



ecoStorm® Stormwater Treatment System specifications

Structural, hydrodynamic, gross particulate separation technology

Part 1.00 – General

1.01 Description

A. Work included:

The contractor, and/or manufacturer selected by the contractor and approved by the engineer, shall furnish all labor, commodity materials, equipment, and incidentals required and shall install the structural stormwater treatment system and appurtenances in accordance with the drawings and these specifications.

1.02 Quality control inspection

- A. The structural stormwater treatment system shall be dry-fitted in the manufacturer's yard prior to shipment to the project site. The unit, when dry-fitted, shall have all component connections pre-drilled and anchored. Section joints shall be clearly marked for the contractor to properly install and align the unit in the field.
- B. The quality of materials, the process of manufacture, and the finished sections shall be subject to inspection by the engineer. Such inspection may be made at the place of manufacture, on the work site after delivery, or at both locations. Sections rejected after delivery to the site shall be marked for identification and shall be removed from the site at once. Any section that has been damaged after delivery may be rejected and, if already installed, shall be acceptably repaired (if permitted) or removed and replaced, entirely at the contractor's expense.
- C. All sections shall be inspected for general appearance, dimensions, soundness, etc. The surface shall be dense, close-textured, and free of excess bug holes, cracks, roughness, and exposure of reinforcement.
- D. Imperfections may be repaired, subject to the acceptance of the engineer. Repairs shall be carefully inspected before final acceptance.

1.03 Submittals

A. Shop drawings:

The contractor shall submit to the engineer six sets of shop drawings and the corresponding hydraulic sizing and calibration for the specific site for which the stormwater treatment system has been designed prior to release of bid documents.

Part 2.00 – Products

2.01 Materials and design

The structural stormwater treatment system shall be made of pre-cast concrete. The manufacturer shall be a member of the American Concrete Pipe Association or the National Pre-cast Concrete Association and meet the following manufacturing requirements:

- A. Structures shall be designed to comply with ASTM Designation C-478.
- B. Sections shall have watertight joints consisting of either gasketed joints per ASTM C-443, or a butyl mastic sealant conforming to ASTM C-990.
- C. Pipe openings shall be provided with a flexible rubber sleeve per ASTM C-923, or shall be made watertight by the contractor with cement mortar, and shall be sized to accept pipes of the specified size(s) and material(s).
- D. Internal components shall be made of stainless steel, fiberglass, and/or high density polyethylene (HDPE).
- E. Casting for manhole frames and covers shall be vented and per the governing city's requirements.
- F. All sections shall be cured by an approved method. Sections shall not be shipped until the concrete has attained a compressive strength of 4,000 psi.

2.02 Hydraulic design

The specified stormwater treatment system shall be hydraulically designed for the specific site in which it will be installed. The calibration of the specified system shall account for peak flow rates (supplied to specified stormwater treatment system company by owner/engineer) that correspond with predetermined regional rainfall data to maintain peak removal efficiencies and to not cause upstream flooding or pooling of stormwater.

The structural stormwater treatment system shall consist of one round pre-cast concrete structure (D1) with another smaller diameter structure (D2) housed within the main structure D1. The D2 structure should be integrally cast or sealed with a bitumastic sealant to the base of the D1 structure.

The D1 structure shall have an on-center, mechanically fastened inlet palladium weir or deflector plate that induces a swirling flow pattern between the D1 and the D2 walls. This area will accumulate, store and retain captured/settled solids deposited by numerous storm events and prevent washout of separated solid pollutants under peak design flow until which time the maximum storage volume of solid contaminants is reached.

The D3 internal piping shall be fiberglass or PVC and designed to discharge clean water downstream, while retaining floatable debris within the structure to a defined peak flow rate.

2.03 Manufacturer

The structural stormwater treatment system shall be the ecoStorm® Stormwater Treatment System as manufactured and patented by Royal Environmental Systems of Stacy, Minnesota, or an authorized manufacturer approved by Royal Environmental Systems to produce the ecoStorm Stormwater Treatment System.

Part 3.00 – Execution

3.01 Installation

- A. The structural stormwater treatment system shall be constructed according to the sizes shown on the drawings and as specified herein. Install at elevations and locations shown on the drawings or as otherwise directed by the engineer.

- B. Place the pre-cast base units on a granular sub-base in accordance with the governing city's requirements. The granular sub-base shall be checked for level prior to setting and the pre-cast base sections of the stormwater treatment system shall be checked with a horizontal level at four quadrants after setting. If the slope exceeds 0.25%, the base section shall be removed and the granular excavation floor material re-leveled.
- C. The ecoStorm Stormwater Treatment System is designed to be watertight. The final installation must guarantee a watertight structure either through infiltration or exfiltration testing. Failure to achieve a watertight structure is grounds for rejection.

END OF SECTION