

SECTION 072726 - FLUID-APPLIED MEMBRANE AIR BARRIERS**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. Section Includes:
 - 1. Vapor-permeable, fluid-applied air barriers.
- B. Related Requirements:
 - 1. Section 061600 "Sheathing"
 - 2. Section 072110 "Continuous Insulated Wall Sheathing"

1.3 DEFINITIONS

- A. Air-Barrier Material: A primary element that provides a continuous barrier to the movement of air.
- B. Air-Barrier Accessory: A transitional component of the air barrier that provides continuity.
- C. Air-Barrier Assembly: The collection of air-barrier materials and accessories applied to an opaque wall, including joints and junctions to abutting construction, to control air movement through the wall.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review air-barrier requirements and installation, special details, mockups, air-leakage and bond testing, air-barrier protection, and work scheduling that covers air barriers.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Submit technical data, less than 10 years old, showing products conform to the standards listed below.
 - 2. Include manufacturer's written instructions for evaluating, preparing, and treating each substrate; technical data; dry film thickness; and tested physical and performance properties of products.
- B. Shop Drawings: For air-barrier assemblies.
 - 1. Show locations and extent of air-barrier materials, accessories, and assemblies specific to Project conditions. Do not include standard published details that are not applicable to the project.
 - 2. Include details for substrate joints and cracks, counterflashing strips, penetrations, inside and outside corners, terminations, and tie-ins with adjoining construction.
 - 3. Include details of interfaces with other materials that form part of air barrier.

1.6 INFORMATIONAL SUBMITTALS

- A. Submit letters showing installer and manufacturer meet the qualifications listed above. "Submit a statement of compatibility from the AB and sealant manufacturers verifying the materials used will perform as required by contract when used together."
- B. Qualification Data: For Installer. Include list of ABAA-certified installers and supervisors employed by Installer, who work on Project.

- C. Product Certificates: From air-barrier manufacturer, certifying compatibility of air barriers and accessory materials with Project materials that connect to or that come in contact with the barrier.
 - 1. Submit a statement of compatibility from the air-barrier manufacturer and sealant manufacturers verifying the materials used will perform as required by contract when used together.
- D. Product Test Reports: For each air-barrier assembly, for tests performed by a qualified testing agency.

1.7 QUALITY ASSURANCE

- A. Manufacturer: Minimum of 20 years' experience in manufacturing of liquid applied weather barrier systems.
 - 1. Manufacturer's technical representative shall be on site once every week that product is being installed and issue a short report of observations.
- B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
 - 1. Installer shall be licensed by ABAA according to ABAA's Quality Assurance Program and shall employ ABAA-certified installers and supervisors on Project.
 - 2. Minimum of 5 years' experience with similar sized projects using similar materials. Installer must have completed three similar projects of similar scope. Installer must be approved by manufacturer to install the products.
- C. Preinstallation Meeting: Shall be held within 10 days of starting mockup installation. Attendees shall be the installer, general contractor, architect, owner and the manufacturer's technical representative.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Remove and replace liquid materials that cannot be applied within their stated shelf life.
- B. Protect stored materials from direct sunlight.

1.9 FIELD CONDITIONS

- A. Environmental Limitations: Apply air barrier within the range of ambient and substrate temperatures recommended in writing by air-barrier manufacturer.
 - 1. Protect substrates from environmental conditions that affect air-barrier performance.
 - 2. Do not apply air barrier to a damp or wet substrate or during snow, rain, fog, or mist.

1.10 FIELD TESTING

- A. In Progress Testing: Owner may test work for material thickness, air leakage (ASTM E 1186) and adhesion (ASTM D7234). Contractor is responsible for providing OSHA approved access to areas for testing. Contractor must remedy all conditions causing failed tests. Areas found to be out of compliance shall be remedied by contractor at no additional expense to owner. Additional applications of material, additional surface prep or the addition of a surface conditioner are some options to remedy non-compliant areas. In rare cases, change of product may be required to meet contract requirements.

1.11 WARRANTIES

- A. Manufacturer shall provide a minimum 5 year material warranty.
 - 1. Installer shall provide a 2 year workmanship warranty.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Source Limitations: Obtain primary air-barrier materials and air-barrier accessories from single source from single manufacturer.

2.2 HIGH-BUILD AIR BARRIERS, VAPOR PERMEABLE

- A. High-Build, Vapor-Permeable Air Barrier: Synthetic polymer membrane with an installed dry film thickness, according to manufacturer's written instructions, of 35 mils or thicker over smooth, void-free substrates.
- B. The following products are approved for use as air barriers. No substitutions are allowed after bid. All air barriers shall be provided with a liquid applied membrane flashing to be used as a single, warrantable system.
 - 1. Thick Mil Systems
 - a. WR Meadows Air Shield LMP w/ Air Shield Liquid Applied Membrane Flashing
 - b. Prosoco CAT5 w/ Flashflash Liquid Applied Membrane Flashing
 - c. Carlisle Barritech VP w/ Barribond Liquid Applied Membrane Flashing
 - d. WR Grace Permabarrier VPL w/ PB Liquid Flashing Liquid Applied Membrane Flashing
 - e. Tyvek Fluid Applied WB+ w/ Fluid Applied Flashing and Joint Compound Liquid Applied Membrane Flashing
 - f. GP DensElement integral weather barrier in the gypsum wall board with STPe based liquid flashing.
 - 2. Physical and Performance Properties: Only those products designed to work as a system with liquid applied flashing are acceptable. Manufacturer shall have standard detail for various penetrations, flashings and transitions to other envelope materials. Systems shall withstand all positive and negative pressures anticipated for the building, including HVAC and other wind and non-wind pressures, without damage. System shall meet the following minimum requirements:
 - a. Air Leakage: Less than 0.04cfm per sq. ft. of air leakage when tested at 1.57 psf per ASTM E2357.
 - b. ICC-ES AC212 Acceptance Criteria for Water-Resistive Coatings Used as Water Resistive Barriers over Exterior Sheathing.
 - c. Vapor Permeable: 10 perms when tested per ASTM E96 dry cup and 18 perms when tested per wet cup when installed at maximum recommended thickness.
 - d. Air Permeability: Less than 0.004 cfm per sq. ft. per ASTM E2178.
 - e. Nail Sealability: Pass (no leakage) per ASTM D1970
 - f. Chemistry: Acrylic, STPe or STPu
 - g. Adhesion: 15 psi or substrate failure per ASTM C297 or ASTM D4541
 - h. Liquid Flashing: Weather Barrier manufacturer shall offer a liquid applied membrane flashing product for use as flashings at wall openings. Liquid Applied Membrane Flashing product chemistry shall be STPe or STPu and be non-reverting when exposed to saturation condition.
 - i. Elongation: 200% per ASTM D412
 - j. Tensile Strength: 100 psi per ASTM D412
 - k. Exposure: 6 months minimum
 - l. Fire: If required, pass NFPA 285. The wall assemblies used in the project, must resist flame propagation and flame spread requirements of NFPA 285 if applicable for the designated type of construction, building height and exterior insulation. ASTM E84: Class A Rated, Flame Spread < 25, Smoke Development < 450
 - m. VOC Compliant.

2.3 ACCESSORY MATERIALS

- A. General: Provide primers, transition strips, termination strips, joint reinforcing fabric and strips, joint sealants, counterflashing strips, flashing sheets and metal termination bars, termination mastic, substrate patching materials, adhesives, tapes, foam sealants, lap sealants, and other accessory materials that are recommended in writing by air-barrier manufacturer to produce a complete air-barrier assembly and that are compatible with primary air-barrier material and adjacent construction to which they may seal.
- B. Liquid Flashings: Unless approved otherwise in writing, all wall penetrations shall be flashed with liquid applied membrane flashing. Liquid Applied Membrane Flashing shall be STPe, STPu, or urethane-based products, provided by the air-barrier manufacturer, as long as they meet the following criteria.
 - 1. Vapor permeable (10 perms minimum per ASTM E96 tested wet).
 - 2. Non-reverting when exposed to saturation conditions.

3. 98% solids minimum.
 4. VOC compliant.
 5. Tack free in 2 hours.
 6. Self-healing at fasteners (ASTM D1970).
 7. One step application that does not involve embedding a separate fabric material.
 8. Unless the weather barrier (WB or air barrier) is factory installed on the sheathing, the liquid applied membrane flashing shall be supplied by the same manufacturer of, and compatible with, the air barrier. If the air barrier is factory installed on the sheathing, the liquid applied membrane flashing shall form a part of the compatible, tested assembly and be warranted by the sheathing manufacturer.
 9. Air leakage less than 0.03 cfm/sf @ 1.57 psf when tested per ASTM E2357 for air barrier wall assemblies (ASHRAE/ABAA 90.1) and no leakage when tested per ASTM E331 @ 2.86 psf for 15 minutes (ICC).
 10. Selection of sealants compatible with and properly bonded to the liquid applied membrane flashing is the responsibility of the contractor. Sealant shall be approved by the air barrier and sealant manufacturer.
- C. Self-Adhered Flexible Flashing:
1. Basis of design is Hohmann & Barnard Textra Flash.
 - a. Dow Weathermate, DuPont Flashing Tape and Typar Butyl Flashing are acceptable alternates). Self-adhered butyl, acrylic, PVC, KEE, or other non-bleeding, polymer-based products may be acceptable when submitted for approval prior to bid.
 2. Self-Adhered Flexible Flashing shall meet the minimum requirements listed below.
 - a. Thickness: 40 mils minimum consisting of an 8 mil minimum cross laminated polyethylene film with the remainder consisting of a polymer based adhesive waterproofing membrane.
 - b. Non-drooling when exposed to temperatures up to 220 degrees F.
 - c. UV exposure: No less than 90 days.
 - d. Tensile strength and elongation: Minimum 1,200 psi and 15% per ASTM D412
 - e. Puncture: > 80 lbs. per ASTM E154
 - f. Water Absorption: <1 %
 - g. Adhesion in peel: 60 lbs. minimum per ASTM D903
 - h. Water Permeability: <1 perms per ASTM E96
 - i. Low Temperature Flexibility: No affect per ASTM D1970
 - j. Self-adhered flexible flashing manufacturer shall offer a compatible sealant to use at cut edges, laps and terminations in the self-adhered flexible flashing.
- D. Termination Bars: Termination bars shall be 1/8" thick by 1" wide with integral caulk tray in top for manufacturer specified sealant. Bars in masonry construction (including those in cavity walls for masonry veneer) shall be stainless steel. Termination bars shall be pre-punched at 8 inches on center for anchoring to substrates. 20 gage by minimum 6 inch wide galvanized straps shall be installed behind gypsum wall board centered on termination bars to allow for anchorage of the termination bar at 8 inches on center.
- E. Metallic Flashings: Metallic flashings shall be 26 gauge stainless steel (SS) or 16 oz. copper. Other metals (zinc, lead coated copper, aluminum) may be warranted in rare occasions. All metal flashings shall be end lapped 4" with hems (if present) removed from bottom piece. Mitered corners are NOT allowed.
- F. Primer: Liquid waterborne primer recommended for substrate by air-barrier material manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
1. Verify that substrates are sound and free of oil, grease, dirt, excess mortar, or other contaminants.

2. Verify that substrates have cured and aged for minimum time recommended in writing by air-barrier manufacturer.
3. Verify that substrates are visibly dry and free of moisture.
4. Verify that masonry joints are flush and completely filled with mortar.

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

3.2 SURFACE PREPARATION

- A. All surfaces shall be dry and free from gaps, holes, projections, cracks and voids that could cause pin holing of the air barrier. Strike masonry substrate joints flush. Installer shall inspect substrates and record observations in daily logs. Treat joints in substrate per manufacturer's recommendations prior to installing air barrier.
- B. Clean, prepare, treat, fill, and seal substrate and joints and cracks in substrate according to manufacturer's written instructions and details. Provide clean, dust-free, and dry substrate for air-barrier application.
- C. Mask off adjoining surfaces not covered by air barrier to prevent spillage and overspray affecting other construction.
- D. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.
- E. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids in concrete with substrate-patching material.
- F. Remove excess mortar from masonry ties, shelf angles, and other obstructions.
- G. At changes in substrate plane, apply sealant or termination mastic beads at sharp corners and edges to form a smooth transition from one plane to another.
- H. Cover gaps in substrate plane and form a smooth transition from one substrate plane to another with stainless-steel sheet mechanically fastened to structural framing to provide continuous support for air barrier.
- I. Bridge isolation joints expansion joints and discontinuous wall-to-wall, deck-to-wall, and deck-to-deck joints with air-barrier accessory material that accommodates joint movement according to manufacturer's written instructions and details.

3.3 ACCESSORIES INSTALLATION

- A. Install accessory materials according to air-barrier manufacturer's written instructions and details to form a seal with adjacent construction and ensure continuity of air and water barrier.
 1. Coordinate the installation of air barrier with installation of roofing membrane and base flashing to ensure continuity of air barrier with roofing membrane.
 2. Install transition strip on roofing membrane or base flashing so that a minimum of 3 inches of coverage is achieved over each substrate.
 3. Unless manufacturer recommends in writing against priming, apply primer to substrates at required rate and allow it to dry.
 4. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by air-barrier material on same day. Reprime areas exposed for more than 24 hours.
- B. Connect and seal exterior wall air-barrier material continuously to roofing-membrane air barrier, concrete below-grade structures, floor-to-floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings, using accessory materials.
- C. At end of each working day, seal top edge of strips and transition strips to substrate with termination mastic.
- D. Flashings: All penetrations through the air barrier shall be flashed. Flashing shall be installed to meet the following.
 1. Liquid applied membrane flashing shall be used at all wall penetrations.
 2. Treat all gaps and joints between blocking per manufacturer's written instructions.

3. Flashings shall extend 6 inches onto the air barrier on all sides of the opening. This shall be measured from the outside edge of blocking.
 4. Install water tight stainless steel (SS) sleeves through the air barrier and the veneer for elements to be installed after the veneer is installed. Install water tight SS sleeves for all HVAC duct penetrations.
 5. Sealants shall be installed between the flashed opening and the penetrating element. The Contractor is responsible for ensuring compatibility between the sealant and the liquid applied membrane flashing. Mockup pull testing of the sealant is required.
- E. Through Wall Flashings:
1. Through wall flashing shall be installed in the following locations.
 - a. Shelf angles.
 - b. Horizontal and VERTICAL transitions into and out of barrier wall and drainage cavity systems (i.e., hung precast).
 - c. Below window sill stones where there is no through wall flashing within 8 feet of the bottom of the sill stone.
 - d. Below all coping stones and APC.
 2. Through wall flashing shall be installed to meet the following minimum requirements.
 - a. Liquid applied membrane flashing shall not be used to fabricate through wall flashings .
 - b. The top of all self-adhered flexible flashing shall be terminated at 8" on center and contain an upper caulk tray at ALL locations. Sealant in termination bars shall be approved by liquid applied membrane flashing manufacturer. Vertical edges typically will not require a termination bar.
 - c. Metallic flashing extenders shall be lapped 4 inches and the hem shall be removed from the lower piece to provide a clean splice at the drip.
 - d. Horizontal and vertical splices in the self-adhered flexible flashing shall lap a minimum of 4" unless a larger lap length is required by the manufacturer. A 3/8" bead of cut edge sealant (lap sealant) shall be installed along the edges of the self-adhered flexible flashing at all splices.
 - e. Flashings below copings shall have the following elements.
 - 1) 3/8" maximum SS hemmed drip on face of building.
 - 2) 360 degree SS receiver projecting below the rear of the coping to hold a metallic counterflashing
 - 3) Self-adhered flexible flashing on top of the metallic flashing to seal tie anchor penetrations.
 - 4) Copings with both faces exposed shall have a two piece flashing extender with drips on both sides to ensure drips do not project beyond 1/4" from the face of the veneer. The inside edges of the flashing extenders shall lap and be sealed with self-adhered flexible flashing.
- F. Apply joint sealants forming part of air-barrier assembly within manufacturer's recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- G. Wall Openings: Prime concealed, perimeter frame surfaces of windows, curtain walls, storefronts, and doors. Apply transition strip so that a minimum of 3 inches of coverage is achieved over each substrate. Maintain 3 inches of full contact over firm bearing to perimeter frames, with not less than 1 inch of full contact.
1. Transition Strip: Roll firmly to enhance adhesion.
- H. Fill gaps in perimeter frame surfaces of windows, curtain walls, storefronts, and doors, and miscellaneous penetrations of air-barrier material with foam sealant.
- I. Seal strips and transition strips around masonry reinforcing or ties and penetrations with termination mastic.
- J. Seal top of through-wall flashings to air barrier with an additional 6-inch-wide, transition strip.
- K. Seal exposed edges of strips at seams, cuts, penetrations, and terminations not concealed by metal counterflashings or ending in reglets with termination mastic.
- L. Repair punctures, voids, and deficient lapped seams in strips and transition strips. Slit and flatten fishmouths and blisters. Patch with transition strips extending 6 inches beyond repaired areas in strip direction.

3.4 PRIMARY AIR-BARRIER MATERIAL INSTALLATION

- A. Apply air-barrier material to form a seal with strips and transition strips and to achieve a continuous air barrier according to air-barrier manufacturer's written instructions and details. Apply air-barrier material within manufacturer's recommended application temperature ranges.
 - 1. Unless manufacturer recommends in writing against priming, apply primer to substrates at required rate and allow it to dry.
 - 2. Limit priming to areas that will be covered by air-barrier material on same day. Reprime areas exposed for more than 24 hours.
 - 3. Where multiple prime coats are needed to achieve required bond, allow adequate drying time between coats.
- B. High-Build Air Barriers: Apply continuous unbroken air-barrier material to substrates according to the following thickness. Apply air-barrier material in full contact around protrusions such as masonry ties.
 - 1. Vapor-Permeable, High-Build Air Barrier: Total dry film thickness as recommended in writing by manufacturer to comply with performance requirements, but not less than 35 mils.
 - 2. Spraying of air barrier onto masonry substrates is NOT allowed. Application of air barrier on masonry substrates shall be by roller, trowel, or stiff bristle brush. Air barrier at wall ties on masonry substrates shall be touched up with stiff bristle brushes. Six (6) wet mill thickness measurements shall be taken every 1000 square feet of air barrier applied and for every day the air barrier is applied and recorded in installer's daily log.
- C. Do not cover air barrier until it has been tested and inspected by testing agency.
- D. Correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air-barrier components.

3.5 FIELD QUALITY CONTROL

- A. ABAA Quality Assurance Program: Perform examinations, preparation, installation, testing, and inspections under ABAA's Quality Assurance Program.
- B. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- C. Inspections: Air-barrier materials, accessories, and installation are subject to inspection for compliance with requirements. Inspections may include the following:
 - 1. Continuity of air-barrier system has been achieved throughout the building envelope with no gaps or holes.
 - 2. Air-barrier dry film thickness.
 - 3. Continuous structural support of air-barrier system has been provided.
 - 4. Masonry and concrete surfaces are smooth, clean, and free of cavities, protrusions, and mortar droppings.
 - 5. Site conditions for application temperature and dryness of substrates have been maintained.
 - 6. Maximum exposure time of materials to UV deterioration has not been exceeded.
 - 7. Surfaces have been primed, if applicable.
 - 8. Laps in strips and transition strips have complied with minimum requirements and have been shingled in the correct direction (or mastic has been applied on exposed edges), with no fishmouths.
 - 9. Termination mastic has been applied on cut edges.
 - 10. Strips and transition strips have been firmly adhered to substrate.
 - 11. Compatible materials have been used.
 - 12. Transitions at changes in direction and structural support at gaps have been provided.
 - 13. Connections between assemblies (air-barrier and sealants) have complied with requirements for cleanliness, surface preparation and priming, structural support, integrity, and continuity of seal.
 - 14. All penetrations have been sealed.
- D. Tests: As determined by testing agency from among the following tests:

1. Air-Leakage-Location Testing: Air-barrier assemblies will be tested for evidence of air leakage according to ASTM E1186, chamber pressurization or depressurization with smoke tracers.
 2. Air-Leakage-Volume Testing: Air-barrier assemblies will be tested for air-leakage rate according to ASTM E783.
 3. Adhesion Testing: Air-barrier assemblies will be tested for required adhesion to substrate according to ASTM D4541 for each 600 sq. ft. of installed air barrier or part thereof.
- E. Air barriers will be considered defective if they do not pass tests and inspections.
1. Apply additional air-barrier material, according to manufacturer's written instructions, where inspection results indicate insufficient thickness.
 2. Remove and replace deficient air-barrier components for retesting as specified above.
- F. Repair damage to air barriers caused by testing; follow manufacturer's written instructions.
- G. Prepare test and inspection reports.

3.6 CLEANING AND PROTECTION

- A. Protect air-barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions.
1. Protect air barrier from exposure to UV light and harmful weather exposure as recommended in writing by manufacturer. If exposed to these conditions for longer than recommended, remove and replace air barrier or install additional, full-thickness, air-barrier application after repairing and preparing the overexposed materials according to air-barrier manufacturer's written instructions.
 2. Protect air barrier from contact with incompatible materials and sealants not approved by air-barrier manufacturer.
- B. Clean spills, stains, and soiling from construction that would be exposed in the completed work using cleaning agents and procedures recommended in writing by manufacturer of affected construction.
- C. Remove masking materials after installation.

END OF SECTION 072726