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inclined track, single-sliding, center-parting pair.

5. Type of power operators if used, service characteristics and connection points.

6. Location and type of controls if power operators are used.

7. Solid grouting of jambs in hollow core masonry.

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 653/A 653M (2004a) Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

ASTM C 1036 (2001) Flat Glass

FM GLOBAL (FM)

FM P7825 (2005) Approval Guide

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
NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)	
NFPA 70	(2005) National Electrical Code
NFPA 80	(1999) Fire Doors and Fire Windows
UNDERWRITERS LABORATORIES (UL)	
UL 10A	(1998; Rev thru Mar 2003) Tin-Clad Fire Doors
UL 10B	(1997; Rev thru Oct 2001) Fire Tests of Door Assemblies
UL 14B	(1998) Sliding Hardware for Standard, Horizontally Mounted Tin-Clad Fire Doors
UL 228	(2006) Door Closers-Holders, With or Without Integral Smoke Detectors
UL 325	(2002) Door, Drapery, Gate, Louver, and Window Operators and Systems
UL 33	(2003; Rev thru Feb 2004) Heat Responsive Links for Fire-Protection Service
UL 9	(2000; Rev thru Aug 2000) Fire Tests of Window Assemblies

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

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

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

SD-03 Product Data

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

Electrical Work[; G][; G, [____]]

Submit wiring diagrams for motors and controls

SD-08 Manufacturer's Instructions

Sliding fire doors

SD-10 Operation and Maintenance Data

Sliding fire doors, Data Package 2; [; G][; G, [____]]

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

1.3 DELIVERY AND STORAGE

Deliver fire doors to the job site wrapped in a protective covering bearing manufacturer's name and brand. Store doors in dry locations with adequate

ventilation, free from dust or water, and in such a manner to permit access for inspection and handling. Handle doors carefully to prevent damage. Remove damaged items that cannot be restored to like-new condition and provide new items.

PART 2 PRODUCTS

2.1 SLIDING FIRE DOORS

Shall conform to NFPA 80, UL 10B, and the requirements specified herein, and shall be listed (labeled). Provide doors complete with operating devices, hardware, and accessories.

2.2 FABRICATION

NOTE: Types of doors should be specified optionally unless appearance is a factor or if certain doors are unobtainable in ratings required. Manufacturer's catalogs should be consulted before a selection is made.

Provide one of the following types:

2.2.1 Steel-Covered Composite

Flush panel consisting of a manufactured core material, such as calcium-silicate block insulation, covered on both faces with a bonded steel sheet not lighter than 0.9 mm thick 20 gage and on edges with a steel perimeter channel not lighter than 1.2 mm thick 18 gage. Door panel edges shall be encased in a steel channel not lighter than 1.8 mm thick 14 gage. All joints in face sheets shall be backed by an interior steel "H" column and covered with a steel, surface-applied faceplate or adequately reinforced panels at connecting joints to provide a solid one piece unit when installed.

2.2.2 Hollow-Metal

Flush panel consisting of a resin-impregnated, kraft honeycomb core covered on both faces with a bonded steel sheet not lighter than [0.9 mm thick 20 gage for door openings up to and including 3000 mm 10 feet in height] [and] [1.2 mm thick 18 gage for door openings over 3000 mm 10 feet in height] and on edges with a steel perimeter channel not lighter than 1.2 mm thick 18 gage. Door panel edges shall be encased in a steel channel not lighter than 1.8 mm thick 14 gage. All joints in face sheets shall be backed by an interior steel "H" column and covered with a steel, surface-applied faceplate or adequately reinforced panels at connecting joints to provide a solid one piece unit when installed.

2.2.3 Corrugated Sheet Metal

Approximately 65 mm 2 1/2 inches thick consisting of two galvanized corrugated steel sheets not lighter than 0.8 mm thick 22 gage each sheet. The corrugations shall be approximately 65 mm 2 1/2 inches on centers and shall run vertically on one side of the door and horizontally on the other. A 2 mm 1/16 inch thick layer of noncombustible insulation material shall be provided between the sheets. Steel frame composed of structural steel shapes shall be provided at all edges of door leafs. Frame shall be

secured to corrugated sheets by through bolting or by welding.

2.2.4 Tin-Clad

Shall conform to **UL 10A**. Door shall have a core made up of layers of boards nailed to each other and encased in terne- or zinc-coated plates that are jointed together at their edges with nails driven through the joints into the core.

2.3 OPERATION

NOTE: Modify paragraph to agree with type of operation indicated on drawings. Power operators should be specified for sliding fire doors subject to heavy usage and required to remain closed. Power operated doors should also be used between heated production areas and unheated storage areas where there is frequent traffic between the two areas. Use last sentence to cover doors in hazardous locations such as ammunition loading areas. Refer to NFPA 70, National Electrical Code, for proper classes, groups, and divisions.

NOTE: If operator controls occur in hazardous locations, utilize the proper portion. Refer to NFPA 70 for requirements. NEMA Type 7 enclosures are suitable for indoor use in Class 1, Groups A, B, C, or D. NEMA Type 8 enclosures are suitable for indoor or outdoor use in Class 1, Groups A, B, C, or D. NEMA Type 9 enclosures are suitable for indoor use in Class II, Groups E, F, or G.

[Single-slide] [Center-parting] on [level] [inclined] tracks normally [closed] [open with automatic closing system of UL labeled [reel type] [or] [weight type with weight box of sheet steel not lighter than 1.5 mm thick 16 gage. Weight box shall be of continuous length for the entire travel of the weights.] [Provide fusible links as required by **NFPA 80** to activate at 71 degrees C 160 degrees F.] [Doors shall be manually operated and shall be operable with a force of 20 kilograms 45 pounds.] [Provide [pneumatic] [electric] operators conforming to **NFPA 80** and the requirements specified herein and a UL or (**FM P7825**) listed releasing device to permit automatic closing in case of power failure.] Provide safety edges to reverse direction of doors when an obstruction is encountered and limit switches to stop the doors in the fully open or fully closed position. Operators, holders, and release devices shall conform to **UL 228** and **UL 325** and be listed (labeled).] [Operating devices for use on door No. [_____] shall conform to Article 500 - of **NFPA 70**, Class [_____] , Group [_____] , Division [_____] .]

[2.3.1 Pneumatic Operators

NOTE: Select the applicable paragraph(s) from the following:

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

NOTE: If operator controls occur in hazardous locations utilize the proper portion. Refer to NFPA 70 for requirements. NEMA Type 7 enclosures are suitable for indoor use in Class 1, Groups A, B, C, or D. NEMA Type 8 enclosures are suitable for indoor or outdoor use in Class 1, Groups A, B, C, or D. NEMA Type 9 enclosures are suitable for indoor use in Class II, Groups E, F, or G.

Heavy-duty type designed to operate door at 0.3 meters one foot per second with air pressure of [_____] kPa psi. Operator shall open, close, start, and stop the door smoothly. Control equipment shall be [electrical conforming to NEMA ICS 1 and NEMA ICS 2; enclosures shall be NEMA ICS 6, Type 12,] [pneumatic] [pushbutton wall switches] [ceiling pull switches] [roll-over floor treadle] [as indicated] [except that for enclosures for use in the hazardous space indicated as [_____] shall conform to Article 500 of NFPA 70]. [Pushbuttons shall be the full-guarded type to prevent accidental operation.]]

[Electric Operators

NOTE: Modify the paragraph to suit the type of controls required. Insert the electrical characteristics that will be available for the door operation. Motors provided for operation on 480-volt circuits should have a voltage rating of 460 volts. Motors provided for operation on 208-volt circuits should have a voltage rating of 200 volts.

NOTE: If operator controls occur in hazardous locations, utilize the proper portion. Refer to NFPA 70 for requirements. NEMA Type 7 enclosures are suitable for indoor use in Class 1, Groups A, B, C, or D. NEMA Type 8 enclosures are suitable for indoor or outdoor use in Class 1, Groups A, B, C, or D. NEMA Type 9 enclosures are suitable for indoor use in Class II, Groups E, F, or G.

Heavy-duty type designed to operate door at not less than 0.2 two-thirds or more than 0.3 meters one foot per second. Control equipment shall be electrical conforming to NEMA ICS 1 and NEMA ICS 2; enclosures shall be NEMA ICS 6, Type 12, [pushbutton wall switches] [ceiling pull switches] [roll-over floor treadle] [as indicated] [except that for enclosures for use in the hazardous space indicated as [_____] shall conform to Article 500 of NFPA 70]. [Pushbuttons shall be the full-guarded type to prevent

accidental operation.] Electric power operators shall be of the type recommended by the door manufacturer and shall be complete with motor, controls, limit switches, magnetized reversing contactor, and other necessary accessories. The operator shall be so designed that the motor may be removed without disturbing the limit-switch timing and without affecting the emergency operators. The operator shall be provided with slipping clutch coupling to prevent stalling the motor. Where control voltages differ from motor voltage, a control voltage transformer shall be provided in and as part of the starter. Motors shall conform to NEMA MG 1; be high-starting torque, reversible type; be of sufficient kilowatt horsepower and torque output to move the door in either direction from any position; and produce a door travel speed of not less than 0.2 two-thirds or more than 0.3 meters one foot per second without exceeding the rated capacity. Motors shall be rated [_____] volts, [_____] hertz, [_____] -phase current and suitable for across-the-line magnetic starting. All motors shall be designed to operate at full capacity with a voltage variation of plus or minus 10 percent of the motor voltage rating. Each door motor shall have an enclosed, across-the-line type, magnetic reversing contactor having thermal overload protection.

]2.3.2 Electrical Work

NOTE: This paragraph applies to both pneumatic and
electric operated doors.

Shall conform to NFPA 70. Provide all control devices and all conduit and wiring from the motor to controls necessary for the proper operation of the doors. Electrical wiring for power from the power source to the operators or controls is specified in Division 16. Electrical wiring from controls to operators shall be provided under this section.

2.4 HARDWARE

Shall conform to NFPA 80, UL 14B, and the requirements specified herein, and shall be listed (labeled). Tracks, roller assemblies, and installation hardware shall be designed to support a dead load to 1-1/2 times the door and attached hardware without deformation which would interfere with the operation of the door. Tracks shall be formed of sheet steel not lighter than 1.8 mm thick 14 gage. Ball or roller bearing wheels or rollers with case-hardened races shall be provided on all devices incorporating wheels or rollers. Recessed steel pulls shall be provided on both sides of all door leaves [except for corrugated sheet metal doors which may be surface mounted]. Fusible links shall conform to UL 33 and shall be listed (labeled).

2.5 ACCESSORIES

2.5.1 Track Hood

NOTE: Delete paragraph if exterior doors mounted on
the exterior of the wall are not used.

Form of zinc-coated steel not lighter than 1.2 mm thick 18 gage.

2.5.2 Glass Lights

NOTE: Delete paragraph if glass lights are not used.

UL 9 listed (labeled) and ASTM C 1036, Type II, Class I, Form 1, M1 or M2, 6 mm 1/4 inch thick of size indicated, except that in no case shall the size be larger than permitted with the required fire rating.

2.5.3 Weather Stripping

NOTE: Modify paragraph to indicate where weather stripping is required. If weather stripping is not required, delete paragraph.

Provide on head, jamb, and sills of [exterior doors] [interior doors [____]]. [Form of 1.5 mm 1/16 inch thick fabric-reinforced neoprene. Install using steel continuous retainers.] [Provide nylon filament brush type in extruded aluminum retainers.]

2.5.4 Locking Device

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

[Provide heavy-duty hasp and staple on doors [____]. Locate on [____] side.] [Provide heavy-duty mortise sliding door locks with [double] [single] pin-tumbler cylinders.]

2.6 FINISH

2.6.1 Exterior Door[s] [and Interior Door[s]] With Hardware

Steel Surfaces of Exterior Door[s] [and Interior Door[s]] Including Hardware: Concealed surfaces shall be provided with a galvanized finish. Exposed surfaces shall be provided with a shop-primed galvanized finish. Galvanizing shall conform to ASTM A 653/A 653M, coating designation Z275 G90 for steel sheets and ASTM A 123/A 123M for assembled steel products. All galvanized surfaces damaged during fabrication shall be cleaned and coated with galvanized repair paint. Prior to receiving primer, thoroughly clean all surfaces and phosphate treat to assure maximum paint adherence. Primer shall be a metallic oxide or synthetic resin primer of the manufacturer's standard type and shall be applied by dipping or spraying.

2.6.2 Steel Surfaces of Interior Door[s] Including Hardware

NOTE: Delete paragraph if interior doors are to receive same finish as exterior doors.

Exposed surfaces shall be provided with a shop-primed finish or a

galvanized finish. Galvanizing shall conform to ASTM A 653/A 653M, coating designation Z275 G90 for steel sheets and ASTM A 123/A 123M for assembled steel products. Primer shall be a metallic oxide or synthetic resin primer of the manufacturer's standard type and shall be applied by dipping or spraying. Prior to receiving primer, thoroughly clean all surfaces and phosphate treat to assure maximum paint adherence.

2.7 LABELS

Fire doors shall bear labels of the UL or FM P7825 as evidence of the door[s] conforming to the rating[s] indicated. The construction details necessary to obtain the labels shall take precedence over details indicated or specified herein. Labels shall be a minimum of 20 by 50 mm 3/4 by 2 inch brass plate with 13 mm 1/2 inch high raised letters. Label shall be permanently attached to the door and shall not be painted.

2.7.1 Contractor's Option

In lieu of UL or FM P7825 labels, the fire doors may bear the label of a nationally recognized testing agency. The testing agency shall be adequately equipped and competent to perform services equivalent to the UL inspection and certification program. Copies of the test reports indicating compliance with required ratings shall accompany the certificates of compliance.

2.7.2 Oversized Doors

Where fire doors and frames exceed the size for which testing and labeling service is offered, furnish certificates of inspection from the testing laboratory. The certificate shall state that the doors, frames, and hardware to be provided are identical in design, materials, and construction to a door that has been tested and rated.

PART 3 EXECUTION

3.1 INSTALLATION

Install fire doors in accordance with NFPA 80 and the manufacturer's approved instructions and shop drawings. Doors shall be free from warp, twist, or distortion and shall be lubricated and properly adjusted to operate freely.

-- End of Section --