

Specifications for ConVault Protected/Secondarily Contained Aboveground Tank

A. GENERAL

1. Provide the ConVault Aboveground Tank System approved for listing under U.L. Standard 2085, Aboveground Tanks, Protected Type, Secondary Containment with Vehicle Impact and Projectile Resistance. Unit must comply with all provisions of U.F.C. 79-7, Appendix A-II-F. The tank and its enclosure shall be a completed unit at the factory (shop fabricated). The tank system shall be approved for Phase I and Phase II Vapor Recovery by the California Air Resource Board for gasoline and methanol. Contact Core Engineered Solutions, Inc. at (703) 563-0320 or (800) 826-5472

B. PRODUCTS

1. **Primary Tank:** The primary tank shall be rectangular in shape, constructed with a minimum of 10 gauge thick carbon steel, listed per U.L. Standard 142, and meet the requirements of N.F.P.A. 30. Welds shall be continuous on all sides, conforming to the American Welding Society Standard for continuous weld. The tank shall be warranted for a minimum of 20 years by the manufacturer.

2. **Concrete Encasement:** The concrete encasement shall be 6" thick with a minimum design strength of 4000 psi. Concrete enclosure shall encase and protect both the primary steel tank and the secondary containment. The concrete design shall include the following for long-term durability: less than 3% air entrainment, water-reducing admixture, and steel reinforcing bars. Concrete placement shall be monolithic (without seams) and placement methods shall ensure the absence of voids on all sides and beneath the steel tank. An exterior steel jacket covering the concrete vault will NOT be permitted. The steel tank shall be prestressed at factory by pressurizing the primary steel tank to 5 psi during concrete encasement to allow for expansion and contraction of the primary steel tank. Vault enclosure shall have concrete support legs of unitized monolithic construction raising the concrete enclosure a minimum of 3" above the ground to meet visual inspection requirements. A mid-level seam or other joint construction which could compromise the liquid tightness (secondary containment) and fire protection capability of the vault is not permitted.

3. **Fire Resistance:** The tank system shall be designed and tested to provide 2 hour fire protection for the primary tank as per U.L. 2085 2-hour furnace fire test and 2 hour simulated pool fire test. No steel members shall penetrate the walls or floor of the concrete encasement to assure isolation from pool fire heat.

4. **Thermal and Corrosion Protection:** The tank construction shall include thermal insulation equivalent to .25 inches of polystyrene to protect against temperature extremes, and to protect against corrosion by isolating the steel tank from the concrete or other corrosive material. All steel exterior to the concrete encasement shall be anti-oxidant powder coated to inhibit corrosion and meet A.S.T.M. B117.

5. **Blast Resistance:** The tank system design shall be the subject of a Blast Effects Analysis (BEA) for resistance and performance under the following blast threat scenarios:

- 1) a 50-pound man-portable improvised explosive device (MPIED) at the standoff distance of 5 ft. and 20 ft.;
- 2) a 500-pound vehicle-borne improvised explosive device (VBIED) at the standoff distance of 5 ft. and 20 ft.;
- 3) a vapor cloud explosion (VCE) with a load of 10 psi.

The BEA shall conclude that the tank system shall resist and remain intact, without failure of the primary tank. The engineering consultants performing the BEA shall be a nationally recognized firm with over 10 years experience offering comprehensive services related to blast and impact effects analysis, explosive safety design, vulnerability assessments and threat mitigation.

6. **Secondary Containment with Leak Monitoring:** The tank system shall include an impervious barrier of 30 mil high-density polyethylene to contain leaks from the primary tank. A monitoring tube shall be located between the inner tank and secondary barrier.

7. **Spill/Overfill Containment:** The tank system shall include a U.L. listed 7-gallon spill/overfill container manufactured as an integral part of the primary tank, surrounding the fill pipe, and protected by 2 hour fire rating of the enclosure. The spill/overfill container shall include a stick port and normally closed valve to release spilled product into the main tank. Exterior steel shall be anti-oxidant powder coated to inhibit rust.

8. **Overfill Protection:** Overfill protection shall be provided by the following methods: a) direct reading level gauge visible from fill pipe access; b) valve rated for pressurized delivery located within fill pipe to close automatically at 95% full level; c) high level alarm

9. **Exterior Finish:** The tank system shall be a low maintenance exposed aggregate or architectural (STO, Permacrete, Thorocoat) exterior concrete finish. Fiber clad steel, or painted steel vault tanks are not acceptable.

10. **Signage:** Tanks shall be marked on all sides as per state and local codes. Signs will be recessed in concrete exterior to insure against damage during off-loading, refilling or general functions.

11. **Venting:** Tank system shall include a 2" atmospheric vent and emergency venting in accordance with N.F.P.A. 30.

C. EXECUTION

1. Manufacturer will have a minimum of 5 years experience in producing specified tank for commercial use and document at least 10 installations in satisfactory operation.

2. The tank system including accessories shall be installed in strict accordance with the manufacturer's recommendations and applicable fire and environmental codes. All state and local permits shall be obtained by contractor prior to installation.

3. Tanks shall be installed on a reinforced concrete base slab designed to support the fully loaded tank. Protective bollards shall be installed where required by state and local codes.

4. Tanks shall be marked on all sides with warning signs: "FLAMMABLE" or "COMBUSTIBLE", "NO SMOKING", product identification and other signs as required by applicable codes.

5. Electrical work shall be in accordance with applicable codes and shall be rated for hazardous area as required. Electric feed for dispensing pumps shall include an emergency shutoff switch located per code requirements. Tanks shall be electrically grounded in accordance with N.F.P.A. 78.

6. The system installation shall be inspected and approved by the system supplier or its certified contractor. The system supplier shall submit a comprehensive checklist of quality and safety items critical to the system and verify that the installation has been in accordance with these standards and applicable fire and environmental codes.

7. Any proposed equal alternatives to this specification must be submitted for review and approval prior to bid opening. If the proposed alternative is deemed to present a better solution, review expenses will be waived. If the proposed alternative is denied or deemed to be equal, all expenses incurred for such review is to be paid for by the bidder prior to submittal of bid.

Rev. 2/08

For additional drawings or more information on Core Engineered Solutions, contact us at:

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