SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

Revise this Section by deleting and inserting text to meet Project-specific requirements.

1. GENERAL
   * + 1. SUMMARY
          1. Section includes:

Interior standard steel doors and frames.

Exterior standard steel doors and frames.

Interior custom hollow-metal doors and frames.

Exterior custom hollow-metal doors and frames.

* + - * 1. Related Requirements:

Retain subparagraphs below to cross-reference requirements Contractor might expect to find in this Section but are specified in other Sections.

Section 081119 "Stainless-Steel Doors and Frames" for hollow-metal doors and frames manufactured from stainless steel.

Section 083463 "Detention Doors and Frames" for hollow-metal doors and frames for detention facilities.

Section 083473.13 "Metal Sound Control Door Assemblies" for packaged, acoustically rated hollow-metal door and frame assemblies.

[**Section 087100 "Door Hardware"**] for door hardware for hollow-metal doors.

Section 134900 "Radiation Protection" for lead-lined, hollow-metal doors and frames.

* + - 1. DEFINITIONS

Retain terms that remain after this Section has been edited for a project.

Retain "Minimum Thickness" paragraph below to indicate that metal thicknesses specified are base-metal measurements and do not include metallic coatings or finishes. Thicknesses indicated in this Section are according to ANSI/SDI A250.8 and NAAMM-HMMA 803, both of which use the same values.

* + - * 1. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or ANSI/SDI A250.8.
      1. COORDINATION
         1. Coordinate anchorage installation for hollow-metal 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.
         2. Coordinate requirements for installation of door hardware, electrified door hardware, and access control and security systems.
      2. PREINSTALLATION MEETINGS

Retain "Preinstallation Conference" paragraph below if Work of this Section is extensive or complex enough to justify a conference.

* + - * 1. Preinstallation Conference: Conduct conference at **Project site.**
      1. SUBMITTALS
         1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions
         2. Manufacturer’s installation instructions shall be provided along with product data.
         3. Submittal’s shall be provided in the order in which they are specified and tabbed (for combined submittals).
         4. Product Data: For each type of product.

Include construction details, material descriptions, core descriptions, [**fire-resistance ratings,**] [**temperature-rise ratings,**] and finishes.

* + - * 1. Sustainable Design Submittals:

Retain "Product Data" subparagraph below to require minimum recycled content for LEED 2009 MR Credit 2 - "Recycled Content."

Product Data: For recycled content, indicating postconsumer and preconsumer recycled content and cost.

Retain "Shop Drawings" paragraph below if applicable. ANSI/SDI A250.8 indicates that manufacturer's published details can replace Shop Drawings for hollow-metal doors and frames unless otherwise indicated.

* + - * 1. Shop Drawings: Include the following:

Elevations of each door type.

Details of doors, including vertical- and horizontal-edge details and metal thicknesses.

Frame details for each frame type, including dimensioned profiles and metal thicknesses.

Locations of reinforcement and preparations for hardware.

Details of each different wall opening condition.

Details of electrical raceway and preparation for electrified hardware, access control systems, and security systems.

Details of anchorages, joints, field splices, and connections.

Details of accessories.

Details of moldings, removable stops, and glazing.

Retain "Samples for Initial Selection" paragraph and "Finishes" subparagraph below for two-stage Samples of factory-applied finishes.

* + - * 1. Samples for Initial Selection: For hollow-metal doors and frames with factory-applied color finishes.
        2. Samples for Verification:

Retain "Finishes" subparagraph below if required for two-stage Samples of factory-applied finishes.

Finishes: For each type of exposed finish required, prepared on Samples of not less than 3 by 5 inches.

Retain "Fabrication" subparagraph below if fabrication Sample is required.

Fabrication: Prepare Samples approximately [**12 by 12 inches**] [**8 by 10 inches**] <**Insert dimension**> to demonstrate compliance with requirements for quality of materials and construction:

Doors: Show vertical-edge, top, and bottom construction; core construction; and hinge and other applied hardware reinforcement. Include separate section showing glazing if applicable.

Frames: Show profile, corner joint, floor and wall anchors, and silencers. Include separate section showing fixed hollow-metal panels and glazing if applicable.

* + - * 1. Product Schedule: For hollow-metal doors and frames, prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final door hardware schedule.

Retain one of or both "Fire-Rated Door Inspector" and "Egress Door Inspector" subparagraphs below, or delete first two subparagraphs and retain third subparagraph. First subparagraph applies to the IBC and NFPA 101. Second subparagraph applies to NFPA 101. Certification in third subparagraph below should be acceptable by all authorities having jurisdiction. See the Evaluations.

Fire-Rated Door Inspector: Submit documentation of compliance with NFPA 80, Section 5.2.3.1.

Egress Door Inspector: Submit documentation of compliance with NFPA 101, Section 7.2.1.15.4.

Submit copy of DHI Fire and Egress Door Assembly Inspector (FDAI) certificate.

* + - * 1. Product Test Reports: For each type of [**fire-rated hollow-metal door and frame assembly**] [**fire-rated borrowed-lite assembly**] [**windborne-debris impact resistance door**] [**and**] [**thermally rated door assemblies**] for tests performed by a qualified testing agency indicating compliance with performance requirements.

Retain "Oversize Construction Certification" paragraph below for oversized fire-rated assemblies.

* + - * 1. Oversize Construction Certification: For assemblies required to be fire-rated and exceeding limitations of labeled assemblies.
        2. Field quality control reports.
      1. CLOSEOUT SUBMITTALS
         1. Record Documents: For fire-rated doors, list of door numbers and applicable room name and number to which door accesses.
      2. QUALITY ASSURANCE
         1. Fire-Rated Door Inspector Qualifications: Inspector for field quality control inspections of fire-rated door assemblies shall meet the qualifications set forth in NFPA 80, Section 5.2.3.1 and the following:

Retain subparagraph below if requiring fire door inspectors to be certified under DHI's certification program. Verify, with authorities having jurisdiction, if other DHI certifications are acceptable, such as Architectural Hardware Consultant (AHC), Certified Door Consultant (CDC), and Architectural Openings Consultant (AOC).

Door and Hardware Institute Fire and Egress Door Assembly Inspector (FDAI) certification.

* + - * 1. Egress Door Inspector Qualifications: Inspector for field quality control inspections of egress door assemblies shall meet the qualifications set forth in NFPA 101, Section 7.2.1.15.4 and the following:

Retain subparagraph below if requiring egress door inspectors to be certified under DHI's certification program. Verify, with authorities having jurisdiction, if other DHI certifications are acceptable, such as AHC, CDC, and AOC.

Door and Hardware Institute Fire and Egress Door Assembly Inspector (FDAI) certification.

* + - 1. DELIVERY, STORAGE, AND HANDLING
         1. Deliver hollow-metal doors and frames palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.

Provide additional protection to prevent damage to factory-finished units.

Retain first paragraph below for welded frames. Temporary spreader bars are intended for shipping and handling purposes only.

* + - * 1. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
        2. Store hollow-metal doors and frames vertically under cover at Project site with head up. Place on minimum 4-inch high wood blocking. Provide minimum 1/4-inch space between each stacked door to permit air circulation.

1. PRODUCTS

Manufacturers and products listed in SpecAgent and MasterWorks Paragraph Builder are neither recommended nor endorsed by the AIA or Deltek. Before inserting names, verify that manufacturers and products listed there comply with requirements retained or revised in descriptions and are both available and suitable for the intended applications.

* + - 1. MANUFACTURERS
      2. PERFORMANCE REQUIREMENTS

Revise "Fire-Rated Assemblies" paragraph below to allow neutral pressure testing if required and as acceptable to authorities having jurisdiction. Retain option if temperature-rise-rated assemblies are required.

* + - * 1. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings[**and temperature-rise limits**] indicated on Drawings, based on testing at positive pressure according to NFPA 252 or UL 10C.

Smoke- and Draft-Control Door Assemblies: Listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities having jurisdiction, based on testing according to UL 1784 and installed in compliance with NFPA 105.

Retain "Oversize Fire-Rated Door Assemblies" subparagraph below if required by authorities having jurisdiction.

Oversize Fire-Rated Door Assemblies: For units exceeding sizes of tested assemblies, provide certification by a qualified testing agency that doors comply with standard construction requirements for tested and labeled fire-rated door assemblies except for size.

Retain "Temperature-Rise Limit" subparagraph below if required and coordinate with option in "Fire-Rated Assemblies" paragraph above. The IBC allows an exception for buildings equipped throughout with fire-suppression sprinklers.

Temperature-Rise Limit: [**Where indicated on Drawings**] [**At vertical exit enclosures and exit passageways**], provide doors that have a maximum transmitted temperature end point of not more than 450 deg F above ambient after 30 minutes of standard fire-test exposure.

* + - * 1. Fire-Rated, Borrowed-Lite Assemblies: Assemblies complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 257 or UL 9.

Retain "Windborne-Debris Impact Resistance" paragraph below to suit Project. The IBC establishes criteria for buildings in hurricane-prone locations. In paragraph, "enhanced" option applies to essential facilities and has additional requirements. Verify requirements of authorities having jurisdiction. Verify which manufacturers have tested products and can demonstrate compliance.

* + - * 1. Windborne-Debris Impact Resistance: Passes ASTM E1886 missile-impact and cyclic-pressure tests in accordance with ASTM E1996 for Wind Zone [**1**] [**2**] [**3**] [**4**] for [**basic**] [**enhanced**] protection.

Insert increased height if different from option in "Large-Missile Test" subparagraph below.

Large-Missile Test: For glazed openings located within [**30 feet**] <**Insert dimension**> of grade.

Retain "Thermally Rated Door Assemblies" paragraph below if required. The IECC requires testing per NFRC 100, but hollow-metal door and frame manufacturers generally provide test results per ASTM C1363 or ASTM E1423. Values in options are examples only; verify with manufacturers. See the Evaluations.

* + - * 1. Thermally Rated Door Assemblies: Provide door assemblies with U-factor of not more than [**0.50 deg Btu/F x h x sq. ft.**] [**0.40 deg Btu/F x h x sq. ft.**] [**0.38 deg Btu/F x h x sq. ft.**] <**Insert U-factor**> when tested according to ASTM C518.

Insert requirements for air infiltration if required. See the Evaluations.

* + - 1. INTERIOR STANDARD STEEL DOORS AND FRAMES

Retain this article to specify interior hollow-metal doors and frames meeting requirements of SDI. Use of the term "standard" in article title reflects the term used in SDI standard. Many options are available from manufacturers, and some customization is possible with doors specified to SDI standard; consult manufacturers. See the Evaluations.

* + - * 1. Construct hollow-metal doors and frames to comply with standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

"Standard-Duty Doors and Frames," "Heavy-Duty Door and Frames," "Extra-Heavy-Duty Doors and Frames," and "Maximum-Duty Doors and Frames" paragraphs below describe various door- and frame-assembly types produced to SDI requirements; if Project contains more than one type, retain each applicable paragraph and indicate locations. If Project contains more than one variation for each paragraph, copy and indicate locations of each variation.

"Standard-Duty Doors and Frames" paragraph below describes interior-use assemblies fabricated to SDI requirements and containing doors with 0.032-inch- thick, (nominal 20-gage) face sheets and laminated cores.

* + - * 1. Standard-Duty Doors and Frames: ANSI/SDI A250.8, Level 1; ANSI/SDI A250.4, Level C. [**At locations indicated in the Door and Frame Schedule**] <**Insert locations**>.

Doors:

Type: As indicated in the Door and Frame Schedule.

Thickness: [**1-3/4 inches**] [**1-3/8 inches**].

Revise "Face" subparagraph below if embossed or textured faces are required.

Face: [**Uncoated**] [**Metallic-coated**] steel sheet, minimum thickness of 0.032 inch.

Edge Construction: [**Model 1, Full Flush**] [**Model 2, Seamless**].

ANSI/SDI A250.8 allows the edge bevel to be determined by manufacturer unless otherwise indicated.

Edge Bevel: [**Bevel lock and hinge edges 1/8 inch in 2 inches**] [**Bevel lock edge 1/8 inch in 2 inches**] [**Provide manufacturer's standard beveled or square edges**].

Unless otherwise indicated, ANSI/SDI A250.8 permits manufacturers to choose core types, including kraft-paper honeycomb, polystyrene, polyurethane, polyisocyanurate, mineral board, or vertical steel stiffener. Retain first option in "Core" subparagraph below to allow manufacturer to select core, or retain one of the other options to require a particular core.

Core: [**Manufacturer's standard**] [**Kraft-paper honeycomb**] [**Polystyrene**] [**Polyurethane**] [**Polyisocyanurate**] [**Vertical steel stiffener**].

Fire-Rated Core: Manufacturer's standard [**vertical steel stiffener**] [**laminated mineral board**] core for fire-rated [**and temperature-rise-rated**]doors.

Frames:

Materials: [**Uncoated**] [**Metallic-coated**] steel sheet, minimum thickness of 0.042 inch.

[**Sidelite**] [**and**] [**Transom**] Frames: Fabricated from same thickness material as adjacent door frame.

Construction: [**Knocked down**] [**Slip-on drywall**] [**Face welded**] [**Full profile welded**].

In "Exposed Finish" subparagraph below, verify with manufacturers availability of factory-finish option for welded frames.

Exposed Finish: [**Prime**] [**Factory**].

"Heavy-Duty Doors and Frames" paragraph below describes interior-use assemblies fabricated to SDI requirements and containing doors with 0.042-inch- thick, (nominal 18-gage) face sheets and laminated cores.

* + - * 1. Heavy-Duty Doors and Frames: ANSI/SDI A250.8, Level 2; ANSI/SDI A250.4, Level B. [**At locations indicated in the Door and Frame Schedule**] <**Insert locations**>.

Doors:

Type: As indicated in the Door and Frame Schedule.

Thickness: 1-3/4 inches.

Revise "Face" subparagraph below if embossed or textured faces are required.

Face: [**Uncoated**] [**Metallic-coated**] steel sheet, minimum thickness of 0.042 inch.

Edge Construction: [**Model 1, Full Flush**] [**Model 2, Seamless**].

ANSI/SDI A250.8 allows the edge bevel to be determined by manufacturer unless otherwise indicated.

Edge Bevel: [**Bevel lock and hinge edges 1/8 inch in 2 inches**] [**Bevel lock edge 1/8 inch in 2 inches**] [**Provide manufacturer's standard beveled or square edges**].

Unless otherwise indicated, ANSI/SDI A250.8 permits manufacturers to choose core types, including kraft-paper honeycomb, polystyrene, polyurethane, polyisocyanurate, mineral board, or vertical steel stiffener. Retain first option in "Core" subparagraph below to allow manufacturer to select core, or retain one of the other options to require a particular core.

Core: [**Manufacturer's standard**] [**Kraft-paper honeycomb**] [**Polystyrene**] [**Polyurethane**] [**Polyisocyanurate**] [**Vertical steel stiffener**].

Fire-Rated Core: Manufacturer's standard [**vertical steel stiffener**] [**laminated mineral board**] core for fire-rated [**and temperature-rise-rated**]doors.

Frames:

Materials: [**Uncoated**] [**Metallic-coated**] steel sheet, minimum thickness of 0.053 inch.

[**Sidelite**] [**and**] [**Transom**] Frames: Fabricated from same thickness material as adjacent door frame.

Construction: [**Knocked down**] [**Slip-on drywall**] [**Face welded**] [**Full profile welded**].

In "Exposed Finish" subparagraph below, verify with manufacturers availability of factory-finish option for welded frames.

Exposed Finish: [**Prime**] [**Factory**].

"Extra-Heavy-Duty Doors and Frames" paragraph below describes interior-use assemblies fabricated to SDI requirements and containing doors with 0.053-inch- thick, (nominal 16-gage) face sheets and laminated cores.

* + - * 1. Extra-Heavy-Duty Doors and Frames: ANSI/SDI A250.8, Level 3; ANSI/SDI A250.4, Level A. [**At locations indicated in the Door and Frame Schedule**] <**Insert locations**>.

Doors:

Type: As indicated in the Door and Frame Schedule.

Thickness: 1-3/4 inches.

Revise "Face" subparagraph below if embossed or textured faces are required.

Face: [**Uncoated**] [**Metallic-coated**] steel sheet, minimum thickness of 0.053 inch.

Edge Construction: [**Model 1, Full Flush**] [**Model 2, Seamless**] [**Model 3, Stile and Rail**].

ANSI/SDI A250.8 allows the edge bevel to be determined by manufacturer unless otherwise indicated.

Edge Bevel: [**Bevel lock and hinge edges 1/8 inch in 2 inches**] [**Bevel lock edge 1/8 inch in 2 inches**] [**Provide manufacturer's standard beveled or square edges**].

Unless otherwise indicated, ANSI/SDI A250.8 permits manufacturers to choose core types, including kraft-paper honeycomb, polystyrene, polyurethane, polyisocyanurate, mineral board, or vertical steel stiffener. Retain first option in "Core" subparagraph below to allow manufacturer to select core, or retain one of the other options to require a particular core.

Core: [**Manufacturer's standard**] [**Kraft-paper honeycomb**] [**Polystyrene**] [**Polyurethane**] [**Polyisocyanurate**] [**Vertical steel stiffener**].

Fire-Rated Core: Manufacturer's standard [**vertical steel stiffener**] [**laminated mineral board**] core for fire-rated [**and temperature-rise-rated**]doors.

Frames:

Materials: [**Uncoated**] [**Metallic-coated**] steel sheet, minimum thickness of 0.053 inch.

[**Sidelite**] [**and**] [**Transom**] Frames: Fabricated from same thickness material as adjacent door frame.

Construction: [**Knocked down**] [**Slip-on drywall**] [**Face welded**] [**Full profile welded**].

In "Exposed Finish" subparagraph below, verify with manufacturers availability of factory-finish option for welded frames.

Exposed Finish: [**Prime**] [**Factory**].

"Maximum-Duty Doors and Frames" paragraph below describes interior-use assemblies fabricated to SDI requirements and containing doors with 0.067-inch- thick, (nominal 14-gage) face sheets and laminated cores.

* + - * 1. Maximum-Duty Doors and Frames: ANSI/SDI A250.8, Level 4; ANSI/SDI A250.4, Level A. [**At locations indicated in the Door and Frame Schedule**] <**Insert locations**>.

Doors:

Type: As indicated in the Door and Frame Schedule.

Thickness: 1-3/4 inches.

Revise "Face" subparagraph below if embossed or textured faces are required.

Face: [**Uncoated**] [**Metallic-coated**] steel sheet, minimum thickness of 0.067 inch.

Edge Construction: [**Model 1, Full Flush**] [**Model 2, Seamless**].

ANSI/SDI A250.8 allows the edge bevel to be determined by manufacturer unless otherwise indicated.

Edge Bevel: [**Bevel lock and hinge edges 1/8 inch in 2 inches**] [**Bevel lock edge 1/8 inch in 2 inches**] [**Provide manufacturer's standard beveled or square edges**].

Unless otherwise indicated, ANSI/SDI A250.8 permits manufacturers to choose core types, including kraft-paper honeycomb, polystyrene, polyurethane, polyisocyanurate, mineral board, or vertical steel stiffener. Retain first option in "Core" subparagraph below to allow manufacturer to select core, or retain one of the other options to require a particular core.

Core: [**Manufacturer's standard**] [**Kraft-paper honeycomb**] [**Polystyrene**] [**Polyurethane**] [**Polyisocyanurate**] [**Vertical steel stiffener**].

Fire-Rated Core: Manufacturer's standard [**vertical steel stiffener**] [**laminated mineral board**] core for fire-rated [**and temperature-rise-rated**]doors.

Frames:

Materials: [**Uncoated**] [**Metallic-coated**] steel sheet, minimum thickness of 0.067 inch.

[**Sidelite**] [**and**] [**Transom**] Frames: Fabricated from same thickness material as adjacent door frame.

Construction: [**Knocked down**] [**Slip-on drywall**] [**Face welded**] [**Full profile welded**].

In "Exposed Finish" subparagraph below, verify with manufacturers availability of factory-finish option for welded frames.

Exposed Finish: [**Prime**] [**Factory**].

* + - 1. EXTERIOR STANDARD STEEL DOORS AND FRAMES

Retain this article to specify exterior hollow-metal doors and frames meeting requirements of SDI. Use of the term "standard" in article title reflects the term used in SDI standard. Many options are available from manufacturers, and some customization is possible with doors specified to SDI standard; consult manufacturers. See the Evaluations.

* + - * 1. Construct hollow-metal doors and frames to comply with standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

"Heavy-Duty Door and Frames," "Extra-Heavy-Duty Doors and Frames," and "Maximum-Duty Doors and Frames" paragraphs below describe various door- and frame-assembly types produced to SDI requirements; if Project contains more than one type, retain each applicable paragraph and indicate locations. If Project contains more than one variation for each paragraph, copy and indicate locations of each variation. SDI does not recommend standard-duty doors and frames for exterior use.

"Heavy-Duty Doors and Frames" paragraph below describes exterior-use assemblies fabricated to SDI requirements and containing doors with 0.042-inch- thick, (nominal 18-gage) face sheets and laminated cores.

* + - * 1. Heavy-Duty Doors and Frames: ANSI/SDI A250.8, Level 2; ANSI/SDI A250.4, Level B. [**At locations indicated in the Door and Frame Schedule**] <**Insert locations**>.

Doors:

Type: As indicated in the Door and Frame Schedule.

Thickness: 1-3/4 inches.

Revise "Face" subparagraph below if embossed or textured faces are required.

Face: Metallic-coated steel sheet, minimum thickness of 0.042 inch, with minimum [**A40**] [**A60**] coating.

Edge Construction: [**Model 1, Full Flush**] [**Model 2, Seamless**].

ANSI/SDI A250.8 allows the edge bevel to be determined by manufacturer unless otherwise indicated.

Edge Bevel: [**Bevel lock and hinge edges 1/8 inch in 2 inches**] [**Bevel lock edge 1/8 inch in 2 inches**] [**Provide manufacturer's standard beveled or square edges**].

Top Edge Closures: Close top edges of doors with flush closures of same material as face sheets. Seal joints against water penetration.

Bottom Edges: Close bottom edges of doors[**where required for attachment of weather stripping**] with end closures or channels of same material as face sheets. Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape.

Unless otherwise indicated, ANSI/SDI A250.8 permits manufacturers to choose core types, including kraft-paper honeycomb, polystyrene, polyurethane, polyisocyanurate, mineral board, or vertical steel stiffener. Retain first option in "Core" subparagraph below to allow manufacturer to select core, or retain one of the other options to require a particular core. Coordinate core type with thermal requirements in "Thermally Rated Door Assemblies" paragraph in "Performance Requirements" Article.

Core: [**Manufacturer's standard**] [**Polystyrene**] [**Polyurethane**] [**Polyisocyanurate**] [**Vertical steel stiffener**].

Fire-Rated Core: Manufacturer's standard [**vertical steel stiffener with insulation**] [**laminated mineral board**] core for fire-rated doors.

Frames:

Materials: Metallic-coated steel sheet, minimum thickness of 0.053 inch, with minimum [**A40**] [**A60**] coating.

Some manufacturers have thermally broken frames available; revise "Construction" subparagraph below if required.

Construction: [**Knocked down**] [**Face welded**] [**Full profile welded**].

In "Exposed Finish" subparagraph below, verify with manufacturers availability of factory-finish option for welded frames.

Exposed Finish: [**Prime**] [**Factory**].

"Extra-Heavy-Duty Doors and Frames" paragraph below describes exterior-use assemblies fabricated to SDI requirements and containing doors with 0.053-inch- thick, (nominal 16-gage) face sheets and laminated cores.

* + - * 1. Extra-Heavy-Duty Doors and Frames: ANSI/SDI A250.8, Level 3; ANSI/SDI A250.4, Level A. [**At locations indicated in the Door and Frame Schedule**] <**Insert locations**>.

Doors:

Type: As indicated in the Door and Frame Schedule.

Thickness: 1-3/4 inches.

Revise "Face" subparagraph below if embossed or textured faces are required.

Face: Metallic-coated steel sheet, minimum thickness of 0.053 inch, with minimum [**A40**] [**A60**] coating.

Edge Construction: [**Model 1, Full Flush**] [**Model 2, Seamless**] [**Model 3, Stile and Rail**].

ANSI/SDI A250.8 allows the edge bevel to be determined by manufacturer unless otherwise indicated.

Edge Bevel: [**Bevel lock and hinge edges 1/8 inch in 2 inches**] [**Bevel lock edge 1/8 inch in 2 inches**] [**Provide manufacturer's standard beveled or square edges**].

Top Edge Closures: Close top edges of doors with flush closures of same material as face sheets. Seal joints against water penetration.

Bottom Edges: Close bottom edges of doors[**where required for attachment of weather stripping**] with end closures or channels of same material as face sheets. Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape.

Unless otherwise indicated, ANSI/SDI A250.8 permits manufacturers to choose core types, including kraft-paper honeycomb, polystyrene, polyurethane, polyisocyanurate, mineral board, or vertical steel stiffener. Retain first option in "Core" subparagraph below to allow manufacturer to select core, or retain one of the other options to require a particular core. Coordinate core type with thermal requirements in "Thermally Rated Door Assemblies" paragraph in "Performance Requirements" Article.

Core: [**Manufacturer's standard**] [**Polystyrene**] [**Polyurethane**] [**Polyisocyanurate**] [**Vertical steel stiffener**].

Fire-Rated Core: Manufacturer's standard [**vertical steel stiffener with insulation**] [**laminated mineral board**] core for fire-rated doors.

Frames:

Materials: Metallic-coated steel sheet, minimum thickness of 0.053 inch, with minimum [**A40**] [**A60**] coating.

Some manufacturers have thermally broken frames available; revise "Construction" subparagraph below if required.

Construction: [**Knocked down**] [**Face welded**] [**Full profile welded**].

In "Exposed Finish" subparagraph below, verify with manufacturers availability of factory-finish option for welded frames.

Exposed Finish: [**Prime**] [**Factory**].

"Maximum-Duty Doors and Frames" paragraph below describes exterior-use assemblies fabricated to SDI requirements and containing doors with 0.067-inch- thick, (nominal 14-gage) face sheets and laminated cores.

* + - * 1. Maximum-Duty Doors and Frames: ANSI/SDI A250.8, Level 4; ANSI/SDI A250.4, Level A. [**At locations indicated in the Door and Frame Schedule**] <**Insert locations**>.

Doors:

Type: As indicated in the Door and Frame Schedule.

Thickness: 1-3/4 inches.

Revise "Face" subparagraph below if embossed or textured faces are required.

Face: Metallic-coated steel sheet, minimum thickness of 0.067 inch, with minimum [**A40**] [**A60**] coating.

Edge Construction: [**Model 1, Full Flush**] [**Model 2, Seamless**].

ANSI/SDI A250.8 allows the edge bevel to be determined by manufacturer unless otherwise indicated.

Edge Bevel: [**Bevel lock and hinge edges 1/8 inch in 2 inches**] [**Bevel lock edge 1/8 inch in 2 inches**] [**Provide manufacturer's standard beveled or square edges**].

Top Edge Closures: Close top edges of doors with flush closures of same material as face sheets. Seal joints against water penetration.

Bottom Edges: Close bottom edges of doors[**where required for attachment of weather stripping**] with end closures or channels of same material as face sheets. Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape.

Unless otherwise indicated, ANSI/SDI A250.8 permits manufacturers to choose core types, including kraft-paper honeycomb, polystyrene, polyurethane, polyisocyanurate, mineral board, or vertical steel stiffener. Retain first option in "Core" subparagraph below to allow manufacturer to select core, or retain one of the other options to require a particular core. Coordinate core type with thermal requirements in "Thermally Rated Door Assemblies" paragraph in "Performance Requirements" Article.

Core: [**Manufacturer's standard**] [**Polystyrene**] [**Polyurethane**] [**Polyisocyanurate**] [**Vertical steel stiffener**].

Fire-Rated Core: Manufacturer's standard [**vertical steel stiffener with insulation**] [**laminated mineral board**] core for fire-rated doors.

Frames:

Materials: Metallic-coated steel sheet, minimum thickness of 0.067 inch, with minimum [**A40**] [**A60**] coating.

Some manufacturers have thermally broken frames available; revise "Construction" subparagraph below if required.

Construction: [**Knocked down**] [**Face welded**] [**Full profile welded**].

In "Exposed Finish" subparagraph below, verify with manufacturers availability of factory-finish option for welded frames.

Exposed Finish: [**Prime**] [**Factory**].

* + - 1. INTERIOR CUSTOM HOLLOW-METAL DOORS AND FRAMES

Retain this article to specify interior hollow-metal doors and frames meeting requirements of HMMA. Use of the term "custom" in article title reflects the term used in HMMA standards. Many options are available from manufacturers, and some customization may be possible with doors specified to HMMA standards; consult manufacturers. See the Evaluations.

"Hollow-Metal Doors and Frames," "Commercial Doors and Frames," and "Commercial Laminated Doors and Frames" paragraphs below describe various door- and frame-assembly types produced to HMMA requirements; if Project contains more than one type, retain each applicable paragraph and indicate locations. If Project contains more than one variation for each paragraph, copy and indicate locations of each variation.

"Hollow-Metal Doors and Frames" paragraph below describes interior-use assemblies fabricated to HMMA requirements and containing doors with 0.032-inch- thick, (nominal 20-gage) face sheets and steel-stiffened cores. See "Commercial Laminated Doors and Frames" paragraph for doors with laminated cores instead of steel stiffened.

* + - * 1. Hollow-Metal Doors and Frames: NAAMM-HMMA 860; ANSI/SDI A250.4, Physical Performance Level A. [**At locations indicated in the Door and Frame Schedule**] <**Insert locations**>.

Doors:

Type: As indicated in the Door and Frame Schedule.

Thickness: 1-3/4 inches.

Revise "Face" subparagraph below if embossed or textured faces are required.

Face: [**Uncoated**] [**Metallic-coated**] steel sheet, minimum thickness of [**0.032 inch**] [**0.042 inch**] [**0.053 inch**].

In "Edge Construction" subparagraph below, first option is unavailable with doors using 0.032-inch- (0.8-mm-) thick, face sheets.

Edge Construction: [**Continuously welded with no**] [**Projection or tack welded with no**] [**Interlocking with**] [**Projection or tack welded with**] visible seam.

Core: Steel stiffened.

Fire-Rated Core: Manufacturer's standard [**vertical steel stiffener**] [**laminated mineral board**] core for fire-rated [**and temperature-rise-rated**]doors.

Frames:

Materials: [**Uncoated**] [**Metallic-coated**] steel sheet, minimum thickness of 0.053 inch.

[**Sidelite**] [**and**] [**Transom**] Frames: Fabricated from same thickness material as adjacent door frame.

Construction: [**Knocked down**] [**Slip-on drywall**] [**Face welded**] [**Full profile welded**].

Exposed Finish: Prime.

"Commercial Doors and Frames" paragraph below describes interior-use assemblies fabricated to HMMA requirements and containing doors with 0.042-inch-thick, (nominal 18-gage) face sheets and steel-stiffened cores.

* + - * 1. Commercial Doors and Frames: NAAMM-HMMA 861; ANSI/SDI A250.4, Physical Performance Level A. [**At locations indicated in the Door and Frame Schedule**] <**Insert locations**>.

Doors:

Type: As indicated in the Door and Frame Schedule.

Thickness: 1-3/4 inches.

Revise "Face" subparagraph below if embossed or textured faces are required.

Face: [**Uncoated**] [**Metallic-coated**] steel sheet, minimum thickness of 0.042 inch.

Edge Construction: Continuously welded with no visible seam.

Core: Steel stiffened.

Fire-Rated Core: Manufacturer's standard [**vertical steel stiffener**] [**laminated mineral board**] core for fire-rated [**and temperature-rise-rated**]doors.

Frames:

Materials: [**Uncoated**] [**Metallic-coated**] steel sheet, minimum thickness of 0.053 inch, except 0.067 inch for openings exceeding 4 feet wide.

[**Sidelite**] [**and**] [**Transom**] Frames: Fabricated from same material as adjacent door frame.

Construction: [**Face**] [**Full profile**] welded.

Exposed Finish: Prime.

"Commercial Laminated Doors and Frames" paragraph below describes interior-use assemblies fabricated to HMMA requirements and containing doors with 0.053-inch-thick, (nominal 16-gage); 0.042-inch-thick, (nominal 18-gage); or 0.032-inch-thick, (nominal 20-gage) face sheets and laminated cores.

* + - * 1. Commercial Laminated Doors and Frames: NAAMM-HMMA 867; ANSI/SDI A250.4, Physical Performance Level A. [**At locations indicated in the Door and Frame Schedule**] <**Insert locations**>.

Doors:

Type: As indicated in the Door and Frame Schedule.

Thickness: 1-3/4 inches.

Revise "Face" subparagraph below if embossed or textured faces are required.

Face: [**Uncoated**] [**Metallic-coated**] steel sheet, minimum thickness of [**0.032 inch**] [**0.042 inch**] [**0.053 inch**].

Edge Construction: [**Continuously welded with no visible seam**] [**Interlocking with visible seam**] [**Interlocking with no visible seam**] [**Projection, spot, or tack welded with or without visible seams**].

NAAMM-HMMA 867 calls for the lock edge to be beveled, but hinge edge to be determined by manufacturer unless otherwise indicated.

Edge Bevel: [**Bevel lock and hinge edges 1/8 inch in 2 inches**] [**Bevel lock edge 1/8 inch in 2 inches**].

Core: [**Kraft-paper honeycomb**] [**Polyisocyanurate**] [**Polystyrene**] [**Polyurethane**] [**Vertical steel stiffener**].

Fire-Rated Core: Manufacturer's standard [**vertical steel stiffener**] [**laminated mineral board**] core for fire-rated [**and temperature-rise-rated**]doors.

Frames:

Materials: [**Uncoated**] [**Metallic-coated**] steel sheet, minimum thickness of 0.053 inch.

[**Sidelite**] [**and**] [**Transom**] Frames: Fabricated from same thickness material as adjacent door frame.

Construction: [**Knocked down**] [**Slip-on drywall**] [**Face welded**] [**Full profile welded**].

Second option in "Exposed Finish" subparagraph below is available for metallic-coated units.

Exposed Finish: [**Prime**] [**Unprimed**].

* + - 1. EXTERIOR CUSTOM HOLLOW-METAL DOORS AND FRAMES

Retain this article to specify exterior hollow-metal doors and frames meeting requirements of HMMA. Use of the term "custom" in article title reflects the term used in HMMA standards. Many options are available from manufacturers, and some customization may be possible with doors specified to HMMA standards; consult manufacturers. See the Evaluations.

"Commercial Doors and Frames" and "Commercial Laminated Doors and Frames" paragraphs below describe various door- and frame-assembly types produced to HMMA requirements; if Project contains more than one type, retain each applicable paragraph and indicate locations. If Project contains more than one variation for each paragraph, copy and indicate locations of each variation.

"Commercial Doors and Frames" paragraph below describes exterior-use assemblies fabricated to HMMA requirements and containing doors with 0.053-inch-thick, (nominal 16-gage) face sheets and steel-stiffened cores.

* + - * 1. Commercial Doors and Frames: NAAMM-HMMA 861; ANSI/SDI A250.4, Physical Performance Level A. [**At locations indicated in the Door and Frame Schedule**] <**Insert locations**>.

Doors:

Type: As indicated in the Door and Frame Schedule.

Thickness: 1-3/4 inches.

Revise "Face" subparagraph below if embossed or textured faces are required.

Face: Metallic-coated steel sheet, minimum thickness of 0.053 inch, with minimum G60 or A60 coating.

Edge Construction: Continuously welded with no visible seam.

Top Edge Closures: Close top edges of doors with flush closures of same material as face sheets. Seal joints against water penetration.

Bottom Edges: Close bottom edges of doors[**where required for attachment of weather stripping**] with end closures or channels of same material as face sheets. Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape.

Coordinate core type with thermal requirements in "Thermally Rated Door Assemblies" paragraph in "Performance Requirements" Article.

Core: Steel stiffened.

Frames:

Materials: Metallic-coated steel sheet, minimum thickness of 0.053 inch, except 0.067 inch for openings exceeding 4 feet wide; with minimum G60 or A60 coating.

Some manufacturers have thermally broken frames available; revise "Construction" subparagraph below if required.

Construction: [**Face**] [**Full profile**] welded.

Exposed Finish: Prime.

"Commercial Laminated Doors and Frames" paragraph below describes exterior-use assemblies fabricated to HMMA requirements and containing doors with 0.053-inch-thick, (nominal 16-gage), or 0.042-inch-thick, (nominal 18-gage), face sheets and laminated cores.

* + - * 1. Commercial Laminated Doors and Frames: NAAMM-HMMA 867; ANSI/SDI A250.4, Physical Performance Level A. [**At locations indicated in the Door and Frame Schedule**] <**Insert locations**>.

Doors:

Type: As indicated in the Door and Frame Schedule.

Thickness: 1-3/4 inches.

Revise "Face" subparagraph below if embossed or textured faces are required.

Face: Metallic-coated steel sheet, minimum thickness of [**0.053 inch**] [**0.042 inch**], with minimum G60 or A60 coating.

Edge Construction: [**Continuously welded with no visible seam**] [**Interlocking with visible seam**] [**Interlocking with no visible seam**] [**Projection, spot, or tack welded with or without visible seams**].

Top Edge Closures: Close top edges of doors with flush closures of same material as face sheets. Seal joints against water penetration.

Bottom Edges: Close bottom edges of doors[**where required for attachment of weather stripping**] with end closures or channels of same material as face sheets. Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape.

Coordinate core type with thermal requirements in "Thermally Rated Door Assemblies" paragraph in "Performance Requirements" Article.

Core: [**Kraft-paper honeycomb**] [**Polyisocyanurate**] [**Polystyrene**] [**Polyurethane**] [**Vertical steel stiffener**].

Frames:

Materials: Metallic-coated steel sheet, minimum thickness of 0.053 inch, with minimum G60 or A60 coating.

Some manufacturers have thermally broken frames available; revise "Construction" subparagraph below if required.

Construction: [**Knocked down**] [**Face welded**] [**Full profile welded**].

Second option in "Exposed Finish" subparagraph below is available for metallic-coated units.

Exposed Finish: [**Prime**] [**Unprimed**].

* + - 1. BORROWED LITES
         1. Fabricate of [**uncoated**] [**metallic-coated**] steel sheet, minimum thickness of [**0.053 inch**] [**0.042 inch** ].
         2. Construction: [**Knocked down**] [**Face welded**] [**Full profile welded**].
         3. Fabricate in one piece except where handling and shipping limitations require multiple sections. Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of metal of same or greater thickness as metal as frames.
         4. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
      2. HOLLOW-METAL PANELS
         1. Provide hollow-metal panels of same materials, construction, and finish as adjacent door assemblies.
      3. FRAME ANCHORS
         1. Jamb Anchors:

Type: Anchors of minimum size and type required by applicable door and frame standard, and suitable for performance level indicated.

Quantity: Minimum of three anchors per jamb, with one additional anchor for frames with no floor anchor. Provide one additional anchor for each 24 inches of frame height above 7 feet.

Postinstalled Expansion Anchor: Minimum 3/8-inch diameter bolts with expansion shields or inserts, with manufacturer's standard pipe spacer.

* + - * 1. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor.

Retain "Floor Anchors for Concrete Slabs with Underlayment" paragraph below when using flowable underlayment over slabs or floor structure.

* + - * 1. Floor Anchors for Concrete Slabs with Underlayment: Adjustable-type anchors with extension clips, allowing not less than 2-inch height adjustment. Terminate bottom of frames at top of underlayment.
        2. Material: ASTM A879, Commercial Steel (CS), 04Z coating designation; mill phosphatized.

For anchors built into exterior walls, steel sheet complying with ASTM A1008 or ASTM A1011; hot-dip galvanized according to ASTM A153, Class B.

* + - 1. MATERIALS

Retain "Recycled Content of Steel Products" paragraph below to specify recycled content if required. An alternative method of requiring recycled content is to retain requirement in Project's Division 01 sustainable design requirements Section that gives Contractor the option and responsibility to determine how recycled content requirements will be met.

* + - * 1. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than [**25**] <**Insert value**> percent.
        2. Cold-Rolled Steel Sheet: ASTM A1008, Commercial Steel (CS), Type B; suitable for exposed applications.
        3. Hot-Rolled Steel Sheet: ASTM A1011, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
        4. Metallic-Coated Steel Sheet: ASTM A653, Commercial Steel (CS), Type B.
        5. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A153.
        6. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.
        7. Mineral-Fiber Insulation: ASTM C665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E136 for combustion characteristics.
        8. Glazing: Comply with requirements in Section 088000 "Glazing."
      1. FABRICATION

Retain "Door Astragals" paragraph below if astragals are required for fire-protection rating.

* + - * 1. Door Astragals: Provide overlapping astragal on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted or as required to comply with published listing of qualified testing agency.
        2. Hollow-Metal Frames: Fabricate in one piece except where handling and shipping limitations require multiple sections. Where frames are fabricated in sections, provide alignment plates or angles at each joint, fabricated of metal of same or greater thickness as frames.

[**Sidelite**] [**and**] [**Transom Bar**] Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by welding[**, or by rigid mechanical anchors**].

Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.

Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.

Single-Door Frames: Drill stop in strike jamb to receive three door silencers.

Double-Door Frames: Drill stop in head jamb to receive two door silencers.

Terminated Stops (Hospital Stops): Terminate stops [**6 inches**] <**Insert dimension**> above finish floor with a [**45**] [**90**]-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.

* + - * 1. Hardware Preparation: Factory prepare hollow-metal doors and frames to receive templated mortised hardware, and electrical wiring; include cutouts, reinforcement, mortising, drilling, and tapping according to ANSI/SDI A250.6, the Door Hardware Schedule, and templates.

Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

Comply with BHMA A156.115 for preparing hollow-metal doors and frames for hardware.

* + - * 1. Glazed Lites: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with [**butted**] [**or**] [**mitered**] hairline joints.

Provide stops and moldings flush with face of door, and with [**beveled**] [**square**] stops unless otherwise indicated.

Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.

Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames. Provide loose stops and moldings on inside of hollow-metal doors and frames.

Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.

Provide stops for installation with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches o.c. and not more than 2 inches o.c. from each corner.

* + - 1. STEEL FINISHES

Retain "Prime Finish" or "Factory Finish" paragraph below.

* + - * 1. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.

Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

Verify, with manufacturer, availability of finishes in "Factory Finish" paragraph below; not all manufacturers provide factory finishes.

* + - * 1. Factory Finish: Clean, pretreat, and apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat, complying with ANSI/SDI A250.3.

Retain "Color and Gloss" subparagraph below for factory finish.

Color and Gloss: [**As indicated by manufacturer's designations**] [**Match Approved sample**] [**As selected by Director’s Representative from manufacturer's full range**] <**Insert color and gloss**>.

* + - 1. LOUVERS

Revise this article to include other types such as pierced louvers, adjustable louvers, air grilles, and galvanized exterior louvers with insect screens. Louvers are typically provided as an accessory installed in an opening in the door, but integral louvers, which are manufactured within the door, are available; revise text if required. If a specific net-free area is required for ventilation purposes, add requirement to text.

* + - * 1. Provide louvers for interior doors, where indicated, which comply with SDI 111, with blades or baffles formed of 0.020-inch thick, cold-rolled steel sheet set into 0.032-inch thick steel frame.

Retain louver types required from "Sightproof Louver," "Lightproof Louver," and "Fire-Rated Automatic Louvers" subparagraphs below or delete all three. See the Evaluations for discussion of free area of louvers.

Sightproof Louver: Stationary louvers constructed with inverted-V or inverted-Y blades.

Lightproof Louver: Stationary louvers constructed with baffles to prevent light from passing from one side to the other.

See the Evaluations for discussion of fire-rated louvers.

Fire-Rated Automatic Louvers: Louvers constructed with movable blades closed by actuating fusible link and listed and labeled for use in fire-rated door assemblies of type and fire-resistance rating indicated by same qualified testing and inspecting agency that established fire-resistance rating of door assembly.

* + - * 1. Form corners of moldings with hairline joints. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.

1. EXECUTION
   * + 1. PREPARATION

Retain first paragraph below for installation of welded frames.

* + - * 1. 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. Touch up factory-applied finishes where spreaders are removed.
        2. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
      1. INSTALLATION
         1. Install hollow-metal doors and frames plumb, rigid, properly aligned, and securely fastened in place. Comply with approved Shop Drawings and with manufacturer's written instructions.

In "Hollow-Metal Frames" paragraph below, retain option for SDI or NAAMM-HMMA installation standard to match standards organization cited for fabrication.

* + - * 1. Hollow-Metal Frames: Comply with [**ANSI/SDI A250.11**] [**NAAMM-HMMA 840**].

Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces without damage to completed Work.

Where frames are fabricated in sections, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces. Touch-up finishes.

Install frames with removable stops located on secure side of opening.

Fire-Rated Openings: Install frames according to NFPA 80.

Floor Anchors: Secure with postinstalled expansion anchors.

Retain first subparagraph below if permitted.

Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.

Retain first subparagraph below if required. Insulation may help reduce sound transmission.

Solidly pack mineral-fiber insulation inside frames.

Retain "Masonry Walls" subparagraph below only when required. Grouting of frames is not recommended by SDI. See the Evaluations.

Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout or mortar.

Retain option in "In-Place Concrete or Masonry Construction" subparagraph below if required.

In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors.[**Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.**]

Installation Tolerances: Adjust hollow-metal frames to the following tolerances:

Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.

Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.

Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.

Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.

Add text if grouting frames is required. Industry recommendations discourage grouting. See the Evaluations.

* + - * 1. Hollow-Metal Doors: Fit and adjust hollow-metal doors accurately in frames, within clearances specified below.

In "Non-Fire-Rated Steel Doors" subparagraph below, retain first option if using SDI standards in Part 2; retain second option if using NAAMM-HMMA standards in Part 2.

Non-Fire-Rated Steel Doors: Comply with [**ANSI/SDI A250.8**] [**NAAMM-HMMA 841 and NAAMM-HMMA guide specification indicated**].

Retain "Fire-Rated Doors" and "Smoke-Control Doors" subparagraphs below if required.

Fire-Rated Doors: Install doors with clearances according to NFPA 80.

Smoke-Control Doors: Install doors according to NFPA 105.

* + - * 1. Glazing: Comply with installation requirements in Section 088000 "Glazing" and with hollow-metal manufacturer's written instructions.
      1. FIELD QUALITY CONTROL

Retaining second option in "Inspection Agency" paragraph below is typical. If retaining second option in "Inspection Agency" paragraph, retain "Field quality-control reports" paragraph in "Informational Submittals."

* + - * 1. Inspection Agency: **Engage** a qualified inspector to perform inspections and to furnish reports to the Director’s Representative.
        2. Inspections:

Fire-Rated Door Inspections: Inspect each fire-rated door according to NFPA 80, Section 5.2.

Retain "Egress Door Inspections" subparagraph below for projects under NFPA 101, for Assembly, Educational, Day-Care, and Residential Board and Care occupancies.

Egress Door Inspections: Inspect each door equipped with panic hardware, each door equipped with fire exit hardware, each door located in an exit enclosure, each electrically controlled egress door, and each door equipped with special locking arrangements according to NFPA 101, Section 7.2.1.15.

* + - * 1. Repair or remove and replace installations where inspections indicate that they do not comply with specified requirements.
        2. Reinspect repaired or replaced installations to determine if replaced or repaired door assembly installations comply with specified requirements.
        3. Prepare and submit separate inspection report for each fire-rated door assembly indicating compliance with each item listed in [**NFPA 80**] [**and**] [**NFPA 101**].
      1. REPAIR

Retain "Prime-Coat Touchup," "Metallic-Coated Surface Touchup," or "Factory-Finish Touchup" paragraph below for field touchup of painted surfaces; or delete all and retain "Touchup Painting" paragraph below if touchup is included in painting Sections.

* + - * 1. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
        2. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.
        3. Factory-Finish Touchup: Clean abraded areas and repair with same material used for factory finish according to manufacturer's written instructions.
        4. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION 081113