

## **Part 1 General**

### **1.1 RELATED DOCUMENTS**

- .1 Drawings and Division 01 Specification Sections, apply to this Section.
- .2 Execute the Work in compliance with the requirements of Section 01 14 00 "Work Restrictions".

### **1.2 SUMMARY OF WORK**

- .1 Work Included:
  - .1 The work of this Section includes the provision of all labour, materials, equipment and services required to supply and install monolithic elastomeric spray applied membrane to seal above grade wall assemblies and prevent air infiltration/exfiltration, vapour transmission and water penetration and to supply and install membrane air barrier transitions strips between adjacent assemblies as required to maintain the continuity of the exterior envelope air/vapour barrier, as indicated on the drawings, as specified herein and as required for a complete project.
- .2 Related Sections:
  - .1 Section 06 10 00 - Rough Carpentry.
  - .2 Section 07 21 00 - Board and Batt Insulation.
  - .3 Section 07 21 20 - Urethane Foam Insulating Sealant.
  - .4 Section 07 52 16 - Modified Bituminous Roofing
  - .5 Section 07 92 00 – Joint Sealants
  - .6 Section 08 11 13 - Steel Doors and Frames.
  - .7 Section 08 33 23 - Overhead Coiling Door.
  - .8 Section 08 44 13 - Glazed Aluminum Curtain Wall and Windows.

### **1.3 REFERENCES**

- .1 American Society for Testing and Materials (ASTM):
    - .1 ASTM C 920 - Standard Specification for Elastomeric Joint Sealants
    - .2 ASTM C 1193 - Guide for Use of Joint Sealants
    - .3 ASTM D 412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers - Tension
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- .4 ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials
- .5 ASTM E 96/E 96M - Standard Test Methods for Water Vapor Transmission of Materials
- .6 ASTM E283-04(2012), Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
- .7 ASTM E330/E330M-14, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- .8 ASTM E 1186 - Practices for Air Leakage Site Detection in Building Envelopes and Air Barrier Systems
- .9 ASTM E 2178 - Standard Test Method for Air Permeance of Building Materials
- .10 ASTM E 2357 - Standard Test Method for Determining Air Leakage of Air Barrier Assemblies
  
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
  
- .3 International Standards Organization (ISO):
  - .1 CAN/CSA-ISO 9001-09, Quality Management Systems - Requirements.

#### **1.4 ADMINISTRATIVE REQUIREMENTS**

- .1 Coordination: Coordinate installation of joint sealants with cleaning of joint sealant substrates and other operations that may impact installation or finished joint sealant work.
  
- .2 Pre-installation Conference: Conduct conference at Project Site.
  - .1 Review requirements for air barrier products and installation, project and manufacturer's details, mockups, testing and inspection requirements, and coordination and sequencing of air barrier work with work of other Sections.
  - .2 Review manufacturer's instructions for air barrier application meeting Project requirements for substrates specified.

#### **1.5 QUALIFICATIONS**

- .1 The air barrier membrane manufacturer shall be ISO certified. Upon request from the Departmental Representative, submit copy of manufacturer certificate indicating that all products supplied in this specification meet the requirements of ISO-9001.
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- .2 The work of this Section shall be executed by a company approved by the material manufacturer as an applicator, using skilled tradesmen who are fully familiar with the application of air barrier membranes and are experienced in this work.

## **1.6 PERFORMANCE REQUIREMENTS**

- .1 Spray Applied Elastomeric Membrane:
  - .1 General: Membrane air barrier shall be capable of performing as a continuous vapor-permeable air barrier and as a moisture drainage plane transitioned to adjacent flashings and discharging water to the building exterior. Membrane air barriers shall accommodate substrate movement and seal expansion and control joints, construction material transitions, opening transitions, penetrations, and perimeter conditions without moisture deterioration and air leakage exceeding performance requirements.
  - .2 Air-Barrier Assembly Air Leakage: Maximum (0.2 L/s x sq. m of surface area at 75 Pa), when tested according to ASTM E 2357.
- .2 Self-Adhering Sheet Membrane and Transition Strips:
  - .1 Provide transition strips as required to maintain continuity of the air barrier throughout the entire building envelope with a maximum air leakage of 0.01 L/s.m<sup>2</sup> when tested to ASTM E283 at pressure a differential of 75 Pa and to ASTM E330 at a pressure differential of 3000 Pa.
  - .2 Provide transition strips at the interface between adjacent construction elements such as the perimeter of window and door openings, wall/roof connections, and similar conditions where the continuity of the air barrier might otherwise be interrupted.
- .3 The Departmental Representative may conduct air infiltration tests to verify the performance of the air barrier. In the event of failure to meet specification requirements, the Contractor shall make the necessary corrections.

## **1.7 SUBMITTALS**

- .1 General: Submit each item in this Article according to the Conditions of the Contract and the applicable Division 01 Specification Sections.
  - .2 Product Data:
    - .1 Provide product data.
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- .2 Include installation instructions for the membrane air barrier.
- .3 Include manufacturer's material safety data sheets for the safe handling of the specified materials and products, in accordance with Workplace Hazardous Materials Information Service (WHMIS) requirements.
- .4 Manufacturer's Product Compatibility Certificate: Certify compatibility of air barrier products with adjacent materials.
- .5 Product Test Reports: Test data for air barrier products and air barrier assembly, by qualified testing agency, indicating proposed membrane air barrier meets performance requirements, when requested by Departmental Representative.
- .6 Field Quality Control reports.

## **1.8 QUALITY ASSURANCE**

- .1 Mock-up:
  - .1 Construct mock-up in accordance with Section 01 45 00 Quality Control.
  - .2 Construct typical exterior wall panel 1200 mm wide x full wall height, incorporating connection to curtain wall, insulation, and junction with roof system; illustrating materials interface and seals.
  - .3 Locate where directed.
  - .4 Mock-up may remain as part of finished work.
  - .5 Allow 24 hours for inspection of mock-up by Departmental Representative before proceeding with air barrier work.

## **1.9 ENVIRONMENTAL REQUIREMENTS**

- .1 No installation work shall be performed during rainy or inclement weather or on frost covered or wet surfaces.
- .2 Apply air barrier within the range of ambient and substrate temperatures recommended by air-barrier manufacturer.
- .3 Protect substrates from environmental conditions that affect air-barrier performance.

## **1.10 SEQUENCING AND COORDINATION**

- .1 Sequence work to permit installation of materials in conjunction with related materials and seals.
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- .2 Coordinate work of this section with related other sections to ensure continuity of the air seal.

#### **1.11 DELIVERY, STORAGE & HANDLING**

- .1 Deliver products in original unopened packaging with legible manufacturer's identification.
- .2 Store materials in strict accordance with the manufacturer's recommendations.

#### **1.12 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate and recycle waste materials, including packaging materials, in accordance with Section 01 74 21 "Waste Management and Disposal".

### **Part 2 Products**

#### **2.1 MATERIALS**

- .1 Spray Applied Elastomeric Membrane Air Barrier:
    - .1 Fluid-Applied, Vapor-Retarding Membrane Air Barrier: Elastomeric, polymer-modified bituminous membrane.
      - .1 Air Permeance, ASTM E 2178: Less than 0.02 L/s x sq. m of surface area at 75-Pa pressure difference.
      - .2 Vapor Permeance, ASTM E 96/E96M: Maximum 5 ng/Pa x s x sq. m.
      - .3 Elongation, Ultimate, ASTM D 412, Die C: 1,000 percent, minimum.
      - .4 Thickness of Membrane Air Barrier: Not less than 1.5 mm (wet) and 1.0 mm (dry), applied in single continuous coat.
      - .5 Cold Air Application Temperature: Membrane can be spray applied down to a minimum of -7 deg. C.
  - .2 Self-Adhering Sheet Membrane and Transition Strips:
    - .1 Air/moisture barrier membrane: Vapour-permeable, self-adhering reinforced modified polyolefin tri-laminate sheet air barrier membrane for wall construction, specifically designed to be water-resistant and vapour-permeable. Adhesive backing to be protected with a two-piece release film.
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- .2 Transition strips: SBS modified bitumen, self-adhering sheet membrane, intergrally laminated to an engineered plastic film.
  - .3 Sheet membrane primer: as recommended by the membrane manufacturer for each specific application.
  - .4 Rubberized sealant: One-part, thermoplastic rubber based sealant, as recommended by the membrane manufacturer.
- .3 Joint Sealants:
- .1 Refer to section 07 92 00 – Joint Sealants.
  - .2 Joint sealant to be approved by air barrier manufacturer for adhesion and compatibility with membrane air barrier system.

## **Part 3 Execution**

### **3.1 EXAMINATION**

- .1 Examine areas and conditions under which work is to be performed. Inspect all substrate surfaces and notify the Departmental Representative in writing of conditions detrimental to the proper and timely completion of the work.
- .2 Ensure that surfaces are dry and provide a continuous, sound, compatible substrate for the membrane.
- .3 Ensure that substrates are clean of oil or excess dust; all masonry joints struck flush; all concrete surfaces free of large voids, spalled areas or sharp protrusions.
- .4 Do not proceed with the work until unsatisfactory conditions have been corrected to the satisfaction of the installer.
- .5 Commencement of the installation will be construed as acceptance of the site conditions and, thereafter, the Contractor shall be fully responsible for satisfactory work as specified herein.

### **3.2 PREPARATION**

- .1 Preparation:
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- .1 Clean, prepare, and treat substrate in accordance with air barrier manufacturer's written instructions. Not all surfaces require priming. Refer to the manufacturer's recommendations.
  - .1 Mask adjacent finished surfaces.
  - .2 Remove contaminants and film-forming coatings from substrates.
  - .3 Remove projections and excess materials and fill voids with substrate patching material.
  - .4 Prepare and treat joints and cracks in substrate per ASTM C 1193 and membrane air barrier manufacturer's written instructions.
- .2 Apply primer to surfaces by spray, brush or lambs wool roller at the rate of 2 to 6 m<sup>2</sup>/L, depending on porosity and texture of surface. Apply in accordance with the manufacturer's instructions.
- .3 Allow surface conditioner to dry completely (minimum 2 hours) before installing air/moisture barrier membrane.

### **3.3 APPLICATION OF ACCESSORY MATERIALS**

- .1 General: Install strips, transition strips, and accessory materials according to air-barrier manufacturer's written instructions. Install transition materials and other accessories to form connect and seal membrane air barrier material to adjacent components of building air barrier system, including, but not limited to, roofing system air barrier, exterior fenestration systems, door framing, and other openings.
  - .2 Primer: Apply primer to substrates when recommended by air barrier manufacturer at required rate for those substrates that will be receiving a modified bituminous self-adhered membrane. Reprime areas not covered within 24 hours.
  - .3 Assembly Transitions: Connect and seal exterior wall air barrier material continuously to roofing-membrane air barrier, concrete below-grade structures, floor-to-floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings, using accessory materials.
    - .1 Opening Transitions: Fill gaps at perimeter of openings with foam sealant and apply approved transition or accessory material.
    - .2 Penetrations: Fill gaps at perimeter of penetrations with foam sealant and level with approved sealant or seal transition strips around penetrating objects and terminate with approved sealant.
    - .3 Joints: Bridge and cover isolation joints, expansion joints, and discontinuous joints between separate assemblies utilizing approved transition or accessory materials.
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- .4 Changes in Plane: Apply approved sealant beads at corners and edges to form smooth transition.
- .5 Substrate Gaps: Cover gaps with stainless steel sheet mechanically attached to substrate and providing continuous support for air barrier.
- .4 Flashings: Seal top of through-wall flashings to membrane air barrier with a continuous bead of approved sealant recommended by air barrier manufacturer.
- .5 Seal punctures, voids, and seams. Patch with approved transition and accessory materials following air barrier manufacturer's recommendations and extend repair beyond repaired areas to maintain continuity.

### **3.4 FLUID AIR-BARRIER MEMBRANE INSTALLATION**

- .1 General: Apply fluid air-barrier material to form a seal with transition materials and accessories to achieve a continuous air barrier according to air-barrier manufacturer's written instructions. Apply fluid air-barrier material within manufacturer's recommended application temperature ranges.
- .2 Membrane Air Barrier: Apply fluid air barrier material in full contact with substrate to produce a continuous seal according to membrane air barrier manufacturers written instructions.
- .3 Cold Temperature Application: when applicable, follow manufacturer's written instructions for maintaining materials and equipment temperatures and using co-spray additives when application is taking place in cold temperatures.
- 4 Assembly Transitions: Connect and seal exterior wall air barrier material continuously to roofing-membrane air barrier, concrete below-grade structures, floor-to-floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings, using accessory materials.

### **3.5 FIELD QUALITY CONTROL**

- .1 Testing Agency: Departmental Representative will engage a qualified testing agency to perform tests and inspections.
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- 2 Coordination of Testing: Cooperate with testing agency. Allow access to work areas and staging. Notify testing agency in writing of schedule for Work of this Section to allow sufficient time for testing and inspection.
  - .1 Do not cover Work until testing and inspection is completed and accepted.
- 3 Correction: Correct deficient applications not passing tests and inspections, make necessary repairs, and retest as required to demonstrate compliance with requirements.

### **3.6 PROTECTION OF FINISHED WORK**

- .1 Protect finished Work from damage. Do not permit adjacent work to damage the work of this section.
- .2 Install board insulation as soon as possible after the air/moisture barrier membrane has been installed and reviewed by the Departmental Representative.

### **3.7 CLEANING AND PROTECTING**

- .1 Upon completion of the work of this Section remove from the premises all surplus material, masking materials, dirt and debris caused by the work of this Section and leave the installation clean.
- .2 Protect membrane air barrier from damage from subsequent work. Protect membrane materials from exposure to UV light for period in excess of that acceptable to membrane air barrier manufacturer; replace overexposed materials and retest.

**END OF SECTION**

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