

SECTION 02440
BIOFILTRATION WATER QUALITY BMP
ADDENDUM NO. 2

PART 1 - GENERAL

1-1. **SCOPE.**

This section covers the furnishing and installation of an acceptable pre-engineered stormwater biofiltration system to pre-treat stormwater runoff for dry weather flows and other contaminated water sources.

BMP Units.	North System	South System
Number of units.	2 units	1 unit
Ponding Elevation, ft (min. water level upstream of unit)	1405.10	1404.40
Location.	South of Decarbonator Area	West of Forebay

Each system shall be capable of draining by gravity to the storm drain, without needing a pump. At the end of any storm, water will pond upstream of each up to the indicated ponding elevation.

1-2. **GENERAL.**

Products furnished under this section shall be fabricated and assembled in full conformity with Drawings, Specifications, engineering data, instructions, and recommendations of the equipment manufacturer, unless exceptions are noted by Engineer.

1-2.01. **General Equipment Stipulations.** The General Mechanical and Equipment Provisions section shall apply to all equipment furnished under this section. If requirements in this specification differ from those in the General Mechanical and Equipment Provisions section, the requirements specified herein shall take precedence.

1-2.02. **Seismic Design Requirements.** Seismic design requirements for products specified herein shall be as indicated in the Meteorological and Seismic Design Criteria section.

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1-3. SUBMITTALS.

1-3.01. Drawings and Data. Complete fabrication and assembly drawings, together with detailed specifications and data covering materials, and accessories forming a system, shall be submitted in accordance with the General Conditions, Section F-29 Equipment and Material Items section.

Shop drawings are to detail the system and all components required and the sequence for installation, including but not limited to the following:

- System Configuration with Primary Dimensions
- Interior Components
- Any accessory equipment called out on shop drawings
- Engineered biofiltration media
- Accessory equipment

1-3.02. Operation and Maintenance Data and Manuals. Operation and maintenance manuals shall be submitted in accordance with the General Conditions, Section F-29 Equipment and Material Items section and the Maintenance Manual Requirements section.

PART 2 - PRODUCTS

2-1. SERVICE CONDITIONS.

Each unit shall be designed and constructed to treat the indicated rated peak flow capacity. The treatment system shall be able to treat the required flow based on the indicated maximum design head condition, equal to the invert of the weir minus the invert of the outlet pipe.

BMP systems shall be suitable for the following service conditions:

BMP System	North BMP No. 1	North BMP No. 2	South BMP No. 1	
Rated Capacity	0.34	0.34	0.266	cfs
Ultimate Capacity	0.34	0.34	0.532	cfs
Bypass Capacity (approx.)	11	11	16	cfs
Maximum Design Head (water at invert of weir)	3.0	3.0	2.0	ft
Weir Invert Elevation	1407.70	1407.70	1406.10	ft, elev
Inlet Invert Elevation	1404.90	1404.90	1404.30	ft, elev

BMP System	North BMP No. 1	North BMP No. 2	South BMP No. 1	
Outlet Invert Elevation	1404.70	1404.70	1404.10	ft, elev
Maximum Footprint	8' x 16'	8' x 16'	8' x 16'	

2-2. MANUFACTURERS

Pre-engineered biofiltration systems and component parts shall as manufactured by the following manufactures:

- Bio Clean Environmental, Inc.
- Contech Engineered Solutions LLC
- Or Approved Equal

2-3 PERFORMANCE AND DESIGN REQUIREMENTS.

The biofiltration system shall have no moving internal components and shall function based on gravity flow, unless otherwise specified. The system shall remove and retain debris, sediment, TSS, dissolved and particulate metals, and nutrients including nitrogen and phosphorus species, bacteria, BOD, oxygen demanding substances, organic compounds and hydrocarbon entering system during frequent storm events and continuous dry weather flows. The system shall be designed to prevent erosion and resuspension of pollutants during the high flow event.

The system shall include pre-treatment chamber components, biofiltration chamber components and flow control discharge structures as required by each engineered system.

Each unit shall be designed with and overflow and bypass systems to bypass influent flows greater than the rated capacity.

2-4. MATERIALS.

All components including biofiltration media, underdrain piping, vegetation must be included as part of the system and shall be provided by manufacture. Concrete structure shall meet or exceed requirement within the Cast-In-Place Concrete and/or Precast Concrete Vaults Sections and as required by supplier.

PART 3 - EXECUTION

3-1. INSTALLATION.

Premanufactured units shall be delivered to the project site by the manufacturer. The Contractor is responsible for offloading, storing, handling and installation of pre-

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manufactured bio-filtration system units. After unloading, any of repairs or replacement costs are the responsibility of the Contractor.

The engineered biofiltration media shall be delivered by the manufacturer. If media is shipped separately from units, the Manufacturer or a Manufacturer's certified representative shall install or be present to supervise proper installation. Contractor shall take appropriate actions to protect media from sediment and other debris during construction.

The biofiltration system units shall not be placed in operation until the project site is clean and stabilized. The project site includes any surface that contributes storm drainage to the system. All impermeable surfaces shall be clean and free of dirt and debris. All catch basins, manholes, and pipes shall be free of dirt and sediment.

The units shall be placed on top of a 6" gravel base on top of 12" Engineered fill sub-base compacted to 90% relative compaction. Refer to General Mechanical and Equipment Provision Section for additional requirements.

3-2. INSPECTION.

After installation, the manufacturer shall confirm that the systems have been installed per manufacturer recommendation and requirements. The Contractor shall submit a Manufacturers Certificate of Proper Installation.

3-3. TRAINING.

The services of a qualified representative shall be provided to instruct plant personnel with operations and maintenance requirements. The manufacturer shall also provide field services for a minimum of two site visits within one year at the request of the Owner after the systems are placed in operation. Field services to be provided for manufacturer to confirm proper operation during storm events and to advise on maintenance activities.

END OF SECTION