

Part 1 - General

1.1 SUMMARY

- .1 This Section includes requirements for supply and installation of the following, as required for complete and proper installation:
 - .1 Fluid Applied Waterproofing Membrane
 - .2 Fabric Reinforcement
 - .3 Flashing Membrane
 - .4 Adhesives
 - .5 Protection Board
 - .6 Drainage Board
 - .7 Auxiliary Materials

1.2 RELATED REQUIREMENTS

- .1 Section 03 30 00 - Cast-In-Place Concrete
- .2 Section 03 31 00 - Structural Concrete
- .3 Section 03 41 00 - Precast Structural Concrete
- .4 Section 04 20 00 - Masonry
- .5 Section 05 30 00 - Metal Decking
- .6 Section 06 10 00 - Rough Carpentry
- .7 Section 06 15 00 - Wood Decking
- .8 Section 07 21 00 - Thermal Insulation
- .9 Section 07 62 00 - Sheet Metal Flashing and Trim
- .10 Section 07 92 00 - Joint Sealants
- .11 Section 32 10 00 - Bases, Ballasts, and Paving

1.3 REFERENCES

- .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 Sheeting.
- .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 D1970 – Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
- .7 ASTM D2243 – Standard Test Method for Freeze-Thaw Resistance of Water-Borne Coatings.
- .8 ASTM D5385 – Standard Test Method for Hydrostatic Pressure Resistance of Waterproofing Membranes.
- .9 ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
- .10 ASTM E96 – Standard Test Methods for Water Vapor Transmission of Materials.
- .11 ASTM E154 – Standard Test Methods for Water Vapour Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover.

- .12 CAN/CGSB 37.58 – Membrane, Elastomeric, Cold-Applied Liquid, for Non-Exposed Use in Roofing and Waterproofing.

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination: Coordinate the Work of this Section with the installation of exterior substrate; Sequence work so that installation of fluid applied waterproofing membrane coincides with installation of substrate preparation without causing delay to the Work.
- .2 Pre-Construction Conference: Arrange a site meeting attended by the Contractor, the Subcontractor, the consultant, materials supplier(s), and other relevant personal before commencement of work for this Section:
 - .1 Review methods and procedures related to installation, including manufacturer's written instructions,
 - .2 Examine substrate conditions for compliance with manufacturers installation requirements,
 - .3 Review temporary protection measures required during and after installation.

1.5 SUBMITTALS

- .1 Provide requested information in accordance with Section 01 33 00 Submittals Procedures.
- .2 Action Submittals: Provide the following submittals before starting any work of this Section:
 - .1 Product Data: Submit manufacturer's data sheets covering the care and recommended maintenance procedures for incorporation into maintenance manuals.
 - .2 Certifications: .1 Submit copies of manufacturers' current ISO 9001 certification. Fluid applied waterproofing membrane, adhesives and associated auxiliary materials shall be included.
 - .3 Submit references clearly indicating that the fluid applied waterproofing membrane manufacturer has successfully completed projects on an annual basis of similar scope and nature for a minimum of fifteen (15) years. Submit references for a minimum of ten (10) projects.
 - .4 Submit manufacturers' complete set of standard details for the fluid applied waterproofing membrane showing a continuous plane of water tightness below grade.
 - .5 Provide material checklist complete with application rates and minimum thickness of adhesives and primers.

1.6 QUALITY ASSURANCE

- .1 Qualifications: Provide proof of qualifications when requested by consultant:
 - .1 Submit in writing, a document stating that the applicator of the fluid applied waterproofing membrane specified in this section is recognized by the manufacturer as suitable for the execution of the Work.
 - .2 Perform Work in accordance with the manufacturer's written instructions of the fluid 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 during execution of the Work, allow access to Work site by the fluid applied waterproofing membrane manufacturers' representative.
- .5 Source all components used in this section from one manufacturer; including fluid applied waterproofing membrane, sealants, primers, mastics and adhesives.

1.7 MOCK-UPS

- .1 Mock-ups: Construct mock-ups to verify selections made under submittals and to set quality standards for materials and execution in accordance with Section 01 45 00 Quality Control for mock-ups and as follows:
 - .1 Where directed by consultant, construct typical assembly, 2134mm x 2134mm, incorporating substrate materials, fluid applied waterproofing membrane and adjacent materials including flashing, protection course, insulation, and drainage boards; showing fluid applied waterproofing membrane application details.
- .2 Notify consultant a minimum seven (7) days prior to mock-up construction.
- .3 Review and acceptance of mock-ups does not constitute approval of deviations from the Contract Documents contained in mock-ups unless consultant specifically notes such deviations in writing.
- .4 Once reviewed by consultant, acceptable mock-up can form a permanent part of the Work and will form the basis for acceptance for the remainder of the project.
- .5 Remove and replace materials found not acceptable at no additional cost to Owner.

1.8 DELIVERY, STORAGE AND HANDLING

- .1 Delivery:
 - .1 At the time of delivery, visually inspect all materials for damage.
 - .2 Note any damaged to materials on the receiving ticket and immediately report to the shipping company and the material manufacturer.
 - .3 Remove damaged materials from the site immediately.
- .2 Storage:
 - .1 Store materials as recommended by manufacturer and conforming to applicable safety regulatory agencies. Refer to all applicable data including but not limited to MSDS sheets, Product Data sheets, product labels, and specific instructions for personal protection.
 - .2 Store materials off the ground and cover with a weatherproof flame-resistant sheeting or tarpaulin.
 - .3 Store role materials on end in original packaging.
 - .4 Store fluid applied waterproofing in closed containers outdoors.
 - .5 Store adhesives and primers at temperatures of 5 deg C and above to facilitate handling.
 - .6 Keep solvent away from open flame or excessive heat.
 - .7 Protect rolls from direct sunlight until ready for use.
- .3 Handling: Material shall be handled in accordance with sound material handling practices and in accordance with manufacturer's written instructions.

1.9 COORDINATION

- .1 Ensure continuity of the water seal throughout the scope of this section.

- .2 Ambient Conditions:
 - .1 Install materials outlined in this Section after completion of work by other Sections is complete; to provide adequate dry, clean, level, and plumb surfaces for installation and adhesion.
 - .2 Apply when ambient air and substrate temperatures are above temperature range indicated by fluid applied waterproofing membrane manufacturer, during time of install, and for a minimum of forty-eight (48) hours after installation, unless otherwise indicated.
 - .3 Ensure surfaces are sound, dry, clean and free of oil, grease, dirt, excess mortar or other contaminants.
 - .4 Do not permit traffic of any kind over unprotected waterproof membranes. Apply protection course as soon as possible in accordance with manufacturers written instructions.

1.10 ALTERNATES

- .1 Submit requests for alternates in accordance with Section [project specific].
- .2 Alternate submission format to include:
 - .1 Evidence that alternate materials meet or exceed performance characteristics of product requirements and documentation from an approved independent testing laboratory certifying that the performance of the system including auxiliary components exceed the requirements of the local building code.
 - .2 References clearly indicating that the manufacturer has successfully completed projects of similar scope and nature on an annual basis for a minimum of ten (10) years.
 - .3 Manufacturer's guide specification.
 - .4 Manufacturer's complete set of technical data sheets for assembly.
 - .5 Manufacturer's complete set of details for assembly.
 - .6 Product certification that the assembly components are supplied and warranted by single source manufacturer.
 - .7 Sample warranty as specified.
- .3 Submit requests for alternates to this specification a minimum of ten (10) working days prior to bid date. Include a list of twenty-five (25) projects executed over the past five (5) years.
- .4 Acceptable alternates will be confirmed by addendum. Substitute materials not approved in writing prior to tender closing shall not be permitted for use on this project.

1.11 WARRANTY

- .1 Contractor Warranty: Warrant that the fluid applied waterproofing membrane and membrane flashings will stay in place and remain leak proof for two (2) years.
- .2 Manufacturer's Warranty: Fluid applied waterproofing membrane manufacturer must warranty the membrane and membrane flashings for leak coverage due to faulty materials for a period of ten (10) years from the date of substantial completion.

Part 2 - Products

2.1 MATERIALS MANUFACTURER

- .1 Components and auxiliary materials must be obtained as a single-source from the assembly manufacturer to ensure total system compatibility and integrity.
- .2 Materials and accessories specified herein are manufactured by:
 - .1 Henry Company 15 Wallsend Drive,
Scarborough, Ontario, Canada, M1E 3X6
(800) 387 9598 www.henry.com

2.2 MATERIALS

- .1 Fluid Applied Waterproofing Membrane:
 - .1 Cold applied, elastomeric, one component waterproofing membrane, in compliance with CGSB 37.58 and having the following properties:
 - .1 Colour: Black
 - .2 Solids by Weight: 65%
 - .3 Application Temperature: -12 deg C minimum.
 - .4 Water Vapour Permeance (ASTM E96): 2.9 ng/Pa.m2.s., (0.05 perms)
 - .5 Elongation (ASTM D412): 1500%
 - .6 Recovery: 85%
 - .7 Basis of Design Product:
 - .1 Aqua-Bloc 770-06 by Henry Company.
- .2 Fabric Reinforcement: Unsaturated spun bonded polyester mat reinforcement sheet having the following physical properties:
 - .1 Grab tensile strength: MD 107N, XMD 98N
 - .2 Trapezoid Tear: MD 38N, XMD 38N
 - .3 Mullen Burst: 117 kPa.
 - .4 Thickness: 0.2 mm.
 - .5 Basis of Design Product:
 - .1 Polyester Fabric Reinforcement Sheet by Henry Company.
- .3 Flashing Membrane:
 - .1 Elastomeric and Expansion Joint Sheet Flashings: Consisting of a flexible flashing membrane composed of combination of butyl and EPDM polymers having the following physical properties:
 - .1 Colour: Black
 - .2 Tensile strength (ASTM D412): 210 kN/m.
 - .3 Tear resistance (ASTM D624): 26 kN/m.
 - .4 Elongation (ASTM D412): 500%
 - .5 Basis of Design Product: 990-25 Elastomeric Flashing Sheet Unreinforced by Henry Company.
- .4 Adhesives:
 - .1 Flashing Membrane Adhesive:
 - .1 Colour: Black
 - .2 Solids by Volume: 40%
 - .3 Application Temperature: 5 deg C (40 deg F) minimum.

- .4 Lap Shear Strength: 275kPa (40 psi)
 - .5 Peel Strength: 3.2 kN/m (18 lbs./in.)
 - .6 Low Temperature Flexibility (ASTM D2823) Pass
 - .7 Basis of Design Adhesive:
 - .1 MB Flashing 880-11 manufactured by Henry Bakor.
 - .2 Insulation, Drainage Board and Protection Board Adhesive: Synthetic rubber base compound having the following characteristics:
 - .1 Colour: Cream.
 - .2 Compatible with fluid 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.
 - .6 Basis of Design Products:
 - .1 230-21 Insulation Adhesive by Henry Company.
- .5 Protection Board:
 - .1 Extruded flexible twin wall board made of polypropylene copolymer and 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
 - .7 Basis of Design Product:
 - .1 990-31 Polypropylene Protection Board by Henry Company.
- .6 Drainage Boards:
 - .1 Henry DB Drainage Composite two-part prefabricated geo-composite drain board consisting of a formed polystyrene core covered on one side with a woven or non-woven polypropylene filter fabric.
 - .1 Vertical Applications: Designed for vertical installations requiring a high compressive strength and moderate flow capacity:
 - .1 Basis of Design Product:
 - .1 Bakor DB 6200 by Henry Company.
 - .2 Horizontal Applications: Designed for demanding horizontal applications in plaza deck, split slab and horizontal flatwork and pavement construction:
 - .1 Basis of Design Product:
 - .1 Bakor DB 9000 by Henry Company.
- .7 Auxiliary Materials:
 - .1 Securement Bars (By Others): Continuous aluminum, stainless steel or galvanized metal, 3mm x 25mm x 25mm in size and shall be pre-drilled for non-corrosive screw attachment on a maximum of 200mm centers.
 - .2 Insulation: Extruded Polystyrene rigid board as indicated in Section 07 21 00 Thermal Insulation.

Part 3 - Execution

3.1 EXAMINATION

- .1 Verification of Conditions:
 - .1 Examine substrates to receive work and surrounding adjacent surfaces for conditions affecting installation.
 - .2 Strike masonry joints flush. Concrete surfaces shall be smooth and without large voids, honeycombing, spalled areas or sharp protrusions.
 - .3 New concrete should be cured for a minimum of fourteen (14) days after forms are removed.
 - .4 Notify consultant in writing of any discrepancies. Commencement of the work or any parts thereof shall mean acceptance of the prepared substrate.
- .2 Notify Consultant in writing of any conditions that are not acceptable.
- .3 Examine and determine that surfaces and conditions are ready to accept the Work of this section in accordance with manufacturer's instructions. Commencement of Work on any parts means installers acceptance of substrate.

3.2 PREPARATION

- .1 All surfaces must be sound, dry, clean and free of oil, grease, dirt, excess mortar or other contaminants.
- .2 Provide adequate protection of materials and work of this section from damage by weather, backfilling operations and other causes.
- .3 Protect adjacent surfaces and Work of other trades from damage resulting from Work of this section. Make good such damage at no additional cost to the Owner.
- .1 Provide sound handling and installation procedures to prevent and protect against spillage and overspray of materials specified in this Section.

3.3 INSTALLATION

- .1 Non-Moving Substrate Crack Treatment and Corner Treatment:
 - .1 Penetrations and Projections:
 - .1 Coat penetrations, such as brackets, clips, braces, etc. that are set into the concrete with a 2.3mm (90 mil) coating of fluid applied waterproofing membrane to height of wearing course and around projections to ensure a complete seal prior to coating the entire area.
 - .2 Flash penetrations subject to movement with fabric reinforcement set into a minimum thickness of 2.3mm coating of fluid applied waterproofing membrane to required height on wall and at least 100mm on slab. Embed fabric reinforcement into wet coating of fluid applied waterproofing membrane.
 - .2 Crack and Gap Treatment:
 - .1 Gaps up to 3mm wide: Apply a coat of fluid applied waterproofing membrane at a minimum thickness of 2.3mm and reinforce with fabric reinforcement. Embed fabric reinforcement into wet coating of fluid applied waterproofing membrane.

- .2 Gaps above 3mm wide: Apply flashing membrane into wet fluid applied waterproofing membrane. Overlap end joint of flashing membrane a minimum 75mm.
- .3 Deck to Vertical Junctures:
 - .1 At monolithic deck to vertical junctures, apply fluid applied waterproofing membrane at a minimum thickness of 2.3mm to required height on wall and a minimum 100mm on slab. Embed fabric reinforcement into wet liquid applied waterproofing membrane.
 - .2 At non-monolithic deck to vertical junctures, apply flashing membrane to required height on wall and a minimum 100mm on slab, set into wet liquid applied waterproofing membrane.
- .2 Fluid Applied Waterproofing Membrane – Single Coat Application:
 - .1 Apply a full and continuous coat of liquid applied waterproofing membrane, at a rate of 2.5 l/m² to provide a minimum wet thickness of 2.3mm ensuring no pinholes or blisters.
 - .2 Apply second coat of liquid applied waterproofing membrane if pinholes or blisters persist when curing.
- .3 Protection Board Installation:
 - .1 Install protection board over the fluid applied waterproofing membrane to prevent damage from backfilling.
 - .2 Apply protection board adhesive in 13mm wide strips spaced at 457mm o/c to fluid 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.
- .4 Drainage Board Installation:
 - .1 Attach drainage board to surface using adhesive. Permanent fixing is achieved once backfilling operation is complete.
 - .2 Vertical Application: Place drainboard with fabric side outwards.
 - .1 Start at the top or bottom of the wall. Drain board may be applied horizontally or vertically.
 - .2 When installed horizontally, position edge of core with flange at the top. When installed vertically, align edge with flange at the upstream edge.
 - .3 Bottom panel should be placed behind the discharge pipe.
 - .3 Horizontal Application: Place drainboard with fabric side up.
 - .1 Start installation at lowest point to ensure positive drainage. Position edge of core with flange at the higher edge of the substrate, away from drains.
 - .4 Overlaps: Pull back loose fabric to expose core. Position core of second panel over the overlap flange of first level.
 - .1 Overlap in direction of water flow and adhere the overlapped fabric with adhesive to prevent soils and/or concrete from entering core.
 - .5 Corners: Bend drainage board for inside corners. Cut drainage board to reach corner, providing 100mm of extra fabric to wrap around corner. Overlap fabric at joint.
- .5 Insulation Installation:

- .1 Co-ordinate with Section 07 21 00 Thermal Insulation for insulating materials.
- .2 Adhesive (Optional):
 - .1 Apply the insulation adhesive in a serpentine pattern to fluid applied waterproofing membrane.
 - .2 Immediately embed insulation into the adhesive and press firmly into place to ensure full contact. Apply additional adhesive if allowed to skin over.
 - .3 Fully butter all joints of insulation panels with adhesive during installation, except at expansion joints.
 - .4 Stagger the end joints of the insulation.
 - .5 Cut the insulation to fit closely to all protrusions and obstructions.
- .3 Insulation Clips:
 - .1 Mechanically fasten insulation clips to the fluid applied waterproofing membrane with adhesive recommended by insulation clip manufacturer.
 - .2 Apply number of insulation clips as recommended by insulation manufacturer, in locations indicated in their written documentation.

3.4 FIELD QUALITY CONTROL

- .1 Final Observation and Verification:
 - .1 Final inspection of fluid applied waterproofing membrane shall be carried out by the Owner's representative, and the contractor.
 - .2 Contact Manufacturer for warranty issuance requirements.
- .2 Fluid applied waterproofing membrane is not designed for permanent UV exposure. Apply protection board as soon as possible after installation of fluid applied waterproofing membrane. Refer to manufacturer published literature for product limitations.

3.5 CLEANING AND PROTECTION

- .1 Progress Cleaning: Leave work area clean at the end of each workday, ensuring safe movement of passing pedestrians.
- .2 Waste Management: Co-ordinate recycling of waste materials and packaging at appropriate facility, diverting waste from landfill. Certified installer is responsible for ensuring waste management efforts are applied.

END OF SECTION