

EFFECTIVE JANUARY 21, 2019 AND SUPERSEDES ALL PREVIOUS VERSIONS.

SPEC NOTE: Henry® 790-11 or 790-11EV Hot Applied Rubberized Asphalt Waterproofing/Roofing System.

This specification is ideally suited for the protection and waterproofing of a plaza deck, Inverted Roof Membrane Assembly (IRMA), or Protected Membrane Roof (PMR).

SPEC NOTE: Henry® 790-11 hot rubberized asphalt waterproofing/roofing system is certified by FM approval when installed per FM approved tested criteria. Buildings requiring a FM approved Henry® 790-11 assembly must refer to the FM RoofNav Assembly Number: 397437-397438-0 for authorized assembly components and utilize the Henry® 790-11 FM specific guide specification.

SPEC NOTE: This guide specification is a reference for recommended installation procedures of the products/assembly described; formatted in accordance with the Construction Specifications Institute (CSI) Manual of Practice. It is the discretion of the project specification author to use the information within as a whole, or in part, to set a minimum standard of performance. Update “[project specific]” notes and coordinate as required. Use of General Contractor/installing Subcontractor identified accordingly; modify as required.

SPEC NOTE: This document includes Henry® Company notes to assist the architect/specification writer. A Henry® Company “SPEC NOTE” will always immediately precede the text to which it is referring. The section serves as a guideline; modify to meet specific project requirements.

SPEC NOTE: Delete “SPEC NOTE” sections in the final copy of the specification.

SPEC NOTE: This spec is for new construction projects located in the continental US. For remedial and construction additions or projects located in Alaska, Hawaii, Puerto Rico, and non-US locations contact Henry® Company technical services at (800) 486-1278.

SPEC NOTE: Contact Henry® Company technical services at (800) 486-1278 for hurricane speed winds or Miami Dade installation requirements.

**SECTION 07 14 13
HOT FLUID-APPLIED RUBBERIZED ASPHALT WATERPROOFING**

PART 1 - GENERAL

1.01. GENERAL REQUIREMENTS

- A. The General Conditions, Supplementary Conditions, Instructions to Bidders, and Division 01-General Requirements shall be read in conjunction with and govern this section.
- B. Read this Specification 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 installing Subcontractor the extent of their Work.

1.02. SUMMARY

- A. This Section includes requirements for supplying labor, materials, tools, and equipment to complete the Work as shown on the Drawings Architectural Division and as specified herein including, but not limited to, the following:
 - 1. Primer
 - 2. Flashing
 - 3. Reinforced Hot Rubberized Asphalt Waterproofing Membrane
 - 4. Protection Course/Separation Sheet
 - 5. Insulation
 - 6. Drainage Composite
 - 7. Filter Fabric
 - 8. Paver Ballast

SPEC NOTE: Coordination of terminations, transitions, and penetrations are pertinent to ensure chemical compatibility and adhesion of adjacent products. Edit the following related sections as required to specify a continuous air and watertight building envelope. Contact manufacturer(s) where products transition from one assembly to another to confirm minimum installation requirements for warranty issuance.

1.03. RELATED REQUIREMENTS

- A. DIVISION 03 – Concrete, Section 03 50 00 – Cast Roof Decks
 - 1. Coordination of this section is necessary to facilitate the successful installation of the waterproofing membrane. Refer to Sections 3.01 Examination and 3.02 Preparation for additional information.
 - 2. Acceptable substrates:
 - a. Form Release Agents: Submit technical data sheet to Henry® Company technical services for formal review.
 - b. Curing compounds: Submit technical data sheet to Henry® Company technical services for formal review.
 - c. Cast-in-Place/Precast Structural Concrete/Composite Deck:
 - 1. Strength/density:
 - a. Minimum 2,500 psi (17 mPa) compressive strength and minimum 115 pcf (1842 kg/m3) density
 - 2. Finish:
 - a. Broom, wood-float, or wood-troweled equivalent finish.
 - 3. Concrete Hydration (Cure):
 - a. Method of Cure: Water cure, wet coverings, paper sheets, plastic sheets or approved liquid curing compound (sodium silicate preferred).
 - b. Duration of Cure/Dry:
 - 1. Recommend 28 days, minimum 14 days, after concrete form removal.
 - d. Lightweight Insulating Concrete:
 - 1. Not an acceptable substrate.
 - e. Lightweight Structural Concrete:
 - 1. Metal pan decks should be venting type.
 - 2. Contact Henry® Company technical services if metal pan deck is not venting type.
 - 3. Strength/density:
 - a. Minimum 2,500 psi (17mPa) compressive strength and minimum 115 pcf (1842 kg/m3) density
 - 4. Finish:
 - a. Broom, wood-float, or wood-troweled equivalent finish.
 - 5. Concrete Hydration (Cure):
 - a. Method of Cure: Water cure, wet coverings, paper sheets, plastic sheets or approved liquid curing compound (sodium silicate preferred).
 - b. Duration of Cure/Dry:
 - 1. Recommend 60 days, minimum 28 days, after concrete form removal.

SPEC NOTE: Metal pan decks should be venting type due to moisture trapping potential. Coordinate metal decking section as required and contact Henry® Company technical services at (800) 486-1278 for further assistance.

- B. DIVISION 05 – Metals, Section 05 30 00 – Metal Decking
 - 1. Acceptable Substrates:
 - a. Metal Deck
 - 1. Vented metal deck
- C. DIVISION 06 – Wood, Plastics, and Composites, Section 06 16 00 – Sheathing
 - 1. Acceptable Substrates:

- a. Sheathing over [metal decking] [steel decking]
 - 1. Gypsum roof board:
 - a. Thickness: 5/8" (15.9 mm) minimum
 - 2. Plywood:
 - a. Thickness: 1/2" (12 mm) minimum
 - b. Tongue and groove joints: required
 - c. Free of chemicals that may affect membrane adhesion.
- D. DIVISION 07 – Flashing and Sheet Metal, Section 07 62 00 – Sheet Metal Flashing and Trim
- E. DIVISION 07 Thermal and Moisture Protection, Section 07 22 16 – Roof Board Insulation
- F. DIVISION 07 Thermal and Moisture Protection, Section 07 92 00 – Joint Sealants
- G. DIVISION 22 Plumbing, Section 22 14 00 – Facility Storm Drainage

SPEC NOTE: Projects not referencing LEED delete Sections “1.03. H” and “1.05.E” as stated below.

- H. DIVISION Project Specific # - LEED Requirements [Section Project Specific #] – Project Specific Title.

1.04. ALTERNATES

- A. Submit requests for alternates in accordance with Section [project specific].
- B. Waterproofing Assemblies must meet the following standards:
 - 1. A single source manufacturer must warrant waterproofing Assembly components.
 - 2. Hot Rubberized Asphalt Waterproofing:
 - a. UL/ULC: Class A Classification for use in Ballasted Systems.
 - b. Meets ASTM D5329; chemically resistant to water, calcium, chloride, salt, mild acid, alkaline solutions, fertilizer, and animal waste.
 - c. CAN/CGSB-37.50-M89, Standard for Asphalt, Rubberized, Hot Applied, for Roofing and Water-proofing
 - d. FM Approval Certification 4470
- C. 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 Waterproofing Assembly Manufacturer has successfully completed projects of similar scope and nature on an annual basis for a minimum of ten (10) years.
 - 3. Waterproofing Assembly Manufacturer’s complete set of technical data sheets for assembly.
- D. 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.
- E. Issued addendums confirm acceptable alternates. Do not submit substitute materials after tender closing.

1.05. REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. ASTM D41M-11: Asphalt Primer used in Roofing, Dampproofing, and Waterproofing.

2. ASTM D92-12: Standard Test Method for Flash and Fire Points by Cleveland Open Cup
 3. ASTM D3407: Standard Test Method for Joint Sealants, Hot Poured, for Concrete and Asphalt Pavements.
 4. ASTM D5329-09: Standard Test Method for Sealants and Fillers, Hot-Applied for Joints and Cracks in Asphaltic and Portland Cement Concrete Pavements.
 5. ASTM E96: Water Vapor Transmission of Materials
- B. Canadian General Standards Board (CGSB):
1. CAN/CGSB-37.50-M89, Standard for Asphalt, Rubberized, Hot Applied, for Roofing and Water-proofing
 2. CAN/CGSB-37.51M90, Application for Hot-Applied Rubberized Asphalt, for Roofing and Waterproofing
 3. CAN/CGSB-37-GP-56M, Membrane, Modified, Bituminous, Prefabricated and Reinforced for Roofing.
 4. CAN/CGSB-37-GP-9MA, Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing
- C. Factory Mutual (FM):
1. Approval Standard for Liquid Applied Roof Assemblies for use in Class 1 and Noncombustible Roof Deck Construction (Class Number 4470)
- D. Underwriters Laboratories (UL):
1. UL/ULC: Class A Classification for use in Ballasted Systems
- E. US Green Building Council (USGBC), Leadership in Energy and Environmental Design (LEED):
1. LEED Reference Guide, Version 4.0, and USGBC Project Calculation Spreadsheet. Web Site <http://www.usgbc.org>.

1.06. ADMINISTRATIVE REQUIREMENTS

- A. Pre-installation meetings:
1. When required, and with prior notice, a Waterproofing Assembly Manufacturer representative will meet with the necessary parties at the jobsite to review and discuss project conditions as it relates to the integrity of the assembly.

SPEC NOTE: Observe Gold Seal Warranted installations as described below. Material and System Warranties do not require installation observations. Delete sections not applicable to project specific conditions.

- B. Installation Observations:
1. Onsite installation observations include the following phases:
 - a. Waterproofing membrane installation start
 - b. Prior to overburden installation

1.07. SUBMITTALS

- A. Provide the following requested information in accordance with Section [project specific] Submittal Procedures.
- B. Action Submittals:
1. Product Data:
 - a. Waterproofing Manufacturer's guide specification
 - b. Waterproofing Manufacturer's complete set of technical data sheets
 - c. Waterproofing Manufacturer's complete set of standard details
 - d. Evidence that the waterproofing assembly meets the following standards:

1. CAN/CGSB-37.50-M89
2. UL/ULC: Class A Classification for use in Ballasted Systems
2. Certificates:
 - a. Product certification stating that assembly components are supplied and warranted by a single source Waterproofing Manufacturer.
 - b. Statement that installing Subcontractor is authorized by Waterproofing Manufacturer to complete Work as specified.
 - c. Copy of Waterproofing Manufacturer's current ISO Certifications
3. Warranty:
 - a. Warranty and verification documents as required by the Waterproofing Manufacturer.
 1. Sample warranty

1.08. QUALITY ASSURANCE

- A. Single Source Responsibility:
 1. Obtain Waterproofing and auxiliary materials including waterproofing, flashings, fabric reinforcement, sealants, adhesives, and overburden from a single Waterproofing Manufacturer regularly engaged in the manufacturing and supply of the specified products.
 2. Verify product compliance with federal, state, and local regulations.
- B. Manufacturer Qualifications:
 1. Waterproofing Manufacturer shall demonstrate qualifications to supply materials of this section by certifying the following:
 - a. Waterproofing Manufacturer must not issue warranties for terms longer than they have been manufacturing and supplying specified products for similar scope of Work.
- C. Installer Qualifications:
 1. Only authorized Subcontractor(s) shall install the waterproofing assembly.
 2. Perform Work in accordance with the Waterproofing Manufacturer's published literature and as specified in this section.
 3. Maintain one (1) copy of the Waterproofing Manufacturer's instructions on site.
 4. Allow the Waterproofing Manufacturer representative site access during installation.
 5. Contact the Waterproofing Manufacturer a minimum of two weeks prior to scheduling a meeting.

SPEC NOTE: Mock-ups establish quality of 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.

1.09. MOCK-UPS

- A. Mock-ups:
 1. Where directed by [engineer] [architect] [consultant] construct mock-ups to verify selections made under submittals and to set quality standards for materials and execution in accordance with Section [project specific].

1.10. DELIVERY, STORAGE, AND HANDLING

- A. Delivery of Materials:
 1. Deliver materials to the jobsite in undamaged and clearly marked containers and/or wrapping indicating the name of the Waterproofing Manufacturer and product.
- B. Storage of Materials:
 1. Store materials as recommended by the Waterproofing Manufacturer and conforming to applicable safety regulatory agencies. Refer to applicable data including, but not limited to, Safety Data Sheets (SDS), Technical Data Sheets (TDS), product labels, and specific instructions for personal protection.

2. Keep solvents away from open flame or excessive heat.
3. Store rolled materials on end.
4. Product requirements may vary. Refer to Waterproofing Manufacturer's published literature.

- C. Handling:
1. Product requirements may vary. Refer to Waterproofing Manufacturer's published literature.

1.11. SITE CONDITIONS

- A. Environmental Requirements:
1. Do not perform Work during rain or inclement weather.
 2. Do not perform Work on frost covered substrates or surfaces that are wet to touch.
 3. Product requirements may vary. Refer to Waterproofing Manufacturer's published literature.
- B. Protection:
1. It is the responsibility of the installing Subcontractor to protect all surfaces not included in scope of Work from damage.
 2. It is the responsibility of the General Contractor to organize and protect installed waterproofing components from damage by other trades.
 - a. Temporary protection:
 1. Protect waterproofing membrane to prevent damage from work of other trades, foreign materials, and exposure to oil or solvents until permanent protection provided.
- C. Complete preparation Work prior to installing the waterproofing assembly.
- D. Ground electrical equipment during operations.

1.12. WARRANTY

- A. Single source warranty:
1. Installing Subcontractor Warranty:
 - a. Installing Subcontractor must warrant the system and installation. Provide material and labor costs for repair for a period of two years from the date of installation completion as a result of any of the following:
 1. Faulty workmanship

 SPEC NOTE: Henry® Company offers three (3) warranty configurations. Select one (1) of the following warranty terms and desired warranty durations. Delete sections not applicable to project specific conditions

2. Manufacturer's single source warranty:
 - a. Material warranty:
 1. Installing Subcontractor must be an authorized subcontractor.
 2. Manufacturer must warrant the material against product defect for a period of [five (5)] [ten (10)] [fifteen (15)] [twenty (20)] years from date of purchase.
 - b. System warranty:
 1. Installing Subcontractor must be an authorized subcontractor.
 2. Manufacturer must warrant the system and installation. Provide material and labor costs for repair for a period of [five (5)] [ten (10)] [fifteen (15)] [twenty (20)] years from the date of installation completion as a result of any of the following:
 - a. Manufacturing product defect

3. Insulation shall retain a minimum of eighty percent (80%) of its thermal value for the duration of the insulation warranty.
 4. Pavers shall not split, crack or disintegrate prematurely due to freeze-thaw cycling for the duration of the paver warranty.
- c. Gold Seal warranty:
1. Installing Subcontractor must be a Gold Seal Authorized Subcontractor.
 2. Manufacturer must warrant the system and installation. Provide material and labor costs for repair for a period of [five (5)] [ten (10)] [fifteen (15)] [twenty (20)] years from the date of installation completion as a result of any of the following:
 - a. Manufacturing product defect
 - b. Faulty workmanship
 3. Insulation shall retain a minimum of eighty percent (80%) of its thermal value for the duration of the insulation warranty.
 4. Pavers shall not split, crack or disintegrate prematurely due to freeze-thaw cycling for the duration of the paver warranty.

PART 2 - PRODUCTS

2.01. MANUFACTURERS

- A. Acceptable Manufacturers:
1. Henry Company
 999 N. Pacific Coast Highway, Suite 800
 El Segundo, CA 90245
 (800) 486-1278
www.henry.com

2.02. MATERIALS

- A. Obtain waterproofing and auxiliary materials as a single-source from the Waterproofing Manufacturer to ensure compatibility, warranty, and compliance with the following requirements:
1. Hot applied rubberized asphalt waterproofing/roofing assembly; having the following properties:
 - a. Complies with CAN/CGSB-37.50
 - b. Meets ASTM D5329; chemically resistant to water, calcium, chloride, salt, mild acid, alkaline solutions, fertilizer, and animal waste.
 - c. FM Approval Certification 4470

SPEC NOTE: Henry® Company supplies two types of hot rubberized asphalt. Warranty duration and performance characteristics remain constant for both 790-11 and 790-11EV, however Henry® 790-11EV is comprised of recycled content as listed in the product description below. Delete sections not applicable to project specific conditions.

- B. Primary Assembly Products:
1. Hot Applied Rubberized Asphalt Waterproofing/Roofing Membrane; choose from the following:
 - a. Hot applied, rubberized asphalt composed of a specially selected blend of refined asphalts, synthetic rubber and mineral stabilizers to promote adhesion, improve low temperature flexibility, and provide a monolithic fully bonded roofing and waterproofing membrane; having the following typical properties:
 1. Basis of Design: Henry® 790-11 EV Environmental Grade Hot Applied Rubberized Asphalt Waterproofing/Roofing Membrane
 2. Complies with CAN/CGSB-37.50
 3. Recycled Content: 25%
 4. Chemical Resistance:

- a. Resists water, calcium chloride, salt, mild acids, alkaline solutions, fertilizer, and animal waste
- b. Non-resistant to oil, grease, or solvents
5. Solids Content: 100%
6. Flash Point (Open cup): 555 degrees F (291 degrees C)
7. Flow (1/8" film, 75 degree angle, 5 hours @ 140 degrees F): No Flow
8. Toughness (CAN/CGSB-37.50): 16.0J
9. Ratio of Toughness to Peak Load (CAN/CGSB-37.50): 0.05
10. Water absorption (CAN/CGSB-37.50): +0.10 g
11. Low Temperature Flexibility and Adhesion @ Minus 13°F (CAN/CGSB-37.50):
 - a. No cracking
 - b. No loss of adhesion
 - c. No delamination
12. Heat Stability for 5 hours @ 390°F (CAN/CGSB-37.50):
 - a. No loss of adhesion
 - b. Meets Flow, Penetration
13. Crack Bridging Capability:
 - a. No cracking
 - b. No splitting
14. Viscosity @ 390 degrees F (CAN/CGSB-37.50): Low temperature flexibility
15. Resistance to Hydrostatic Pressure
16. Volatile Organic Content (VOC) (ASTM D3960/EPA Method 24): 0 grams/liter
17. Water Vapor Permeability (ASTM E96 Procedure E): 0.016 perms
- b. Hot applied, rubberized asphalt composed of a specially selected blend of refined asphalts, synthetic rubber and mineral stabilizers to promote adhesion, improve low temperature flexibility, and provide a monolithic fully bonded roofing and waterproofing membrane; having the following typical properties:
 1. Basis of Design: Henry® 790-11 Hot Applied Rubberized Asphalt Waterproofing/Roofing Membrane
 2. Complies with CAN/CGSB-37.50
 3. Chemical Resistance:
 - a. Resists water, calcium chloride, salt, mild acids, alkaline solutions, fertilizer, and animal waste
 - b. Non-resistant to oil, grease, or solvents
 4. Solids Content: 100%
 5. Flash Point (Open cup): 555 degrees F (291 degrees C)
 6. Flow (1/8" film, 75 degree angle, 5 hours @ 140 degrees F): No Flow
 7. Toughness (CAN/CGSB-37.50): 16.0J
 8. Ratio of Toughness to Peak Load (CAN/CGSB-37.50): 0.05
 9. Water absorption (CAN/CGSB-37.50): +0.10 g
 10. Low Temperature Flexibility and Adhesion @ Minus 13°F (CAN/CGSB-37.50):
 - a. No cracking
 - b. No loss of adhesion
 - c. No delamination
 11. Heat Stability for 5 hours @ 390°F (CAN/CGSB-37.50):
 - a. No loss of adhesion
 - b. Meets Flow, Penetration
 12. Crack Bridging Capability:
 - a. No cracking
 - b. No splitting
 13. Viscosity @ 390 degrees F (CAN/CGSB-37.50): Low temperature flexibility
 14. Resistance to Hydrostatic Pressure
 15. Volatile Organic Content (VOC) (ASTM D3960/EPA Method 24): 0 grams/liter
 16. Water Vapor Permeability (ASTM E96 Procedure E): 0.016 perms

SPEC NOTE: Henry® Company supplies two types of primer for the hot rubberized asphalt waterproofing system. Henry® 910 Asphalt Primer achieves significantly improved adhesion; however, Henry® 930 Polymer Modified

Adhesive is required in OTC States for VOC compliance. Delete sections not applicable to project specific conditions.

2. Primer; choose from the following:
 - a. Solvent based synthetic rubber adhesive, where VOC compliant, for priming surfaces prior to hot rubberized asphalt application to assure substrate bond:
 1. Basis of Design: Henry® 930-18 Polymer Modified Adhesive
 - b. Thin penetrating solution of selected asphalt base in a petroleum solvent for priming surfaces prior to hot rubberized asphalt application to assure substrate bond:
 1. Basis of Design: Henry® 910-01 Asphalt Primer
3. Polyester fabric reinforcement:
 - a. Polyester Fabric unsaturated spun bonded polyester mat reinforcement sheet:
 1. Basis of Design: Henry® Polyester Fabric

SPEC NOTE: Henry® Company offers flashing membrane options for exposed and non-exposed installations. Henry® Company recommends the use of Henry® 990-25 Henry® ModifiedPLUS® NP180, or Pumadeq™ System flashings in place of standard neoprene sheets. Delete sections not applicable to project specific conditions.

4. Flashing membranes; choose from the following:
 - a. Torch grade flashing; choose from the following:
 1. SBS modified bitumen non-woven polyester reinforced granulated cap sheet with a thermofusible poly lower surface for torch applied installation to substrate specifically designed for indefinite UV exposure:
 - a. Basis of Design: Henry® ModifiedPLUS® NP180gT4
 2. SBS modified bitumen with a sanded upper surface to receive liquid applied membranes and a thermofusible lower surface for torch applied installation:
 - a. Basis of Design: Henry® ModifiedPLUS® NP180s/p
 - b. Mop grade flashing; choose from the following:
 1. SBS modified bitumen non-woven polyester reinforced granulated cap sheet with a sanded lower surface for liquid applied membrane installation to substrate specifically designed for indefinite UV exposure:
 - a. Basis of Design: Henry® ModifiedPLUS® NP180gM4
 2. SBS modified bitumen non-woven polyester reinforced membrane with a sanded upper and lower surface for liquid applied membrane installation to substrate not intended for indefinite UV exposure:
 - a. Basis of Design: Henry® ModifiedPLUS® NP180s/s
 3. Butyl and EPDM polymer combination flexible flashing membrane specifically designed for enhanced elongation:
 - a. Basis of Design: Henry® 990-25 Elastomeric Flashing Sheet Unreinforced
 4. Uncured neoprene flexible flashing membrane specifically designed for enhanced elongation:
 - a. Basis of Design: Henry® Neoflash Uncured Neoprene
 - c. Liquid applied flashing:
 1. Polyurethane modified methyl methacrylate (PUMA) reinforced liquid flashing:
 - a. Basis of Design: Henry® Pumadeq™ System
5. Protection course/separation sheet:
 - a. SBS modified bitumen glass reinforced membrane with a sanded upper and lower surface for liquid-applied membrane installation not intended for indefinite UV exposure:
 1. Basis of Design: Henry® ModifiedPLUS® G100s/s
6. Sealant; choose from the following:
 - a. A one part moisture cure premium silyl-terminated polyether polymer with low VOC and odor providing excellent weathering resistance and flexibility:
 1. Basis of Design: Henry® 925 BES Sealant
 - b. Polymer modified sealing compound used in concealed applications:

1. Basis of Design: Polybitume 570-05 Polymer Modified Sealing Compound
7. Insulation:
 - a. Extruded polystyrene rigid board insulation supplied by Henry® Company:
 1. Acceptable Manufacturers:
 - a. DOW
 - b. Owens Corning
 2. Minimum thermal resistance (R-Value): Project specific Minimum R-Value
 3. Cellular Polystyrene Thermal Insulation (ASTM C-578): [Type VI], [Type VII]
 4. Compressive Strength: [40], [60], [100] psi.
 5. Water Absorption (ASTM C272): 0.1%

SPEC NOTE: Henry® Company offers a variety of drainage composites. Drainage composite physical properties vary. Refer to product specific technical data sheet for further information.

8. Drainage Composite:
 - a. 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: Henry® [DB200] [DB500] [DB350] [D650]
9. Filter Fabric:
 - a. Non-woven biodegradable geotextile fabric made up of polypropylene fibers and resistance to most soil chemicals, acids, and alkali with a pH range of 3 to 12:
 1. Basis of Design: Henry® Filter Fabric N04
10. Paver ballast:
 - a. Paver and pedestal assembly supplied by Henry® Company; choose from the following:
 1. Acceptable Manufacturers:
 - a. Bison
 - b. Hanover
 - c. T-Clear
 - d. Wausau
 - e. Westile

PART 3 - EXECUTION

3.01. EXAMINATION

- A. It is the installing Subcontractor's responsibility to verify the substrate is dry and in accordance with Section 1.03 Related Requirements prior to installation of waterproofing. Commencement of the Work or any parts thereof, indicates installer acceptance of the substrate.
 1. Verify substrates are in accordance with Waterproofing Manufacturer's published literature and as specified in this Section prior to installation.
 2. Substrates must be continuous and secured.
 3. Fill spalled areas with appropriate repair mortar to provide an even plane.
 4. Remove curing compounds or foreign matter detrimental to the adhesion.
- B. The installing Subcontractor must verify the following:
 1. Moisture detection survey:
 - a. Visual inspection
 - b. ASTM D4263 - Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method
 2. Adhesion/Pull Test:
 - a. Complete a waterproofing adhesion test in accordance with Waterproofing Manufacturer's published literature prior to installation of waterproofing assembly.

- C. Do not apply waterproofing assembly components until substrate and environmental conditions are in accordance with Waterproofing Manufacturer's product specific TDS, and as specified in this Section.

3.02. PREPARATION

- A. Surfaces must be sound, dry, clean, and free of oil, grease, dirt, excess mortar, frost, laitance, loose and flaking particles, or other contaminants.
- B. Waterproofing Membrane Preparation:
 - 1. Heat waterproofing membrane in a mechanically agitating melter specifically designed for the preparation of hot rubberized asphalt membranes to a consistent temperature:
 - a. Heating temperature: 356 °F (180 °C) to 392 °F (200 °C)

3.03. INSTALLATION

- A. Verify substrate is ready to receive the waterproofing assembly in accordance with the Waterproofing Manufacturer's TDS and guide specification.
- B. Air and substrate temperature limitations:
 - 1. None
- C. Primer:
 - 1. Apply primer in accordance with Waterproofing Manufacturer's TDS.
 - 2. Do not over spray primer; excessive and/or ponding primer is not recommended.
- D. Detailing/Flashing:
 - 1. Install detailing and flashings per Waterproofing Manufacturer's details.
 - 2. Install prefabricated expansion joint assemblies prior to installation of waterproofing.
 - 3. Set drains at proper deck height and do not impede drainage.
 - 4. Secure flashing at drain with an integral clamping ring.
- E. Installation of Waterproofing Assembly:
 - 1. Install one layer of waterproofing membrane at ninety (90) mils minimum to form a continuous monolithic membrane over horizontal and vertical surfaces.
 - 2. Fully embed polyester fabric into waterproofing membrane.
 - 3. Coat side and end laps of embedded polyester fabric with waterproofing membrane. Overlap of dry polyester fabric is not acceptable.
 - 4. Overlap polyester fabric a minimum of one-quarter (1/4) inch.
 - 5. Apply second layer of waterproofing membrane at one-hundred twenty-five (125) mils minimum to form a continuous monolithic membrane over previously coated areas.
 - 6. Total reinforced waterproofing membrane thickness shall be two-hundred and fifteen (215) mils minimum.
- F. Installation of Protection Course:
 - 1. Install protection course in a shingle pattern starting at the low point(s) or drain location(s).
 - 2. Install protection course while waterproofing membrane is partially cured to a warm and tacky consistency.
 - 3. Install protection course in full continuous sheets.
 - 4. Overlap protection course dry adjoining edges approximately two (2) inches.
- G. Waterproofing Integrity Test; choose from the following:
 - 1. Electronic Leak Detection (Alternate to Flood Test):
 - a. Conduct electronic leak detection upon waterproofing assembly completion and prior to overburden placement.
 - b. Contact pre-approved test provider several weeks in advance to coordinate schedule.
 - c. In the event of a breach of the membrane, repair and retest the system in accordance with project specifications.

- d. Report results of testing to the [Architect] [Consultant] and Waterproofing Manufacturer. Submit results with the warranty application.
 - e. No other Work is to proceed without prior direction from the [Architect] [Consultant].
2. Flood Test:
- a. Conduct flood test upon waterproofing assembly completion prior to overburden placement.
 - b. Provide temporary stops and plugs for the roof drain(s) or scupper(s) within the test area.
 - c. Flood test with a minimum of two (2) inches of water for no less than twenty-four (24) hours.
 - d. In the event of a breach of the membrane, repair, and retest the system for no less than twenty-four (24) hours.
 - e. Remove temporary stops and plugs.
 - f. Report results of testing to the [Architect] [Consultant] and Waterproofing Manufacturer. Submit results with the warranty application.
 - g. No other Work is to proceed without prior direction from the [Architect] [Consultant].
- H. Installation of Insulation:
- 1. Refer to Insulation Manufacturer's published literature for a complete guide to required installation practices and exposure limitations.
 - 2. Loose lay insulation in full continuous sheets completely covering the field membrane to provide a continuous thermal resistance layer:
 - a. Stagger and firmly abut adjacent insulation.
 - b. Stagger board joints between layers.
 - 3. Cut insulation to fit around penetrations and drain(s).
 - 4. Provide temporary ballasting until installing permanent covering material.
- I. Installation of Drainage Composite:
- 1. Loose lay drainage composite in full continuous sheets completely covering the membrane to promote water drainage.
 - 2. Abut adjacent drainage composite panels overlapping the fabric approximately one (1) inch.
 - 3. Cut drainage composite to fit around penetrations and drain(s).
 - 4. Provide temporary ballasting until installing permanent covering material.
- J. Installation of Filter Fabric:
- 1. Install filter fabric in a shingle pattern starting at the low point(s) or drain location(s).
 - 2. Loose lay filter fabric in full continuous sheets completely covering the field membrane and all vertical waterproofed surfaces to promote debris obstruction.
 - 3. Overlap the filter fabric adjoining edges approximately six (6) inches.
 - 4. Provide temporary ballasting until installing permanent covering material.
- K. Installation of Paver Ballast:
- 1. Install paver ballast in accordance with Paver Ballast Manufacturer's published literature.
 - 2. Install paver ballast ensuring pavers are accurately aligned and leveled with upper surface of pavers in plane with adjacent units.
 - 3. Cut paver ballast to fit irregularly shaped areas and around protrusions.
 - 4. Refer to project specific drawings for specified location and layout.

3.04. FIELD QUALITY CONTROL

- A. Final Observation and Verification:
- 1. [Architect] [Consultant] [General Contractor] and Waterproofing Manufacturer to complete final inspection of waterproofing assembly as required by warranty.
 - 2. Contact Waterproofing Manufacturer for warranty issuance requirements.

3.05. CLEANING

- A. As the Work proceeds, and upon completion, promptly clean up and remove from the premises all rubbish and surplus materials resulting from the foregoing Work.
- B. Clean soiled surfaces, spatters, and damage caused by Work of this Section.
- C. Check area to ensure cleanliness and remove debris, equipment, and excess material from the site.

END OF SECTION