

## CONSTRUCTION MASTER SPECIFICATION

### SECTION 08110{PRIVATE }

#### STEEL DOORS AND FRAMES

**\*\*\*\*\* This guide section can be used for specifying various types of hollow steel doors and frames for construction projects at SNL. The specifier will need to edit this section for a specific project to reflect the options and applications being used. The guide section has been written so that most editing can be accomplished by deleting unnecessary requirements and options. Depending on project requirements, some additional information will need to be added by the specifier. Options are indicated by [ ]. Notes to assist the specifier in selecting options and editing the specification guide are printed in bold and indicated with \*\*\*\*\*. For final editing, all brackets and notes will need to be deleted from the guide, and this specification will need to be made into a Construction Special Specification.**

**Throughout this product guide specification, references are made to other specification sections that might be contained in the project manual. These references are presented as examples and coordination reminders. \*\*\*\*\***

**CONSTRUCTION MASTER SPECIFICATION**

**SECTION 08110**

**STEEL DOORS AND FRAMES**

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**CONSTRUCTION MASTER SPECIFICATION**

**SECTION 08110**

**STEEL DOORS AND FRAMES**

**PART 1 - GENERAL**

**1.01 SUMMARY**

**\*\*\*\*\* Edit the following to reflect steel door and frame components required for project.  
\*\*\*\*\***

- A. Section includes: [Non-rated] [and] [fire rated], [exterior] [and] [interior], hollow steel doors and frames.
1. Flush doors.
  2. Stile and rail glazed doors.
  3. Dutch doors.
  4. Transom panels.
  5. Door frames.
  6. Sidelight and transom frames.
  7. Fixed window frames.
  8. Acoustical door and frame assemblies.
  9. Door vision lights.
  10. Door louvers.
  11. Removable mullions.
  12. Grouting of frames.

**\*\*\*\*\* List other specification sections dealing with work directly related to this section such as the following. \*\*\*\*\***

- B. Related sections:
  - 1. Section 08210, "Wood Doors": Interior wood doors to be installed in hollow steel frames.
  - 2. Section 08710, "Door Hardware": Hardware for steel doors.
  - 3. Section 08800, "Glazing": Glazing for steel doors, vision lights, and steel window frames.
  - 4. Section 09900, "Painting": Field painting of doors and frames.
  
- C. See Door Schedule in Drawings for types, sizes, and fire ratings of steel doors and frames.

## 1.02 REFERENCES

**\*\*\*\*\* List by number and full title reference standards referred to in remainder of specification section. Delete non-applicable references. \*\*\*\*\***

- A. American National Standards Institute (ANSI):
  - ANSI A250.6 Hardware on Steel Doors (Reinforcement Application).
  - ANSI A250.8 Specification for Standard Steel Doors and Frames.
  - ANSI A250.10 Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors.
  - ANSI A250.11 Recommended Erection Instructions for Steel Frames.
  
- B. American National Standards Institute/Door Hardware Institute (ANSI/DHI):
  - DHI Handbook Recommended Locations for Architectural Hardware for Standard Steel Door and Frames.
  - ANSI/DHI A115 Installation Guide for Doors and Hardware.
  
- C. American Society of Testing and Materials (ASTM):

ASTM A153 Zinc-Coating (Hot-Dip) on Iron and Steel Hardware

ASTM A366 Steel, Carbon, Cold Rolled Sheet, Commercial Quality.

ASTM A653/A653M Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

ASTM A780 Standard Practice for Repair of Damaged & Uncoated Areas of Hot-Dip Galvanized Coatings.

ASTM A924 General Requirements for Sheet Steel, Metallic Coated by the Hot-Dip Process.

ASTM A1008/A1008M Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.

ASTM A1011/A1011M Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.

ASTM C236 Test Method for Steady-State thermal Performance of Building Assemblies by Means of a Guarded Hot Box.

ASTM C578 Specification for Rigid, Cellular Polystyrene Thermal Insulation.

ASTM C665 Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.

ASTM C1363 Test Method for the Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus.

ASTM E152 Test Methods for Detention Locks for Swinging Doors

ASTM E413 Classification for Rating Sound Insulation.

ASTM E1408 Test Method for Laboratory Measurement of the Sound Transmission Loss of Door Panels and Door Systems.

D. Code of Federal Regulations (CFR):

CFR 16-CFR 1201 Standard for Architectural Glazing Materials.

E. Door Hardware Institute (DHI):

Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames.

- F. Factory Mutual (FM):
- G. Green Seal (GS):
  - GC-03 Environmental Criteria for Anti-Corrosive Paints.
- H. Military Standardization documents (MIL):
  - MIL-DTL-P24441/20A Paint, Epoxy-Polyamide, Green Primer, Formula 150, Type III.
- I. National Association of Architectural Metal Manufacturers (NAAMM):
  - Metal Finishes Manual
- J. National Fenestration Rating Council (NFRC):
  - NFRC 400 Procedure for Determining Fenestration Product Air Leakage.
- K. National Fire Protection Association (NFPA):
  - NFPA 80 Standard for Fire Doors, Fire Windows.
  - NFPA 105 Recommended Practice for the Installation of Smoke-Control Door Assemblies.
- L. Steel Door Institute (SDI):
  - SDI 111-C Steel Doors and Frame Details.
  - SDI 112 Zinc-Coated (Galvanized/Galvannealed) Standard Steel Doors and Frames
  - SDI 117 Manufacturing Tolerances Standard Steel Doors and Frames.
  - SDI 125 High Frequency Hinge Preparation for Frames
- M. Steel Structures Painting Council (SSPC):
  - SSPC SP 1 Solvent Cleaning

SSPC SP 5/NACE No 1 White Metal Blast Cleaning.

SSPC Paint 20 Zinc-Rich Primers (Type I-Inorganic, and Type II-Organic).

N. International Building Code (IBC)

O. Underwriters Laboratories (UL):

### 1.03 SUBMITTALS

A. Submit in accordance with Section 01330, "Submittal Procedures":

1. Product data- Detailed technical information for each type of door and frame specified.
2. Shop drawings indicating door and frame elevations, dimensions, frame configurations and profiles, cutouts for hardware, reinforcement, anchors, and details for fabrication, glazing, and installation.
3. Door and Frame schedule: Use same reference numbers as indicated in Contract Documents. Indicate coordination of glazing frames and stops with glass and glazing requirements.
4. Certificates documenting:
  - a. Fire testing: Fire-rated units have been successfully tested in accordance with Paragraph 1.4.B.
  - b. R-value: Thermal units have been successfully tested in accordance with Paragraph 1.4.C.
  - c. Air leakage: Exterior doors and frames have been successfully tested in accordance with Paragraph 1.4.D.
  - d. Sound transmission class (STC): Acoustically rated doors have been successfully tested in accordance with Paragraph 1.4.E.
  - e. Domestic steel: Steel doors and frames are manufactured from United States produced steel as required by Paragraph 2.2.A and in accordance with Quality Assurance article.
  - f. Ozone depleting substances (ODS): Core materials do not contain ODS as required by Paragraph 2.2.B.
  - g. Primer environmental criteria: Primers comply with GS GC-03 as required by Paragraph 2.2.C.

## 1.04 QUALITY ASSURANCE

**\*\*\*\*\* Edit this article to reflect types of door assemblies being specified and project conditions. \*\*\*\*\***

- A. Conform to the requirements of ANSI A250.8.
  
- B. Fire rated doors and frames: Provide units that comply with NFPA 80, are identical to door and frame assemblies tested for fire-test-response characteristics per ASTM E152, and are labeled and tested by Factory Mutual (FM), Underwriters Laboratories (UL), or other National Recognized testing agency acceptable to SNL Site Fire Marshal. Units shall bear testing agency labels.
  - 1. Oversize door assemblies: Provide certificate that assemblies exceeding fire tested assemblies sizes conform to fabrication of tested and labeled assemblies except for size.
  - 2. Temperature-Rise Rated Doors: Provide certificate that designated assemblies have been tested to withstand 450 degree F (232 degrees C) temperature-rise in 30 minutes of fire exposure.
  - 3. Positive pressure: Provide certificate that fire rated doors have been tested for positive pressure in accordance with IBC or NFPA.
  
- C. Wherever practical, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory-assembled before shipment, to assure proper assembly at project site.
  
- D. Thermal resistance rating: Provide certificate that flush panel exterior doors have been tested to provide minimum R-value of 3.8 when tested in accordance with ASTM C .
  
- E. Air-leakage: Provide certificate that exterior doors and frames have been tested in accordance with NFRC 400 as door assembly with weather-stripping and gaskets specified in Section 08710, "Door Hardware" to provide maximum air leakage of 0.4 cubic feet per minute per square foot.
  
- F. Sound transmission class: Provide certificate that door assemblies have been tested in accordance with ASTM E413 and ASTM E1408 to achieve minimum sound transmission class (STC).
  - 1. Acoustically rated flush panel doors: STC 43.
  - 2. Flush panel doors with polystyrene core: STC 31.



3. Flush panel doors with honeycomb core: STC 33.

G. Door and window glazing: Comply with CFR 16-CFR 1201 and other applicable safety requirements. Each piece of safety glazing shall be permanently labeled with appropriate marking.

#### 1.05 PRODUCT HANDLING

A. Frame spreaders: Before shipment, install temporary spreaders at bottom of frames; do not remove until frames are in place.

B. Protection: During shipping and storage protect doors with cardboard or other resilient packaging. Immediately remove wrappings that become wet.

C. Inspection: Upon delivery, inspect units. When approved by Contracting Officer, minor damage may be repaired such that repaired item matches undamaged items. Remove and replace all other damaged units.

D. Storage: Store under cover in dry, vented, humidity free, protected space. Place units on 4 inch high blocking with 1/4-inch air circulation spaces between units.

### PART 2 - PRODUCTS

#### 2.01 ACCEPTABLE MANUFACTURERS

A. Ceco Door Products; Milan, Tennessee; ([www.cecodoor.com](http://www.cecodoor.com)).

B. Curries Company; Mason City, Iowa; ([www.curries.com](http://www.curries.com)).

C. Republic Builders Products; McKenzie, Tennessee; ([www.republicdoor.com](http://www.republicdoor.com)).

D. Steelcraft; Cincinnati, Ohio; ([www.steelcraft.com](http://www.steelcraft.com)).

#### 2.02 MATERIALS

A. Steel: Manufactured in United States.

1. Cold-Rolled Steel Sheet: Commercial quality, stretcher level for flatness complying with ASTM A366 and ASTM A1008/A1008M.

2. Galvanized Steel Sheet: Zinc-Coated carbon steel commercial quality, complying with ASTM A924 and ASTM A653/A653M, with A60 or G60 coating designation, mill phosphatized.
  3. Hot-Rolled Steel Sheet: Comply with ASTM A1011/A1011M.
- B. Door core: Materials not containing ozone-depleting substances (ODS), including CFC (Chlorofluorocarbon) or HCFC (Hydrochlorofluorocarbon) blowing agents. NO CFC or HCFC-based insulating materials shall be furnished and installed under this contract.

**\*\*\*\*\* Hollow steel doors are provided with several different core materials. Basically honeycomb cores are used for interior doors and polystyrene for exterior doors. Temperature rise rated and acoustically rated doors may require special cores. Provide clearances according to NFPA 80. Polyurethane foam insulation is not to be used as door core for SNL projects. \*\*\*\*\***

1. Honeycomb: Resin-impregnated cardboard honeycomb with 1-inch maximum cells.
  2. Fiberglass: Loose batt type complying with ASTM C665 with 1.5 PCF minimum density.
  3. Polystyrene: Rigid, expanded, fire retardant, closed cell board complying with ASTM C578.
  4. Temperature Rise Rated Door Core: Loose batt type, high-density mineral fiber with adhesive capable of limiting temperature rise in excess of 450 degrees F (232 degrees C) on un-exposed side of door.
  5. Acoustically rated door core: Acoustical composite material.
- C. Galvanizing Repair Paint: Comply with SSPC - Paint 20.
- D. Primers:
1. Galvanized steel: Zinc-dust, Zinc Oxide, air-dried primer complying with MIL-DTL-P24441/20A and GS GC-03.
  2. Cold rolled steel: Rust-inhibiting primer complying with ANSI A250.10 and GS GC-03 and compatible for field applied finish paint coats. Factory applied and either air-dried or thermo set.
- E. Glazing: As specified in Section 08800, "Glazing".

- F. Grout: Perlite gypsum type. Mix with only enough water for stiff workable mixture.
- G. Supports and Anchors: Fabricated from not less than 0.0478-inch- (1.2-mm-) thick steel sheet; 0.0516-inch- (1.3-mm-) thick galvanized steel where used with galvanized steel frames.
- H. Inserts, Bolts, and Fasteners: Manufacturer's standard units. Where items are to be built into exterior walls, hot-dip galvanize complying with ASTM A153, Class C or D as applicable.
- I. Shop-Applied Paint: Rust-inhibitive primer, either air-drying or baking, suitable as base for specified finish paints on steel surfaces.

## 2.03 STEEL DOORS

**\*\*\*\*\* Edit this article to reflect types of door assemblies being specified and project conditions. Delete door types not required. Coordinate requirements with Door Schedule on Drawings to ensure door types, sizes, fire ratings, STC ratings, and other specific requirements are indicated on Door Schedule and that terminology conforms to descriptions in this article. \*\*\*\*\***

- A. Type: Hollow steel construction manufactured in compliance with ANSI A250.8.
- B. Thickness: 1-3/4 inches.
- C. Fabrication:
  - 1. Edges: Smooth, seamless, unbroken edges with no visible seams along hinge, lock, and face surfaces. Interlocking joints shall be tack welded, filled, and ground smooth.
  - 2. Exterior doors: Close top and bottom edges flush as integral part of door. Seal joints against water penetration.
  - 3. Prepare doors to receive hardware in accordance with ANSI A250.6. Provide hardware reinforcement plates welded in place. Coordinate with hardware supplier to ensure proper preparation of doors for mounting hardware items.
  - 4. Coordinate cutouts for vision lights and louvers to ensure integrity of fire rated doors.

5. Manufacturing tolerances: Comply with SDI 117.
6. Door numbers: Permanently stamp hinge side of door with reference number as designated on Drawings.

D. Exterior Flush Panel Doors:

1. ANSI A250.8, Grade III, Extra Heavy-Duty, Model 1 (Level A, full flush design).
2. Face sheet: 16-gauge minimum, galvanized steel sheet.
3. Core: Polystyrene rigid insulation.
4. Sound transmission class: STC 31, minimum.

E. Interior Flush Panel Doors:

1. ANSI A250.8, Grade II, Heavy-Duty, Model 1 (Level B, full flush design).
2. Face sheet: 18-gauge minimum, cold-rolled steel sheet.

**\*\*\*\*\* Galvanized face sheets are used for exterior doors. Interior doors in high humidity conditions such as kitchens and locker rooms are also fabricated with galvanized steel. Modify the following paragraph if Galvanized Interior Doors are required. \*\*\*\*\***

1. Fabricate according to SDI 112.
2. Face sheet: 18-gauge minimum, cold rolled steel sheet.
3. Core: Honeycomb.
4. Sound transmission class: STC 33, minimum.

**\*\*\*\*\* Include the following paragraph if full glazed Steel Entrance Doors are required. \*\*\*\*\***

F. Interior and Exterior Stile and Rail, Full Glazed Steel Doors:

1. ANSI A250.8, Grade III, Extra Heavy-Duty, Model 3.
2. Stiles and rails: Tubular sections fabricated from 16-gauge minimum, galvanized steel sheet.
3. Minimum Dimensions:

- a. Stiles and top and intermediate rails: 5-1/2 inches.
- b. Bottom rails: 12 inches.
4. Core: Polystyrene rigid insulation.
5. Stile and rails joints: Stiles shall extend full height of door. Rails shall mechanically join stiles with flush joint filled and ground smooth.

**\*\*\*\*\* Include the following paragraph if project conditions require Temperature Rise Rated Doors. Provide clearances according to NFPA 80. \*\*\*\*\***

- G. Interior Temperature Rise-Rate, Flush Panel Doors:
1. ANSI A250.8, Grade II, Heavy-Duty, Model 2.
  2. Face sheet: 18-gauge minimum, cold rolled steel sheet.
  3. Core: Mineral fiber capable of limiting temperature rise in excess of 450 degrees F (232 degrees C) on un-exposed side of door.

**\*\*\*\*\* Include the following paragraph if project conditions require Thermal-Rated Assemblies. \*\*\*\*\***

- H. Thermal-Rated (Insulating) Assemblies: Where shown or scheduled, provide doors fabricated as thermal-insulating assemblies and tested in accordance with ASTM C1363 on fully operable door assemblies.
1. Unless otherwise indicated, provide thermal-rated assemblies U-value rating of 0.41 Btu/square foot x h x degree F (2.33 W/sq. m x K) or better.

Air leakage for thermal-rated assemblies shall not exceed 0.4 cubic feet per minute per square foot, as determined in accordance with NFRC 400.

**\*\*\*\*\* Increased security can be provided with steel stiffeners welded to inside face sheets. Include one or both of the following paragraphs if steel stiffened doors are required. \*\*\*\*\***

- I. Exterior Steel Stiffened, Flush Panel Doors:
1. ANSI A250.8, Grade III, Extra Heavy-Duty, Model 2.
  2. Face sheet: 16-gauge minimum, galvanized steel sheet.
  3. Core: Doors reinforced with 20-gauge hat shaped steel stiffeners at 6 inches maximum welded to inside face sheet. Areas between stiffeners filled with fiberglass insulation.

J. Interior Steel Stiffened, Flush Panel Doors:

1. ANSI A250.8, Grade II, Heavy-Duty, Model 2.
2. Face sheet: 18-gauge minimum, cold rolled steel sheet.
3. Core: Doors reinforced with 20-gauge hat shaped steel stiffeners at 6 inches maximum welded to inside face sheet. Areas between stiffeners filled with fiberglass insulation.

**\*\*\*\*\* Most hollow steel doors have a sound transmission rating of at least STC 31. Sound transmission is a function of door panel, frame, hardware, and installation. Include one or both of the following paragraphs if sound control door assemblies with high STC ratings are required. Coordinate with Section 08710, "Door Hardware" to ensure that sound seal, automatic door bottoms, and other necessary hardware are provided for achieving specified STC. Provide information verifying testing in accordance with ASTM E1408 and classified in accordance with ASTM E413. \*\*\*\*\***

K. Exterior, Acoustically Rated, Flush Panel Doors:

1. ANSI A250.8, Grade II, Heavy-Duty, Model 2.
2. Face sheet: 16-gauge minimum, galvanized steel sheet.
3. Core: Composite acoustical material placed in all door voids to stiffen, insulate, and sound deaden door panel and provide minimum sound transmission class (STC) of 43.

L. Interior, Acoustically-Rated, Flush Panel Doors:

1. ANSI A250.8, Grade II, Heavy-Duty, Model 2.
2. Face sheet: 16-gauge minimum, cold rolled steel sheet.
3. Core: Composite acoustical material placed in all door voids to stiffen, insulate, and sound deaden door panel and provide minimum sound transmission class (STC) of 43.

M. Fire-Rated Doors: Provide fire-rated units as indicated in Door Schedule on Drawings. Other characteristics of fire-rated door shall be as stated on Door Schedule and specified above. Permanently attach fire-rating label to door edge.

## 2.04 DUTCH DOOR

**\*\*\*\*\* Include this article if Dutch Door assembly with two leaves and service shelf is required. \*\*\*\*\***

- A. Type: Door consisting of two leaves, one above, the other, and operated independently or together. Provide lower leaf with service shelf.
- B. Construction: Same as interior flush door specified in Paragraph 2.3.E.
- C. Service shelf:
  - 1. Shape and size: As indicated on Drawings.
  - 2. Locate top of shelf 34 inches above finish floor.
  - 3. Fabricate from 16-gauge steel with 3/4 inch wide, double hemmed edges with welded corners.
  - 4. Support brackets: Provide triangular shaped flanged brackets fabricated from 16-gauge sheet steel. Fasten brackets with screws and welds to door leaf and bottom of shelf.

## 2.05 TRANSOM PANELS

**\*\*\*\*\* Include this article if floor to ceiling doorframes are used with flush transom panel installed above door panel. \*\*\*\*\***

- A. Type: Flush panel, 1-3/4 inch thick, fabricated same as adjoining flush door. Size as indicated on Drawings.
- B. Attachment:
  - 1. Provide 16-gauge steel reinforcing channels spot-welded to head and jambs of transom panel. Spot-weld second set of channels to doorframe. Field attach transom panels to reinforcing channels with screws.
  - 2. Provide 3/16-inch clip angles welded to jambs of doorframe to receive and support bottom of transom panel.
- C. Provide 14-gauge flat astragal spot-welded to bottom of transom panel to receive head of door panel.

- D. Prepare and reinforce transom panels to receive door hardware.

## 2.06 DOOR GLAZING

**\*\*\*\*\* Include this article if steel doors are either full glazed or contain vision lights. \*\*\*\*\***

- A. Provide vision lights and glazed openings of dimensions and configurations indicated on Drawings.
- B. Equip openings with glazing frames and moldings that are flush with door face. Frames for fire-rated doors shall be of size and type to maintain fire rating.
- C. Glazing stops: Rectangular profile. Exterior stop to be non-removable. Interior stop to be removable snap-on type or attached with countersunk screws.
- D. Glazing: Factory glaze doors with glazing as specified in Section 08800, "Glazing":
  - 1. Fire Rated Interior Doors: 1/4-inch thick, clear wire glass with square mesh.
  - 2. Non-Rated Interior Doors: 1/4-inch thick, clear, tempered, safety glass.
  - 3. Exterior doors: 1 inch thick, clear, insulating double pane, tempered safety glass.

## 2.07 DOOR LOUVERS

**\*\*\*\*\* Include this article if louvers are to be installed in steel doors. Select type of louver required. If operable or fire-rated fusible link louvers are required, this type will need to be added. \*\*\*\*\***

- A. Door Louvers: Provide louvers according to SDI 111-C for interior doors where indicated, with blades or baffles formed of 24-gauge (0.0239-inch-) (0.6-mm-) thick cold-rolled steel sheet set into minimum 20-gauge (0.0359-inch-) (0.9-mm-) thick steel frame.
  - 1. Sight-Proof Louvers: Stationary louvers constructed with inverted V-shaped or Y-shaped blades.



2. Lightproof Louvers: Stationary louvers constructed with baffles to prevent light from passing from one side to the other, any angle.

B. Equip exterior door louvers with insect screens.

C. Finish: Baked enamel factory finish. Color selected by Contracting Officer.

## 2.08 FRAMES

A. Provide metal frames for doors, transoms, sidelights, borrowed lights, and other openings, according to ANSI A250.8 and SDI 125, and of types and styles as shown on Contract Documents. Conceal fastenings, unless otherwise indicated.

B. Fabrication:

1. Fabricate frames as welded units with mitered corners and reinforced. Welds shall be full length of joint and ground smooth. Face joints shall be seamless.
2. Mortise, reinforce with plates, and drill frames to receive hardware in accordance with ANSI A250.6 and ANSI/DHI A115. Coordinate with hardware supplier to ensure proper preparation of frames for mounting hardware items.
3. Prepare doorframes for 3 silencers.

C. Fire-Rated Frames: Where indicated in Door and Window Schedules on Drawings, provided fire rated frames. Attach fire rated label to each labeled frame.

D. Profile: Combination type with integral stop and trim of size and configuration shown on Drawings. Minor variations to accommodate manufacturer's standard fabrication are acceptable.

E. Sanitary stops: Where indicated in Door Schedule on Drawings, provide door jamb frames with stop cut off at 45 degrees 4 inches above floor surface.

F. Exterior frames:

1. ANSI A250.8, Grade III, Extra Heavy-Duty.
2. Material: 16-gauge minimum, cold-rolled or hot-rolled sheet.

- G. Interior frames:
  - 1. ANSI A250.8, Grade II, Heavy-Duty.
  - 2. Material: 16-gauge minimum, cold-rolled steel sheet or hot-rolled sheet.
- H. Existing Doors in New Frames: Coordinate frame hinge and strike locations with existing doors.
- I. Provide anchors for mechanical attachment of frames to adjacent structure.
  - 1. Masonry: Install at least three (3) wall anchors per jamb adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Acceptable anchors include masonry wire anchors and masonry T-shaped anchors.
  - 2. Metal-Stud Partition: Sheet metal Z screw attached to studs, install at least three (3) wall anchors per jamb at hinge and strike levels.
  - 3. Wood Studs: Double flanges with pre-drilled holes for nailing to wood studs.
  - 4. Existing Concrete: Provide pinch and dimple anchor preparation to accommodate 3/4 inch diameter pipe spacer, 3/8 inch countersunk flathead bolt, and expansion shell. Install at least three (3) completed opening anchors per jamb adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb.
  - 5. Floor Anchors: 18-gauge, adjustable base anchor for direct attachment to floor. Attachment with powder-actuated anchors will not be allowed.
  - 6. Anchors for galvanized frames shall have hot dip galvanized finish.

## 2.09 REMOVABLE MULLIONS

**\*\*\*\*\* Include this article if removable mullions for pairs of doors are required. Electrified removable mullions are typically specified in Section 08710, "Door Hardware". \*\*\*\*\***

- A. Fabricate with same material, construction, and profile as doorframe. Removable mullion shall be same width as doorframe with integral doorstops on both sides.
- B. Provide 12-gauge minimum channel shaped anchors for attachment to floor and doorframe head. Removable mullion shall be slotted to fit channels.

- C. On secure side, fasteners attaching removable mullion shall be concealed by closed.

## 2.10 WINDOW GLAZING

**\*\*\*\*\* Include this article if hollow steel fixed windows are required. \*\*\*\*\***

- A. Glazing stops: Provide sidelight, transom, and window frames with channel shaped glazing stops with mitered corners. Provide permanent frame stop on secure side of glazing. On opposite side, attach stops with countersunk screws.
- B. Window Glazing: As specified in Section 08800, "Glazing":
  - 1. Fire Rated Interior Windows: 1/4-inch thick, clear wire glass with square mesh.
  - 2. Non-Rated Interior Windows not requiring safety glass: 1/4 inch thick, clear, annealed glass.
  - 3. Non-Rated Interior Windows required or indicated on Drawings to have safety glass: 1/4-inch thick, clear, fully tempered, safety glass.
  - 4. Exterior windows not requiring safety glass: 1-inch thick, clear, insulating double pane.
  - 5. Exterior windows required or indicated on Drawings to have safety glass: 1-inch thick, clear, insulating double pane, fully tempered safety glass.

## 2.11 STOPS AND MOLDINGS

- A. Provide stops and moldings around solid, glazed, and louvered panels where indicated.
- B. Form fixed stops and moldings integral with frame, unless otherwise indicated.
- C. Provide removable stops and moldings where indicated or required, formed of not less than 20-gauge (0.0358-inch-) (0.90-mm-) steel sheets matching steel of frames. Secure with countersunk flat or oval head machine screws spaced uniformly not more than 12 inches (304.8-mm-) O.C. Form corners with butted hairline joints.

- D. Coordinate width of rabbet between fixed and removable stops with type of glass or panel and type of installation indicated.
- E. Glazing Stops: Minimum 0.0359-inch- (0.90-mm-) thick steel or 0.040-inch- (1.0-mm-) thick aluminum.
  - 1. Provide non-removable stops on outside of exterior doors and on secure side of interior doors for glass, louvers, and other panels in doors.
  - 2. Provide screw-applied, removable, glazing beads on inside of glass, louvers, and other panels in doors.

## 2.12 FACTORY APPLIED FINISHES

**\*\*\*\*\*Comply with NAAMM's "Metal Finishes Manual" for recommendations relative to applying and designating finishes. \*\*\*\*\***

### A. Cold-Rolled Steel Sheet Finishes:

- 1. Preparation: In accordance with SSPC-SP 1, clean with non-petroleum solvent to remove oil, dirt, grease, and other contaminants. Remove mill scale and rust to comply with SSPC SP 5/NACE No 1.
- 2. Pretreatment: Immediately after preparation, apply conversion coating compatible with primer.
- 3. Primer: Immediately after pretreatment, apply primer that complies with ANSI A250.10 acceptance criteria, GS GC-03 environmental criteria for VOC concentration limit 250 grams per liter of product minus water and chemical component restrictions, is compatible with finish paint systems indicated, and has capability to provide a sound foundation for field-applied topcoats.

### B. Galvanized Steel Sheet Finishes:

- 1. Preparation: Clean with non-petroleum solvent to remove oil, dirt, grease, and other contaminants. Clean welds, mechanical connections, and abraded areas and apply galvanizing repair paint in accordance with ASTM A780, SSPC Paint 20, and GS GC-03.
- 2. Pretreatment: Immediately after preparation, apply conversion coating compatible with primer.
- 3. Primer: Zinc-Dust, Zinc-Oxide primer paint complying with performance requirements of MIL-DTL-P24441/20A and environmental criteria of GS GC-

03 (VOC concentration limit of 250 grams per liter minus water and chemical component restrictions for Gloss, Semi-Gloss, and Flat).

### PART 3 - EXECUTION

#### 3.01 INSTALLATION

- A. Install in accordance with approved shop drawings, manufacturer's instructions, and ANSI A250.11.
- B. Install fire-rated frames and door assemblies in accordance with NFPA 80 for class indicated in Door Schedule on Drawings.
- C. Placing Frames: Comply with provisions of ANSI A250.11, unless otherwise indicated.
  - 1. For new construction, place frames before constructing enclosing walls, and ceilings.
  - 2. Center in opening, plumb, square and level.
  - 3. Door jamb anchors: Install three (3) minimum at each jamb, at hinge and at strike locations.
  - 4. Floor anchors: Provide frames with minimum 18-gauge anchors for attachment to floor. For wall conditions that do not allow the use of a floor anchor, provide additional jamb anchors. Attachment with powder-actuated anchors will not be allowed.
  - 5. Window frame anchors: Provide and place anchors as indicated on approved shop drawings with two (2) minimum per jamb.
- D. Fully grout hollow metal frames in masonry construction.
- E. Seal joints around frames in accordance with Section 07900, "Joint Sealers".
- F. Glazing: Field glaze hollow steel windows in accordance with Section 08800, "Glazing".

- G. Hardware: Install door hardware in accordance with Section 08710, "Door Hardware". Ensure gaskets and weather-stripping are provided for all exterior frames. Locate hardware as indicated on approved shop drawings or, if not indicated, in accordance with DHI "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames".
  
- H. Door installation: Fit steel doors accurately in frames in accordance with ANSI A250.8 within these clearances:
  - 1. Head and Jamb: 1/8 inch (3.2mm).
  - 2. Bottom: 3/4 inch (19.1mm).
  - 3. Pair of Doors Meeting Edges: 1/8 inch (3.2mm).
  - 4. Door Face and Stop: 1/16 inch (1.6mm).
  - 5. Fire Rated Doors: Clearances specified in NFPA 105 and NFPA 80.
  - 6. Smoke control doors: Comply with NFPA 105.
  
- I. New Doors in Existing Frames: Coordinate door hinge/strike locations with existing frames.

### 3.02 ADJUST AND CLEAN

- A. Immediately after erection, sand smooth all rusted and damaged areas of prime coat. Touch-up with compatible, air-drying primer.
  
- B. Check and readjust hardware items, leaving doors and frames in proper operating condition.

END OF SECTION