

SECTION 33 52 43.00 - FUEL SYSTEM GENERAL PROVISIONS

PART 1 - GENERAL

1.1 SUMMARY:

- A. Work in this section includes furnishing all materials, labor and supervision necessary for the construction of the new Jet Fuel distribution system. The work shall include all pipe, fittings, valves, appurtenances and activities as specified herein and shown on the drawings. All testing, inspection and flushing shall be provided as specified to provide a complete and operational system.
- B. The General Provisions described herein, together with the General Conditions, Special Provisions and Division 1 of the contract, apply to the work in Division 33 52 43 – Aviation Fuel Distribution. This Section is hereby made a part of all other Sections of Division 33 52 43 - Fuel System Work, as if repeated in each. This section shall also be made a part of the following Sections:
 - 1. Section 09 97 13.00 - Fuel System Coatings
 - 2. Section 33 52 43.11 - Fuel System Piping Specialties
 - 3. Section 33 52 43.13 - Aviation Fuel Pipe, Fittings, and Installation
 - 4. Section 33 52 43.15 - Fuel System General Valves
 - 5. Section 33 52 43.24 - Fuel System Inspection, Testing, and Flushing
 - 6. Section 33 52 43.25 - Fuel System Service Pits and Access Covers
- C. All permits and licenses that are required by governing authorities for the performance of work shall be procured and paid for by the Contractor.
- D. The work will be completed during normal operating hours and conditions unless otherwise specified. Staging of construction activities is required.
 - 1. Connection of the new fuel system piping to the existing fuel system piping will be performed at night and shall be coordinated with the fuel system operator to assure the continued operation of the existing fuel system.

1.2 REFERENCES:

- A. Refer to each individual section in this division for a list of applicable references from each of the following organizations:
 - 1. American Petroleum Institute (API):
 - 2. National Fire Protection Association (NFPA):
 - 3. Underwriters Laboratories (UL):
 - 4. American Society of Mechanical Engineers (ASME):
 - a. B31.3 - Process Piping
 - 5. American Society for Testing and Materials (ASTM):
 - 6. American National Standards Institute (ANSI):
 - 7. Factory Mutual Engineering Division (FM):
 - 8. Industrial Risk Insurance (IRI):

9. Military Specifications (Mil):
10. Petroleum Equipment Industry (PEI):
11. Occupational Safety and Health Administration (OSHA):

1.3 DEFINITIONS:

- A. "Piping" includes in addition to pipe, all fittings, valves, sleeves, hangers, and other supports and accessories related to such piping.
- B. The words "furnish and install", "provide", "furnish", and "install" are used to mean the Contractor shall furnish and completely install the system, service, equipment, or material named along with other associated devices, equipment, material, wiring, piping, etc. as required. System shall be a complete operating installation, and shall conform to the codes, standards and guidelines applicable to this type of project.
- C. It is the intent of the specifications and drawings to call for finished work, tested and ready for operation.
 1. All apparatus, appliances, materials, or work not shown on drawings but mentioned in specifications, or vice versa, and/or all incidental accessories necessary to make work complete and ready for operation, even though not specified or shown on drawings, shall be furnished and installed without increase in contract price.
 2. Should there be discrepancies or questions of intent, refer matter to the Owner in writing for a decision before ordering any equipment or materials or before starting any related work.

1.4 COMPLIANCE SUBMITTALS:

- A. Submittals are required for all material specified in this Division. If material or equipment is shown on the drawings to be included in this project but is not specified, the Contractor shall bring this to the immediate attention of the Engineer. Submittals are required for all material and equipment incorporated into this project whether specified or not.
- B. The Contractor's attention is called to the Engineer's review of Compliance Submittals. This review shall be completed and the submittal returned to the Contractor before starting procurement, installation or fabrication.
- C. The Contractor's submission of a compliance submittal constitutes that he has both verified and coordinated all dimensional data, quantities, field conditions, catalog data, and compliance with the specification or he assumes full responsibility for doing so.
- D. Compliance Submittals shall include all components and units of fabrication for the hydrant fueling system specified in the following sections:
 1. Section 09 97 13.00 - Fuel System Coatings
 2. Section 33 52 43.11 - Fuel System Piping Specialties
 3. Section 33 52 43.13 - Aviation Fuel Pipe, Fittings, and Installation
 4. Section 33 52 43.15 - Fuel System General Valves
 5. Section 33 52 43.25 - Fuel System Service Pits and Access Covers
- E. Submittal Formats are as follows:

1. Product Information: Submit manufacturer's data sheets identifying equipment size, descriptions, materials, ratings, etc.
2. Drawings: Submit drawings which graphically show relationship of various components of the work, schematic diagrams of systems, details of fabrication, layouts of particular elements, connections, and other relational aspects of the work.
3. Instructions: Preprinted material describing installation of a product, system or material, including special notices and material safety data sheet, if any, concerning impedance, hazards and safety precautions.
4. Statements: A document required of the Contractor, or through the Contractor, from a supplier, installer, manufacturer, or other lower tier Contractor. The purpose of which is to confirm the quality or orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel, qualifications or other verifications of quality.
5. Reports: Reports of inspections or tests, including analysis and interpretation of test results. Each report shall be properly identified. Test methods used shall be identified and test results shall be recorded.
6. Certificates: Statement signed by an official authorized to certify on behalf of the manufacturer of a product, system or material, attesting that the product, system or material meets specified requirements. The statement must be dated after the award of this contract, must state the Contractor's name and address, must name the project and location, and must list the specific requirements that are being certified.
7. Records: Documentation to record compliance with technical or administrative requirements.

1.5 QUALITY ASSURANCE:

- A. Minimum Qualifications for Aviation Fuel Distribution System Contractor: All Aviation Fuel Distribution System work as outlined in this section and any related sections shall be completed by a contractor and/or subcontractor who:
1. Has been involved in the construction of aviation fueling industry projects for a minimum of five (5) years.
 2. Has successfully completed three (3) projects similar in complexity and scope within the last five (5) years. The projects shall include working with internally coated piping and the installation of isolation valve pits and hydrant valve pits. The contractor shall provide references on these projects to include contact name, phone number and organization.
 3. Has developed and implemented an aviation fuel system flushing plan, using either a recirculation method or by flushing into mobile tankage. The flushing plan must have incorporated the fuel quality requirements of ATA 103. Provide a list of projects where flushing plans have been developed and implemented by the contractor.
 4. Has as a member of his team, a controls subcontractor who has successfully completed three (3) PLC based Emergency Fuel Shutoff Systems (EFSO) for airport terminals with hydrant fueling systems similar in complexity and scope within the last five (5) years. The controls contractor shall provide references on these projects to include contact name, phone number and organization.
- B. Materials and equipment shall be new, unused, and shall bear manufacture's name, model number, and other identification marking.
- C. Materials and equipment shall be standard product of manufacturer regularly engaged in the production of required type of material or equipment for at least 5 years (unless specifically

exempted by Engineer in writing) and shall be manufacturer's latest design having published properties.

- D. Equipment shall have been in satisfactory commercial service for 2 years prior unless specified by model # and manufacturer.
- E. If more than one unit of the same type of equipment is required, (i.e., control valves, manual valves, etc.) they shall be products of a single manufacturer.
- F. All equipment, materials, components, coatings, and accessories provided shall be suitable for use with the specific fuel type being used in the system. The following table is provided to indicate the basic design conditions of the components:

SERVICE	PRESSURE	TEMPERATURE	SPECIFIC GRAVITY
Jet Fuel (ANSI 150 lb)	275 psig	-20 to 110 degrees F	0.81 +/- 0.05

- G. The Contractor is responsible for protecting all equipment and material from loss or damage until the system is completed and accepted by the Owner.
- H. All portions of equipment coming in contact with Jet A shall be free of copper, brass, bronze or zinc material. Aluminum is not allowed unless specified otherwise. All trim shall be stainless steel.
- I. The Contractor shall be responsible for coordinating with the manufacturer for installation of the equipment furnished. The Contractor shall be responsible for warranty work required and shall coordinate with the manufacturer of the equipment to accomplish warranty work including any labor and additional cost for such warranty work. The equipment manufacturer shall provide the Contractor with installation manuals and instructions. The Contractor shall receive and install this equipment for a complete furnished and installed installation including all accessories as specified within these specifications and as shown on drawings.
- J. The Contractor shall check equipment delivered to job site by the equipment supplier against approved Compliance Submittals or other required documentation. The Contractor shall report all discrepancies, shortages, or lack of data to the Owner and equipment supplier for adjustments within one week after equipment is received. If such report is not made within one week, it shall be assumed no discrepancies, shortages, or lack of data has been found.
- K. Contractor shall provide the following for all equipment furnished:
 - 1. All rough-ins for equipment and accessories.
 - 2. Installation of loose trim provided with equipment by the equipment supplier.
 - 3. Furnish and install all piping connections, valves, unions, control valves, drains, and other accessories as indicated on the plans and as specified here within these documents.
- L. The products of specific manufacturers have been used as the basis of design. Any changes to the structure, piping, controls, and electrical connections that result from the use of other manufacturers shall be coordinated with all other trades by the Contractor and approved in writing on letterhead by the Engineer before the ordering of the equipment from the manufacturer. Any resultant modifications required shall be performed without incurring additions to the contract price.

- M. The Contractor shall verify delivery dates for timeliness. Desired product substitutions shall be brought to the Engineer's attention in accordance with Section 01 25 13 Product Substitutions Procedures. No consideration shall be given to substitutions after bids are received.
- N. Contractor shall furnish and install at the job site the equipment, material, labor and services as specified herein and shown on the drawings.

1.6 DRAWINGS:

- A. Drawings are diagrammatic and indicate the general arrangement of systems and work included in the contract. Drawings are not to be scaled. All drawings and details shall be examined and coordinated by the Contractor to establish exact location of piping and equipment. Where conflicts occur, the Contractor shall inform the Owner immediately.
- B. The Contractor shall follow all contract drawings in laying out work and shall check shop drawings of other trades to verify spaces in which work will be installed.

1.7 MAINTENANCE MANUALS:

- A. In addition to the requirements specified in the General Conditions, at the project's completion, the Contractor shall submit a complete system Operating and Maintenance Manual (O&M). The manual at a minimum shall include the following:
 - 1. The manual shall be composed of typed instruction sheets with large drawing sheets (not reduced) folded in with reinforced margin. It shall have a post binder system so that the sheets can be easily substituted and shall have a hard cover.
 - 2. The manual shall be organized into systems and shall contain the manufacturer's complete detailed operating and maintenance instructions with data sheets for each piece of equipment furnished under this project.
 - 3. Include a spare parts list for each major piece of equipment furnished for the project including but not limited to:
 - a. Manual Valves
 - 4. Provide a comprehensive list of maintenance procedures for preventative maintenance and troubleshooting; repair and reassembly, aligning and adjusting, and disassembly.

1.8 NAMEPLATES:

- A. All major equipment items shall have a permanent, stamped metal, nameplate. The nameplate shall be permanently attached to the equipment in a manner such that it does not hinder the operation of the equipment. All nameplates shall be protected from overspray during field painting operations. Nameplates shall generally include the applicable items in the following list:
 - 1. Manufacturer's Size and Type
 - 2. Serial Number
 - 3. Design Capacity
 - 4. Design Pressure
 - 5. Design Temperature
 - 6. Code Conformance

1.9 CODE REQUIREMENTS AND PERMITS:

- A. All work indicated on the contract drawings and herein specified shall conform to all applicable codes or laws of the State of Texas and any other governmental bodies having jurisdiction and shall be installed to the satisfaction of the inspecting authority.
- B. Any deviations from the contract documents or specifications required for conformance with the applicable codes or laws shall be made without change in contract price, but not until such deviations have been brought to the attention of, and approved in writing, by the Engineer.
- C. The applicable codes and laws shall govern the minimum requirements only. Where the drawings or specifications call for materials, construction limitations, or other similar requirements in excess of the code requirements, the drawings and specifications shall be followed.
- D. The Contractor shall obtain and pay for permits and licenses, and shall pay all fees and taxes and give all notices bearing on the conduct of the work as drawn and specified. Certificates of compliance, approval, or acceptance from all authorities having jurisdiction over the work shall be obtained and delivered to the Owner.
- E. All work indicated on the drawings and herein specified shall conform with all applicable standards of the National Fire Protection Association, American Petroleum Institute, Energy Institute, American National Standards Institute and American Society for Testing and Materials.
- F. All work indicated on the drawings, and herein specified, or tasks required in the performance of the work but not specifically indicated in the drawing or specifications, shall conform with the applicable requirements of the Occupational Safety and Health Administration (OSHA) as provided in 29 CFR. Applicable requirements include, but are not limited to, Part 1910 – Occupational Safety and Health Standards and Part 1926 – Safety and Health Regulations for Construction.
- G. All equipment, materials, and specialties shall be installed and connected in accordance with the best engineering practice and standards for this type of work. Unless otherwise specified or shown on the drawings, the recommendations and instructions of the manufacturer shall be followed for installing the work.
- H. The Contractor shall promptly notify the Owner in writing, of any instances in the specifications or on the drawings that are in conflict with any of the aforementioned authorities so that any required changes shall be adjusted before the contract is awarded. If the Contractor performs any work contrary to such laws, rules, regulations or recommendations, without notice, he shall bear all cost arising therefrom.

PART 2 - PRODUCTS - NOT APPLICABLE

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION:

- A. Contractor shall be responsible for the safety and protection from loss or damage of all equipment and material received until all the work under this contract is complete and the Contractor has received final acceptance. Protect all equipment and material during storage and prior to start-up, which shall include the coverings of all openings, protection against rust and other damage, etc.
- B. For all industrial control panels as defined by Article 100 and Article 409 of the NEC, determine the short circuit current ratings (SCCRs) in accordance with UL 508A. All industrial control panels shall be labeled with their SCCR in accordance with NEC Article 509 and UL 508A. Submit, with all equipment product data, each applicable equipment item's SCCR.
- C. Contractor shall ensure that all equipment installed as part of this contract shall be properly aligned, adjusted and lubricated before final acceptance.
- D. Contractor shall spot paint all equipment where the shop paint has been damaged or flaked off.
- E. Furnish all bolts, studs, nuts and gaskets for makeup of all connections to the equipment and replace all gaskets, bolts and fasteners damaged or as directed during the flushing process.
- F. All connections to equipment shall be made with socket welds, unions or flanges.

3.2 REQUIREMENTS:

- A. Mechanical and electrical designs are based on the requirements for the specified manufacturers listed in the equipment specification. Conduit sizes are selected on the basis of specified equipment. Increased manufacturers requirements necessitating piping changes, additional power conductors, controls, foundations, etc., or any changes required to accommodate any alternate or substitute manufacturer's equipment, other than as shown on drawings shall be provided without any increase in contract price by Contractor.
- B. Manufacturers, where specifically called for, must provide factory tests, unit installation observations, unit start-up and tests, etc., as specified. Signed reports shall be submitted to the Owner upon completion of these services. Subletting of these services will not be permitted. Compliance Submittals shall be accompanied with a letter of certification by the manufacturer that the specified services shall be provided. Failure to do so shall be cause to reject the Compliance Submittals.
- C. The Contract Drawings are in part schematic, intended to convey the scope of work and indicate the general layout, design, and arrangement. The Contractor shall follow these drawings in the layout of his work and shall consult general construction drawings, electrical drawings, and all other drawings for this project. Contractor shall verify all existing site conditions to determine all conditions affecting the work shown or specified. The Contract

Drawings are not to be scaled and the Contractor shall verify areas in which the work is to be installed.

- D. Follow drawings in laying out work, check drawings of other trades to verify spaces in which work will be installed, and maintain maximum space conditions at all points. Where space conditions appear inadequate, Owner shall be notified before proceeding with installation.
- E. All work shall be performed by trained personnel of the particular trade involved and shall be done in neat and workman like manner as approved by the Owner.
 - 1. Work shall be performed in cooperation with other trades and scheduled to allow timely and efficient completion of project.
 - 2. Furnish other trades advance information on locations and sizes of frames, boxes, sleeves and openings needed for work. Also furnish information and shop drawings necessary to permit other trades affected to install their work properly without delay.
 - 3. Where there is evidence that work of one trade will interfere with work of other trades, all trades shall assist in working out space conditions to make satisfactory adjustments.
- F. Work installed before coordinating with other trades causing interference with work of such other trades shall be changed to correct such condition without increase in contract price and as directed by the Owner.
- G. Where specific details and dimensions are not shown on the drawings, the Contractor shall take measurements and make layouts as required for the proper installation of the work and for coordination with all other work on the project. In case of any discrepancies between the drawings and the specifications, it shall be assumed by the signing of the Contract that the higher cost (if any difference in costs) is included in the contract price. The Contractor shall perform the work in accordance with the drawings or with the specifications, as determined and approved by the Owner.
- H. The Contractor shall be responsible for a scheduled sequence in performing the work so that it will not interfere with the Owner's operation. Before any work is started, the Contractor shall consult with the Owner and arrange a satisfactory schedule.
 - 1. Make temporary alterations as required to execute work so that all operations and services are maintained with the minimum possible interruption.
 - 2. Temporary shut-downs shall be segregated and shall be of the shortest possible duration. All facilities shall be kept in continuous operation unless Owner grants specific written permission to the contrary.
- I. It is the responsibility of the Contractor to monitor the construction area for the presence of flammable vapors and to assure the proper construction methods and equipment are used if hazardous conditions exist.

3.3 EXISTING CONDITIONS:

- A. Subcontractor shall inspect the site as required for knowledge of existing conditions. Failure to obtain such knowledge shall not relieve the subcontractor of the responsibility to meet existing conditions in performing the work under the Contract.
- B. Where new work cannot be installed without changes in existing plant, facility, or systems or where it is indicated on drawings to re-work an existing installation, this contract shall include alterations to existing work as required to install new work. Additions to the contract cost will not be allowed because of the Contractor's failure to inspect existing conditions.

- C. Existing conditions indicated on the drawings are taken from the best information available on previous contract drawings and from visual site inspection. They are not to be construed as "As Built" conditions, but are to indicate the intent of this work. It shall be the responsibility of the Contractor to verify all existing conditions at the project site and to perform the work as required to meet the existing conditions and the intent of this work indicated.
- D. Unless specified otherwise, all existing material and equipment shown or required to be removed from existing construction and not shown to be reused or turned over to the Owner shall become the property of the Contractor and shall be promptly removed from the site.
- E. Any existing material or equipment which is to be reused or is to remain in place and which is damaged by this Contractor in performing the contract work shall be repaired to the satisfaction of the Owner or shall be replaced with new equipment and material.

3.4 STORING MATERIALS:

- A. Unless otherwise arranged for by the Contractor, buildings of the Owner shall not be used for Contractor storage or job office purposes. Open or exposed space for storage of material and location of temporary job facilities will be allocated to the Contractor. The Contractor, at his own expense, shall provide any temporary structures such as trailers and sheds, as may be required for this purpose.

3.5 CUTTING AND PATCHING:

- A. The responsibility for the cutting of existing masonry and concrete which is required for the installation of new work shall be by the Contractor. The Contractor shall coordinate with the Owner before any cutting and obtain approval from the Owner prior to any cutting.
- B. Cutting shall be done with extreme care and in such a manner that the strength of the structure will not be endangered. Wherever possible, openings in concrete or masonry construction shall be by concrete saw or rotary core drill. Openings in any construction shall be cut the minimum size required for the installation of the work.
- C. Where openings or holes are cut in existing construction and the cutting breaks existing electrical circuitry, control circuitry, communications, conduit, or wiring, then it shall be the responsibility of the Contractor to have the circuitry, conduit, and rewiring re-routed as required and as approved by the Owner. Temporary completion shall be provided where necessary before the permanent re-routing and completion work is finished. All costs for this work shall be the responsibility of the Contractor and no additions will be allowed to the contract price.
- D. Where existing work is removed from openings in existing construction and the opening is not to be reused for new work, the opening shall be filled and patched to match existing adjacent construction.

3.6 ELECTRICAL COORDINATION:

- A. All electrical products and their installation shall be in accordance with Division 26 of these specifications.

3.7 TESTING LABORATORY SERVICES:

- A. The Contractor shall secure the services of an independent testing laboratory approved by the Engineer and Owner to perform all testing, witnessing and certification of materials. This applies to coating integrity, fuel acceptability, pressure tests and weld examinations.
- B. The cost for all laboratory services will be the responsibility of the Contractor.
- C. The laboratory shall:
 - 1. Cooperate with the Owner and Contractor; and provide qualified personnel promptly on notice.
 - 2. Perform specified inspections, sampling and testing of materials and methods of construction:
 - a. Comply with specified standards; ASTM, other recognized authorities and as specified.
 - b. Ascertain compliance with requirements of Contract Documents.
 - 3. Promptly notify the Owner and Contractor of irregularities or deficiencies of work which are observed during performance of services.
 - 4. Promptly submit 2 copies of reports of inspections and test to the Owner including:
 - a. Date Issued
 - b. Project Title and Number
 - c. Testing Laboratory Name and Address
 - d. Name and Signature of Inspector
 - e. Date of Inspection or Sampling
 - f. Record of Temperature and Weather
 - g. Date of Test
 - h. Identification of Product and Specification Section
 - i. Location in Project
 - j. Type of Inspection or Test
 - k. Observations Regarding Compliance with Contract Documents
 - 5. Perform additional pre-approved services as required by the Engineer, Owner, and Contractor.
 - 6. The laboratory is not authorized to:
 - a. Release, revoke, alter, or enlarge on, requirements of Contract Documents
 - b. Approve or accept any portion of work
 - c. Perform any duties of the Contractor
- D. The Contractor shall:
 - 1. Coordinate laboratory services, cooperate with laboratory personnel, provide access to the project and to manufacturer's operations.
 - 2. Furnish to laboratory preliminary representative samples of materials to be tested, in required quantities.
 - 3. Furnish labor and facilities:
 - a. To provide access to work to be tested
 - b. To obtain and handle samples at the site
 - c. To facilitate inspections and tests
 - d. For laboratory's use for storage of test samples

4. Arrange with laboratory and pay for pre-approved additional samples and tests required for Contractor's convenience.
5. The Owner shall reserve the right to request the Contractor to obtain the services of a separate, equally qualified independent testing laboratory, to perform additional inspections, sampling and testing required when initial test indicate work does not comply with contract documents. The Contractor shall pay the costs of such retesting.

3.8 WARRANTY BY CONTRACTOR:

- A. Warrant all systems, equipment, materials and components installed under these specifications for a period of not less than one (1) year from time of beneficial use of the facility and systems by the Owner. Coatings shall be warranted for a period of five (5) years for pitting, rusting, and adhesion.

END OF SECTION 33 52 43.00