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Specifier to supply information for all yellow highlighted areas in specification. Contact Highland Tank if additional assistance is required. A [sizing guide](http://www.highlandtank.com/steel-storage-tank-sizing) is available on the Highland Tank web site.

Model HTC Aboveground Cylindrical Double-wall Oil/Water Separator with Corella® Coalescer Plate System

Project Description: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Scope

The separator shall be designed for gravity separation of free oils (hydrocarbons and other petroleum products) along with some settleable solids from wastewater associated with \_\_\_\_\_\_\_\_\_\_\_\_\_\_ operations. Separator shall be prefabricated with inclined, parallel, flat/corrugated plate and impingement coalescers. Separator shall be installed underground with top access at or above grade level. The source of the influent to the separator shall be gravity flow from stormwater runoff, hydrocarbon spills, and/or cleaning/maintenance operations.

Specifications

Provide Highland Tank Model HTC-2000 Aboveground Cylindrical Double-wall Parallel Flat/Corrugated Plate Gravity Displacement Oil/Water Separator(s). Separator shall be furnished with oil level alarm and leak detection systems having a total volume of 2000 gallons to comply with Spill Prevention Control and Countermeasures (SPCC) plan requirements at the facility. The sizing of this oil/water separator is consistent with industry protocols for complying with the minimum federal spill and discharge regulations. A separator of smaller volume is not permissible.

Separator to be furnished with a Corella® inclined parallel flat/corrugated plate coalescer to simultaneously separate free oil droplets and settleable or suspended solids particles from water without clogging of the coalescer.

Quantity: \_\_\_\_\_\_

Nominal Dimensions:

 Nominal Diameter: 5-feet, 4-inches, as indicated on the drawings.

 Nominal Length: 12-feet, 0-inches, as indicated on the drawings

Performance

Influent Characteristics

Provide separator designed for intermittent and variable flows of water, oil, or any combination of non-emulsified oil-water mixtures ranging from zero to 200 gal/min. Nominal separator retention time shall be 10 minutes, based on total unit volume. (Actual retention time will be less due to air space above fluid level).

Typical operating temperature range of the influent oil in water mixture: 40º F to 80º F.

 • Installation site operating temperatures: Minimum \_\_\_\_\_ º F, Maximum \_\_\_\_\_ º F.

Typical specific gravity range of the oils at operating temperatures: 0.71 to 0.92.

 • Installation site oils specific gravity: \_\_\_\_\_.

Typical specific gravity range of the fresh water at operating temperatures: 1.00 to 1.03.

 • Installation site fresh water specific gravity: \_\_\_\_\_.

Effluent Characteristics

The free oil and grease concentration in the effluent from the separator shall not exceed 10 mg/l (10 PPM) to satisfy requirements of the NPDES stormwater discharge permit. To achieve this goal, it will be necessary to remove all free oil droplets equal to and greater than 20 microns.

Design Criteria

Separator shall be designed in accordance with Stokes Law and the American Petroleum Institute Publication 421, "Monographs on Refinery Environmental Control - Management of Water Discharges; Design and Operation of Oil/Water Separators.” The total effective surface area of the parallel-corrugated plate coalescer shall be determined by OWS manufacturer for the flow, temperature, and oil specific gravity conditions specified above. The total effective surface area of the polypropylene impingement coalescer shall be determined by OWS manufacturer for the flow, temperature, and oil specific gravity conditions specified above. Calculations, signed and stamped by a Registered Professional Engineer shall be submitted to document specified effluent quality based on complete removal of the specified oil globule. A separator with lower effective surface areas is not permissible.

Separator capacities, dimensions, construction, and thickness shall be in strict accordance with Underwriters Laboratories, Subject UL-142 Standard for Safety, Steel Underground Tanks for Flammable and Combustible Liquids, Double-wall construction with 360-degree Steel Secondary Containment. Separator shall comply with National Fire Protection Association NFPA 30 Flammable and Combustible Liquids Code. The inner steel tank shall be completely contained within the outer steel tank, enclosing 100% of the tank volume. The tank must have a double steel shell without a defined space between the layers (UL Type I Double-wall). The space between the inner and outer steel walls shall be monitored with an approved electronic leak detection device through a pipe that extends vertically to the top of the tank from the bottom of the shell. Tank construction using thin walled primary tank with external fiberglass jacket shall not be permissible.

Separator shall be the standard patented product of a steel tank manufacturer regularly engaged in the production of such equipment. Manufacturer shall have at least 20-years’ experience in manufacturing similar units for identical applications. No subcontracting of tank fabrication shall be permitted.

Separator shall be fabricated, inspected, and tested for leakage before shipment from the factory by manufacturer as a completely assembled vessel (to the greatest extend possible with consideration to shipping requirements) ready for installation.

Separator shall be cylindrical, horizontal, atmospheric-type steel vessel intended for the separation and storage of flammable and combustible liquids. The separator shall have the structural strength to withstand static and dynamic hydraulic loading while empty and during operating conditions. A separator with a reduced shell thickness is not permissible.

Separator shall have the following oil storage capacities:

 • High oil level (warning), equal to about 20% of the static vessel volume,

 • High-high oil (alarm), equal to about 43% of the static vessel volume,

* Emergency oil spill capacity equal to about 80% of the static vessel volume.

Description

Separator shall be standard prefabricated, inclined parallel-flat / corrugated plate, gravity displacement type unit with removable manway cover(s).

The separator shall be a pre-packaged, pre-engineered, ready to install unit consisting of:

A 6-inch flanged influent connection. An internal influent nozzle at the inlet end of the separator. Nozzle discharge to be located at the furthest diagonal point from the effluent discharge opening.

A non-clogging flow distributor and energy dissipating, velocity head diffusion baffle and stationary under flow baffle at the inlet to:

 • reduce horizontal velocity and flow turbulence.

 • distribute the flow equally over the separators cross sectional area.

 • direct the flow in a serpentine path in order to enhance hydraulic characteristics and fully utilize all

 separator volume.

 • completely isolate all inlet turbulence from the separation chamber.

A sediment chamber to disperse flow and collect oily solids and sediments.

A sludge baffle to retain settleable solids and sediment and prevent them from entering the separation chamber.

An Oil/Water Separation Chamber containing a, inclined parallel corrugated plate coalescer with removable corrugated plates sloped downward toward the sediment chamber and sectionalized removable Petro-Screen polypropylene impingement coalescer

Inclined parallel corrugated plate coalescer to:

 • shorten the vertical distance than an oil globule must rise for effective removal. Minimum plate gap to be 1-1/4".

 • enhance coalescence by generating a slight sinusoidal (wave like) flow pattern thereby causing smaller, slow rising, oil globules to coalesce together on the undersides of the plates forming larger, rapidly rising sheets of oil.

 • direct the paths of the separated oil to the surface of the separator.

Sectionalized removable "Petro-Screen" polypropylene impingement coalescer designed to intercept oil globules of less than 20 microns in diameter. Heavy, one-piece impingement coalescers are not permissible.

Two, cylindrical manways complete with removable vapor tight cover, gasket, and bolts.

 • one manway shall be placed between the inlet and the parallel flat/corrugated plate coalescer to facilitate access into Sediment Chamber for solids removal

 • one manway shall be placed between the parallel flat/corrugated plate coalescer and outlet, over the Petro-Screen Coalescer, to facilitate removable of the sectionalized Petro-Screen Coalescer and to provide access into the Oil/Water Separation Chamber

An internal effluent downcomer at the outlet-end of the separator, to allow for discharge from the bottom of the oil water separator only.

A 6-inch flanged effluent connection.

Two factory supplied saddles, seal welded to the OWS, located as shown on the drawing.

Fittings for vent, interface/level sensor, waste oil pump-out, sampling, and gauge.

Lifting lugs at balancing points for handling and installation.

Identification plates: Plates to be affixed in prominent location and be durable and legible throughout equipment life.

Internal surfaces commercial grit blast and coated with 15 mils DFT heavy-duty polyurethane.

External surfaces commercial grit blast and coated with heavy-duty Epoxy Primer and Urethane Topcoat, Color: White.

Accessories & Options

• Internal surfaces commercial grit blasted and coated with 15 mils DFT heavy duty polyurethane.

 o    **High-LINK® LevelShield Series W**- Separator shall be supplied with a High-LINK® cloud based remote
 monitoring system in either of the below formats, dependent on oil/water separator design. Please
 [visit this link](https://www.highlandtank.com/app/data/literature/O_LIT_High-LINK-Oil-WaterShield-Wastewater-Monitoring-Systems.pdf) for product literature and description on the High-LINK® LevelShield Series W.

o   Overall High-LINK® system features include:

o   Provides remote, real-time cloud-based monitoring of system with annual High-LINK®subscription package

o   Alerts personnel of activity & alarms via email. Email alerts are managed via High-LINK® software application.

o   Can send an automatic alert to waste haulers when reaching capacity if customer desires

o   Prevents costly service with predictive maintenance tool by monitoring various system component performances.

o   Eliminate unnecessary cleanouts.

o   Verify vendor BOL and work performed

o   Collect history data for budget forecasting

o   **LevelShield Series WL-**

§  The control panel shall contain both level sensor and leak detection control. The control panel shall be NEMA 4 minimum enclosure rating. Power to the control panel is to be 120VAC volt, single phase.

§  Provides onsite continuous monitoring of overall liquid level, oil level in gallons, and set point alarm conditions for high oil level and high-high oil level in the oil/water separator.

§  An audible and visual leak detection alarm system for monitoring the interstice is also provided.

§  A silence control shall be provided for the audible alarms.

§  Panel shall include intrinsically safe connection to sensors. Level Sensor to be constructed of stainless steel with polyvinylidene floats.

o   **LevelShield Series WC-**

* + - Includes all the WL operations plus additional features for:
			* High sand and grit level detection
			* Pump and valve operations
			* Effluent quality monitoring
			* Variable site-specific monitoring or control points (please contact Highland Tank for custom monitoring & controls)

 • Separator shall be supplied with Highland Tank Deadman Anchoring System that includes

 polyester hold-down straps and concrete deadman anchors.

 • Polyester or steel hold-down straps (10’-6” maximum diameter for polyester straps)

* Grade Level Manways for vehicle traffic loading (H20)
* Electronically actuated valves
* Leak detection sensors
* Influent, effluent and/or oil pumps
* Separator shall be supplied with a freeze protection system, consisting of immersion heaters and insulation. Heaters shall be sized to maintain 40ºF inside the insulated OWS, at a minimum ambient temperature of \_\_\_ºF. Insulation shall consist of 2” thickness of closed cell foam, contained without a steel exterior wrap of steel. Insulation to provide a minimum R factor of R14.

Quality Assurance

Submittals:

Shop Drawings: Shop drawings for oil/water separators shall show principal dimensions and location of all fittings.

Instructions: Provide three complete sets of installation, operation, and maintenance instructions with separator.

Quality Control: Quality control and inspection procedures shall be considered part of the submittal package. Quality Control reports shall be available upon request after fabrication.

Warranty

The manufacturer shall warrant its products to be free from defects in material and workmanship for a period of one year from the date of shipment. The warranty shall be limited to repair or replacement of the defective part(s).

Approved Manufacturers

Highland Tank and Mfg. Co., One Highland Road, Box 338, Stoystown, PA 15563,

Phone 814 893-5701, FAX 893-6126, shall manufacture the Oil/Water Separator.

For additional information visit us at [**www.highlandtank.com**](http://www.highlandtank.com/)