SECTION 08350

ELECTRIC VERTICAL LIFT DOOR
TYPE I – ONE LEAF – EXTERIOR MOUNT

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to the Work of this Section.

1.02 SUMMARY

A. This Section describes the requirements for providing electric vertical lift doors as shown on the Drawings and as specified.

B. Provide complete operating door assemblies including door sections, guides, hardware, operators, controls, and installation accessories.

C. Concrete or grout work is specified in Division 3, and is by others.

D. Opening framing is specified in Division 5, and is by others.

E. Finish painting is specified in Division 9, and is by others.

F. Electrical connections, including disconnects, conduit, wire, junction boxes, and field wiring of high or low voltage systems for powered operators and accessories are specified in Division 26, and are by others.

NOTE: Be sure to specify work in Division 3, 5, 9, 26, and any others.

1.03 SUBMITTAL

A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

B. Product Data: Submit manufacturer's product data, roughing-in diagrams, and installation instructions for each type and size of electric vertical lift door.

Provide operating instructions, maintenance information, and electrical rough-in instructions.

C. Shop Drawing: Show construction details; clearance requirements, metal gauges, finish, electrical requirements, and interface requirements for Work of other Sections of this Specification.

D. Door Manufacturer shall submit a reference list including names and telephone numbers of five (5) successful installations of this type within the past two (2) years.

1.04 QUALITY ASSURANCE

A. Furnish each electric vertical lift door as a complete unit produced by one manufacturer, including hardware, accessories, mounting and installation components.

B. Door manufacturer shall have at least 10 years experience in manufacturing doors of the type specified.

C. Single Source: Furnish electric vertical lift door units by one manufacturer for entire Project.

D. Inserts and Anchorages: Furnish setting drawings and information for installation of anchorage devices. Coordinate delivery with other Work to avoid delay. See concrete and masonry Sections of these Specifications for installation of inserts and anchorage devices.

E. Design Criteria: The door panels will be designed such that they will not deflect more than L/120 of their span under a minimum windload of 20 pounds per square foot with calculations based on the premise that the door panels are supported on the two non-spanning edges. Loads shall be applied to the vertical perimeter members. Door components shall be designed in accordance with the following specifications of latest adoption:

1. Shapes, Plates, and Bars – AISC Specification for the design, fabrication, and erection of structural steel for buildings.

****Check Local Codes for actual wind loads****

F. Submit written certification verifying door assembly ability to support specified loads.

PART 2 – PRODUCTS

2.01 MANUFACTURER

A. Project design is based on materials and systems of:

Electric Power Door, 522 West 27th Street, Hibbing, MN 55746, 1-800-346-5760, www.electricpowerdoor.com

B. Similar materials and systems of other manufacturers will be considered for substitution, providing that all items of the specification are complied with and subject to the requirements Division 1, "Substitutions".

2.02 MATERIALS AND FABRICATION

A. General: Comply with the following standards for forms and type of materials for required items of work.

1. Structural Shapes and plates: ASTM A36
2. Castings, Cast Iron: ASTM A48
3. Face Sheets: Steel sheet metal, flat, hot rolled, 14 gauge minimum ASTM A1011

B. Door Panel Construction: Custom metal fabrications as indicated.

1. Door panel frames will have both horizontal and vertical structural framing, and shall be 4" minimum thickness constructed of standard structural steel channels and angles of ample size and strength for loads and stresses imposed under the specified conditions. Interior door panel frame members shall not be spaced at more than 24 inches center to center. The interior members shall run vertically. Pan style construction or the use of cold/hot formed sheet metal channels, hats, angles, or other formed members in the panel construction will not be allowed.

2. Door panel frames shall be of welded construction and all joints shall develop the full strength of the framing members. Frame members shall be true to dimension and square in all directions and shall not be bowed, warped, or out of line by more than 1/8" in 20 feet.

3. Door panel frames shall be sheeted on both sides with 14 gauge flat hot rolled steel which is welded to the door panel frame. All exposed seams of the door panel sheeting shall be caulked with adhesive caulk after fabrication and prior to prime painting.

4. Door sections shall be insulated with a minimum of 2" of fibrous glass batt-type insulation providing a U-value of .12 or less. The insulating material shall be fitted to cover the entire surface of the door panel between the structural members.

5. **Door Panel Options: Door panel can be provided with windows, personnel doors, and / or louvers. If items are required, specify type, size, quantity, and configuration.**

6. Door guide assemblies (tracks) shall consist of a series of structural shapes and plates arranged as shown on the plans. Guide assemblies shall be fabricated for field bolting or welding to the structural framing as required for a rigid installation. Minimum thickness of the door guide plate materials shall be ¼". Door guide angles shall be ¼" thick minimum.

7. Steel plate sectional counterweight shall be provided to properly balance door panel for easy operation. Cast iron counterweight will not be allowed. The counterweight shall be contained in a steel plate box, which is suspended on cables attached to the door, operating over cast iron sheaves. Counterweight box shall be guided throughout the full height of travel by a counterweight enclosure (tower) with internal guides. Counterweight guide tower material shall be ¼" minimum. The counterweight tower shall be enclosed with 14 gauge steel the full height.

8. Weather hood Structure – Door manufacturer to provide weather hood structure. Weather hood can be constructed similar to door panel or can be frame construction sheeted with exterior building cladding. **Specify weather hood type and the exterior cladding material if required.**

9. Exposed welds and welds which interfere with the installation of various parts shall be ground smooth.

2.03 HARDWARE

A. Provide hardware necessary for a complete installation. Hardware shall be heavy duty type, including all bolts and fittings for the hardware as follows:

1. Guide Rollers: The doors shall have a minimum of eight 1 ¼" minimum diameter anti-friction bearing cam followers per panel. Two cam followers at each corner shall engage single angle steel door guides and guide the panel up and down. The cam followers and support bracketry shall be of sufficient size to transmit the wind load from the door panel to the steel door guides. Metal to metal sliding guides will not be allowed. Cam followers shall not extend above or below the door panel. The cam rollers will be easily accessible through the door access panels and will be easily removable for maintenance or replacement purposes. Cam follower brackets will be bolted on.

2. Cable System: Provide all necessary wire rope, sheave assemblies, and fittings to make this system operable. Wire ropes shall be designed to sustain the dead weight of door panel plus 25% impact allowance with minimum safety factor of five. The ends of the wire ropes at the door panel shall be equipped with turnbuckles or other means for independent adjustment. Traction sheaves shall be 12" Ø minimum and idler sheaves shall be 8" Ø minimum. All idler sheaves shall be provided with sealed roller bearings. All cables supporting the doors and counterweight shall be 6x36 IWRC type.

3. Safety Catches: The door panel shall be provided with two (2) emergency stop devices, one at each side. The devices will impede the downward slide of the door panel should a cable break or there is an attachment failure.

4. Weatherstrip: Doors shall be completely weather stripped with snap-on type weather seal at the jambs and head with a combination reversing edge and rubber seal on the bottom edge of the door panel.

5. Operating Unit: Doors shall be suspended on wire ropes reeved from the panel over traction sheaves to counterweights. Traction sheaves shall be driven by motor operator (**specify if mounted on top of tower or at floor level**) with auxiliary hand crank operation. Pull required on hand crank to open the door shall not exceed 20 pounds. Electric power operator shall be complete with electric gear motor, magnetic brake, brackets, and other accessories specified and required. The power operator shall be designed such that the gear motor may be removed without disturbing the limit switch setting and without affecting the emergency operation. Provisions shall be made for immediate emergency manual operation of door in the event of electrical failure. The emergency operating mechanism shall be arranged such that it can be placed in and out of operation from the floor and its use shall not affect the timing of the limit switches.

   Manual operation shall be by means of a hand crank connected to the drive system by a roller chain drive. A manual interlock switch shall be provided to disconnect the motor when the manual operating hand crank is engaged. Emergency operation of door by operating through the motor gearing will not be permitted.

   a. Gear motor: Motor shall be high-starting torque type, with sufficient torque output to move door in either direction from any position and produce a door travel speed of not less than two-thirds, nor more than one foot per second, without exceeding the rated capacity. Motor shall be equipped with a magnetic brake. Motor shall conform to NEMA standards and shall be suitable for operation on 460V, 3 phase, 60 hertz current. **Specify different voltage if required.**

2.04 ELECTRICAL CONTROLS

A. Control Panel: Each door shall be furnished with a NEMA 4 control panel enclosure, housing a reversing across-the-line type magnetic motor starter having thermal-overload protection along with relays, fuses, terminal strips, and other electronic components as required to provide the specified operating sequences. All components shall be prewired to the terminal strips, and neatly labeled. Power circuits in excess of 200 volts shall be provided with control transformers

to reduce voltage in the control circuit to either 24 volts or 120 volts. Control panel assembly shall be U.L. labeled. **Specify other NEMA Classes if required.**

B. Pushbuttons: Pushbuttons shall be located on the interior of the building where shown and shall be the three-button type, with the buttons marked "OPEN", "CLOSE", and "STOP". The "OPEN" button shall be of the type requiring only momentary pressure by the operator to cause the door to go from the closed to the fully open position. The "CLOSE" button shall require constant pressure from the operator to maintain the closing motion of the door. When the door is in motion and the "STOP" button is pressed, the door shall stop instantly and remain in the stop position; from the stop position, the door may then be operated in either direction by pushing the "OPEN", or "CLOSE" button. Pushbuttons shall be NEMA 4 rated. **Specify other controls and sequences of operation if required.**

C. Limit Switches: Shall be NEMA rated switches.

D. Photo Eye: A fail-safe photo electric eye shall be provided. The photo eye will automatically reverse the door if an obstruction is in the door opening during closing. Photo eye shall be through beam type. Photo eye enclosure to be NEMA 4X or IP6.

E. Reversing Device: Pneumatic-type reversing edge shall be the full width of the door and located on the bottom of the panel. Reversing edge will automatically reverse the door should it come in contact with an obstruction during closing. The reversing edge shall not substitute for limit switches.

F. **Optional Items: Consult factory for details**

1. Programmable logic controller (PLC)
2. Variable frequency drive (VFD)
3. Radio controls with transmitters
4. Timed auto closing
5. Selector switch – Auto, Manual, Off
6. Electrical disconnect switch – non-fused, fused, or circuit breaker types available
7. Door interlocks – with other doors or equipment
8. Door position indicators

2.05 SHOP FINISHING

A. General: Thoroughly clean, pre-treat and prime surfaces of door assembly including fixed panels, trim, support, and closure pieces.

1. Pre-treatment: As required by primer manufacturer.

2. Primer must be compatible with field finish coating as specified in Division 9.

PART 3 – EXECUTION

3.01 INSPECTION

A. Verify that conditions are satisfactory for installation of electric vertical lift doors.

B. Do not proceed with the Work of this Section until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. The installation of doors shall be by a Door Company that is factory trained and certified by the door manufacturer or supervised by an authorized representative of the door manufacturer.

B. Install door and operating equipment complete with necessary hardware, jamb and head weather strips, anchors, inserts, hangers, and equipment supports in accordance with final Shop Drawings, manufacturer's instructions, and as specified herein.

C. Upon completion of installation including work by other trades, lubricate, test and adjust doors to operate easily, free from warp, twist, or distortion and fitting weathertight for entire perimeter.