

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Fluid-Applied Waterproofing:
 - 1. Hot-applied rubberized asphalt waterproofing.
 - 2. Cold-applied rubberized asphalt waterproofing.
 - 3. Polyurethane waterproofing.

1.02 RELATED REQUIREMENTS

- A. Section 033000 - Cast-in-Place Concrete: Concrete substrate.
- B. Section 034113 - Precast Concrete Hollow Core Planks: Grouting joints of precast concrete deck surfaces.
- C. Section 042000 - Unit Masonry: Masonry joints prepared to receive flashings.
- D. Section 072100 - Thermal Insulation: Insulation used for protective cover.
- E. Section 076200 - Sheet Metal Flashing and Trim: Metal parapet covers, copings, and counterflashings.

1.03 ABBREVIATIONS

- A. CSPE - Chlorosulfonated Polyethylene.
- B. HDPE - High-Density Polyethylene.
- C. SBS - Styrene-Butadiene-Styrene.

1.04 REFERENCE STANDARDS

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.
- B. ASTM C836/C836M - Standard Specification for High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course; 2015.
- C. ASTM C1306 - Standard Test Method for Hydrostatic Pressure Resistance of a Liquid-Applied Waterproofing Membrane; 2008.
- D. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2016.
- E. ASTM D624 - Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers; 2000 (Reapproved 2012).
- F. ASTM D746 - Standard Test Method for Brittleness Temperature of Plastics and Elastomers by Impact; 2014.
- G. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness; 2015e1.
- H. ASTM D4541 - Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers; 2017.

- I. ASTM D6506 - Standard Specification for Asphalt Based Protection for Below-Grade Waterproofing; 2001 (Reapproved 2009).
- J. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2016.
- K. ASTM E154/E154M - Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover; 2008a, with Editorial Revision (2013).
- L. ICC-ES AC29 - Acceptance Criteria for Cold, Liquid-Applied, Below-Grade, Exterior Dampproofing and Waterproofing Materials; 2011, with Editorial Revision (2014).
- M. NRCA (WM) - The NRCA Waterproofing Manual; 2005.

1.05 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data for membrane, surface conditioner, flexible flashings, joint cover sheet, and joint and crack sealants.
- C. Shop Drawings: Indicate special joint or termination conditions and conditions of interface with other materials.
- D. Certificate: Certify that products meet or exceed specified requirements.
- E. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention, and acceptable installation temperatures.
- F. Warranty:
 - 1. Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
 - 2. Submit installer's certification that installation complies with warranty conditions for the waterproofing membrane.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years documented experience.
- B. Installer Qualifications: Company specializing in installation of fluid-applied waterproofing with minimum five years experience.
- C. Single Source Responsibility for Waterproofing: Provide and install products from single source.

1.07 MOCK-UP

- A. Construct mock-up consisting of 100 sq ft (10 sq m) of horizontal waterproofed panel; to represent finished work including internal and external corners, drainage panel, base flashings, control joints, expansion joints, counterflashings, protective cover, and wall/footing transitions.
- B. Locate where directed.
- C. Mock-up may remain as part of this Work.

1.08 FIELD CONDITIONS

- A. Maintain ambient temperatures above 40 degrees F (5 degrees C) for 24 hours before and during application and until cured.

1.09 WARRANTY

- A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
- B. Contractor shall correct defective Work within a five year period after Date of Substantial Completion; remove and replace materials concealing waterproofing at no cost to Owner.
- C. Provide five year manufacturer warranty for waterproofing failing to resist penetration of water, except where such failures are the result of structural failures of building. Hairline cracking of concrete due to temperature change or shrinkage is not considered a structural failure.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Hot-Applied Rubberized Asphalt Waterproofing:
 - 1. American Hydrotech, Inc; ____: www.hydrotechusa.com.
 - 2. Carlisle Coatings & Waterproofing, Inc; ____: www.carlisleccw.com/sle.
 - 3. Henry Company; 790-11: www.henry.com/sle.
- B. Polyurethane Waterproofing:
 - 1. Carlisle Coatings & Waterproofing, Inc; MiraSEAL TDS: www.carlisleccw.com/sle.
 - 2. Gaco Western; GacoFlex LM-60V: www.gaco.com.
 - 3. BASF Construction Chemicals-Building Systems; ____: www.buildingsystems.basf.com
- C. Cold-Applied Modified-Polymer Elastomeric Waterproofing:
 - 1. Carlisle Coatings & Waterproofing, Inc; Miraseal: www.carlisleccw.com/sle.

2.02 MEMBRANE AND FLASHING MATERIALS

- A. Hot-Applied Rubberized Asphalt Waterproofing: Elasticized rubberized asphaltic compound, hot-applied and quick setting.
 - 1. Suitable for installation over concrete, gypsum board, and plywood substrates.
 - 2. Ultimate Elongation: 500 percent, minimum, measured in accordance with ASTM D412.
 - 3. Water Vapor Permeance: 0.3 perms (1.7 ng/(Pa s sq m)), maximum, measured in accordance with ASTM E96/E96M.
- B. Cold-Applied Rubberized Asphalt Waterproofing: Rubberized asphaltic compound, suitable for installation on concrete and concrete masonry.
 - 1. Cured Thickness: 0.06 inch (1.5 mm), minimum.
 - 2. Complying with ICC-ES AC29; evidence of compliance includes current ICC-ES evaluation report citing ICC-ES AC29.
 - 3. Hydrostatic Pressure Resistance: When tested in accordance with ASTM C1306, at least 50 pounds per square inch (340 kPa) by the rapid test and at least 35 pounds per square inch (240 kPa) by the long term test.
 - 4. Low Temperature Resistance: No cracking, loss of adhesion, splitting or pinholes when tested at minus 15 degrees F (minus 25 degrees C) in accordance with ASTM C836/C836M.
 - 5. Adhesion: No separation when tested in accordance with ASTM C836/C836M.
 - 6. Decay Resistance: No decay when tested in accordance with ASTM E154/E154M.

7. Wet Film Sag Resistance: No sag or sag within plus/minus 5 mils (0.1 mm) when tested in accordance with ASTM C836/C836M.
 8. Water Vapor Permeance: Less than one perm (60 ng/(Pa s sq m)), when tested in accordance with ASTM E96/E96M.
 9. Heat Aging Resistance: No cracking, splitting, or pinholes when tested in accordance with ASTM C836/C836M.
 10. Elongation at Break: 1000 percent, minimum, when tested in accordance with ASTM D412.
- C. Polyurethane Waterproofing: Cold-applied one or two component polyurethane, complying with ASTM C836/C836M.
1. Cured Thickness: 60 mils (1.5 mm), minimum.
 2. Suitable for installation over concrete substrates.
 3. VOC Content: None.
 4. Tensile Strength: 400 psi (2.758 MPa), measured in accordance with ASTM D412.
 5. Ultimate Elongation: 180 percent, measured in accordance with ASTM D412.
 6. Hardness: 30, measured in accordance with ASTM D2240, using Type A durometer.
 7. Permeance: 0.073 perms (4 ng/(Pa s sq m)), measured in accordance with ASTM E96/E96M.
 8. Permeability: 0.01 perm inch (0.8 ng/ (Pa s m)), measured in accordance with ASTM E96/E96M.
 9. Adhesion: greater than 150 psi (1.03 MPa), measured in accordance with ASTM D4541.
 10. Brittleness Temperature: minus 50 degrees F (minus 44 degrees C), measured in accordance with ASTM D746.
 11. Products:
 - a. Carlisle Coatings & Waterproofing, Inc; CCW 703 Liqueal: www.carlisleccw.com/sle.
 - b. Gaco Western; GacoFlex LM-60: www.gaco.com.
 - c. BASF MasterSeal HLM 5000 - High Build System.
- D. Flexible Flashings: Type recommended by membrane manufacturer.
- E. Joint Cover Sheet: 1 inch (25.4 mm) thick elastic sheet material designated for and compatible with membrane.

2.03 ACCESSORIES

- A. Surface Conditioner: cementitious type, compatible with membrane compound; as recommended by membrane manufacturer.
- B. Sealant for Joints and Cracks in Substrate: Type compatible with waterproofing material and as recommended by waterproofing manufacturer.
- C. Protection Board: Provide type capable of preventing damage to waterproofing due to backfilling and construction traffic.
 1. Hardboard, 1/4 inch (6 mm) thick.
- D. Drainage Panel: Drainage layer with geotextile filter fabric on earth side.
 1. Composition: Dimpled polystyrene core; polypropylene filter fabric.
 2. Products:
 - a. CCW Mira-Drain 6000.
- E. Cant Strips: Provide cant strips in size and material recommended by the waterproofing system manufacturer
- F. Counterflashings: Two-piece counterflashing as specified in Section 076200.

- G. Counterflashings: As recommended by membrane and protection board manufacturer.
- H. Reglet Strip Devices: Compatible and matching counterflashing material configured as detailed on the drawings or approved by the architect..

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify substrate surfaces are free of frozen matter, dampness, loose particles, cracks, pits, projections, penetrations, or foreign matter detrimental to adhesion or application of waterproofing system.
- C. Verify that substrate surfaces are smooth, free of honeycomb or pitting, and not detrimental to full contact bond of waterproofing materials.
- D. Verify items that penetrate surfaces to receive waterproofing are securely installed.

3.02 PREPARATION

- A. Protect adjacent surfaces from damage not designated to receive waterproofing.
- B. Clean and prepare surfaces to receive waterproofing in accordance with manufacturer's instructions.
- C. Do not apply waterproofing to surfaces unacceptable to waterproofing manufacturer.
- D. Fill non-moving joints and cracks with a filler compatible with waterproofing materials.
- E. Seal moving cracks with sealant and non-rigid filler, using procedures recommended by sealant and waterproofing manufacturers.
- F. Prepare building expansion joints at locations as indicated on drawings.
- G. Install cant strips at inside corners.

3.03 INSTALLATION

- A. Install waterproofing to specified minimum thickness in accordance with manufacturers instructions and NRCA (WM) applicable requirements.
- B. Apply primer or surface conditioner at a rate recommended by manufacturer, and protect conditioner from rain or frost until dry.
- C. At joints and cracks less than 1/2 inch (13 mm) in width including joints between horizontal and vertical surfaces, apply 12 inch (300 mm) wide strip of joint cover sheet.
- D. At joints from 1/2 inch to 1 inch (12.7 mm to 25.4 mm) in width, loop joint cover sheet down into joint between 1-1/4 inch to 1-3/4 inch (31.8 mm to 44.5 mm), and extend sheet at least 6 inches (152 mm) on either side of expansion joint.
- E. Center joint cover sheet over joints, roll sheet into 1/8 inch (3.2 mm) thick coating of waterproofing material and apply second coat over sheet extending at least 6 inches (152 mm) beyond sheet edges.

- F. Extend membrane over cants and up intersecting surfaces at membrane perimeter minimum 6 inches (150 mm) above horizontal surface for first ply and ____ inches (____ mm) at subsequent plies laid in shingle fashion.
- G. Apply extra thickness of waterproofing material at corners, intersections, and angles.
- H. Flexible Flashings: Seal items watertight that penetrate through waterproofing membrane with flexible flashings.
- I. Seal membrane and flashings to adjoining surfaces.

3.04 INSTALLATION - DRAINAGE PANEL AND PROTECTION BOARD

- A. Immediately after curing, dust membrane with tack-reducing surfacing at rate of approximately 10 lbs/100 sq ft (4 kg/10 sq m).
- B. After membrane has cured, but before it becomes dusty, apply separation sheet. Lap joints to ensure complete coverage.
- C. Place drainage panel directly against membrane, butt joints, place to encourage drainage downward, and scribe and cut boards around projections, penetrations, and interruptions.
- D. Adhere drainage panel to substrate with compatible adhesive.

3.05 FIELD QUALITY CONTROL

- A. Owner will provide testing services in accordance with Section 014500 - QUALITY CONTROL. Contractor shall provide temporary construction and materials for testing.
- B. Upon completion of horizontal membrane installation, dam installation area in preparation for flood testing.
- C. Flood to minimum depth of 1 inch (25 mm) with clean water, and after 48 hours inspect for leaks.
- D. If leaking is found, remove water, repair leaking areas with new waterproofing materials as directed by Architect; repeat flood test, and repair damage to building.
- E. When area is proven watertight, drain water and remove dam.

3.06 PROTECTION

- A. Do not permit traffic over unprotected or uncovered membrane.

END OF SECTION