UNIFIED FACILITIES GUIDE SPECIFICATIONS

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

SECTION TABLE OF CONTENTS

DIVISION 08 - OPENINGS

SECTION 08 36 19

VERTICAL LIFT DOORS

08/20

PART 1 GENERAL

1.1 REFERENCES
1.2 SUBMITTALS
1.2.1 Shop Drawing Information
1.2.2 Operation and Maintenance Data
1.3 DELIVERY, STORAGE, AND HANDLING

PART 2 PRODUCTS

2.1 MATERIALS
2.1.1 Steel Sheet
2.1.2 Steel Shapes
2.1.3 Aluminum Extrusions
2.1.4 Aluminum Sheets and Strips
2.1.5 Glass
2.2 DOORS
2.3 MANUAL OPERATORS
2.4 ELECTRIC OPERATORS
2.4.1 Motors
2.4.2 Controls
2.4.3 Entrapment Protection Devices
2.4.4 Control Transformers
2.4.5 Electrical Components
2.4.6 Hazardous Locations
2.5 WEATHER SEALS [AND SENSING EDGES]
2.6 FINISHES
2.6.1 Galvanized and Shop Primed
2.6.2 Aluminum

PART 3 EXECUTION

3.1 FABRICATION
3.1.1 Door Sections
3.1.1.1 Insulated Sections
3.1.1.2 Aluminum Sections

3.1.2 Guides and Jamb Plates
3.1.3 Hardware
3.1.4 Glazing
3.2 INSTALLATION
3.3 ELECTRICAL WORK
3.4 TESTING

-- End of Section Table of Contents --

****

USACE / NAVFAC / AFCEC / NASA	**UFGS-08 36 19 (August 2020)**

Preparing Activity: NAVFAC	**Superseding**
	UFGS-08 36 19 (November 2011)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated January 2021

****

SECTION 08 36 19

VERTICAL LIFT DOORS
08/20

****

NOTE: This guide specification covers the requirements for vertical lift metal doors of the stacking type.

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. Location and size of door openings.

2. Type and details of door frames.

3. Design wind loads required for the building.

4. Wire and conduit from power source to operators and controls for electrically-operated doors.

5. Electrical power characteristics and location of motors and control station.

6. Counterweight tower location relative to door.

****

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 INSTITUTE OF STEEL CONSTRUCTION (AISC)

AISC 360	(2016) Specification for Structural Steel Buildings

ASTM INTERNATIONAL (ASTM)

ASTM A36/A36M	(2019) Standard Specification for Carbon Structural Steel
ASTM A123/A123M	(2017) Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A653/A653M	(2020) Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM B209	(2014) Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
ASTM B209M	(2014) Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric)
ASTM B221	(2014) Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
ASTM B221M	(2013) Standard Specification for Aluminum

	and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric)
ASTM C136/C136M	(2019) Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM E330/E330M	(2014) Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference

DOOR AND ACCESS SYSTEM MANUFACTURERS ASSOCIATION (DASMA)

ANSI/DASMA 102	(2011) Specifications for Sectional Overhead-Type Doors

NATIONAL ASSOCIATION OF ARCHITECTURAL METAL MANUFACTURERS (NAAMM)

NAAMM AMP 500	(2006) Metal Finishes Manual

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA ICS 1	(2000; R 2015) Standard for Industrial Control and Systems: General Requirements
NEMA ICS 2	(2000; R 2005; Errata 2008) Industrial Control and Systems Controllers, Contactors, and Overload Relays Rated 600 V
NEMA ICS 6	(1993; R 2016) Industrial Control and Systems: Enclosures
NEMA MG 1	(2018) Motors and Generators

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(2020; ERTA 20-1 2020; ERTA 20-2 2020; TIA 20-1; TIA 20-2; TIA 20-3; TIA 20-4) National Electrical Code

UNDERWRITERS LABORATORIES (UL)

UL 325	(2017; Reprint Feb 2020) UL Standard for Safety Door, Drapery, Gate, Louver, and Window Operators and Systems

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[, [_____]]

SD-03 Product Data

Doors; G[, [_____]]

[Motors; G[, [_____]]]

[Controls; G[, [_____]]]

SD-08 Manufacturer's Instructions

Doors

SD-10 Operation and Maintenance Data

Doors, Data Package 2; G[, [_____]]

1.2.1 Shop Drawing Information

Show types, sizes, locations, metal gages, hardware provisions, installation details, and other details of construction.[For electrically operated doors, include supporting brackets for motors, location, type, and ratings of motors, and safety devices. Include wiring

diagrams for motors and controls.]

[1.2.2 Operation and Maintenance Data

For electrically operated doors, include wiring diagrams for motors and controls.

]1.3 DELIVERY, STORAGE, AND HANDLING

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. Storage must permit easy access for inspection and handling. Remove damaged items that cannot be restored to like-new condition and provide new items.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Steel Sheet

ASTM A653/A653M.

2.1.2 Steel Shapes

ASTM A36/A36M.

2.1.3 Aluminum Extrusions

ASTM B221M ASTM B221, Alloy 6063-T5.

2.1.4 Aluminum Sheets and Strips

ASTM B209M ASTM B209, alloy and temper best suited for the purpose.

2.1.5 Glass

Fully tempered, clear float glass, [3] [_____] mm [1/8] [_____] inch thick.

2.2 DOORS

****
NOTE: Determine design wind loads in accordance with ASCE 7-16. The normal design wind load for vertical lift metal doors is one kPa 20 psf positive and negative. If conditions require greater design loads, use appropriate loads.
****

Doors must consist of multiple sections set one behind the other. Arrange door operation and travel so that sections arrive simultaneously at the full open position. Sections must stack vertically in a compact group above the head of the opening. Provide doors with counterweights. Design doors, components, and methods of installation in accordance with AISC 360 and ANSI/DASMA 102. Design wind loads must be [[one kPa] [___ kPa]] [[20 psf] [___ psf]] positive load and [[one kPa][___kPa]] [[20 psf][___psf]] negative load. Door wind load performance must be determined in accordance with ASTM E330/E330M. Maximum wind load deflection of the door must not exceed the door height in mm inches divided by 120 and the door

width in mm inches divided by 120. Doors must be operable during design wind load.

2.3 MANUAL OPERATORS

Provide a galvanized, endless chain operating over a sprocket. Extend chain to within 900 mm 3 feet of the floor and mount on inside of building. Obtain reduction by use of roller chain and sprocket drive or gearing. Provide chain cleat and pin for securing operator chain. Hoist must allow for future installation of electric operators. The force required to operate the door must not exceed 15.75 kilograms 35 pounds.

2.4 ELECTRIC OPERATORS

****

NOTE: Specify three-phase motors wherever three-phase electrical service is or will be available. Locate control stations so operator will have complete visibility of the door at all times, within building at least 1500 mm 5 feet above floor line; one station should be placed about 600 mm 2 feet from jamb, guide, or track.

****

Provide operators of the type recommended by the door manufacturer. Operators must be labeled and listed to the requirements of UL 325. Operators must include electric motor, machine-cut reduction gears, steel chain and sprockets, magnetic brake, brackets, pushbutton controls, limit switches, magnetic reversing contactor, a manual operator as specified above for emergency use, and other accessories necessary for operation. The electric operator must be designed so that the motor may be removed without disturbing the limit switch timing and without affecting the manual operator. The manual operator must be clutch controlled so that it may be engaged and disengaged from the floor; operation must not affect limit switch timing. Provide an electrical or mechanical device that disconnects the motor from the operating mechanism when the manual operator is engaged.

2.4.1 Motors

NEMA MG 1, high-starting torque, reversible type with sufficient horsepower and torque output to move the door in either direction from any position. Motor must produce a door travel speed of not less than 200 mm two-thirds foot or more than 300 mm one foot per second without exceeding the rated capacity. Motors must operate on current of the characteristics indicated at not more than 377 rad/s 3600 rpm. [Single-phase motors must not have commutation or more than one starting contact.][Provide drip-proof type motor enclosures or NEMA totally enclosed non-ventilated (TENV) type.]Install motors in approved locations.

2.4.2 Controls

Each door motor must have an enclosed, across-the-line type, magnetic reversing contactor, thermal overload and undervoltage protection, solenoid-operated brake, limit switches, and control switches. Locate control switches at least 1500 mm 5 feet above the floor so the operator will have complete visibility of the door at all times. Control equipment must conform to NEMA ICS 1 and NEMA ICS 2. Control enclosures must be NEMA ICS 6, Type 12 or Type 4, except that contactor enclosures may be

Type 1. Each control switch station must be of the three-button type; buttons must be marked "OPEN," "CLOSE," and "STOP." The "OPEN" and "STOP" buttons must require only momentary pressure to operate. The "CLOSE" button must require constant pressure to maintain the closing motion of the door. If the door is in motion and the "STOP" button is pressed or the "CLOSE" button released, the door must stop instantly and remain in the stop position; from the stop position, the door may be operated in either direction by the "OPEN" or "CLOSE" buttons. Pushbuttons must be full-guarded to prevent accidental operation. Provide limit switches to automatically stop doors at the fully open and closed positions. Limit switch positions must be readily adjustable.

2.4.3 Entrapment Protection Devices

Entrapment protection devices must be provided for electrically operated doors in accordance with UL 325. These devices must immediately stop and reverse the door in its closing travel upon sensing an obstruction in the door opening or upon failure of the device or any component of the control system. Any momentary door-closing circuit must be automatically locked out and the door must be operable manually or with constant pressure controls until the failure or damage has been corrected. No entrapment protection device can be used as a limit switch unless its function is specifically intended to do so.

2.4.4 Control Transformers

UL 325. Provide transformers in power circuits as necessary to reduce the voltage on the control circuits to 120 volts or less.

2.4.5 Electrical Components

****

NOTE: Ensure that labor and materials for connecting motors and controls are specified in the electrical section, such as "Vertical Lift Metal 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 door manufacturer's wiring diagrams.

****

NFPA 70. Provide 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 operation of the doors. Conduit, wiring, and mounting of controls are specified in Section 26 20 00 INTERIOR DISTRIBUTION SYSTEM.

[2.4.6 Hazardous Locations

****

NOTE: Delete this paragraph if not applicable. If applicable, identify doors.

****

Electrical materials, equipment, and devices for installation in hazardous locations, as defined by NFPA 70, must be specifically approved by Underwriters Laboratories or by another independent testing agency using equivalent standards, for the particular chemical group and the class and

division of hazardous location involved.

]2.5 WEATHER SEALS [AND SENSING EDGES]

Provide exterior doors with weatherproof joints between sections, a rubber or vinyl adjustable weatherstrip at the top, and a compressible neoprene or rubber weather seal attached to the bottom of the door.[On exterior doors that are electrically operated, where a sensing edge is employed, the bottom seal must be a combination compressible weather seal and sensing edge for stopping [and reversing] door movement.][On interior doors that are electrically operated, where a sensing edge is employed, the bottom seal must be a compressible type of sensing edge for stopping [and reversing] door movement.]

2.6 FINISHES

Concealed ferrous metal surfaces must be hot-dip galvanized. Exposed ferrous metal surfaces must be hot-dip galvanized and shop primed.

2.6.1 Galvanized and Shop Primed

Surfaces specified must have a zinc coating, a phosphate treatment, and a shop prime coat of rust-inhibitive paint. The galvanized coating must conform to ASTM A653/A653M, coating designation Z275 G90, for steel sheets, and ASTM A123/A123M for assembled steel products. The weight of coatings for assembled products must be as designated in Table I of ASTM A123/A123M for the class of material to be coated. The prime coat must 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 application of galvanizing repair paint and spot prime. At the Contractor's option, a two-part system including bonderizing, baked-on epoxy primer, and baked-on enamel topcoat may be applied to slats before forming in lieu of prime coat specified.

2.6.2 Aluminum

[Surfaces must receive a clear anodized finish, AA-M10-C22-A41, in accordance with NAAMM AMP 500.] [Exposed surfaces must receive a pretreatment and a [white] [_____] baked-on enamel finish as standard with the manufacturer.]

PART 3 EXECUTION

3.1 FABRICATION

3.1.1 Door Sections

Provide vertical and horizontal door section members constructed of structural steel angle or channel shapes. Cover door section exteriors with sheet steel not lighter than 1.8 mm thick 14 gage, bolted, plug welded, or edge welded to frame at not more than 230 mm 9 inches on centers. Provide intermediate horizontal or vertical stiffeners so the maximum unsupported area of sheet is 1.8 square meters 20 square feet. Corners and intersections of frame members must be welded and ground smooth on exposed surfaces. Welds must develop the full strength of frame.

3.1.1.1 Insulated Sections

****

NOTE: Door assembly may be required to be rated for U-factor. Doors may obtain U-factor in accordance with either ANSI/DASMA 105 or NFRC 100.
****

Insulated door sections must be insulated with material providing a "U" factor of 0.14 or less when tested in accordance with ASTM C136/C136M. Interior of door sections must be covered with steel sheets not lighter than 0.6 mm thick 24 gage to completely enclose the insulating material.

3.1.1.2 Aluminum Sections

At the Contractor's option, door sections may be constructed of aluminum in lieu of steel. Aluminum sections must, as a minimum, provide the same structural and thermal properties as steel sections.

3.1.2 Guides and Jamb Plates

Door sections must run in structural steel guides, securely fastened to the counterweight tower and to the idler tower, which must be attached to the building construction. The counterweight enclosure must extend approximately to the same height as the guides. Set back guides and tower faces on walls to provide clear door opening unobstructed by door guides, except when indicated otherwise.

3.1.3 Hardware

Door sections must be supported by chain or steel cable with a safety factor of five. The sheaves over which the chain or cable passes to the door must have permanently sealed precision bearings. Cast-iron counterweights must be stacked on a steel weight rod or in a special container. The counterweight tower must be enclosed with a removable steel cover not lighter than 1.8 mm thick 14 gage to a height of 2150 mm 7 feet above the floor. Provide doors with a positive locking device and cylinder lock with two keys.

3.1.4 Glazing

Provide glass panels where indicated. Install panels using rubber gaskets as standard with the door manufacturer.

3.2 INSTALLATION

NFPA 70. Install doors in accordance with approved detail drawings and manufacturer's instructions. Accurately locate anchors and inserts for guides, brackets, [motors,] [switches,] hardware, and other accessories. Upon completion, doors must be weathertight and free from warp, twist, or distortion. Doors must be lubricated and adjusted to operate freely.

3.3 ELECTRICAL WORK

NFPA 70. Conduit, wiring, and mounting of controls are specified in Section 26 20 00 INTERIOR DISTRIBUTION SYSTEMS.

3.4 TESTING

After installation is complete, operate doors to demonstrate installation and function of operators, safety features, and controls. Correct deficiencies.

-- End of Section --