

General Industries

FIREGUARD Quick Spec.

1.1 SCOPE OF SECTION

- A. This section describes requirements for providing the equipment, labor and materials necessary to furnish and install Fuel Dispensing System(s) utilizing two-hour fire-rated aboveground steel tank(s) with 110% secondary containment.
- B. Requirements include furnishing and installing all equipment and accessories necessary to make complete systems for the storage and dispensing of [gasoline] [diesel]. Entire system shall be UL Listed per Subject 2085, Aboveground Flammable Liquid Tank Systems.
- C. All system components must be approved within the UL-2085 System Listing.
- D. The following components shall be provided by the Owner and installed by the Contractor.
- E. The following components shall be provided by the Contractor, but not installed as a part of this contract.

1.2 GENERAL REQUIREMENTS

- A. Unless otherwise specified, equipment furnished under this section shall be fabricated and installed in compliance with the instructions of the manufacturer.
- B. The contractor shall ensure that all equipment, accessories and installation materials comply with the specification and that adequate provision is made in the tank design and fabrication for mounting the specified system equipment and accessories.
- C. The Contractor is solely responsible for construction means, methods, techniques, sequences and procedures and for safety precautions and programs.
- D. The contractor shall provide all labor, equipment and material required to provide a complete and functional system.
- E. The Contractor shall obtain necessary permits, arrange for inspections and obtain approval of the appropriate Authority Having Jurisdiction over the work described.

1.3 STANDARDS

- A. The manufacture and installation of aboveground storage tank systems described in this section shall adhere to the following standards and regulatory requirements.
 - Aboveground Flammable Liquid Tank System, Standard for Insulated Secondary Containment—Protected Type Aboveground Storage Tanks, Standard UL 2085; Standard for Steel Aboveground Tanks for Flammable and Combustible Liquids, Standard UL 142; Control Equipment for Use With Flammable Liquid Dispensing Devices, UL 1238; Pipe Connectors for Flammable and Combustible Liquids and LP-Gas, UL 567; Powered-operated Dispensing Devices for Petroleum Products, UL 87; Valves for Flammable Fluids, UL 842; UL Listed Non-Metal Pipe, UL 971; Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, Illinois 60062, (847) 272-8800
 - Recommended Practices for Installation of Aboveground Storage Systems for Motor Vehicle Fueling, PEI/RP200; Recommended Practices for Installation and Testing of Vapor Recovery at Vehicle Fueling Sites, PEI/RP300; Petroleum Equipment Institute, PO Box 2380, Tulsa, OK 74101
 - Protected Aboveground Tanks for Motor Vehicle Fuel-Dispensing Stations Outside Buildings, Uniform Fire Code, 2000, International Fire Code Institute, 5360 Workman Mill Road, Whittier, California 90601-2298
 - Standard for Thermally Insulated Aboveground Storage Tanks, F941; Fireguard Installation and Testing Instructions for Thermally Insulated, Lightweight, Double Wall Fireguard Aboveground Storage Tanks, R942; Standard for Inspection of In-Service Shop Fabricated Aboveground Tanks for Storage for Combustible and Flammable Liquids, SP001-00, Steel Tank Institute, 570 Oakwood Road, Lake Zurich, IL 60047 (847) 438-8265
 - Flammable and Combustible Liquids Code, NFPA 30, 1996, National Fire Protection Association, 1 Batterymarch Park, Quincy, Massachusetts 02269-9101
 - Automotive and Marine Service Station Code, NFPA 30A, 1996, National Fire Protection Association, 1 Batterymarch Park, Quincy, Massachusetts 02269-9101

- National Electric Code, NFPA 70, 1993, National Fire Protection Association, 1 Batterymarch Park, Quincy, Massachusetts 02269-9101
 - National Fire Prevention Code, 1996, Building Officials and Code Administrators, 4051 West Flossmoor Road, Country Club Hill Illinois 6478
 - Standard Fire Prevention Code, 1996, Southern Building Code Congress International, 900 Montclair Road, Birmingham, Alabama 35213-1206
 - Occupational Safety and Health Standards, particularly Flammable and Combustible Liquids, 29CFR 1910.106, Personal Protective Equipment 29CFR 1910 Subpart I, U. S. Department of Labor, Occupational Safety and Health Administration (OSHA), Washington, DC
 - Clean Water Act and Oil Pollution Act of 1990, Spill Prevention, Control and Countermeasure (SPCC) Plans, 40CFR 112, 113 and 114
 - Uniform Building Code, International Conference of Building Officials, 5360 Workman Mill Road, Whittier, California 90601-2298
 - Applicable state and local regulations and ordinances
- B. In case of differences between building codes, state laws, local ordinances, utility company regulations, and contract documents, the most stringent shall govern.
- C. The codes and standards listed are the latest as of this publication. Codes and standards are continuously updated, the Contractor shall confirm the construction standard edition enforced by the authority having jurisdiction.

1.4 SUBMITTALS

- A. The Contractor shall provide one (1) set of shop drawings of the following system components for approval before commencing construction.
- Shop drawings of the tank(s) by the tank manufacturer.
 - Assembly and installation drawings.
 - Other [list]
- B. The Contractor shall provide product data sheets and descriptive material for major components to be provided.
- Tank coatings.
 - Pumps, valves and fittings.
 - Piping, venting equipment, leak detection equipment, and overflow prevention equipment.
 - Other system accessories. [list]
- C. Submittals shall be delivered to the engineer within [10 days] of notice to proceed. The Engineer shall review the drawings and return them to the Contractor approved, or with appropriate comments, within [14 days] of receipt.

1.5 CONSTRUCTION DOCUMENTATION

- A. At contract close-out, the Contractor shall provide three (3) sets of the following installation instructions:
- Tank(s) and equipment integral to the UL 2085 system(s)
 - Pumps, [dispensars], valves and fittings
 - Vapor recovery components
 - Applicable foundation pad and anchoring details
 - Other. [list]
- B. The Contractor shall provide three (3) sets of the UL 2085 “Uniform Fire Code, NFPA 30 & NFPA 30A Code Compliance Verification List”.
- C. The Contractor shall provide three (3) sets of manufacturers’ system component operation and maintenance manual instructions.
- D. The Contractor shall provide record (“as built”) drawings and photographs of the completed tank system in place.
- E. The Contractor shall provide copies of all testing and inspection reports to the Owner prior to substantial completion.

1.6 GUARANTEES, WARRANTIES AND INSURANCE

- A. The Contractor shall provide the following insurance [List type and limits]
- B. The Contractor shall provide the following guarantees/warranties. [List requirements]
- C. The tank Manufacturer shall provide a Steel Tank Institute Third Party 30 year Warranty. Manufacturer’s Warranty is not acceptable.

1.7 TANK REGISTRATION

- A. The [Contractor] [Owner] shall register each tank and serial number with Steel Tank Institute in accordance with instructions provided by the manufacturer with tank.

END OF SECTION

2.1 PROTECTED DOUBLE-WALL ABOVEGROUND TANK SYSTEM(S)

- A. Storage Tanks: The storage tank(s) shall be cylindrical Fireguard aboveground tank(s) for the storage of petroleum product(s) at near atmospheric pressure. Number, size(s) and weight(s) of tank(s) shall be as follows:
- (1) _____ gallon capacity (nominal) cylindrical tank for [List] storage. Dimensions to be (diameter, length): _____ x _____ inches.
- The primary and secondary tanks shall be manufactured in accordance with Steel Tank Institute Publication No. F941, "Standard for Thermally Insulated Aboveground Storage Tanks".
 - The listed assembly shall meet the requirements for "protected" tanks and for "fire resistant" tanks as defined by Underwriters Laboratories including impact resistance, ballistics protection and hose stream resistance criteria.
 - The tank shall consist of an inner steel wall, encased by lightweight thermal insulation material, and an outer steel wall.
 - The outer steel wall shall be UL 142 Listed and capable of providing a minimum 110% containment of the primary storage tank's content.
 - A legible UL2085 and Steel Tank Institute label shall be affixed to the side of the aboveground storage tank assembly.
 - Steel outer wall of the tank shall SSPC-SP6 (commercial sandblast), zinc primer at 4mils and 4-6mils urethane, to prolong weather resistance and to reduce maintenance needs.
 - A means of grounding the tank shall be provided.
 - The storage tank, supports, and components as provided within the UL 2085 Listings shall be delivered as a complete UL-listed unit.
 - The storage tank and support shall meet all the requirements for Seismic Zone 1 per Uniform Building Code requirements.
- B. Fire Resistance: Tank(s) shall be designed for use aboveground and include integral secondary containment, and thermal insulation that provides a minimum two-hour fire rating when tested to UL 2085 criteria.
- Provide a porous, lightweight monolithic thermal insulation material in the tank's interstitial space. The nominal insulation thickness shall be 6".
 - The thermal insulating material shall allow liquid to migrate through the interstice to the monitoring point.
 - The thermal insulation material shall not be exposed to weathering and shall be protected by the steel secondary containment outer wall.
 - Thermal insulation material shall be installed at the factory.
- C. Normal Venting: Tank system(s) shall include one (1) normal vent for the primary tank(s). Pressure/vacuum vents must be used for tanks containing class I fluids (gasoline). Open vents may be used in place of pressure/vacuum vents for class II fluids (diesel fuel).
- Capacity of the vent shall be sized according to Table 2-8, NFPA 30.
 - Vent riser piping shall be a minimum 2" diameter, Schedule 40 steel pipe, pre-cut for field assembly, and conform to ANSI B31.3 or ASTM A53, A106 or A135. Length of pipe shall be such that the point of vent discharge is a minimum 12 feet above grade.
 - Vents shall incorporate a UL-Listed flame arrester.
 - Vent installation shall comply with applicable sections of the fire and mechanical codes, including, but not limited to, NFPA 30A and NFPA 30.
- D. Emergency Venting for Primary tank compartment, UL-Listed (EGVV).
- Vent size shall be determined by the tank configuration, the primary tank capacity, and the product stored.
 - Emergency venting shall comply with provisions of NFPA 30A, NFPA 30, and UFC.
- E. Emergency Venting for Secondary Tank: Tank system(s) shall include one (1) emergency vent for each secondary containment tank interstice, UL-Listed (EGVV).
- The venting capacity is determined by the tank configuration, secondary tank capacity, and the product stored.
 - Emergency venting shall comply with provisions of NFPA 30A, NFPA 30, and UFC.

- Vents shall be located as close to the center of the tank as possible.
- F. Manway Hatch: Tank system(s) shall include one (1) manway hatch for each tank over 5,000 gallons. The minimum nominal diameter of opening shall be not less than 16”.
- G. Spill Container: Tank system(s) shall include one (1) spill container to contain product spills from the fill hose. Spill container shall be painted or plated steel, 14 gauge minimum thickness. Hinged lockable metal rainproof lid shall be provided. Spill containment shall comply with UFC and NFPA codes.
- Fill pipe spill container shall have a capacity of not less than five gallons.
 - For top-mounted spill containers, a means for returning collected product to the storage tank must be provided.
- H. Fill Assembly: Tank system(s) shall include top fill assembly, inclusive of :
- One (1) lockable fill cap [2-____” in size] with a liquid tight seal and positive mechanical locking mechanism.
 - One (1) fill pipe adapter [2-____” in size] with a threaded fitting with cam-and-groove or bayonet style lip that provides a fill hose connection that will not expose fuel to air during delivery.
 - One (1) drop tube (fill pipe) constructed of corrosion-resistant metal [2-____” nominal diameter]. Fill pipe shall terminate within 6” of the inside bottom of the tank. A striker plate may be provided at bottom of fill pipe.
 - Comply with provisions of NFPA 30 and UFC Article 79.
- I. Overfill Prevention: Tank system(s) shall include overfill prevention equipment which complies with the requirements of NFPA 30A and which incorporates the following:
- A positive shut-off fill limiter which will stop the flow of liquid into the tank when product level reaches 95% of tank capacity. Fill limiting device shall be rated to accept the fill flow rate and pressures up to 100 psi, and must be UL-Listed (EGVV).
 - An audible alarm which will sound when the product level in the tank has reached 90% of tank capacity. Alarm system may be UL Listed electric type (FTRV, ZTSZ, ZTZY or EQXX) or mechanical type. Electric type systems shall use intrinsically-safe tank-mounted probes, suitable for use in Class I, Div II, Group D locations, and monitoring console, suitable for use in Class I, Div II, Group D locations or located more than 10 feet from tank shell.
- J. Liquid Level Gauge: Tank system(s) shall include a means for determining the liquid level in the tank, which is visible to the delivery operator, in accordance with NFPA 30, NFPA 30A and UFC Article 79. Acceptable means:
- Stick gauge.
 - Float-type mechanism, the face of which shall be visible from the point of fill.
 - Electric monitoring system with console and tank-mounted sensors or probes for continuous tank level monitoring. System shall be calibrated and preset at factory and may include alarm accessories. Electric liquid level gauging system shall be UL-Listed (FTRV, ZTSZ, ZTZY or EQXX). Systems shall use intrinsically-safe tank-mounted probes, suitable for use in Class I, Div II, Group D locations, and monitoring console, suitable for use in Class I, Div II, Group D locations or located more than 10 feet from tank shell.
- K. Interstitial Leak Detection: Tank system(s) shall include leak detection for each tank interstice to continuously monitor both the primary and secondary containment tanks. Acceptable means:
- Stick gauge.
 - Float-type device.
 - Electric monitoring system with console and tank-mounted sensors or probes. Console may be installed in the field. Probes shall be factory-installed in the interstitial space with probe at bottom of secondary tank. Electric interstitial leak detection system shall be UL-Listed (FTRV, ZTSZ, ZTZY or EQXX). Systems shall use intrinsically-safe tank-mounted probes, suitable for use in Class I, Div II, Group D locations, and monitoring console, suitable for use in Class I, Div II, Group D locations or located more than 10 feet from tank shell.
- L. Dispensing Device: Tank system(s) shall include UL-Listed (EWTV) electric motor-operated suction pump to draw fuel from the tank. Dispensing device sub-assembly shall be factory-assembled, but sub-assembly may be field-mounted. Sub-assembly shall consist of the following items:
- Suction pump: [qty]-hose, [single] [two] [multi]-product, [gasoline] [diesel] pump with rated capacity of [qty] gallons per minute (minimum) [and with Stage II vapor recovery system].
 - UL-Listed (ERBY) emergency breakaway coupling, with indication for use with flammable and combustible liquids, and installed per manufacturer’s instructions.
 - UL-Listed (ETAZ) nozzle, automatic, self-closing type with or without latch open device, or manual-closing type without latch open device, installed per manufacturer’s instructions.
 - UL-Listed (MVQJ or MWHT) pump hose, installed per manufacturer’s instructions.
 - Dispenser mount bracket, welded or mounted on the tank, constructed of steel with a minimum thickness of 0.1” and able to withstand anticipated loads. Anticipated loads include equipment weight and tear-away load with a minimum safety factor of 2 (yield strength) for the structure, welds and fasteners.
 - UL-Listed (ERLV) swivel connector, installed per manufacturer’s instructions.

- Hose retriever, installed per manufacture’s instructions, which may be field-mounted.
 - Fuel filter, installed inside or outside dispenser unit, downstream of fuel pump. Minimum pressure rating shall be 50 psig and filter shall be sized to match system flow rate requirements without excessive backpressure.
- M. Signage: Recognized UL component Marking and Labeling system (PGDQ2) must be affixed to the side of the tank, including but not limited to:
- “No Smoking”
 - Identification of product by name or NFPA coding
 - The statement “Follow Installation Instructions”

2.2 EMERGENCY SHUT-OFF

- A. Provide an emergency shut-off system located in a accessible area, at least 20 feet but not more than 100 feet from the dispenser. Confirm the final location with the Owner prior to installation
- Provide a palm type switch button that will shut off electrical power to the pump.
 - The emergency shut-off shall be clearly identified with signage.
 - Emergency shut-off shall have manual reset.

2.3 VAPOR RECOVERY SYSTEMS

- A. Provide a Stage I vapor recovery system to capture displaced vapors during the tank filling process.

2.4 GENERAL SAFETY PROVISIONS

- A. Provide [concrete barriers] [“U” shaped steel pipe guards] [bollards] around aboveground tanks and piping to protect against vehicular collision in accordance with fire regulations and building codes.
- B. Provide [quantity] [size] diameter [“U” shaped steel pipe guards] [bollards] to be placed at the ends of the pump island, primed and painted.
- C. Provide portable Class ABC [20 pound] [40 pound] fire extinguisher(s) and weather proof cabinet(s) at dispenser island(s) and [other locations] in accordance with applicable fire codes.

3.1 SITE PREPARATION

- A. The site shall be prepared to ensure adequate support for the tank system and drainage of surface water.
- The foundation and tank supports shall be capable of supporting the weight of the tank and associated equipment when full.
 - The foundation may be comprised of concrete, asphalt, gravel or other stable material designed to prevent tank movement, and must be rated for the seismic zone noted in Section 2.1 A 8 for each tank.
- B. Diking may not be required for Fireguard tanks on 12,000 gallon capacity and smaller.
- Regional and local fire codes authorities shall be consulted for local requirements.
 - Notify the Engineer of any local requirements not incorporated in the system as designed.
- C. Maintain legal separation distances from property lines, buildings, public ways, dispenser, vehicles being fueled and other storage tanks.
- Caution: Distance requirements vary significantly between jurisdictions.
 - National standards dealing with set back and separation distances are included in NFPA 30A and UFC Article 79.
- D. Provide a chain-link fence at least 6 feet high, separated from the tanks by at least 10 feet and having a gate that is properly secured against unauthorized entry per NFPA 30A.
- Regional and local fire codes authorities shall be consulted for local requirements.
 - Fencing at the tank area is not required by NFPA if the property on which the tanks are located is secured with a perimeter security fence.

3.2 TANK HANDLING, STORAGE AND INSTALLATION

- A. Tanks shall be handled, lifted, stored and secured in accordance with the manufacturer’s instructions.
- B. Unload with equipment having sufficient lifting capacity to avoid damage to the tank. Securely store the tank at the job site.

- C. The tank and associated equipment shall be installed in accordance with the fire safety codes, regulations, standards and manufacturers' instructions including:
 - Federal, state and local fire safety, occupational health and environmental regulations.
 - Steel Tank Institute installation instructions for Fireguard aboveground tanks (Publication No. R942, Installation and Testing Instructions for Thermally Insulated Lightweight Double Wall Fireguard Aboveground Storage Tanks).
 - Steel Tank Institute installation instructions for UL 2085.
 - The installation instructions of other system component manufacturers.
 - The Construction Documents and associated Drawings.
 - Recommended Practices for Installation of Aboveground Storage Systems for Motor Vehicle Fueling, PEI/RP 200, Petroleum Equipment Institute.
- D. Advise the Owner of any shipping or handling damage encountered.
- E. No modifications shall be made to any tank without the prior written approval of the manufacturer and the Engineer. This includes any welding on tank shell, adding penetrations in the tank structure, or repairing damage which might affect the integrity of the inner or outer tank.

3.3 CORROSION PROTECTION

- A. Any portion of the fueling system in contact with the soil shall be protected from corrosion in accordance with sound engineering practice and in accordance with NFPA 30A.
- B. Protect aboveground piping and equipment from corrosion by painting or wrapping it with a coating which is compatible with the product stored and the conditions of the exposure.

3.4 EQUIPMENT INSTALLATION

- A. Contractor shall install tank(s), dispenser(s), piping and equipment in accordance with the manufacturers' installation instructions, industry standard recommended practices and federal, state and local regulations.
- B. Calibration and start-up of equipment shall be performed by factory-trained and qualified personnel.

3.5 ELECTRICAL

- A. Installation shall be in accordance with manufacturers' installation instructions and shall conform to state and local electrical codes with special attention to compliance with requirements for work in classified areas.
- B. The Contractor shall provide explosion-proof electrical junction boxes, conduit, seal offs and wiring in accordance with the National Electrical Cod (NEC).

3.6 TESTING

- A. The Contractor is responsible for testing all installed systems for liquid tightness and proper operation, including:
 - Pre-installation inspection of all material.
 - Product, containment and vent piping during construction.
 - Containment sump integrity.
 - System tightness test after all work is completed and before the system is placed in service.
- B. Test each component of the system fro calibration, tightness and proper operation in accordance with the instructions of the component manufacturer.
- C. Testing shall be documented by the Contractor in writing, witnessed by the Owner, and signed by the individuals who performed and witnessed the test.
 - Provide a record of the testing to the Owner at the time of system start-up.
- D. Tests shall be performed in conformance with the manufacturers' instructions, state laws and the quoted industry standards, particularly PEI/RP200.

3.7 TESTING PRIMARY AND SECONDARY TANKS

- A. Air pressure testing of the inner tank and secondary containment tank shall be conducted on-site, in the presence of the Engineer, before placing the tank in service. Interstitial vacuum testing may be used for field tightness testing of cylindrical horizontal tanks.
- B. Refer to STI Publications No. R942 and Installation Instructions for Aboveground Flammable Liquid Tanks System for Motor Vehicle Fuel Dispensing for complete procedural details.

C. Other integrity tests may be required by the local authority having jurisdictions.

3.8 TESTING PRODUCT AND VENT PIPING

A. Test product and vent piping in accordance with manufacturers' instructions and quoted industry standards, particularly PEI/RP-100.

3.9 MANUFACTURER

A. Manufacturer shall be General Industries or equal, but must have Engineer's prior approval a minimum of 30 days prior to Bid date.