



SPECIFICATIONS

AQUA-FILTER™

SCOPE

These specifications apply to the performance, materials and manufacture of Aqua-Filter storm water filtration units supplied by Soleno.

FILTRATION UNIT REQUIREMENTS

The Aqua-Filter storm water filtration unit shall be supplied by Soleno Inc. and shall comply with these materials and performance specifications based on specified flow and pollutants to be treated.

RAW MATERIALS

The Aqua-Filter storm water filtration system, including the Aqua-Swirl treatment unit, shall be made from high-density polyethylene (HDPE) resin.

- **Physical properties of the resin**
 - The filtration system shall be made from high-density polyethylene (HDPE) resin that complies with standards ASTM D3350.
- **Chemical properties of the resin**
 - HDPE resists corrosion, as it is not an electrical conductor.
 - Biological resistance is unaffected by microbial organisms.
 - It can be used in applications with pH values ranging from 1.5 to 14 due to its inert molecular structure.

PERFORMANCE

- The Aqua-Filter storm water filtration system must include a _____ mm _____ in interior diameter Aqua-Swirl vortex hydrodynamic separator for pretreating the water entering the system. A tangential inlet pipe shall induce a whirlpool which will deposit solid sediments at the bottom of the treatment chamber and prevent these sediments from being resuspended. An arched deflector in the chamber shall prevent oils, grease, and floating debris from exiting the Aqua-Swirl unit.
- The Aqua-Filter storm water filtration system shall include a _____ mm _____ in interior diameter filtration chamber with a filtering bed at least _____ m _____ ft long, containing _____ filter cells. A distribution system shall equally distribute low flows across the filter cells. A derivative of an overflow spillway shall allow flows greater than the design capacity of the filtering bed to sidestep the bed and exit the filtration chamber. Filter media shall be made from natural materials capable of removing up to 80 % of total suspended solids (TSS), 95 % of total petroleum hydrocarbons (TPH), 80 % of phosphorus and 90 % of zinc, on a net annual basis.
- The Aqua-Filter storm water filtration system shall include a _____ m³ _____ ft³ sediment storage reservoir and may also contain _____ litres _____ gallons of oils, grease, and floating debris. The system shall be designed for _____ m³/s _____ ft³/s water quality filtration rate. Size of particles to control: from clay to medium silt (20 microns and over).
- The treatment unit shall include between one (1) and three (3) 750 mm (30 in) interior diameter inspection chimneys, and one (1) 900 mm (36 in) chimney with a ladder to provide access to all maintenance zones.

MANUFACTURING THE TREATMENT UNIT

- The storm water treatment unit shall be made from HDPE pipes that comply with the standard ASTM F894.
- The thickness of the plate at the bottom of the treatment unit shall be determined based on standard ASTM F1759 requirements.
- Inlets and outlets are HDPE extrusion-welded inside and outside the structure.
- The deflector shall be made from HDPE and welded to the inside of the treatment unit with 180-degree couplers at each end.
- HDPE lift eyelets may be attached to the outside of the treatment unit to prevent undesirable stress on critical elements during loading, unloading and maintenance of the unit. Lift eyelets are an integral part of the unit and shall be HDPE extrusion-welded.
- The upper section of the treatment unit shall be built in compliance with site requirements and confirmed by shop drawings. When the backfill is deep, the upper section shall be reinforced to resist the loads encountered. In roadway use, the treatment unit shall be equipped with a concrete slab to distribute the load over the entire surface of the unit. The cast iron frame and cover must also be able to support these loads. The consulting engineer shall approve the concrete slab design
- Buoyancy calculations (Archimedes' principle) may be provided upon request. Standard installation drawings for concrete anti-buoyancy structures may also be provided. The consulting engineer in charge of the project is responsible for final approval of the anti-buoyancy structure. The contractor shall provide the anti-buoyancy structure.



SPECIFICATIONS

AQUA-FILTER™ (CONT'D)

DIMENSIONS AND QUANTITIES

Dimensions and quantities shall comply with tender documents and drawings.

INSTALLATION

Installation shall be carried out in compliance with manufacturer recommendations.

- **Excavation and bedding**
The trench and bedding shall meet the requirements of standard BNQ 1809-300. The HDPE Aqua-Filter system shall be installed on stable bedding composed of CG-14 granular material (standard BNQ 2560-114-III), at least 300 mm (12 in) deep, compacted to 95 % modified Proctor density. To ensure adequate support, any additional bedding shall be uniformly compacted under the lower section of the filtration chamber up to the pipe axis. The contractor is responsible for all safety precautions during Aqua-Filter system installation.
- **Backfill**
Backfill material shall be composed of CG-14 granular material, in layers of minimum depth of 200 mm (8 po), compacted to 90 % modified Proctor density. The backfill and bedding shall be free of debris. Backfill shall meet the requirements of standard BNQ 1809-300. Backfill shall extend at least 1.0 m (3.3 ft) beyond the perimeter of the Aqua-Filter system, from below the bedding to the full height of the system and extend laterally up to the undisturbed part of the soil.
- **Connecting inlet and outlet pipes**
Flexible couplers with stainless steel tightening collars shall be used to connect treatment unit inlets and outlets to the pipes. When connecting to a Solflo Max pipe, a bell with integrated gasket with clips shall be factory-welded to the filtration and treatment unit.

SHARED RESPONSIBILITY

- **Soleno's responsibilities**
Soleno shall deliver the the Aqua-Filter system to the site. This system includes the Aqua-Swirl unit with all its internal components and surface access chimney, the filtration chamber with all its internal components and its surface access chimneys, filter media, connections between the Aqua-Swirl unit and the filtration chamber, and cast iron frames and covers.
- **Contractor's responsibility**
The contractor shall prepare the site for system installation. This includes, but is not limited to, temporary diversion of the water flow, excavation, cutting and removing existing pipe, supplying new pipe, bedding, backfill and compacting, etc. The contractor is responsible for providing suitable lifting equipment for unloading the system from the delivery truck. The contractor shall provide any concrete that may be required for the anti-buoyancy structure, anchors, slabs, collars, etc., and any belts and connection adapters required. The contractor is responsible for cutting on site, if required, and installing access chimneys to the finish grade level. The contractor is responsible for watertightness of connections to the inlet and outlet pipes of the filtration and treatment unit, backfill, labor, tools and any other equipment that may be required.

APPROVAL DOCUMENTS

Shop drawings showing all system dimensions shall be provided to the contractor, who must submit them to the consulting engineer for approval prior to manufacture.