

SECTION 08 42 29.33 - SWINGING AUTOMATIC ENTRANCES

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. Exterior and interior swinging, power-operated automatic entrances.

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-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.
- D. IBC: International Building Code.
- E. Safety Device: A control that, to avoid injury, prevents a door from opening or closing.
- F. For automatic door terminology, refer to BHMA A156.10 and BHMA A156.19 for definitions of terms.

1.4 COORDINATION

- A. Templates: Distribute for doors, frames, and other work specified to be factory prepared for installing automatic entrances.
- B. Coordinate hardware with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish. Coordinate hardware for automatic entrances with hardware required for rest of Project.
- C. Electrical System Roughing-in: Coordinate layout and installation of automatic entrances 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 entrances.
 - 2. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
- B. Shop Drawings: For automatic entrances.
 - 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. Include diagrams for power, signal, and control wiring.
 - 4. Indicate locations of activation and safety devices.
 - 5. Include hardware schedule and indicate hardware types, functions, quantities, and locations.
- C. Samples for Initial Selection: For units with factory-applied **[color]** **[and]** **[metal-clad]** finishes.
 - 1. Include Samples of hardware and accessories involving color or finish selection.
- D. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.
- E. Delegated-Design Submittal: For automatic entrances.

1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data for Installer.
- B. Product Certificates: For each type of automatic entrance. Include emergency-exit features of automatic entrances serving as a required means of egress.
- D. Sample Warranties: For manufacturer's special warranties.

1.8 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For automatic entrances, safety devices, and control systems to include in operation and maintenance manuals. A representative for UH Access Control shall be present at closeout to sign-off on work performed.

1.9 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A manufacturer with company certificate issued by AAADM indicating that manufacturer has a Certified Inspector on staff.
- B. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation and maintenance of units required for this Project and who employs an AAADM Certified Inspector. Installing company shall provide local central dispatch system for warranty service, which shall be available 24 hours a day/365 days a year. A sticker shall be placed in a prominent position on the header of each installed unit giving details of local service company name and telephone number.
 - 1. Maintenance Proximity: Not more than two hours' normal travel time from Installer's place of business to Project site.
- C. Certified Inspector Qualifications: Certified by AAADM.
- D. Doors shall meet performance design criteria of the following standards:
 - ANSI/BHMA 156.10
 - NFPA 101
 - Underwriters Laboratories UL 325 and UL 991
 - International Building Code (IBC)
 - International Conference of Building Officials (ICBO)
 - Building Officials and Code Administrators International (BOCA)
 - National Association of Architectural Metal Manufacturers (NAAMM)
 - American Architectural Manufacturers Association (AAMA)

1.10 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of automatic entrances that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including, but not limited to, excessive deflection.
 - b. Faulty operation of operators, controls, and hardware.
 - c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.
 - 2. Warranty Period: Two years from date of Substantial Completion.
- B. Special Finish Warranty: Manufacturer agrees to repair or replace components on which finishes fail in materials or workmanship within specified warranty period.
 - 1. Deterioration includes, but is not limited to, the following:

- a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
2. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

- A. Source Limitations: Obtain swinging and sliding automatic entrances from single source from single manufacturer.
- B. 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.
- C. Power-Operated Door Standard: BHMA A156.10.
- D. Power-Assist and Low-Energy Door Standard: BHMA A156.19.

2.2 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 40 00 "Quality Requirements," to design automatic entrances.
- B. Structural Performance: Automatic entrances shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated according to [ASCE/SEI 7] <Insert requirement>.
 1. Seismic Loads: <Insert loads>.
 2. Wind Loads: <Insert loads>.
- C. Windborne-Debris Impact Resistance: Automatic entrances shall pass [large-missile-impact] [small-missile-impact] and cyclic-pressure tests of [ASTM E 1996 according to the IBC] <Insert testing and code requirements> for [Wind Zone 1] [Wind Zone 2] [Wind Zone 3] [Wind Zone 4].
- D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
 1. Temperature Change: [120 deg F, ambient; 180 deg F, material surfaces] <Insert temperature change>.
- E. Operating Temperature Range: Automatic entrances shall operate within [minus 20 to plus 122 deg F] <Insert temperature range>.
- F. Air Infiltration: Maximum air leakage through fixed glazing and framing areas of [1.25 cfm/sq. ft.] <Insert value> of fixed entrance-system area when tested according to ASTM E 283 at a minimum static-air-pressure difference of [1.57 lbf/sq. ft.] [6.24 lbf/sq. ft.] <Insert value>.

G. Opening Force:

1. Power-Operated Doors: Not more than 50 lbf required to manually set door in motion if power fails, and not more than 15 lbf required to open door to minimum required width.
2. Power-Operated Swinging Doors: Not more than 30 lbf required to manually open door if power fails.
3. Breakaway Device for Power-Operated Doors: Not more than 50 lbf required for a breakaway door or panel to open.
4. Power-Assist and Low-Energy Doors: Not more than 15 lbf required to release a 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 if power fails.
5. Accessible, Power-Assist Interior Doors: Not more than 5 lbf to push or pull door to fully open position.

H. Entrapment-Prevention Force:

1. Power-Operated Swinging Doors: Not more than 40 lbf required to prevent stopped door in the last 10 degrees of opening from moving in the direction of opening; not more than 30 lbf required to prevent stopped door from moving in direction of closing.
2. Low-Energy Doors: Not more than 15 lbf required to prevent stopped door from closing or opening.

2.3 SWINGING AUTOMATIC ENTRANCES

- A. General: Provide manufacturer's standard automatic entrances including doors, framing, headers, door operators, controls, and accessories required for a complete installation.
- B. Swinging, Power-Operated Automatic Entrance <Insert drawing designation>:
1. Manufacturers: Subject to compliance with requirements, provide swinging entrances by **Record USA** or comparable product by one of the following:
 - a. Nabco Entrances Inc.
 - b. Horton Automatics; a division of Overhead Door Corporation.
 - c. Besam Entrance Solutions; Subsidiary of ASSA ABLOY Entrance Systems
 2. Models Approved for Exterior Application:
 - a. Record-USA #8100
 - b. Nabco, Gyro-Tech GT 500
 - c. Horton, HD-swing
 - d. Besam Entrance Solutions, SM 900
 3. Models Approved for Interior Applications:
 - a. Record USA #6100
 - b. Nabco, Gyro-Tech GT 500
 - c. Horton, 400-LE

4. Configuration: Single-swinging door[**with transom**].
 - a. Traffic Pattern: [**One**] [**Two**] way.
 - b. Mounting: [**Between jambs**] .
 5. Configuration: Pair of swinging doors [**with transom**].
 6. Operator Features:
 - a. Power opening and [**power-assist**] spring closing.
 - b. Adjustable opening and closing speeds.
 - c. Adjustable hold-open time between zero and 30 seconds.
 - d. Adjustable backcheck and latching.
 - e. Obstruction recycle.
 - f. Automatic door re-open if stopped while closing.
 - g. On-off/hold-open switch to control electric power to operator, key operated.
 - h. .
 7. Controls: Activation and safety devices as indicated on Drawings and according to BHMA standards.
 - a. Activation Device: Motion sensor mounted on ingress side of door header to detect pedestrians in activating zone and to open door.
 - b. Activation Device: Control mat installed on ingress side of door to detect pedestrians in activating zone and to open door.
 - c. Activation Device: [**Push-plate switch**] [**Push-button switch**] [**Key switch**] [**on each side of door**]to activate door operator.
 - d. Safety Device: Presence sensor mounted on [**door header**] [**horizontal door muntin**] [**guide rail**] to detect pedestrians in presence zone and to prevent door from closing.
 - e. Safety Device: One photoelectric beam mounted in guide rails to detect pedestrians in presence zone and to prevent door from closing.
 - f. Safety Device: Control mat(s) installed on egress side of door to detect pedestrians in presence and safety zones and to prevent door from closing.
 8. Finish: Finish framing, door(s), and header with [**Class I, clear anodic finish**] [**Class II, clear anodic finish**] [**Class I, color anodic finish**] [**Class II, color anodic finish**] [**baked-enamel or powder-coat finish**] [**high-performance organic finish (two-coat fluoropolymer)**] [**high-performance organic finish (three-coat fluoropolymer)**] [**finish matching adjacent curtain wall**] [**finish matching adjacent storefront**].
 - a. Color: [**Light bronze**] [**Medium bronze**] [**Dark bronze**] [**Black**] [**As indicated by manufacturer's designations**] [**Match Architect's sample**] [**As selected by Architect from full range of industry colors and color densities**] <Insert color>.
- C. Swinging, Low-Energy, Power-Operated Automatic Entrance :
1. Basis-of-Design Product: Subject to compliance with requirements, provide 8600 series assembly by Record USA, or comparable product by one of the following:

- a. Horton Automatics; a division of Overhead Door Corporation, HD-Swing Type 4500.
- b. Besam Entrance solutions; Subsidiary of ASSA ABLOY Entrance Systems, model IK-A2.

2.4 ENTRANCE COMPONENTS

- A. Framing Members: Extruded aluminum, minimum 0.125 inch thick and reinforced as required to support imposed loads.
 1. Nominal Size: **[As indicated on Drawings] [1-3/4 by 4-1/2 inches] [1-3/4 by 6 inches] <Insert dimensions>**.
 2. Extruded Glazing Stops and Applied Trim: Minimum 0.062-inch wall thickness.
- B. Stile and Rail Doors: 1-3/4-inch- thick, glazed doors with minimum 0.125-inch- thick, extruded-aluminum tubular stile and rail members. Mechanically fasten corners with reinforcing brackets that are welded, or incorporate concealed tie-rods that span full length of top and bottom rails.
 1. Glazing Stops and Gaskets: **[Beveled] [Square]**, snap-on, extruded-aluminum stops and preformed gaskets.
 2. Stile Design: **[As indicated on Drawings] [Narrow stile, 2-1/8-inch nominal width] [Medium stile, 3-1/2-inch nominal width]**.
 3. Rail Design: **[As indicated on Drawings] [5-inch nominal height] [6-1/2-inch nominal height] [10-inch nominal height]**.
 4. Muntin Bars: Horizontal tubular rail member for each door; match stile design and finish.
- C. **[Sidelite(s)] [and] [Transom]**: 1-3/4-inch- deep **[sidelite(s)] [and] [transom]** with minimum 0.125-inch- thick, extruded-aluminum tubular stile and rail members matching door design.
 1. Glazing Stops and Gaskets: Same materials and design as for stile and rail door.
 2. Muntin Bars: Horizontal tubular rail members for each sidelite; match stile design.
- D. Headers: Fabricated from minimum 0.125-inch- thick extruded aluminum and extending full width of automatic entrance units 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.
 1. Mounting: **[Surface mounted] [Concealed, with one side of header flush with framing]**.
- E. Brackets and Reinforcements: High-strength aluminum with nonstaining, nonferrous shims for aligning system components.
- F. Signage: As required by cited BHMA standard.
 1. Application Process: **[Decals] [Silk-screened] [Door manufacturer's standard process] <Insert requirement>**.

2. Provide sign materials with instructions for field application after glazing is installed.

2.5 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. Steel Reinforcement: Reinforcement with corrosion-resistant primer complying with SSPC-PS Guide No. 12.00 applied immediately after surface preparation and pretreatment. Use surface preparation methods according to recommendations in SSPC-SP COM and prepare surfaces according to applicable SSPC standard.
- C. Stainless-Steel Bars: ASTM A 276 or ASTM A 666, [**Type 304**] [**Type 316**] <Insert type>.
- D. Stainless-Steel Tubing: ASTM A 554, [**Grade MT 304**] [**Grade MT 316**] <Insert grade>.
- E. Stainless-Steel Sheet: ASTM A 240/A 240M or ASTM A 666, [**Type 304**] [**Type 316**] <Insert type>, stretcher-leveled standard of flatness, in entrance manufacturer's standard thickness.
- F. *Brass Sheet: ASTM B 36/B 36M, Alloy UNS No. C26000 (cartridge brass, 70 percent copper), in entrance manufacturer's standard thickness.*
- G. *Bronze Sheet: ASTM B 36/B 36M, Alloy UNS No. C28000 (muntz metal, 60 percent copper) or Alloy UNS No. C23000 (red brass, 85 percent copper), in entrance manufacturer's standard thickness.*
- H. Expanded Aluminum Mesh: [**Expanded**] [**Expanded and flattened**] aluminum sheet according to the geometry of ASTM F 1267.
- I. Polycarbonate Sheet: ASTM C 1349, Appendix X1, Type II, coated, mar-resistant, UV-stabilized polycarbonate with coating on both surfaces.
- J. Glazing: As specified in [**Section 08 80 00 "Glazing."**] [**Section 08 88 53 "Security Glazing."**]
- K. Sealants and Joint Fillers: As specified in Section 07 92 00 "Joint Sealants."
- L. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.
- M. Fasteners and Accessories: Corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.

2.6 DOOR OPERATORS AND CONTROLS

- A. General: Provide operators and controls, which include activation and safety devices, according to BHMA standards, for condition of exposure, and for long-term, maintenance-free operation under normal traffic load for type of occupancy indicated.
- B. Door Operators: Provide door operators of size recommended by manufacturer for door size, weight, and movement.
 - 1. Door Operator Performance: Door operators shall open and close doors and maintain them in fully closed position when subjected to Project's design wind loads.
 - 2. Electromechanical Operators: Concealed, self-contained, overhead unit powered by fractional-horsepower, permanent-magnet dc motor; with closing speed controlled mechanically by gear train and dynamically by braking action of electric motor; with solid-state microprocessor controller; and with manual operation with power off.
- C. Motion Sensors: Self-contained, K-band-frequency, microwave-scanner units; fully enclosed by its plastic housing; adjustable to provide detection-field sizes and functions required by BHMA A156.10.
 - 1. Provide capability for switching between bidirectional and unidirectional detection.
 - 2. For one-way traffic, sensor on egress side shall not be active when doors are fully closed.
- D. 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. Approved Manufacturers:
 - 1. Bodyguard, mfd. by BEA
 - 2. Optex, mfd. by Optex, Inc.
- E. Photoelectric Beams: Pulsed infrared, sender-receiver assembly for recessed mounting. Beams shall not be active when doors are fully closed.
- F. Control Mats: 1/2-inch- thick, synthetic-rubber or flexible-plastic mat in safety-ribbed surface pattern, with extruded-aluminum frame; with pressure switches for low-voltage control wiring; and complying with performance requirements of BHMA A156.10.
 - 1. Frame: **[Recessed to fit flush with floor, with concealed anchors] [Surface mounted, with tapered safety edge].**
 - 2. Size: As indicated, but no smaller than required by BHMA A156.10 including Appendix A.
 - 3. Color: **[As indicated by manufacturer's designations] [Match Architect's sample] [As selected by Architect from full range of industry colors and color densities].**
- G. Push-Plate Control Device: Momentary-contact door-control switch with flat push-plate actuator with contrasting-colored, engraved message. "Hard-wiring" is required in all new construction.]
 - 1. Approved manufacturers:
 - a. Door Control Services, Inc.

- b. BEA
 - 2. Configuration: Square push plate with 4.75-by-4.75-inch junction box.
 - 3. Mounting: [As indicated on Drawings] [Recess mounted, semiflush in wall] [Surface mounted on post] [Surface mounted on wall]. Theft-proof mounting required.
 - 4. Push-Plate Material: Stainless steel
 - 5. Message: "Push to Open" with International symbol of accessibility.
 - 6. Reset Button: To be installed at the top of the Automatic Operator Header.
 - 7. Keyed Junction Box: Required to terminate power to the door. Box shall be mounted no higher than five feet (5') above finished floor to work in conjunction with IC Best 7 Pin Core.
 - 8. Bollard Post: If required, the post shall be recessed into the subgrade. Surface-mounted posts are not acceptable.
 - H. Key Switch: Recess-mounted, door-control switch with key-controlled actuator; enclosed in 2-by-4-inch junction box. Provide faceplate engraved with letters indicating switch functions.
 - 1. Face-Plate Material: Stainless steel as selected by Architect from manufacturer's full range.
 - 2. Functions: **[On-off, momentary contact] [On-off, maintained contact] [Two-way automatic, hold open, one-way exit, and off] [Two-way automatic, hold open, one-way exit, off, full open, and partial open].**
 - 3. Mounting: [As indicated on Drawings] [Recess mounted, semiflush in wall] [Recess mounted in door jamb] [Surface mounted on wall] [Surface mounted on post].
 - I. Wireless or Remote Radio Control Switch [\[NOTE: May only be used when projects conditions require this type of application\]](#): Auxiliary radio control system consisting of header-mounted receiver and **[wall-mounted] [hand-held, battery-operated]** transmitter switch **[for each entrance] <Insert requirement>**.
 - 1. Wall-Mounted Transmitter Switch: One red-button, momentary-contact actuator enclosed in 4-by-4-inch junction box. Provide blue plastic cover engraved with "Press Button to Open" in white letters and international symbol of accessibility.
- 2.7 HARDWARE
- A. General: Provide units in sizes and types recommended by automatic entrance and hardware manufacturers for entrances and uses indicated. Finish exposed parts to match door finish **[unless otherwise indicated]**.
 - B. Manual Opening for Power-Operated Swinging Doors: Provide hardware that, in a power failure, allows door to open with a manual force stipulated in "Performance Requirements" Article.
 - C. Breakaway Device for Power-Operated Doors: Device that allows door to swing out in direction of egress to full 90 degrees from any operating position. Maximum force to open door shall be as stipulated in "Performance Requirements" Article. Interrupt powered operation of door operator while in breakaway mode.

- D. Manual Opening for Power-Assist and Low-Energy Doors: Provide hardware that, in a power failure, allows door to open with a manual force as stipulated in "Performance Requirements" Article.
- E. Hinges:
 - 1. Center-Pivot Sets: BHMA A156.4, Grade 1, with exposed parts of cast-aluminum alloy.
 - 2. Offset Pivots: BHMA A156.4, Grade 1, with exposed parts of cast-aluminum alloy.
 - 3. Butt Hinges: BHMA A156.1, Grade 1, five-knuckle, 4-1/2-by-4-inch ball-bearing butts.
 - a. Provide nonremovable pins at hinges exposed on outside of door.
 - b. Provide nonferrous hinges for doors exposed to weather.
 - c. Provide three hinges at each leaf for doors up to 36 inches wide and 80 inches tall; provide four hinges at each leaf for wider or taller doors.
- F. Deadlocks: Deadbolt operated by exterior cylinder and interior thumb turn, with minimum 1-inch-long throw bolt; BHMA A156.5, Grade 1.
 - 1. Cylinders: **[BHMA A156.5, Grade 1, six-pin mortise type.] [As specified in Section 08 71 00 "Door Hardware." [As specified in Section 08 71 11 "Door Hardware (Descriptive Specification)."]]**
 - a. Keying: **[No master] [Integrate into building master]** key system.
 - 2. Deadbolts: Laminated-steel hook, mortise type, BHMA A156.5, Grade 1.
 - 3. Two-Point Locking for Swinging Doors: Mechanism in stile of active door leaf that automatically extends second lockbolt into **[header] [threshold]**.
- G. Push Bars: **[As selected by Architect from manufacturer's full range of full-door-width, single] [Manufacturer's standard surface-mounted, aluminum]** push bars.
- H. Pull Handles: **[As selected by Architect from manufacturer's full range of pull handles and plates] [Manufacturer's standard aluminum pull handles]**.
- I. Thresholds: BHMA A156.21, extruded-aluminum raised thresholds; with beveled edges with a slope of not more than 1:2 and a maximum height of 1/2 inch. Provide cutouts as required for door operating hardware.
- J. Weather Stripping: Replaceable components.
 - 1. Sliding Type: AAMA 701, made of wool, polypropylene, or nylon woven pile with nylon-fabric or aluminum-strip backing.
 - 2. Compression Type: Made of ASTM D 2000, molded neoprene, or ASTM D 2287, molded PVC.
 - 3. Weather Sweeps: Nylon brush sweep mounted to underside of door bottom.
- K. Finger Guards: Collapsible neoprene or PVC gasket.

2.8 ACCESSORIES

- A. Guide Rails: **[Anodized aluminum]** **[Baked-enamel or powder-coated aluminum]** **[Stainless steel]**, fabricated from **[bars]** **[or]** **[tubing]**, minimum 30 inches high, and finished to match doors unless otherwise indicated; positioned and projecting from face of door jamb for distance as indicated, but not less than **[that required by BHMA A156.10 for type of door and direction of travel]** **<Insert dimension>**; with filler panel.
1. Filler Panel: **[Expanded aluminum mesh]** **[Clear polycarbonate sheet]** **[Colored polycarbonate sheet]** **<Insert material>**.
 - a. Orient expanded aluminum mesh with long dimension of diamonds **[parallel to top rail]** **[perpendicular to top rail]**.
 - b. Color: **[Match Architect's sample]** **[As selected by Architect from manufacturer's full range]** **<Insert color>**.
 2. Provide intermediate rail in guide rail suitable for supporting photoelectric beams.
 3. Mounting: **[As indicated on Drawings]** **[Jamb and floor]** **[Floor, freestanding]**.
 4. Aluminum Finish: **[Class I, clear anodic finish]** **[Class II, clear anodic finish]** **[Class I, color anodic finish]** **[Class II, color anodic finish]** **[Baked-enamel or powder-coat finish]** **[Finish matching door and frame]** **<Insert finish>**.
 - a. Color: **[Light bronze]** **[Medium bronze]** **[Dark bronze]** **[Black]** **[Match Architect's sample]** **[As selected by Architect from full range of industry colors and color densities]** **<Insert color>**.
 5. Stainless-Steel Finish: **[No. 4 directional-satin-finish stainless steel]** **[Finish matching door and frame]** **<Insert finish>**.
- B. Guide Rails: See **[Section 05 52 13 "Pipe and Tube Railings."]** **[Section 05 73 00 "Decorative Metal Railings."]**

2.9 FABRICATION

- A. General: Factory fabricate automatic entrance components to designs, sizes, and thicknesses indicated and to comply with indicated standards.
1. Form aluminum shapes before finishing.
 2. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
 3. Use concealed fasteners to greatest extent possible. Where exposed fasteners are required, use countersunk Phillips flat-head machine screws, **finished to match framing** **[, fabricated from stainless steel]**.
 - a. Where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration, use self-locking devices.
 - b. Reinforce members as required to receive fastener threads.

4. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.
- B. Framing: Provide automatic entrances as prefabricated assemblies. Complete fabrication, assembly, finishing, hardware application, and other work before shipment to Project site.
1. Fabricate tubular and channel frame assemblies with welded or mechanical joints. Provide subframes and reinforcement as required for a complete system to support required loads.
 2. Perform fabrication operations in manner that prevents damage to exposed finish surfaces.
 3. Form profiles that are sharp, straight, and free of defects or deformations.
 4. Provide components with concealed fasteners and anchor and connection devices.
 5. Fabricate components with accurately fitted joints with ends coped or mitered to produce hairline joints free of burrs and distortion.
 6. Fabricate exterior components to drain condensation and water passing joints within system to the exterior.
 7. Provide anchorage and alignment brackets for concealed support of assembly from building structure.
 8. Allow for thermal expansion of exterior units.
- C. Doors: Factory fabricated and assembled in profiles indicated. Reinforce as required to support imposed loads and for installing hardware.
- D. Metal Cladding: Factory-fabricated and installed metal cladding, completely covering all visible surfaces as part of prefabricated entrance assembly before shipment to Project site.
1. Perform fabrication operations in manner that prevents damage to exposed finish surfaces.
 2. Form profiles that are sharp, straight, and free of defects or deformations.
 3. Provide components with concealed fasteners and anchor and connection devices.
 4. Fabricate components with accurately fitted joints with ends coped or mitered to produce hairline joints free of burrs and distortion.
 5. Fabricate exterior components to drain water passing joints and condensation and moisture occurring or migrating within system to the exterior.
 6. Allow for thermal expansion at exterior entrances.
- E. Door Operators: Factory fabricated and installed in headers, including adjusting and testing.
- F. Glazing: Fabricate framing with minimum glazing edge clearances for thickness and type of glazing indicated, according to GANA's "Glazing Manual."
- G. Hardware: Factory install hardware to greatest extent possible; remove only as required for final finishing operation and for delivery to and installation at Project site. Cut, drill, and tap for factory-installed hardware before applying finishes.
1. Provide sliding-type weather stripping, mortised into door, at perimeter of doors[**and breakaway sidelites**].

2. Provide compression-type weather stripping at fixed stops of exterior doors. At locations without fixed stops, provide sliding-type weather stripping retained in adjustable strip mortised into door edge.
3. Provide weather sweeps mounted to underside of door bottoms of exterior doors.
4. Provide finger guards at each swinging-door leaf that has clearance at hinge side greater than 1/4 inch and less than 3/4 inch with door in any position. Anchor guards to hinge-jamb frame.

H. Controls:

1. General: Factory install activation and safety devices in doors and headers as required by BHMA A156.10 for type of door and direction of travel.
2. Install photoelectric beams in sides of guide rails, with dimension above finished floor not less than 24 inches.

2.10 GENERAL FINISH REQUIREMENTS

- A. Protect mechanical finishes on exposed surfaces from damage by applying a 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 the range of approved Samples and are assembled or installed to minimize contrast.

2.11 ALUMINUM FINISHES

- A. Clear Anodic Finish: AAMA 611, [**AA-M12C22A41, Class I, 0.018 mm**] [**AA-M12C22A31, Class II, 0.010 mm**] or thicker.
- B. Color Anodic Finish: AAMA 611, [**AA-M12C22A42/A44, Class I, 0.018 mm**] [**AA-M12C22A32/A34, Class II, 0.010 mm**] or thicker.
- C. 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.
- D. High-Performance Organic Finish: Two-coat fluoropolymer finish complying with [**AAMA 2604**] [**AAMA 2605**] and containing not less than [**50**] [**70**] percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
- E. High-Performance Organic Finish: Three-coat fluoropolymer finish complying with AAMA 2605 and containing not less than [**50**] [**70**] percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances, header support, and other conditions affecting performance of automatic entrances.
- B. Examine roughing-in for electrical systems to verify actual locations of power connections before automatic entrance installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Install automatic entrances according to manufacturer's written instructions and cited BHMA standard for direction of pedestrian travel, including signage, controls, wiring, and connection to the building's power supply.
 - 1. Do not install damaged components. Fit frame joints to produce hairline joints free of burrs and distortion. Rigidly secure nonmovement joints. Seal joints watertight.
 - 2. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.
 - 3. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous coating.
- B. Entrances: Install automatic entrances plumb and true in alignment with established lines and grades without warp or rack of framing members and doors. Anchor securely in place.
 - 1. Install surface-mounted hardware using concealed fasteners to greatest extent possible.
 - 2. Set headers, operating brackets, and guides level and true to location with anchorage for permanent support.
 - 3. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within system to exterior.
 - 4. Provide thresholds [**at exterior doors**] [**and**] [**where indicated**].
- C. Door Operators: Connect door operators to electrical power distribution system.
- D. Access-Control Devices: Connect access-control devices to access-control system as specified in Section 28 13 00 "Access Control."
- E. Controls: Install and adjust activation and safety devices according to manufacturer's written instructions and cited BHMA standard for direction of pedestrian travel. Connect control wiring according to Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables."

- F. Guide Rails: Install rails according to BHMA A156.10, including Appendix A, and manufacturer's written instructions unless otherwise indicated.
- G. Glazing: Install glazing as specified in [**Section 08 80 00 "Glazing."**] [**Section 08 88 53 "Security Glazing."**]
- H. Sealants: Comply with requirements specified in Section 07 92 00 "Joint Sealants" to provide weathertight installation.
 - 1. Set thresholds, framing members, and flashings in full sealant bed.
 - 2. Seal perimeter of framing members with sealant.
- I. Signage: Apply signage on both sides of each door[**and breakaway sidelite**] as required by cited BHMA standard for direction of pedestrian travel.
- J. Wiring within Automatic Entrance Enclosures: Bundle, lace, and train conductors to terminal points with no excess and without exceeding manufacturer's written limitations on bending radii. Provide and use lacing bars and distribution spools.

3.3 FIELD QUALITY CONTROL

- A. Certified Inspector: [**Owner will engage**] [**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 AAAADM Certified Technician**:
 - 1. Test and inspect each automatic entrance, using AAADM inspection forms, to determine compliance of installed systems with applicable BHMA standards. Technician shall demonstrate function, working aspects of the operator, and safety checks to be implemented.
- C. Automatic entrances will be considered defective if they do not pass tests and inspections.
- D. Prepare test and inspection reports.

3.4 ADJUSTING

- A. Adjust hardware, moving parts, door operators, and controls to function smoothly, and lubricate as recommended by manufacturer; comply with requirements of applicable BHMA standards.
 - 1. Adjust exterior doors for weathertight closure.
- B. Readjust door operators and controls after repeated operation of completed installation equivalent to three days' use by normal traffic (100 to 300 cycles).

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

3.5 CLEANING

- A. Clean glass and metal surfaces promptly after installation. Remove excess glazing and sealant compounds, dirt, and other substances. Repair damaged finish to match original finish.
 - 1. Comply with requirements in [Section 08 80 00 "Glazing"] [Section 08 88 53 "Security Glazing"] for cleaning and maintaining glass.

3.6 MAINTENANCE SERVICE

- A. Initial Maintenance Service: Beginning at Substantial Completion, maintenance service shall include [three] [six] [nine] [12] months' full maintenance by skilled employees of automatic entrance Installer. Include [monthly] [quarterly] preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper automatic entrance operation. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.
 - 1. Engage a Certified Inspector to perform safety inspection after each adjustment or repair and at end of maintenance period. Furnish completed inspection reports to Owner.
 - 2. Perform maintenance, including emergency callback service, during normal working hours.
 - 3. Include 24-hour-per-day, 7-day-per-week, emergency callback service.

3.7 DEMONSTRATION

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

END OF SECTION 08 42 29.33