# 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. Low-energy door operators for swinging doors.

B. Related Requirements:
   1. Section 018113 “Sustainable Design Requirements.”

## 1.3 DEFINITIONS

A. AAADM: American Association of Automatic Door Manufacturers.

B. Activation Device: A control that, when actuated, sends an electrical signal to the door operator to open the door.

C. Double-Egress (Doors): A pair of doors that simultaneously swing with the two doors moving in opposite directions with no mullion between them.

D. Double-Swing (Doors): A pair of doors that swing with the two doors moving in opposite directions with a mullion between them; each door functioning as a single-swing door.

E. Safety Device: A control that, to avoid injury, prevents a door from opening or closing.

F. For automatic door terminology, see BHMA A156.19 for definitions of terms.

## 1.4 COORDINATION

A. Coordinate sizes and locations of recesses in concrete floors for recessed control mats that control automatic door operators. Concrete, reinforcement, and formwork requirements are specified elsewhere.

B. Templates: Distribute for doors, frames, and other work specified to be factory prepared and reinforced for installing automatic door operators.

C. Coordinate hardware for doors with operators to ensure proper size, thickness, hand, function, and finish.

D. Electrical System Roughing-in: Coordinate layout and installation of automatic door operators with connections to power supplies and access-control system.

1.5 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for automatic door operators.
   2. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

B. Shop Drawings: For automatic door operators.
   1. Include plans, elevations, sections, hardware mounting heights, and attachment details.
   2. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
   3. Indicate locations of activation and safety devices.
   4. Include diagrams for power, signal, and control wiring.

C. Samples: For each exposed product and for each color and texture specified, manufacturer's standard size.

1.7 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer and Certified Inspector.

B. Product Certificates: For each type of automatic door operator. For each operator for fire-rated door assemblies, certify that operator is listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for use on types and sizes of labeled fire doors required.

C. Field quality-control reports.

D. Sample Warranties: For manufacturer's special warranties.

1.8 CLOSEOUT SUBMITTALS

A. Maintenance Data: For automatic door operators, safety devices, and control systems, to include in maintenance manuals.

1.9 QUALITY ASSURANCE

A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer for installation and maintenance of units required for this Project and who employs a Certified Inspector.
   1. Maintenance Proximity: Not more than two hours' normal travel time from Installer's place of business to Project site.

B. Certified Inspector Qualifications: Certified by AAADM.

1.10 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of automatic door operators that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Faulty or sporadic operation of automatic door operator, including controls.
      b. Deterioration of metals, metal finishes, and other materials beyond normal weathering or use.
   2. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide operators from one of the following:
   1. Besam Entrance Solutions; ASSA ABLOY (Basis-of-Design).
   2. Stanley Access Technologies

B. Source Limitations: Obtain automatic door operators, including activation and safety devices, from single source from single manufacturer.

2.2 AUTOMATIC DOOR OPERATORS, GENERAL

A. General: Provide operators of size recommended by manufacturer for door size, weight, and movement; for condition of exposure; and for long-term, maintenance-free operation under normal traffic load for occupancy type indicated; and according to UL 325. Coordinate operator mechanisms with door operation, hinges, and activation and safety devices.
   1. Fire-Rated Doors: Provide door operators for fire-rated door assemblies that comply with NFPA 80 for fire-rated door components and are listed and labeled by a qualified testing agency.
   2. Wind Load: Provide door operators on exterior doors that will open and close doors and maintain them in fully closed position when subjected to normal wind load.

B. Electromechanical Operating System: Self-contained unit powered by permanent-magnet 1/4 hp dc motor; with closing speed controlled mechanically by gear train and dynamically

by braking action of electric motor, connections for power and activation- and safety-device wiring, and manual operation including spring closing when power is off.

1. Automatic operator shall be capable of operating and controlling up to a 700 pound door, 48 inche) in width.
2. Battery Mode: Operator to maintain continuous operation by battery power during power failure. Battery is continuously monitored and provides a warning signal if the battery is not working properly.

C. In-Ground Concealed System: Besam SW200i-IG in-ground, low energy automatic door operator (Basis of Design):

1. In-Ground Operator Enclosure and Drive Unit:
   a. Cement case shall be 12 gauge minimum thickness steel, fully welded enclosure.
   b. Corrosion Protection: 6 to 10 mill powder coat finish suitable for continuous protection when in contact with concrete and masonry.
   c. Removable top case cover shall be 12 gauge minimum thickness steel with powder coat finish.
   d. Cover shall be sealed to cement case by a neoprene gasket.
   e. All penetrations including the operator drive shaft shall have seals to prevent water and moisture infiltration.
   f. Drive Mechanism Assembly: Manufacturer's drive mechanism assembly designed to provide swing door operation from an in-ground automatic door operator.
   g. Operator shaft shall be directly coupled to the pivot assembly.
   h. Weight of door shall be fully supported independently through a pivot bearing support. Door weight shall not be supported by the operator or the gear box assembly.
   i. Connecting hardware to door shall be a door arm attached to the bottom rail of the swing door.
   j. Door arm and top pivot shall be supplied by operator manufacturer.
2. Floor Cover Threshold: 1/2 inch high ADA compliant bronze threshold extending the width of the door opening.

D. Hinges: Offset pivoted or continuous hinge; refer to Section 087100 "Door Hardware" for hinge type for each door that door operator shall accommodate.

E. Housing for Overhead Concealed Operators: Fabricated from minimum 0.125-inch-thick, extruded or formed aluminum and extending full width of door opening including door jambs to conceal door operators and controls. Provide hinged or removable access panels for service and adjustment of door operators and controls. Secure panels to prevent unauthorized access.

F. Cover for Surface-Mounted Operators: Fabricated from 0.125-inch-thick, extruded or formed aluminum; continuous over full width of operator-controlled door opening with enclosed end caps, provision for maintenance access, and fasteners concealed when door is in closed position.

G. Brackets and Reinforcements: Fabricated from aluminum with non-staining, nonferrous shims for aligning system components.

H. Fire-Door Package: Consisting of UL-listed operator and latch mechanism, power-reset box, and caution signage for fire-rated doors. Latch mechanism shall allow door to swing free during automatic operation; when fire is detected, latch actuator shall cause exit hardware to latch when door closes. Provide electric latch retraction exit devices with fail-secure design.

I. Electrical Components, Devices, and Accessories: Listed and labeled as defined in CEC, by a qualified testing agency, and marked for intended location and application.

2.3 LOW-ENERGY DOOR OPERATORS

A. Standard: BHMA A156.19.

B. Performance Requirements:
1. Opening Force if Power Fails: Not more than 15 lbf required to release latch if provided, not more than 30 lbf required to manually set door in motion, and not more than 15 lbf required to fully open door.
2. Entrapment-Prevention Force: Not more than 15 lbf required to prevent stopped door from closing or opening.

C. Configuration: Operator to control pair of swinging doors.
1. Traffic Pattern: Two way, Dual egress and Dual swing.
2. Mounting: Surface and In-Ground Concealed.

D. Operation: Power opening and spring closing. Provide time delay for door to remain open before initiating closing cycle as required by BHMA A156.19. When not in automatic mode, door operator shall function as manual door closer, with or without electrical power.

E. Operating System: Electromechanical.

F. Microprocessor Control Unit: Solid-state controller.
1. Electric Lock Management:
a. Internal module for electrified locking integration.
b. Electric Lock Output: Selectable 12 VDC, maximum 1200 mA / 24 VDC, maximum 600 mA.
c. Lock monitoring prevents operator(s) from opening door(s) until release of electrified lock.
d. Operator pulls door closed before opening, automatically unjamming electric latch hardware.
e. Sequenced operation between operators for pairs of doors allowing lock release and astragal coordination.

G. Features:
1. Adjustable opening and closing speed.
2. Adjustable opening and closing force.
3. Adjustable back-check.
4. Adjustable hold-open time from zero to 30 seconds.
5. Adjustable time delay.

6. Adjustable acceleration.
7. Obstruction recycle.
8. On-off/hold-open switch to control electric power to operator; key operated.
9. Automatic Reset.

H. Activation Device: Push-plate switch on each side of door to activate door operator.

I. Exposed Finish: Class I, color anodic finish, Baked-enamel or powder-coat finish, Metal cladding.
   1. Color: Clear Anodized, Dark Bronze and as selected by Architect from full range of industry colors and color densities.
   2. Metal Cladding: Bronze.

2.4 MATERIALS

A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
   1. Extrusions: ASTM B 221.
   2. Sheet: ASTM B 209.

B. Fasteners and Accessories: Corrosion-resistant, non-staining, nonbleeding fasteners and accessories compatible with adjacent materials.

2.5 CONTROLS

A. General: Provide controls, including activation and safety devices, according to BHMA standards; for condition of exposure; and for long-term, maintenance-free operation under normal traffic load for occupancy type indicated. Coordinate activation and safety devices with door operation and door operator mechanisms.

B. Presence Sensors: Self-contained, active-infrared scanner units; adjustable to provide detection field sizes and functions required by BHMA A156.10. Sensors shall remain active at all times.

C. Push-Plate Switch: Momentary-contact door control switch with flat push-plate actuator with contrasting-colored, engraved message.
   1. Configuration: Two each Square push plate, located each side of door with 4-by-4-inch junction box.
      a. Mounting: As indicated on Drawings.
   2. Configuration: One each Rectangular push plate located each side of door with 2-by-4-inch junction box.
      a. Mounting: As indicated on Drawings, flush in wall, flush mounted on bollard post.
   3. Push-Plate Material: Stainless steel and Bronze as selected by Architect from manufacturer's full range.
   4. Bollard Posts: Curran Engineering or BEA Inc., custom design, housing card reader and actuation push plate switches, bronze material, finish as selected by Architect from manufacturer's full range.
   5. Message: International symbol of accessibility and "Push to Open."

D. Electrical Interlocks: Unless units are equipped with self-protecting devices or circuits, provide electrical interlocks to prevent activation of operator when door is locked, latched, or bolted.

2.6 FABRICATION

A. Factory fabricate automatic door operators to comply with indicated standards.

B. Form aluminum shapes before finishing.

C. Fabricate exterior components to drain condensation and water passing joints within operator enclosure to the exterior.

D. Use concealed fasteners to greatest extent possible. Where exposed fasteners are required, use countersunk Phillips flat-head machine screws, finished to match operator.

E. Provide metal cladding, completely covering visible surfaces before shipment to Project site. Fabricate cladding with concealed fasteners and connection devices, with accurately fitted joints with ends coped or mitered to produce hairline joints free of burrs and distortion, and with allowance for thermal expansion at exterior doors.

2.7 ACCESSORIES

A. Signage: As required by cited BHMA standard for type of door and its operation.
1. Application Process: Operator manufacturer's standard process.
2. Provide sign materials with instructions for field application when operators are installed.

2.8 GENERAL FINISH REQUIREMENTS

A. Protect mechanical finishes on exposed surfaces from damage by applying strippable, temporary protective covering before shipping.

B. Apply organic and anodic finishes to formed metal after fabrication unless otherwise indicated.

C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within range of approved Samples and are assembled or installed to minimize contrast.

2.9 ALUMINUM FINISHES

A. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils. Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances, door and frame preparation and reinforcements, and other conditions affecting performance of automatic door operators.

B. Examine roughing-in for electrical systems to verify actual locations of power connections before automatic door operator installation.

C. Verify that full-height finger guards are installed at each door with center pivots where door has a clearance at hinge side greater than 1/4 inch and less than 3/4 inch with door in any position.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install automatic door operators according to manufacturer's written instructions and cited BHMA standard for type of door operation and direction of pedestrian travel, including signage, controls, wiring, remote power units if any, and connection to building's power supply.
   1. Do not install damaged components. Fit joints to produce hairline joints free of burrs and distortion.
   2. Install operators true in alignment with established lines and door geometry without warp or rack. Anchor securely in place.

B. Controls: Install activation and safety devices according to manufacturer's written instructions and cited BHMA standard for operator type and direction of pedestrian travel. Connect control wiring according to Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

C. Signage: Apply on both sides of each door as required by cited BHMA standard for type of door operator and direction of pedestrian travel.

3.3 FIELD QUALITY CONTROL

A. Certified Inspector: Engage a Certified Inspector to test and inspect components, assemblies, and installations, including connections.

B. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
   1. Test and inspect each automatic door operator installation, using AAADM inspection forms, to determine compliance of installed systems with applicable BHMA standards.

C. Automatic door operators will be considered defective if they do not pass tests and inspections.

D. Prepare test and inspection reports.

3.4 ADJUSTING

A. Adjust automatic door operators to function smoothly, and lubricate as recommended by manufacturer; comply with requirements of applicable BHMA standards.
   1. Adjust operators on exterior doors for weather-tight closure.

B. After completing installation of automatic door operators, inspect exposed finishes on doors and operators. Repair damaged finish to match original finish.

C. Readjust automatic door operators and controls after repeated operation of completed installation equivalent to three days' use by normal traffic (100 to 300 cycles).

D. Occupancy Adjustment: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain automatic door operators.

END OF SECTION