

## StormTrap Guide Specification

### StormTrap SingleTrap on Pad Foundation with Liner Groundwater BELOW Invert

Revised 11/21/18

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*.

The section must be carefully reviewed and edited by the Engineer to meet the requirements of the project and local building code. Coordinate this section with other specification sections and the Drawings. Delete all "Specifier Notes" when editing this section.

Section numbers are from *MasterFormat 2016 Edition*. Update section numbers to versions if required.

Specifier Notes: This section covers "StormTrap®" precast concrete, modular, storm water detention modules. StormTrap is custom designed to meet the specific requirements of the project.

Consult StormTrap for assistance in editing this section for the specific application.

## SECTION 33 46 23 – MODULAR BURIED STORMWATER STORAGE UNITS

### PART 1 - GENERAL

#### 1.01 SECTION INCLUDES

- A. StormTrap Precast concrete, modular stormwater detention.

#### 1.02 RELATED SECTIONS

- A. Section 31 00 00 – Earthwork
- B. Section 03 30 00 – Cast-in-Place Concrete
- C. Section 03 40 00 – Precast Concrete

#### 1.03 REFERENCE STANDARDS

- A. AASHTO – Standard Specifications for Highway Bridges – Seventh (7<sup>th</sup>) Edition
- B. ACI 318 - Building Code Requirements for Structural Concrete.
- C. ASTM A 615/A 615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
- D. ASTM C 857 - Standard Practice for Minimum Structural Design Loading for Underground Precast Concrete Utility Structures.
- E. ASTM C 858 - Standard Specification for Underground Precast Concrete Utility Structures.
- F. ASTM C 891 - Standard Practice for Installation of Underground Precast Concrete Utility Structures.
- G. ASTM C 990 - Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants.
- H. ASTM A 1064 – Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.

#### 1.04 DESIGN REQUIREMENTS

- A. Precast Concrete Modular Stormwater Detention shall comply with ASTM C858.
- B. Underground precast concrete stormwater management system shall be sized in accordance with the design requirements provided by the Engineer of Record (EOR) and approved by the reviewing agency.
- C. The system shall be designed so modules are aligned and have channels that extend to the bottom of the modules allowing for relatively unrestricted fluid flow in both directions.
- D. Minimum Structural Design Loading: ASTM C 857.
  - 1. Total Cover:
    - a. Minimum: As indicated on the drawings.
    - b. Maximum: As indicated on the drawings.

2. Concrete chamber shall be designed for AASHTO HS-20 wheel load.
3. Minimum Soil Pressure:
  - a. SingleTrap Modules: As indicated on the drawings for concrete pad.
4. Vertical and lateral soil pressures shall be determined using:
  - a. Groundwater: At or below invert of system.
  - b. Lateral soil pressures to be based on Active earth pressure
    - 1) Lateral soil pressure = 35 pcf for 120 pcf backfill unit weight
  - c. Vertical soil pressures
    - 1) Live load = HS-20-44 Dead load = 120 pcf cover fill unit weight
  - d. Engineer to verify geotechnical requirements

1.05 QUALITY ASSURANCE

- A. The manufacture of the concrete modules shall be performed at a precast production facility certified by the NPCA or PCI.

1.06 SUBMITTALS

- A. Comply with Section 01 33 00 - Submittal Procedures, except shop drawings shall be eleven inches (11") by seventeen inches (17").
- B. Product Data: Submit manufacturer's product data and installation instructions.
- C. Record Documents:
  1. Shop Drawings:
    - a. Submit manufacturer's shop drawings, including plans, elevations, sections, and details indicating layout, dimensions, foundation, cover, and joints.
    - b. Indicate size and location of roof openings and inlet and outlet pipe openings.
    - c. Indicate sealing of joints.
- D. Operation and Maintenance Data: Submit manufacturer's operation and maintenance instructions

1.07 DELIVERY, STORAGE AND HANDLING

- A. Delivery of Accessories: Deliver to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Storage of Accessories:
  1. Store in accordance with manufacturer's instructions.
  2. Store in clean, dry area, out of direct sunlight.
- C. Handling: Protect materials during handling and installation to prevent damage.

1.08 WARRANTY

- A. The Manufacturer shall provide a minimum five (5) year limited warranty.

**PART 2 - PRODUCTS**

2.01 MANUFACTURER

- A. StormTrap, LLC, 1287 Windham Parkway, Romeoville, Illinois 60446. Phone (877) 867-6872. Fax (331) 318-5347. Website [www.stormtrap.com](http://www.stormtrap.com).

2.02 STORMWATER DETENTION

- A. All material shall meet or exceed all applicable referenced standards, federal, state and local requirements, and conform to codes and ordinances of authorities having jurisdiction.
- B. Stormwater Detention Modules:
  - 1. Description: Engineered, precast concrete, modular stormwater detention.
  - 2. Module Type: StormTrap SingleTrap.
  - 3. Size: As indicated on the drawings.
  - 4. Concrete: Manufacturer's Approved Mix design providing a minimum compressive strength of 6,000 psi at 28 days.
  - 5. Reinforcing Bars: ASTM A 615, Grade 60.
  - 6. Reinforcing Mesh: ASTM A 1064, Grade 80.
  - 7. Cover for Reinforcing Bars: ACI 318

2.03 CONCRETE PAD (PROVIDED BY CONTRACTOR)

- A. Concrete pad foundation shall be reinforced cast-in-place as specified in Section 03 30 00.
  - 1. Foundation shall have a 1-foot overhang as indicated on the drawings.
  - 2. Minimum Compressive Strength: 4,000 psi at 28 days.
  - 3. Reinforcing Bar Design: As indicated on the drawings.

2.04 ACCESSORIES

- A. Joint Tape:
  - 1. ASTM C 990.
  - 2. Seven eights inch (7/8") diameter, preformed butyl mastic joint sealer.
  - 3. Approved by manufacturer.
- B. Joint Wrap:
  - 1. Eight inch (8") wide self-adhesive elastomeric resin bonded woven puncture resistant polymer wrap.
  - 2. Approved by manufacturer.

- C. Geomembrane Liner (Provided by Contractor)
  - 1. One (1) – Layer BTL40 Liner (or approved equal)
  - 2. Two (2) – Layers non-woven geotextile fabric.
  - 3. Tape on pipe boot kits appropriately sized for inlet and outlet connections.
  - 4. Approved by Engineer.

### **PART 3 - EXECUTION**

#### **3.01 EXAMINATION**

- A. Examine area to receive stormwater detention modules. Notify Engineer if area is not acceptable. Do not begin installation until unacceptable conditions have been corrected.
- B. Verify in field before installation, dimensions and soils conditions, including groundwater and soil bearing capacity.

#### **3.02 INSTALLATION**

- A. Install stormwater detention modules in accordance with manufacturer's instructions and ASTM C 891.
- B. Install modules plumb, on line, and to proper elevation.
- C. Install modules with a maximum space of three quarters inch (3/4") between adjacent modules. If the space exceeds three quarters inch (3/4"), the modules shall be reset with appropriate adjustment made to line and grade to bring the space into compliance.
- D. SingleTrap:
  - 1. Concrete Pad Foundation: Place modules on level, cast-in-place concrete foundation with one foot (1') overhang as indicated on the drawings.
  - 2. Cast-in-place concrete for foundation shall have a minimum compressive strength of 4,000 psi at twenty-eight (28) days.
- E. Joint Tape:
  - 1. Seal perimeter horizontal joint between modules with joint tape in accordance with ASTM C 891, 8.8 and 8.12.
  - 2. Prepare surfaces and install joint tape in accordance with manufacturer's instructions.
- F. Joint Wrap:
  - 1. Seal exterior joints between adjacent modules with joint wrap in accordance with ASTM C 891.
  - 2. Prepare surfaces and install joint wrap in accordance with manufacturer's instructions.
- G. Geomembrane Liner: (Provided by Contractor)
  - 1. Contractor to provide liner and install with minimal seams in accordance with the manufacturer's recommendations.

2. The geomembrane shall provide a water tight barrier for the bottom and sides of the stormwater detention modules.
  3. Special care shall be taken not to damage or penetrate liner during setting of concrete structures or when pouring of concrete slab is required.
  4. All seams shall be field welded by qualified technician.
  5. Liner shall be installed so that there is one (1) layer of geotextile fabric covering both sides of the geomembrane for a sandwich effect.
- H. Field Modifications to the modules is strictly prohibited without prior written consent of StormTrap.
- I. Excavation and fill shall be as specified in Sections 31 00 00.
- J. Fill:
1. Backfill material shall consist of a GW, GP, SW, or SP material as defined by the Unified Soil Classification System and that meets the gradation requirements as indicated on the drawings.
  2. Native materials shall be separated from backfill materials with a geotextile filter fabric unless the drawings indicate separation is not required.
  3. Deposit fill on both sides of modules at same time and to approximate same elevation.
  4. Prevent wedging action against structure by stepping or serrating slopes bounding or within area to be backfilled.
  5. Do not disrupt or damage joint wrap or geomembrane liner during backfilling.
- K. Do not use stormwater detention modules that are damaged, as determined by manufacturer.
- L. Contractor is responsible for installation in accordance with project plans, specifications, and all federal, state, and local regulations.

**END OF SECTION 33 46 23**