MANUFACTURER'S GUIDE SPECIFICATION

Section 07 14 16 – Cold Fluid-Applied Waterproofing

REINFORCED WATERPROOFING SYSTEM

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. All Contract Documents, including General and Supplementary Conditions, and Division 1 General requirements, apply to this section.

1.2 SUMMARY

A. Section includes complete waterproofing system, preparation of substrate, and prefabricated drainage composite system to prevent passage of liquid water into building structure. Compatible with common construction materials such as concrete, concrete masonry units (CMUs), metal, wood (pressure-treated and fire-treated), rigid insulation and insulated concrete forms (ICFs). Includes protection.

1.3 SYSTEM DESCRIPTION

A. Waterproofing system includes:

1. Verification of Waterstop in construction joints.

2. Substrate preparation repair mortars, cants/fillet, crack filler and joint treatment.

3. 100%-solids-content, cold-liquid-applied elastomeric waterproofing membrane; single coat application at 60, 90 or 120 mils.

4. 100%-solids-content, cold-liquid-applied elastomeric waterproofing membrane; reinforced two-coat application at 120 mils.

5. Accessory components: sealants.

6. Protection board

7. Prefabricated protection and drainage composite sheet

8. Drainage accessories

9. Rigid insulation board

10. Testing and inspection

1.4 RELATED SECTIONS

A. Section 01 82 00 - Facility Substructure Performance Requirements

B. Section 02 30 00 - Subsurface Investigation

C. Section 02 32 00 - Geotechnical Investigations

D. Section 03 15 00 – Concrete Accessories

E. Section 03 30 00 – Cast-In-Place Concrete

F. Section 04 20 00 – Unit Masonry

G. Section 07 06 00 - Schedules for Thermal and Moisture Protection

H. Section 07 11 00 – Dampproofing

I. Section 07 13 00 - Sheet Waterproofing

J. Section 07 21 13 - Board Insulation

K. Section 07 26 16 - Below-Grade Vapor Retarders

L. Section 07 60 00 – Flashing and Sheet Metal

M. Section 07 92 00 – Joint Sealants

N. Section 07 95 00 – Expansion Control

O. Section 22 13 00 - Facility Sanitary Sewerage (Penetrations)

P. Section 22 14 00 - Facility Storm Drainage (Penetrations)

Q. Section 26 05 33.13 - Conduit for Electrical Systems (Penetrations)

R. Section 26 05 43 - Underground Ducts and Raceways for Electrical Systems (Penetrations)

S. Section 31 23 00 - Excavation and Fill

T. Section 31 41 00 – Shoring

U. Section 33 46 00 - Subdrainage

1. Section 33 46 13 - Foundation Drainage

2. Section 33 46 16 - Subdrainage Piping

3. Section 33 46 19 - Underslab Drainage

4. Section 33 46 23 - Drainage Layers

5. Section 33 46 26 - Geotextile Subsurface Drainage Filtration

1.5 REFERENCES

A. ASTM C578 – Specification for Preformed, Cellular Polystyrene Thermal Insulation

B. ASTM C836 – Standard Specification for High Solids Content, Cold Liquid Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course

C. ASTM D2697 – Standard Test Method for Volume Nonvolatile Matter in Clear or Pigmented Coatings

D. ASTM D2370 – Standard Test Method for Tensile Properties of Organic Coatings

E. ASTM E96 – Standard Test Methods for Water Vapor Transmission of Materials

F. ASTM C661 – Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer

G. ASTM D2240 – Standard Test Method for Rubber Property—Durometer Hardness

H. ASTM D5385 – Standard Test Method for Hydrostatic Pressure Resistance of Waterproofing Membranes

I. ASTM C794 – Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants

J. ASTM C1522 – Standard Test Method for Extensibility After Heat Aging of Cold Liquid-Applied Elastomeric Waterproofing Membranes

K. ASTM D4263 – Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method

L. ASTM D4491 – Test Methods for Water Permeability of Geotextiles by Permittivity

M. ASTM D4716 – Test Method for Constant Head Hydraulic Transmissivity (In-Place Flow) of Geotextiles and Geotextile Related Products

N. ASTM D4833 – Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products

O. ASTM D5957 – Guide for Flood Testing Horizontal Waterproofing Installations

P. ASTM E154 – Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover

1.6 ACTION SUBMITTALS

A. Product Data: Manufacturer’s product data, installation instructions and details.

B. Samples: Representative samples of the following:

1. Free Film Membrane: 2" x 3" (5 x 7.5 cm)

2. Expanding Waterstop: 3" (7.5 cm)

3. Protection Course: 2" x 3" (5 x 7.5 cm)

4. Drainage Composite Sheet: 4" x 4" (10 x 10 cm)

1.7 INFORMATION SUBMITTALS

A. Waterproofing Manufacturer's Sample Warranty

B. Sustainability Submittals:

1. Provide VOC content of all components.
2. LEED Submittal: Documentation of materials, recycled content and location of manufacturer.

C. Material Certificates: Certification that waterproofing system and components, drainage and protection materials comply with specified performance characteristics and physical requirements and are supplied by single-source manufacturer.

D. Contractor Certificate: Approved Applicator status with waterproofing material Manufacturer.

E. Site Condition Reports: Indicate ambient and substrate surface temperatures, relative humidity and dew point, wind velocity and precipitation during application.

1.8 QUALITY ASSURANCE

A. Installer Qualifications to:

1. Have minimum three (3) years of experience in type of work required by this section.

2. Comply with manufacturer's warranty requirements.

3. Be approved applicator as determined by waterproofing/drainage system manufacturer.

4. Attend necessary job meetings. Provide competent and full-time supervision, experienced mechanics, all materials, tools, and equipment necessary to complete, in acceptable manner, the membrane installation.

B. Manufacturer Qualifications:

1. Capable to supply all components of complete waterproofing system.

2. Minimum of five (5) years of experience in manufacturing of waterproofing systems.

3. Capable of providing product and technical support representation during construction, approving an acceptable applicator, and suggesting appropriate installation methods.

4. ISO 9001-2000 Certified Organization.

5. ISO 14001-2004 Certified Environmental Management Organization.

C. Pre-Installation Conference:

1. Establish procedures to maintain required working conditions.

2. Coordinate this work with related and adjacent work and trades.

3. Verify plumbing floor drains are two-stage drains with 3" (7.5 cm) flange and clamping ring to receive waterproof membrane.

4. Review special project details.

5. Verify with Architect and Contractor that waterproofing and waterstop details comply with waterproofing manufacturer's current installation requirements and recommendations.

6. Attendees should include representatives for Owner, Architect, Quality Assurance, General Contractor, Waterproofing Contractor, Waterproofing Manufacturer, Concrete Contractor, Excavating/backfill Contractor and MEP contractors if MEP work penetrates waterproofing.

7. Give minimum five (5) days' notice to Owner, General Contractor and Manufacturer prior to commencing work. Immediately notify parties of changes in work schedule.

D. Independent Inspection: Owner provided independent inspection service to monitor waterproofing material installation. Inspection to include:

1. Compliance with project contract documents.

2. Compliance with manufacturer's published literature and site-specific details.

3. Produce reports and digital photographs documenting each inspection. Make reports available in timely manner to Contractor, Waterproofing Installer, Waterproofing Material Manufacturer and Architect.

4. Substrate examination at beginning of waterproofing installation, at periodic intervals during waterproofing installation and at final inspection.

5. Flood testing where applicable.

6. Electric field vector mapping where applicable.

7. Authorization to proceed prior to concrete or backfill placement against the waterproofing.

E. Mock-up:

1. Area designated by Architect will be considered Mock-up.

2. Prepare and clean a minimum 4' x 4' (1.22 x 1.22 m) area of each substrate material type and project condition.

3. Demonstrate methods, products and tools to prepare acceptable substrate meeting membrane manufacturer's installation instructions

4. Install cold-liquid-applied waterproofing, reinforcement for reinforced systems only, protection board or drainage composite and accessories.

1.9 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Delivery: Deliver materials in factory-sealed and factory-labeled packaging. Sequence material deliveries to avoid work delays and minimize on-site storage. Follow manufacturer's instructions, recommendations and material safety data sheets for material handling and storage.

B. Storage: Do not double-stack pallets during shipping or storage. Protect waterproofing materials from moisture, excessive temperatures and sources of ignition. Cover the stored material on the top and all sides while on-site, allowing for adequate ventilation. Protect material from construction operation, weather, excessive temperatures and prolonged sunlight.

C. Store and manage hazardous materials in accordance with Section 01 35 29.06 - Health and Safety Requirements and Section 01 35 43 - Environmental Procedures. Remove damaged material from site and dispose of it in accordance with applicable regulations.

1.10 PROJECT CONDITIONS

A. Substrate Condition: Proceed with work only when substrate construction and preparation work are complete and are acceptable for waterproofing application. All structural, plumbing, electrical and mechanical work to be under or penetrating through the waterproofing should be completely secured in proper position prior to waterproofing system installation. Substrate preparation should comply with waterproofing manufacturer’s guidelines.

B. Submit written report to General Contractor of substrate surface defects and work prepared by other Trades that adversely affect quality or dimensions of waterproofing work.

C. Weather Conditions: Perform work only when existing and forecasted weather conditions are within Manufacturer’s guidelines. Those guidelines include but are not limited to:

1. Do not apply waterproofing materials in areas of standing or active water, or over snow, ice or frost.

2. Timely remove standing water caused by precipitation or ground water seepage to maintain acceptable site conditions.

D. Schedule work so the membrane will not be exposed for longer than recommended by Manufacturer.

1.11 WARRANTY

A. Waterproofing System Warranty: Waterproofing Manufacturer to provide sample of [five (5)], [ten (10)], [fifteen (15)], [twenty (20)] year warranty, including waterproofing system requirements. Issuance of Manufacturer's Waterproofing Warranty requires the following:

1. Waterproofing System products and drainage composite products provided by single manufacturer.

2. Installation of waterproofing products, prefabricated drainage composite and all appropriate system accessories are installed by a Manufacturer's Approved Applicator in full accordance with manufacturer's recommendations, installation instructions, specifications and details.

3. Concrete Accessories: Waterstop installed in concrete cold construction joints, formed construction joints, isolation joints and penetrations are required by Cold-Fluid-Applied Warranty.

PART 2 – PRODUCTS

2.1 MANUFACTURER

A. Materials: Obtain waterproofing system including all components and accessories from single manufacturer to ensure material compatibility.

B. Polyglass, 1111 West Newport Center Drive, Deerfield Beach, FL 33442, USA. Toll-Free (888) 410-1375; Website: www.polyglass.us

2.2 COLD-FLUID-APPLIED WATERPROOFING

A. Mapeseal GC: Primary waterproofing membrane shall be Mapeseal GC cold-fluid-applied elastomeric membrane, manufactured by Polyglass, which is a fast-curing, 100%-solids, single-component, moisture-cure, coal-tar-free, polyether waterproofing membrane. Apply in a 120-mil-thick reinforced system (60-mils of Mapeseal 250 GC, Mapeseal Fabric and 60-mils of Mapeseal GC).

2.3 COLD-FLUID-APPLIED WATERPROOFING PERFORMANCE PROPERTIES

A.	Color	Green
B.	Solids content – ASTM D1644	100%
C.	VOCs	44 g/L
D.	Resistance to Water – ASTM D2939	No blistering, No reemulsification
E.	Tensile strength – ASTM D412	381 psi
F.	Elongation – ASTM D412	210% minimum
G.	Water Vapor Permeance – ASTM E96, Water Method	0.04 perms
H.	Extensibility after heat – ASTM C1522	Pass
I.	Weight Loss – ASTM C836	Pass
J.	Adhesion-in-peel – AC29 and ASTM C836	6.4 lbf
K.	Hardness – ASTM D2240, Type OO	87
L.	Resistance to Decay – AC29	Pass
M.	Minimum application temperature	40°F (4°C)
N.	Approximate curing time, at 70°F (21°C) and	2 hours for skinning over; 24 hours

50% relative humidity or initial set; 72 hours for full cure

O. Rain-resistant, at 70°F (21°C) and 50% relative humidity after 2 hours

P. Required curing time for concrete substrates 3 days

2.4 WATERPROOFING ACCESSORIES

A. Reinforcement Fabric: Polyglass Mapeseal Fabric: Calendered, spunbond, nonwoven, polyester fabric weighing 1.18 oz. per sq. yd. (40 g per m^2)

B. Liquid Membrane: Mapeproof Liquid Membrane. 2-part, 100% polyurethane liquid membrane.

C. Backer Rod: Closed-cell polyethylene foam rod

D. Waterstop: Polyglass Mapestrip 25 hydrophilic expandable, pre-formed, flexible rubber strip for watertight construction.

2.5 PROTECTION AND DRAINAGE COMPOSITE SHEET – PREFABRICATED

A. General: Polyglass Mapedrain prefabricated drainage composite sheet to promote positive drainage. It is a high-strength, high-flow, prefabricated drainage composite with filter fabric. The three-dimensional polypropylene drainage core has geotextile adhered to one side to allow water passage while restricting soil particles.

B. Polyglass Mapedrain HS for vertical applications, with high compressive strength and flow rates. Has backer film to prevent potential “die cutting” of a waterproofing membrane installed behind drainage composite.

1. Geotextile fabric: 4 oz. non-woven

2. Compressive strength: 15,000 psf (526 kN/m^2)

3. Flow rate per ASTM D4491: 140 gal/min/ft^2 (5 704 L/min/m^2)

4. Flow (hydraulic gradient = 1) per ASTM D4716: 18 g/min/ft (223 L/min/m)

5. Core thickness: 0.40" (10.16 mm)

C. Polyglass Mapedrain HS PLUS for vertical or horizontal applications, with high compressive strength and flow rates. Has backer film to prevent potential “die cutting” of a waterproofing membrane installed behind drainage composite.

1. Geotextile fabric: 4 oz. non-woven

2. Compressive strength: 15,000 psf (718 kN/m^2)

3. Flow rate per ASTM D4491: 140 gal/min/ft^2 (5 704 L/min/m^2)

4. Flow (hydraulic gradient = 1) per ASTM D4716: 21 g/min/ft (260 L/min/m)

5. Core thickness: 0.40" (10.16 mm)

2.6 BOARD INSULATION: Extruded-polystyrene board insulation complying with ASTM C578.

A. Type IV, 25 psi (173 kPa) minimum compressive strength.

PART 3 – EXECUTION

3.1 SUBSTRATE INSPECTION AND CONDITIONS

A. Examine conditions of substrates and other conditions affecting work of this section with waterproofing Installer, General Contractor and Owner's Independent Inspector present. Notify General Contractor, in writing, of defects in substrate preventing installation of waterproofing. Do not proceed with work until defects in substrate are corrected and acceptable for waterproofing installation and comply with manufacturer's recommendations.

B. Substrates to receive waterproofing must be clean and free of voids, protrusions and surface irregularities.

C. Related work: Verify that waterstop is installed in vertical and horizontal concrete construction cold-pour joints and around penetrations, structural members, and tie-rod form holes that extend through the wall.

D. Chemical additives: Verify that ready-mix additives are compatible with waterproofing.

E. Curing compounds: Concrete should be cured by the water-curing method. Curing compounds may adversely affect adhesive bond of self-adhered sheet waterproofing membrane. Verify that curing compounds of pure sodium silicate type or clear resin-based materials are without waxes, oils or pigments, and are compatible with waterproofing.

F. Form release agents must not transfer to concrete. Remove forms as soon as possible from below horizontal slabs to prevent moisture entrapment. Excess moisture could result in blistering of waterproofing.

G. Mechanically remove from the substrate any curing compounds and form release agents that adversely affect adhesion of waterproofing.

H. Prepare substrate surfaces to accept waterproofing system per requirements of membrane Manufacturer and as directed by Architect.

I. Apply waterproof membrane only in dry weather, when ambient and substrate temperatures are above 40°F (4°C).

3.2 PREPARATION

A. Remove contaminants such as dirt, debris, oil, grease, wax, cement laitance, or other foreign matter that will impair or negatively affect performance of waterproofing and drainage system.

B. Protect adjacent work areas and finish surfaces not receiving waterproofing from damage or contamination from waterproofing products spillage and overspray during installation operations.

C. New concrete should be cured for a minimum of 3 days and must be dry before waterproofing membranes are applied.

D. Protect waterproofing from direct sunlight immediately after installation.

3.3 GENERAL INSTALLATION GUIDELINES

A. Comply with contract documents and manufacturer's product data, including product

application and installation instructions and details. Cold-fluid-applied waterproofing can be applied to concrete, metal, wood, insulated wall systems and masonry surfaces.

B. Maintain adequate ventilation during preparation and application of waterproofing materials.

C. Cap off all exposed fabric at the end of each day.

D. Apply protection board or drainage composite over work installed each day.

E. Inspect cold-fluid-applied waterproofing before covering with protection board or drainage composite. Repair damaged or inadequate areas as necessary.

F. Protect cold-fluid-applied waterproofing on vertical and horizontal applications with immediate application of drainage composite sheet or protection board.

3.4 DETAILING/FLASHING

A. All detailing and flashing shall be completed prior to installation of field waterproofing membrane.

B. All detailing and flashing shall be installed per manufacturer's standard details.

3.5 APPLICATION OF COLD-FLUID-APPLIED WATERPROOFING

A. Ensure deck is ready to receive cold-fluid-applied waterproofing membrane in accordance with published literature.

B. Apply first layer of cold-fluid-applied waterproofing membrane evenly to a minimum thickness of 60 mils to form a continuous monolithic coating.

C. Apply reinforcing fabric and fully embed into first layer of cold fluid applied waterproofing. Overlap reinforcing fabric approximately 1" to 2" (2.5 to 5 cm), ensuring that the cold-fluid-applied waterproofing bleeds completely through both layers.

D. Apply second layer of cold-fluid-applied waterproofing membrane over the reinforcing fabric to a minimum thickness of 60 mils, providing a total thickness of 120 mils.

3.6 PROTECTION

A. Protection course: Cover waterproofing with protection course following curing of waterproofing and prior to installation of backfill or overburden.

B. On vertical applications, install protection or drainage composite sheet as soon as possible to avoid damage from other trades, construction materials or backfill.

C. For horizontal applications, use drainage composite. Install protection as soon as possible to avoid damage from other trades, construction materials or backfill.

D. Protect completed waterproofing assembly from subsequent construction activities. Protect waterproofing materials from exposure to UV light for a period in excess of that acceptable to waterproofing manufacturer; replace overexposed materials.

3.7 BACKFILL/OVERBURDEN

A. Install backfill or overburden as soon as possible according to project requirements. Use care during backfill operation to avoid damage to waterproofing system. Follow generally accepted industry practices for backfilling and compaction. Backfill should be added and compacted in lifts from 6" to 24" (15 to 61 cm).

3.8 CLEANUP

A. In areas where adjacent finished surfaces or work are contaminated by waterproofing material, immediately notify General Contractor and trade responsible for area. Consult manufacturer of surfaces for cleaning advice and conform to their recommendations and instructions. Remove all tools, equipment and remaining product on-site. Dispose of debris and damaged product in accordance with applicable regulations.

B. Maintain work area in a neat and workmanlike condition. Remove empty cartons and rubbish from site daily.

C. Repair or replace defaced or disfigured finishes caused by work of this section.

END OF SECTION 07 14 16