SPEC NOTE: This master specification section includes HENRY COMPANY SPEC NOTEs for information purposes and to assist the architect / specification writer in making appropriate decisions. HENRY COMPANY SPEC NOTEs always immediately precede the text to which it is referring. The section serves as a guideline only and should be edited with deletions and additions to meet specific project requirements.

SPEC NOTE: This specification section follows the recommendations of the Construction Specifications Canada, Manual of Practice including MasterFormat, SectionFormat, and PageFormat. Optional text is indicated by square brackets [ ]; delete the optional text including the brackets in the final copy of the specification. Delete all SPEC NOTEs in the final copy of the specification.

SPEC NOTE: This specification includes materials and installation procedures for 790-11 Hot-Applied Rubberized Asphalt Protected Membrane Roofing.

1. GENERAL
   1. GENERAL REQUIREMENTS
      1. The General Conditions, the Supplementary Conditions, the Instructions to Bidders and Division 1 General Requirements shall be read in conjunction with and govern this section.
      2. The Specification shall be read as a whole by all parties concerned. Each Section may contain more or less than the complete work of any trade. The Contractor is solely responsible to make clear to the Subcontractors the extent of their work.
   2. SUMMARY
      1. This Section includes requirements for supply and installation of the following, as required for complete and proper installation:
         1. Concrete Deck (by others)
         2. Primer and Hot-Applied Rubberized Asphalt Protected Membrane Roofing
         3. Protection Course
         4. Pavers [Surface Treatment], [Drain Board and Overburden].
   3. RELATED REQUIREMENTS

SPEC NOTE: Include in this paragraph only those sections and documents that directly affect the work of this section. Do not include Division 00 Documents or Division 01 Sections since it is assumed that all technical sections are related to all project Division 00 Documents and Division 01 Sections to some degree. Refer to other documents with caution since referencing them may cause them to be considered a legal part of the Contract. Edit the following paragraphs to suit specific project conditions.

* + 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 05 12 00 – Structural Steel Framing
    5. Section 06 10 00 - Rough Carpentry
    6. Section 07 33 63 - Vegetated Roofing
    7. Section 07 62 00 - Sheet Metal Flashing and Trim
    8. Section 07 92 00 - Joint Sealants
    9. Section 32 10 00 - Bases, Ballasts, and Paving
  1. REFERENCES
     1. Canadian General Standards Board (CGSB):
        1. CGSB-37-GP-9MA, Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing.
        2. CGSB-37.50-M89, Hot Applied, Rubberized Asphalt for Roofing and Waterproofing.
        3. CGSB-37.51M90, Application for Hot-Applied Rubberized Asphalt, for Roofing and Waterproofing.
        4. CGSB-37-GP-56M, Membrane, Modified, Bituminous, Prefabricated and Reinforced for Roofing.
  2. ADMINISTRATIVE REQUIREMENTS
     1. Coordination: Coordinate the Work of this Section with the installation of substrate; Sequence work so that installation of hot-applied roofing 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 [engineer] [architect] [consultant], materials supplier(s), and other relevant personal before commencement of work for this Section; as indicated in Section [01 31 13 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.
  3. 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 certification. Membrane, primers, sealants, adhesives and associated auxiliary materials shall be included.
        3. Submit references clearly indicating that the 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 a hot-applied rubberized asphalt protected membrane roofing system showing a continuous plane of water tightness throughout the building roofing assembly.
        5. Provide material checklist complete with application rates and minimum thickness of primary membranes.
  4. QUALITY ASSURANCE
     1. Qualifications: Provide proof of qualifications when requested by [engineer] [architect] [consultant]:
        1. Submit in writing, a document stating that the applicator of the roofing 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 roofing 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 manufacturers' representative.
        5. Components used in this section shall be sourced from one manufacturer, including hot-applied rubberized asphalt roofing, primers, liquid sealants, mastics, adhesives, reinforcement, flashing membrane, drainage board, and protection course.

SPEC NOTE: Mock-ups establish quality of the work for the materials indicated in this Section. Delete the following paragraph if the scope of work in this Section is minimal and a mock-up is not required.

* 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 [engineer] [architect] [consultant], construct typical assembly, 2134mm x 2134mm (8' x 8'), incorporating substrate materials, roofing membrane, fabric reinforcement and adjacent materials including flashing, protection course, [insulation,] [drainage boards,] termination sealant and [pavers][surface treatment][drain board and overburden]; showing hot-applied rubberized asphalt roofing membrane application details.
     2. Notify [engineer] [architect] [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 [engineer] [architect] [consultant] specifically notes such deviations in writing.
     4. Once reviewed by [engineer] [architect] [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 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 manufacturer.
        1. Remove damaged materials from the site immediately.
     2. Storage:
        1. Store materials in accordance with manufacturer's written instructions, raised off the ground and cover with a weather proof flame resistant sheeting or tarpaulin.
        2. Store role materials on end in original packaging.
        3. Store fluid-applied roofing in closed containers outdoors.
        4. Store adhesives and primers at temperatures of 5 deg C (41 deg F) and above to facilitate handling.
        5. Keep solvent away from open flame or excessive heat.
        6. Protect products 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 hot-applied rubberized asphalt roofing membrane throughout the scope of this section. Work shall be so scheduled as to provide a watertight seal at the end of each working day on the areas worked upon during the day.
     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. Do not permit installation of materials listed in this Section during rainy or inclement weather and on frost or wet covered surfaces.
        3. In cold weather store sheet membranes in heated area and take onto roof immediately prior to use.
        4. Do not store sheet membranes at ambient temperatures above 49 degrees C (120 degrees F).
        5. Do not permit traffic of any kind over unprotected roof membranes. Apply protection course as soon as possible in accordance with manufacturers written instructions.
     3. Protection:
        1. Provide temporary protection of the membrane to prevent mechanical damage or damage from spillage of oil or solvents until such time as permanent protection is provided.
  4. 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.

SPEC NOTE: There are three (3) warranty configurations available from Henry Company. Select one (1) of the following and delete the remaining warranty configurations not required on this project.

* 1. WARRANTY
     1. Manufacturer’s Material Warranty:
        1. Contractor must warranty that the roofing membrane and membrane flashings will stay in place and remain leak proof for two (2) years.
        2. Roofing 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] [fifteen (15) years] [twenty (20) years] from the date of substantial completion.
     2. Manufacturer’s Labour and Material System Warranty:
        1. Contractor must warranty the roofing membrane and membrane flashings for leak coverage for two (2) years.
        2. Roofing 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] [fifteen (15) years] [twenty (20) years] from the date of substantial completion.

SPEC NOTE: Warranty fees apply to Gold Seal Warranties.

* + 1. Manufacturer’s Gold Seal Warranty:
       1. Contractor must warranty the roofing membrane and membrane flashings for leak coverage for two (2) years.
       2. Roofing membrane manufacturer must warranty the membrane and membrane flashings for leak coverage as a result of faulty materials or installation workmanship for a period of [five (5) years] [ten (10) years] [fifteen (15) years] [twenty (20) years] from the date of substantial completion.
    2. Submit for Owner's acceptance, manufacturer's warranty document indicated above, executed by an authorized company official.

1. PRODUCTS
   1. MATERIALS MANUFACTURER
      1. Materials and accessories specified herein are manufactured by:

Henry Company

15 Wallsend Drive, Scarborough, Ontario, Canada, M1E 3X6

Phone: (800) 387 9598

Website: www.henry.com

* 1. MATERIALS
     1. Protected Roofing Membrane:
        1. Hot-applied, rubberized asphalt composed of a specially selected blend of refined asphalts, synthetic rubber and mineral stabilizers, designed to provide a seamless membrane, and having the following physical characteristics:
           1. Complies with CAN/CGSB 37.50.
           2. Solids Content: 100%
           3. Low Temperature Flexibility and Adhesion: No cracking, delamination or loss of adhesion @ -25 deg C (-13 deg F)
           4. Water Vapor Permeance (ASTM E96): Procedure E: 0.016 perms (1.0 ng/Pa m² sec)
           5. Low Temperature Crack Bridging Capability: No cracking, No splitting, No loss of adhesion
           6. Specific Gravity: 1.23 +/- 0.03
           7. Colour: Black
           8. Basis of Design Product: 790-11 Hot Applied Rubberized Asphalt by Henry Company.
     2. Primers:

SPEC NOTE: Select the following for a quick setting, high adhesion primer used to provide excellent bonding of membranes at normal and low temperatures.

* + - 1. Hot Rubberized Asphalt and Flashings: Synthetic rubber based adhesive, quick setting and low temperature application.
         1. Basis of Design Product: Bakor 930-18 Poly-Tac Rubberized Adhesive by Henry Company.

SPEC NOTE: Select the following for a penetrating primer which seals dusty, absorbent surfaces to improve bonding of asphalt coatings.

* + - 1. Penetrating primer for priming thermal insulation, concrete, masonry, gypsum and asphalt roofing felts.
         1. Basis of Design Product: 910-01 Penetrating Asphalt Primer by Henry Company.
    1. Fabric Reinforcement: Unsaturated spun bonded polyester mat reinforcement sheet having the following physical properties:
       1. Grab tensile strength: MD 107N (24 lbs.); XMD 98N (22 lbs.)
       2. Trapezoid Tear: MD 38N (8.5 lbs.); XMD38N (8.5 lbs.)
       3. Mullen Burst: 117 kPa (17 psi)
       4. Thickness: 0.2 mm (8 mils)
       5. Basis of Design Product: Polyester Fabric Reinforcement Sheet by Henry Company.
    2. Flashing and Crack Treatment:
       1. Flashing and Reinforcement Membranes: SBS modified bitumen membrane having a minimum thickness of 3mm (120 mils) and a non-woven polyester reinforcement of 180 g/m2, meeting CGSB 37-GP-56M Type 2 Class C Grade 2.
          1. Polyethylene film upper and lower surface for torch application.

Basis of Design Product: *modified*PLUS NP180p/p by Henry Company.

* + - * 1. Sanded upper and lower surface for setting in hot rubberized asphalt.

Basis of Design Product: *modified*PLUS NP180s/s by Henry Company.

* + - 1. Cap Flashing Membrane: SBS modified bitumen membrane having a minimum thickness of 4mm (160 mils) and a non-woven polyester reinforcement of 180 g/m2, meeting CGSB 37-GP-56M Type 1 Class A Grade 2.
         1. Upper surface shall have ceramic granules and the lower surface shall have a polyethylene film for torch application.

Basis of Design Product: *modified*PLUS NP180gT4 by Henry Company.

* + - * 1. Upper surface shall have ceramic granules and the lower surface shall have a sanded surface for hot applied application.

Basis of Design Product: *modified*PLUS NP180gM by Henry Company.

* + - 1. Expansion Joint and Exposed Flashing Membrane:
         1. Flexible flashing membrane composed of combination of butyl and EPDM polymers, set into hot applied rubberized asphalt.

Basis of Design Product: 990-25 Elastomeric Flashing Sheet Unreinforced by Henry Company.

* + - * 1. 1.5mm (60 mils) thick, black flashing membrane; Having 300% elongation, 125 lbs/in min tear resistance, and 1800 psi min tensile strength

Basis of Design Product: Neoflash by Henry Company.

* + - 1. Self-Adhering Flashing Transition Membrane: 1.5mm (60 mils) minimum thick, SBS modified bitumen, self-adhering sheet membrane with a cross-laminated polyethylene film, and having elongation of 300% to ASTM D412.
         1. Basis of Design Product: Blueskin WP200 by Henry Company.
      2. Liquid-Applied Flashing System: AQUA-BLOC® PUMA System by Henry Company with catalyst mix and application rates per product technical data sheet, and consisting of:
         1. AQUA-BLOC® PUMA Primer or AQUA-BLOC® PUMA Early Prime
         2. AQUA-BLOC® PUMA Resin
         3. AQUA-BLOC® PUMA Catalyst
         4. HE195 – Polyester Fabric
      3. Crack Treatment Reinforcement Membrane: SBS modified bitumen membrane having a minimum thickness of 2.2mm (90 mils) and a non-woven polyester reinforcement of 180 g/m2, meeting CGSB 37-GP-56M Type 2 Class C Grade 2.
         1. Upper and lower surface shall be sanded and be fully compatible with the primary membrane.
         2. Basis of Design Product: *modified*PLUS NP180s/s by Henry Company.
    1. Protection Course:
       1. Non-exposed SBS modified bitumen having a sanded upper and lower surface, having the following physical properties in accordance with CGSB 37-GP-56M, Type 2, Class C, Grade 1:
          1. Thickness: 2.0mm (80 mils)
          2. Breaking strength: MD 631 N (142 lbf) XD 581N (131 lbf)
          3. Ultimate elongation: MD 17% XD 21%
          4. Low temperature flexibility at -10 deg C (14 deg F): No sign of cracking and pass water tightness
          5. Basis of Design Product: *modified*PLUS G100s/s by Henry Company.
       2. Asphalt Cover Board: Semi-flexible asphalt sheet, consisting of a blend of asphalt, plasticizer and inert fillers sandwiched between two skins of asphalt-saturated fiberglass.
          1. Thickness: 6mm (1/4”)
       3. Horizontal 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. Basis of Design Product: Bakor DB 9000 by Henry Company.
          2. Designed for demanding horizontal applications in plaza deck, split slab and horizontal flatwork and pavement construction.
    2. Termination Sealant:
       1. Concealed Termination Sealant: Polymer modified sealing compound, compatible with self-adhered membrane, substrate and insulation materials, complies with CGSB 37.29, remains flexible with ageing and chemically resistant to alkalis, calcium chloride, mild acid and salt solutions.
          1. Basis of Design Product: POLYBITUME 570-05 Polymer Modified Sealing Compound by Henry Company.
       2. Exposed Termination Sealant:
          1. One-component, moisture cure, medium modulus sealant for construction joints subject to dynamic joint movement. Basis of Design Product: HE925 BES Sealant by Henry Company.
          2. One-component, high-performance synthetic rubber termination sealant in both vertical and horizontal joints. Basis of Design Product: Kop-R-Lastic Thermoplastic Sealant by Henry Company.
    3. Securement Bars (By Others):
       1. Securement bars shall be continuous aluminum, stainless steel or galvanized metal, 3mm x 25mm x 25mm (1/8" x 1" x 1") in size and shall be pre-drilled for non-corrosive screw attachment on a maximum of 200mm (8") centers.

SPEC NOTE: Select the compressive strength in accordance with project requirements.

* + 1. Insulation:
       1. Extruded Polystyrene rigid board insulation meeting the following properties:
          1. ASTM C-578, Type VI or VII
          2. ASTM E96 Water vapor permeance: 1.0 perms
          3. Minimum water absorption by volume per ASTM C-272 of 0.1%
          4. Minimum compressive strength to ASTM C-1621 shall be [40], [60] or [100] psi.
          5. Acceptable Manufacturers:

The Dow Chemical Company

Owens Corning Canada

* + 1. Roof Ballast:
       1. Precast Plaza Deck Pavers: Heavyweight, hydraulically pressed, concrete units, square edged, factory cast for use as roof pavers; absorption not greater than 5 percent, ASTM C140; no breakage and maximum 1 percent mass loss when tested for freeze-thaw resistance, ASTM C78 and as follows:
          1. Size: 610mm x 610mm x 50mm (24" x 24" x 2").
          2. Compressive Strength: 7500 psi, minimum ASTM C140
          3. Colours and Textures: As selected by [engineer] [architect] [consultant]
          4. Pedestal Supports: Pedestal supports for pavers shall be in accordance with the paver manufacturer recommendations.
       2. Stone Ballast: River gravel, round, washed free from dust, humidity, ice, snow and foreign objects. Nominal diameter 38mm (1-1/2”), applied at a rate of 50 kg/m2.
       3. Concrete Pour Topping: As indicated in Section [03 31 00 Structural Concrete].

SPEC NOTE: As a requirement for meeting certain warranty conditions, the roofing membrane must be tested for leaks. The completed roofing system may be tested by either flood testing the area or Electric Vector Testing (EVT). Select one of the following paragraphs below.

* 1. FIELD QUALITY CONTROL
     1. Electric Vector Testing (EVT) Quality Assurance Components (Alternate to flood testing):
        1. Provide electrical wiring, and other components necessary for a testing agency to perform integrity testing of roofing membrane.
     2. Flood Testing:
        1. Flood horizontal roofing installations having a slope which is not greater than two (2) percent slope, as per ASTM D5957.

1. EXECUTION
   1. EXAMINATION
      1. Verification of Conditions:
         1. Examine substrates to receive work and surrounding adjacent surfaces for conditions affecting installation.
         2. Notify [engineer] [architect] [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. Proceed with installation after verification and correction of surface conditions acceptable to manufacturer.
   2. PREPARATION
      1. All surfaces must be sound, dry, clean and free of oil, grease, dirt, excess mortar, added laitance or other contaminants. Concrete surfaces shall be free of large voids and spalled areas. Fill areas in substrate to provide an even plane.
      2. Provide and install prefabricated expansion joint assemblies prior to application of the roofing assembly.

SPEC NOTE: Select one or more of the following substrate preparation applications which are required for this project.

* + 1. Acceptable Substrates:
       1. Concrete:
          1. Form Release Agents: Contact Henry Company
          2. Cast-in-Place Concrete/Composite Deck/Precast Concrete:

Strength/Density: Minimum 17 mPa (2,500 psi) compressive strength and minimum 1842 kg/m3 (115 pcf) density.

Finish: Wood-float, or wood-troweled equivalent finish.

Sandblast or shotblast decks with a steel float finish in order to remove laitance prior to the application of the roofing system.

Concrete Hydration (Cure):

Method of Cure: Water cure, wet coverings, paper sheets, plastic sheets or approved liquid curing compound (sodium silicate preferred).

Duration of Cure/Dry: Recommended 28 days, minimum 14 days prior to application of the membrane for structural weight concrete. Recommended 60 days, minimum 28 days prior to application of membrane for lightweight structural concrete.

* 1. INSTALLATION PRIMER AND FLASHING
     1. Primer:
        1. Apply primer uniformly at the rate recommended by the manufacturer avoiding excessive or over-spraying application. Ponding of the primer is not recommended.
        2. The primer shall be dry before applying the hot-applied rubberized asphalt roofing.
     2. Joint Treatment for Precast Concrete Deck:
        1. Torch Applied Method:
           1. Reinforce joints along length of units with a strip of 150mm (6") wide thermofusible flashing membrane, centered over joint. Joint width not to exceed 12mm (1/2").
           2. Reinforce joints along ends of units with a strip of 300mm (12") wide thermofusible flashing membrane, centered over joint.
        2. Set in Hot-Applied Rubberized Asphalt:
           1. At joints occurring along the width of the precast units, reinforce with a minimum of 150mm (6") wide flashing membrane, embedded into a 3mm (1/8") thick coat of membrane, centered over joint. Joint width not to exceed 12mm (1/2").
           2. Reinforce joints along ends of units with a strip of 300mm (12") wide flashing membrane, centered over joint.
     3. Deck to Vertical Junctures:
        1. Torch Applied Method:
           1. Reinforce all deck to vertical junction using a strip of 150mm (6") wide polyethylene film upper and lower surface flashing membrane. Extend flashing membrane 75mm (3") on vertical and horizontal surface. Lap flashing membrane a minimum of 75mm (3"). Ensure membrane is fully bonded to the substrate and that all terminations are well sealed.
           2. Membrane should be free of voids, wrinkles or fish mouths prior to application of the hot-applied rubberized asphalt.
           3. At monolithic pour, install strip of 150mm (6") wide Polyester Fabric, set in 3mm (1/8") coating of the hot-applied rubberized asphalt.
        2. Set in Hot-Applied Rubberized Asphalt:
           1. Apply hot-applied rubberized asphalt membrane to provide a thickness of approximately 3mm (1/8") to the vertical faces and a minimum of 200mm (8") out onto the horizontal surface.
           2. Embed flashing membrane in the hot-applied rubberized asphalt membrane, avoiding any wrinkles or fish mouths, extending a minimum of 75mm (3") out onto the horizontal surface and 75mm (3") up vertical. Lap ends of flashing membrane a minimum of 75mm (3").
           3. At monolithic pour, install strip of 150mm (6") wide Polyester Fabric.
        3. Self-Adhering Membrane:
           1. Apply self-adhering membrane to prepared substrate in lengths of 2440mm (8’) or less.
           2. Horizontal to vertical inside corner transition areas are to be pre-treated with a fillet bead of termination sealant extending 19mm (3/4") vertically and horizontally from the corner. Apply a minimum 229mm (9”) strip of self-adhering membrane centred at the joint.
           3. All outside corners are to be pre-treated with a minimum 229mm (9") strip of self-adhering membrane centred at the joint.
           4. Where three or more planes, come into contact reinforce with cut sections of self-adhering membrane reinforcing sheet as per manufacturer’s instructions.
           5. Provide 65mm (2-1/2") laps at both sides and ends. Position for alignment and remove protective film. Press firmly into place and roll all laps with roller to effect seal. If more than one length is required on a vertical surface, apply in a shingle fashion.
           6. Terminate self-adhering membrane using termination sealant and counter flashing as indicated.
           7. Seal all laps within 305mm (12") of a 90 degree change in planes with termination sealant.
     4. Crack Treatment:
        1. Torch Applied Method:
           1. Seal cracks and joints between 3mm (1/8") and 12mm (1/2") in width with a strip of 150mm (6") wide polyethylene film upper and lower surface flashing membrane, centered on crack or joint. Provide 150mm (6") end laps.
        2. Membrane set in Hot-Applied Rubberized Asphalt:
           1. Treat cracks between 1.5mm (1/16") and 3mm (1/8") with 150mm (6") wide strip of polyester fabric set in 3mm (1/8") membrane.
           2. Treat cracks and joints between 3mm (1/8") and 12mm (1/2") with 3mm (1/8") thick coat of hot-applied rubberized asphalt membrane and strip of 150mm (6") wide flashing membrane, centered on joint. Extending membrane 75mm (3") beyond the sheet edges.
     5. Expansion Joint Treatment:
        1. Flashing Membrane set in Hot-Applied Rubberized Asphalt:
           1. At expansion joints use adhesive grade reinforcement membrane, loop expansion joint membrane down into joint, embedded into a 3mm (1/8") thick layer of hot-applied rubberized asphalt membrane.
           2. Ensure that the depth of loop is minimum 1.5 x the joint width. Extend flashing membrane minimum of 150mm (6") on each side of joint. Seal end joints a minimum of 150mm (6") and seal with a 3mm (1/8") coat of membrane. Fill loop with membrane.
           3. In vertical applications secure top of expansion joint sheet with continuous fixing bar at vertical wall locations.
     6. Membrane Flashing at Drains:
        1. Torch Applied Method:
           1. Provide a polyethylene film upper and lower surface flashing membrane, centered over the drain flange extending a minimum 150mm (6") beyond the flange.
           2. Apply free of wrinkles, blisters or fish-mouths. Ensure edges of sheet are completely sealed to the substrate.
           3. Apply clamping ring exerting sufficient pressure to affect a seal between clamping ring and membrane. Temporarily block all drains during the application of ballast, or other materials, which might block the drains. Remove blocking when work is not in progress and upon completion. Scorch top surface film prior to the application of the hot applied rubberized asphalt.
        2. Membrane set in Hot-Applied Rubberized Asphalt:
           1. Coat area around drains with hot-applied rubberized asphalt membrane at a thickness of 3mm (1/8").
           2. Apply flashing sheet over the coat drain flange extending a 150mm (6") beyond the flange.
           3. Apply second coat of hot-applied rubberized asphalt membrane over the flashing sheet at a thickness of 3mm (1/8").
           4. Apply clamping ring exerting sufficient pressure to affect a seal between clamping ring and membrane. Temporarily block all drains during the application of ballast, or other materials, which might block the drains. Remove blocking when work is not in progress and upon completion.
     7. Membrane Flashing at Protrusions:
        1. Torch Applied Method:
           1. At mechanical vent, protrusions and pipe flashings provide a polyethylene film upper and lower surface flashing membrane as per manufacturers details. Install clamps as required.
           2. At pitch pockets, place pan on top of the flashing membrane and attach into roof deck. Apply flashing membrane over top of flange and extend a minimum of 25mm (1") beyond edge of first ply. Fill pitch pocket with hot-applied rubberized asphalt or rubber asphalt sealer in order to shed water. Scorch top surface polyethylene film prior to the application of the hot-applied rubberized asphalt.
        2. Membrane set in Hot-Applied Rubberized Asphalt:
           1. At mechanical vent, protrusions and pipe flashings provide flashing membrane set into 3mm (1/8") layer of hot-applied rubberized asphalt membrane. Overcoat and seal with membrane. Install clamps as required.
           2. At pitch pockets, place pan on top of the membrane and attach into roof deck. Set flashing membrane into 3mm (1/8") hot-applied rubberized asphalt membrane over top of flange. Fill pitch pocket with hot-applied rubberized asphalt or rubber asphalt sealer in order to shed water.
        3. Liquid Applied Flashing:
           1. Once primer is dry, mix resin and catalyst as recommended by manufacturer, and apply the first coat at a wet film thickness of 1.27mm (50 mils).
           2. Embed fleece reinforcement into wet resin with brush or roller, ensuring to remove all trapped air and excess resin.
           3. Apply second coat at a wet film thickness of 0.76mm (30 mils) onto the fleece until it is completely saturated (no shiny areas).
           4. Resin should extend a minimum of 50mm (2") past the projected installed edge of Fleece.
  2. INSTALLATION ROOFING AND PROTECTION COURSE
     1. Hot-Applied Rubberized Asphalt Roofing Membrane:
        1. Ensure deck is ready to receive hot-applied rubberized asphalt membrane. Where torch applied flashing membranes have been used, ensure top polyethylene has been scorched away prior to application of the membrane.
        2. Apply membrane smooth, free from air pockets, wrinkles, or tears and to manufacturer's instructions. Ensure full bond of membrane to substrate.
        3. Apply first layer of hot-rubberized asphalt membrane evenly to a minimum thickness of 2mm (90 mils) to form a continuous monolithic coating over horizontal and vertical surfaces including previously reinforced areas.
        4. Apply fabric reinforcing sheet and firmly press into first layer of hot-rubberized asphalt membrane. Overlap fabric approximately 6mm (1/4") ensuring that a layer of membrane is present between overlaps. Apply second layer of membrane over the fabric to a minimum thickness of 3mm (125 mils) providing a total thickness of 5mm (215 mils).
     2. Protection Course:
        1. SBS modified bitumen membrane:
           1. Roll protection course onto hot-applied rubberized asphalt membrane while still warm and tacky.
           2. Lap protection course 50mm (2") on side laps and 150mm (6") on end laps.
           3. Starting at the low points or drains lay the protection course membrane in full continuous sheets in a shingle pattern. Stager all end laps.
        2. Asphalt Cover Board:
           1. Lay cover board into hot-applied rubberized asphalt membrane while still warm and tacky.
           2. Stagger joints between boards and rows.

SPEC NOTE: As a requirement for meeting certain warranty conditions, the roofing membrane must be tested for leaks. The completed roofing system may be tested by either Electronic Vector Testing (EVT) or flood testing.

SPEC NOTE: Select the same option as above and delete the test inspection which is not required on this project.

* 1. FINAL INSPECTION
     1. Notify [engineer] [architect] [consultant] when sections of work are complete so as to allow for review prior to installing drainage composite, insulation and ballast.
     2. Electronic Vector Testing (EVT) (Alternate to Flood Test):
        1. EVT to be conducted upon the completion of the roofing assembly and all associated terminations prior.
        2. Contact pre-approved test provider several weeks in advance to coordinate schedule.
        3. In the event of a breach of the membrane, repair and retest the system in accordance with project specifications.
        4. Report results of testing to the [Engineer][Architect][Consultant] and submit results with the warranty application to Henry Warranty department.
        5. No other Work is to proceed without prior direction from the [Engineer][Architect][Consultant].
     3. Flood Test:
        1. Conduct flood test upon the completion of the roofing assembly and all associated terminations, as per ASTM D5957.
        2. Provide temporary stops and plugs for the roof drains within the test area.
        3. Flood test with minimum 50mm (2") of water for no less than 24 hours.
        4. In the event of a breach of the membrane, repair, and retest the system for no less than 24 hours.
        5. Remove temporary stops and plugs.
        6. Report results of testing to the [Engineer][Architect][Consultant] and submit results with the warranty application to Henry Warranty department.
        7. No other Work is to proceed without prior direction from the [Engineer][Architect][Consultant].
  2. INSTALLATION - DRAINAGE BOARD
     1. Install drainage board as indicated on the drawings and in accordance with manufacturers written instructions.
     2. Overlap core flange with core flange of adjacent sheet a minimum of 25mm (1") and top layer of filter fabric a minimum of 65mm (2-1/2").
     3. Cut core and fabric to fit tightly around penetrations.
     4. Install drainage board up vertical flashing to the intended finish grade.
  3. INSTALLATION - INSULATION
     1. Install insulation as indicated on the drawings and in accordance with manufacturers written instructions.
     2. Loose lay and tightly butt all insulation boards together with a maximum 10mm (3/8") wide gap between boards and 19mm (3/4") wide gap at projections and penetrations.
     3. Stagger the end joints of the insulation.
     4. Cut the insulation to fit closely to all cants, protrusions and obstructions.
     5. When installing multiple layers of insulation, install the thickest layer first. Install the second layer with joints staggered with the layer below.
  4. INSTALLATION - PAVERS
     1. Installation of pavers to be completed after placement of curb details as indicated on drawings.
     2. Cut pavers to fit irregularly shaped areas and around protrusions as required. Install according to manufacturer's instructions.
     3. Accurately align and place concrete pavers on pedestals to maintain a level upper surface with adjacent units.
  5. OBSERVATION AND VERIFICATION
     1. Prior to overburden installation, final inspection of roofing assembly shall be carried out by the owner's representative, the contractor, or manufacturer as required by warranty. Contact Manufacturer for warranty requirements.
  6. CLEANING AND PROTECTION
     1. Progress Cleaning: Leave work area clean at the end of each work day, 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 shall be responsible for ensuring waste management efforts are practiced.
     3. Check area drains to ensure cleanliness and proper function, and remove debris, equipment and excess material from the site.

END OF SECTION 07 55 56.13