Precon Products™ Guide Specification

Storm Prism™ EQ
For
Detention Systems

Released 03/05/2021

This product guide Specification is written according to the Construction Specifications Institute (CSI) 3-Part Format, including MasterFormat, SectionFormat, and PageFormat, contained in the *CSI Manual of Practice*.

This Section must be carefully reviewed and edited by the Engineer to meet the requirements of the Project and local building codes. Coordinate this Section with other Specification Sections and the Project Plans. Delete all "Specifier Notes" when editing this section.

Section numbers are from *MasterFormat 2018 Edition*. Update Section numbers to current versions if required.

Specifier Notes: This Section covers Storm Prism™ EQ precast concrete, modular buried stormwater storage units. The Storm Prism™ EQ is custom designed to meet the specific requirements of the Project.

Consult Precon Products™ for assistance in editing this Section for the specific Project or application.

SECTION 33 46 23 – MODULAR BURIED STORMWATER STORAGE UNITS

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Storm Prism™ EQ precast concrete, modular, buried stormwater storage units and accessories.

1.02 SUMMARY

A. This Section includes the performance criteria, materials, design, production, and installation for precast concrete, modular, buried, stormwater storage units that together form an underground stormwater storage system. The Work performed under this Section includes all labor, materials, equipment, related services, and supervision required for the supply, installation and commissioning of the precast concrete, modular, buried, stormwater storage units formed into an underground stormwater storage system.

1.03 RELATED SECTIONS

A. Section 01 33 00 – Submittal Procedures
B. Section 31 00 00 – Earthwork
C. Section 03 40 00 – Precast Concrete

1.04 REFERENCE STANDARDS

A. American Association of State Highway Transportation Officials (AASHTO)

1. AASHTO – Standard Specifications for Highway Bridges, 17th Edition – 2002
2. AASHTO M105 – Standard Specifications for Gray Iron Castings
3. AASHTO M198 – Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants
4. AASHTO M288 – Standard Specification for Geosynthetic Specification for Highway Applications

B. American Concrete Institute (ACI)

1. ACI 318 – Building Code Requirements for Structural Concrete
2. ACI 350 – Code Requirements for Environmental Engineering Concrete Structures
3. ACI 350.3 – Seismic Design of Liquid-Containing Structures and Commentary

C. American Society for Testing and Materials (ASTM)

1. ASTM A48 – Standard Specification for Gray Iron Castings

2. ASTM A615 – Standard Specification for Deformed & Plain Carbon-Steel Bars for Concrete Reinforcement
3. ASTM A1064 – Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
4. ASTM C32 – Standard Specification for Sewer and Manhole Brick (Made form Clay or Shale)
5. ASTM C33 – Standard Specification for Concrete Aggregates
6. ASTM C139 – Standard Specification for Concrete Masonry Units for Construction of Catch Basins and Manholes
7. ASTM C150 – Standard Specification for Portland Cement
8. ASTM C478 – Standard Specification for Circular Precast Reinforced Concrete Manhole Sections
9. ASTM C595 – Standard Specification for Blended Hydraulic Cement
10. ATM C836 – Standard Specification for High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course
11. ASTM C857 – Standard Practice for Minimum Structural Design Loading for Underground Precast Concrete Utility Structures
12. ASTM C858 – Standard Specification for Underground Precast Concrete Utility Structures
13. ASTM C877 – Standard Specification for External Sealing Bands for Concrete Pipe, Manholes, and Precast Box Sections
14. ASTM C891 – Standard Practice for Installation of Underground Precast Concrete Utility Structures
15. ASTM C913 – Standard Specification for Precast Concrete Water and Wastewater Structures
16. ASTM C920 – Standard Specifications for Elastomeric Joint Sealants
17. ASTM C923 – Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals
18. ASTM C990 – Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants
19. ASTM C1107 – Packaged Dry, Hydraulic Cement Grout (Non-Shrink)
20. ASTM C1478 – Standard Specification for Storm Drain Resilient Connectors Between reinforced Concrete Storm Sewer Structures, Pipes, and Laterals
21. ASTM C1675 – Standard Specification for Installation of Precast Reinforced Concrete Monolithic Box Sections for Culverts, Storm Drains, and Sewers
22. ASTM D448 – Standard Classification for Sizes of Aggregate for Road and Bridge Construction
23. ASTM D698 – Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort
24. ASTM D545 – Standard Test Method for Preformed Expansion Joint Fillers for Concrete Construction (Nonextruding Resilient Types)

25. ASTM D1751 – Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
26. ASTM D2487 – Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
27. ASTM D4014 – Standard Specification for Plain and Steel-Laminated Elastomeric Bearings for Bridges
28. ASTM D5992 – Standard Guide for Dynamic Testing of Vulcanized Rubber and Rubber-Like Materials Using Vibratory Methods
29. ASTM D7957 – Standard Specification for Solid Round Glass Fiber Reinforced Polymer Bars for Concrete Reinforcement
30. ASTM D8139 – Standard Specification for Semi-Rigid, Closed-Cell Polypropylene Foam, Preformed Expansion Joint Fillers for Concrete Pacing and Structural Construction
31. ASTM E1745 – Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs
32. ASTM F2510 – Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures and Corrugated Dual- and Triple-Wall Polyethylene and Polypropylene Pipes

1.05 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide an underground stormwater storage system capable of withstanding design loads as indicated on the Plans and as detailed herein:

1. Dead Loads shall be determined using the following:

    i. Soil load based on minimum and maximum depth of burial as indicated on the Plans using a minimum of 120 pcf for soil density.
    ii. Lateral soil pressures to be based on a minimum “At Rest Earth Pressure” of 60 pcf.
    iii. Other dead loads as indicated on the Plans.

2. Live Loads shall be determined using the following:

    i. HS20 Loading per AASHTO – Standard Specifications for Highway Bridges, 17th Edition – 2002 based on the minimum and maximum depth of burial as indicated on the Plans. For burial depths less than two feet, a concentrated point load shall be utilized for the calculated live load.

3. Interior Water Load shall be determined using the following:

    i. A minimum of 62.4 pcf water density at the maximum water storage depth as indicated on the Plans.

4. Maximum Soil Bearing Pressure shall be evaluated using the following:

    i. Soil bearing capacities as determined by the Project Geotechnical Engineer or as listed in the Project Geotechnical Report.
    ii. The maximum bearing pressure of the selected precast module.

5. Seismic Loads shall be based on the Plans and Project Geotechnical Report.

6. Other Loads (if any) shall be determined using the following:

    i. As detailed on the Plans and Drawings or otherwise listed in the Specifications.

B. Water Storage Capacity: Provide an underground stormwater storage system with a minimum water storage capacity as indicated on the Plans or as indicated in the Water Quality Management Plan (WQMP). The storage volume shall reflect any necessary freeboard. Water detention times and water release rates shall not deviate from the requirements listed in the WQMP.

C. System Footprint: Provide an underground stormwater storage system with a footprint size as detailed on the Plans. Any deviation from the system footprint must be reconciled with the project Plans and Project WQMP.

1.06 DESIGN REQUIREMENTS

A. Structural precast concrete, modular, buried, stormwater storage units shall be designed in accordance with ACI 350, ACI 350.3, and ACI 318 latest addition and the details listed herein;

1. Wall thickness, and top slab thickness of the stormwater storage units shall conform to ACI 350 and ACI 318 and shall be no less than the minimum thickness necessary to sustain HS20 loading requirements as determined by a Licensed Professional Engineer.
2. Wall thickness, top slab thickness and bottom slab thickness of the stormwater storage system shall be no less than the minimum thickness necessary to sustain the expected soil loading based on the required burial depths for the Project as determined by a Licensed Professional Engineer.
3. Wet mix concrete or self-consolidating concrete (SCC) with a water/cement ratio of no greater than 0.40 shall be utilized for all precast and any field cast elements. Dry cast concrete shall not be allowed in order to maintain dimensional tolerances and to ensure adequate consolidation around heavy reinforcement.
4. The interior assembled floor of the stormwater storage system shall be flat to within ½” and shall not slope greater than 1%.
5. All vertical load bearing elements shall contain transverse reinforcement per ACI 350 and ACI 318 to provide confinement and ensure that spalling of the shell concrete does not result in a loss of axial load strength.
6. Access shall be provided for manned entry into the system. The access point(s) for ingress and egress shall be located in the system in such a manner that a point

of egress shall be visible at all times by entry personnel from any location within the system.

7. The stormwater storage system shall be designed with no internal ledges, steps, slopes, walls, or other form of blockage between any interior space and at least one egress opening that may encumber access or retrieval of personnel or equipment.
8. Areas within the stormwater storage system with ingress and egress restrictions resulting in a 30% reduction in size of the standard interior height and/or width of the system and any step-over that is 3-inches in size or larger shall be considered separate compartments of the system and should be minimized. Each separate compartment shall require unique surface level ingress and egress points for safe access and exit from the system as well as to provide adequate air supply during manned entry.

1.07 QUALITY ASSURANCE

A. The precast concrete, modular, buried, stormwater storage units shall be manufactured at a precast concrete facility certified by the NPCA.

B. The materials, methods and completed concrete, subsurface, stormwater storage system(s) shall be subject to inspection by the Engineer. Acceptance or rejection of the system shall be based on the Specifications contained in this Section.

1.08 SUBMITTALS

A. Submittals shall conform to Section 01 33 00 - Submittal Procedures.

B. Action Submittals

1. Shop Drawings
   i. Detail fabrication and installation of structural precast concrete units including joint interface at member ends and to each adjoining members.
   ii. Indicate locations, plan views, elevations, dimensions, shapes, and cross sections of each unit, openings, support conditions and types of reinforcement, including special reinforcement.
   iii. Detail loose and cast-in hardware, lifting and erection inserts, connections, and interface surfaces.
   iv. Indicate location and details of joint treatment.
   v. Designate and provide details for all separate compartments (if any) within the stormwater storage system as described in Section 1.06-A.10.

2. Concrete Design Mixtures
   i. Include a submittal for each concrete design mixture including compressive strength.

3. Water Storage Sizing

    i. Include supporting data to confirm the stormwater storage system is sized with sufficient water storage capacity per the Plans and Water Quality Management Plan (WQMP).
    ii. Alternate stormwater storage systems to any Specified system shall supply a continuous simulation hydrologic model that supports the system is sized with sufficient water storage capacity, conforms to the required draw-down time, and conforms to the maximum release rates and other pertinent design parameters as detailed on the Plans and in the WQMP. The model and results shall be reviewed and require Approval by the Reviewing Agency prior to acceptance of an alternate system.

C. Informational Submittals

1. Material Test Reports

    i. Aggregates: Material test reports shall be from an accredited agency indicating and interpreting test results for compliance with Reference Standards and Specifications as detailed herein.
    ii. Compressive Strength: Concrete compressive strength test results shall be supplied for each batch of concrete utilized in the production of the precast concrete, modular, buried, stormwater storage units.

2. Material Certifications: Material certifications shall be signed by the Manufacturers certifying that each of the following items comply with the Reference Standards and Specifications as detailed herein.

    i. Cementitious materials.
    ii. Reinforcing materials.
    iii. Admixtures.
    iv. Bearing pads.
    v. Sealants.

3. Operations and Maintenance Manual.

4. Installation Verification: The installation of the subsurface, stormwater storage system shall be verified by a Licensed Professional Engineer and a certification provided indicating that the system has been constructed and is in substantial conformance with the Approved Plans and WQMP.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Deliver all precast concrete members in such quantities and at such times to assure compliance with the agreed upon Project schedule and setting sequence to ensure continuity of installation.
B. Transport and handle members in a manner to avoid excessive stresses that could cause cracking or other damage.

C. Store members with adequate dunnage and bracing, and protect units to prevent contact with soil, staining, and to control cracking, distortion, warping or other physical damage.

D. Store members with dunnage across the full width of each bearing point unless otherwise Specified or shown on the Shop Drawings.

E. Place stored members so identification marks are clearly visible and units can be inspected.

F. Place dunnage of even thickness between each member.

G. Members may be stacked according to the manufacturer's recommendation.

H. Lift and support members only at designated points indicated on the Shop Drawings. Do not drag, slide or push members.

I. Accessories:

1. Accessory components shall be delivered in the manufacturer's original, unopened packaging and/or containers with labels that clearly identify the make, model and manufacturer.
2. Accessory components shall be stored in a clean, dry area out of direct sunlight.

PART 2 - PRODUCTS

2.01 MANUFACTURER

A. Precon Products
240 West Los Angeles Avenue
Simi Valley, California 93065
Phone: (800) 882-3399
Email: info@pre-conproducts.com
Website: www.preconproducts.com

2.02 MODULAR BURIED STORMWATER STORAGE UNITS

A. All material shall meet or exceed the applicable standards referenced in this Specification and shall conform to all federal, state, and local requirements.

B. Precast Concrete Members

1. ***(Specifier Note: Select the appropriate configuration and delete all other configurations. Edit the font to standard font when completed.)***
   - ***Storm Prism™ EQ Single Module with modular, precast concrete, solid base for detention.***
   - ***Storm Prism™ EQ Single Module with field poured concrete slab for detention.***
   - ***Storm Prism™ EQ Double Module with solid base for detention.***
2. Cement shall be Type II/V Portland cement conforming to ASTM C 150.
3. Aggregate shall conform to ASTM C33, except that the requirement for gradation shall not apply.

4. Reinforcement shall consist of steel bar conforming to ASTM A615, Grade 60/80, glass fiber reinforced polymer bars conforming to ASTM D7957, or mesh conforming to ASTM A1064, Grade 60/80.
5. All sections shall be cured by an approved method. Sections shall not be shipped until the concrete has attained full design strength as determined by an American Concrete Institute Certified Laboratory Technician – Level 2 but in no case shall the compressive strength be less than 2,000 psi.
6. Pipe openings shall be sized to accept pipes of the specified size(s) and material(s), and shall be sealed by the Contractor with hydraulic cement grout conforming to ASTM C1107 or sealed by use of a Resilient Connector conforming to ASTM C923, C1478, or F2510.
7. Access risers and any necessary associated grade adjustments shall conform to ASTM A478 for round access risers and ASTM C857, C858, or C913 for square/rectangular access risers and shall provide for an access opening with a minimum dimension of 48-inches.
8. Castings for manhole frames and covers shall be in accordance with ASTM A48, CL.30B and AASHTO M105. The access cover/s shall be designed for HS20-44 traffic loading and shall provide a minimum of 30-inch clear opening.
9. Brick or masonry used to level the manhole frames and covers to finished grade shall conform to ASTM C32 or ASTM C139 and shall be installed in conformance with all local requirements.

(Specifier Note: Section C. for Field Poured Concrete Slabs is only necessary for certain configurations of the modular, buried, stormwater storage system. Delete this Section if the Field Poured Concrete Slab is not to be utilized.)

C. Field Poured Concrete Slab

1. The dimensions of the slab shall be as detailed on the Plans.
2. Cement shall be Type II/V Portland cement conforming to ASTM C 150 or blended hydraulic cement conforming to ASTM C595.
3. Aggregate shall conform to ASTM C33, except that the requirement for gradation shall not apply.
4. Reinforcement shall consist of bar conforming to ASTM A615, Grade 60/80 or mesh conforming to ASTM A1064, Grade 60/80.
5. All sections shall be cured by an approved method. Vertical construction shall not begin until the concrete has attained full design strength as determined by a Licensed Professional Engineer but in no case shall the compressive strength be less than 2,000 psi.

D. Accessory Components

1. Spacer/backer for use between concrete members shall be a ½" thick x 4" wide closed-cell polypropylene foam conforming to ASTM D8139, ASTM D1751, and ASTM D545.
2. Joint filler for use between concrete member floors shall be a non-shrink hydraulic cement grout conforming to C1107.

3. Joint sealer for use between concrete member floors shall be a cold-applied, water proof membrane conforming to ASTM C836.
4. Joint sealer for use between concrete member walls shall be a rapid-cure, elastomeric sealant conforming to ASTM C920.
5. Joint sealer to span between concrete member roofs shall be a polyolefin backed exterior joint wrap conforming to ASTM C877.

E. Bedding, Backfill and Final Fill

1. Bedding Material: The bedding material for the precast concrete, modular, buried, stormwater storage system shall conform to ASTM D2487, classification GW, GP, SW or SP and be free-draining with 100% passing a 1-inch sieve provided the material, after compaction, provides the same minimum soil bearing capacity as the in-situ subgrade material as detailed in the Project Plans or the Project Geotechnical Report. The bedding material shall be a minimum of 6-inches deep and shall extend beyond the footprint of the stormwater storage system by a sufficient distance to ensure working room to properly and safely compact bedding and backfill materials but at no times shall the distance be less than 18-inches.
2. Backfill Material: Backfill material for the precast concrete, modular, buried, stormwater storage system shall conform to ASTM D2487, classification GW, GP, SW or SP and be free-draining. Alternate materials may be considered by the reviewing agency.
3. Final Fill: The final fill material shall conform to ASTM D2487 any classification except OL, CH, MH, OH, and PT provided the material can be adequately compacted with no adverse effects to the stormwater storage system.
4. If any bedding, backfill, or final fill material is selected to be a poorly graded (open graded) material, the material shall be separated by a non-woven geotextile conforming to AASHTO M228, Class 2.

PART 3 – EXECUTION

3.01 Earthwork

A. Excavation, trenching, and backfilling shall be as specified in Division 31 00 00 “Earthwork.”

3.02 Identification

A. All precast concrete, modular, buried, stormwater storage systems shall be identified at the surface level with permanent, clearly visible markings indicating they are stormwater storage systems.

3.03 Inspection

A. General
1. Precast concrete members, accessories, and aggregate material used during installation shall be inspected prior to installation and any defective, damaged or non-conforming material shall be replaced.

B. Precast Concrete Members

1. Any precast concrete member with a fracture or continuous crack greater than 12-inches in length and 0.01 in width shall be rejected and replaced.
2. Any precast concrete member that has not reached the required design strength shall be rejected and replaced.
3. Any precast concrete member with indications of imperfections in mixing and/or molding, honeycombed, or open textured surface, shall be rejected and replaced.
4. Any precast concrete member with indications of substantial patches or repairs shall be rejected and replaced.
5. Any precast concrete member with exposed reinforcing steel shall be rejected and replaced.

(Specifier Note: This Section for Field Poured Concrete Slabs is only necessary for certain configurations of the modular, buried, stormwater storage system. Delete this Section if the Field Poured Concrete Slab is not to be utilized.)

C. Field Poured Concrete Slab

1. Any field poured concrete with a fracture or continuous crack greater than 12-inches length and 0.01 in width shall be rejected and re-poured.
2. Any field poured concrete that has not reached the required design strength shall be rejected and re-poured.
3. Any field poured concrete with indications of imperfections in mixing and/or molding, honeycombed, or open textured surface, shall be rejected and re-poured.
4. Any field poured concrete with indications of substantial patches or repairs shall be rejected and re-poured.
5. Any field poured concrete with exposed reinforcing steel shall be rejected and re-poured.

D. Accessories

1. All accessory components shall be free from defects and damage.

E. Aggregate Material Used During Installation

1. All aggregate material shall be supplied with material certifications from the plant indicating conformance to the Referenced Specifications. Non-conforming material shall be rejected and removed from the site.

3.04 Stormwater Storage System Installation

A. General

1. General Locations and Arrangements: Plans and Shop Drawings shall indicate the general location and arrangement of the stormwater storage system. Installation shall conform to ASTM C891. Where specific installation procedures

are not indicated in this Referenced Specification or the Plans, follow the product manufacturer's written instructions.

2. All precast concrete members shall be inspected for defects and cracks before being lowered into the trench. Any defective, damaged or unsound structure or any product that has had its grade disturbed after laying shall be taken up and replaced. The interior of the treatment system shall be free from dirt, excess water and other foreign materials as the installation progresses and left clean at the completion of the installation.

3.05 Excavation

A. Excavation

1. Excavate the pit to ensure that sides will be stable under all working conditions. Slope trench walls or provide supports in conformance with all federal, state, and local safety standards. Excavate only as much as can be safely maintained by available equipment.
2. Where excavation walls are stable or supported, provide a width sufficient, but no greater than necessary, to ensure working room to properly and safely place and compact embedment materials. The space between the stormwater storage system and excavation wall must be wider than the compaction equipment used in the compaction area.

B. Dewatering

1. Do not lay or embed any precast concrete member in standing or running water. Surface runoff shall be prevented from entering the excavation at all times.
2. When water is present in the work area, dewater to maintain stability of in-situ and imported materials. Maintain water level below the stormwater storage system bedding and foundation to provide a stable excavation bottom. Use, as appropriate, sump pumps, well points, deep wells, geofabrics, perforated underdrains, or stone blankets of sufficient thickness to remove and control water in the excavation. When excavating while depressing ground water, ensure the ground water is below the bottom of cut at all times to prevent washout from behind sheeting or sloughing of exposed excavation walls. Maintain control of water in the excavation before, during, and after the stormwater storage system installation and until embedment is installed and sufficient backfill has been placed to prevent flotation of the system, attached piping or accessory drainage structures.

C. Removal of Rock

1. Rock in either ledge or boulder formation shall be replaced with suitable materials to provide a compacted earth cushion having a thickness between exposed rock and the stormwater storage system of at least 12 inches.

D. Removal of Unstable Material

1. Where wet or otherwise unstable soil incapable of properly supporting the stormwater storage system, as determined by the Engineer, is encountered in the bottom of an excavation, such material shall be removed to at least 24 inches below bottom of the system and replaced to the proper grade with select granular material, compacted as directed by the Engineer. When removal of unstable material is due to the fault or neglect of the Contractor while performing shoring and sheeting, water removal, or other specified requirements, such removal and replacement shall be performed at no additional cost to the Owner.

3.06 Bedding

A. A stable and uniform bedding shall be provided for the stormwater storage system and any protruding features. The bedding shall be compacted to a minimum of 90% of maximum density per AASHTO T99, or as shown in the Plans. Structure bedding shall be a minimum of 6" in thickness. The bedding surface shall provide a firm foundation of uniform density throughout the entire footprint of the system.

3.07 Placing Precast Concrete Members

A. Each precast concrete member shall be thoroughly examined before being placed; defective or damaged members shall not be used. Precast concrete members shall be placed to within ± ¾" of the elevations as indicated on the Plans. Proper equipment shall be provided for lowering and setting precast concrete members into the excavation. Precast concrete members shall not be laid in water, and the members shall not be laid when trench conditions or weather are unsuitable for such work. Diversion of drainage or dewatering of excavations shall be provided as directed by the Engineer; see dewatering section.

B. Precast concrete members shall receive a ½" thick x 4" wide closed-cell polypropylene foam conforming to ASTM D8139, ASTM D1751, and ASTM D545 on all sides that will abut an adjacent member. The foam member shall remain in place to ensure proper alignment and act as backer material for subsequent sealing.

C. Precast concrete members shall be placed and aligned to within 1-1/4" of each other horizontally and vertically. The Engineer should be consulted for a course of action when joint gaps exceed 1-1/4".

D. Precast members transferring vertical loads to other members or slabs shall use a random oriented fiber bearing pad conforming to ASTM D4014 and ASTM D5992 between members with a minimum bearing surface area of 18 square-inches.

E. Minor mis-alignment of upper sections on slab or upper sections on other members may be adjusted through shimming using random oriented fiber pads conforming to the ASTM D4014 and ASTM D5992 provided the minimum bearing surface area from Section 3.07-D. is maintained.

3.08 Jointing/Sealing

A. Interior floor joints between concrete members shall be filled up to within ¾" of the member floor using a non-shrink hydraulic cement conforming to ASTM C595 or C1107. Joint sealer conforming to ASTM C836 shall be used to fill the remaining

portion of the joint between the concrete members to the final floor elevation with enough material applied to fill the joint gap but not exceed the finished floor elevation.

B. Interior Joints between concrete members running vertically shall be sealed with a rapid cure elastomeric sealant conforming to ASTM C920. Enough material shall be applied within the joint to make the wall connection between members flush with one another and the material applied shall fill the joint gap but not exceed the plane of the finished walls.

C. Joints on the exterior top and side surface shall be sealed using a polyolefin backed exterior joint wrap conforming to ASTM C877. The joint wrap shall span the joint by a minimum of 4-inches on either side of the joint.

D. All sealed joints shall be protected from damage during placement of additional members and during final backfill. Damage during construction shall require re-sealing of the joints.

3.09 Backfilling

A. General

1. Backfill placement and compaction shall be constructed in accordance with the Specifications herein and the product manufacturer's published installation guides.

B. Backfilling Stormwater Storage System in Excavation

1. After the precast concrete member and accessory drainage connections have been properly bedded, select material from excavation or borrow, at a moisture content that will facilitate compaction, shall be placed along all sides of the system in layer depths to ensure minimum compaction density is obtained evenly throughout the backfill material. The backfill shall be brought up evenly on all sides of the structure. Each layer shall be thoroughly compacted with mechanical tampers or rammers. Tests for density shall be made as necessary to ensure conformance to the compaction requirements as Specified in the Geotechnical Report. Where it is necessary, in the opinion of the Engineer, that sheeting or portions of bracing used be left in place, the contract will be adjusted accordingly. Untreated sheeting shall not be left in place beneath structures or pavements.

C. Movement of Construction Machinery

1. Movement of construction machinery over a stormwater storage system at any stage of construction shall be at the Contractor's risk. Any damaged member shall be removed and replaced. Any equipment used during any stage of construction shall have a loading no greater than HS20 per AASHTO – Standard Specifications for Highway Bridges, 17th Edition – 2002. Permissible equipment shall not be permitted to operate over top of the system with less than 12-inches of structural cover.

END OF SECTION 33 46 23

REVISION TABLE		
Revision	Release Date	Summary of Changes
A	03/05/2021	Initial Release