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UNIFIED FACILITIES GUIDE SPECIFICATION

References are in agreement with UMRL dated October 2014

SECTION 08 34 19.10 20

ROLLING SERVICE [AND FIRE] DOORS 02/12

NOTE: This guide specification covers the requirements for rolling service doors, rolling fire doors and minimum glazing requirements for antiterrorism force protection (ATFP) in accordance to UFC 4-010-01, "DoD Minimum Antiterrorism Standards for Buildings".

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 items(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. Locations and sizes of door openings
2. Side of wall where door is to be located
3. Details of door openings and frames
4. Method, type, and spacing of frame anchors
5. Electrical wiring, conduit, and devices for motor-operated doors; power characteristics; and location of controls

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 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 A123/A123M	(2013) Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A653/A653M	(2013) Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM A780/A780M	(2009) Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
ASTM E84	(2014) Standard Test Method for Surface Burning Characteristics of Building Materials

DOOR AND ACCESS SYSTEM MANUFACTURERS ASSOCIATION (DASMA)

ANSI/DASMA 108	(2005) Standard Method for Testing Sectional Garage Doors and Rolling Doors: Determination of Structural Performance Under Uniform Static Air Pressure Difference
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NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA ICS 1	(2000; R 2008; E 2010) Standard for
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Industrial Control and Systems: General Requirements

NEMA ICS 2	(2000; R 2005; Errata 2008) Standard for Controllers, Contactors, and Overload Relays Rated 600 V
NEMA ICS 6	(1993; R 2011) Enclosures
NEMA MG 1	(2011; Errata 2012) Motors and Generators
NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)	
NFPA 70	(2014; AMD 1 2013; Errata 1 2013; AMD 2 2013; Errata 2 2013; AMD 3 2014; Errata 3 2014) National Electrical Code
NFPA 80	(2013) Standard for Fire Doors and Other Opening Protectives

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.

The Guide Specification technical editors have designated 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 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.

An "S" following a submittal item indicates that the submittal is required for the Sustainability Notebook to fulfill federally mandated sustainable requirements in accordance with Section 01 33 29 SUSTAINABILITY REQUIREMENTS.

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.] [for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government.] Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REQUIREMENTS. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Rolling service doors[; G][; G, [____]]

[Rolling fire doors[; G][; G, [____]]]

Submit drawings for doors showing types, sizes, locations, metal gages, hardware provisions, installation details, and other details of construction. [For motor-operated doors include supporting brackets for motors, location, type, and ratings of motors, and safety devices.]

SD-03 Product Data

Rolling service doors[; G][; G, [____]]

[Rolling fire doors[; G][; G, [____]]]

[Motors[; G][; G, [____]]]

[Controls[; G][; G, [____]]]

[For electrically operated system, submit wiring diagrams for motor and controls.]

SD-08 Manufacturer's Instructions

Rolling service doors

[Rolling fire doors]

Submit manufacturer's currently recommended installation procedures for doors with the shop drawings.

SD-10 Operation and Maintenance Data

Rolling service doors, Data Package 2.

[Rolling fire doors, Data Package 2.]

Submit in accordance with Section 01 78 23 OPERATION AND MAINTENANCE DATA. Include wiring diagrams.

1.3 DELIVERY AND STORAGE

Protect doors and accessories from damage during delivery, storage, and handling. Clearly mark manufacturer's brand name. Store doors in dry locations with adequate ventilation, free from dust and water, and in such

a manner as to permit access for inspection and handling. Handle doors carefully to prevent damage. Remove damaged items that cannot be restored to like-new condition and provide new items.

PART 2 PRODUCTS

2.1 ROLLING SERVICE DOORS

 NOTE: Insert design wind load for the building if
 greater than 0.96 kilopascals 20 PSF.

Shall be spring counterbalanced, rolling type, and shall be designed for use on [exterior] [or] [interior] openings, as indicated. Doors shall be operated [by means of lifting handles] [by hand chain with gear or sprocket reduction] [by hand crank with gear or sprocket reduction] [by electric-power with auxiliary hand chain operation]. Doors shall be complete with guides, hardware, fastenings, operating mechanisms, and accessories. Doors shall be surface-mounted type with guides at jambs set back a sufficient distance to provide a clear opening when door is in open position. Doors, hardware, and anchors shall be designed to withstand a wind pressure of [0.96] [_____] kilopascals [20] [_____] pounds per square foot of door area in accordance with ANSI/DASMA 108. Sound engineering principles may be used to interpolate or extrapolate test results to door sizes not specifically tested. [Exterior doors shall be mounted [as indicated] [on interior side of walls].] [Where service doors are indicated to be chain- or crank-operated, the door design and construction shall allow for future installation of electric-power operation.]

2.1.1 Operational Cycle Life

 NOTE: The particular needs of the project are those that will be used to determine frequency of usage. The normal operating frequency for rolling service doors is 10 cycles per day. Typical rolling doors are designed for 15,000-20,000 spring cycles. If doors are expected to operate at a significantly higher frequency, the number of cycles per day or hour should be specified. One complete cycle of door operation is defined as when the door is in the closed position, moves to the fully open position and returns to the closed position.

All portions of the door, hardware and operating mechanism that is subject to movement, wear or stress fatigue must be designed to operate through a minimum number of [10] [_____] cycles per [day] [hour].

2.2 FABRICATION

2.2.1 Curtains

 NOTE: For security applications, steel slats as heavy as 1.2 mm thick 118 gage may be specified. For severe climates, 38 mm 1 1/2 inch thick insulated slats with a "U" factor of 0.11 are

available from some manufacturers.

NOTE: When antiterrorism/force protection minimum measures are required, specify minimum frame bites and non-thermal, laminated glass vision panels for exterior rolling service doors and include reference to Section 08 81 00 GLAZING.

Shall be formed of interlocking [galvanized steel] [stainless steel] [aluminum] slats of shapes standard with the manufacturer, except that slats for exterior doors shall be flat type. Curtain shall roll up on a barrel supported at head of opening on brackets and be balanced by a torsion spring system in the barrel. Slats shall be of the gage required for the width indicated and the wind pressure specified above. [Exterior door glazing shall have a minimum frame bite of 9.5 mm 3/8 inch for structurally glazed window systems and 25 mm 1 inch for vision panels that are not structurally glazed. Provide non-thermal, laminated glass vision panels in doors indicated for glazing. Glazing is specified in Section 08 81 00 GLAZING.] [Slats for exterior doors shall be insulated with not less than 17 mm 11/16 inch thick polyurethane or polyisocyanurate foam insulation. Insulation shall have a maximum flame-spread and smoke-development indexes of 75 and 450, respectively, according to ASTM E84. Interior side of insulation shall be covered with interlocking [galvanized steel] [Stainless Steel] [Aluminum] slats not lighter than the standard thickness with the manufacturer.]

2.2.2 Endlocks [and Windlocks]

The ends of each slat or each alternate slat shall have malleable iron or galvanized steel endlocks of manufacturer's stock design. [In addition to endlocks, exterior doors which are more than 4877 mm 16 feet wide or which have a design wind load of more than 0.96 kilopascals 20 pounds per square foot, shall have windlocks of manufacturer's standard design. Windlocks shall prevent curtain from leaving guide because of deflection from wind pressure or other forces.]

2.2.3 Bottom Bar

The curtain shall have a [steel] [stainless steel] [aluminum] bottom bar consisting of two angles of equal weight, one on each side, or an equivalent extruded aluminum section, fastened to bottom of curtain. Do not use aluminum on doors more than 1877 mm 16 feet wide. In addition, exterior doors shall have a compressible and replaceable rubber, neoprene, or vinyl weather seal attached to bottom bar. [Attach a combination compressible seal and reversing safety device for stopping and reversing the travel of the door to the bottom bar of doors that are electric-power operated.]

2.2.4 Guides

Steel structural shapes or formed steel shapes fastened to wall with steel shapes not less than 5 mm 3/16 inch thick. Guides shall be of sufficient depth or shall incorporate a steel locking bar to retain the curtain in place under the wind pressure specified. Provide continuous vinyl or neoprene weather seals on guides at exterior doors. Securely attach guides to adjoining construction with not less than 10 mm 3/8 inch diameter bolts,

spaced near each end and not over 762 mm 30 inches apart.

2.2.5 Barrel

Steel pipe or commercial welded steel tubing of proper diameter and thickness for the size of curtain. Deflection shall not exceed .76 mm per 305 mm 0.03 inch per foot of span. Close ends of barrel with cast-iron plugs, machined to fit the pipe and either pinned or attached with screws or welded in the spring barrel, except that drive end plug may be steel welded in place. Install within the barrel an oil-tempered, stress relieved, helical, counterbalancing steel spring, capable of producing sufficient torque to assure easy operation of the door curtain from any position. At least 80 percent of the door weight shall be counterbalanced at any position. Spring-tension shall be adjustable without removing the hood.

2.2.6 Brackets

Fabricate of steel plate to support the barrel, curtain, and operator and to form a supporting ring and end closure for the hood. Provide prelubricated, self-aligning ball bearings, shielded or sealed.

2.2.7 Hoods

NOTE: Aluminum is not available for fire doors.

Steel, not lighter than 0.531 mm thick 0.0209 inch thick 24 gage [stainless steel, not lighter than 0.531 mm 0.0209 inch thick 24 gauge] [Aluminum, not lighter than 1.113 mm 0.0438 inch thick 18 gauge] formed to fit contour of end brackets and reinforced with rolled beads at top and bottom edges. [Hoods for openings more than 3658 mm 12 feet in width shall have intermediate supporting brackets.] [Provide a weather baffle at the lintel or inside the hood of each exterior door.]

2.2.8 Locking Device

For each manually operated exterior rolling door provide manufacturer's standard chain- or bar-type locking device on the inside. The locking device shall be of type to receive a padlock with a 8 mm 5/16 inch diameter shackle.

2.3 MANUAL OPERATION

2.3.1 Manual Push-Up Operation

Provide lifting handles on both sides of door and counterbalance in a manner to provide easy operation while raising or lowering the curtain by hand. The force required to operate the door shall not exceed 14 kgs 30 pounds. Provide pull-down straps or pole hooks on bottom rail of doors over 2134 mm 7 feet high.

2.3.2 Manual Hand-Chain Operation

Provide galvanized, endless chain operating over a sprocket and extending to within 914 mm 3 feet of floor. Obtain reduction by use of roller chain and sprocket drive or suitable gearing. Gears shall be high-grade gray iron, cast from machine-cut patterns. The pull required to operate the

door shall not exceed 16 kgs 35 pounds.

2.3.3 Manual Crank Operation

Provide a fully enclosed, permanently lubricated, geared power unit mounted 864 mm 34 inches above the floor; a removable crank; and a vertical shaft connecting the unit to the counterbalance drive system. The force required to operate the door shall not exceed 11 kgs 25 pounds. Gears shall be of high-grade gray iron, cast from machine-cut patterns.

2.4 ELECTRIC OPERATION

2.4.1 Operator Features

Provide operators complete with components and other accessories necessary for proper operation. The operator shall be so designed that the motor may be removed without disturbing the limit-switch timing and without affecting the emergency auxiliary operators. Make provision for immediate emergency manual operation of door in case of electrical failure. The emergency manual operating mechanism shall be so arranged that it may be put into and out of operation from the floor, and its use shall not affect the timing of the limit switches. Provide an electrical or mechanical device which will disconnect the motor from the operating mechanism when the emergency manual operating mechanism is engaged.

2.4.2 Motors

Shall conform to NEMA MG 1, high-starting torque, reversible type of sufficient horsepower and torque output to move the door in either direction from any position, and produce a door travel speed of not less than 0.2 meters per second two-thirds foot per second or more than 0.3 meters per second one foot per second, without exceeding the rated capacity. Motors shall be suitable for operation on current of the characteristics indicated. [Single-phase motors shall not have commutation or more than one starting contact.] [Motor enclosures shall be the drip-proof type or NEMA TEFC and TENV type.] Install motors in approved locations.

2.4.3 Controls

Remote control switches shall be at least 1500 mm 5 feet above the floor line, and all switches shall be located so that the operator will have complete visibility of the door at all times. The control equipment shall conform to NEMA ICS 1 and NEMA ICS 2. Control enclosures shall be NEMA ICS 6, Type 12 or Type 4, for interior locations and Type 4 for exterior locations, except that contactor enclosures may be Type 1. Locate control switches inside the building unless otherwise indicated. Each switch control station shall be of the three-button type, with the buttons marked "OPEN," "CLOSE," and "STOP." The "OPEN" and "STOP" buttons shall be of the type requiring only momentary pressure to operate. The "CLOSE" button shall be of the type either requiring constant pressure to maintain the closing motion of the door or momentary pressure when installed with a monitored entrapment detection device which, upon failure of the device or any component of the control system, cause the door to return to its full open position. When the door is in motion, and the "STOP" button is pressed, the door shall stop and remain in the stop position; from the stop position, the door may then be operated in either direction by the "OPEN" or "CLOSE" buttons. When the door is in motion, and the "CLOSE" button of the constant pressure type is released, the door shall stop and

remain in the stop position or reverse to the user set up position; from the stop position, the door may then be operated in either direction by the "OPEN" or "CLOSE" buttons. Pushbuttons shall be full-guarded to prevent accidental operation. Controls shall be adjustable to automatically stop the doors at their fully open and closed positions. Open and closed positions shall be readily adjustable.

2.4.4 Safety Device

Power-operated doors shall have a safety device that will immediately stop and reverse the door in its closing travel upon detecting an obstruction in the door opening or upon failure of the device or any component of the control system and cause the door to return to its user-defined open position. Any momentary door-closing circuit shall be automatically locked out and the door shall be operable manually or with constant pressure controls until the failure or damage has been corrected. Do not use safety device as a limit switch.

2.4.5 Control Power Supply

Shall be provided in power circuits as necessary to reduce the voltage on the control circuits to 120 volts or less (preferably 24 volts). The power supply, whether it incorporates a transformer or a switched mode power supply (SMPS), shall conform to the appropriate UL Standard.

2.4.6 Electrical Work

NOTE: See that labor and materials for connecting motors and controls are specified in the electrical section, "Rolling Doors: Mount controls, including type SO cable and takeup reels furnished by the door manufacturer, and provide necessary conduit, conductors, and devices in accordance with the door manufacturer's wiring diagrams."

Electrical components and installation shall conform to **NFPA 70**. The door manufacturer shall furnish manual or automatic control and safety devices, including extra flexible type SO cable and spring-loaded automatic takeup reel or equivalent device, as required for proper operation of the doors. Conduit, wiring, and mounting of controls are specified in Section **26 20 00 INTERIOR DISTRIBUTION SYSTEM**.

2.4.7 [Hazardous Locations]

NOTE: Delete this paragraph if not applicable.
Doors to which it is applicable should be identified in the specifications.

Electrical materials, equipment, and devices for installation in hazardous locations, as defined by **NFPA 70**, shall be specifically approved by Underwriters Laboratories or an independent testing agency using equivalent standards, for the particular chemical group and the class and division of hazardous location involved.

]2.5 FINISHES

Slats and hoods shall be hot-dip galvanized and shop primed. Prime finish other parts of coiling doors, except faying surfaces.

2.5.1 Primed Finish

Clean surfaces thoroughly, treat to assure maximum paint adherence, and provide a factory dip or spray coat of rust-inhibitive metallic oxide or synthetic resin primer on exposed surfaces.

2.5.2 Galvanized and Shop-Primed Finish

Surfaces specified shall have a zinc coating, a phosphate treatment, and a shop prime coat of rust-inhibitive paint. The galvanized coating shall conform to **ASTM A653/A653M**, coating designation **Z275 G90**, for steel sheets, except that hoods located on interior of the building may be **Z180 G60**, and **ASTM A123/A123M** for iron and steel products. The weight of coatings for products shall be as designated in Table I of **ASTM A123/A123M** for the thickness of base metal to be coated. The prime coat shall be a type especially developed for materials treated by phosphates and adapted to application by dipping or spraying. Repair damaged zinc-coated surfaces by the materials and methods conforming to **ASTM A780/A780M** and spot prime. At the option of the Contractor, a two-part system including bonderizing, baked-on epoxy primer, and baked-on enamel top coat may be applied to slats and hoods before forming, in lieu of prime coat specified.

2.6 ROLLING FIRE DOORS

NOTE: The appropriate design and fire rating classification shall be selected. Depending on the size of the fire door, labeling and oversize certificates and/or labels will vary with the individual manufactures. Generic installation of a rolling fire door, as shown in NFPA 80 is applicable to masonry type fire walls and the manufacturer's listed procedures, or the authority having jurisdiction. Other wall construction listings such as non-masonry (drywall) will be accomplished per the individual manufacturer's listed procedures or as approved by the authority having jurisdiction.

Shall conform to the requirements specified herein and to **NFPA 80** for the class indicated. Doors shall bear labels of Underwriters Laboratories, or another independent testing agency which has follow-up service and which uses equivalent standards, indicating the applicable fire rating. The construction details necessary for labeled doors shall take precedence over details indicated or specified for service doors. Fire doors shall be equipped with automatic closing mechanism. Doors shall be forced into a closed position at a rate of descent of not more than **0.61 meters 2 feet** per second and not less than **0.15 meters 6 inches** per second without impact. The curtain shall be held against the sill until the release mechanism has been reset. The automatic closing mechanism shall not interfere with normal operation of the door. Fire doors shall be complete with hardware, accessories, and automatic closing device as required by **NFPA 80**.

PART 3 EXECUTION

3.1 INSTALLATION

NOTE: Structural steel door frames should be
specified in [Section 05 50 13 MISCELLANEOUS METAL
FABRICATIONS][Section 05 51 33 METAL LADDERS][
Section 05 52 00 METAL RAILINGS][Section 05 51 00
METAL STAIRS].

Install doors in accordance with approved detail drawings and
manufacturer's directions. Locate anchors and inserts for guides,
brackets, [motors,] [switches,] hardware, and other accessories accurately.
Upon completion, doors shall be weathertight and shall be free from warp,
twist, or distortion.

3.2 FINAL ADJUSTMENT

Doors shall be lubricated and properly adjusted to operate freely.

-- End of Section --