

# BaySaver<sup>®</sup> Stormwater Separation System Specifications

## MATERIALS AND DESIGN

### Concrete

- A. The structure shall be designed for H-20 loading traffic and applicable earth loads. The materials and structural design of the devices shall be per ASTM C857 and ASTM C858.
1. The minimum compressive strength of the concrete in the manhole base, riser, and top sections shall be 4000 psi.
  2. The minimum wall thickness shall be one twelfth of the internal diameter of the riser or largest cone diameter.
  3. Cement shall conform to the requirements for Portland cement of Specification C150.
  4. Aggregates shall conform to Specification C33, except that the requirement for gradation shall not apply.
  5. Reinforcement shall consist of wire conforming to Specification A82 or Specification A496, of wire fabric conforming to Specification A185 or Specification A497, or of bars of Grade 40 steel conforming to Specification A615/A615M.
  6. The access cover shall be designed for HS20-44 traffic loading and shall provide a minimum of 30 inch clear opening.
  7. All joints shall be waterproofed with wrapped gaskets or sealed with a mastic treatment.
  8. Any grout used within the system shall meet the ASTM C 1107 "Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Non-Shrink)". Grades A, B and C at a pour able and plastic consistency at 70°F. CRD C 621 "Corps of Engineers Specification For Non-Shrink Grout."
  9. Storage manhole connector holes shall be equipped with a seal gasket the meets or exceeds material specifications of ASTM C-923 or other locally approved methods.

### BaySaver<sup>®</sup> Separator Unit

- A. Smooth wall pipes within the system, (i.e. tee pipes, connector pipes and down pipes) shall be constructed of SDR 26 HDPE pipe of standard ASTM F412.
- B. Pipe and fitting material shall be high-density polyethylene meeting ASTM D330 minimum cell classification 335400C for 12- through 60- inch diameters. The 12- through 60- inch pipe material shall be Hancor Resin 8<sup>TM</sup>, which is a slow crack resistant material evaluated using the single point notched constant tensile load (SP-NCTL) test.
- C. Installation shall be in accordance with ASTM D2321 with the exception that minimum cover in trafficked areas for 4- to 48- inch diameters shall be one-foot and for 60-inch diameters shall be 1.5 ft.
- D. Sheet material that makes up the weir plate and bypass plate is to be made of HYA-022. HYA-022 is a high molecular weight, high density polyethylene resin designed for medium and large part blow molding. This product exhibits excellent impact strength and stress crack resistance.
- E. All pipe joints, particularly the reducer/adaptor to the mainline, shall be installed with an exterior joining coupler. The joint coupler shall be Polyseal Pipe Coupler as manufactured by Mar-Mac Manufacturing Company or an approved equal and shall be installed according to the manufacturer's recommendations.
- F. The connector pipes should be connected with the down pipes using Fernco Flexible Couplings that have been manufactured to conform to ASTM C-425.

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## Design

- A. An Oil/Water/Grit Separator(s) shall be supplied as defined in the attached drawings. This stormwater treatment system shall comprise two structures with a connecting separator unit between them. The system shall be configured such that fine sediments and floatable pollutants are retained in an off-line structure to prevent resuspension. This separator(s) shall be capable of separating both suspended solids and oils (hereafter called pollutants) from stormwater at a rate of no less than 80% removal efficiency<sup>1</sup> at the maximum treatment flow rate.
- B. The unit shall be designed to allow for three flow paths, which are used during different flow rates. These three flow paths shall be defined as the optimal treatment flow path, the maximum treatment flow path and the peak design flow path, and are described below.
- C. During optimal treatment flows the unit shall work by separating the lighter pollutants to the top of the primary manhole and directing these pollutants to the secondary (storage) manhole, while heavier suspended solids are directed to the bottom of the primary manhole. In this way the unit shall be capable of treating all flows up to the optimal treatment flow rate though both manholes in a primary and secondary treatment<sup>2</sup> process.
- D. At higher flows, less than the defined maximum treatment flow rate, the unit shall continue to treat all fluids in the primary manhole and shall direct those lighter pollutants from the top of the primary manhole to the storage manhole for a secondary treatment process. At the same time, the unit shall remove the clean fluids from the center of primary manhole and direct these treated fluids directly out of the unit. Thus the unit shall avoid re-suspension of previously collected pollutants in the storage manhole with these clean and treated fluids from the first manhole.
- E. At flow rates above the maximum treatment flow the unit shall offer a third flow path that allows for redirection of the fluids past the storage manhole thus eliminating re-suspension of the pollutants collected in the storage manhole by these higher flows.
- F. The unit shall not possess any elbows of greater than 60° between the primary and storage manholes.
- G. The unit shall be capable of having the storage manhole completely inspected and maintained from the top opening without obstruction.
- H. No system that does not consist of at least two separate treatment manholes and at least two treatment flow rates plus a bypass flow rate shall be considered an "or equal."

## Contact Information

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<sup>1</sup>  $E = (P_i - P_o) / P_i$  where E is the collection efficiency,  $P_i$  is the input pollutant load by weight and  $P_o$  is the output pollutant load on a weight basis.

<sup>2</sup> Treating or treatment shall be defined as a combination of fluid redirection (centripetal) and gravity principles to separate the non-dissolved constituents from the fluid to be cleaned by using the density differences between the cleaned fluids and the pollutants to be removed.