

SECTION 072713

SELF-ADHERED SHEET AIR BARRIER

1. GENERAL
   1. SECTION INCLUDES
      * + 1. This section includes the following:

Self-adhered sheet air barrier located in the non-accessible part of the wall.

Materials to bridge and seal the following air leakage pathways and gaps:

Connections of the walls to the roof air barrier.

Connections of the walls to the foundation air barrier.

Seismic and expansion joints.

Openings and penetrations of window frames, storefront, curtain wall.

Barrier precast concrete and other envelope systems.

Door frames.

Piping, conduit, duct and similar penetrations.

Masonry ties, screws, bolts and similar penetrations.

All other air leakage pathways in the building envelope.

SPEC NOTE: COORDINATE RELATED WORK REQUIREMENTS WITH CONTENTS OF REFERENCED SPECIFICATION SECTIONS.

* + - * 1. Related Work in other Sections includes the following:

Section 014000 - Quality Requirements; coordination with Owner’s independent testing and inspection agency.

Section 014339 - Mock-Ups; exterior wall mock-ups.

Section 015000 - Temporary Facilities and Controls; requirement to schedule work to prevent sunlight and weather exposure of materials beyond limits established by manufacturer; requirement to protect materials from damage after installation and prior to installation of enclosing work.

Section 033000 – Cast-In-Place Concrete; requirement that backup concrete be smooth without protrusions.

Section 042000 – Unit Masonry; requirement that backup masonry joints are flush and completely filled with mortar, and that excess mortar on brick ties will be removed; requirement for gap at deflection joints and fillers; coordination with sequencing of through-wall flashing.

Section 061600 – Sheathing; requirement that backup sheathing has been installed.

Section 075000 - Membrane Roofing; requirement for coordination with sequencing of membrane roofing; requirement to seal roof membrane to wall air barrier.

* 1. PERFORMANCE REQUIREMENTS
     + - 1. Material Performance: Provide air barrier materials which have an air permeance not to exceed 0.004 cubic feet per minute per square foot under a pressure differential of 1.57 pounds per square foot (0.004 cfm/ft2 @ 1.57 psf), [0.02 liters per square meter per second under a pressure differential of 75 Pa (0.02 L/(s·m2) @ 75 Pa)] when tested in accordance with ASTM E2178 (unmodified).
         2. The water vapor permeance [Desiccant method, (Procedure A) and Water method (Procedure B)] shall be determined in accordance with ASTM E96 and shall be declared by the material manufacturer.

SPEC NOTE: THE WATER VAPOR PERMEANCE IS DECLARED BY THE MANUFACTURER AND INCLUDED IN THIS DOCUMENT SO THAT THE DESIGN PROFESSIONAL HAS THIS INFORMATION READILY AVAILABLE.

* + - * 1. Assembly Performance: Provide a continuous air barrier in the form of an assembly that has an air leakage not to exceed 0.04 cubic feet per minute per square foot under a pressure differential of 1.57 pounds per square foot (0.04 cfm/ft2 @ 1.57 psf) [0.2 liters per square meter per second under a pressure differential of 75 Pa (0.2 L/(s·m2) @ 75 Pa)] when tested in accordance with ASTM E2357. The assembly shall accommodate movements of building materials by providing expansion and control joints as required. Expansion / control joints, changes in substrate and perimeter conditions shall have appropriate accessory materials at such locations.

The air barrier assembly shall be capable of withstanding combined design wind, fan and stack pressures, both positive and negative on the envelope without damage or displacement, and shall transfer the load to the structure.

Materials of the air barrier assembly shall not displace adjacent materials in the assembly under full load.

The air barrier assembly shall be joined in an airtight and flexible manner to the air barrier materials of adjacent assemblies, allowing for the relative movement of assemblies due to thermal and moisture variations, creep, and anticipated seismic movement.

* + - * 1. Connections to Adjacent Materials: Provide connections to prevent air leakage at the following locations:

Foundation and walls, including penetrations, ties and anchors.

Walls, windows, curtain walls, storefronts, louvers and doors.

Different assemblies and fixed openings within those assemblies.

Wall and roof connections.

Floors over unconditioned space.

Walls, floor and roof across construction, control and expansion joints.

Walls, floors and roof to utility, pipe and duct penetrations.

Seismic and expansion joints.

All other potential air leakage pathways in the building envelope.

* 1. SUBMITTALS
     + - 1. Submittals: Submit in accordance with Division 1 requirements.
         2. Quality Assurance Program: Submit evidence of current Contractor accreditation and Installer certification under the Air Barrier Association of America’s (ABAA) Quality Assurance Program (QAP). Submit accreditation number of the Contractor and certification number(s) of the ABAA Certified Installer(s).
         3. Product Data: Submit material Manufacturer’s Product Data, material manufacturer’s instructions for evaluating, preparing, and treating substrate, temperature and other limitations of installation conditions, Technical Data, and tested physical and performance properties.

Submit letter from primary air barrier material manufacturer indicating approval of materials that are proposed to be used that are not currently listed in the accessories section of this specification for that manufacturer’s material.

Include statement from the primary air barrier material manufacturer that the materials used in their air barrier assembly which will be used to adhere to the underlying substrate are chemically compatible to the substrate material.

* + - * 1. Samples: Submit clearly labeled samples, three (3) inch by four (4) inch (75 mm by 100 mm) minimum size of each material specified.
        2. Shop Drawings of Mock-Up: Submit Shop Drawings of proposed mock-ups showing plans, elevations, large-scale details, and air barrier transitions and terminations.
        3. Field Test Results of Mock-Up: Submit test results of air leakage test and water leakage test of mock-up in accordance with specified standards, including retesting if initial results are not satisfactory.
        4. Shop Drawings: Submit Shop Drawings showing locations and extent of air barrier assemblies and details of all typical conditions, intersections with other envelope assemblies and materials, membrane counter-flashings, and details showing how gaps in the construction will be bridged, how inside and outside corners are negotiated, how materials that cover the materials are secured with air-tight condition maintained, and how miscellaneous penetrations such as conduits, pipes, electric boxes and similar items are sealed.

Include VOC content of each material, and applicable legal limit in the jurisdiction of the project.

Include statement that materials are compatible with adjacent materials proposed for use.

Include required values for field adhesion test on each substrate.

* + - * 1. Compatibility: Submit letter from primary material manufacturer stating that materials proposed for use are permanently chemically compatible and adhesively compatible with adjacent materials proposed for use. Submit letter from primary material manufacturer stating that cleaning materials used during installation are chemically compatible with adjacent materials proposed for use.
        2. Air Barrier Subcontractor Qualifications: Air barrier Subcontractor(s) shall be accredited at the time of bidding and during the complete installation, period by the Air Barrier Association of America (ABAA) whose Installer(s) are certified in accordance with the site Quality Assurance Program used by ABAA.

Self-adhered sheet air barrier Installer(s) shall be certified by BPQI (Building Performance Quality Institute) for the ABAA Quality Assurance Program in accordance with the requirements outlined in the QAP program used by ABAA. Installers shall have their photo-identification air barrier certification cards in their possession and available on the project site, for inspection upon request.

* + - * 1. Manufacturer: Obtain primary ABAA Evaluated Materials from a single ABAA Evaluated Manufacturer regularly engaged in manufacturing specified self-adhered sheet air barriers. Obtain secondary materials from a source acceptable to the primary material manufacturer.
        2. Accredited Laboratory Testing for Materials: Laboratory accredited by International Accreditation Service Inc. (IAS), American Association for Laboratory Accreditation (A2LA), or the Standards Council of Canada (SCC).
        3. VOC Regulations: Provide products which comply with applicable regulations controlling the use of volatile organic compounds.
        4. Preconstruction Meeting: Convene a minimum of two weeks prior to commencing Work of this Section. Agenda shall include, at a minimum, construction and testing of mock-up, sequence of construction, coordination with substrate preparation, air barrier materials approved for use, compatibility of materials, coordination with installation of adjacent and covering materials, and details of construction and chemical/fire safety plans. Attendance is required by representatives of related trades including covering materials, substrate materials and adjacent materials.
        5. Field Quality Assurance: Implement the site Quality Assurance Program requirements used by ABAA. Cooperate with ABAA Auditors and any independent testing and inspection agencies engaged by the Owner. Do not cover the air barrier assembly until it has been inspected, tested and accepted.
        6. Mock-Ups: Build mock-up representative of primary air barrier assemblies and glazing assemblies including backup wall and typical penetrations as acceptable to the Architect. Mock-up shall be dimensioned no less than eight (8) feet long by eight (8) feet high (2.50 meters long by 2.50 meters high) and include the air barrier materials and air barrier accessories proposed for use in the exterior wall assembly. Mock-ups shall be suitable for testing as specified in the following paragraph.

SPEC NOTE: COORDINATE TESTING WITH PROJECT REQUIREMENTS. DELETE PARAGRAPH BELOW IF NOT REQUIRED, OR IF OWNER’S INDEPENDENT TESTING AGENT WILL PERFORM TESTING.

* + - * 1. Mock-Up Tests for Air and Water Infiltration: The third party testing agency shall test the mock-up for air and water infiltration in accordance with ASTM E1186 (air leakage location), ASTM E783 (air leakage quantification) at a pressure differential of 1.57 lb/ft2 (75 Pa), and ASTM E1105 (water penetration). Use smoke tracer to locate sources of air leakage. If deficiencies are found, the air barrier Contractor shall reconstruct mock-up at their cost for retesting until satisfactory results are obtained. Deficiencies include air leakage beyond values specified, uncontrolled water leakage, unsatisfactory workmanship.

Perform the air leakage test and water penetration test of mock-up prior to installation of cladding and trim but after installation of all fasteners for cladding and trim and after installation of other penetrating elements.

* + - * 1. Mock-Up Tests for Membrane Adhesion: The third party testing agency shall test the mock-up for self-adhered sheet air barrier material and transition membrane adhesion in accordance with ASTM D4541 (modified), using a type II pull tester except that the membrane shall be cut through to separate the material attached to the disc from the surrounding material. Perform test after curing period recommended by the material manufacturer. Record mode of failure and area where the material failed in accordance with ASTM D4541. When the air barrier material manufacturer has established a minimum adhesion level for the product on the particular substrate, the inspection report shall indicate whether this requirement has been met. Where the material manufacturer has not declared a minimum adhesion value for their product/substrate combination, the value shall simply be recorded.
        2. Air Barrier Assembly Testing: Verify air barrier assembly testing by the material Manufacturer by visiting the ABAA website to ensure an ASTM E2357 test has been completed and to obtain results. Visit the ABAA website for the reported air barrier assembly leakage rate and illustrations or CAD details which includes the methods in which the assembly test mock-ups shall be assembled.
  1. DELIVERY, STORAGE, AND HANDLING
     + - 1. Deliver materials to Project site in original packages with seals unbroken, labeled with the material Manufacturer's name, product, date of manufacture, and directions for storage.
         2. Store materials in their original undamaged packages in a clean, dry, protected location and within temperature range required by material manufacturer. Protect stored materials from direct sunlight.
         3. Handle materials in accordance with material manufacturer’s recommendations.
  2. PROJECT CONDITIONS
     + - 1. Temperature: Install self-adhered sheet air barrier within range of ambient and substrate temperature, and moisture content recommended by the primary material manufacturer. Do not apply air barrier to a damp or wet substrate.
         2. Field Conditions: Do not install air barrier materials in snow, rain, fog, or mist. Do not install air barrier when the temperature of substrate surfaces and surrounding air temperatures are below those recommended by the material manufacturer.
         3. Sequencing. Do not install air barrier material before the roof assembly has been sufficiently installed to prevent a buildup of water in the interior of the building
         4. Compatibility. Do not allow air barrier materials to come in contact with chemically incompatible materials.
         5. Ultra-violet exposure. Do not expose air barrier materials to sunlight longer than as recommended by the primary material manufacturer.
  3. WARRANTY

SPEC NOTE: VERIFY WARRANTY LENGTH WITH MANUFACTURERs specified.

* + - * 1. Material Warranty: Provide primary material manufacturer’s standard product warranty, for a minimum three (3) years from date of Substantial Completion.
        2. Subcontractor (approved by ABAA and Manufacturer) Installation Warranty: Provide a two (2) year installation warranty from date of Substantial Completion, including all accessories and materials of the air barrier assembly, against failures including loss of air tight seal, loss of watertight seal, loss of attachment, loss of cohesion/adhesion and failure to cure properly.

1. MATERIALS
   1. AIR BARRIER MATERIALS

SPEC NOTE: RETAIN MANUFACTURERS LISTED BELOW. NOTE THAT BOTH water-based AND solvent-based primerS ARE TYPICALLY USED ON A SINGLE PROJECT BASED ON THE SUBSTRATE AND WEATHER CONDITIONS.

* + - * 1. Self-Adhered Sheet Air Barrier: Self-adhered membrane composed of flexible facing material coated completely and uniformly on one side with adhesive material, formed into uniform, flexible sheets, interleaved with disposable release liner that is removed prior to installation. Use regular, high temperature or low-temperature formulation depending on site conditions, within temperature ranges specified by material manufacturer. Subject to compliance with requirements, provide one of the following:

1. Material: HEATLOK ABS by Demilec (www.demilec.com):

AIR BARRIER MATERIAL PROPERTIES:

1. Air permeance for this material has been tested and reported as being 0.0001 cubic feet per minute per square foot under a pressure differential of 1.57 pounds per square foot (0.0001 cfm/ft2 @ 1.57 psf), [< 0.0005 liters per square meter per second under a pressure differential of 75 Pa (< 0.0005 L/(s·m2) @ 75 Pa)] when tested in accordance with ASTM E2178 (unmodified).
2. Water vapor permeance for this material has been tested and reported as being 0.016 nanograms of water vapor passing through each square meter of area per second for each Pascal of vapor pressure differential (0.016 ng/(Pa·s·m2)  [0.89 US perms] when tested in accordance with ASTM E 96 (desiccant method – unmodified).
3. Water vapor permeance for this material has been tested and reported as being 1.8 nanograms of water vapor passing through each square meter of area per second for each Pascal of vapor pressure differential (1.8 ng/(Pa·s·m2)  [0.031 US perms] when tested in accordance with ASTM E96 (water method - unmodified).

AIR BARRIER ACCESSORY MATERIALS:

1. Heatlok ABS Primer Solvent Based
2. Heatlok ABS Primer Water Based
3. Heatlok ABS Mastic
4. EXECUTION
   1. EXAMINATION
      * + 1. The ABAA Certified Air Barrier Contractor shall examine substrates, areas, and conditions under which the air barrier assembly will be installed, with General Contractor, ABAA Certified Installer present, for compliance with the following requirements.

Confirm site access logistics and scheduling requirements, including but not limited to use of scaffolding, lifts and staging.

At the end of each working day the General Contractor shall provide weather protection at the top of parapet walls and non finished roofs to prevent moisture migration into walls and damage to installed air barrier systems.

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.

Ensure that the following conditions are met:

Surfaces are sound, dry, even, and free of excess mortar or other contaminants.

Inspect substrates to be smooth without large voids or sharp protrusions. Inform General Contractor if substrates are not acceptable and need to be repaired by the concrete sub-trade.

Inspect masonry joints to be reasonably flush and completely filled, and ensure all excess mortar sitting on masonry ties has been removed. Inform General Contractor if masonry joints are not acceptable and need to be repaired by the mason sub-trade.

Verify substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D4263 and take suitable measures until substrate passes moisture test.

Verify sealants are compatible with membrane proposed for use. Perform field peel-adhesion test on materials to which sealants are adhered.

Notify Architect in writing of anticipated problems using self-adhered sheet air barrier over substrate prior to proceeding.

* 1. SURFACE PREPARATION
     + - 1. The Air Barrier Contractor shall ensure the substrate is clean, dust-free, dry and prepared in accordance with the air barrier material manufacturer's written instructions. The General Contractor shall be notified if this is not the case.

Ensure that penetrating work by other trades is in place and complete.

Prepare surfaces by brushing, scrubbing, scraping, grinding or compressed air to remove loose mortar, dust, oil, grease, oxidation, mill scale and other contaminants which will affect adhesion of the self-adhered sheet air barrier.

Wipe down metal surfaces to remove release agents or other non-compatible coatings using clean sponges or with a material chemically compatible with the primary air material.

* + - * 1. Prime substrate as per manufacturer’s instructions for installation of self-adhered sheet air barrier and sheet membrane transition strips as follows:

Prime masonry, concrete substrates with primers.

Prime glass-fiber surfaced gypsum sheathing with an adequate number (if applicable) of coats to achieve required bond, with adequate drying time between coats.

Prime wood, metal, structural steel, sheet metal, and painted substrates with primer.

Prepare, treat, and seal vertical and horizontal surfaces at terminations and penetrations through air barrier and protrusions.

* 1. INSTALLATION
     + - 1. Self-Adhering Sheet Air Barrier: Install air barrier accessory materials and self-adhered sheet air barrier to provide continuity throughout the building envelope in a shingle fashion. Install materials in accordance with manufacturer's recommendations and as follows (unless manufacturer recommends other procedures in writing based on project conditions or particular requirements of their recommended materials):

Install veneer anchors as per air barrier manufacturer installation sequencing.

Apply primer for transition material at the rate instructed by the air barrier material manufacturer for 1 inch (25mm) beyond terminating edge of transition membrane. Allow primer to set/cure completely before transition strip application.

Position subsequent sheets of transition material so that membrane overlaps the membrane sheet below by a minimum of 2 inches (50 mm), unless greater overlap is recommended by the material manufacturer. Ensure transition membrane is securely sealed onto substrate with roller.

Overlap horizontally adjacent pieces of transition material a minimum of 2 inches (50 mm), unless greater overlap is recommended by the material manufacturer. Roll all areas of transition strip including seams with roller.

Seal around all penetrations with termination mastic/sealant, membrane counter-flashing or other procedure in accordance with material manufacturer’s instructions, ensuring chemical compatibility amongst adjoining materials.

Provide transition material at changes in substrate plane (with bead of mastic/sealant, membrane counter-flashing or other material recommended by material manufacturer) under membrane to eliminate all sharp 90 degree inside corners and to make a smooth transition from one plane to another.

Provide mechanically fastened non-corrosive metal sheet or other manufacturer approved transition material to span gaps greater than 1 inch (25 mm) in substrate plane and to make a smooth transition from one plane to the other. Transition membrane shall be installed continuously from the self-adhered membrane onto the sheet metal maintaining 2 inch [50 mm] overlap on both edges.

At through-wall flashings, provide an additional 6 inches [150 mm] wide strip of manufacturer’s recommended membrane counter-flashing to seal top of through-wall flashing to primary air barrier material. Seal exposed top edge of flashing with bead of mastic/sealant as required by manufacturer.

At deflection and control joints, provide backup for the self-adhered membrane to accommodate anticipated movement.

At expansion and seismic joints provide transition to the joint assemblies.

Apply a bead or trowel coat of mastic/sealant along membrane seams at reverse lapped seams, rough cuts, and as recommended by the manufacturer.

Connect air barrier in exterior wall assembly continuously to the air barrier of the roof, to concrete below-grade structures, to windows, curtain wall, storefront, louvers, exterior doors, other intersection conditions and transitions from wet cavity to dry cavity and seal penetrations using accessory materials in accordance with the material manufacturer’s instructions.

Apply primer for self-adhered sheet air barrier at the rate instructed by the air barrier material manufacturer. Allow primer to set/cure completely before transition strip application.

Position subsequent sheets of self-adhered sheet air barrier membrane to overlap the membrane sheet below by a minimum of 2 inches (50 mm), unless greater overlap is recommended by the material manufacturer. Ensure self-adhered sheet air barrier is securely sealed by rolling it smooth on the substrate with a roller, rolling out any “fishmouths”, voids or wrinkles.

At end of each working day, seal top edge of membrane to substrate with termination mastic/sealant.

Inspect installation prior to enclosing assembly and repair punctures, damaged areas and inadequately lapped seams with a patch of membrane lapped as recommended by manufacturer.

* 1. FIELD QUALITY CONTROL
     + - 1. Owner’s Inspection and Testing: Cooperate with Owner’s testing agency. Allow access to work areas and staging. Notify Owner’s testing agency in writing of schedule for Work of this Section to allow sufficient time for testing and inspection. Do not cover Work of this Section until testing and inspection is accepted.
         2. Air Barrier Association of America Installer Audits: Cooperate with ABAA’s testing agency. Allow access to work areas and staging. Notify ABAA in writing of schedule for Work of this Section to allow sufficient time for testing and inspection. Do not cover Work of this Section until testing and inspection is accepted. Arrange and pay for site inspections by ABAA to verify conformance with the material Manufacturer’s instructions, the site Quality Assurance Program used by ABAA, and this section of the project specification.

Audits and subsequent testing shall be carried out at the following rate:

Up to 10,000 ft2 of air barrier contract requires one (1)audit.

10,001 – 35,000 ft2 of air barrier contract requires two (2)audits.

35,001 – 75,000 ft2 of air barrier contract requires three (3)audits.

75,001 - 125,000 ft2 of air barrier contract requires four (4)audits.

125,001 – 200,000 ft2 of air barrier contract requires five (5)audits.

200,001 ft2 and over of air barrier contract requires six (6)audits.

Forward written audit reports to the Architect within 10 working days of the inspection and test being performed.

If the inspections reveal any defects, promptly remove and replace defective work at no additional cost to the Owner.

* 1. PROTECTING AND CLEANING

1. Protect air barrier materials from damage during installation and the remainder of the construction period, according to material manufacturer's written instructions.

Coordinate with installation of materials which cover the air barrier assemblies, to ensure exposure period does not exceed that recommended by the air barrier material manufacturer.

1. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction and acceptable to the material manufacturer.

END OF SECTION