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This specification specifies **Marflex 5000™ Water-based Waterproofing Membrane**. This product is manufactured by Marflex Building Solutions. Revise section number and title below to suit project requirements, specification practices and section content. Refer to CSI MasterFormat for other section numbers and titles.

This specification utilizes the Construction Specifications Institute (CSI) Manual of Practice, including MasterFormat™ 2004, SectionFormat™ and PageFormat™. This is a manufacturer-specific proprietary product specification using the proprietary method of specifying applicable to project specifications and master guide specifications. Optional text is indicated by brackets []; delete optional text in final copy of specification. Specifier Notes typically precede specification text; delete notes in final copy of specification. Trade/brand names with appropriate symbols typically are used in Specifier Notes; symbols are not used in specification text. Metric conversion, where used, is soft metric conversion.

SECTION 071400 FLUID-APPLIED WATERPROOFING

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Fluid-Applied Waterproofing.

Specifier Note: Article below may be omitted when specifying manufacturer's proprietary products and recommended installation. Retain Reference Article when specifying products and installation by an industry reference standard. If retained, list standard(s) referenced in this section. Indicate issuing authority name, acronym, standard designation and title. Establish policy for indicating edition date of standard referenced. Conditions of the Contract or Division 1 References Section may establish the edition date of standards. This article does not require compliance with standard but is merely a listing of references used. Article below should list only those industry standards referenced in this section.

- B. Related Sections:

1. Section 033000 – Cast in Place Concrete
2. Section 312310 – Building Excavation and Fill
3. Section 334616 – Subdrainage
4. Section 334619 – Underslab Drainage
5. Section 042200 – Masonry
6. Section 072113 – Board Insulation
7. Section 076000 – Flashing & Sheet Metal

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM):
1. ASTM C-719 Standard Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement (Hockman Cycle).
 2. ASTM C-836 Standard Specification for High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course.
 3. ASTM D-2939 Standard Test Methods for Emulsified Bitumens Used as Protective Coatings.
 4. ASTM E-96 Standard Test Method for Water Vapor Transmission of Materials.
 5. ASTM D-466 Standard Test Method for Films Deposited from Bituminous Emulsions
 6. ASTM D-412 Standard Test Method for Vulcanized Rubber and Thermoplastic Elastomers-Tension
 7. ASTM D-3274 Standard Test Method for Emulsified Bitumens Used as Protective Coatings
 8. ASTM D-2196 Standard Test Method for Rheological Properties of Non-Newtonian Materials by Rotational (Brookfield type) Viscometer

1.03 SUBMITTALS

- A. General: Submit listed submittals in accordance with Conditions of the Contract and Division 1 Submittal Procedures Section.
- B. Product Data: Submit manufacturer's product data and installation instructions.
- C. Quality Assurance/Control Submittals: Submit the following:
1. Certificates: Submit certificate that applicator complies with requirements of this section.

Specifier Note: Article below should include prerequisites, standards, limitations and criteria that establish an overall level of quality for products and workmanship for this section. Coordinate article below with Division 1 Quality Assurance Section.

1.04 QUALITY ASSURANCE

Specifier Note: Paragraph below should list obligations for compliance with specific code requirements particular to this section. General statements to comply with a particular code are typically addressed in Conditions of the Contract and Division 1 Regulatory Requirements Section. Repetitive statements should be avoided.

- A. Applicator Qualifications: Utilize an applicator trained and approved by the waterproofing manufacturer.
- B. Regulatory Requirements and Approvals: Comply with requirements of the following:
 - 1. ICC Evaluation Service, Inc. (ICC-ES)
 - a. ESR-3062

Specifier Note: Article below should include special and unique requirements. Coordinate article below with Division 1 Product Requirements Section.

1.05 DELIVERY, STORAGE & HANDLING

- A. General: Comply with Division 1 Product Requirement Section.
- B. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- C. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.

1.06 PROJECT/SITE CONDITIONS

- A. Environmental Requirements: Comply with application temperature range of 20 - 130°F (-6.67 - 55°C).

1.07 WARRANTY

- A. Manufacturer's Material Only Warranty available.

PART 2 PRODUCTS

Specifier Note: Retain article below for proprietary method specification. Add product attributes, performance characteristics, material standards and descriptions as applicable. Use of such phrases as "or equal" or "or approved equal" or similar phrases may cause ambiguity in specifications. Such phrases require verification (procedural, legal and regulatory) and assignment of responsibility for determining "or equal" products.

2.01 FLUID-APPLIED WATERPROOFING

Specifier Note: Paragraph below is an addition to CSI SectionFormat. Retain or delete paragraph below per project requirements and specifier's practice.

- A. Manufacturer: Mar-flex Waterproofing and Building Products
 - 1. Contact: Mar-flex: 500 Business Pkwy, Carlisle, OH 45005; Telephone: (800) 498-1411, (513) 422-7285; Fax: (513) 422-7282
 - 2. E-mail: info@mar-flex.com website: www.Mar-flex.com
- B. Proprietary Products/Systems should be purchased through an Authorized Dealer of Mar-flex Products.
- C. Fluid-Applied Waterproofing and related products, including the following:

Specifier Note: Select method of application to suit project requirements and specify below.

- 1. Mar-flex 5000™ WB Waterproofing Membrane:
 - a. Material: Emulsion
 - b. Color: Black
 - c. Total Solids: 60-70%, VOC <100 g/L
 - d. Application Method: [Spray] [Brush] [Roll]
 - e. Coverage Rate: Spray = 25-30 sqft/gal Brush/Roll = 20 sqft/gal
 - f. Film Thickness, Wet: 55 mil Dry: 40 mil (1.5 mm) min.
 - g. Total Cure Time: 24 hours
 - h. Weight/Gallon: 8.24 lb (3.73 kg)
 - i. Elongation at 70°F (21°C) (ASTM D-412 Method A): >2200%
 - j. Tensile Strength (ASTM C-719): 40.5 psi (279 kPa)

- k. Low Temperature Flexibility at -15°F (ASTM C 719): No cracking
- l. Crack Bridging (ASTM C-836): 10 cycles without bond failure
- m. Viscosity/Centipoise: (ASTM D-2196): 3600 centipoise
- n. Resistance to Water Flow (ASTM D-466): Bond strength not affected
- o. Water Solubility (ASTM D-2939): No blistering or re-emulsion
- p. Resistance to Hydrostatic Pressure (Federal Spec TT-C-555B, Par.4.4.7.):
 - i. Water Leaks: None
 - ii. Weight Gain: None
- q. Water Vapor (ASTM E-96):
 - i. Transmission: 0.11 grains/sf/h.
 - ii. Permeability: 0.35 perms (g/h-sq.ft.-in.Hg)

Specifier Note: Specify appropriate drainage/insulation board below to suit project requirements.

Specifier Note: ArmorDrain 400 is designed for flat decking, retaining walls and bridge abutments

1. Drain & Dry Insulation/Drainage Board:
 - a. Material: Inorganic glass fiber
 - b. Thermal Resistance: 3.1 - 10
 - c. Foundation Drainage Rate: Up to 65 gal/hr/lin ft
2. TopGun Foundation Protection/Drainage Board:
 - a. Material: Semi Rigid Board
 - b. Thermal Resistance: 3- 15
 - c. Foundation Drainage Rate: Up to 338 gph/ft-width
3. Geo-Mat™ Plus Drainage Roll:
 - a. Material: High Density Polyethylene (HDPE) drainage rolls with attached polypropylene geotextile mat.
 - b. Foundation Drainage Rate: 18 gal/min/ft
4. ArmorDrain 110 Dimpleboard:
 - a. Material: Polystyrene compressed into a light-duty dimpled core bonded to a single layer of non-woven filter fabric.
 - b. Foundation Drainage Rate: 9 g/pm/ft width
5. ArmorDrain 150 Dimpleboard:
 - a. Material: Polystyrene compressed into a moderate-duty dimpled core bonded to a single layer of non-woven filter fabric.
 - b. Foundation Drainage Rate: 21 g/pm/ft width
6. ArmorDrain 400 Decking Drainage Mat:
 - a. Material: Polystyrene compressed into a moderate-duty dimpled core bonded to a single layer of non-woven filter fabric.
 - b. Foundation Drainage Rate: 8.5 g/pm/ft width

Specifier Note: Edit Article below to suit project requirements. If substitutions are permitted, edit text below. Add text to refer to Division 1 Project Requirements (Product Substitutions Procedures) Section.

2.02 PRODUCT SUBSTITUTIONS

- A. Substitutions: No substitutions permitted.

2.03 ACCESSORY MATERIALS

- A. Provide proprietary accessory materials, including the following:

Specifier Note: Specify mastic below to patch cracks, voids and holes in the concrete or masonry walls, which are to receive waterproofing. Mar-flex All Season Mastic is made of fiberated, trowel grade, asphalt-based mastic, which is fortified with Bio fiber. These materials adhere tightly to form a strong, flexible bond. They may be used in any weather conditions, including applying to damp or cold surfaces, for patching tie holes and honeycombed areas in both rough and smooth masonry surfaces.

1. Mar-flex All Season Mastic:
 - a. Material: Plastic or resin material compatible with the waterproofing membrane.

Specifier Note: For horizontal application, specify drainage material to remove drainage water.

2. Mar-flex 12" GeoDrain Tile
3. Mar-flex 12" Connectors

PART 3 EXECUTION

Specifier Note: Article below is an addition to the CSI SectionFormat. Revise article below to suit project requirements and specifier's practice.

3.01 MANUFACTURER'S INSTRUCTIONS

- A. Comply with the most current written installation instructions and recommendations of the waterproofing manufacturer.

3.02 EXAMINATION

- A. Site Verification of Condition:
 1. Verify that site conditions are acceptable for application of the waterproofing system.
 2. Do not proceed with application until unacceptable conditions are corrected.

3.03 PREPARATION

- A. Surface Preparation:
 1. Ensure that the surfaces to receive waterproofing are structurally sound and free of moisture, dust, mud, loose mortar, fins, metal projections or any substances that would be detrimental to the bonding of the membrane to the surface.
 2. Remove wall ties.
 3. Patch cracks, voids and holes with non-shrink grout or mastic.

Specifier Note: Coordinate article below with manufacturer's recommended application requirements.

3.04 APPLICATION

- A. For vertical application [Spray] [Brush] [Roll] [Trowel] apply a uniform coat of waterproofing to entire wall area. Obtain a seamless membrane free of entrapped gasses, with a minimum dry film thickness of 80 mil (2 mm) at 10 feet (3.1 m) below-grade wall application, 100 mil (2.5 mm) at 20 feet (6.1 m) below-grade wall application and 120 mil (3 mm) at 30 feet (9.2 m) or more for below-grade wall application.
 1. Apply fluid membrane onto footing area a minimum of 4 inches (102 mm) to prevent water pooling.
 2. Allow membrane to cure for 24 hours before placing any backfill against the wall.
 3. Can be applied to "Green" concrete following form removal.
 4. Follow the current installation instructions.
- B. For horizontal application [Spray] [Brush] [Roll] apply a uniform coat of waterproofing to entire wall area. Obtain a seamless membrane free of entrapped gases, with a minimum dry film thickness of 100 mil (2.5 mm) for Above/At grade application.
 1. Allow the fluid membrane to cure out approximately 3-4 hours.
 2. Fluid membrane will still be tacky.
 3. Install ArmorDrain 400 following current installation instructions.

3.05 INSULATING/DRAINAGE PANEL INSTALLATION

Specifier Note: Edit, retain or delete paragraphs below to comply with project requirements and specifier practices.

- A. When using the Drain & Dry begin installation of panels after membrane has been applied. Place and secure drainage panels to substrate according to manufacturer's current written instructions.
 1. Install panels from top of footing extending to finish grade level. When Drain & Dry is to be stacked, maintain a factory-equivalent edge at all seams to ensure proper fit and drainage channel alignment.
 2. Secure Drain & Dry to the wall using powder actuated mechanical fasteners. Install top fasteners within 4" (102 mm) of the tops of each panel.
 3. If the board overlaps the membrane once you have reached the grade line, a utility knife or similar tool can be used to cut the boards to the correct height.
- B. When using TopGun Board, install after membrane has been applied. Place and secure to substrate according to manufacturer's current written instructions.

1. While the membrane is still tacky, starting at a corner with the filter fabric side facing out-ward, install the TopGun Drainage Board horizontally over the sprayed sections of the wall. The boards should be placed side by side, extending from the top of the footers to finished grade.
 2. Apply uniform pressure to the board throughout the surface area, not just the edges and corners. Note: If boards are stacked, maintain a factory-equivalent edge at all seams to ensure proper fit. If needed (Recommended) secure the TopGun to the wall using powder actuated mechanical fasteners at corners and seams. Install top fasteners within the top 4" (102 mm) of each panel.
 3. If the board overlaps the membrane once you have reached the grade line, a utility knife or similar tool can be used to cut the boards to the correct height.
- C. When using Geo-Mat Plus, install after membrane has been applied. Place and secure to substrate according to manufacturer's current written instructions.
1. While the membrane is still tacky, begin installation at a corner. Install horizontally against the waterproofing membrane with the polypropylene geotextile mat side facing outward.
 2. Install panels from top of footing extending to finish grade level. If there is overlapping off the membrane once you have reached the grade line, a utility knife or similar tool can be used to cut the rolls to the correct height.
 3. For good adherence, apply uniform pressure throughout the surface area, not just the edges and corners.
- D. When using ArmorDrain 110 or 150, install after membrane has been applied. Place and secure to substrate according to manufacturer's current written instructions.
1. While the membrane is still tacky, begin installation at a corner. Install horizontally against the waterproofing membrane with the non-woven filter fabric side facing out-ward.
 2. Install panels from top of footing extending to finish grade level. If there is overlapping off the membrane once you have reached the grade line, a utility knife or similar tool can be used to cut the rolls to the correct height.
 3. For good adherence, apply uniform pressure throughout the surface area, not just the edges and corners.
 4. When two edges come together from two separate pieces, overlap the dimples to create a continuous coverage of the wall.
 5. If needed, secure the panels to the wall using a powder actuated mechanical fastener or concrete nail.
 6. If the board overlaps the membrane once you have reached the grade line, a utility knife or similar tool can be used to cut the boards to the correct height.
- E. When using ArmorDrain 400 for flat decking, begin installation after membrane has been applied. Place draincore to substrate according to manufacturer's current written instructions.
1. Unroll the 400, placing gray side down against membrane. To keep in place, use double sided tape, adhesives or nails.
 2. For overlaps, place adjacent sections so that the cores abut. Secure fabric overlaps at five-foot intervals with glue, tape or nails.
 3. Join roll ends by peeling back fabric and removing 4" of core. Place end panels so that cores abut, then glue, tape or nail fabric overlap.
 4. Make cuts for any drains to allow water to be drained.
 5. Allow 24-hour set time.
 6. Pour desired thickness of concrete over AD400.
- F. Protect installed insulation/drainage panels during subsequent construction.
- G. Backfill and Drainage
1. #57 Gravel or equivalent must go no less than 2' high at the base of the foundation and 1' in depth away from the foundation walls.
 2. Adequate interior and exterior foundation drainage at the base of the foundation walls, across any floors or adjacent flower beds must be properly installed and functioning properly.
 3. Backfilling should begin no sooner than 24 hours after the installation of the board but must be backfilled within 15 days.
- H. 12" Geo-Drain Tile Vertical Collection System Installation
1. Unroll material along foundation base; adhere to partially cured waterproofing material; use adhesive acceptable to waterproofing material manufacturer for cured waterproofing or other sheet waterproofing not requiring curing.
 2. Install preformed corner fittings at foundation interior and exterior corners. Install outlet fittings where indicated; connect to corrugated drainage pipe if present at time of modular system installation; leave ready for connection to corrugated drainage pipe if not present.

Specifier Note: Coordinate article below with Division 1 Execution Requirements (Cleaning) Section.

3.06 CLEANING

- A. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.