

SECTION 07 14 13

HOT, FLUID-APPLIED, RUBBERIZED-ASPHALT WATERPROOFING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Surface preparation, supply, and installation of reinforced, hot, fluid-applied, rubberized-asphalt waterproofing system, including primers and flashings, protection course materials, drainage boards, filter fabric, and insulation.
- B. Related Sections:
 - 1. Section 07 60 00 - Flashing and Sheet Metal
 - 2. Section 07 95 10 - Sealants

1.2 REFERENCES

- A. Definitions:
 - 1. ASTM D1079 for standard terminology.
- B. Reference Standards: Standards latest edition of date of Specification.
 - 1. American Concrete Institute (ACI):
 - a. 301: Specifications for Structural Concrete.
 - 2. ASTM International:
 - a. C578: Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
 - b. D41/D41M: Standard Specification for Asphalt Primer Used in Roofing, Damproofing, and Waterproofing.
 - c. D92: Standard Test Method for Flash and Fire Points by Cleveland Open Cup Tester.
 - d. D412: Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers - Tension.
 - e. D624: Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
 - f. D1079: Standard Terminology Relating to Roofing and Waterproofing.
 - g. D1621: Standard Test Method for Compressive Properties of Rigid Cellular Plastics.
 - h. D2137: Standard Test Methods for Rubber Property - Brittleness Point of Flexible Polymers and Coated Fabrics.
 - i. D4258: Standard Practice for Surface Cleaning Concrete for Coatings.
 - j. D4259: Standard Practice for Abrading Concrete.
 - k. D4263: Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
 - l. D4491: Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
 - m. D4632: Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
 - n. D4716: Test Method for determining the (In-plane) Flow Rate per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head.
 - o. D4751: Standard Test Method for Determining Apparent Opening Size of a Geotextile.
 - p. D4833: Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products.

- q. D5295: Standard Guide for Preparation of Concrete Surfaces for Adhered (Bonded) Membrane Waterproofing Systems.
- r. D5957: Standard Guide for Flood Testing Horizontal Waterproofing Installations.
- s. E96: Standard Test Methods for Water Vapor Transmission of Materials.
- 3. Canadian Government Specification Board (CAN/CGSB):
 - a. 37.50: Hot-Applied, Rubberized Asphalt for Roofing and Waterproofing (withdrawn January 2005).
- 4. International Concrete Repair Institute (ICRI):
 - a. 310.2: Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays.

1.3 SUBMITTALS

- A. Product Data: Waterproofing manufacturer's literature including written instructions for evaluating, preparing, and treating substrate; technical data including tested physical and performance properties; and application instructions. Include VOC content of components.
- B. Shop Drawings: Plans showing locations and the extent of waterproofing specific details for this project. Submit plans and details to waterproofing manufacturer for review and approval prior to submitting to Architect.
- C. Samples:
 - 1. Hot, fluid-applied, rubberized-asphalt, three cured samples
 - 2. Reinforcing sheet, three 8" x 10" pieces
 - 3. Neoprene flashing sheet, three 8" x 10" pieces
 - 4. Protection layer, three 8" x 10" pieces
- D. Product Test Reports: From qualified independent testing agency indicating and interpreting test results of waterproofing for compliance with requirements, based on comprehensive testing of current waterproofing formulations.
- E. Field Quality Control: Reports for site visits of waterproofing manufacturer's representative.
- F. Waterproofing Installer Qualifications:
 - 1. Certification signed by waterproofing manufacturer, certifying that Installer complies with manufacturer's requirements to install specified, warranted, waterproofing system.
 - 2. Evidence that Installer's existing company has minimum 5 years of continuous experience in similar waterproofing work; list of at least 5 representative, successfully-completed projects of similar scope and size.
- G. Sample Warranties: Copies of waterproofing manufacturer's warranty, Waterproofing Installer's warranty, and Contractor's warranty, all stating obligations, remedies, limitations, and exclusions. Submitted with Bid.
- H. Prior to installation of waterproofing system, letter from waterproofing manufacturer stating approval of use of waterproofing system on Project and eligibility for manufacturer's warranty, based on review of:
 - 1. Manufacturer's Project Registration Form, with information filled out completely and accurately, including deviations from Specification.
 - 2. Complete set of drawings of waterproofing system installation showing substrate limits, outline, dimensions, transitions, and types and locations of penetrations.
 - 3. Atypical or special condition details which are to be used.

- I. Following completion of Work,
 1. Waterproofing manufacturer's warranty inspection reports.
 2. Completed joint and several warranty from waterproofing manufacturer and Waterproofing Installer.
 3. Completed warranty from Waterproofing Installer.
 4. Completed warranty from Contractor.

1.4 QUALITY ASSURANCE

- A. Waterproofing Installer Qualifications: Experienced firm that has successfully completed waterproofing work similar in material, design, and extent to that indicated for Project; that is approved, authorized, or licensed by waterproofing manufacturer to install waterproofing; and that is eligible to receive waterproofing manufacturer's warranty. Must have successful installations of specified materials in local area in use for minimum of 5 years.
 1. Employ foreman trained by waterproofing manufacturer and with minimum 5 years of experience as foreman on similar projects, who is fluent in English, to be on Site at all times during Work. Do not change foremen during course of Project except for reasons beyond control of Installer; inform Architect/Engineer in advance of any changes.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle materials according to manufacturer's recommendations and in such manner as to prevent damage to materials and structure.
- B. Deliver materials to Site in original containers with seals unbroken, labeled with manufacturer's name, product brand name and type, date of manufacture, lot number, and directions for storing and mixing with other components.
- C. Keep materials dry and do not allow materials to be exposed to moisture during transportation, storage, handling, and installation. Reject and remove from Site new materials which exhibit evidence of moisture during application, or have been exposed to moisture.
- D. Store materials in original, undamaged containers in clean, dry, protected location on raised platforms with weather-protective coverings, within temperature range required by waterproofing manufacturer. Protect stored materials from direct sunlight. Manufacturer's standard packaging and covering is not considered adequate weather protection.
- E. Limit stored materials on structures to safe loading capacity of structure at time materials are stored, and to avoid permanent deck deflection.
- F. Conspicuously mark damaged or opened containers or containers with contaminated materials, and remove from Site as soon as possible.
- G. Remove and replace materials that cannot be applied within stated shelf life.

1.6 PROJECT CONDITIONS

- A. Protect existing waterproofing at areas adjacent to work areas from damage from construction activities. Repair damage to existing waterproofing from construction activities that result in leakage.
- B. Ensure that drains are operational at end of each workday or if precipitation is forecast.

- C. Environmental Limitations: Apply waterproofing when existing and forecast weather conditions permit waterproofing to be installed according to waterproofing manufacturer's written instructions and warranty requirements.
 - 1. Apply when substrate and ambient temperatures are above 0 degrees F, or within range recommended by waterproofing manufacturer.
 - 2. Do not apply to damp or wet substrate.
- D. Handle and install materials in strict accordance with safety requirements required by waterproofing manufacturer, Material Safety Data Sheets, and local, state, and federal rules and regulations. Maintain Material Safety Data Sheets with materials in storage area and available for ready reference on Site.
- E. Maintain adequate ventilation during application and curing of waterproofing materials.
 - 1. Locate kettles away from flammable materials and mechanical air intake systems. Observe fire, safety, and pollution regulations of governing authorities.
 - 2. Adhesives contain petroleum distillates and are extremely flammable. Do not breathe vapors or use near open fire. Do not use in confined areas without adequate ventilation. Consult container and packaging labels and Material Data Safety Sheets for specific safety information.

1.7 WARRANTY

- A. Joint and Several Warranty from Manufacturer and Waterproofing Installer:
 - 1. Written warranty signed by waterproofing manufacturer and Waterproofing Installer, including:
 - a. Repair or replace waterproofing or sheet flashings that do not comply with requirements; that do not remain watertight; that fail in adhesion, cohesion, or general durability; or that deteriorate in manner not clearly specified by submitted waterproofing manufacturer's data as inherent quality of material for application indicated.
 - b. Removal and reinstallation of protection board, drainage panels, and insulation. Warranty includes replacing materials as necessary.
 - c. Warranty does not include removal or reinstallation of concrete pavement.
 - 2. Warranty Period: 10 years after Substantial Completion date.
- B. Waterproofing Installer's Warranty:
 - 1. Written warranty signed by Waterproofing Installer and Contractor, including:
 - a. Repair or replace waterproofing or sheet flashings that do not comply with requirements; that do not remain watertight; that fail in adhesion, cohesion, or general durability; or that deteriorate in manner not clearly specified by submitted waterproofing manufacturer's data as inherent quality of material for application indicated.
 - b. Removal and reinstallation of protection board, drainage panels, and insulation. Warranty includes replacing materials as necessary.
 - c. Repair or replacement, to satisfaction of Owner, of other work or items which may have been displaced or damaged as consequence of defective work.
 - d. Make immediate emergency repairs within 48 hours of notice of leakage.
 - e. Warranty does not include removal or reinstallation of concrete pavement.
 - 2. Warranty Period: 10 years after Substantial Completion date; 2 years for removal and replacement of overburden.

- C. Contractor Warranty:
 - 1. Written warranty signed by Contractor, including:
 - a. Removal and reinstallation of concrete pavement.
 - b. Repair or replacement, to satisfaction of Owner, other work or items which may have been displaced or damaged as consequence of defective work.
 - c. Make immediate emergency repairs within 48 hours of notice of leakage.
 - 2. Warranty Period: 2 years after Substantial Completion date.

PART 2 PRODUCTS

2.1 HOT, FLUID-APPLIED, RUBBERIZED ASPHALT

- A. Source Limitations: Obtain materials through 1 source from single waterproofing manufacturer, or from sources approved by waterproofing manufacturer.
- B. General: single-component, 100-percent-solids, hot, fluid-applied, rubberized asphalt; with following properties measured per applicable test methods in CAN/CGSB-37.50 (withdrawn January 2005) or as otherwise noted.
 - 1. Flash Point: ASTM D92 - 500 degrees F.
 - 2. Penetration, 0.1 mm (0.004 inches): 110 mm (4.3 inches) maximum at 25 degrees C (77 degrees F) and 200 mm (7.9 inches) maximum at 50 degrees C (122 degrees F).
 - 3. Flow: 3 mm (0.1 inches) maximum at 60 degrees C (140 degrees F).
 - 4. Toughness: 5.5 Joules (4.1 foot-pounds) minimum.
 - 5. Ratio of Toughness to Peak Load: 0.040 minimum.
 - 6. Adhesion Rating: Pass.
 - 7. Water Vapor Permeability: ASTM E96, Procedure E - 1.7 ng/Pa x second x sq. m (2.4 x 10-12 pounds/ (pounds per square inch) x second x square foot) maximum.
 - 8. Water Absorption: 0.35 g (0.8 pounds) maximum mass gain or 0.18 g (0.4 pounds) maximum mass loss.
 - 9. Low Temperature Flexibility: No cracking, delamination, or adhesion loss.
 - 10. Crack Bridging Capability: No cracking, splitting, or adhesion loss.
 - 11. Heat Stability: Comply with requirements for penetration, flow, low temperature flexibility, and viscosity when heated for 5 hours at waterproofing manufacturer's recommended application temperature.
 - 12. Viscosity Test: 2 to 15 seconds.
 - 13. Minimum thickness: 215 mils.
- C. Use one of following products or approved equal:
 - 1. Monolithic Membrane 6125 manufactured by American Hydrotech, Inc.
 - 2. Ram-Tough 250 manufactured by Barrett Company.
 - 3. CCW 500 Hot Rubberized-Asphalt by Carlisle.

2.2 AUXILIARY MATERIALS

- A. General: Furnish auxiliary materials recommended by waterproofing manufacturer for intended use and compatible with hot, fluid-applied, rubberized asphalt.
 - 1. Furnish liquid-type auxiliary materials that comply with VOC limits of authorities having jurisdiction.
- B. Primer: ASTM D41/D41M, asphaltic primer.

- C. Elastomeric Flashing Sheet: 50 mil minimum, non-staining, uncured sheet neoprene.
 - 1. Properties.
 - a. Tensile Strength: ASTM D412, Die C - 1400 pounds per square inch minimum.
 - b. Elongation: ASTM D412 - 300 percent minimum.
 - c. Tear Resistance: ASTM D 624, Die C - 125 pounds per square inch minimum.
 - d. Brittleness: ASTM D2137 - does not break at minus 30 degrees F.
 - 2. Splicing Cement (used to bond elastomeric flashing sheets together): As recommended by waterproofing manufacturer for type of elastomeric flashing sheet.
 - 3. Lap Sealant (used to seal edges of elastomeric flashing sheet splices): As recommended by waterproofing manufacturer for type of elastomeric flashing sheet.
 - 4. Bonding Adhesive (used to bond elastomeric flashing sheets to an approved substrate: As recommended by waterproofing manufacturer for type of flashing sheet.
- D. Reinforcing Fabric: Waterproofing manufacturer's recommended spun-bonded polyester fabric.
- E. Protection (Cap) Sheet: Flexible base sheet comprised of fiberglass-reinforced, smooth surfaced, SBS-modified bitumen.
- F. Sealants and Accessories: Waterproofing membrane manufacturer's recommended sealants and accessories.

2.3 DRAINAGE PANELS

- A. Molded-Sheet Drainage Panel: Prefabricated, composite drainage panels, manufactured with permeable, geotextile facing laminated to dimpled-plastic-sheet drainage core.
 - 1. Drainage Core: Three-dimensional, non-biodegradable, molded-plastic-sheet material designed to effectively drain water under backfill pressure.
 - 2. Compressive Strength: ASTM D 1621 - 15,000 pounds per square foot, minimum.
 - 3. Approved by waterproofing manufacturer as being compatible with their system to provide adequate drainage.
 - 4. Flow Rate: ASTM D4716 - 18 gallons per minute per foot, minimum, at hydraulic gradient of 1.0 and compressive stress of 25 pounds per square inch.

2.4 PROTECTION COURSE

- A. Semi-rigid sheets of fiberglass or mineral-reinforced-asphaltic core, pressure laminated between 2 asphalt-saturated fibrous liners.
 - 1. Nominal Thickness:
 - a. For horizontal applications: 1/4 inch.
 - b. For vertical applications: 1/8 inch.
 - 2. Protection Course Adhesive: As recommended by waterproofing manufacturer for type of protection course.

2.5 FILTER FABRIC

- A. Non-woven Geotextile: Non-woven needle-punched geotextile, manufactured for subsurface drainage, made from polyolefin or polyester.
 - 1. Grab Strength: ASTM D4632 - 82 pounds minimum.
 - 2. Puncture Strength: ASTM D4833 - 45 pounds minimum.
 - 3. Elongation: ASTM D4632 - 50 percent minimum.
 - 4. Permittivity: ASTM D4491 - 0.5 per second minimum.
 - 5. Water Flow Rate: ASTM D4491 - 140 gallons per minute per square foot minimum.

6. Apparent Opening Size: ASTM D4751 - No. 70 sieve minimum.

2.6 INSULATION

- A. Board Insulation: ASTM C578; square-edged, extruded-polystyrene, board insulation.
 1. Type VI, 1.8-pounds-per-cubic-foot minimum density and 60-pounds-per-square-inch minimum compressive strength.

2.7 ACCESSORIES

- A. Termination Bars: A666, Type 304 stainless-steel or aluminum; approximately 1-inch wide by 3/16 inch thick; with predrilled holes at 8 inches on center.
- B. Fasteners:
 1. For concrete and masonry substrates:
 - a. Made of corrosion-resistant materials.
 - b. Mushroom-head anchors; 1/4-inch diameter, 1-1/4-inch embedment minimum.
 - c. Use stainless steel Zamac Nailin fasteners manufactured by Power Fastening, Inc., or equal.
 2. For sheet metal substrates:
 - a. Made of corrosion-resistant materials or coated for corrosion resistance.
 - b. Minimum No. 8-18 by 1-1/4-inch long, self-drilling.
 - c. Use TEK 2 Self-Drilling Fasteners manufactured by ITW Buildex; Dril-Flex screws manufactured by Elco Industries, Inc.; or equal.
 3. For wood substrate:
 - a. Nails: Corrosion-resistant steel; sufficient length to provide 1-1/2-inch minimum embedment into wood substrate.
 - b. Washers: 1 inch diameter minimum; same corrosion-resistant material as nails.
- C. Draw bands: Stainless steel draw band as recommended by waterproofing manufacturer to terminate around round pipes.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions with Waterproofing Installer and waterproofing manufacturer's representative for compliance with requirements and other conditions affecting installation or performance of waterproofing.
 1. Ensure that work done by other trades is complete and ready for waterproofing Work.
 2. Verify that areas and conditions under which waterproofing Work is to be performed permit proper and timely completion of Work.
 3. Notify Architect/Engineer in writing of conditions which may adversely affect installation or performance waterproofing and recommend corrections.
 4. Do not proceed with waterproofing Work until adverse conditions have been corrected and reviewed by Architect/Engineer.
 5. Commencing waterproofing Work constitutes acceptance of Work surfaces and conditions.

3.2 PROTECTION

- A. Take precautions to ensure safety of people, including building users, passers-by, and workmen, and animals, and protection of property, including adjacent building elements, landscaping, and motor vehicles.
- B. Prevent construction debris and other materials from coming into contact with pedestrians, motor vehicles, landscaping, buildings, and other surfaces that could be harmed by such contact.
- C. Protect paving and sidewalk, and adjacent building areas from mechanical damage due to scaffolding and other equipment.
- D. Limit access to Work areas.
- E. Erect temporary protective canopies, as necessary, over walkways and at points of pedestrian and vehicular access that must remain in service during Work.
- F. Comply with waterproofing manufacturer's written instructions for protecting building and other surfaces against damage from exposure to its products.
- G. Cover adjacent surfaces with materials that are proven to resist waterproofing materials.
- H. Assume responsibility for injury to persons or damage to property due to Work, and remedy at no cost to Owner.

3.3 SURFACE PREPARATION

- A. Remove existing waterproofing and other materials to expose substrate.
 - 1. Remove only as much of existing waterproofing as can be prepared and new waterproofing installed in 1 workday, unless provisions are implemented to maintain water tightness in interim.
 - 2. Provide temporary protection as needed if water tightness is compromised.
 - 3. Do not begin removal of existing waterproofing when weather conditions are not conducive to maintaining water tightness or for application of new waterproofing.
- B. Clean and prepare concrete substrate according to waterproofing manufacturer's written instructions and recommendations in ASTM D5295. Provide clean, dust-free, and dry substrate for waterproofing application.
 - 1. Verify that concrete has cured and aged for minimum time period recommended by waterproofing manufacturer.
 - 2. Verify that concrete substrate is sound, clean, dust- free, and acceptably dry and free of moisture.
 - a. Test for moisture on new concrete decks by pouring 1 pint of hot, fluid-applied, rubberized asphalt on deck at start of each day's work and at start of each work area or plane. Do not proceed with waterproofing work if test sample foams or can be easily and cleanly stripped after cooling.
 - b. If necessary, test for moisture vapor emission by plastic sheet method according to ASTM D4263.
 - c. Provide a written note to A/E indicating that the concrete substrate has been inspected and tested, and determined to be acceptable for application of waterproofing membrane.

3. Remove concrete fins and projections and other irregularities which would prevent monolithic, continuous application of waterproofing.
 4. Properly patch substrate defects (such as voids, form tie holes, honeycombing, and cracks) with latex-modified concrete or another material acceptable to waterproofing manufacturer and Architect/Engineer.
 5. Remove grease, oil, asphalt solids, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.
 6. Shotblast or scarify concrete to provide clean surface, free of laitance, dirt, and other loose or foreign material.
 7. Uniformly clean concrete surfaces by abrasive blast, according to ASTM D4259, to expose top surface of fine aggregate and provide sound surface, free of laitance, dirt, and other loose or foreign material. Use self-contained, recirculating, blast-cleaning apparatus. Remove remaining loose material and clean surfaces according to ASTM D4258. Produce surface texture equal to CSP 3 or 4 from ICRI 310.2.
 8. Thoroughly sweep substrate and clean with oil-free compressed air.
- C. Mask off adjoining surfaces not receiving waterproofing to prevent spillage and overspray affecting other construction.
- D. Close off deck drains and other deck penetrations to prevent spillage and migration of waterproofing fluids.
- E. Waterproofing Installer and waterproofing manufacturer's representative shall examine substrate to ensure that it is properly prepared and ready to receive waterproofing. Waterproofing manufacturer's representative shall report in writing to Waterproofing Installer and Architect/Engineer conditions which will adversely affect waterproofing system installation or performance. Do not proceed with waterproofing installation until these conditions have been corrected and reviewed by Architect/Engineer.
- F. Proceed with installation only after unsatisfactory conditions have been corrected. Commencing installation constitutes acceptance of Work surfaces and conditions.

3.4 PRIMER APPLICATION

- A. Apply primer only when weather conditions are conducive to installation of new waterproofing. Do not apply in environmental conditions exceeding recommendations of waterproofing manufacturer.
- B. Apply primer to substrate using hand-held sprayer or short-nap roller, evenly at a rate of 300 to 600 square feet per gallon, depending on surface texture. Primer should "tan" concrete surface, not blacken it.
- C. Allow sufficient time for primer to thoroughly dry prior to waterproofing application. Waterproofing will not bond to primer which has not dried.
- D. Do not spray primer onto previously-installed waterproofing.

3.5 WATERPROOFING PREPARATION

- A. Heat waterproofing material in double-jacketed, oil-bath melter with mechanical agitation, specifically designed for heating of hot, fluid-applied, rubberized-asphalt waterproofing materials.

- B. Heat material until it can be drawn free-flowing at a temperature range between 350 degrees F and 425 degrees F.

3.6 FLASHING INSTALLATION

- A. Prepare and treat substrates to receive waterproofing, including cracks, joints, deck drains, corners, and penetrations according to waterproofing manufacturer's written instructions.
- B. Begin flashing installation only when weather conditions are conducive to installation of materials. Do not apply in environmental conditions exceeding recommendations of waterproofing manufacturer.
- C. Non-moving cracks and joints:
 - 1. Rout and install sealant in joints and cracks in substrate. Remove dust and dirt from surface with blast of oil-free compressed air in general accordance with ASTM D4258.
 - 2. Cracks over 1/16 inch wide: Adhere 6-inch-wide strip of elastomeric uncured neoprene flashing sheet to substrate in 125-mil-thick layer of hot, fluid-applied, rubberized asphalt, centered along crack. Use longest pieces of fabric which are practical based on Site conditions. Cover with waterproofing material.
 - 3. Construction and Control Joints: Adhere 6-inch-wide strip of elastomeric uncured neoprene flashing sheet to substrate in 125-mil-thick layer of hot, fluid-applied, rubberized asphalt, centered along joint. Use longest pieces of fabric which are practical based on Site conditions. Cover with waterproofing material.
 - 4. Deck-to-Wall Transitions: Center 6-inch-wide strip of elastomeric flashing sheet along transition; adhere to horizontal surface in 125-mil-thick layer of hot, fluid-applied, rubberized asphalt; and adhere to vertical surface with bonding adhesive. Use longest pieces of fabric which are practical based on Site conditions. Cover with waterproofing material.
- D. Expansion Joints and Discontinuous Deck-to-Wall and Deck-to-Deck Joints (joint with possible movement): See Drawings for applicable detail or review specific conditions on-site with Architect/Engineer when as-built conditions are exposed on-site.
- E. Bonding Adhesive:
 - 1. Thoroughly mix bonding adhesive before using and frequently while in use.
 - 2. Apply bonding adhesive evenly, without globs or puddles, with a 9-inch-wide, short-nap, paint roller to both flashing and substrate at rate covering approximately 60 square feet per gallon for both surfaces. Do not apply bonding adhesive to lap area.
 - 3. Allow bonding adhesive to dry until it is tacky, but will not slide when pushed with finger or string up from dry finger touch.
 - 4. Roll coated flashing into coated substrate, avoiding wrinkles.
 - 5. Roll bonded flashing immediately after placing sheet into adhesive with metal roller to ensure maximum contact.
 - 6. Install adjoining sheets in same manner, overlapping previous sheet a minimum of 3 inches.
- F. Lap Splices:
 - 1. Fold top sheet of lap back about 12 inches. Remove dirt by wiping both matting surfaces with clean rag. Completely clean splice of dust or other contaminants. Finished surface shall be solid black with no streaks.
 - 2. Thoroughly mix splicing cement before using and frequently while in use.

3. Apply splicing cement using 3-to-4-inch-wide, 1/2-inch-thick paint brush in smooth, even coat without globs or puddles. Apply at rate of approximately 240 linear feet per gallon for a 3-inch-wide seam for both sides. Coat both sides of splice at same time to achieve uniform drying time.
 4. Check splicing cement for proper drying. Splicing cement should not slide when pushed with finger or string up from dry finger touch.
 5. When splice cement is properly dried, roll splice in and smooth it into place with hand pressure, being careful not to stretch or wrinkle flashing.
 6. After assembly, immediately roll perpendicular to seam edge.
 7. Apply lap sealant to seam edges in not less than 2 hours or more than next workday.
- G. Drains: Adhere elastomeric flashing sheet, centered over drain bowl, to substrate in 125-mil-thick layer of hot, fluid-applied, rubberized asphalt.
1. Extend flashing at least 6 inches beyond drain bowl flange onto deck.
 2. If substrate has been cut out and patched to install drain, extend flashing at least 6 inches beyond patch cold joints.
 3. Install clamping ring on drain bowl, making sure that bolts are properly tightened.
 4. Cut out center of flashing in drain bowl.
- H. Penetrations at Pipes, Supports, and Vents: Properly secure penetrations to substrate and flash.
1. Seal flashing directly to penetration. Do not terminate flashing at intermediate element, such as metal flashing, insulation, or surface treatment, which could fail and admit moisture beneath waterproofing.
 2. Enclose flexible penetrations in stable "goose neck" set in waterproofing and secured to substrate. Use field-fabricated pipe seal to flash "goose neck."
 3. Hot pipes: Performance of waterproofing assembly is jeopardized by temperatures greater than 180 degrees F. In such cases, flash to intermediate "cool" sleeve in accordance with a detail acceptable to waterproofing manufacturer.

3.7 WATERPROOFING APPLICATION

- A. Apply rubberized asphalt according to waterproofing manufacturer's written instructions.
1. Begin waterproofing installation only when weather conditions are conducive to installation of materials. Do not apply in environmental conditions exceeding recommendations of waterproofing manufacturer.
 2. Install components of waterproofing system in sequence and in such quantities that entire waterproofing system in Work area is completed by end of day.
- B. Start application with waterproofing manufacturer's representative present.
- C. Apply surface conditioner and prepare waterproofing as described above.
- D. Reinforced Waterproofing: Apply waterproofing to substrates and adjoining surfaces indicated.
1. Spread hot, fluid-applied, rubberized-asphalt to a thickness of 90 mils.
 2. Embed reinforcing fabric, overlapping sheets 2 inches.
 3. Spread another 125-mil-thick layer to provide a uniform, reinforced, seamless waterproofing 215 mils thick.
- E. Apply waterproofing over prepared joints and up wall terminations and vertical surfaces to heights indicated or required by waterproofing manufacturer.

- F. Install protection sheet with 1-inch-overlapped joints over waterproofing while waterproofing is still warm, to ensure that good bond is achieved.
- G. Cure waterproofing according to waterproofing manufacturer's written recommendations, taking care to prevent contamination and damage during application stages and curing.
- H. Do not allow any construction activity on waterproofing until integrity testing is complete and protection course has been installed.
- I. Provide water cut-offs where and when danger of moisture getting under new waterproofing exists. Install water cut-offs at end of each workday and completely remove prior to beginning new waterproofing installation Work on next workday. Use materials and methods in accordance with waterproofing manufacturer's written instructions.
- J. Before installing protection course, perform integrity testing of 100% of waterproofing and repair any defects as noted in quality control section below.

3.8 INSTALLATION OF PROTECTION COURSE, INSULATION, AND FILTER FABRIC

- A. Install protection course with ends butted tightly together, before starting subsequent construction activities.
- B. Install filter fabric in accordance with waterproofing manufacturer's written instructions.
 - 1. Overlap edges at least 12 inches.
 - 2. Install filter fabric so that no joints will exist between sheets parallel to and within 6 feet of perimeter.
 - 3. Extend filter fabric to 3 inches above insulation at perimeter and penetrations.
 - 4. Install filter fabric at other locations shown on Drawings.

3.9 FIELD QUALITY CONTROL

- A. Site Visits by Waterproofing Manufacturer's Representative: Waterproofing manufacturer's representative shall visit Site at following times.
 - 1. At beginning of waterproofing installation to establish standard of quality to be used for remainder of waterproofing Work.
 - 2. Periodically during Work at critical times and as required to meet provisions of waterproofing manufacturer's warranty.
 - 3. Submit written report with observations, field decisions, and request for design changes to Architect/Engineer for each Site visit.
 - 4. Coordinate Site visits with Architect/Engineer.
- B. High Voltage Membrane Integrity Testing: Perform high voltage membrane integrity testing of all horizontal and vertical membrane areas, after completing waterproofing but before overlying construction is placed.
 - 1. All defects to be marked onto the membrane and repaired by the Contractor. The areas marked and repaired are to be tested again until defect is repaired.
- C. Notify Architect/Engineer 48 hours in advance of testing. Architect/Engineer may observe integrity testing.

3.10 CLEANING

- A. At end of each workday, clean Site and Work areas and place rubbish, empty cans, rags, and other discarded materials in appropriate containers.
- B. After completing waterproofing Work:
 - 1. Clean spillage and soiling from adjacent surfaces using cleaning agents and procedures recommended by manufacturer of affected surface. Exercise care to avoid scratching or damage to surfaces.
 - 2. Repair surfaces stained, marred, or otherwise damaged during waterproofing Work.
 - 3. Clean up debris and surplus materials and remove from Site.
- C. Waste Management:
 - 1. Collect surplus waterproofing materials that cannot be reused and deliver to recycling or disposal facility.
 - 2. Treat materials that cannot be reused as hazardous waste and dispose of in appropriate manner.

3.11 PROTECTION

- A. Protect waterproofing from damage and wear during remainder of construction period.
 - 1. Do not permit foot or vehicular traffic on unprotected waterproofing.
 - 2. Do not allow waste products (petroleum, grease, oil, solvents, vegetable oil, mineral oil, animal fat, etc.) to come into contact with waterproofing. Exposure to foreign materials or chemical discharges must be presented to waterproofing manufacturer for evaluation to determine impact on waterproofing performance.
- B. Over service life, do not expose waterproofing or accessories to constant temperature in excess of 180 degrees F (i.e., hot pipes and vents, direct steam venting, etc.).

INSTALLER'S WARRANTY

WHEREAS <Insert name> of <Insert address>, herein called *Waterproofing Installer*, has performed waterproofing and associated work, designated *Work*, on following project:

Owner: <Insert name of Owner.>

Address: <Insert address.>

Building Name/Type: <Insert information.>

Address: <Insert address.>

Area of Work: <Insert information.>

Acceptance Date: <Insert date.>

Warranty Period: 10 years.

Expiration Date: <Insert date.>

AND WHEREAS Waterproofing Installer has contracted, either directly with Owner or indirectly as subcontractor, to warrant said Work against leaks and faulty or defective materials and workmanship for designated Warranty Period.

NOW THEREFORE Waterproofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period it will, at its own cost and expense, make or cause to be made such repairs to or replacement of said Work as are necessary to correct faulty and defective work and as are necessary to maintain said Work in watertight condition, and warrants against following.

1. Components of waterproofing system that do not comply with requirements; that do not remain watertight; that fail in adhesion, cohesion, or general durability; or that deteriorate in manner not clearly specified by submitted waterproofing manufacturer's data as inherent quality of material for application indicated, regardless of whether Work was previously accepted by Owner.

Warranty is made subject to following terms and conditions:

1. Specifically excluded from Warranty is damage to Work due to unusual abuse or neglect. When Work has been damaged by unusual abuse or neglect, Warranty shall be null and void until such damage has been repaired by Waterproofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
2. Waterproofing Installer is responsible for damage to Work covered by Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of Work.
3. Owner will promptly notify Waterproofing Installer of observed, known, or suspected leaks, defects, or deterioration and will afford reasonable opportunity for Waterproofing Installer to inspect Work and to examine evidence of such leaks, defects, or deterioration. Waterproofing Installer shall inspect leak, defect, or deterioration within 7 days of notification.
4. If permanent repair or replacement of warranted condition cannot be made immediately, due to weather conditions, availability of appropriate labor or materials, building occupancy, etc., Waterproofing Installer must make, or cause to be made, immediate temporary repairs to prevent any further damage, deterioration, or unsafe conditions. Permanent repair or replacement of warranted condition shall be scheduled as soon thereafter as practical, and with Owner's consent and approval.
5. If Owner notifies Waterproofing Installer of warranted condition that requires immediate attention to prevent potential injury or damage, and Waterproofing Installer cannot or does not promptly inspect and repair same, either permanently or temporarily, then Owner may make, or cause to be made, such temporary repairs as may be essential and Waterproofing Installer will reimburse Owner for cost of such repairs. Such action will not relieve Waterproofing Installer of its obligation to perform any necessary permanent repairs, and Warranty shall remain in full force and effect for remaining portion of its original term.

6. Waterproofing Installer shall provide equipment, labor, and material required to remedy warranted conditions, including repair or replacement of damage to other work resulting there from, and removal and replacement of other work required to access warranted condition. Additional required work will be at Waterproofing Installer's sole expense for full term of Warranty. Warranty includes removal and replacement of protection board, drainage panels, and insulation.
7. Warranty is recognized to be only Warranty of Waterproofing Installer on said Work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, Warranty shall not operate to relieve Waterproofing Installer of responsibility for performance of original Work according to requirements of Contract Documents, regardless of whether Contract was directly with Owner or with Owner's General Contractor.

IN WITNESS THEREOF, and intending to be legally bound hereby, Waterproofing Installer has caused this document to be executed by undersigned, duly-authorized officer.

(Waterproofing Installer) Corporate Seal:

By: _____
(Signature)

(Name)

(Date)

[_____ Corporate Seal:
(Contractor)

By: _____
(Signature)

(Name)

(Date)]

Subscribed and sworn to before me this ____ day of ____, 20__

Notary Public
My commission expires _____

END OF SECTION