

UNDERGROUND FIBERGLASS OIL/WATER SEPARATOR SPECIFICATIONS

SECTION 02700 DRAINAGE

PART 1: GENERAL

1.01 Related Documents

- 1. The provisions of the General Conditions, Supplementary Conditions, Sections included under Division 1, General Requirements, and Section ______ of this Division are included as part of this Section as though bound herein.
- 2. Refer to details and schedules on the drawings for additional requirements.

1.02 Related Work

- 1. Flowtite Fiberglass Drop out manhole/Catch Basin: contractor to furnish and install (1) FRP drop out manhole/catch basin.
- 2. Plastic pipe: contractor to furnish and install all necessary PVC drainage pipe and fittings. Contractor shall install one butterfly valve between the drop out box and tank inlet, as well as one additional butterfly valve between the outlet of the separator and the effluent pipe.

1.03 Description/Summary

- 1. The Contractor shall furnish the labor, materials, equipment, appliances, services and hauling, and perform operations in connection with the construction and installation of the work. Work shall be as herein specified and as denoted on the accompanying Drawings but not limited to the following general terms of work:
 - a. Storm sewers.
 - b. Sanitary sewer
 - c. Catch basin and manholes
 - d. Trench drains
 - e. Oil/water separators / Interceptors
- Provide ______ double wall ______ gallon reinforced fiberglass oil/water separator tank(s), hold-down straps and anchoring system, hydrostatic leak detection system for tanks, turbine enclosure or manway extension, piping and venting for the influent and effluent, vent piping and cap for tank, and oil draw-off pump(s) (if necessary) required to make a complete installation ready for use.

- 2a. Provide _______ single wall ______ gallon reinforced fiberglass oil/water separator tank(s), hold-down straps and anchoring system, turbine enclosure or manway extension, piping and venting for the influent and effluent, vent piping and cap for tank, and oil draw-off pump(s) (if necessary) required to make a complete installation ready for use.
- 3. The separator shall be a pre-packaged, pre-engineered, ready to install unit.
- 4. The Contractor will provide filling of tanks with clean water.
- 5. Tanks/anchoring system shall be constructed for non-flotation under full submersion of water.
- 6. The contractor shall mechanically unload the oil/water separator at the job site using an appropriate lifting device attached to the tank lifting lugs.

1.04 Governing Standards

- 1. ASTM Specification D4021-92. Glass Fiber Reinforced Polyester Underground Petroleum Storage Tanks.
- 2. U.L. 1316 Underwriters Laboratories, Inc. Glassfiber Reinforced Plastic Underground Storage Tanks for Petroleum Products.
- National Fire Protection Assoc. (NFPA 30 Flammable and Combustible Liquids Code, (NFPA 30A) Automotive and Marine Service Station Code, (NFPA 70) National Electrical Code.
- 4. Military Specification MIL-T-52777A, dated July 6, 1978, Tanks, Storage, Underground, Glass Fiber Reinforced Plastic.
- 5. General Service Administration, Public Building Service Guide Specification, PBS: 1568.
- All tanks and piping shall be properly installed in accordance with the manufacturer's instructions and either "Petroleum Equipment Institute Publication RP100-97; Recommended Practices for Installation of Underground Liquid Storage Systems" or "American Petroleum Institute Publication 1615-87; Installation of Underground Petroleum Storage Systems."
- 7. Piping to and from oil/water separator shall be non-metallic.
- 8. ASTM Specification D2996. Filament Wound Reinforced Thermosetting Resin in pipe.
- 9. API manual on disposal of refinery wastes
- 10. API bulletin no. 1630 first edition
- 11. API bulletin no. 421

1.05 Quality Assurance

- 1. Oil/Water separator tank shall be _____ wall fiberglass tank constructed in strict accordance with UL-1316.
- 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.
- 3. All OWS tanks, equipment and piping materials shall be physically inspected and air tested before being installed. Any defects observed shall be immediately brought to the attention of the Owner. It shall be the sole responsibility of the Contractor to correct any deficiencies, with the manufacturer in strict accordance with manufacturers' recommendations, at no additional cost to the Owner.
- 4. Contractor shall submit _____ copies of manufacturer's literature including _____ copies of manufacturer's current installation instructions to the Owner.
- 5. The Contractor shall be a licensed UST installer in the State of ______, during the entire duration of the project. The Contractor shall have the responsibility of notifying and coordinating with all local and state officials, including ______ and the City of ______ Fire Department (where required). All inspection and registration fees shall be paid by the Owner (where required). The Contractor shall coordinate with the Owner to provide a written site safety plan (where required).
- 6. Containment Solutions Gravity Type Oil/water separators will not remove oils with specific gravity's greater than .95, chemical or physical emulsions, dissolved hydrocarbons, or volatile organic compounds (VOC).
- 7. The contractor shall obtain and pay for all permits, tests, inspections, etc. required by the local boards that have jurisdiction over the project. All work shall be executed and inspected in accordance with all local and state codes, rules, ordinances, or regulations pertaining to the particular work involved. Should any changes in the contract drawings and specifications be required to conform to such ordinances, notify the owner at time of submitting bid. After entering into the contract the contractor shall be held responsible for the completion of all work necessary for a complete and approved installation without extra expense to the owner.

PART 2: PRODUCTS

2.00 Acceptable Manufacturers:

- 1. Oil/water Separator: CONTAINMENT SOLUTIONS INC., CONROE, TEXAS
- 2. Turbine Enclosure or Manway Extension: CONTAINMENT SOLUTIONS INC.
- 3. Oil/Water Separator Control System: CONTAINMENT SOLUTIONS INC.
- 4. Oil/water Interface Float Sensor: CONTAINMENT SOLUTIONS INC.
- 5. Hydrostatic Monitoring System: CONTAINMENT SOLUTIONS INC.
- 6. Drop Out Manhole and Catch Basins: CONTAINMENT SOLUTIONS INC.
- 7. Gate/Butterfly Valves: AMERICAN FLOW CONTROL
- 8. Inlet and Outlet T's:

- 9. Manholes: CONTAINMENT SOLUTIONS INC.
- 10. Vent Cap and Piping:
- 11. Oil Draw Off: By Vacuum Truck:
- 12. Pipe Materials:
- 13. Trench Drains:

OPTIONAL:

- 14. Optional Scavenger Tank: CONTAINMENT SOLUTIONS INC.
- 15. Optional Oil Draw Off Pump:
 - * Air Driven: CONTAINMENT SOLUTIONS INC.
 - * Electric Driven: CONTAINMENT SOLUTIONS INC.
- 16. Optional Control Panel: CONTAINMENT SOLUTIONS INC.
- 17. Optional Overfill Sensor for Scavenger Tank: CONTAINMENT SOLUTIONS INC
- 18. Optional Dry Interstitial Sensors: CONTAINMENT SOLUTIONS INC.
- 19. Optional Effluent Pumps: CONTAINMENT SOLUTIONS INC.

Manufacturer equals must be submitted to the engineer for approval at least _____ days prior to bidding. If approved, the engineer will then forward addendum out for contractor's consideration.

- **2.01 Oil/ Water Separator Tanks:** Provide ______ wall fiberglass reinforced plastic underground oil/water separator tank with fittings and accessories as denoted on the Drawings.
 - 1. Loading Conditions; Tank shall meet the following Design Criteria:
 - a. External Hydrostatic Pressure: Buried in ground with seven feet of overburden over the top of the tank. (Consult manufacturer for burial depths greater then seven feet). The hole fully flooded and a safety factor of 5:1 against general buckling.
 - b. Surface Loads: When installed according to manufacturer's installation instruction, tank will withstand surface H-20 axle loads. (32,000 lbs/axle)

c. Internal Load: Tank shall withstand 5 psi air pressure test with 5 to 1 safety factor. Test prior to installation, since this design condition is the test for leakage.

d. Tank shall be designed to support accessory equipment as denoted on plans when installed according to manufacturer's recommendations and limitations.

- 2. Tank must be separately vented at the influent tee, oil/water separator chamber and at the effluent tee.
- 3. Tank shall be capable of storing liquids with specific gravity of up to 1.1.
- 4. Tank shall be capable of storing grease and oils at temperatures not to exceed 150 degrees Fahrenheit at the tank interior face.
- 5. Tanks shall be chemically inert to petroleum products.
- 6. The tank shall be warranted for a period of 30 years from date of original delivery against external corrosion.

- 7. The tank shall be warranted for a period of 30 years from date of original delivery due to internal corrosion.
- 8. The tank shall be warranted for a period of 30 years from date of original delivery due to structural failure provided (1) the installing contractor completes an Containment Solutions installation checklist, (2) the installing contractor has been educated in the use of fiber glass tank installation through the use Containment Solutions educational materials.
- 9. Coalescer plates and associated internal mounting hardware shall be rust- proof and removable through a 22" x 29" oval access manway. Areas above and below the coalescer plates must be sealed off to prevent oil/water mixture from flowing around the coalescer packs.
- 10. Provide glass fiber-reinforced plastic anchor straps for each tank shown. Number and locations of straps shall be as specified by manufacturer. Each strap shall be capable of withstanding the buoyancy load for tank diameter as shown.

4'0- 4,200 lbs. 6'0-18,000 lbs. 8'0-25,000 lbs. 10'0-32,000 lbs.

- 11. 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 cast iron plugs. Standard threaded fittings are 4" in diameter and shall be half couplings. Reducers are to be used for smaller sizes where specified and provided by Contractor. See contract drawings for size and locations of fittings.
- 12. The tank laminate shall consist of granular inert material with less than 1 percent moisture content and a silica filler for structural strength.

CAPABILITY AND DIMENSIONAL REQUIREMENTS

- 1. Oil/water Separator shall be a Single-Wall or Double-Wall Tank.
- 2. Nominal volume of the separator tank shall be _____ gallons.
- 3. The total spill capacity shall be _____ gallons.
- 3a. The total oil storage capacity shall be ______ gallons.
- 4. Inlet oil specific gravity shall range from _____ to _____.
- 5. Inlet oil concentration shall be no more than 200,000 parts per million.
- 6. Intermittent Flow rate shall be from zero (0) _____ GPM.
- 7. Effluent free oil shall be no greater than _____ parts per million.

- 8. Inlet flange diameter shall be _____ inches.
- 9. Effluent flange diameter shall be _____ inches.
- 10. Nominal overall length of the tank shall be _____ feet.
- 11. Nominal outside diameter of the separator shall be ______ feet.
- 12. Oil/water separator shall be for any combination of free floating oil in water.
- 13. Operating temperatures of the influent oil/water mixture shall range from 40° F to 150° F.
- 14. (1) 22" x 29" oval or access manway will be provided with each tank. Separator tanks greater than 3,000-gallon total capacity will also include one 22" flanged manway for access to the inlet chamber.
- 15. All manways will be furnished complete with U.L. listed gaskets, bolts and covers.
- 16. Location -- see standard tank drawings.
- **2.02 Turbine Enclosures and Manway Extensions**: Provide fiberglass reinforced plastic secondary containment collar and turbine enclosure as shown on the drawings. Provide manway extensions as shown on the drawings if applicable.
 - 1. The optional secondary containment collar shall be 42" diameter for containment around the 22" manway on the tank.
 - 2. The height for the turbine enclosure/manway extension shall be _____ feet high.
 - 3. The turbine enclosure top and lid assembly shall be sealed watertight and waterproof.
 - 4. The manufacturer is to furnish two adhesive kits for every sealed enclosure supplied.
 - 5. If manway extensions are shown on drawings, an extension to just below grade shall be supplied.
- **2.03 Oil/Water Separator Control System:** Provide an electronic control panel constructed of U.L. listed, electronic components. The control panel power source is 120 volts AC (contractor provided wiring). The sensor monitoring circuit is an intrinsically safe circuit, i.e., the circuit incapable of releasing sufficient electrical or thermal energy to cause ignition of specific hazardous material under "normal" or "fault" operating conditions.
 - 1. The model number shall be Model CPF or approved equal as provided by Containment Solutions.
 - 2. The number of monitoring circuits shall be determined by the number of sensing devices.
 - 3. The electrical components rating shall be Weatherproof (NEMA 4).
 - 4. The dimensions of the control unit are 11.5" x 8" x 4.5" deep.

- 5. The total power consumption is 0.1 amps and 120 VAC.
- 6. The monitoring circuit power is 12 Volts D.C. at 15ma.
- 7. Both the model FHRB810 sensor and the FOWS interface alarm sensor can connect at the Model CPF control panel.
- 8. All control panels include:
 - Alarm lights for each circuit
 - Warning horn
 - Auxiliary dry contacts switch output for each sensing circuit
 - Panel housing materials: steel, epoxy coated
 - Alarm horn silence switch
 - Containment Solutions electronics do not require shielded cable. Sensor cable uses #18 AWG up to 5000 feet (provided by contractor).
- Note: All wiring materials are provided by the contractor. Wiring is required from the power source to the control panel and from the control panel to the probe assembly. Sensor wires must be in a separate conduit from the power wires.
- **2.04 Oil/Water Interface Float Sensor:** Provide an Oil/Water interface Alarm Sensor that is used to determine one or two separate high waste oil levels in the separator.
 - 1. The oil/water interface sensor is to be model FOWS _____by Containment Solutions.
 - The standard unit is set up for 24" riser pipe. The contractor is responsible for referring to Containment Solutions Fluid Electronics Pub. No. ELC 7052FOWS-A for installation details.
 - 3. Oil Level Warning Alarm: As the top float approaches the bottom of its travel, the oil level warning alarm will activate. This alarm warns that the OWS tank is almost full of oil and the oil will need to be removed soon.
 - 4. Oil Pump-out Alarm: As the bottom float approaches the stem bottom, the oil pump out alarm activates. The pump out alarm alerts the operator that the oil must be removed immediately to maintain efficiency of the oil/water separator.
- **2.05** Leak Detection System and Reservoir Sensor: Tank shall provide an interstitial space between the primary and secondary tank walls to allow for free flow of brine monitoring liquid between tank's walls and containment of any released product from the primary tank.
 - 1. Optional Dry Interstitial Leak Detection system:
 - a. No brine in interstitial or reservoir is required.
 - b. Containment Solutions Fluid Electronics Sensor Model FDAS 710 shall come from the factory installed.
 - c. Sensor shall be wired to CPF control panel.

- 2. The hydrostatic tank leak detection system shall be capable of detecting a breach in the inner and/or outer tank under the following installed conditions:
 - when the inner tank is empty
 - when the inner tank is partially or completely full and the ground water table is below the tank bottom
 - when the inner tank is partially or completely full and the tank is partially or completely submerged in ground water
- 3. The hydrostatic leak detection system shall meet the California State Water Resources Control Board as a precision test.
- 4. The leak detection performance of the monitoring system shall be tested and verified by a qualified independent consultant to detect leaks as small as .05 gallons per hour with a 99.9% probability of detection and 1.2% probability of false alarm.
- 5. The leak detection performance is to be documented on an EPA generated form called "Results of U.S. EPA Standard Evaluation -Volumetric Tank Tightness Testing Method".
- 6. The hydrostatic monitoring fluid shall be a non-toxic brine solution and shall be shipped in the tank interstitial space from the manufacturing plant. The brine shall be dyed a deep green color so as to aid contractor in identifying damage to tank. The tanks laminate shall be U.L. listed for compatibility with monitoring fluid.
- 7. The hydrostatic reservoir sensor shall include titanium conductance probes to determine monitoring fluid levels in the tank mounted reservoir. The sensor shall be supplied by Containment Solutions. The model number shall be FHRB 810. Each tank is to have one FHRB 810 per tank.
- **2.06 Drop-out Manhole and Catch Basins**: Contractor to furnish and install Containment Solutions Flowtite drop-out manhole and catch basins.
 - 1. Catch Basins and Drop Out Manholes shall be constructed in accordance with ASTM D3753.
 - 2. Bottom, sides and top shall be designed and constructed to withstand backfill pressures and surcharge pressures resulting from AASTHO H-20-44 loading.
 - 3. Catch Basins and Drop Out Manholes shall be covered by a (20) year corrosion and structural warranty.

- **2.07 Gate Butterfly Valves**: Contractor to furnish a _____" gate/ butterfly valve with stem extensions. Valves shall be located between the drop out box and the tank inlet, as well as one located downstream of the effluent tee. Butterfly valves should be used if the inlet and outlet drain lines are 14" or larger in diameter. If the drain lines are 4" through 12" in diameter, then a ductile iron resistant wedge gate valve with 316 stainless steel bolt shall be used. The iron wedge shall be encapsulated with a bonded in place Nitrile elastomer covering. Gate valve shall be Model ACF-2500 as manufactured by American Flow Control or equal.
 - 1. The valves must be 100% open during the normal operation to prevent flow turbulence.
 - 2. The valves must be the same size as the piping with no valve seat or trim reduction.
 - 3. When gate valves are used the contractor shall provide access to the 2" square operating nut with 8" diameter PVC pipe. The PVC pipe should overlap the containment manhole skirt to prevent pea gravel intrusion.
 - 4. Contractor shall provide (1) one valve key operating wrench clearly tagged for the owner upon completion.
- **2.08** Inlet and Outlet Tee's and Piping: Provide _____" inlet and _____" outlet T's for the described separator system. The flanges are to be standard ANSI class 125/150 flanges.
 - 1. The T's are to have a _____" tapped blind flanges in the top of them to provide venting as shown on the drawings.
 - 4. Plug the inlet and effluent pipe until the drainage site is paved and the drop out box is installed.
 - 5. Inlet and outlet piping to and from the OWS tank must be greater than or equal to the tank inlet and outlet nozzle diameter.
 - 6. If the inlet and outlet piping is greater than 6" diameter, install appropriate expansion joints or loops on any inlet and outlet tee/elbow connections.
 - 5. Both the inlet and outlet piping tees/elbows must be vented to the atmosphere.
 - 6. A sampling port is to be installed by the contractor by installing ____ " tee on the effluent pipe and surrounding this pipe with ____ " PVC pipe and capping it.

- **2.09** Manholes: Provide manholes as needed from the schedule shown below:
 - 1. Gate/Butterfly Valve Manholes: 8" round manhole. Two are needed for each separator. Universal model 60-8075 or equal.
 - 2. Oil Draw Off Manhole: Industry standard spill containment manhole. Emco Wheaton A1003-009 or OPW 4580 or equal.
 - Oil /Water Interface Sensor Manhole: 18" round manhole with screws and gaskets. Manhole to be offset to allow maximum clearance between oil draw off manhole and interface sensor manhole. Universal 98-1810 or equal.
 - 4. Access Manhole for 22" manway with 42" containment collar: 36" x 10" round manhole. Universal 68-3610 or equal.
 - 5. Reservoir Sensor Manhole: 18" round manhole with screws and gaskets. Universal 98-1810 or equal.
 - Access Manhole for Coalescer Removal: 42" Safe-lite composite manhole. EBW 781-443-12 or equal.
 - 7. Effluent/Influent Sample Manhole: 8" monitoring well manhole with a clearly marked cast iron cover with a monitoring well designation. Unit to be Universal model 65-8012-WC or equal.
- **2.10 Vent Cap and Piping:** Provide vent materials according to the schedule below. Contractor to use 2" FRP single wall piping.
 - 1. Vent cap: 2" aluminum upward "v" vent cap. OPW 23 or equal.
 - 2. The OWS tank inlet, outlet, and the tank itself must be vented separately to the atmosphere to ensure proper operation of the OWS tank. See drawing for details.
 - 3. All vents must be separate. Manifolding of vent pipes is not permitted.
- 2.11 Oil Draw Off by Vac Truck: Provide following materials for oil draw off:
 - 1. See section 2.09 for manhole specifications.
 - 2. 120 Emco Wheaton 4 x 2 double tapped bushing or equal.
 - 3. 200-F-AL Andrews 2" Cam & Grove adapter and Male NPT or equal.
 - 4. 200-DC-AL Andrews 2" Cam & Grove Dust Cap.
 - 5. 2" suction pipe (length to be determined by burial depth).

- 2.12 **Pipe Materials**: Provide the following materials as specified on the drawings:
 - 1. Ductile iron pipe, designated DIP on the drawings, shall be centrifugally cast push on joint ductile iron pipe conforming to ANSI specification A21.51 with rubber gaskets conforming to ANSI specification A21.11 Fittings shall be ductile iron conforming ANSI specification A21.10.
 - 2. Polyvinyl chloride pipe and fittings, designated PVC on the drawings, shall conform to ASTM D3034, SDR 35.
 - 3. Reinforced concrete pipe, designated RCP on the drawings, shall conform to ASTM specification C76, Class IV, Wall B, with gasketed joints conforming to ASTM specification C443.
- **2.13 Trench Drains**: Provide the following materials as specified on the drawings:
 - 1. Trench drains shall be a precast polymer concrete system of interlocking channel sections with fitting outlets, endcaps and catch basins equal to Polydrain as manufactured by ABT Inc., Troutman, N.C.
 - 2. Grate shall be a ductile iron frame and grate equal to Polydrain Part No. 514 with the Locking Device No. 815c.
- **2.14 Optional Waste Oil Scavenger Tank**: Provide _____ gallon double wall fiberglass reinforced plastic underground tank with fittings and accessories as denoted on the Drawings.
 - 1. Loading Conditions; Tank shall meet the following Design Criteria:
 - a. External Hydrostatic Pressure: Buried in ground with seven feet of overburden over the top of the tank. The hole fully flooded and a safety factor of 5:1 against general buckling.
 - b. Surface Loads: When installed according to manufacturer's installation instruction, tank will withstand surface H-20 axle loads. (32,000 lbs./axle)
 - c. Internal Load: Tank shall withstand 5 psi air pressure test with 5 to 1 safety factor. Test prior to installation, since this design condition is the test for leakage.
 - d. Tank shall be designed to support accessory equipment as denoted on plans when installed according to manufacturer's recommendations and limitations.
 - 2. Tank shall be capable of storing liquids with specific gravity of up to 1.1.
 - 3. Tank shall be capable of storing grease and oils at temperatures not to exceed 150 degrees F at the tank interior face.
 - 4. Tanks shall be chemically inert to petroleum products.
 - 5. The tank shall be warranted for a period of 30 years from date of original delivery against external corrosion.

- 6. The tank shall be warranted for a period of 30 years from date of original delivery due to internal corrosion.
- 7. The tank shall be warranted for a period of 30 years from date of original delivery due to structural failure provided (1) the installing contractor completes an Containment Solutions installation checklist, (2) the installing contractor has been educated in the use of fiber glass tank installation through the use Containment Solutions educational materials.
- 8. Provide glass fiber-reinforced plastic anchor straps for each tank shown. Number and locations of straps shall be as specified by manufacturer. Each strap shall be capable of withstanding the buoyancy load for tank diameter as shown.
 - 4'0 4,200 lbs. 6'0 - 18,000 lbs. 8'0 - 25,000 lbs. 10'0 - 32,000 lbs.
- 9. Threaded fittings on U.L. labeled tank shall be of a material of construction consistent with the requirements of the U.L. label. Fittings to be supplied with cast iron plugs. Standard threaded fittings are 4" in diameter and shall be half couplings. Reducers are to be used for smaller sizes where specified and provided by Contractor. See contract drawings for size and locations of fittings.
- 10. The tank laminate shall consist of granular inert material with less than 1 percent moisture content.
- **2.15 Optional Automatic Oil Draw Off Pump**: Separator shall be furnished with oil level/liquid levels controls to start and stop oil pump at predetermined levels. Contractor to furnish a 2 inch FRP secondarily contained line (either FRP or flexible) to connect the pump to the oil/water separator. Contact your CSI representative for proper sizing.
- **2.16 Optional Overfill Sensor for Scavenger Tank:** Contractor to provide a tank product level alarm float switch for the scavenger tank. This sensor is used to determine when fuel in the tank approaches a predetermined level. The control panel alarm will activate when the high level float passes the set point. The sensor will not provide overfill shutoff.
 - 1. The sensor to be model FOVF600 (brass or stainless) by Containment Solutions.
 - 2. The sensor to have stainless steel or brass stem.
 - 3. The sensor is to have intrinsically safe circuits.

- **2.17 Optional Interstitial Sensor:** Contractor to provide a monitoring system to monitor the annular space of the double wall oil/water separator tank. The sensors interface with CPF control panels or approved equal as furnished by Containment Solutions
 - 1. System to include the following models from Containment Solutions:
 - * FDAS710 Dry Annular Space Float Switch
 - * FHRB810 Hydrostatic Sensor
 - 2. Sensors to have intrinsically safe circuits.
- **2.18 Optional Clean Water Pump-out Chamber:** When effluent cannot be removed from the separator via gravity a separate effluent pump-out chamber must be added to the discharge end of the tank. Access to this chamber shall be sized in accordance with the pump requirements. A pump platform shall be installed to support the pump(s) off the bottom of the tank. For pump sizing and controls contact your CSI representative.

PART 3: EXECUTION

3.01 Installation of FRP Tanks

- 1. Contractor's personnel involved with tank system installation shall be educated by tank system manufacturer and any state governing agency.
- 2. Contractor shall test and install tank according to two (2) current installation instructions provided with tank.
- 3. Tanks cannot be unloaded from the truck manually. Capacity of lifting equipment must be checked before moving tanks.
- 4. Tank shall be placed on 12-inch thick bed of clean aggregate; smooth and level, free of voids around and adjacent to the tank. Gravel shall be 1/8 to 3/4 inch diameter pea gravel, or equal approved by the tank manufacturer, with not more than 3% passing No. 8 sieve. The gravel shall conform to ASTM C33 (naturally rounded aggregate, free flowing). The dry gravel density must be a minimum of 95 lbs. per cubic foot.
- 5. Contractor shall require a sieve analysis from backfill supplier to show that backfill supplied meets tank manufacturer specifications.
- 6. Tank shall be installed in a dry hole. Pumps should be provided by contractor to keep water table down during installation. Do not install tank on timber, blocks, or cradles. Place backfill in no greater than 12 inch layers. Backfill shall be placed to ensure a complete filling of voids between tank, ballast pad and side of excavations.
- 7. A 12" gravel bed for tank shall be placed on concrete anchor pad. Secure the tank to the concrete ballast pad with tank manufacturer's recommended straps. Anchor points in concrete at bottom of hole must be aligned within 1" from the arrows on the ribs of the tank. The concrete must extend a minimum of 18" beyond the sides of the tank and be at least equal to the length of the tank. Wire rope must be triple clamped. Coat exposed metal with bitumastic coating.

- 8. Place the first 12" lift of backfill evenly around tanks. The backfill must be pushed completely beneath tank bottom, between ribs and under end caps to provide necessary support. Place another 12" lift of backfill evenly around tanks. After completion of second lift, backfill can be brought to top of tanks without additional hand work.
- 9. Do not fill tanks until backfill is to top of tank.
- 10. 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.
- 11. Tanks shall be tested and installed according to the current installation instructions provided with the tank (refer to Containment Solutions publication #3-PE-18151 and include as part of your specification).

SPECIAL FOR OIL/WATER SEPARATOR TANKS:

- 1. Upon delivery, inspect the owe tank for exterior damage. Remove manway cover plates and inspect interior to insure that all baffles, coalescer packs and internal piping are secure and have not been damaged. Remove any shipping bands around the plate packs.
- 2. Install the OWS tank with sufficient truck access (top side clearance) for removal of oil, sludge and water.
- 3. The OWS tank must be installed in either of the following positions:
 - a. A level and plumb position.
 - b. The outlet side 1/2" to 1" lower than the inlet side.
- 4. Slope inlet piping to OWS tank 1/4" to 1/16" per foot downward to attain proper gravity flow. Slope the effluent piping away from the OWS tank following the same pitch.
- 5. Waste oils should not be intentionally drained into the OWS tank.
- 6. The OWS tank should be filled with clean water immediately after installation and prior to use. The OWS should be filled at all times for proper operation.

MAINTENANCE INSTRUCTIONS

- 1. Close inlet and outlet pipes before entering the tank. Drain tank.
- 2. The coalescer packs must be removed for cleaning. Do not attempt to clean the coalescer packs inside the OWS.
- Maintenance is required at the following times (whichever comes first)
 * Once per year.
 - * When the OWS tank bottom sludge is 12" deep.
 - * When the effluent water contains high contaminant levels.

4. See Containment Solutions Pub. No. OWS 2012 & 2013 for installation, start-up, operations and maintenance requirements.