

## SECTION 08110

### STEEL DOORS AND FRAMES

#### PART 1 GENERAL

##### 1.1 SUMMARY

###### A. Scope

1. Provide hollow metal steel doors, door frames and window/glazing frames as specified, shown, or scheduled, with components and accessories as required for a complete installation.

###### B. Related Work Specified Under Other Sections

1. Glazing – DIVISION 8.
2. Hollow Metal Steel Doors in Demountable Partitions - DIVISION 10.
3. Painting - DIVISION 9.
4. Door Hardware – DIVISION 8.
5. Electric Power to Door Hardware - DIVISION 16.
6. Building in of anchors and grouting of frames in masonry construction - DIVISION 4.

###### C. Products Installed But Not Furnished Under This Section

1. Door Hardware – DIVISION 8.

##### 1.2 QUALITY ASSURANCE

###### A. Door and Frame Standards

1. Steel doors and frames shall meet ANSI A250.8 for levels and models specified and ANSI A250.4 for physical-endurance levels.
2. All steel doors and frames shall meet the tolerances established by the Steel Door Institute (SDI #117-93 dated 3/95).

##### 1.3 SUBMITTALS

###### A. Shop Drawings And Product Data

1. Furnish submittals for items that are identified in this SECTION by a different typeface and a bracketed code (e.g., *Item [L]*). Refer to Division 1, General Requirements for definition of codes for types of submittals and the administrative requirements governing submittal procedure. Additional submittal requirements pertaining to this SECTION are specified herein under this Article.
2. Door Locations and Identification: Submit shop drawings, and list the location in building and identification mark for each hollow steel door and frame. Indicate door hardware requirements. Submit manufacturer's printed instructions covering installation of the specified work.
3. Submit shop drawings and product data, and identify applicable details of design and construction of all hollow steel work.

## 1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver hollow steel work cartoned or crated to provide protection during transit and job storage. Provide additional sealed plastic wrapping for factory finished doors.
- B. Inspect hollow steel work upon delivery for damage. Minor damages may be repaired provided refinished items are equal in all respects to new work and acceptable to OWNER'S REPRESENTATIVE; otherwise, remove and replace damaged items as directed.
- C. Store doors and frames at building site under cover. Place units on minimum 4 inch high wood blocking. Avoid use of non-vented plastic or canvas shelters which could create humidity chamber. If cardboard wrapper on door becomes wet, remove carton immediately. Provide 1/4 inch spaces between stacked doors to promote air circulation.

## PART 2 PRODUCTS

### 2.1 MATERIALS

- A. Steel Sheet
  - 1. Stock Commercial Doors: Hot rolled sheets per ASTM A-569, commercial steel (CS), Type B; or cold-rolled steel per ASTM A-568.
  - 2. Frames and Unexposed Surfaces: Prime quality, cold-rolled, commercial stock.
  - 3. Galvanized Members: Zinc-coated steel sheet per ASTM A 653; galvanized G60, chemically treated and with minimized spangle; or galvanized A60, dull gray. Use at all exterior door and frame locations, and at other door and frame locations so specifically noted.
- B. Prime Finish System
  - 1. Prime Paint: Rust-inhibitive type, oven-bake or air dry curing type complying with ANSI 250.10.
  - 2. Filler: Mineral type compatible with the prime paint used and the oven-bake or air dry curing process.
- C. Accessories
  - 1. Insulation for Non-Fire-Rated Doors: Mineral rock wool, mineral fiber, or polyurethane or polystyrene core at all exterior locations, and honeycomb or polystyrene core at interior locations.
  - 2. Button Silencers: Solid, molded rubber.
  - 3. Frame Anchors: Galvanized steel, minimum 18 gage, of the following types:
    - a. Provide at masonry walls, T-type, flat or corrugated anchors with head to fit snug in frame profile and stem 3 inches x 10 inches. Wire anchors are acceptable.
    - b. At wood or metal stud partitions, use insert type anchor with notched stem designed for sheet metal screw attachment to wood or closed metal stud or for wire-tying to open metal stud.
  - 4. Rough-Buck Sub-Frame: 12 gage, galvanized steel.

## 2.2 FABRICATION AND MANUFACTURE

### A. Manufacturers

1. Stock Commercial Hollow Steel Fabricator
  - a. Amweld Building Products, Inc.
  - b. Ceco Door Products Div., A United Dominion Co.
  - c. Curries Co.
  - d. The Kewanee Corp.
  - e. Pioneer Industries Inc.
  - f. Mesker Door Inc.
  - g. Steelcraft, an Ingersoll-Rand Co.

### B. Quality Of Work

1. Cut and form joints to hairline measurements. Make all exposed joints smooth and invisible. Grind all exposed welds smooth and flush. Form all arises sharp and true. Miter all face joints.

### C. Doors

1. *Stock Commercial Doors [D,P]*: Flush seamless, 1-3/4 inch thick; use ANSI A250.8, Level 3 with 16 gage galvanized face sheets, Physical Performance level A, model 2-Seamless, with Polyurethane or Polystyrene Core at exterior locations; and use ANSI A250.8, Level 2 with 18 gage face sheets, Physical Performance Level B, Model 2-Seamless, with Honeycomb or Polyurethane Core at interior locations. Provide closed flush tops on exterior doors to prevent moisture penetration.
2. Fabricate doors with rabbeted openings for glazing.
3. Built-in Louver Units: Furnish of thickness to match doors. Fabricate louver units with inverted "V" shaped blades set in a narrow line subframe. Louver units shall have a 35% minimum free air area. Door louver units shall be mounted flush into the door without overlapping molding on the door face sheet.
  - a. Furnish UL approved fusible-link louvers in fire-rated doors.
4. Door Integral Astragal: Furnish with all pairs of doors labeled or nonlabeled, unless otherwise noted.
5. Double Door Wireway: Provide in double doors in which an electric strike is mounted in the inactive leaf.
6. Thermal Insulated Doors: Provide at all exterior locations. Interior of thermal insulated doors shall be completely filled with rigid foamed-in-place polyurethane or procured polystyrene foamed board, permanently bonded to each face panel. The U-value through the door shall not exceed 0.24. The door assembly, consisting of door frame, and perimeter seals, shall have an air infiltration rate not greater than 0.20 cubic feet per minute per foot of crack length when tested in accordance with ASTM E 283.
7. Furnish closed flush tops at all exterior doors to prevent moisture penetration.

D. Door And Window Frames

1. *Door and Window Frames [D]*: Of the type that conceal anchors in place, with the following exceptions or as indicated.
  - a. At concrete or existing masonry walls, use either “existing wall anchor assembly” or rough-buck sub-frame.
  - b. At structural channel or plate rough openings, weld the frames to the rough opening steel.
2. Frame Door Stop: Form integral with frame.
3. Shop-fabricate frames from a single width of 14 gage galvanized steel sheet at exterior openings and 16 gage prime painted steel sheet at interior openings unless noted otherwise on DRAWINGS. All frames shall be continuously welded and ground smooth, with mitered corners and two temporary spreader bars. Use spreader bars for shipping only, remove prior to setting frames in wall. Installer responsible for setting frames in wall shall use wood spreader bars for the purpose of plumbing and truing all frames. Frames shall be made to a true rectangular shape, and the vertical plane formed by the door stops and the face of the frame shall be in parallel planes, with all parts out of wind.
4. After welding and grinding mitered corners on galvanized frames, re-galvanize inside and outside of the welded corners with Z.R.C. or Brite Zinc cold galvanizing compound and re-prime coat all the area.
5. Door Frame Angle Reinforcement: Furnish and weld in frame heads as scheduled, and position to allow the vertical leg to fit in with adjacent construction.
6. Door Frame Adjustable Jamb Anchors: Space not over two feet on centers nor less than three per jamb. For labeled frames, weld the anchors to the frames in the shop. Frame jambs shall extend to surface of finish floor only. Provide frame jambs with two piece adjustable floor anchors at bottom, of length to extend to concrete base slabs. Drill bottom piece of floor anchor to receive two 3/8 inch diameter expansion bolts.
  - a. Rough-buck sub-frames shall be continuous for full length of jamb.
7. Furnish frames with not less than three button silencers in the lock jamb; in frames for pairs of doors, provide two button silencers in head, placed near meeting edge of each leaf. Provide leak-proof caps at all holes in frames, welded to inside of frame.

E. Glazing Frames

1. *Glazing Frames [D]*: Fabricate from not less than 16 gage material, with non-removable and removable with glass stop mouldings. Provide anchors as specified for door frames. Shop-fabricate glazing frames as a part of the door frames where adjacent to each other.

F. Moldings

1. Moldings: Furnish around glazed or louvered panels in doors and in glazing frames. Moldings on exterior side of doors and frames on corridor or other non-secure-area side of interior doors and glazing frames shall be non-removable. Moldings on the interior or secure-area side shall be removable.
2. Moldings for doors and frames, including glazing frames, shall be square or rectangular shaped, formed from No. 18 gage sheet. Non-removable moldings shall either be integral with the door or frame, or welded thereto. Removable moldings shall have butted corners producing hairline joints, and shall be secured with countersunk Phillips head machine screws; provide a minimum of two screws per each length of molding; where length is

more than 18 inches long, provide additional screw anchorage at not over 12 inches on center. Moldings shall be mounted flush into the door or frame without overlapping the door or frame face sheet.

#### G. Preparation For Door Hardware

1. Cut out, drill, tap, countersink, reinforce and otherwise prepare doors and door frames as required to receive door hardware. Countersink butts, strikes and lockset fronts into the surface, so as to be flush.
2. Close countersink areas with reinforcing, not less than 3/16 inch thick steel plate for butts, 16 gage for latch and lock sets, and 12 gage for closers. Weld reinforcing plates to the interior of the door frames.
3. Reinforcing shall be of minimum gage, shape and securement per ANSI A250-6.
4. Refer to DIVISION 8 "DOOR HARDWARE" for hardware locations.

#### H. Finishing

1. Clean, degrease and "bonderize" hollow steel surfaces prior to finishing. Prime all surfaces, including inside surfaces of frames, with rust-inhibitive priming paint. Welded corner frames are to be re-prime painted after welding.
2. Apply one coat of rust-inhibitive primer to exposed surfaces of hollow steel work, make surfaces flush and smooth, fill irregularities with one or more coats of mineral filler, and apply another coat of primer. Sand smooth between coats and separately bake-on each coat.
3. Apply one coat of specified type of rust-inhibitive primer to exposed surfaces of hollow steel work.
4. Apply a coating of Z.R.C. Cold Galvanizing Compound or Brite Zinc Galvanizing Compound to areas where welding and grinding have removed the galvanizing from the door or frame and re-prime area.

### PART 3 EXECUTION

#### 3.1 INSTALLATION

##### A. Frames

1. Deliver frames to the Project Site for installation.
2. Install frames in concrete walls or existing masonry walls. Where rough-buck sub-frames occur, secure same at two feet centers maximum; secure hollow steel frames to sub-frames along face of returns, at 18 inch centers maximum. Where rough-buck sub-frames do not occur, bolt the hollow steel frames to the wall opening edges with the "existing wall anchor assemblies". Provide one assembly each at top and bottom of jamb, not over eight inches away from end and at not over 2 feet between end assemblies, in each jamb. Countersink bolt heads to be flush with the face of the stops, through sleeved spacers behind the stops.
3. Install frames at structural channel or plate rough openings by welding the frames to the rough opening steel. At each jamb, use four 2-inch long fillet welds at each face of frame (total of 16 welds). At head, use three 2-inch long fillet welds at each face of frame (total of 6 welds).

4. Comply with provisions of SDI-105-92 “Recommended Erection Instructions for Steel Frames”, unless otherwise shown.

**B. Doors**

1. Assemble door hardware, place accurately and attach securely to the doors and frames.
2. Hang doors to fit closely in frames without binding; to be in full contact with stops at all points when closed; to swing easily and quietly, without striking the floor at any point of the swing; and to remain in any position left between opened and closed without moving. Exterior doors shall be weathertight when closed.
3. Fit doors accurately in frames, within clearances specified in ANSI A250.8.
4. Thermal insulated door perimeter seals shall be adjusted for proper operation.

**3.2 FIELD QUALITY CONTROL**

- A. After doors are installed, test-demonstrate in the presence of the OWNER’S REPRESENTATIVE that the doors operate properly under all conditions. Adjust doors and door hardware if tests show improper functioning.

END OF SECTION

Revision History	
Date	Rev. No.
A	0
B	0
C	0
D	0
E	0
F	0
02-19-09	0

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