

\*\*\*\*\*  
USACE / NAVFAC / AFCEC / NASA UFGS-08 36 13 (August 2011)  
Change 1 - 05/13  
-----  
Preparing Activity: NAVFAC Superseding  
UFGS-08 36 13 (July 2006)

## UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated July 2019

\*\*\*\*\*

### SECTION TABLE OF CONTENTS

#### DIVISION 08 - OPENINGS

#### SECTION 08 36 13

#### SECTIONAL OVERHEAD DOORS

08/11

#### 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 Entrapment Protection Devices
  - 2.6.5 Control Transformers

- 2.6.6 Electrical Components
- 2.6.7 Hazardous Locations
- 2.7 WEATHER SEALS [AND SENSING EDGES]
- 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 / AFCEC / NASA UFGS-08 36 13 (August 2011)  
Change 1 - 05/13  
-----  
Preparing Activity: NAVFAC Superseding  
UFGS-08 36 13 (July 2006)

## UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated July 2019

\*\*\*\*\*

### SECTION 08 36 13

#### SECTIONAL OVERHEAD DOORS 08/11

\*\*\*\*\*

NOTE: This guide specification covers sectional overhead doors. Vertical lift metal doors of the overhead stacking type are now covered in Section 08 36 19 VERTICAL LIFT DOORS.

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. 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 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 in the text by the basic designation only.

### ALUMINUM ASSOCIATION (AA)

AA DAF45 (2003; Reaffirmed 2009) Designation System for Aluminum Finishes

### ASTM INTERNATIONAL (ASTM)

ASTM A36/A36M (2014) Standard Specification for Carbon Structural Steel

ASTM A123/A123M (2017) Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

ASTM A227/A227M (2017) Standard Specification for Steel Wire, Cold-Drawn for Mechanical Springs

ASTM A229/A229M (2017) Standard Specification for Steel Wire, Quenched and Tempered for Mechanical Springs

ASTM A653/A653M (2018) 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 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
- ANSI/DASMA 108 (2012) Standard Method for Testing  
Sectional Garage Doors and Rolling Doors:  
Determination of Structural Performance  
Under Uniform Static Air Pressure  
Difference

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 (2016; SUPP 20162018) Motors and Generators
- NEMA ST 20 (1992; R 19972014) Standard for Dry-Type  
Transformers for General Applications

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

- NFPA 70 (2017; ERTA 1-2 2017; TIA 17-1; TIA 17-2;  
TIA 17-3; TIA 17-4; TIA 17-5; TIA 17-6;  
TIA 17-7; TIA 17-8; TIA 17-9; TIA 17-10;

TIA 17-11; TIA 17-12; TIA 17-13; TIA  
17-14; TIA 17-15; TIA 17-16; TIA 17-17 )  
National Electrical Code

UNDERWRITERS LABORATORIES (UL)

UL 325

(2017) 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 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.

The "S" following a submittal item indicates that  
the submittal is required for the Sustainability  
eNotebook to fulfill federally mandated sustainable  
requirements in accordance with Section 01 33 29  
SUSTAINABILITY REPORTING. Locate the "S" submittal  
under the SD number that best describes the  
submittal item.

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

\*\*\*\*\*

Submittals with an "S" are for inclusion in the Sustainability eNotebook,  
in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the  
following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

SD-02 Shop Drawings

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

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

Submit Data Package 2 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. Remove damaged items and provide new. Provide easy access for inspection and handling of overhead doors prior to installation.

## PART 2 PRODUCTS

### 2.1 MATERIALS

#### 2.1.1 Hard-Drawn Springwire

ASTM A227/A227M.

#### 2.1.2 Oil-Tempered Springwire

ASTM A229/A229M.

#### 2.1.3 Steel Sheet

ASTM A653/A653M.

#### 2.1.4 Steel Shapes

ASTM A36/A36M.

#### 2.1.5 Aluminum Extrusions

ASTM B221M ASTM B221, Alloy 6063-T5.

#### 2.1.6 Aluminum Sheets and Strips

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

#### 2.1.7 Glass

\*\*\*\*\*  
NOTE: In accordance with DASMA TDS-158, safety  
glazing may not be required in all applications.  
Refer to conditions listed within DASMA TDS-158.  
\*\*\*\*\*

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

#### 2.2 DOORS

Doors shall comply with ANSI/DASMA 102. Metal doors to have 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. Provide doors with [standard lift type designed to slide up and back into a horizontal overhead position and requiring a maximum of 400 mm 16 inch of headroom for 50 mm 2 inch tracks and 535 mm 21 inch 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 inch of headroom for 50 mm 2 inch tracks and 300 mm 12 inch 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 operate [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: Design wind loads should be determined in  
accordance with ASCE 7. Insert design wind load for  
the building if not shown on the drawings Note that  
plus or minus 0.64 kilopascals plus or minus 13.3 PSF  
encompasses 185 KMH 115 MPH Exposure B per ASCE 7,  
which includes over 80 percent of the U.S.  
geographic area.  
\*\*\*\*\*

Design wind load shall [conform to the design wind load for the building]  
[withstand a wind pressure of [plus or minus 0.64] [ ] kilopascals [a  
minimum of plus or minus 13.3] [ ] pounds per square foot] of door  
area without damage. Doors shall be tested in accordance with either  
ASTM E330/E330M or ANSI/DASMA 108 and shall meet the acceptance criteria  
of ANSI/DASMA 108.

#### 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 [ 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]. Install sections not less than 50 mm 2 inch in thickness. Meeting rails to have interlocking joints to ensure a weathertight closure and alignment for full width of the door. Provide sections of the height indicated or the manufacturer's standard. Do not exceed 600 mm thick 24 inch height for intermediate sections. Bottom sections may be varied to suit door height. Do not exceed 750 mm 30 inch height for bottom section. [Provide glass panels and install panels using manufacturer's standard for rubber gaskets.]

\*\*\*\*\*

NOTE: Door assembly may be required to be rated for U-factor. Doors obtain U-factor in accordance with either ANSI/DASMA 105 or NFRC 100. Note that the U value of 0.27 is met in common insulation offerings such as 25.4 mm 1 inch polyurethane or 35 mm 1-3/8 inch EPS.

\*\*\*\*\*

2.4.1.1 Insulated Sections

Insulate door sections with plastic foam or other material providing a "U" factor of 0.27 or less. Cover interior of door sections with steel sheets of not lighter than 0.4 mm thick 27 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. Provide the same structural and thermal properties for aluminum sections as specified for steel sections.

]2.4.2 [Aluminum Panel Overhead Doors

Provide door panel construction with extruded aluminum stiles and rails with aluminum [and glass] panels. Stiles and rails has 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. Provide sections to the height indicated or the manufacturer's standard, but the height of an intermediate section not to exceed 600 mm 24 inch. Bottom sections may be varied to suit door height, but to not exceed 750 mm 30 inch in height. Provide aluminum panels 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 14 gage thick for 50 mm 2 inch tracks and not lighter than 2.5 mm 12 gage thick for 75 mm 3 inch tracks. Provide galvanized steel vertical tracks with continuous

galvanized 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. Install roller brackets and hinges with 14 gage galvanized steel. Provide rollers with 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. Provide adjustable spring tension, connect spring to doors with cable through cable drums. Provide cable safety factor of at least 5 to 1.

### 2.5 MANUAL OPERATORS

#### 2.5.1 Pushup Operators

Provide lifting handles on both sides of door. Do not exceed the lesser of 10 percent of the door weight or 11.25 kilograms 25 pounds for the maximum lifting force of required to operate the door. 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. Allow for future installation of power operators to chain hoist operator. Do not exceed the maximum lifting force of 15.75 kilograms 35 pounds required to operate the door.

### 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

Operators shall be labeled and listed to the requirements of UL 325. Provide operators of the drawbar type or side mount (jack shaft) type as

recommended by the manufacturer. Include operators with 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 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. Provide a clutch controlled emergency manual operator so that it may be engaged and disengaged from the floor; do not affect limit switch timing by operation. 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. Provide a motor to produce a door travel speed of not less than 200 mm 8 inch 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.] [Provide motor enclosures with drip-proof type or NEMA TENV type.]

#### 2.6.3 Controls

Provide a motor for each door with 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. Provide control equipment to conform to NEMA ICS 1 and NEMA ICS 2. Provide control enclosures with NEMA ICS 6, Type 12 or Type 4, except that contactor enclosures may be Type 1. Provide a three-button type control switch stations 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 Entrapment Protection Devices

Entrapment protection devices shall be provided for electrically-operated doors in accordance with UL 325. These devices shall 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 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. No entrapment protection device shall be used as a limit switch, unless its function is specifically intended to do so.

### 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, for operation of the doors. Conduit wiring and mounting of controls are specified in the corresponding electrical specification section.

### 2.6.7 [Hazardous Locations]

\*\*\*\*\*

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

\*\*\*\*\*

Conform to **NFPA 70** In addition to meeting other requirements specified, electrical materials, equipment, and devices for installation in hazardous locations and 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 SENSING EDGES]

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, or vinyl adjustable weatherstrip at the top and jambs; 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 shall be 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 shall be a compressible type of sensing edge for stopping [and reversing] door movement.]

### 2.8 FINISHES

Hot-dip galvanize concealed metal surfaces and tracks in accordance with **ASTM A123/A123M**. Hot-dip galvanized and other ferrous metal surfaces, except rollers and lock components, which are galvanized or plated shop primed.

### 2.8.1 Galvanized and Shop Primed

Provide a zinc coating on specified surfaces, a phosphate treatment, and a shop prime coat of rust-inhibitive paint. Conform to [ASTM A653/A653M](#) for galvanized coating, coating designation [Z180 G60](#), for steel sheets, and [ASTM A123/A123M](#) for assembled steel products. The weight of coatings for assembled products shall be as designated in Table I of [ASTM A123/A123M](#) for the class of material to be coated. Provide a prime coat 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

Provide a clear anodized finish to aluminum surfaces in accordance with AA-M10-C22-A41 contained in [AA DAF45](#) and [NAAMM AMP 500](#). Pretreat exposed surfaces and apply a [white] [\_\_\_\_\_] baked-on enamel finish in accordance with manufacturer's standard.

## PART 3 EXECUTION

### 3.1 INSTALLATION

[NFPA 70](#). Install doors in accordance with approved shop drawings and manufacturer's written installation instructions. Lubricate and adjust doors to operate freely.

Provide a weathertight installation and free from warp, twist, or distortion. Adjust and lubricate doors to operate freely.

Provide all items and accessories for a complete installation in every respect.

### 3.2 ELECTRICAL WORK

[NFPA 70](#). Conduit, wiring, and mounting of controls.

### 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 --