

SECTION 072713

Self-adhered Sheet Membrane Air Barrier, Vapor Impermeable

Perm-A-Barrier® Wall Membrane

PART 1 — GENERAL

1.01 RELATED DOCUMENTS

- A. All of the Contract Documents, including General and Supplementary Conditions and Division 1 General Requirements, apply to the work of this section.

1.02 SUMMARY

- A. The work of this section includes, but is not limited to, the following:
 - 1. Materials and installation methods for fluid applied air and vapor barrier membrane system located in the non-accessible part of the wall.
 - 2. Materials and installation methods to bridge and seal air leakage pathways in roof and foundation junctions, window and door openings, control and expansion joints, masonry ties, piping and other penetrations through the wall assembly.
- B. Related Sections: Other specification sections that directly relate to the works of this section include, but are not limited to, the following:
 - 1. Section 03300 – Cast-In-Place Concrete
 - 2. Section 04200 – Unit Masonry
 - 3. Section 07140 – Below Grade Waterproofing
 - 4. Section 07110 – Below Grade Dampproofing
 - 5. Section 07200 – Roof Membrane [and Vapor Retarder]
 - 6. Section 07600 – Flashing and Sheet Metal
 - 7. Section 07900 – Joint Sealers
 - 1. Section [-----] – Other

1.03 PERFORMANCE REQUIREMENTS

- A. Provide an air and vapor barrier system to perform as a continuous barrier to air infiltration/exfiltration and water vapor transmission and to act as a liquid water drainage plane flashed to discharge any incidental condensation or water penetration.

NOTE TO SPECIFIER: Delete or insert local energy code requirements below where relevant

- A. Commonwealth of Massachusetts Building Code Requirements: The intent of this specification is to require compliance with 780 CMR 13, Section 1304.3 Air Leakage.

1304.3.1 Air Barriers: The building envelope shall be designed and constructed with a continuous air barrier to control air leakage into, or out of the conditioned space. An air barrier shall also be provided for interior partitions between conditioned space and space designed to maintain temperature or humidity levels which differ from those in the conditioned space by more than 50% of the difference between the conditioned space and design ambient conditions. The air barrier shall have the following characteristics:

- 1. It must be continuous, with all joints made airtight.
- 2. It shall have an air permeability not to exceed 0.004 cfm/ft² under a pressure differential of 0.3 in. water. (1.57 psf.) (equal to 0.02L/s/m² @ 75 Pa.).
- 3. It shall be capable of withstanding positive and negative combined design wind, fan and stack pressures on the envelope without damage or displacement, and shall transfer the load to the structure. It shall not displace adjacent materials under full load.
- 4. It shall be durable or maintainable.
- 5. The air barrier shall be joined in an airtight and flexible manner to the air barrier material of adjacent systems, allowing for the relative movement of systems due to thermal and moisture variations and creep. Connection shall be made between:
 - a. Foundation and walls.
 - b. Walls and windows or doors.
 - c. Different wall systems.
 - d. Wall and roof.
 - e. Wall and roof over unconditioned space.
 - f. Walls, floor and roof across construction, control and expansion joints.
 - g. Walls, floors and roof to utility, pipe and duct penetrations.

1304.3.2 Air barrier penetrations:

All penetrations of the air barrier and paths of air infiltration/exfiltration shall be made airtight.

1.04 REFERENCES

The following standards and publications are applicable to the extent referenced in the text. The most recent version of these standards is implied unless otherwise stated.

American Society for Testing and Materials (ASTM)

- a. 1. E96 Test Methods for Water Vapor Transmission of Materials
- b. 2. D570 Test Method for Water Absorption of Plastics
- c. 3. E154 Test Method for Water Vapor Retarders used in contact with Earth Under Concrete Slabs, on Walls or as Ground Cover
- d. 4. D1004 Test Method for Initial Tear Resistance of Plastic Film and Sheeting
- e. 5. D1938 Test Method for Tear Propagation Resistance of Plastic Film and Thin Sheeting by a Single-Tear Method
- f. 6. D1876 Test Method for Peel Resistance of Adhesives
- g. 7. D1970 Standard Specifications for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection
- h. 8. D412 Test Methods for Vulcanized Rubber & Thermoplastic Rubbers and Thermoplastic Elastomers – Tension
- i. 9. E2178 Standard Test Method for Air Permeance of Building Materials
- j. 10. E2357 Standard Test Method for Determining Air Leakage of Air Barrier Assemblies

1.05 SUBMITTALS

Product Data: Submit manufacturer's product data, installation instructions, use limitations and substrate preparation recommendations.

Shop drawings showing locations and extent of air and vapor barrier system including details for terminations flashings, penetrations, window and door openings and treatment of substrate joints and cracks.

Written documentation demonstrating installers qualifications under the "Quality Assurance" article including reference projects of a similar scope.

Samples: Submit representative samples of the following for approval:

1. Self-Adhered Air Barrier Membrane
2. Self-Adhered Transition Membrane
3. Self-Adhered Through Wall Flashing

Warranty: Submit a sample warranty identifying the terms and conditions stated in Section 1.09.

1.06 QUALITY ASSURANCE

Manufacturer: Air and vapor barrier systems shall be manufactured and marketed by a firm with a minimum of 20 years experience in the production and sales of waterproofing and air barrier products. Manufacturers proposed for use, but not named in these specifications shall submit evidence of ability to meet all requirements specified, and include a list of projects of similar design and complexity completed within the past five years.

Installer: The installer shall demonstrate qualifications to perform the work of this Section by submitting the following:

List of at least three (3) projects contracted within the past five (5) years of similar scope and complexity to this project carried out by the firm and site supervisor.

Installer must show evidence of adequate equipment and trained field personnel to successfully complete the project in a timely manner.

Materials: Self-adhered air and vapor barrier material shall be 40 mil (.004 in) comprising 36 mil (.0036 in.) rubberized asphalt integrally bonded to 4 mil (.0004 in.) cross-laminated polyethylene film. For each type of material required for the work of this section, provide primary materials that are the products of one manufacturer.

Pre-Installation Conference: A pre-installation conference shall be held prior to commencement of field operations to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work. Agenda for meeting shall include but not be limited to the following:

Review of submittals.

Review of surface preparation, minimum curing period and installation procedures.

Review of special details and flashings.

Sequence of construction, responsibilities and schedule for subsequent operations.

Review of mock-up requirements.

Review of inspection, testing, protection and repair procedures.

Mock-up: Prior to installation of the air and vapor barrier system a field-constructed mock-up shall be provided under the provisions of Section [01340 – Shop Drawings, Product Data, Samples and Mock-ups] to verify details and tie-ins and to demonstrate the required quality of materials and installation.

Construct a typical exterior wall section, 8 feet long and 8 feet wide, incorporating back-up wall, cladding, window and doorframe and sill, insulation, flashing and any other critical junction (roof, foundation, etc).

Allow 24 hours for inspection and testing of mock-up before proceeding with air and vapor barrier work.

Mock-up may remain as part of the work.

Inspection and Testing: Cooperate and coordinate with the Owner's inspection and testing agency. Do not cover any installed air and vapor barrier membrane until it has been inspected, tested and approved.

1.07 DELIVERY, STORAGE AND HANDLING

Deliver materials and products in labeled packages. Store and handle in strict compliance with manufacturer's instructions, recommendations and material safety data sheets. Protect from damage from sunlight, weather, excessive temperatures and construction operations. Remove damaged material from the site and dispose of in accordance with applicable regulations.

Do not double-stack pallets of fluid applied membrane components on the job site. Provide cover on top and all sides, allowing for adequate ventilation.

Protect fluid-applied membrane components from freezing and extreme heat.

Sequence deliveries to avoid delays, but minimize on-site storage.

1.08 PROJECT CONDITIONS

Perform work only when existing and forecasted weather conditions are within the limits established by the manufacturer of the materials used. Proceed with installation only when the substrate construction and preparation work is complete and in condition to receive the air and vapor barrier membrane.

1.09 WARRANTY

Submit manufacturer's warranty that air and vapor barrier and accessories are free of defects at time of delivery and are manufactured to meet manufacturer's published physical properties and material specifications.

PART 2 — PRODUCTS

2.01 GENERAL

For each type of material required for the work of this section, provide primary materials that are the products of one manufacturer.

2.02 SELF-ADHERED AIR BARRIER MEMBRANE

A. Description: Min. 1 mm (.040 in) thick membrane comprised of 0.9 mm (0.036 in) of self-adhesive rubberized asphalt integrally bonded to 0.1 mm (.004 in) of cross-laminated, high-density polyethylene film. Membrane shall be interleaved with disposable silicone-coated release paper until installed.

B. Performance Requirements:

Property	Test Method	Typical Value
Thickness	ASTM D 3767 Method A	1.0 mm (0.040 in.) nominal
Air Permeance at 75Pa (0.3 in. water) Differential Pressure	ASTM E 2178	<0.001 L/(s.m ²) (<0.0002 cfm/ft ²)
Assembly Air Permeance at 75Pa (0.3 in. water) Differential Pressure	ASTM E 2357	<0.004 L/s*m ² (<0.0008 cfm/ft ²)
Water Vapor Permeance	ASTM E 96, Method B	Less than 2.9 ng/Pa.s.m ² (0.05 perms)
Water Absorption: -	ASTM D 570	Max. 0.1% by weight
Puncture Resistance	ASTM E 154	178 N (40 lbs.)
Tear Resistance	Initiation - ASTM D 1004 Propagation - ASTM D1938	Min. 58 N (7.0 lbs.) M.D. Min. 40 N (4.0 lbs.) M.D.
Lap Adhesion at -4°C (25°F)	ASTM D 1876	880 N/m (5.0 lbs./in.) of width
Low Temperature Flexibility	ASTM D 1970	Unaffected to -43°C (-45°F)
Tensile Strength	ASTM D 412, Die C Modified	Min. 2.7 MPa (400 psi)
Elongation, Ultimate Failure of Rubberized Asphalt	ASTM D 412 - Die C	Min. 200%

C. Materials:

Perm-A-Barrier® Wall Membrane from GCP Applied Technologies, 62 Whittemore Avenue, Cambridge, MA.

2.03 TRANSITION MEMBRANE

Description: Min. 1 mm (.040 in) thick membrane comprised of 0.9 mm (0.036 in) of self-adhesive rubberized asphalt integrally bonded to 0.1 mm (.004 in) of cross-laminated, high-density polyethylene film. Membrane shall be interleaved with disposable silicone-coated release paper until installed.

Performance Requirements:

Water Vapor Transmission: ASTM E 96, Method B:	2.9 ng/m ² sPa (0.05 perms) max.
Air Permeance at 75Pa (0.3 in. water) pressure difference:	0.0006 L/(s.m ²) (0.00012 cfm/ft ²) max.
Puncture Resistance:	ASTM E 154: 178 N (40 lbs.) min.
Lap Adhesion at -4°C (25°F), ASTM D 1876:	880 N/m (5.0 lbs./in.) of width min.
Low Temperature Flexibility, ASTM D 1970:	Unaffected to -43°C (-45°F).
Tensile Strength, ASTM D 412, Die C Modified:	min. 2.7 MPa (400 psi)
Elongation, Ultimate Failure of Rubberized Asphalt, ASTM D 412 Die C:	min. 200%

Materials:

Perm-A-Barrier Detail Membrane manufactured by GCP Applied Technologies.

2.04 FLEXIBLE MEMBRANE WALL FLASHING

Description: Min. 1 mm (.040 in) thick membrane comprised of 0.8 mm (0.032 in) of self-adhesive rubberized asphalt integrally bonded to 0.2 mm (.008 in) of cross-laminated, high-density polyethylene film. Membrane shall be interleaved with disposable silicone-coated release paper until installed.

Performance Requirements:

Water Vapor Transmission, ASTM E 96, Method B:	2.9 ng/m ² sPa (0.05 perms) max.
Water Absorption, ASTM D 570:	max. 0.1% by weight
Puncture Resistance, ASTM E 154:	356 N (80 lbs.) min.
Tear Resistance	
Initiation ASTM D 1004:	min. 58 N (13.0 lbs.) M.D.
Propagation ASTM D 1938:	min. 40 N (9.0 lbs.) M.D.
Lap Adhesion at -4°C (25°F), ASTM D 1876:	880 N/m (5.0 lbs./in.) of width
Low Temperature Flexibility, ASTM D 1970:	Unaffected to -43°C (-45°F)
Tensile Strength, ASTM D 412, Die C Modified:	min. 5.5 MPa (800 psi)
Elongation, Ultimate Failure of Rubberized Asphalt, ASTM D412, Die C:	min. 200%

Materials:

Perm-A-Barrier Wall Flashing manufactured by GCP Applied Technologies.

2.05 AIR & VAPOR BARRIER ACCESSORIES

Primer: Water-based primer which imparts an aggressive, high tack finish on the treated substrate

Flash Point: No flash to boiling point

Solvent Type: Water

VOC Content: Not to exceed 10 g/l

Application Temperature: -4°C (25°F) and above

Freezing point (as packaged): -7°C (21°F)

Product: Perm-A-Barrier WB Primer manufactured by GCP Applied Technologies.

Sealant: Two-part, elastomeric, trowel grade material designed for use with self-adhered membranes and tapes. 10 g/l max. VOC Content.

Product: Bituthene® Liquid Membrane manufactured by GCP Applied Technologies.

Optional Primers:

Description: High tack water based primer. 10 g/l max. VOC content.

Product: Perm-A-Barrier Liquid Part B manufactured by GCP Applied Technologies.

Description: High tack low VOC solvent based primer. <200 g/l max. VOC content.

Product: Bituthene Primer B2 LVC manufactured by GCP Applied Technologies.

Description: High tack solvent based primer. 440 g/l max. VOC content.

Product: Bituthene Primer B2 manufactured by GCP Applied Technologies.

PART 3 — EXECUTION

3.01 EXAMINATION

The installer shall examine conditions of substrates and other conditions under which this work is to be performed and notify the contractor, in writing, of circumstances detrimental to the proper completion of the work. Do not proceed with work until unsatisfactory conditions are corrected.

3.02 PREPARATION

Refer to manufacturer's literature for requirements for preparation of substrates. Surfaces shall be sound and free of voids, spalled areas, loose aggregate and sharp protrusions. Remove contaminants such as grease, oil and wax from exposed surfaces. Remove dust, dirt, loose stone and debris. Use repair materials and methods that are acceptable to manufacturer of the fluid-applied waterproofing.

Exterior sheathing panels: Ensure that the boards are sufficiently stabilized with corners and edges fastened with appropriate screws in accordance with exterior sheathing manufactures written instructions.

Masonry Substrates: Apply air and vapor barrier over concrete block and brick with smooth and flush mortar joints. Fill all voids and holes, particularly in the mortar joints, with a lean mortar mix, non-shrinking grout or parge coat.

Related Materials: Treat construction joints and install flashing as recommended by air barrier manufacturer.

3.03 INSTALLATION

Refer to manufacturer's literature for recommendations on installation

Apply air barrier membrane to achieve a continuous air barrier according to air barrier manufacturer's written instructions.

Application of Self-Adhered Air Barrier Membrane

1. Install air & vapor barrier to dry surfaces at air and surface temperatures of -4°C (25°F) and above in accordance with manufacturer's recommendations, at locations indicated on Construction Documents.
2. Prime substrate to receive air barrier membrane as required per manufacturers written instructions.
3. Precut pieces of air & vapor barrier into easily handled lengths.
4. Remove silicone-coated release paper and position membrane carefully before placing length horizontally against the surface.
5. Begin installation at the base of the wall placing top edge of membrane immediately below any masonry reinforcement or ties protruding from substrate.
6. When properly positioned, place against surface by pressing firmly into place. Roll membrane with extension-handled countertop roller immediately after placement.
7. Overlap horizontally adjacent pieces 50 mm (2 in.) and roll seams.
8. Subsequent sheets of membrane applied above shall be positioned immediately below masonry reinforcement or ties. Bottom edge shall be slit to fit around reinforcing wires or ties, and membrane shall overlap the membrane sheet below by 50 mm (2 in.). Roll firmly into place.
9. Seal around masonry reinforcing or ties and all penetrations with termination mastic.
10. Continue the membrane into all openings in the wall, such as doors, windows, etc., and terminate at points that will prevent visibility from interior.
11. Coordinate the installation of air & vapor barrier with roof installer to ensure continuity of membrane with rooftop air & vapor membrane.
12. At end of each working day seal top edge of air & vapor barrier to substrate with termination mastic.
13. Do not allow the rubberized asphalt surface of the air & vapor barrier membrane to come in contact with polysulfide sealants, creosote, uncured coal tar products or EPDM.
14. Do not expose air & vapor barrier membrane to sunlight for more than thirty days prior to enclosure.
15. Inspect installation prior to enclosing and repair punctures, damaged areas and inadequately lapped seams with a patch of the membrane sized to extend 150 mm (6 in.) in all directions from the perimeter of the affected area.

Application of Transition Membrane

1. Prime substrate to receive transition membrane as required per manufacturers written instructions.
2. Apply transition membrane with a minimum overlap of 75mm (3 in.) onto each surface at all beams, columns and joints as indicated in detail drawings.
3. Tie in to window and door frames, spandrel panels, roof and floor intersections and changes in substrate.
4. Use pre-cut, easily handled lengths for each location.
5. Remove silicone-coated release paper and position membrane flashing carefully before placing it against the surface.
6. When properly positioned, place against surface by pressing firmly into place by hand roller.
7. Overlap adjacent pieces 50 mm (2 in.) and roll all seams with a hand roller.
8. Seal top edge of flashing with termination mastic.
9. When transition flashing is pre-installed prior to application of Fluid Applied Membrane, apply transition flashing as above. Spray or trowel a continuous uniform film of Fluid Membrane at min. 60 mils (1.5 mm or .060 in.) dry film thickness using multiple, overlapping passes, with a minimum overlap of 75 mm (3 in.) onto transition flashing. For sill condition, spray or trowel Fluid Membrane onto pre-installed sill flashing and onto horizontal section of sill.

Application of Flexible Membrane Wall Flashing

Prime substrate to receive wall flashing as required per manufacturers written instructions.

Precut pieces of flashing to easily handled lengths for each location.

Remove silicone-coated release paper and position flashing carefully before placing it against the surface.

When properly positioned, place against surface by pressing firmly into place by hand roller. Fully adhere flashing to substrate to prevent water from migrating under flashing.

Overlap adjacent pieces 50 mm (2 in.) and roll all seams with a hand roller.

Trim bottom edge 13 mm (1/2 in.) back from exposed face of the wall. Flashing shall not be permanently exposed to sunlight.

At heads, sills and all flashing terminations, turn up ends a minimum of 50 mm (2 in.) and make careful folds to form an end dam, with the seams sealed.

Seal top edge of flashing with termination mastic.

Do not allow the rubberized asphalt surface of the flashing membrane to come in contact with poly-sulfide sealants, creosote, uncured coal tar products or EPDM.

3.06 PROTECTION AND CLEANING

Remove any masking materials after installation. Clean any stains on materials that would be exposed in the completed work using procedures as recommended by manufacturer.

Perm-A-Barrier Wall Membrane is not suitable for permanent exposure and should be protected from the effects of sunlight.

Schedule work to ensure that the Perm-A-Barrier Wall Membrane system is covered as soon as possible after installation. Protect Perm-A-Barrier Wall Membrane system from damage during subsequent operations. If the Perm-A-Barrier Wall Membrane system cannot be covered within 30 days after installation, apply temporary UV protection such as dark plastic sheet or tarpaulins.

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