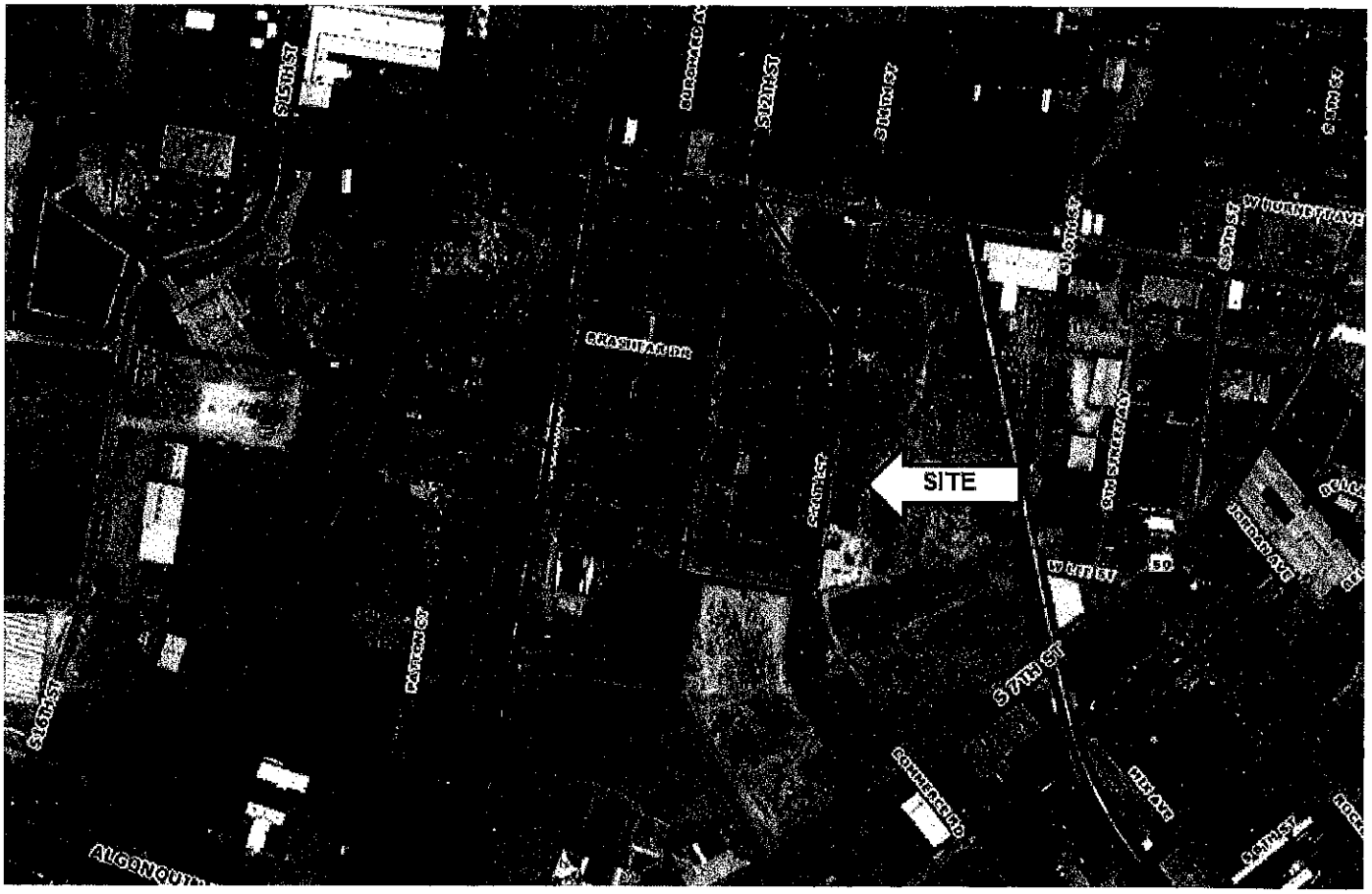
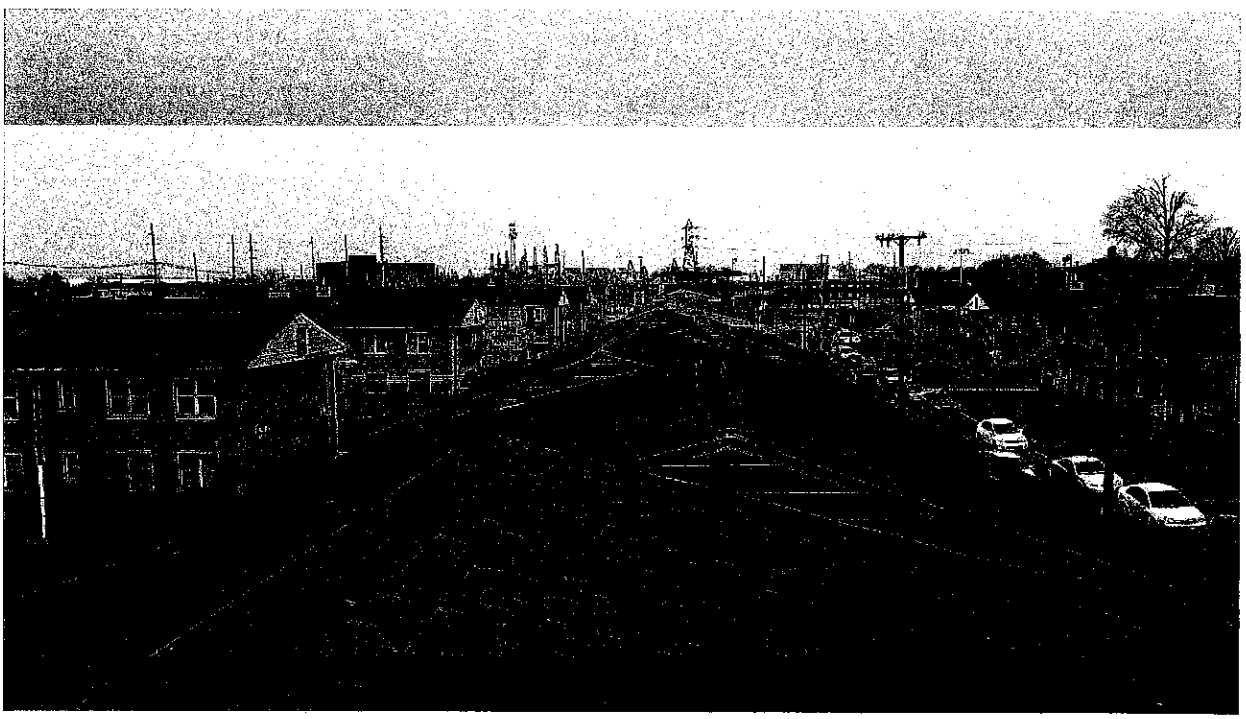
APPENDIX A

SITE LOCATION FIGURE AND SITE PHOTOGRAPHS



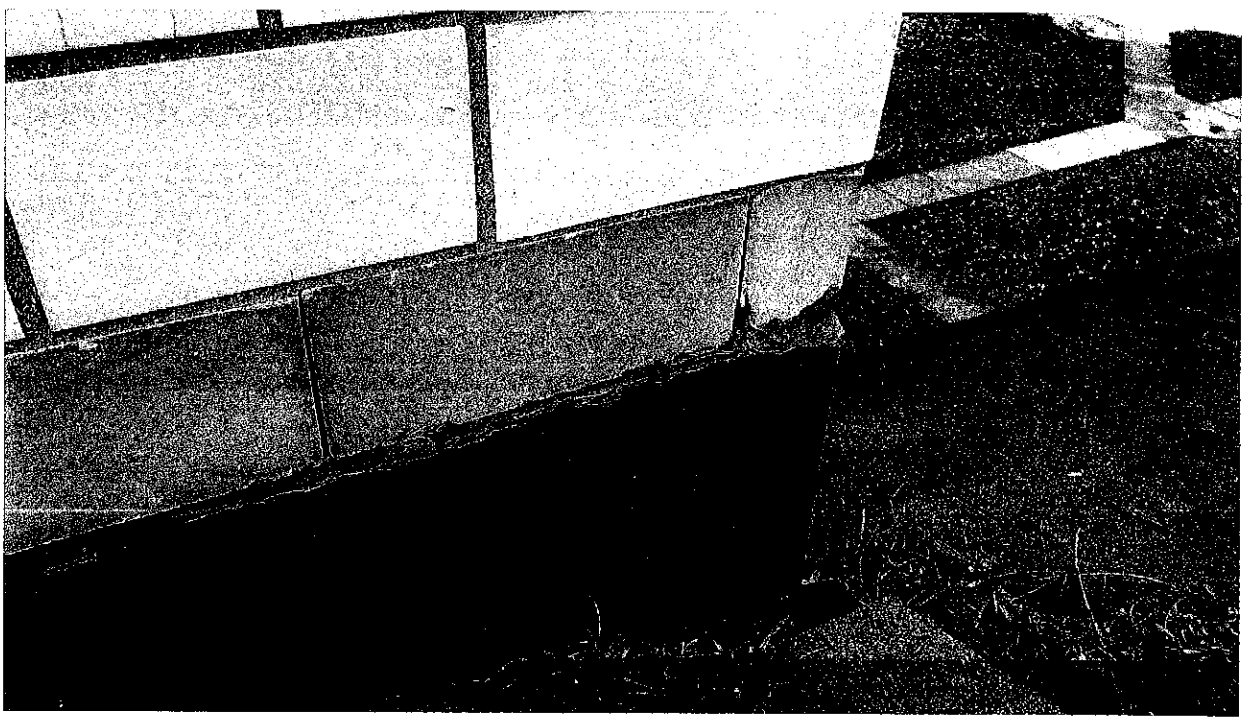
N	Figure 1	**Parkway Place Housing Community** Louisville, KY
	NTS	February 20, 2020

1	DESCRIPTION	View of the gabled roofing systems looking northeast.
	DATE	February 20, 2020



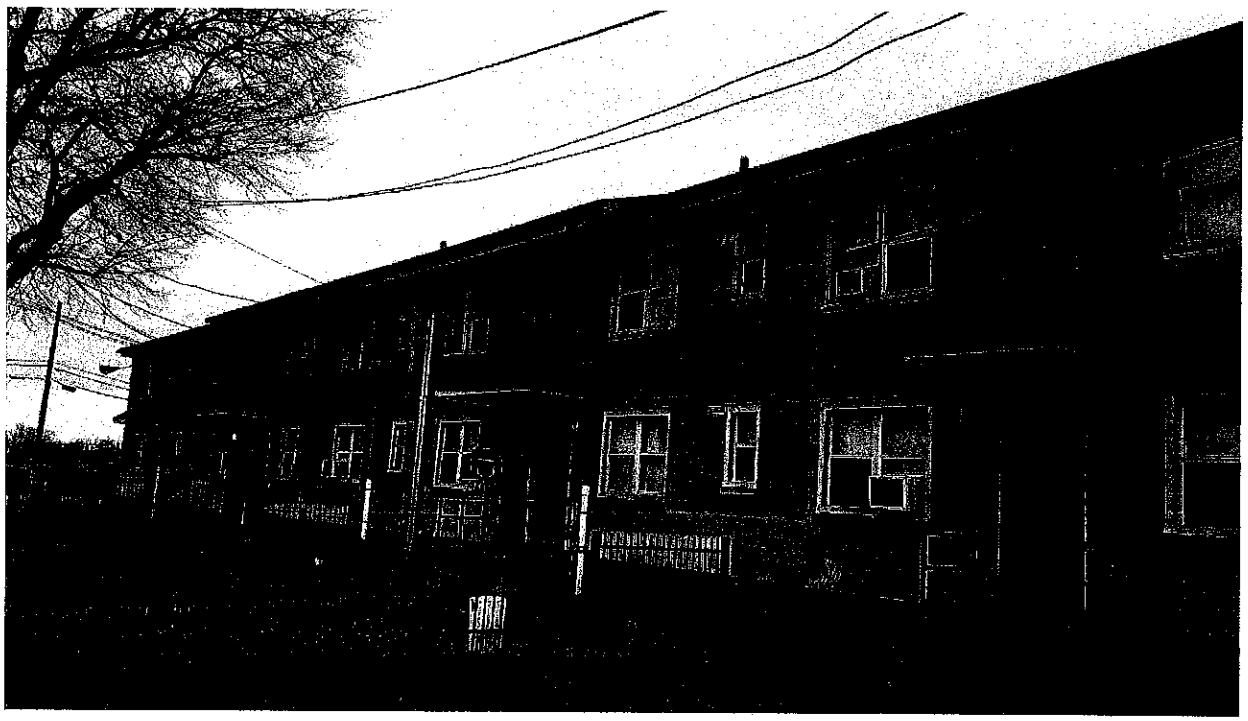
2	DESCRIPTION	View of the gabled roofing system on building 26.
	DATE	February 20, 2020

3	DESCRIPTION	View of a vent penetration boot on building 3. Flashing caulk was not observed on any vent penetrations.
	DATE	February 20, 2020

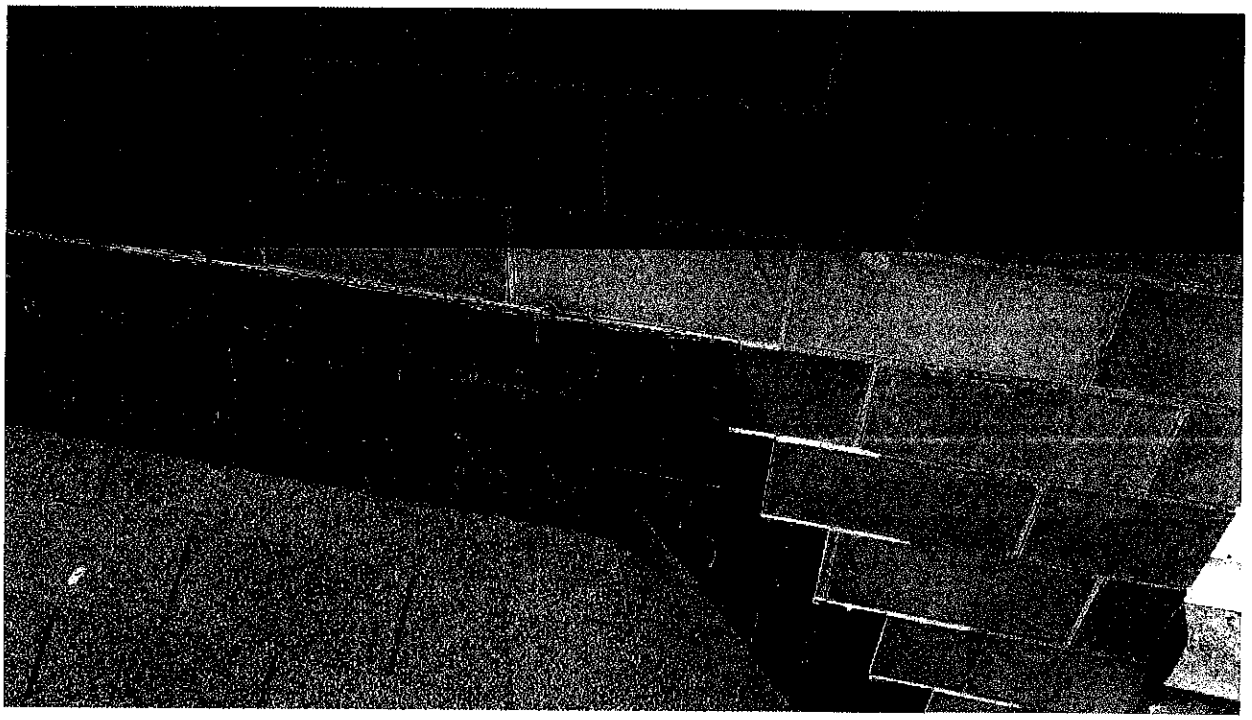


4	DESCRIPTION	View of the chimney flashing on building 2.
	DATE	February 20, 2020

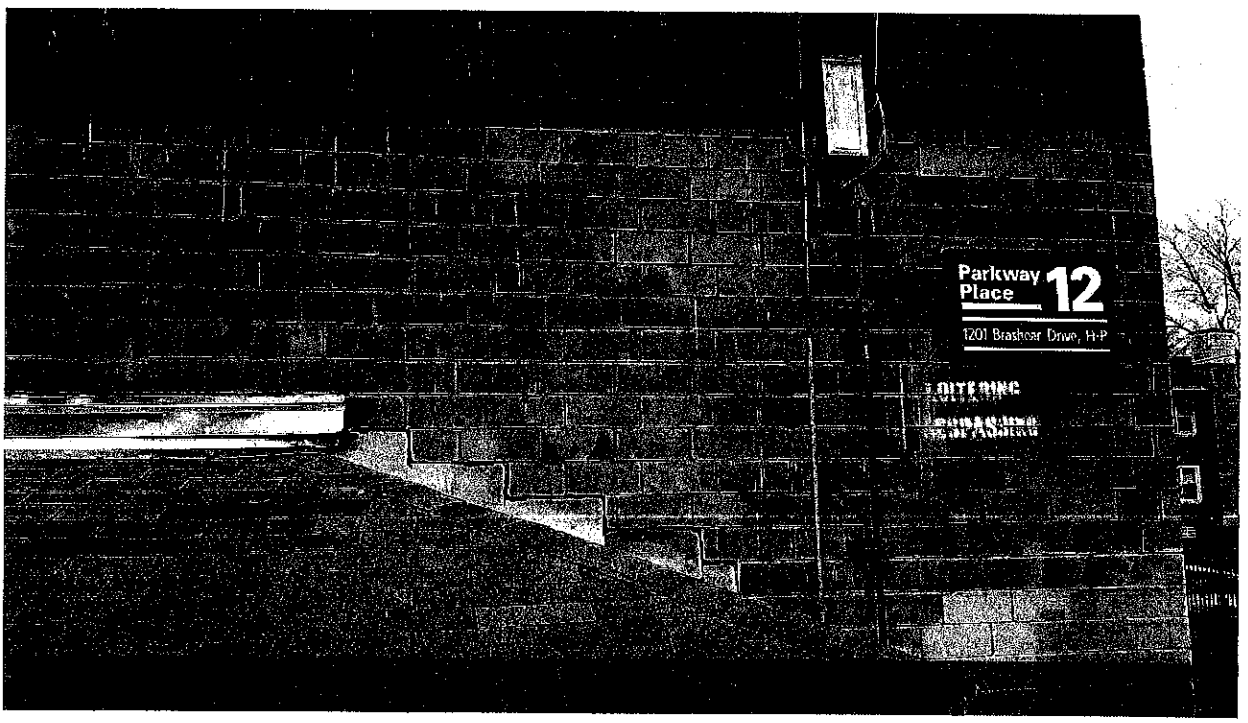
5	DESCRIPTION	View of a single layer of asphalt shingles and tar paper over a plywood roof deck on building 5.
	DATE	February 20, 2020



6	DESCRIPTION	Ground level view of awnings over apartment entrances.
	DATE	February 20, 2020



7	DESCRIPTION	View of an awning over apartment entrances on building 3. The caulk between the flashing and the block is positive for ACM.
	DATE	February 20, 2020



8	DESCRIPTION	View of an awning over the basement entrance of building 12. The white caulk beneath the brown top layer of caulk is positive for ACM.
	DATE	February 20, 2020

9	DESCRIPTION	View of a roof deck elevation transition on building 32. Caulk was not observed associated with the Al trim or flashing.
	DATE	February 20, 2020

10	DESCRIPTION	View of a roof deck elevation transition on building 4. Caulk was not observed associated with the Al trim or flashing.
	DATE	February 20, 2020

11	DESCRIPTION	View of a roof deck elevation transition on building 11. The tar beneath the top layer of caulk between the shingles and siding is positive for ACM.
	DATE	February 20, 2020

12	DESCRIPTION	View of a roof deck elevation transition on building 11. The tar beneath the top layer of caulk between the shingles and siding is positive for ACM.
	DATE	February 20, 2020

APPENDIX B

HISTORIC DOCUMENTS

LIMITED ASBESTOS CONTAINING MATERIALS INSPECTION REPORT

Building 17 – Roof and Fire Damaged Units
Parkway Place Housing Community
Louisville, Kentucky 40210

Prepared for:

Louisville Metro Housing Authority
420 South Eighth Street
Louisville, Kentucky 40203

Prepared by:

TriEco, LLC
7710 Springvale Drive, Suite 201
Louisville, Kentucky 40241-2745

PROJECT NO. 12-TE0731

REPORT DATE
August 8, 2012

Table of Contents

1.0 ASBESTOS INSPECTION

1.1 BACKGROUND AND SITE SUMMARY

TriEco, LLC (TriEco), on behalf of the Louisville Metro Housing Authority (LMHA), has compiled this report following a limited inspection for asbestos containing materials (ACM) associated with the roof and fire damaged unit(s) within Building 17 at the Parkway Place Housing Community. The objective of this project was to collect material that would assist in the identification of ACM which may be disturbed during renovation activities. The subject property is a multi-family residential community consisting of 58 buildings with 654 individual apartment units. Each building consists of brick construction with a pitched shingled roof and a full concrete basement. The housing community was constructed in 1943 and is located within downtown Louisville near the intersection of South 13th Street and West Hill Street. All inspection and sampling activities were conducted in accordance with the National Emissions Standard for Hazardous Air Pollutants (NESHAP) General Inspection Procedures found within 40 CFR 61, Subpart M. Historic record reviews and owner/operator questionnaires were not part of this assessment. This inspection report provides background information, scope-of-work performed, limitations and exceptions, assessment results, findings and conclusions, and recommendations. Selected site photographs are included within Appendix A.

Asbestos is a general term for a group of fibrous minerals (primarily chrysotile, amosite, and crocidolite) that have long been used as a fireproof insulation and as a strengthener in pipe insulation, roofing tiles, floor tiles, mastic, wall coverings, and other materials. Undisturbed asbestos containing materials (ACMs) are not dangerous. However, when ACMs are broken or torn (such as during remodeling or demolition) the fibers can be spread into the air, especially if the material is friable. A material is considered an ACM if it is found to contain 1% or greater of asbestos. Studies have shown that inhaling high concentrations of these fibers over time can cause diseases such as asbestosis, lung cancer, and mesothelioma. The Louisville Metro Air Pollution Control District requires all asbestos containing materials be removed prior to demolition or renovation regardless of friability or quantity. Therefore, any exemptions for abatement based on friability or reportable quantities are not applicable when dealing with demolition or renovations in the Louisville Metropolitan Area.

1.2 LIMITATIONS AND EXCEPTIONS

This assessment pertains directly to those areas observed and sampled within the subject property and is not intended to provide indoor air quality data or information for the entirety of the structure. Only those areas accessible during the site visit including living areas considered "typical" of those conditions and materials found throughout the property structure were sampled for laboratory analysis. This assessment was limited to the roof and fire damaged units of Building 17. Other areas were not accessed or sampled for laboratory analysis.

None of the work performed hereunder shall constitute or be represented as a legal opinion of any kind or nature, but shall be a representation of findings from the site visit. There are no warranties or guarantees, expressed or implied, included or intended by the report, except that it has been prepared in accordance with the current generally accepted practices and standards

consistent with the level of care and skill exercised under similar circumstances by professional consultants or firms performing the same or similar service.

Changes in the condition of the building may occur with time due to either natural processes or human activities. The findings presented in this report are based on site conditions existing at the time of the investigation. The potential exists for ACM to be present in areas that may not be reveled until renovation or remodeling activities begin. During renovation or remodeling activities, if potential ACM materials are discovered that are not identified within this report, those materials should be sampled by a licensed inspector, analyzed by an accredited laboratory, and removed accordingly. This report was compiled for the sole use of the Louisville Metro Housing Authority. This report is not intended to be distributed or relied upon by third parties without the written permission of TriEco.

1.3 SCOPE OF WORK

TriEco performed the following scope-of-work, which was based, in part, upon information provided by persons deemed knowledgeable of the property and our experience with similar projects.

An assessment for ACM was conducted within Building 17 at the Parkway Place Housing Community on August 2, 2012. The survey was performed to assess potential ACM within the roofing system and fire damaged components prior to replacement and renovation activities. Gregory Bailey, a Kentucky accredited asbestos inspector, conducted the survey activities. A copy of Mr. Bailey's Kentucky credentials is included in Appendix B.

Samples of potential ACM were collected from homogeneous areas, which consisted of materials that were similar in color, texture, and size. A copy of the building material sample log is included in Appendix C. The suspect ACM samples were delivered to San Air Laboratory, Inc (San Air) of Powhatan, Virginia for Polarized Light Microscopy (PLM) analysis under chain of custody protocols. The National Voluntary Laboratory Accreditation Program (NVLAP) accredits San Air for Asbestos Fiber Analysis. A summary of positive ACM samples collected and results are listed in Section 1.4.

1.4 RESULTS

A copy of the San Air Laboratory analytical results for the ACM assessment is included in Appendix D. A summary of analytical results positive for ACM are noted in the following table:

ASBESTOS CONTAINING MATERIAL

SAMPLE ID	COLOR/DESCRIPTION	FRIABILITY	RESULT
10-A	Floor Tile	Non Friable	**3% Chrysotile**
10-A1	Floor Tile Mastic	Non Friable	**5% Chrysotile**
12-A	Green Exterior Window Caulk	Non Friable	**3% Chrysotile**

1.5 FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

TriEco has performed this assessment for ACM within Building 17 at the Parkway Place Housing Community in Louisville, Jefferson County, Kentucky in accordance with the scope of services as defined in this report. Our assessment has revealed the following:

- ACM was indicated within the composite floor tile and mastic located through the entirety of the interior of the fire damaged units.

- ACM was indicated with the green exterior window caulk located under the sill wrapping.

Recommendations

Based upon the results of this limited assessment, TriEco recommends the following:

- Abatement is required prior to the planned renovation activities that will disturb the asbestos containing materials. All defined quantities must be field verified by the abatement contractor. Asbestos abatement should occur in accordance with local, state, and federal regulations including those of the Louisville Metro Air Pollution Control District.

- Should potential Asbestos Containing Materials (ACMs) be discovered during renovation activities that have not previously been sampled all renovation activities which disturb the potential ACM should cease until the material(s) have been sampled. If asbestos is discovered during renovation activities, appropriate asbestos abatement should occur in accordance with federal, state, and local regulations.

- All contractors and employees should be alerted to the presence and location of the identified and presumed ACM and hazards, in accordance with applicable Occupational and Safety Health Administration (OSHA) regulations.

- A standardized specification for abatement should be established for the removal of asbestos containing materials identified at the referenced property. It is recommend that a licensed asbestos designer develop the specification to address important issues including an accurate scope of work, regulatory requirements, insurance

requirements, notification procedures, air sampling requirements and other pertinent information.

- If demolition/renovation to any areas outside the original project scope is planned, it will be necessary to investigate and collect bulk samples in order to confirm the presence or absence of asbestos content.

1.6 APPENDICIES

1.6.1 Appendix A: Selected Site Photographs
1.6.2 Appendix B: License and Certifications
1.6.3 Appendix C: Building Survey Sample Log
1.6.4 Appendix D: Laboratory Analytical Results

2.0 SIGNATURES AND QUALIFICATIONS OF ENVIRONMENTAL PROFESSIONALS

Prepared by:

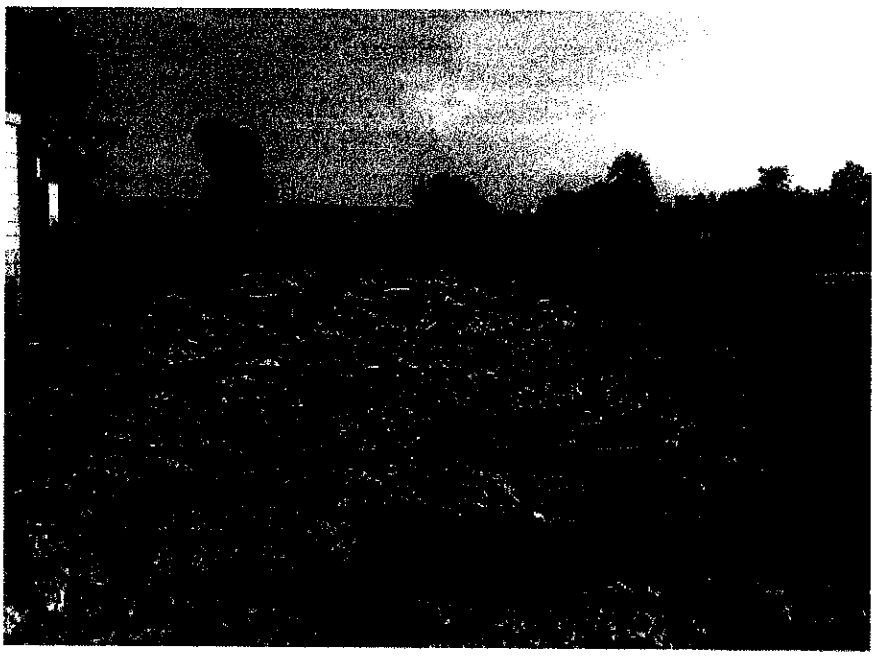
Gregory Bailey
Environmental Scientist

Date: August 8, 2012

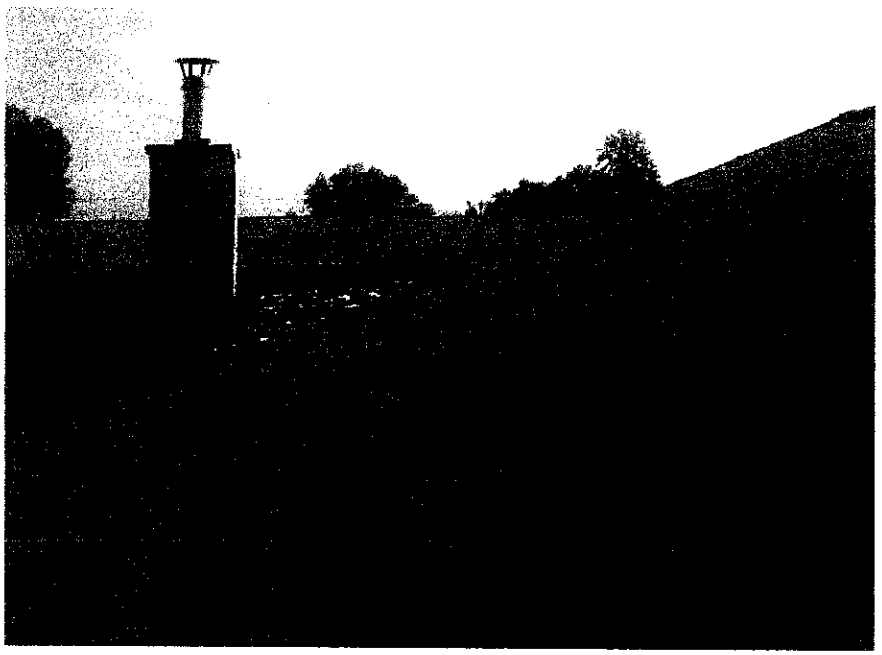
Mr. Bailey is an Environmental Site Supervisor for TriEco and has over two years of environmental management, industrial hygiene and remediation experience. Mr. Bailey is a Kentucky Accredited Asbestos Inspector with additional experience including characterization, profiling, coordination, and disposal of hazardous and nonhazardous waste. Mr. Bailey has experience managing soil, asbestos, and mold remediation projects.

APPENDIX A

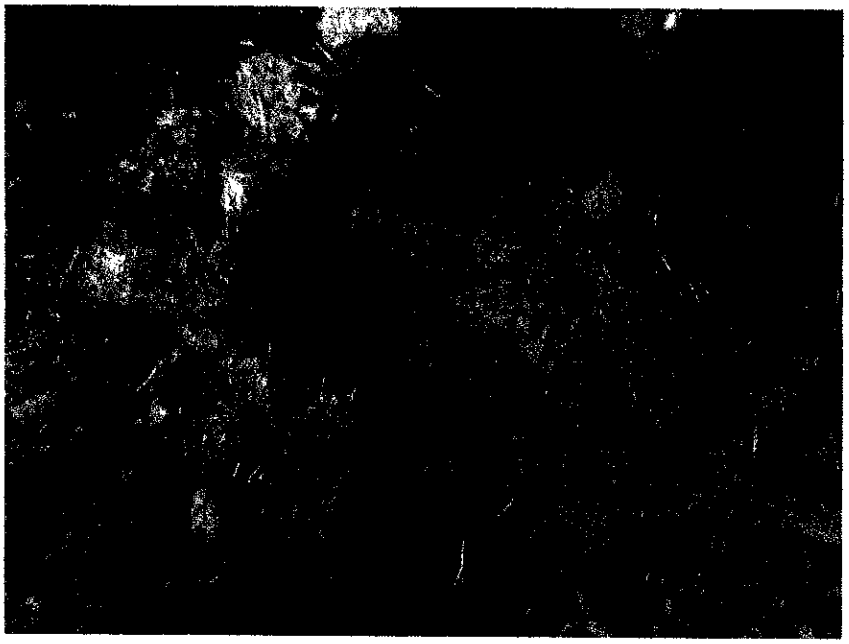
SELECTED SITE PHOTOGRAPHS



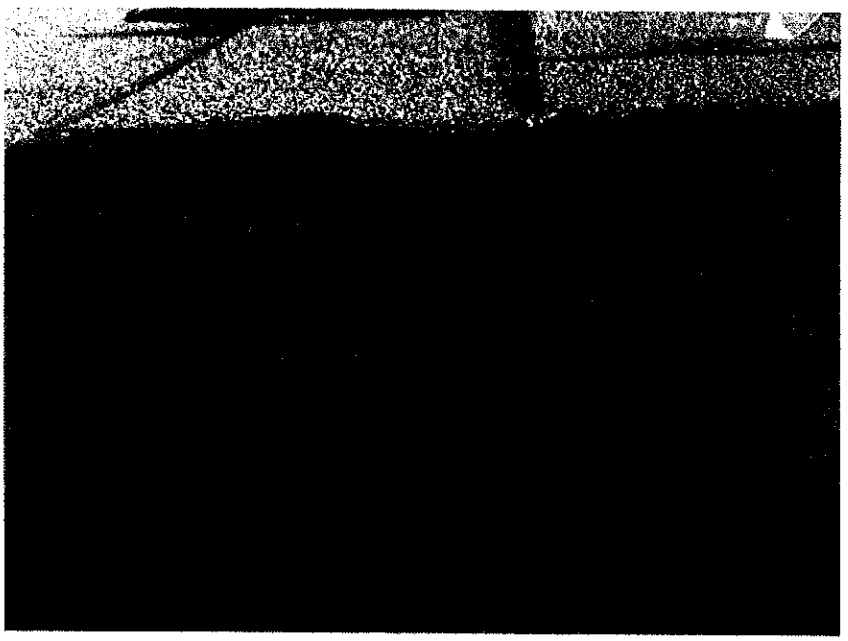
1	DESCRIPTION	View of Fire Damaged Roof of Building 17
	DATE	August 2, 2012



2	DESCRIPTION	View of Intact Shingled Gable Roof
	DATE	August 2, 2012

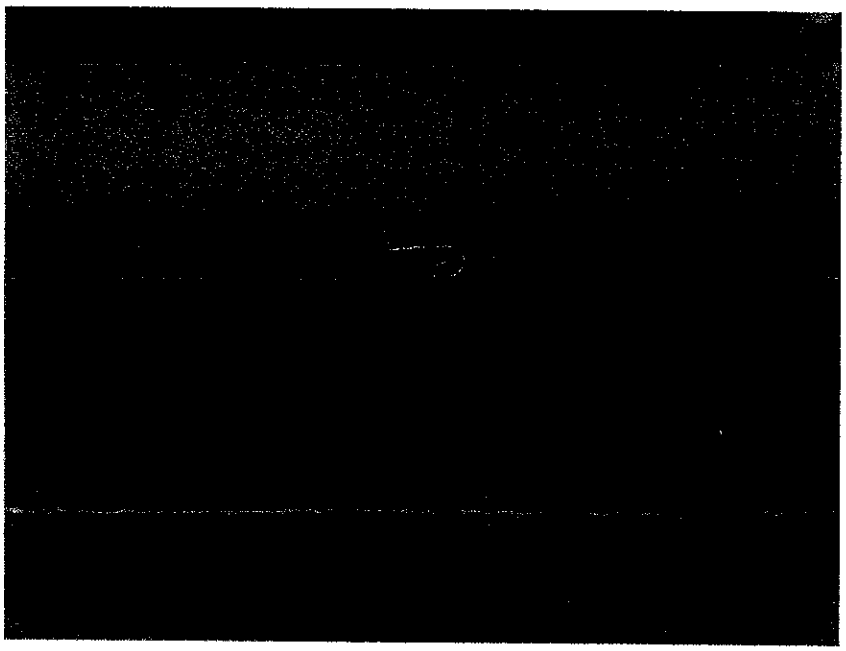


3	DESCRIPTION	View of Multi-Layer Built up Asphalt Roof on Concrete Slab
	DATE	August 2, 2012



4	DESCRIPTION	View of Single Layer of Shingle and Tar Paper on Pitched Roof
	DATE	August 2, 2012

5	DESCRIPTION	View of Composite Tile and Mastic Positive for ACM
	DATE	August 2, 2012



6	DESCRIPTION	View of Green Window Caulk Positive for ACM
	DATE	August 2, 2012

APPENDIX B

LICENSES AND CERTIFICATIONS

Steven L. Beshear
Governor

Leonard K. Peters
Secretary

Commonwealth of Kentucky
Energy and Environment Cabinet
Department for Environmental Protection
Division for Air Quality
200 Fair Oaks Lane, 1st Floor
Frankfort, Kentucky 40601-1403
www.air.ky.gov

November 30, 2011

Mr. Gregory Bailey
TRIECO
7710 Springvale Dr.
Louisville, KY 40241

RE: I11-11-2337

Issued: November 30, 2011
Expires: October 28, 2012

Dear Mr. Bailey:

This is to acknowledge receipt of your application for accreditation as an asbestos abatement professional. Your application for *asbestos inspector* has been approved and the above-referenced card is enclosed.

Kentucky is issuing accreditation in five disciplines. It is important to note that accreditation in some disciplines automatically allows performance in other disciplines. A management planner is automatically allowed to perform additionally as an inspector, and an abatement supervisor is automatically allowed to perform additionally as an abatement worker. The initial accreditation fee is $100.00 per person per discipline, except for abatement worker ($20.00). For example, if anyone seeks accreditation as an inspector and an abatement worker, the fee will be $120.00 and they will be issued two cards. If they seek accreditation in all five disciplines, the fee is $300.00, and they will be issued three cards; one for project designer, management planner for inspections and plans, and supervisor for the other two disciplines. The renewal fee is one-half the initial fee. There is a $10.00 duplication charge to replace a lost card.

If you have any questions regarding this matter you may call Ms. Cindy Mitchell at (502) 564-3999.

Sincerely,

Cindy K. Mitchell

Cindy K. Mitchell
Environmental Technologist III
Field Support Section

COMMONWEALTH OF KENTUCKY
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION FOR AIR QUALITY

Has fulfilled the requirements of 40 CFR 58:005 and is
ACCREDITED as an
ASBESTOS INSPECTOR

Date Issued 11-30-11 10-28-12

Cindy K. Mitchell
Cindy Mitchell
Environmental Technologist III

John S. Lyons
Director

No. I11-11-2337

APPENDIX C

BUILDING SURVEY SAMPLE LOG

TriEco

integrity • knowledge • imagination

BUILDING SURVEY SAMPLE LOG

FACILITY: Parkway Place Housing Community
BUILDING # / AREA: Building 17
DATE: August 2, 2012
PROJECT NO:

SAMPLE NO.	DESCRIPTION/LOCATION
01-A	Fiberglass Insulation - Roof
01-B	Fiberglass Insulation - Roof
01-C	Fiberglass Insulation - Roof
02-A	Core Sample of Built – Up Roof (Under insulation and aggregate)
02-B	Core Sample of Built – Up Roof (Under insulation and aggregate)
02-C	Core Sample of Built – Up Roof (Under insulation and aggregate)
03-A	Mat Under Built – Up Roof
03-B	Mat Under Built – Up Roof
03-C	Mat Under Built – Up Roof
04-A	Mastic under Flashing
04-B	Mastic under Flashing
04-C	Mastic under Flashing
05-A	Shingle
05-B	Shingle
05-C	Shingle
06-A	Tar Paper
06-B	Tar Paper
06-C	Tar Paper
07-A	Drywall
07-B	Drywall
07-C	Drywall
08-A	Window Caulk – Interior - White
08-B	Window Caulk – Interior - White
08-C	Window Caulk – Interior - White

Laboratory: SanAir Technologies - Powhatan, VA

TriEco

integrity • knowledge • imagination

BUILDING SURVEY SAMPLE LOG

FACILITY: Parkway Place Housing Community
BUILDING # / AREA: Building 17
DATE: August 2, 2012
PROJECT NO:

SAMPLE NO.	DESCRIPTION/LOCATION
09-A	Gray Window Caulk – Between Frame and Wood Built - Up
09-B	Gray Window Caulk – Between Frame and Wood Built - Up
09-C	Gray Window Caulk – Between Frame and Wood Built - Up
10-A	Floor Tile + Mastic
10-B	Floor Tile + Mastic
10-C	Floor Tile + Mastic
11-A	Red Exterior Window Caulk
11-B	Red Exterior Window Caulk
11-C	Red Exterior Window Caulk
12-A	Green Exterior Window Caulk
12-B	Green Exterior Window Caulk
12-C	Green Exterior Window Caulk

Laboratory: SanAir Technologies - Powhatan, VA

APPENDIX D

LABORATORY ANALYTICAL RESULTS

SanAir Technologies Laboratory

Analysis Report

prepared for

TriEco, LLC

Report Date: 8/8/2012
Project Name: Parkway Place Bldg 17
SanAir ID#: 12015284

NVLAP LAB CODE 200870-0

Certification # 652931

License # LAB0166

804.897.1177 www.sanair.com

SanAir Technologies Laboratory, Inc.
1551 Oakbridge Drive, Suite B, Powhatan, VA 23139
804.897.1177 Toll Free: 888.895.1177 Fax: 804.897.0070
Web: http://www.sanair.com E-mail: iaq@sanair.com

TriEco, LLC
7710 Springvale Drive
Louisville, KY 40241

August 8, 2012

SanAir ID # 12015284
Project Name: Parkway Place Bldg 17
Project Number:

Dear Greg Balley,

We at SanAir would like to thank you for the work you recently submitted. The 36 sample(s) were received on Friday, August 03, 2012 via FedEx. The final report(s) is enclosed for the following sample(s): 01-A, 01-B, 01-C, 02-A, 02-B, 02-C, 03-A, 03-B, 03-C, 04-A, 04-B, 04-C, 05-A, 05-B, 05-C, 06-A, 06-B, 06-C, 07-A, 07-B, 07-C, 08-A, 08-B, 08-C, 09-A, 09-B, 09-C, 10-A, 10-B, 10-C, 11-A, 11-B, 11-C, 12-A, 12-B, 12-C.

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

Sincerely,

Sandra Sobrino

Sandra Sobrino
Asbestos & Materials Laboratory Manager
SanAir Technologies Laboratory

Final Report Includes:
- Cover Letter
- Analysis Pages
- Disclaimers and Additional Information

sample conditions:
36 sample(s) in Good condition

SanAir Technologies Laboratory, Inc.

1551 Oakbridge Drive, Suite B, Powhatan, VA 23139
804.897.1177 Toll Free: 888.895.1177 Fax: 804.897.0070
Web: http://www.sanair.com E-mail: laq@sanair.com

SanAir ID Number
12015284
FINAL REPORT

Name: TriEco, LLC
Address: 7710 Springvale Drive
Louisville, KY 40241

Project Number:
P.O. Number:
Project Name: Parkway Place Bldg 17

Collected Date: 8/2/2012
Received Date: 8/3/2012 10:00:00 AM
Report Date: 8/8/2012 9:29:32 AM
Analyst: Tallert, Jonathan G.

Asbestos Bulk PLM EPA 600/R-93/116

SanAir ID / Description	Stereoscopic Appearance	Components % Fibrous	% Non-Fibrous	Asbestos Fibers
01-A / 12015284-001 Fiberglass Insulation - Roof	Pink Fibrous Homogeneous	98% Glass	2% Other	None Detected

SanAir ID / Description	Stereoscopic Appearance	Components % Fibrous	% Non-Fibrous	Asbestos Fibers
01-B / 12015284-002 Fiberglass Insulation - Roof	Pink Fibrous Homogeneous	98% Glass	2% Other	None Detected

SanAir ID / Description	Stereoscopic Appearance	Components % Fibrous	% Non-Fibrous	Asbestos Fibers
01-C / 12015284-003 Fiberglass Insulation - Roof	Pink Fibrous Homogeneous	98% Glass	2% Other	None Detected

SanAir ID / Description	Stereoscopic Appearance	Components % Fibrous	% Non-Fibrous	Asbestos Fibers
02-A / 12015284-004 Core Sample Built Up Roof	Black Non-Fibrous Homogeneous	10% Cellulose	90% Other	None Detected

SanAir ID / Description	Stereoscopic Appearance	Components % Fibrous	% Non-Fibrous	Asbestos Fibers
02-B / 12015284-005 Core Sample Built Up Roof	Black Non-Fibrous Homogeneous	10% Cellulose	90% Other	None Detected

SanAir ID / Description	Stereoscopic Appearance	Components % Fibrous	% Non-Fibrous	Asbestos Fibers
02-C / 12015284-006 Core Sample Built Up Roof	Black Non-Fibrous Homogeneous	10% Cellulose	90% Other	None Detected

SanAir ID / Description	Stereoscopic Appearance	Components % Fibrous	% Non-Fibrous	Asbestos Fibers
03-A / 12015284-007 Mat Under Built-Up Roofing	Brown Fibrous Homogeneous	100% Cellulose	< 1% Other	None Detected

Certification

Signature: [signature] Date: 8/7/2012

Reviewed: Sandra Sobrino Date: 8/8/2012

SanAir Technologies Laboratory, Inc.

1551 Oakbridge Drive, Suite B, Powhatan, VA 23139
804.897.1177 Toll Free: 888.895.1177 Fax: 804.897.0070
Web: http://www.sanair.com E-mail: laq@sanair.com

SanAir ID Number
12015284
FINAL REPORT

Name: TriEco, LLC
Address: 7710 Springvale Drive
Louisville, KY 40241

Project Number:
P.O. Number:
Project Name: Parkway Place Bldg 17

Collected Date: 8/2/2012
Received Date: 8/3/2012 10:00:00 AM
Report Date: 8/8/2012 9:29:32 AM
Analyst: Tallert, Jonathan G.

Asbestos Bulk PLM EPA 600/R-93/116

SanAir ID / Description	Stereoscopic Appearance	Components % Fibrous	% Non-Fibrous	Asbestos Fibers
03-B / 12015284-008 Mat Under Built-Up Roofing	Brown Fibrous Homogeneous	100% Cellulose	< 1% Other	None Detected
03-C / 12015284-009 Mat Under Built-Up Roofing	Brown Fibrous Homogeneous	100% Cellulose	< 1% Other	None Detected
04-A / 12015284-010 Mastic Under Flashing, 1	Black Non-Fibrous Homogeneous		100% Other	None Detected
04-B / 12015284-011 Mastic Under Flashing	Black Non-Fibrous Homogeneous		100% Other	None Detected
04-C / 12015284-012 Mastic Under Flashing	Black Non-Fibrous Homogeneous		100% Other	None Detected
05-A / 12015284-013 Shingle	Black Non-Fibrous Homogeneous	10% Glass	90% Other	None Detected
05-B / 12015284-014 Shingle	Black Non-Fibrous Homogeneous	10% Glass	90% Other	None Detected

Certification

Signature: _____ Reviewed: Sandra Asbury
Date: 8/7/2012 Date: 8/8/2012

SanAir Technologies Laboratory, Inc.

1551 Oakbridge Drive, Suite B, Powhatan, VA 23139
804.897.1177 Toll Free: 888.895.1177 Fax: 804.897.0070
Web: http://www.sanair.com E-mail: laq@sanair.com

SanAir ID Number
12015284
FINAL REPORT

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Address: 7710 Springvale Drive
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Project Name: Parkway Place Bldg 17

Collected Date: 8/2/2012
Received Date: 8/3/2012 10:00:00 AM
Report Date: 8/8/2012 9:29:32 AM
Analyst: Tallert, Jonathan G.

Asbestos Bulk PLM EPA 600/R-93/116

SanAir ID / Description	Stereoscopic Appearance	Components % Fibrous	% Non-Fibrous	Asbestos Fibers
05-C / 12015284-015 Shingle	Black Non-Fibrous Homogeneous	10% Glass	90% Other	None Detected
06-A / 12015284-016 Tar Paper	Black Fibrous Homogeneous	75% Cellulose	25% Other	None Detected
06-B / 12015284-017 Tar Paper	Black Fibrous Homogeneous	75% Cellulose	25% Other	None Detected
06-C / 12015284-018 Tar Paper	Black Fibrous Homogeneous	75% Cellulose	25% Other	None Detected
07-A / 12015284-019 Drywall	White Non-Fibrous Homogeneous	5% Cellulose	95% Other	None Detected
07-B / 12015284-020 Drywall	White Non-Fibrous Homogeneous	5% Cellulose	95% Other	None Detected
07-C / 12015284-021 Drywall	White Non-Fibrous Homogeneous	5% Cellulose	95% Other	None Detected

Certification

Signature: _____ Reviewed: Sandra Robins

Date: 8/7/2012 Date: 8/8/2012

SanAir Technologies Laboratory, Inc.
1551 Oakbridge Drive, Suite B, Powhatan, VA 23139
804.897.1177 Toll Free: 888.895.1177 Fax: 804.897.0070
Web: http://www.sanair.com E-mail: iaq@sanair.com

SanAir ID Number
12015284
FINAL REPORT

Name: TriEco, LLC
Address: 7710 Springvale Drive
Louisville, KY 40241

Project Number:
P.O. Number:
Project Name: Parkway Place Bldg 17

Collected Date: 8/2/2012
Received Date: 8/3/2012 10:00:00 AM
Report Date: 8/8/2012 9:29:32 AM
Analyst: Tallert, Jonathan G.

Asbestos Bulk PLM EPA 600/R-93/116

SanAir ID / Description	Stereoscopic Appearance	Components % Fibrous	% Non-Fibrous	Asbestos Fibers
08-A / 12015284-022 Window Caulk - Interior	White Non-Fibrous Homogeneous		100% Other	None Detected
08-B / 12015284-023 Window Caulk - Interior	White Non-Fibrous Homogeneous		100% Other	None Detected
08-C / 12015284-024 Window Caulk - Interior	White Non-Fibrous Homogeneous		100% Other	None Detected
09-A / 12015284-025 Window Caulk - Between Frame And Wood	Grey Non-Fibrous Homogeneous		100% Other	None Detected
09-B / 12015284-026 Window Caulk - Between Frame And Wood	Grey Non-Fibrous Homogeneous		100% Other	None Detected
09-C / 12015284-027 Window Caulk - Between Frame And Wood	Grey Non-Fibrous Homogeneous		100% Other	None Detected
10-A / 12015284-028 Floor Tile & Mastic, Floor Tile	White Non-Fibrous Homogeneous		97% Other	3% Chrysotile
10-A / 12015284-028 Floor Tile & Mastic, Mastic	Black Non-Fibrous Homogeneous		95% Other	5% Chrysotile

Certification

Signature: [signature] Reviewed: Sandra Robins
Date: 8/7/2012 Date: 8/8/2012

SanAir Technologies Laboratory, Inc.
1551 Oakbridge Drive, Suite B, Powhatan, VA 23139
804.897.1177 Toll Free: 888.895.1177 Fax: 804.897.0070
Web: http://www.sanair.com E-mail: iaq@sanair.com

SanAir ID Number
12015284
FINAL REPORT

Name: TriEco, LLC
Address: 7710 Springvale Drive
Louisville, KY 40241

Project Number:
P.O. Number:
Project Name: Parkway Place Bldg 17

Collected Date: 8/2/2012
Received Date: 8/3/2012 10:00:00 AM
Report Date: 8/8/2012 9:29:32 AM
Analyst: Tallert, Jonathan G.

Asbestos Bulk PLM EPA 600/R-93/116

SanAir ID / Description	Stereoscopic Appearance	Components % Fibrous	% Non-Fibrous	Asbestos Fibers
10-B / 12015284-029 Floor Tile & Mastic				Not Analyzed
10-C / 12015284-030 Floor Tile & Mastic				Not Analyzed
11-A / 12015284-031 Exterior Window Caulk	Red Non-Fibrous Homogeneous		100% Other	None Detected
11-B / 12015284-032 Exterior Window Caulk	Red Non-Fibrous Homogeneous		100% Other	None Detected
11-C / 12015284-033 Exterior Window Caulk	Red Non-Fibrous Homogeneous		100% Other	None Detected
12-A / 12015284-034 Exterior Window Caulk	Green Non-Fibrous Homogeneous		97% Other	3% Chrysotile
12-B / 12015284-035 Exterior Window Caulk				Not Analyzed

Certification

Signature: _____ Reviewed: Sandra Tobrinz
Date: 8/7/2012 Date: 8/8/2012

SanAir Technologies Laboratory, Inc.
1551 Oakbridge Drive, Suite B, Powhatan, VA 23139
804.897.1177 Toll Free: 888.895.1177 Fax: 804.897.0070
Web: http://www.sanair.com E-mail: iaq@sanair.com

SanAir ID Number
12015284
FINAL REPORT

Name: TriEco, LLC
Address: 7710 Springvale Drive
Louisville, KY 40241

Project Number:
P.O. Number:
Project Name: Parkway Place Bldg 17

Collected Date: 8/2/2012
Received Date: 8/3/2012 10:00:00 AM
Report Date: 8/8/2012 9:29:32 AM
Analyst: Tallert, Jonathan G.

Asbestos Bulk PLM EPA 600/R-93/116

SanAir ID / Description	Stereoscopic Appearance	Components % Fibrous	% Non-Fibrous	Asbestos Fibers
12-C / 12015284-036 Exterior Window Caulk				Not Analyzed

Certification

Signature: [signature] Reviewed: Sandra Sobrino
Date: 8/7/2012 Date: 8/8/2012

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

Asbestos Chain of Custody

SanAir ID Number: 1201284

Company: TriEco LLC	Project #:	Collected by: Greg Bailey
Address: 7710 Springvale Drive Suite 201	Project Name: Parkway Place Bldg 17	Phone #: 502-235-8542
City, St., Zip: Louisville, KY 40241	Date Collected: August 2, 2012	Fax #: 502-657-0241
State of Collection: KY Account#: 1867	P.O. Number:	Email: gbailey@trieco.net

Bulk

ABB	PLM EPA 600/R-93/116	☑
	Positive Stop ☑	
ABEPA	PLM EPA 400 Point Count	☐
ABB1K	PLM EPA 1000 Point Count	☐
ABBEN	PLM EPA NOB	☐
ABBCH	TEM Chatfield	☐
ABBTM	TEM EPA NOB	☐

Water

ABHE	EPA 100.2	☐

Air

ABA	PCM NIOSH 7400	☐
ABA-2	OSHA w/ TWA	☐
ABTEM	TEM AHERA	☐
ABATN	TEM NIOSH 7402	☐
ABT2	TEM Level II	☐

New York ELAP

PLM NY	PLM EPA 600/M4-82-020	☐
ABEPA2	NY ELAP 198.1	☐
ABENY	NY ELAP 198.6 PLM NOB	☐
ABBNY	NY ELAP 198.4 TEM NOB	☐

Soil/Vermiculite

ABSE	PLM EPA 600/R-93/116 (Qual.)	☐
ABSP	PLM CARB 435 (LOD <1%)	☐
ABSP1	PLM CARB 435 (LOD 0.25%)	☐
ABSP2	PLM CARB 435 (LOD 0.1%)	☐

Dust

ABWA	TEM Wipe ASTM D-6480	☐
ABDMV	TEM Microvac ASTM D-5755	☐

Matrix	Other	
		☐

Turn Around Times				
	3 HR (4 HR TEM) ☐	6 HR (8HR TEM) ☐	12 HR ☐	24 HR ☐
	2 Days ☐	3 Days ☐	4 Days ☐	5 Days ☐

Special Instructions

Sample #	Sample Identification/Location	Volume or Area	Sample Type	Flow Rate	Time Start – Stop	
01-A	Fiberglass Insulation - Roof		B			
01-B	Fiberglass Insulation - Roof		B			
01-C	Fiberglass Insulation - Roof		B			
02-A	Core Sample of Built - Up Roof (Under insulation and aggregate)		B			
02-B	Core Sample of Built - Up Roof (Under insulation and aggregate)		B			
02-C	Core Sample of Built - Up Roof (Under insulation and aggregate)		B			
03-A	Mat Under Built – Up Roof		B			
03-B	Mat Under Built – Up Roof		B			
03-C	Mat Under Built – Up Roof		B			
04-A	Mastic under Flashing		B			
04-B	Mastic under Flashing		B			
04-C	Mastic under Flashing		B			

Relinquished by	Date	Time	Received by	Date	Time
Greg Bailey	August 2, 2012	1700		AUG 03 2012	

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

1201528Y

Sample #	Sample Identification/Location	Sample Type	Flow Rate	Time Start – Stop	
05-A	Shingle	B			
05-B	Shingle	B			
05-C	Shingle	B			
06-A	Tar Paper	B			
06-B	Tar Paper	B			
06-C	Tar Paper	B			
07-A	Drywall	B			
07-B	Drywall	B			
07-C	Drywall	B			
08-A	Window Caulk – Interior - White	B			
08-B	Window Caulk – Interior - White	B			
08-C	Window Caulk – Interior - White	B			
09-A	Gray Window Caulk – Between Frame and Wood Built - Up	B			
09-B	Gray Window Caulk – Between Frame and Wood Built - Up	B			
09-C	Gray Window Caulk – Between Frame and Wood Built - Up	B			
10-A	Floor Tile + Mastic	B			
10-B	Floor Tile + Mastic	B			
10-C	Floor Tile + Mastic	B			
11-A	Red Exterior Window Caulk	B			
11-B	Red Exterior Window Caulk	B			
11-C	Red Exterior Window Caulk	B			
12-A	Green Exterior Window Caulk				
12-B	Green Exterior Window Caulk				
12-C	Green Exterior Window Caulk				

Special Instructions	

Relinquished by	Date	Time	Received by	Date	Time
Gregory Bailey	August 2, 2012	1700		AUG 03 2012	

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

Disclaimer

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

APPDENDIX C

ASBESTOS FIELD SAMPLE LOG

TriEco

ASBESTOS BUILDING SURVEY SAMPLE LOG

FACILITY: _Parkway Place Housing Community
BUILDING # / AREA: Gabled Roofing Systems
DATE: February 20, 2020
PROJECT NO: 200112-G

SAMPLE #	DESCRIPTION	LOCATION
R-01A	Tar Paper Under Siding	Building 12
R-02A	Shingle	Building 32
R-02B	Shingle	Building 26
R-02C	Shingle	Building 11
R-02D	Shingle	Building 3
R-02E	Shingle	Building 2
R-02F	Shingle	Building 5
R-02G	Shingle	Building 4
R-03A	Tar Paper	Building 32
R-03B	Tar Paper	Building 26
R-03C	Tar Paper	Building 11
R-03D	Tar Paper	Building 3
R-03E	Tar Paper	Building 2
R-03F	Tar Paper	Building 5
R-03G	Tar Paper	Building 4
R-04A	Chimney Flashing – On Block	Building 12
R-05A	Chimney Flashing Caulk – White	Building 12
R-06A	Chimney Flashing Caulk	Building 32
R-06B	Chimney Flashing Caulk	Building 26
R-06C	Chimney Flashing Caulk	Building 11
R-06D	Chimney Flashing Caulk	Building 3
R-06E	Chimney Flashing Caulk	Building 2
R-06F	Chimney Flashing Caulk	Building 5
R-06G	Chimney Flashing Caulk	Building 4
R-06H	Chimney Flashing Caulk	Building 12

TriEco

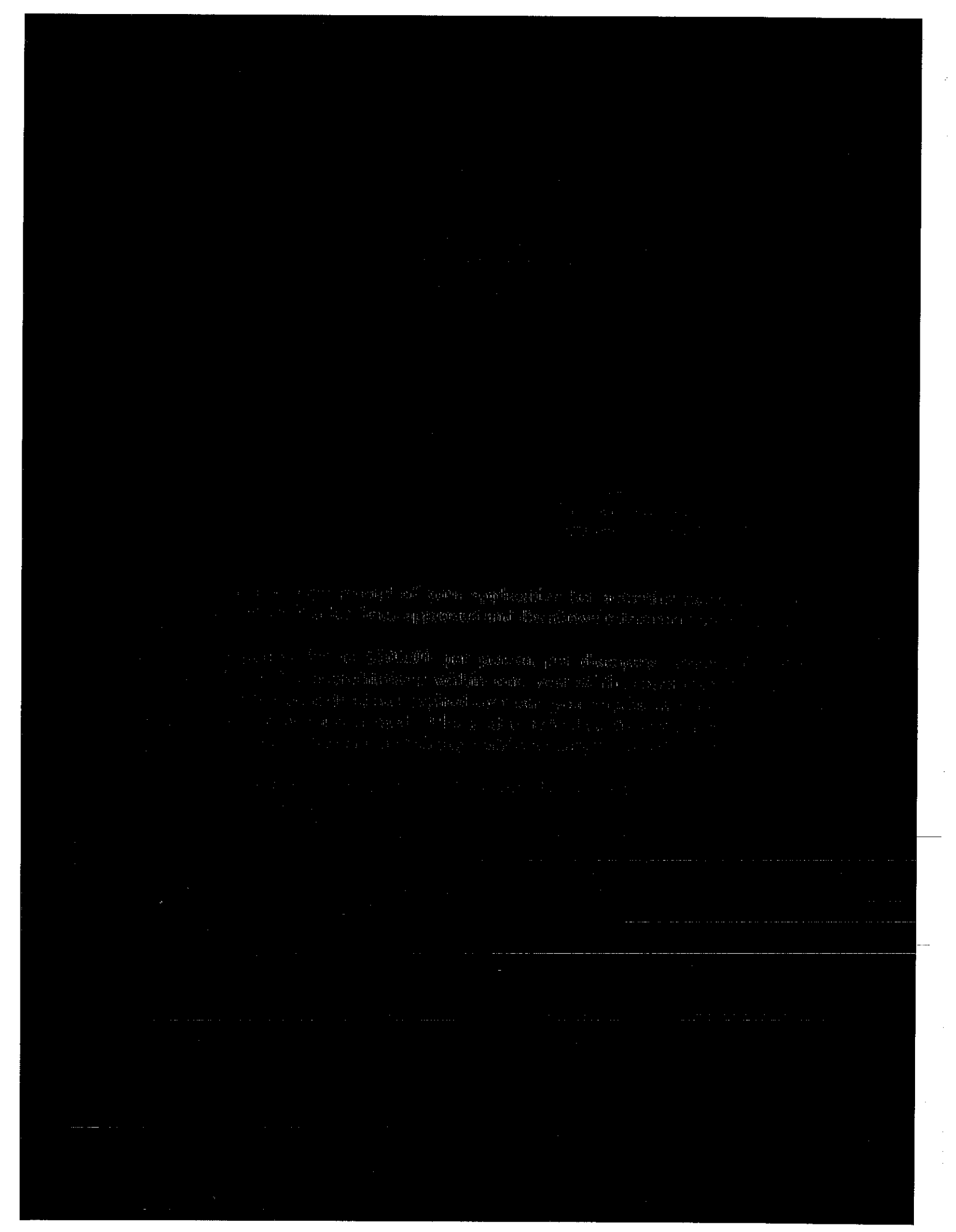
ASBESTOS BUILDING SURVEY SAMPLE LOG

FACILITY: _Parkway Place Housing Community
BUILDING # / AREA: Gabled Roofing Systems
DATE: February 20, 2020
PROJECT NO: 200112-G

SAMPLE #	DESCRIPTION	LOCATION
R-07A	Block Mortar	Chimney – Building 12
R-07B	Block Mortar	Chimney – Building 3
R-07C	Block Mortar	Chimney – Building 26
R-07D	Block Mortar	Chimney – Building 32
R-08A	Block	Chimney - Building 32
R-08B	Block	Chimney - Building 26
R-08C	Block and Mortar	Chimney - Building 11
R-08D	Block and Mortar	Chimney - Building 3
R-08E	Block and Mortar	Chimney - Building 2
R-08F	Block and Mortar	Chimney - Building 5
R-08G	Block and Mortar	Chimney - Building 4
R-08H	Block	Chimney - Building 12
R-09A	Siding to Shingle Caulk	Building 11
R-10A	Awning Flashing Caulk	Building 3
R-10B	Awning Flashing Caulk	Building 2
R-10C	Awning Flashing Caulk	Building 11
R-10D	Basement Awning Flashing Caulk	Building 12

APPENDIX D

ASBESTOS LICENSES AND CERTIFICATION



APPDENDIX E

LABORATORY ANALYTICAL RESULTS

SanAir Technologies Laboratory

The Identification Specialists

Analysis Report prepared for TriEco, LLC

Report Date: 3/1/2020

Project Name: Parkway Place Roof

Project #: 200112-G

SanAir ID#: 20009146

NVLAP® TESTING

NVLAP LAB CODE 200870-0

1551 Oakbridge Dr. Suite B I Powhatan, Virginia 23139-8061
888.895.1177I 804.897.1177 I fax: 804.897.0070 I IAQ@SanAir.com I SanAir.com

SanAir
Technologies Laboratory

SanAir ID Number
20009146
FINAL REPORT
3/1/2020 1:31:38 PM

Name: TriEco, LLC
Address: 7710 Springvale Drive
Louisville, KY 40241
Phone: 502-657-0240

Project Number: 200112-G
P.O. Number:
Project Name: Parkway Place Roof
Collected Date: 2/20/2020
Received Date: 2/25/2020 10:10:00 AM

Dear Greg Bailey,

We at SanAir would like to thank you for the work you recently submitted. The 42 sample(s) were received on Tuesday, February 25, 2020 via FedEx. The final report(s) is enclosed for the following sample(s): R-01A, R-02A, R-02B, R-02C, R-02D, R-02E, R-02F, R-02G, R-03A, R-03B, R-03C, R-03D, R-03E, R-03F, R-03G, R-04A, R-05A, R-06A, R-06B, R-06C, R-06D, R-06E, R-06F, R-06G, R-06H, R-07A, R-07B, R-07C, R-07D, R-08A, R-08B, R-08C, R-08D, R-08E, R-08F, R-08G, R-08H, R-09A, R-10A, R-10B, R-10C, R-10D.

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

Sincerely,

Sandra Sobrino

Sandra Sobrino
Asbestos & Materials Laboratory Manager
SanAir Technologies Laboratory

Final Report Includes:
- Cover Letter
- Analysis Pages
- Disclaimers and Additional Information

Sample conditions:
- 42 samples in Good condition.

SanAir Technologies Laboratory

SanAir ID Number
20009146
FINAL REPORT
3/1/2020 1:31:38 PM

Name: TriEco, LLC
Address: 7710 Springvale Drive
Louisville, KY 40241
Phone: 502-657-0240

Project Number: 200112-G
P.O. Number:
Project Name: Parkway Place Roof
Collected Date: 2/20/2020
Received Date: 2/25/2020 10:10:00 AM

Analyst: Vaughan, Nathaniel

Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		
SanAir ID / Description	Appearance	% Fibrous	% Non-fibrous	Asbestos Fibers
R-01A / 20009146-001 Tar Paper Under Siding Building 12	Black Fibrous Heterogeneous	90% Cellulose	10% Other	None Detected
R-02A / 20009146-002 Shingle Building 32	Brown Non-Fibrous Heterogeneous	10% Glass	90% Other	None Detected
R-02B / 20009146-003 Shingle Building 26	Brown Non-Fibrous Heterogeneous	10% Glass	90% Other	None Detected
R-02C / 20009146-004 Shingle Building 11	Brown Non-Fibrous Heterogeneous	10% Glass	90% Other	None Detected
R-02D / 20009146-005 Shingle Building 3	Brown Non-Fibrous Heterogeneous	10% Glass	90% Other	None Detected
R-02E / 20009146-006 Shingle Building 2	Brown Non-Fibrous Heterogeneous	10% Glass	90% Other	None Detected
R-02F / 20009146-007 Shingle Building 5	Brown Non-Fibrous Heterogeneous	10% Glass	90% Other	None Detected
R-02G / 20009146-008 Shingle Building 4	Brown Non-Fibrous Heterogeneous	10% Glass	90% Other	None Detected
R-03A / 20009146-009 Tar Paper Building 32	Black Fibrous Heterogeneous	90% Cellulose	10% Other	None Detected
R-03B / 20009146-010 Tar Paper Building 26	Black Fibrous Heterogeneous	30% Cellulose 20% Glass	50% Other	None Detected

Analyst: Nathaniel Vaughan Approved Signatory:

Analysis Date: 2/29/2020 Date: 3/1/2020

SanAir
Technologies Laboratory

SanAir ID Number
20009146
FINAL REPORT
3/1/2020 1:31:38 PM

Name: TriEco, LLC
Address: 7710 Springvale Drive
Louisville, KY 40241
Phone: 502-657-0240

Project Number: 200112-G
P.O. Number:
Project Name: Parkway Place Roof
Collected Date: 2/20/2020
Received Date: 2/25/2020 10:10:00 AM

Analyst: Vaughan, Nathaniel

Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		
SanAir ID / Description	Appearance	% Fibrous	% Non-fibrous	Asbestos Fibers
R-03C / 20009146-011 Tar Paper Building 11	Black Fibrous Heterogeneous	90% Cellulose	10% Other	None Detected
R-03D / 20009146-012 Tar Paper Building 3	Black Fibrous Heterogeneous	90% Cellulose	10% Other	None Detected
R-03E / 20009146-013 Tar Paper Building 2	Black Fibrous Heterogeneous	90% Cellulose	10% Other	None Detected
R-03F / 20009146-014 Tar Paper Building 5	Black Fibrous Heterogeneous	90% Cellulose	10% Other	None Detected
R-03G / 20009146-015 Tar Paper Building 4	Black Fibrous Heterogeneous	90% Cellulose	10% Other	None Detected
R-04A / 20009146-016 Chimney Flashing-On Block Building 12	Black Non-Fibrous Heterogeneous	40% Cellulose	60% Other	None Detected
R-05A / 20009146-017 Chimney Flashing Caulk Building 12	White Non-Fibrous Heterogeneous		100% Other	None Detected
R-06A / 20009146-018 Chimney Flashing Caulk Building 32	Grey Non-Fibrous Heterogeneous		100% Other	None Detected
R-06B / 20009146-019 Chimney Flashing Caulk Building 26	Brown Non-Fibrous Heterogeneous		100% Other	None Detected
R-06C / 20009146-020 Chimney Flashing Caulk Building 11	Brown Non-Fibrous Heterogeneous		100% Other	None Detected

Analyst: Nathan Vaughan Approved Signatory:

Analysis Date: 2/29/2020 Date: 3/1/2020

SanAir
Technologies Laboratory

SanAir ID Number
20009146
FINAL REPORT
3/1/2020 1:31:38 PM

Name: TriEco, LLC
Address: 7710 Springvale Drive
Louisville, KY 40241
Phone: 502-657-0240

Project Number: 200112-G
P.O. Number:
Project Name: Parkway Place Roof
Collected Date: 2/20/2020
Received Date: 2/25/2020 10:10:00 AM

Analyst: Vaughan, Nathaniel

Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		
SanAir ID / Description	Appearance	% Fibrous	% Non-fibrous	Asbestos Fibers
R-06D / 20009146-021 Chimney Flashing Caulk Building 3	Brown Non-Fibrous Heterogeneous		100% Other	None Detected
R-06E / 20009146-022 Chimney Flashing Caulk Building 2	Brown Non-Fibrous Heterogeneous		100% Other	None Detected
R-06F / 20009146-023 Chimney Flashing Caulk Building 5	Brown Non-Fibrous Heterogeneous		100% Other	None Detected
R-06G / 20009146-024 Chimney Flashing Caulk Building 4	Brown Non-Fibrous Heterogeneous		100% Other	None Detected
R-06H / 20009146-025 Chimney Flashing Caulk Building 12	Brown Non-Fibrous Heterogeneous		100% Other	None Detected
R-07A / 20009146-026 Block Mortar Chimney-Building 12	Brown Non-Fibrous Heterogeneous		100% Other	None Detected
R-07B / 20009146-027 Block Mortar Chimney-Building 3	Brown Non-Fibrous Heterogeneous		100% Other	None Detected
R-07C / 20009146-028 Block Mortar Chimney-Building 26	Brown Non-Fibrous Heterogeneous		100% Other	None Detected
R-07D / 20009146-029 Block Mortar Chimney-Building 32	Brown Non-Fibrous Heterogeneous		100% Other	None Detected
R-08A / 20009146-030 Block Chimney-Building 32	Beige Non-Fibrous Heterogeneous		100% Other	None Detected

Analyst: Nathan Vaughn Approved Signatory:

Analysis Date: 2/29/2020 Date: 3/1/2020

SanAir Technologies Laboratory

SanAir ID Number
20009146
FINAL REPORT
3/1/2020 1:31:38 PM

Name: TriEco, LLC
Address: 7710 Springvale Drive
Louisville, KY 40241
Phone: 502-657-0240

Project Number: 200112-G
P.O. Number:
Project Name: Parkway Place Roof
Collected Date: 2/20/2020
Received Date: 2/25/2020 10:10:00 AM

Analyst: Vaughan, Nathaniel

Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		
SanAir ID / Description	Appearance	% Fibrous	% Non-fibrous	Asbestos Fibers
R-08B / 20009146-031 Block Chimney-Building 26	Beige Non-Fibrous Heterogeneous		100% Other	None Detected
R-08C / 20009146-032 Block And Mortar Chimney-Building 11	Beige Non-Fibrous Heterogeneous		100% Other	None Detected
R-08D / 20009146-033 Block And Mortar Chimney-Building 3	Beige Non-Fibrous Heterogeneous		100% Other	None Detected
R-08E / 20009146-034 Block And Mortar Chimney-Building 2	Beige Non-Fibrous Heterogeneous		100% Other	None Detected
R-08F / 20009146-035 Block And Mortar Chimney-Building 5	Beige Non-Fibrous Heterogeneous		100% Other	None Detected
R-08G / 20009146-036 Block And Mortar Chimney-Building 4	Beige Non-Fibrous Heterogeneous		100% Other	None Detected
R-08H / 20009146-037 Block Chimney-Building 12	Beige Non-Fibrous Heterogeneous		100% Other	None Detected
R-09A / 20009146-038 Siding To Shingle Caulk Building 11, Siding	Black Non-Fibrous Heterogeneous		100% Other	None Detected
R-09A / 20009146-038 Siding To Shingle Caulk Building 11, Tar	Black Non-Fibrous Heterogeneous		95% Other	5% Chrysotile
R-10A / 20009146-039 Awning Flashing Caulk Building 3	Grey Non-Fibrous Heterogeneous		95% Other	5% Chrysotile

Analyst: Nathaniel Vaughan Approved Signatory:

Analysis Date: 2/29/2020 Date: 3/1/2020

SanAir Technologies Laboratory

SanAir ID Number
20009146
FINAL REPORT
3/1/2020 1:31:38 PM

Name: TriEco, LLC
Address: 7710 Springvale Drive
Louisville, KY 40241
Phone: 502-657-0240

Project Number: 200112-G
P.O. Number:
Project Name: Parkway Place Roof
Collected Date: 2/20/2020
Received Date: 2/25/2020 10:10:00 AM

Analyst: Vaughan, Nathaniel

Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		
SanAir ID / Description	Appearance	% Fibrous	% Non-fibrous	Asbestos Fibers
R-10B / 20009146-040 Awning Flashing Caulk Building 2				Not Analyzed
R-10C / 20009146-041 Awning Flashing Caulk Building 11				Not Analyzed
R-10D / 20009146-042 Awning Flashing Caulk Building 12				Not Analyzed

Analyst: Nathaniel Vaughan Approved Signatory:

Analysis Date: 2/29/2020 Date: 3/1/2020

Disclaimer

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

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

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

Asbestos Certifications
NVLAP lab code 200870
City of Philadelphia: ALL-460
PA Department of Environmental Protection Number: 68-05397
California License Number: 2915
Colorado License Number: AL-23143
Connecticut License Number: PH-0105
Massachusetts License Number: AA000222
Maine License Number: LB-0075
New York ELAP lab ID: 11983
Rhode Island License Number: AAL-126
Texas Department of State Health Services License Number: 300440
Commonwealth of Virginia 3333000323
Washington State License Number: C989
West Virginia License Number: LT000566
Vermont License: AL166318

Revision Date: 11/30/2017

SanAir Technologies Laboratory
1551 Oakbridge Dr. STE B
Powhatan, VA 23139
804.897.1177 / 888.895.1177
Fax 804.897.0070
sanair.com

Asbestos Chain of Custody

Form 140, Rev 3, 8/28/19

SanAir ID Number: 20009146

Company: TriEco LLC	Project #: 200112-G	Collected by: Gregory Bailey I
Address: 7710 Springvale Drive Suite 201	Project Name: Parkway Place Roof	Phone #: 502-235-8542
City, St., Zip: Louisville, KY 402412	Date Collected: February 20, 2020	Fax #: 502-657-0241
State of Collection: KY Account#: 1867	P.O. Number:	Email: gbailey@trieco.net

Bulk

ABB	PLM EPA 600/R-93/116	☑
	Positive Stop	☑
ABEPA	PLM EPA 400 Point Count	☐
ABB1K	PLM EPA 1000 Point Count	☐
ABBEN	PLM EPA NOB**	☐
ABBCH	TEM Chatfield**	☐
ABBTM	TEM EPA NOB**	☐
ABQ	PLM Qualitative	☐

** Available on 24-hr. to 5-day TAT

Water

ABHE	EPA 100.2	☐

Air

ABA	PCM NIOSH 7400	☐
ABA-2	OSHA w/ TWA*	☐
ABTEM	TEM AHERA	☐
ABATN	TEM NIOSH 7402	☐
ABT2	TEM Level II	☐
Other:		☐

New York ELAP

ABEPA2	NY ELAP 198.1	☐
ABENY	NY ELAP 198.6 PLM NOB	☐
ABBNY	NY ELAP 198.4 TEM NOB	☐

Soil

ABSE	PLM EPA 600/R-93/116 (Qual.)	☐

Vermiculite & Soil

ABSP	PLM CARB 435 (LOD <1%)	☐
ABSP1	PLM CARB 435 (LOD 0.25%)	☐
ABSP2	PLM CARB 435 (LOD 0.1%)	☐

Dust

ABWA	TEM Wipe ASTM D-6480	☐
ABDMV	TEM Microvac ASTM D-5755	☐

Matrix	Other	
		☐

Turn Around Times				
3 HR (4 HR TEM) ☐	6 HR (8HR TEM) ☐	12 HR ☐	1 Day ☐
☐ 2 Days	■ 3 Days	☐ 4 Days	☐ 5 Days

Special Instructions

Sample #	Sample Identification/Location	Volume or Area	Sample Date	Flow Rate*	Start – Stop Time*	
SEE ATTACHED SAMPLE LOG						
3 PAGES TOTAL						

Relinquished by	Date	Time	Received by	Date	Time
	Feb 24, 2020	1700	CM	2-25-20	10:00 AM

If no technician is provided, then the primary contact for your account will be selected. Unless scheduled, the turnaround time for all samples received after 3 pm EST will be logged in the next business day. Weekend or holiday work must be scheduled ahead of time and is charged at 150% of the 3hr TAT or a minimum charge of $150. A courier charge will be applied for same day and one-day turnaround times for offsite work. SanAir covers Standard Overnight FedEx shipping. Shipments billed to SanAir with a faster shipping rate will result in additional charges.

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200091CFL0

ASBESTOS BUILDING SURVEY SAMPLE LOG

FACILITY: Parkway Place Housing Community
BUILDING # / AREA: Gabled Roofing Systems
DATE: February 20, 2020
PROJECT NO: 200112-G

SAMPLE #	DESCRIPTION	LOCATION
R-01A	Tar Paper Under Siding	Building 12
R-02A	Shingle	Building 32
R-02B	Shingle	Building 26
R-02C	Shingle	Building 11
R-02D	Shingle	Building 3
R-02E	Shingle	Building 2
R-02F	Shingle	Building 5
R-02G	Shingle	Building 4
R-03A	Tar Paper	Building 32
R-03B	Tar Paper	Building 26
R-03C	Tar Paper	Building 11
R-03D	Tar Paper	Building 3
R-03E	Tar Paper	Building 2
R-03F	Tar Paper	Building 5
R-03G	Tar Paper	Building 4
R-04A	Chimney Flashing – On Block	Building 12
R-05A	Chimney Flashing Caulk – White	Building 12
R-06A	Chimney Flashing Caulk	Building 32
R-06B	Chimney Flashing Caulk	Building 26
R-06C	Chimney Flashing Caulk	Building 11
R-06D	Chimney Flashing Caulk	Building 3
R-06E	Chimney Flashing Caulk	Building 2
R-06F	Chimney Flashing Caulk	Building 5
R-06G	Chimney Flashing Caulk	Building 4
R-06H	Chimney Flashing Caulk	Building 12

MH 2-25-20 10:10 am

TriEco

200091446

ASBESTOS BUILDING SURVEY SAMPLE LOG

FACILITY: Parkway Place Housing Community
BUILDING # / AREA: Gabled Roofing Systems
DATE: February 20, 2020
PROJECT NO: 200112-G

SAMPLE #	DESCRIPTION	LOCATION
R-07A	Block Mortar	Chimney – Building 12
R-07B	Block Mortar	Chimney – Building 3
R-07C	Block Mortar	Chimney – Building 26
R-07D	Block Mortar	Chimney – Building 32
R-08A	Block	Chimney - Building 32
R-08B	Block	Chimney - Building 26
R-08C	Block and Mortar	Chimney - Building 11
R-08D	Block and Mortar	Chimney - Building 3
R-08E	Block and Mortar	Chimney - Building 2
R-08F	Block and Mortar	Chimney - Building 5
R-08G	Block and Mortar	Chimney - Building 4
R-08H	Block	Chimney - Building 12
R-09A	Siding to Shingle Caulk	Building 11
R-10A	Awning Flashing Caulk	Building 3
R-10B	Awning Flashing Caulk	Building 2
R-10C	Awning Flashing Caulk	Building 11
R-10D	Basement Awning Flashing Caulk	Building 12

cm 2-25-20 10:10am

SECTION 061000 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Framing with dimension lumber.
2. Wood blocking and nailers.

1.3 DEFINITIONS

A. Exposed Framing: Framing not concealed by other construction.

B. Dimension Lumber: Lumber of 2 inches nominal or greater but less than 5 inches nominal (114 mm actual) in least dimension.

C. Timber: Lumber of 5 inches nominal or greater in least dimension.

D. Lumber grading agencies, and the abbreviations used to reference them, include the following:

1. NeLMA: Northeastern Lumber Manufacturers' Association.
2. SPIB: The Southern Pine Inspection Bureau.

1.4 SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
2. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
3. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

B. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.

C. Research/Evaluation Reports: For the following, showing compliance with building code in effect for Project:

1. Wood-preservative-treated wood.
2. Engineered wood products.
3. Power-driven fasteners.
4. Powder-actuated fasteners.
5. Metal framing anchors.

1.5 QUALITY ASSURANCE

A. Source Limitations for Engineered Wood Products: Obtain each type of engineered wood product through one source from a single manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece.
3. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
4. Provide dressed lumber, S4S, unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

A. Preservative Treatment by Pressure Process: AWPA C2, except that lumber that is not in contact with the ground and is continuously protected from liquid water may be treated according to AWPA C31 with inorganic boron (SBX).

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

D. Application: Treat items indicated on Drawings, and the following:

1. Wood nailers, blocking, and similar members in connection with roofing, flashing, vapor barriers, etc.
2. Wood blocking and similar concealed members in contact with masonry or concrete.

2.3 DIMENSION LUMBER FRAMING

A. Maximum Moisture Content: 19 percent.

B. Framing Members: Construction or No. 2 grade and any of the following species:

1. Mixed southern pine; SPIB.

2.4 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.
2. Nailers.

B. For items of dimension lumber size, provide Construction or No. 2 grade lumber with 19 percent maximum moisture content of any species.

C. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.

2.5 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.

1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153 or of Type 304 stainless steel.

B. Nails: ASTM F 1667.

1. Staples are not permitted.

C. Power-Driven Fasteners: NES NER-272.

D. Wood Screws: ASME B18.6.1.

E. Lag Bolts: ASME B18.2.1.

F. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 hex nuts and, where indicated, flat washers.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate nailers, blocking, , and similar supports to comply with requirements for attaching other construction.

B. Framing Standard: Comply with AF&PA's "Details for Conventional Wood Frame Construction," unless otherwise indicated.

C. Metal Framing Anchors: Install metal framing to comply with manufacturer's written instructions.

D. Do not splice structural members between supports, unless otherwise indicated.

E. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

F. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

G. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

1. Use inorganic boron for items that are continuously protected from liquid water.
2. Use copper naphthenate for items not continuously protected from liquid water.

H. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. Published requirements of manufacturer.

I. Use common wire nails, unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood; do not countersink nail heads, unless otherwise indicated.

3.2 WOOD, BLOCKING, AND NAILER INSTALLATION

A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated.

3.3 WALL FRAMING INSTALLATION

A. General: Provide single bottom plate and double top plates using members of 2-inch nominal (38-mm actual) thickness whose widths equal that of studs, except single top plate may be used for non-load-bearing partitions. Fasten plates to supporting construction, unless otherwise indicated.

1. Provide continuous horizontal blocking at midheight of partitions more than 96 inches high, using members of 2-inch nominal thickness and of same width as wall or partitions.

B. Frame openings with multiple studs and headers. Provide nailed header members of thickness equal to width of studs. Support headers on jamb studs.

3.8 PROTECTION

A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061000

SECTION 061600 - SHEATHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Wall sheathing.
2. Roof sheathing.
3. Building wrap.

1.3 SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. For building wrap, include data on air-/moisture-infiltration protection based on testing according to referenced standards.

B. Research/Evaluation Reports: For the following, showing compliance with building code in effect for Project:

1. Building wrap.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Stack plywood and other panels flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PANEL PRODUCTS, GENERAL

A. Oriented Strand Board: DOC PS 2.

B. Factory mark panels to indicate compliance with applicable standard.

2.2 ROOF SHEATHING

A. Oriented-Strand-Board Roof Sheathing: **Exposure 1, Structural I Exposure 1** sheathing.

1. Span Rating: Not less than **24/0.**
2. Nominal Thickness: Not less than as indicated on drawings.

2.3 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.

1. Provide coated, corrosion resistant fasteners suitable for the installation, complying with all applicable requirements and Codes, for allowable loads, withdrawal resistance, lateral strength, etc.

B. Nails: ASTM F 1667.

1. Staples are not permitted.

C. Power-Driven Fasteners: NES NER-272.

D. Wood Screws: ASME B18.6.1.

2.4 BUILDING WRAP

A. Building Wrap: ASTM E 1677, Type I air retarder; with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, when tested according to ASTM E 84; UV stabilized; and acceptable to authorities having jurisdiction.

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

a. DuPont (E. I. du Pont de Nemours and Company); Tyvek
b. Or equal.

2. Water-Vapor Permeance: Not less than **152** g through 1 sq. m of surface in 24 hours per ASTM E 96, Desiccant Method (Procedure A).
3. Allowable UV Exposure Time: Not less than three months.

B. Building-Wrap Tape: Pressure-sensitive plastic tape recommended by building-wrap manufacturer for sealing joints and penetrations in building wrap.

2.5 MISCELLANEOUS MATERIALS

A. Adhesives for Field Gluing Panels to Framing: Formulation complying with ASTM D 3498 that is approved for use with type of construction panel indicated by manufacturers of both adhesives and panels.

1. Use adhesives that have a VOC content of 70 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction, unless otherwise indicated.

C. Securely attach to substrate by fastening as indicated, complying with the following:

1. Published requirements or metal framing anchor manufacturer.

D. Coordinate sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.

E. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

3.2 WOOD STRUCTURAL PANEL INSTALLATION

A. General: Comply with applicable recommendations in APA Form No. E30S, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.

B. Fastening Methods: Fasten panels as indicated below:

1. Wall and Roof Sheathing:

a. Nail or screw to wood framing. Apply a continuous bead of glue to framing members at edges of wall sheathing panels.
b. Space panels 1/8 inch (3 mm) apart at edges and ends.
c. Provide 18 ga. Galvanized roof sheathing clips installed between panels; spaced per manufacturers recommendations.

3.3 BUILDING WRAP INSTALLATION

A. General: Cover sheathing as follows:

B. Building Wrap: Comply with manufacturer's written instructions.

1. Seal seams, edges, fasteners, and penetrations with tape.
2. Extend into jambs of openings and seal corners with tape.

END OF SECTION 061600

SECTION 073113 - ASPHALT SHINGLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Asphalt shingles.
2. Felt or Manufacturers Synthetic Underlayment.
3. Self-adhering sheet underlayment.

1.3 DEFINITIONS

A. Roofing Terminology: Refer to ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definitions of terms related to roofing work in this Section.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for Selection: For each type of asphalt shingle and ridge vent.

1. Include similar Samples of trim and accessories involving color selection.

2. Selection will vary from building to building.

C. Qualification Data: For Installer.

D. Maintenance Data: For asphalt shingles to include in maintenance manuals.

E. Warranties: Special warranties specified in this Section.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A firm or individual that is approved, authorized, or licensed by asphalt shingle roofing system manufacturer to install roofing system indicated.

B. Source Limitations: Obtain shingles, ridge vents, felt underlayment and self-adhering sheet underlayment through one source from a single asphalt shingle manufacturer.

C. Fire-Test-Response Characteristics: Provide asphalt shingle and related roofing materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.

1. Exterior Fire-Test Exposure: Class **A**; ASTM E 108 or UL 790, for application and roof slopes indicated.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store roofing materials in a dry, well-ventilated, weathertight location according to asphalt shingle manufacturer's written instructions. Store underlayment rolls on end on pallets or other raised surfaces. Do not double-stack rolls.

1. Handle, store, and place roofing materials in a manner to avoid significant or permanent damage to roof deck or structural supporting members.

B. Protect unused underlayment from weather, sunlight, and moisture when left overnight or when roofing work is not in progress.

1.7 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit asphalt shingle roofing to be performed according to manufacturer's written instructions and warranty requirements.

1. Install self-adhering sheet underlayment within the range of ambient and substrate temperatures recommended by manufacturer.

1.8 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace asphalt shingles that fail in materials or workmanship within specified warranty period. Materials failures include manufacturing defects and failure of asphalt shingles to self-seal after a reasonable time.

1. Material Warranty Period: Minimum 30 years from date of Final Completion.
2. Wind-Speed Warranty Period: Asphalt shingles will resist blow-off or damage caused by wind speeds up to 110 mph for 5 years from date of Final Completion.
3. Algae-Discoloration Warranty Period: Asphalt shingles will not discolor 10 years from date of Final Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

1. Owens Corning Roofing.
2. CertainTeed Corporation
3. GAF Materials Corporation
4. Or Equal

2.2 GLASS-FIBER-REINFORCED ASPHALT SHINGLES

A. Multi-Strip Asphalt Shingles: ASTM D 3462, glass-fiber reinforced, mineral-granule surfaced, and self-sealing.

1. Butt Edge: Manufacturer's standard.
2. Strip Size: Manufacturer's standard.
3. Algae Resistance: Granules treated to resist algae discoloration.
4. Color and Blends: As selected by Architect from manufacturer's full range.
5. CRRC Rated Cool Roof.
6. Energy Star Qualified
7. Dimensional.

B. Hip and Ridge Shingles: Manufacturer's standard units to match asphalt shingles. Site-fabricated units cut from asphalt shingle strips. Trim each side of lapped portion of unit to taper approximately 1 inch (25 mm).

2.3 UNDERLAYMENT MATERIALS

A. Felts: ASTM D 226, Type I, asphalt-saturated organic felts, nonperforated.

B. Manufacturers Brand Synthetic Roof Underlayment.

C. Self-Adhering Sheet Underlayment, Granular Surfaced: ASTM D 1970, minimum of 55-mil- (1.4-mm-) thick sheet; glass-fiber-mat-reinforced, SBS-modified asphalt; mineral-granule surfaced; with release paper backing; cold applied.

1. Available Products:

a. Owens Corning; WeatherLock G.
b. Or Equal.

2.4 ACCESSORIES

A. Asphalt Roofing Cement: ASTM D 4586, Type II, asbestos free.

B. Roofing Nails: ASTM F 1667; aluminum, stainless-steel, copper, or hot-dip galvanized steel wire shingle nails, minimum 0.120-inch- (3-mm-) diameter, barbed shank, sharp-pointed, with a minimum 3/8-inch- (9.5-mm-) diameter flat head and of sufficient length to penetrate 3/4 inch (19 mm) into solid wood decking or extend at least 1/8 inch (3 mm) through OSB or plywood sheathing.

1. Where nails are in contact with metal flashing, use nails made from same metal as flashing.

C. Felt Underlayment Nails: Aluminum, stainless-steel, or hot-dip galvanized steel wire with low profile capped heads or disc caps, 1-inch (25-mm) minimum diameter.

D. Rigid Ridge Vent: Manufacturer's standard rigid section high-density polypropylene or other UV-stabilized plastic ridge vent with nonwoven geotextile filter strips and with external deflector baffles; for use under ridge shingles.

1. Available Products:

   a. Owens Corning; VentSure Ridge Vent.
   b. GAF, Cobra Ridge
   c. Tamko, Cool Ridge
   d. Or equal.

2. Minimum Net Free Area: 18 square inches per foot.
3. Width: Manufacturer's standard.
4. Thickness: Manufacturer's standard.

2.5 METAL FLASHING AND TRIM

A. Sheet Metal Flashing and Trim: Comply with requirements in Division 07 Section "Sheet Metal Flashing and Trim."

B. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item.

1. Apron Flashings: Fabricate with lower flange a minimum of 4 inches (100 mm) over and 4 inches (100 mm) beyond each side of downslope asphalt shingles and 6 inches (150 mm) up the vertical surface.
2. Step Flashings: Fabricate with a headlap of 2 inches (50 mm) and a minimum extension of 4 inches (100 mm) over the underlying asphalt shingle and up the vertical surface.
3. Drip Edges: Fabricate in lengths not exceeding 10 feet (3 m) with 2-inch (50-mm) roof deck flange and 1-1/2-inch (38-mm) fascia flange with 3/8-inch (9.6-mm) drip at lower edge.

   a. Provide full length pieces. Do not install pieces less than 18 inches. Where the installed length exceeds the allowable length of drip edge, such as Rakes, provide drip edge in equal lengths.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.

1. Examine roof sheathing to verify that sheathing joints are supported by framing and blocking or metal clips and that installation is within flatness tolerances.
2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and completely anchored; and that provision has been made for flashings and penetrations through asphalt shingles.
3. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 UNDERLAYMENT INSTALLATION

A. Single-Layer Felt Underlayment: Install single layer of felt underlayment on roof deck perpendicular to roof slope in parallel courses. Lap sides a minimum of 2 inches (50 mm) over underlying course. Lap ends a minimum of 4 inches (100 mm). Stagger end laps between succeeding courses at least 72 inches (1830 mm). Fasten with felt underlayment nails.

1. Install felt underlayment on roof deck not covered by self-adhering sheet underlayment. Lap sides of felt over self-adhering sheet underlayment not less than 3 inches (75 mm) in direction to shed water. Lap ends of felt not less than 6 inches (150 mm) over self-adhering sheet underlayment.

B. Manufacturers Synthetic Roof Underlayment: Install per manufacturers instructions.

B. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free, on roof deck. Comply with low-temperature installation restrictions of underlayment manufacturer if applicable. Install at locations indicated below, lapped in direction to shed water. Lap sides not less than 3-1/2 inches (89 mm). Lap ends not less than 6 inches (150 mm) staggered 24 inches (600 mm) between courses. Roll laps with roller. Cover underlayment within seven days.

1. Eaves: Extend from edges of eaves 24 inches (600 mm) beyond interior face of exterior wall.
2. Rakes: Extend from edges of rake 24 inches (600 mm) beyond interior face of exterior wall.
3. Valleys: Extend from lowest to highest point 18 inches (450 mm) on each side.
4. Hips: Extend 18 inches (450 mm) on each side.
5. Ridges: Extend 36 inches (914 mm) on each side without obstructing continuous ridge vent slot.
6. Sidewalls: Extend beyond sidewall 18 inches (450 mm) and return vertically against sidewall not less than 4 inches (100 mm).

7. Dormers and other Roof-Penetrating Elements: Extend beyond penetrating element 18 inches (450 mm) and return vertically against penetrating element not less than 4 inches (100 mm).
8. Roof Slope Transitions: Extend 18 inches (450 mm) on each roof slope.

C. Concealed Woven Valley Lining: Comply with ARMA and NRCA recommendations. Install a 36-inch- (914-mm-) wide felt underlayment centered in valley. Fasten to roof deck with roofing nails.

1. Lap roof deck felt underlayment over valley felt underlayment at least 6 inches (150 mm).
2. Install a 36-inch- (914-mm-) wide strip of granular-surfaced valley lining centered in valley, with granular-surface face up. Lap ends of strips at least 12 inches (300 mm) in direction to shed water, and seal with asphalt roofing cement. Fasten to roof deck with roofing nails.

3.3 METAL FLASHING INSTALLATION

A. General: Install metal flashings and other sheet metal to comply with requirements in Division 07 Section "Sheet Metal Flashing and Trim."

1. Install metal flashings according to recommendations in ARMA's "Residential Asphalt Roofing Manual" and asphalt shingle recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."

B. Apron Flashings: Extend lower flange over and beyond each side of downslope asphalt shingles and up the vertical surface.

C. Step Flashings: Install with a headlap of 2 inches (50 mm) and extend over the underlying asphalt shingle and up the vertical surface. Fasten to roof deck only.

D. Rake Drip Edges: Install rake drip edge flashings over underlayment and fasten to roof deck.

E. Eave Drip Edges: Install eave drip edge flashings below underlayment and fasten to roof sheathing.

F. Pipe Flashings: Fasten and seal to asphalt shingles as recommended by manufacturer.

3.4 ASPHALT SHINGLE INSTALLATION

A. Install asphalt shingles according to manufacturer's written instructions, recommendations in ARMA's "Residential Asphalt Roofing Manual," and asphalt shingle recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."

1. Staples are NOT permitted.

B. Install starter strip along lowest roof edge, consisting of an asphalt shingle strip with tabs removed with self-sealing strip face up at roof edge.

1. Extend asphalt shingles 1/2 inch (13 mm) over fascia at eaves and rakes.
2. Install starter strip along rake edge.

C. Install first and remaining courses of asphalt shingles stair-stepping diagonally across roof deck with manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.

D. Install first and remaining courses of asphalt shingles stair-stepping diagonally across roof deck with manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.

E. Install asphalt shingles by single-strip column or racking method, maintaining uniform exposure. Install full length first course followed by cut second course, repeating alternating pattern in succeeding courses.

F. Fasten asphalt shingle strips with a minimum of five roofing nails located according to manufacturer's written instructions.

1. When ambient temperature during installation is below 50 deg F (10 deg C), seal asphalt shingles with asphalt roofing cement spots.

2. Staples are NOT permitted.

G. Woven Valleys: Extend succeeding asphalt shingle courses from both sides of valley 12 inches (300 mm) beyond center of valley, weaving intersecting shingle-strip courses over each other. Use one-piece shingle strips without joints in the valley.

1. Do not nail asphalt shingles within 6 inches (150 mm) of valley center.

H. Ridge and Hip Cap Shingles: Maintain same exposure of cap shingles as roofing shingle exposure. Lap cap shingles at ridges to shed water away from direction of prevailing winds. Fasten with roofing nails of sufficient length to penetrate sheathing.

I. Ridge Vents: Install continuous ridge vents over asphalt shingles according to manufacturer's written instructions. Fasten with roofing nails of sufficient length to penetrate sheathing.

END OF SECTION 073113

SECTION 074600 - SIDING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Fiber-cement siding.
2. Soffit.
3. Trim.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for Selection: For siding and soffit.

1.4 QUALITY ASSURANCE

A. Source Limitations for Siding and Soffit: Obtain each type, color, texture, and pattern of siding and soffit, including related accessories, through one source from a single manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store materials in a dry, well-ventilated, weathertight place.

1.6 PROJECT CONDITIONS

A. Weather Limitations: Proceed with siding installation only if substrate is completely dry and if existing and forecasted weather conditions permit siding to be installed according to manufacturer's written instructions.

1.7 SEQUENCING

A. Coordinate installation with flashings and other adjoining construction to ensure proper sequencing.

1.8 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace siding that does not comply with requirements or that fails within specified warranty period. Failures include, but are not limited to, cracking, deforming, or otherwise deteriorating beyond normal weathering.

1. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

2.2 SIDING

A. Fiber-Cement Siding: Siding made from fiber-cement board that does not contain asbestos fibers; complies with ASTM C 1186, Type A, Grade II; is classified as noncombustible when tested according to ASTM E 136; and has a flame-spread index of 25 or less when tested according to ASTM E 84.

1. Available Manufacturers:

a. James Hardie Inc.

2. Horizontal Pattern: Boards with exposure, noted in drawings.

a. Texture: Smooth.

3. Factory Finishing: Manufacturer's standard factory primed finish, ready for field painting.

2.3 SOFFIT

A. Fiber Cement Soffit: Complies with ASTM C 1186, Type A, Grade II, non-combustible in accordance with ASTM E 136, flame spread index of 25 or less when tested ASTM E 84.

1. Pattern: Smooth texture.
2. Ventilation: Provide perforated soffit, as designated on drawings.

3. Factory Primed: Manufacturer's standard.

   a. Product to be field painted.

2.4 TRIM

A. Provide Fiber cement trim boards in sizes indicated in drawings and as described below.

1. Surface: Primed on all four sides with one face smooth and one face textured.
2. Size: Boards shall be nominal 5/4" (inch) thickness in sizes indicated on drawings, unless otherwise noted.
3. Installation: Per manufacturer's printed installation instructions.
4. Finish: Field painted per manufacturer's printed instructions.

2.5 ACCESSORIES

A. Siding Accessories: Provide starter strips, edge trim, and other items as recommended by siding manufacturer for building configuration.

1. Provide accessories made from same material as adjacent siding, unless otherwise indicated.
2. Provide accessories matching color and texture of adjacent siding, unless otherwise indicated.

B. Fasteners:

1. For fastening fiber-cement siding, use hot-dip galvanized fasteners.
2. For fastening vinyl, use hot-dip galvanized fasteners. Where fasteners will be exposed to view, use prefinished aluminum fasteners in color to match item being fastened.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of siding. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrates of projections and substances detrimental to application.

3.3 INSTALLATION

A. General: Comply with siding manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply. Center nails in elongated nailing slots without binding siding to allow for thermal movement. Overlap joints to shed water away from direction of prevailing wind.

3.4 ADJUSTING AND CLEANING

A. Remove damaged, improperly installed, or otherwise defective siding materials and replace with new materials complying with specified requirements.

B. Clean finished surfaces according to siding manufacturer's written instructions and maintain in a clean condition during construction.

END OF SECTION

SECTION 076200 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes sheet metal flashing and trim in the following categories:

1. Roof-drainage systems.
2. Sheet metal flashing and trim.

1.3 PERFORMANCE REQUIREMENTS

A. General: Install sheet metal flashing and trim to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failing.

1.4 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product Data including manufacturer's material and finish data, installation instructions, and general recommendations for each specified flashing material and fabricated product.

C. Shop Drawings of each item specified showing layout, profiles, methods of joining, and anchorage details.

D. Samples of sheet metal flashing, trim, and accessory items, in the specified finish. Where finish involves normal color and texture variations, include Sample sets composed of 2 or more units showing the full range of variations expected.

1. 8-inch- (200-mm-) square Samples of specified sheet materials to be exposed as finished surfaces.
2. 12-inch- (300-mm-) long Samples of factory-fabricated products exposed as finished Work. Provide complete with specified factory finish.

E. Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects

with project names and addresses, names and addresses of architects and owners, and other information specified.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experience Installer who has completed sheet metal flashing and trim work similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.

1.6 PROJECT CONDITIONS

A. Coordinate Work of this Section with interfacing and adjoining Work for proper sequencing of each installation. Ensure best possible weather resistance, durability of Work, and protection of materials and finishes.

PART 2 - PRODUCTS

2.1 METALS

A. Aluminum: Alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated and with not less than the strength and durability of alloy and temper designated below:

2.2 MISCELLANEOUS MATERIALS AND ACCESSORIES

A. Fasteners: Same metal as sheet metal flashing or other noncorrosive metal as recommended by sheet metal manufacturer. Match finish of exposed heads with material being fastened.

B. Asphalt Mastic: SSPC-Paint 12, solvent-type asphalt mastic, nominally free of sulfur and containing no asbestos fibers, compounded for 15-mil (0.4-mm) dry film thickness per coat.

C. Mastic Sealant: Polyisobutylene; nonhardening, nonskinning, nondrying, nonmigrating sealant.

D. Elastomeric Sealant: Generic type recommended by sheet metal manufacturer and fabricator of components being sealed and complying with requirements for joint sealants as specified in Division 7 Section "Joint Sealants."

E. Adhesives: Type recommended by flashing sheet metal manufacturer for waterproof and weather-resistant seaming and adhesive application of flashing sheet metal.

F. Metal Accessories: Provide sheet metal clips, straps, anchoring devices, and similar accessory units as required for complete installation of Work, matching or compatible with material being installed; noncorrosive; size and thickness required for performance.

G. Roofing Cement: ASTM D 4586, Type I, asbestos free, asphalt based.

2.3 FABRICATION, GENERAL

A. Sheet Metal Fabrication Standard: Fabricate sheet metal flashing and trim to comply with recommendations of SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions, metal, and other characteristics of the item indicated.

B. Fabricate sheet metal flashing and trim that fit substrates and result in waterproof and weather-resistant performance once installed. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.

C. Form exposed sheet metal Work that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems.

D. Separate metal from noncompatible metal or corrosive substrates by coating concealed surfaces at locations of contact with asphalt mastic or other permanent separation as recommended by manufacturer.

E. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of sheet metal exposed to public view.

F. Fabricate cleats and attachment devices from same material as sheet metal component being anchored or from compatible, noncorrosive metal recommended by sheet metal manufacturer.

1. Size: As recommended by SMACNA manual or sheet metal manufacturer for application but never less than thickness of metal being secured.

2.4 SHEET METAL FABRICATIONS

A. General: Fabricate sheet metal items in thickness or weight needed to comply with performance requirements but not less than that listed below for each application and metal.

B. Gutters: Fabricate from the following material: Gutters shall be seamless.

1. Aluminum: 0.0320 inch (0.8 mm) thick.
2. Size: As indicated indicated on drawings.

C. Downspouts: Fabricate from the following material:

1. Aluminum: 0.024 inch (0.6 mm) thick.
2. Size: As indicated on drawings.

D. Flashing

1. Provide flashing in areas shown/noted in the drawings.

2. Provide pre-finished flashing where exposed.
3. Fabricate from the following material:

    a. Aluminum: 0.0320 inch thick.

3.1 ALUMINUM FINISHES

A. General: Comply with Aluminum Association's (AA) "Designation System for Aluminum Finishes" for finish designations and application recommendations.

B. Provide manufacturer's standard baked-on, acrylic shop finish on sheet metal units (gutters, downspouts, flashing and similar exposed units); 1.0-mil (0.025-mm) dry film thickness.

PART 3 - EXECUTION

4.1 EXAMINATION

A. Examine substrates and conditions under which sheet metal flashing and trim are to be installed and verify that Work may properly commence. Do not proceed with installation until unsatisfactory conditions have been corrected.

4.2 INSTALLATION

A. General: Unless otherwise indicated, install sheet metal flashing and trim to comply with performance requirements, manufacturer's installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Anchor units of Work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install Work with laps, joints, and seams that will be permanently watertight and weatherproof.

B. Install exposed sheet metal Work that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.

C. Separations: Separate metal from noncompatible metal or corrosive substrates by coating concealed surfaces, at locations of contact, with asphalt mastic or other permanent separation as recommended by manufacturer.

    1. Bed flanges of Work in a thick coat of roofing cement where required for waterproof performance.

D. Roof-Drainage System: Install drainage items fabricated from sheet metal, with straps, adhesives, and anchors recommended by SMACNA's Manual or the item

manufacturer, to drain roof in the most efficient manner. Coordinate roof-drain flashing installation with roof-drainage system installation. Coordinate flashing and sheet metal items for steep-sloped roofs with roofing installation.

4.3 CLEANING AND PROTECTION

A. Clean exposed metal surfaces, removing substances that might cause corrosion of metal or deterioration of finishes.

B. Provide final protection and maintain conditions that ensure sheet metal flashing and trim Work during construction is without damage or deterioration other than natural weathering at the time of Completion.

END OF SECTION 076200

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes joint sealants for the following applications, including those specified by reference to this Section:

1. Exterior joints in vertical surfaces and horizontal nontraffic surfaces.

1.3 PERFORMANCE REQUIREMENTS

A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

B. Provide joint sealants for interior applications that establish and maintain airtight and water-resistant continuous joint seals without staining or deteriorating joint substrates.

1.4 SUBMITTALS

A. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized Installer who is approved or licensed for installation of elastomeric sealants required for this Project.

B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

1.6 PROJECT CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F (5 deg C).

2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience.

B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 ELASTOMERIC JOINT SEALANTS

A. Elastomeric Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

B. Stain-Test-Response Characteristics: Where elastomeric sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

2.3 JOINT-SEALANT BACKING

A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 26 deg F (minus 32 deg C). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and to otherwise contribute to optimum sealant performance.

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.4 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
2. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:

    a. Concrete.
    b. Masonry.

3. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:

a. Metal.

B. Joint Priming: Prime joint substrates, where recommended by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.

3. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.
4. Provide flush joint configuration where indicated per Figure 5B in ASTM C 1193.
5. Provide recessed joint configuration of recess depth and at locations indicated per Figure 5C in ASTM C 1193.

    a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

3.4 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.6 JOINT-SEALANT SCHEDULE

A. Provide joint sealants of the type are indicated and locations noted:

1. Type and Grade: S (single component) and NS (nonsag).
2. Class: 25.
3. Use Related to Exposure: NT (nontraffic) for use intended.

B. PROVIDE URETHANE CAULK AT EXTERIOR JOINTS.

END OF SECTION 079200

SECTION 099100 - PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes surface preparation, painting, and finishing of exposed interior and exterior items and surfaces.

1. Surface preparation, priming, and finish coats specified in this Section are in addition to shop-priming and surface treatment specified under other Sections.

B. Paint exposed surfaces whether or not colors are designated in schedules, except where a surface or material is specifically indicated not to be painted or is to remain natural. Where an item or surface is not specifically mentioned, paint the same as similar adjacent materials or surfaces. If color or finish is not designated, the Architect will select from standard colors or finishes available.

C. Painting is not required on prefinished items, finished metal surfaces, concealed surfaces, operating parts, and labels.

1.3 SUBMITTALS

A. General: Submit the following according to Conditions of the Contract and Division 1 Specification Sections.
B. Product data for each paint system specified and primers.

1. Provide the manufacturer's technical information including label analysis and instructions for handling, storage, and application of each material proposed for use.
2. List each material and cross-reference the specific coating, finish system, and application. Identify each material by the manufacturer's catalog number and general classification.
3. Certification by the manufacturer that products supplied contain NO volatile organic compounds (VOCs).

C. Samples for color selection in the form of manufacturer's color charts.

1. After color selection, the Architect will furnish color chips for surfaces to be coated. Some color selections have been inserted in this specification for design intent purposes. Submit manufacturer's color charts.

1.4 QUALITY ASSURANCE

A. Applicator Qualifications: Engage an experienced applicator that has completed painting system applications similar in material and extent to those indicated for the Project that have resulted in a construction record of successful in-service performance.

1 Application of the Epoxy Floor Coating product shall be by a certified qualified applicant approved by the manufacturer for the system provided. The installer must have completed at least two successful similar projects.

B. Single-Source Responsibility: Provide primers and undercoat paint produced by the same manufacturer as the finish coats.

C. Field Samples: On wall surfaces and other exterior components, duplicate finishes of prepared samples. Provide full-coat finish samples on at least 100 sq. ft. of surface until required sheen, color, and texture are obtained; simulate finished lighting conditions for review of in-place work.

1. Final acceptance of colors will be from job-applied samples.
2. The Architect will select one room as field mock-up to represent surfaces and conditions for each type of coating and substrate to be painted. Apply coatings in this room or surface according to the schedule or as specified to be used as standard of quality for remainder of project.

    a. After finishes are accepted, this room or surface will be used to evaluate coating systems of a similar nature.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to the job site in the manufacturer's original, unopened packages and containers bearing manufacturer's name and label, and the following information:
1. Product name or title of material.
2. Product description (generic classification or binder type).
3. Manufacturer's stock number and date of manufacture.
4. Contents by volume, for pigment and vehicle constituents.
5. Thinning instructions.
6. Application instructions.
7. Color name and number.

B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F (7 deg C). Maintain containers used in storage in a clean condition, free of foreign materials and residue.

1. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

1.6 JOB CONDITIONS

A. Apply water-based paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 50 deg F (10 deg C) and 90 deg F (32 deg C).

B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 45 deg F (7 deg C) and 95 deg F (35 deg C).

C. Do not apply paint in snow, rain, fog, or mist; or when the relative humidity exceeds 85 percent; or at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by the manufacturer during application and drying periods.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

1. Sherwin Williams.

2.2 PAINT MATERIALS, GENERAL

A. Material Compatibility: Provide primers, finish coat materials, and related materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by the manufacturer based on testing and field experience.

B. Material Quality: Provide the manufacturer's best-quality trade sale paint material of the various coating types specified. Paint material containers not displaying manufacturer's product identification will not be acceptable.

1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish the manufacturer's material data and certificates of performance for proposed substitutions.

C. Colors: Provide color selections made by the Architect from the manufacturer's full range of standard colors.

1. Color selections will vary from building to building.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions under which painting will be performed for compliance with paint application requirements. Surfaces receiving paint must be thoroughly dry before paint is applied.

1. Do not begin to apply paint until unsatisfactory conditions have been corrected.
2. Start of painting will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.

B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.

1. Notify the Architect about anticipated problems using the materials specified over substrates primed by others.

3.2 PREPARATION

A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted, or provide surface-applied protection prior to surface preparation and painting. Remove these items, if necessary, to completely paint the items and adjacent surfaces. Following completion of painting operations in each space or area, have items reinstalled by workers skilled in the trades involved.

B. Cleaning: Before applying paint or other surface treatments, clean the substrates of substances that could impair the bond of the various coatings. Remove oil and grease prior to cleaning. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.

C. Surface Preparation: Clean and prepare surfaces to be painted according to the manufacturer's instructions for each particular substrate condition and as specified.

1. Provide barrier coats over incompatible primers or remove and reprime. Notify Architect in writing about anticipated problems using the specified finish-coat material with substrates primed by others.
2. Ferrous Metals: Clean ferrous metal surfaces that have not been shop-coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with recommendations of the Steel Structures Painting Council (SSPC).

a. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.
b. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by the paint manufacturer, and touch up with the same primer as the shop coat.

3. Galvanized Surfaces: Clean galvanized surfaces with non-petroleum-based solvents so that the surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.

D. Materials Preparation: Carefully mix and prepare paint materials according to manufacturer's directions.

1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.

2. Stir material before application to produce a mixture of uniform density; stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material before using.
3. Use only thinners approved by the paint manufacturer and only within recommended limits.

E. Tinting: Tint each undercoat a lighter shade to facilitate identification of each coat where multiple coats of the same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.3 APPLICATION

A. General: Apply paint according to manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.

B. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.

1. Paint colors, surface treatments, and finishes are indicated in the schedules.
2. Provide finish coats that are compatible with primers used.
3. The number of coats and the film thickness required are the same regardless of the application method. Do not apply succeeding coats until the previous coat has cured as recommended by the manufacturer. Sand between applications where sanding is required to produce a smooth even surface according to the manufacturer's directions.
4. Apply additional coats if undercoats, stains, or other conditions show through final coat of paint until paint film is of uniform finish, color, and appearance. Give special attention to ensure that surfaces, including edges, corners, crevices, welds, and exposed fasteners, receive a dry film thickness equivalent to that of flat surfaces.
5. The term exposed surfaces includes areas visible when permanent or built-in fixtures, convector covers, covers for finned tube radiation, grilles, and similar components are in place. Extend coatings in these areas, as required, to maintain the system integrity and provide desired protection.

6. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
7. Omit primer on metal surfaces that have been shop-primed and touch-up painted.

C. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.

1. Allow sufficient time between successive coats to permit proper drying. Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and where application of another coat of paint does not cause the undercoat to lift or lose adhesion.

D. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to the manufacturer's directions.

1. Brushes: Use brushes best suited for the material applied.
2. Rollers: Use rollers of carpet, velvet back, or high-pile sheep's wool as recommended by the manufacturer for the material and texture required.
3. Spray Equipment: Use airless spray equipment with orifice size as recommended by the manufacturer for the material and texture required.

E. Minimum Coating Thickness: Apply materials no thinner than the manufacturer's recommended spreading rate. Provide the total dry film thickness of the entire system as recommended by the manufacturer.

F. Prime Coats: Before applying finish coats, apply a prime coat of material, as recommended by the manufacturer, to material that is required to be painted or finished and that has not been prime-coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.

G. Stipple Enamel Finish: Roll and redistribute paint to an even and fine texture. Leave no evidence of rolling such as laps, irregularity in texture, skid marks, or other surface imperfections.

H. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with specified requirements.

3.4 FIELD QUALITY CONTROL

A. The Owner reserves the right to invoke the following test procedure at any time and as often as the Owner deems necessary during the period when paint is being applied:
1. The Owner will engage the services of an independent testing agency to sample the paint material being used. Samples of material delivered to the Project will be taken, identified, sealed, and certified in the presence of the Contractor.
2. The testing agency will perform appropriate tests for the following characteristics as required by the Owner:

a. Quantitative materials analysis.
b. Abrasion resistance.
c. Apparent reflectivity.
d. Flexibility.

e. Washability.
f. Absorption.
g. Accelerated weathering.
h. Dry opacity.
i. Accelerated yellowness.
j. Recoating.
k. Skinning.
l. Color retention.
m. Alkali and mildew resistance.

3. If test results show material being used does not comply with specified requirements, the Contractor may be directed to stop painting, remove noncomplying paint, pay for testing, repaint surfaces coated with rejected paint, and remove rejected paint from previously painted surfaces if, upon repainting with specified paint, the two coatings are incompatible.

3.5 CLEANING

A. Cleanup: At the end of each work day, remove empty cans, rags, rubbish, and other discarded paint materials from the site.

1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping. Be careful not to scratch or damage adjacent finished surfaces.

3.6 PROTECTION

A. Protect work of other trades, whether being painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting, as acceptable to Architect.
B. Provide "Wet Paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others to protect their work after completing painting operations.

1. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.7 EXTERIOR PAINT SCHEDULE

A. General: Provide the following paint systems for the various substrates, as indicated.

B. Ferrous Metal: Primer is not required on shop-primed items.

1. Full-Gloss Alkyd Enamel: Two finish coats over primer.

a. Primer: Synthetic rust-inhibiting primer.
b. First and Second Coats: Gloss alkyd enamel.

C. Fiber-Cement Products

1. Satin Finish Acrylic: Two finish coats over factory primed products.

2. Comply with fiber-cement manufacturer's printed instructions for prepping and painting.

END OF SECTION 099100