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USACE / NAVFAC / AFCEA / NASA UFGS-08 13 73 (January 2008)

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UFGS-08 13 73 (April 2006)
UFGS-08 13 73.00 40 (April 2007)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated October 2008

SECTION 08 13 73

SLIDING METAL DOORS 01/08

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

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

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

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

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

PART 1 GENERAL

NOTE: This guide specification is intended to cover horizontal sliding steel doors used primarily for fire rated applications. Use a center parting door at locations where an overhead monorail passes through the opening or where there is limited side room due to the lack of unobstructed wall space adjacent to the opening.

The following information should be indicated on the project drawings:

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

1.1 REFERENCES

NOTE: This paragraph is used to list the publications cited in the text of the guide specification. The publications are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title.

Use the Reference Wizard's Check Reference feature when you add a RID outside of the Section's Reference Article to automatically place the reference in the Reference Article. Also use the Reference Wizard's Check Reference feature to update the issue dates.

References not used in the text will automatically be deleted from this section of the project specification when you choose to reconcile references in the publish print process.

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM A 307	(2007b) Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength
ASTM A 325	(2007a) Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
ASTM A 325M	(2008) Standard Specification for Structural Bolts, Steel, Heat Treated, 830 Mpa Minimum Tensile Strength (Metric)
ASTM A 36/A 36M	(2008) Standard Specification for Carbon Structural Steel

ASTM A 653/A 653M	(2008) Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM A 924/A 924M	(2008) Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process
ASTM B 136	(1984e1; R 2008) Standard Method for Measurement of Stain Resistance of Anodic Coatings on Aluminum
ASTM B 137	(1995; R 2004) Standard Test Method for Measurement of Coating Mass Per Unit Area on Anodically Coated Aluminum
ASTM B 209	(2007) Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
ASTM B 209M	(2007) Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric)
ASTM E 330	(2002) Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference
ASTM F 568M	(2007) Standard Specification for Carbon and Alloy Steel Externally Threaded Metric Fasteners

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

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

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(2007; AMD 1 2008) National Electrical Code - 2008 Edition
NFPA 80	(2006; Errata 2008) Standard for Fire Doors and Other Opening Protectives

U.S. DEPARTMENT OF DEFENSE (DOD)

MIL-A-8625	(Rev F; Am 1) Anodic Coatings, for Aluminum and Aluminum Alloys
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UNDERWRITERS LABORATORIES (UL)

UL 10A	(1998; Rev thru Mar 2003) Tin-Clad Fire Doors
UL 14B	(1998; Rev thru Oct 2007) Sliding Hardware for Standard, Horizontally Mounted Tin-Clad Fire Doors
UL 506	(2000; Rev thru May 2006) Standard for Specialty Transformers

1.2 SUBMITTALS

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

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

For submittals requiring Government approval on Army projects, a code of up to three characters within the submittal tags may be used following the "G" designation to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy, Air Force, and NASA projects.

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

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

SD-02 Shop Drawings

Sliding Metal Doors

SD-07 Certificates

Fire Doors

Fabrication Drawings

Installation Drawings

Design Analysis and Calculations

Sliding Door Assemblies

Hardware and Accessories

Doors

Flush Doors

Rails

Paint

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

1.3 GENERAL REQUIREMENTS

NOTE: If Section 26 00 00.00 20 BASIC ELECTRICAL MATERIALS AND METHODS is not included in the project specifications, insert applicable requirements and delete the following paragraph.

Section 26 00 00.00 20 BASIC ELECTRICAL MATERIALS AND METHODS applies to work specified in this section.

Conform to the requirements of Underwriters Laboratories, Inc., for motors.

Conform to the requirements of Underwriters Laboratories, Inc., for wiring.

Conform to the requirements of Underwriters Laboratories, Inc., for controls.

1.4 DESIGN REQUIREMENTS

NOTE: For exterior doors, use wind load values selected from the tables below; the first table is metricated, the second table shows I-P units. The applicable basic wind speed and importance factor will be selected in accordance with ASCE/SEI 7-05, Minimum Design Loads For Buildings and Other Structures. Design wind loads may be reduced by 10

percent when the roof slope is equal to or less than 10 degrees. Delete this paragraph if exterior doors are not specified.

Design Wind Load (+/- Pa)

Basic Wind Speed (m/s)	Importance Factor				
	0.95	1.00	1.05	1.07	1.11
31	720	765	860	910	960
36	910	1005	1100	1150	1245
40	1150	1295	1435	1485	1580
45	1435	1580	1770	1820	1965
49	1725	1915	2105	2200	2395
54	2060	2300	2540	2635	2825

(Design Wind Load (+/- psf))

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

Fire doors must conform to NFPA 80 and the requirements specified herein. Fire doors must bear the Underwriters Laboratories, Warnock Hersey, Factory Mutual, or other nationally recognized testing laboratory label for the required fire rating class and temperature rise classification if applicable. Provide each door with a permanent label showing the manufacturer's name and address and the model number of the door. Doors in excess of the labeled size must be deemed oversize and provided with a certificate signed by an official of the company, certifying that the door and operator have been designed to meet the specified requirements. Provide each door complete with operating devices, hardware, and accessories. Minimum design wind load is [_____] Pa psf. Construct doors to sustain a superimposed load, both inward and outward, equal to 1-1/2 times the minimum design wind load and not to deflect more than 1/120 of the door width and height. When tested in accordance with the static air pressure test procedure of ASTM E 330, the door must support the superimposed loads for a minimum period of 10 seconds without evidence of serious damage and be operable after conclusion of the tests. As an option, conduct the tests using an equivalent uniform static load. The uniform static load test specimen must be supported using rollers and track as required for project installation. Recovery must be at least three-fourths of the maximum deflection within 24 hours after the test load is removed.

1.5 DRAWINGS

Submit Fabrication Drawings with framing member details, welding details, and finish and painting details for sliding door assemblies. Drawings must

include elevations of each door type, details of anchorage, details of construction, location and installation of hardware, shape and thickness of materials, details of joints and connections, and details of tracks, rollers, power operators, controls, and fittings. Include a schedule showing the location of each door with the drawings. Include the manufacturer's catalog data.

Provide [Installation Drawings](#) with type and location of hardware, framing details, and rough opening dimensions and details for horizontal door and biparting door systems.

1.6 PERFORMANCE REQUIREMENTS

[Design Analysis and Calculations](#) must meet design specifications as required by referenced standards within this section.

Equipment and Performance data for [Sliding Door Assemblies, Hardware, and Accessories](#) must meet design specifications as required by referenced standards within this section.

1.6.1 Door Performance

Provide [an electrically operated door with manual override mechanism] [a manually operated door], industrial type constructed of [ASTM A 36/A 36M](#) [structural steel sections] [formed plates] sized for loads specified.

Provide doors of the [one-way sliding] [and] [biparting double-leaf] type as indicated [supported on recessed rails set in floor with top guides]. Furnish doors complete with hardware, tracks, guides, and accessories.

Leaves of exterior biparting doors must be designed as follows:

- a. Windload of [\[2400\]](#) [\[_____\]](#) pascal [\[50\]](#) [\[_____\]](#) pounds per square foot (psf)
- b. Windload deflection not to exceed [\[_____\]](#) [the door height in [millimeter](#) [inches](#) divided by 120] [\[_____\]](#).
- c. Interior horizontal sliding doors must withstand designed an internal pressure of [\[500\]](#) [\[_____\]](#) pascal, [\[10\]](#) [\[_____\]](#) psf, both directions.
- d. Door operating speed must be [\[0.15\]](#) [\[_____\]](#) meter per second [\[30\]](#) [\[_____\]](#) feet per minute (fpm) maximum and [\[0.08\]](#) [\[_____\]](#) meter per second [\[15\]](#) [\[_____\]](#) fpm minimum.

Doors must require operating personnel to walk with leaf as it moves. Each door leaf must have separate drive units, [driving one or more wheels]. Each leaf must have [motor-mounted, spring-set,] [\[_____\]](#) [solenoid-released] motor brake. Each leaf must move independently from other leaves.

[Personnel door must be interlocked to prevent movement of the leaf, or group in which it is located, when the personnel door is open.]

1.6.2 Seal Performance

Pressure must keep doors closed and hold center seals tight. When power fails, a braking device must hold each door shut and maintain seals.

When pressure is applied to the OPEN button, seals must automatically deflate before doors open. Upon deflation of pressure in each seal switches [connected in series] must energize door-open controller. Every seal must deflate properly before permitting doors to move. Coordinate controls with this operating sequence for seals and door movement.

1.7 DELIVERY AND STORAGE

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

1.8 WARRANTY

Provide manufacturer's standard performance guarantees or warranties that extend beyond a 1 year period.

1.9 OPERATION AND MAINTENANCE MANUALS

Provide manufacturer's installation, operation, and maintenance instructions for [sliding metal doors](#).

PART 2 PRODUCTS

2.1 [DOORS](#)

Leaf sections must be welded construction. Provide joints to develop 100 percent of the strength of the framing members. Members may be prefabricated for field assembly. When using bolts, conform to [ASTM A 325M](#) [ASTM A 325](#) for fastening main members. Bolts conforming to [ASTM F 568M](#) [ASTM A 307](#) are permitted for fastening secondary members.

Vertical members must be continuous throughout the height of the door. Members adjoining each other at splices must be made to facilitate field assembly. Framing members must be true to dimensions and square in all directions. No leaf must be out of line in vertical or horizontal plane of the door opening by [[3 millimeter in 6100 millimeter](#) [1/8 inch in 20 feet](#)] [_____] maximum.

Provide [full-depth members] [gusset plates at the one-third points] for lateral support to all main vertical members. Diagonal bracing must support the leaf assembly to withstand shipping, assembly, and operational loads. Provide ground smooth welds.

Fabricate cover sheets from [[1.2 millimeter](#) [0.050 inch](#)] [_____] thick (minimum) [aluminum] [_____] facing, [Alloy 3003] [_____] , meeting [ASTM B 209M](#) [ASTM B 209](#) requirements. Provide [ribbed] [fluted] finish. Joints must be the [butt] [_____] type showing a minimum crack. Reinforce to ensure rigid construction and prevent warping and sagging.

Seal cover sheets with an approved calking compound. Fasten to frame with corrosion-resistant [steel] [_____] fasteners [[230 millimeter](#) [9 inch](#)] [_____] on center. Where flat sheets are attached as either covering or linear sheets, do not exceed [[2.3 square meter](#) [25 square feet](#)] [_____] for

unsupported areas.

2.2 PERSONNEL DOORS

NOTE: Delete the following paragraph when personnel
doors are not required.

Provide manufacturer's standard Flush Doors of [aluminum type,] [_____] size as indicated, complete with hardware and airtight seals.

2.3 SLIDING DOORS

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

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

Edit the following paragraphs to meet project requirements.

Sliding doors must be of the following types:

[2.3.1 Steel-Covered Composite

Composite fire doors must be [[3 hour] [4 hour] [_____] rated] [as shown on drawings]. Doors must be flush panel consisting of a manufactured core material, such as calcium silicate block or mineral fiberboard insulation, covered on both faces with a bonded steel sheet not lighter than 1.0 mm 20 gauge and covered on edges with a steel perimeter channel not lighter than 1.3 mm 18 gauge. Doors may be fabricated using several panels, with panel edges encased in a steel channel not lighter than 1.9 mm 14 gauge. Joints in panels must be joined or backed by an interior steel H column and covered with a steel-surface applied face plate. Fire-rated doors must have a [maximum temperature rise rating of 121 degrees C 250 degrees F at 30 minutes] [non-temperature rise rating].

] [2.3.2 Hollow Metal

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

] [2.3.3 Flush Steel Tubular Frame

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

] [2.3.4 Tin-Clad

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

] [2.3.5 Insulated

NOTE: Doors with a thermal conductance (U-value) of 0.85 W/square meter times K (0.15 btu/hr times sq f times f) are readily available. Specify and indicate on the drawings all doors with a lower thermal conductance (U-value) where indicated by the energy budget analysis. Review manufacturer's literature to verify the availability of doors with lower thermal conductance (U-values).

[Non-labeled insulated doors must be flush panel consisting of a urethane, polystyrene, or fiberglass insulation core covered on both faces with a bonded steel sheet not lighter than 1.3 mm (18 gauge) 18 gauge and covered on the edges with a steel perimeter channel not lighter than 1.3 mm (18 gauge) 18 gauge.] [Provide flush panel labeled [3/4] [1-1/2] [3] [4] hour rated doors consisting of fiberglass insulation core covered on both faces with a bonded steel sheet not lighter than 1.3 mm (18 gauge) 18 gauge and covered on the edges with a steel perimeter channel not lighter than 1.3 mm (18 gauge) 18 gauge. Fire rated doors must have a [maximum temperature rise rating of 121 degrees C 250 degrees F at 30 minutes] [non-temperature rise rating] [rating as shown]]. Door construction must provide a thermal conductance (U-value) of [0.85 W/square meter times K 0.15 btu/hr times sq

f times f] [____]. Doors may be fabricated using several panels. Panel edges must be encased in a steel channel not lighter than 1.9 mm (14 gauge) 14 gauge. Back joints in face sheets by an interior steel H column and covered with a steel surface-applied face plate. The Contractor must comply with EPA requirements in accordance with Section 01 62 35 RECYCLED / RECOVERED MATERIALS.

] 2.4 OPERATION

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

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

2.4.1 Power Operators

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

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

[2.4.2 Pneumatic Operators

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

Provide heavy duty industrial type operator, designed to operate the door at [0.3] [0.6] [0.9] [1.2] m [1] [2] [3] [4] ft per second with air pressure of [____] kPapsi. The operator must open, close, start, and stop the door smoothly. Control must be [[electrical, conforming to NEMA ICS 2 and NEMA ICS 6. Enclosures must be Type 12 (industrial use), Type 7 or 9 in

hazardous locations,] [pneumatic,] with [push button wall switches.]
[ceiling pull switches.] [roll-over floor treadle.]] [as indicated on the
drawings.]

]2.4.3 Electric Operators

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

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

2.4.3.1 Motors

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

2.4.3.2 Controls

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

2.4.4 Electrical Work

Provide conduit and wiring necessary for proper operation in accordance

with Section 26 20 00 INTERIOR DISTRIBUTION SYSTEM. Make flexible connections between doors and fixed supports with extra flexible type SO cable, except in hazardous locations where wiring conforms to NFPA 70. The cable must have spring-loaded automatic take-up reel coil cord or an equivalent and approved device.

2.4.5 Transformer

Conform to UL 506 for control transformers.

2.5 HARDWARE

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

[2.6 RAILS

Provide [steel] [_____] rails for horizontal sliding doors of [18 kilogram 40 pound] [as indicated].

]2.7 SAFETY DEVICE

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

2.8 ACCESSORIES

2.8.1 Track Hood

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

2.8.2 Glass Lights

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

2.8.3 Weatherstripping

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

[2.8.4 Locking Device

NOTE: Do not provide locking devices on doors of
required exitways unless approval is first obtained
from the Fire Protection Engineer. Delete this
paragraph if locking devices are not required.

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

] [2.8.5 Pass Door

Provide a pass door of nominal size [____] [as shown on the drawings]
complete with an integral frame. Factory install and fit the pass door.
The pass door must be complete with three full mortise spring hinges and a
mortise latch set with flush cup and lever handle with US32D finish.

] 2.8.6 Top Guide Rollers

Provide top guide rollers of the [horizontal] [____] type [with single
wheel] [as indicated]. Provide rollers of [steel] [malleable iron] [cast
iron] and sized for load conditions. Rollers must have [permanently
lubricated] [____] anti-friction bearings. Construct assemblies allowing
removal. Construct top roller assemblies to transmit the load from the
door to the building structure.

2.8.7 Bottom Rollers

Provide bottom rollers of [double-flanged cast steel] [welded pressed
steel] [____] having minimum tread diameter of [455] millimeter [18] inch
[____]. When the door leaf height-to-width exceeds 3, provide adjustable
rollers. Construct rollers for removal without removing the door leaf from
rail.

Treads must have bearing seats. Horizontal clearance between the wheel and
the rail must be [3] millimeter [1/8] inch [____] maximum at the bottom and
[6] millimeter [1/4] inch [____] maximum at edge of flanges.

Provide bearing seats must fit meeting the bearing manufacturer's
requirements. Bearings of [ball] [roller] type arranged to ensure that
vertical loads and horizontal wind loads will be transmitted from leaves to
wheels. Bearings with seals must retain grease and prevent the entrance of
dirt. Equip bearings with high-pressure grease fittings.

2.8.8 Track Cleaners

Provide door leaves with sweeps to clear debris from the rail head and
wheel flange grooves as the leaf is moved.

2.8.9 Toe Guards

Attach an adjustable full-length flexible toe guard reaching to the floor
to the exterior bottom edge of each leaf of bi-parting doors.

2.8.10 Warning Device

Provide alarms with each leaf which signals door movements. Device must be

[electronically] [electrically] [mechanically] activated.

2.8.11 Track Bumpers

When limit switch fails, bumpers must limit door travel and automatically stop the door.

2.8.12 Drive Clutch

When power is not applied, the clutch must disengage from the door drives.

2.8.13 Manual Operators

Provide a manual [removable crank] [hand wheel] device that open doors.
[Door leaf must have readily accessible brackets for crank storage.]

2.9 FINISH

2.9.1 Steel Surfaces of Exterior Doors

Provide galvanized coating on all steel surfaces of exterior doors, after first applying a shop-primed finish. Galvanizing must conform to [ASTM A 653/A 653M](#) or [ASTM A 924/A 924M](#), coating designation G90, for steel sheets. Prior to receiving primer, all surfaces must be cleaned and phosphate-treated for maximum paint adherence. Primer must be metallic oxide or synthetic resin primer of the manufacturer's standard type and applied by dipping or spraying.

2.9.2 Exposed Steel Surfaces of Interior Doors

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

[2.10 SPECIAL FINISHES

Provide surfaces of [aluminum] [_____] doors with [an anodic] [_____] coating conforming to [MIL-A-8625](#), Type II] [_____] ; coating must be sealed. Weight and effectiveness of sealing and coating(s) must be determined in accordance with [ASTM B 137](#) and [ASTM B 136](#)] [_____] . Apply [_____] coat(s) of [a clear [methacrylate lacquer] [_____]] to [_____] surfaces prior to shipment.

] [2.11 SHOP PAINTING

Paint [steel] [_____] portions of doors with [_____] coats of manufacturer's standard [rust-inhibitive] [Paint](#).

Paint [aluminum] [_____] surfaces which contact dissimilar metals with bituminous paint.

]PART 3 EXECUTION

3.1 INSTALLATION

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

[3.2 FIELD FINISHING

Finish doors to receive field finish in accordance with Section 09 90 00 PAINTING, GENERAL. Color must be [in accordance with Section 09 06 90 COLOR SCHEDULE] [_____].

]3.3 TESTING

Test doors in the presence of a representative of the door manufacturer and the Contracting Officer. Testing must consist of [10] complete opening and closing cycles for each individual door, each pair of doors, and [three] complete manual cycles. On the fifth and tenth cycles, check, the inflatable seals for wear and leakage. Switches must function properly, and operation of doors must be smooth.

[A successful soap-bubble test made with the doors closed must show an airtight condition.]

-- End of Section --