SECTION 02723
HIGH EFFICIENCY OIL/WATER SEPARATOR SPECIFICATIONS

PART 1.00 GENERAL

1.1 INTRODUCTION

A. The Ecol ESK system, with the performance specifications as described in Section 2.2, shall remove essentially all free and dispersed, non-emulsified oil and settable solids from an oil/water mixture at the specified flow rates and operating temperatures. The system design shall utilize the difference in specific gravity between oil and water (i.e., buoyancy force) to separate these fluids. The separation process shall be enhanced through the use of proprietary Ecol ESK media and component insert. The separator shall be designed to receive non- emulsified oily water by gravity or pumped flow *(Separator should be fed by gravity and any pumping station should be located downstream of the separator, Otherwise, the chamber for calming the flow of water should be applied before the separator)* and shall process it on a once through basis. The system shall be a single wall, rectangular or round tank installed below grade.

1.2 DESCRIPTION

A. Acceptable Manufacturer: CrystalStream Technologies Authorized Distributor

Phone: 800-748-6945 www.crystalstream.com

B. Acceptable Product: ESK Oil/Water Separator

C. The Ecol ESK system shall be housed within a rectangular or round, precast reinforced concrete tank. Within the precast concrete tank, coalescing media shall be utilized to provide enhanced gravity separation of oil and water mixtures. The separator shall include an optional baffled inlet compartment, separation chamber, and clean water outlet chamber. *(there is only one chamber with inlet pipe made of PE, coalescence media filter /polyurethane/ with supporting elements /stainless steel/, float /PE and stainless steel/ and outlet pipe /PE/.*

1.3 QUALITY CONTROL INSPECTION

A. The quality of materials, the process of manufacture, and the finished sections shall be subject to inspection by the Engineer. Such inspection may be made at the place of manufacturing, or on the work site after delivery, or at both places, and the sections shall be subject to rejection at any time if material conditions fail to meet any of the specification requirements, even though sample sections may have been accepted as satisfactory at the place of manufacturing.

B. All sections shall be inspected for general appearance, dimensions, soundness, etc. The surface shall be dense, close-textured and free of blisters, cracks, roughness and exposure of reinforcement. (Coatings will be applied based on engineer specifications and requirements.)

C. Imperfections may be repaired, subject to the acceptance of the Engineer, after demonstration by the manufacturer that strong and permanent repairs result. Repairs shall be carefully inspected before final acceptance. Cement mortar used for repairs shall have a minimum compressive strength of 4,000 psi (28 MPa) at the end of 7 days and 5,000 psi (34MPa) at the end of 28 days when tested in 3-inch (76 mm) by 6-inch (152 mm) cylinders stored in the standard manner. Epoxy mortar may be utilized for repairs.

1.4 SUBMITTALS

A. The Contractor shall be provided with dimensional drawings and, when specified, utilize these drawings as the basis for preparation of shop drawings showing details for construction, reinforcing, joints and any cast-in-place appurtenances. Shop drawings shall be annotated to indicate all materials to be used and all applicable standards for materials, required tests of materials and design assumptions for structural analysis.

PART 2.00 PRODUCTS

2.1 MATERIALS AND DESIGN

A. Concrete for the precast Ecol ESK system shall conform to ASTM C 857 and C 858 and meet the following additional requirements:

1. The exterior wall thickness shall not be less than 4-inches or as shown on the dimensional drawings prepared by CrystalStream Technologies. In all cases the wall thickness shall be no less than the minimum thickness necessary to sustain HS20 loading requirements as determined by a Licensed Professional Engineer.

2. Sections shall have tongue-and-groove joints or shiplap joints and be sealed with a gasket designed to be resistant to fuel and oil. Joints shall be sealed with a closed cell injection sealant supplied with the precast structure.

3. Cement shall be Type II Portland cement, or approved equal, conforming to ASTM C 150.

4. All precast concrete sections shall be cured by an approved method. Sections shall not be shipped until the concrete has attained a compressive strength of 4,000 psi (28 MPa) or until 5 days after fabrication and/or repair, whichever is longer.

5. All interior concrete surfaces shall be sealed with a Butymastic sealant.

B. Coalescing media shall be supplied per CrystalStream Technologies in conjunction with Ecol-Unicon recommendations.

C. Coalescing media shall be held in place with 11 gauge 304 stainless steel baskets or as recommended by Crystalstream Technologies.

D. Manhole frames and covers shall be provided by the manufacturer in the numbers and configurations as shown on the dimensional drawings prepared by CrystalStream Technologies. Casting for manhole frames and covers shall be in accordance with ASTM A48, CL.35B and AASHTO M105 and shall be Syracuse Castings, or approved equal.

E. Hatchways shall be provided by the manufacturer in the numbers and configurations as shown on the dimensional drawings prepared by CrystalStream Technologies. Hatchways shall be made of steel or aluminum, and shall meet HS20 loading requirements when required.

F. Brick or masonry used to build the casting and hatchway frames to grade shall conform to ASTM C 32 or ASTM C 139 and shall be installed in conformance with all local requirements.

G. Separator Dimensions and Capacity

1. Separator shall have a nominal capacity of _____gallons.
2. Separator shall be designed to accommodate an influent flow rate of ___gallons per minute.
3. Total Oil Storage or Spill Capacity of_____ gallons.
4. Influent oil specific gravity shall range between _____ and _____.
5. Specific application for the oil/water separator is _____ .

2.2 PERFORMANCE

A. Separator shall be capable of handling liquids with a specific gravity of up to 1.1.

B. Separator shall be capable of handling water and oils at temperatures not to exceed 150ºF.

C. The Ecol ESK system shall remove essentially all free and dispersed non-emulsified oil from the water stream and produce a desired effluent based on an oil droplet typical of the site.

MANUFACTURER

A. The manufacturer of said oil water system shall have been regularly engaged in the engineering design and production of systems for the physical treatment of stormwater runoff for a minimum of 10 years. Each Ecol ESK system shall be manufactured by CrystalStream Technologies or approved equal.

PART 3.00 ACCESSORIES

3.1 Electronic Liquid Level Monitoring System Optional

A. All UL-listed separators shall have the option of an electronic liquid level monitoring system if required by owner or project engineer, including a controller and sensor.

B. The Controller shall be UL-listed and shall have a NEMA 4X or equal weatherproof, corrosion resistant junction box.

C. If required the controller shall have an audio and visual alarm activated by a float sensor.

PART 4.00 EXECUTION

4.1 INSTALLATION

A. Each Ecol ESK system shall be constructed according to the sizes shown on the drawings and as specified herein or as recommended by CrystalStream Technologies. Install at elevations and locations shown on the drawings or as otherwise directed by the engineer.

B. Place the precast base unit on a granular sub-base of minimum thickness of 6 inches (152 mm) after compaction or of greater thickness and compaction if specified elsewhere. The granular sub-base shall be checked for level prior to setting and the precast base section of the trap shall be checked for level at all four corners after it is set. If the slope from any corner to any other corner exceeds 0.5% the base section shall be removed and the granular sub-base material re-leveled.

C. Prior to setting subsequent sections place ConSealTm brand CS-440 butyl mastic sealant, or approved equal in conformance with ASTM C 990-91, along the construction joint in the section that is already in place.

D. After setting the precast roof section of the Ecol ESK system, set precast concrete manhole riser sections, to the height required to bring the cast iron manhole covers to grade, so that the sections are vertical and in true alignment with a 1/4-inch (6 mm) maximum tolerance allowed. Backfill in a careful manner, bringing the fill up in 6-inch (152 mm) lifts on all sides. If leaks appear, clean the inside joints and caulk with lead wool to the satisfaction of the Engineer. Precast sections shall be set in a manner that will result in a watertight joint. In all instances, installation of the Ecol ESK system shall conform to ASTM specification C 891 “Standard Practice for Installation of Underground Precast Utility Structures”.

E. Holes made in the concrete sections for handling or other purposes shall be plugged with a non-shrink grout or by using grout in combination with concrete plugs.