

SECTION 072700 - AIR BARRIERS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Air barriers.

1.2 RELATED REQUIREMENTS

- A. Section 061001 - Rough Carpentry - Architecture for exterior wall sheathing.

1.3 DEFINITIONS

- A. Air Barrier: Airtight barrier made of material that is virtually air impermeable but water vapor permeable, both to amount as specified, with sealed seams and sealed joints to adjacent surfaces.

1.4 REFERENCE STANDARDS

- A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer.
- B. ASTM C836/C836M - Standard Specification for High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course.
- C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants.
- D. ASTM C1305/C1305M - Standard Test Method for Crack Bridging Ability of Liquid-Applied Waterproofing Membrane.
- E. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension.
- F. ASTM D570 - Standard Test Method for Water Absorption of Plastics.
- G. ASTM D1876 - Standard Test Method for Peel Resistance of Adhesives (T-Peel Test).
- H. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
- I. ASTM D2178/D2178M - Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing.
- J. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- K. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials.

- L. ASTM E154/E154M - Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover.
- M. ASTM E2178 - Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials.
- N. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components.

1.5 SUBMITTALS

- A. See Section 013300 - Submittal Procedures for submittal procedures.
- B. Product Data: Provide data on material characteristics, performance criteria, and limitations.
- C. Shop Drawings: Provide drawings of special joint conditions.

1.6 QUALITY ASSURANCE

- A. Air Barrier Association of America (ABAA) Quality Assurance Program (QAP); www.airbarrier.org/#sle:
 - 1. Installer Qualification: Use accredited contractor, certified installers, evaluated materials, and third-party field quality control audit.
- B. Air Barrier Association of America (ABAA) Evaluated Air Barrier Assemblies; www.airbarrier.org/#sle: Use evaluated materials from a single manufacturer regularly engaged in air barrier material manufacture, and use secondary materials approved in writing by primary material manufacturer.
- C. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.
- D. Manufacturer Qualification: Use evaluated materials from a single manufacturer regularly engaged in air barrier material manufacture, and use secondary materials approved in writing by primary material manufacturer.
- E. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

1.7 MOCK-UPS

- A. Construct air barrier mock-up, 10 feet long by 20 feet wide, indicating workmanship and detailing at openings.
- B. Locate where directed.
- C. Mock-up may remain as part of work.

1.8 FIELD CONDITIONS

- A. Maintain temperature and humidity recommended by materials manufacturers before, during, and after installation.

PART 2 PRODUCTS

2.1 AIR BARRIER MATERIALS (AIR IMPERMEABLE AND WATER VAPOR IMPERMEABLE)

A. Air and Vapor Barrier Sheet, Self-Adhered:

1. Air Permeance: 0.002 cfm/sq ft, maximum, when tested in accordance with ASTM E2178.
2. Water Vapor Permeance: 0.05 perms, maximum, when tested in accordance with ASTM E96/E96M using Procedure B - Water Method.
3. Water Penetration Resistance Around Nails: Pass, when tested in accordance with ASTM D1970/D1970M (modified).
4. Pliability: At 180° bend over 1 in. (25 mm) mandrel, pass when tested in accordance with ASTM D1970/D1970M.
5. Minimum Tensile Strength: 400 psi (2.8 MPa), when tested in accordance with ASTM D412.
6. Minimum Elongation: 200 percent when tested in accordance with ASTM D412.
7. Minimum Puncture Resistance: 40 lbs (178 N) when tested in accordance with ASTM E154/E154M.
8. Lap Peel Adhesion at Minimum Application: 4 lbs/in. width (700 N/m) when tested in accordance with ASTM D1876.
9. Water Absorption: 0.1 percent (weight gain at 24 hours) when tested in accordance with ASTM D570.
10. Ultraviolet (UV) and Weathering Resistance: Approved in writing by manufacturer for up to 90 of weather exposure.
11. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less, Class A when tested in accordance with ASTM E84.
12. Complies with NFPA 285 requirements for wall assembly.
13. Seam and Perimeter Tape: As recommended by sheet manufacturer.
14. Products:
 - a. Basis of Design: GCP Applied Technologies; PAB Wall Membrane Sheet: www.gcpat.com.
 - b. Carlisle Coatings and Waterproofing, Inc: www.carlisleccw.com.
 - c. Elevate: www.holcimelevate.com.
 - d. Substitutions: See Section 016000 - Product Requirements.

2.2 ACCESSORIES

- A. All accessory products to be from same manufacturer as sheet product to form a complete air barrier system.
- B. Sealants, Tapes, and Accessories for Sealing Air Barrier and Adjacent Substrates: As indicated or in compliance with air barrier manufacturer's installation instructions.
- C. Primer: Water-based liquid applied polymer.
 1. Color: Green.
 2. Products:
 - a. Basis of Design; GCP Applied Technologies; Perm-A-Barrier WB Primer: www.gcpat.com.
 - b. Carlisle Coatings and Waterproofing, Inc: www.carlisleccw.com.

- c. Elevate: www.holcimelevate.com.
 - d. Substitutions: See Section 016000 - Product Requirements.
- D. Foil-Faced Self-Adhering Flashing: Membrane consisting of cross-laminated high-density polyethylene facer laminated to ultraviolet (UV) and weather-resistant exterior aluminum foil facer, using nonasphaltic, butyl-based adhesive to self-adhere to substrate.
- 1. Thickness: 40 mil, 0.040 inch, minimum.
 - 2. Roll Size: 50 feet long by 4 inches wide or as required to bridge openings with a single roll width.
 - 3. Color: Silver aluminum.
 - 4. Tensile Strength, Membrane: 600 psi, minimum, when tested in accordance with ASTM D412.
 - 5. Tensile Strength, Film: 4000 psi, minimum, when tested in accordance with ASTM D412.
 - 6. Minimum Elongation (to failure of rubberized asphalt): 200 percent, when tested in accordance with ASTM D412.
 - 7. Pliability: At 180° bend over 1 in. (25 mm) mandrel: pass when tested in accordance with ASTM D1970/D1970M.
 - 8. Crack Cycling, 1/8in. (3.2 mm) at -25°F (-32°C): unaffected when tested in accordance with ASTM C836/C836M.
 - 9. Minimum Puncture Resistance: 80 lbs when tested in accordance with ASTM E154/E154M.
 - 10. Water Absorption: 0.1 percent (weight gain at 24 hours) when tested in accordance with ASTM D570.
 - 11. Products:
 - a. Basis of Design; GCP Applied Technologies; Perm-A-Barrier Aluminum Flashing: www.gcpat.com.
 - b. Carlisle Coatings and Waterproofing, Inc: www.carlisleccw.com.
 - c. Elevate: www.holcimelevate.com.
 - d. Substitutions: See Section 016000 - Product Requirements.
- E. Preformed Transition Membrane: Self-adhesive, rubberized asphalt/polyethylene detail membrane, tapered edges, tear resistant.
- 1. Thickness: 3/64 inches (1 mm), minimum.
 - 2. Roll Size: 75 feet long by 6 inches wide or as required to bridge openings with a single roll width.
 - 3. Color: Green.
 - 4. Tensile Strength, Membrane: 400 psi, minimum, when tested in accordance with ASTM D412.
 - 5. Tensile Strength, Film: 5000 psi, minimum, when tested in accordance with ASTM D412.
 - 6. Minimum Elongation (to failure of rubberized asphalt): 200 percent, when tested in accordance with ASTM D412.
 - 7. Pliability: At 180° bend over 1 in. (25 mm) mandrel, pass when tested in accordance with ASTM D1970/D1970M.
 - 8. Crack Cycling, 1/8in. (3.2 mm) at -25°F (-32°C): unaffected when tested in accordance with ASTM C836/C836M.
 - 9. Minimum Puncture Resistance: 40 lbs (178 N) when tested in accordance with ASTM E154/E154M.

10. Lap Peel Adhesion at Minimum Application: 4 lbs/in. width (700 N/m) when tested in accordance with ASTM D1876.
 11. Maximum Permeance to Water Vapor Transmission: 0.05 perms/(Pa.s.m) (2.9 ng) when tested in accordance with ASTM E96/E96M.
 12. Air Permeance: 0.0002 cf/min/ft (<0.001 L/s/m) when tested in accordance with ASTM D2178/D2178M.
 13. Water Absorption: 0.1 percent (weight gain at 24 hours) when tested in accordance with ASTM D570.
 14. Products:
 - a. Basis of Design; GCP Applied Technologies; Perm-A-Barrier Detail Membrane: www.gcpat.com.
 - b. Carlisle Coatings and Waterproofing, Inc: www.carlisleccw.com.
 - c. Elevate: www.holcimelevate.com.
 - d. Substitutions: See Section 016000 - Product Requirements.
- F. Liquid Flashing: One part, fast curing, nonsag, elastomeric, gun grade, trowelable.
1. Hardness (Shore A): >35 when tested in accordance with ASTM C661.
 2. Minimum Elongation (to failure of rubberized asphalt): 600 percent, when tested in accordance with ASTM D412.
 3. Ultimate Tensile Strength: 150 psi when tested in accordance with ASTM D412.
 4. Modulus at 100 Percent Elongation: 50 psi when tested in accordance with ASTM D412.
 5. Elastomeric Joint Sealants: Class 50 when tested in accordance with ASTM C920.
 6. Water Vapor Permeance: 15 perms when tested in accordance with ASTM E96/E96M.
 7. Water Penetration Around Nails: Pass when tested in accordance with ASTM D1970/D1970M.
 8. Crack Bridging Ability: Category I, Pass when tested in accordance with ASTM C1305/C1305M.
 9. Products:
 - a. Basis of Design: GCP Applied Technologies; Perm-A-Barrier Universal Flashing and Sealant: www.gcpat.com.
 - b. Carlisle Coatings and Waterproofing, Inc: www.carlisleccw.com.
 - c. Elevate: www.holcimelevate.com.
 - d. Substitutions: See Section 016000 - Product Requirements.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces and conditions are ready for work of this section.
- B. Where existing conditions are responsibility of another installer, notify Architect of unsatisfactory conditions.
- C. Do not proceed with this work until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.

- B. Clean and prime substrate surfaces to receive adhesives and sealants in accordance with manufacturer's installation instructions.

3.3 INSTALLATION

- A. Install materials in accordance with manufacturer's installation instructions.
- B. Air Barriers: Install continuous airtight barrier over surfaces indicated, with sealed seams and with sealed joints to adjacent surfaces.
- C. Apply sealants and adhesives within recommended temperature range in accordance with manufacturer's installation instructions.
- D. Self-Adhered Sheets:
 - 1. Prepare substrate in accordance with sheet manufacturer's installation instructions; fill and tape joints in substrate and between dissimilar materials.
 - 2. Lap sheets shingle fashion to shed water and seal laps airtight.
 - 3. Once sheets are in place, press firmly into substrate with resilient hand roller; ensure that laps are firmly adhered with no gaps or fishmouths.
 - 4. Use same material, or other material approved by sheet manufacturer, to seal to adjacent substrates, and as flashing.
 - 5. At wide joints, provide extra flexible membrane allowing joint movement.
- E. Openings and Penetrations in Exterior Air Barriers:
 - 1. Install flashing over sills, covering entire sill frame member, extending at least 5 inches onto air barrier and at least 6 inches up jambs; mechanically fasten stretched edges.
 - 2. At openings with frames having nailing flanges, seal head and jamb flanges using a continuous bead of sealant compressed by flange and cover flanges with sealing tape at least 4 inches wide; do not seal sill flange.
 - 3. At openings with nonflanged frames, seal air barrier to each side of framing at opening using flashing at least 9 inches wide, and covering entire depth of framing.
 - 4. At head of openings, install flashing under air barrier extending at least 2 inches beyond face of jambs; seal air barrier to flashing.
 - 5. At interior face of openings, seal gap between window/door frame and rough framing, using joint sealant over backer rod.
 - 6. Service and Other Penetrations: Form flashing around penetrating item and seal to air barrier surface.

3.4 FIELD QUALITY CONTROL

- A. See Section 014000 - Quality Requirements for additional requirements.
- B. Do not cover installed air barriers until required inspections have been completed.
- C. Obtain approval of installation procedures from air barrier manufacturer based on a mock-up installed in place, prior to proceeding with remainder of installation.
- D. Take digital photographs of each portion of installation prior to covering up air barriers.

3.5 PROTECTION

NCWSA Office Addition – 100% Design
Wendel Project No. 616202

- A. Do not leave materials exposed to weather longer than recommended by manufacturer.

END OF SECTION 072700