

1 General

1.1 **SUMMARY**

.1 Section Includes

- .1 Labour, Products, equipment and services necessary to complete the Work of this section.
- .2 Be responsible for supplying and installing a door system that is complete in all respects and smoothly operating. Provide all components and accessories as specified or as required to meet this requirement.

1.2 **DEFINITIONS**

- .1 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.
- .2 NEMA ICS: National Electrical Manufacturers Association Industrial Control and Systems standard.

1.3 **DESIGN CRITERIA**

- .1 Design exterior doors to withstand the following specified (unfactored) wind loads in the closed position, with a maximum deflection under full design load of L/240 of the span:
 - .1 1.54 kN/m² positive (inward, toward the interior of the building)
 - .2 1.68 kN/m² negative (outward, toward the exterior)
- .2 Design operators to function against loading consequential to the foregoing.
- .3 Use the same design criteria where interior doors can be subjected to wind forces due to building arrangement.

1.4 **CODES AND REGULATIONS**

- .1 For electrical equipment and installation thereof, comply with all local and provincial laws, and with all other mandatory requirements. Be responsible to ensure an installation which is in compliance with all such laws and regulations, and all changes or alterations required by the authorized inspector of the authority having jurisdiction made without charge to the Owner.
- .2 It is the door manufacturer's responsibility to ensure that specified colour coding is acceptable to local jurisdiction.

1.5 **QUALITY ASSURANCE**

- .1 Installer: Retain door manufacturer or an installation specialist company licensed or franchised by door manufacturer.

1.6 **SUBMITTALS**

.1 Shop Drawings

- .1 Submit in accordance with Section 01 33 00.
- .2 Show and describe in detail:
 - .1 Detailed door assemblies.

- .2 Door elevations, sections and details, tracks, hardware and operating components, dimensions, gauges, finishes.
 - .3 Door operators, make, and horsepower rating.
 - .4 The relationship of the foregoing components to adjacent construction.
 - .5 Complete electrical schematics and wiring diagrams and sequence of door operation.
 - .3 Prepare Shop Drawings on one standard size drawing sheet. Standard "cuts" or stock drawings will not be acceptable.
 - .4 Confirm with a note that exterior doors meet the design requirements specified.
 - .2 Operation and Maintenance Data
 - .1 Submit printed operation instructions and maintenance data in accordance with Section 01 33 00.
 - .2 Indicate the following:
 - .1 "As-Built" straight line wiring diagrams showing electrical connections and control circuitry.
 - .2 Instructions explaining operation.
 - .3 Lubrication chart indicating lubrication points and type of lubricant recommended for equipment.
- 1.7 **HANDLING, STORAGE AND PROTECTION**
- .1 Handle components with care. Protect against damage, dirt, disfigurement and weather.
 - .2 Store on site off the ground, and in a covered location.
- 1.8 **WARRANTY**
- .1 Warrant Work of this section against defects and deficiencies for a period of three years from date Work is certified as substantially performed in accordance with the general conditions of the Contract.
 - .2 Promptly make good defects and deficiencies which become apparent within the Warranty Period by replacing defective Work satisfactory to the Consultant and at no expense to the Owner.
- 2 **Products**
- 2.1 **OVERHEAD DOORS**
- .1 Sectional doors are made of anodized tubular extrusions fastened with self-tapping screws which have a stop notch. The extrusions shall have a minimum diameter of 159 mm at the perimeter of the door. The top-to-bottom end of the aluminum extrusions shall be doubled at each end in order to obtain a minimum support of 159 mm. Doors 4.27 m wide and over will have 45 mm horizontal reinforcement integrated into the aluminum extrusions.

- .2 Acceptable Products
 - .1 " Polytite P175/P175T" by Richard-Wilcox
 - .2 Or equal from Upwardor, Garaga Inc. or Wayne Dalton.
- .3 Component Minimum Requirements
 - .1 Tubular aluminum extrusions are 1.6 mm thick, clear anodized in accordance with ASTM B209 and ASTM B209M and have additional 3.2 mm thickness where hinges are fastened.
 - .2 Bottom door section: Double-walled in 26-gauge, G60 galvanized steel. Polyurethane injected with a total thickness of 45 mm.
 - .3 Paneling 5/8" (16 mm) thick, triple-wall extruded polycarbonate clear panels, R= 2.5 ft² hF/Btu (U=2.271 W/ m²K), light transmission 74%, SHGC= 0.75 retained with polyethylene gaskets.
- .4 Hardware
 - .1 Track: 12 gauge galvanized steel, 76 mm. Horizontal track is reinforced with a steel angle of 50 mm x 50 mm.
 - .2 Hinges: 13 gauge galvanized steel.
 - .3 Rollers: 75 mm diameter with 10 ball bearings.
 - .4 Struts for large doors (if applicable): Doors 3759 mm wide or larger shall come with 22-gauge galvanized steel horizontal struts and 13-gauge double hinges at each end.
 - .5 Torsion-type springs: The lifting system will consist of all the parts and accessories required for its installation. Doors weighing more than 454 kg (hardware included) must be approved by a professional installer approved by the manufacturer to choose the hardware.
 - .6 Counterbalance: Job rated torsion springs helically wound from oil tempered steel wire for a minimum 100,000 cycle quality. Provide a cycle counter in the control panel.
 - .7 Locking device: Individual electrical interlock bolts designed to accommodate a card reading device. Provide a limit switch in each door to cut off power to door when interlock bolts are engaged. Card readers are supplied by the Owner.
 - .8 Hand chain: "Endless", heavy chrome plated steel.
 - .9 Weatherstripping to head, jambs and meeting rails: Factory applied, of type to ensure a weathertight seal. Design weatherstripping assembly for easy replacement when weatherstrip is worn. The weatherstripping shall be made of a semi-circular TPE tubing. Weatherstripping on the exterior side of the door jamb and lintel shall be an aluminum extrusion and a double-edged strip of arctic vinyl.

2.2 DOOR FABRICATION

- .1 Provide framing required to support doors, tracks and operators from structure.
- .2 Fabricate bottom section panels as follows, with:
 - .1 Plain exterior and plain interior steel facing.

- .2 Space between facings solidly filled with foamed-in-place insulation, fully face bonded to steel.
- .3 All ends closed and sealed.
- .4 Top and bottom edges rebated to fit tightly together, and to provide weathering.
- .5 Top panel sufficiently stiffened to carry load of panels below.
- .3 There shall be no visible welds, bolts, screws.
- .4 Fabricate the Work true to dimensions and square. Accurately fit joints and intersecting members with adequate fastenings.

2.3 **ELECTRIC OPERATORS AND CONTROLS**

- .1 Controls for Non-Loading Dock Doors:
 - .1 Control cabinet s at each overhead door: NEMA 12-Oil and Dust Tight by Allen Bradley, Ralston or Hammond, of size that provides easy access for removal of all components, with a face mounted fused disconnect switch.
 - .1 Interior pushbuttons: "OPEN-CLOSE-STOP", momentary contact ~~(maintained pressure)~~. Housing: NEMA 12-Oil and Dust Tight ~~(NEMA 1-General Purpose) (NEMA 4-Watertight) (NEMA 7-Explosion Proof) (NEMA 9-Explosion Proof)~~
 - ~~.2 Exterior pushbuttons: "OPEN-CLOSE-STOP", momentary contact (maintained pressure). Housing: NEMA 4-Watertight.~~
 - .3 Pull cord switches on interior only: Crouse-Hinds AFC 210 complete with safety coded polyethylene pull cords.
 - .4 Timer: Adjustable unit with range of one-half second to ninety seconds. Reset each time an opening control is activated during timer cycle.
 - .5 Starter: Size 1 reversing starter with electro mechanical interlocks.
 - .6 Door heater limit switch: To enable door heater to operate as soon as exterior door rises, Provide 120 V limit switch which will provide a dry contact closure when door is not in the fully closed position.
 - .7 Photo-electric control: Unit consisting of modulated light transmitter assembly and modulated light receiver assembly. The receiver shall feed modulated signal back to electric eye amplifier mounted in control cabinet. Mount to provide horizontal beam within range of bus driving through. Mount at interior side of door opening.
 - ~~.2 Induction loops: Solid state and self tuning inductive device. The system for actuation shall be unbalancing an inductive circuit by the entrance of mass of metal. Each loop detector unit shall handle no more than two loops at any given location. Loop detector shall have internal adjustable setting for time delay.~~
 - .3 Wire: Type RW90, 208V, not less than #12 AWG for power wiring, and #14 AWG for control.
 - .4 Conduit: Rigid galvanized steel with compression fittings.
 - .5 Control voltage: 24 V.

2.4 **FABRICATION**

- .1 Fabricate Work with materials and with component dimensions and gauges, reinforcing, attached anchors and fastenings of adequate strength to prevent warping, buckling, opening of joints and seams, loosening of hardware, distortion and displacement within limits of intended and specified use.
- .2 Conceal and weld connections wherever possible.
- .3 Fit joints and junctions between components tightly and in true planes.
- .4 Isolate from each other dissimilar metals, and metal from concrete or masonry to prevent electrolysis.

2.5 **SHOP FINISHING OF DOOR SYSTEM**

- .1 Phosphatize all galvanized metal surfaces to provide for adhesion of finish paint. Clean ferrous metal surfaces except working parts of machinery and faying surfaces and prime with a rust inhibitive primer. Clean supplementary steel supports and likewise, prime with a rust inhibitive primer.
- .2 Apply in the shop, specified paint system to a minimum dry film thickness of 100 microns (4 mils) in accordance with paint finisher's standards. For baked system, bake components prior to foam insulation application.

3 Execution

3.1 **INSTALLATION**

- .1 Supply information and templates required for installation Work. Assist and/or supervise setting of anchorage built into Work of other sections.
- .2 Drill, tap and cut frames and other Work as required to install doors, tracks, operators, hardware, fittings, etc., and Provide necessary bolts, anchors, inserts, and supplementary framing and supports required to complete the Work.
- .3 Provide material required to suspend tracks from walls or roof steel including members between joists.
- .4 Do not use fasteners which penetrate through walls.
- .5 Furnish inserts and anchoring devices which must be set in concrete or built in masonry for the installation of doors. Provide setting drawings, templates and printed instructions for the installation of the anchorage devices.
- .6 Install units to fit tight at edges of jambs and heads of frames and ensure smooth and free operation under all conditions of operation. Leave in proper condition in all respects.

3.2 **ELECTRICAL WORK**

- .1 Provide wiring, conduit and fittings, and interconnect all electrical components of door system, back to master control panel. Terminate wiring in master control panel and tag.
- .2 Provide equipment or contacts necessary for interlocking doors and levellers in a manner such that door does not close if leveller is not in down position or such that leveller cannot be raised if door is closed.
- .3 Where conduit is installed in slab, coordinate with Section 03 35 00.

- .4 Identify control and indicating devices on front panel of door control cabinets with lamacoid nameplates.
- .5 Nameplates shall be laminated phenolic plastic, white front with black core, with lettering etched through the outer covering. Letters to be black.
- .6 Tag motors, limit switches, etc, with brass tags indicating component number or function.
- .7 Identify conductors at all points of connection with Wieland Type Z wire markers. The identification shall correspond to the Shop Drawings.
- .8 Identify components, including inside of control cabinet.
- .9 Colour coding: Utilize the following throughout:
 - .1 Red - Phase A
 - .2 Black - Phase B
 - .3 Blue - Phase C
 - .4 Green - Ground
 - .5 White - Neutral
 - .6 Orange - Control
 - .7 Yellow - Interlock

3.3 **FIELD TOUCH-UP**

- .1 Touch up prepainted finishes disturbed during transport and installation using a spray formulation of the baked enamel paint.

3.4 **LUBRICATION**

- .1 Upon completion of erection of units and operating equipment, lubricate moving parts before operation.
- .2 Grease all sprockets, bearings, cables, link chains and guides. Lubricant shall be as recommended by the manufacturer.

3.5 **ADJUSTMENT AND DEMONSTRATION**

- .1 Test-operate doors and demonstrate the operation of same at the time of acceptance of the completed Work.
- .2 Adjust Work to provide free-running, tightly closing and properly counterbalanced operation. Ensure that installation is free from warp, twist, or other distortion.
- .3 Clean Work on completion of installation.

End of Section