

Marshalling Yard Improvements**Saint John Ferry Terminal****Saint John, New Brunswick****Project No. R.090690.001**

Modified Bituminous Sheet Waterproofing

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PART 1 - GENERAL**1.1 Related
Requirements**

- .1 Section 32 32 13.13 - Packaged Lift Station, Wet Well Type

1.2 References

- .1 Specification American Society for Testing and Materials (ASTM):
 - .1 ASTM D412, Standard Test Method for Vulcanized Rubber and Thermoplastic Elastomers - Tension
 - .2 ASTM D570, Standard Test Method for Water Absorption of Plastics
 - .3 ASTM D882, Standard Test Method for Tensile Properties of Thin Plastic Sheet
 - .4 ASTM D903, Standard Test Method for Peel or Stripping Strength of Adhesive Bonds
 - .5 ASTM D1876, Standard Test Method for Peel Resistance of Adhesives (T-Peel Test)
 - .6 ASTM D2243, Standard Test Method for Freeze-Thaw Resistance of Water-Borne Coatings
 - .7 ASTM D5385, Standard Test Method for Hydrostatic Pressure Resistance of Waterproofing Membranes
 - .8 ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials
 - .9 ASTM E96, Standard Test Methods for Water Vapor Transmission of Materials
 - .10 ASTM E154, Standard Test Methods for Water Vapour Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover
 - .2 Canadian Construction Materials Centre (CCMC):
 - .1 CCMC 13297-R
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1.3 Action and
Informational
Submittals

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 35 29 - Health and Safety Requirements.
- .3 Quality Assurance Submittals: submit following in accordance with Section 01 45 00 - Testing and Quality Control.
 - .1 Existing Substrate Condition: report deviations in writing to Departmental Representative.
 - .2 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
 - .3 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, and cleaning procedures.
- .4 Qualifications: Provide proof of qualifications when requested by Departmental Representative:
 - .1 Submit in writing, a document stating that the applicator of the sheet applied waterproofing membrane specified in this section is recognized by the

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| | | manufacturer as suitable for the execution of the Work. |
| | .2 | Perform Work in accordance with the manufacturer's written instructions of the sheet applied waterproofing membrane and this specification. |
| | .3 | Maintain one copy of manufacturer's written instructions on site. |
| | .4 | At the beginning of the Work and at all times during the execution of the Work, allow access to Work site by the sheet applied waterproofing membrane manufacturers' representative. |
| | .5 | Components used in this section shall be sourced from one manufacturer; including sheet applied waterproofing membrane, sealants, primers, mastics and adhesives. |
| 1.4 Delivery,
Storage and
<u>Handling</u> | .1 | Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements. |
| | .2 | Deliver, store and handle materials in accordance with manufacturer's written instructions. |
| 1.5 Waste
Management and
<u>Disposal</u> | .1 | Separate waste materials for reuse and recycling. |
| | .2 | Place materials defined as hazardous or toxic waste in designated containers. |
| 1.6 Ambient
<u>Conditions</u> | .1 | Apply when ambient air and substrate temperatures are above temperature range indicated by sheet applied waterproofing membrane manufacturer, during time of install, and for a minimum of forty-eight (48) hours after installation, unless otherwise indicated. |
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| | .2 | Ensure surfaces are sound, dry, clean and free of oil, grease, dirt, excess mortar or other contaminants. |
| | .3 | Do not permit traffic of any kind over unprotected waterproof membranes. Apply protection course as soon as possible in accordance with manufacturers written instructions. |
| 1.7 <u>Sequencing</u> | .1 | Sequence work in accordance with Section 01 32 16.07 - Construction Progress Schedules. |
| | .2 | Sequence work to permit installation of materials in conjunction with related materials and seals. |
| 1.8 Measurement for
<u>Payment</u> | .1 | Will be considered incidental to work under 32 32 13.13. |
| PART 2 - PRODUCTS | | |
| 2.1 <u>Sheet Materials</u> | .1 | Sheet Applied Waterproofing Membrane: |
| | .1 | Self-adhering waterproofing membrane (Henry Bakor Blueskin WP200 or approved equivalent) consisting of SBS modified bitumen and a cross-laminated polyethylene film, having the following properties: |
| | .1 | Thickness: 1.5mm (60 mils) |
| | .2 | Water Vapour Transmission (ASTM E96): 1.14 ng/Pa.m2.s., (0.02 perms) |
| | .3 | Peel Strength (ASTM D903): 1576N/m |
| | .4 | Minimum Puncture Resistance - Membrane (ASTM E154): 222 N/m |
| | .5 | Hydrostatic Head (ASTM D1876): 70m of Water |
| | .6 | Moisture Absorption (ASTM D570): 0.1% Maximum |
| | .7 | Tensile Strength (ASTM D412-modified): 2.24 MPa |
| | .8 | Elongation (ASTM D412-modified): 300% |
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**2.2 Adhesives and
Primers**

- .1 Adhesive for self-adhering membranes at temperatures above -12°C shall be Blueskin® Adhesive manufactured by Henry-Bakor (or approved equivalent), a synthetic rubber based adhesive, quick setting, having the following physical properties:
 - .1 Colour: Blue,
 - .2 Weight: 0.8 kg/L,
 - .3 Solids by weight: 35%,
 - .4 Drying time (initial set): 30 minutes
 - .2 Warm weather application adhesive for self-adhering waterproofing membranes at temperatures above -4 degrees C shall be Aquatac® Primer manufactured by Henry-Bakor (or approved equivalent), a polymer emulsion based adhesive, quick setting, having the following physical properties:
 - .1 Colour: Aqua,
 - .2 Weight: 1.0 kg/l,
 - .3 Solids by weight: 58%,
 - .4 Water based, no solvent odours,
 - .5 Drying time (initial set): 30 minutes at 50%RH and 20 degrees C.
 - .3 Cold weather application adhesive for self-adhering waterproofing membranes at temperatures above -12°C shall be Blueskin® Hi-Tac Adhesive (or approved equivalent) a rubber-based adhesive, quick setting, having the following properties:
 - .1 Colour: Yellow
 - .2 Weight:: 0.8 kg/l
 - .3 Solids By Weight: 35%
 - .4 Drying Time (initial set): Approximately 30 minutes.
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**2.3 Mastics and
Termination Sealants**

- .1 Insulation and Protection Board Adhesive: Synthetic rubber base compound (230-21 Insulation Adhesive by Henry Company, or approved equivalent) having the following characteristics:
 - .1 Colour: Cream.
 - .2 Compatible with sheet applied waterproofing membrane, substrate and insulation materials.
 - .3 Long term flexibility: Pass CGSB 71-GP-24M.
 - .4 Chemical resistance: Alkalis, mild acid and salt solutions.
 - .5 Application Temperature: between -12 deg C and 40 deg C.
 - .2 Termination and Joint Sealant: Polymer modified sealing compound (POLYBITUME 570-05 Polymer Modified Sealing Compound by Henry Company, or approved equivalent) having the following characteristics:
 - .1 Colour: Black.
 - .2 Compatible with sheet applied waterproofing membrane and substrate.
 - .3 Solids by volume: 70%.
 - .4 Vapour permeance: 2.9 ng/Pa.m².s, ASTM E96.
 - .5 Complies with CGSB 37.29.
 - .6 Remains flexible with ageing.
 - .7 Adheres to wet surfaces.
 - .8 Chemical resistance: Alkalis, calcium chloride, mild acid and salt solutions.
 - .3 Protection Board
 - .1 Extruded flexible twin wall board made of polypropylene copolymer (990-31 Polypropylene Protection Board by Henry Company, or approved equivalent)
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having the following physical properties:

- .1 Thickness 2mm (80 mils)
- .2 Tensile Strength Yield Point: 32 kg/cm²
- .3 Tensile Strength Point of Failure: 242 kg/cm²
- .4 Elongation: 167%
- .5 Compression Strength (ASTM D695): 0.54 kg/cm²
- .6 Impact Strength at 0 degrees C (32 degrees F): 8.9 kg/cm

PART 3 - EXECUTION**3.1 Manufacturer's Instructions**

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 Examination

- .1 Carefully expose and clean existing membrane for inspection by Departmental Representative.
 - .2 Verify that surfaces and conditions are ready to accept work of this section.
 - .3 Ensure surfaces are clean, dry, sound, smooth, continuous and comply with membrane manufacturer's requirements.
 - .4 Report unsatisfactory conditions to Departmental Representative in writing.
 - .5 Do not start work until deficiencies have been corrected.
 - .6 Beginning of Work implies acceptance of
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conditions.**3.3 Preparation**

- .1 Remove loose or foreign matter, which might impair adhesion of materials.
- .2 Ensure substrates are clean of oil or excess dust; masonry joints struck flush, and open joints filled; and concrete surfaces free of large voids, spalled areas or sharp protrusions.
- .3 Ensure substrates are free of surface moisture prior to application of membrane and primer.
- .4 Ensure metal closures are free of sharp edges and burrs.
- .5 Prime substrate surfaces to receive adhesive and sealants in accordance with manufacturer's instructions.

3.4 Installation

- .1 Install materials in accordance with manufacturer's instructions.
 - .2 Non-Moving Substrate Crack Treatment and Corner Treatment:
 - .1 Gaps up to 3mm (1/8") wide:
 - .1 Sealant Method: Apply 1.5mm (60 mil) coating of termination and crack sealant, 50mm (2") wide, centered on the gap and strike smooth. Allow to dry prior to application of membrane.
 - .2 Sheet Applied Method: Apply adhesive and allow to dry. Apply 150mm (6") wide strip of sheet applied waterproofing membrane, centered over gap and roll
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- in place. Provide 75mm (3") end laps.
 - .2 Horizontal to Vertical Inside Corners: Pre-treated with termination and crack sealant, fillet extending 19mm (3/4") vertically and horizontally from the corner. Apply a minimum 225mm (8-3/4") strip of sheet applied waterproofing membrane centred at the joint and roll in place.
 - .3 Outside Corners: Apply adhesive and allow to dry. Apply a minimum 225mm (8-3/4") strip of sheet applied waterproofing membrane centred at the joint and roll in place.
 - .4 Projections: Extend sheet applied waterproofing membrane tight to projection and seal with termination and crack sealant extending 65mm (2-1/2") along projection and 65mm (2-1/2") onto waterproofing membrane.
 - .3 Adhesive or Primer for Sheet Applied Waterproofing Membrane:
 - .1 Apply adhesive or primer for sheet applied waterproofing membrane at rate recommended by manufacturer.
 - .2 Apply adhesive or primer to all areas to receive sheet applied waterproofing membrane. Apply by roller or spray and allow minimum thirty (30) minute open time. Surfaces not covered by sheet applied waterproofing membrane during the same working day must be re-applied.
 - .4 Sheet Applied Waterproofing Membrane - Vertical Application:
 - .1 Align and position sheet applied waterproofing membrane, to
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- prepared and primed substrate in lengths of 2400mm (8') or less.
 - .2 Provide 65mm (2-1/2") laps at both sides and ends. Position for alignment and remove protective film.
 - .3 Press firmly into place and promptly roll all laps to seal.
 - .4 Overlap additional sheets in shingle fashion, staggering all vertical joints, in accordance with manufacturer's recommendations.
 - .5 Terminate sheet applied waterproofing membrane using termination sealant or termination bar, reglet or counter. Refer to manufacturers standard details.
 - .6 Seal all laps within 305mm (12") of a 90 degrees change in plane with termination sealant. Trowel apply a feathered edge to all horizontal termination sealant applications to allow shedding of water.
 - .7 Sealant to be applied around all penetrations as per manufacturer's instructions.
 - .5 Sheet Applied Waterproofing Membrane - Horizontal Application:
 - .1 Apply 2 plies of sheet applied waterproofing membrane to prepared substrate in lengths of 2400mm (8') or less.
 - .2 Provide 65mm (2-1/2") laps at both sides and ends. Position for alignment and remove protective film.
 - .3 Press firmly into place. Promptly roll all laps to affect seal.
 - .4 Overlap additional sheets in shingle fashion, staggering all vertical joints, in accordance
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- with manufacturer's recommendations.
 - .5 Terminate sheet applied waterproofing membrane using termination sealant or bar, reglet or counter flashing. Refer to manufacturers standard details.
 - .6 Seal all laps within 305mm (12") of a 90 degrees change in plane with termination sealant.
 - .7 Sealant to be applied around all penetrations as per manufacturer's instructions.
 - .6 Protection Board Installation:
 - .1 Install protection board over the sheet applied waterproofing membrane to prevent damage from backfilling.
 - .2 Apply protection board adhesive in 13mm (1/2") wide strips spaced at 457mm (18") o/c to sheet applied waterproofing membrane.
 - .3 Immediately embed protection board and press into adhesive to ensure full contact.
 - .4 Backfill once protection board adhesive has fully cured.
- 3.5 Field Quality Control
- .1 Final Observation and Verification:
 - .1 Final inspection of sheet applied waterproofing membrane shall be carried out by Departmental Representative and the contractor.
 - .2 Contact Manufacturer for warranty issuance requirements.
 - .2 Sheet applied waterproofing membrane is not designed for permanent UV exposure. Apply protection board as soon as possible after installation of sheet applied waterproofing membrane. Refer to manufacturer published literature for product limitations.
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3.6 Cleaning

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

3.7 Protection of Work

- .1 Protect finished work in accordance with Section 01 61 00 - Material and Equipment.
- .2 Do not permit adjacent work to damage work of this section.
- .3 Ensure finished work is protected from climatic conditions.

END OF SECTION
