
USACE / NAVFAC / AFCEA / NASA UFGS-08 13 73 (April 2006)

Preparing Activity: USACE Replacing without change
UFGS-08165 (August 2004)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UML dated October 2007

Latest change indicated by CHG tags

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04/06

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SECTION 08 13 73

SLIDING METAL DOORS 04/06

NOTE: This guide specification covers the requirements for horizontal sliding steel doors used primarily for fire rated application.

Edit this guide specification for project specific requirements by adding, deleting, or revising text. For bracketed items, choose applicable items(s) or insert appropriate information.

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

Comments and suggestions on this guide specification are welcome and should be directed to the technical proponent of the specification. A listing of technical proponents, including their organization designation and telephone number, is on the Internet.

Recommended changes to a UFGS should be submitted as a Criteria Change Request (CCR).

PART 1 GENERAL

NOTE: This guide specification is intended to cover horizontal sliding steel doors used primarily for fire rated applications. The center parting door may be used at locations where an overhead monorail passes through the opening or where there is limited sideroom. The lack of unobstructed wall space adjacent to the opening may preclude the use of sliding doors.

The following information should be indicated on the project drawings:

- a. Size of door openings.
- b. Fire rating classification for each door.
- c. Type of door operation.
- d. Type of power operators and service characteristics.
- e. Location and type of power operator controls.
- f. Type of closing system required.

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 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.

ASTM INTERNATIONAL (ASTM)

ASTM A 653/A 653M	(2007) Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM A 924/A 924M	(2007) Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process
ASTM E 330	(2002) Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA ICS 2	(2000; Errata 2002; R 2005; Errata 2006) Standard for Industrial Control and Systems: Controllers, Contractors, and Overload Relays Rated Not More than 2000 Volts AC or 750 Volts DC: Part 8 - Disconnect Devices for Use in Industrial Control Equipment
NEMA ICS 6	(1993; R 2006) Standard for Industrial Controls and Systems Enclosures
NEMA MG 1	(2006; Errata 2007) Standard for Motors and Generators

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(2005; TIA 2005) National Electrical Code
NFPA 80	(2007) Standard for Fire Doors and Other Opening Protectives

UNDERWRITERS LABORATORIES (UL)

UL 10A	(1998; Rev thru Mar 2003) Tin-Clad Fire Doors
UL 14B	(1998; Rev thru Jul 2000) Sliding Hardware for Standard, Horizontally Mounted Tin-Clad Fire Doors

1.2 SUBMITTALS

NOTE: Review submittal description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list to reflect only the submittals required for the project. Submittals should be kept to the minimum required for adequate quality control.

A "G" following a submittal item indicates that the submittal requires Government approval. Some submittals are already marked with a "G". Only delete an existing "G" if the submittal item is not complex and can be reviewed through the Contractor's Quality Control system. Only add a "G" if the submittal is sufficiently important or complex in context of the project.

For submittals requiring Government approval on Army projects, a code of up to three characters within the submittal tags may be used following the "G" designation 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.

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" designation; submittals not having a "G" designation are for [Contractor Quality Control approval.][information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government.] The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Sliding Metal Doors

Drawings including elevations of each door type, details of anchorage, details of construction, location and installation of hardware, shape and thickness of materials, details of joints and connections, and details of tracks, rollers, power operators, controls, and fittings. A schedule showing the location of each door shall be included with the drawings. Manufacturer's catalog data shall be included.

SD-07 Certificates

Fire Doors

Certificates of inspection from an independent testing laboratory, for oversize fire doors, stating that the doors and hardware are identical in design, materials, and construction to a door that has been tested and meets the requirements for the class indicated.

1.3 DESIGN REQUIREMENTS

NOTE: For exterior doors, use wind load values selected from the tables below; the first table is metricated, the second table shows I-P units. The applicable basic wind speed and importance factor will be selected in accordance with ASCE 7, Minimum Design Loads For Buildings and Other Structures. Design wind loads may be reduced by 10 percent when the roof slope is equal to or less than 10 degrees. Delete this paragraph if exterior doors are not specified.

Design Wind Load (+/- Pa)

Basic Wind Speed (m/s)	Importance Factor				
	0.95	1.00	1.05	1.07	1.11
31	720	765	860	910	960

Design Wind Load (+/- Pa)

Basic Wind Speed (m/s)	Importance Factor				
	0.95	1.00	1.05	1.07	1.11
36	910	1005	1100	1150	1245
40	1150	1295	1435	1485	1580
45	1435	1580	1770	1820	1965
49	1725	1915	2105	2200	2395
54	2060	2300	2540	2635	2825

(Design Wind Load (+/- psf))

Basic Wind Speed (mph)	Importance Factor				
	0.95	1.00	1.05	1.07	1.11
70	15	16	18	19	20
80	19	21	23	24	26
90	24	27	30	31	33
100	30	33	37	38	41
110	36	40	44	46	50
120	43	48	53	55	59

Fire doors shall conform to NFPA 80 and the requirements specified herein. Fire doors shall bear the Underwriters Laboratories, Warnock Hersey, Factory Mutual, or other nationally recognized testing laboratory label for the required fire rating class and temperature rise classification if applicable. Each door shall be provided with a permanent label showing the manufacturer's name and address and the model number of the door. Doors in excess of the labelled size shall be deemed oversize and shall be provided with a certificate signed by an official of the company, certifying that the door and operator have been designed to meet the specified requirements. Each door shall be complete with operating devices, hardware, and accessories. Minimum design wind load shall be [_____] Pa psf.

Doors shall be constructed to sustain a superimposed load, both inward and outward, equal to 1-1/2 times the minimum design wind load and shall not deflect more than 1/120 of the door width and height. When tested in accordance with the static air pressure test procedure of ASTM E 330, the door shall support the superimposed loads for a minimum period of 10 seconds without evidence of serious damage and shall be operable after conclusion of the tests. As an option, tests shall be conducted using an equivalent uniform static load. The uniform static load test specimen shall be supported using rollers and track as required for project installation. Recovery shall be at least three-fourths of the maximum deflection within 24 hours after the test load is removed.

1.4 DELIVERY AND STORAGE

Doors shall be delivered to the jobsite wrapped in a protective covering, with the brands and names clearly marked thereon. Doors shall be stored in an adequately ventilated, dry location that is free from dust, water, or other contaminants and in a manner that permits access for inspection and handling. Doors shall be handled carefully to prevent damage to the faces, edges, and ends. Damaged items that cannot be restored to like-new condition shall be replaced.

1.5 WARRANTY

Manufacturer's standard performance guarantees or warranties that extend beyond a 1 year period shall be provided.

1.6 OPERATION AND MAINTENANCE MANUALS

Manufacturer's installation, operation, and maintenance instructions for sliding metal doors shall be provided.

PART 2 PRODUCTS

2.1 SLIDING DOORS

NOTE: Types of doors should be specified optionally where a fire rating is required unless appearance is a factor. Manufacturer's catalogs should be consulted before a selection is made. If doors are not fire rated, the hollow metal and flush tubular frame doors should be specified for interior use, and the insulated door should be specified for exterior use.

Composite doors are available in 3 or 4 hour models and may be specified with or without a temperature rise rating. Hollow metal doors are available up to a 4 hour rating; however, they are not available with a temperature rise rating. The maximum size available with a UL listing and a FM approval is 3.6 m by 3.6 m (12 foot by 12 foot) for the composite and hollow metal doors. Tin-clad doors are available as 2-ply and 3-ply types. The 2-ply door is available with 3/4 and 1-1/2 hour rating. The 3-ply door is available with a 3/4, 1-1/2, and 3 hour rating. Tin-clad doors with a 1-1/2 or 3 hour rating have a maximum temperature rise limitation.

Edit the following paragraphs to meet project requirements.

Sliding doors shall be of the following types:

2.1.1 Steel-Covered Composite

Composite fire doors shall be [[3 hour] [4 hour] [_____] rated] [as shown].

Doors shall be flush panel consisting of a manufactured core material, such as calcium silicate block or mineral fiberboard insulation, covered on both faces with a bonded steel sheet not lighter than 1.0 mm (20 gauge) 20 gauge and covered on edges with a steel perimeter channel not lighter than 1.3 mm (18 gauge) 18 gauge. Doors may be fabricated using several panels, with panel edges encased in a steel channel not lighter than 1.9 mm (14 gauge) 14 gauge. Joints in panels shall be joined or backed by an interior steel H column and covered with a steel-surface applied face plate. Fire-rated doors shall have a [maximum temperature rise rating of 121 degrees C 250 degrees F at 30 minutes] [non-temperature rise rating].

2.1.1.2 Hollow Metal

Hollow metal doors shall be [[non] [3 hour] [4 hour] [_____] rated] [as shown]. Doors shall be flush panel consisting of a resin impregnated Kraft honeycomb core covered on both faces with a bonded steel sheet not lighter than 1.0 mm (20 gauge) 20 gauge and covered on edges with a steel perimeter channel not lighter than 1.3 mm (18 gauge) 18 gauge. Doors may be fabricated using several panels, with panel edges encased in a steel channel not lighter than 1.9 mm (14 gauge) 14 gauge. Joints in face sheets shall be backed by an interior steel H column and covered with a steel surface applied face plate.

2.1.1.3 Flush Steel Tubular Frame

Flush steel tubular frame doors shall be [[non] [3 hour] [4 hour] [_____] rated] [as shown]. Doors shall be flush panel consisting of a 1.6 mm (16 gauge) 16 gauge steel tubing frame with 1.3 mm (18 gauge) 18 gauge face sheets with fiberglass core. Intermediate stiffeners shall be provided at 600 mm 24 inches on center maximum. The face sheets shall be spot welded to the frame and stiffeners. Door may be fabricated using several panels, with 3.1 mm (11 gauge) 11 gauge steel splice plates full height on both sides. Fire rated doors shall have a [maximum temperature rise rating of 121 degrees C 250 degrees F at 30 minutes] [non-temperature rise rating].

2.1.1.4 Tin-Clad

Tin-clad doors shall be [[2-ply [3/4] [1-1/2]] [3-ply [3/4] [1-1/2] [3]] hour rated] [as shown]. Doors shall conform to UL 10A. Hardware shall conform to UL 14B. Doors shall have a core made up of layers of 19 mm 3/4 inch thick wooden boards nailed to each other and encased in terne or zinc plates that are jointed together at their edges with nails through the joints into the core. Doors with 1-1/2 hour and 3 hour rating shall have a maximum temperature rise rating of 121 degrees C 250 degrees F at 30 minutes.

2.1.1.5 Insulated

NOTE: Doors with a thermal conductance (U-value) of 0.85 W/square meter times K (0.15 btu/hr times sq f times f) are readily available. Doors with a lower thermal conductance (U-value) should be specified where indicated by the energy budget analysis. Manufacturer's literature should be reviewed to verify the availability of doors with lower thermal conductance (U-values).

[Non-labeled insulated doors shall be flush panel consisting of a urethane, polystyrene, or fiberglass insulation core covered on both faces with a bonded steel sheet not lighter than 1.3 mm (18 gauge) 18 gauge and covered on the edges with a steel perimeter channel not lighter than 1.3 mm (18 gauge) 18 gauge.] [Labeled insulated [3/4] [1-1/2] [3] [4] hour rated doors shall be flush panel consisting of fiberglass insulation core covered on both faces with a bonded steel sheet not lighter than 1.3 mm (18 gauge) 18 gauge and covered on the edges with a steel perimeter channel not lighter than 1.3 mm (18 gauge) 18 gauge. Fire rated doors shall have a [maximum temperature rise rating of 121 degrees C 250 degrees F at 30 minutes] [non-temperature rise rating] [rating as shown]]. Door construction shall

provide a thermal conductance (U-value) of [0.85 W/square meter times K 0.15 btu/hr times sq f times f] [_____]. Doors may be fabricated using several panels. Panel edges shall be encased in a steel channel not lighter than 1.9 mm (14 gauge) 14 gauge. Joints in face sheets shall be backed by an interior steel H column and covered with a steel surface-applied face plate. The Contractor shall comply with EPA requirements in accordance with Section 01 62 35 RECYCLED / RECOVERED MATERIALS.

2.2 OPERATION

NOTE: Edit this paragraph to agree with type of operation indicated on the drawings. Tin-clad doors are available with inclined tops.

Doors shall be [single-slide] [center-parting] on [level] [inclined] tracks and shall be designed to normally remain in the [open position and close automatically in case of fire] [or] [closed position but permit normal operation for passage]. Doors shall be [manual] [power] operated. Automatic closing system shall be a [labeled automatic reel type closer] [or] [weight type closer with a weight box fabricated of steel not lighter than 1.6 mm (16 gauge) 16 gauge]. Fusible links shall be provided as required by NFPA 80 and shall activate at 71 degrees C 160 degrees F.

2.2.1 Power Operators

NOTE: Power operators should be specified for sliding doors which are subject to heavy usage and are required to remain closed. Power operated sliding doors should also be used between heated production areas and unheated storage areas where there is a frequent traffic flow between the two areas. This paragraph applies to both pneumatic and electric operated doors.

The operator shall be of the [pneumatic] [electric] type conforming to NFPA 80 and the requirements specified herein. Both the door and the power actuating device shall be provided with a UL or FM listed releasing mechanism that will permit the required self-closing feature to function and close the door automatically in case of fire irrespective of power failure or manual operation. Readily adjustable limit switches shall be provided to automatically stop the door in its full open or closed position. All operating devices shall be suitable for the Class, Division, and Group shown and as defined in NFPA 70.

2.2.2 Pneumatic Operators

NOTE: Edit this paragraph to suit the type of controls required. Insert the air pressure that will be available for the door operation.

The operator shall be heavy-duty industrial type designed to operate the door at [0.3] [0.6] [0.9] [1.2] m [1] [2] [3] [4] ft per second with air

pressure of [_____] kPapsi. The operator shall open, close, start, and stop the door smoothly. Control shall be [[electrical, conforming to NEMA ICS 2 and NEMA ICS 6. Enclosures shall be Type 12 (industrial use), Type 7 or 9 in hazardous locations,] [pneumatic,] with [push button wall switches.] [ceiling pull switches.] [roll-over floor treadle.]] [as indicated.]

2.2.3 Electric Operators

NOTE: Edit this paragraph to suit the type of controls required. Insert the electrical characteristics that will be available for the door operation.

The operator shall be heavy-duty industrial type designed to operate the door at not less than [0.3] [0.6] [0.9] [1.2] m [1] [2] [3] [4] ft per second. Electrical controls shall be [push button wall switches] [ceiling-pull switches] [roll-over floor treadle] as indicated. Electric power operators shall be complete with electric motor, brackets, controls, limit switches, magnetic reversing starter, and all other accessories necessary. The operator shall be designed so that the motor may be removed without disturbing the limit-switch timing and without affecting the emergency closing system. The power operator shall be provided with a slipping clutch coupling or torque limiter, as required to prevent stalling of the motor. Operators shall have provisions for immediate emergency manual operation of the door in case of electrical failure. Where control voltages differ from motor voltage, a control voltage transformer shall be provided in and as part of the starter. Control voltage shall be 120 volts or less. Control shall be electrical, conforming to NEMA ICS 2 and NEMA ICS 6. Enclosures shall be Type 12 (industrial use), Type 7 or 9 in hazardous locations, [with [push button wall switches.] [ceiling pull switches.] [roll-over floor treadle.]] [as indicated.]

2.2.3.1 Motors

Drive motors shall conform to NEMA MG 1, shall be high-starting torque, reversible type, and shall be of sufficient power and torque output to move the door in either direction from any position at the required speed without exceeding the rated capacity. Motors shall be suitable for operation on [_____] volts, [60] [_____] hertz, [single] [three] phase, and shall be suitable for across-the-line starting. Motors shall be designed to operate at full capacity over a supply voltage variation of plus or minus 10 percent of the motor voltage rating.

2.2.3.2 Controls

Each door motor shall have thermal overload protection, limit switches, and remote-control switches. The control equipment shall conform to NEMA ICS 2. Enclosures shall be NEMA ICS 6 Type 12 (industrial use), Type 7 or 9 in hazardous locations, or as otherwise indicated. Each wall control station shall be of the three-button type, with the controls marked "OPEN," "CLOSE," and "STOP." When the door is in motion and the "STOP" control is pressed, the door shall stop instantly and remain in the stop position; from the stop position, the door shall be operable in either direction by the "OPEN" or "CLOSE" controls. Controls shall be of the full-guarded type to prevent accidental operation.

2.2.4 Electrical Work

Conduit and wiring necessary for proper operation shall be provided in accordance with Section 26 20 00 INTERIOR DISTRIBUTION SYSTEM. Flexible connections between doors and fixed supports shall be made with extra flexible type SO cable, except in hazardous locations where wiring shall conform to NFPA 70. The cable shall have spring-loaded automatic take-up reel coil cord or an equivalent and approved device.

2.3 SAFETY DEVICE

The leading edge of doors shall have a safety device that will immediately reverse the door movement upon contact with an obstruction and cause the door to return to its full open position. The safety device shall not substitute for a limit switch. Exterior doors shall be provided with a combination weather seal and safety device.

2.4 HARDWARE

Hardware shall conform to NFPA 80, UL 14B and the requirements specified herein. Tracks, roller assemblies, and installation hardware shall be designed to support a dead load equal to 1-1/2 times the weight of the door and attached hardware without deformation that would interfere with the operation of the door. Tracks shall be formed of galvanized G90 steel not lighter than 1.9 mm (14 gauge) 14 gauge. Ball or roller bearing wheels or rollers with case hardened races shall be provided on all devices incorporating wheels or rollers. Hardware shall be attached using zinc plated through bolts, nut plates, or similar devices to ensure adequate fastener strength. Recessed steel pulls shall be provided on both sides of all door leaves. Closing system for [sliding doors] [and] [sliding fire doors] shall be [counterweight closing with weight boxes] [cable reel closer] [controlled speed cable reels].

2.5 ACCESSORIES

2.5.1 Track Hood

Track hood for exterior doors mounted on the exterior face of the wall shall be zinc-coated steel not lighter than 1.3 mm (18 gauge) 18 gauge.

2.5.2 Glass Lights

Glass lights shall be of the size indicated, except that in no case shall the size be larger than that permitted by the required fire rating. Glass shall be in accordance with Section 08 81 00 GLAZING.

2.5.3 Weatherstripping

Weatherstripping shall be provided on head, jamb, and sills of exterior doors. Weatherstripping shall be 1.6 mm 1/16 inch thick fabric-reinforced neoprene or shall be nylon-brush type, shall have continuous metal retainers and shall be UL listed.

2.5.4 Locking Device

NOTE: Locking devices will not be provided on doors
of required exitways unless approval is obtained
from the Fire Protection Engineer. Delete this

paragraph if locking devices are not required.

[Heavy-duty hasp and staple] [Electric solenoid lock] shall be provided on doors [____], located on [____] side.

2.5.5 Pass Door

A pass door of nominal size [____] [as shown] shall be furnished complete with an integral frame. The pass door shall be factory installed and fitted. The pass door shall be complete with three full mortise spring hinges and a mortise latchset with flush cup and lever handle with US32D finish.

2.6 FINISH

2.6.1 Steel Surfaces of Exterior Doors

Steel surfaces of exterior doors shall be provided with a galvanized coating. Exposed surfaces shall be provided with a shop-primed finish in addition to the galvanized coating. Galvanizing shall conform to ASTM A 653/A 653M or ASTM A 924/A 924M, coating designation G90, for steel sheets. Prior to receiving primer, all surfaces shall be cleaned and phosphate-treated for maximum paint adherence. Primer shall be metallic oxide or synthetic resin primer of the manufacturer's standard type and shall be applied by dipping or spraying.

2.6.2 Exposed Steel Surfaces of Interior Doors

Exposed steel surfaces of interior doors shall be provided with a [shop-primed finish] [and] [galvanized coating. Galvanizing shall conform to ASTM A 653/A 653M or ASTM A 924/A 924M, coating designation G90, for steel sheets]. Primer shall be a metallic oxide or synthetic resin primer of the manufacturer's standard type and shall be applied by dipping or spraying. Prior to receiving primer, all surfaces shall be cleaned and phosphate treated for maximum paint adherence.

PART 3 EXECUTION

3.1 INSTALLATION

Doors shall be installed in accordance with NFPA 80, approved detail drawings and manufacturer's instructions. Anchors and inserts for guides, brackets, [motors,] [switches,] hardware, and accessories shall be accurately located. Upon completion, doors shall be free from warp, twist, or distortion. Exterior doors shall be weather tight. Doors shall be lubricated, properly adjusted, and demonstrated to operate freely.

3.2 FIELD FINISHING

Doors to receive field finish shall be finished in accordance with Section 09 90 00 PAINTING, GENERAL. Color shall be [in accordance with Section 09 06 90 COLOR SCHEDULE] [____].

-- End of Section --