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SECTION 083323 - OVERHEAD COILING DOORS

TIPS:

To view non-printing **Editor's Notes** that provide guidance for editing, click on MasterWorks/Single-File Formatting/Toggle/Editor's Notes.

To read **detailed research, technical information about products and materials, and coordination checklists**, click on MasterWorks/Supporting Information.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Service doors[**with integral pass doors**].
2. Insulated service doors[**with integral pass doors**].
3. Fire-rated service doors.
4. Fire-rated, insulated service doors.

B. Related Requirements:

1. Section 055000 "Metal Fabrications" for miscellaneous steel supports, door-opening framing, corner guards, and bollards.

2. [Section 099113 "Exterior Painting"] [and] [Section 099123 "Interior Painting"] for finish painting of factory-primed doors.
3. Section 111200 "Parking Control Equipment" for parking control equipment interlocked to overhead coiling doors.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type and size of overhead coiling door and accessory.
 1. Include construction details, material descriptions, dimensions of individual components, profiles for slats, and finishes.
 2. Include rated capacities, operating characteristics, electrical characteristics, and furnished accessories.
 3. Include description of automatic-closing device and testing and resetting instructions.
- B. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data.
 1. Include plans, elevations, sections, and mounting details.
 2. Include details of equipment assemblies, and indicate dimensions, required clearances, method of field assembly, components, and location and size of each field connection.
 3. Include points of attachment and their corresponding static and dynamic loads imposed on structure.
 4. For exterior components, include details of provisions for assembly expansion and contraction and for excluding and draining moisture to the exterior.
 5. Show locations of controls, locking devices[, **detectors or replaceable fusible links**], and other accessories.
 6. Include diagrams for power, signal, and control wiring.
- C. Samples for Initial Selection: Manufacturer's finish charts showing full range of colors and textures available for units with factory-applied finishes.
 1. Include similar Samples of accessories involving color selection.
- D. Samples for Verification: For each type of exposed finish on the following components, in manufacturer's standard sizes:
 1. Curtain slats.
 2. Bottom bar.
 3. Guides.
 4. Hood.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For overhead coiling doors to include in maintenance manuals.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation and maintenance of units required for this Project.
- B. Fire-Rated Door Assemblies: Complying with NFPA 80; listed and labeled by qualified testing agency, for fire-protection ratings indicated, based on testing at as close to neutral pressure as possible according to [NFPA 252] [or] [UL 10B].
- C. Accessibility Standard: Comply with applicable provisions in [the USDOJ's "2010 ADA Standards for Accessible Design"] [the ABA standards of the Federal agency having jurisdiction] [and] [ICC A117.1] <Insert requirement>.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain overhead coiling doors from single source from single manufacturer.
 - 1. Obtain operators and controls from overhead coiling-door manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Structural Performance, Exterior Doors: Capable of withstanding the following design wind loads:
 - 1. Design Wind Load: [As indicated on Drawings] [Uniform pressure (velocity pressure) of **20 lbf/sq. ft. (960 Pa)**, acting inward and outward] <Insert loads>.
 - 2. Testing: According to ASTM E 330/E 330M [or DASHA 108 for garage doors and complying with acceptance criteria of DASHA 108] <Insert requirement>.
 - 3. Deflection Limits: Design overhead coiling doors to withstand design wind load without evidencing permanent deformation or disengagement of door components.
 - 4. Operability under Wind Load: Design overhead coiling doors to remain operable under [design] [uniform pressure (velocity pressure) of **20-lbf/sq. ft. (960-Pa)**] <Insert load> wind load, acting inward and outward.

2.3 DOOR ASSEMBLY <Insert drawing designation>

- A. [Service] [Insulated Service] Door: Overhead coiling door formed with curtain of interlocking metal slats.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Advanced Door Technologies; 300/400 Series or a comparable product by one of the following:
 - a. ACME Rolling Doors.
 - b. Alpine Overhead Doors, Inc.
 - c. C.H.I. Overhead Doors, Inc.
 - d. Clopay Building Products.
 - e. Cornell Iron Works, Inc.
 - f. Lawrence Roll-Up Doors, Inc.
 - g. McKeon Rolling Steel Door Company, Inc.
 - h. Overhead Door Corporation.
 - i. Raynor.
 - j. Wayne-Dalton Corp.
 - k. <Insert manufacturer's name>.

- B. Operation Cycles: Door components and operators capable of operating for not less than [10,000] [20,000] [50,000] [100,000] [150,000]. One operation cycle is complete when a door is opened from the closed position to the fully open position and returned to the closed position.
 1. Include tamperproof cycle counter.

- C. STC Rating: 25.

- D. Curtain R-Value: 8.0 deg F x h x sq. ft./Btu (1.409 K x sq. m/W).

- E. Door Curtain Material: [Galvanized steel] [Stainless steel] [Aluminum].

- F. Door Curtain Slats: [Curved] [Flat] profile slats of manufacturer's standard center-to-center height.
 1. Perforated Slats: Approximately 0.097-inch (2.5-mm) diameter holes on 0.125-inch (3.2-mm) staggered centers.
 2. Fenestrated Flat Slats: Approximately 8- by 1-inch (203- by 25-mm) openings spaced approximately 8 inches (203 mm) apart and beginning 12 inches (305 mm) from jamb guides in [two] [three] <Insert number> rows of slats at height indicated on Drawings.
 3. Vision Panels: Approximately 8- by 1-inch (203- by 25-mm) lite spaced approximately 8 inches (203 mm) apart and beginning 12 inches (305 mm) from end guides; in [two] [three] <Insert number> rows of slats at height indicated on Drawings.

- G. Bottom Bar: Two angles, each not less than [1-1/2 by 1-1/2 by 1/8 inch (38 by 38 by 3 mm) thick] <Insert dimensions>; fabricated from [hot-dip galvanized steel] [stainless steel] [or] [aluminum extrusions] and finished [to match door] <Insert requirement>.

- H. Curtain Jamb Guides: [Galvanized steel] [Stainless steel] [Aluminum] with exposed [painted] [mill] finish.

- I. Pass Door(s): [Hinged] [Rigid] frame with [lockset] [exit hardware].

- J. Hood: [Match curtain material and finish] [Galvanized steel] [Stainless steel] [Aluminum].
 1. Shape: [Half hex] [Round] [Square].

2. Mounting: [**Face of wall**] [**Between jambs**] [**As indicated on Drawings**].
- K. Locking Devices: Equip door with [**slide bolt for padlock**] [**and**] [**chain lock keeper**].
1. Locking Device Assembly: Single-jamb side locking bars, operable from [**inside**] [**outside**].
- L. Manual Door Operator: [**Push-up operation**] [**Chain-hoist operator**] [**Manufacturer's standard crank operator**].
1. Provide operator with through-wall operation.
 2. Provide operator with manufacturer's standard removable operating arm.
- M. Electric Door Operator:
1. Usage Classification: [**Heavy duty, 25 or more cycles per hour and more than 90 cycles per day**] [**Standard duty, up to 25 cycles per hour and up to 90 cycles per day**] [**Medium duty, up to 12 cycles per hour and up to 50 cycles per day**] [**Light duty, up to 10 cycles per hour**] <Insert classification>.
 2. Operator Location: [**Top of hood**] [**Front of hood**] [**Wall**] [**Bench**] [**Through wall**] [**As indicated on Drawings**].
 3. Safety: Listed according to UL 325 by a qualified testing agency for commercial or industrial use[; **moving parts of operator enclosed or guarded if exposed and mounted at 8 feet (2.44 m) or lower**].
 4. Motor Exposure: [**Interior**] [**Exterior, wet, and humid**].
 5. Motor Electrical Characteristics:
 - a. Horsepower: [**1/3**] [**1/2**] [**3/4**] [**1**] [**1.5**] [**2**] [**3**] hp.
 - b. Voltage: [**115-V ac**] [**208-V ac**] [**230-V ac**], single phase, 60 Hz.
 - c. Voltage: [**208-V ac**] [**230-V ac**] [**460-V ac**], three phase, 60 Hz.
 6. Emergency Manual Operation: [**Push-up**] [**Chain**] type.
 7. Obstruction-Detection Device: Automatic [**photoelectric sensor**] [**electric sensor edge on bottom bar**] [**pneumatic sensor edge on bottom bar**] [; **self-monitoring type**] [; **non-monitoring type**].
 - a. Sensor Edge Bulb Color: [**Black**] [**As selected by Architect from manufacturer's full range**] <Insert color>.
 8. Control Station(s): [**Interior mounted**] [**Exterior mounted**] [**Where indicated on Drawings**] <Insert location>.
 9. Other Equipment: [**Audible and visual signals**] [**Portable radio-control system**] <Insert device>.
- N. Curtain Accessories: Equip door with [**smoke seals**] [**weatherseals**] [**astragal**] [**push/pull handles**] [**pull-down strap**] [**poll hook**] [**and**] [**automatic-closing device**] <Insert item>.
- O. Door Finish:
1. Aluminum Finish: [**Mill**] [**Clear anodized**] [**Light bronze anodized**] [**Medium bronze anodized**] [**Dark bronze anodized**] [**Black anodized**].

2. Powder-Coated Finish: [**Color as indicated by manufacturer's designations**] [**Color matching Architect's sample**] [**Color as selected by Architect from manufacturer's full range**] <Insert color>.
3. Factory Prime Finish: Manufacturer's standard color.
4. Stainless-Steel Finish: [**No. 2B (bright, cold rolled)**] [**No. 4 (polished directional satin)**] <Insert finish>.
5. Interior Curtain-Slat Facing: [**Match finish of exterior curtain-slat face**] [**Finish as indicated by manufacturer's designations**] [**Finish matching Architect's sample**] [**Finish as selected by Architect from manufacturer's full range**] <Insert finish>.

2.4 FIRE-RATED DOOR ASSEMBLY <Insert drawing designation>

- A. Fire-Rated [**Service**] [**Insulated Service**] Door: Overhead fire-rated coiling door formed with curtain of interlocking metal slats.
 1. Basis-of-Design Product: Subject to compliance with requirements, provide Advanced Door Technologies; 700 Series or a comparable product by one of the following:
 - a. ACME Rolling Doors.
 - b. Alpine Overhead Doors, Inc.
 - c. C.H.I. Overhead Doors, Inc.
 - d. Clopay Building Products.
 - e. Cornell Iron Works, Inc.
 - f. Lawrence Roll-Up Doors, Inc.
 - g. McKeon Rolling Steel Door Company, Inc.
 - h. Overhead Door Corporation.
 - i. Raynor.
 - j. Wayne-Dalton Corp.
 - k. <Insert manufacturer's name>.
- B. Operation Cycles: Door components and operators capable of operating for not less than [**10,000**] [**20,000**] [**50,000**] [**100,000**] [**150,000**]. One operation cycle is complete when a door is opened from the closed position to the fully open position and returned to the closed position.
 1. Include tamperproof cycle counter.
- C. Fire Rating: [**3/4 hour**] [**1-1/2 hours**] [**3 hours**].
- D. STC Rating: 25.
- E. Curtain R-Value: **4.2 deg F x h x sq. ft./Btu** (**0.740 K x sq. m/W**).
- F. Door Curtain Material: [**Galvanized**] [**Stainless**] steel.
- G. Door Curtain Slats: [**Curved**] [**Flat**] profile slats of manufacturer's standard center-to-center height.
- H. Curtain Jamb Guides: [**Galvanized**] [**Stainless**] steel with exposed finish matching curtain slats.
- I. Hood: [**Match curtain material and finish**] [**Galvanized steel**] [**Stainless steel**].

1. Shape: [**Half hex**] [**Round**] [**Square**].
 2. Mounting: [**Face of wall**] [**Between jambs**] [**As indicated on Drawings**].
- J. Locking Devices: Equip door with [**slide bolt for padlock**] [**and**] [**chain lock keeper**].
1. Locking Device Assembly: Single-jamb side locking bars, operable from [**inside**] [**outside**].
- K. Manual Door Operator: [**Push-up operation**] [**Chain-hoist operator**] [**Manufacturer's standard crank operator**].
1. Provide operator with manufacturer's standard removable operating arm.
- L. Electric Door Operator:
1. Usage Classification: [**Heavy duty, 25 or more cycles per hour and more than 90 cycles per day**] [**Standard duty, up to 25 cycles per hour and up to 90 cycles per day**] [**Medium duty, up to 12 cycles per hour and up to 50 cycles per day**] [**Light duty, up to 10 cycles per hour**] <Insert classification>.
 2. Operator Location: [**Top of hood**] [**Front of hood**] [**Wall**] [**Bench**] [**As indicated on Drawings**].
 3. Safety: Listed according to UL 325 by a qualified testing agency for commercial or industrial use[; **moving parts of operator enclosed or guarded if exposed and mounted at 8 feet (2.44 m) or lower**].
 4. Motor Exposure: [**Interior**] [**Exterior, wet, and humid**].
 5. Motor Electrical Characteristics:
 - a. Horsepower: [**1/3**] [**1/2**] [**3/4**] [**1**] [**1.5**] [**2**] [**3**] hp.
 - b. Voltage: [**115-V ac**] [**208-V ac**] [**230-V ac**], single phase, 60 Hz.
 - c. Voltage: [**208-V ac**] [**230-V ac**] [**460-V ac**], three phase, 60 Hz.
 6. Emergency Manual Operation: [**Push-up**] [**Chain**] type.
 7. Obstruction-Detection Device: Automatic [**photoelectric sensor**] [**electric sensor edge on bottom bar**] [**pneumatic sensor edge on bottom bar**] [; **self-monitoring type**] <Insert type>.
 - a. Sensor Edge Bulb Color: [**Black**] [**As selected by Architect from manufacturer's full range**] <Insert color>.
 8. Control Station(s): [**Interior mounted**] [**Exterior mounted**] [**Where indicated on Drawings**] <Insert location>.
 9. Other Equipment: [**Audible and visual signals**] [**Portable radio-control system**] <Insert device>.
- M. Curtain Accessories: Equip door with [**smoke seals,**] [**automatic-closing device,**] [**astragal**] [**push/pull handles**] [**pull-down strap**] [**poll hook**] [**and**] <Insert item>.
- N. Door Finish:

1. Powder-Coated Finish: [Color as indicated by manufacturer's designations] [Color matching Architect's sample] [Color as selected by Architect from manufacturer's full range] <Insert color>.
2. Factory Prime Finish: Manufacturer's standard color.
3. Stainless-Steel Finish: [No. 2B (bright, cold rolled)] [No. 4 (polished directional satin)] <Insert finish>.
4. Interior Curtain-Slat Facing: [Match finish of exterior curtain-slat face] [Finish as indicated by manufacturer's designations] [Finish matching Architect's sample] [Finish as selected by Architect from manufacturer's full range] <Insert finish>.

2.5 MATERIALS, GENERAL

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.6 DOOR CURTAIN MATERIALS AND CONSTRUCTION

- A. Door Curtains: Fabricate overhead coiling-door curtain of interlocking metal slats, designed to withstand wind loading indicated, in a continuous length for width of door without splices. Unless otherwise indicated, provide slats of thickness and mechanical properties recommended by door manufacturer for performance, size, and type of door indicated, and as follows:
 1. Steel Door Curtain Slats: Zinc-coated (galvanized), cold-rolled structural-steel sheet; complying with ASTM A 653/A 653M, with G90 (Z275) zinc coating; nominal sheet thickness (coated) of 0.028 inch (0.71 mm); and as required.
 2. Stainless-Steel Door Curtain Slats: ASTM A 666, Type 304; sheet thickness of 0.025 inch (0.64 mm); and as required.
 3. Aluminum Door Curtain Slats: ASTM B 209 (ASTM B 209M) sheet or ASTM B 221 (ASTM B 221M) extrusions, alloy and temper standard with manufacturer for type of use and finish indicated; thickness of 0.050 inch (1.27 mm); and as required.
 4. Vision-Panel Glazing: Manufacturer's standard clear glazing, fabricated from transparent acrylic sheet.
 5. Insulation: Fill slats for insulated doors with manufacturer's standard thermal insulation complying with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, according to ASTM E 84 or UL 723. Enclose insulation completely within slat faces.
 6. Metal Interior Curtain-Slat Facing: Match metal of exterior curtain-slat face, with [minimum steel thickness of 0.025 inch (0.64 mm)] [and] [minimum aluminum thickness of 0.036 inch (0.91 mm)].
- B. Curtain Jamb Guides: Manufacturer's standard angles or channels and angles of same material and finish as curtain slats unless otherwise indicated, with sufficient depth and strength to retain curtain, to allow curtain to operate smoothly, and to withstand loading. Slot bolt holes for guide adjustment. Provide removable stops on guides to prevent overtravel of curtain, and to meet loads for a continuous bar for holding windlocks.
- C. Pass Door(s): Swinging-door and frame assembly constructed integrally with the coiling-door assembly. Comply with the accessibility standard of authorities having jurisdiction.

1. Door Frame and Integral Jamb Guide: Fabricate of angles or channels and angles of same material and finish as curtain slats unless otherwise indicated, with sufficient depth and strength to retain curtain, to allow curtain to operate smoothly, and to withstand loading.
2. Hinged Frame: Hinged pass door and frame that swings out of the way, as a unit, to allow use of the full coiling-door opening width. One jamb of the pass-door frame is hinged and the other jamb includes a guide for the lower, narrower part of the coiling-door curtain.
3. Locking Hardware:
 - a. [Lockset] [Exit Hardware]: [As specified in Section 087100 "Door Hardware."] [As specified in Section 087111 "Door Hardware (Descriptive Specification)."] [As selected by Architect from manufacturer's full range.] <Insert requirement.>
 - b. Lock Cylinders: As [specified in Section 087100 "Door Hardware"] [specified in Section 087111 "Door Hardware (Descriptive Specification)"] [standard with manufacturer] [and keyed to building keying system].
 - c. Keys: [Two] [Three] <Insert number> for each cylinder.

2.7 HOODS

- A. General: Form sheet metal hood to entirely enclose coiled curtain and operating mechanism at opening head. Contour to fit end brackets to which hood is attached. Roll and reinforce top and bottom edges for stiffness. Form closed ends for surface-mounted hoods and fascia for any portion of between-jamb mounting that projects beyond wall face. Equip hood with intermediate support brackets as required to prevent sagging.
 1. Galvanized Steel: Nominal 0.024-inch- (0.61-mm-) thick, hot-dip galvanized-steel sheet with G90 (Z275) zinc coating, complying with ASTM A 653/A 653M.
 2. Stainless Steel: 0.024-inch- (0.61-mm-) thick, stainless-steel sheet, Type 304, complying with ASTM A 666.
 3. Aluminum: 0.024-inch- (0.61-mm-) thick aluminum sheet complying with ASTM B 209 (ASTM B 209M), of alloy and temper recommended by manufacturer and finisher for type of use and finish indicated.
 4. Exterior-Mounted Doors: Fabricate hood to act as weather protection.

2.8 LOCKING DEVICES

- A. Slide Bolt: Fabricate with side-locking bolts to engage through slots in tracks for locking by padlock, located on both left and right jamb sides, operable from coil side.
- B. Chain Lock Keeper: Suitable for padlock.
- C. Safety Interlock Switch: Equip power-operated doors with safety interlock switch to disengage power supply when door is locked.

2.9 CURTAIN ACCESSORIES

- A. Smoke Seals: Equip each fire-rated door with replaceable smoke-seal perimeter gaskets or brushes for smoke and draft control as required for door listing and labeling by a qualified testing agency.
- B. Weatherseals for Exterior Doors: Equip each exterior door with weather-stripping gaskets fitted to entire exterior perimeter of door for a weather-resistant installation unless otherwise indicated.
 - 1. At door head, use **1/8-inch- (3-mm-)** thick, replaceable, continuous-sheet baffle secured to inside of hood or field-installed on the header.
 - 2. At door jambs, use replaceable, adjustable, continuous, **[flexible, 1/8-inch- (3-mm-) thick seals of flexible vinyl, rubber, or neoprene] [nylon brushes] <Insert material>**.
- C. Astragal for Interior Doors: Equip each door bottom bar with a replaceable, adjustable, continuous, compressible gasket of flexible vinyl, rubber, or neoprene as a cushion bumper.
- D. Push/Pull Handles: Equip each push-up-operated or emergency-operated door with lifting handles on each side of door, finished to match door.
- E. Pull-Down Strap: Provide pull-down straps for doors more than **84 inches (2130 mm)** high.
- F. Poll Hooks: Provide pole hooks and poles for doors more than **84 inches (2130 mm)** high.
- G. Automatic-Closing Device: Equip each fire-rated door with an automatic-closing device or holder-release mechanism and governor unit complying with NFPA 80 and an easily tested and reset release mechanism. **[Testing for manually operated doors shall allow resetting by opening the door without retensioning the counterbalance mechanism][Release mechanism for motor-operated doors shall allow testing without mechanical release of the door.]** Automatic-closing device shall be designed for activation by the following:
 - 1. Replaceable fusible links with temperature rise and melting point of **165 deg F (74 deg C)** interconnected and mounted on both sides of door opening.
 - 2. Manufacturer's standard UL-labeled smoke detector and door-holder-release devices.
 - 3. Manufacturer's standard UL-labeled heat detector and door-holder-release devices.
 - 4. Building fire-detection, smoke-detection, and -alarm systems.

2.10 COUNTERBALANCE MECHANISM

- A. General: Counterbalance doors by means of manufacturer's standard mechanism with an adjustable-tension, steel helical torsion spring mounted around a steel shaft and contained in a spring barrel connected to top of curtain with barrel rings. Use grease-sealed bearings or self-lubricating graphite bearings for rotating members.
- B. Counterbalance Barrel: Fabricate spring barrel of manufacturer's standard hot-formed, structural-quality, carbon-steel pipe, of sufficient diameter and wall thickness to support rolled-up curtain without distortion of slats and to limit barrel deflection to not more than **0.03 in./ft. (2.5 mm/m)** of span under full load.

- C. Counterbalance Spring: One or more oil-tempered, heat-treated steel helical torsion springs. Size springs to counterbalance weight of curtain, with uniform adjustment accessible from outside barrel. Secure ends of springs to barrel and shaft with cast-steel barrel plugs.
- D. Torsion Rod for Counterbalance Shaft: Fabricate of manufacturer's standard cold-rolled steel, sized to hold fixed spring ends and carry torsional load.
- E. Brackets: Manufacturer's standard mounting brackets of either cast iron or cold-rolled steel plate.

2.11 MANUAL DOOR OPERATORS

- A. General: Equip door with manual door operator by door manufacturer.
- B. Push-up Door Operation: Lift handles and pull rope for raising and lowering doors, with counterbalance mechanism designed so that required lift or pull for door operation does not exceed [**25 lbf (111 N)**] <Insert value>.
- C. Chain-Hoist Operator: Consisting of endless steel hand chain, chain-pocket wheel and guard, and gear-reduction unit with a maximum [**25-lbf (111-N)**] [**30-lbf (133-N)**] <Insert value> force for door operation. Provide alloy-steel hand chain with chain holder secured to operator guide.
- D. Crank Operator: Consisting of crank and crank gearbox, steel crank drive shaft, and gear-reduction unit, of type indicated. Size gears to require not more than [**25-lbf (111-N)**] [**30-lbf (133-N)**] <Insert value> force to turn crank. Fabricate gearbox to be oiltight and to completely enclose operating mechanism. Provide manufacturer's standard crank-locking device.

2.12 ELECTRIC DOOR OPERATORS

- A. General: Electric door operator assembly of size and capacity recommended and provided by door manufacturer for door and operation-cycles requirement specified, with electric motor and factory-prewired motor controls, starter, gear-reduction unit, solenoid-operated brake, clutch, control stations, control devices, integral gearing for locking door, and accessories required for proper operation.
 - 1. Comply with NFPA 70.
 - 2. Control equipment complying with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6, with NFPA 70 Class 2 control circuit, maximum 24-V ac or dc.
- B. Usage Classification: Electric operator and components capable of operating for not less than number of cycles per hour indicated for each door.
- C. Door Operator Location(s): Operator location indicated for each door.
 - 1. Top-of-Hood Mounted: Operator is mounted to the right or left door head plate with the operator on top of the door-hood assembly and connected to the door drive shaft with drive chain and sprockets. Headroom is required for this type of mounting.

2. Front-of-Hood Mounted: Operator is mounted to the right or left door head plate with the operator on coil side of the door-hood assembly and connected to the door drive shaft with drive chain and sprockets. Front clearance is required for this type of mounting.
 3. Wall Mounted: Operator is mounted to the inside front wall on the left or right side of door and connected to door drive shaft with drive chain and sprockets. Side room is required for this type of mounting. Wall-mounted operator can also be mounted above or below shaft; if above shaft, headroom is required.
 4. Bench Mounted: Operator is mounted to the right or left door head plate and connected to the door drive shaft with drive chain and sprockets. Side room is required for this type of mounting.
 5. Through-Wall Mounted: Operator is mounted on other side of wall from coil side of door.
- D. Motors: Reversible-type motor[**with controller**] for motor exposure indicated for each door assembly.
1. Electrical Characteristics: Minimum as indicated for each door assembly. If not indicated, large enough to start, accelerate, and operate door in either direction from any position, at a speed not less than **8 in./sec. (203 mm/s)** and not more than **12 in./sec. (305 mm/s)**, without exceeding nameplate ratings or service factor.
 2. Operating Controls, Controllers, Disconnect Switches, Wiring Devices, and Wiring: Manufacturer's standard unless otherwise indicated.
 3. Coordinate wiring requirements and electrical characteristics of motors and other electrical devices with building electrical system and each location where installed.
- E. Limit Switches: Equip each motorized door with adjustable switches interlocked with motor controls and set to automatically stop door at fully opened and fully closed positions.
- F. Obstruction-Detection Devices: External entrapment protection consisting of indicated automatic safety sensor capable of protecting full width of door opening.[**For non-fire-rated doors, activation of device immediately stops and reverses downward door travel.**][**For fire-rated doors, activation delays closing.**]
1. Photoelectric Sensor: Manufacturer's standard system designed to detect an obstruction in door opening without contact between door and obstruction.
 - a. Self-Monitoring Type: Designed to interface with door operator control circuit to detect damage to or disconnection of sensing device. When self-monitoring feature is activated, door closes only with sustained or constant pressure on close button.
 2. Electric Sensor Edge: Automatic safety sensor edge, located within astragal or weather stripping mounted to bottom bar. Contact with sensor activates device. Connect to control circuit using manufacturer's standard take-up reel or self-coiling cable.
 - a. Self-Monitoring Type: Four-wire-configured device designed to interface with door operator control circuit to detect damage to or disconnection of sensor edge.
 - b. Non-Monitoring Type: Two-wire-configured device.
 3. Pneumatic Sensor Edge: Automatic safety sensor edge, located within astragal or weather stripping mounted to bottom bar. Contact with sensor activates device.

- G. Control Station: Three-button control station in fixed location with momentary-contact push-button controls labeled "Open" and "Stop" and sustained- or constant-pressure push-button control labeled "Close."
1. Interior-Mounted Units: Full-guarded, [**surface-**] [**flush-**]mounted, heavy-duty type, with general-purpose NEMA ICS 6, Type 1 enclosure.
 2. Exterior-Mounted Units: Full-guarded, standard-duty, surface-mounted, weatherproof type, NEMA ICS 6, Type 4 enclosure, key operated.
- H. Emergency Manual Operation: Equip each electrically powered door with capability for emergency manual operation. Design manual mechanism so required force for door operation does not exceed [**25 lbf (111 N)**] [**30 lbf (133 N)**] <Insert value>.
- I. Emergency Operation Disconnect Device: Equip operator with hand-operated disconnect mechanism for automatically engaging manual operator and releasing brake for emergency manual operation while disconnecting motor without affecting timing of limit switch. Mount mechanism so it is accessible from floor level. Include interlock device to automatically prevent motor from operating when emergency operator is engaged.
- J. Motor Removal: Design operator so motor may be removed without disturbing limit-switch adjustment and without affecting emergency manual operation.
- K. Audible and Visual Signals: Audible alarm and visual indicator lights in compliance with the accessibility standard.
- L. Portable Radio-Control System: Consisting of [**one**] [**two**] <Insert number> of the following per door operator:
1. Three-channel universal coaxial receiver to open, close, and stop door.
 2. Portable control device to open and stop door may be momentary-contact type; control to close door shall be sustained- or constant-pressure type.
 3. Remote-antenna mounting kit.

2.13 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM/NOMMA 500 for recommendations for applying and designating finishes.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.14 ALUMINUM FINISHES

- A. Mill Finish: Manufacturer's standard.
- B. Clear Anodic Finish: AAMA 611, [**AA-M12C22A41, Class I, 0.018 mm**] [**AA-M12C22A31, Class II, 0.010 mm**] or thicker.

- C. Color Anodic Finish: AAMA 611, [**AA-M12C22A42/A44, Class I, 0.018 mm**] [**AA-M12C22A32/A34, Class II, 0.010 mm**] or thicker.
- D. Powder-Coat Finish: AAMA 2603. Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

2.15 STEEL AND GALVANIZED-STEEL FINISHES

- A. Factory Prime Finish: Manufacturer's standard primer, compatible with field-applied finish. Comply with coating manufacturer's written instructions for cleaning, pretreatment, application, and minimum dry film thickness.
- B. Powder-Coat Finish: Manufacturer's standard baked-on finish consisting of prime coat and thermosetting topcoat. Comply with coating manufacturer's written instructions for cleaning, pretreatment, application, and minimum dry film thickness.

2.16 STAINLESS-STEEL FINISHES

- A. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.
- B. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.
 - 1. Run grain of directional finishes with long dimension of each piece.
 - 2. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
 - 3. Directional Satin Finish: No. 4.
- C. Bright, Cold-Rolled, Unpolished Finish: No. 2B.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates areas and conditions, with Installer present, for compliance with requirements for substrate construction and other conditions affecting performance of the Work.
- B. Examine locations of electrical connections.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install overhead coiling doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; according to manufacturer's written instructions and as specified.

- B. Install overhead coiling doors, hoods, controls, and operators at the mounting locations indicated for each door.
- C. Accessibility: Install overhead coiling doors, switches, and controls along accessible routes in compliance with the accessibility standard.
- D. Fire-Rated Doors: Install according to NFPA 80.
- E. Power-Operated Doors: Install[**automatic garage doors openers**] according to UL 325.

3.3 STARTUP SERVICE

- A. Engage a factory-authorized service representative to perform startup service.
 - 1. Complete installation and startup checks according to manufacturer's written instructions.
 - 2. Test and adjust controls and safety devices. Replace damaged and malfunctioning controls and equipment.
 - 3. Test door closing when activated by detector or alarm-connected automatic-closing system. Reset door-closing mechanism after successful test.

3.4 ADJUSTING

- A. Adjust hardware and moving parts to function smoothly so that doors operate easily, free of warp, twist, or distortion.
 - 1. Adjust exterior doors and components to be weather resistant.
- B. Lubricate bearings and sliding parts as recommended by manufacturer.
- C. Adjust seals to provide tight fit around entire perimeter.

3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain overhead coiling doors.

END OF SECTION 083323