

# SECTION 07 27 13.02 SELF-ADHERED NON PERMEABLE AIR BARRIER MEMBRANE

SPEC NOTE: This specification includes materials and installation procedures for Blueskin® SA, a sheet applied self-adhering non permeable air barrier membrane meeting the requirements of the Massachusetts Energy Code for the building envelope. The Blueskin® SA system assembly is used in cavity wall construction to provide an air/vapor and rain barrier membrane meeting ASTM E-2357. This specification should be adapted to suit the requirements of individual projects. It is prepared in CSI three part format and should be included as a separate section under Division 7 - Thermal and Moisture Protection.

## PART 1 - GENERAL

### 1.01 GENERAL REQUIREMENTS

- A. General Conditions, Supplementary Conditions, Instructions to Bidders and Division One General Requirements shall be read in conjunction with and govern this section.
- B. This Specification shall be read as a whole by all parties concerned. Each Section may contain more or less than the complete Work of any trade. The Contractor is solely responsible to make clear to the Subcontractors the extent of their Work.

### 1.02 DESCRIPTION

- A. Supply labor, materials and equipment to complete the Work as shown on the Drawings and as specified herein 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 and door frames, store front, curtain wall.
  - 5. Piping, conduit, duct and similar penetrations.
  - 6. Masonry ties, screws, bolts and similar penetrations.
  - 7. All other air leakage pathways in the building envelope.
- B. Materials and installation methods of the primary air/vapor barrier membrane system and accessories.
- C. Materials and installation methods of through-wall flashing membranes.

### 1.03 RELATED SECTIONS

- A. Concrete Section [03 XX XX]
- B. Masonry: Section [04 XX XX]
- C. Gypsum Sheathing Section [06 XX XX]
- D. Plywood Sheathing Section [06 XX XX]
- E. Insulation: Section [07 XX XX]
- F. Roofing: Section [07 XX XX]
- G. Wall Panels Section [07 XX XX]
- H. Flashing Section [07 XX XX]
- I. Sealants: Section [07 XX XX]
- J. Door Frames: Section [08 XX XX]
- K. Window Frames: Section [08 XX XX]

### 1.04 REFERENCES

- A. The following standards are applicable to this section:
  - 1. ASTM E 2357: Standard Test Method for Determining Air Leakage of Air Barrier Assemblies.
  - 2. ASTM E2178: Standard Test Method for Air Permeance of Building Materials.
  - 3. ASTM E283: Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
  - 4. ASTM E1677 Specification for Air Retarder (AR) Material or System for Low-Rise Framed Building Walls.
  - 5. ASTM E330: Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
  - 6. ASTM E331: Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
  - 7. ASTM E96: Water Vapor Transmission of Materials.

8. CGSB 37-GP-56M: Membrane, Modified, Bituminous, Prefabricated, and Reinforced.
9. AMMA 2400: Standard Practice for Installation of Windows with a Mounting Flange in Stud Frame Construction.
10. ASTM E 2112: Standard Practice for Installation of Exterior Windows, Doors and Skylights.

1.05 SUBMITTALS

- A. Submit documentation from an approved independent testing laboratory certifying the air leakage rates of the air barrier membranes assembly, including primary membrane, primer and sealants have been tested to meet ASTM E 2357.
- B. Submit documentation from an approved independent testing laboratory certifying the air leakage and vapor permeance rates of the air barrier membranes, including primary membrane and transition sheets, exceed the requirements of the Massachusetts Energy Code and in accordance with ASTM E 2178.
  1. Test report submittals shall include test results on porous substrate and include sustained wind load and gust load air leakage results.
- C. Submit manufacturers' current product data sheets for the air barrier membrane system.

1.06 QUALITY ASSURANCE

- A. Submit document stating the applicator of the primary air/vapor barrier membranes specified in this section is qualified by the manufacturer as suitable for the execution of the Work.
- B. Perform Work in accordance with manufacturer's written instructions and this specification.
- C. Maintain one copy of manufacturer's written instructions on site.
- D. Allow access to Work site by the air barrier membrane manufacturer's representative.
- E. Components used shall be sourced from one manufacturer, including sheet membrane, air barrier sealants, primers, mastics, and adhesives.
- F. Single-Source Responsibility:
  1. Obtain air barrier materials from a single manufacturer regularly engaged in manufacturing the product.
  2. Provide products which comply with all federal, state and local regulations controlling use of volatile organic compounds (VOCs).

1.07 MOCK-UP

- A. Construct mock-up in accordance with Section 01 43 39 – Mock-ups.
- B. Provide mock-up of air/vapor barrier materials under provisions of Section 01 33 23 - Shop Drawings, Product Data and Samples.
- C. Where directed by [engineer] [architect] [consultant], construct typical exterior wall panel, 6 foot long by 6 foot wide, incorporating substrate, window frame, attachment of insulation and showing air barrier membrane application details.
- D. Allow 48 hours for inspection of mock-up by [engineer] [architect] [consultant] before proceeding with air barrier work. Mock-up may remain as part of the Work.
- E. Test mock-up for air and water infiltration to conform with Section 01400 - Quality Control, in accordance with ASTM E 783 and ASTM E 1105.

1.08 PRE-INSTALLATION CONFERENCE

- A. Contractor shall convene [one] week prior to commencing Work of this section, under provisions of Section 01 31 19 – Project Meetings.
- B. Ensure all contractors responsible for creating a continuous plane of air tightness are present.

1.09 DELIVERY, STORAGE AND HANDLING

- A. Refer to current Product MSDS for proper storage and handling.
- B. Deliver materials to the job site in undamaged and original packaging indicating the name of the manufacturer and product.
- C. Store role materials on end in original packaging. Protect rolls from direct sunlight until ready for use.
- D. Store air barrier membranes, adhesives and primers at temperatures of 40 degrees F and rising.
- E. Keep solvent away from open flame or excessive heat.
- F. Wasted Management and Disposal
  1. Separate and recycle waste materials in accordance with Section [01355 - Waste Management and Disposal], and with the Waste Reduction Work Plan

- G. Contractor to verify compliance for Volatile Organic Compounds (VOC) limitations of products to comply with all federal, state and local regulations controlling use of volatile organic compounds (VOCs).

1.10 CO-ORDINATION

- A. Ensure continuity of the air seal throughout the scope of this section.

1.11 ALTERNATES

- A. Submit request for alternates in accordance with Section 01 25 00 – Substitution Procedures.
- B. Submit requests for alternates a minimum of ten (10) working days prior to bid date.
- C. Alternate submission to include:
  - 1. Evidence that alternate materials meet or exceed performance characteristics of Product requirements as well as documentation from an approved independent testing laboratory certifying the air leakage rates and vapor permeance rates of the air barrier membranes, including primary membrane and transition sheets, exceed the requirements of ASTM E 2357, the Massachusetts Energy Code and in accordance with ASTM E 2178.
  - 2. Copies of the manufacturer's current ISO certification
  - 3. Ten (10) references clearly indicating the membrane manufacturer has successfully completed projects of similar scope and nature for a minimum of ten (10) years
  - 4. Manufacturer's complete set of details for air barrier membrane system showing a continuous plane of air tightness throughout the building envelope.
- D. Acceptable alternates will be confirmed by addendum. Substitute materials not approved in writing prior to bid date shall not be permitted for use on this project.

1.12 WARRANTY

- A. Provide manufacturer's standard 10-year material warranty.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Air/vapor barrier membrane components and accessories must be obtained as a single-source from the membrane manufacturer to ensure total system compatibility and integrity.
  - 1. Acceptable Manufacturer: Henry Company.  
909 N Sepulveda Blvd, Suite 650  
El Segundo, CA 90245  
(800) 598-7663  
Web Site: [www.Henry.com](http://www.Henry.com)

2.02 MEMBRANES (Basis-of-Design)

- A. Primary sheet air/vapor barrier membrane shall be Blueskin® SA manufactured by Henry; an SBS modified bitumen, self-adhering sheet membrane complete with a cross-laminated polyethylene film. For application temperatures down to 10 degrees F use Blueskin® SA LT. Membrane shall have the following physical properties:
  - 1. Air leakage: <0.0001 CFM/ft<sup>2</sup> @1.6 lbs/ft<sup>2</sup> to ASTM E 2178 and ASTM E 283 and have no increased air leakage when subjected to a sustained wind load of 10.5 lbs/ft<sup>2</sup> for 1 hour and gust wind load pressure of 62.8 lbs/ft<sup>2</sup> for 10 seconds when tested at 1.6 lbs/ft<sup>2</sup> to ASTM E331
  - 2. Tested to ASTM E 2357 for the air barrier assembly,
  - 3. Vapor permeance: 0.05 perms to ASTM E96
  - 4. Membrane Thickness: 0.0394" (40 mils)
  - 5. Low temperature flexibility: -22 degrees F to CGSB 37-GP-56M
  - 6. Elongation: 200% to ASTM D412-modified
  - 7. Meets CAN/CGSB-51-33 Type I Water Vapor Permeance requirements

Spec Note: Masonry Flashings are typically specified in Section 04 05 23.16. Co-ordinate material selection and application with air barrier membrane systems. Blueskin TWF is specifically designed for flashing details with a stronger film and resistance to flow.

- E. Through-wall flashing membrane (Self-Adhering) shall be Blueskin® TWF manufactured by Henry; an SBS modified bitumen, self-adhering sheet membrane complete with a cross-laminated polyethylene film. Membrane shall have the following physical properties:
1. Membrane Thickness: 0.0394 inches (40 mils)
  2. Film Thickness: 4.0 mils
  3. Flow (ASTM D5147): Pass @ 212 degrees F
  4. Puncture Resistance: 134 lbf to ASTM E154
  5. Tensile Strength (film): 5723 psi ASTM D882
  6. Tear Resistance: 13lbs. MD to ASTM D1004
  7. Low temperature flexibility: -22 degrees F to CGSB 37-GP-56M

#### 2.05 PRIMERS

- A. Primer for self-adhering membranes at temperatures above 25 degrees F shall be Aquatac™ Primer manufactured by Henry; a polymer emulsion based adhesive, quick setting. Primer shall have the following physical properties:
1. Colour: Aqua
  2. Weight: 8.7 lbs/gal
  3. Solids by weight: 53%
  4. Water based, no solvent odours
  5. Drying time (initial set): 30 minutes at 50% RH and 70 degrees F
- B. Primer for self-adhering membranes at all temperatures shall be Blueskin® Adhesive manufactured by Henry, a synthetic rubber based adhesive, quick setting, having the following physical properties:
- .1 Color: Blue,
  - .2 Weight: 6 lbs/gal,
  - .3 Solids by weight: 35%,
  - .4 Drying time (initial set): 30 minutes.

#### 2.06 PENETRATION & TERMINATION SEALANT

- A. Termination Sealant shall be HE925 BES Sealant manufactured by Henry; a moisture cure, medium modulus polymer modified sealing compound having the following physical properties:
1. Compatible with sheet air barrier, roofing and waterproofing membranes and substrate,
  2. Complies with Fed. Spec. TT-S-00230C, Type II, Class A
  3. Complies with ASTM C 920, Type S, Grade NS, Class 25
  4. Elongation: 450 – 550%
  5. Remains flexible with aging
  6. Seals construction joints up to 1 inch wide

**SPEC NOTE: THERMAL SHORT CIRCUITING** To reduce heat loss and restrict air convection between the air barrier membrane and insulating materials, secure the insulation in place with an insulation adhesive applied in a serpentine pattern and butter the joints of panels. Co-ordinate with the Cavity Wall Insulation Section.

#### 2.05 INSULATION ADHESIVE

- A. Insulation adhesive shall be Air-Bloc 21 Insulation Adhesive manufactured by Henry; a synthetic, trowel applied, rubber based adhesive, having the following physical properties:
1. Compatibility: With air barrier membrane, substrate and insulation
  2. Air leakage: 0.0026 CFM/ft2 @ 2.1 lbs/ft2 to ASTM E283
  3. Water vapor permeance: 0.03 perms to ASTM E96
  4. Long term flexibility: CGSB 71-GP-24M

### PART 3 EXECUTION

#### 3.01 EXAMINATION

- A. Verify that surfaces and conditions are ready to accept the Work of this section. Notify [engineer] [architect] [consultant] in writing of any discrepancies. Commencement of the work or any parts thereof shall mean acceptance of the prepared substrates.
- B. All surfaces must be sound, dry, clean and free of oil, grease, dirt, excess mortar or other contaminants. Fill spalled areas in substrate to provide an even plane. Strike masonry joints flush.
- C. Where curing compounds are used they must be clear resin based without oil, wax or pigments.

- D. Do not proceed with application of air barrier membrane when rain is expected within 24 hours.
- E. Condition materials to room temperature prior to application to facilitate handling.

### 3.02 SURFACE PREPARATION

- A. Surfaces must be sound, clean and free of oil, grease, dirt, excess mortar or other contaminants. Fill spalled areas in substrate to provide an even plane.
- B. New concrete should be cured for a minimum of 14 days and must be dry before air/vapor barrier membranes are applied.
- C. Ensure all preparatory Work is complete prior to applying primary air/vapor barrier membrane.
- D. Mechanical fasteners used to secure sheathing boards or penetrate sheathing boards shall be set flush with sheathing and fastened into solid backing.
- E. Apply primer at rate recommended by manufacturer to all areas to receive self-adhering sheet air/vapor barrier membrane and or through-wall flashing membrane as indicated on drawings by roller or spray and allow minimum 30 minute open time. Primed surfaces not covered by self-adhering membrane or self-adhering through-wall flashing membrane during the same working day must be re-primed.

### 3.03 INSTALLTION OF AIR BARRIER SYSTEM

#### A. INSIDE AND OUTSIDE CORNERS

- 1. Seal inside and outside corners of sheathing boards with a strip of self-adhering air/vapor barrier membrane extending a minimum of 3 inches on either side of the corner detail.
  - a. Prime surfaces as per manufacturers' instructions and allow to dry.
  - b. Align and position self-adhering transition membrane, remove protective film and press firmly into place. Ensure minimum 2 inches overlap at all end and side laps of membrane.
  - c. Roll all laps and membrane with a counter top roller to ensure seal.

#### B. TRANSITION AREAS

- 1. Tie-in to structural beams, columns, floor slabs and intermittent floors, parapet curbs, foundation walls, roofing systems and at the interface of dissimilar materials as indicated in drawings with self-adhering air/vapor barrier membrane.
  - a. Prime surfaces as per manufacturers' instructions and allow to dry.
  - b. Align and position self-adhering transition membrane, remove protective film and press firmly into place. Provide minimum 3 inch lap to all substrates.
  - c. Ensure minimum 2 inch overlap at all end and side laps of membrane.
  - d. Roll all laps and membrane with a counter top roller to ensure seal.

Spec Note: Best construction practice requires window sill details to be waterproofed and flashed prior to the placement of the window assembly. SBS modified self-adhering membranes provide the flexibility to wrap around the configurations of wall openings and provide the self-sealing properties to guard against leaks by mechanical fastener attachment.

Spec Note: Specific window manufacturer's instructions over-ride Henry specifications for window openings. The installer is responsible to resolve any conflicts in the specifications, sequencing, materials or techniques between window manufacturer's instructions and Henry specifications BEFORE CONSTRUCTION.

#### C. WINDOWS AND ROUGH OPENINGS

- 1. Wrap rough openings with self-adhering air/vapor barrier membrane as detailed.
  - a. Prime surfaces as per manufacturers' instructions and allow to dry.
  - b. Align and position self-adhering transition membrane, remove protective film and press firmly into place. Ensure minimum 2 inch overlap at all end and side laps of membrane.
  - c. Roll all laps and membrane with a counter top roller to ensure seal.

#### D. THROUGH-WALL FLASHING MEMBRANE

- 1. Apply through-wall flashing membrane along the base of masonry veneer walls and over shelf angles as detailed.

- a. Prime surfaces and allow to dry, press membrane firmly into place, over lap minimum 2 inches at all end and side laps. Promptly roll all laps and membrane to ensure the seal.
- b. Applications shall form a continuous flashing membrane and shall extend up a minimum of 8 inches up the back-up wall.
- c. Seal the top edge of the membrane where it meets the substrate using termination sealant. Trowel-apply a feathered edge to seal termination to shed water.
- d. Install through-wall flashing membrane and extend 1/2 inch from outside edge of veneer. Provide "end dam" flashing as detailed.

E. PRIMARY AIR BARRIER

1. Apply self-adhering air/vapor barrier membrane complete and continuous to prepared and primed substrate in an overlapping shingle fashion and in accordance with manufacturer's recommendations and written instructions. Stagger all vertical joints.
  - a. Prime surfaces as per manufacturers' instructions and allow to dry.
  - b. Align and position self-adhering air/vapor barrier membrane, remove protective film and press firmly into place. Ensure minimum 2 inch overlap at all end and side laps of membrane.
  - c. Roll all laps and membrane with a counter top roller to ensure seal.
  - d. At the end of each days work seal the top edge of the membrane where it meets the substrate with termination sealant. Trowel apply a feathered edge to seal termination and shed water.

3.04 APPLICATION OF TERMINATION SEALANT

- A. Seal membrane terminations, heads of mechanical fasteners, masonry tie fasteners, around penetrations, duct work, electrical and other apparatus extending through the primary water resistive air barrier membrane and around the perimeter edge of membrane terminations at window and door frames with specified termination sealant.

3.05 FIELD QUALITY CONTROL

- A. Make notification when sections of Work are complete to allow review prior to covering air/vapor barrier system.

3.06 INSTALLATION OF INSULATION

- A. Co-ordinate with Cavity Wall Insulation Section [XXXXX] for insulating materials.
- B. Apply insulation adhesive in a serpentine pattern over the air/vapor barrier membrane.
- C. Immediately embed insulation into the adhesive and press firmly into place to ensure full contact. Apply additional adhesive if allowed to skin over.

3.07 PROTECTION

- A. Damp substrates must not be inhibited from drying out. Do not expose the backside of the substrate to moisture or rain.
- B. Cap and protect exposed back-up walls against wet weather conditions during and after application of membrane.
- C. Air/vapor barrier membrane is not designed for permanent exposure. Good practice calls for covering as soon as possible. Special consideration must be given to the exposed un-insulated membrane during winter months of construction so as to avoid the risk of condensation.

END OF SECTION