

PART 1 - GENERAL

1.1 DESCRIPTION

- .1 The work covered by this section consists of the construction of a structural underground stormwater oil and sediment separator. The Contractor shall furnish all equipment, tools, labour and materials necessary to complete the work in accordance with the Drawings and Specifications.

1.2 SHOP DRAWINGS

- .1 Shop drawings consisting of all catalogue cuts and all fabricator drawings showing the structure and frames, grates, or covers shall be submitted by the Departmental Representative for approval prior to construction.
- .2 Submit all drawings, calculations, sizing, and fabrication drawings for review. Submit at least two weeks for the Departmental Representative's review.
- .3 Submit additional LEED submittal requirements provided by pre-approved manufacturers in accordance with 01 35 21 – LEED 2009 Requirements.

1.3 HANDLING AND STORAGE

- .1 Care shall be taken in loading, transporting, and unloading to prevent damage to materials during storage and handling.

PART 2 - PRODUCTS

2.1 GENERAL

- .1 The stormwater treatment unit shall be constructed from pre-cast concrete components conforming to either ASTM C857-11 and C858 or ASTM C478M-09 and shall meet the manufacturer's specifications.
- .2 The stormwater treatment unit shall meet the following requirements:
 - .1 Maximum treatable flow is 0.0754 cu m/s from a combined area of 3,822 sq. m.
 - .2 Removes 80% of annual TSS Loading.
 - .3 Removes Free Oil.
 - .4 Shall retain floatables and trapped sediment up to, and including, peak treatment capacity.
 - .5 Shall be contained in one structure.
 - .6 Shall be capable of transmitting all flows delivered by the upstream pipes.

- .7 The following SWTU providers have been pre-approved:
 - .1 Stormceptor (OSR)
 - .2 Contech Engineered Solutions (Jellyfish)
 - .1 Continuous Deflection Separation Technology (CDS)
 - .2 Jellyfish Filter

2.2 PRECAST CONCRETE SECTIONS

- .1 All precast concrete components shall be designed and manufactured to a minimum live load to the Canadian Highway Bridge Design Code truck loading requirements.

2.3 JOINTS

- .1 The concrete joints shall be water-tight and shall meet the design criteria according to CSA A257.4.

2.4 FRAME AND COVER

- .1 The frame and cover shall include an indented top design with lettering of the unit's name cast into the cover to allow for easy identification in the field. All manhole frame and covers to comply with Section 33 05 13 - Manholes, Catch Basin and Utility Structures.

2.5 INSPECTION

- .1 All precast concrete sections shall be inspected to ensure that dimensions, appearance and quality of the product meet the Specifications.

2.6 PERFORMANCE

- .1 The stormwater quality treatment device shall remove oil and sediment from stormwater as follows:
 - .1 The treatment device shall be capable of removing 80 percent of the average annual total suspended solids (TSS) load without scouring previously captured pollutants. Design methodologies shall provide calculations substantiating removal efficiencies and correlation to field monitoring results using both practical size and TSS removal efficiency. The manufacturer shall provide performance data that the stormwater quality treatment system does not scour previously captured pollutants based on the particle size distribution as specified in Table 2.1. Performance data shall include laboratory testing with an initial sediment

load of 50 percent of the unit's sediment capacity at an operating rate of 125% or greater.

- .2 The separator shall be capable of removing 95 percent of the floatable free oil.
- .3 The separator shall be capable of trapping fine sand, silt, clay and organic particles in addition to larger sand, gravel particles and small floatables.
- .4 The stormwater quality treatment unit shall be sized to a specific particle size distribution as specified below in Table 2.1.

Table 2.1 - Particle Size Distribution

<u>Amount</u>	<u>Diameter (microns)</u>	<u>Specific Gravity</u>
20%	20	1.3
20%	60	1.8
20%	150	2.2
20%	400	2.65
20%	2000	2.85

PART 3 - EXECUTION

3.1 INSTALLATION

- .1 Installation of the pre-cast concrete stormwater treatment unit shall conform to the manufacturer's installation instructions, specifications and recommendations.

3.2 EXCAVATION

- .1 Excavation for the installation of the stormwater treatment unit shall conform to the requirements of Section 31 23 33.01 - Excavating, Trenching and Backfilling.
- .2 The stormwater treatment unit shall not be installed on frozen ground. Excavation should allow for adequate compaction around the structure. If the bottom of the excavation provides an unsuitable foundation, additional excavation may be required.

3.3 BACKFILLING

- .1 Backfilling material shall conform to the requirements of Section 31 23 33.01 - Excavating, Trenching and Backfilling.
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3.4 INLET AND OUTLET PIPES

- .1 Inlet and outlet pipes shall be securely set into the stormwater quality treatment unit using approved pipe seals providing a water tight connection.

3.5 FRAME AND COVER OR FRAME AND GRATE INSTALLATION

- .1 The grade adjustment units shall be laid in a full bed of mortar with successive units being joined using sealant recommended by the manufacturer. Frames for the cover shall be set in a full bed of mortar at the elevation specified in the Contract Documents.