

SECTION (____)
WATER POLISHER MEDIA FILTRATION SYSTEM
STORMWATER QUALITY – MEDIA FILTRATION SYSTEM STANDARD SPECIFICATION

1. GENERAL

- 1.1. The Contractor shall furnish and install the Water Polisher, complete and operable as shown and as specified herein, in accordance with the requirements of the plans and contract documents. The water quality treatment flow shall be as determined and approved by the Engineer of Record. The Water Polisher removes pollutants from stormwater runoff through the unit operations of sedimentation, floatation, and media filtration.
- 1.2. The Water Polisher shall be of a type that has been installed and in use for a minimum of five (5) consecutive years preceding the date of installation of the system. The manufacturer shall have been, during the same consecutive five (5) year period, engaged in the engineering design and production of systems deployed for the treatment of storm water runoff and which have a history of successful production, acceptable to the Engineer of Record and/or the approving Jurisdiction. The manufacturer of the Water Polisher shall be, without exception:

Contech Engineered Solutions
9100 Centre Pointe Drive
West Chester, OH, 45069
Tel: 1 800 338 1122

- 1.3. Submittals: Shop drawings for the structure and performance are to be submitted with each order to the contractor. Contractor shall forward shop drawing submittal to the consulting engineer for approval. Shop drawings are to detail the structure precast concrete and call out or note the internals/components.
- 1.4. Product Substitutions: Any proposed product substitution to this specification must be submitted for review and approved 10 days prior to project bid date by the Engineer of Record. Review package should include third party reviewed performance data for both flow rate and pollutant removal. Contractor to coordinate with the Engineer of Record any applicable modifications to the project estimates of cost, bonding amount determinations, plan check fees for changes to approved documents, and/or any other regulatory requirements resulting from the product substitution.
- 1.5. American Society for Testing and Materials (ASTM) Reference Specifications:
- 1.5.1. ASTM C891: Standard Specification for Installation of Underground Precast Concrete Utility Structures
 - 1.5.2. ASTM C858: Standard Specification of Underground Precast Concrete Utility Structures
 - 1.5.3. ASTM C857: Standard Practice for Minimum Structural Design Loading for Underground Precast Concrete Utility Structures
 - 1.5.4. ASTM C990: Standard Specification for Joints for Concrete Manholes Using Preformed Flexible Joint Sealants

1.5.5. ASTM D3787- Standard Test Method for Bursting Strength of Textiles

2. MATERIALS

- 2.1. Precast Concrete Structure: The device shall be an all concrete structure (including risers), constructed from precast concrete riser and slab components or monolithic precast structure(s). Precast concrete vault shall be provided according to ASTM C857 and C858. Both structure types shall be installed to conform to ASTM C891 and to any required state highway, municipal or local specifications; whichever is more stringent. All precast concrete components shall be manufactured to a minimum live load of HS-20 truck loading or greater based on local regulatory specifications, unless otherwise modified or specified by the design engineer.
- 2.2. Gaskets: Gaskets and/or sealants shall be used to seal between concrete joints. Joints shall be sealed with preformed joint sealing compound conforming to ASTM C990.
- 2.3. Internal Components:
 - 2.3.1. Sediment Chamber: The sediment chamber shall extend at least 18 inches below the bottom of the up-flow filter cage. The sediment chamber shall be fully accessible from finish surface. The chamber portion located under the up-flow filter cage shall be accessible via removable panel on the bottom cage.
 - 2.3.2. Baffle Wall: The baffle wall shall be constructed of concrete with a minimum 28-day compressive strength of 5,000 psi. The baffle wall shall be located between the inlet and outlet pipe. The top of the baffle wall shall be at an elevation above the top of the up-flow filter cage and the bottom of the baffle wall shall be at an elevation below the bottom of the up-flow filter cage.
 - 2.3.3. Up-flow Media Filter: The up-flow media filter shall be mounted in the area on the effluent side of the baffle wall. The entire up-flow media filter (frame and media) shall be located below the invert elevation of the outlet connection(s).
 - 2.3.3.1. Media Filter Frame shall be constructed of stainless-steel grade 304 and/or marine grade, corrosion resistant aluminum. All joints and seams are to be welded or fastened together with stainless steel and/or aluminum hardware. All sides of media filter frame shall be fixed. The top section of the media filter frame shall have a locking hinged top section to allow for removal of the media. The bottom section of the media filter frame shall be fixed. The media filter frame shall be located below the access castings to allow access for maintenance. The media filter frame shall be secured to the concrete baffle(s) with stainless steel or aluminum concrete anchors.
 - 2.3.3.2. Media Filter Screens shall be manufactured of flattened expanded stainless-steel grade 304 and/or marine grade, corrosion resistant aluminum. As an alternate, the media filter screens may also be manufactured of perforated stainless steel or aluminum of the same grade mentioned previously.

- 2.3.3.3. The Up-flow Media Filter shall house one or more types of media specifically formulated by the manufacture to remove fine particulate and dissolved pollutants. The media mix and media specifications will be provided by the manufacturer.

3. PERFORMANCE

- 3.1. Function: The Water Polisher shall function to remove pollutants by the following unit treatment processes; sedimentation, floatation, and media filtration.
- 3.2. Pollutants: The Water Polisher shall remove debris, trash, coarse and fine particulates, particulate-bound pollutants, metals, and nutrients from stormwater during runoff events.
- 3.3. Bypass: The Water Polisher shall typically utilize an external bypass to divert excessive flows. Where an internal bypass is utilized, bypass water shall not pass through the treatment sump or up-flow media filtration bed.
- 3.4. Treatment Flux Rate (Surface Loading Rate): The Water Polisher filter shall treat 100% of the required water quality treatment flow based on a maximum design flux rate (surface loading rate) across the filter media bed not to exceed 4 gpm/ft².
- 3.5. Suspended Solids Removal: The Water Polisher filter shall have demonstrated a minimum median TSS removal efficiency of 92.8% and a minimum median SSC removal efficiency of 92.9%.
- 3.6. Nutrient (Total Phosphorus & Total Nitrogen) Removal: The Water Polisher shall have demonstrated a minimum median Total Phosphorus removal of 80.0%, and a minimum median Total Nitrogen removal of 50.0%.
- 3.7. Metals (Total Zinc & Total Copper) Removal: The Water Polisher shall have demonstrated a minimum median Total Zinc removal of 84.0%, and a minimum median Total Copper removal of 73.5%.

4. EXECUTION

- 4.1. Handling and Storage: Prevent damage to materials during storage and handling.
- 4.2. Precast Concrete Structure: The installation of the precast concrete device should conform to ASTM C891 and to any state highway, municipal or local specification for the installation of underground precast concrete structures, whichever is more stringent. Selected sections of a general specification that are applicable are summarized below.

- 4.2.1. The precast concrete device is installed in sections in the following sequence:

- aggregate base
- base section
- connect inlet and outlet pipes
- concrete riser section(s) (if required)
- top slab
- maintenance riser section(s) (if required)
- frame and access cover

- 4.2.2. The precast base should be placed level at the specified grade. The entire base should be in contact with the underlying compacted, granular material. Subsequent sections, complete with joint seals, should be installed in accordance with Contech's recommendations.
- 4.2.3. Adjustment of the Water Polisher filter can be performed by lifting the upper sections free of the excavated area, re-leveling the base, and re-installing the sections. Damaged sections and gaskets should be repaired or replaced as necessary to restore original condition and seals. Once the Water Polisher has been constructed, any/all lift holes must be plugged with mortar or non-shrink grout.
- 4.3. Inlet and Outlet Pipes: Inlet and outlet pipes should be securely set into the device using approved pipe seals (flexible boot connections, where applicable), and such that any pipe intrusion into the device does not impact the device functionality.
- 4.4. Frame and Cover Installation: Adjustment units (e.g. grade rings) should be installed to set the frame and cover at the required elevation. The adjustment units should be laid in a full bed of mortar with successive units being joined using sealant recommended by Contech. Frames for the cover should be set in a full bed of mortar at the elevation specified.

5. INSPECTION AND MAINTENANCE

- 5.1. Inspection: After installation, the contractor shall demonstrate that the Water Polisher has been properly installed at the correct location(s), elevations, and with appropriate components. All components associated with the Water Polisher and its installation shall be subject to inspection by the engineer at the place of installation. In addition, the contractor shall demonstrate that the Water Polisher has been installed per the manufacturer's specifications and recommendations.
- 5.2. Maintenance: The manufacturer recommends cleaning and debris removal and replacement of the media as needed. The maintenance shall be performed by a qualified professional. A maintenance manual is available upon request from the manufacturer. A maintenance/inspection record shall be kept by the maintenance operator. The record shall include any maintenance activities performed, amount and description of debris collected, and the condition of the media.
- 5.3. Material Disposal - All debris, trash, organics, and sediments captured by the Water Polisher shall be transported and disposed of at an approved facility or disposal site in accordance with local and state requirements.

END OF SECTION