SECTION 071353 - ELASTOMERIC SHEET WATERPROOFING

Revise this Section by deleting and inserting text to meet Project-specific requirements.

1. GENERAL
	* + 1. RELATED DOCUMENTS

Retain or delete this article in all Sections of Project Manual.

* + - * 1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
			1. SUMMARY
				1. Section Includes:

EPDM rubber sheet waterproofing.

Pedestal-supported plaza-deck pavers.

* + - 1. PREINSTALLATION MEETINGS

Retain "Preinstallation Conference" paragraph below if Work of this Section is extensive or complex enough to justify a conference.

* + - * 1. Preinstallation Conference: Conduct conference at Project site.

Review waterproofing requirements including surface preparation, substrate condition and pretreatment, minimum curing period, forecasted weather conditions, special details and sheet flashings, installation procedures, testing and inspection procedures, and protection and repairs.

* + - 1. SUBMITTALS
				1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
				2. Manufacturer’s installation instructions shall be provided along with product data.
				3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
				4. Product Data: For each type of product.

Include construction details, material descriptions, and tested physical and performance properties of waterproofing.

Include manufacturer's written instructions for evaluating, preparing, and treating substrate.

Include manufacturer’s current written installation instructions.

* + - * 1. Sustainable Design Submittals:

Retain "Shop Drawings" paragraph below if justified by extent or complexity of waterproofing.

* + - * 1. Shop Drawings: Show locations and extent of waterproofing and details of substrate joints and cracks, expansion joints, sheet flashings, penetrations, inside and outside corners, tie-ins with adjoining waterproofing, and other termination conditions.

Retain subparagraph below if using pedestal-supported concrete pavers on plaza decks over waterproofing.

Include setting drawings showing layout, sizes, sections, profiles, and joint details of pedestal-supported concrete pavers.

Retain "Samples" paragraph below for single-stage Samples.

* + - * 1. Samples: For each exposed product and for each color and texture specified, including the following products:

Retain required Samples in subparagraphs below; revise to suit Project.

8-by-8-inch square of waterproofing and flashing sheet.

4-by-4-inch square of drainage panel.

Plaza-deck paver, **[4-by-4-inch square] [full sized]**, in each color and texture required.

Paver pedestal assembly.

* + - * 1. Quality Control Submittals:

Qualification Data: For Installer.

Retain "Field quality-control reports" paragraph below if Contractor is responsible for field quality-control testing and inspecting.

Field quality-control reports.

Sample Warranties: For special warranties.

* + - 1. QUALITY ASSURANCE

Coordinate "Installer Qualifications" paragraph below with qualifications that manufacturer requires of Installer for warranty purposes; verify with manufacturers that installers meeting this requirement are available for Project location.

* + - * 1. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by waterproofing manufacturer.
				2. Benchmark: Build benchmarks to verify selections made under Sample submittals and to set quality standards for installation.

Retain option in first subparagraph below if using pavers.

Build for each typical waterproofing installation including**[ pavers and]** accessories to demonstrate surface preparation, crack and joint treatments, inside and outside corner treatments, and protection.

Size: **[**100 sq. ft. **in area] [As indicated on Drawings]**.

Description: Each type of [wall] [deck] [and] [plaza] <Insert description> installation.

Approval of benchmarks does not constitute approval of deviations from the Contract Documents contained in benchmarks unless Director’s Representative specifically approves such deviations in writing.

Subject to compliance with requirements, approved benchmarks may become part of the completed Work if undisturbed at time of Substantial Completion.

* + - 1. FIELD CONDITIONS
				1. Environmental Limitations: Apply waterproofing within the range of ambient and substrate temperatures recommended in writing by waterproofing manufacturer. Do not apply waterproofing to a damp or wet substrate.

Do not apply waterproofing in snow, rain, fog, or mist.

* + - * 1. Maintain adequate ventilation during preparation and application of waterproofing materials.
			1. WARRANTY

When warranties are required, verify with Director’s Representative's counsel that warranties stated in this article are not less than remedies available to Director’s Representative under applicable local laws. Waterproofing warranties for EPDM sheet waterproofing are limited to materials only. These warranties customarily do not include costs of excavating and exposing the waterproofing membrane or backfilling and installing replacement waterproofing material.

* + - * 1. Manufacturer's Warranty: Manufacturer agrees to furnish replacement waterproofing material for waterproofing that does not comply with requirements or that fails to remain watertight within specified warranty period.

Verify available warranties and warranty periods.

Warranty Period: **[10] [20] <Insert number>** years from date of Substantial Completion.

Retain "Installer's Special Warranty" paragraph below if a separate installer's warranty is required and if this is an accepted practice locally; revise to suit Project. Coordinate requirements of both warranties to clarify responsibilities. If a specific installer's warranty form is required, see low-slope roofing Sections for examples that may be revised for waterproofing and inserted at end of this Section.

* + - * 1. Installer's Special Warranty: Specified form, **[on warranty form at end of this Section, ]**signed by Installer, covering Work of this Section, for warranty period of **[two] <Insert number>** years.

Warranty includes removing and reinstalling protection board, drainage panels, insulation, pedestals, and pavers on plaza decks.

* + - * 1. Warranty Extension: The one year period required by Paragraph 9.8 of the General Conditions is extended to 5 years for the Work of this Section.
1. PRODUCTS

Review products/manufacturers listed below in “Sheet Waterproofing,” “Molded-Sheet Drainage Panels,” “Insulation Drainage Panels,” and “Plaza Deck Pavers.” Products and manufacturers listed are examples/suggestions; review with manufacturers for recommendations and availability.

* + - 1. MANUFACTURERS

Retain applicable products from options in "Source Limitations for Waterproofing System" paragraph below; revise to suit Project.

* + - * 1. Source Limitations for Waterproofing System: Obtain waterproofing materials**[, protection course,] [and] [molded-sheet drainage panels]** from single source from single manufacturer.

Retain "Source Limitations for Plaza-Deck Paving" paragraph below if required for plaza-deck pavers.

* + - * 1. Source Limitations for Plaza-Deck Paving: Obtain plaza-deck pavers**[ and paver pedestals]** from single source from single manufacturer.
			1. SHEET WATERPROOFING
				1. EPDM Rubber Sheet: ASTM D6134, Type I, 60-mil-thick flexible sheet, unreinforced, formed from EPDM.

[Basis-of-Design Product:](http://www.specagent.com/Lookup?ulid=1628) Subject to compliance with requirements, provide:

[Carlisle Coatings & Waterproofing Inc](http://www.specagent.com/Lookup?uid=123457131791);

Sure-Seal EPDM;

Approved equivalent.

* + - 1. AUXILIARY MATERIALS
				1. Furnish auxiliary materials recommended by waterproofing manufacturer for intended use and compatible with sheet waterproofing.

Insert specific VOC-limit values in subparagraph below if known; coordinate with products and revise to suit Project.

Furnish liquid-type auxiliary materials that comply with VOC limits of authorities having jurisdiction.

* + - * 1. Concealed Sheet Flashing: Same material, construction, and thickness as sheet waterproofing or 60-mil-thick, uncured EPDM, as required by manufacturer.

Retain “Exposed Sheet Flashing” paragraph below if sheet flashings are exposed.

* + - * 1. Exposed Sheet Flashing: 60-mil-thick EPDM, cured or uncured, as required by manufacturer.

Retain “Bonding Adhesives” paragraph below for sheets fully and partially adhered installations and for sheet flashings.

* + - * 1. Bonding Adhesives: For bonding waterproofing sheets and sheet flashings to substrates and projections.

Retain “Splicing Cement and Cleaner” paragraph below for splicing seams in EPDM.

* + - * 1. Splicing Cement and Cleaner: Single-component butyl splicing cement and solvent-based splice cleaner.

Retain “Butyl Gum Tape” Subparagraph below with “Splicing Cement and Cleaner” paragraph above if seams require splicing cement and butyl gum tape.

Butyl Gum Tape: 30-mil-thick-by-6-1/4-inch-wide, uncured butyl with polyethylene release film.

* + - * 1. Lap Sealant: Single-component sealant.

Retain “In-Seam Sealant” paragraph below if seams use splicing cement without butyl gum tape.

* + - * 1. In-Seam Sealant: Single-component sealant.
				2. Water-Cutoff Mastic: Butyl mastic sealant.
				3. Waterproofing and Sheet-Flashing Accessories: Sealants, pourable sealers, cone and vent flashings, inside and outside corner flashings, termination reglets, and other accessories recommended by waterproofing manufacturer for intended use.
				4. Metal Termination Bars: Manufacturer’s standard aluminum bars, approximately 1 inch wide, prepunched, with fasteners.

Retain one of two “Protection Course” paragraphs below; revise text or insert another product to suit Project. Delete paragraphs if molded-sheet drainage panels or insulation drainage panels replace protection course. Verify acceptability of protection course type with waterproofing manufacturer. Indicate locations, such as plaza deck and foundation walls, if more than one protection course type is required.

Product in first “Protection Course” paragraph below describes Carlisle’s “Protection Board H.”

* + - * 1. Protection Course: Semirigid sheets of asphalt-impregnated organic mat, mineral surface, with a nominal thickness of 1/8 inch.

Product in “Protection Course” paragraph below describes Carlisle’s “Protection Board V.”

* + - * 1. Protection Course: Fan folded, with a core of extruded-polystyrene board insulation, a nominal thickness of ¼ inch, and a compressive strength of not less than 8 psi.
			1. MOLDED-SHEET DRAINAGE PANELS

Retain this article if molded-sheet drainage panels are required. Insert other drainage-panel types if required.

Retain one or more molded-sheet drainage-panel paragraphs below if specifying molded-sheet drainage panels in this Section; revise to suit Project. If not indicated on Drawings, insert thickness requirement only after coordinating required thickness with required flow rate.

Retain “Nonwoven-Geotextile-Faced, Molded-Sheet Drainage Panel with Polymeric Film” or “Nonwoven-Geotextile-Faced, Molded-Sheet Drainage Panel without Polymeric Film” paragraph below if required, usually for foundation walls.

* + - * 1. Nonwoven-Geotextile-Faced, Molded-Sheet Drainage Panel with Polymeric Film: Composite subsurface drainage panel acceptable to waterproofing manufacturer and consisting of a studded, nonbiodegradable, molded-plastic-sheet drainage core; with a nonwoven, needle-punched geotextile facing with an apparent opening size not exceeding No. 70 sieve laminated to one side of the core and a polymeric film bonded to the other side; and with a vertical flow rate through the core of **[9 to 21 gpm per ft.] <Insert values>**.

[Products:](http://www.specagent.com/Lookup?ulid=7252) Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

Carlisle Coatings & Waterproofing Inc; **[CCW MiraDRAIN 6200][CCW MiraDRAIN 6200XL]**.

CETCO; Aquadrain 15XP.

GCP Applied Technologies Inc.; **[Hydroduct 220][Hydroduct 660]**.

Approved equivalent.

* + - * 1. Nonwoven-Geotextile-Faced, Molded-Sheet Drainage Panel without Polymeric Film: Composite subsurface drainage panel acceptable to waterproofing manufacturer and consisting of a studded, nonbiodegradable, molded-plastic-sheet drainage core; with a nonwoven, needle-punched geotextile facing with an apparent opening size not exceeding No. 70 sieve laminated to one side of the core, without a polymeric film bonded to the other side; and with a vertical flow rate through the core of **[9 to 21 gpm per ft.] <Insert values>**.

[Products:](http://www.specagent.com/Lookup?ulid=7253)

Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

Carlisle Coatings & Waterproofing Inc; **[**CCW MiraDRAIN 6000**][**CCW MiraDRAIN 6000XL**]**.

CETCO; **[Aquadrain 10X] [**Aquadrain 15X**] [**Aquadrain 18H**]**.

GCP Applied Technologies Inc.; **[**Hydroduct 200**]**.

Approved equivalent.

Retain "Woven-Geotextile-Faced, Molded-Sheet Drainage Panel with Polymeric Film" or "Woven-Geotextile-Faced, Molded-Sheet Drainage Panel without Polymeric Film" paragraph below if specifying woven-geotextile-faced drainage panels, usually for plaza decks.

* + - * 1. Woven-Geotextile-Faced, Molded-Sheet Drainage Panel with Polymeric Film: Composite subsurface drainage panel acceptable to waterproofing manufacturer and consisting of a studded, nonbiodegradable, molded-plastic-sheet drainage core; with a woven-geotextile facing with an apparent opening size not exceeding No. 40 sieve, laminated to one side of the core and a polymeric film bonded to the other side; and with a horizontal flow rate through the core of not less than **[2.8 gpm per ft.] <Insert value>**.

[Products:](http://www.specagent.com/Lookup?ulid=7254) Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

[GCP Applied Technologies Inc](http://www.specagent.com/Lookup?uid=123457131782).; Hydroduct 225.

Approved equivalent.

* + - * 1. Woven-Geotextile-Faced, Molded-Sheet Drainage Panel without Polymeric Film: Composite subsurface drainage panel acceptable to waterproofing manufacturer and consisting of a studded, nonbiodegradable, molded-plastic-sheet drainage core; with a woven-geotextile facing with an apparent opening size not exceeding No. 40 sieve laminated to one side of the core, without a polymeric film bonded to the other side; and with a horizontal flow rate through the core of not less than **[2.8 gpm per ft.]<Insert value>**.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

Carlisle Coatings & Waterproofing Inc; [CCW MiraDRAIN 9000][CCW MiraDRAIN 9900]

CETCO; [Aquadrain 20H][Aquadrain 30H]

W.R. Meadows, Inc; Mel-Drain.

Approved equivalent.

Retain "Molded-Sheet Collector-Panel System with Polymeric Film" or "Molded-Sheet Collector-Panel System Wrapped with Geotextile" paragraph below if required in lieu of piped subdrainage collection, usually for foundation walls or the perimeter of an on-grade slab where molded-sheet drainage panels are required. Before retaining, consult Project's geotechnical engineer to determine required horizontal flow rate to subdrainage piping and consult manufacturers for the capability of manufacturers' systems.

* + - * 1. Molded-Sheet Collector-Panel System with Polymeric Film: Composite subsurface collector-panel system by same manufacturer as primary molded-sheet drainage panels; consisting of a high-profile, studded, nonbiodegradable, molded-plastic-sheet drainage core; with a nonwoven-geotextile facing with an apparent opening size not exceeding No. 40 sieve laminated to one side of the core and a polymeric film bonded to the other side; and with a vertical flow rate through the core of **[9 to 17 gpm per ft.] <Insert values>** and a minimum horizontal, in-plane flow rate **[as indicated on Drawings] <Insert requirement>**. Provide system with manufacturer's outlets, connectors, tapes, and other accessories to connect primary molded-sheet drainage panels with piped subdrainage system.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

GCP Applied Technologies Inc.; Hydroduct Coil 600.

ISI Building Products; AquaCheck DS.

Polyguard Products, Inc.; Totalflow.

Approved equivalent.

* + - * 1. Molded-Sheet Collector-Panel System Wrapped with Geotextile: Composite subsurface collector-panel system by same manufacturer as primary molded-sheet drainage panels; consisting of a high-profile, studded, nonbiodegradable, molded-plastic-sheet drainage core; wrapped with a nonwoven-geotextile facing with an apparent opening size not exceeding No. 40 sieve; and with a vertical flow rate through the core of **[21 to 82 gpm per ft.] <Insert values>** and a minimum horizontal, in-plane flow rate **[as indicated on Drawings] [of 21 gpm per ft.]** **<Insert value>**. Provide system with manufacturer's outlets, connectors, tapes, and other accessories to connect primary molded-sheet drainage panels with piped subdrainage system.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

Carlisle Coatings & Waterproofing Inc; CCW MiraDRAIN HC.

CETCO; Aquadrain 100BD.

W.R. Meadows, Inc; Total-Drain.

Approved equivalent.

* + - 1. INSULATION DRAINAGE PANELS

Retain this article if insulation drainage panels are required. Verify acceptability of type of drainage panel with waterproofing manufacturer.

Retain "Insulation" paragraph below if specifying insulation drainage panels in another Section; revise to suit Project.

* + - * 1. Insulation: Comply with Section 072100 "Thermal Insulation" for general building insulation**[, including insulation drainage panels]**.

Retain one or more paragraphs below if insulation drainage panels are required over waterproofing and the panels are not specified in another Section. If retaining more than one type of insulation drainage panel, indicate locations of each on Drawings or by inserts. If not indicated on Drawings, insert thickness requirement.

Retain "Unfaced, Wall-Insulation Type IV, Drainage Panels"; "Unfaced, Wall-Insulation Type VI, Drainage Panels"; "Geotextile-Faced, Wall-Insulation Type IV, Drainage Panels"; or "Geotextile-Faced, Wall-Insulation Type VI, Drainage Panels" paragraph below if required for foundation-wall applications.

* + - * 1. Unfaced, Wall-Insulation Type IV, Drainage Panels: Extruded-polystyrene board insulation according to ASTM C578, Type IV, 25-psi minimum compressive strength; unfaced; fabricated with shiplap or channel edges and with one side having grooved drainage channels.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

DiversiFoam Products; [CertiFoam 25 Drainage Board with channel edges][CertiFoam 25 Drainage Board with channels 12 inches [CertiLite Drainage Board].

Dow Chemical Company (The); STYROFOAM Brand PERIMATE.

Owens Corning; Foamular Pink-Drain.

Approved equivalent.

* + - * 1. Unfaced, Wall-Insulation Type VI, Drainage Panels: Extruded-polystyrene board insulation according to ASTM C578, Type VI, 40-psi minimum compressive strength; unfaced; fabricated with shiplap or channel edges and with one side having grooved drainage channels.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

DiversiFoam Products; [CertiFoam 40 Drainage Board with channel edges][CertiFoam 40 Drainage Board with channels 12 inches o.c].

Owens Corning; Foamular 404 RB.

Approved equivalent.

* + - * 1. Geotextile-Faced, Wall-Insulation Type IV, Drainage Panels: Extruded-polystyrene board insulation according to ASTM C578, Type IV, 25-psi minimum compressive strength; fabricated with tongue-and-groove edges and with one side having grooved drainage channels faced with nonwoven geotextile filter fabric.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

Owens Corning; Foamular Insul-Drain.

T. Clear Corporation, a subsidiary of Fin Pan Inc; Thermadry 750.

Approved equivalent.

* + - * 1. Geotextile-Faced, Wall-Insulation Type VI, Drainage Panels: Extruded-polystyrene board insulation according to ASTM C578, Type VI, 40-psi minimum compressive strength; fabricated with tongue-and-groove edges and with one side having grooved drainage channels faced with nonwoven geotextile filter fabric.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

T. Clear Corporation, a subsidiary of Fin Pan Inc; Thermadry 1250.

Approved equivalent.

Retain "Unfaced, Plaza-Deck Insulation Type VI, Drainage Panels"; "Unfaced, Plaza-Deck Insulation Type VII, Drainage Panels"; "Geotextile-Faced, Plaza-Deck Insulation Type VI, Drainage Panels"; or "Geotextile-Faced, Plaza-Deck Insulation Type VII, Drainage Panels" paragraph below if required. Retain Type VI insulation for limited, intermittent pedestrian traffic; retain Type VII for heavier pedestrian traffic.

* + - * 1. Unfaced, Plaza-Deck Insulation Type VI, Drainage Panels: Extruded-polystyrene board insulation according to ASTM C578, Type VI, 40-psi minimum compressive strength; unfaced; fabricated with shiplapped, channel, or tongue-and-groove edges and with one side having ribbed drainage channels.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

DiversiFoam Products; [CertiFoam 40 Drainage Board with channel edges][CertiFoam 40 Drainage Board with channels 12 inches o.c].

Dow Chemical Company (The); STYROFOAM Brand Ribbed ROOFMATE.

Owens Corning; Foamular 404 RB.

Approved equivalent.

* + - * 1. Unfaced, Plaza-Deck Insulation Type VII, Drainage Panels: Extruded-polystyrene board insulation according to ASTM C578, Type VII, 60-psi minimum compressive strength; unfaced; fabricated with shiplapped, channel, or tongue-and-groove edges and with one side having ribbed drainage channels.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

Owens Corning; Foamular 604 RB.

Approved equivalent.

* + - * 1. Geotextile-Faced, Plaza-Deck Insulation Type VI, Drainage Panels: Extruded-polystyrene board insulation according to ASTM C578, Type VI, 40-psi minimum compressive strength; fabricated with tongue-and-groove edges, with one side having grooved drainage channels, and faced with manufacturer's standard, nonwoven geotextile filter fabric.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

T. Clear Corporation, a subsidiary of Fin Pan Inc; Thermadry 1250.

Approved equivalent.

* + - * 1. Geotextile-Faced, Plaza-Deck Insulation Type VII, Drainage Panels: Extruded-polystyrene board insulation according to ASTM C578, Type VII, 60-psi minimum compressive strength; fabricated with tongue-and-groove edges, with one side having grooved drainage channels, and faced with manufacturer's standard, nonwoven geotextile filter fabric.

[Products:](http://www.specagent.com/Lookup?ulid=12309) Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

[T. Clear Corporation, a subsidiary of Fin Pan Inc](http://www.specagent.com/Lookup?uid=123457131842); Thermadry 1750.

Approved equivalent.

* + - 1. PLAZA-DECK PAVERS

Retain this article for plaza-deck pavers installed on pedestals over waterproofing. Specify pavers installed in an aggregate, a mortar, or a bituminous setting bed in Section 321400 "Unit Paving."

Retain "Plaza-Deck Pavers" or "Stone Plaza-Deck Pavers" paragraph below if specifying plaza-deck pavers in another Section; revise to suit Project. Insert other paver types if required.

* + - * 1. Plaza-Deck Pavers: **[Brick] [Concrete] [Asphalt-block]** pavers specified in Section 321400 "Unit Paving."
				2. Stone Plaza-Deck Pavers: **[Granite] [Limestone] [Marble] [Quartz-based stone] [Slate] [Travertine] <Insert type>** pavers specified in Section 321400 "Unit Paving."
				3. Concrete Plaza-Deck Pavers: Solid, hydraulically pressed, standard-weight concrete units, **[square edged] [with top edges beveled 3/16 inch]**, manufactured for use as plaza-deck pavers; **[7500-psi] [6500-psi] <Insert value>** minimum compressive strength, ASTM C140; absorption not greater than 5 percent, ASTM C140; no breakage and maximum 1 percent mass loss when tested for freeze-thaw resistance according to ASTM C67.

Retain "Concrete Plaza-Deck Pavers" paragraph below if specifying plaza-deck pavers in this Section; revise to suit Project. Verify availability of pavers with manufacturers for characteristics required; insert other characteristics if required. paragraph describes concrete pavers commonly used in pedestal set applications over insulation and waterproofing or for placing on a setting bed; Hanover Architectural Products and perhaps other manufacturers offer concrete plaza-deck pavers of lightweight concrete and with integrally cast concrete pedestals. Limit pedestal systems to pedestrian plazas; they are generally unsuitable for vehicles.

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Carlisle Coatings & Waterproofing Inc.

[Hanover Architectural Products](http://www.specagent.com/Lookup?uid=123457131784).

Roofblok Limited.

Sunny Brook Pressed Concrete Company.

Wausau Tile Inc.

Westile Roofing Products.

Approved equivalent.

Retain one thickness and one face size from options in "Thickness" and "Face Size" subparagraphs below. Include special paver sizes and insert descriptions of custom pavers such as stair tread and riser units, coping or curbed termination pavers, and oversize pavers.

Thickness: **[2 inches] [2-3/8 inches] <Insert dimension>**.

Face Size: **[12 inches square] [12 by 24 inches] [18 inches square] [24 inches square] [As indicated] <Insert dimension(s) and shape>**.

Color and Texture: **[As indicated by manufacturer’s designations] [Match Director’s Representative’s sample] [As selected by Director’s Representative from manufacturer’s full range] <Insert requirement>**.

Generally, retain “Paver Pedestals” paragraph below if setting-bed systems are not required; revise to suit Project and products by named manufacturers. If retaining first option but not third option, do not name other manufacturers.

* + - * 1. Paver Pedestals: Paver-support assembly, **[standard with paver manufacturer] [or] [as named below]**, including **[fixed-height] [adjustable or stackable]** pedestals, shims, and spacer tabs for joint spacing of **[1/8 inch] [3/16 inch] [1/8 to 3/16 inch]**.

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Envirospec, Inc.

Hanover Architectural Products.

[Roofblok Limited](http://www.specagent.com/Lookup?uid=123457131846).

Sunny Brook Pressed Concrete Company.

Wausau Tile Inc.

Westile Roofing Products.

Approved equivalent.

Retain "Fill" Subparagraph below if specifying telescoping pedestals that require fill.

Fill: As recommended in writing by pedestal manufacturer.

1. EXECUTION
	* + 1. EXAMINATION
				1. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of waterproofing.

Verify that concrete has cured and aged for minimum time period recommended in writing by waterproofing manufacturer.

Verify that substrate is visibly dry and within the moisture limits recommended in writing by manufacturer. Test for capillary moisture by plastic sheet method according to ASTM D4263.

* + - * 1. Proceed with installation only after unsatisfactory conditions have been corrected.
			1. PREPARATION
				1. Clean, prepare, and treat substrates according to manufacturer's written instructions. Provide clean, dust-free, and dry substrates for waterproofing application.
				2. Mask off adjoining surfaces not receiving waterproofing to prevent spillage and overspray affecting other construction.
				3. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.
				4. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids.
				5. Prepare, fill, prime, and treat joints and cracks in substrates. Remove dust and dirt from joints and cracks according to ASTM D4258.
				6. Prepare, treat, and seal vertical and horizontal surfaces at terminations and penetrations through waterproofing and at drains and protrusions.
			2. INSTALLATION OF FULLY ADHERED SHEET

Retain this article for fully adhered horizontal or vertical installations.

* + - * 1. Install fully adhered sheets over entire area to receive waterproofing according to manufacturer's written instructions and per recommendations in ASTM D5843.
				2. Accurately align sheets and maintain uniform side and end laps of minimum dimensions required. Stagger end laps.
				3. Apply bonding adhesive to substrates at required rate and allow it to partially dry.
				4. Apply bonding adhesive to sheets and firmly adhere sheets to substrates. Do not apply bonding adhesive to splice area of sheet.

Retain first paragraph below if tie-ins to existing waterproofing are required.

* + - * 1. Install fully adhered sheets and auxiliary materials to tie into existing waterproofing.
				2. Repair tears, voids, and lapped seams in waterproofing that do not comply with requirements. Slit and flatten fishmouths and blisters. Patch with sheet waterproofing extending beyond repaired areas in all directions.
				3. Horizontal Application: Apply sheets with side laps shingled with slope of deck where possible.

Spread sealant bed over deck drain flange at deck drains and securely seal sheet waterproofing in place with clamping ring.

* + - 1. INSTALLATION OF PARTIALLY ADHERED SHEET

Retain this article for partially adhered vertical installations.

* + - * 1. Install partially adhered sheets over entire area to receive waterproofing according to manufacturer's written instructions.
				2. Accurately align sheets and maintain uniform side and end laps of minimum dimensions required. Stagger end laps.
				3. Apply bonding adhesive to the following areas of substrates and to each sheet at required rate and allow it to partially dry:

Subparagraph below is based on Carlisle's recommendations for partially adhered EPDM sheet. Revise area to suit Project.

Upper 25 percent of length of each sheet and 18 inches around perimeter of each sheet.

* + - * 1. Firmly adhere sheets to substrate. Do not apply bonding adhesive to splice area of sheet.

Retain first paragraph below if tie-ins to existing waterproofing are required.

* + - * 1. Install partially adhered sheets and auxiliary materials to tie into existing waterproofing.
				2. Repair tears, voids, and lapped seams in waterproofing that do not comply with requirements. Slit and flatten fishmouths and blisters. Patch with sheet waterproofing extending beyond repaired areas in all directions.
			1. INSTALLATION OF COMPARTMENTED, LOOSELY LAID SHEET

Retain this article for compartmented, loosely laid, horizontal installations.

* + - * 1. Install compartmented, loosely laid sheets over entire area to receive waterproofing according to manufacturer's written instructions.
				2. Accurately align sheets and maintain uniform side and end laps of minimum dimensions required. Stagger end laps.
				3. Apply continuous beads of water-cutoff mastic, of size recommended in writing by waterproofing manufacturer, to substrates in a 60-by-60-inch grid pattern before installing sheet.
				4. Apply sheets with side laps shingled with slope of deck where possible.
				5. Spread sealant bed over deck drain flange at deck drains and securely seal sheet waterproofing in place with clamping ring.

Retain first paragraph below if tie-ins to existing waterproofing are required.

* + - * 1. Install compartmented, loosely laid sheets and auxiliary materials to tie into existing waterproofing.
				2. Repair tears, voids, and lapped seams in waterproofing that do not comply with requirements. Slit and flatten fishmouths and blisters. Patch with sheet waterproofing extending beyond repaired areas in all directions.
			1. INSTALLATION OF SEAMS

Retain "Cement Splice" paragraph below for cement splicing of EPDM sheet seams.

* + - * 1. Cement Splice: Clean splice areas, apply splicing cement and in-seam sealant, and firmly roll side and end laps of overlapping sheets according to manufacturer's written instructions to produce a splice not less than 6 inches wide and to ensure a watertight seam installation. Apply lap sealant and seal edges of sheet terminations.

Retain "Cement and Tape Splice" paragraph below for cement and butyl gum tape splicing of EPDM sheet seams.

* + - * 1. Cement and Tape Splice: Clean splice areas, apply splicing cement and butyl gum tape, and firmly roll side and end laps of overlapping sheets according to manufacturer's written instructions to ensure a watertight seam installation. Apply lap sealant and seal edges of sheet terminations.
			1. INSTALLATION OF SHEET FLASHING
				1. Install sheet flashings and preformed flashing accessories and adhere to substrates according to waterproofing manufacturer's written instructions.

Retain one of first two paragraphs below; revise to suit Project.

* + - * 1. Form wall flashings using exposed sheet flashing.
				2. Extend deck sheet waterproofing to form wall flashings.

Flash penetrations and field-formed inside and outside corners with uncured sheet flashing.

Clean splice areas, apply splicing cement, and firmly roll side and end laps of overlapping sheets to ensure a watertight installation. Apply lap sealant and seal edges of sheet-flashing terminations.

Verify, with manufacturer, that first paragraph below applies to Project for EPDM sheet; revise if required. Coordinate expansion-joint treatment with expansion-joint assemblies that interface with waterproofing. Specialty manufacturers such as Situra also produce membrane-type waterproofing expansion joints.

* + - * 1. Cover expansion joints and discontinuous deck-to-wall or deck-to-deck joints by extending deck sheet waterproofing over joints.
				2. Terminate and seal top of sheet flashings[ with mechanically anchored termination bars].
			1. INSTALLATION OF PROTECTION COURSE
				1. Install protection course over waterproofing membrane according to manufacturer's written instructions and before beginning subsequent construction operations. Minimize exposure of membrane.

Retain applicable options in subparagraph below if drainage panels or board insulation is used and is permitted by waterproofing manufacturer to replace protection course.

**[Molded-sheet drainage panels] [Insulation drainage panels] [Board insulation]** may be used in place of a separate protection course for vertical applications when approved by waterproofing manufacturer.

* + - 1. INSTALLATION OF MOLDED-SHEET DRAINAGE PANEL
				1. Place and secure molded-sheet drainage panels, with geotextile facing away from wall or deck substrate, according to manufacturer's written instructions. Use adhesive or another method that does not penetrate waterproofing. Lap edges and ends of geotextile to maintain continuity. Protect installed molded-sheet drainage panels during subsequent construction.

Retain subparagraph below if installing board insulation or protection course before installing molded-sheet drainage panels.

For vertical applications, install **[board insulation] [protection course]** before installing drainage panels.

* + - 1. INSTALLATION OF INSULATION DRAINAGE PANEL
				1. Install insulation drainage panels over waterproofed surfaces. Cut and fit to within 3/4 inch of projections and penetrations.
				2. Ensure that drainage channels are aligned and free of obstructions.

Retain first paragraph below if support is required during backfilling.

* + - * 1. On vertical surfaces, set insulation drainage panels in adhesive or tape applied according to manufacturer's written instructions.
				2. On horizontal surfaces, loosely lay insulation drainage panels according to manufacturer's written instructions. Stagger end joints and tightly abut insulation units.
			1. INSTALLATION OF PLAZA-DECK PAVERS

Retain this article for pavers installed on pedestals.

* + - * 1. Install pavers according to manufacturer's written instructions.

Retain first two paragraphs below if installing pavers on paving pedestals.

* + - * 1. Install paver pedestals and accessories to required elevations. Adjust for final level and slope of paved surfaces.
				2. Loosely lay pavers on pedestals, maintaining a uniform open joint width. Tightly seat pavers against spacers to eliminate lateral movement or drift of paving assembly. Align joint patterns parallel in each direction.

Revise subparagraph below to suit Project. Consider paved area layout, paver module, and construction tolerances when imposing limits. Verify minimum dimensions with paver manufacturer. Minimum pedestal dimensions may also govern. Custom-dimensioned pavers or pavers scored to repeat module may be available.

Lay out pavers to avoid less-than-half-width pavers at perimeter or other terminations.

Insert special installation requirements here. Examples might include tread/riser units or treatment of pavers at plaza/building expansion joints.

* + - * 1. Install pavers to vary no more than 1/16 inch in elevation between adjacent pavers and no more than 1/16 inch from surface plane elevation of individual paver.
				2. Limit variation in paving installation to within **[1/4 inch in 10 feet] <Insert dimensions>** of surface plane in any direction; noncumulative.
			1. FIELD QUALITY CONTROL

Retain testing requirements if required; revise to suit Project. Manufacturer may also require inspections as a warranty condition.

Retain "Testing Agency" and "Manufacturer's Field Service" paragraphs below to identify who shall perform tests and inspections. If retaining second option in "Testing Agency" paragraph or if retaining "Manufacturer's Field Service" paragraph, retain "Field quality-control reports" paragraph in "Informational Submittals" Article.

* + - * 1. Testing Agency: **[Director’s Representative will engage] [Engage]** a qualified testing agency to perform tests.

Retain "Manufacturer's Field Service" paragraph below to require a factory-authorized service representative to perform inspections. Manufacturer may require this as a warranty condition.

* + - * 1. Manufacturer's Field Service: Engage a **[full-time ]**site representative qualified by waterproofing membrane manufacturer to inspect substrate conditions, surface preparation, membrane application, flashings, protection, and drainage components; and to furnish daily reports to Director’s Representative.

Retain "Flood Testing" paragraph below if required for horizontal surfaces sloping up to 2 percent or 1/4 in./ft. Revise paragraph by identifying particular Project areas to flood test if required. Limit water depth to not exceed deck load capacity.

* + - * 1. Flood Testing: Flood test each deck area for leaks, according to procedures in ASTM D5957, after completing waterproofing but before placing overlying construction. Install temporary containment assemblies, plug or dam drains, and flood with potable water.

Flood to an average depth of 2-1/2 inches with a minimum depth of 1 inch and a maximum depth of 4 inches. Maintain 2 inches of clearance from top of sheet flashings.

ASTM D5957 sets 24 hours as minimum and 72 hours as maximum duration for flood testing.

Flood each area for **[24] [48] [72]** hours.

Testing agency shall observe flood testing and examine underside of decks and terminations for evidence of leaks during flood testing.

After flood testing, repair leaks, repeat flood tests, and make further repairs until waterproofing installation is watertight.

* + - * 1. Waterproofing will be considered defective if it does not pass tests and inspections.
				2. Prepare test and inspection reports.
			1. PROTECTION, REPAIR, AND CLEANING

Retain first paragraph below for horizontal applications.

* + - * 1. Do not permit foot or vehicular traffic on unprotected membrane.
				2. Protect waterproofing from damage and wear during remainder of construction period.

Retain first paragraph below if insulation drainage panels are required and may be exposed for a period of time.

* + - * 1. Protect installed insulation drainage panels from damage due to UV light, harmful weather exposures, physical abuse, and other causes. Provide temporary coverings where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.
				2. Correct deficiencies in or remove waterproofing that does not comply with requirements; repair substrates, reapply waterproofing, and repair sheet flashings.
				3. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended in writing by manufacturer of affected construction.

Insert Installer’s Special Warranty Form here if required.

END OF SECTION 071353