

APPENDIX F

SiteSaver Material Specifications

The section must be carefully reviewed and edited by the Engineer to meet the requirements of the project and local building code. Coordinate this section with other specification sections and the Drawings.

Verify latest version of specifications

PART 1-GENERAL

1.1 DESCRIPTION

- A. This work shall consist of installing a SiteSaver®, generally referred to as a Manufactured Treatment Device (MTD), for the purification of stormwater run-off at each location as shown on the contract plans. The unit shall treat the water quality design storm flow and drain excess flows as specified on the contract drawings.
- B. The MTD shall include at least one or more treatment systems for floatable suspended solids capture with net(s) or screening basket(s). Sorption materials and baffles sorb hydrocarbons and detain the hydrocarbons at the listed capacity. Sorption materials are accessible for immediate removal by an oil spill response team in the event of a significant spill. During water quality flow events, the MTD shall retain matter that exceeds the opening size of the trash treatment device (netting bags or screening baskets) such as trash, debris, litter cigarette butts, etc. The inclined cell settler supports the netting bag or screening basket and facilitates efficient settling of sediment. Sediment accumulates on the floor of the MTD. During excess water quality flow conditions, excess flow shall be drained across the hydraulic relief weir(s) to the exit pipe. This product is produced by StormTrap, LLC. (815) 941-4663.
- C. External by-pass structures can be utilized with SiteSaver however external by-pass structures are not required.
- D. All flow is directed into the netting bag or screening basket. The netting bag or screening basket can hold sorption material to capture oil and grease. The oil sorption material contained in the netting bag can sorb oil sheen and grease. Oil sorption materials can also be located outside of the netting bag or screening device and secured to the SiteSaver structure. The net opening size determines the size of captured floatable trash and debris.
- E. The inclined plate separator shall operate based on the hydrostatic pressure differential between the inlet and outlet pipe. The flow is split in proportion to the number of inclined plate cells. The cells treat the water in parallel and combine the flows at the orifice baffle. The inclined plate cell surfaces facilitate sliding of the sediment to the device floor where it is protected from wash-out from subsequent flows.
- F. The oil bunker chamber, the sediment hopper and recombination effluent chamber shall be accessible through removable covers and hatches at grade. Removal of floatable material, hydrocarbons, and sediment occurs from the access opening above the oil bunker. Water and the settled solids and floating particulates are removed by a vacuum truck. No confined space entry shall be required for removal of captured pollutants. Refer to the SiteSaver Manufacturer's Instruction Manual for more detailed maintenance instructions and procedures.
- G. Captured sediment storage shall be not less than 0.7 Ft³/Ft² of device floor area. Refer to the SiteSaver drawings for unit specific storage capacities.
- H. Oil Storage is dependent upon selection of optional hydrocarbon accessories. Refer to the SiteSaver drawings for unit specific storage capacities.

1.2 RELATED SECTIONS

- A. Section XXXXX
- B. Section XXXXX
- C. Section XXXXX
- D. Section XXXXX

1.3 REFERENCES

- A. ASTM International (ASTM):
 - a. A-615/615M - Standard specification for deformed and plain billet-steel bars for concrete reinforcement
 - b. C-857 - Standard practice for minimum structural design loading for underground precast concrete utility structures
 - c. C-858 - Standard specification for underground precast concrete utility structures
 - d. C-891 - Standard practice for installation of underground precast concrete utility structures
 - e. C-990 - Standard specification for joints for concrete pipe, manholes, and precast box sections using preformed flexible joint sealants
- B. American Concrete Institute (ACI):
 - a. 318 - Building code requirements for structural concrete
- C. Federal Specifications (FS):
 - a. FS-SS-S-210 - Sealing Compound, Preformed Plastic for Expansion Joints and Pipe Joints

1.4 DESIGN REQUIREMENTS

- A. Precast concrete modular storm water detention: ASTM C 858
- B. Minimum Structural Design Loading: ASTM C 857.
 - a. Total Cover:
 - i. Minimum: As indicated on the Drawings.
 - ii. Maximum: As indicated on the Drawings.
 - b. Concrete chamber shall be designed for AASHTO HS-20 wheel load and applicable impact.
 - c. Minimum Soil Pressure:
 - i. As indicated on the Drawings.
 - d. Vertical and lateral soil pressures shall be determined using:
 - i. Groundwater: At or below invert of system.
 - ii. Soil density is assumed to be 120 pcf.

1.5 SUBMITTALS

- A. Comply with Section 01330 (01 33 00) - Submittal Procedures, except shop drawings shall be 11 inches by 17 inches.
- B. Product Data: Submit manufacturer's product data and installation instructions.

- C. Shop Drawings:
 - a. Submit manufacturer's shop drawings, including plans, elevations, sections, and details, indicating layout, dimensions, foundation, cover, and joints.
 - b. Indicate size and location of roof openings and inlet and outlet pipe openings.
 - c. Indicate sealing of joints.
- D. Certification by a Professional Engineer licensed in the State of installation shall be submitted that the MTD meets or exceeds the structural design standards listed in this specification and local codes.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Delivery of Accessories: Deliver to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Storage of Accessories:
 - a. Store in accordance with manufacturer's instructions.
- C. Handling: Protect materials during handling and installation to prevent damage.

PART 2- PRODUCTS

2.1 MANUFACTURER

- A. StormTrap, 1287 Windham Parkway, Romeoville, IL 60446. Phone (815) 941-4663. Fax (331) 318-5347. Website www.stormtrap.com.

2.2 QUALITY ASSURANCE

- A. The in-line netting floatables collection system shall be a product of an established firm experienced and qualified in the manufacture and design of such systems and who can demonstrate adequate installation and performance of similar systems elsewhere. An established supplier or firm must:
 - a. Have a minimum of five (5) years' experience in the manufacture/design of such systems;
 - b. Have undertaken physical modeling hydraulic studies of their debris collection and sedimentation systems to substantiate head loss requirements and have documented test results available for review by the engineer or owner;
 - c. Have a minimum of ten (10) floatables collection systems in service for a minimum of 2 years with satisfactory performance. For each installation, the Contractor shall provide:
 - i. Location and owner,
 - ii. Installation date,
 - iii. Contact person and telephone number,
 - iv. Model number of the system or the capacity.

2.3 MATERIALS AND DESIGN

- A. Precast concrete stormwater modules:
 - a. Size: As indicated on the drawings

- b. Concrete:
 - i. Minimum compressive strength: 6,000 psi at 28 days
 - ii. Entrained air content: 5 to 8 percent
 - c. Reinforcing bars: ASTM A 615, Grade 60
 - d. Cover for reinforcing bars: ACI 318
- B. Concrete accessories:
- a. Joint Tape:
 - i. ASTM C 990
 - ii. 7/8-inch diameter, preformed mastic joint sealer
 - iii. Approved by manufacturer
 - b. Joint Wrap:
 - i. 8-inch wide sealant with protective release paper
 - ii. Approved by manufacturer
- C. Access openings:
- a. Size: As indicated on the drawings
 - i. Hatches intended for net maintenance shall have a minimum clear opening as specified on the drawings or the width of the net frame plus 6-inches or more.
 - ii. Hatches shall be provided with a lockable latch and lift springs or cylinders and prop up mechanism to hold the hatch doors in opened position
 - iii. Circular manhole covers shall be bolt down lids
 - b. Size and locations approved by manufacturer
- D. Pipe openings:
- a. Size: As indicated on the drawings
 - i. Pipe openings shall maintain a minimum of 1'-0" clearance from a vertical edge of the SiteSaver modules
 - b. Size and locations approved by manufacturer
- E. Disposable nets:
- a. Disposable nets shall be constructed of a knotless knitted mesh synthetic material with openings as indicated on the drawings mounted on a one piece molded plastic tapered frame, sized to permit rapid installation and removal from the floatables collection system without contact with the floatables captured in the net.
 - b. The composition, denier, and the method of knitting of the mesh material shall be such that the finished mesh material has a minimum tensile strength of 250 pounds and a minimum elongation of 100% in the direction of the fabric wales and a minimum tensile strength of 220 pounds and a minimum elongation of 100% in the direction of the fabric courses. The tensile strength shall be determined by an independent accredited testing laboratory of The American Association for Laboratory Accreditation using ASTM Test Procedure #5034-95 using an Instron® Testing Machine. The testing laboratory must be accredited for technical competence in the field of Mechanical Testing and be certified to perform tensile and strength tests.
 - c. The Manufacturer shall provide certified copies of these test results at the request of the ENGINEER. The material shall be stable over the temperature range of -20 to +115

degrees Fahrenheit without melting, deforming or otherwise suffering loss of the mechanical and chemical properties contained in this specification.

- d. The material shall be unaffected by chemical pH from 4.5 to 7.5 as determined using the American Association of Textiles Chemists and Colorists pH Test Procedure.
- e. The net frame shall be constructed of wood or a single piece molded from high density polyethylene plastic with lifting holes formed into the tapered frame. The net frame shall be a 30-inch square molded frame.

F. Screening Baskets

- a. The screening baskets shall be constructed of materials of adequate size and type to withstand anticipated loads per the structural calculations
- b. The opening size of the screening baskets shall be sized as indicated on the drawings

G. Mounting and Support System and Guide Rails:

- a. The mounting system, lifting units, guide rails, and support members shall be constructed of materials of adequate size and type to withstand anticipated loads per the structural calculations.
- b. The mounting and support system, guide rails, and drain screen shall be installed in the concrete channel surfaces, horizontal and vertical as designed using bolts, nuts, and washers of adequate size and numbers to withstand the anticipated loads.
 - i. All mounting will be "drill-in" type anchors and drilled into the sidewalls and floor of the containment chamber.
 - ii. The mounting system will be designed for the impact by the peak flow rate.
- c. The guide rails shall extend from the top of the net support frame to the bottom of the lid.
- d. If not factory assembled, the manufacturer shall supply all necessary hardware required to install the mounting and support system to the concrete housing. This hardware shall be of the same materials of construction as the mounting and support system.
- e. Calculations to document that the design meets the bid requirements shall be provided by the CONTRACTOR with the Submittals.
- f. The mounting and support system area shall be kept to a minimum and shall direct flow into the open mouth of the nets or screening baskets to the maximum extent practical.

H. Netting accessories (Optional):

- a. Sizing: Sorbent booms shall be placed in the device for the absorption of gasoline; diesel fuel, lube oil, jet fuel, transformer oils, chlorinated solvents, aromatic solvents, hydraulic oils, light crude.
- b. The sorbent boom or Rubberizer® boom shall be manufactured by Haz-Mat Response Technologies Inc. or approved equal.
- c. Refer to sorbent boom manufacturer for specific product details

2.4 PERFORMANCE

- A. The inlet pipe shall discharge the storm water into the net or basket cavity located above the inclined plate area. Liquids and particles lighter than the density of water float on the water

surface. Emulsified oils are not captured and are not part of the floatable mass. The heavy fraction of the solids shall settle to floor of the device.

- B. Gross pollutants and particles larger than the net or screen opening size cross the primary weir and enter the net or basket cavity above the incline cell settler insert where the net or basket traps floatables that exceed the net opening size. Smaller matter discharges into the inclined cells below.
- C. The solids and water between the inclined cell plate walls flows from the inlet towards the hydraulic relief weir located near the outlet pipe. During this process, solids shall settle and slide down towards the bottom of each plate cell and sink to the device floor. The purified water continues to the exit pipe.
- D. The particles that shall be removed in the inclined cell plate walls shall be silt, fine sand, and sand. The typical density of these particles is 2400 kg/M3 [150lbs/ft3], and their size between 2 microns and 1000 microns.
- E. Capacities:
 - a. Water quality flow ___ CFS
 - b. Peak flow ___ CFS
 - c. Hydrocarbon capacity ___ Gallons
 - d. Sedimentation capacity ___ Ft³.
 - e. Effective settling area ___ Ft²
 - f. Net/Screen Opening size ___ in.

PART 3-INSTALLATION

3.1 EXAMINATION

- A. Examine area to receive the manufactured treatment device. Notify the engineer if area is not acceptable. Do not begin installation until unacceptable conditions have been corrected.
- B. Verify in field before installation, dimensions and soil conditions, including but not limited to groundwater and soil bearing capacity.

3.2 INCLINED PLATE SEPARATOR FABRICATION

- A. Fabrication of the inclined plate hydrodynamic separator water quality device shall be in strict accordance with the design.
- B. If field installation is applicable, the inclined plate hydrodynamic separator water quality device shall be provided with mounting brackets for installation into the precast concrete structure with mounting anchors. Refer to installation guide for more detailed installation guidelines and procedures

3.3 PRECAST MODULAR STORMWATER STRUCTURES

- A. Stormwater modules shall be manufactured according to shop drawings approved by the installing contractor and engineer. The shop drawings shall indicate size and location of roof openings and pipe openings.

- B. Excavation shall be as specified in Section 02300 (31 00 00)
- C. Modules shall be installed in accordance with manufacturer's instructions and ASTM C 891-09, standard practice for installation of underground pre-cast concrete utility structures. The following additions and/or exceptions shall apply:
 - a. Specifications on the engineer's drawings shall take precedence
 - b. Modules shall be placed on a level pad of 3/4" aggregate that extends 2'-0" past the outside of the system, per ASTM C891-09
 - c. Modules shall be placed such that the maximum space between adjacent modules does not exceed 3/4". If the space exceeds 3/4", the modules shall be reset with appropriate adjustment made to line and grade to bring the space into specification
 - d. The perimeter horizontal joint of the modules shall be sealed with preformed mastic joint sealer according to ASTM C891-09, 8.8 and 8.12.
 - e. All exterior joints between adjacent modules shall be sealed with pre-formed, cold-applied, self-adhering elastomeric resin bonded to a woven highly puncture resistant polymer wrap conforming to ASTM C891-09 and shall be 0'-8" wide with integrated primer sealant as approved by manufacturer. The adhesive exterior joint wrap shall be installed according to the following installation instructions:
 - i. Use a brush or wet cloth to thoroughly clean the outside surface at the point where the joint wrap is to be applied
 - ii. A release paper protects the adhesive side of the joint wrap. Place adhesive tape (Butyl side down) around the structure, removing the release paper as you go. Press the joint wrap firmly against the module surface when applying.
- D. Modules shall be backfilled in accordance with manufacturer's instructions and ASTM C 891-09, standard practice for installation of underground pre-cast concrete utility structures. The following additions and/or exceptions shall apply:
 - a. The fill placed around the device must be deposited on both sides at the same time and to approximately the same elevation. At no time shall the fill behind one side wall be more than 2'-0" higher than the fill on the opposite side.
 - b. Backfill shall be compacted to 95% standard proctor density or otherwise specified by engineer.
 - c. Care shall be taken to prevent any wedging action against the structure, and all slopes bounding or within the area to be backfilled must be stepped or serrated to prevent wedge action.
 - d. Care shall also be taken as not to disrupt the joint wrap from the joint during the backfill process.
 - e. Backfill material shall be clean, crushed, angular No.5 (AASHTO M43) aggregate.
- E. Align the center of pipe to correct elevation and insert into opening. The annular space between the pipe and the opening shall be filled with non-shrink grout.
- F. Use precast adjusting rings as needed to meet grade. For cover over 2'-0" it is recommended to use a precast barrel or cone section.
- G. The contractor is responsible to ensure the selected water tight solution performs as specified by the manufacturer.

- H. Do not use modules that are damaged, as determined by manufacturer.

3.4 MANUFACTURER INSTALLATION TECHNICAL ASSISTANCE

- A. At the time and place of installation of any SiteSaver®, StormTrap, LLC. will provide a Product Liaison on site to offer installation advice to the installation contractor if reasonable notification (approximately two-week notice) of the install date is given.

3.5 OPERATION AND MAINTENANCE

- A. The maintenance of the SiteSaver® is the responsibility of the Owner. Each site has unique site conditions. It is the responsibility of the Owner to establish a schedule according to the conditions of the specific SiteSaver location. Failure maintain the device can lead to reduced flow capacity and blockage due to collected pollutants. It is strongly recommended that the Owner follow the prescribe maintenance specifications and procedures published by StormTrap, LLC.

End of Section