

SECTION 23 13 00
E85 FUEL STORAGE, DISPENSING AND MANAGEMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Scope: This work shall consist of furnishing and installing E85 fuel island equipment and systems including 5,000-gallon double wall aboveground fuel storage tank, complete as a packaged system. All work shall be done in accordance with the details shown on the plans and these special provisions. Foundations, supports, mechanical and electrical work, and all other work incidental to, and necessary for, the proper installation and operation of the items of equipment shall conform to the requirements specified for similar work elsewhere in these special provisions. The finished installation shall meet all provisions of National Fire Protection Association and Americans with Disabilities Act.
- B. Permits to Operate: The Contractor shall provide or obtain all the required permits and licenses, including but not limited to Federal, State, and local, to install and operate The Contractor shall perform all the required tests associated with the permit process. Costs associated for all permitting and testing are the responsibility of the selected Vendor. Provide Contracting Officer's Technical Representative (COTR) copies of all required permits.

1.2 CODES AND STANDARDS

- A. Publications listed below (including amendments, addenda, revisions, supplements and errata) form a part of this specification to the extent referenced. Publications are reference in the text by designation only.
- B. National Fire Protection Association (NFPA):
- 1-12Fire Code
 - 10-13Standard for Portable Fire Extinguishers
 - 30-12Flammable and Combustible Liquids Code
 - 30A-12Code for Motor Fuel Dispensing Facilities
and Repair Garages

31-11Standard for the Installation of
Oil-Burning Equipment

70-14National Electrical Code

C. Underwriters Laboratories, Inc. (UL):

142-06Standard for Steel Aboveground Tanks for
Flammable and Combustible Liquids

971-95Standard for Nonmetallic Underground Piping
for Flammable Liquids

2085-97Standard for Protected Aboveground Tanks
for Flammable and Combustible Liquids

D. ADA - Americans with Disabilities Act

1.3 SUBMITTALS

A. Product Data: Manufacturer's descriptive data for all equipment, including installation instructions, shall be submitted for approval. Manufacturer's descriptive data shall be submitted to include the following:

Aboveground fuel storage tank

Tank anchoring system

Fuel tank/piping/pump monitoring system

Enhanced leak detection certification process & procedures

Fuel tank fittings and accessories

Fuel pumps and accessories

Warning signs

Turnkey Enclosed Fuel Island dispensing and management systems (detailed fuel island shop drawings shall be submitted indicating arrangement of equipment and components, dimensions and equipment list, electrical, communications and piping connections, and power requirements prior to fabrication)

B. Working Drawings:

1. Drawings are diagrammatic and show the general design, arrangement and extent of the systems. Do not scale or attempt to use drawings for roughing-in measurements, nor use as shop drawings. Make field measurements and prepare shop drawings

for submittal. Coordinate work with shop drawings of other specification divisions.

2. Contractor shall investigate the capacity and space requirements of the proposed equipment before submitting shop drawings. Where conditions necessitate a rearrangement, prepare and submit to the COTR, for review, drawings of the proposed rearrangement.
3. Because of the small scale of the drawings, it is not possible to show all offsets, fittings, and accessories, which may be required. Carefully investigate the conditions and the work of other trades and arrange work accordingly, furnishing such fittings, traps, valves and accessories as may be required to meet such conditions.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Manuals: Prior to the completion of the contract, four (4) identified copies of the operation and maintenance instructions for the equipment specified herein shall be submitted in accordance with Section 01 33 23 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES. The Operation and Maintenance Manual instructs personnel how to operate and maintain a piece of equipment, device, or sub-system. The manuals typically include general information about a product, such as a description of its features, warranties, drawings, etc. The manual enables people not familiar with various systems to operate those systems on a day-to-day basis, including troubleshooting procedures to take when a fault occurs, or there is an emergency. The instructions and parts lists shall be in a bound manual form and shall be complete and adequate for the equipment installed. The Operation and Maintenance Manual should have tabbed sections that include:

Description of systems

Operating and maintenance instructions

Commissioning reports and test data

Warranties and guarantees

System Components

As-built drawings

List of contacts (name/address/telephone: day & night) of companies that can respond in the event of emergency, maintenance, etc.

B. As-Builts:

1. The As-Built submittal shall include three (3) Electronic File Deliverable Media. All electronic files shall be submitted on ISO 9660 format CD-ROM. Each disk shall have a clearly marked label stating the Contractor's firm name, project name and location, submittal type (AS-BUILT), and date. The submittal shall be accompanied by a hard copy transmittal sheet that contains the above information along with a tabulated information sheet about each file.
2. Electronic File Submittal Requirements: The electronic file(s) deliverable shall be in AutoCAD (.DWG) binary format and PDF format. All support files required to display or plot the file(s) in the same manner as they were developed shall be delivered along with the files. These files include but are not limited to Font files, Menu files, Plotter Setup, and Referenced files. Layering shall conform to the guidelines defined by the American Institute of Architects (AIA) standard document, "CAD Layer Guidelines", latest version. An explanatory list of which layer is used at which drawing and an explanatory list of all layers which do not conform to the standard AIA CAD Layer Guidelines including any user definable fields permitted by the guidelines shall be provided with each submittal.
3. Do not include unnecessary cut sheets, i.e. piping, pipe fittings, piping supports, spec or code sections, etc. Vital components such as pumps, switches, alarm devices, detectors, etc. indicate which models were installed.
4. Inadequate or incomplete material shall be returned. The Contractor shall resubmit adequate and complete manuals at no expense to the VAMC.

PART 2 - PRODUCTS

2.1 ABOVEGROUND FUEL STATION

- A. General: Fuel storage tanks shall be constructed of steel. All tanks shall be of the same material of construction and guaranteed compatible with the contents indicated on the drawings. Tanks and appurtenances shall be Underwriters Laboratories (UL) listed for storage of petroleum products. They shall also meet the provision of NFPA 1, NFPA 30, NFPA 31, and Environmental Protection Agency requirements.
- B. E85 Fuel Station shall be a complete storage, dispensing and management facility.
 - 1. The tank package shall include a 5,000 gallon double wall steel tank, conforming to the requirements of UL 2085. Modern Welding Company, Model Fireguard or approved equal and a Pneumercator TMS2000 or approved equal tank monitor and leak detection system. The leak detection system shall detect and alarm leaks in the annular/interstitial space of a double wall above ground containment tank (AST's) and below grade containment piping and sumps. Contractor shall coordinate exact station equipment configuration and orientation with COTR and station manufacturer.
 - 2. The fuel island package for fuel dispensing and management shall be a skid mounted, 6 foot enclosed turnkey fuel island which will include but not be limited to a single Bennett Pump Company Model 3711 E85 Fuel Dispenser, Multiforce Systems Corporation Model FF 894-ADA pedestal mounted card reader/fuel management system (pedestal base height shall be customized so that the keypad height does not exceed 48 inches from the concrete slab or bottom of the island skid per ADA), an NFPA 10 80-B fire extinguisher, E85 compatible filter, hose retriever/retractor, fire resistant enclosure and hood, fire valve, transition sump, 20 foot high light pole with LED light, explosion proof light switch, explosion proof electrical fittings and conduit, wiring and junction boxes, power and telephone connection stubs, and fire resistant flex

hose. Hose length shall be as required to accommodate fueling requirements. The fuel island shall be U-Fuel, Inc., Turnkey Enclosed Fuel Island Model TFIE00061P-PLD20-XPLS1PL or approved equal.

3. The fuel island card reader/fuel management system shall be capable of providing secure authorization and reporting capable of authorizing and recording both fuel and fuel transactions using the Wright Express (WEX) and General Services Administration (GSA) Smart fuel cards processing system. The controller shall be compatible with the GSA controller and the system shall be connected to remote authorizing, recording and billing services.
4. Field installed piping and sumps between tank and fuel island: Underground fuel piping shall be double wall flexible type, providing both primary and secondary containment, and conforms to the requirements of UL 971 for use with E85 biofuel. The piping shall consist of an outer containment pipe, which include inner stand-off ribs to create a small interstitial space which allows for optimum fluid migration, continuous monitoring and easy periodic testing. The fuel piping shall be FlexWorks manufactured by OPW Fueling Containment Systems or approved equal.
5. Transition sumps shall be installed for underground piping connections. The transition sump shall be Model PST-5030, as manufactured by OPW Fueling Containment Systems or approved equal.

C. Tank to be set on reinforced concrete pad as shown on drawings. Install tanks in strict conformance with manufacturer's instructions. Contractor shall be trained by the tank manufacturer for installation of the tanks.

2.2 TANK APPURTENANCES

- A. Tank appurtenances shall be Underwriters Laboratories (UL) listed for storage of petroleum products. All appurtenances shall, where practical, be shop installed, tested and painted/coated with the same coating going on the tank before shipment to the site.

PART 3 -- EXECUTION

3.1 INSTALLATION

- A. Aboveground Fuel Storage and Dispensing System: Install in accordance with the drawings, the referenced publications, and the manufacturer's written instructions, checklists, and warranty requirements for each system component.
- B. Underground Fuel Piping System: Install in accordance with the drawings and manufacturer's written instructions. The piping shall be field connected to the tank and fuel island.
- C. Fire Extinguisher: Fire extinguishers shall be installed in approved locations but not more than 50 feet from the fuel dispenser as required in NFPA 10, State and Local regulations. NFPA requires a Dry Chemical 80-B extinguisher. Mounting height for the fire extinguisher shall comply with Americans with Disabilities Act. The extinguisher shall be unobstructed and accessed from the front. The maximum forward reach height (the height of the top handle of the extinguisher) shall not exceed 48 inches above the floor.
- D. Warning Signs: Warning sign sizes, messages, lettering type, size and installation locations shall be as required in NFPA, State and Local regulations.
- E. Emergency Shut-Off: A labeled emergency shut-off shall be installed in approved locations but not less than 20 feet or more than 100 feet from the fuel dispenser. Mounting height for the emergency shut-off switch shall comply with Americans with Disabilities Act.
- F. Concrete Pad and Access Roadways: Rough plans for the layout of the fuel system are included on the drawings.
 - 1. Contraction and expansion joints are required. Contraction or control joints may be tooled into the concrete surface at the time of placement or. Contraction or control joints may also be sawed into the hardened concrete surface. Joints should be sawed as soon as the concrete will withstand the energy of sawing without raveling or dislodging aggregate particles. For most concrete mixtures, sawing should be completed within the first 6 to 18 hours and never delay more than 24 hours. Space

- joints (in feet) no more than 2-3 times the slab thickness (in inches). A 6 inch slab should have joints 12-15 feet apart. Cut joints 25% of the depth of the slab. A 6 inch thick slab should have joints 1-1/4 inch deep. An expansion joint should always be utilized where a concrete member will join or abut an existing structure of any type. Expansion joint shall be installed between new and old or existing concrete. Expansion joint consist of installing pre-formed, or pre-molded elastic/resilient material of approximately 1/2 inch thickness and as wide as the concrete is thick. Install expansion joint material before the new concrete is poured. Contractor shall install caulking, glazing or sealant to vertical surfaces to prevent water intrusion.
2. The concrete pad shall be sloped to drain water from pad toward or a collection basin large enough to comply with all applicable regulations. Compressive strength at 28 days shall be not less than 4000 psi. Finish exterior slabs, ramps, and stair treads with a bristle brush moistened with clear water after surfaces have been floated. Brush in a direction transverse to main traffic. Match texture approved by COTR. Refer to Section 32 05 23 CEMENT AND CONCRETE FOR EXTERIOR IMPROVEMENTS.
 3. Access to the tanks by an off-loading 8,500-gallon semi tanker truck must be provided.

G. Physical Protection:

1. The fuel station will have vehicle barriers/guard posts, on each corner and others as required. Guard posts shall be 4 inches in diameter Schedule 40 steel, have lifting rings or lugs and filled with concrete. The height of the steel pipe shall be seven feet, four feet above ground and three feet below. The guard post shall be removable, utilizing a 6 inch steel below grade mounted casing for support. The guards shall be spaced not to exceed four feet on centers. Surfaces to be painted, painting systems, and the number of coats to be applied shall be as outlined below. Comply with the

manufacturer's printed instructions. Barriers/Guard Posts:
One coat Alkyd Primer, spread rate 425 square feet per gallon,
2.0 mils DFT. Two coats Alkyd Gloss Finish, spread rate 417
square feet per gallon, 2.0 mils DFT. Color to be High
Visibility Safety Yellow. Refer to detail on the drawing
sheets.

2. The fuel station will be enclosed utilizing a chain link fence, complying with NFPA 30A. The fence shall be 6 feet in height and separated from the tank by 10 feet around the entire perimeter. A horizontal sliding type gate shall be provided to provide entry. Refer to Section 32 31 13 Chain Link Fences and Gates.
3. Provide and install galvanized anchor bolts to secure fueling station to concrete pad. The size and number shall be in accordance with manufacturer's printed installation instructions. Install anchors in concrete after concrete is placed and completely cured. Plastic anchors or plastic expansion shields will not be permitted under any circumstances.
4. Security lighting of any facility handling or storing fuel is required. Refer to Division 26 - Electrical.

3.2 TESTING

- A. Tank: Perform aboveground air tests in accordance with the tank manufacturer's written instructions.
- B. Underground Piping: Perform tests in accordance with the piping manufacturer's written instructions.

3.3 TRAINING

- A. The extent of training and responsibility to provide is to be determined by the VAMC but in no case shall be less than 8 hours. Personnel involved in operating regulated facilities must receive training covering the following material:

Contents of the facility Spill Prevention, Control, and

Countermeasure (SPCC) Plan.

Facility operations.

Operation and maintenance to prevent discharges.

Discharge response procedures.

Applicable laws and regulations.

3.4 ELECTRICAL

A. Refer to Division 26 - Electrical.

B. Pump / Dispenser - Specifications Section 23 13 00 Paragraph;

2.1.B.

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