SECTION 07 27 26

FLUID-APPLIED MEMBRANE AIR BARRIERS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Fluid-applied, vapor-impermeable, water-resistive membrane air barriers.

1.02 RELATED REQUIREMENTS

A. Section 03 33 00 – Cast-in-Place Concrete: Vapor-retarding air barriers under concrete slabs-on-grade.

B. Section 07 24 00 – Exterior Insulation and Finish System: Water-resistive barrier under insulation.

C. Section [**07 __ __ – _____**]: Vapor-retarding air barriers installed under [**shingles**] [**clay tiles**] [**metal roof panels**] [**and**] [**clay tiles**].

D. Section [**07 __ __ – _____**]: vapor retarder installed as part of roofing system.

E. Section 07 62 00 – Sheet Metal Flashing and Trim: Metal flashings installed in conjunction with fluid-applied membrane air barrier.

1.03 REFERENCES

A. AATC 127 – Water Resistance: Hydrostatic Pressure Test

B. ASTM C 661 – Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer

C. ASTM C 719 – Standard Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement (Hockman Cycle)

D. ASTM C 920 – Standard Specification for Elastomeric Joint Sealants

E. ASTM C 1193 – Standard Guide for Use of Joint Sealants

F. ASTM C 1305 – Standard Test method of Crack Bridging Ability of Liquid-Applied Waterproofing Membrane

G. ASTM C 1330 – Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants

H. ASTM D 412 – Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension

I. ASTM D 624 – Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers

J. ASTM D 4541 – Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers

K. ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials

L. ASTM E 96/E 96M – Test Method for Water Vapor Transmission of Materials

M. ASTM E 783 – Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors

N. ASTM E 1105 – Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference

O. ASTM E 1186 – Standard Practices for Air Leakage Site Detection in Building Envelopes and Air Barrier Systems

P. ASTM E 2178 – Standard Test Method for Air Permeance of Building Materials

Q. ASTM E 2357 – Standard Test Method for Determining Air Leakage of Air Barrier Assemblies

R. ASTM E 1354 – Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter

S. ASTM G 155 – Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials

T. EPA Method 24 (40 CFR 59, Subpart D) – Determination of Volatile Matter Content, Water Content, Density, Volume Solids, and Weight Solids of Surface Coatings

1.04 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Convene conference at Project site before start of work in accordance with provisions of [**Conditions of the Contract for Construction**] [**Section 01 30 00 – Administrative Requirements]**.
   1. Attendance: Manufacturer's field representative, air barrier installer, and installers of work directly contacting and penetrating air barrier; optionally Architect and Owner.
   2. Agenda: Review air barrier installation on mockups **[and results of preconstruction testing]**; manufacturer's instructions for applying air barrier and accessory materials over Project substrates; transition, penetration, and termination details; scheduling; protection of completed Work; and other items necessary to ensure a continuous membrane air barrier.

1.05 ACTION SUBMITTALS

A. Product Data: For air barrier material and accessories, manufacturer's technical data, tested physical and performance properties, and limitations[**; include VOC content**].

B. Shop Drawings: Indicate location and extent of air barrier. Show details for treatment of substrate cracks and joints, penetrations, inside and outside corners, and tie-ins to adjacent construction.

C. Samples: For air barrier material applied to rigid backing of manufacturer's standard size.

1.06 INFORMATIONAL SUBMITTALS

A. Product Certificates: Signed by manufacturer certifying air barrier material and accessories are compatible with each other and substrates and materials to which they contact.

1. Include copy of ABAA Evaluated Material Certificate.

B. Product Test Reports: For air barrier assembly, tests performed by qualified testing agency.

C. Manufacturer's Instructions: For air barrier material and accessories to Project substrates.

D. Test Reports: For field tests, prepared by a qualified inspection and testing agency.

1. Include third-party inspection and test reports required for ABBA Quality Assurance Program.

E. Qualifications: For installer [**and manufacturer's field representative**], from manufacturer.

1. From ABAA, include current installer accreditation and certification for supervisors and personnel who work on Project.

F. Warranties: Sample of special warranties.

1.07 CLOSEOUT SUBMITTALS

A. Warranties: Copies of final, executed warranty documents.

1.08 QUALITY ASSURANCE

A. Quality Assurance Program: Implement and comply with provisions of Air Barrier Association of America (ABBA) Quality Assurance Program (QAP).

B. Installer Qualifications: Engage company employing supervisors and applicators who are trained and qualified by manufacturer.

1. Installer: Accredited by ABBA per ABAA's Quality Assurance Program and employ ABBA-certified applicators and supervisors on Project; maintain credentials from receipt of bids to Substantial Completion.

C. Manufacturer's Field Representative Qualifications: Individual trained and authorized by manufacturer to perform specified field services.

D. Mockups: Construct integrated mockup of [**each**] exterior wall assembly [**as shown on Drawings**] [**100 sq. ft. (9 sq. m) in area**] <**Insert other requirement**> to establish quality standards for materials and application[**and for preconstruction testing**].
   1. Incorporate exterior wall construction, air barrier, exterior [**window**] [**storefront**] [**curtain wall**] frame, insulation, ties, flashing, typical penetrations, and exterior cladding.
   2. Treat substrate joints and changes-of-plane; tie air barrier material into adjacent materials.
   3. Coordinate mockup construction to permit air barrier [**tests and**] inspections before being covered by exterior cladding.

E. Preconstruction Testing: [**Owner will engage a qualified testing agency**] [**Engage a qualified testing agency**] to test air barrier assemblies incorporated into mockups and to verify compliance with specified performance requirements. [**Testing agency will perform the following tests:**] [**Perform the following tests:**]
   1. Adhesion: ASTM D 4541, modified so that membrane is cut through to separate material attached to disc from surrounding material using Type II pull tester
   2. Qualitative Air Leakage Testing: ASTM E 1186, chamber pressurization or depressurization with smoke tracers.
   3. Quantitative Air Leakage Testing: ASTM E 783.
   4. Water Penetration: ASTM E 1105.
   5. [**Insert additional performance requirements and test methods to verify compliance**].

1.09 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original packaging with unbroken seals, labeled with manufacturer's name, product identification, lot code, and directions for storage and application.

B. Store materials in original undamaged packaging, within temperature and humidity limits recommended by manufacturer; protect from direct sunlight.

C. Remove and replace liquid materials that cannot be installed within their stated shelf life.

1.10 FIELD CONDITIONS

A. Apply liquid materials when ambient temperatures are between 10 degrees F (minus 12 degrees C) and 100 degrees F (37 degrees C).

B. Do not apply liquid materials in snow, rain, fog or mist, or when precipitation is imminent. Do not apply air barrier materials to wet or frozen substrates.

C. Do not apply liquid materials to substrates contaminated with materials or substances that may interfere with adhesion. Prevent contact with chemically incompatible materials.

D. Weather Exposure: Cover air barrier no later than maximum time recommended by manufacturer for exposure to ultra-violet radiation.

1.11 WARRANTY

A. Material Warranty: Provide manufacturer's 10-year material warranty commencing at date of Substantial Completion.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturer: Design is based on products manufactured by Pecora Corporation; 165 Wambold Road, Harleysville, PA 19438; Tel: 800-523-6688; Fax: 215-721-0286; Email: techservices@pecora.com; Web: http://www.pecora.com.
   1. Substitutions: Not permitted.
   2. Substitutions: Requests for substitutions will be considered under the provisions of [**Conditions of the Contract for Construction**] [**Section 01 60 00 – Product Requirements**].

B. Product Options: Use air barrier materials and accessories that have been evaluated and listed by ABAA under its Evaluated Materials Program.

C. Source Limitations: Obtain air barrier materials and accessories from the same manufacturer.

2.02 SYSTEM DESCRIPTION

A. Fluid-applied Membrane Air Barrier: Air barrier assembly consisting of brush-, roller- or spray-applied air barrier coating, trowel-applied substrate patching material, termination mastic[**, silicone transition membrane**], and joint sealants applied to opaque walls that together perform as continuous, vapor-impermeable air barrier capable of the following without damage, displacement, or air leakage exceeding specified limits:
   1. Adhering to adjacent systems, materials, and membranes to form continuous building air enclosure.
   2. Sealing substrate expansion and control joints, material changes, penetrating items, inside and outside corners, and roofing and waterproofing system tie-ins.
   3. Withstanding positive and negative wind pressures, and fan and stack pressures on the building enclosure.
   4. Accommodating creep, thermal movement, and anticipated seismic and building movement.
   5. Shedding and draining liquid water and incidental condensation.

B. Source Limitations: Obtain air barrier materials and accessories from the same manufacturer.

2.03 VAPOR-IMPERMEABLE MEMBRANE AIR BARRIER

A. Fluid-Applied, Vapor-Impermeable Membrane Air Barrier: Synthetic polymer membrane consisting of silyl terminated polyurethane (STPU) coating, with the following physical properties:
   1. Air Permeance: 0.00031 L/s x sq. m of surface area at 75Pa (0.000062. cfm/sq. ft. at 1.57 psf) pressure difference per ASTM E 2178.
   2. Vapor Permeance: Maximum 0.10 perm (5.72 ng/Pa x s x sq. m) per desiccant method in Procedure A of ASTM E 96/E 96M.
   3. Water Penetration Resistance: Pass when tested per AATC 127.
   4. Ultimate Elongation: Minimum 500 percent per ASTM D 412.
   5. Nail Sealability: No leakage per ASTM D 1970, when installed at recommended dry film thickness.
   6. Low-Temperature Crack Bridging: Pass at minus 15 degrees F (minus 26 degrees C) per ASTM C 1305.
   7. Surface Burning Characteristics: Flame spread index 10; smoke developed index 45, per ASTM E 84.
   8. Heat Release Characteristics, per ASTM E 1354:
      a. Peak Heat Release Rate: 126.6 kW/sq. m.
      b. Total Heat Release Rate: 6.88 MJ/sq. m.
      c. Effective Heat of Combustion: 5.38 MJ/kg.
   9. Accelerated Aging: Pass, 5000 hours QUV exposure per ASTM G 155.
   10. UV Exposure: Minimum 24-month, continuous.
   11. Color: Black.
   12. Basis-of-Design Product: Pecora XL-Perm (ULTRA) NP Fluid Applied Non-Permeable STPU Air, Vapor & Water Barrier Membrane.

2.04 ACCESSORIES

A. General: Provide accessory materials recommended by air barrier manufacturer that are compatible with air barrier material and Project substrates to produce a continuous air barrier assembly.

B. Substrate Patching Material: ASTM C 920, Class 12.5, single-component, non-sag, silyl-terminated polyurethane (STPU) sealant.
   1. Shore A Hardness: 55 plus or minus 5, per ASTM C 661.
   2. Basis-of-Design Product: Pecora XL-Flash STPU Liquid Flashing and Joint Filler.

C. Termination Mastic: ASTM C 920, Class 25, single-component, non-sag, neutral curing silicone sealant formulated for adhesion to air, vapor, and weather barrier membranes, including polyethylene sheet membranes.
   1. Dynamic Movement: Plus and minus 25 percent per ASTM C 719.
   2. Color: Black.
   3. Basis-of-Design Product: Pecora AVB Silicone Sealant.

D. Precured Silicone Transition Strip: Air barrier manufacturer's standard flexible, translucent silicone extrusion.
   1. Movement Capability: Minimum plus and minus 200 percent per ASTM C 719.
   2. Tensile Strength: Minimum 1200 psi (8.3 MPa) per ASTM D 412.
   3. Tear Strength: Minimum 90 psi (0.6 MPa) per ASTM D 624.
   4. Elongation: Minimum 750 percent per ASTM D 412.
   5. Form: 50 ft. (15 m) roll.
   6. Width: [**9 inches (228 mm)**] [**6 inches (152 mm)**] [**3 inches (76 mm)**] [**As required to bridge gap between air barrier membrane and adjacent construction**].
   7. Basis-of-Design Product: Pecora XL-Span.

E. Self-Adhering Sheet Flashing: [**Type ___ as specified in Section 07 65 00 for Flexible Flashing**] [**Provide one of the following**] <**Enter Other Requirement(s)**>; approved by air barrier manufacturer.
   1. <**Enter Product**>
   2. <**Enter Product**>
   3. <**Enter Product**>

F. Joint Sealant: [**Type ___ as specified in Section 07 92 00 for Joint Sealants**] [**ASTM C 920, Type S, Grade NS, Class 100/50, Use G, A, M, O, neutral curing silicone sealant**].
   1. Basis-of-Design Product: Pecora 890NST.

2.05 MISCELLANEOUS MATERIALS

A. Sealant Primer: Liquid solvent-borne type recommended for joint substrates by the air barrier material manufacturer.

B. Substrate Cleaners: Noncorrosive, non-staining type, recommended by air barrier manufacturer, compatible with substrates and air barrier materials.

C. Masking Material: Non-staining, nonabsorbent material compatible with air barrier material and surfaces adjacent to joints.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates indicated to receive air barrier membrane for compliance with requirements prior to commencing installation.
   1. Verify that substrates are clean, dust-free, dry, and are in sound condition.
   2. Verify that substrates are free of film-forming or bond-inhibiting substances.
   3. Verify that items that will penetrate air barriers are securely installed.
   4. Verify that concrete has cured for the minimum 28 days and is free of honeycombs, pits, cracks, fins and other surface variations.
   5. Verify that masonry joints are flush and completely filled with mortar and that excess mortar on **[brick ties] [veneer anchors]** will be removed.
   6. Verify that through-wall flashing has been **[embedded into masonry substrates] [installed in reglets]**.
   7. Verify that **[plywood]**, **[oriented strand board], [gypsum] [and] [glass-matt-faced gypsum]** sheathing fasteners are flush with the surface of the sheathing.

B. Do not proceed with installation until unsatisfactory conditions are corrected.

3.02 PREPARATION

A. Joint Treatment: Clean, prepare, and seal substrate joints, cracks, gaps, penetrations, and changes-of-plane with substrate patching material per manufacturer's written instructions.
   1. Extend minimum 2 inches (50 mm) on each side of treated joints and corners.
   2. Extend minimum 2 inches (50 mm) beyond thermal break of [**window**] [**storefront**] [**and**] [**curtain wall**] frames, toward building interior.

B. Through-wall Flashing: Apply minimum 1/2-inch (13 mm) continuous, smooth fillet bead of substrate patching material at junction of substrate and top of flashing to promote downward flow of water.

C. Pipe, Electrical and Mechanical Penetrations: Apply minimum 1/2-inch (13 mm) continuous fillet bead of substrate patching material around perimeter of penetrating items.

D. Cover adjacent surfaces not to receive air barrier materials to protect from overspray.

3.03 INSTALLATION – GENERAL

A. Apply air barrier material and accessories to opaque building substrates per the manufacturer's written instructions; provide continuous, unbroken, airtight membrane tied-in to adjacent construction.

B. Apply transition membrane, mastic, and sealants to join and seal air barrier material to adjacent materials [**as detailed**], per manufacturer's instructions:
   1. Foundation waterproofing membrane.
   2. Frames of doors, **[windows]**, **[storefronts]**, **[curtain walls]**, **[louvers]**, and **[_____]**.
   3. Roofing **[vapor retarder]** membrane.
   4. Utility and pipe penetrations.
   5. Across changes in exterior wall substrate materials.
   6. Across building expansion joints.
   7. <**Insert substrate condition**>.

3.04 FLUID-APPLIED AIR BARRIER MEMBRANE APPLICATION

A. Apply air barrier material to substrates using brush, nap roller or airless sprayer[**, as permitted by authority having jurisdiction**].

B. Apply air barrier material at 17 to 20 mil (0.017- to 0.02-inch) (0.43 to 0.50 mm) wet film thickness to achieve a cured dry film thickness of at least 17 mil (0.017 inch) (0.43 mm).

C. Inspect air barrier membranes for voids, pinholes, gaps, punctures, insufficient coating thickness, damaged areas, and other deficiencies.

D. Apply additional material where coating is missing or to achieve specified dry film thickness.

3.05 MASTIC [**AND JOINT SEALANT**] INSTALLATION

A. Apply mastic [**and joint sealant**] in locations recommended by manufacturer per ASTM C 1193.

3.06 TRANSITION MEMBRANE INSTALLATION

A. Install [**precured silicone transition membrane**] [**and**] [**self-adhering membrane flashing**] of sizes and in configurations necessary to connect air barrier material to adjacent construction [**and span joints**] per the air barrier manufacturer's written instructions.
   1. Seal tie-ins and make permanently airtight.
   2. Make smooth transitions from one plane to another.
   3. Join and seal laps using continuous perimeter bead of termination mastic.
   4. Provide minimum 2-inch (50 mm) laps with adjacent materials and construction.
   5. Use multiple transition strips, lapped minimum 2 inches (50 mm) and fully sealed together if widths greater than manufacturer's standard widths are necessary to produce a continuous, flexible transition.

B. Shingle membrane laps to permit downward flow of water to flashing and weeps.

C. Provide transition membranes of widths necessary to accommodate anticipated movement.

3.07 FIELD QUALITY CONTROL

A. Field Tests and Inspections: Owner will engage a testing agency to perform tests and inspections.
   1. Inspections: Air barrier materials accessories, and installation are subject to inspection for compliance with requirements.
   2. Tests: As determined by testing agency.
   3. Results: Air barriers will be considered defective if they do not pass tests and inspections.

B. Field Tests and Inspections: Arrange and pay for tests and inspections required by ABAA Quality Assurance Program.

3.08 CLEANING

A. Clean off excess air barrier material from substrates and surfaces not indicated to receive air barrier as the Work progresses using methods recommended by manufacturer.

3.09 PROTECTION

A. Protect air barrier material during and after curing period from contamination and from damage resulting from construction operations.
   1. Ensure air barrier is not damaged or deteriorated at time of concealment.

B. Remove masking materials after installation.

C. Do not leave air barrier exposed to weather longer than recommended by manufacturer.

END OF SECTION