

SECTION 08 11 13
HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Hollow metal doors hung in hollow metal frames at interior and exterior locations.
2. Hollow metal door frames for wood doors and borrowed lights at interior locations.

1.2 RELATED REQUIREMENTS

- A. Frames fabricated of structural steel: Section 05 50 00, METAL FABRICATIONS.
- B. Door Hardware: Section 08 71 00, DOOR HARDWARE.
- C. Glazing: Section 08 80 00, GLAZING.
- D. Card Readers and Biometric Devices: Section 28 13 00, PHYSICAL ACCESS CONTROL SYSTEM.
- E. Intrusion Alarm: Section 28 16 00, INTRUSION DETECTION SYSTEM.
- F. Security Monitors: Section 28 23 00, VIDEO SURVEILLANCE.

1.3 APPLICABLE PUBLICATIONS

- A. Comply with references to extent specified in this section.
- B. American National Standard Institute (ANSI):
 1. A250.8-2014 - Standard Steel Doors and Frames.
- C. ASTM International (ASTM):
 1. A240/A240M-15b - Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
 2. A653/A653M-15 - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip.
 3. A1008/A1008M-15 - Steel, Sheet, Cold-Rolled, Carbon, Structural, High Strength Low Alloy and High Strength Low Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.
 4. B209-14 - Aluminum and Aluminum-Alloy Sheet and Plate.
 5. B209M-14 - Aluminum and Aluminum-Alloy Sheet and Plate (Metric).
 6. B221-14 - Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
 7. B221M-13 - Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric).

- 8. D3656/D3656M-13 - Insect Screening and Louver Cloth Woven from Vinyl Coated Glass Yarns.
- 9. E90-09 - Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
- D. Federal Specifications (Fed. Spec.):
 - 1. L-S-125B - Screening, Insect, Nonmetallic.
- E. Master Painters Institute (MPI):
 - 1. No. 18 - Primer, Zinc Rich, Organic.
- F. National Association of Architectural Metal Manufacturers (NAAMM):
 - 1. AMP 500-06 - Metal Finishes Manual.
- G. National Fire Protection Association (NFPA):
 - 1. 80-16 - Fire Doors and Other Opening Protectives.
- H. UL LLC (UL):
 - 1. 10C-09 - Positive Pressure Fire Tests of Door Assemblies.
 - 2. 1784-15 - Air Leakage Tests of Door Assemblies and Other Opening Protectives.

1.4 SUBMITTALS

- A. Submittal Procedures: Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Submittal Drawings:
 - 1. Show size, configuration, and fabrication and installation details.
- C. Manufacturer's Literature and Data:
 - 1. Description of each product.
 - 2. Include schedule showing each door and frame requirements, fire label, and smoke control label, for openings.
 - 3. Installation instructions.
- D. Sustainable Construction Submittals:
 - 1. Recycled Content: Identify post-consumer and pre-consumer recycled content percentage by weight.
- E. Test reports: Certify each product complies with specifications.
 - 1. Sound rated door.
- F. Qualifications: Substantiate qualifications comply with specifications.
 - 1. Manufacturer with project experience list.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications:
 - 1. Regularly manufactures specified products.

2. Manufactured specified products with satisfactory service on five similar installations for minimum five years.

a. Project Experience List: Provide contact names and addresses for completed projects.

1.6 DELIVERY

- A. Fasten temporary steel spreaders across the bottom of each door frame before shipment.
- B. Deliver products in manufacturer's original sealed packaging.
- C. Mark packaging, legibly. Indicate manufacturer's name or brand, type, production run number, and manufacture date.
- D. Before installation, return or dispose of products within distorted, damaged, or opened packaging.

1.7 STORAGE AND HANDLING

- A. Store products indoors in dry, weathertight conditioned facility.
- B. Protect products from damage during handling and construction operations.

1.8 WARRANTY

- A. Construction Warranty: FAR clause 52.246-21, "Warranty of Construction."

PART 2 - PRODUCTS

2.1 SYSTEM PERFORMANCE

- A. Design hollow metal doors and frames complying with specified performance:
 - 1. Fire Doors and Frames: UL 10C; NFPA 80 labeled.
 - a. Fire Ratings: See drawings.
 - 2. Stair Doors: Temperature rise rated fire doors.
 - 3. Smoke Control Doors and Frames: UL 1784; NFPA 80 labeled, maximum 0.15424 cu. m/s/sq. m (3.0 cfm/sf) at 24.9 Pa (0.10 inches water gage) pressure differential.
 - 4. Sound Rated Doors and Frames: Minimum 45 sound transmission class (STC) when tested according to ASTM E90.
 - 5. Thermal Transmittance: 31_____ U-value at exterior doors .

2.2 MATERIALS

- A. Stainless Steel: ASTM A240/A240M; Type 304.
- B. Sheet Steel: ASTM A1008/A1008M, cold-rolled.

- C. Galvanized Sheet Steel: ASTM A653.
- D. Insect Screening: ASTM D3656/D3656M, 18 by 18 aluminum wire mesh.
- E. Aluminum Sheet: ASTM B209M (ASTM B209).
- F. Aluminum Extrusions: ASTM B221M (ASTM B221).

2.3 PRODUCTS - GENERAL

- A. Provide hollow metal doors and frames from one manufacturer.
- B. Sustainable Construction Requirements:
 - 1. Steel Recycled Content: 30 percent total recycled content, minimum.
 - 2. Stainless Steel Recycled Content: 70 percent total recycled content, minimum.
 - 3. Aluminum Recycled Content: 50 percent total recycled content, minimum.

2.4 HOLLOW METAL DOORS

- A. Hollow Metal Doors: ANSI A250.8; 44 mm (1-3/4 inches) thick. See drawings for sizes and designs.
- B. Door Faces:
 - 1. Interior Doors: Galvanized sheet steel minimum Z275 (G90) coating.
 - 2. Exterior Doors: Galvanized sheet steel minimum Z275 (G90) coating.
- C. Door Cores:
 - 1. Interior Doors: Kraft paper honeycomb.
 - 2. Exterior Doors: Polystyrene.
 - 3. Fire Doors: Manufacturer's standard complying with specified fire rating performance.

2.5 HOLLOW METAL FRAMES

- A. Hollow Metal Frames: ANSI A250.8; face welded. See drawings for sizes and designs.
 - 1. Interior Frames:
 - a. Level 1 Hollow Metal Doors: 1.0 mm (0.042 inch) thick.
 - b. Level 3 Hollow Metal Doors: 1.3 mm (0.053 inch) thick.
 - c. Wood Doors and Borrowed Lights: 1.3 mm (0.053 inch) thick.
 - 2. Interior Borrowed Light Frames: 1.3 mm (0.051 inch) thick.
- B. Frame Materials:
 - 1. Interior Frames: Galvanized sheet steel minimum Z275 (G90) coating.
 - 2. Exterior Frames: Galvanized sheet steel minimum Z275 (G90) coating .

2.6 LOUVERS - NOT USED

2.7 FABRICATION

- A. Hardware Preparation: ANSI A250.8; for hardware specified in Section 08 71 00, DOOR HARDWARE.
- B. Hollow Metal Door Fabrication:
 - 1. Close top edge of exterior doors flush and seal to prevent water intrusion.
 - 2. Fill spaces between vertical steel stiffeners with insulation.
- C. Fire and Smoke Control Doors:
 - 1. Close top and vertical edges flush.
 - 2. Apply steel astragal to active leaf at pair and double egress doors.
 - a. Exception: Where vertical rod exit devices are specified for both leaves swinging in same direction.
 - 3. Fire and Smoke Control Door Clearances: NFPA 80.
- D. Custom Metal Hollow Doors:
 - 1. Provide custom hollow metal doors where nonstandard steel doors are shown on drawings.
 - a. Provide door sizes, design, materials, construction, gages, and finish as specified for standard steel doors.
- E. Sound Rated Doors:
 - 1. Seals: Integral spring type automatic door bottom seal.
 - 2. Fabricate vision panel cutouts and frames to receive double glazing as shown on drawings.
- F. Hollow Metal Frame Fabrication:
 - 1. Fasten mortar guards to back of hardware reinforcements, except on lead-lined frames.
 - 2. Concealed Closers in Head Frame: Provide 1 mm (0.042 inch) thick steel removable stop sections for access to concealed face plates and control valves, except when cover plates are furnished with closer.
 - 3. Terminated Stops: ANSI A250.8.
 - 4. Borrowed Light Panel Opening Frames:
 - a. Provide integral stop on exterior, corridor, or secure side of door.
 - b. Design rabbet width and depth to receive glazing material or panel shown on drawings.
 - 5. Two Piece Frames:

- a. One piece unequal leg finished rough buck sub-frames as shown, drilled for anchor bolts.
 - b. Unequal leg finished frames formed to fit subframes and secured to subframe legs with countersunk, flat head screws, spaced 300 mm (12 inches) on center at head and jambs on both sides.
 - c. Preassemble at factory for alignment.
6. Frame Anchors:
- a. Floor anchors:
 - 1) Provide extension type floor anchors to compensate for depth of floor fills.
 - 2) Provide 1.3 mm (0.053 inch) thick steel clip angles welded to jamb and drilled to receive floor fasteners.
 - 3) Provide mullion 2.3 mm (0.093 inch) thick steel channel anchors, drilled for two floor fasteners and frame anchor screws.
 - 4) Provide continuous 1 mm (0.042 inch) thick steel rough bucks drilled for floor fasteners and frame anchor screws for sill sections.
 - a) Space floor bolts 50 mm (2 inches) on center.
 - b. Jamb anchors:
 - 1) Place anchors on jambs:
 - a) Near top and bottom of each frame.
 - b) At intermediate points at maximum 600 mm (24 inches) spacing.
 - 2) Form jamb anchors from steel minimum 1 mm (0.042 inch) thick.
 - 3) Anchors set in masonry: Provide adjustable anchors designed for friction fit against frame and extended into masonry minimum 250 mm (10 inches). Provide one of following types:
 - a) Wire Loop Type: 5 mm (3/16 inch) diameter wire.
 - b) T-Shape type.
 - c) Strap and stirrup type: Corrugated or perforated sheet steel.
 - 4) Anchors for stud partitions: Provide tabs for securing anchor to sides of studs. Provide one of the following:
 - a) Welded type.
 - b) Lock-in snap-in type.
 - 5) Anchors for frames set in prepared openings:

- a) Steel pipe spacers 6 mm (1/4 inch) inside diameter, welded to plate reinforcing at jamb stops, or hat shaped formed strap spacers 50 mm (2 inches) wide, welded to jamb near stop.
 - b) Drill jamb stop and strap spacers for 6 mm (1/4 inch) flat head bolts to pass through frame and spacers.
 - c) Two piece frames: Subframe or rough buck drilled for 6 mm (1/4 inch) bolts.
- 6) Anchors for observation windows and other continuous frames set in stud partitions.
 - a) Weld clip anchors to sills and heads of continuous frames over 1200 mm (4 feet) long.
 - b) Space maximum 600 mm (24 inches) on centers.
 - 7) Modify frame anchors to fit special frame and wall construction.
 - 8) Provide special anchors where shown on drawings and where required to suit application.

G. Sound Rated Door Frames:

- 1. Seals: Integral continuous gaskets on frames.

H. Louver Fabrication:

- 1. Fabricate louvers as complete units.
- 2. Weld stationary blades to frames.
- 3. Factory install louvers in door cutouts, welded to door.

I. Louver Screen Fabrication:

- 1. Fabricate frame to hold wire fabric in channel with retaining bar anchor and to mount on surface of door with screws.
- 2. Do not lap frame over louver opening.
- 3. Miter frame corners and join by concealed mechanical fastenings extending about 57 mm (2-1/4 inches) into ends of each member.
- 4. Drill frame and doors for screw attachment:
 - a. Space screws 50 mm (2 inches) from end of each leg of frame and maximum 300 mm (12 inches) on center.
- 5. Insect Screens: Fasten insect screens to interior side of doors with retaining bar against door and not exposed to view.
- 6. Wire Guards: Fasten wire guard to exterior side of door with retaining bar against door and not exposed to view.

2.8 FINISHES

- A. Galvanized Steel: ANSI A250.8; shop primed.

- B. Stainless Steel: NAAMM AMP 500; No. 4 polished finish.
 - 1. Blend welds to match adjacent finish.
- C. Finish exposed surfaces after fabrication.
- D. Aluminum Anodized Finish: NAAMM AMP 500.
 - 1. Clear Anodized Finish: AA-C22A41; Class I Architectural, 0.018 mm (0.7 mil) thick.
 - 2. Color Anodized Finish: AA-C22A42 or AA-C22A44; Class I Architectural, 0.018 mm (0.7 mil) thick.
 - 3. Clear Anodized Finish: AA-C22A31; Class II Architectural, 0.01 mm (0.4 mil) thick.
 - 4. Color Anodized Finish: AA-C22A32 or AA-C22A34; Class II Architectural, 0.01 mm (0.4 mil) thick.

2.9 ACCESSORIES

- A. Primers: ANSI A250.8.
- B. Barrier Coating: ASTM D1187/D1187M.
- C. Welding Materials: AWS D1.1/D1.1M, type to suit application.
- D. Clips Connecting Members and Sleeves: Match door faces.
- E. Fasteners: Galvanized steel.
 - 1. Metal Framing: Steel drill screws.
 - 2. Masonry and Concrete: Expansion bolts and power actuated drive pins.
- F. Anchors: stainless steel.
- G. Galvanizing Repair Paint: MPI No. 18.
- H. Insulation: Unfaced mineral wool.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Examine and verify substrate suitability for product installation.
- B. Protect existing construction and completed work from damage.
- C. Apply barrier coating to metal surfaces in contact with cementitious materials to minimum 0.7 mm (30 mils) dry film thickness.

3.2 INSTALLATION - GENERAL

- A. Install products according to manufacturer's instructions and approved submittal drawings.
 - 1. When manufacturer's instructions deviate from specifications, submit proposed resolution for Contracting Officer's Representative consideration.
 - 2. Install fire doors and frames according to NFPA 80.

3. Install smoke control doors and frames according to NFPA 105.

3.3 FRAME INSTALLATION

- A. Apply barrier coating to concealed surfaces of frames built into masonry.
- B. Plumb, align, and brace frames until permanent anchors are set.
 1. Use triangular bracing near each corner on both sides of frames with temporary wood spreaders at midpoint.
 2. Use wood spreaders at bottom of frame when shipping spreader is removed.
 3. Where construction permits concealment, leave shipping spreaders in place after installation, otherwise remove spreaders when frames are set and anchored.
 4. Remove wood spreaders and braces when walls are built and jamb anchors are secured.
- C. Floor Anchors:
 1. Anchor frame jambs to floor with two expansion bolts.
 - a. Lead Lined Frames: Use 9 mm (3/8 inch) diameter bolts.
 - b. Other Frames: Use 6 mm (1/4 inch) diameter bolts.
 2. Power actuated drive pins are acceptable to secure frame anchors to concrete floors.
- D. Jamb Anchors:
 1. Masonry Walls:
 - a. Embed anchors in mortar.
 - b. Fill space between frame and masonry with grout or mortar as walls are built.
 2. Metal Framed Walls: Secure anchors to sides of studs with two fasteners through anchor tabs.
 3. Prepared Masonry and Concrete Openings:
 - a. Direct Securement: 6 mm (1/4 inch) diameter expansion bolts through spacers.
 - b. Subframe or Rough Buck Securement:
 - 1) 6 mm (1/4 inch) diameter expansion bolts on 600 mm (24 inch) centers.
 - 2) Power activated drive pins on 600 mm (24 inches) centers.
 - c. Secure two-piece frames to subframe or rough buck with machine screws on both faces.
- E. Frames for Sound Rated Doors: Fill frames with insulation.
- F. Touch up damaged factory finishes.

1. Repair galvanized surfaces with galvanized repair paint.
2. Repair painted surfaces with touch up primer.

3.4 DOOR INSTALLATION

- A. Install doors plumb and level.
- B. Adjust doors for smooth operation.
- C. Touch up damaged factory finishes.
 1. Repair galvanized surfaces with galvanized repair paint.
 2. Repair painted surfaces with touch up primer.

3.5 CLEANING

- A. Clean exposed door and frame surfaces. Remove contaminants and stains.

3.6 PROTECTION

- A. Protect doors and frames from traffic and construction operations.
- B. Remove protective materials immediately before acceptance.
- C. Repair damage.

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