

SECTION 11500**FUEL STORAGE TANKS****PART 1 - GENERAL**

1.01 SCOPE OF WORK

- A. The work under this Section includes furnishing and installing above ground fuel storage tanks, with concrete bases, gauges, valves and piping, as required and as shown on Drawings; and other related items necessary for a complete installation, as indicated on the Contract Drawings.

1.02 RELATED SECTIONS

- A. Section 02314 - Excavation, Backfill and Fill For Structures
- B. Section 03300 - Cast-in-place Concrete, Reinforcing and Formwork.
- C. Section 09900 – Painting
- D. Section 16420 - Stationary Engine-Generator Set
- E. Section 16425 - Portable Engine-Generator Set

1.03 REFERENCE, CODES AND STANDARDS

- A. FDEP - Florida Department of Environmental Protection, Ch. 62-761 & 62-762, FAC
- B. NFPA 30 - Flammable and Combustible Liquids Code.
- C. NFPA 31 - Installation of Oil-Burning Equipment.
- D. NFPA 70 – National Electrical Code (NEC)
- E. NFPA 78 - Protection of Life and Property against Lightning.
- F. FBC - Florida Building Code.
- G. RER – Regulatory & Economic Resources Department, Miami-Dade County, Ch. 24-Miami-Dade County Environmental Code
- H. U.L. Subject #2085 and #142.
- I. UFC - ICBO Uniform Fire Code, Section 79 Appendix A-II-F
- J. OSHA – Occupational Safety and Health Administration Standard 1910.23-1910.24

1.04 QUALITY ASSURANCE

- A. Comply with the appropriate codes, regulations and standards referenced in paragraph 1.03.

1.05 SUBMITTALS

- A. The fuel storage tank and accessories shall be FDEP approved and installation plans must have been reviewed and approved by RER/DERM.
- B. Prepare and submit a site plan, drawn to scale, containing the following:
 - 1. Show property lines and indicate occupancy or use of adjacent property.
 - 2. Show streets, intersections and railroads.
 - 3. Show buildings on the site and indicate type of construction. Show building openings on walls adjacent to tanks.
 - 4. Show important utility lines, sewer, water, gas and electric including fire hydrants and catch basins.
 - 5. Show any nearby waterways, streams, rivers, lakes or bodies of water.
 - 6. Show any existing underground or aboveground tanks.
 - 7. Show location of proposed tank and indicate shortest distance to buildings and property lines.
- C. Prepare and submit detail drawings of tank, to include the following:
 - 1. Tank type double-walled aboveground or underground storage tank (AST or UST), size, dimensions and spacing between adjacent tanks. Note: Miami Dade Water and Sewer Department requires aboveground tanks whenever possible.
 - 2. Base slab dimensions and bollard location and size.
 - 3. Vent size, height, location and type of cap.
 - 4. Fill details including spill containment and overfill protection.
 - 5. Piping details including shut-off/isolation valves and anti-siphon valve.
 - 6. Pumps and other equipment, where applicable, including location, size and type.
 - 7. Electrical details including shut-off switch location and grounding wire.
 - 8. Level gauges and leak detection equipment. (i.e. Morrison Clock gauge for fuel level, Krueger Pop-up gauge for interstitial monitoring)
 - 9. Signs and decals.

1.06 WARRANTY

The tank must carry a thirty year (30) warranty.

1.07 DELIVERY AND STORAGE

- A. Deliver, store, protect and handle products under provisions of Section 01600.
- B. Protect while transporting, storing, installing until work is completed.
- C. Do not handle or move tank unless it is empty.

- D. Do not drop or drag the tank.
- E. Do not handle or install tank without having knowledge and experience in procedures involved with proper and safe installation of tank used for storage of stable, flammable and combustible liquids.
- F. Equipment required for the shipping and off-loading of aboveground and underground storage tanks include lifting straps, forklift and crane up to 150 ton capacity and nylon tie down straps.

1.08 GENERAL FIRE PROTECTION

- A. A sign which prohibits smoking shall be conspicuously posted.
- B. Portable fire extinguisher shall be provided for the suppression of fires in accordance with NFPA 10 and UFC for high hazard area.
- C. Exterior warning signs and labels shall be at proper location and configuration to meet applicable code requirements.

PART 2 - PRODUCTS

2.01 ABOVEGROUND TANKS

A. General:

The Contractor shall furnish an FDEP approved secondary contained shop fabricated aboveground storage tank (AST) for flammable and combustible liquids. Storage tank system shall be UL listed for both vehicle impact protection and projectile resistant and shall be tested to and listed for the following:

1. UL - 142, aboveground steel tanks for flammable and combustible liquids.
 2. UL - 2085, protected aboveground tanks for flammable and combustible liquids.
- B. The tank shall be cylindrical in shape and have continuous welds on all sides conforming to the American Welding Standard for continuous weld. The primary and secondary tank shall be minimum 0.125 inch thick carbon steel and manufactured in accordance with U.L. 142. However, thickness shall be based on a thirty year (30) warranty.
 - C. The tank shall be designed and tested to provide 2-hour fire protection. The fire resistance of the tank shall be tested in accordance with the procedure established in U.L. 2085.
 - D. The primary steel tanks shall have "emergency vent" system as per NFPA 30 Code requirements.

- E. The AST shall have a tank leak detector tube to allow for physical monitoring capability of the interstitial space between the primary and the secondary tank. A mechanical interstitial monitoring gauge (i.e., Kreuger Pop-Up) shall be installed.
- F. The AST shall have a mechanical level gauge (i.e., Morrison Bros. Clock Gauge Model 818/818F).
- G. The primary steel tank shall be pressure tested at 5 psig for 24 hours.
- H. All openings shall be from the top only.
- I. The AST shall have a coated exterior to resist weather and reflect sunlight.
- J. The AST shall have a warranty of 30 years regardless of capacity.
- K. The AST shall be constructed to allow for grounding in accordance with NFPA 78.
- L. Tank shall be Fireguard Aboveground Tank or approved equal.

2.02 TANK CAPACITY

The tank capacity shall be as shown on Drawings. Minimum tank size shall be based on the fuel capacity required to run one pump continuously for five days, at maximum horsepower.

2.03 VENTING

- A. Atmospheric Vent: The tank system shall be furnished with a 2-inch vent and an appropriate emergency vent. An open atmospheric utility vent cap shall be installed on the 2-inch vent line to protect against intrusion and blockage from water, debris or insects. Venting systems shall meet all 2-inch standard vent and emergency vent requirements of U.L. 142. Height of the vent line shall be per code. Vent line shall be capable of sufficient venting into the atmosphere in case of pressure build-up inside the tank. Vent cap shall be installed with no overhead obstructions to allow free flow of vapors from the vent.
- B. Primary Tank Emergency Vent: The tank system shall be furnished with pressure relief nipples and emergency pressure relief devices to automatically relieve the pressure of the primary tank before it reaches 2.5 psig. It shall include a fire screen to prevent ignition from an external source.
- C. Secondary Containment Venting Device: The tank system's secondary containment shall be furnished with an emergency venting device. The venting device shall consist of a pressure relief nipple and a relief device. The emergency device will open before the secondary containment internal pressure reaches 2.5 psig.

2.04 OVER SPILL CONTAINMENT

- A. The AST systems shall include an FDEP approved over spill containment device.

- B. Over spill containment device shall be mounted on top of the tank and shall surround the tank fill pipe to catch occasional spills.
- C. A hand-activated spring-loaded normally closed valve shall be provided inside the containment to drain the spill back into the tank.
- D. Lid to over spill containment device shall meet proper color-coding requirements for diesel fuel.

2.05 FILL PIPE

The tank system shall be furnished with a MNPT fitting for filling. The fill pipe shall be equipped with an adapter and lockable cap. Fill pipe diameter shall be 4-inches.

2.06 COLLISION PROTECTION

Collision protection approved by the tank manufacturer shall be located around tank perimeter for vehicular protection. Pipe bollards shall be installed for collision protection, as follows: concrete filled steel posts, 4-inches diameter (minimum) by 6 feet long, shall be set 3 feet into the ground within a 15-inch diameter concrete filled hole. Post shall be spaced 4 feet center to center and shall be spaced from tank in accordance local codes.

2.07 CONCRETE PAD

The tank system shall be installed on a reinforced concrete pad to protect against stresses from uneven settlement and to assure that the tank supports allow for inspection and maintenance beneath the tank. Concrete foundation (i.e, pad) shall have a minimum compressive strength in 28 days equal to 3000 psi. Pad length, width, thickness and placement specifications shall be as recommended by the manufacturer or engineer of record.

2.08 PIPING AND ACCESSORIES

- A. All accessories (vents, product fill, etc.) shall be installed to meet the site specific requirements and governing codes.
- B. Adherence to all operational safety precautions shall be taken under consideration and piping shall include safety valves as follows:
 - 1. Angle check valve with pressure relief or foot valve and strainer. Foot valve and strainer shall be located 1-inch from the inside bottom of the tank.
 - 2. Shut-off/isolation valve with fusible link on supply and return piping.
 - 3. Anti-siphon valve (i.e., OPW Model # 199ASV) on the highest point of the supply line closest to the tank, if suction/supply line falls below the high fuel level.
 - 4. Check valve in the return line.

- C. Exterior warning signs and labels shall be properly located and meet applicable code requirements. Tanks shall be marked as required with warning signs: "FLAMMABLE" or "COMBUSTIBLE", "NO SMOKING", product identification, etc.
- D. Exposed piping exterior surface shall be primed and coated with protective finish (i.e., Keeler and Long Tri-Polar Ferrite Primer and Rust-Oleum Industrial Acrylic Enamel 5225 (Royal "Safety" Blue) in a WASD approved safety blue color for diesel product.

2.09 ELECTRICAL

- A. Electrical service and fuel piping to the pumps unit shall be installed in accordance with the requirements of NEC and NFPA and local code requirements.
- B. All electrical devices used with or located twenty (20) feet of the tank shall conform to NFPA 70 Hazardous Locations. All electrical conduits and wiring connected to the tank shall be explosion proof and in strict accordance with NEC Class 1, Division 1.
- C. Electrical grounding shall be installed on tank.

2.10 STAIRS AND CATWALKS

- A. Install stairs/catwalks to facilitate access, inspections and maintenance services to the tanks as required.
- B. Stairs shall comply with OSHA Standard 1910.24.
- C. Railings shall be provided as required by OSHA Standard 1910.23
- D. Stairs shall be 36" wide, straight-tread with top platform.
 - a. Top platform shall be 30" in direction of travel by 36" wide.
 - b. Top platform shall be 24"-30" below top of tank (excluding appurtenances).
- E. Stair assembly shall be galvanized carbon-steel, free-standing with a 1"-3" clear gap between stairs and tank. (It shall not be in contact with tank or be supported by tank.)

PART 3 - EXECUTION

3.01 TANK SITE

- A. The tank location and foundation shall comply with the all applicable local codes and ordinances.
- B. Tanks shall not be located over underground utilities or directly beneath overhead power and telephone lines.

- C. The tank shall be protected from vandalism and accidental damage in accordance with all applicable codes.
- D. Fire department vehicle access should be provided within 150 feet of the tank.
- E. The venting of the tank to a remote location must include the use of a steel pipe equal to or greater in size than the vent outlet. The methods of supporting such piping against displacement must comply with local codes.

3.02 FOUNDATION REQUIREMENT

- A. The foundation for the tank shall be designed to support the tank plus 100% of the weight of the maximum amount of the product the tank will be storing. The foundation design shall also include provision for draining surface water away from the tank to minimize the risk of fuel accumulation from the over fill or spills at the tank footings.
- B. The tank foundation (concrete pad) shall sit on compacted fill, free of organic material. The tank shall be installed on a continuous solid slab which will uniformly distribute the weight of the tank and its contents to the soil.

3.03 INSTALLATION OF ABOVEGROUND FUEL TANKS

- A. General: The aboveground tanks shall be set on a concrete foundation (pad) in accordance with current installation instructions, foundation engineering drawings and shall comply with all governing code requirements.
 - 1. Concrete Foundation (Pad): Reference and follow the appropriate manufacturer's or engineer of record's drawings for the respective foundation size and load bearing requirements for pad lengths, widths, thickness, and placement specifications.
 - 2. Unloading and Handling: A thorough inspection of the entire assembly shall be conducted prior off loading. Check for any damage, chipping or other impairments incurred during transportation. Do not remove the shrink wrapped plastic cover until after final installation of vents and piping. However, shrink wrap should be left on if installation is not to concur with delivery, as vault finish will be affected if shrinkwrapped and left exposed to sunlight for several days.
 - 3. Equipment used to off-load: The equipment shall be adequate size and capability to lift the vault without dragging and dropping to ensure that no damage is done to the vault or its coating. The vault shall be lifted lowered, and secured only by use of nylon straps (chain and cables are not allowed) placed at designated lifting areas to avoid damage to the assembly.
 - 4. The vault shall be anchored in accordance with applicable code requirements.

5. Air Pressure Test of Internal Steel Tank: Contractor shall verify the internal steel tank tightness during the process of placing the unit into service. Use the basic procedure and desired result as an unvaulted steel tank, and in accordance the industry standard procedures as published by the Steel Tank Institute or other professional organizations and manufacturer recommended procedures. Pressure test the tank at 5 psig. No leakage shall be permitted. Vaults under pressure shall not be left unattended.

END OF SECTION