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**SECTION 08 11 00**  
**STEEL DOORS AND FRAMES**

**PART 1 – GENERAL**

**SCOPE**

This Section describes all standard and non-standard steel doors and steel door frames delivered to the Project.

Part 1 – General

Scope

Definitions

Related Work

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Deliver, Storage, and Handling

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**DEFINITIONS**

Minimum Thickness: Minimum thickness of base metal without coatings.

Standard Hollow Metal Work: Hollow metal work fabricated according to ANSI/ SDI A250.8.

**RELATED WORK**

Applicable provisions of Division 1 shall govern all work in this section.

Division 8 Section 08 70 00 – Finish Hardware

**QUALITY ASSURANCE**

Standards:

Comply with applicable standards specified:

(BHMA) Builders Hardware Manufacturers Association

(SDI) Steel Door Institute

(NFPA) National Fire Protection Association

(UFC) Unified Facilities Criteria

(UL)Underwriters Laboratories, Inc.

(FM)Factory Mutual Research Approvals

(ANSI)American National Standards Institute

(ASTM)American Society for Testing and Materials

(FS)Federal Specifications (FS)

1  
2 Qualifications of Manufacturer:  
3 Products used in this work of this Section shall be produced by manufacturer regularly engaged in manufacture of  
4 similar items and with a history of successful production acceptable to the Architect.  
5 Qualifications of Installers:  
6 Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and  
7 who are completely familiar with the specified requirements and the methods needed for proper performance of the  
8 work of this Section.  
9 Single Source:  
10 All work of this Section shall be produced by a single manufacturer unless otherwise approved by the Architect.

11  
12 **SUBMITTALS**

13 Product Data: For each type of product indicated. Include construction details, material descriptions, core  
14 descriptions, and finishes.  
15 Within 15 calendar days after Notice to Proceed, submit:  
16 Design Calculations for framing design showing compliance with requirements of regulatory agency.  
17 Complete materials list of all items proposed to be furnished and installed under this Section.  
18 Manufacturer's specifications and other data required to demonstrate compliance with the specified requirements.  
19 Shop drawings showing details of each frame type, elevations of each door design type, details of all openings, and  
20 all details of construction, installation, and anchorage.  
21 The manufacturer's recommended installation procedures, when approved by the Architect, will become the basis  
22 for inspecting or rejecting actual installation procedures used on the Work.

23  
24 **DELIVERY, STORAGE, AND HANDLING**

25 Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project-site  
26 storage. Do not use nonvented plastic. Provide additional protection to prevent damage to finish or factory-finished  
27 units.  
28 Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and  
29 mullions.  
30 Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position  
31 with heads up, spaced by blocking, on minimum 4-inch-high wood blocking. Do not store in a manner that traps  
32 excess humidity.  
33 Protection:  
34 Use all means necessary to protect materials of this Section before, during, and after installation and to protect  
35 installed work and materials of all other trades.  
36 Replacements:  
37 In the event of damage, immediately make all repairs and replacements necessary to the approval of the  
38 Architect/Engineer and at no additional cost to the Owner.

39  
40 **PROJECT CONDITIONS**

41 Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.  
42

43 **COORDINATION**

44 Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions  
45 for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver  
46 such items to Project site in time for installation.  
47

48 **PART 2 – PRODUCTS**

49 **ACCEPTABLE MANUFACTURERS**

50 Curries Products, ASSA ABLOY  
51 Ceco Door Products, ASSA ABLOY  
52 Deansteel Manufacturing Company, Inc.  
53 Mesker Openings Group  
54

1 (MPI) Metal Products Inc.  
2 Pioneer Industries, ASSA ABLOY  
3 Premier Steel Doors and Frames  
4 Republic Doors and Frames, Allegion  
5 Steelcraft, Allegion  
6

7 **MATERIALS**

8 Cold-Rolled Carbon Steel: Cold rolled, ASTM A 1008/A 1008M, Commercial Steel (CS), Type B, suitable for  
9 exposed applications.  
10 Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface  
11 defects; pickled and oiled.  
12 Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel, (CS), Type B, with minimum G60 or A60  
13 metallic coating.  
14 Frame Anchors: ASTM A 591/A 591M, Commercial Steel (CS), 40Z coating designation; mill phosphatized. For  
15 anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M,  
16 hot-dip galvanized according to ASTM A 153/A 153M, Class B.  
17 Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.  
18 Powder-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from  
19 corrosion-resistant materials, with clips or other accessory devices for attaching hollow metal frames of type  
20 indicated.  
21 Closed Cell Foam Insulation: Quad Foam, Great Stuff, Dap Products.  
22 Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per  
23 coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious  
24 impurities.  
25

26 **STEEL FINISHES**

27 Factory-Applied Paint Finish: Manufacturer's standard, complying with ANSI/SDI A250.3 for performance and  
28 acceptable criteria.  
29 Color and Gloss: As selected by Architect from manufacturer's full range.  
30

31 **STANDARD HOLLOW METAL DOORS**

32 General: Provide doors of design indicated, not less than thickness indicated, fabricated with smooth surfaces,  
33 without visible joints or seams on exposed faces unless otherwise indicated. Comply with ANSI/SDI A250.8.  
34 Design: Flush panel.  
35 Core Construction: Manufacturer's standard polystyrene, polyurethane, polyisocyanurate, mineral-board,  
36 or vertical steel stiffener core.  
37 Thermal-Rated (Insulated) Doors: Where indicated, provide doors fabricated with thermal-resistance  
38 value (R-value) of not less than 6.0 deg F x h x sq. ft./Btu when tested according to ASTM C 1363.  
39 Locations: Exterior doors, and interior doors where indicated.  
40 Vertical Edges for Single-Acting Doors: Manufacturer's standard.  
41 Vertical Edges for Double-Acting Doors: Round vertical edges with 2-1/8-inch radius.  
42 Top and Bottom Edges: Closed with flush or inverted 0.042-inch-thick, end closures or channels of same  
43 material as face sheets.  
44 Tolerances: Comply with SDI 117, "Manufacturing Tolerances for Standard Steel Doors and Frames."  
45 Exterior Doors: Face sheets fabricated from metallic-coated steel sheet. Provide doors complying with  
46 requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for  
47 physical performance level.  
48 Level 3 and Physical Performance Level A (Extra Heavy Duty), Model 1 (Full Flush).  
49 Interior Doors: Face sheets fabricated from cold-rolled steel sheet unless metallic-coated sheet is indicated. Provide  
50 doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and  
51 ANSI/SDI A250.4 for physical performance level:  
52 Level 3 and Physical Performance Level A (Extra Heavy Duty), Model 1 (Full Flush).  
53 Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as  
54 door face sheets.

1 Fabricate concealed stiffeners and hardware reinforcement from either cold- or hot-rolled steel sheet.

2

### 3 **STANDARD HOLLOW METAL FRAMES**

4 General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.

5 Fabricate frames as face welded unless otherwise indicated.

6 Exterior Frames: Fabricated from metallic-coated sheet steel.

7 Fabricate frames with mitered or coped corners.

8 Fabricate frames as face welded unless otherwise indicated.

9 Frames for Level 3 Steel Doors: 0.053-inch-thick steel sheet.

10 Interior Frames: Fabricated from cold-rolled steel sheet unless metallic-coated sheet is indicated.

11 Fabricate frames with mitered or coped corners.

12 Fabricate frames as face welded unless otherwise indicated.

13 Frames for Level 3 Steel Doors: 0.053-inch-thick steel sheet.

14 Frames for Borrowed Lights: Same as adjacent door frame.

15 Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 with reinforcement plates from same material  
16 as frames.

17

### 18 **FRAME ANCHORS**

19 Jamb Anchors:

20 Post installed Expansion Type for In-Place Concrete: Minimum 3/8-inch-diameter bolts with expansion shields  
21 or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each  
22 anchor location.

23 Floor Anchors: Formed from same material as frames, not less than 0.042 inch thick, and as follows:

24 Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.

25 Separate Topping Concrete Slabs: Adjustable-type anchors with extension clips, allowing not less than 2-inch  
26 height adjustment. Terminate bottom of frames at finish floor surface.

27

### 28 **ACCESSORIES**

29 Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.

30 Ceiling Struts: Minimum 1/4-inch-thick by 1-inch-wide steel.

31

### 32 **OTHER MATERIALS**

33 All other materials not specifically described but required for the complete and proper installation of the work of this  
34 Section shall be new, first quality for their respective kinds and subject to approval of the Architect/Engineer.

35

### 36 **FABRICATION**

37 Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required  
38 sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in  
39 manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently  
40 factory assembled before shipment.

41 Tolerances: Fabricate hollow metal work to tolerances indicated in SDI 117.

42 Hollow Metal Doors:

43 Exterior Doors: Provide weep-hole openings in bottom of exterior doors to permit moisture to escape. Seal  
44 joints in top edges of doors against water penetration.

45 Astragals: Provide overlapping astragals on one leaf of pairs of doors where required by NFPA 80 for fire-  
46 performance rating or where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is  
47 mounted.

48 Hollow Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide  
49 alignment plates or angles at each joint, fabricated of same thickness metal as frames.

50 Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.

51 Sidelight and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints,  
52 fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.

53 Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise  
54 indicated.

1 Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.  
2 Jamb Anchors: Provide number and spacing of anchors as follows:  
3 Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not  
4 more than 32 inches o.c. and as follows:  
5 Two anchors per jamb up to 60 inches high.  
6 Three anchors per jamb from 60 to 90 inches high.  
7 Four anchors per jamb from 90 to 120 inches high.  
8 Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above  
9 120 inches high.  
10 Postinstalled Expansion Type: Locate anchors not more than 6 inches from top and bottom of frame.  
11 Space anchors not more than 26 inches o.c.  
12 Door Silencers: Except on weather-stripped doors, drill stops to receive door silencers as follows. Keep holes  
13 clear during construction.  
14 Single-Door Frames: Drill stop in strike jamb to receive three door silencers.  
15 Double-Door Frames: Drill stop in head jamb to receive two door silencers.  
16 Fabricate concealed stiffeners, edge channels, and hardware reinforcement from either cold- or hot-rolled steel sheet.  
17 Hardware Preparation: Factory prepare hollow metal work to receive templated mortised hardware; include cutouts,  
18 reinforcement, mortising, drilling and tapping according to Door Hardware Schedule and templates furnished as  
19 specified in Division 08 Section "Finish Hardware."  
20 Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.  
21 Reinforce doors and frames to receive nontemplated, mortised and surface-mounted door hardware.  
22 Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for  
23 preparation of hollow metal work for hardware.  
24 Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and  
25 moldings with butted or mitered hairline joints.  
26 Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow-metal work.  
27 Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of  
28 being removed independently.  
29 Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.  
30 Provide loose stops and moldings on inside of hollow metal work.  
31 Coordinate rabbet width between fixed and removable stops with type of glazing and type of installation  
32 indicated.  
33

### 34 PART 3 – EXECUTION

#### 35 EXISTING CONDITIONS

##### 36 Inspection:

37 Prior to all work of this Section, carefully inspect the installed work of all other trades and verify that all such work  
38 is complete to the point when this installation will properly commence.  
39 Verify that all hollow metal work may be installed in accordance with all product codes and regulations, the original  
40 design and their referenced standards.  
41  
42

#### 43 INSTALLATION

44 General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with  
45 Drawings and manufacturer's written instructions

46 Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11.

47 Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After  
48 wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.

49 Where frames are fabricated in sections because of shipping or handling limitations, field splice at  
50 approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and  
51 invisible on exposed faces.

52 Install frames with removable glazing stops located on secure side of opening.

53 Install door silencers in frames before foam insulating.

54 Remove temporary braces necessary for installation only after frames have been properly set and secured.

1 Check plumbness, squareness, and twist of frames as walls are constructed. Shim as necessary to comply  
2 with installation tolerances.  
3 Field apply bituminous coating to backs of frames that are filled with foam insulation.  
4 Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with  
5 postinstalled expansion anchors.  
6 Floor anchors may be set with powder-actuated fasteners instead of postinstalled expansion anchors if so  
7 indicated and approved on Shop Drawings.  
8 In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors.  
9 Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.  
10 Ceiling Struts: Extend struts vertically from top of frame at each jamb to overhead structural supports or  
11 substrates above frame unless frame is anchored to masonry or to other structural support at each jamb. Bend  
12 top of struts to provide flush contact for securing to supporting construction. Provide adjustable wedged or  
13 bolted anchorage to frame jamb members.  
14 Installation Tolerances: Adjust hollow metal door frames for squareness, alignment, twist, and plumb to  
15 the following tolerances:  
16 Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb  
17 perpendicular to frame head.  
18 Alignment: Plus or minus 1/16 inch, measured to opposite face corners of jambs on parallel lines, and  
19 perpendicular to plane of wall.  
20 Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and  
21 perpendicular to plane of wall.  
22 Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.  
23 Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as  
24 necessary.  
25 Non-Fire-Rated Standard Steel Doors:  
26 Jambs and Head: 1/8 inch plus or minus 1/16 inch.  
27 Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.  
28 Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.  
29 Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.  
30 Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches o.c.  
31 and not more than 2 inches o.c. from each corner.  
32

### 33 **PREPARATION FOR HARDWARE**

34 Comply with applicable requirements in ANSI/SDI A250.6 specifications for preparation of hollow metal door work  
35 for hardware.  
36

### 37 **FINISH**

38 Dress tool marks and surface imperfections to smooth surfaces and remove irregularities.  
39 Chemically treat and clean doors and frames.  
40 Apply manufacturer's standard primer.  
41 Final painting to be completed per section 09 90 00.  
42

### 43 **INSPECTION**

44 Assure that frame openings correspond to dimensions of frame furnished.  
45 Check that surfaces to contact frame are free of debris.  
46 Do not proceed with installation until unsatisfactory conditions are corrected.  
47

### 48 **ADJUSTMENT AND CLEANING**

49 Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work  
50 in complete and proper operating condition. Remove and replace defective work, including hollow metal work that  
51 is warped, bowed, or otherwise unacceptable.  
52 Remove dirt and excess sealants or glazing compound from exposed surfaces.  
53 Touch-up marred or abraded surfaces to match original finish.  
54 Adjust moving parts for smooth operation.

1 Remove debris from Project site.

2

3 **GUARANTEES**

4 Guarantee doors and frames against failure of materials or workmanship to include excessive leakage of air  
5 infiltration, excessive deflections, faulty operation of sash, deterioration of finish or metal in excess of normal  
6 weathering, and defects in hardware and weather-stripping.

7 Guarantee to extend for one year.

8

**END OF SECTION**

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**SECTION 08 36 13**  
**OVERHEAD SECTIONAL DOORS**

**PART 1 - GENERAL**

**DESCRIPTION OF WORK**

The work required in this Section includes all labor, materials and equipment for the fabrication and installation of electrically operated overhead sectional steel doors in designated locations indicated on the Drawings. It shall include making such tests of installation as required by the Owner and Architect/Engineer.

The Contractor will be held to have examined the Drawings and read over this Specification for work required to be done by other trades in connection with work of this Section and shall furnish and install such supplementary material as needed to properly and completely support the work furnished in this Section or as otherwise required for the complete installation.

The Contractor will cooperate with the Mechanical trades to avoid interference with such equipment as structure, unit heaters, ductwork, piping, etc. and provide adequate track bracing and supports.

**RELATED WORK**

Applicable provisions of Division 1 shall govern all work in this section.

**WORK UNDER OTHER HEADINGS**

Steel Bollards at door openings will be furnished and installed under metal fabrications.

Interior finish painting, including touch up, shall be performed under "Paints and Coating".

**QUALITY ASSURANCE**

Provide the overhead sectional doors, as complete units produced by one manufacturer, including hardware, controls, accessories, stations, mounting and installation components. The operator, track, door, hardware, mounting hardware, and safety edge to reverse shall be installed by the Door Contractor. Door Contractor shall provide to the Electrical Contractor for installation, push button controls, photo detector control, and radio transmitter receivers.

Manufacturer:

Provide overhead sectional doors as manufactured by one of the following, or as approved equal by Architect/Engineer:

Raynor.

Overhead Door Corporation

Wayne-Dalton Corp.

Haas Door

**SUBMITTALS**

Manufacturer's Data:

Within 25 calendar days after Notice to Proceed submit.

Complete materials list of all items proposed to be furnished and installed under this Section.

Shop drawings for each type of overhead door units showing components, arrangements, dimensions, orientation on walls, sections of trim members, insulation resistant values, dimension elevations, grounds, motors, reinforcements, operators, controls, and accessories.

1 PART 2 - PRODUCTS

2 MOTOR OPERATED OVERHEAD SECTIONAL DOORS AND FRAMES

3 Door Sections:

4 Sections shall be 2" thick, Raynor TM200 Series or approved equal, roll formed from commercial quality hot dip  
5 galvanized steel per ASTM A-525 and A-526. Door sections constructed of 26 gauge interior and exterior skins  
6 mechanically interlocked and pressure bonded to a 1-7/8" thick expanded polystyrene core. Interior and exterior  
7 skins to be separated by a continuous dual durometer vinyl extrusion to form an effective thermal break and a  
8 complete weather-tight seal along section joint. Thermal break extrusion to be held in place by means of a  
9 mechanical interlock. End stiles to be minimum 14 gauge, separated from exterior skin with vinyl thermal break.

10 Finish:

11 Exterior and interior of door skins pre-coated prior to roll forming with epoxy primer. Two coats of finish paint by  
12 door manufacturer.

13 Color to be: **Selected** from manufacturer's standard color palette, by AE.

14 Weatherstripping:

15 Door shall be furnished with complete weatherstripping system to reduce air infiltration. Top of door provided with  
16 EPDM rubber sealing strip. Bottom of door to have flexible U-shaped vinyl seal encased in extruded aluminum  
17 retainer to conform to irregularities in floor. Jamb seal to be EPDM rubber blade type attached to track angle  
18 mounting with rigid vinyl snap-on extrusion. Weatherstripping to be replaceable without removal of track, angle  
19 mounting, or door hardware. Maximum air leakage per foot of door perimeter (floor, jamb, and header) shall not  
20 exceed .81 CFM @ 25 M.P.H. No air leakage shall be detected between section joints when tested in accordance  
21 with ASTM E-283.

22 Tracks:

23 Galvanized track shall be 3". Tracks to be provided for weather-tight closing. Tracks to be bracket mounted or  
24 continuous angle mounted and fully adjustable for sealing door to jamb. Continuous angle size to be not less than 3-  
25 1/2"x 6"x1/8" on 3" track. Horizontal track to be adequately reinforced with continuous angle. Provide normal  
26 headroom door track systems, unless noted otherwise on drawings. Tracks to be fastened to new steel by using  
27 5/16" – 12 Tek Screws. Welding of tracks to steel is not permitted.

28 Hardware:

29 All hinges and brackets made from galvanized steel. Track rollers shall have ten 1/4" diameter hardened steel balls  
30 per roller (2") and ten 5/16" diameter hardened steel balls per roller (3").

31 Spring Counterbalance:

32 Heavy duty oil tempered wire torsion springs on continuous ball bearing cross header shaft. Galvanized aircraft  
33 type lifting cables with minimum safety factor of 5 to 1.

34 Lock:

35 Interior Locking-Interior dead bolt shall be provided with hole to receive padlock.

36 Wind Load:

37 Design to withstand 20 lbs. per sq. ft. Deflection of door in horizontal position to be maximum 1/120th of door with.

38 Glazing:

39 34"x16" Lite inserts to be tempered glass. Glass unit to be encased in one piece vulcanized EPDM rubber frame.  
40 Provide quantity as seen on the Drawing Elevations.

42 Insulating Value:

43 Section set shall have overall R-value of 18.3 as tested in accordance with ASTM C-236.

44 Override Operation:

45 Manual override operation designed to meet specified applications shall be internal. In direct drive or 3:1 drive  
46 ratio. When override operation is functioning, the door shall be operated by lifting the door by one man.

- 1 Panel Height:
- 2 Panel height not to exceed two feet.
- 3 Springs:
- 4 50,000 cycles
- 5 **CONTROLS AND ELECTRICAL**
- 6 Furnish to Electrical Contractor for all overhead doors standard three button momentary contact on
- 7 OPEN/CLOSE/STOP, quantity and type of transmitters listed below, and Photosensor.
- 8 Transmitters: Transmitters shall be Model 62LM for two-channel, or equal. Provide two transmitters for each door.
- 9 Each transmitter to operate two doors serving each drive thru lane.
- 10 Doors:
- 11 Dual Control/Two Button Transmitter, provide six transmitters per overhead door.
- 12 Receivers
- 13 Universal Coaxial Receiver as manufactured by Lift Master Model No. 412LM for single channel and Model No.
- 14 422LM for two channel receiver, or equal.
- 15 Photosensor
- 16 Detection: AT10D Receiver with through beam detection.
- 17 Range: 10 meters
- 18 Light Source: Infrared LED
- 19 Power Supply: 24v
- 20 Response Time: 25msec
- 21 Provide manufacturers emergency disconnect switches.
- 22 **OPERATOR DESIGN**
- 23 General
- 24 Overhead Doors:
- 25 Operator shall be jackshaft type RHX as manufactured by Overhead Door, or equal as approved by the
- 26 Architect/Engineer. Provide H.P., voltage, phase as indicated in the Electrical Drawings.
- 27 General Contractor shall provide all mounting pads, struts, and girts necessary for mounting overhead doors to the
- 28 designed wall construction.
- 29 Reduction
- 30 Furnish heavy duty worm gear drive running in oil with additional reduction by chain and sprockets.
- 31 Motors-
- 32 Provide 120 volt single phase motors. Motors shall be separate from reduction mechanism for ease of maintenance.
- 33 Roller Chain Drive
- 34 Door shall be driven by roller chain at 6" to 12" per second.
- 35 Adjustable Friction Clutch
- 36 Shall be provided to protect door and operator if door movement is obstructed.
- 37 Starter - Reversing Contactor Type
- 38 Furnish heavy duty across the line reversing type with mechanical interlock.
- 39 Limit Switches
- 40 Provide positive chain drive screw type limit switch, enclosed in electrical control box, easily accessible for
- 41 precision setting.
- 42 Provide limit switch for interlock of ventilation system.
- 43 Provide limit switch for interlock of signal system.
- 44 Control Voltage

- 1 Control voltage shall be 24 volts for safety.
- 2 Overload Protection
- 3 Provide manual reset for overload protection.
- 4 Emergency Operation
- 5 A disconnect shall be provided so door can be manually operated.
- 6 Magnetic Brake
- 7 Furnish a magnetic solenoid brake for positive stop.
- 8

9 **PART 3 - EXECUTION**

10 **COORDINATION**

- 11 All electrical work shall comply with the latest editions of the Underwriter's Laboratory, Inc., and the National
- 12 Electrical Code (NEC).
- 13 The electrical work specifications cover the installation of conduit, conduit fittings, supports, power wiring, and
- 14 including connection.
- 15 Control wiring shall be concealed in conduit and the control wiring and control conduit shall be performed by the
- 16 electrical contractor.
- 17 Receiver:
- 18 Make sure all connections are correct before turning on power. Mount receiver at location recommended by the
- 19 manufacturer.
- 20 Remove protective cover on receiver for access to sensitivity adjustment, time selection, and light/dark switch.
- 21 Always keep gasket in place to insure water tightness.
- 22 Use screws PF 1/2 when wiring with conduit.
- 23 After wiring, mount cover onto the terminal base by tightening screws until spring washers are flat.
- 24 Use dry, soft cloth for cleaning the lens and case.
- 25 Do not cycle on/off frequently.
- 26 Connect auxiliary relay for longer life.
- 27 Sensitivity Adjustment:
- 28 Set an object to the desired position and then increase the Sensitivity Adjustment gradually from the minimum
- 29 position until the indicator LED is on. Remove the object and gradually decrease the Sensitivity Adjustment from
- 30 the maximum position until the LED is off. If the LED is still off even through potentiometer is at maximum
- 31 position (Point B).
- 32 Set potentiometer at the center between Points A and B.

33 **MAINTENANCE**

- 34 Maintenance and call back service for all equipment shall be provided for a period of one year after date of final
- 35 acceptance of the building.
- 36 This service shall include regular examinations by competent and trained personnel, all necessary adjustments,
- 37 greasing, oiling, cleaning, and parts to keep equipment in perfect condition, except such part made necessary by
- 38 misuse, accidents or negligence not caused by the Contractor.

39 **GUARANTEE**

- 40 The door, motor, and controls shall be guaranteed for a period of two years. During this period the Contractor shall
- 41 affect any repairs required, without cost to the Owner, due to failures caused by material, workmanship, normal
- 42 usage, design or construction.

43

44

1    **INSPECTION**

2    Examine the areas and conditions under which work of this Section will be installed. Correct conditions detrimental  
3    to proper and timely completion of the work. Verify spacing of door frame, motor, controls, and structure that offset  
4    installation of accessories. Do not proceed until unsatisfactory conditions have been corrected.

5    **TESTING**

6    For actual testing and reporting of tests, use only those personnel and methods approved in advance by the  
7    Architect/Engineer. All test reports shall be signed by the individual as authorized in the testing plan approved by  
8    the Architect/Engineer and submitted prior to final payment.

9    **SCHEDULE OF DOOR CONTROLS**

10

11    Flush mounted three button momentary contact on OPEN/CLOSE/STOP at each door location.

12    Receiver w/ antenna through exterior wall, and photosensors to reverse. Provide (2) Transmitters at each door  
13    location.

14

**END OF SECTION**

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- 1 Rhodes Lever Handle Style
- 2 Combination Lockset: Simplex L1021B Cypher Combination Lock with lever handle and interchangeable key core  
3 or approved equivalent.
- 4 **ELECTRIC STRIKES**
- 5 HES 9600, Von Duprin 6222, Adams Rite 74R1.
- 6 **BUTT HINGES**
- 7 Shall be Hager, McKinney or Stanley ball bearing, non-rising loose pin, flat button tip, unless otherwise specified.
- 8 Provide 1-12/ pair butts per door for doors up to 7'-6" in height. Doors over 7'-6" in height shall have two (2) pairs  
9 of butts.
- 10 Butt size requirements:
- 11 Interior doors up to 37" wide 4-1/2 x 4-1/2.
- 12 Interior doors over 37" wide 5 x 4-1/2.
- 13 Exterior doors 5 x 4-1/2. Door butt legend: (unless otherwise noted in Schedule)
- 14 Exterior doors BB1199 – NRP (nonremovable pin).
- 15 Interior doors BB1179 – TBB.
- 16 Furnish U.L. approved butts on labeled doors.
- 17 Continuous gear hinges to be Select Hinge, McKinney, or Stanley.
- 18 **DOOR CLOSERS**
- 19 Shall be LCN 4040XP, Norton 7500, or Yale 4400 of proper size as described in manufacturer's schedule of sizes.
- 20 Where parallel arm or weather strip is specified, closers shall be one size larger than manufacturer's recommendations.
- 21 Closers shall have key adjusting device. Furnish six adjusting keys.
- 22 Mount to provide maximum opening permitted by building construction or equipment, and note on this schedule the  
23 maximum swing per location for other trades involved in reinforcement or installation.
- 24 Closers shall be of cast iron, of full rack and pinion construction, including two speed closing adjustment, adjustable  
25 hydraulic back-check and fully adjustable spring power plus reversible shoe feature, of type listed in schedule. Close  
26 fluid shall be "all weather" type not subject to normal temperature changes.
- 27 All door closers shall be similar in design and appearance to those listed in the schedule, so far as possible, and shall  
28 be of one manufacturer. Furnish special arms and applications as indicated in hardware schedule or as dictated by  
29 structural conditions or local code requirements.
- 30 Door closers at labeled fire doors shall bear U.L. approval. Provide thru-bolts for mineral core doors.
- 31 Door closers finish to match finish hardware.
- 32 Where more than one door occurs in an opening, equip each door with closer, unless otherwise noted.
- 33
- 34 **KICKPLATES**
- 35 Shall be as manufactured by Hager Companies, Assa Abloy or equivalent.
- 36 All plates shall be 16-gauge (0.050) with beveled sides and countersunk screw holes at intervals of not over 6" on all  
37 four sides. Screws shall be stainless steel oval head, finish to match plates. Size of kick, armor, and mop plates as  
38 noted.
- 39 Kickplate on push side of door 16 ga.
- 40 **MISCELLANEOUS HARDWARE**
- 41 Thresholds: National Guard, Reese, or Zero as listed. Cope around mullions.

1 Weather-strip: National Guard, Reese or Zero as listed.

2 Latch Protectors: Don-Jo LP-110-630

3 **FINISHES**

4 Materials shall be the following: Provide with the finish designated in parenthesis ( ).

5 Knobs, locks, and latches: Satin chrome (US26D).

6 Dead locks: To Match Locksets

7 Kickplates: As indicated in Hardware Groups

8 Door closers: To Match Locksets

9 Door butts: nonferrous for exterior and wet areas. Ferrous for other doors.

10 Door stops and holders - Satin chrome (US26D).

11 Miscellaneous items: As indicated

12 Note: Verify all finishes with architect prior to ordering hardware.

13 **KEYING**

14 Lockset cores will be provided by the owner, to match their existing Best 7-pin core system. Locksets shall be  
15 compatible to receive these core inserts. Coordinate with the owner.

16 **TOOLS AND MANUALS**

17 Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions for  
18 Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

19

20

**PART 3 - EXECUTION**

21 **PRODUCT HANDLING**

22 Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.

23 Tag each item or package separately with identification coordinated with the door hardware schedule, and include  
24 installation instructions, templates, and necessary fasteners with each item or package.

25 Protection:

26 Use all means necessary to protect materials of this Section before, during, and after installation, as well as the  
27 materials of other trades.

28 Replacements:

29 In the event of damage, immediately make all repairs and replacements necessary to the approval of the  
30 Architect/Engineer, at no additional cost to the owner.

31 **MATERIALS**

32 Loc-Tite shall be furnished for installation on all screw threads of hardware installation.

33 **OTHER MATERIALS**

34 All other materials not specifically described but required for a complete and proper installation of the work of this  
35 Section, shall be as selected by the Contractor, subject to the approval of the Architect.

36 **INSTALLATION**

37 Qualification of Installers:

38 Use adequate numbers of skilled workmen who are trained and experienced in the necessary crafts and who are  
39 completely familiar with the specified requirements and methods needed for proper performance of this section.

40 Install the materials in strict accordance with the manufacturer's recommendations and schedules.

41 Anchor all screws with Loc-Tite to assure permanence of attachment.

42 All doors and hardware to be left in proper working order and cleaned.

1 **DELIVERIES**

2 Stockpile all items sufficiently in advance to ensure their availability, and make all necessary deliveries in a timely  
3 manner to ensure orderly progress of the total work.

4 All hardware shall be delivered to a destination as directed by the general contractor with sufficient time in advance  
5 for proper inspection in order not to delay the scheduled completion date.

6 The Owner/General Contractor shall provide a lockable room with ample shelving for the storage of hardware. Upon  
7 receipt of the hardware, the Finish Hardware supplier shall unpack and place on the shelves all hardware in order of  
8 the item and/or door numbers.

9 **FINAL INSPECTION**

10 The Finish Hardware supplier shall inspect the installation of all hardware furnished and shall report any installation  
11 adjustments as are necessary to have all hardware in perfect working order.

12 The Finish Hardware supplier shall verify the keying with the Owner to ensure proper location of the locksets and  
13 cylinders and shall assist the owner in correcting faulty operation of any lock or other items called to attention. He  
14 shall have all closers checked and adjusted for closing, latching and back check by the manufacturer's representative.

15 Prior to final acceptance of the building, the Finish Hardware supplier shall make a final inspection of all hardware  
16 furnished to verify that all adjustments and corrections have been made and that all hardware are in good working  
17 order.

18 **WARRANTY**

19 Provide a written warranty in approved form in compliance with the related requirements of the General Conditions,  
20 covering all Finish Hardware furnished under this section against defects in manufacturing and workmanship for a  
21 period of one (1) year from the final acceptance of the building.

22 Any material failing to comply with the above guarantee shall be removed and replaced with satisfactory material at  
23 the Finish Hardware supplier's expense, including the necessary labor for removing and replacing.

24 During the Warranty Period, the Finish hardware supplier shall, upon request, make prompt adjustments, repairs or  
25 replacement as requested to any hardware installed under this contract, other than normal maintenance service.

26 **END OF SECTION**