

SHORT FORM SPECIFICATION

The contractor shall provide the appropriate underground fiberglass chemical storage tank for Aqueous Film Forming Foam (AFFF) application and any optional accessories as indicated on tank drawings. Capacity, dimensions, and fitting locations and sizes will also be indicated on tank drawings. The tank will be as manufactured by Containment Solutions, Inc. The tank will be installed according to manufacturer's current installation instructions

LONG FORM SPECIFICATION**1. GENERAL**

1.1. Quality Assurance

1.1.1. Acceptable Manufacturers:
Containment Solutions, Inc., Conroe, Texas

1.1.2. Governing Standards, as applicable:

1.1.2.1. Underwriters Laboratories Inc. Standard 1316, Glass-Fiber Reinforced Plastic Underground Storage Tanks for Petroleum Products, Alcohols, and Alcohol-Gasoline Mixtures.

1.1.2.2. Underwriters Laboratories of Canada standard ULC-S615, Reinforced Plastic Underground Tanks for Flammable & Combustible Liquids.

1.1.2.3. ASTM D4097 Standard Specification for Contact-Molded Glass-Fiber-Reinforced Thermoset Resin Corrosion-Resistant Tanks

1.1.2.4. American Concrete Institute standard ACI 318, Building Code Requirements for Structural Concrete.

1.2. Submittals

1.2.1. Contractor shall submit ____ copies of: shop drawings, manufacturer's product brochures, installation instructions and calibration charts.

2. PRODUCTS

2.1. Double-Wall Fiberglass Underground Storage Tanks

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

2.1.1.1. 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.

2.1.1.2. Surface Loads: When installed according to manufacturer's current installation instructions, tanks shall withstand surface HS-20 axle loads (32,000 lbs/axle).

2.1.1.3. Internal Load: Primary and secondary tanks shall withstand 5 psig (35 kPa), or 3 psig for 12' diameter tanks, air pressure test with 5:1 safety factor.

2.1.1.4. Tanks shall be designed to support accessory equipment when installed according to manufacturer's recommendations and limitations.

2.1.2. Product-Storage Requirements

2.1.2.1. All primary tanks must be vented. Tanks are designed for operation at atmospheric pressure only.

2.1.2.2. Tanks shall be capable of storing liquids with specific gravity up to 1.1.

2.1.2.3. Tank must be operated at ambient temperatures

2.1.2.4. Tank shall be capable of storing the following products:

- The tank will normally be empty and will be used to temporarily contain chemicals after some emergency event. The tank is not designed for the continuous storage of these chemicals. To insure short exposure times, the tank must be emptied and then rinsed and cleaned of any residual chemicals within 72 hours of use.

2.1.3. Materials

2.1.3.1. The tank shall be manufactured as a matrix of premium resin modified to include a 0.100" liner with surface veil and vinyl ester resin, glass fibers and silane-treated silica that together result in a composite providing improved corrosion protection.

2.1.3.2. Tank inner wall shall be fabricated against a mold to produce a non-air inhibited and high gloss laminate to provide fully cured inner surface without the need of 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.

2.1.3.3. Tank to include liner with surface veil on 100% of the tank interior surface per Section 7.1.1 of ASTM D4097 (Standard Specification for Contact-Molded Glass-Fiber-Reinforced Thermoset Resin Corrosion-Resistant Tanks).

2.1.4. Dimensional Requirements (refer to Containment Solutions literature)

2.1.4.1. Nominal capacity of the tank shall be ____ gallons / liters.

2.1.4.2. Nominal outside diameter of the tank shall be ____ feet.

2.1.4.3. Nominal overall length of the tank shall be ____ feet.

2.1.5. Monitoring Capabilities

- 2.1.5.1. 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.
- 2.1.5.2. The following continuous monitoring conditions shall be compatible with the cavity between the inner and outer tanks:
 - Vented to atmosphere
 - Vacuum – 5 psig maximum
 - External hydrostatic pressure – 7' maximum groundwater head pressure over tank top
- 2.1.5.3. Tanks larger than 1000 gallons shall have an integrally mounted annular space reservoir installed on the tank for factory-installed brine and continuous hydrostatic monitoring. The reservoir shall be constructed of fiberglass reinforced plastic materials and be included in the tank warranty.
- 2.1.5.4. The monitoring fitting for the monitoring space shall be a 4" NPT fitting.
- 2.1.5.5. 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.
- 2.1.5.6. The leak detection performance of the monitoring system shall be tested and verified by a qualified independent consultant to detect leaks in the primary or secondary tank walls as small as 0.10 gallons per hour within one-month.
- 2.1.5.7. 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. Flanged Manways

- 2.2.1.1. The standard manway is 22" I.D. and will be furnished with gaskets and carbon steel cover.
- 2.2.1.2. Location – see standard tank drawing.
- 2.2.1.3. Optional manway extensions shall be fiberglass and ____ feet long.

2.2.2. Tank Bottom Deflector Plates

- 2.2.2.1. The tank wall under each service fitting and manway opening will be reinforced with additional thickness to provide protection against impact.

2.2.3. Secondary Containment Collar

- 2.2.3.1. Shall be factory installed.
- 2.2.3.2. The collar shall be fiberglass reinforced plastic, 42", 48" or 54" in diameter and shall be factory-installed in accordance with drawings.
- 2.2.3.3. The collar shall include an internal adhesive channel.

2.2.4. Adhesive Kit (Kit AD)

- 2.2.4.1. Adhesive kit shall be supplied by tank manufacturer.
- 2.2.4.2. Adhesive kit shall provide a watertight seal at the tank sump and containment collar joint to prevent the ingress of water or egress of fuel. The adhesive kit includes resin, catalyst, mixing stick, putty knife, grout bag, and installation instructions.

2.2.5. Tank Sumps

- 2.2.5.1. Tank sump shall be supplied by the tank manufacturer.
- 2.2.5.2. Tank sump components shall be constructed of fiberglass reinforced plastic. The tank sump shall be 42", 48" or 54" in diameter and must mount to the secondary containment collar. Standard tank sump shall consist of an octagon shaped base (round base is optional), round body extension and enclosure top.
- 2.2.5.3. The octagon base shall be 24" in height and provide 19" high panels for piping entry points. The base must be capable of joining to the collar with an internal adhesive channel.
- 2.2.5.4. A 34" or 40" watertight lid shall be provided by the tank manufacturer.
- 2.2.5.5. Refer to tank sump drawings for standard models and configurations.

2.2.6. Anchor Straps

- 2.2.6.1. Straps shall be supplied by the tank manufacturer.
- 2.2.6.2. Number and location of straps shall be as specified by manufacturer.
- 2.2.6.3. Each strap shall be capable of withstanding a maximum load of 25,000 lbs.

2.2.7. Prefabricated Concrete Deadmen Anchors

2.2.7.1. Design Conditions – Deadmen shall meet the following design criteria:

- Deadman shall be designed to ACI 318
- Manufactured with 4,000 psig concrete
- Manufactured in various lengths
- Provide adjustable anchor points for hold down straps

2.2.8. Fittings Threaded NPT

2.2.8.1. All threaded fittings shall be located on a manway cover or the tank top center line. Fittings to be supplied with temporary thread protectors or threaded plugs.

2.2.8.2. All standard fittings shall be 4" diameter NPT half couplings.

2.2.8.3. Internal piping shall be terminated at least 4" from the tank bottom (6" for 12' diameter tanks).

2.2.9. Fittings - Fiberglass Nozzles

2.2.9.1. All fiberglass nozzles will be supplied with flat-faced flanges and bolt pattern in accordance with ANSI B165, Class 150.

2.2.9.2. Fiberglass nozzles shall be constructed of vinyl ester resin.

3. EXECUTION

3.1. Installation and Testing

3.1.1. Fiberglass underground tanks must be tested and installed according to the current installation instructions provided with the tank (refer to Containment Solutions Pub. No. INST 6001). Tanks are installed with pea gravel or crushed stone as specified in current installation instructions. Containment Solutions' tanks may only be used for storing products listed in the current limited warranty.

4. LIMITED WARRANTY

4.1. Limited Warranty

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