

EPDM WATERPROOF MEMBRANE

1. GENERAL

1.1 Work Included

- .1 Supply and installation of ethylene propylene diene monomer (EPDM) membrane and insulation to extents shown on the Drawings including the following major items of Work:
 - .1 Wall and footing membrane.
 - .2 Flashings at grade to extents shown on the Drawings.
 - .3 Membrane and polyethylene slip sheets at perimeter of walls.
 - .4 Insulation, geotextile, protection board, and pressure treated wood framing systems.

1.2 Storage and Handling

- .1 Provide and maintain dry, off-ground weatherproof storage.
- .2 Store materials on supports to prevent deformation.
- .3 Remove only in quantities required for same day use.
- .4 Store uncured flashing and jointing materials to prevent premature curing and freezing.
- .5 Store materials in accordance with Manufacturer's written instructions.

1.3 Environmental Requirements

- .1 Do not proceed with Work when wind chill effect would tend to set bitumen before proper curing takes place.
- .2 Maintain air temperature and substrate temperature at membrane installation area above 5°C for twenty four (24) hours before, during, and twenty four (24) hours after installation, or as recommended by the Manufacturer.
- .3 Do not apply membrane in wet weather.

1.4 Shop Drawings

- .1 Submit Shop Drawings in accordance with Specification E10.
- .2 Shop Drawings shall include a completed Table 1 attached to this Section, indicating conformance with the required membrane characteristics.
- .3 Shop Drawings shall indicate material and membrane sheet joint layout.

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1.5 Mock-Up

- .1 Construct mock-up of minimum 10 m² size showing typical lap joint, typical corner, insulation and pressure treated wood framing support systems.
- .2 Reviewed and accepted mock-up may form part of completed Work.
- .3 Allow twenty four (24) hours for review of mock-up by Contract administrator before proceeding with membrane work.
- .4 Arrange for membrane Manufacturer's representative to be On-Site during mock-up and periodically during progress of the Work to ensure installation is in accordance with Manufacturer's instructions and requirements.

1.6 Qualifications

- .1 The installation contractor shall provide documentation showing the firm to be a membrane material applicator approved by the membrane Manufacturer.
- .2 Work is to be performed in accordance with elastomeric membrane Manufacturer's printed application instructions unless specified otherwise.

1.7 Guarantees

- .1 The membrane Manufacturer shall provide a pro-rated written guarantee against manufacturing defects in the membrane materials for a period of twenty (20) years from the date of Total Performance. The Manufacturer shall complete and sign the enclosed Form W1: Manufacture Guarantee Agreement (attached to this Section) upon Award of Contract. The Manufacturer shall indicate his written approval in Form W1 of the selected Applicator for the installation of the membrane system.
- .2 The approved Applicator shall provide a written guarantee stating that the membrane system will provide leak-free service for a period of five (5) years from the date of Total Performance. The Applicator shall complete and sign the enclosed Form W2: Application Guarantee Agreement (attached to this Section) upon Award of Contract.

2. PRODUCTS

2.1 Materials

- .1 EPDM Membrane:
 - .1 EPDM membrane shall be felt-backed EPDM synthetic rubber waterproofing membrane applied with hot rubberized asphalt for the walls and footings. Membrane shall be Lexcan Design D, 1.5 mm thick felt-backed membrane or accepted alternate.
 - .2 Splice cleaner, adhesive, tape, and sealant shall conform to the membrane Manufacturer's recommendations.

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- .3 Asphalt for wall application shall conform to CAN/CGSB-37.5-M89, 7106 Foundation Mastic by Insulmastic Building Products or accepted alternate.
- .4 Membrane material shall conform to the performance characteristics shown on Table 1 attached to this Section.
- .2 Polystyrene Insulation:
 - .1 Polystyrene insulation shall conform to CAN/CGSB-51.20-M, Type 4, 100 mm in thickness, shiplapped edges, and minimum compressive strength of 240 kPa, Foamular 400 by Owens Corning or accepted alternate.
- .3 Polyethylene Slip-Sheet:
 - .1 Polyethylene Slip-Sheet shall conform to CAN2-51.34, Type 1, 0.25 mm thick.
- .4 Geotextile, Protection Board, Pressure Treated Wood Framing.
 - .1 Geotextile shall be Trevira 1114 or Texel 7609 filter fabric or accepted alternate.
 - .2 Protection board shall be commercially available 12 mm cementitious board as accepted by the Contract Administrator.
 - .3 Pressure Treated Wood shall be sawn lumber with pressure treatment in accordance with the most recent applicable CSA standard.

3. EXECUTION

3.1 Substrate Examination

- .1 Before starting this Work examine Work done by others that affects this Work.
- .2 Notify the Contract Administrator of any conditions such as concrete fins or sharp projections that would jeopardize proper completion of this Work.
- .3 Commencement of Work implies acceptance of existing conditions.
- .4 Prior to commencement of Work ensure substrates are firm, straight, smooth, dry, free of snow, ice, or frost, and swept clean of dust and debris

3.2 Protection

- .1 At end of each day's Work or when stoppage occurs due to inclement weather, provide protection for completed work and materials out of storage.
- .2 Seal and secure exposed edges.

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3.3 Membrane Application

.1 General:

- .1 Do not install EPDM membrane when air and substrate temperature remains below 5°C in accordance with Manufacturer's recommendations or when wind chill gives equivalent cooling effect.
- .2 Install EPDM membrane on dry smooth substrate, free of deleterious materials and sharp projections. Use only dry materials and apply only during weather that will not introduce moisture into the system.
- .3 Ensure that temperature of substrate and its moisture content conforms to Manufacturer's minimum requirements, before proceeding with Work.
- .4 Membrane shall be installed only after successful watertightness testing.

.2 Positioning Membrane Sheets

- .1 Ensure substrate is clean, flat, and free from dirt or debris that might be detrimental to the performance of the membrane.
- .2 Unroll membrane sheets from the top of wall and position according to accepted Shop Drawings, ensuring a tight butt-edge with adjacent sheets. Do not over-lap sheets.

.3 Bonding to Substrate:

- .1 Apply specified asphalt base by trowel in accordance with the Manufacturer's instructions to achieve a coverage of a minimum of 1.0 kg of material per square metre. Limit application to the applied roll width of EPDM membrane.
- .2 While the asphalt is still in an adhesive state, roll the membrane into asphalt, avoiding air bubbles or wrinkles (refer to flash cure set period from Manufacturer's product information). Brush down on the membrane with a push broom to achieve maximum contact. Ensure proper alignment at butt seam joints.
- .3 Leave a minimum of 500 mm of un-bonded membrane at the top of the membrane application for incorporation into the building envelope wall assembly.

.4 Splicing Membrane Sheets

- .1 Clean a 20 cm wide strip of EPDM membrane with Seam Cleaner. Ensure any asphalt spills are scraped off. Apply a 20 cm wide strip of splice adhesive to the membrane, centred over the seam. Apply with a paint brush using straight painting strokes (not a circular motion). Allow adhesive to dry until it is tacky, but does not stick to a dry finger touch.
- .2 Remove paper backing and apply Overlay Seam Tape to the membrane, centred lengthwise over the seam. Overlap tape ends and "T" junctions a minimum of 10 cm. Roll tape heavily with a steel roller.

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- .3 Apply 30 cm² overlay patches of flashing centred over all seam “T” junctures, seam overlays, and corners. Apply with Splice Adhesive according to adhesive Manufacturer’s application directions.
- .4 Caulk both edges of Overlay Seam Tape all exposed membrane of flashing edges with Lap Sealant. Feather sealant with tool provided.

3.4 Insulation Application

- .1 Insulation to be laid in parallel rows with ends staggered.

3.5 Flashing Application

- .1 Install cured or uncured EPDM membrane flashings in accordance with Manufacturer’s written instructions.
- .2 Flash pipes, conduits, and other penetrations through waterproofing, using prefabricated or field fabricated membrane flashings and stainless steel clamps.

3.6 Cleaning

- .1 Clean soiled surfaces, spatters, and damage caused by work of this Section to satisfaction of Contract Administrator.

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Table 1: Required Membrane Characteristics

PROPERTY	ASTM TEST	REQUIREMENTS	YES	NO
Thickness	D751	± 10%		
Breaking Strength, minimum	D751	14.0 kN/m		
Elongation @ Fabric Break	D751	80%		
Elongation @ Rubber Break	D751	350%		
Elongation, Ultimate	D421	400%		
Tearing Resistance, minimum	D624, DIEC	35.0 kN/m		
Tongue Tear Strength, minimum	D751	156 N		
Brittleness Point, maximum	D2137	-60°C		
Ozone Resistance (7 days @ 100 pphm, 20% elong 40C)	D1149	No cracks @7 x mag		
Water Absorption, maximum	D471	+ 1%		
Factory Seam Strength	D816	9.6 kN/m		
HEAT AGING, 28 DAYS @ 115C				
Breaking Strength, minimum	D751	7.5 kN/m		
Elongation @ Rubber Break	D751	250%		
Elongation, Ultimate	D421	250%		
Tearing Resistance, minimum	D624, DIEC	30.6 kN/m		
Tongue Tear Strength, minimum	D751	111 N		
Linear Dimensional Change, maximum	D1204	±1%		
Hot Applied Rubberized Asphalt to CAN/CGSB-37.5				

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Form W1: Manufacture Guarantee Agreement
Sheet 1 of 1

**RWPS AND VALVE CHAMBER MEMBRANE SYSTEM
GUARANTEE TO THE CITY OF WINNIPEG**

FOR PROJECT:

**WATER TREATMENT PROGRAM – RAW WATER PUMPING STATION FOUNDATIONS
AND CONCRETE STRUCTURES**

BID OPPORTUNITY NO. 650-2005

Manufacture's Name and Address

does hereby provide, in accordance with the Specifications of the Contract, the following Guarantee for the herein identified RWPS and Valve Chamber Membrane System.

The EPDM membrane material is guaranteed against the following defects attributable to defective material for a period of twenty (20) years from the date of issue of the Certificate of Total Performance of the membrane system:

1. Premature deterioration in forms of cracking, brittleness, loss of elongation characteristics, tearing resistance, water absorption qualities to the point of failure under the effects of historical climatic conditions.
2. The membrane system shall be defined as membrane, rubberized asphalt, flashing, tapes, adhesives, sealant, and joint reinforcement membrane strips and any other products required for use in the membrane system.
3. Material failure shall be defined as any defects that results in the loss of leak free performance during the guarantee period.

Remedial works covered by this guarantee shall include the repair or replacement of the defective membrane area. The cost of removal and replacement of material above or adjacent to the membrane is not included in this guarantee.

All remedial works shall carry a minimum twenty (20) year guarantee as stipulated above.

MANUFACTURER APPROVAL OF SELECTED APPLICATOR

We, the Manufacturer, approve the selection of _____ as the Applicator of our roof membrane system.

MANUFACTURER

Name of Company Officer

Corporate Position

Signature of Company Officer

Name of Witness

Signature of Witness

Date

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Form W2: Applicator Guarantee Agreement

Sheet 1 of 1

**RWPS AND VALVE CHAMBER MEMBRANE SYSTEM
GUARANTEE TO THE CITY OF WINNIPEG**

FOR PROJECT:

**WATER TREATMENT PROGRAM – RAW WATER PUMPING STATION FOUNDATIONS
AND CONCRETE STRUCTURES**

BID OPPORTUNITY NO. 650-2005

Applicator's Name and Address

does hereby provide, in accordance with the Specifications of the Contract, the following Guarantee for the herein identified RWPS and Valve Chamber Membrane System.

The Membrane System is guaranteed against the following defects attributable to faulty installation for a period of five (5) years from the date of issue of the Certificate of Total Performance with respect to the membrane system:

1. Leak free performance of the membrane system. The membrane system shall be defined as membrane, rubberized asphalt, flashing, tapes, adhesives, sealant, and joint reinforcement membrane strips and any other products recommended by the Manufacturer for use in the membrane system.
2. Debonding of the EPDM sheet membrane material from the wall and foundation construction.

Remedial works covered by this guarantee shall include the repair or replacement of the defective membrane area. The cost of removal and replacement of material above or adjacent to the membrane is not included in this guarantee.

All remedial works shall carry a minimum five (5) year guarantee as stipulated above.

APPLICATOR

Name of Company Officer

Corporate Position

Signature of Company Officer

Name of Witness

Signature of Witness

Date

END OF SECTION