SPECIFICATIONS

STORM WATER SETTLING AND SEPARATION UNIT

SCOPE
These specifications apply to the performance, materials and manufacture of Soleno's storm water settling and separation units.

SETTLING UNIT REQUIREMENTS
The storm water treatment unit shall be supplied by Soleno Inc. and shall comply with these materials and performance specifications based on specified flow and storage capacity.

RAW MATERIALS
The storm water settling unit shall be manufactured from high-density polyethylene (HDPE) resin.

- HDPE resin: the treatment unit must be made of high-density resin, with high molecular weight (HMW). Resin shall meet the criteria of standard ASTM D3350-02 with minimum cell classification 345420C.
- **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.

The storm water treatment unit may be refused if it does not meet the requirements of these specifications.

PERFORMANCE
- The storm water settling unit shall include a _____ mm _____ in interior diameter and _____ mm _____ in long sedimentation chamber for treating the water entering the unit, as well as a _____ mm long oil separation chamber.
- The storm water settling unit shall include a _____ m^3 _____ ft^3 sediment storage reservoir and may also contain _____ m^3 _____ ft^3 of hydrocarbons. The storm water treatment unit shall capture the oils, grease, waste and floating debris and 80 % of Total Suspended Solids (TSS) entering the chamber (annually).
- An inlet pipe with deflector shall eliminate water turbulence to allow solid sediments to be deposited at the bottom of the sedimentation chamber to prevent these sediments from being resuspended.
- Size of particles to control: from very fine sand to very coarse sand (100 microns and over)
- Deflectors inside each chamber shall separate and facilitate solid sedimentation and oil floatation in their respective chambers. An outlet section with a 90° elbow shall prevent liquid oils and floating solids from exiting the unit.
- The storm water settling unit shall include two 750 mm (30 in) interior diameter access shafts with triple walls, located at the top of each chamber, to provide safe access for routine inspection and maintenance.

SPECIFICATIONS

STORM WATER SETTLING AND SEPARATION UNIT (CONT'D)

MANUFACTURING SETTLING UNITS

- The storm water settling unit shall be made from HDPE pipes that comply with standards BNQ 3624-120, AASHTO M294 or ASTM F894, based on the diameters required.
- Inlets and outlets are HDPE extrusion-welded inside and outside the structure.
- Deflectors shall be made from HDPE and extrusion welded to the inside of the settling unit.
- HDPE lift eyelets may be attached to the outside of the settling unit so as to prevent undesirable stress on critical elements during loading, unloading and maintenance of the unit.
- The storm water settling unit shall be built in compliance with site requirements, confirmed by shop drawings and, if necessary, approved by the engineer in charge of the project. In a roadway installation, the settling unit shall be equipped with one or more adjustable grate(s) and cast iron cover(s) complying with standard BNQ 1809-300.

Buoyancy calculations (Archimedes' principle) may be provided upon request. 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.

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, article 9, Excavation and Backfill. The storm water settling unit shall be installed on stable bedding composed of CG-14 granular material (standard BNQ 2560-114-III, article 6.5), with a minimum depth of 300 mm (12 in), compacted to 95 % modified Proctor density. The contractor is responsible for all safety precautions during settling unit installation.
- **Backfill**
  Backfill material shall be composed of CG-14 granular material 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, Article 9, Excavation and Backfill. Backfill shall extend at least 1.0 m (3.3 ft) beyond the perimeter of the unit, from below the bedding to the full height of the unit, and laterally up to the undisturbed part of the soil.
- **Connecting inlet and outlet pipes**
  Bell couplings with integrated gaskets shall be installed to connect unit inlets and outlets to the pipes.

SHARED RESPONSIBILITY

- **Soleno's responsibilites**
  Soleno shall deliver the the storm water settling system to the site. The system includes the settling unit with debris deflector, inlet and outlet connections, 750 mm (30 in) interior diameter access chimneys with smooth exterior walls, up to the finish grade level.
- **Contractor's responsibility**
  The contractor shall prepare the site for system installation, including, 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 shall also provide suitable lifting equipment for unloading the settling unit 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 also responsible for cutting on site, if required, and installing access chimneys to the grade level indicated on approved drawings. The contractor is also responsible for watertightness of connections from the settling unit to the inlet and outlet pipes, 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.

SPECIFICATIONS

STORM WATER SETTLING AND SEPARATION UNIT (CONT'D)

QUALITY ASSURANCE AND INSPECTION

- **Materials**
  The quality of materials used, the manufacturing process and the entire unit are subject to inspection by the consulting engineer, at any time during the course of the project (at the manufacturing plant or on site). If it does not meet the requirements of these specifications, the settling unit may be refused, even if parts of the unit were previously accepted at the factory. All parts refused after delivery to the site shall be marked for identification purposes and removed from the site. Any damaged part of the unit that cannot be repaired on site shall be refused. If this part is already installed, it must be repaired to the satisfaction of the consulting engineer, if accepted, or completely replaced at the contractor's expense.
- **Inspection**
  All parts of the unit shall be inspected for overall appearance, dimensions, general condition, etc.
- **Defects**
  Structural defects may be repaired (with the approval of the consulting engineer) after the manufacturer has demonstrated the durability and strength of the proposed repair. The consulting engineer shall carefully verify the quality of the repairs carried out before final acceptance of all the components.