

OIL / WATER SEPARATORS

UNDERGROUND FIBERGLASS STORAGE TANKS



MODELS: CSI-10 / CSI-15 / UL 2215



CONTAINMENT
SOLUTIONS®

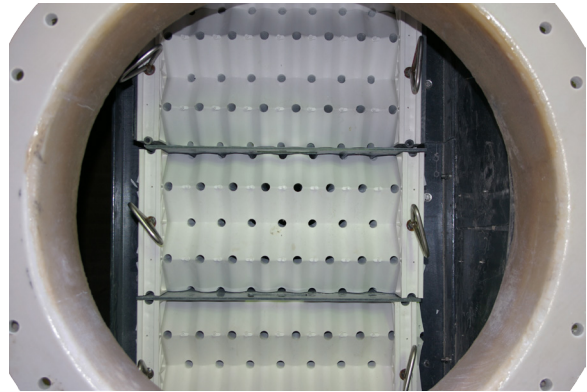
FIBERGLASS UNDERGROUND OIL/WATER SEPARATORS

Containment Solutions, Inc. (CSI) provides a full range of dependable products for the oil/water separator industry. Our underground separators utilize the same fiberglass manufacturing technology the petroleum industry relies on for environmental protection. The inherently non-corrosive properties of fiberglass provide the most compatible option for your separator application, built by one of the most trusted brands in the world. CSI provides several options in both single and double-wall construction to meet your unique needs.

CSI separators are constructed to remove hydrocarbons with a specific gravity up to 0.95 through the use of an enhanced oleophilic coalescer pack system. Oil/water separator designs vary based on required effluent quality and flow rates. An effluent quality of 10 parts per million (10ppm) is typical but the difference between continuous flow and intermittent flow will drastically alter the coalescer pack sequence. For intermittent flow applications we offer CSI-10 and CSI-15 models. The CSI-10 model provides an effluent quality of 10ppm, while the CSI-15 model provides an effluent quality of 15ppm. For continuous flow applications look no further than the CSI UL 2215 separator. For more information on the CSI UL 2215, please contact your CSI representative.

SYSTEM PROCESS

CSI fiberglass separators are buried and filled with water. Each separator includes a combination of baffles and coalescer packs, based on effluent requirements, to accelerate separation. Waste water enters through the inlet and gravity naturally settles heavier solids to the bottom of the tank as the oil floats to the top of the water level. The oily water then passes through the coalescing plates in a straight flow or cross flow direction depending on the tank model. The configuration of the packs efficiently coalesces or joins oil droplets together forming larger masses of oil that rise to the surface where it accumulates and can be removed. Gravity displacement discharges the effluent through the outlet at a lower point in the tank chamber. Separator systems can also be equipped with drop boxes, electronic monitoring with high oil level alarms and control panels, and oil stop valves.



PERFORMANCE CLAIMS:

- Fiberglass construction provides corrosion resistance without coatings or protection systems.
- Enhanced coalescer system is comprised of oleophilic plates to maximize separation and minimize maintenance.
- Removable plates simplifies routine cleaning.
- All tanks are built to the stringent performance requirements of UL 1316.
- Removes free floating oils and settleable solids for oil/water mixtures to achieve 10ppm effluent quality (or 15 ppm if specified).
- Includes a 30-year internal / external corrosion and structural limited warranty.

SEPARATOR DESIGN & SIZING

Since each site is unique, the most effective approach is to analyze each situation and design the system accordingly. CSI's engineering staff can help determine the best fit for your technical considerations and site specific needs.

The major design parameters include:

- *Inlet flow rates*
- *Oil spill capacity*
- *Inlet/outlet concentration*
- *Oil storage capacity*
- *Effluent quality*
- *Temperature*
- *Specific gravity of contaminants*

CSI UL 2215 separators are sized primarily on flow rates. A complete list of flow rate plate pack options are available, contact your CSI representative for more information.

INTERCEPTORS

In addition to separators, interceptors are available in single, double, and triple basin designs. CSI interceptors reduce sand, settleable materials, and oil or grease prior to sewer discharge. CSI interceptors can be used as stand alone units or as the initial stage of a more efficient treatment system utilizing CSI oil/water separators.

ELECTRONICS / ACCESSORIES

Oil/Water Separator monitoring and control systems can be configured to satisfy a wide range of customer requirements. Control panels, sensors, probes and gauges are available for double-wall and single-wall oil/water separator systems as well as for single-tank or multiple-tank installations. CSI carries a full line of pump controls, inlet and outlet pumps, and waste oil pumps. We can package the right model with the proper electronics so when the tank arrives the only thing left to do is connect the piping.

PERFORMANCE	MODELS			
	UL 2215	CSI-10	CSI-15	Interceptor
Stokes' Law	●	●	●	●
UL 1316	●	●	●	●
API 1630	●	●	●	
API 421	●	●	●	
USCG 46CFR 162.050	●	●	●	
15ppm	●	●	●	
10ppm	●	●		
UL 2215	●			
Continuous Flow	●			



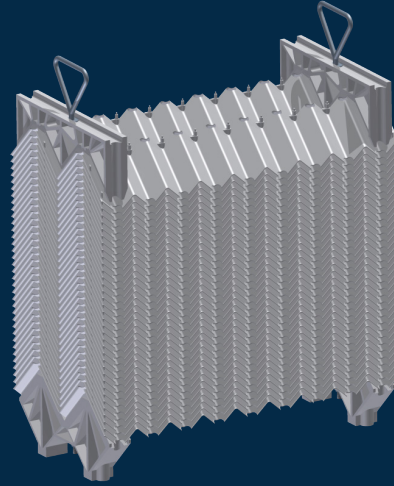
APPLICATION: RAINWATER RUNOFF

Oil drippings and spills from parking lots, driveways, oil terminals and other vehicular traffic surfaces are being washed into our water supplies by rainwater, creating serious environmental concerns.

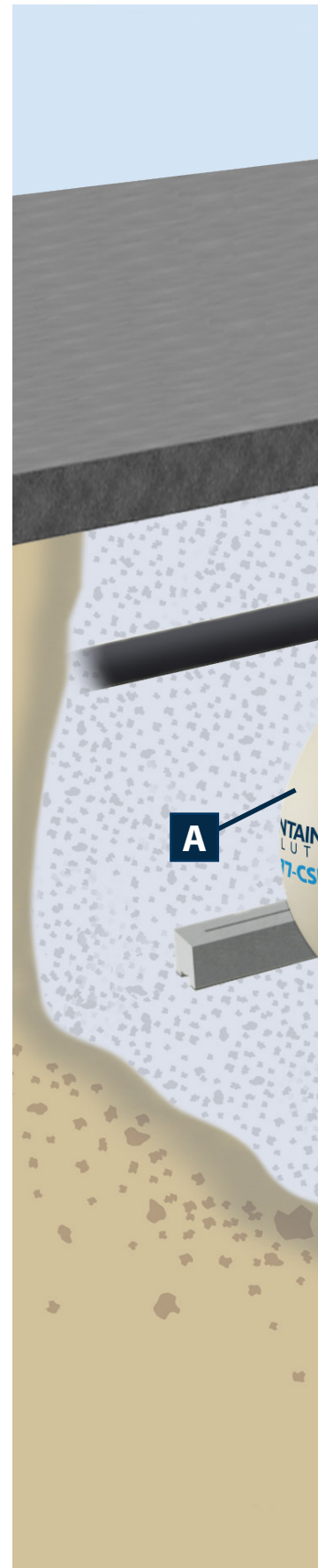
CSI Oil/Water Separators are designed to meet EPA guidelines for rainwater runoff control.

TYPICAL FEATURES

- A. Double-Wall Separator
- B. FRP Manway Extension
- C. Oil Draw Pipe
- D. Hydrostatic Reservoir
- E. Tank Sump
- F. Cross flow Baffle
- G. Coalescer Plate Packs
- H. Oil Stop Valve
- I. Anchor Straps
- J. Deadman Anchor System

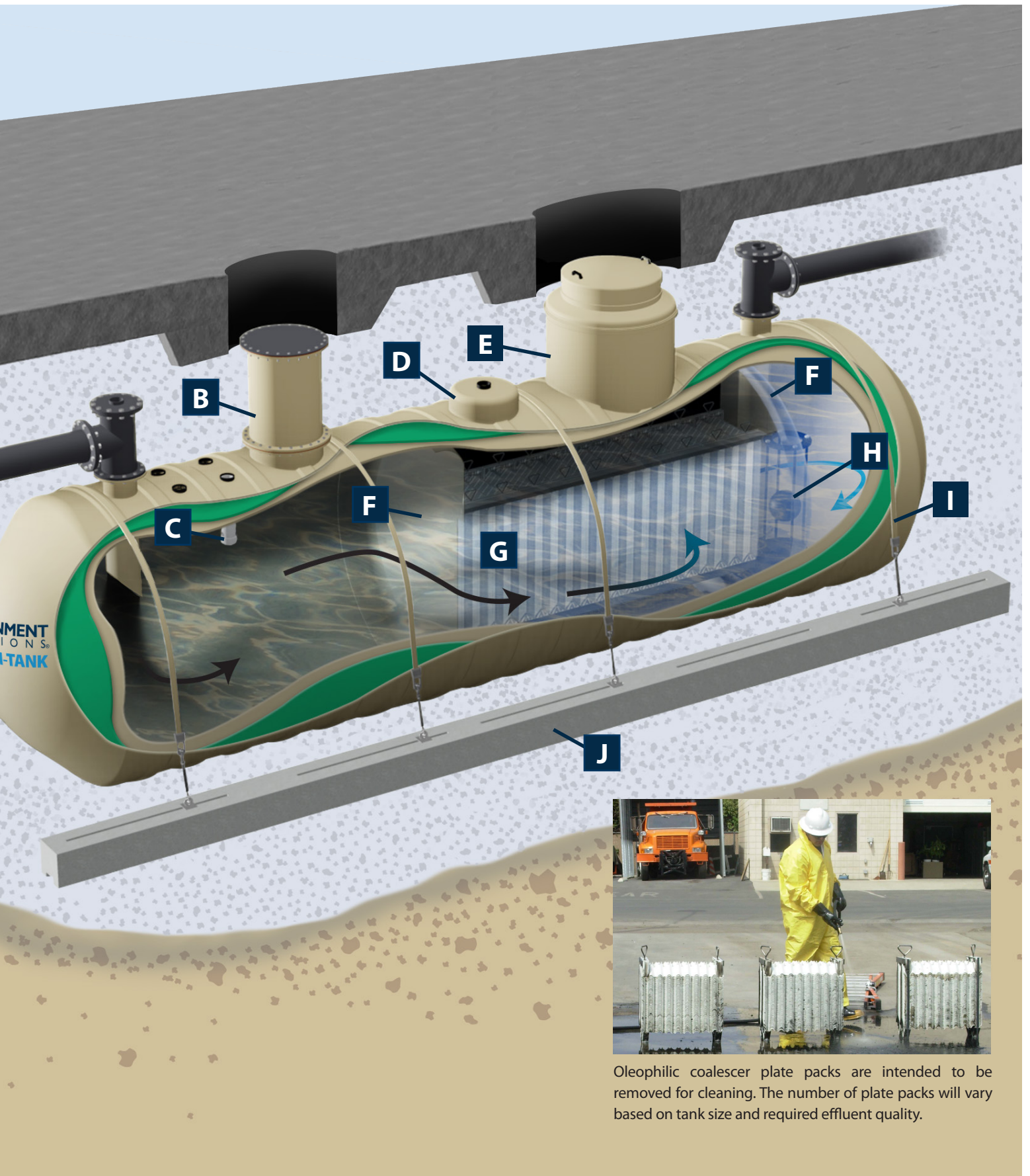


Corrugated plate packs coalesce, or join, oil droplets together forming larger masses of oil which rise to the surface.



STANDARD TANK DIMENSIONS for CSI-10 & CSI-15 Models

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	Nominal Capacity (gallons)	Flow Rate (gpm)	Oil Storage Capacity (gallons)	Oil Spill Capacity (gallons)	Inlet / Outlet (sizes)	Nominal Length		Nominal Weight (lbs)	
						Single-Wall	Double-Wall	Single-Wall	Double-Wall
4' Dia.	550	55	110	440	4"	9' 8"	9' 9"	425	900
	1,000	100	200	800	4"	11'	11' 1"	500	1,050
	1,500	150	300	1,200	4"	16' 10"	16' 11"	750	1,275
6' Dia.	2,000	200	400	1,600	6"	13' 10"	13' 8"	1,000	2,275
	3,000	300	600	2,400	6"	16'	16' 9"	1,075	2,750
	4,000	400	800	3,200	6"	19' 8"	19' 9"	1,475	2,975
	5,000	500	1,000	4,000	8"	24' 8"	25'	1,800	3,475
	6,000	600	1,200	4,800	8"	29' 6"	30' 3"	2,100	3,900
	6,000	600	1,200	4,800	8"	19' 5"	19' 6"	2,300	4,200
8' Dia.	7,000	700	1,400	5,600	8"	22' 2"	23' 7"	2,650	4,675
	8,000	800	1,600	6,400	10"	24' 11"	26' 4"	2,950	5,075
	9,000	900	1,800	7,200	10"	27' 8"	27' 9"	3,300	5,450
	10,000	1,000	2,000	8,000	10"	30' 5"	30' 6"	3,550	5,950
	12,000	1,200	2,400	9,600	10"	35' 11"	36'	4,375	7,000
	15,000	1,500	3,000	12,000	12"	44' 5"	44' 6"	5,350	8,650
10' Dia.	20,000	2,000	4,000	16,000	14"	37' 8"	37' 9"	6,950	11,900
	25,000	2,500	5,000	20,000	16"	45' 11"	46'	8,300	13,900
	30,000	3,000	6,000	24,000	16'	54' 2"	54' 3"	9,600	16,300
	40,000	4,000	8,000	32,000	20"	71' 3"	71' 4"	12,650	20,975



Oleophilic coalescer plate packs are intended to be removed for cleaning. The number of plate packs will vary based on tank size and required effluent quality.

FIBERGLASS OIL/WATER SEPARATOR SPECIFICATIONS

Specifications for Models CSI-10 / CSI-15

Long form specifications for the UL 2215 model oil/water separator or oil/sand/grit interceptor are available on the CSI website.

SHORT FORM SPECIFICATION

The contractor shall provide fiberglass underground Oil/Water Separators, in types (single-wall or double-wall) and sizes as shown on the drawings. The separators shall be manufactured by Containment Solutions. Separators shall be tested and installed with pea gravel or crushed stone or approved alternate backfill material, according to the current installation instructions (Containment Solutions' Pub. No. INST 6001 and OWS 2013 provided with the tank).

LONG FORM SPECIFICATION

1. GENERAL

1.1. Related Work

- 1.1.1. Containment Solutions, Inc. Fiberglass Drop out Box: Contractor to furnish and install (1) Fiberglass drop out box.
- 1.1.2. Plastic pipe: Contractor to furnish and install all necessary PVC drainage pipe and fittings. Contractor shall install a butterfly valve between the drop out box and tank inlet, as well as one between the outlet of the separator and the effluent pipe.

1.2. Quality Assurance

- 1.2.1. Acceptable Manufacturer: Containment Solutions, Inc., Conroe, TX
- 1.2.2. Governing Standards
 - 1.2.2.1. U.L. 1316 Underwriters Laboratories, Inc. Glass Fiber Reinforced Plastic Underground Storage Tanks for Petroleum Products.
 - 1.2.2.2. National Fire Protection Assoc. (NFPA 30 Flammable and Combustible Liquids Code, (NFPA 30A) Automotive and Marine Service Station Code, (NFPA 70) National Electrical Code.
 - 1.2.2.3. All tanks and piping shall be properly installed in accordance with the manufacturer's instructions and either "Petroleum Equipment Institute Publication RP100; Recommended Practices for Installation of Underground Liquid Storage Systems" or "American Petroleum Institute Publication 1615; Installation of Underground Petroleum Storage Systems."
 - 1.2.2.4. API manual on disposal of refinery wastes
 - 1.2.2.5. API bulletin no. 1630 first edition
 - 1.2.2.6. API bulletin no. 421

1.3. Submittals

- 1.3.1. Oil/Water separator tank(s) shall be _____ wall fiberglass tank(s) constructed in strict accordance with UL-1316.
- 1.3.2. Shop Drawings: Contractor shall submit _____ copies of shop drawings for each OWS tank. Drawings shall include all critical dimensions, locations of fittings and accessories, i.e.: manways, hold-down straps, secondary containment collar, manway extensions, etc.
- 1.3.3. Contractor shall submit _____ copies of manufacturer's literature including _____ copies of manufacturer's current installation and maintenance instructions to the Owner.

2. PRODUCTS

2.1. Oil/Water Separator Tanks

- 2.1.1. Provide _____ wall fiberglass reinforced plastic underground oil/water separator tank with fittings and accessories as denoted on the drawings.

2.1.2. Loading Conditions - Tanks shall meet the following design criteria:

- 2.1.2.1. External hydrostatic pressure: Buried in ground with 7' of over burden over the top of the tank, the excavation fully flooded and a safety factor of 5:1 against general buckling.
- 2.1.2.2. Surface Loads: When installed according to manufacturer's current installation instructions, tanks shall withstand surface HS-20 axle loads (32,000 lbs/axle).
- 2.1.2.3. Internal Load: Primary and secondary tanks shall withstand 5 psig (35kPa), or 3 psig for 12' diameter tanks, air pressure test with 5:1 safety factor.
- 2.1.2.4. Tanks shall be designed to support accessory equipment such as heating coils, ladders, drop tubes, etc. when installed according to manufacturer's recommendations and limitations.

2.1.3. Product Storage Requirements

- 2.1.3.1. Tank must be separately vented at the influent tee, oil/water separator chamber and at the effluent tee.
- 2.1.3.2. Tank shall be capable of storing liquids with specific gravity of up to 1.1.
- 2.1.3.3. Tank shall be capable of storing grease and oils at temperatures not to exceed 150°F at the tank interior face. Operating temperatures of the influent oil/water mixture shall range from 40° F to 150° F.
- 2.1.3.4. Tank shall be chemically inert to petroleum products.

2.1.4. Materials

- 2.1.4.1. The tank shall be manufactured as a matrix of premium resin, glass fibers and silane-treated silica that together result in a composite providing improved corrosion protection.
- 2.1.4.2. Tank inner wall shall be fabricated against a mold to produce a non-air inhibited and high gloss laminate to provide a fully cured inner surface without the need for wax coats, a low coefficient of friction and a natural resistance to the build-up of algae or other contamination on the surface. Wax and wax resin coatings cannot be used to achieve full surface cure on tank shells and endcaps.

2.1.5. Capability and Dimensional Requirements

- 2.1.5.1. Nominal volume of the separator shall be _____ gallons.
- 2.1.5.2. Nominal outside diameter of the separator shall be _____ feet.
- 2.1.5.3. Intermittent flow rate shall be _____ GPM.
- 2.1.5.4. Total spill capacity shall be _____ gallons.
- 2.1.5.5. Total oil storage capacity shall be _____ gallons.
- 2.1.5.6. Inlet oil specific gravity shall range between _____ and _____.
- 2.1.5.7. Inlet oil concentration shall be no more than 200,000 parts per million.
- 2.1.5.8. Effluent discharge quality shall be _____ ppm free oil and grease.

2.1.6. Monitoring Capabilities

- 2.1.6.1. Double-wall tanks shall have a monitoring space between the walls to allow for the free flow and containment of leaked product from the primary tank. The monitoring space shall provide equal communication in all directions.
- 2.1.6.2. The following continuous monitoring conditions shall be compatible with the cavity between the inner and outer tanks:
 - Vented to atmosphere
 - Vacuum – 5 psig maximum
 - Positive air pressure (3 psig maximum)
 - External hydrostatic pressure – 7' maximum groundwater head pressure over tank top

FIBERGLASS OIL/WATER SEPARATOR SPECIFICATIONS

2.1.6.3. The monitoring system shall be capable of detecting a breach in the inner and outer tank under the following installed conditions:

- When the primary tank is empty.
- When the primary tank is partially or completely full and the ground water table is below tank bottom.
- When the primary tank is partially or completely full and the tank is partially or completely submerged in groundwater.

2.1.6.4. The leak detection performance of the monitoring system shall be listed as a continuous interstitial monitoring method (liquid filled) by the National Work Group on Leak Detection Evaluations (NWGLDE). The system should be capable of detecting leaks in the primary or secondary tank walls as small as 0.10 gallons per hour within one-month.

2.1.6.5. The hydrostatic monitoring system shall be capable of a precision tank test that is listed by the National Work Group on Leak Detection Evaluations (NWGLDE).

2.1.6.6. If hydrostatically monitored, any solution used in the monitoring space shall be compatible with the tank and be of a contrasting color to the tank.

2.2. Accessories

2.2.1. Coalescer plates and associated internal mounting hardware shall be rust-proof and removable through a 22" x 29" oval access manway.

2.2.2. Provide fiberglass anchor straps, turnbuckles and concrete deadmen as provided by tank manufacturer.

2.2.3. Threaded fittings on tank shall be of a material of construction consistent with the requirements of the U.L. label. Fittings to be supplied with temporary PVC plugs. Standard threaded fittings are 4" in diameter. Reducers are to be used for smaller sizes where specified and provided by Contractor. See contract drawings for size and locations of fittings.

2.2.4. Oil Draw Off

2.2.4.1. Tank shall have a PVC factory installed oil draw off assembly.

2.2.5. Liquid Sensor Drawstring

2.2.5.1. Galvanized steel drawstring shall be factory installed at the monitoring fitting to facilitate field insertion of sensor.

2.2.6. Flanged Manways

2.2.6.1. (1) 22" x 29" oval or access manway will be provided with each tank. Tanks greater than 3,000-gallon total capacity will also include one 22" flanged manway.

2.2.6.2. All manways will be furnished complete with U.L. listed gaskets, bolts and covers.

2.2.6.3. Location - refer to drawings for location.

2.2.6.4. Optional manway extensions shall be fiberglass and ____ feet long.

2.2.7. Flanged Nozzles

2.2.7.1. Inlet and outlet nozzles shall be of fiberglass or PVC construction. The nozzles shall have standard 150# ANSI Flange.

2.2.7.2. Nozzles shall be of sufficient size for inlet flow rate.

2.2.8. Secondary Containment Collars

2.2.8.1. The secondary containment collar shall be 42" diameter for containment around the 22" (or the 22" X 29" oval) manway on the tank.

2.2.8.2. The collar shall be factory installed.

2.2.8.3. The collar shall include an internal adhesive channel.

2.2.9. Tank Sumps

2.2.9.1. Provide fiberglass reinforced plastic tank sump as shown on the drawings.

2.2.9.2. The height for the tank sump shall be ____ feet high.

2.2.9.3. The tank sump top and lid assembly shall be sealed watertight with factory supplied adhesive.

2.2.10. Oil/Water Separator Electronics

2.2.10.1. Provide control panel and required sensors, probes and gauges as provided by tank manufacturer.

- Model CPF Oil/Water Separator Control Panels
- Model FOWS Oil/Water Separator Interface Sensor
- Model FHRB 810 Reservoir Sensor for Hydrostatically Monitored Double-Wall Tanks
- Model FDAS 710 Annular Space Sensor for Dry Monitored Double-Wall Tanks
- Model FCBS 700 Collar, Bulkhead, Sump Float Switch

3. EXECUTION

3.1. Installation of FRP Tanks

3.1.1. Contractor's personnel involved with tank system installation shall be educated by tank manufacturer.

3.1.2. Contractor shall test and install tank, and accessories, according to all current installation instructions provided with tank.

3.1.3. Contractor is to complete the installation checklist provided by the manufacturer. A copy of the installation checklist must be retained by the tank Owner and/or installation Contractor to validate any future warranty claim.

3.1.4. Tanks shall be tested and installed according to the current installation and start-up instructions provided with the tank (refer to Containment Solutions pub. no.'s INST 6001 and OWS 2013).

3.2. Maintenance Instructions

3.2.1. See Containment Solutions Pub. No. 2012 for maintenance requirements.

4. LIMITED WARRANTY

4.1. Limited Warranty

4.1.1. Warranty shall be Containment Solutions' limited warranty in effect at time of delivery.

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CONTAINMENT SOLUTIONS MANUFACTURES:

Underground and Aboveground Storage Tanks

Urea DEF Storage Tanks

Automotive Oil and Lubricant Storage Tanks

Flowtite® Water Tanks

Chemical Storage Tanks

Fiberglass Manholes and Wetwells



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