

## SECTION 07 27 00 - AIR BARRIERS

### PART 1 - GENERAL

#### 1.1 SUMMARY

##### A. Section Includes:

1. Sheet air barriers (WRB): Self-adhering, vapor-permeable, nonbituminous.
2. Self-adhered membrane flashings (SAMs).
3. Transition membrane flashings to other systems.
4. Silicone sheet, for use at joints within air barrier materials.
5. Utility penetration flashing panels.
6. Building envelope performance verification.

##### B. Product Specified in this Section but provided and installed in other Sections:

1. Window, Openings Weatherseal Sealant, for Division 08 Sections.

##### C. Related Requirements:

1. Section 01 83 16 "Exterior Envelope Performance Requirements."
2. Section 03 30 00 "Cast-in-Place Concrete" for substrate preparation of concrete.
3. Section 06 16 00 "Sheathing" for wall sheathing for substrate requirements.
4. Section 07 05 43 "Cladding Support Systems" for cladding supports attached through air barriers.
5. Section 07 11 13 "Bituminous Dampproofing" for transition coat placed over bituminous dampproofing prior to air barrier materials at existing slabs.
6. Section 07 26 00 "Vapor Retarders" for liquid air barrier used as interior vapor retarder.
7. Section 07 54 23 "TPO Roofing" for transitions of roofing materials interfacing with air barrier materials; for roofing vapor retarder, air-control layer of roofing assembly, and its transition to air barriers.
8. Section 07 62 00 "Sheet Metal Flashing and Trim" for flashings integrated into air barrier assemblies.
9. Section 07 92 00 "Joint Sealants" for requirements.
10. Sections 08 41 13 "Aluminum-Framed Entrances and Storefronts" and 08 44 13 "Glazed Aluminum Curtain Walls" for openings in air barriers.
11. Section 08 44 13 "Glazed Aluminum Curtain Walls" for silicone sheet used in curtain wall openings.

#### 1.2 COORDINATION

##### A. Coordinate field preparation and priming of substrates.

1. Substrates shall be provided ready for installation of air barrier materials, with cleaning and remediation of substrates in other Sections where substrates are installed.

##### B. Coordinate repair requirements with materials being placed and directly attached through air barriers.

##### C. Coordinate transitions to other membranes and enclosure materials, with roofing and opening systems.

- D. Coordinate envelope verification and inspection requirements with all exterior envelope Work, including but not limited to those specified in "Related Requirements" Paragraph in "Summary" Article above.

### 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. Attendees:
    - a. Owner.
    - b. Architect.
    - c. Contractor.
    - d. Installer.
    - e. Installer of work interfacing or integrated in air barrier assemblies.
  - 2. Review air-barrier requirements, sequencing, and installation, special details, mockups, air-leakage and bond testing, air-barrier protection, and work scheduling that covers air barriers.
  - 3. Review integration of other Work into air barriers.
  - 4. Review repair requirements for work requiring penetrations into air barriers.

### 1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Include manufacturer's written instructions for evaluating, preparing, and treating each substrate; technical data; 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.
  - 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. Qualification Data: For Installer.
- B. 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 air barrier.

- C. Product Test Reports: For each air-barrier assembly, for tests performed by a qualified testing agency.
- D. Sample Warranty.

#### 1.7 CLOSEOUT SUBMITTALS

- A. Special Warranty: Executed warranties.
  - 1. Signed by air barrier manufacturer, certifying that all materials supplied under this Section are acceptable for special warranty, except those materials manufactured and provided by other manufacturers.
  - 2. Installer's Warranty Certificate: Signed by installer, certifying installation complies with all warranty conditions for the air-barrier for the warranty period.

#### 1.8 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- B. Mockups: Build mockups to set quality standards for materials and execution.
  - 1. Integrated Mockups: See Section 01 83 16.
  - 2. Build mockup of typical exterior wall assembly indicated on Drawings, 150 sq. ft. to demonstrate preparation and installation of air barriers and air barrier accessories, to demonstrate surface preparation, crack and joint treatment, application of air barriers, and sealing of gaps, terminations, penetrations of air-barrier assembly for providing air sealed envelope-enclosure.
    - a. Include openings for glazing systems, edge of slab and closure of air barrier systems.
    - b. Include top and bottom of wall transitions to other membranes.
    - c. Coordinate construction of mockups to permit inspection of air barrier before external insulation and cladding are installed.
  - 3. Adhesion Testing: Test mockup for required air-barrier adhesion to substrate in accordance with ASTM D4541.
  - 4. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
  - 5. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

#### 1.9 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.

#### 1.10 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.

#### 1.11 WARRANTY

- A. Manufacturer's Special Warranty: Manufacturer agrees to repair or replace air barrier materials that fails in materials or workmanship within specified warranty period.
  1. Warranty Period: 10 years from date of Substantial Completion.
- B. Special Warranty, Silicone Sealants: See Section 07 92 00 "Joint Sealants" for materials warranty.
- C. Special Project Warranty: Submit Installer's warranty, covering all components of the Work of this Section, for materials and workmanship, within the specified warranty period:
  1. Warranty Period: Two years from date of Substantial Completion.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Source Limitations: Obtain primary air-barrier materials and air-barrier accessories from single source from single manufacturer.
  1. Silicone sheet for project shall be single manufacturer. Coordinate requirements with Section 08 44 13 "Glazed Aluminum

#### 2.2 PERFORMANCE REQUIREMENTS

- A. Air-Barrier Performance: Air-barrier assembly and seals with adjacent construction shall be capable of performing as a continuous air barrier and as a liquid-water drainage plane flashed to discharge to the exterior incidental condensation or water penetration. Air-barrier assemblies shall be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, penetrations, tie-ins to installed waterproofing, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.
  1. Not all conditions and installation requirements are shown. Provide air barrier and accessory flashing systems necessary to install watertight and exclude water and moisture from cavity construction. Where required for performance requirements and installation, details shall be revised without change and considered within the scope required for the Project and shall not be cause for modifications to the Contract.
- B. Air-Barrier Assembly Air Leakage: Maximum 0.04 cfm/sq. ft. of surface area at 1.57 lbf/sq. ft., when tested according to ASTM E2357.

## 2.3 SYSTEM REQUIREMENTS

- A. Work of this Section includes the responsibility to provide a complete air barrier assembly incorporating all components to form a continuous envelope, incorporating flashings, and transitions to other membranes, and provide closure for penetrations and openings. Provide air barrier system as indicated on Drawings and as follows:
1. Air barrier applied to walls.
    - a. Transition membrane at top of wall to roofing.
    - b. Transition membrane at perimeter of new to existing walls.
    - c. Opening membrane at transition from slab on grade to walls.
    - d. Extend across base of wall sheathing joints to top of footings or grade.
    - e. Extend across rigid board insulation between concrete slabs and footings.
  2. Underlayment and high-temperature foil flashings under metal trims.
  3. Openings, Window: Applied accessory membrane flashings to the back, interior face of openings.
    - a. Foil face membrane for sill pan, with upturn legs 6 inches and overlapping wall or vertical face of air barrier below.
    - b. Foil face membrane for Opening membrane heads and jambs, where serving as substrate for silicone sheet transitions.
    - c. Liquid flashing or tooled sealant, at all opening inside corners, extending onto wall face, and all exposed edges in opening.
  4. At Roof:
    - a. Parapet caps, provide high temperature underlayment.
    - b. Air Barrier Transitions Before roofing: Any foil-faced high-temperature SAM.
    - c. Transitions, before air barrier: Metal-faced in Section 07 54 23. Coordinate sequencing.
    - d. Over roofing or in contact with roofing materials: not permitted.
  5. At Masonry and Below Grade: Provide through-wall membrane where extending below grade and in masonry bearing assemblies.
  6. Leading Edges: Where exposed leading, top edges of air barrier system are exposed, apply liquid flashing or detail sealant.
- B. All air barrier with accessory air barrier products shall be compatible with one another and with all air barrier application substrates.
1. Use membranes approved for substrates:
    - a. Foam insulation.
- C. All installation shall shingle to drain, without reverse lapping unless otherwise indicated. Sequence installation necessary for installation of other interfacing Work, and to maintain installation requirements.
- D. Comply with installation and compatibility requirements of Section 01 83 16.
- ## 2.4 MANUFACTURERS
- A. Source Limitations: A. Obtain primary air-barrier materials and air-barrier accessories from single source from single manufacturer unless otherwise indicated.

- B. Manufacturer, Basis of Design: Henry Company; other products listed are considered basis-of-design and are compatible for uses indicated.
  - 1. Other Manufacturers: Subject to compliance with requirements, provide comparable full air-barrier products and accessory products by one of the following under substitution requests:
    - a. Dorken Systems Inc.; Delta-Vent SA.
    - b. VaproShield LLC.; Wrapshield SA.
    - c. Carlisle, Fire Resit 705 VP.
  - 2. Other Manufacturers, Fluid-Applied Air Barriers: In lieu of sheet air barriers, non- asphaltic fluid-applied air barriers are acceptable, with supplementary opening and transition membrane flashing provided, by one of the following manufacturers:
    - a. Henry Co., Tremco, and Carlisle.

## 2.5 SHEET AIR BARRIERS, WRB

- A. Vapor-Permeable Nonbituminous Sheet: Minimum 20-mil-thick, self-adhering sheet consisting of a breathable carrier film or fabric and an adhesive with release liner on adhesive side and formulated for application with primer that complies with VOC limits.
  - 1. Basis of Design Product: Henry Company, Blueskin VP160.
  - 2. Physical and Performance Properties:
    - a. Air Permeance: Maximum 0.004 cfm/sq. ft. of surface area at 1.57-lbf/sq. ft. pressure difference; ASTM E2178.
    - b. Nail Sealability: Pass; ASTM D1970, AAMA 711.
    - c. Vapor Permeance: Minimum 18 perms; ASTM E96/E96M, Desiccant Method, Procedure A.
    - d. UV Resistance: Can be exposed to sunlight for 150 days according to manufacturer's written instructions.

## 2.6 AIR-BARRIER ACCESSORY SELF-ADHERED MEMBRANE FLASHINGS (SAMs)

- A. Opening Flashing: Composite, self-adhesive, flashing product consisting of a pliable, rubberized-asphalt compound, bonded to a high-density polyethylene film or spunbonded polyolefin to produce an overall thickness of not less than 40 mils.
  - 1. Product: Henry Blueskin SA LT or Henry Blueskin SA.
  - 2. For foam-insulation substrates, use Henry Blueskin SA.
- B. High Temperature, Underlayment: Minimum 30 mil thick, consisting of a slip-resistant polyethylene- or polypropylene-film top surface laminated to a layer of butyl- or SBS- modified asphalt adhesive, with release-paper backing; specifically designed to withstand high metal temperatures beneath metal flashing assemblies.
  - 1. Provide primer in accordance with manufacturer's written instructions.
  - 2. Low-Temperature Flexibility: ASTM D1970/D1970M; passes after testing at minus 20 deg F or lower.
  - 3. Products: Henry Blueskin PE200HT.
    - a. Henry Blueskin Metal Clad.
    - b. Use PE200HT where underlayment is indicated.

- C. Transition Membrane and Foil-Faced High Temperature: Composite, self-adhesive, flashing product consisting of a pliable adhesive, bonded to aluminum foil to produce an overall thickness of not less than 0.040 inch. Either modified SBS or butyl rubber compound adhesive. Complying with requirements for underlayment.
  - 1. Product: Henry Blueskin Metal Clad.
- D. Foil Faced, High Temperature Butyl: Composite, self-adhesive, flashing product consisting of a pliable butyl adhesive, bonded to aluminum foil to produce an overall thickness of not less than 0.045 inch.
  - 1. Product: Protectowrap, Protectoseal 45 Butyl.
- E. High Temperature Butyl: Composite, self-adhesive, flashing product consisting of a pliable butyl adhesive, bonded polyethylene sheet:
  - 1. Product: Henry Blueskin Butyl Flash.
- F. Through-Wall: Manufacturer's membrane flashing acceptable for use in load-bearing conditions in through-wall masonry assemblies and acceptable for use in below grade applications; and bridging foam insulation substrates.
  - 1. Product: Henry Blueskin TWF.

## 2.7 UTILITY PENETRATION FLASHING PANELS

- A. Premanufactured flashing for plumbing, electrical and HVAC penetrations with weatherproof seals.
  - 1. Manufacturers and Products: Subject to compliance with requirements, provide products by one of the following:
    - a. Quickflash.
    - b. Other approved equal.

## 2.8 ACCESSORY MATERIALS

- A. Provide primers, transition strips, termination 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. Primer: Liquid waterborne primer recommended for substrate by air-barrier material manufacturer.
- C. Liquid Flashing: Manufacturer's standard fluid-applied flashing.
  - 1. Product: Henry Air-Bloc LF Liquid Flash.
- D. Sealants, General: Comply with Section 07 92 00 "Joint Sealants."
  - 1. Penetration and Detail Sealant: Manufacturer's standard for detail, edge sealing and penetrations other than glazing and louver opening weathersealing.
    - a. Products:

- 1) Henry 925 BES.
- 2) Henry 212 All purpose.

E. Silicone Sheet Transitions, Preformed Silicone Extrusion: See-Installed under Section 08 44 13 "Glazed Aluminum Curtain Walls" for products and accessory sealant.

1. Application: For deflection and vertical shear joints in field of air barriers: where indicated.

## 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. Test concrete substrates for capillary moisture by plastic sheet method according to ASTM D4263.
  4. Verify that masonry joints are flush and completely filled with mortar.
  5. Verify that edge of slab and bituminous dampproofing has transition coating in Section 07 11 13.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 SURFACE PREPARATION

- A. 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.
- B. Mask off adjoining surfaces not covered by air barrier to prevent spillage and overspray affecting other construction.
- C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.
- D. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids in concrete with substrate-patching membrane.
- E. 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.
- F. 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.
- G. Bridge isolation joints, expansion joints, deflection joints, and/or 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 AIR BARRIER INSTALLATION

- A. Install 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. Unless manufacturer recommends in writing against priming, apply primer to substrates at required rate and allow it to dry.
  - 2. Extend first air barrier membranes above subsequent placed sheet metal and other membrane flashings to always provide positive lap during striping in with a minimum 3-inches of lap between membranes and continuous with integrated sheet metal breaks.
- B. Prepare, treat, and seal inside and outside corners and vertical and horizontal surfaces at terminations and penetrations with termination mastic.
- C. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by air-barrier sheet on same day. Reprime areas exposed for more than 24 hours.
- D. Apply and firmly adhere air-barrier sheets over area to receive air barrier. Accurately align sheets and maintain uniform 3-inch-minimum lap widths and end laps. Overlap and seal seams, and stagger end laps to ensure airtight installation.
  - 1. Apply sheets in a shingled manner to shed water.
  - 2. Roll sheets firmly to enhance adhesion to substrate.
- E. Apply continuous air-barrier sheets over accessory strips bridging substrate cracks, construction, and contraction joints.
  - 1. At deflection joints, install air-barrier sheets with backing sufficient to bridge deflection joint widths with film-backed sheet membrane flashings sized no less than two times the joint width.
  - 2. At corners and where deflection joints terminate at openings, install silicone sheet.
    - a. In openings, return silicone sheet to weatherseal joints. Opening system silicone sheet and air barrier silicone sheet shall lap over each other 1- inch.
- F. Connect and seal exterior wall air-barrier sheet 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.
- G. Install air-barrier sheet and accessory materials to form a seal with adjacent construction and to maintain a continuous air barrier.
  - 1. Coordinate air-barrier installation with installation of roofing membrane and sheet metal flashing to ensure continuity of air barrier.
  - 2. Install transition strip behind roofing membrane and sheet metal flashing so that a minimum of 3 inches of coverage is achieved over each substrate.
- H. Integrate through-wall flashings in air-barrier.
- I. Seal exposed edges of sheet at seams, cuts, penetrations, and terminations not concealed by metal counterflashings or ending in reglets with termination mastic.
- J. Seal all horizontal leading edges and exposed ends of accessory flashings with liquid flashing or sealant bead. Exposed top edges of self-adhered flashings are prohibited.

- K. At end of each working day, seal top edge of air-barrier material to substrate with termination mastic.
- L. 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.
- M. At horizontal surfaces and minor steps, provide detail sealant cants and slopes to maintain positive draining.
- N. Wall Openings: Prime concealed, perimeter frame surfaces of windows, curtain walls, storefronts, doors and other openings. Apply transition strip so that a minimum of 3 inches of coverage is achieved over each substrate. Extend to back of opening or back of glazing systems. Roll firmly to enhance adhesion.
  - 1. At back-dam angles, extend air barriers to top of angles.
- O. Fill gaps in or miscellaneous penetrations of air-barrier material with foam sealant to provide backing for detail sealant or air-barrier system.
- P. Repair punctures, voids, and deficient lapped seams in air barrier. Slit and flatten fishmouths and blisters. Patch with air-barrier sheet extending 6 inches beyond repaired areas in all directions.
- Q. Correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air-barrier components.

### 3.4 PENETRATION FLASHING INSTALLATION

- A. Install penetration flashings weather-tight per manufacturer's installation instructions.
- B. Install integral with the primary weather resistive barrier. Ensure proper weather lapping to allow water to shed properly.

### 3.5 FIELD QUALITY CONTROL

- A. Contractor's Field-Inspection: Coordinate field inspection of Section 01 83 16 "Exterior Enclosure Performance Requirements" for mandatory inspection of installation.
  - 1. Inspect air barrier installation as work progresses according to "Inspections" Paragraph below.
- B. Inspections: Air-barrier materials, accessories, and installation are subject to inspection for compliance with requirements. Inspections include the following:
  - 1. Coordinate inspection of air barrier before external insulation and cladding are installed.
  - 2. Continuity of air-barrier system has been achieved throughout the building envelope with no gaps or holes.
  - 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.

8. Laps in sheet materials have complied with the minimum requirements and have been shingled in the correct direction (or mastic applied on exposed edges), with no fishmouths.
  9. Termination mastic has been applied on cut edges.
  10. Air barrier has 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.
- C. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- D. Tests: As determined by testing agency from among the following tests: Test according to ASHRAE 90.1-2022, 5.4.3.1.4-a:
1. Whole-building Pressurization Testing: Test air barrier for air-leakage in accordance with ASTM E3158, ASTM E779 or ASTM E1827.
    - a. Exclude HVAC related elements. Close HVAC systems.
    - b. Air leakage of the building envelope shall not exceed 0.35 cfm/sq. ft. under a differential of 75 Pa.
- 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.
1. Report to comply with ASHRAE 90.1-2022, 4.2.5.1.2: Provide reports to Owner and retain with Project Record Documents.

### 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.

END OF SECTION