
USACE / NAVFAC / AFCEA / NASA UFGS-08330 (August 2004)

Preparing Activity: USACE MasterFormat™ 2004 - 08 30 00
Superseding
UFGS-08330A (October 2003)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UML dated 23 June 2005

Latest change indicated by CHG tags

SECTION TABLE OF CONTENTS

DIVISION 08 - DOORS AND WINDOWS

SECTION 08330

OVERHEAD ROLLING DOORS

08/04

PART 1 GENERAL

- 1.1 REFERENCES
- 1.2 DESCRIPTION
 - 1.2.1 Wind Load Requirements
 - 1.2.2 Operational Cycle Life
- 1.3 SUBMITTALS
- 1.4 DELIVERY AND STORAGE
- 1.5 WARRANTY
- 1.6 OPERATION AND MAINTENANCE MANUALS

PART 2 PRODUCTS

- 2.1 OVERHEAD ROLLING DOORS
 - 2.1.1 Curtains
 - 2.1.1.1 Non-Insulated Curtains
 - 2.1.1.2 Insulated Curtains
 - 2.1.2 Endlocks and Windlocks
 - 2.1.3 Bottom Bar
 - 2.1.4 Guides
 - 2.1.5 Barrel
 - 2.1.6 Springs
 - 2.1.7 Brackets
 - 2.1.8 Hoods
 - 2.1.9 Weatherstripping
 - 2.1.10 Slat Openings
 - 2.1.10.1 Vision Lites
 - 2.1.10.2 Ventilation/Vision Perforations
 - 2.1.11 Operation
 - 2.1.11.1 Manual Push-Up Operation
 - 2.1.11.2 Manual Hand-Chain Operation
 - 2.1.11.3 Manual Crank Operation
 - 2.1.11.4 Electric Power Operator With Auxiliary Chain Hoist

- Operation
- 2.1.12 Inertia Brake
- 2.1.13 Locking
- 2.1.14 Finish
- 2.2 FIRE DOORS

PART 3 EXECUTION

- 3.1 INSTALLATION
- 3.2 FIELD PAINTED FINISH
- 3.3 TESTS

-- End of Section Table of Contents --

USACE / NAVFAC / AFCEA / NASA UFGS-08330 (August 2004)

Preparing Activity: USACE MasterFormat™ 2004 - 08 30 00
Superseding
UFGS-08330A (October 2003)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated 23 June 2005

Latest change indicated by CHG tags

SECTION 08330

OVERHEAD ROLLING DOORS

08/04

NOTE: This guide specification covers the requirements for overhead rolling doors for commercial use.

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.

This guide specification includes tailoring options for non-insulated curtains, insulated curtains, manual push-up operation, manual hand chain operation, manual crank operation, electric power operation, and fire doors. Selection or deselection of a tailoring option will include or exclude that option in the section, but editing the resulting section to fit the project is still required.

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.

AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING
ENGINEERS (ASHRAE)

ASHRAE Fundamentals Handbook (2001) Fundamentals Handbook

ASTM INTERNATIONAL (ASTM)

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

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

ASTM E 84 (2004) Surface Burning Characteristics of
Building Materials

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA ICS 2 (2000; R 2004) Industrial Controls and
Systems: Controllers, Contactors, and
Overload Relays Rated Not More than 2000
Volts AC or 750 Volts DC

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

1.2 DESCRIPTION

NOTE: To provide maximum protection from the weather, exterior doors will normally be installed on the interior face of the wall. Weather protection features should be considered for doors installed on the exterior face of the wall.

The appropriate design and fire rating classification will be selected. Depending on the size of the fire door, labelling and oversize certificates and/or labels will vary with the individual manufacturers. Generic installation of a rolling fire door, as shown in NFPA 80 is applicable to masonry type fire walls and the manufacturer's listed procedures, or the authority having jurisdiction. Other wall construction listings such as non-masonry (drywall) will be accomplished per the individual manufacturer's listed procedures or as approved by the authority having jurisdiction. Manufacturer's catalogs should be consulted for required headroom and sideroom.

The following information must be indicated on the project drawings:

- a. Size of door openings.
- b. Type and details of door frames or jambs plus sideroom, jamb loads and door curtain deflection under pressure load.
- c. All wire and conduit from source of power to the operators and/or controls for electric power operated doors.

Overhead rolling doors shall be spring counterbalanced, rolling type, with interlocking slats, complete with guides, fastenings, hood, brackets, and operating mechanisms, and shall be designed for use on openings as indicated. Fire doors shall bear the Underwriters Laboratories, Warnock Hersey, Factory Mutual or other nationally recognized testing laboratory label for [Class [_____] rating.] [the rating listed on the drawings.] Each door shall be provided with a permanent label showing the manufacturer's name and address and the model/serial number of the door. Doors in excess of the labelled size shall be deemed oversize and shall be provided with a listing agency oversize label, or a listing agency oversize certificate, or a certificate signed by an official of the manufacturing company certifying that the door and operator have been designed to meet the specified requirements.

1.2.1 Wind Load Requirements

NOTE: For exterior doors, applicable wind load values will be determined based on ASCE 7, Minimum Design Loads For Buildings and Other Structures. Wind loads will be determined based on design wind

speed, importance factor, exposure classification,
mean roof height of the structure, building
classification, size of door, wall zone, and impact
resistance of the structure's openings.

Doors and components shall be designed to withstand the minimum design wind load of [960 Pa 20 psf] [[_____] Pa. psf.] Doors shall be constructed to sustain a superimposed load, both inward and outward, equal to 1-1/2 times the minimum design wind load. [Calculations shall be provided that prove the door design meets the design windload requirements.] [Test data showing compliance with design windload requirements for the specific door design tested in accordance with the uniform static air pressure difference test procedures of ASTM E 330 shall be provided.] Recovery shall be at least 3/4 of the maximum deflection within 24 hours after the test load is removed. Sound engineering principles may be used to interpolate or extrapolate test results to door sizes not specifically tested

1.2.2 Operational Cycle Life

NOTE: The particular needs of the project are those that will be used to determine frequency of usage. The normal operating frequency for overhead coiling doors is 10 cycles per day. Typical rolling doors are designed for 15,000-20,000 spring cycles. If doors are expected to operate at a significantly higher frequency, the number of cycles per day or hour should be specified.

All portions of the door and door operating mechanism that are subject to movement, wear, or stress fatigue shall be designed to operate through a minimum number of [10] [_____] cycles per [day] [hour]. One complete cycle of door operation is defined as when the door is in the closed position, moves to the full open position, and returns to the closed position.

1.3 SUBMITTALS

NOTE: Review submittal description (SD) definitions in Section 01330 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 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Approved Detail Drawings
Installation

Drawings showing the location of each door including schedules. Drawings shall include elevations of each door type, details and method of anchorage, details of construction, location and installation of hardware, shape and thickness of materials, details of joints and connections, and details of guides, power operators, controls, and other fittings.

SD-03 Product Data

Overhead Rolling Doors

Manufacturer's catalog data, test data, and summary of forces and loads on the walls/jambs.

Manufacturer's preprinted installation instructions.

SD-06 Test Reports

Tests

Written record of fire door drop test.

SD-04 Samples

Overhead Rolling Doors

Submit [three][_____] color samples of factory applied finishes.

SD-07 Certificates

Fire Doors

Oversize labels or certificates stating that the overhead

rolling doors conform to requirements of this section. Certificates for oversize fire doors stating that the doors and hardware are manufactured in compliance with the requirements for doors of this type and class and have been tested and meet the requirements for the class indicated. Certificate is not required when fire door has a listing agency label or oversize label on the door bottom bar.

SD-10 Operation and Maintenance Data

Operation and Maintenance Manuals

[Six] [_____] copies of the [system operation manual] [and] [system maintenance and repair manual] for each type of door and control system.

1.4 DELIVERY AND STORAGE

Doors shall be delivered to the jobsite wrapped in a protective covering with the brands and names clearly marked thereon. Doors shall be stored in a dry location that is adequately ventilated and free from dirt and dust, water, and other contaminants, and in a manner that permits easy access for inspection and handling.

1.5 WARRANTY

Manufacturer's standard performance guarantees or warranties that extend beyond a 1-year period shall be provided.

1.6 OPERATION AND MAINTENANCE MANUALS

Operating instructions outlining the step-by-step procedures required for motorized door and shutter operation for the overhead rolling door unit shall be provided. The instructions shall include the manufacturer's name, model number, service manual, parts list, and brief description of all equipment and their basic operating features. Maintenance instructions listing routine maintenance procedures, possible breakdowns and repairs, troubleshooting guides, and simplified diagrams for the equipment as installed shall be provided. A complete list of parts and supplies, source of supply, and a list of the high mortality maintenance parts shall be provided.

PART 2 PRODUCTS

2.1 OVERHEAD ROLLING DOORS

Doors shall be surface-mounted type with guides at jambs set back a sufficient distance to clear the opening. Exterior doors shall be mounted [as indicated.] [on interior side of walls.]

2.1.1 Curtains

The curtains shall roll up on a barrel supported at the head of opening on brackets, and shall be balanced by helical torsion springs. [[Steel] [stainless steel] slats for doors less than 4.6 m 15 feet wide shall be minimum bare metal thickness of 0.71 mm. 0.0281 inches.] [[Steel] [stainless steel] slats for doors from 4.6 to 6.4 m 15 to 21 feet wide shall be minimum bare metal thickness of 0.87 mm. 0.0344 inches.] [[Steel] [stainless steel] slats for doors 6.4 m 21 feet wide and wider shall be

minimum bare metal thickness of 1.1 mm. 0.0438 inches.] [Aluminum slats for doors up to 5.6 m 18 feet 4 inches wide shall be minimum 1.3 mm. 0.050 inches.] Slats shall be of the minimum bare metal decimal thickness required for the width indicated and the wind pressure specified above. Slats for fire doors over 3.6 m 12 feet wide and under 6 m 20 feet wide shall be not less than 0.87 mm 0.0329 inches steel. Slats for fire doors 6 m 20 feet wide or wider shall be not less than 1.1 mm 0.0438 inches steel.

2.1.1.1 Non-Insulated Curtains

NOTE: Where physical abuse of the doors may be a problem, the minimum decimal thickness of material (bare metal) should be specified for the various door widths. If physical abuse is not a factor, the decimal thickness of material may be determined by wind pressure alone and the references to door width will be deleted. The referenced bare metal thicknesses do not include galvanization or paint coating thicknesses.

Curtains shall be formed of interlocking slats of shapes standard with the manufacturer. Slats for exterior doors shall be flat type.

2.1.1.2 Insulated Curtains

NOTE: Several manufacturers can provide insulated slats that comply with all specified requirements. Check manufacturers' literature for information on R-value. At least one manufacturer makes an oversize slat that provides increased insulation.

Insulated slats will not be specified for fire doors.

The slat system shall supply a minimum R-value of 4 [_____] when calculated in accordance with ASHRAE Fundamentals Handbook. Slats shall be of the flat type as standard with the manufacturer. Slats shall consist of a [urethane] [polystyrene] core not less than 17 mm 11/16 inch thick, completely enclosed within metal facings. Exterior face of slats shall be gauge as specified for curtains. Interior face shall be not lighter than 0.56 mm. 0.0219 inches. The insulated slat assembly shall have a flame spread rating of not more than 25 and a smoke development factor of not more than 50 when tested in accordance with ASTM E 84.

2.1.2 Endlocks and Windlocks

The ends of each alternate slat for interior doors shall have [steel] [iron] endlocks of manufacturer's stock design. [Endlocks shall be provided in accordance with manufacturer's listing on fire doors when required by test results performed by the code listing agency.] [In addition to endlocks, non-rated exterior doors shall have the manufacturer's standard windlocks as required to withstand the wind load. Windlocks shall prevent the curtain from leaving guides because of deflection from specified wind pressure.]

2.1.3 Bottom Bar

The curtain shall have a [standard] [off-set] [sloped] bottom bar consisting of [two hot-dip galvanized steel angles for steel doors.] [two aluminum angles for aluminum doors.] [extruded aluminum T-shape.] A sensing edge shall be attached to the bottom bar of doors that are electric-power operated.

2.1.4 Guides

NOTE: Wind load forces acting on the coiling (rolling) door slats may cause severe tensile loadings at the door jambs. The magnitude of these tensile loads should be evaluated. Door jamb construction and door guide fastening must be designed to withstand the anticipated tensile loads. Omit the requirement for the detailed written analysis of forces and loads if not required. Omit all text relating to equipment for hazardous areas if not required for the project.

Guides shall be steel structural shapes or formed steel shapes, of a size and depth to provide proper clearance for operation and resistance under the design windload. Guides shall be attached to adjoining construction with fasteners recommended by the manufacturer. Spacing of fasteners shall be as required to meet the minimum design windload. Doors and guides in hazardous areas shall have static grounding.

2.1.5 Barrel

The barrel shall be steel pipe or commercial welded steel tubing of proper diameter for the size of curtain. Deflection shall not exceed 2.5 mm per meter 0.03 inch per foot of span. Ends of the barrel shall be closed with metal plugs, machined to fit the pipe. Aluminum plugs are acceptable on non-fire door barrels.

2.1.6 Springs

NOTE: Coordinate with manufacturer's literature to determine the amount of sideroom required for spring tension adjustment.

Oil tempered helical steel counter-balance torsion springs shall be installed within the barrel and shall be capable of producing sufficient torque to assure easy operation of the door curtain. Access shall be provided for spring tension adjustment from outside of the bracket without removing the hood.

2.1.7 Brackets

Brackets shall be of steel plates to close the ends of the roller-shaft housing, and to provide mounting surfaces for the hood. An operation bracket hub and shaft plugs shall have sealed prelubricated ball bearings.

2.1.1.8 Hoods

Hoods shall be [steel] [stainless steel] [aluminum] with minimum bare metal thickness of 0.56 mm 0.0219 inches formed to fit contour of the end brackets, and shall be reinforced with steel rods, rolled beads, or flanges at top and bottom edges. Multiple segment and single piece hoods shall be provided with support brackets of the manufacturer's standard design as required for adequate support.

2.1.1.9 Weatherstripping

Exterior doors shall be fully weatherstripped. A compressible and replaceable weather seal shall be attached to the bottom bar. Weather seal at door guides shall be continuous vinyl or neoprene, bulb or leaf type, or shall be nylon-brush type. A weather baffle shall be provided at the lintel or inside the hood. Weatherstripping shall be easily replaced without special tools.

2.1.1.10 Slat Openings

2.1.1.10.1 Vision Lites

Vision lites shall be those standard for the manufacturer. The lite assembly shall consist of [3 separate lites across and 5 slats high] [_____]. Opening shall have manufacturer's standard acrylic coverings.

2.1.1.10.2 Ventilation/Vision Perforations

Perforations shall be manufacturer's standard design and size. Weather stripping for door guides and hoods shall be omitted from perforated doors.

2.1.1.11 Operation

NOTE: The required method of operation will be shown on the drawings. Electric operation should be considered for large doors, as the controlled operating action will extend the life of the door. The indicated lifting force should be adequate unless conditions dictate that it be less. Manual push-up operation should be limited to doors not exceeding 2.4 m (8 feet) high or 7.4 square meters (80 square feet) in area. Omit all text relating to equipment for hazardous areas if not required for the project.

Doors shall be operated by means of [manual [push-up] [hand-chain] [crank] [with provision made for future installation of electric power]] [electric power with auxiliary chain hoist]. Equipment shall be designed and manufactured for usage in [non-hazardous] [hazardous Class [_____] , Division [_____] , and Group [_____] areas].

2.1.1.1.1 Manual Push-Up Operation

One lifting handle shall be provided on each side of the door. The maximum force required for lift-handle operation shall not exceed 111 N. 25 lbf. Pull-down straps or pole hooks shall be provided on bottom rail of doors over 2.1 m 7 feet high.

2.1.11.2 Manual Hand-Chain Operation

Operation shall be by means of a [galvanized] [bronze (in hazardous areas)] endless chain extending to within 915 mm 3 feet of floor. Reduction shall be provided by use of roller chain and sprocket drive or suitable gearing, to reduce the pull required on hand chain to not over 156 N. 35 lbf. Gears shall be high grade gray cast iron.

2.1.11.3 Manual Crank Operation

Operation shall be by means of a vertical shaft, gear box, and [crank located approximately 864 mm 34 inches above the floor] [or] [reduction gearing and awning type handle]. Gears shall be of high grade gray cast-iron. Gear reduction shall be provided to reduce pressure exerted on the crank to not over 156 N. 35 lbf.

2.1.11.4 Electric Power Operator With Auxiliary Chain Hoist Operation

NOTE: When power operators are specified, project drawings must indicate location of motors and control switches. Three-phase motors will be provided whenever three-phase electrical service is specified. The control switch stations will be located within the building, at least 1.5 m (5 feet) above the floor line. One control switch will be placed about 0.6 m (2 feet) from the door jamb track. Where dual control switches are necessary for the same door, the second switch control station will be located so the operator will have complete visibility of the door. Select "necessary means of reduction for medium-duty doors"; for doors less than 4.8 x 4.8 m (16 x 16 foot) used 1 to 2 times daily. Select "self-locking worm gear in oil bath for heavy-duty doors"; for doors 4.8 x 4.8 m (16 x 16 foot) or over used 3 times or more daily.

The term "Controls" refers to the electrical push button, key operated control stations. Requirements of hazardous environment should be exactly specified in terms of compliance with NFPA 70, Article 501, 502, 503, or 504. The motor, limit switches, reversing starter, or some other component requiring enclosures greater than NEMA 1 should be exactly specified.

Pneumatic sensing edge devices generally require more maintenance and are more likely to have malfunctions than electric sensing edge devices. The pneumatic device should be used when avoidance of electrical devices is critical. The electric sensing edge can be standard or fail-safe. The standard design must be tested daily to insure proper operation. The fail-safe design will not allow electric operation of the door if the sensing edge or wiring is defective. This reflects a common industry advisory statement.

Electric power operators shall be heavy-duty industrial type. The unit shall operate the door through the operational cycle life specified. The electric power operator shall be complete with electric motor, auxiliary operation, [necessary means of reduction for medium-duty doors,] [self-locking worm gear in oil bath for heavy-duty doors,] brake, mounting brackets, push button controls, limit switches, magnetic reversing starter, and all other accessories necessary to operate components specified in other paragraphs of this section. The operator shall be so designed that the motor may be removed without disturbing the limit-switches settings and without affecting the emergency chain operator. Doors shall be provided with an auxiliary operator for immediate emergency manual operation of the door in case of electrical failure. Auxiliary operation shall be by means of [galvanized] [bronze (in hazardous areas)] endless chain extending to within 915 mm 3 feet of the floor. The emergency manual operating mechanism shall be so arranged that it may be operated from the floor without affecting the settings of the limit switches. A mechanical device shall be included that will disconnect the motor from the drive operating mechanism when the auxiliary operator is used. Where control voltages differ from motor voltage, a control voltage transformer shall be provided in and as part of the electric power operator system. Control voltage shall not exceed 120 volts.

a. Motors: Drive motors shall conform to NEMA MG 1, shall be high-starting torque, reversible type, and shall be of sufficient wattage horsepower and torque output to move the door in either direction from any position at a speed range of 0.18 m per second (6 to 8 inches per second) 6 to 8 inches per second without exceeding the rated capacity. Motors shall be suitable for operation on [_____] volts, [60] [_____] hertz, [single] [3-] phase current and shall be suitable for across-the-line starting. Motors shall be designed to operate at full capacity over a supply voltage variation of plus or minus 10 percent of the motor voltage rating. Motors shall be provided with overload protection.

b. Controls: Control equipment shall conform to NEMA ICS 2. Enclosures shall conform to NEMA ICS 6, Type 12 (industrial use), Type 7 or 9 in hazardous locations, in accordance with NFPA 70. Exterior control stations shall be weatherproof key-operated type with corrosion-resistant cast-metal cover. Each control station shall be of the three position [button] [or] [switch] type, marked "OPEN," "CLOSE," and "STOP." The "OPEN" and "STOP" controls shall be of the momentary contact type with seal-in contact. The "CLOSE" control shall be of the [momentary contact type] [constant pressure type]. When the door is in motion and the "STOP" control is pressed, the door shall stop instantly and remain in the stop position; from the stop position, the door shall be operable in either direction by the "OPEN" or "CLOSE" controls. Controls shall be of the full-guarded type to prevent accidental operation. Readily adjustable limit switches shall be provided to automatically stop the doors at their fully open and closed positions.

c. Sensing Edge Device: The bottom edge of electric power operated doors shall have [an electric] [a pneumatic] sensing edge for [hazardous] [non-hazardous] areas that will reverse the door movement upon contact with an obstruction and cause the door to return to its full open position. The sensing edge shall not substitute for a limit switch. Exterior doors shall be provided with a combination compressible weather seal and sensing edge.

d. Electrical Work: Conduit and wiring necessary for proper operation shall be provided under Section 16402 INTERIOR DISTRIBUTION

SYSTEM. Flexible connections between doors and fixed supports shall be made with flexible type SJO cable, except in hazardous locations where wiring shall conform to NFPA 70, as appropriate. The cable shall have a spring-loaded automatic take up reel or a coil cord equivalent device.

2.1.12 Inertia Brake

NOTE: This should be an optional item because of the expense. Omit the paragraph if the brakes are not required. A mechanical inertia brake should be specified only for doors which have a high frequency of usage. This type of mechanism does not provide protection against failure of the pipe or pipe shaft. Selection of the brake unit size should be based on maximum moment force for the door. Inertia brakes have an opening and closing speed limit depending on the door size. Review the manufacturer policy regarding requirement for factory reset of inertia brake following one or more than one activation of the brake unit. Selection of brake size is based on the force required to stop the door. Factory reset is per the manufacturer's recommendations.

Overhead rolling door shall have a mechanical inertia brake device which will stop the door from free fall in any position, should there be a failure in the motor operator brake or roller chain drive. The unit shall be capable of being reset with a back drive action.

2.1.13 Locking

Locking shall consist of [interior slide bolts, suitable for padlock by others, for manual push-up doors] [chain lock keeper, suitable for padlock by others, for chain operated doors] [locking disc or slide bolt, suitable for padlock by others, for crank operated doors]. Locking for motor operated doors shall consist of self-locking gearing [and optional master keyed cylinder with electrical interlock] [with chain lock for emergency hand chain].

2.1.14 Finish

NOTE: G90 galvanized coating without baked on primer coat may be selected for steel exterior and interior doors subject to high moisture. G60 galvanized coating with baked-on primer coat and finish coat may be selected for most applications because of its superiority. Generally, there is no advantage to using the heavier G90 galvanizing under baked-on paint systems.

Editing of color reference sentence(s) shall be coordinated with the Government. Generally the 09915 COLOR SCHEDULE or drawing is used when the project is designed by an Architect or Interior designer. Color shall be selected from manufacturers standard colors or identified as a

manufacturers color in this specification only when the project is very simple and has minimal finishes.

When the Government directs that color be located in the drawings a note shall be added that states:
"Where color is shown as being specific to one manufacturer, an equivalent color by another manufacturer may be submitted for approval. Manufacturers and materials specified are not intended to limit the selection of equal colors from other manufacturers. The word "color" as used herein includes surface color and pattern."

Prior to specifying a custom color finish, research to determine if additional cost and lead time is feasible. Note there is often a minimum order requirement; this requirement will also affect future orders.

When a manufacturer's name, stock number, pattern, and color is used, be certain that the product conforms to this specification, as edited.

[Steel slats and hoods shall be hot-dip galvanized [G90 in accordance with ASTM A 653/A 653M,] [G60 in accordance with ASTM A 653/A 653M,] and shall be treated for paint adhesion and shall receive a [factory baked-on finish coat] [factory baked-on prime coat for field finishing].] [Aluminum slats and hoods shall receive a [mill] [clear anodized] [color anodized] finish.] [Stainless steel slats and hoods shall receive a [#2 B] [#4] finish.] Surfaces other than slats, hood, and faying surfaces shall be cleaned and treated to assure maximum paint adherence and shall be given a factory dip or spray coat of rust inhibitive metallic oxide or synthetic resin primer. Color shall be [in accordance with Section 09915 COLOR SCHEDULE] [as indicated on the drawings.] [selected from manufacturers standard colors.] [white.] [brown.] [gray.] [[_____.] Color listed is not intended to limit the selection of equal colors from other manufacturers.].

2.2 FIRE DOORS

NOTE: Activation of the automatic closing device on fire rated doors shall be by the building's fire alarm system when doors are located in smoke barriers, horizontal exits, or where life safety would be endangered by fire and smoke if the doors were left open. Fusible link devices will only be used in those areas where protection of property from fire is the only consideration. The NFPA 101 Life Safety Code should be consulted to determine acceptability of coiling fire doors in association with means of egress.

Fire rated rolling doors shall be provided at locations shown on the drawings. Fire doors shall conform to the requirements specified herein and to NFPA 80 for the class indicated. Doors shall bear the label or oversize label, or be provided with oversize certification of a recognized testing agency indicating the listed rating for the fire door. The

construction details necessary for the listed rating shall take precedence over conflicting details shown or specified herein. Fire doors shall be complete with hardware, accessories, and automatic closing device. An automatic closing device shall operate upon [the fusing of a 74 degree C 165 degree F replaceable fusible link.] [activation of the building's fire alarm system.]

PART 3 EXECUTION

3.1 INSTALLATION

Doors shall be installed in accordance with approved detail drawings and manufacturer's instructions. Anchors and inserts for guides, brackets, [motors,] [switches,] hardware, and other accessories shall be accurately located. Upon completion, doors shall be free from warp, twist, or distortion. Doors shall be lubricated, properly adjusted, and demonstrated to operate freely. Fire doors shall be installed in conformance with the requirements of NFPA 80 and the manufacturer's instructions.

3.2 FIELD PAINTED FINISH

Steel doors and frames shall be field painted in accordance with Section 09900 PAINTING, GENERAL. Weatherstrips shall be protected from paint. Finish shall be free of scratches or other blemishes. Color shall be [in accordance with Section 09915 COLOR SCHEDULE] [as indicated on the drawings] [_____].

3.3 TESTS

The fire doors shall be drop tested in accordance with NFPA 80 to show proper operation and full automatic closure and shall be reset in accordance with the manufacturer's instructions. A written record of initial test shall be provided to the Contracting Officer.

-- End of Section --