SECTION  – cold fluid-applied waterproofing

1. General
   1. SUMMARY
      1. This Section includes requirements for supply and installation of a cold applied below grade waterproofing membrane system, as required for complete and proper installation:
         1. Fluid Applied Waterproofing Membrane
         2. Fabric Reinforcement
         3. Flashing Membrane
         4. Flashing Membrane Adhesives
         5. Mastics & Termination Sealants
         6. Drainage Board
         7. Protection Board
         8. Auxiliary Materials
      2. Related Requirements:
         1. Section 03 30 00 – Cast-In-Place Concrete.
         2. Section 03 35 00 – Concrete Finishing.
         3. Section 07 14 13 – Hot Fluid-Applied Rubberized Asphalt Waterproofing.
         4. Section 07 16 16 – Crystalline Waterproofing.
         5. Section 07 21 13 – Board Insulation.
         6. Section 31 23 33 – Excavation, Trenching and Backfilling.
   2. reference standards
      1. American Society for Testing of Materials (ASTM):
         1. ASTM C 836/C 836M, Standard Specification for High Solids Content, Cold Liquid Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course.
         2. ASTM D 412, Standard Test Method for Vulcanized Rubber and Thermoplastic Elastomers œ Tension.
         3. ASTM D 570, Standard Test Method for Water Absorption of Plastics.
         4. ASTM D 882, Standard Test Method for Tensile Properties of Thin Plastic Sheeting.
         5. ASTM D 903, Standard Test Method for Peel or Stripping Strength of Adhesive Bonds.
         6. ASTM D 1227, Standard Specification for Emulsified Asphalt Used as a Protective Coating for Roofing.
         7. ASTM D 1876, Standard Test Method for Peel Resistance of Adhesives (T-Peel Test).
         8. ASTM D 1970, Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
         9. ASTM D 2243, Standard Test Method for Freeze-Thaw Resistance of Water-Borne Coatings.
         10. ASTM D 3330, Standard Test Method for Peel Adhesion of Pressure Sensitive Tape.
         11. ASTM D 5385, Standard Test Method for Hydrostatic Pressure Resistance of Waterproofing Membranes.
         12. ASTM E 96, Standard Test Methods for Water Vapor Transmission of Materials.
         13. ASTM E 154, Standard Test Methods for Water Vapour Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover.
      2. Canadian General Standards Board (CGSB):
         1. CAN/CGSB 37.2, Emulsified Asphalt, Mineral-Colloid Type, Unfilled, for Dampproofing and Waterproofing, and for Roof Coatings.
   3. 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 as indicated in Section 01 31 19 – Project Meetings.
         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.
   4. SUBMITTALS
      1. Provide required information in accordance with Section 01 33 00 – Submittal 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.
   5. QUALITY ASSURANCE

Retain "Installer Qualifications" Paragraph below if applicable. For warranty purposes, manufacturer may qualify an installer. Coordinate paragraph with qualifications manufacturer requires of Installer.

* + 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 at all times during the execution of the Work, allow access to Work site by the fluid applied waterproofing membrane manufacturers' representative.
       5. Components used in this section shall be sourced from one manufacturer; including fluid applied waterproofing membrane, sealants, primers, mastics, and adhesives.
  1. 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, 2134 mm x 2134 mm (8' x 8'), 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.
  2. DELIVERY, STORAGE, AND HANDLING
     1. Delivery: At the time of delivery, visually inspect all materials for damage. Note any damaged to materials on the receiving ticket and immediately report to the shipping company and the material manufacturer.
        1. 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 (41 deg F) 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.
  3. 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. Ensure surfaces are dry prior to and a minimum of sixteen (16) hours after time of install.
        5. Do not permit traffic of any kind over unprotected waterproof membranes. Apply protection course as soon as possible in accordance with manufacturers written instructions.
  4. 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 as a result of faulty materials for a period of [five (5) years] [ten (10) years] from the date of substantial completion.

1. Products

Manufacturers and Products listed are neither recommended nor endorsed by the AIA or Avitru.. Before inserting names, verify that manufacturers and products listed there comply with requirements retained or revised in descriptions and are both available and suitable for the intended applications. For definitions of terms and requirements for Contractor's product selection, see Section 01 61 00 – Common Product Requirements.

* 1. manufacturers
     1. Components and auxiliary materials must be obtained as a single source from the assembly manufacturer to ensure total system compatibility and integrity.
     2. Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
        1. Henry Company.
        2. W.R. Meadows.
        3. Carlisle Coatings and Waterproofing.
        4. Tremco Commercial Sealants and Waterproofing.
  2. materials
     1. Fluid Applied Waterproofing Membrane:
        1. Cold applied, elastomeric, one component asphalt emulsion waterproofing membrane, in compliance with CGSB 37.2, containing not less than 60% solids, and having the following characteristics:
           1. Solids by Weight: Not less than 60% Solids.
           2. Application Temperature: 5 deg C (40 deg F) minimum.
           3. Tensile Strength: 320 kPa (50 psi).
           4. Elongation (ASTM D 412): 2000%.
           5. Maximum VOC: 10 g/L.
           6. Water Vapour Permeance (ASTM E 96): 10 ng/Pa.m2. s., (0.2 perms).
           7. Hydrostatic Pressure Resistance: Passes 45 psi or 104 ft. at 65 mills.
           8. Basis of Design Materials:

Henry Company, Aqua-Bloc 720-38.

W.R. Meadows, Hydralastic 836 Waterproofing Membrane.

Carlisle, MiraSEAL Fluid-Applied Waterproofing Membrane.

Tremco, TREMproof 250GC.

* + 1. Fabric Reinforcement: Manufacturer's standard open weave glass fabric consisting of glass fibre yarn saturated with synthetic resins.
    2. Sheet Flashing: Nominal 1.6 mm (1/16"), manufacturer's standard non staining premanufactured elastomeric membrane and adhesive.
    3. Reinforcing Strip: Manufacturer's recommended fibreglass mesh or polyester fabric.
    4. Termination and joint Sealant: Polymer modified sealing compound, compatible with waterproofing; and as recommended by manufacturer for substrate and joint conditions.
    5. Drainage Board: 6 mm (1/4") thick, dimpled designed, pre-moulded, high impact polystyrene core board with needle punched, non-woven, filter fabric adhered to core face and film adhered to core back.
       1. Drainage Board Adhesive: As recommended by the membrane manufacturer.
    6. Protection Board: 6 mm (1/4") thick semi-flexible type protection board, consisting of a core of blended asphalt and mineral fillers, laminated between faces of asphalt saturated felts, conforming to DSM 9.90.60.
       1. Protection Board Adhesive: As recommended by membrane protection board manufacturer.
    7. Auxiliary Materials:
       1. Securement Bars (By Others): Continuous aluminum, stainless steel or galvanized metal, 3 mm x 25 mm x 25 mm (1/8" x 1" x 1") in size and shall be pre-drilled for non-corrosive screw attachment on a maximum of 200 mm (8") centers.
       2. Below Grade Insulation: As specified in Section 07 21 13 – Board Insulation.

1. Execution
   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. Notify Consultant in writing of any discrepancies. Commencement of the work or any parts thereof shall mean acceptance of the prepared substrate.
      2. Notify Contractor in writing of any conditions that are not acceptable.
      3. The installing contractor shall examine and determine that surfaces and conditions are ready to accept the Work of this section in accordance with published literature. Commencement of Work or any parts thereof shall mean installers acceptance of the substrate.
   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. 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 2.3 mm (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 2.3 mm (90 mil) coating of fluid applied waterproofing membrane to required height on wall and at least 100 mm (4") on slab. Embed fabric reinforcement into wet coating of fluid applied waterproofing membrane.
         2. Crack and Gap Treatment:
            1. Gaps up to 3 mm (1/8") wide: Apply a coat of fluid applied waterproofing membrane at a minimum thickness of 1.5 mm (60 mil) and reinforce with fabric reinforcement. Embed 150 mm (6") wide fabric reinforcement into wet coating of fluid applied waterproofing membrane.
            2. Gaps between 3 mm (1/8") and 12 mm (1/2") wide: Apply sheet applied flashing membrane onto primed substrate. Roll sheet applied flashing membrane to ensure full contact with substrate. Overlap end joint of sheet applied flashing membrane a minimum 75 mm (3").
         3. Deck to Vertical Junctures:
            1. At monolithic deck to vertical junctures, apply fluid applied waterproofing membrane at a minimum thickness of 2.3 mm (90 mil) to required height on wall and a minimum 100 mm (4") 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 100 mm (4") on slab, set into wet liquid applied waterproofing membrane.

SPEC NOTE: Single coat application is for vertical applications only; two-coat applications are used when horizontal applications are required.

* + 1. Fluid Applied Waterproofing Membrane œ Single Coat Application:
       1. Apply a full and continuous coat of liquid applied waterproofing membrane, at a rate of 2.0 l/m2 (5 gal. U.S./100ft.2) to provide a minimum wet thickness of 2.3 mm (90 mils) ensuring no pinholes or blisters. Allow liquid applied waterproofing membrane to fully cure prior to subsequent application coatings.
       2. Apply second coat of liquid applied waterproofing membrane if pinholes or blisters persist when curing.
    2. Fluid Applied Waterproofing Membrane œ Two Coat Application:
       1. Apply a full and continuous prime coat of liquid applied waterproofing membrane, diluted 25% volume with clean water, at approximately 0.5 l/m2 (1.2 gal. US/100ft2) and allow to cure.
       2. Apply a full and continuous coat of liquid applied waterproofing membrane at approximately 0.5 l/m2 (1.2 gal. US/100ft2) and embed fabric reinforcement into wet coating of liquid applied waterproofing membrane. Brush fabric reinforcement into place with soft brush to eliminate wrinkles, air pockets or blisters and ensure no fishmouths are created. Allow liquid applied waterproofing membrane to fully cure prior to subsequent application coatings.
       3. Extend fabric reinforcement a minimum of 50 mm (2") at all joints.
       4. At corners and junctions, reinforce with two (2) additional coats of liquid applied waterproofing membrane and fabric reinforcement a minimum of 100 mm (4") on each side of corner or junction.
       5. Apply a seal coat of liquid applied waterproofing membrane over entire coated area at 1.0 l/m2 (2.4 gal./100ft.2) and allow to cure prior to placing protection and/or drainage board.
    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 13 mm (1/2") wide strips spaced at 457 mm (18") 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 drainage board 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 drainage board 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 100 mm (4") of extra fabric to wrap around corner. Overlap fabric at joint.
    5. Insulation Installation:
       1. Co-ordinate with Section 07 21 13 – Board 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.
    6. 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.
  1. 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 as soon as possible after installation of fluid applied waterproofing membrane. Refer to manufacturer published literature for product limitations.
  2. CLEANING AND PROTECTION
     1. Protect waterproofing from damage and wear during remainder of construction period.
     2. Progress Cleaning: Leave work area clean at the end of each workday, ensuring safe movement of passing pedestrians.
     3. Waste Management: Co-ordinate recycling of waste materials and packaging at appropriate facility, diverting waste from landfill. Certified installer shall be responsible for ensuring waste management efforts are practiced.

END OF SECTION