UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated January 2021
****

SECTION TABLE OF CONTENTS

DIVISION 08 - OPENINGS

SECTION 08 11 13

STEEL DOORS AND FRAMES

08/20

PART 1 GENERAL

1.1 REFERENCES
1.2 SUBMITTALS
1.3 DELIVERY, STORAGE, AND HANDLING

PART 2 PRODUCTS

2.1 STANDARD STEEL DOORS
2.1.1 Classification - Level, Performance, Model
2.1.1.1 Standard Duty Doors
2.1.1.2 Heavy Duty Doors
2.1.1.3 Extra Heavy Duty Doors
2.1.1.4 Maximum Duty Doors
2.2 CUSTOM HOLLOW METAL DOORS
2.3 INSULATED STEEL DOOR SYSTEMS
2.4 ACCESSORIES
2.4.1 Shelves for Dutch Doors
2.4.2 Louvers
2.4.2.1 Interior Louvers
2.4.2.2 Exterior Louvers
2.4.3 Astragals
2.4.4 Moldings
2.5 INSULATION CORES
2.6 STANDARD STEEL FRAMES
2.6.1 Welded Frames
2.6.2 Knock-Down Frames
2.6.3 Mullions and Transom Bars
2.6.4 Stops and Beads
2.6.5 Terminated Stops
2.6.6 Cased Openings
2.6.7 Anchors
2.6.7.1 Wall Anchors
2.6.7.2 Floor Anchors
2.7 FIRE [AND] [SMOKE] DOORS AND FRAMES
2.7.1 Labels

2.7.2 Oversized Doors
2.7.3 Astragal on Fire [and Smoke] Doors
2.8 EXTERIOR FRAMES
2.9 HARDWARE PREPARATION
2.10 FINISHES
2.10.1 Factory-Primed Finish
2.10.2 Hot-Dip Zinc-Coated and Factory-Primed Finish
2.10.3 Electrolytic Zinc-Coated Anchors and Accessories
2.10.4 Factory-Applied Enamel Finish
2.11 FABRICATION AND WORKMANSHIP
2.12 PROVISIONS FOR GLAZING

PART 3 EXECUTION

3.1 INSTALLATION
3.1.1 Frames
3.1.2 Doors
3.1.3 Fire [and Smoke] Doors and Frames
3.2 PROTECTION
3.3 CLEANING

-- End of Section Table of Contents --

****

USACE / NAVFAC / AFCEC / NASA	**UFGS-08 11 13 (August 2020)**

Preparing Activity: NAVFAC	**Superseding**
	UFGS-08 11 13 (February 2010)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated January 2021

****

SECTION 08 11 13

STEEL DOORS AND FRAMES
08/20

****

NOTE: This guide specification covers steel doors and frames. Some paragraphs may need to be supplemented to meet project requirements.

Include Section 08 34 73 SOUND CONTROL DOOR ASSEMBLIES when project includes flush steel sound retardant doors with Sound Transmission Classification (STC) ranging from 25 to 45.

Adhere to UFC 1-300-02 Unified Facilities Guide Specifications (UFGS) Format Standard when editing this guide specification or preparing new project specification sections. Edit this guide specification for project specific requirements by adding, deleting, or revising text. For bracketed items, choose applicable item(s) or insert appropriate information.

Remove information and requirements not required in respective project, whether or not brackets are present.

Comments, suggestions and recommended changes for this guide specification are welcome and should be submitted as a Criteria Change Request (CCR).

****

****

NOTE: On the drawings, show:

1. Sizes of door openings, thicknesses of doors, swings, and travels of doors, and design of doors, whether flush panel, full flush, paneled, glazed, or louvered. It is recommended that standard door-type nomenclature, SDI 106, be used to indicate designs (e.g., F, L, G, GL in lieu of A, B, C).

2. Details of nonstructural mullions, mullion covers, and removable mullions.

3. Type and thickness of glazing required; whether

or not insulating glass units are required.

4. Method, type, and spacing required for anchoring door frames to adjoining construction.

5. Lintels and reinforcement required to support walls or partitions above doors.

6. Type of shop finish on steel surfaces.

7. Free area for louvers in doors.

8. Complete door schedule. Schedule should assign a separate number for each opening and should indicate door type and style, material, design, size, thickness, glazed or unglazed, class fire rating for fire doors, hardware set number, threshold material, if any, and material for frames, mullions, and transom bars.

****

PART 1 GENERAL

1.1 REFERENCES

****

NOTE: This paragraph is used to list the publications cited in the text of the guide specification. The publications are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title.

Use the Reference Wizard's Check Reference feature when you add a Reference Identifier (RID) outside of the Section's Reference Article to automatically place the reference in the Reference Article. Also use the Reference Wizard's Check Reference feature to update the issue dates.

References not used in the text will automatically be deleted from this section of the project specification when you choose to reconcile references in the publish print process.

****

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1/D1.1M (2020) Structural Welding Code - Steel

ASTM INTERNATIONAL (ASTM)

ASTM A653/A653M (2020) Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by

	the Hot-Dip Process
ASTM A879/A879M	(2012; R 2017) Standard Specification for Steel Sheet, zinc Coated by the Electrolytic Process for Applications Requiring Designation of the Coating Mass on Each Surface
ASTM A924/A924M	(2020) Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process
ASTM C578	(2019) Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation
ASTM C591	(2020) Standard Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation
ASTM C612	(2014; R 2019) Standard Specification for Mineral Fiber Block and Board Thermal Insulation
ASTM D2863	(2019) Standard Test Method for Measuring the Minimum Oxygen Concentration to Support Candle-Like Combustion of Plastics (Oxygen Index)
ASTM E1300	(2016) Standard Practice for Determining Load Resistance of Glass in Buildings
ASTM F2247	(2018) Standard Test Method for Metal Doors Used in Blast Resistant Applications (Equivalent Static Load Method)
ASTM F2248	(2012) Standard Practice for Specifying an Equivalent 3-Second Duration Design Loading for Blast Resistant Glazing Fabricated with Laminated Glass
ASTM F2927	(2012) Standard Test Method for Door Systems Subject to Airblast Loadings

BUILDERS HARDWARE MANUFACTURERS ASSOCIATION (BHMA)

ANSI/BHMA A156.115	(2016) Hardware Preparation in Steel Doors and Steel Frames

NATIONAL ASSOCIATION OF ARCHITECTURAL METAL MANUFACTURERS (NAAMM)

NAAMM HMMA 810	(2009) Hollow Metal Doors

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 80	(2019) Standard for Fire Doors and Other Opening Protectives
NFPA 105	(2019) Standard for Smoke Door Assemblies and Other Opening Protectives

NFPA 252	(2017) Standard Methods of Fire Tests of Door Assemblies

STEEL DOOR INSTITUTE (SDI/DOOR)

SDI/DOOR 111	(2009) Recommended Details for Standard Steel Doors, Frames, and Accessories and Related Components
SDI/DOOR 113	(2013; R2018) Standard Practice for Determining the Steady-State Thermal Transmittance of Steel Door and Frame Assemblies
SDI/DOOR A250.3	(2019) Test Procedure and Acceptance Criteria for Factory Applied Finish Coatings for Steel Doors and Frames
SDI/DOOR A250.4	(2018) Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors
SDI/DOOR A250.6	(2015) Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames
SDI/DOOR A250.8	(2017) Specifications for Standard Steel Doors and Frames
SDI/DOOR A250.11	(2012) Recommended Erection Instructions for Steel Frames

U.S. DEPARTMENT OF DEFENSE (DOD)

UFC 4-010-01	(2018;with Change 1, 2020) DoD Minimum Antiterrorism Standards for Buildings

UNDERWRITERS LABORATORIES (UL)

UL 10C	(2016) UL Standard for Safety Positive Pressure Fire Tests of Door Assemblies

1.2 SUBMITTALS

****

NOTE: Review Submittal Description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list, and corresponding submittal items in the text, to reflect only the submittals required for the project. The Guide Specification technical editors have classified those items that require Government approval, due to their complexity or criticality, with a "G." Generally, other submittal items can be reviewed by the Contractor's Quality Control System. Only add a "G" to an item if the submittal is sufficiently important or complex in context of the project.

For Army projects, fill in the empty brackets following the "G" classification, with a code of up to three characters to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy, Air Force, and NASA projects.

The "S" classification indicates submittals required as proof of compliance for sustainability Guiding Principles Validation or Third Party Certification and as described in Section 01 33 00 SUBMITTAL PROCEDURES.

Choose the first bracketed item for Navy, Air Force, and NASA projects, or choose the second bracketed item for Army projects.

****

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are [for Contractor Quality Control approval.][for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government.] Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Doors; G[, [_____]]

Frames; G[, [_____]]

Accessories

Schedule of Doors; G[, [_____]]

Schedule of Frames; G[, [_____]]

SD-03 Product Data

Doors; G[, [_____]]

Recycled Content for Steel Door Product; S

Frames; G[, [_____]]

Recycled Content for Steel Frame Product; S

Accessories

[SD-04 Samples

Factory-applied Enamel Finish; G[, [_____]]

]1.3 DELIVERY, STORAGE, AND HANDLING

Deliver doors, frames, and accessories undamaged and with protective wrappings or packaging.[Strap knock-down frames in bundles.][Provide temporary steel spreaders securely fastened to the bottom of each welded frame.] Store doors and frames on platforms under cover in clean, dry, ventilated, and accessible locations, with 6 mm 1/4 inch airspace between doors. Remove damp or wet packaging immediately and wipe affected surfaces dry. Replace damaged materials with new.

PART 2 PRODUCTS

2.1 STANDARD STEEL DOORS

****
NOTE: Standard steel doors are the most common and competitively priced which apply to most metal door openings in most projects. Different classifications and performance requirements are available as explained in the editor's notes in paragraph CLASSIFICATION - LEVEL, PERFORMANCE, MODEL.
****

****
NOTE: For forced entry, include the bracketed option below regarding exterior glazing when personnel density is greater than one person per 40 square meters 430 square feet and the minimum AT/FP standoff distances are met. This does not include guard type facilities or single and duplex detached family housing. These requirements are specified in UFC 4-010-01 "DoD Minimum Antiterrorism Standards for Buildings". Include last bracketed sentence if exterior doors must meet antiterrorism requirements of UFC 4-010-01.
****

SDI/DOOR A250.8, except as specified otherwise. Prepare doors to receive door hardware as specified in Section 08 71 00 DOOR HARDWARE. Undercut where indicated. Provide exterior doors with top edge closed flush and sealed to prevent water intrusion. Provide doors at 44.5 mm 1-3/4 inch thick, unless otherwise indicated. Provide door material that uses a minimum of 25 percent recycled content. Provide data indicating percentage of recycled content for steel door product.[Provide exterior glazing in accordance with ASTM F2248 and ASTM E1300.][Exterior doors must be tested in accordance with ASTM F2247 or ASTM F2927 to meet requirements of UFC 4-010-01.]

2.1.1 Classification - Level, Performance, Model

****
NOTE: When a door level is not required, delete the entire paragraph for that level. Door levels for various locations should be determined in accordance with SDI 108 Table 2 and the following list.

Closet doors (without locks) Level 1
Individual offices, storage rooms, classrooms, patients' rooms,

bathrooms, and bedrooms (except BEQ bedrooms) Level 2
BEQ sleeping room entrance doors and interior egress doors Level 3
Exterior Main entrance and circulation doors and other locations Level 4

Model designations are as follows:

Model 1 Full Flush Design
Model 2 Seamless Design
Model 3 Stile and Rail

Where appearance is important and edge seams are objectionable, use Model 2.

Core constructions must be at the manufacturer's discretion and are as follows:

a. Kraft/Paper Honeycomb
b. Polyurethane Modified Polyisocyanurate
c. Polystyrene
d. Mineral Board
e. Vertical Steel Stiffeners

****

2.1.1.1 Standard Duty Doors

SDI/DOOR A250.8, Level 1, physical performance Level C, Model [1] [2], of size(s) and design(s) indicated and core construction as required by the manufacturer. Provide [where shown][for doors No. [_____]].

2.1.1.2 Heavy Duty Doors

SDI/DOOR A250.8, Level 2, physical performance Level B, Model [1][2], with core construction as required by the manufacturer [for interior doors][and][for exterior doors], of size(s) and design(s) indicated.[Where vertical stiffener cores are required, the space between the stiffeners must be filled with board insulation.][Provide Level 2 [where indicated][for doors No. [_____]].]

2.1.1.3 Extra Heavy Duty Doors

SDI/DOOR A250.8, Level 3, physical performance Level A, Model [1][2][3] with core construction as required by the manufacturer [for interior doors][and][for indicated exterior doors], of size(s) and design(s) indicated.[Where vertical stiffener cores are required, the space between the stiffeners must be filled with board insulation.][Provide Level 3 [where indicated] [for doors No. [_____]].]

2.1.1.4 Maximum Duty Doors

SDI/DOOR A250.8, Level 4, physical performance Level A, Model [1][2] with core construction as required by the manufacturer [for interior doors][and][for indicated exterior doors], of size(s) and design(s) indicated.[Where vertical stiffener cores are required, the space between the stiffeners must be filled with board insulation.][Provide Level 4 [where indicated] [for doors No. [_____]].]

[2.2 CUSTOM HOLLOW METAL DOORS

****
NOTE: Custom steel doors are typically scheduled in locations that (1) require unique dimensions that are oversized, non-standard, or located in special use buildings or retrofits, (2)require enhanced performance from weather, sound reduction, forced entry, bullet resistant, or blast doors, or (3) require specific aesthetics that require embossments, attractive panels or other customization possibly for historic or other installations. Where only standard steel doors are used in a project, delete this paragraph.
****

****
NOTE: For forced entry, include the bracketed option below regarding exterior glazing when personnel density is greater than one person per 40 square meters 430 square feet and the minimum AT/FP standoff distances are met. This does not include guard type facilities or single and duplex detached family housing. These requirements are specified in UFC 4-010-01 "DoD Minimum Antiterrorism Standards for Buildings". Include last bracketed sentence if exterior doors must meet antiterrorism requirements of UFC 4-010-01.
****

Provide custom hollow metal doors where nonstandard steel doors are indicated. Provide custom steel doors in the door size(s), design(s), materials, construction, gages, and finish as specified for custom steel doors and complying with the requirements of NAAMM HMMA 810. Fill all spaces in exterior doors with insulation. Close top and bottom edges with steel channels not lighter than 1.5 mm thick 16 gage.[Close tops of exterior doors flush with an additional channel and seal to prevent water intrusion.] Prepare doors to receive hardware specified in Section 08 71 00 DOOR HARDWARE.[Undercut doors where indicated.] Provide doors at 44.5 mm 1-3/4 inch thick, unless otherwise indicated.[Provide exterior glazing in accordance with ASTM F2248 and ASTM E1300.][Exterior doors much be tested in accordance with ASTM F2247 and ASTM F2927 to meet the requirements of UFC 4-010-01.]

][2.3 INSULATED STEEL DOOR SYSTEMS

****
NOTE: Insulated steel doors and frames are recommended for entrances to dwelling units in UEPH's and barracks. Edit or delete the paragraph to suit the project.
****

Provide insulated steel doors and frames in accordance with SDI/DOOR 113 at entrances to dwelling units and where indicated. Meet energy requirements including Solar Heat Gain Coefficient (SHGC) and U-factor. Provide insulated steel doors with a core of polyurethane foam; face sheets, edges, and frames of galvanized steel not lighter than 0.7 mm thick 23 gage, 1.5 mm thick 16 gage, and 1.5 mm 16 gage respectively; magnetic

weatherstripping; nonremovable-pin hinges; thermal-break aluminum threshold; and vinyl door bottom. Provide to doors and frames a phosphate treatment, rust-inhibitive primer, and baked acrylic enamel finish. Test doors in accordance with SDI/DOOR A250.4 and meet the requirements for Level C. Prepare doors to receive specified hardware. Provide doors 44.5 mm 1-3/4 inch thick.

]2.4 ACCESSORIES

2.4.1 Shelves for Dutch Doors

SDI/DOOR 111. Fabricate shelves of steel not lighter than 1.5 mm thick 16 gage, [[_____] mm inches wide][of the size indicated]. Provide brackets of stock type fabricated of the same metal used to fabricate shelves.

2.4.2 Louvers

****
NOTE: Interior and exterior louvers are applied to steel doors differently. Interior door louvers are removable on side by molding flange and exterior door louver frames are permanently welded to the door and provided with removable bird screen or insect screen.
****

****
NOTE: Avoid louvers on exterior doors in humid locations or project locations with Environmental Severity Classifications (ESC) of C3 thru C5 as they are very susceptible to weather deterioration. Humid locations are those in ASHRAE climate zones 0A, 1A, 2A, 3A, 3C, 4C and 5C (as identified in ASHRAE 90.1). See UFC 1-200-01 for determination of ESC for project locations. Consider other means of providing the venting function.

Ensure that louvers in doors are drainable, weatherproof and factory primed. Doors with factory-installed louvers are also recommended.
****

2.4.2.1 Interior Louvers

****
NOTE: Lightproof louvers are used when light transmission must be avoided. However, these provide a minimal free air flow.
****

SDI/DOOR 111. Where indicated, provide louvers of stationary [sightproof][and][lightproof] type[where scheduled].[Louvers for lightproof must not transmit light.] Detachable moldings on room or non security side of door; on security side of door, moldings to be integral part of louver. Form louver frames of 0.9 mm thick 20 gage steel and louver blades of a minimum 0.6 mm 24 gage.[Louvers for lightproof doors must have minimum of 20 percent net-free opening.][Sightproof louvers to be inverted ["V" blade design with minimum 55][and][inverted ["Y"] blade design with minimum 40] percent net-free opening.]

2.4.2.2 Exterior Louvers

****

NOTE: Use aluminum screens in humid locations or project locations with Environmental Severity Classifications (ESC) of C3 thru C5. Humid locations are those in ASHRAE climate zones 0A, 1A, 2A, 3A, 3C, 4C and 5C (as identified in ASHRAE 90.1). See UFC 1-200-01 for determination of ESC for project locations.

****

Provide louvers of the inverted ["Y"]["V"]["Z"] type with minimum of [30][55][35] percent net-free opening. Weld or tenon louver blades to continuous channel frame and weld assembly to door to form watertight assembly. Form louvers of hot-dip galvanized steel of same gage as door facings. At louvers provide steel-framed [insect][bird] screens secured to room side and readily removable. Provide [aluminum wire cloth, 7 by 7 per 10 mm or 7 by 6 per 10 mm 18 by 18 or 18 by 16 inch mesh, for insect screens][galvanized steel, 13 by 13 mm 1/2 by 1/2 inch mesh hardware cloth, for bird screens]. Net-free louver area to be before screening.

2.4.3 Astragals

For pairs of exterior steel doors which will not have aluminum astragals or removable mullions, as specified in Section 08 71 00 DOOR HARDWARE provide overlapping steel astragals with the doors.

2.4.4 Moldings

Provide moldings around glass of interior and exterior doors and louvers of interior doors. Provide nonremovable moldings on outside of exterior doors and on corridor side of interior doors. Other moldings may be stationary or removable. Secure inside moldings to stationary moldings, or provide snap-on moldings.

2.5 INSULATION CORES

****

NOTE: Door manufacturers use various insulation materials as their standard. Unless the designer has a specific reason to eliminate an insulation material, it is advised to maintain all listed types of insulation materials.

If additional interior or specialty doors require thermal insulation include the bracketed option and indicate these requirements on the door schedule in the drawings.

****

Provide insulating cores at all exterior doors[and other specific doors noted in the door schedule], and provide an apparent U-factor of .48 in accordance with SDI/DOOR 113 and conforming to:

a. Rigid Cellular Polyisocyanurate Foam: ASTM C591, Type I or II, foamed-in-place or in board form, with oxygen index of not less than 22 percent when tested in accordance with ASTM D2863; or

b. Rigid Polystyrene Foam Board: ASTM C578, Type I or II; or

c. Mineral board: ASTM C612, Type I.

2.6 STANDARD STEEL FRAMES

****
NOTE: Designate whether frames are to be welded or knock-down field-assembled type. In general, utilize welded frames unless knock-down frames are required due to a renovation project or the temporary nature of the partitions being constructed. Welded frames must be built in as CMU walls are constructed or before drywall is installed on studs. Slip-on drywall frames must be knock-down type to be inserted after drywall is installed. When both types are required for the project, modify paragraph to specify both types and locations where required.
****

SDI/DOOR A250.8, Level [1][2][3][4], except as otherwise specified. Form frames to sizes and shapes indicated, with [welded corners][or][knock-down field-assembled corners]. Provide steel frames for doors, [transoms,] [sidelights,] [mullions,] [cased openings,][and][interior glazed panels,] unless otherwise indicated. Provide frame product that uses a minimum of 25 percent recycled content. Provide data indicating percentage of recycled content for steel frame product.

2.6.1 Welded Frames

Continuously weld frame faces at corner joints. Mechanically interlock or continuously weld stops and rabbets. Grind welds smooth.

Weld frames in accordance with the recommended practice of the Structural Welding Code Sections 1 through 6, AWS D1.1/D1.1M and in accordance with the practice specified by the producer of the metal being welded.

[2.6.2 Knock-Down Frames

****
NOTE: Remove this section unless knock-down frames are required due to a renovation project or the temporary nature of the partitions being constructed.
****

Design corners for simple field assembly by concealed tenons, splice plates, or interlocking joints that produce square, rigid corners and a tight fit and maintain the alignment of adjoining members. Provide locknuts for bolted connections.

]2.6.3 Mullions and Transom Bars

Provide mullions and transom bars of closed or tubular construction with heads and jambs butt-welded together[or knock-down for field assembly]. Bottom of door mullions must have adjustable floor anchors and spreader connections.

2.6.4 Stops and Beads

Provide form and loose stops and beads from 0.9 mm thick 20 gage steel. Provide for glazed and other openings in standard steel frames. Secure beads to frames with oval-head, countersunk Phillips self-tapping sheet metal screws or concealed clips and fasteners. Space fasteners approximately 300 to 400 mm 12 to 16 inch on center. Miter molded shapes at corners. Butt or miter square or rectangular beads at corners.

2.6.5 Terminated Stops

****

NOTE: Specify or indicate when stops (rabbet strips) are required to be terminated above the floor; generally, terminated stops are used in hospitals and similar buildings to eliminate projections on which wheels of beds and carts are caught and to eliminate small, dirt-catching corners.

****

Where indicated, terminate interior door frame stops 150 mm 6 inch above floor.[Do not terminate stops of frames for [lightproof,] [soundproof,] [or lead-lined] doors.]

2.6.6 Cased Openings

Fabricate frames for cased openings of same material, gage, and assembly as specified for metal door frames, except omit door stops and preparation for hardware.

2.6.7 Anchors

Provide anchors to secure the frame to adjoining construction. Provide steel anchors, zinc-coated not lighter than 1.2 mm thick 18 gage.

2.6.7.1 Wall Anchors

Provide at least three anchors for each jamb. For frames which are more than 2285 mm 7.5 feet in height, provide one additional anchor for each jamb for each additional 760 mm 2.5 feet or fraction thereof.

a. Masonry: Provide anchors of corrugated or perforated steel straps or 5 mm 3/16 inch diameter steel wire, adjustable or T-shaped;

b. Stud partitions: Weld or otherwise securely fasten anchors to backs of frames. Design anchors to be fastened [to wood studs with nails,] [to closed steel studs with sheet metal screws, and to open steel studs by wiring or welding];

c. Completed openings: Secure frames to previously placed concrete or masonry with expansion bolts in accordance with SDI/DOOR 111; and

d. Solid plaster partitions: Secure anchors solidly to back of frames and tie into the lath. Provide adjustable top strut anchors on each side of frame for fastening to structural members or ceiling construction above. Provide size and type of strut anchors as recommended by the frame manufacturer.

2.6.7.2 Floor Anchors

****

NOTE: In masonry construction, extension clips at bottom of frames are usually required in locations where additional floor fill occurs on top of structural slabs, and the metal frames and partitions are installed before the fill is placed. In such cases, the drawings or specifications should indicate the distance required between the rough slab and finished floor.

****

Provide floor anchors drilled for 10 mm 3/8 inch anchor bolts at bottom of each jamb member.[Where floor fill occurs, terminate bottom of frames at the indicated finished floor levels and support by adjustable extension clips resting on and anchored to the structural slabs.]

2.7 FIRE [AND] [SMOKE] DOORS AND FRAMES

****

NOTE: For each opening requiring labeled doors, specify or indicate the hourly rating of fire doors, as established by the National Fire Protection Association. When labeled doors are necessary on both sides of a fire wall, provide adequate details. Labels cannot be obtained for double-acting doors or for steel angle frames. Metal frames to receive labeled wood fire doors must also be labeled.

If the facility includes sprinklers and other fire protection measures, doors may or may not require insulation for temperature rise. In projects that require temperature rise criteria on fire doors, include the bracketed last sentence in the paragraph below and indicate this requirement in the door schedule.

****

Provide fire[and smoke] doors and frames in accordance with NFPA 80[and][NFPA 105] and this specification.[Include insulated core materials in fire doors where indicated in the door schedule.]

2.7.1 Labels

Provide fire doors and frames bearing the label of Underwriters Laboratories (UL), Factory Mutual Engineering and Research (FM), or Warnock Hersey International (WHI) attesting to the rating required. Testing must be in accordance with NFPA 252 or UL 10C. Provide labels that are metal with raised letters, bearing the name or file number of the door and frame manufacturer. Labels must be permanently affixed at the factory to frames and to the hinge edge of the door. Do not paint door and labels.

2.7.2 Oversized Doors

For fire doors and frames which exceed the size for which testing and labeling are available, furnish certificates stating that the doors and

frames are identical in design, materials, and construction to a door which has been tested and meets the requirements for the class indicated.

2.7.3 Astragal on Fire [and Smoke] Doors

On pairs of labeled fire doors, conform to NFPA 80 and UL requirements.[On smoke control doors, conform to NFPA 105.]

2.8 EXTERIOR FRAMES

****

NOTE: In lieu of grouting exterior frames which is no longer recommended by SDI/Door, the minimum thickness of exterior door frames required herein provides security without grouting the frame.

****

Provide thermal insulation in all exterior frames. Provide frames of a minimum Level 4, with frames of a minimum thickness of 1.7 mm 0.067 inch, 14 gage.

2.9 HARDWARE PREPARATION

Drill and tap doors and frames to receive finish hardware. Prepare doors and frames for hardware in accordance with the applicable requirements of SDI/DOOR A250.8 and SDI/DOOR A250.6. For additional requirements refer to ANSI/BHMA A156.115. Drill and tap for surface-applied hardware at the project site. Build additional reinforcing for surface-applied hardware into the door at the factory. Punch door frames[, with the exception of frames that will have weatherstripping [or] [lightproof] [or] [soundproof] gasketing,] to receive a minimum of two rubber or vinyl door silencers on lock side of single doors and one silencer for each leaf at heads of double doors. Set lock strikes out to provide clearance for silencers.

2.10 FINISHES

****

NOTE: Specify the type finish required for the type of steel used for fabrication of doors and frames. Specify hot-dip zinc-coated steel for exterior hollow metal doors and frames in humid locations or project locations with Environmental Severity Classifications (ESC) of C3 thru C5. Also specify hot-dip zinc-coated steel for interior hollow metal doors and frames in high humidity building spaces and interior doors at project locations with ESC classifications of C4 and C5. Hugh humidity building spaces include bathrooms, locker rooms, shower areas, laundry rooms, pools, and trainers. Humid locations are those in ASHRAE climate zones 0A, 1A, 2A, 3A, 3C, 4C and 5C (as identified in ASHRAE 90.1). See UFC 1-200-01 for determination of ESC for project locations. Galvannealed steel is suitable for interior doors and frames in most buildings in ESC locations of C1 and C2. Unless factory finish coating is required, specify finish coating will be applied by field painting in Section 09 90 00 PAINTS AND COATINGS.

****

[2.10.1 Factory-Primed Finish

Thoroughly clean all surfaces of doors and frames then chemically treat and factory prime with a rust inhibiting coating as specified in SDI/DOOR A250.8[.][, or paintable A25 galvannealed steel without primer. Where coating is removed by welding, apply touchup of factory primer.]

][2.10.2 Hot-Dip Zinc-Coated and Factory-Primed Finish

Fabricate [exterior][interior][scheduled] doors and frames from hot dipped zinc coated steel, alloyed type, that complies with ASTM A924/A924M and ASTM A653/A653M. The coating weight must meet or exceed the minimum requirements for coatings having 122 grams per square meter 0.4 ounces per square foot, total both sides, i.e., ZF120 A40. Repair damaged zinc-coated surfaces by the application of zinc dust paint. Thoroughly clean and chemically treat to insure maximum paint adhesion. Factory prime as specified in SDI/DOOR A250.8.[Provide for [exterior doors][and][interior doors][door openings No. [_____]]].

]2.10.3 Electrolytic Zinc-Coated Anchors and Accessories

Provide electrolytically deposited zinc-coated steel in accordance with ASTM A879/A879M, Commercial Quality, Coating Class A. Phosphate treat and factory prime zinc-coated surfaces as specified in SDI/DOOR A250.8.

[2.10.4 Factory-Applied Enamel Finish

****
NOTE: Use this paragraph if field coatings as specified in Section 09 90 00 PAINTS AND COATINGS are not required or provided. One coat of factory-applied enamel finish is readily available in standard colors. Two coats and special colors add to cost and to delivery time.
****

Provide coatings that meet test procedures and acceptance criteria in accordance with SDI/DOOR A250.3. After factory priming, apply [one coat][two coats] of [low-gloss][medium-gloss] enamel to exposed surfaces. Separately bake or oven dry each coat. Drying time and temperature requirements must be in accordance with the coating manufacturer's recommendations. Provide finish coat color(s) [as indicated][_____] to match approved color sample(s).

]2.11 FABRICATION AND WORKMANSHIP

Provide finished doors and frames that are strong and rigid, neat in appearance, and free from defects, waves, scratches, cuts, dents, ridges, holes, warp, and buckle. Provide molded members that are clean cut, straight, and true, with joints coped or mitered, well formed, and in true alignment. Dress exposed welded and soldered joints smooth. Design door frame sections for use with the wall construction indicated. Corner joints must be well formed and in true alignment. Conceal fastenings where practicable.[Frames for use in solid plaster partitions must be welded construction.][On wraparound frames for masonry partitions, provide a throat opening 3 mm 1/8 inch larger than the actual masonry thickness.][Design[other] frames in exposed masonry walls or partitions to allow sufficient space between the inside back of trim and masonry to

receive caulking compound.]

2.12 PROVISIONS FOR GLAZING

Materials are specified in Section 08 81 00, GLAZING.

PART 3 EXECUTION

3.1 INSTALLATION

3.1.1 Frames

Set frames in accordance with SDI/DOOR A250.11. Plumb, align, and brace securely until permanent anchors are set. Anchor bottoms of frames with expansion bolts or powder-actuated fasteners. Build in or secure wall anchors to adjoining construction.[Where frames require ceiling struts or overhead bracing, anchor frames to the struts or bracing.]

3.1.2 Doors

Hang doors in accordance with clearances specified in SDI/DOOR A250.8. After erection and glazing, clean and adjust hardware.

3.1.3 Fire [and Smoke] Doors and Frames

Install fire doors and frames, including hardware, in accordance with NFPA 80.[Install[fire rated] smoke doors and frames in accordance with [NFPA 80][and][NFPA 105].]

3.2 PROTECTION

Protect doors and frames from damage. Repair damaged doors and frames prior to completion and acceptance of the project or replace with new, as directed. Wire brush rusted frames until rust is removed. Clean thoroughly. Apply an all-over coat of rust-inhibitive paint of the same type used for shop coat.

3.3 CLEANING

Upon completion, clean exposed surfaces of doors and frames thoroughly. Remove mastic smears and other unsightly marks.

-- End of Section --