SECTION 071700 - March, 2023

**TegoBloc Swell Bentonite Geotextile Waterproofing System**

**with Drain-Max Prefabricated Drainage Composite**

**Master Guideline Specification for Cast-In-Place Concrete**

**PART 1 - GENERAL**

1.01 RELATED DOCUMENTS

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

1.02 WORK SUMMARY

A. The work of this section includes, but is not limited to the furnishing and installing the following materials, per project specifications and drawings, or as directed by waterproofing manufacturer:

1. TegoBloc Swell waterproofing membrane with all applicable accessory products.

2.Drain-Max Prefabricated drainage composite and Drain-Max Total Drain Base Drain

1.03 RELATED SECTIONS

A. Other specification Sections which directly relate to the work of this section include, but are not limited to, the following:

1. Division 2: Subsurface and Geotechnical Investigations

2. Division 3: Waterstops

3. Division 5: Expansion Joint Products

4. Division 7: Joint Treatment/ Sealants, Flashing and sheet metal, and Insulation

5. Division 22: Deck and Floor Drains and other Mechanical Penetrations

6. Division 26: Conduit and other Electrical Penetrations

7. Division 31: Earthwork, Excavation and Fill, Shoring,

8. Division 33: Geocomposite Foundation Drainage

1.04 SYSTEM DESCRIPTION

1. Provide waterproofing system and prefabricated drainage composite system to prevent the passage of liquid water and install without defects, damage or failure. Waterproofing shall be two high strength geotextiles interlocked encapsulating minimum 5.37 kg/sqm (1.10-lbs/sf) granular sodium bentonite.

1.05 SUBMITTALS

A. General: Prepare and submit specified submittals in accordance with "Conditions of the Contract" and Division 1 Submittals Sections.

B. Product Data: Submit manufacturer’s product data, with complete general and specific installation instructions, recommendations, and limitations.

C. Product Samples: Submit representative samples of the following for approval:

1. TegoBloc Swell waterproofing membrane

2.Drain-Max Total Drain Base Drain and Drain-Max 220 Prefabricated drainage composite

D. Waterproofing Material and Labor Warranty: At time of bid, submit a sample copy of the Manufacturer’s Waterproofing warranty complete with all coverage’s, limitations, and conditions.

E. Contractor Certificate: At time of bid, submit written certification that installer has current Approved Applicator status with waterproofing material manufacturer.

1.06 QUALITY ASSURANCE

A. Installer Qualifications: Installing company should have at least three (3) years experience in work of the type required by this section, who can comply with manufacturer's warranty requirements, and who is an Approved Applicator as determined by waterproofing/drainage system manufacturer.

B. Manufacturer Qualifications: Waterproofing membranes and all accessory products shall be provided by a single manufacturer with a minimum of 30 years experience in the direct production and sales of waterproofing systems. Manufacturer shall be capable of providing field service representation during construction, approving an acceptable installer, and recommending appropriate installation methods.

C. Pre-Installation Conference: A pre-installation conference shall be held prior to commencement of field installation to establish procedures to maintain required working conditions and to coordinate this work with related and adjacent work. Verify that final waterproofing and waterstop details comply with waterproofing manufacturer's current installation requirements and recommendations. Pre-con meeting attendees should include representatives for the owner, architect, inspection firm, general contractor, waterproofing contractor, concrete contractor, excavating/backfill contractor, and mechanical and electrical contractors if work penetrates the waterproofing.

D. Materials: Obtain waterproofing membrane with accessory products and prefabricated drainage materials from a single manufacturer to assure material compatibility.

E. Independent Inspection: Owner shall make all arrangements and payments for an independent inspection service to monitor waterproofing material installation compliance with the project contract documents and manufacturer’s published literature and site-specific details. Independent Inspection Firm shall be an approved company participating with the waterproofing manufacturer’s Certified Inspection Program. Inspection service shall produce reports and digital photographs documenting each inspection. Reports shall be made available in a timely manner to the Contractor, waterproofing installer, waterproofing material manufacturer, and Architect. Inspections should include substrate examination, beginning of waterproofing installation, periodic intervals, and final inspection prior to concrete or backfill placement against the waterproofing.

F. Water Sample Test: Waterproofing contractor shall supply project site water sample to waterproofing membrane manufacturer for analysis. Manufacturer shall conduct test free of charge. Contractor is responsible for collection and shipment 2-liters (64-fluid ounces) of actual site water. Water should be shipped in uncontaminated, sealed plastic container to: GMX, Inc. 3014 Chamber Drive, Monroe NC 28110, Attn: Technical Services. Also provide project name, city and state along with return address to forward test results.

1.07 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Delivery and Handling: Deliver materials in factory sealed and labeled packaging. Sequence deliveries to avoid delays, while minimizing on-site storage. Handle and store following manufacturer's instructions, recommendations and material safety data sheets. Protect from construction operation related damage, as well as damage from weather, excessive temperatures and prolonged sunlight. Remove damaged material from site and dispose of in accordance with applicable regulations.

1. Storage: Do not double-stack pallets during shipping or storage. Protect waterproofing materials from moisture, excessive temperatures and sources of ignition. Provide cover, top and all sides, for materials stored on-site, allowing for adequate ventilation.

1.08 PROJECT CONDITIONS

1. Substrate Condition: Proceed with work only when substrate construction and preparation work is complete and in condition to receive waterproofing system. All plumbing, electrical, mechanical and structural items to be under or passing through the waterproofing shall be positively secured in their proper positions prior to waterproofing system installation. Substrate preparation shall be per waterproofing manufacturer’s guidelines.
2. Weather Conditions: Perform work only when existing and forecasted weather conditions are within the guidelines established by the manufacturer of the waterproofing materials. Do not apply waterproofing materials in areas of standing or active water; or over ice and snow. Though exposure to precipitation and ground water seepage typically will not adversely affect TegoBloc Swell, the General Contractor shall maintain site conditions to remove standing water from precipitation or ground water seepage in a timely manner. Should TegoBloc Swell be subjected to pre-hydration because of prolonged immersion, inspection of the material and written acceptance from GMX, Inc. is required prior to concrete or backfill placement.

1.09 WARRANTY

1. Material only Warranty from the Manufacturer for five (5) years.
2. Installation warranty from the Applicator for two (2) years.

**PART 2 - PRODUCTS**

2.01 MANUFACTURER

1. Provide TegoBloc Swell waterproofing membrane and applicable accessories as manufactured by GMX, Inc. 3014 Chamber Drive, Monroe NC 28110 [www.gmxco.com](http://www.gmxco.com)

2.02 MATERIALS

A. TEGOBLOC SWELL BENTONITE GEOTEXTILE WATERPROOFING MEMBRANE

1. TEGOBLOC SWELL MEMBRANE: 1.2 x 4.5m (4’ x 15’) roll of interlocked geotextiles encapsulating a minimum 4.8 kg/sqm (1.0-lbs/sf) of granular sodium bentonite. Composite shall consist of one woven and one nonwoven polypropylene geotextile, interlocked using a needle-punching process that produces interlocks over the entire area of the product.

TegoBloc Swell performance properties:

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| --- | --- | --- |
| PROPERTY | TEST METHOD | TYPICAL VALUE |
| Hydrostatic Pressure Resistance | ASTM D 5385 mod. | 70 m (231 ft.) |
| Permeability | ASTM D 5084 | 1 x 10-9 cm/sec. |
| Grab Tensile Strength | ASTM D 4632 | 422 N (95 lbs.) |
| Puncture Resistance | ASTM D 4833 | 445 N (100 lbs.) |
| Low Temperature Flexibility | ASTM D 1970 | Unaffected at -32°C (-25°F) |
| Peel Adhesion to Concrete | ASTM D 903 mod. | 2.6 kN/m (15 lbs. /in.) |

B. ACCESSORY WATERPROOFING PRODUCTS: All accessory waterproofing materials shall be provided by the waterproofing manufacturer or shall have manufacturer’s written approval for substitution.

1. TegoBloc LiquiSeal: Trowel grade detailing mastic

2. TegoBloc TxSwell: 50 mm diameter x 60 cm 2’ long, water soluble tube container filled with active granular sodium bentonite.

3. TegoBloc GrSwell: 22.7 kg (50 lbs.) bag of active granular sodium bentonite.

4.FasTape: sealant tape.

5. Termination Bar: Min. 3 mm (1/8”) thick by 25 mm (1”) wide stainless steel or aluminum termination bar with pre-punched holes punched 150 mm (6”) on center for fastening.

6. Cementitious Wall Board: 12 mm (½”) thick cementitious board for protection of waterproofing during the removal of metal soldier pile cap and top lagging boards.

7. Ultra-Guard EFS – single-component general sealant and adhesive

8. TegoBloc Boots – pre-formed, single piece thermoplastic cover for tie-back heads and soil nails. Three sizes available: 6”, 8”, and 10”.

9. TegoBloc SA – self-adhering flashing membrane used for grade and thru-wall detailing.

C. BASE AND SHEET DRAINAGE COMPOSITE

Drain-Max drainage composite by GMX, Inc. shall be used where specified to promote positive drainage. Use base drain accessory connectors and outlets as required.

1.Drain-Max ® 220 – 4-ft x 50ft roll of a three-dimensional polypropylene drainage core with a nonwoven geotextile adhered to one side to allow water passage while restricting soil particles. Composite includes a thin polyethylene sheet on the back of the drainage core.

A. Compressive Strength, 718 kPa (15,000psf); B. Water Flow Rate, 251 l/m/m (20gpm/ft);

C. Thickness, 11 mm (7/16”)

2.Drain-Max ® Total Drain Base Drain – (1”) thick x 300 mm (12”) high base drain composite designed to collect water from sheet composite drainage and then discharge the water to proper sump system or gravity to daylight.

A. Compressive Strength, 457 kPa (10,000psf); B. Water Flow rate, 1,197 l/m/m (97gpm/ft);

C. Thickness, 25 mm (1”)

**PART 3- EXECUTION contains work sections pertaining to both zero-lot line construction and backfilled foundation wall construction. Therefore, PART 3 should be edited to only include work sections specific to the job site conditions required on the project. Sections 3.01, 3.02, and 3.03 pertain to all applications. Section 3.04 through Section 3.11 pertain only to zero-lot line construction. Sections 3.04B, through Section 3.10B pertain only to backfilled cast-in-place concrete wall applications.**

**PART 3 – EXECUTION**

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

3.01 SUBSTRATE INSPECTION AND CONDITIONS

A. The installer, with the Owner’s Independent Inspector present, shall examine conditions of substrates and other conditions under which this section work is to be performed and notify the contractor, in writing, of circumstances detrimental to the proper completion of the work. Do not proceed with work until unsatisfactory conditions are corrected and are acceptable for compliance with manufacturer's warranty requirements. General substrate conditions acceptable for the waterproofing installation are listed below. For conditions not covered in this Section, contact the waterproofing manufacturer for guidance.

B. WORKING MUD SLAB: Working concrete mud slabs should have a float finish to provide a planar surface; without sharp angular depressions, voids or raised features.

C. COMPACTED SOIL OR GRAVEL SUB-GRADE: Sub-grade shall be compacted to a minimum Modified Proctor compaction of 85% or greater as specified by civil/geotechnical engineer. The finished sub-grade surface shall be well-leveled, uniform, free of debris and standing water or ice. Aggregate sub-grades shall consist of 19 mm (¾”) stone or smaller and rolled flat, free from any protruding sharp edges. If substrate consists of large aggregate, place a high-strength geotextile layer over the aggregate and then provide several inches of compacted soil or sand for uniform support and containment of waterproofing sheets. Specific sub-grade preparation shall be approved by the project’s civil or geotechnical engineer.

D. WOOD TIMBER SHORING: Wood lagging shoring should extend to the lowest level of the waterproofing installation with any voids or cavities exterior of the lagging timbers filled with compacted soil or cementitious grout. Interior surface of lagging boards should be planar and tight together with gaps less than 25 mm (1”). Gaps more than 25 mm (1”) should be filled with cementitious grout, compacted soil, wood, extruded polystyrene (20 psi min.) or GMX, INC. approved polyurethane spray foam. Do not use plywood or other surface treatment over large lagging gaps that leave the cavity void. In areas where lagging gaps are 63 mm (2-1/2”) or less, Drain-Max sheet drainage can be installed over lagging to provide uniform surface to mount the waterproofing without requirement of filling gaps. Drain-Max sheet and Total Drain base drain system should be connected to an operative water discharge system. All lagging board nails and other mechanical projections shall be removed or pounded flush. Install a protection material over all soldier piles with raised lagging hanger bolts, form tie rods, or other irregular surface; protection material should extend a minimum 150 mm (6”) to both sides of the steel piling.

E. CUT ROCK FACE OR AUGER CAST CAISSON SHORING WALLS: Interior surface of cut rock and concrete auger pile retention walls should be planar without irregular surface conditions, voids, and sharp transitions that would leave a void space to the outside of the drainage and waterproofing installation. Irregular rock, void pockets, cracks, sharp concave transitions should be completely filled or smoothed with cementitious grout, shotcrete, or other approved solid material.

F. MECHANICAL OR OTHER PENETRATIONS: Mechanical, structural, or architectural materials that will pass through the plane of the waterproofing membrane shall be properly installed and secured in their final position prior to installation of the waterproofing system.

G. CONCRETE: Concrete to be waterproofed shall be properly placed and consolidated. Reinforced structural slabs should be a minimum of 150 mm (6") thick when placed on a working mud slab. Reinforced concrete slab(s) on compacted grade shall be a minimum of 100 mm (4”) thick. When hydrostatic conditions exist, install TegoBloc Swell under all footings, elevator pits and grade beams. Cast-in-place concrete to receive waterproofing shall be of sound structural grade with a smooth finish, free of debris, oil, grease, laitance, dirt, dust, or other foreign matter which will impair the performance of the waterproofing and drainage system and which do not comply with manufacturer's warranty requirements. TegoBloc Swell can be installed on green structural concrete as soon as the forms are removed provided the contractor gains written approval from project structural engineer listing any site-specific concrete curing time requirement. Do not apply TegoBloc Swell waterproofing directly over lightweight insulating concrete, wood, or steel decking.

* + - 1. Remove dirt, debris, oil, grease, cement laitance, or other foreign matter which will impair or negatively affect the performance of the waterproofing and drainage system.
      2. Protect adjacent work areas and finished surfaces from damage or contamination from waterproofing products during installation operations.
      3. Form fins, ridges, ponding ridges and other protrusions should be level and smooth with concrete surface.
      4. Honeycombing, aggregate pockets, tie-rod holes and other voids shall be completely filled with non-shrink cementitious grout and level with monolithic concrete surface.
      5. Horizontal deck or roof concrete surfaces should be sloped for positive drainage to the deck drains or the perimeter edges. Deck drain positions should be designed with an appropriate sump depression surrounding the drain.
      6. Precast concrete deck units shall be installed and secured to structural supports in accordance with the concrete panel manufacturer’s requirements and industry practice. All joints between precast units shall be completely grouted and flush with deck. Any differential in elevation between precast units shall be feathered for a smooth transition.

7. For below grade expansion joints between 25 mm – 100 mm (1”- 4”) in width, install appropriate Expansion Joint prior to the installation of the TegoBloc Swell Waterproofing System

NOTE: Related work to be completed under Division 3. GMX Waterstop-RX shall be installed in all applicable vertical and horizontal concrete construction cold pour joints and around applicable penetrations, structural members, and tie-rod form holes that extend through the wall. Refer to GMX Waterstop-RX Product Manual for further installation procedures and guidelines.

3.02 SURFACE PREPARATION

A. Remove dirt, debris, oil, grease, cement laitance, or other foreign matter which will impair or negatively affect the performance of the waterproofing and drainage system.

B. Protect adjacent work areas and finish surfaces from damage or contamination from waterproofing products during installation operations.

3.03 GENERAL INSTALLATION GUIDELINES

A. Property Line Walls, install TegoBloc Swell membrane with the dark gray woven geotextile side in the direction to receive concrete pour; white geotextile side outward against retaining wall. Overlap TegoBloc Swell membrane edges minimum 100mm (4”). Under slab, install TegoBloc Swell with the dark gray woven geotextile side up; white geotextile side facing down. Overlap TegoBloc Swell membrane edges minimum 100 mm (4”). Backfilled walls and roofs of earth covered structures, install TegoBloc Swell with the white geotextile side outward, away from the concrete, facing the installer, dark gray geotextile against concrete. For backfilled walls overlap TegoBloc Swell membrane edges a minimum 100mm (4”).

B. Expansion Joints: TegoBloc Swell waterproofing is not an expansion joint filler or sealant but can be incorporated with an Expansion Joint to create a warranty eligible, solution for waterproofing the below grade expansion joint. Please refer to the Expansion Joint Installation Guide for installation instructions.

3.04 AQUADRAIN DRAINAGE COMPOSITE (Non-Hydrostatic Applications)

1. At the base of the lagging wall, install Drain-Max Total Drain base-drain horizontally oriented with the open core edge up and the 50 mm (2”) fabric flap side away from the lagging wall. Secure the bottom edge of Total Drain to the lagging wall with washer-head fasteners every few feet. Use couplers and corner fittings, as required, to form a continuous Total Drain installation. Install discharge outlet fittings to connect with discharge pipes as required for the project. Weep discharge pipes stubbed into Total Drain or Drain-Max sheet without proper discharge connection fittings is not acceptable.

B. Install the bottom course of Drain-Max 220 sheet drainage (geotextile side against the lagging wall) with the 220 bottom edge fabric flap tucked behind the top edge of the Total Drain against the lagging to prevent the passage of soil into the core at the connection. Bottom edge of 220 core should be in contact with open top core edge of Total Drain. Place the 50 mm (2”) fabric flap of the Total Drain over the back of the 220 core and secure it with tape to maintain flap position. Secure the top edge of Total Drain to the lagging wall with washer-head fasteners 600 mm (24”) on center.

C. Install subsequent courses of Drain-Max 220 sheet drainage to within 300 mm (12”) of finished grade or as shown on the project drawings. Tightly abut adjoining sheet drain core edges and tuck the extra fabric flaps behind the adjacent roll edge to prevent soil from entering the sheet drain. Secure sheet drain to lagging wall with washer-head fasteners. Where drainage sheet panels are installed overlapped, bottom edge of higher course shall be installed to the outside of the lower course to shed water like a roof shingle.

D. Prior to installing drainage composite near grade, install 12 mm (½”) thick cementitious wall board centered over metal soldier pile from finished grade elevation to specified depth of soldier pile removal. Cementitious wall board will protect drainage and waterproofing when top of soldier pile is excavated and removed. Remove cementitious board with removal of soldier pile top and lagging.

E. Around penetrations and tie-back heads, cut sheet drainage composite to fit and wrap extra filter fabric around open core edge to prevent soil from entering core.

F. At the top of the sheet drain installation, wrap the filter fabric flap behind the exposed top core edge to prevent intrusion of soil into the core and secure sheet drain to wall with termination bar fastened 300 mm (12") on center with the fabric wrapped.

Note: Specify Drain-Max sheet composite and base drain for non-hydrostatic site conditions for collection and transport of water. Drain-Max system shall be connected to an operable drain discharge system.

3.05 SLAB TO ZERO-LOT LINE SHORING WALL TRANSITION COURSE

A. At base of shoring wall, install TegoBloc Swell corner transition sheet horizontally oriented (white geotextile side against shoring wall; dark gray geotextile side facing installer) with the bottom edge extending out onto the horizontal substrate a minimum 300 mm (12") and the top edge of the sheet extending a minimum 300 mm (12") above the finished slab elevation. Secure TegoBloc Swell sheet to shoring wall through the Drain-Max with washer-head fasteners maximum 600 mm (24") on center. Overlap edges of TegoBloc Swell sheets a minimum 100 mm (4").

B. If the slab thickness is greater than 600 mm (24"), install a second full sheet or cut strip of TegoBloc Swell horizontally oriented on the shoring wall to meet the 300 mm (12") requirement above of the top slab elevation. Overlap top edge of previous sheet and edges of adjacent sheets a minimum 100 mm (4").

3.06 UNDER SLAB INSTALLATION

A. Reinforced structural foundation slabs should be a minimum of 150 mm (6") thick when placed on a working mud slab. Reinforced concrete slab(s) on compacted grade shall be a minimum of 100 mm (4”) thick. Install TegoBloc Swell under all footings, elevator pits and grade beams when hydrostatic conditions exist or are anticipated per the historical high ground water elevation reported in the project’s geotechnical documents.

B. Install under slab TegoBloc Swell membrane extending to base of shoring wall (dark gray geotextile side up) fully overlapping the 300 mm (12”) horizontal tail of the TegoBloc Swell corner transition sheet installed per Section 3.05 Work. Secure corner edge of membrane with washer-head fasteners or pneumatic staples 300 mm (12”) on center.

C. Place TegoBloc Swell directly on properly prepared substrate (white geotextile side down; dark gray geotextile side up facing installer) with adjoining edges overlapped a minimum of 100 mm (4”). Stagger sheet end seams a minimum of 60 cm (24”). Mechanically fasten or staple TegoBloc Swell membrane as required to prevent movement from construction operations or concrete placement. When the slab is poured in sections, extend TegoBloc Swell a minimum 300 mm (12") beyond the slab edge to enable proper overlapping.

D. Install waterproofing system at all grade beams, pile caps, and other detail areas in accordance with manufacturer’s detail for specific project condition(s).

E. Slab Penetrations: For all pipe, rebar, structural or other penetrations install waterproofing system in accordance with manufacturer’s standard detail for specific project condition(s).

F. Inspect finished TegoBloc Swell installation and repair any damaged material prior to concrete slab placement.

NOTE: Related work to be completed under Division 3. Waterstop-RX shall be installed in all slab joints, around applicable slab penetrations and structural members. Refer to Waterstop-RX Product Manual for further installation procedures and guidelines.

3.07 WOOD LAGGING WALL INSTALLATION

A. Install a strip of TegoBloc Swell over all soldier piles with raised lagging hanger bolts, form tie rods, or other irregular surface. TegoBloc Swell strip should extend a minimum 150 mm (6”) to both sides of the piling. Apply TegoBloc LiquiSeal 6 mm (¼”) thick by 50 mm (2”) to TegoBloc Swell strip surface along both side edges of the soldier pile.

B. Starting at the base corner, install base course of TegoBloc Swell (horizontally oriented) to lagging wall over the previously installed sheet drainage and corner transition TegoBloc Swell course (Section 3.04 and 3.05 Work). Secure sheet edges to shoring wall with washer-head fasteners placed a maximum 600 mm (24") on center around sheet edge. Overlap adjacent TegoBloc Swell sheet edges a minimum 100 mm (4”).

C. After the bottom horizontal course, TegoBloc Swell sheets can be installed either vertically or horizontally oriented. Continue TegoBloc Swell installation up wall to finished grade elevation detail, staggering all sheet roll ends of adjacent courses a minimum 300 mm (12"). Do not allow horizontal TegoBloc Swell overlap joints to run at same elevation as the concrete pour lift joints; extend membrane past a minimum 150mm (6”). Overlap adjacent TegoBloc Swell sheet edges a minimum 100 mm (4”).

1. Tie-Back Heads: For all tie-back heads and soil nails, install waterproofing system with applicable size TB-Boot in accordance with manufacturer’s detail for specific project condition(s). For irregular shoring wall conditions at tie-backs or oversize tie-back heads consult manufacturer for alternate detail for specific project condition(s).

D. Penetrations: For all pipe, rebar, structural and other penetrations install waterproofing system in accordance with manufacturer’s detail for specific project condition(s).

E. Inspect finished TegoBloc Swell installation and repair any damaged material prior to concrete placement.

3.08 LAGGING WALL EXCAVATION, GRADE TERMINATION AND BACKFILL

A. Coordinate with excavation and backfill operations conducted under Division 31 Work to remove the top few wood lagging timbers and top end of the metal soldier piles per local building code or project requirements. Identify and repair any waterproofing and drainage sheet damaged by excavation and removal of soldier pile heads and lagging. Where excavated, fasten all exposed TegoBloc Swell overlap seams maximum 600mm (24”) on center.

B. Terminate TegoBloc Swell membrane 300 mm (12”) below finished grade elevation secured with washer-head fasteners maximum 300 mm (12”) on center to exterior surface of concrete wall. Per manufacturer’s detail for specific project condition(s), install TegoBloc SA flashing to primed concrete substrate with bottom edge overlapping top edge of TegoBloc Swell membrane minimum 100 mm (4”). Overlap all roll ends a minimum 100 mm (4”) to form a continuous flashing. Height of flashing shall be per project details and specifications. Install a rigid termination bar along the top edge of TegoBloc SA; fastened maximum 300 mm (12”) on center. Complete grade termination detail with tooled bead of Ultra-Guard EFS along the top edge, at all penetrations through the flashing, and all exposed overlap seams.

C. Backfill shall be placed and compacted to minimum 85% Modified Proctor density promptly after waterproofing has been installed. Closely coordinate with contractor responsible for Backfill work by informing them each time a waterproofed area is ready for backfill. Backfill shall consist of compactable soil or angular aggregate free of debris, sharp objects, and stones larger than 19 mm (¾”). Care should be used during backfill operation to avoid damage to the waterproofing system. If damage occurs, cease backfilling and report damage. Damaged waterproofing must be repaired per manufacturer’s guidelines.

3.09 METAL SHEET PILING RETENTION WALLS

A. Trowel 12 mm (1/2") thick layer of TegoBloc GrSwell along all sheet piling interlocks. Any areas of water seepage at the interlocks can be sealed prior to TegoBloc Swell installation by injecting TegoBloc GrSwell to the outside of the sheet piling interlocks.

B. Cut the under slab TegoBloc Swell to tightly contour with the metal sheet piling wall. Then pour 38 mm (1-1/2”) cant of TegoBloc GrSwell on top of the TegoBloc Swell along the property line wall. Then install the base shoring wall TegoBloc Swell sheet overlapping the under slab TegoBloc Swell sheet a minimum 300 mm (12”). Cut the bottom edge of the shoring wall sheet at piling transitions to allow the bottom strips to lay flat onto the under slab TegoBloc Swell. Finally, apply TegoBloc GrSwell at the cut TegoBloc Swell edges extending outward from the shoring wall for a minimum of 150 mm (6”).

C. Starting at the base corner, install course of TegoBloc Swell (horizontally oriented) to metal sheet piling wall over the previously installed sheet drainage and corner transition TegoBloc Swell course. Secure sheet edges to shoring wall with washer-head fasteners placed a maximum 600 mm (24") on center around sheet edge.

D. After the bottom horizontal course, TegoBloc Swell sheets can be installed either vertically or horizontally oriented. Continue TegoBloc Swell installation up wall to finished grade elevation detail, staggering all sheet roll ends of adjacent courses a minimum 300 mm (12"). Do not allow horizontal TegoBloc Swell overlap joints to run at same elevation as the concrete pour lift joints; extend membrane past a minimum 150mm (6”). Overlap adjacent TegoBloc Swell sheet edges a minimum 100 mm (4”).

1. Tie-Back Heads: For all tie-back heads and soil nails, install waterproofing system with applicable size TB-Boot in accordance with manufacturer’s detail for specific project condition(s). For irregular shoring wall conditions at tie-backs or oversize tie-back heads consult manufacturer for alternate detail for specific project condition(s).

F. Penetrations: For all pipe, rebar, structural and other penetrations install waterproofing system in accordance with manufacturer’s detail for specific project condition(s).

G. Terminate TegoBloc Swell membrane 300 mm (12”) below finished grade elevation secured with washer-head fasteners maximum 300 mm (12”) on center to exterior surface of concrete wall. Per manufacturer’s detail for specific project condition(s), install TegoBloc SA grade flashing to primed concrete substrate with bottom edge overlapping top edge of TegoBloc Swell membrane minimum 100 mm (4”). Overlap all roll ends a minimum 100 mm (4”) to form a continuous flashing. Height of flashing shall be per project details and specifications. Install a rigid termination bar along the top edge of TegoBloc SA; fastened maximum 300 mm (12”) on center. Complete grade termination detail with tooled bead of Ultra-Guard EFS along the top edge, at all penetrations through the flashing, and all exposed overlap seams.

H. Inspect finished TegoBloc Swell installation and repair any damaged material prior to concrete placement.

3.10 CUT ROCK FACE OR AUGER CAST CAISSON RETENTION WALLS

A. Cut rock face or auger cast caisson wall should be sufficiently planar to provide adequately smooth surface to apply TegoBloc Swell. TegoBloc Swell will conform to large gradual change in planes (e.g., around caisson column) but should not be installed over sharp surface deflections or voids. Deflections/voids should be filled with cementitious material to create suitable substrate for waterproofing installation.

B. Install TegoBloc Swell wall transition course at base of cut face rock or auger cast caisson wall per Section 3.05 instructions.

C. Starting at the base corner, install course of TegoBloc Swell (horizontally oriented) to the shoring wall over the previously installed sheet drainage and TegoBloc Swell corner transition course (Section 3.04 and 3.05 Work). Secure sheet edges to shoring wall with washer-head fasteners placed a maximum 600 mm (24") on center around sheet edge. Overlap adjacent TegoBloc Swell sheet edges a minimum 100 mm (4”).

D. After the bottom horizontal course, TegoBloc Swell sheets can be installed either vertically or horizontally oriented. Continue TegoBloc Swell installation up wall to finished grade elevation detail, staggering all sheet roll ends of adjacent courses a minimum 600 mm (24"). Do not allow horizontal TegoBloc Swell overlap joints to run at same elevation as the concrete pour lift joints; extend membrane past a minimum 150mm (6”). Overlap adjacent TegoBloc Swell sheet edges a minimum 100 mm (4”).

E. Tie-Back Heads: For all tie-back heads and soil nails, install waterproofing system with applicable size TB-Boot in accordance with manufacturer’s detail for specific project condition(s). For irregular shoring wall conditions at tie-backs or oversize tie-back heads consult manufacturer for alternate detail for specific project condition(s).

F. Penetrations: For all pipe, rebar, structural and other penetrations install waterproofing system in accordance with manufacturer’s detail for specific project condition(s).

G. Terminate TegoBloc Swell membrane 300 mm (12”) below finished grade elevation secured with washer-head fasteners maximum 300 mm (12”) on center to exterior surface of concrete wall. Per manufacturer’s detail for specific project condition(s), install TegoBloc SA grade flashing to primed concrete substrate with bottom edge overlapping top edge of TegoBloc Swell membrane minimum 100 mm (4”). Overlap all roll ends a minimum 100 mm (4”) to form a continuous flashing. Height of flashing shall be per project details and specifications. Install a rigid termination bar along the top edge of TegoBloc SA; fastened maximum 300 mm (12”) on center. Complete grade termination detail with tooled bead of Ultra-Guard EFS along the top edge, at all penetrations through the flashing, and all exposed overlap seams.

H. Inspect finished TegoBloc Swell installation and repair any damaged material prior to concrete placement.

3.11 CLEAN UP

1. In areas where adjacent finished surfaces are soiled by work of this Section, 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 section work debris and damaged product following all applicable regulations.

***The following Sections 3.04B, through Section 3.10B pertain only to backfilled cast-in-place concrete wall applications.***

3.04B SLAB / BACKFILLED WALL FOOTING EDGE TRANSITION COURSE

A. Inside the slab/footing form edge, secure TegoBloc Swell sheet horizontally oriented (white geotextile side down; dark gray geotextile side up) to the top inside edge of the exterior slab/footing form with the sheet conforming to the interior form surfaces and then extending out onto the horizontal slab substrate a minimum 300 mm (12"). Overlap edges of adjacent TegoBloc Swell sheets a minimum 100 mm (4") and secure to prevent sheet movement during construction or concrete placement.

3.05B UNDER SLAB INSTALLATION

1. Install TegoBloc Swell under all footings, elevator pits and grade beams when hydrostatic conditions exist or are anticipated per the historical high ground water elevation reported in the project’s geotechnical documents.
2. Install TegoBloc Swell membrane (white geotextile side down; dark gray geotextile side up) extending to interior edge of footing/slab edge, fully overlapping the 300 mm (12”) horizontal tail of the TegoBloc Swell slab edge sheet installed in Section 3.04B. Overlap edges of adjacent TegoBloc Swell sheets a minimum 100 mm (4") and secure to prevent sheet movement during construction or concrete placement.
3. Place TegoBloc Swell directly on properly prepared substrate (white geotextile side down; dark gray geotextile side up facing installer) with adjoining edges overlapped a minimum of 100 mm (4”). Stagger sheet end seams a minimum of 60 cm (24”). Mechanically fasten or staple TegoBloc Swell as required to prevent movement from construction operations or concrete placement. When the slab is poured in sections, extend TegoBloc Swell a minimum 300 mm (12") beyond the slab edge to enable proper overlapping.
4. Install waterproofing system at all grade beams, pile caps, and other detail areas in accordance with manufacturer’s detail for specific project condition(s).
5. Slab Penetrations: For all pipe, rebar, structural or other penetrations install waterproofing system in accordance with manufacturer’s standard detail for specific project condition(s).
6. Inspect finished TegoBloc Swell installation and repair any damaged material prior to concrete slab placement.

NOTE: Related work to be completed under Division 3. Waterstop-RX shall be installed in all slab joints, around applicable slab penetrations and structural members. Refer to Waterstop-RX Product Manual for further installation procedures and guidelines.

3.06B BACKFILLED CAST-IN-PLACE CONCRETE WALLS

A. Place TegoBloc TxSwell along the wall/footing intersection with ends “butted” tightly together to form a continuous installation.

B. Trowel 19 mm (3/4") thick, continuous TegoBloc GrSwell fillet at all inside wall corner transitions. Trowel TegoBloc GrSwell form-tie pockets/patches and any slightly irregular concrete surface honeycomb areas.

C. Starting at the base of the wall, install TegoBloc Swell sheet horizontally (dark gray geotextile side against the wall; white geotextile side facing installer) covering the TegoBloc TxSwell and extending onto the footing a minimum of 150 mm (6”). For hydrostatic conditions, cover the entire footing and overlap waterproofing membrane from under slab work a minimum of 150 mm (6”). Attach TegoBloc Swell using washer-headed mechanical fasteners maximum 600 mm (24”) on center. Overlap all adjacent sheet edges a minimum 100 mm (4”). Stagger all vertical overlap seams a minimum of 300 mm (12”).

D. After the bottom horizontal course, TegoBloc Swell sheets can be installed either vertically or horizontally oriented. Continue TegoBloc Swell installation up wall to finished grade elevation detail, staggering all sheet roll ends of adjacent courses a minimum 300 mm (12"). Do not allow horizontal TegoBloc Swell overlap joints to run at same elevation as the concrete pour lift joints. Overlap all adjacent TegoBloc Swell sheet edges a minimum 100 mm (4”) and secure with washer-head fastener maximum 600 mm (24”) on center.

E. Penetrations: For all pipe, rebar, structural and other penetrations install waterproofing system in accordance with manufacturer’s detail for specific project condition(s).

F. Terminate TegoBloc Swell membrane 300 mm (12”) below finished grade elevation secured with washer-head fasteners maximum 300 mm (12”) on center to exterior surface of concrete wall. Per manufacturer’s detail for specific project condition(s), install TegoBloc SA flashing to primed concrete substrate with bottom edge overlapping top edge of TegoBloc Swell membrane minimum 100 mm (4”). Overlap all roll ends a minimum 100 mm (4”) to form a continuous flashing. Height of flashing shall be per project details and specifications. Install a rigid termination bar along the top edge of TegoBloc SA; fastened maximum 300 mm (12”) on center. Complete grade termination detail with tooled bead of Ultra-Guard EFS along the top edge, at all penetrations through the flashing, and all exposed overlap seams.

G. Inspect finished TegoBloc Swell installation and repair any damaged material prior to backfill placement. Assure that TegoBloc Swell is not displaced during backfill placement or soil compaction.

3.07B PREFABRICATED DRAINAGE COMPOSITE INSTALLATION (Non-Hydrostatic Walls)

A. At the base of the wall, place Drain-Max Total Drain (Total Drain) base-drain horizontally oriented with the open core side up and the 50 mm (2”) flap of fabric side tight against the wall over the previously installed TegoBloc Swell waterproofing using wash-head mechanical fasteners or general construction adhesive. The 50 mm (2”) fabric flap along the top edge of Total Drain should be tightly secured against the wall. Use Total Drain accessory fittings, as required, to form a continuous installation. Install Total Drain discharge outlet fittings to connect to discharge pipes as required for the project.

B. Install the bottom course of Drain-Max 220 sheet drainage (plastic core side against the wall) with the 220-bottom core edge in contact with open top core edge of Total Drain. Secure sheet drain to wall with washer-head fasteners. Secure extra fabric flap of 220 extending down the top front edge of Total Drain to prevent the passage of soil into the core at the connection.

C. Install subsequent courses of Drain-Max 220 sheet drainage to within 300 mm (12”) of finished grade or as shown on the project drawings. Tightly abut adjoining sheet drain core edges together and secure the extra fabric flaps over the front of adjacent roll edges to prevent soil from entering the sheet drain. Secure sheet drain to wall with washer-head fasteners. Where drainage sheet panels are installed overlapped, bottom edge of higher course shall be installed to the outside of the lower course to shed water like a roof shingle.

D. Around penetrations and tie-back heads, cut sheet drainage composite to fit and wrap extra filter fabric around open core edge to prevent soil from entering core.

F. At the top of the sheet drain installation, wrap the filter fabric flap behind the exposed top core edge to prevent intrusion of soil into the core and secure sheet drain to wall with termination bar fastened 300 mm (12") on center.

3.08B INSULATION

A. Always apply TegoBloc Swell waterproofing directly to properly prepared structural concrete substrates. Insulation, if used, should be installed to the exterior of the waterproofing. Do not apply TegoBloc Swell waterproofing over lightweight insulating concrete.

3.09B BACKFILL EXCAVATED CAST-IN-PLACE CONCRETE WALLS

1. Backfill shall be placed and compacted to minimum 85% Modified Proctor density promptly after waterproofing has been installed. Closely coordinate with contractor responsible for Backfill work by informing them each time a waterproofed area is ready for backfill. Backfill shall consist of compactable soil or angular aggregate free of debris, sharp objects, and stones larger than 19 mm (¾”). Care should be used during backfill operation to avoid damage to the waterproofing system. If damage occurs, cease backfilling and report damage. Damaged waterproofing must be repaired per manufacturer’s guidelines.

3.10B CLEAN UP

A. In areas where adjacent finished surfaces are soiled by work of this Section, 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 section work debris and damaged product following all applicable regulations.

End of Section 071700