

PART 1 - GENERAL

- 1.1 WORK INCLUDED .1 This section specifies requirements for providing all labour, tools, materials, and equipment for exterior waterproofing (horizontal and vertical) and geomembrane on below grade exterior surfaces of sanitary manholes as indicated on drawings.
- 1.2 RELATED WORK .1 Cast-in-Place Concrete: Section 03 30 00
- 1.3 QUALITY ASSURANCE .1 Membrane: applied by applicator trained and approved by manufacturer for application of its products.
- .2 Notify manufacturer's representative as to work start-up by applicator.
- .3 Manufacturer's representative:
- .1 Inspect substrate prior to commencement of Work, during application of membrane and upon completion of Work.
- .2 Provide technical assistance to applicator and assist where required in correct installation of membrane.
- 1.4 DELIVERY, STORAGE AND HANDLING .1 Deliver materials to the job site in undamaged and original packaging indicating the name of the manufacturer and product.
- .2 Store rolled materials in original packaging.
- .3 Store adhesives and primers at temperatures of 5°C and above to facilitate handling.
- .4 Keep solvent away from open flame or excessive heat.
- .5 Protect rolls from direct sunlight until ready for use.
- 1.5 COORDINATION .1 Confirm continuity of the waterproofing membrane throughout the scope of this section.
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- 1.6 ENVIRONMENTAL PROTECTION .1 Provide forced air circulation during installation and curing periods for enclosed applications.
- 1.7 WARRANTY .1 Provide warranty stating water-proofing membrane assembly will stay in place and remain leakproof for two (2) years from the date of completion certificate.
- .2 Waterproofing membrane manufacturer to warrant that the waterproofing membrane will remain in a watertight condition and will not leak as a result of faulty materials for a period of five (5) years.

PART 2 - PRODUCTS

- 2.1 MATERIALS .1 Exterior waterproofing for vertical and horizontal applications to consist of sheet membrane waterproofing of composite sheets comprised of rubberized asphalt integrally bonded to a film of high density cross laminated polyethylene, minimum 1.5 mm (60 mils) thick. The material shall be suitable for application at low temperature.
- .1 Acceptable material:
- .1 Bakor Blueskin WP200
- .2 W.R. Grace Bituthene 3000,
- .3 Mel-Rol by W.R. Meadows
- .2 Primer: as recommended by the waterproofing manufacturer.
- .3 Mastic and tapes: as recommended by membrane manufacturer.
- .4 Fillet T-joint sealant: as recommended by membrane manufacturer.
- .5 Adhesives: as recommended by membrane manufacturer.
- .6 Liquid membrane for detailing: as recommended by membrane manufacturer.
- .7 Geomembrane cover: 1.0mm HDPE membrane.
- .1 Acceptable products:
- .1 Solmax 400
- .2 GSE Textured Geomembrane by GSE Environmental
- .3 AMS Geomembrance Sheet by Arun Manufacturing Services.

- 2.2 COMPATIBILITY .1 Confirm that all materials used are compatible.
.2 Provide proof of compatibility.

PART 3 - EXECUTION

- 3.1 GENERAL .1 Install materials only in suitable weather, when there is no threat of precipitation, and in accordance with manufacturer's instructions.

- 3.2 PREPARATION .1 Prime all surfaces to receive membrane waterproofing by means of roller or spray at a rate recommended by the manufacturer.
.2 Allow primer to dry adequately before proceeding with membrane. Avoid puddles.
.3 Treat only as much area as can be covered with membrane the same day. Primed surfaces not covered by waterproofing membrane during the same working day must be reprimed.
.4 Metal surfaces must be free of grease, oil dirt, loose paint, rust or other contaminants.
.5 Concrete surfaces shall be smooth, clean, dry and free of foreign matter.

- 3.3 APPLICATION .1 Do waterproofing work in accordance with membrane manufacturers printed application instructions.
.2 Apply membrane and fully adhere to surfaces as indicated.
.3 Lap membrane joints minimum 300mm. Roll all seams continuously.
.4 Install 450mm wide reinforcing strip of membrane waterproofing centered over all outside corners. Install reinforcing strips prior to field membrane application.
.5 Centre reinforcing strip of membrane waterproofing over non-working joints and cracks up to a maximum of 5 mm. Width of reinforcing strip as recommended by manufacturer.

3.3 APPLICATION
(Cont'd)

- .6 Notify Departmental Representative of non-working joints over 5 mm and treat as directed.
- .7 Apply liquid mastic to horizontal and vertical terminations.
- .8 Seal daily terminations with mastic.
- .9 Seal penetrations through membrane with liquid membrane and sheet membrane as recommended by manufacturer.

3.4 GEOMEMBRANE

- .1 Confirm geomembrane is undamaged before application.
- .2 Apply geomembrane over entire surface of approved waterproofing membrane using compatible adhesive. Follow manufacturer's recommendations.
- .3 Minimum lap: 450mm, shingle style for horizontal laps.
- .4 Poly strapping may be applied to secure geomembrane on approval of Departmental Representative.

PART 1 - GENERAL

- 1.1 WORK INCLUDED .1 This Section specifies requirements for furnishing all materials, labour, tools and equipment necessary to complete rigid insulation as indicated.
- 1.2 REFERENCES .1 CAN/ULC-S701-2011, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.
- .2 CGSB 71-GP-24M-1997, Adhesive, Flexible for Bonding Cellular Polystyrene Insulation.
- 1.3 PRODUCT DELIVERY, STORAGE AND HANDLING .1 Package insulation materials and label them to designate manufacturer, type, density and insulation value, and reference standard specification number if applicable.
- .2 Store insulation materials in dry areas, protected from wetting and traffic.
- .3 Store insulation board flat, on a flat surface, to prevent edge damage and placing of materials on top of stored boards.
- .4 Confirm that insulation board, and adhesives are stored at a minimum temperature of 4°C for 12 hours before installation, and that freezable adhesives are stored only at temperatures above 0°C at all times.
- 1.4 JOB CONDITIONS .1 Install insulation materials subject to damage by water, freezing, sunlight or similar adverse environmental conditions with adequate protection against damage.
- .2 Protect polystyrene insulation from sunlight at all times until permanent cover is installed.
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PART 2 - PRODUCTS

- 2.1 GENERAL
- .1 Confirm that all materials of an insulation system and the construction with which it is in contact are compatible.
 - .2 Confirm that others whose Work is affected are informed of the thickness and installation methods of insulation to be installed.
- 2.2 MATERIALS
- .1 Rigid insulation: to CAN/ULC-S701, Type 4, expanded polystyrene, minimum compressive strength 415 kPa (60psi).
 - .1 Standards of Acceptance:
 - .1 Styrofoam Highload 60 as manufactured by Dow Chemical
 - .2 Foamular 600 as manufactured by Owens Corning.
 - .3 Truefoam 300
 - .2 Vapour barrier type adhesive: to CGSB 71-GP-24, Type 2, Class as recommended by manufacturer and compatible with polystyrene insulation.
- 2.3 COMPATIBILITY
- .1 Confirm all materials that come in contact with insulation board adhesive are compatible. Provide proof of compatibility if requested.
- 2.4 PERFORMANCE REQUIREMENTS
- .1 Fit insulation within construction elements and dimensions indicated on Drawings, without compression.
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PART 3 - EXECUTION

3.1 WORKMANSHIP

- .1 Install insulation after building substrate materials are dry.
- .2 Confirm all surfaces to which board insulation is applied are clean, reasonably smooth with no abrupt changes in plane, free of grease and with protruding fins of mortar or concrete removed, and that the surfaces are otherwise acceptable for board insulation application as specified.
- .3 Install insulation to maintain continuity of thermal protection to building elements and spaces.
- .4 Fit insulation tightly around electrical boxes, pipes and ducts, openings and other protrusions.
- .5 Cut and trim insulation neatly to fit spaces. Butt joints tightly, offset vertical joints. Use only insulation boards free from chipped or broken edges. Use largest possible dimensions to reduce number of joints.
- .6 Do not enclose insulation until it has been inspected and approved by the Departmental Representative.

3.2 EXAMINATION

- .1 Examine substrates and immediately inform Departmental Representative in writing of defects.
- .2 Prior to commencement of Work confirm:
 - .1 Substrates are firm, straight, smooth, dry, free of snow, ice or frost, and clean of dust and debris.
 - .2 Surfaces have not been coated with releasing agents, and other contaminants which would affect positive bonding of polyurethane insulation.
- .3 Report, in writing, to Departmental Representative defects or conditions which would affect work. Do not proceed with Work until conditions have been rectified.

3.3 PLACEMENT

- .1 Form fit and extend boards as indicated on exterior face of surface to be applied in accordance with manufacturer's recommendations. Use only compatible

3.3 PLACEMENT <u>(Cont'd)</u>	.1	(Cont'd) adhesives, approved mechanical means or strapping secure insulation.
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3.4 ADJUSTMENT <u>AND CLEANING</u>	.1	Remove adhesive and clean surfaces without marring or damaging surface.
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