

**SECTION 081119 - STAINLESS-STEEL DOOR FRAMES**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Stainless-steel, hollow-metal frames.

**1.2 RELATED WORK**

- A. Sustainable design requirements and procedures including submittal requirements: Section 018111, SUSTAINABLE DESIGN.
- B. Procedures and requirements for managing and disposing construction and demolition waste: Section 017419, CONSTRUCTION WASTE MANAGEMENT.
- C. Section 087100 "Door Hardware" for door hardware for stainless-steel door frames.

**1.3 COORDINATION**

- A. Coordinate anchorage installation for stainless-steel frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

**1.4 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, fire-resistance rating, and finishes.
- B. LEED Submittals: Submit in accordance with Section 018111.
  - 1. LEED submittals are in addition to other submittals. If submitted item is identical to that submitted to comply with other requirements, submit duplicate copies as a separate submittal to verify compliance with indicated LEED requirements.
  - 2. LEED Product Data Submittal Form: Submit completed product data form provided by the Contracting Officer's Representative; certified by vendor, installer, subcontractor, and/or manufacturer as appropriate.
- C. Shop Drawings: For stainless-steel hollow-metal work.
  - 1. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
  - 2. Locations of reinforcement and preparations for hardware.
  - 3. Details of each different wall opening condition.
  - 4. Details of anchorages, joints, field splices, and connections.
  - 5. Details of accessories.
  - 6. Details of moldings, removable stops, and glazing.
  - 7. Details of conduit and preparations for power, signal, and control systems.
- D. Samples:

1. Finishes: For each type of exposed finish required, prepared on Samples of not less than 3 by 5 inches.
2. Frames: Show profile, corner joint, floor and wall anchors, and silencers. Include separate section showing fixed hollow-metal panels and glazing if applicable.

#### **1.5 QUALITY ASSURANCE**

- A. Provide the following upon request:
  1. Product Test Reports: For assemblies required to be fire rated performed by a qualified testing agency.
  2. Oversize Construction Certification: For assemblies required to be fire rated and exceeding limitations of labeled assemblies.
  3. Metal Certification: Submit letter from stainless steel supplier certifying that stainless steel is Type 316.

#### **1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver frames palletized, wrapped, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.
- B. Shipping Spreaders: Deliver welded frames with two removable spreader bars across bottom of frames, tack welded or mechanically attached to jambs and mullions.
- C. Store frames under cover at Project site. Place units in a vertical position with heads up, spaced by blocking, on minimum 4-inch- high wood blocking. Avoid using nonvented plastic or canvas shelters that could create a humidity chamber.

### **PART 2 - PRODUCTS**

#### **2.1 PERFORMANCE REQUIREMENTS**

- A. Performance: Level A, SDI A250.4.
- B. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.
- C. Smoke- and Draft-Control Door Assemblies: Where indicated, provide assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
  1. Air Leakage Rate: Maximum air leakage of 0.3 cfm/sq. ft. at the tested pressure differential of 0.3-inch wg of water.

#### **2.2 STAINLESS-STEEL FRAMES**

- A. Stainless-Steel Frames: Fabricate stainless-steel frames of construction indicated, with faces of corners mitered and contact edges closed tight.
  1. Frame Construction: Machine mitered and full (continuously) welded.
    - a. Weld frames according to NAAMM-HMMA 820.
  2. Door Frames for Openings 48 Inches Wide or Less: Fabricate from 0.062-inch- thick, stainless-steel sheet.

3. Door Frames for Openings More Than 48 Inches Wide: Fabricate from 0.078-inch- thick, stainless-steel sheet.
4. Hardware Reinforcement: Fabricate according to NAAMM-HMMA 866 with reinforcing plates from stainless steel.
5. Head Reinforcement: 0.109-inch- thick, stainless-steel channel or angle stiffener for opening widths more than 48 inches.
6. Jamb Anchors:
  - a. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.050-inch- thick stainless steel.
  - b. Compression Type for Drywall Slip-on Frames: Fabricate adjustable compression anchors from stainless steel.
  - c. Postinstalled Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch- diameter, stainless-steel bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.
7. Terminated Stops: Terminate stops 6 inches above finish floor with a 45-degree angle cut, and close open end of stop with steel sheet closure. Cover opening in extension of frame with welded-steel filler plate, with welds ground smooth and flush with frame. (ADD#01)
8. Floor Anchors: Not less than 0.078-inch- thick stainless steel, and as follows:
  - a. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
  9. Plaster Guards: Not less than 0.019-inch- thick stainless steel.
- B. Materials:
  1. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
  2. Stainless-Steel Sheet: ASTM A 240/A 240M, austenitic stainless steel, Type 316.
  3. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, commercial steel, Type B; with minimum G60 or A60 metallic coating.
  4. Frame Anchors: Stainless-steel sheet.
  5. Inserts, Bolts, and Anchor Fasteners: Stainless-steel components complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2 for bolts and nuts.
- C. Stainless-Steel Finishes: Remove tool and die marks and stretch lines, or blend into finish. Grind and polish surfaces to produce uniform finish, free of cross scratches. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
  1. Directional Satin Finish: No. 4.

### 2.3 FABRICATION

- A. Stainless-Steel Frame Fabrication: Fabricate stainless-steel frames to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
1. Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible. Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated from same thickness metal as frames.
  2. Provide countersunk, flat-, or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
  3. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
  4. Jamb Anchors: Provide number and spacing of anchors as follows:
    - a. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c.
    - b. Stud-Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. Two anchors per head for frames more than 42 inches wide and mounted in metal-stud partitions.
    - c. Compression Type: Not less than two anchors in each jamb.
    - d. Postinstalled Expansion Type: Locate anchors not more than 6 inches from top and bottom of frame. Space anchors not more than 26 inches o.c.
  5. Head Reinforcement: For frames more than 48 inches wide, provide continuous head reinforcement for full width of opening, welded to back of frame at head.
  6. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Provide plastic plugs to keep holes clear during construction.
    - a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
    - b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.
  7. Hardware Preparation: Factory prepare stainless-steel frames to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping, according to the door hardware schedule.
    - a. Reinforce frames to receive nontemplated mortised and surface-mounted door hardware.
  8. Plaster Guards: Weld guards to frame at back of hardware mortises and mounting holes in frames to be grouted.
  9. Tolerances: Fabricate frames to tolerances indicated in NAAMM-HMMA 866.

## 2.4 ACCESSORIES

- A. Grout: Comply with ASTM C 476, with a slump of not more than 4 inches as measured according to ASTM C 143/C 143M.
- B. Mineral Fiber Insulation: Insulation made of rock-wool fibers, slag-wool fibers, or glass fibers.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of stainless-steel frames.
- B. Examine roughing-in for embedded and built-in anchors to verify actual locations of stainless-steel door-frame connections before frame installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
- B. Prior to installation and with installation spreaders in place, adjust and securely brace stainless-steel door frames for squareness, alignment, twist, and plumb to the following tolerances:
  - 1. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb, and perpendicular to frame head.
  - 2. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
  - 3. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
  - 4. Plumbness: Plus or minus 1/16 inch, measured at jambs on a perpendicular line from head to floor.
- C. Drill and tap frames to receive nontemplated mortised and surface-mounted door hardware.

### 3.3 INSTALLATION

- A. General: Install stainless-steel frames plumb, rigid, properly aligned, and securely fastened in place; comply with NAAMM-HMMA 866 and manufacturer's written instructions.
- B. Stainless-Steel Frames:
  - 1. Set frames accurately in position; plumb, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
    - a. At fire-protection-rated openings, install frames according to NFPA 80.

- b. Where frames are fabricated in sections due to shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
  - c. Install frames with removable glazing stops located on secure side of opening.
  - d. Install door silencers in frames before grouting.
  - e. Remove temporary braces necessary for installation only after frames have been properly set and secured.
  - f. Check plumb, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
  - g. Apply corrosion-resistant coating to backs of grout-filled frames.
2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor and secure with postinstalled expansion anchors.
    - a. Floor anchors may be set with powder-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
  3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation behind frames.
  4. Grouted Frames: Solidly fill space between frames and substrate with grout. Take precautions, including bracing frames, to ensure that frames are not deformed or damaged by grout forces.
  5. Installation Tolerances: Adjust stainless-steel frames for squareness, alignment, twist, and plumb to the following tolerances:
    - a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb, and perpendicular to frame head.
    - b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
    - c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
    - d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.

#### **3.4 ADJUSTING AND CLEANING**

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work including stainless-steel frames that are warped, bowed, or otherwise unacceptable.
- B. Clean grout and other bonding material off stainless-steel frames immediately after installation.
- C. Stainless-Steel Touchup: Immediately after erection, smooth any abraded areas of stainless steel and polish to match undamaged finish.

**3.5 CONSTRUCTION WASTE MANAGEMENT**

- A. General: Comply with Contractor's Waste Management Plan and Section 017419, CONSTRUCTION WASTE MANAGEMENT.
- B. To the greatest extent possible, separate reusable and recyclable products from contaminated waste and debris in accordance with the Contractor's Waste Management Plan. Place recyclable and reusable products in designated containers and protect from moisture and contamination.

**END OF SECTION**