

\*\*\*\*\*  
USACE / NAVFAC / AFCEA / NASA      UFGS-08 36 13 (April 2006)  
-----  
Preparing Activity:    NAVFAC      Replacing without change  
   UFGS-08361 (August 2001)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UML dated 1 April 2006

Latest change indicated by CHG tags

\*\*\*\*\*

SECTION TABLE OF CONTENTS

DIVISION 08 - OPENINGS

SECTION 08 36 13

SECTIONAL OVERHEAD DOORS

04/06

PART 1    GENERAL

- 1.1    REFERENCES
- 1.2    SUBMITTALS
- 1.3    DELIVERY, STORAGE, AND HANDLING

PART 2    PRODUCTS

- 2.1    MATERIALS
  - 2.1.1    Hard-Drawn Springwire
  - 2.1.2    Oil-Tempered Springwire
  - 2.1.3    Steel Sheet
  - 2.1.4    Steel Shapes
  - 2.1.5    Aluminum Extrusions
  - 2.1.6    Aluminum Sheets and Strips
  - 2.1.7    Glass
- 2.2    DOORS
- 2.3    DESIGN REQUIREMENTS
- 2.4    FABRICATION
  - 2.4.1    Steel Overhead Doors
    - 2.4.1.1    Insulated Sections
    - 2.4.1.2    Aluminum Sections
  - 2.4.2    Aluminum Panel Overhead Doors
  - 2.4.3    Tracks
  - 2.4.4    Hardware
  - 2.4.5    Counterbalancing
- 2.5    MANUAL OPERATORS
  - 2.5.1    Pushup Operators
  - 2.5.2    Chain Hoist Operators
- 2.6    ELECTRIC OPERATORS
  - 2.6.1    Operator Features
  - 2.6.2    Motors
  - 2.6.3    Controls
  - 2.6.4    Safety Device

- 2.6.5 Control Transformers
- 2.6.6 Electrical Components
- 2.6.7 Hazardous Locations
- 2.7 WEATHER SEALS [AND SAFETY DEVICE]
- 2.8 FINISHES
  - 2.8.1 Galvanized and Shop Primed
  - 2.8.2 Aluminum

PART 3 EXECUTION

- 3.1 INSTALLATION
- 3.2 ELECTRICAL WORK
- 3.3 TESTING

-- End of Section Table of Contents --

\*\*\*\*\*  
USACE / NAVFAC / AFCEA / NASA           UFGS-08 36 13 (April 2006)  
-----  
Preparing Activity:   NAVFAC           Replacing without change  
  UFGS-08361 (August 2001)

## UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated 1 April 2006

Latest change indicated by CHG tags

\*\*\*\*\*

### SECTION 08 36 13

#### SECTIONAL OVERHEAD DOORS 04/06

\*\*\*\*\*

NOTE: This guide specification covers the requirements for sectional overhead doors.

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).

Use of electronic communication is encouraged.

Brackets are used in the text to indicate designer choices or locations where text must be supplied by the designer.

\*\*\*\*\*

\*\*\*\*\*

NOTE: Vertical lift metal doors of the overhead stacking type, formerly a part of this guide specification, are now covered in Section 08 36 19 VERTICAL LIFT DOORS.

\*\*\*\*\*

\*\*\*\*\*

NOTE: On the drawings, show:

1. Location and size of door openings
2. Type and details of door frames
3. Wire and conduit from power source to operators and controls for electrically-operated doors
4. Type of lift required (consult manufacturer's catalogs for required headroom and backroom)

5. Design wind loads required for building
6. Profile of door panel if important. Do not use proprietary profile.
7. Size and location of glazed panels
8. Location of motors and control stations.

\*\*\*\*\*

## 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 A 123/A 123M	(2002) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A 227/A 227M	(1999) Steel Wire, Cold-Drawn for Mechanical Springs
ASTM A 229/A 229M	(1999) Steel Wire, Oil-Tempered for Mechanical Springs
ASTM A 36/A 36M	(2005) Carbon Structural Steel
ASTM A 653/A 653M	(2004a) Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM B 209	(2004) Aluminum and Aluminum-Alloy Sheet and Plate

ASTM B 209M (2004) Aluminum and Aluminum-Alloy Sheet and Plate (Metric)

ASTM B 221 (2005) Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes

ASTM B 221M (2005) Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric)

ASTM C 236 (1989; R 1993e1) Steady-State Thermal Performance of Building Assemblies by Means of a Guarded Hot Box

ASTM E 330 (2002) Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference

DOOR AND ACCESS SYSTEM MANUFACTURERS ASSOCIATION (DASMA)

DASMA 102 (2003) Sectional Overhead Type Doors

NATIONAL ASSOCIATION OF ARCHITECTURAL METAL MANUFACTURERS (NAAMM)

NAAMM MFM (1988) Metal Finishes Manual

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA ICS 1 (2000; R 2005) Industrial Control and Systems: General Requirements

NEMA ICS 2 (1996; R 2004) 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 2001) Industrial Control and Systems: Enclosures

NEMA MG 1 (2003; R 2004) Motors and Generators

NEMA ST 20 (1992; R 1997) Dry-Type Transformers for General Applications

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70 (2005) National Electrical Code

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.] [for 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

Doors[; G][; G, [\_\_\_\_\_]]

Show types, sizes, locations, metal gages including minimum metal decimal thickness, hardware provisions, installation details, and other details of construction. [For electrically-operated doors, include supporting brackets for motors, location, type, and ratings of motors, switches, and safety devices.]

#### SD-03 Product Data

Doors[; G][; G, [\_\_\_\_\_]]

[ Electric operators[; G][; G, [\_\_\_\_\_]]

[ For electrically motor-operated doors, submit manufacturer's wiring diagrams for motor and controls.]

#### SD-08 Manufacturer's Instructions

Doors

## SD-10 Operation and Maintenance Data

Doors, Data Package 2; [; G][; G, [\_\_\_\_\_]]

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

### 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 shall permit easy access for inspection and handling. Remove damaged items and provide new.

## PART 2 PRODUCTS

### 2.1 MATERIALS

#### 2.1.1 Hard-Drawn Springwire

ASTM A 227/A 227M.

#### 2.1.2 Oil-Tempered Springwire

ASTM A 229/A 229M.

#### 2.1.3 Steel Sheet

ASTM A 653/A 653M.

#### 2.1.4 Steel Shapes

ASTM A 36/A 36M.

#### 2.1.5 Aluminum Extrusions

ASTM B 221MASTM B 221, Alloy 6063-T5.

#### 2.1.6 Aluminum Sheets and Strips

ASTM B 209MASTM B 209, alloy and temper best suited for the purpose.

#### 2.1.7 Glass

Fully tempered, clear float glass [3] [1/8] [\_\_\_\_\_] mm inchthick.

### 2.2 DOORS

\*\*\*\*\*

NOTE: DASMA 102 designates doors as follows:

Residential. Intended for use in residential garage, normally operated less than 1,500 cycles per year.

Commercial. Intended for vehicular use at entrances of commercial buildings such as loading docks and

service stations, normally operated less than 5,000 cycles per year.

Industrial. Intended for vehicular use at entrances of parking garages, factories, and manufacturing plants, normally operated in excess of 5,000 cycles per year.

If profile is indicated and there is a requirement for matching, add "Profile of panels shall match profile indicated."

\*\*\*\*\*

**DASMA 102.** [Residential] [Commercial] [Industrial] doors. Metal doors shall be horizontal sections hinged together which operate in a system of tracks to completely close the door opening in the closed position and make the full width and height of the door opening available for use in the open position. Provide a permanent label on the door indicating the name and address of the manufacturer. Doors shall be of the [standard lift type designed to slide up and back into a horizontal overhead position and requiring a maximum of 400 mm 16 inches of headroom for 50 mm 2 inch tracks and 535 mm 21 inches of headroom for 75 mm 3 inch tracks] [low headroom type designed to slide up and back into a horizontal overhead position and requiring a maximum of 250 mm 10 inches of headroom for 50 mm 2 inch tracks and 300 mm 12 inches of headroom for 75 mm 3 inch tracks] [high lift type designed to slide up and back into a combination vertical and horizontal position] [vertical lift type designed to slide upward into a vertical position]. Doors shall be operated [by 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].

## 2.3 DESIGN REQUIREMENTS

\*\*\*\*\*

**NOTE:** Insert design wind load for the building if not shown on the drawings.

\*\*\*\*\*

**DASMA 102** [except that design wind load shall be [as indicated for the building] [\_\_\_\_\_] kilopascals pounds per square foot]]. Doors shall remain operable and undamaged after conclusion of tests conducted in accordance with **ASTM E 330** using the design wind load.

## 2.4 FABRICATION

\*\*\*\*\*

**NOTE:** Choose this paragraph and subparagraphs or the paragraph below entitled "Aluminum Panel Overhead Doors."

\*\*\*\*\*

### 2.4.1 Steel Overhead Doors

Form door sections of hot-dipped galvanized steel not lighter than [1.5 mm thick 16 gage with flush surface without ribs or grooves] [or] [0.9 mm thick 20 gage with longitudinal integral reinforcing ribs] [or] [0.6 mm thick 24 gage with longitudinal integral reinforcing ribs and flat bottom V-grooves]. Sections shall be not less than 50 mm 2 inches in thickness. Meeting rails shall have interlocking joints to ensure a weathertight



closure and alignment for full width of the door. Sections shall be of the height indicated or the manufacturer's standard, except the height of an intermediate section shall not exceed 600 mm thick 24 inches. Bottom sections may be varied to suit door height, but shall not exceed 750 mm 30 inches in height. [Provide glass panels as indicated. Install panels using rubber gaskets as standard with the door manufacturer.]

#### 2.4.1.1 Insulated Sections

Insulate door sections with fibrous glass or plastic foam to provide a "U" factor of 0.14 or less when tested in accordance with ASTM C 236. Cover interior of door sections with steel sheets of not lighter than 0.6 mm thick 24 gage to completely enclose the insulating material.

#### [2.4.1.2 Aluminum Sections

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

#### ] 2.4.2 Aluminum Panel Overhead Doors

Door sections shall be of panel construction with extruded aluminum stiles and rails with aluminum [and glass] panels. Stiles and rails shall have a minimum wall thickness of 1.5 mm 0.060 inch. Meeting rails shall have interlocking joints to ensure a weathertight closure and alignment for full width of door. Sections shall be of the height indicated or the manufacturer's standard, but the height of an intermediate section shall not exceed 600 mm 24 inches. Bottom sections may be varied to suit door height, but shall not exceed 750 mm 30 inches in height. Aluminum panels shall be not less than 1.0 mm 0.040 inch in thickness. Install panel using a continuous vinyl gasket and snap-in type of aluminum or vinyl glazing bead. [Install glass panels as specified for aluminum panels.]

#### ] 2.4.3 Tracks

Provide galvanized steel tracks not lighter than 1.8 mm thick for 50 mm 14 gage for 2 inch tracks and not lighter than 2.5 mm thick for 75 mm 12 gage for 3 inch tracks. Provide vertical tracks with continuous steel angle not lighter than 2.1 mm thick 13 gage for installation to walls. Incline vertical track through use of adjustable brackets to obtain a weathertight closure at jambs. Reinforce horizontal track with galvanized steel angle; support from track ceiling construction with galvanized steel angle and cross bracing to provide a rigid installation.

#### 2.4.4 Hardware

Provide hinges, brackets, rollers, locking devices, and other hardware required for complete installation. Roller brackets and hinges shall be 14 gage galvanized steel. Rollers shall have ball bearings and case-hardened races. Provide reinforcing on doors where roller hinges are connected. Provide a positive locking device and cylinder lock with two keys on manually operated doors.

#### 2.4.5 Counterbalancing

Counterbalance doors with an oil-tempered, helical-wound torsional spring mounted on a steel shaft. Spring tension shall be adjustable; connect spring to doors with cable through cable drums. Cable safety factor shall

be at least 7 to 1.

## 2.5 MANUAL OPERATORS

### 2.5.1 Pushup Operators

Provide lifting handles on both sides of door. The force required to operate the door shall not exceed 11.25 kilograms 25 pounds. Provide pulldown straps or ropes at bottom of doors over 2130 mm 7 feet high.

### 2.5.2 Chain Hoist Operators

Provide a galvanized, endless chain operating over a sprocket. Extend chain to within 1200 mm 4 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 shall allow for future installation of power operators. The force required to operate the door shall not exceed 15.75 kilograms 35 pounds.

## 2.6 ELECTRIC OPERATORS

\*\*\*\*\*  
NOTE: Indicate location of motors and control switches when electric operators are required. Specify three-phase motors whenever three-phase electric service is specified. Locate control stations at least 1500 mm 5 feet above floor line, so operator will have complete visibility of door at all times. Place one control station about 600 mm 2 feet from door jamb, guide, or track.  
\*\*\*\*\*

### 2.6.1 Operator Features

Provide operators of the drawbar type or side mount (jack shaft) type as recommended by the manufacturer. Operators shall include electric motor, machine-cut reduction gears, steel chain and sprockets, magnetic brake, brackets, pushbutton controls, limit switches, magnetic reversing contactor, a manual chain hoist operator as specified above for emergency use, and other accessories necessary for operation. Design electric operator so motor may be removed without disturbing the limit switch timing and without affecting the manual operator. Provide the operator with slipping clutch coupling to prevent stalling the motor. The emergency manual operator shall be clutch controlled so that it may be engaged and disengaged from the floor; operation shall not affect limit switch timing. The manual operator is not required if door can be manual-pushup operated with a force not to exceed 11.25 kilograms 25 pounds. Provide an electrical or mechanical device that disconnects the motor from the operating mechanism when the manual operator is engaged.

### 2.6.2 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 shall 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 shall be operate on current of the characteristics indicated at not more than 377 rad/s 3600 rpm. [Single-phase motors shall not have commutation or more than one starting contact.] [Motor enclosures

shall be drip-proof type or NEMA TENV type.]

### 2.6.3 Controls

Each door motor shall 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 shall conform to NEMA ICS 1 and NEMA ICS 2. Control enclosures shall be NEMA ICS 6, Type 12 or Type 4, except that contactor enclosures may be Type 1. Each control switch station shall be of the three-button type with buttons marked "OPEN," "CLOSE," and "STOP." The "OPEN" and "STOP" buttons shall require only momentary pressure to operate. The "CLOSE" button shall 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 shall 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" button. Pushbuttons shall be full-guarded to prevent accidental operation. Provide limit switches to automatically stop doors at the fully open and closed positions. Limit switch positions shall be readily adjustable.

### 2.6.4 Safety Device

Provide a pneumatic or electric type safety device on the bottom edge of electrically-operated doors. The device shall immediately stop and reverse the door movement during the closing travel upon contact with an obstruction in the door opening or upon failure of any component of the control system. The door-closing circuit shall be automatically locked out and the door shall be operable manually until the failure or damage has been corrected. Do not use the safety device as a limit switch.

### 2.6.5 Control Transformers

NEMA ST 20. Provide transformers in power circuits as necessary to reduce the voltage on the control circuits to 120 volts or less.

### 2.6.6 Electrical Components

\*\*\*\*\*

NOTE: Ensure that labor and materials for connecting motors and controls are specified in the electrical section, e.g., "Sectional Overhead 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."

\*\*\*\*\*

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

#### [2.6.7 Hazardous Locations

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

In addition to meeting other requirements specified, electrical materials, equipment, and devices for installation in hazardous locations, as defined by NFPA 70, shall be specifically approved by Underwriters Laboratories or by an independent testing agency using equivalent standards, for the particular chemical group and the class and division of hazardous location involved.

#### ]2.7 WEATHER SEALS [AND SAFETY DEVICE]

Provide exterior doors with weatherproof joints between sections by means of tongue-and-groove joints, rabbetted joints, shiplap joints, or wool pile, vinyl or rubber weatherstripping; a rubber, wool pile, or vinyl, adjustable weatherstrip at the top and jams; and a compressible neoprene, rubber, wool pile, or vinyl weather seal attached to the bottom of the door. [On exterior doors that are electrically operated, the bottom seal shall be combination compressible weather seal and safety device for stopping [and reversing] door movement.] [Interior doors that are electrically operated shall have a compressible type of safety device for stopping [and reversing] door movement.]

#### 2.8 FINISHES

Concealed ferrous metal surfaces and tracks shall be hot-dip galvanized. Other ferrous metal surfaces, except rollers and lock components, shall be hot-dip galvanized and shop primed.

##### 2.8.1 Galvanized and Shop Primed

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 A 653/A 653M, coating designation Z180 G60, for steel sheets, and ASTM A 123/A 123M for assembled steel products. The weight of coatings for assembled products shall be as designated in Table I of ASTM A 123/A 123M for the class of material 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 with 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 in lieu of prime coat specified.

##### 2.8.2 Aluminum

[Surfaces shall receive a clear anodized finish, AA-M10-C22-A41, in accordance with NAAMM MFM.] [Exposed surfaces shall receive a pretreatment and a [white] [\_\_\_\_\_] baked-on enamel finish as standard with the manufacturer.]

## PART 3 EXECUTION

### 3.1 INSTALLATION

**NFPA 70.** Install doors in accordance with approved shop drawings and manufacturer's instructions. Upon completion, doors shall be weathertight and free from warp, twist, or distortion. Lubricate and adjust doors to operate freely.

### 3.2 ELECTRICAL WORK

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

### 3.3 TESTING

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

-- End of Section --