

## **SECTION 33 52 43.30 - FUEL SYSTEM ELECTRICAL GENERAL**

### **PART 1 - GENERAL**

#### **1.1 GENERAL**

- A. The general provisions of the contract outlined in Divisions 00 and 01 apply to work included in this specification.

#### **1.2 DESCRIPTION**

- A. This division of the Specifications, Division 33, covers the complete fueling electrical systems as indicated on the drawing or as specified herein. Provide all materials, labor, equipment and supervision to install electrical systems.

#### **1.3 QUALITY ASSURANCE**

- A. Building Codes
- B. All electrical work shall be in accordance with the following codes and regulations. Except where a specific date is given in the general conditions, specific conditions or herein, the issue in effect (including amendments, addenda, revisions, and supplements) on the date of the contract, shall apply.
  - 1. The National Electrical Code (NFPA 70)
  - 2. The National Electrical Safety Code (A.N.S.I. C2)
  - 3. The Life Safety Code (NFPA 101)
  - 4. Municipal ordinances governing electrical work
- C. Material Standards - All material shall be new and shall conform to the standards where such have been established for the particular material in question. Publications and Standards of the organization listed below are applicable to materials specified herein.
  - 1. American society for Testing and Materials (A.S.T.M.)
  - 2. Underwriter's Laboratories, Inc. (U.L.)
  - 3. National Electrical Manufacturer Association (N.E.M.A.)
  - 4. Insulated Cable Engineers Association (I.C.E.A.)
  - 5. Institute of Electrical and Electronic Engineers (I.E.E.E.)
  - 6. National Fire Protection Association (N.F.P.A.)
  - 7. American National Standards Institute (A.N.S.I.)

#### **1.4 PERMITS**

- A. Obtain all permits and inspections for the installation of this work and pay all charges incident there to. Deliver to the Owner all certificates of said inspection issued by authorities having jurisdiction.

## **1.5 WARRANTY**

- A. For warranty of work under 33 refer to the Conditions of the Contract and Division 1.

## **1.6 DRAWINGS**

- A. The drawings indicate the arrangement of electrical equipment. Review architectural drawings for door swings, cabinets, counters and built-in equipment; conditions indicated on architectural plans shall govern. Coordinate installation of electrical equipment with structural system and mechanical equipment and access there to. Coordinate installation of recessed electrical equipment with concealed ductwork and piping, and wall thickness.
- B. Do not scale drawings. Obtain dimensions for layout of equipment from Civil, Mechanical or Architectural plans unless indicated on Electrical plans.
- C. Bring all discrepancies shown on different drawings, between drawings and specifications or between documents and field conditions to the immediate attention of the Engineer.
- D. Equipment layout is based on one manufacturer's product. Where equipment is selected by the Contractor for use on the job differs from layout, the Contractor shall be responsible for coordinating space requirements and connection arrangements.

## **1.7 DEVIATIONS**

- A. The Contractor shall provide written notice of any deviations from the requirements of the contract or construction documents that he proposes to undertake. The Contractor remains liable for any deviations unless reviewed and written acknowledgment is received from the Engineer.

## **1.8 SUBMITTALS**

- A. General
  - 1. Refer to the individual sections for identified equipment and material for which submittals are required. Do not submit on equipment or materials not requested in the specifications.
- B. Emergency Fuel Shut-Off Pushbutton Stations and related components.
- C. Record Drawings
  - 1. Record documents shall in accordance with Division 1 requirements of this specification.
- D. Prior to the final inspection and at a time designated by the Engineer, provide number of sets as indicated in Division 1 of data on electrical equipment used in the project. Data shall be in bound form and shall include the following items:
  - 1. Shop drawings and product data of all equipment and materials specified to be submitted in the shop drawings and product data section of the specification.
- E. Certificates of inspection from authorities having jurisdiction.

- F. Refer to the Conditions of the Contract and General Requirements for record (as-built) drawings.
- G. Records Drawings(As-Builts)
  - 1. Provide and keep up to date a complete set of record (as-built) prints, which shall be corrected regularly to show electrical changes from original set of Contract Drawings, including Addenda, Modifications, Change Orders, field order, job decisions, etc. Project record set shall be kept as Record Drawings. Drawings to be dimensioned.

## **1.9 OPERATION AND MAINTENANCE INSTRUCTIONS**

- A. Prior to the final inspection and at a time designated by the Owner's Representative, the services of a competent representative shall be provided by the Contractor to instruct Using Agency in the operation and maintenance of each of the systems specified herein.
  - 1. Emergency Fuel Shutoff System

## **1.10 EQUIPMENT REQUIRING ELECTRICAL SERVICE**

- A. Review all specification sections and drawings including fuel systems, plumbing and HVAC drawings and Division 33 of the specifications for equipment requiring electrical service.
- B. Drawings indicate design loads and voltages and corresponding control equipment and feeders. If equipment furnished differs with those indicated on the drawings or specified herein, over current protection, control equipment and circuits shall be adjusted in size accordingly at no additional cost to OWNER.
- C. The products of specific manufacturers have been used as the basis of design. Any changes to the structure, piping, controls, electrical wiring, conduit, disconnecting means and branch circuit protection 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 by the Contractor without incurring additions to the contract price.
- D. 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.

## **1.11 SCHEDULING OF OUTAGES**

- A. Electrical work requiring interruption of electrical power for a period of more than two hours, which would adversely affect the normal operation of the other portions of the Owner's property, shall be done at the time other than normal working hours. Normal working hours shall be considered six a.m. to eleven p.m.
- B. Schedule all work requiring interruption of electrical power two weeks prior to actual shut down. Submit schedule in writing indicating extent of system to be de-energized, date and time when power is intended to be interrupted, and date and time power will be restored.
- C. Schedule shall be subject to the approval of the Engineer and the Representative of the Owner.

## 1.12 SITE INVESTIGATION

- A. Prior to submitting bids of the project, visit the site of the work to become aware of existing conditions which may affect the cost of the project. Where work under this project requires extension, relocation, reconnections or modifications to existing equipment or systems, the existing equipment or systems, shall be restored to their original condition before the completion of this project.

## PART 2 - MATERIALS

### 2.1 GENERAL

- A. All material shall be new.
- B. Furnish all materials specified herein or indicated on the drawings.
- C. Materials of the same type shall be the product of one manufacturer.
- D. U.L. list material shall be U.L. label.

### 2.2 EFSO MANUAL PUSHBUTTON STATIONS

- A. EFSO manual pushbutton boxes shall be located per the requirements of NFPA 407. The manual pushbutton box shall be mounted to EFSO Pushbutton Station as detailed on the drawings with a mounting height of 54" from box centerline above finished grade. Pushbutton station shall be weatherproof and rated for use outdoors. Pushbutton stations shall be per the standards of DFW, see drawings for details.
- B. Each station shall be supplied with signage. Signage shall meet the requirements of NFPA 407 except that signs shall be reflective white background with red border, with red letters 2" high and ½" strokes; EFSO signage shall be designed to be mounted at a minimum height of 7 feet above the finish grade to bottom of sign. Final sign mounting height shall be approved by Fire Marshal prior to installation. Sign shall read "JET-A EMERGENCY FUEL SHUTOFF STATION PUSH." See drawings for details.
- C. Each station shall be supplied with DFW required signage. Signage shall be supplied for EFSO station identification. Sign shall be 6" x 10", orange background with black lettering a minimum of 3/4" tall, phenolic material, and shall be mounted by rivet or a nut/bolt combination. The use of adhesives is not permitted. Attachment devices shall be stainless steel. See drawings for details.

### 2.3 SPARE PARTS AND ATTIC STOCK

- A. Prior to the final inspection and at the time designated by the Engineer, turn over to the Owner spare parts or attic stock consisting of the following materials in the quantity specified. Materials shall be new, in the original packing, of the same manufacturer and type as installed on the project and comply with these specifications receive receipt for all materials turned over to Owner.

## **PART 3 - EXECUTION**

### **3.1 EMERGENCY FUEL SHUTOFF SYSTEM (EFSO)**

- A. Upon completion of all work, each new station shall be manually operated and it shall be verified that the corresponding button symbol located on the existing OnyxWorks computer and Wonderware graphics screen are displayed as pressed, and that the fuel farm is correctly notified and all audio/visual alarms are working properly. Test results shall be recorded and submitted for record.

### **3.2 MODIFICATION OF EXISTING CONTROLS**

- A. The existing control system consisting of the Fuel Farm Notifier OnyxWorks graphics computer will accommodate the addition of the new EFSO Pushbutton Stations at Terminal A and C piers. Ensure new EFSO Pushbutton Stations at Terminal A and C piers are graphically represented on the existing OnyxWorks computer and Wonderware graphics screen.
- B. Activation of EFSO Pushbuttons at Terminal A and C Piers shall be programmed to initiate the same sequence of operations as all existing EFSO Pushbutton at Terminal A and C.
- C. Controls integrator shall be Custom Control Mfr.
  - 1. Location: Overland Park, KS
  - 2. Phone Number: (913) 722-0343

### **3.3 PRODUCT DELIVERY, STORAGE, HANDLING AND PROTECTION**

- A. Refer to the general requirements section of the specifications, Division 1, for storage, protection, and handling requirements.
- B. Inspect material upon arrival at Project and verify conformance to Contract Documents. Prevent unloading of unsatisfactory material.
- C. Provide trailers or shed for storage of materials, equipment, tools, etc., requiring such a facility. Areas for general storage trailers or sheds shall be provided by Contractor.
- D. Provide dry, weathertight place for storing materials requiring protection from weather.
- E. Store packaged materials in original undamaged condition with manufacturer's labels and seals intact.
- F. Handle and store materials in accordance with manufacturer's and supplier's recommendations and in manner to prevent damage to materials during storage and handling. Replace damaged materials.
- G. Containers which are broken, opened, watermarked, or otherwise damaged materials are unacceptable and shall be removed from premises.
- H. Provide protection against direct sunlight, rain, snow, wind, ice, or heat for suitable storage of materials or equipment delivered to site to be incorporated into Project.

- I. Equipment and materials shall not be installed until such time as the environmental conditions of the job site are not suitable to protect the equipment or materials. Conditions shall be those for which the equipment or materials are designed to be installed. Equipment and materials shall be protected from water, direct sunlight, cold or heat. Equipment or materials damaged or which are subjected to these elements are unacceptable and shall be removed from the premises and replaced.

### **3.4 CLEANING AND PAINTING**

- A. Remove, oil, dirt, grease and foreign materials from all raceways, fittings, boxes, panelboard trims and cabinets to provide a clean surface for painting. Touchup scratched or marred surfaces of lighting fixtures, panelboard and cabinet trims, or equipment enclosure with paint furnished by the equipment manufacturers specifically for that purpose.
- B. Unless indicated on the drawings or specified herein to the contrary, all painting shall be done under the "painting", Section of these Specifications.
- C. Paint exterior, exposed conduit, conduit supports and hardware to match surroundings.
- D. Paint all rack structures in color matching surroundings, or, if no exterior wall, tank or piping to match, paint rack support structures dark bronze color.
- E. Painting shall be in accordance with Division 09 of these specifications.

### **3.5 EQUIPMENT CONNECTIONS**

- A. Connect all equipment requiring electrical connections under Division 26 of these specifications. Where electrical connections to equipment require specific locations, obtain locations from shop drawings.
- B. Electrical circuits to equipment furnished under other divisions of these specifications are based on design loads. If actual equipment furnished has loads other than design loads, revise electrical circuits and protective devices to be compatible with equipment furnished and in compliance with the National Electrical Code at no additional cost to the Owner.

### **3.6 ELECTRICAL SYSTEMS, OPERATIONAL TESTS, MANUFACTURERS SYSTEMS CERTIFICATION AND DESIGN AUTHORITY ASSISTANCE**

- A. Testing
  1. Refer to the individual specification sections for test requirements.
  2. Prior to the final inspection, the systems or equipment shall be tested and reported as herein specified. Submit test reports to the Owner's Representative for approval.
  3. All electrical systems shall be tested for compliance with the specifications.
- B. Manufacturers' Certifications
  1. The electrical systems specified herein shall be reviewed for compliance with these specifications, installation in accordance with the manufacturer's recommendations and system operation by a representative of the manufacturer. The manufacturer shall submit certification that the recommendations and is operating in accordance with the specifications.

2. Provide manufacturers certification for the following systems:
  - a. Emergency Fuel Shutoff System

C. Design Authority Assistance

1. The Contractor shall provide personnel to assist the Owner's Representative during all construction review visits. The Contractor shall provide all necessary tools and equipment to demonstrate the system operation and provide access to equipment, including screwdrivers, wrenches, ladders, flashlights, circuit testing devices, meters, keys, lifts, vehicles, etc.
2. Remove equipment covers (i.e. panelboard trims, motor controls, device plates, and junction box covers) as directed for inspection of internal wiring.
3. Energize and de-energize circuits and equipment as directed. Demonstrate operation of equipment as directed by the representative.
4. The Contractor shall provide authorized representatives of the manufacturers to demonstrate to the Engineer compliance with the specifications of their respective system during or prior to the final inspection at a time designated by the Engineer. Refer to the specific specification section for additional testing requirements for demonstrations:
  - a. Emergency Fuel Shutoff System

**END OF SECTION 33 52 43.30**