

PART 1 - GENERAL

1.01 SCOPE

- A. Work described in this section includes furnishing all labor, equipment, materials, tools, and incidentals required for a complete and operable installation of the Up-Flo® Extended Maintenance Cartridge (UFF EMC) stormwater treatment system as shown on the drawings and specified herein.
- B. The manufacturer shall design and supply the equipment listed herein and the Contractor shall install the equipment in accordance with the manufacturer's Handling, Storage, and Installation Instructions.

1.02 GENERAL REQUIREMENTS

- A. The treatment system shall consist of modular floor mounted filter cartridges containing polymer ribbons of the size specified on the plans and drawings, with integrated individual self-activating backwash tanks.
- B. Upon request, independently verified / certified performance data and references shall be made available to the Engineer of Record for use in determining that the treatment system meets the design criteria and performance requirements stated herein. Refer to Section 2.02

1.03 SUBMITTALS

- A. Submittals shall be provided and shall include the following:
 - i. Site plan showing location and orientation of proposed pipe sizes, connections, and excavation limits.
 - ii. Product installation drawings showing plan and elevation views with water elevations for the flow conditions specified herein.
 - iii. Performance data as required in Section 2.02.
 - iv. Inspection and maintenance procedures.

1.04 QUALITY ASSURANCE

- A. The Technology Owner shall be a member of the Stormwater Equipment Manufacturer Association (SWEMA).
- B. Supplier / Manufacturer – The treatment system shall be manufactured and/or supplied under the direction of a company(s) with at least 10 years' experience in the design, manufacture, and supply of stormwater treatment equipment.
- C. Inspection – The treatment system shall be subject to inspection by the Engineer of Record or the owner's representative at either the place of manufacture or the project site. Any defects shall be repaired to the satisfaction of the owner or owner's representative, or replacement shall be made available.

- D. Warranty – The manufacturer shall guarantee the treatment system free from defects in materials and workmanship for a period of two years following installation. If during the warranty period defects in materials or workmanship are noted, then the manufacturer shall be promptly notified. The decision to repair or replace affected units shall be made at the discretion of the manufacturer.
- E. Patent Indemnity – Upon request, the manufacturer shall warrant that the treatment system does not infringe upon or violate any patent, copyright, trade secret or any other proprietary right of any third party and shall indemnify the Owner against any loss, cost, expense, or liability arising out of such claim whether or not such claim is successful.
- F. Certificate of Compliance – Upon request, the manufacturer shall provide a “Letter of Certification” to certify that the treatment system adheres to the specifications required herein and complies with the project’s stormwater management permit.

1.05 TECHNOLOGY OWNER

- A. Hydro International, 94 Hutchins Dr, Portland, Maine, USA.

PART 2 – STORMWATER TREATMENT DEVICE

2.01 General

- A. Treatment Device – The treatment device shall use a precast concrete box type structure to house all components.
- B. Water Quality Flow (WQF) – The flow rate at which the Device must achieve the pollutant reduction standard required without bypass. Flows in excess of the WQF are considered bypass flow and may flow directly to the outlet unless otherwise specified by the Engineer of Record.
- C. Headloss – The system must be designed to operated normally without creating upstream ponding or flooding.
- D. Site – The treatment system shall fit within the limits of excavation (area and depth) as shown in the project plans.
- E. Structures and Access Covers – All structures and castings shall conform to relevant AASHTO and ASTM standards including any local and job specific requirements that may exceed these standards.

2.02 Performance

- A. Size – The Device shall be sized based on treating the WQF calculated using locally approved methods, or standard methods outlined in the applicable design guides and regulations.

- B. Verification / Certification – The treatment system performance shall be tested using New Jersey Department of Environmental Protection Laboratory Protocol to Assess Total Suspended Solids Removal by a Filtration Manufactured Treatment Device” dated January 25, 2013 and be verified by New Jersey Corporation for Advanced Technology (NJCAT).
- C. Sedimentation Area to Filter Cartridge Ratio – The available filter bay floor area for sedimentation accumulation in the filtration bay must be no more than 1.7 square feet per Filter Cartridge excluding any pretreatment or other pre-settling area.
- D. Filter Cartridges must have a backwash function that operates by creating a head pressure above the filters using filtered water and releases a fixed volume of water to backwash the filters with pressure.
- E. Substitutions – Substitutions require preapproval authorization by the Engineer of Record. Substitutions must be submitted to the Engineer of Record prior to bid, documentation demonstrating the proposed Device meets all aspects of this specification. Post bid substitutions are not permitted. The Contractor is responsible for all costs associated with gaining approval for alternate Devices, including engineering fees, permitting fees, etc.

PART 3 – MATERIALS

- A. Structural and Non-Replaceable Components;
 - i. All precast and other structural components shall be manufactured with materials typically used in stormwater drainage systems that have a minimum life expectancy of 30 years.
 - ii. Precast shall be manufactured with concrete that has attained a compressive strength of 4,000 psi after 28 days. The structure shall be reinforced to withstand an HS20-44 loading. Slab tops shall be suitably reinforced and provided with manhole openings and covers as required.
 - iii. The cast iron frames and covers shall be sized as per the manufacturer’s drawings and shall be in accordance with ASTM A48, CL.35B and AASHTO M105.
 - iv. The masonry fixing bolts shall be Type 304 stainless steel.
All piping connections, ancillary connections, and items not listed herein shall be provided by the Contractor.
Any local applicable standards or project unique requirements must be read in conjunction with this specification.
- B. Replaceable Cartridges, Filter Ribbons, and Associated Hardware;
 - i. Filter Cartridges shall be modular, self-contained, and able to be handled without the use of lifting equipment, cranes, or other mechanical lifting systems.
 - ii. Filter material shall be polymer ribbons without pleats.
 - iii. Materials of construction for the above components shall be high-density polyethylene (HDPE) and acrylonitrile butadiene styrene (ABS). Seals shall be rubberized silicone. Metal components and hardware shall be

type 304 stainless steel. All components shall be designed to withstand all normal loadings associated with fabrication, shipping, site installation, and normal operation of the equipment.

PART 4 - DELIVERY

- A. The treatment system shall be delivered within six weeks of date of approved technical submittal unless agreed otherwise.
- B. The components of the treatment system shall be preassembled and delivered to the site fully fabricated and ready for the final assembly and installation.
- C. Off-loading, storage, and installation shall be by the Contractor.
- D. The Contractor shall inspect and provide signed acceptance of equipment prior to unloading or notify the manufacturer of any damage to equipment to effect proper remedial action. Failure to notify the manufacturer of damage to equipment prior to unloading will void all warranties pertaining to subject equipment.

PART 5 - INSTALLATION

- A. The system shall be installed in strict accordance with the site plans, and the manufacturer's general arrangement drawings and handling, storage, and installation instructions. The Contractor shall be responsible for installing the equipment and all necessary site connections.
- B. The Manufacturer shall be notified immediately of any equipment which is damaged during unloading, storage, or installation. The damaged equipment shall be repaired or replaced at the discretion of the manufacturer and entirely at the Contractor's expense.
- C. The precast concrete structure shall be set on a granular base of $\frac{3}{4}$ inch (19 mm) clean drainage stone. The sub-base material shall have a thickness of no less than 12 inches.
- D. The precast concrete structure shall be set level and plumb to within 0.5%.
- E. Non-shrink grout or hydraulic cement conforming to ASTM C 595 shall be used to provide a watertight seal in the lift holes, any drain holes, and around the concrete knockouts for outlet pipes.
- F. The treatment system must not be placed in service until the site has been cleaned and stabilized with all construction site erosion control measures no longer required.