SECTION 083613 - SECTIONAL DOORS

1. GENERAL
	* + 1. SUMMARY
				1. Section Includes:

Sectional-door assemblies.

* + - 1. SUBMITTALS
				1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
				2. Manufacturer’s installation instructions shall be provided along with product data.
				3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
				4. Product Data: For each type and size of sectional door and accessory.

Include construction details, material descriptions, dimensions of individual components, profile door sections, and finishes.

For power-operated doors, include rated capacities, operating characteristics, electrical characteristics, and furnished accessories.

* + - * 1. Shop Drawings: For each installation and for components not dimensioned or detailed in manufacturer's product data.

Include plans, elevations, sections, and mounting details.

Include details of equipment assemblies. Indicate dimensions, required clearances, method of field assembly, components, and location and size of each field connection.

Include points of attachment and their corresponding static and dynamic loads imposed on structure.

Retain subparagraph below for power-operated doors.

Include diagrams for power, signal, and control wiring.

* + - * 1. Samples: For each exposed product and for each color and texture specified, in manufacturer's standard size.
				2. Quality Control Submittals

Qualification Data: For Installer.

Sample Warranties: For manufacturer's warranty and finish warranty.

* + - * 1. Contract Closeout Submittals

Maintenance Data: For sectional doors to include in maintenance manuals.

Manufacturer's warranty.

Finish warranty

* + - 1. QUALITY ASSURANCE
				1. 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.
				2. Regulatory Requirements: Comply with provisions in the [**U.S. Department of Justice's "2010 ADA Standards for Accessible Design"] [U.S. Department of Transportation's "ADA Standards for Transportation Facilities"] [the United States Access Board's "Architectural Barriers Act (ABA) Standards"] [41 CFR, Appendix A to Subpart 101-19.6, "Uniform Federal Accessibility Standards"] Uniform Code A117.1] <Insert requirements**> applicable to sectional doors.

Design Consultant to review code references and verify that the referenced sections/tables are current. Note that code references shall be based on the current version of the Uniform Code.

* + - 1. WARRANTY

When warranties are required, verify with Director’s Representative’s that warranties stated in this article are not less than remedies available to Director’s Representative under prevailing local laws.

* + - * 1. Manufacturer's Warranty: Manufacturer agrees to repair or replace components of sectional doors that fail in materials or workmanship within specified warranty period.

Failures include, but are not limited to, the following:

Structural failures including, but not limited to, excessive deflection.

Failure of components or operators before reaching required number of operation cycles.

Faulty operation of hardware.

Deterioration of metals, metal finishes, and other materials beyond normal weathering and use; rust through.

Retain first subparagraph below for insulated panels.

Delamination of exterior or interior facing materials.

Verify available warranties and warranty periods.

Warranty Period: 10 years from date of Substantial Completion.

Retain "Finish Warranty" paragraph below for factory-finished doors. Delete for field-painted steel doors.

* + - * 1. Finish Warranty: Manufacturer agrees to repair or replace components that show evidence of deterioration of factory-applied finishes within specified warranty period.

Verify available warranties and warranty periods; coordinate with finishes required.

Warranty Period: 10 years from date of Substantial Completion.

1. PRODUCTS
	* + 1. MANUFACTURERS, GENERAL
				1. Source Limitations: Obtain sectional doors from single source from single manufacturer.

Retain subparagraph below or revise to suit Project.

Obtain operators and controls from sectional door manufacturer.

* + - 1. PERFORMANCE REQUIREMENTS

Retain option in "General Performance" paragraph below if installation of temporary reinforcement ("active" preparation) is unacceptable for high-wind events. See "Wind Loads" Article in the Evaluations.

* + - * 1. General Performance: Provide sectional doors that comply with performance requirements specified without failure from defective manufacture, fabrication, installation, or other defects in construction [ **and without requiring temporary installation of reinforcing components**].

Retain "Structural Performance, Exterior Doors" paragraph below for exterior doors.

* + - * 1. Structural Performance, Exterior Doors: Capable of withstanding the design wind loads.

Usually retain first option in "Design Wind Load" subparagraph below, and indicate design wind loads determined by Project's structural engineer on the Drawings. Verify requirements of authorities having jurisdiction. See the Evaluations.

Design Wind Load: As indicated on Drawings.

Retain "Testing" subparagraph below if required by authorities having jurisdiction. Generally, retain option unless there are no garage doors. Consult manufacturers for availability of tested assemblies.

Testing: In accordance with ASTM E330 or DASMA 108 for garage doors and complying with DASMA 108 acceptance criteria.

Revise "Deflection Limits" subparagraph below to suit Project. Deflection limits indicated for horizontal position (open) are based on DASMA 102 requirements; consult manufacturer for project-specific deflection requirements.

Deflection Limits: Design sectional doors to withstand design wind loads without evidencing permanent deformation or disengagement of door components.

Deflection of door sections in horizontal position (open) shall not exceed 1/120 of door width.

Deflection of horizontal track assembly shall not exceed 1/240 of door height.

Retain "Operability under Wind Load" subparagraph below if required. It is an uncommon requirement; verify availability with manufacturers. See "Wind Loads" Article in the Evaluations.

Operability under Wind Load: Design sectional doors to remain operable under uniform pressure (velocity pressure) of 20 lbf/sq. ft. wind load, acting inward and outward.

Retain "Windborne-Debris Impact Resistance" paragraph if required.

* + - * 1. Windborne-Debris Impact Resistance: Provide sectional doors complying with the following requirements:

Retain "Glazed Openings" or "Garage-Door Glazed Openings" subparagraph below, or both, and revise to suit Project. See "Wind Loads" Article in the Evaluations. Verify requirements of authorities having jurisdiction and that manufacturers have tested products and can demonstrate compliance.

Insert requirements for Small Missile Test in "Glazed Openings" subparagraph below if sectional door is located more than 30 ft. above grade. Retain "enhanced" option for essential facilities, which require testing with larger missiles to comply with ASTM E1996 requirements. The BCNYS amends the wind-zone requirements in ASTM E1996 and establishes wind zones based on basic design wind speeds; verify requirements of authorities having jurisdiction.

Glazed Openings: Pass ASTM E1886 Large Missile Test and cyclic-pressure tests in accordance with ASTM E1996 for [**basic] [enhanced**] protection and Wind Zone [**applicable to basic design wind speed indicated on Drawings] <Insert requirements**>.

Garage-Door Glazed Openings: Pass DASMA 115.

Retain "Seismic Performance" paragraph below if required. Nonstructural architectural components in Seismic Design Category A are exempt from seismic design requirements; in Seismic Design Category B, nonstructural architectural components are generally exempt if the Component Importance Factor is 1. Coordinate requirements with Project's structural engineer.

* + - * 1. Seismic Performance: Provide sectional doors that withstand the effects of earthquake motions determined in accordance with [**ASCE/SEI 7] <Insert requirement**>.

The value in "Component Importance Factor" subparagraph below is determined in accordance with ASCE/SEI 7 based on anticipated risk and need. Revise subparagraph if more than one sectional door is required and they have different component importance factors. Coordinate requirement with Project's structural engineer.

Component Importance Factor: **[1.5] [1.0] <Insert requirements**>.

* + - 1. SECTIONAL-DOOR ASSEMBLY <**Insert drawing designation**>

Copy this article and re-edit for each sectional-door unit required. Consult manufacturers for recommendations.

Insert drawing designation. Use these designations on Drawings to identify each product.

Review products listed and confirm applicability to project and availability. Update as required. Typical limitations of products selections include size of doors and thermal performance. Higher thermal performance doors are available.

* + - * 1. Steel Sectional Door: Provide sectional door formed with hinged sections and fabricated so that finished door assembly is rigid and aligned with tight hairline joints; free of warp, twist, and deformation; and complies with requirements in DASMA 102.

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Clopay Building Products; 3717 Energy Series with Intellicore.

[Haas Door](http://www.specagent.com/Lookup?uid=123457148332); Insulated Steel 716.

Overhead Door Corporation; Thermacore Section Steel Doors 591.

Raynor Garage Doors; TC Series.

Wayne-Dalton Corp; Thermospan or ThermoMark Series.

Or equal.

Retain one option in "Operation Cycles" paragraph below. First option is standard with some manufacturers; second option is commonly used. Third, fourth, and fifth options are used for high-cycle operation, corrosive environments, and severe or abusive use. Consult manufacturers for recommendations.

* + - * 1. Operation Cycles: Door components and operators capable of operating for not less than [**10,000] [25,000] [50,000] [75,000] [100,000] <Insert numbe**r> operation cycles. One operation cycle is complete when door is opened from closed position to the open position and returned to closed position.

Retain "Air Infiltration" paragraph below if required for exterior doors. Test requirements and rate in option are based on "garage door" requirements in the ECCNYS. Manufacturers generally do not publish air-infiltration testing or values in accordance with ASTM E283 or DASMA 105. Verify availability of tested assemblies and tested values with manufacturers.

* + - * 1. Air Infiltration: Maximum rate **of 0.15 cfm/sq. ft.** or less when tested in accordance with ASTM E283 or DASMA 105.

Retain "U-Value" paragraph below if required. Options are examples only; verify available U-values with manufacturers and coordinate with insulation specified. Values usually do not include glazed areas. Or with a minimum R-value of 10. Products listed above have an R-value of around 16.

* + - * 1. U-Value: 0.10 Btu/sq. ft. x h x deg F or less.

Retain "Steel Door Sections" paragraph below for steel doors.

* + - * 1. Steel Door Sections: ASTM A653, zinc-coated (galvanized), cold-rolled, commercial steel sheet with G90 zinc coating.

Doors 3 inches thick are available from some manufacturers to accommodate thicker insulation.

Door-Section Thickness: minimum 1-5/8 inches.

Revise "Section Faces" subparagraph below. Section heights vary among manufacturers and within each door to accommodate door heights in 3 inch or other increments.

Section Faces:

Retain "Thermal-Break Construction" subparagraph below if required for insulated doors.

Thermal-Break Construction: Provide sections with continuous thermal-break construction separating the exterior and interior faces of door.

Exterior Face: Fabricated from single sheets, not more than 24 inches high; with horizontal meeting edges rolled to continuous, interlocking, keyed, rabbeted, shiplap, or tongue-in-groove, weather- and pinch-resistant seals and reinforcing flange return.

Steel Sheet Thickness: 0.016-inch nominal coated thickness.

Retain one option in "Surface" subparagraph below or revise to suit Project.

Surface: Manufacturer's standard, [**ribbed] [paneled] [stucco embossed] [wood-grain embossed**].

Retain "Interior Face" subparagraph below if facing covers thermal insulation on the interior. For garage doors, the BCNYS requires a thermal barrier over foam-plastic insulation or testing and acceptance in accordance with DASMA 107.

Interior Face: Enclose insulation completely within steel exterior facing and interior facing material, with no exposed insulation. Provide the following interior-facing material:

Retain "Zinc-Coated (Galvanized) Steel Sheet" subparagraph below and revise to suit Project. Verify material and thickness availability with manufacturers. Coordinate with code requirements and authorities having jurisdiction for thermal barriers protecting foamed plastics.

Zinc-Coated (Galvanized) Steel Sheet: With minimum nominal coated thickness of 0.016-inch.

Review product selections and coordinate minimum end stile thickness required, confirm if single end hinge stile or double end hinge stile are required. Thickness of material will be dependent on type.

End Stiles: Enclose open ends of sections with channel end stiles formed from galvanized-steel sheet not less than [**0.040-inch] [0.064-inch] <Insert dimension**> nominal coated thickness and welded to door section.

Retain "Intermediate Stiles" subparagraph below if required.

Intermediate Stiles: Provide intermediate stiles formed from not less than [**0.040-inch-] [0.064-inch-] <Insert dimension**> thick galvanized-steel sheet, cut to door section profile, and welded in place. Space stiles not more than [**48 inches] <Insert requirements**> apart.

Retain option in "Section Reinforcing" subparagraph below for doors with vision lites; consult manufacturer for recommendations.

Section Reinforcing: Horizontal and diagonal reinforcement as required to stiffen door and for wind loading. Provide galvanized-steel bars, struts, trusses, or strip steel, formed to depth and bolted or welded in place.[ **Ensure that reinforcement does not obstruct vision lites.**]

Retain option in "Bottom Section" subparagraph below if weatherseal is required.

Bottom Section: Reinforce section with a continuous channel or angle conforming to bottom-section profile [ **and allowing installation of astragal (weatherseal**)].

Hardware Locations: Provide reinforcement for hardware attachment.

Retain option in "Thermal Insulation" subparagraph below if required; verify availability with manufacturers. Coordinate insulation requirements with U-value requirements.

Thermal Insulation: Insulate interior of steel sections with door manufacturer's standard  insulation CFC-free of type indicated below:

Board Insulation: Polystyrene or polyurethane, secured to exterior face sheet.

Fire-Resistance Characteristics: Maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, in accordance with ASTM E84.

* + - * 1. Track: Manufacturer's standard, galvanized-steel, [**standard-lift] [low-headroom] [high-lift] [vertical-lift] [contour] <Insert description**> track system. Provide complete system including brackets, bracing, and reinforcement to ensure rigid support of ball-bearing roller guides.

Material: Galvanized steel, ASTM A653, minimum G60 zinc coating.

Size: 3 inches wide <**Insert requirements**>.

Track Reinforcement and Supports: Provide galvanized-steel members to support track without sag, sway, and vibration during opening and closing of doors. Slot vertical sections of track spaced 2 inches apart for door-drop safety device.

Retain one option in "Vertical Track" subparagraph below or revise to suit Project. Coordinate with supporting wall construction. Consult manufacturers for recommendations.

Vertical Track: Incline vertical track to ensure weathertight closure at jambs. Provide [**continuous angle] [continuous reverse angle] [intermittent jamb brackets] <Insert requirements**> attached to track and wall.

Horizontal Track: Provide continuous reinforcing angle from curve in track to end of track, attached to track and supported at points by laterally braced attachments to overhead structural members.

Retain "Removable Center Posts" paragraph below for where multiple doors are installed in one opening.

* + - * 1. Removable Center Posts: Manufacturer's standard [**carry-away] [roll-away] [swing-up**] type for multiple doors in one opening; provide in quantity and locations indicated on Drawings.

Retain last option for combination weatherseal and sensor edge bottom seal in "Weatherseals" paragraph below if required for motor-operated doors. Bottom weatherseals are often called "astragals."

* + - * 1. Weatherseals: Replaceable, adjustable, continuous, compressible weather-stripping gaskets of flexible vinyl, rubber, or neoprene fitted to bottom [**top] [and] [jambs**] of door.[ **Provide combination bottom weatherseal and sensor edge for bottom seal**.]

Retain "Windows" paragraph if required; verify availability with manufacturers and revise to suit Project. Show shapes, sizes, and locations of windows on Drawings.

* + - * 1. Windows: Manufacturer's standard window units of shape and size and in locations indicated on Drawings. Set glazing in vinyl, rubber, or neoprene glazing channel. Provide removable stops of same material as door-section frames. Provide the following glazing:

IGU glazing options include tempered glass, polycarbonate, multi-wall polycarbonate, etc. Verify with manufacturer most appropriate selection to achieve thermal performance required.

Insulating Glass Units: [**Manufacturer's standard] <Insert description**>.

<**Insert glazing requirements**>.

Retain "Pass Door" paragraph below if required. Generally, pass doors may not be used as required fire exits, and their sills are not compliant with the accessibility codes and standards. Delete reference in paragraph below to electric operation if not required. Avoid pass doors when possible; when necessary, overhead door opening limitations should be checked. Pass doors do not qualify as an exit door under some codes. Overhead doors with a pass door will not withstand 20 psf wind load.

* + - * 1. Pass Door: Provide manufacturer's standard pass door in size and location indicated on Drawings; complete with glazing, operating hardware, and mortise lock; and with welded frame, exterior matching door face, and integral shiplap weather seal.

Hinges: [**Manufacturer's standard geared hinges] <Insert requirements**>.

Door Closer: [**Manufacturer's standard pneumatic closer sized for swing door and mounted on interior] <Insert requirements**>.

Retain one of three options in "Lock Cylinders" subparagraph below or revise to suit Project.

Lock Cylinders: Cylinders [**complying with Section 087100 "Door Hardware" requirements] [standard with manufacturer] <Insert requirements**>.

Keying: Keyed night latch lock.

Retain "Keys" subparagraph below if cylinders are provided by door manufacturer.

Keys: [**Two] [Three] <Insert number**> for each cylinder.

Features:

Rain Cap: To protect door from accumulated water.

Vision Lite: <**Insert requirements**>.

Retain “safety interlock switch” when overhead door is electric operated, required to prevent operation of overhead door when pass door is open.

Safety Interlock Switch.

Retain "Exhaust Port" paragraph below if required for exhausting vehicle emissions to exterior.

* + - * 1. Exhaust Port: [**Manufacturer's standard, installed in bottom section in location indicated on Drawings] <Insert requirements**>.
				2. Hardware: Heavy-duty, corrosion-resistant hardware, with hot-dip galvanized, stainless steel, or other corrosion-resistant fasteners, to suit door type.

Hinges: Heavy-duty, galvanized-steel hinges of not less than 0.079-inch nominal coated thickness at each end stile and at each intermediate stile, in accordance with manufacturer's written recommendations for door size.

Attach hinges to door sections through stiles and rails with bolts and lock nuts or lock washers and nuts. Use rivets or self-tapping fasteners where access to nuts is impossible.

Provide double-end hinges where required for doors more than 16 ft. wide unless otherwise recommended by door manufacturer in writing.

Rollers: Heavy-duty rollers with steel ball bearings in case-hardened steel races, mounted to suit slope of track. Extend roller shaft through both hinges where double hinges are required. Match roller-tire diameter to track width.

Retain second option in "Roller-Tire Material" subparagraph below to prevent sparking in hazardous atmospheres.

Roller-Tire Material: Case-hardened steel [**Neoprene or bronze**].

Retain "Push/Pull Handles" subparagraph below for push-up doors or emergency push-up operation.

Push/Pull Handles: Equip each door with galvanized-steel lifting handles on each side of door, finished to match door.

Retain subparagraph below if required to insert other hardware requirements to suit Project.

<**Insert hardware requirements>.**

* + - * 1. Locking Device:

Retain "Slide Bolt," "Locking Device Assembly," "Chain Lock Keeper," and "Safety Interlock Switch" subparagraphs below to suit Project.

Slide Bolt: Fabricate with side-locking bolts to engage through slots in tracks for locking by padlock, located on single-jamb side, operable from inside only.

Locking Device Assembly: Fabricate with cylinder lock, spring-loaded deadbolt, operating handle, cam plate, and adjustable locking bars to engage through slots in tracks.

Retain “Lock Cylinders” below for standard requirements.

Lock Cylinders: Five pin, 1-1/8 inch rim cylinder lock assembly (except cylinder) with chromium-plated operating handle and die cast aluminum plate retainers, operable from inside and outside.

Keying: [**Keyed to building keying system] <Insert requirements**>.

Retain “Lock Cylinders” below for special orders.

Lock Cylinders Assembly with keyed spring-loaded dead bolt lock, chromium-plated operating handle(s), cam plate, and adjustable locking bar to engage through slots in track.

Retain one of the next two “Locking Bar” subparagraphs. If “inside only” operation is specified below, delete “keyed” from paragraph above.

Locking Bar: Cremone type, operable from inside and outside.

Locking Bar: Cremone type, operable from inside only.

Retain "Keys" subparagraph below if cylinders are provided by door manufacturer.

Keys: [**Two] [Three] <Insert number**> for each cylinder.

Retain "Chain Lock Keeper" subparagraph below for chain-hoist-operated doors or for emergency chain-hoist operation.

Chain Lock Keeper: Suitable for padlock.

Retain "Safety Interlock Switch" subparagraph below for power-operated doors.

Safety Interlock Switch: Equip power-operated doors with safety interlock switch to disengage power supply when door is locked.

Check drawings for provision for supporting counter-balancing mechanism above door head. Mounting brackets have to be fastened to some structural member, such as a masonry wall or steel framing. Special items required for mounting, such as mounting plates (pads) or auxiliary steel members, must be clearly indicated. Long life springs (50,000 or 100,000 cycles) are available (coordinate with performance requirements).

* + - * 1. Counterbalance Mechanism:

Torsion Spring: Adjustable-tension torsion springs complying with requirements of DASMA 102 for number of operation cycles indicated, mounted on torsion shaft.

Cable Drums and Shaft for Doors: Cast-aluminum cable drums mounted on torsion shaft and grooved to receive door-lifting cables as door is raised.

Mount counterbalance mechanism with manufacturer's standard ball-bearing brackets at each end of torsion shaft.

Provide one additional midpoint bracket for shafts up to 16 ft. long and two additional brackets at one-third points to support shafts more than 16 ft. long unless closer spacing is recommended in writing by door manufacturer.

Cables: Galvanized-steel, multistrand, lifting cables with cable safety factor of at least 7 to 1.

Cable Safety Device: Include a spring-loaded steel or bronze cam mounted to bottom door roller assembly on each side and designed to automatically stop door if lifting cable breaks.

Bracket: Provide anchor support bracket as required to connect stationary end of spring to the wall and to level the shaft and prevent sag.

Bumper: Provide spring bumper at each horizontal track to cushion door at end of opening operation.

Retain "Manual Door Operator" or "Electric Door Operator" paragraph below.

* + - * 1. Manual Door Operator:

Retain "Push-Up Operation" or "Chain-Hoist Operator" subparagraph below.

Push-Up Operation: Lift handles and pull rope for raising and lowering doors located on inside and outside of bottom section; with counterbalance mechanism designed so that required lift or pull for door operation does not exceed 25 lbf.

Chain-Hoist Operator: Consisting of endless steel hand chain, chain-pocket wheel and guard, and gear-reduction unit with a maximum 35 lbf force for door operation. Provide alloy-steel hand chain with chain holder secured to operator guide.

* + - * 1. Electric Door Operator: Electric door operator assembly of size and capacity recommended by door manufacturer for door and operation cycles 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.

Comply with NFPA 70.

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.

Retain "Safety" subparagraph below if door is used as an automatic garage door; consider retaining for all power-operated doors. Option is requirement of UL 325; revise to suit Project. The IBC requires UL 325 listing for automatic garage door openers.

Safety: Listed in accordance with 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 ft. or lower] <Insert requirements**>.

Retain one of four options in "Usage Classification" subparagraph below or revise to suit Project. Usage classification varies among manufacturers and for each operator design; it is a durability requirement separate from whole-door operation cycles. Consult manufacturers for specific recommendations.

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>.**

Retain one option in "Operator Type" subparagraph below or revise to suit Project. Consult manufacturers for recommendations on operator types. Selection depends on size and weight of door, type of operation, and track configuration. Backroom and minimal headroom are required for trolley type. Headroom is required for jackshaft, center-mounted type, and side room is required for jackshaft, side-mounted type.

Operator Type: [**Manufacturer's standard for door requirements] [Trolley] [Jackshaft, center mounted] [Jackshaft, side mounted] [As indicated on Drawings] <Insert requirements>**.

Retain first option in "Motor" subparagraph below unless external controller (disconnect switch) is indicated on Drawings. Coordinate with Project's Electrical Engineer. Retain second or third option based on operating environment or revise to suit Project. Third option applies to locations such as car washes. The Project's operating environment, including hazardous conditions, might require other motor types and enclosure modifications.

Motor: Reversible-type [ **with controller (disconnect switch)] for [interior, clean, and dry] [exterior, dusty, wet, or humid] <Insert requirements**> motor exposure. Use adjustable motor-mounting bases for belt-driven operators.

First option in "Motor Size" subparagraph below describes standard-speed doors. Consult manufacturers for recommendations.

Motor Size: As required to start, accelerate, and operate door in either direction from any position, at a speed not less than 8 in./sec. and not more than 16 in./sec., without exceeding nameplate ratings or service factor.

Electrical Characteristics:

Phase: Single phase.

Volts: 115 V.

Limit Switches: Equip motorized door with adjustable switches interlocked with motor controls and set to automatically stop door at fully opened and fully closed positions.

Obstruction Detection: Automatic external entrapment protection consisting of automatic safety sensor capable of protecting full width of door opening. Activation of device immediately stops and reverses downward door travel.

Monitored Entrapment Protection: Electric sensor edge on bottom section designed to interface with door-operator control circuit to detect damage to or disconnection of sensor and complying with requirements in UL 325.

Unmonitored Entrapment Protection: Pneumatic sensor edge, black, located within weatherseal mounted to bottom bar.

Retain “flush mounted” for Security remote control stations.

Control Station: Surface [**flush**] mounted, three-position (open, close, and stop/off) control.

Retain Key operation for Security remote control stations. Door movement automatically stops when key is in the center OFF/STOP position. Identify typical operation types if more than one type of control station is required.

Typical Operation: [**Push button] [Key] [Push button interior and key exterior] <Insert requirements>**.

Retain "Interior-Mounted Unit" or "Exterior-Mounted Unit" subparagraph below, or both. First option in "Interior-Mounted Unit" subparagraph below is appropriate for clean and dry installations; second for dusty, wet, or humid installations. Revise to suit Project.

Interior-Mounted Unit: Full-guarded, surface-mounted, heavy-duty type, with general-purpose NEMA ICS 6, Type 1 enclosure.

Exterior-Mounted Unit: Full-guarded, surface-mounted, NEMA 3R enclosure.

Features: Provide the following:

Vehicle detection operation.

Radio-control operation.

Card-reader control.

Photocell operation.

Door-timer operation.

Explosion- and dust-ignition-proof control wiring.

Audible and visual signals that comply with regulatory requirements for accessibility.

Retain the next two subparagraphs for Security units.

Momentary contacts with spring return to center.

Key removable in OFF/STOP position only.

Handheld Radio Control Units: Three channel units for full control of OPEN, CLOSE, STOP. Power 24 V AC. Each door to have its own frequency. Provide two units for each door.

Retain “Push-up” or “Chain” option to reflect manual operation selected above. Coordinate door operation force for selected options.

Emergency Manual Operation: [**Push-up] [Chain**] type designed so required force for door operation does not exceed [**25 lbf] [35 lbf**].

Emergency Operation Disconnect Device: 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.

Motor Removal: Design operator so motor can be removed without disturbing limit-switch adjustment and without affecting emergency manual operation.

* + - * 1. Metal Finish: Comply with NAAMM/NOMMA's "Metal Finishes Manual for Architectural and Metal Products (AMP 500-06)" for recommendations for applying and designating finishes.

Baked-Enamel or 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.

1. EXECUTION
	* + 1. EXAMINATION
				1. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for substrate construction and other conditions affecting performance of the Work.
				2. Proceed with installation only after unsatisfactory conditions have been corrected.
			2. INSTALLATION
				1. Install sectional doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; in accordance with manufacturer's written instructions.
				2. Tracks:

Fasten vertical track assembly to opening jambs and framing with fasteners spaced not more than 24 inches apart.

Hang horizontal track assembly from structural overhead framing with angles or channel hangers attached to framing by welding or bolting, or both. Provide sway bracing, diagonal bracing, and reinforcement as required for rigid installation of track and door-operating equipment.

* + - * 1. Accessibility: Install sectional doors, switches, and controls along accessible routes in compliance with regulatory requirements for accessibility.

Retain "Power-Operated Doors" paragraph below to suit Project; option is minimum requirement of the IBC, delete option to include all power-operated doors.

* + - * 1. Power-Operated Doors: Install[**automatic garage doors openers**] in accordance with UL 325.
			1. STARTUP SERVICES
				1. Engage a Company Service Advisor to perform startup service.

Complete installation and startup checks in accordance with manufacturer's written instructions.

Test and adjust controls and safety devices. Replace damaged and malfunctioning controls and equipment.

* + - 1. ADJUSTING
				1. Adjust hardware and moving parts to function smoothly so that doors operate easily, free of warp, twist, or distortion.
				2. Lubricate bearings and sliding parts as recommended by manufacturer.
				3. Adjust doors and seals to provide weather-resistant fit around entire perimeter.
				4. Touchup Painting Galvanized Material: Immediately after welding galvanized materials, clean welds and abraded galvanized surfaces and repair galvanizing to comply with ASTM A780.
			2. DEMONSTRATION
				1. Engage a Company Service Advisor to train Director’s Representative’s maintenance personnel to adjust, operate, and maintain sectional doors.

END OF SECTION 083613