

**SECTION 08100
HOLLOW METAL DOORS AND FRAMES**

PART I - GENERAL

1.01 DESCRIPTION

- A. Scope: Work under this Section shall include all material and installation necessary to provide Hollow Metal Doors and Frames, as shown and detailed on the Drawings and specified herein.

1.02 QUALITY ASSURANCE

- A. Labeled Doors And Frames: Conform to requirements of State Fire Marshal Standard 12-43-4 and Underwriters Laboratory. Provide label information required by Section 12-43-407, Part 12, T-24 CCR.
- B. Design Requirements: Exterior glazed frame members designed to withstand a wind load of 24 lbs. per square foot, minimum.
- C. Reference Standards:
1. Handicapped Requirements:
 - a. General: Comply with requirements of the Americans with Disabilities Act.
 - b. American National Standards Institute (ANSI): ANSI A117.1: Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People.
 2. Steel Door Institute (SDI): ANSI/SDI-100.
 3. Door Hardware Institute (DHI): Installation of Commercial Steel Doors and Steel Frames, Insulated Steel Doors in Wood Frames and Builder's Hardware.
 4. National Fire Protection Association (NFPA):
 - a. NFPA 80: Fire Doors and Windows.
 - b. NFPA 252: Fire Tests for Door Assemblies.
 5. Underwriters Laboratories (UL): UL 10B, Fire Tests for Door Assemblies.

1.03 SUBMITTALS

- A. Shop Drawings: Submit manufacture and installation details, including fastenings, for review. Show details of each condition at 3" scale.
- B. Samples: If specifically requested.
- C. Product Data: Submit manufacturer's specification, data, and installation instructions for review.

PART II - PRODUCTS

2.01 MATERIALS

- A. Steel:
 - 1. Sheet: ASTM A366 (CR) and A569 (HR), uncoated, pickled, and free from pits and defects. Use cold-rolled or hot-rolled for frames; stretcher-leveled for 18 gauge and lighter.
 - 2. Reinforcement: ASTM A36.
- B. Fasteners: Galvanized or cadmium plated.
 - 1. Bolts and Nuts: ASTM A307, Grade A.
 - 2. Machine Screws: FS FF-S-92, Type III cross-recessed, Design I or II recess, Style 2c flat head; carbon steel.
 - 3. Sound Deadening: Fibered asphalt emulsion.
- C. Silencers: Resilient rubber; manufacturer's standard.
- D. Sealant: Refer to Division 7, Section 07920 – Caulking and Sealants.

2.02 MANUFACTURE

- A. Hardware Requirements: Prepare doors and frames at factory to receive template hardware per final schedule; locate as specified under Division 8, Section 08710 – Finish Hardware. Provide reinforcements of specified thicknesses and sizes recommended by hardware manufacturer; hinge reinforcements not less than 7 gauge and at least 9” long; other mortised and countersunk items not less than 12 gauge; surface applied items not less than 14 gauge.
- B. Hollow Metal Doors:
 - 1. General:
 - a. Exterior (Non-thermally Broken): SDI-100 Grade II, Model 1.
 - b. Exterior (Thermally Broken): SDI-100 Grade II, Model 2.
 - c. Interior (Non-rated): SDI-100 Grade II, Model 1.
 - d. Interior (Fire Rated): SDI-100 Grade II, Model 2.
 - e. Interior (Acoustic): SDI-100 Grade II, Model 2.
 - 2. Door Construction:
 - a. Face: Steel sheet in accordance with ANSI/SDI-100.
 - b. Core:
 - 1) General: Manufacturer's standard for following uses.

- 2) Composite: For Fire rating, as shown.
 - 3) Thermal Insulated: Total insulation R value of 11, measured in accordance with ASTM C236.
 - 4) Sound Rated: STC of 50, measured in accordance with ASTM E413.
3. Accessories:
- a. Louvers: Model No. AFDL.
 - b. Vision Light Frames: Model No. BFL-75; glass and glazing per Division 8 "Glass and Glazing" as shown.
 - c. Fasteners: Manufacturer's standard; tamperproof.
4. Astragals: $\frac{1}{8}$ " x 2" steel, as shown, specifically for double doors. Secure with tamperproof bolts at 6" on center and 1" from each end.
- C. Metal Frames:
1. Exterior: 16 gauge; 14 gauge for frames over 3'-0" wide.
 2. Interior Frames: 16 gauge; 14 gauge for frames over 3'-0" wide or fire rated.
- D. Finish: Baked primer Factory baked enamel; color as selected by the University's Representative.

2.03 FABRICATION

- A. Metal Doors:
1. Types:
 - a. Flush Doors: Fabricate doors with hardware reinforcement welded in place. Close top and bottom edge of exterior doors with flush end closure. Seal joints watertight.
 - b. Stile and Rail Doors: Provide where shown with internal continuous channel reinforcement; furnish plain square-type removable glazing beads secured to frame with countersunk screws spaced not more than 12" on center.
 - c. Dutch Doors: Fabricate as specified for flush doors. Provide shelf with boxed edges and closed ends; fabricate from 16 gauge galvanized steel sheet. Support shelf on door manufacturer's standard steel brackets, unless otherwise shown.
 - d. Flush Panels: Fabricate as specified for flush doors. Prepare panels for concealed support and anchorage.
 2. Fire Rated Doors: Permanently attach fire-rating label to each door unit.
 3. Glazed and Louvered Openings: As shown.

4. Door Clearances: Provide 1/8" maximum clearance at jambs, heads, and meeting stiles; threshold clearances as specified under Division 8 "Finish Hardware".
5. Electrical Requirements: Make provisions for installation of electrical items specified in Division 8 "Finish Hardware" and other applicable Sections.

B. Metal Frames:

1. Type:
 - a. Standard Frames: Fabricate frames as welded unit.
 - b. Knock Down Frames: For field assembly.
 - c. Drywall Frames: Drywall slip-on type.
2. Fire Rated Frames: Fabricate as specified for standard metal frames permanently attach fire-rating label to frame.
3. Glazed Lights:
 - a. General: As shown; provide applied stops as required.
 - b. Transom Bars: Fixed type, of same profiles as jamb and head.
4. Reinforcement:
 - a. General: Reinforce frames wider than 48" with roll-formed steel channels fitted tightly into frame head, flush with top.
 - b. Hardware: Fabricate frames with reinforcing plates welded in place. Provide mortar guard boxes, where required.
5. Stops:
 - a. Applied Stops: Rolled steel shape, mitered corners, prepared for countersink style tamper proof screws. Provide replaceable closed-cell sponge neoprene gasket, thickness as recommended by manufacturer.
 - b. Hospital Type: Terminate doorstops 6" above finished floor. Cut stop at 45° angle and close.
6. Mullions for Double Doors: Fixed type, of same profiles as jambs.
7. Silencers:
 - a. Single Doors and Mullions of Double Doors: Provide three (3) single silencers equally spaced on strike side.
 - b. Frame Head at Double Doors without Mullions: Provide two (2) single silencers equally spaced.
8. Sound Deadening: Coat inside (concealed) faces of doorframes in hollow wall construction. Apply emulsion over shop primer 1/8" thick and dry thoroughly before handling.

- C. Anchors:
1. General: Fabricate 16 gauge x 2" wide anchors of same material used for door frames.
 2. Wood Stud Partitions: Wood stud anchors with perforations.
 3. Metal Stud Partitions: Metal stud type anchors.
 4. Masonry: Tee shaped anchors at least 10" long, corrugated or perforated; adjustable type.
 5. Concrete: Tee shaped anchors at least 10" long, corrugated or perforated.
 6. Solid Plaster Partitions: Provide adjustable steel top strut anchors on each side of frame for fastening to structure above, as recommended by the manufacturer.

PART III - EXECUTION

3.01 PREPARATION

- A. General: Refer to Division 1, Section 01310 – Coordination. Verify that opening sizes and tolerances are acceptable.

3.02 INSTALLATION

- A. General: Install in strict conformance with referenced standards, the manufacturer's written directions, as shown, and as herein specified.
- B. Fire Rated Openings: As shown; make manufacturer's installation instructions available to inspecting authorities.
- C. Anchors:
1. Jambs:
 - a. General: Position one (1) anchor above top butt reinforcement and one (1) anchor below bottom butt reinforcement; minimum four (4) anchors per doorjamb, 24" on center maximum.
 - b. Frames Set in Wood Stud Partitions: Weld anchors to frames; secure to wood studs with two (2) fasteners per anchor. Use two (2) No. 12 x 2-1/2" flathead screws, or two (2) 12d nails (wire anchors not acceptable).
 - c. Frames Set in Metal Stud Partitions:
 - 1) General: Weld to frames and studs.
 - 2) 25 gauge Studs: Fasten to studs with sheet metal screws per anchor manufacturer's recommendations.
 - d. Frames Set in Masonry: Friction fit to frames.
 - e. Frames Set in Concrete: Weld to frames.

- f. Frames Set in Previously Placed Concrete or Masonry: Unless otherwise shown, anchor frames with ¼" diameter expansion bolts; space not more than 24" on center, nor with less than four (4) anchors per jamb.
 - g. Frames Set in Solid Plaster Partitions: Fasten strut anchors to concrete with two ¼" diameter expansion bolts and to steel with two (2) welds per anchor.
 - 2. Head: Provide minimum of two (2) anchors at frames over 2'-6" wide; 24" on center, maximum.
 - D. Metal Frames:
 - 1. General: Set frames plumb, straight and square; align and securely brace until permanent anchors are set; use shims where required. Remove temporary braces after wall construction is completed.
 - 2. Door Frames:
 - a. Standard Frames: Where shown, provide overhead frame bracing; securely anchor to structure. Install roll-formed steel reinforcement channels between two abutting frames. Anchor to structure and floor.
 - b. Knock Down Frames: As shown; per manufacturer's instructions.
 - c. Drywall Frames: As shown; per manufacturer's instructions.
 - 3. Glazed Frames: Attach frames to structure to withstand 24 lbs. per square foot wind load normal to glass surface. Coordinate installation of glazing per Division 8, Section 08810 – Glass and Glazing.
 - 4. Sealant: Seal perimeter of frames and adjoining material per Division 7, Section 07920 – Caulking and Sealants.
 - E. Metal Doors:
 - 1. General: Match doors into their respective frames; install plumb, straight and square.
 - 2. Glazed Lights: Coordinate installation of glazing per Division 8, Section 08810 – Glass and Glazing.
 - 3. Door Louvers: As shown.
 - 4. Hardware: Per Division 8, Section 08710 – Finish Hardware.
 - 5. Maximum Diagonal Distortion: ⅛" measured with straight-edge, corner to corner.
 - F. Finish: Touch-up factory applied finish.

3.03 ADJUSTMENTS

- A. General: Prior to acceptance, adjust moveable parts to assure smooth operation.

3.04 CLEANING

- A. General: Upon completion, thoroughly clean exposed surfaces per manufacturer's instructions.

END OF SECTION 08100