
	11-CP2-022			4-foot above the roof surface, north side	3% Amosite, 15% Chrysotile

APPENDIX C

LABORATORY ANALYTICAL REPORT AND COC



EMSL Analytical, Inc.

200 Route 130 North Cinnaminson, NJ 08077

Tel/Fax: (800) 220-3675 / (856) 786-5974

<http://www.EMSL.com> / cinnasblab@EMSL.com

EMSL Order: 041618496

Customer ID: ACON77

Customer PO:

Project ID:

Attention: Eric Harris
Terracon Consultants, Inc.
2640 12th Street Southwest
Cedar Rapids, IA 52404

Phone: (319) 366-0032

Fax: (319) 366-0032

Received Date: 07/07/2016 9:30 AM

Analysis Date: 07/11/2016 - 07/14/2016

Collected Date:

Project: Building 16 Roof / 500 15th Ave SW, Cedar Rapids, Iowa 52404 / Soild Waste Building / F1166091

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

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
01-RF1-001 041618496-0001	Lower Roof South Side 10' South of Chiller and 6' E. of Drain - Bituminous Tar Coating on Steel Deck	Black Fibrous Homogeneous	12% Cellulose	88% Non-fibrous (Other)	None Detected
01-RF1-002 041618496-0002	Lower Roof East South 7' From Edge - Bituminous Tar Coating on Steel Deck	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
02-RF5-003-Rubber Membrane 041618496-0003	Lower Roof South Side 10' South of Chiller and 6' E. of Drain - Rubber over 1/4" Gypsum Board over Gray Paper over 3" Foam	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
02-RF5-003-Gypsum Board 041618496-0003A	Lower Roof South Side 10' South of Chiller and 6' E. of Drain - Rubber over 1/4" Gypsum Board over Gray Paper over 3" Foam	White Fibrous Homogeneous	12% Cellulose 7% Glass	81% Non-fibrous (Other)	None Detected
02-RF5-003-Paper 041618496-0003B	Lower Roof South Side 10' South of Chiller and 6' E. of Drain - Rubber over 1/4" Gypsum Board over Gray Paper over 3" Foam	Brown Fibrous Homogeneous	75% Cellulose 10% Glass	15% Non-fibrous (Other)	None Detected
02-RF5-004-Rubber Membrane 041618496-0004	Lower Roof East South 7' From Edge - Rubber over 1/4" Gypsum Board over Gray Paper over 3" Foam	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
02-RF5-004-Gypsum Board 041618496-0004A	Lower Roof East South 7' From Edge - Rubber over 1/4" Gypsum Board over Gray Paper over 3" Foam	White Fibrous Homogeneous	15% Cellulose 5% Glass	80% Non-fibrous (Other)	None Detected
02-RF5-004-Paper 041618496-0004B	Lower Roof East South 7' From Edge - Rubber over 1/4" Gypsum Board over Gray Paper over 3" Foam				Not Submitted

Report amended: 07/14/2016 11:48:25 Replaces initial report from: 07/13/2016 07:47:59 Reason Code: Client-Samples Added



EMSL Analytical, Inc.

200 Route 130 North Cinnaminson, NJ 08077

Tel/Fax: (800) 220-3675 / (856) 786-5974

<http://www.EMSL.com> / cinnasblab@EMSL.com

EMSL Order: 041618496
Customer ID: ACON77
Customer PO:
Project ID:

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

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
03-SC7-005 <i>041618496-0005</i>	Upper Roof West Side 2nd Vent South from N Edge - White Sealant	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
03-SC7-006 <i>041618496-0006</i>	Lower Roof West Wall Below Old Fire Hose - White Sealant	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
04-RF4-007 <i>041618496-0007</i>	North Side of 2nd Most N. Vent on West Side of Upper Edge - Black EPDM Seam Sealant	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
04-RF4-008 <i>041618496-0008</i>	Well of N. Noat Vent on Corner Cove - Black EPDM Seam Sealant	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
05-RF2-009 <i>041618496-0009</i>	35 North of the South Roof Edge 10' E of S Roof Drain - Paper on Foam Board Both Sides Black	Black Fibrous Homogeneous	45% Cellulose 10% Glass	45% Non-fibrous (Other)	None Detected
05-RF2-010 <i>041618496-0010</i>	Directly East of 009 8' West of edge to Lower Roof - Paper on Foam Board Both Sides Black	Black Fibrous Homogeneous	50% Cellulose 15% Glass	35% Non-fibrous (Other)	None Detected
06-RF1-011 <i>041618496-0011</i>	Directly East of 009 8' West of edge to Lower Roof - Bituminous Coating	Black Fibrous Homogeneous	5% Cellulose 6% Min. Wool	89% Non-fibrous (Other)	None Detected
06-RF1-012 <i>041618496-0012</i>	Southren Most Roof Vent on West Side - Bituminous Coating	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
07-RF1-013 <i>041618496-0013</i>	Southren Most Rood Drain on Upper Roof - Bituminous Coating	Black Fibrous Homogeneous		96% Non-fibrous (Other)	4% Chrysotile
07-RF1-014 <i>041618496-0014</i>	Upper Roof 2nd Drain From Norht - Bituminous Coating	Black Non-Fibrous Homogeneous		95% Non-fibrous (Other)	5% Chrysotile
08-RF4-015 <i>041618496-0015</i>	East Side of Round Vent on N Side of Upper Roof - Black Flashing w/Grey Flecks	Black Fibrous Homogeneous		92% Non-fibrous (Other)	8% Chrysotile
08-RF4-016 <i>041618496-0016</i>	Base of Round Vent Center of West Side Upper Roof - Black Flashing w/Grey Flecks	Black Non-Fibrous Homogeneous		96% Non-fibrous (Other)	4% Chrysotile
09-SC3-017 <i>041618496-0017</i>	NE Most of Roof Vent on Upper Roof South Face - Greyish Paint Coating over Cream	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
09-SC3-018 <i>041618496-0018</i>	Cone Roof Southren Most Vent North Face Low - Greyish Paint Coating over Cream	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Report amended: 07/14/2016 11:48:25 Replaces initial report from: 07/13/2016 07:47:59 Reason Code: Client-Samples Added



EMSL Analytical, Inc.

200 Route 130 North Cinnaminson, NJ 08077

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EMSL Order: 041618496
Customer ID: ACON77
Customer PO:
Project ID:

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

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
10-SC5-019 <i>041618496-0019</i>	Lower Rii Northren Most Penetration - White Coating w/Black under Yellow Paint Gas Pipe	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
10-SC5-020 <i>041618496-0020</i>	Pipe 10' N of #019 - White Coating w/Black under Yellow Paint Gas Pipe	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
11-CP2-021 <i>041618496-0021</i>	At Flance West Face - Transite Vent Pipe	Gray/White Non-Fibrous Homogeneous		60% Non-fibrous (Other)	15% Amosite 25% Chrysotile
11-CP2-022 <i>041618496-0022</i>	4' AGS on North Side - Transite Vent Pipe	Gray Fibrous Homogeneous		82% Non-fibrous (Other)	3% Amosite 15% Chrysotile

Analyst(s)

Frank Dicrescenzo (1)

Michael Orsini (12)

William Bradford (12)

Benjamin Ellis, Laboratory Manager
or Other Approved Signatory

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

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ NVLAP Lab Code 101048-0, AIHA-LAP, LLC-IHLAP Lab 100194, NYS ELAP 10872, NJ DEP 03036, PA ID# 68-00367

Report amended: 07/14/2016 11:48:25 Replaces initial report from: 07/13/2016 07:47:59 Reason Code: Client-Samples Added

01168196

Lab Order ID: Select a Laboratory:
 Lab Location: HQ - Cinnaminson, NJ 101048-0 Page 1 of 2

Asbestos Bulk Sample and Chain of Custody Form

Cedar Rapids: 2640 12th St., SW, Cedar Rapids, IA 52404 (319) 366 8321

Project Name: Building 16 Roof Project Number: JF1166091
 Project Address: 500 15th Ave SW City/State / Zip: Cedar Rapids, Iowa 52404
 Site/Building: Solid Waste Building

Project Manager: D. Smith
 Email Results To: eric.harris@terracon.com

RECEIVED

2016 JUL -7 A 10: 52

Sample Identification HA - Code - Sample #	Sample Location Description	HA General Location	Material Description (Type; Color/Texture)	Quantity (SF, LF, Cubic Ft, Units)	MESHAP Classification ¹	Notes/Physical Condition ²
01 - RA - 001	Lower roof south side, 6' south of chiller and 6' east	Lower roof under HAZ or fan	Bifurcated black or steel deck		F C1 C2	Some C and found on floor
02 - RA - 002	Lower roof east side, south of fan	Lower roof	Rubber over 1/4" gfl board over 3" foam over 3" fan		F C1 C2	foam not included in substrate
03 - RA - 003	Same as #001	Flashing on roof in west wall corner roof, around roof vents and chiller upper roof and lower roof	White sealant		F C1 C2	G D SD
04 - RA - 004	Same as #002	Lower/upper roof seams	Black EPDM seam sealant		F C1 C2	G D SD
05 - RA - 005	Upper roof west side, 2nd vent south from N. side	Upper roof	Paper on floor board (both sides) black,		F C1 C2	G D SD Rubber - fast to fan Paper - fan - to paper - VHS fan - SA
06 - RA - 006	Lower roof west wall below old fire hose reel	may be similar to that in HAZ 02				
07 - RA - 007	North side of 2nd roof N. vent on west side of upper roof					
08 - RA - 008	West of N. West vent on lower roof					
09 - RA - 009	35' North of the roof up roof edge, 10' E of S. roof drain					
10 - RA - 010	Directly east of 009, 8' west of E edge to lower roof					

Inspector's Signature: [Signature] Date: 7/6/16 Time: 1315
 Received by: [Signature] Date: 7/6/16
 Instructions: Terracon ARMS: Stop Positive: Number of samples: 22

¹ F = Friable; C1 = Category I; packings, gaskets, asphaltic roofing products, resilient flooring; C2 = Category II Non-Friable: any materials other than Cat. I containing >1% asbestos
² G = Good (<1%); D = Damaged (<10% localized); or SD = Significantly Damaged (>10% distributed or >25% localized)

041618496



Asbestos Bulk Sample and Chain of Custody Form

Cedar Rapids: 2640 12th St., SW, Cedar Rapids, IA 52404 (319) 366 8321

Lab Order ID: _____

Select a Laboratory:

RECIEVED
Lab Location: HQ - Cincinnati, NJ 101048-0

CINNAMISON, NJ Page 2 of 2

Sample Identification HA - Code BS - Sample #	Sample Location Description	HA General Location	Material Description (Type, Color/Texture)	Quantity (SF, LF, Cubic Ft Units)	NESHAP Classification	Notes/Physical Condition?
06-RP1-011	Same as sample #10	Upper roof on steel, appears historic	Bituminous coating (may have some foam/buffalo board mixed in)		F C1 C2	(G) D (SD) Likely to be same as HA #10
06-RP1-012	Southern most roof vent on west side					
X-F-1-X	X					
07-RP1-013	Southern most roof drain on upper roof	Roof drains upper roof	Bituminous coating from former belvedere roof		F C1 C2	(G) D (SD)
07-RP1-014	Upper roof 2nd drain from North					
X-X-X-X	X					
08-RP1-015	East side of round vent on N. side of upper roof	Round vent steel towers N. end of upper roof	Black flashing w/ grey fleck	BLF 3 penetrations	F C1 C2	(G) D (SD) Same may be friable
08-RP1-016	Base of round vent, center of west side upper roof					
X-X-X-X	X					
09-RP1-017	NE most roof vent on upper roof, South face	Roof vent paint	Grey paint coats over cream		F C1 C2	(G) D (SD) many areas flaking off
09-RP1-018	Corner roof Southern most vent, North face, low					
X-X-X-X	X					
10-RP1-019	Lower roof, Northern most penetrator through roof	Lower/upper roof gas line	White waxy coating w/ black under, yellow paint in gas pipe		F C1 C2	(G) D (SD)
10-RP1-020	PIPE TO N of #019					
X-X-X-X	X					
11-RP1-021	At fence, west face	Lower roof SEC	Transit vent pit	5.5' Dia	F C1 C2	(G) D (SD) Area
11-RP1-022	4'-foot AGI on North side					
X-X-X-X	X					

APPENDIX D

PHOTOGRAPHIC DOCUMENTATION

PHOTOGRAPHIC DOCUMENTATION
Building 16 Roof Replacement
Cedar Rapids, Iowa



Photo 1: View of Building 16 roof access, looking north.



Photo 2: Picture of cast vent penetration with ACM flashing on lower roof, looking south.

PHOTOGRAPHIC DOCUMENTATION
Building 16 Roof Replacement
Cedar Rapids, Iowa



Photo 3: View of asbestos-containing flashing on cast vent on lower roof.

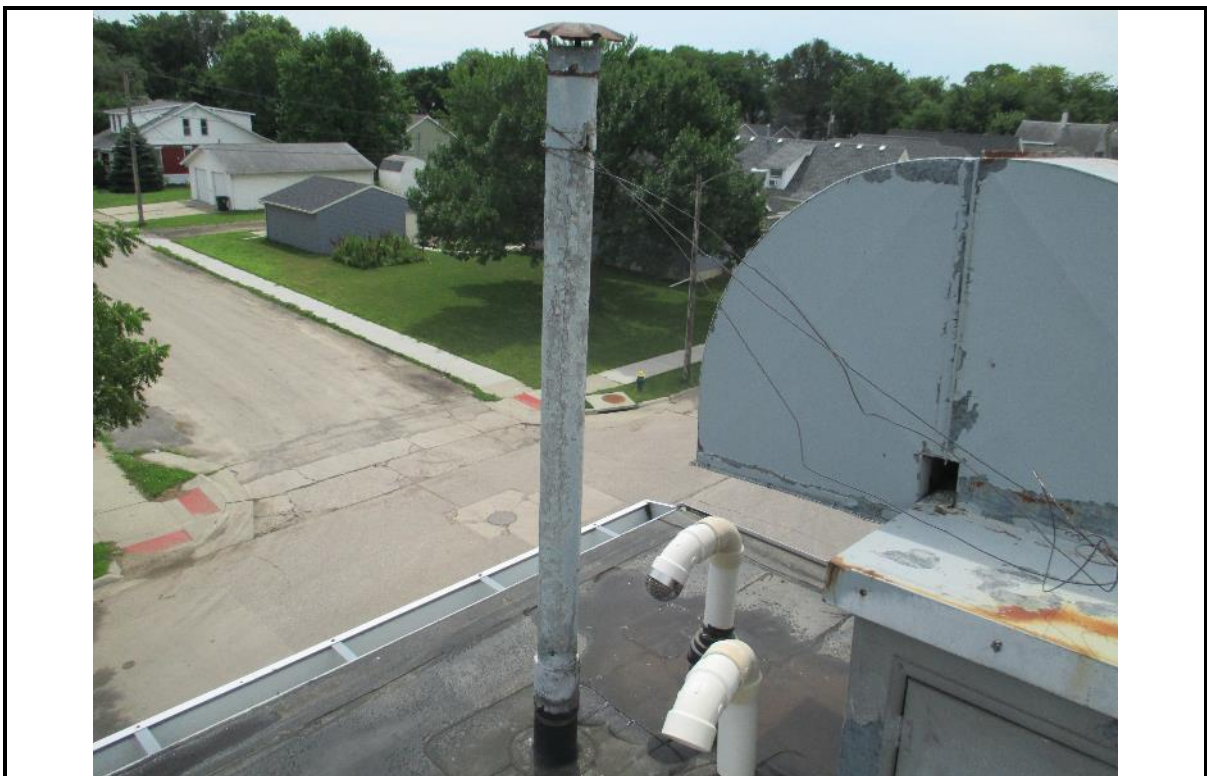


Photo 4: View of asbestos-containing cement pipe on lower roof, southeast corner.

PHOTOGRAPHIC DOCUMENTATION
Building 16 Roof Replacement
Cedar Rapids, Iowa



Photo 5: View of upper roof looking north.



Photo 6: Picture showing the asbestos-containing flashing on the round vent on the north side of the upper roof.

PHOTOGRAPHIC DOCUMENTATION
Building 16 Roof Replacement
Cedar Rapids, Iowa



Photo 7: View the asbestos flashing on the north side round vent.



Photo 8: Picture showing the bituminous coating in the upper roof drains.

PHOTOGRAPHIC DOCUMENTATION
Building 16 Roof Replacement
Cedar Rapids, Iowa



Photo 9: View of the asbestos bituminous coating in the roof drain



Photo 10: Picture of the asbestos cement board siding on the building.

APPENDIX E





EXHIBIT 1 – APPROXIMATE LOCATIONS OF ACMS

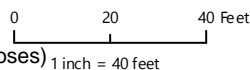
Exhibit 1 - Approximate Locations of ACMs



Linn County, Iowa | IT Department | GIS Division

Legend:

-  - Approximate location of ACM flashing (black with grey flecks) on penetrations
-  - Approximate location of ACM cement piping
-  - Approximate location of ACM bituminous coating on roof drains
-  - Approximate location known Transite cement board (for informational purposes)



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Linn County Auditor's Department
405 2nd St SW
Cedar Rapids, IA 52404
(319) 892-5300

