

SECTION 08110 STEEL DOORS AND FRAMES**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Steel doors
- B. Steel frames
- C. Steel architectural stick systems

1.02 RELATED SECTIONS

- A. Section 08210 - Wood Doors
- B. Section 08220 - Plastic Doors
- C. Section 08710 - Door Hardware
- D. Section 08800 - Glazing
- E. Section 09900 - Paints and Coatings
- F. Section 13710 - Intrusion Detection: Security system
- G. Section 13800 - Building Automation and Control: Building monitoring system
- H. Section 16123 - Building Wire and Cable: Power supply to electric hardware devices

1.03 REFERENCES

It is the intent of this specification that all hollow metal and its application will comply or exceed the standards as listed. The latest published edition of each reference applies.

- A. **ASTM** - American Society for Testing and Materials
 - 1. **ASTM A 653/A 653M** - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 2. **ASTM A 666** - Standard Specification for Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
 - 3. **ASTM A 924** - Specification for General Requirements for Steel Sheet, Metallic Coated by the Hot Dip Process.
 - 4. **ASTM A 1008/A 1008M** - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, High Strength Low-Alloy, High Strength Low Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.
 - 5. **ASTM E 90** - Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.
 - 6. **ASTM E 413** - Classification for Rating Sound Insulation.
- B. **ANSI** - American National Standards Institute
 - 1. **ANSI A115.1** - Preparation for Mortise Locks for 1 3/4 Inch and 1 3/8 Inch Doors.
 - 2. **ANSI A115.2** - Preparation for Bored Locks for 1 3/4 Inch and 1 3/8 Inch Doors.
 - 3. **ANSI A156.7** - Hinge Template Dimensions.
 - 4. **ANSI A 250.3** - Test Procedure and Acceptance Criteria for Factory Applied Finish Painted Steel Surfaces for Steel Doors and Frames.
 - 5. **ANSI A250.4** - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors and Hardware Reinforcing.
 - 6. **ANSI A 250.8** - SDI-100 Recommended Specifications for Standard Steel Doors and Frames.
 - 7. **ANSI A 250.10** - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
 - 8. **ANSI/SDI 250.11** - Recommended Erection Instructions for Steel Frames
 - 9. **ANSI/DHI A 115** - Specifications for Hardware Preparations in Standard Steel Doors and Frames.
 - 10. **ANSI/DHI A 115.IG** - Installation Guide for Doors and Hardware.
- C. **SDI** - Steel Door Institute
 - 1. **SDI 105** - Recommended Erection Instructions for Steel frames.
 - 2. **SDI 111** - Recommended Details and Guidelines for Standard Steel Doors and Frames and Accessories.
 - 3. **SDI 111-H** - High Frequency Hinge Preparation
 - 4. **SDI 112** - Zinc-Coated (Galvanized/Galvannealed) Standard Steel Doors and Frames.
 - 5. **SDI 117** - Manufacturing Tolerances for Standard Steel Doors and Frames.
 - 6. **SDI 118** - Basic Fire Door Requirements.
 - 7. **SDI 122** - Installation and Troubleshooting Guide for Standard Steel Doors and Frames.
 - 8. **SDI 124** - Maintenance of Standard Steel Doors and Frames.

SECTION 08110 STEEL DOORS AND FRAMES *(continued)*

D. NAAMM/HMMA - Hollow Metal Manufacturers Association

1. **HMMA 840** - Guide Specification for Installation and Storage of Hollow Metal Doors and Frames
2. **HMMA 820 TN01- 03** - Grouting Hollow Metal Frames

Spec Writer's Note - Delete the standards which are not applicable to your area

E. Building Code references

1. **NFPA 80** - Standard for Fire Doors and Other Opening Protectives.
2. **UL** - Building Materials Directory; Underwriters Laboratories Inc
3. **ANSI/UL 10C** - Standard for Safety for Positive Pressure Fire Tests of Door Assemblies
4. **Federal Emergency Management Agency (FEMA)** 361 Guidelines
5. **UBC 7-2-1997** - Positive Pressure Fire Tests of Door Assemblies.
6. **WH** - Certification Listings; Warnock Hersey International Inc.
7. **Miami** - Dade County test protocols PA 201, PA 202 and PA 203.
8. **Florida Building Code** test protocols TAS 201, TAS 202 and TAS 203
9. **NFPA 105** - Standard for the Installation of Smoke Door Assemblies and Other Opening Protectives
10. **UL 1784** - Air Leakage Tests of Door Assemblies

1.04 REQUIREMENTS OF REGULATORY AGENCIES:

- A. Doors and frames to conform to applicable codes for fire ratings. It is the intent of this specification that all hardware and its application comply or exceed the standards for labeled openings. In case of conflict between types required for fire protection, furnish type required by NFPA and UL.
 1. Interior vertical stairwell doors will carry a minimum 250°F (121°C) temperature rise rating in addition to the required fire rating.

1.05 SUBMITTALS

- A. Submit for review six (6) complete copies of the hollow metal shop drawings covering complete identification of items required for the project. Include manufacturer's names and identification of product. Included six (6) complete copies of catalog cuts and/or technical data sheets and any other data as may be required to show compliance with these specifications.
 1. The data on the Shop Drawing will be complete with respect to quantities, dimensions, specified performance, and design criteria, materials and similar data to enable the Architect to review the information as required.
- B. Indicate frames configuration, anchor types and spacing, location of cutouts for hardware, reinforcement, to ensure doors and frames are properly prepared and coordinated to receive hardware.
- C. Indicate door elevations, internal reinforcement, closure method, and cutouts for glass lights and louvers.
- D. Submit manufacturer's installation instructions, including a copy of ANSI A250.11-2001 as part of the shop drawing submittal.
- E. Shop drawings, product data, and samples to bear the Contractor's stamp verifying they have been coordinated and reviewed for completeness and compliance with the contract documents.
- F. Shop drawings submitted without the above requirements will be considered incomplete, will NOT be reviewed, and will be returned directly to the Contractor.
- G. Follow the same procedures for re-submittal as the initial submittal with the appropriate dates revised.
- H. After approval of the hollow metal shop drawings this distributor to furnish four (4) complete sets of as-built documents with manufacturers' warranties and product data. Submit information bound in a schedule cover.
- I. Evidence of manufacturer's membership in the Steel Door Institute.

SECTION 08110 STEEL DOORS AND FRAMES *(continued)***1.06 QUALITY ASSURANCE**

- A. Select a qualified hollow metal distributor, who is a direct account of the manufacturer of the products furnished. In addition that distributor must have in their regular employment an Architectural Hardware Consultant (AHC), a Certified Door Consultant (CDC) or an Architectural Openings Consultant (AOC), who will be available to consult with the Architect and Contractor regarding any matters affecting the door and frame opening.
- B. Furnish materials and work performed in conformity with the contract documents.
- C. Conform to requirements of the above reference standards. Submit test reports upon request by the Owner or Architect.
- D. Underwriters' Laboratories and Warnock Hersey, labeled fire doors and frames:
 - 1. Label fire doors and frames listed in accordance with Underwriters Laboratories standard UL10C, Positive Pressure Fire Tests of Door Assemblies and Uniform Building Code Standard 7-2, Fire Tests of Door Assemblies.
 - 2. Construct and install doors and frames to comply with current issue of ANSI/NFPA 80.
 - 3. Manufacture Underwriters' Laboratories labeled doors and frames under the UL factory inspection program and in strict compliance to UL procedures, and provide the degree of fire protection, heat transmission and panic loading capability indicated by the opening class.
 - 4. Manufacture Warnock Hersey labeled doors and frames to meet the specific requirements of that labeling agency's current procedure for the tested hourly rating designated and inspected by representatives of the labeling agency.
 - 5. Affixed physical label or approved marking to fire doors and/or fire door frames, at an authorized facility as evidence of compliance with procedures of the labeling agency. Label embossment is not permitted.
 - 6. Conform to applicable codes for fire ratings. It is the intent of this specification that hardware and its application comply or exceed the standards for labeled openings. In case of conflict between types required for fire protection, furnish type required by NFPA and UL.
 - 7. Fire door assemblies in exit enclosures and exit passageways must have a maximum transmitted temperature end point of not more than 250°F (121°C) above ambient at the end of 30 minutes of the standard fire test exposure.

Spec Writer's Note - Choose the appropriate Severe Storm Products where applicable. Delete this section if not applicable.

- E. **Severe Storm Products:**
 - 1. **Tornado Doors:** Door Systems for Federal Emergency Management Agency (FEMA) community shelters and other areas of refuge meeting the design wind pressures and missile impact loads as detailed in the National Performance Criteria for Tornado Shelters as published by FEMA.
 - 2. **Hurricane Doors:** Door systems required to comply with the Miami-Dade County Product Control Approval System or the Florida Building Code Approval System meeting the requirements of Miami-Dade County test protocols PA 201, PA 202, PA 203 and Florida Building Code test protocols TAS 201, TAS 202 and TAS 203.
- F. **Manufacturer Qualifications:** Member of the Steel Door Institute.
- G. **Installer:** Minimum five years documented experience installing products specified in this Section.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. **Storage of Doors**
 - 1. Store doors vertically in a dry area, under proper cover. Place the units on at least 4" high wood sills on floors in a manner that will prevent rust and damage. Avoid use of non-vented plastic or canvas shelters, which create a humidity chamber and promote rusting. If the door becomes wet, or moisture appears, remove any protective wrapping immediately. Provide a 4" space between the doors to permit air circulation. Proper storage is required to meet the requirements of ANSI/SDI A250.10 and HMMA 840.
- B. **Storage of Frames**
 - 1. Store frames in an upright position with heads uppermost under cover on 4" wood sills on floors in a manner that will prevent rust and damage. Do not use non-vented plastic or canvas shelters, which create a humidity chamber and promote rusting. Store assembled frames in a vertical position, five units maximum in a stack. Provide a 2" space between frames to permit air circulation.
 - 2. Provide proper storage for doors and frames, to maintain the quality and integrity of the factory applied paint, and maintain the requirements of ANSI/SDI A250.10 and HMMA 840.
 - 3. Sand, touch up and clean prime painted surfaces prior to finish painting in accordance with the manufacturer's instructions.

1.08 COORDINATION

- 1. Coordinate Work with other directly affected sections involving manufacture or fabrication of internal cutouts and reinforcement for door hardware, electric devices and recessed items.
- 2. Coordinate work with frame opening construction, door and hardware installation.
- 3. Sequence installation to accommodate required door hardware.
- 4. Verify field dimensions for factory assembled frames prior to fabrication.

SECTION 08110 STEEL DOORS AND FRAMES *(continued)*

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Acceptable manufacturers for doors and frames specified are listed below. Only the products of the listed manufacturers will be accepted. No other approved alternates will be accepted.
1. Steelcraft, Cincinnati, Ohio
 2. Curries, Mason City, Iowa
- B. Provide all steel doors and frames from a single manufacturer.

2.02 DOORS:

- A. Construct exterior/interior doors to the designs and gages as specified:

Spec Writer's Note - Choose one of the appropriate steel thickness and type

1. **Exterior Doors:** Hot-dip galvanized steel, ASTM A 653, Class A60, 18 gage [0.042" (1mm)], 16 gage [0.053" (1.3mm)] or 14 gage [0.067" (1.7mm)] hot dipped galvanized steel, with closed tops.
 - a. Include galvanized components and internal reinforcements with galvanized doors.
 - b. Close tops of exterior swing-out doors to eliminate moisture penetration. Galvanized steel top caps are permitted.
2. **Interior Doors:** Cold-rolled steel, A 1008, 20 gage [0.032" (.8mm)], 18 gage [0.042" (1mm)], or 16 gage [0.053" (1.3mm)] cold rolled or galvanized steel.
 - a. Include galvanized components and internal reinforcements with galvanized doors.

Spec Writer's Note - GrainTech and finish paint are finish options. Delete these options when not applicable.

3. Grain-Tech factory finished doors indicated on door schedule as HMGT.
 4. Factory prime painted doors indicated on door schedule as HM.
 5. Hardware Reinforcements:
 - a. Hinge reinforcements for full mortise hinges: minimum 7 gage [0.180" (4.7mm)].
 - b. Lock reinforcements: minimum 16 gage [0.053" (1.3mm)].
 - c. Closer reinforcements: minimum 14 gage [0.067" (1.7mm)], 20" long.
 - d. Galvanized doors include galvanized hardware reinforcements.
 - e. Projection welded hinge and lock reinforcements to the edge of the door.
 - f. Provide adequate reinforcements for other hardware as required.
- B. Full Flush Type Doors Construction
1. Doors construction conforming to ANSI-A250.4 criteria and tested to 5,000,000 operating cycles.
 2. Approved door core constructions:

Spec Writer's Note - Choose one of the appropriate door core types

- a. **Honeycomb:** Reinforced, stiffened, sound deadened and insulated with impregnated Kraft honeycomb core completely filling the inside of the doors and laminated to inside faces of both panels using contact adhesive applied to both panels and honeycomb core.
Acceptable products:
 - (i) Steelcraft: L
 - (ii) Curries: 707D
- b. **Polystyrene:** Reinforced, stiffened, sound deadened and insulated with a rigid polystyrene core bonded to the inside faces of both panels with contact adhesive. Fill voids around the perimeter of the door with honeycomb. Acceptable products:
 - (i) Steelcraft: L with polystyrene option
 - (ii) Curries: 707D
- c. **Steel Stiffened:** Vertically steel stiffeners and sound deadened with fiberglass batt insulation. Fabricate hat shaped stiffeners from 22 gage [0.026" (0.6mm)] steel. Vertical interior webs located 6" (152mm) apart, welded to the inside of the face sheets 5" (127 mm) on center. Weld the hat shape stiffeners together at the top and bottom of the door. Fill areas between stiffeners with fiberglass.
Acceptable products:
 - (i) Steelcraft: B
 - (ii) Curries: 747D
- d. **Temperature Rise Doors:** Mineral fiber core material to comply with the 250° F (121° C) maximum temperature rise rating.
Acceptable products:
 - (i) Steelcraft: T
 - (ii) Curries: 727D

SECTION 08110 STEEL DOORS AND FRAMES *(continued)***Spec Writer's Note - GrainTech is a finish options. Delete this section when not applicable.**

- e. **GrainTech® Doors:** Fabricated from steel that has an embossed wood grain pattern extending the full height and width of the door. Provide doors with continuous vertical mechanical inter-locking joints at lock and hinge edges with visible edge seams. The wood grain embossment minimum .005" deep. The wood grain face sheets must be cleaned, phosphatized and prime painted with a stain absorbing primer. Vertical edges must be stained using conventional stains to achieve a (select 1) [ash, birch, mahogany, maple, oak, walnut,] color. After staining, the door must be clear coated with UV inhibitors. Applied grain pattern or material will not be permitted
Acceptable products:
- (i) Steelcraft Graintech
 - (ii) Curries: Curristain
3. **Vertical edge seams:** Provide doors with continuous vertical mechanical inter-locking joints at lock and hinge edges with visible edge seams, or a one piece full height 14 gage channel. Apply a continuous bead of structural epoxy in the internal vertical connection.

Spec Writer's Note - Choose one of the appropriate door edges**Edges seam options:**

- a. **Filled Vertical Edges (F):** Continuous vertical mechanical interlocking joint with internal epoxy seal; edge seams epoxy filled and ground smooth.
- (i) Steelcraft: LF edge option
 - (ii) Curries: N edge option
- b. **Welded Vertical Edges (W):** Continuous vertical mechanical interlocking joint; edge seams welded, epoxy filled, and ground smooth.
- (i) Steelcraft LW edge option
 - (ii) Curries: T edge option
4. Bevel hinge and lock door edges 1/8 inch (3 mm) in 2 inches (50 mm). Square edges on hinge and/or lock stiles are not acceptable.
5. Reinforce top and bottom of doors with galvanized 14 gage, welded to both panels.

Spec Writer's Note - Choose the appropriate Severe Storm Products where applicable. Delete this section when not applicable

- C. Tornado Door Systems must comply with Federal Emergency Management Agency (FEMA) 361 Guidelines and provides the highest level of security and safety for tornado shelters and severe storm areas of refuge.
1. **Acceptable Product:**
 - a. Steelcraft Paladin Tornado Door Systems.
 - (i) Steelcraft: P
 - (ii) Curries: Stormpro
 2. Face sheets: 14 gage [0.067" (1.7mm)] hot-dipped galvanized steel having an A60 zinc-iron alloy coating conforming to ASTM designations A653 and A924.
 3. Hinge and lock edges: include continuous vertical mechanical joints with edge seams welded, filled and ground smooth.
 4. Bevel all hinge and lock door edges 1/8 inch (3 mm) in 2 inches (50 mm). Square edges on hinge and/or lock stiles are not acceptable
 5. Galvanized 14 gage [0.067" (1.7mm)] top and bottom steel reinforcement channels projection welded to both face sheets on 4 inches (102 mm) centers.
 6. **Hinge reinforcements:** minimum 7 gage [0.167" (4.4mm)] galvanized steel, projection welded to the edge of the door.
 7. Reinforce door faces with 18 gage [0.042" (1.0mm)] vertical stiffeners manufactured from steel conforming to ASTM A653 and A924 and welded to each face sheet.
 8. Reinforce lock stiles with full-height 12 gage [0.093" (2.5mm)] channels.
 9. **Fire Rated Doors:** Provide door units bearing Labels for fire ratings required in locations indicated.
- D. **Hurricane Doors:** Designed to resist the cyclic pressures, static pressures and missile impact loads as detailed in the Miami-Dade County Product Control Approval System of the Florida Building Code Approval System and meets the requirements of Miami – Dade County test protocols PA 201, PA 202, PA 203 and Florida Building Code test protocols TAS 201, TAS 202 and TAS 203.

SECTION 08110 STEEL DOORS AND FRAMES *(continued)*

Spec Writer's Note - Choose one of the appropriate stile and rail door construction. Delete this section when not applicable

E. Stile and Rail Doors

1. Tubular stile and rail construction, 1-3/4" (45 mm) thick and fabricated from 16 gage (1.3 mm) from commercial quality carbon steel or galvanized steel. Stiles that extend the full height of the door. Rails are internally welded or permanently mechanically joined to the stiles forming a neat seam on the face. Hot-dip galvanized steel stiles and rails conforming to ASTM A 653, Class A60, 16 gage [0.053" (1.3mm)]; formed to rectangular tube shape. Approved door core constructions:
 - a. **Hinge Stile and Lock Stile:** 5-1/4" inch plus 5/8 inch (16 mm) aluminum glass stop. Top Rail: 5 inches plus 5/8 inch (16 mm) for aluminum glass stop. Intermediate Rails: 5 inches plus 1-1/4 inches (29 mm) for aluminum stop. Bottom Rail: 10 inches plus 5/8 inch (16 mm) for aluminum glass stop. Mechanically fastened hairline flush vertical joints
 - (i) Steelcraft: A
 - (ii) Curries: Trulite

F. Electrical Requirements:

1. **General:** Coordinate electrical requirements for doors and frames. Make provisions for installation of electrical items arranged so that wiring can be readily removed and replaced.
2. **Doors with Electric Hinges:**
 - a. **General:** Furnish conduit raceway to permit wiring from electric door hardware.
 - b. **Hinge Locations:** Provide electric hinge at intermediate or center location. Top or bottom electric hinge locations are not acceptable.
 - c. Refer to 08710 for electrified hardware items.

2.03 DOOR FRAMES:

- A. Construct exterior and metal door frames to the profiles, designs and gages as specified.

Spec Writer's Note - Choose one of the appropriate steel thickness and type

1. **Exterior Frames:** Hot-dip galvanized steel, ASTM A 653, Class A60, 16 gage [0.053" (1.3mm)] or 14 gage [0.067" (1.7mm)] hot dipped galvanized steel.
 - a. Include galvanized components and internal reinforcements with galvanized frames.
2. **Interior Frames in Masonry:** 16 gage [0.053" (1.3mm)] cold rolled or galvanized steel.
 - a. Include galvanized components and internal reinforcements with galvanized.
3. **Interior Frames in Drywall:** 16 gage [0.053" (1.3mm)] cold rolled frames.
- B. **Flush Frames:** knocked down for field assembly or set-up and arc-welded with temporary shipping bars. Factory die-mitered corner connections reinforced with four integral tabs to secure and interlock at jambs to head. Unless otherwise indicated, frame will have 2" faces and 5/8" stops. Frame depths per the architectural door schedule
 1. Provide frames with a minimum of six wall anchors and two adjustable base anchors of manufacturer's standard design. Acceptable products:
 - a. **Steelcraft:** F
 - b. **Curries:** M
- C. **Drywall Frames:** same as flush frames, 16 gage except:
 1. Form frames with double return backbends to prevent cutting into drywall surface. Design knock down frames to be securely installed in the rough opening after wallboard is applied.
 - a. **Drywall frames:** knocked down for field assembly. Factory die-mitered corner connections reinforced at miters, including soffit tabs to secure and interlock at jambs to head
 2. Locate adjustable anchors in each jamb 4" from the top of the door opening to hold frame in rigid alignment.
 - a. Provide security anchor at strike jambs on all frames 7'6" high and over.
 3. **Base anchor options:**

SECTION 08110 STEEL DOORS AND FRAMES *(continued)***Spec Writer's Note - Choose one of the appropriate base anchoring systems**

- a. Weld-in base anchor attaching plate in each jamb for field installation of loose base anchors to allow proper anchoring at base of frame.
Acceptable products:
 - (i) Steelcraft: DW
 - (ii) Curries: C with P0087
 - b. Dimpled holes and face screw application. Acceptable products:
 - (i) Steelcraft: K
 - (ii) Curries: C
- D. Prepare all frames to receive inserted type door silencers (3) per strike jamb on single doors, and (2) per head for pair of doors. Stick on silencers are not permitted.
- E. **Frame Hardware Reinforcements:**
1. Mortise hinge reinforcement: minimum 7 gage [0.180" (4.7mm)].
 - a. Provide high frequency hinge reinforcement for top hinge on all exterior, cross corridor, and stairwell frames, in accordance with SDI 111-H, Example "A" Application, where full mortise hinges are specified.
 2. **Strike reinforcements:** minimum 16 gage [0.053" (1.3mm)] and prepared for an ANSI-A115.1-2 strike.
 3. **Closer reinforcement:** minimum 14 gage [0.067" (1.7mm)] steel.
 4. Projection weld hinge and strike reinforcements to the door frame.
 5. Provide metal plaster guards for all mortised cutouts.
 6. Provide adequate reinforcements for other hardware as required.
 7. Include galvanized hardware reinforcements in all galvanized frames.
- F. **Electrical Requirements:**
1. **General:** Coordination all electrical requirements for doors and frames.
Make provisions for installation of electrical items arranged so that wiring can be readily removed and replaced.
 - a. Provide cutouts and reinforcements required for metal door frame to accept electric components.
 - b. Frame with Electrical Hinges: Weld UL listed grout guard cover box welded over center hinge reinforcing.
Top or bottom hinge locations are not permitted. Contractor to reference 3.01.D, for continuous hinges.
 - c. Provide cutouts and reinforcements required to accept security system components.
 - d. Refer to 08710 for electrified hardware items.

Spec Writer's Note - Insert paragraph #2 when applicable monitoring switch may be required

2. Provide mortar box, welded in head of door frame at exterior frames for future door contact switch provided by owner.
Size, type, location and conduit requirements to be provided by owner.

SECTION 08110 STEEL DOORS AND FRAMES *(continued)***2.04 CONSTRUCTION OF ARCHITECTURAL STICK COMPONENTS:**

- A. Fabricate architectural stick frame assemblies from standard frame components, fabricated from 14 gage galvanized steel A60 for exterior, and 16 gage cold rolled steel for interior.
- B. Construct architectural stick frame assemblies of standard frame components, fabricated as specified.

Spec Writer's Note - Choose one of the appropriate steel thickness and type

1. Exterior Frames: Hot-dip galvanized steel, ASTM A 653, Class A60, 16 gage [0.053" (1.3mm)] or 14 gage [0.067" (1.7mm)] hot dipped galvanized steel, with closed tops.
 - a. Include galvanized components and internal reinforcements with all galvanized frames.
2. Interior Frames in Masonry: 16 gage [0.053" (1.3mm)] cold rolled or galvanized steel.
 - a. Include galvanized components and internal reinforcements with all galvanized frames.
- C. **Frame component requirements:**
 1. Prepare required sticks at door openings and frame assemblies for hardware as specified.
 2. Fabricate frame assemblies from three basic components:
 - a. Open Sections (perimeter members) identical in configuration to standard frames
 - b. Closed sections (intermediate members) with identical jamb depth, face dimensions, and stops as open sections.
 - c. Sill sections: Fabricated from galvanized steel, flush with both faces of adjacent vertical members. Cut individual components to length and notched to assure square joints and corners.
 3. Welded and ground smooth joints and corners of the frame assembly at the intersecting faces of the sections. Externally welded face joints at meeting mullions or between mullions and other frame members on the face surfaces only.
 4. Ship frame assemblies to the jobsite completely welded. Field joints will be permitted only with the size of the total assembly exceeds shipping limitations.
 5. Field splice joints will be permitted when the fabricated frame assemblies if large openings are subject to shipping limitations. Oversized frames will be fabricated in sections designated for splicing in the field. Frames to be provided with joint reinforcements 14 gage, 8" long. Field weld joint reinforcement inside and tack weld outside joint at both faces, grind, and finish smooth and uniform in appearance, after installation.
 6. Pierced and dimpled glazing beads for use with manufacturers' standard fasteners.
 7. Provide necessary anchors for jambs, heads, and sills of assemblies.
- D. Verification of field dimensions as required.
Frame fabrication will not begin until these dimensions have been verified, submitted, and approved.

2.05 FABRICATION:

- A. **Face Welded Frames:**
 1. Continuous face weld the joint between the head and jamb faces along their length either internally or externally. Grind, prime paint, and finish smooth face joints with no visible face seams.
 2. Externally weld, grind, prime paint, and finish smooth face joints at meeting mullions or between mullions and other frame members as per ANSI/SDI A250.8 – 2003.
 3. Provide two temporary steel spreaders (welded to the jambs at each rabbet of door openings) on welded frames during shipment.
Remove temporary steel spreaders prior to installation of the frame.

2.06 FINISH:

- A. Doors, frames and frame components are required to be cleaned, phosphatized, and finished with one coat of baked-on rust inhibiting prime paint in accordance with the ANSI/SDI A250.10 "Test Procedures and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames."

SECTION 08110 STEEL DOORS AND FRAMES *(continued)***PART 3 EXECUTION:****3.1 EXAMINATION****3.01 INSTALLATION:**

- A. Install doors and frames in accordance with Steel Door Institute's recommended erection instructions for steel frames ANSI A250.11.
- B. Install label doors and frames in accordance with NFPA-80.
- C. Remove temporary steel spreaders prior to installation of frames.**
- D. Set frames accurately in position; plumb, align and brace until permanent anchors are set. After wall construction is complete, remove temporary wood spreaders.
 - 1. Field splice only at approved locations indicated on the shop drawings. Weld, grind, and finish as required to conceal evidence of splicing on exposed faces.
- E. Provide full height 3/8" to 1-1/2" strip of polystyrene insulation at frames requiring grouting where continuous hinges are specified. Apply the strip to the back of the frame, where the hinge is to be installed, to allow for field drilling or tapping.
- F. Where grouting is required in masonry, provide and install temporary bottom and intermediate wood spreaders to maintain proper width and avoid bowing or deforming of frame members. Refer to ANSI A250.11-2001, Standard.
 - 1. Hollow Metal Frames to receive grouting comply with ANSI/SDI Standard A250.8.2003, 4.2.2, whereby grout will be mixed to provide a 4" maximum slump consistency and hand troweled into place. Do not use grout mixed to a thinner, pumpable consistency is not recommended and not be used. Refer to HMMA 820 TN01-03 Grouting Hollow Metal Frames
- G. Provide a vertical wood brace during grouting of frame at openings over 4'0" wider, to prevent sagging of frame header.
- H. Apply hardware in accordance with hardware manufacturers' instructions and Section 08710 FINISH HARDWARE of these Specifications. Install all hardware with only factory provided fasteners. Adjust door installation to provide uniform clearance at head and jambs, to achieve maximum operational effectiveness and appearance.

3.02 ADJUSTING:

- A. **Final Adjustments:** Adjust operating doors and hardware items just prior to final inspection and acceptance by the Owner and Architect. Leave work in complete and proper operating condition. Remove and replace defective work, including doors or frames that are damaged, bowed or otherwise unacceptable.
- B. **Prime Coat Touch-Up:** Immediately after erection, sand smooth any rusted or damaged areas of prime coat, and apply touch-up of compatible air-drying primer.

3.03 PROTECTION

- A. Provide protective measures required throughout the construction period to ensure that door and frame units will be without damage or deterioration, other than normal weathering, at time of acceptance.