"*FIRST RESPONDER 4*"FOUR FOLD DOORS
Model# FF400-FR-DSI

Section 08350-"First Responder 4" (Fire station door) Four Fold Doors- with Single Overhead Mounted Operator

Part 1-General

1.1 Related Document:

A. Drawing and general provisions of contract, including general and supplementary conditions and division 1 specification section, apply to this section.

1.2 Work Included:

A. Provide all labor, equipment, materials and services required to execute and complete all items of work in connection with furnishing and installing the Four fold doors, including the tubular mounting frames described herein. All work shall be in accordance with the specifications and drawings.

B. **References:**

1. AWS- American welding society
2. AISC –American Institute Of Steel Construction
3. NFPA 70- National Fire Protection Association 2002
4. NEMA MG1- Motors and Generators; National Electrical Manufacturers Association 1998

A. Operation Cycle: One complete cycle of a door begins with the door in the closed position. The door is then moved to the open position and back to the closed position.

1.3 Performance Requirements

A. Provide UL labels on applicable devices.

B. Structural Performance: Provide four fold doors, supporting components, and operating mechanism shall be capable of withstanding the effects of gravity loads and the following loads and stresses without evidencing permanent deformation of door components. It shall be dependable for use in "FIRE STATIONS"

1. Wind Load: Uniform pressure (velocity pressure) of 20 lbf/sq. ft. (1.0 Kpa) acting. Inward and outward

C. Operation-Cycle Requirements: Design four fold door components and operator to operate for not less than 100,000 cycles.

1.4 Guarantee

A. Provide to the owner a written guarantee, warranting the doors against any defects or materials and/or workmanship for the new door for a period of 2 years. With proper maintenance, commencing from the date of final acceptance of the project. Motors shall be guaranteed for a period of 2 years. State that all door and control work that becomes defective during the guarantee period shall be repaired promptly, to the requirements of these specifications and at no cost to the owner.

1.5 Quality Assurance

A. Steel frames shall be designed in accordance with AISC" Steel Construction Manual"

B. Installation work shall only be carried out by the unit manufacturer or by an approved installation specialist approved by the unit manufacturer.

C. Source Limitations: Obtain four fold doors through one source from a single manufacturer.

1. Obtain operators and controls from the four fold door manufacturer.

1.7 Requirements of Regulatory Agencies

A. Equipment and installation shall comply with local, state and federal laws and other mandatory requirements. Be responsible to insure an installation which is in compliance with such laws and regulations and all changes or alterations required by the authorized inspector or the authority having jurisdiction to be made without increase of subcontract price. Systems shall bear labeling for electrical equipment form the following standards;

1. Underwriters Laboratory 508 electrical standards.

1.8 Product Delivery, Storage and Handling

2. Delivery- deliver materials to job site in wooden crates with proper packing materials protecting the finish of the door and with packaging labels
3. Handle components with care. Protect against damage, dirt, disfigurement and weather.

4. Protect other work resulting from work of this section. Replace work, which cannot be satisfactorily repaired or restored at no additional cost to the owner.

1.9 Submittals

A. Submit detailed shop drawings of all work, and list the location in the building for each door. Clearly show and describe in detail, detailed door assemblies, and adjacent construction, including elevations, sections, and details of door, track, hardware, and operating components, dimensions, finishes and relationship of door, frames, track, hardware and operating components to adjacent construction.

B. Submit printed operation instructions and maintenance data for the doors as follows:

1. Wiring diagrams: “as built” straight line wiring and schematic diagrams showing electrical connections and control circuitry.
2. Instructions showing operation.
3. Lubrication chart indicating lubrication points and type of lubricant recommended for equipment.

C. LEED Submittals:
1. Provide the overall value of materials and separate value breakout for materials that contribute to materials and resources credits on LEED worksheets. All steel products have a default of 25% recycled content.

D. Product Data: Provide product literature supporting compliance of the product with specified requirements

Part 2-Products

2.1 Manufacturers and Products

A. Manufacturer: Subject to compliance with requirements. Provide products as manufactured by International Door, Inc. (734) 459-3000, or approved equal by the architect and owner.

B. Model # FF400-FR-DSI

C. Doors shall be of steel construction, and of four fold type as indicated on contract drawings.

2.2 Door Design

A. Design doors to withstand horizontal wind loads in closed position of 20 pounds per square foot positive and negative wind load. Maximum deflection under full design load shall be 1/120 of the span. Fiber stress in main members shall be limited to 27,000 PSI. Steel frames shall be designed in accordance with”AISC Steel Construction Manual”

2.3 Materials

A. Structural Steel: ASTM A36/A36M
B. Steel sheets: Steel sheets of commercial quality complying with ASTM A366/A366M cold –rolled steel sheet Or A569/A569M hot rolled sheets.
C. Steel Tubing, structural welded : ASTM A500 Grade B
D. Hardware: Manufacturer’s standard components
E. Fasteners: Zinc coated

2.4 Door Material and Construction

A. Stiles and rails shall be of structural steel tubing, not smaller than 4”x 3”x 3/16” with all joints welded and ground smooth. Bracing shall consist of horizontal and vertical tubular sections, to adequately stiffen the door panels.

B. Door leaves shall be faced on the exterior side with 14-gauge sheet steel welded to stiles, rails and bracing members from the inside. There shall be no exposed welds on exterior panels. All exterior doors shall be fully insulated with fiberglass thermal insulation, full thickness of panel: door shall be covered on the inside with 14-gauge sheet steel welded to stiles, rails and bracing members. All interior welds are to be ground smooth

C. Surface Mounted Tube Frame: Manufacturer shall supply pre-hung tube frame system, designed to anchor to structural support OR masonry as provided per project documents. All hinges, track supports and operator supports shall be weld attached at the factory

D. Operating Hardware:
   1. All hardware shall be heavy duty, industrial type. Hardware shall include guide track, brackets, trolleys, center guide jamb and fold hinges, bolts, nuts and all fasteners etc.Guide track shall be formed from 3/16" steel plate. Trolleys to include horizontal and vertical rollers fitted with anti friction bearings.
   2. Jamb &Fold Hinges are fitted with "Timken" thrust bearings and needle roller radial bearings. The hinge pintel shall be not less than 1 ¼" diameter solid steel. All hinges are equipped with grease fittings.
   3. Doors with motor-operators shall have fail-safe safety edges on the leading edges of both leading leaves.

E. Weather stripping shall be provided and installed along the bottom of each leaf and at vertical joints of leaves at centerline, to provide a substantially weather tight installation. Weather strip material shall be cloth inserted neoprene adjustable and readily replacebale.

F. Vision panels: provided vision panels 1" thk insulated ,laminated high performance glass size, shape, and location as indicated on the drawings

2.5 Door Finishes

Factory primed with manufacturer's standard epoxy Primer OR sand blasted and Factory applied exterior grade polyurethane, OR POWEDERCOAT, color as selected by customer using "RAL" standard.

2.6 Operator

A. Four fold door shall be operated by an overhead mounted electro-mechanical drive unit, designed for heavy duty operation. Operator consists of a single electric geared brake motor, and rotating drive arm. The door shall be operated with connecting rods attached to the rotating drive arm on the operator and to control arms attached to the jamb door sections and to the door lintel. The connecting rods shall be positive drive, keeping the door under firm control at all times. The connecting rods shall be fitted with spherical bearings and control arms shall be fitted with permanently lubricated ball bearings

Operator shall open and close door with smooth acceleration and deceleration, easily and quietly without jarring under all conditions of wind pressure. Operator shall be adjustable to allow door to clear the opening. Operator shall automatically lock the door in the closed position. Operator shall be equipped with disconnect mechanism to convert to freewheeling mode for manual operation. Motor, brake, and open and close limit switches are to be factory mounted and pre-wired to a terminal block in a NEMA 12 enclosure mounted on door operator. All materials necessary for the pre-wired assembly shall conform to J.I.C. electrical standards for equipment and connections. The door contractor shall furnish and install the electric door operator including the motor, with "open-close" limit switches, hand chain disconnect switched, solenoid, brake, all pre-wired to a terminal box mounted adjacent to the motor.

B. Motor shall be 220/440 volt, 3 phases, 60 cycles, totally enclosed, ball bearing, and continuous duty and of capacity sufficient to operate the door at specified speed without exceeding a temperature rise of 55 degrees Celsius. Braking device to be operated automatically by a solenoid and be adjustable to suit the requirements of the door.

C. Comply with NFPA 70 and NEC

D. Electric Controls: Controls shall be furnished by the door manufacturer and shall be built in accordance with the latest NEMA/NEC standards. The control panel shall bear U.L Label. (Per UL 508). Control circuits shall not exceed a nominal 110volts

1. Controls shall include magnetic reversible starter OR variable frequency drive factory wired with overload and under voltage protection and equipped with mechanical and electrical interlocks, and with the control transformer, necessary relays, timers etc.
2. Enclosure shall be NEMA4 with fusible disconnect. All control components shall be mounted inside the enclosure with a wiring diagram placed inside the enclosure in a pocket
3. Push buttons for operating station shall be momentary pressure three-button station marked" OPEN, CLOSE and STOP". Push button enclosure shall be NEMA4
4. Limit switches shall be provided to stop the travel of the door in its fully open or fully closed positions
5. Photo eyes: Door to be equipped with a minimum of one set of transmitter/ receiver style photo eyes to prevent automatic door closing when vehicle is passing.
6. Radio Control: Provide (1) radio receiver and (2) transmitters per door as required by the project
7. Presence sensor NEMA 4X: Provide (1) interior overhead mounted Presence sensor.
8. Timer Activation: Provide loop detector to activate auto close timer once loop has been activated and cleared. Include hand/auto switch to deactivate timer.

2.7 Reversing Fail Safe Safety Edge

A. Door manufacturer shall provide and install a rubber-encased, reverse action safety mechanism on the electrically-operated four- fold doors leading edges. The system is continuously energized and operates through the electrical system to stop the closing travel of the door on contact with an obstruction, providing an instantaneous reversal of the door travel to the full open position. Failure of any component prevents closing of door. A multi-conductor cord from an electrical junction box on the lead door leaf is provided for the safety edge. The safety edge system shall be catalog # IDI-FSSE-2K as manufactured by International Door, Inc.

2.8 Wiring

Door manufacturer shall supply controls only. Electrical contractor shall install controls and furnish and install all conduit and wiring

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Part 3- Execution

3.1 Installation

A. Installation of the four-fold doors shall be by the manufacturer or a duly authorized agent who is qualified to do this installation. The four- fold door installer shall be responsible for mounting the door guides and hanging the door panels plumb and true with weather-stripping. The door installer will make the final adjustments of the limit switches to ensure proper operation of the doors

B. The door manufacturer shall have total responsibility for the installation of the doors.

C. Koil kords or S.O. cords: The fail -safe safety edge shall be wired with koil kords or S.O. cords. Koil kords or S.O. cords shall be furnished by door manufacturer.

3.2 Adjusting

A. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
B. Any repairs that required an account of faulty materials, workmanship, design or door construction shall be made at no additional charge to the owner.

3.3 Demonstration

A. Startup services: Engage a factory-authorized service representative to perform startup services and to train owner's maintenance personnel as specified below:

1. Train owner's maintenance personnel on procedures and schedules related to startup and shutdown, troubleshooting, servicing, preventive maintenance and procedures for testing and resetting release devices.

2. Review data in the maintenance manuals. Refer to division 1 Section "Contract Closeout"

3. Schedule training with owner with at least 7 days advance notice.

END OF SECTION 08350