

SECTION 07 27 26.11**FLUID-APPLIED MEMBRANE AIR BARRIERS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. A fluid-applied membrane air & vapor barrier and accessory products by Carlisle Coatings & Waterproofing
- B. Materials and installation for an air & vapor barrier assembly within exterior wall assemblies as indicated on drawings
- C. Materials and installation to bridge and seal the following air leakage pathways and gaps:
 - 1. Connections of the walls to the roof air barrier
 - 2. Connections of the walls to the foundations
 - 3. Seismic and expansion joints
 - 4. Openings and penetrations of window frames, door frames, store front, curtain wall
 - 5. Barrier pre-cast concrete and other envelope systems
 - 6. Door frames Piping, conduit, duct and similar penetrations
 - 7. Masonry ties, screws, bolts and similar penetrations
 - 8. All other air leakage pathways through the opaque walls

1.02 PRODUCTS INSTALLED BUT NOT SUPPLIED UNDER THIS SECTION:
Flexible through-wall flashings to be built into masonry are furnished under Section 07 65 26 Self-Adhering Through-Wall Flashing or Section 07 65 23 EPDM Through-Wall Flashing.

1.03 RELATED SECTIONS

- A. Section 03 30 00 - Cast-In-Place Concrete [NOTE TO SPECIFIER:
Require that backup concrete be free of fins, protrusions and large holes]

- B. Section 04 20 00 - Unit Masonry [NOTE TO SPECIFIER: When concrete masonry unit (CMU) block walls are to receive Air & Vapor Barrier materials it is critical to address surface preparation issues in this section. Due to the method of installation of CMU, generally from the inside out, the most critical surfaces to receive Air & Vapor Barrier materials are neglected and not tooled properly. It is strongly suggested to cut and paste text located in PART 3 – EXECUTION, Article 3.02, Paragraph A of Section 07 27 26.11 into Section 04 20 00. The masonry trade must be made aware that this is a critical element for the fluid-applied Air & Vapor Barrier material. Performance of the fluid-applied Air & Vapor Barrier material is directly related to the substrate OVER WHICH IT WILL be applied.]
- C. Section 07 13 00 - Sheet Waterproofing
- D. Section 07 14 00 – Fluid-Applied Waterproofing
- E. Section 07 11 00 – Damp Proofing.
- F. Section 07 21 00 - Thermal Insulation
- G. Section 07 53 00 – Elastomeric Membrane Roofing
- H. Section 07 62 00 - Sheet Metal Flashing and Trim: Metal through-wall flashings
- I. Section 07 65 00 – Flexible Flashings: Self-adhering and EPDM through-wall flashing
- J. Section 07 90 00 - Joint Protection: Joint sealant materials and installation.
- K. Section 08 12 00 - Metal Door Frames
- L. Section 08 43 00 – Storefronts
- M. Section 08 44 00 – Curtain Wall and Glazed Assemblies
- N. Section 08 51 00 - Metal Windows
- O. Section 09 29 00 - Gypsum Sheathing: Gypsum sheathing over metal studs.
- P. Section [_____] Other

1.04 REFERENCES

- A. ASTM C 920 Standard Specification for Elastomeric Joint Sealants
- B. ASTM C 1305 Standard Test Method for Crack Bridging Ability of Liquid-Applied Waterproofing Membrane
- C. ASTM D 412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers - Tension
- D. ASTM D 903 Standard Test Method for Peel and Stripping Strength of Adhesive Bonds
- E. ASTM D 1970 Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection
- F. ASTM D 4541 Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers
- G. ASTM E 96 Standard Test Methods for Water Vapor Transmission of Materials.
- H. ASTM E 283 Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors under Specified Pressure Differences across the Specimen
- I. ASTM E 330 Standard Test Method for the Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Pressure Difference
- J. ASTM E 331 Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure
- K. ASTM E 783 Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors
- L. 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
- M. ASTM E 2178 Standard Test Method for Air Permeance of Building Materials

1.05 PERFORMANCE REQUIREMENTS

- A. Installed Product and Accessories constitute an air barrier assembly, which shall be air-tight, durable and continuous, as described in Commonwealth of Massachusetts Building Code requirements: 780 CMR Chapter 13, Paragraphs 1304.3.1 Air Barriers and 1304.3.2 Air Barrier Penetrations.
- B. Installed Product and Accessories shall exhibit no visible water leakage when tested per ASTM E 331 and shall perform as a liquid water drainage plane flashed to discharge to the exterior any incidental condensation or water penetration.
- C. Installed Product and Accessories shall exhibit an air leakage rate not exceeding 0.02 L/s*m² at 75 Pa (0.004 CFM/ft² at 1.57 PSF) according to ASTM E 283. Air leakage shall not exceed this rate while Product and Accessories remain soundly adhered after exposure to sustained and gust wind loading according to ASTM E 330.
- D. Installed Product and Accessories shall perform as a vapor barrier, installed on the predominantly warm side of the insulation.
- E. Product shall be solvent free, have VOC content of not more than 30 grams per liter and shall be free of noxious odors.
- F. Product, when applied at minimum 0.040 inch (40 mils) cured thickness, shall meet the following requirements:

REQUIREMENT	RESULT	TEST METHOD
Air Permeance	Not more than 0.02 liters per second per square meter of area at 75 Pa pressure differential	ASTM E-2178 modified, spray-applied over medium density concrete masonry unit (CMU) wall
Water Vapor Permeance	Not more than 0.1 Perm	ASTM E-96, Method B
Tensile Elongation	Not less than 500 percent	ASTM D-412
Low Temperature Flexibility	No cracking, 180 degree bend over 1-inch mandrel at minus 20 degrees F	ASTM D 1970
Low-Temperature Crack Bridging	Withstand 10 cycles at minus 15 degrees F	ASTM C 1305
Peel adhesion on HDPE film, concrete, concrete block and gypsum sheathing	Not less than 10 lb per inch of width OR substrate failure	ASTM D 903
Pull adhesion on HDPE film, concrete, concrete block and gypsum sheathing	Not less than 16 lb per square inch OR substrate failure	ASTM D 4541

1.06 SUBMITTALS

- A. Provide submittals in accordance with Section 01 33 00
- B. At bid submission, provide evidence to the Architect of installer qualification by Manufacturer
- C. Provide evidence of evaluation of Product by the Air Barrier Association of America (ABAA).

[Note to specifier: Retain paragraph D for compliance with requirements of Carlisle's NVELOP™ Plus warranty]

- D. At bid submission, provide evidence of licensing and certification under the ABAA Quality Assurance Program.
- E. Shop drawings showing locations and extent of air & vapor barrier and details of typical conditions.
- F. Manufacturer's technical data sheets and material safety data sheets for Product and Accessories.
- G. Manufacturer's installation instructions.
- H. Manufacturer's documentation of volatile organic compounds (VOC) content for Product and Accessories.
- I. Certification of compatibility by Manufacturer, listing all materials on the Project with which the Product and Accessories may come into contact.
- J. Samples, 3 inch by 4 inch minimum size, of cured Product and Transition Membrane.

1.07 QUALITY ASSURANCE

[Note to specifier: Retain sub-paragraph 2 under paragraph A for compliance with requirements of Carlisle's NVELOP™ Plus warranty]

- A. Installer Qualifications:
 - 1. Shall be experienced in applying the same or similar materials and shall be specifically approved in writing by Manufacturer.
 - 2. Shall be licensed and certified to install Fluid-Applied Membrane Air Barriers by the Air Barrier Association of America (ABAA).
- B. Single-Source Responsibility: Obtain Product and Accessories from single manufacturer.

- C. Product and Accessories shall comply with all state and local regulations controlling use of volatile organic compounds (VOCs).

[Note to Specifier: Retain paragraph D for compliance with requirements of Carlisle's NVELOP™ Plus Warranty. If paragraph D is retained, omit paragraphs E, F and G.]

- D. Comply with the provisions of the Owner's Building Envelope Commissioning program in accordance with Section 01 91 15.
- E. Pre-Installation/Construction Meetings: Convene [one] [_____] week prior to commencing Work of this section, in accordance with Section 01 31 19 - Project Meetings.
- F. Field-Constructed Mock-Ups: Prior to installation on Project, apply Product and Accessories on mock-up to verify details under shop drawing submittals, to demonstrate tie-ins with adjoining construction and other termination conditions and to become familiar with properties of materials in application.

[NOTE TO SPECIFIER: incorporate sub paragraph 1 or 2 into Paragraph F]

1. Apply in field-constructed mockups of assemblies as specified in Section 01 43 39 – Mockups
 2. Construct typical exterior wall panel, 8 feet long by 8 feet wide, incorporating back-up wall, cladding, window and doorframe and sill, insulation, flashing, [building corner condition,] [junction with roof system] [foundation wall] [and] [typical penetrations and gaps]; illustrating interface of materials and seals
- G. Allow full cure of Product on mock-up according to Manufacturer's instructions before testing. Test mock-up in accordance with Section 01 43 00 – Quality Assurance and test in accordance with ASTM E 783 and ASTM E1105 for air and water infiltration
 - H. Cooperate and coordinate with the Owner's inspection and testing agency. Do not cover any installed Product unless it has been inspected, tested and approved.

1.08 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to Project site in original packages with seals unbroken, labeled with Manufacturer's name, product name, lot number and directions for storage.
- B. Protect products from freezing.
- C. Store materials in their original, undamaged packages in clean, dry, protected location and within temperature range required by Manufacturer.
- D. Avoid spillage. Immediately notify Owner, [Architect] [Consultant] if spillage occurs and start clean up procedures. Clean spills and leave area as it was prior to spill.

1.09 WASTE MANAGEMENT AND DISPOSAL

- A. Separate and recycle waste materials in accordance with Section 01 74 19 – Construction Waste Management and Disposal, and with the Waste Reduction Work Plan.
- B. Place materials defined as hazardous or toxic waste in designated containers.
- C. Ensure emptied containers are stored safely for disposal away from children.

1.10 PROJECT CONDITIONS

- A. Do not apply Product or Accessories during rain or accumulating snowfall.
- B. Apply Product and Accessories within approved ambient and substrate temperature range stated in Manufacturer's literature.
- C. Do not apply Product or Accessories over incompatible materials.
- D. Observe safety and environmental measures indicated in Manufacturer's MSDS, and mandated by federal, state and local regulations.

- 1.11 WARRANTIES: Provide the Manufacturer's minimum five year material warranty under provisions of Section 01 78 36 – Warranties.

PART 2 PRODUCTS

2.01 PRODUCTS: Provide as manufactured by Carlisle Coatings & Waterproofing, Incorporated. 900 Hensley Lane, Wylie, TX 75098. Phone 1-800-527-7092. Website <http://www.carlisle-ccw.com> :

- A. Spray-Grade: Barriseal™-S pourable consistency, water-based, polymer-modified asphalt
 - B. Roller-Grade: Barriseal™-R paste consistency, water-based, polymer-modified asphalt
- 2.02 ACCESSORIES: Provide as manufactured by Carlisle Coatings & Waterproofing, Incorporated:
- A. Co-Spray: Barricure™ chloride-free liquid concentrate.
 - B. Transition Membrane: 40 mil thickness self-adhering flashing provided in rolls of various widths. Select either:
 - 1. CCW-705 Air & Vapor Barrier Strips
 - 2. CCW-705 LT Air & Vapor Barrier Strips
 - C. Reinforcing Fabric: DCH Reinforcing Fabric woven, white polyester provided in rolls of various widths.
 - D. Sheathing Joint Treatment, select any:
 - 1. 4 inch width Transition Membrane centered over joint and bonded to surface prepared with Contact Adhesive
 - 2. Barritape™ centered over joint and bonded to surface prepared with Contact Adhesive.
 - 3. AB-151 Scrim centered over joint with Barriseal™-R covering scrim and filling joint.
 - 4. 4" DCH Reinforcing Fabric centered over joint and encapsulated in Barriseal™-R
 - E. Contact Adhesive, select any:
 - 1. CCW-702 OR CCW-702 LV Solvent-Based
 - 2. CCW-702 WB Water-Based
 - 3. CAV-GRIP™ Aerosol Spray
 - F. Mastic: LM 800 XL solvent-based synthetic rubber
 - G. Fill Compound, select either:
 - 1. CCW-703 V Trowel-Grade Polyurethane, 2-part
 - 2. CCW-201 Non-Slump Polyurethane, 2-part
 - H. Aerosol Insulation Adhesive: CAV-GRIP™

2.03 RELATED MATERIALS BY OTHERS

- A. Joint Sealant, select either:
 - 1. CCW-201 non-sag, 2-part polyurethane
 - 2. By others as approved by Manufacturer. Shall conform to ASTM C 920 Type 1 or 2, Grade NS, Class 25 or 50.
- B. Polyurethane Foam, approved by Manufacturer, select either:
 - 1. 1-part, can dispense
 - 2. 2-part
- C. Insulation Adhesive: select product approved by Manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine substrates, areas, and conditions affecting installation of Product and Accessories for compliance with requirements. Verify that surfaces and conditions are suitable prior to commencing Work of this section. Do not proceed with installation until unsatisfactory conditions have been corrected.
- B. Concrete shall be cured for a minimum of seven days.
- C. Surfaces shall be sound, dry and free of oil, grease, dirt, excess mortar or other contaminants.
- D. Surfaces shall be supported and flush at joints without large voids or sharp protrusions.
- E. Masonry joints shall be struck flush and completely filled with mortar. Mortar droppings shall be removed from masonry ties and surfaces.
- F. Damaged or improperly-fastened sheathing shall be remedied to comply with building code and sheathing manufacturer's requirements.
- G. Inform Architect [Consultant] [Owner] in writing of
 - 1. Cracks in concrete and masonry.
 - 2. Gaps or obstructions such as steel beams, angles, plates and projections which cannot be spanned or covered by Product or Accessories.
 - 3. Anticipated problems applying Product and Accessories over substrate.

3.02 SURFACE PREPARATION

[NOTE TO SPECIFIER: Incorporate Paragraph A and sub-paragraphs into Section 04 20 00 - Unit Masonry]

- A. [Note to Mason: This project will have fluid-applied Air & Vapor Barrier material applied to the cavity side of the CMU. Special attention and care must be taken to provide a smooth, filled surface to receive the membrane. The care is necessary to insure the design performance of the selected materials.] Concrete masonry unit (CMU) wall shall be prepared as follows to accept the air & vapor barrier:
1. Surfaces shall be free of contaminants such as grease, oil and wax on surfaces to receive membrane
 2. The CMU surfaces shall be free from projections.
 3. Strike mortar joints full and flush to face of concrete block.
 4. Fill voids and holes greater than ½ inch across with mortar or non-shrink grout.
 5. Fill cracks, gaps and joints exceeding ¼ inch width with mortar or non-shrink grout.
 6. Grind flush or make smooth surface irregularities exceeding ¼ inch in height or sharp to touch.
 7. Fill around penetrations with mortar, sealant or other approved fill material and strike flush.
 8. If surfaces cannot be made smooth to the satisfaction of the Architect, it will be the responsibility of the trade to alternatively apply a parge coat (typically one part cement to three parts sand) over surface to receive fluid-applied membrane air barrier.
 9. Remove mortar droppings on brick ties, shelf angles, brick shelves and other horizontal obstructions.
- B. Fill honeycomb in concrete with non-shrink grout or Fill Compound
- C. Fill cracks in concrete and masonry exceeding 1/16 inch width and not exceeding 1/8 inch width with one of these materials
1. Mastic
 2. Roller grade product
 3. Non-shrink grout
- D. Treat cracks in concrete and masonry exceeding 1/8 inch width and not exceeding ¼ inch width with Sheathing Joint Treatment
- E. Fill cracks, gaps and joints exceeding ¼ inch width with tooled Joint Sealant over backer rod.
- F. Fill rough gaps around pipe, conduit and similar penetrations with mortar, non-shrink grout or Polyurethane Foam.

- G. Treat sheathing joints with either method below:
 - 1. Sheathing Joint Treatment
 - 2. Fill with Joint Sealant and strike flush
- H. Prepare areas to receive Transition Membrane with Contact Adhesive. Contact Adhesive shall be provided at recommended coverage rate and visible for 1 inch minimum beyond edge of installed Transition Membrane.
- I. Install Transition Membrane according to Manufacturer's instructions and drawings.
- J. Apply Transition Membrane or Reinforcing Fabric encapsulated in Roller-Grade Product according to Manufacturers instructions and drawings in the following areas: Joints, changes in plane, changes in substrate, window openings, transitions to different systems.
- K. Transition membrane or Reinforcing Fabric shall bear 3 inches minimum onto dissimilar substrates.

3.03 INSTALLATION

- A. Allow materials used during surface preparation to cure fully before applying Product.
- B. Spray-Grade Product: Dispense in tandem with Co-Spray according to Manufacturer's instructions.
- C. Roller-Grade Product: Apply according to Manufacturer's instructions
- D. Cured membrane thickness shall measure a minimum of 0.040 inch (40 mils).
- E. Provide complete coverage without pinholes or voids. Apply greater thickness of Product as necessary to provide continuous coating over rough surfaces and irregularities.
- F. Apply Product 2 inches minimum onto Transition Membrane details.
- G. Apply Product over Sheathing Joint Treatment details.

3.04 SCHEDULE

- A. Seal penetrations made through installed Product according to Manufacturer's instructions and drawings.
- B. Through-wall flashing installed before or after Product:
 - 1. Self-adhering type in accordance with Section 07 65 26
 - 2. EPDM type in accordance with Section 07 65 23
- C. Fenestration installed before or after Product: provide air and water seal between fenestration and opaque wall according to Manufacturer's instructions and drawings.
- D. Board insulation installed after Product: Attach with Aerosol Insulation Adhesive plus mechanical fasteners or with insulation adhesive by others. Seal board joints in accordance with insulation manufacturer's instructions.
- E. Roof air barrier: Join to Product according to Manufacturer's instructions and drawings.

3.05 REPAIR AND PROTECTION

- A. Protect from damage during application and remainder of construction period.
- B. Inspect before covering. Repair or replace damaged material according to Manufacturer's instructions and drawings.
- C. Product and Accessories are not designed for permanent exposure. Cover with insulation or exterior cladding as soon as schedule allows.
- D. Outdoor exposure of installed Transition Membrane shall not exceed 60 days
- E. Outdoor exposure of installed Product shall not exceed 30 days.

END OF SECTION