

# GUIDELINE SPECIFICATIONS

## Gravity Separator

### Short Form

The contractor shall provide a fiberglass reinforced plastic (FRP) underground Gravity type oil/water separator as shown on approved ZCL separator drawings. Capacity, dimensions, fitting sizes and locations, and optional accessories furnished by ZCL shall be as shown on separator drawings. The separator shall be as manufactured by ZCL Composites Inc. Separator shall be installed in accordance with ZCL's current Installation Manual and Operating Guidelines for Fiberglass Underground Storage Tanks, and Gravity Oil/Water Separator Installation, Operation and Maintenance Manual.

### Long Form

#### Part I: General

##### 1.01 Quality Assurance

A. Acceptable Manufacturer: ZCL Composites Inc.

B. Relevant Standards:

1. ULC-S-615 Standard For Reinforced Plastic Underground Tanks for Flammable and Combustible Liquids.
2. American Petroleum Institute (API) manual on disposal of refinery wastes, Chapter V
3. Stoke's Law formula shall be the basis for design
4. Provincial environmental acts and regulations as applicable
5. Provincial plumbing and/or building codes as applicable

C. Materials:

1. Separator shell shall be manufactured of 100% resin and glass-fiber reinforcement-
2. Separator coalescing media shall be oleophilic plate packs resistant to plugging and fouling. Packs shall be removable for servicing and re-installation.
3. Coalescing plate packs and associated internal mounting hardware shall be rustproof.

D. Separator Tank Structural Design:

1. Separator shall be manufactured with integral ribs for structural integrity.
2. Double-wall separators shall have an interstitial space between the primary and secondary walls. The interstitial space will permit the free flow and containment of water or product from the primary tank in the unlikely event of a primary tank wall breach. The interstitial space shall allow for the insertion of leak detection device through a monitor fitting.

### **1.02 Submittals**

#### **A. Shop Drawings:**

1. Contractor shall submit to the engineer \_\_\_ copies of shop drawings for each separator for approval.
2. Drawings shall include all critical dimensions, and locations of all fittings and accessories.

#### **B. Literature Data:**

1. Contractor shall submit to the engineer \_\_\_ copies of manufacturer's literature and maintenance information.

#### **C. Installation Instructions:**

1. Contractor shall submit to the engineer \_\_\_ copies of manufacturer's current Installation Manual for Fiberglass Underground Storage Tanks.

#### **D. Operation and Maintenance Manual:**

1. Contractor shall submit to the engineer \_\_\_ copies of manufacturer's Gravity Oil/Water Separator Installation, Operation and Maintenance Manual.

## **Part II: Products**

### **2.01 Fiberglass Underground Oil/Water Separator**

#### **A. Product-Storage Requirements:**

1. Separator tank shall be capable of handling liquids with specific gravity up to 1.1.
2. Separator shall be capable of handling grease and oils at temperatures not to exceed 150° F.
3. Primary tank shall be vented to atmospheric pressure. The tank is not designed as a pressure vessel.
4. Separator shall be inert to petroleum products.

#### **B. Loading Conditions:** Separator shall meet the following design criteria:

1. Internal Load: Primary and secondary tanks shall withstand a 5-psig air-pressure test with a 5:1 safety factor. Installer shall perform a pneumatic or hydrostatic test on the primary tank for leakage prior to installation. Maximum test pressure is 5 psig.
2. Surface Loads: Separator shall withstand surface H-20 axle loads when properly installed in accordance with the manufacturer's current Installation Manual and Operating Guidelines.
3. External Hydrostatic Pressure and Burial Depth: Separator shall be capable of being buried in ground with 2.1m of overburden, the hole fully flooded. Allowance for a safety factor of 3:1 (single-wall) against general buckling shall apply.

C. Dimensional and Design Requirements:

1. Nominal capacity of the separator shall be \_\_\_\_\_ litres.
2. Total oil spill holding capacity shall be \_\_\_\_\_ litres
3. Nominal outside diameter of the separator shall be \_\_\_\_\_ feet.
4. Nominal overall length of the separator shall be \_\_\_\_\_ feet.

The separator design shall consider the following design conditions:

1. Specific application for the oil/water separator is \_\_\_\_\_.
2. Maximum inlet flow rate shall be \_\_\_\_\_ litres per minute.
3. Design inlet oil specific gravity shall be \_\_\_\_\_.
4. Influent quality under normal operating conditions shall not exceed \_\_\_\_\_ parts per million (mg/L).
5. Effluent quality shall be \_\_\_\_\_ parts per million (mg/L).

## 2.02 Accessories

A. Manways:

1. All separators shall require at least one manway with a bolted and watertight cover or lockable watertight lid to permit access to the coalescing media and interior of the separator.
2. All access manways shall be flanged 30-inch inside diameter minimum .
3. All separator manway extension(s) shall have internal dimensions matching those of the manway(s)
4. Location(s) shall be shown on separator drawing.
5. A manway cover shall include at least one 4-inch NPT steel fitting and plug.
6. Manway extensions shall be FRP and shall be provided for each manway as an option.

B. Influent Pipe:

1. Separator inlet shall be FRP plain pipe end unless otherwise specified. Factory-installed, threaded half couplings or flanged fittings are optional alternatives.
2. Location shall be as shown on separator drawings.

C. Effluent Pipe:

1. Separator discharge shall be FRP plain pipe end unless otherwise specified. Factory-installed, threaded FRP half couplings or flanged fittings are optional alternatives. Discharge piping shall contain a siphon break vented to atmosphere.
2. Location shall be as shown on separator drawings.

D. Vent

1. Separator shall be furnished with a vent(s) sized to maintain the separator at atmospheric pressure under normal operating and pump out conditions.

E. Fittings:

1. Single fittings intended for vent, product and sludge removal, sampling and oil level monitoring shall be located on the top centerline of the separator or in a manway lid.
2. Duplex fittings shall be located on the top centerline of the separator.
3. All standard NPT threaded fittings shall be constructed of carbon steel unless otherwise specified.
4. All standard NPT threaded fittings shall be half-couplings, and of 2-inch, 4-inch or 6-inch diameter. Reducers are to be used for smaller sizes where shown and provided by contractor.
5. Steel NPT fittings shall withstand a minimum of 500 foot-pounds of torque and 1,000 foot-pounds of bending.-
6. FRP nozzles (if provided) shall be flat-faced, flanged and gusseted and conform to ANSI B16.5 150# bolting pattern.
7. Interstitial space monitor fitting(s) or interstitial space monitoring reservoir fitting shall consist of a 4-inch NPT fitting.
8. All threaded fitting tolerances shall be in accordance with the ANSI standard for each fitting size.

F. Sludge Containment:

1. Separators shall have a FRP sludge baffle to limit migration of solids and sludge to the discharge piping.

G. Lifting Lugs:

1. All separators shall have lifting lug(s) that are capable of withstanding weight of separator with a safety factor of 2:1.

H. Optional Fitting Enclosure Collars:

1. Optional factory installed 48" inside diameter fitting enclosure collars are available where space permits.
2. Collars shall be factory-installed.
3. Location shall be as shown on separator drawings.

I. Optional Fitting Enclosure Risers

1. Risers are shall be constructed of fiberglass-reinforced plastic.
2. Risers shall be trimmed to length on site and attached to collars by contractor. Two part adhesive to be supplied by separator manufacturer.
3. Location shall be as shown on separator drawings.

J. Optional Anchor Straps:

1. Optional separator anchoring package consisting of FRP anchor straps and precast concrete deadman beams to be supplied by separator manufacturer if required.
2. Number and location of straps and beams shall be shown on separator drawings.

**2.03 Optional Hydrostatic Leak Monitoring System for Double-Wall Separators**

A. General:

1. The separator manufacturer shall offer the option of a continuously monitored, hydrostatic, leak-detection system.
2. The leak monitoring system shall be designed by the manufacturer to detect a leak in either the primary or secondary tank, at installations with or without groundwater.

B. Requirements:

1. The monitoring system shall include:
  - a.) factory-filled interstitial space monitoring fluid, and
  - b.) a fiberglass reservoir mounted directly on the top centerline of the separator to provide for continuous monitoring of the fluid level.
2. The monitoring fluid shall be compatible with the separator and be freeze resistant to -40.
3. The interstice between the primary and secondary tanks must be vented to atmosphere.
4. The reservoir shall be fitted with one 4-inch NPT fitting for installation of an electronic reservoir-level sensor.

Part III: Execution

A. Testing and Installation:

1. Separator shall be tested and installed in accordance with manufacturer's current Installation Manual and Operating Guidelines for Fiberglass Underground Storage Tanks, and Gravity Oil/Water Separator Installation, Operation and Maintenance Manual.

B. Operation and Maintenance:

1. Separator shall be operated and maintained in accordance with manufacturer's current Gravity Oil/Water Separator Installation, Operation and Maintenance Manual.

**Part IV: Warranty**

Warranty shall be manufacturer's current standard limited warranty.