SECTION 084229.13 - FOLDING AUTOMATIC ENTRANCES

Revise this Section by deleting and inserting text to meet Project-specific requirements.

This spec includes provisions for LEED 2009, LEED v4, IgCC, and Green Globes. Sustainable design requirements may be inserted in the Section Text using the hypertext links.

1. GENERAL
   * + 1. SUMMARY
          1. Section includes [**exterior**] [**and**] [**interior**], folding, power-operated automatic entrances.

Refer to sections listed below for cross-reference requirements Contractor might expect to find in this Section but are specified in other Sections. Sections listed below are for spec editor’s and design team coordination and are to remain as Editor’s Notes. Remove referenced specification sections within the body of the specification if not applicable to the project.

Section 033000 "Cast-in-Place Concrete" for forming recesses in concrete for recessed thresholds.

* + - 1. DEFINITIONS

Retain terms that remain after this Section has been edited for a project.

* + - * 1. AAADM: American Association of Automatic Door Manufacturers.
        2. Activation Device: A control that, when actuated, sends an electrical signal to the door operator to open the door.
        3. BCNYS: Building Code of New York State.
        4. Safety Device: A control that, to avoid injury, prevents a door from opening or closing.
        5. For automatic door terminology, refer to BHMA A156.10 for definitions of terms.
      1. COORDINATION

Retain applicable requirements in this article to suit Project.

* + - * 1. Coordinate sizes and locations of recesses in concrete floors for recessed sliding tracks that control automatic entrances.
        2. Templates: Distribute for doors, frames, and other work specified to be factory prepared for installing automatic entrances.
        3. 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.
        4. Electrical System Roughing-in: Coordinate layout and installation of automatic entrances with connections to power supplies[**and access-control system**] [**and remote activation devices**] [**and remote monitoring systems**].
        5. System Integration: Integrate sliding automatic entrances with other systems as required for a complete working installation.
      1. PREINSTALLATION MEETINGS

Retain "Preinstallation Conference" paragraph below if Work of this Section is extensive or complex enough to justify a conference.

* + - * 1. Preinstallation Conference: Conduct conference at Project site.
      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. Provide Quality Control Submittals prior to submitting the remaining submittals in order specified.

Submit Product Data, Shop Drawings, Samples for Initial Selection, [**and**] [**Delegated Design**] submittals as one package.

* + - * 1. Quality Control Submittals:

Qualification Data: For [**Installer**] [**manufacturer**] [**Certified Inspector]**.

Retain "Product Certificates" paragraph below to require submittal of product certificates from manufacturers. Retain option if applicable to Project.

Product Certificates: For each type of automatic entrance.[ Include emergency-exit features of automatic entrances serving as a required means of egress.]

Generally retain "Product Test Reports" paragraph below for windborne-debris impact-resistance testing if required.

Product Test Reports: For each type of automatic entrance, for tests performed by a qualified testing agency.

Retain "Field quality-control reports" paragraph below if Contractor is responsible for field quality-control testing and inspecting.

Field quality-control reports.

Sample Warranties: For manufacturer's special warranties.

* + - * 1. Product Data: For each type of product.

Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for automatic entrances.

Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

Include manufacturer’s installation instructions.

* + - * 1. Sustainable Design Submittals:
        2. Shop Drawings: For folding automatic entrances.

If custom components are required and detailed or isometric Shop Drawing are acceptable, insert provisions in applicable subparagraphs below. If Drawings are insufficient, insert provisions for samples in "Samples for Verification" paragraph below to indicate details of assembly.

Include plans, elevations, sections, hardware mounting heights, and attachment details.

Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

Include diagrams for power, signal, and control wiring.

Indicate locations of activation and safety devices.

Include hardware schedule and indicate hardware types, functions, quantities, and locations.

Retain "Samples for Initial Selection" and "Samples for Verification" paragraphs below for two-stage Samples.

* + - * 1. Samples for Initial Selection: For units with factory-applied [**color**] [**and**] [**metal-clad**] finishes.

Include Samples of hardware and accessories involving color or finish selection.

If Samples of custom components are required, insert provisions in "Samples for Verification" paragraph below for Samples to indicate details of assembly.

* + - * 1. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.

Retain "Delegated Design Submittal" paragraph below if design services have been delegated to Contractor.

* + - * 1. Delegated Design Submittal: For automatic entrances.
        2. Contract Closeout Submittals:

Operation and Maintenance Data: For automatic entrances, safety devices, and control systems to include in operation and maintenance manuals.

* + - 1. QUALITY ASSURANCE
         1. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation and maintenance of units required for this Project[**and who employs a Certified Inspector**].

Retain "Maintenance Proximity" subparagraph below if retaining "Maintenance Service" Article.

Maintenance Proximity: Not more than [**two**] <**Insert number**> hours' normal travel time from Installer's place of business to Project site.

Retain "Certified Inspector Qualifications" paragraph below if retaining "Manufacturer Qualifications" paragraph above, option in "Installer Qualifications" paragraph above, "Certified Inspector" paragraph in "Field Quality Control" Article, or "Maintenance Service" Article.

* + - * 1. Certified Inspector Qualifications: Certified by AAADM.
      1. WARRANTY

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

* + - * 1. Special Warranty: Manufacturer agrees to repair or replace components of automatic entrances 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.

Faulty operation of operators, controls, and hardware.

Delete option in first subparagraph below if retaining "Special Finish Warranty, Factory-Applied Finishes" or "Special Finish Warranty, Anodized Finishes" paragraph below.

Deterioration of metals[**, metal finishes,**] and other materials beyond normal weathering and use.

Verify available warranties and warranty periods for units and components.

Warranty Period: [**Two**] <**Insert number**> years from date of Substantial Completion.

Verify available special finish warranties with manufacturers. Extended 20-year finish warranties are sometimes available for 70 percent fluoropolymer coatings.

* + - * 1. Special Finish Warranty, Factory-Applied Finishes: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of baked enamel, powder coat, or organic finishes within specified warranty period.

Retain first subparagraph below for factory-painted finishes. Coordinate color fading and chalking limits with finishes retained in Part 2.

Deterioration includes, but is not limited to, the following:

Color fading more than 5 Delta E units when tested in accordance with ASTM D2244.

Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.

Cracking, checking, peeling, or failure of paint to adhere to bare metal.

Coordinate "Warranty Period" subparagraph below with "Aluminum Finishes" Article. AAMA 2604 is intended to represent five years of performance; AAMA 2605 is intended to represent 10 years of performance. Some manufacturers also offer a 20-year warranty. Verify available warranties and warranty periods for finishes.

Warranty Period: [**Five**] [**10**] [**20**] <**Insert number**> years from date of Substantial Completion.

* + - * 1. Special Finish Warranty, Anodized Finishes: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of anodized finishes within specified warranty period.

Retain first subparagraph below for anodized finishes. Coordinate color fading and chalking limits with finishes retained in Part 2.

Deterioration includes, but is not limited to, the following:

Color fading more than 5 Delta E units when tested in accordance with ASTM D2244.

Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.

Cracking, peeling, or chipping.

Coordinate "Warranty Period" subparagraph below with "Aluminum Finishes" Article. Five years is standard for Class I anodized finishes, although several manufacturers offer a 10- or 20-year warranty. Class II anodized finishes often carry less than a five-year warranty. Verify available warranties and warranty periods for finishes.

Warranty Period: [**Five**] [**10**] <**Insert number**> years from date of Substantial Completion.

1. PRODUCTS

Manufacturers and products listed in this Section are neither recommended nor endorsed by the AIA or Deltek. Before selecting manufacturers and products, verify availability, suitability for intended applications, and compliance with minimum performance requirements.

Product options commonly available from manufacturers are included in square brackets throughout the Section Text. Not every manufacturer listed can provide every option offered; verify availability with manufacturers.

* + - 1. AUTOMATIC ENTRANCE ASSEMBLIES

Retain "Source Limitations" paragraph below only if more than one automatic entrance is required. Verify availability of different types of automatic entrances with manufacturers and with Sections where these entrance types are specified, if any. Consider inserting other door types, specified in other Sections, if identical finishes are required. Verify availability with manufacturers.

* + - * 1. Source Limitations: Obtain folding [**sliding**] [**and**] [**swinging**] automatic entrances from single source from single manufacturer.
        2. 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.
        3. Power-Operated Door Standard: BHMA A156.10.
      1. PERFORMANCE REQUIREMENTS
         1. Structural Performance: Automatic entrances withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated in accordance with ASCE/SEI 7.

Consult a structural engineer experienced in engineering building entrances of type indicated to quantify design loads applicable to Project. Verify compliance with codes.

Retain "Seismic Loads" and "Wind Loads" subparagraphs below if design loads and load combinations are not indicated on Drawings.

Seismic Loads: <**Insert loads**>.

Wind Loads: <**Insert loads**>.

Retain "Windborne-Debris Impact Resistance" paragraph below to suit Project. The BCNYS establishes criteria for buildings in hurricane-prone locations. In paragraph, "enhanced" option applies to essential facilities and has additional requirements. Verify requirements of authorities having jurisdiction. Verify which manufacturers have tested products and can demonstrate compliance.

* + - * 1. Windborne-Debris Impact Resistance: Passes ASTM E1886 missile-impact and cyclic-pressure tests in accordance with ASTM E1996 for Wind Zone [**1**] [**2**] [**3**] [**4**] for [**basic**] [**enhanced**] protection.

Insert increased heights if different from those in "Large-Missile Test" and "Small-Missile Test" subparagraphs below.

Large-Missile Test: For glazing located within [**30 feet**] <**Insert dimension**> of grade.

Small-Missile Test: For glazing located between 30 feet and [**60 feet**] <**Insert dimension**> above grade.

* + - * 1. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

Differential values in "Temperature Change" subparagraph below (for aluminum in particular) are suitable for most of the United States.

Temperature Change: [**120 deg F, ambient; 180 deg F, material surfaces**] <**Insert temperature change**>.

* + - * 1. Operating Temperature Range: Automatic entrances operate within [**minus 20 to plus 122 deg F**] <**Insert temperature range**>.

First option in "Air Infiltration" paragraph below, at a static-air-pressure difference of 1.57 lbf/sq. ft., complies with ASHRAE 90.1. ASTM E283 requires using a static-air-pressure difference of 1.57 lbf/sq. ft. unless otherwise indicated, which is equivalent to a 25-mph wind. Static-air-pressure difference of 6.24 lbf/sq. ft. is equivalent to a 50-mph wind.

* + - * 1. 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 in accordance with ASTM E283 at a minimum static-air-pressure difference of [**1.57 lbf/sq. ft.**] [**6.24 lbf/sq. ft.**] <**Insert value**>.
        2. Opening Force:

Requirements in "Power-Operated Doors" subparagraph below are in accordance with the IBC and NFPA 101 for power-operated, means-of-egress doors. The BCNYS also requires compliance with BHMA A156.10. Verify requirements of authorities having jurisdiction.

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.

Requirement in "Breakaway Device for Power-Operated Doors" subparagraph below is in accordance with BHMA A156.10.

Breakaway Device for Power-Operated Doors: Not more than 50 lbf required for a breakaway door or panel to open.

* + - * 1. Entrapment-Prevention Force:

Requirements in "Power-Operated Folding Doors" subparagraph below are in accordance with BHMA A156.10. Verify requirements of authorities having jurisdiction.

Power-Operated Folding 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 closing.

* + - 1. FOLDING AUTOMATIC ENTRANCES
         1. General: Provide manufacturer's standard automatic entrances, including doors, framing, headers, overhead tracks, door operators, controls, and accessories required for a complete installation.

See the table at the end of the Evaluations for a list of manufacturers' products. Use this table in combination with manufacturers' catalogs or product data to insert series, type, model, and designations of other characteristics. Local New York State and area manufacturers and distributers are preferred. Review list below and update to suit project.

Copy "Folding, Power-Operated Automatic Entrance" paragraph below and re-edit for each product.

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

* + - * 1. Folding, Power-Operated Automatic Entrance <**Insert drawing designation**>:

[Products:](http://www.specagent.com/Lookup?ulid=12806) Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

[Besam Entrance Solutions; an ASSA ABLOY Group Company](http://www.specagent.com/Lookup?uid=123457219556); <Insert product designation>.

[DORMA USA, Inc](http://www.specagent.com/Lookup?uid=123457219562).; DORMA ED1200 Automatic Bi-Fold Door.

[Horton Automatics; a division of Overhead Door Corporation](http://www.specagent.com/Lookup?uid=123457219558); <Insert product designation>.

[NABCO Entrances, Inc](http://www.specagent.com/Lookup?uid=123457219559); <Insert product designation>.

[Stanley Access Technologies](http://www.specagent.com/Lookup?uid=123457219561); SB 600 Bi-Folding Door.

Or equal.

Configuration: [**One pair of folding doors that fold to one side**] [**Two pairs of folding doors (biparting) that fold to each side**] of door opening[**with transom**].

Traffic Pattern: [**One**] [**Two**] way.

Mounting: [**Between jambs**] [**Surface**].

Operator Features:

Revise list below to suit Project. Consult manufacturers for availability and necessity of adjustability for specific applications.

Power opening and [**spring**] [**or**] [**power**] closing.

Adjustable opening and closing speeds.

Adjustable hold-open time between zero and 30 seconds.

Obstruction recycle.

Automatic door re-open if stopped while closing.

On-off/hold-open switch to control electric power to operator[**, key operated**].

<**Insert features required**>.

Folding-Door Overhead Tracks: Assembly consisting of guide-track and breakaway system; secured to header. Connect one folding leaf at the top to door operator, and set on a floor-mounted bottom pivot; no bottom track is permitted.

Controls: Activation and safety devices [**as indicated on Drawings and**]in accordance with BHMA standards.

Retain option in "Controls" subparagraph above, or retain one activation device and one safety device from "Activation Device, Motion Sensor," "Activation Device, and "Activation Device, Switch" subparagraphs below. Consult manufacturers for recommendations; revise to suit Project.

Motion sensor is the most common activation device; key switch is usually a supplementary activation device.

Activation Device, Motion Sensor: Mounted on each side of door header to detect pedestrians in activating zone and to open door.

Activation Device, Switch: [**Push-plate switch**] [**Push-button switch**] [**Key switch**] [**Touchless switch**][**on each side of door**] to activate door operator.

Retain "Safety Device, Presence Sensor" subparagraph below with any activation device above.

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.

Retain "Finish" or "Metal Cladding and Finish" subparagraph below.

Revise "Finish" subparagraph below if different finish is required for components of automatic entrances. If more than one finish is required, indicate location of each on Drawings, in schedules, or by inserts.

Finish: Finish framing, door(s), and header with [**clear anodic finish**] [**color anodic finish**] [**baked-enamel or powder-coat finish**] [**high-performance organic finish**] [**superior-performance organic finish**] [**finish matching adjacent curtain wall**] [**finish matching adjacent storefront**].

Retain "Metal Cladding and Finish" subparagraph below only for metal-clad automatic entrances. Verify availability of metal cladding with manufacturers before specifying. Revise subparagraph if different finish is required for components of automatic entrances. If more than one finish is required, indicate location of each on Drawings, in schedules, or by inserts.

Metal Cladding and Finish: Clad framing, door(s), and header with [**No. 4 directional-satin-finish stainless steel sheet**] [**No. 8 mirror finish stainless steel sheet**] [**satin-brass sheet**] [**polished-brass sheet**] [**satin-bronze sheet**] [**polished-bronze sheet**] [**metal sheet in finish matching Director’s Representative's sample**] [**metal sheet in finish as selected by Director’s Representative from manufacturer's full range**] [**metal sheet in finish matching adjacent storefront**] <**Insert finish**>.

* + - 1. ENTRANCE COMPONENTS
         1. Framing Members: Extruded aluminum, minimum 0.125 inch thick and reinforced as required to support imposed loads.

Nominal Size: [**As indicated on Drawings**] [**1-3/4 by 4-1/2 inches**] [**1-3/4 by 6 inches**] <**Insert dimensions**>.

Retain "Extruded Glazing Stops and Applied Trim" subparagraph below for separately framed transoms.

Extruded Glazing Stops and Applied Trim: Minimum 0.062-inch wall thickness.

* + - * 1. 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.

Glazing Stops and Gaskets: [**Beveled**] [**Square**], snap-on, extruded-aluminum stops and preformed gaskets.

Revise "Stile Design" and "Rail Design" subparagraphs below to suit Project. Most folding-door manufacturers offer narrow stiles.

Stile Design: [**As indicated on Drawings**] [**Narrow stile, 2-1/8-inch nominal width**] <**Insert requirement**>.

Last option in "Rail Design" subparagraph below is required for manual doors along an accessible route but is not required for automatic doors.

Rail Design: [**As indicated on Drawings**] [**5-inch nominal height**] [**6-1/2-inch nominal height**] [**10-inch nominal height**].

Retain "Muntin Bars" subparagraph below if required. Many manufacturers include muntins as standard.

Muntin Bars: Horizontal tubular rail member for each door; match stile design and finish.

Retain "Transom" paragraph below if required.

* + - * 1. Transom: 1-3/4-inch- deep with minimum 0.125-inch- thick, extruded-aluminum tubular stile and rail members matching door design.

Glazing Stops and Gaskets: Same materials and design as for stile and rail door.

* + - * 1. 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.

Mounting: [**Surface mounted**] [**Concealed, with one side of header flush with framing**].

* + - * 1. Brackets and Reinforcements: High-strength aluminum with nonstaining, nonferrous shims for aligning system components.
        2. Signage: As required by cited BHMA standard.

First option in "Application Process" subparagraph below is most common.

Application Process: [**Decals**] [**Silk-screened**] [**Door manufacturer's standard process**] <**Insert requirement**>.

Retain subparagraph below for signs on field-installed glass surfaces.

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

* + - 1. MATERIALS
         1. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.

Extrusions: ASTM B221.

Sheet: ASTM B209.

* + - * 1. Steel Reinforcement Primer: Reinforcement with corrosion-resistant primer complying with SSPC-PS Guide No. 12.00 applied immediately after surface preparation and pretreatment. Use surface preparation methods in accordance with recommendations in SSPC-SP COM and prepare surfaces in accordance with applicable SSPC standard.
        2. Stainless Steel Bars: ASTM A276 or ASTM A666, [**type 304**] [**type 316**] <**Insert type**>.
        3. Stainless Steel Tubing: ASTM A554, [**Grade MT 304**] [**Grade MT 316**] <**Insert grade**>.

Retain one or more of "Stainless Steel Sheet," "Brass Sheet," and "Bronze Sheet" paragraphs below for metal-clad finishes.

* + - * 1. Stainless Steel Sheet: ASTM A240 or ASTM A666, [**type 304**] [**type 316**] <**Insert type**>, stretcher-leveled standard of flatness, in entrance manufacturer's standard thickness.

Retain "Brass Sheet" paragraph below for brassy yellow color; revise to suit Project.

* + - * 1. Brass Sheet: ASTM B36, Alloy UNS No. C26000 (cartridge brass, 70 percent copper), in entrance manufacturer's standard thickness.

Retain "Bronze Sheet" paragraph below for bronze look. Neither alloy is a true tin bronze, but both closely match color of extruded architectural bronze (also not a true tin bronze). Revise if only one of these two alloys is acceptable or to specify another alloy.

* + - * 1. Bronze Sheet: ASTM B36, 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.

Retain "Expanded Aluminum Mesh" or "Polycarbonate Sheet" paragraph below for guide-rail infill panel if required. Revise to suit Project, or insert another material if required.

Options in "Expanded Aluminum Mesh" paragraph below are types included in ASTM F1267.

* + - * 1. Expanded Aluminum Mesh: [**Expanded**] [**Expanded and flattened**] aluminum sheet in accordance with the geometry of ASTM F1267.
        2. Polycarbonate Sheet: ASTM C1349, Appendix X1, type II, coated, mar-resistant, UV-stabilized polycarbonate with coating on both surfaces.
        3. Glazing: As specified in [**Section 088000 "Glazing."**] [**Section 088853 "Security Glazing."**]
        4. Sealants and Joint Fillers: As specified in Section 079200 "Joint Sealants."
        5. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D1187.
        6. Fasteners and Accessories: Corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
      1. DOOR OPERATORS AND CONTROLS
         1. General: Provide operators and controls, which include activation and safety devices, in accordance with BHMA standards, for condition of exposure and for long-term, maintenance-free operation under normal traffic load for type of occupancy indicated.
         2. Door Operators: Provide door operators of size recommended by manufacturer for door size, weight, and movement.

Door Operator Performance: Door operators open and close doors and maintain them in fully closed position when subjected to Project's design wind loads.

Electromechanical Operators: Concealed, self-contained, overhead units 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; complying with UL 325; and with manual operation with power off.

Retain one or more activation and safety devices in this article; available devices vary among manufacturers. Generally, indicate location of each device for each door opening on Drawings, because some devices can be used for both activation and safety. Coordinate with devices retained, if any, in "Folding Automatic Entrances" Article. Consult manufacturers and revise retained paragraphs as needed.

* + - * 1. Motion Sensors: Self-contained, K-band-frequency, microwave-scanner units; fully enclosed by their plastic housings; adjustable to provide detection-field sizes and functions required by BHMA A156.10.

Provide capability for switching between bi- and unidirectional detection.

For one-way traffic, sensor on egress side is not active when doors are fully closed.

* + - * 1. Presence Sensors: Self-contained, active-infrared scanner units; adjustable to provide detection-field sizes and functions required by BHMA A156.10. Sensors remain active at all times.
        2. Push-Plate Switch: Momentary-contact door-control switch with flat push-plate actuator[**, with contrasting-colored, engraved message**].

Configuration:

Retain one of three subparagraphs below. Insert mounting height for wall switches if not indicated on Drawings.

Round Push Plate: With 4-by-4-inch junction box.

Mounting: [**As indicated on Drawings**] [**Recess mounted, semiflush in wall**] [**Surface mounted on wall**].

Square Push Plate: With 4-by-4-inch junction box.

Mounting: [**As indicated on Drawings**] [**Recess mounted, semiflush in wall**] [**Surface mounted on wall**].

Rectangular Push Plate: With 2-by-4-inch junction box.

Mounting: [**As indicated on Drawings**] [**Recess mounted, semiflush in wall**] [**Recess mounted in doorjamb**] [**Surface mounted on wall**] [**Surface mounted on post**] [**Surface mounted on guide rail**].

Push-Plate Material: [**Stainless steel**] [**Plastic**], as selected by Director’s Representative from manufacturer's full range.

Message: [**Plain face with no message.**] [**"Push to Open."**] [**International symbol of accessibility.**] [**International symbol of accessibility and "Push to Open."**]

* + - * 1. Touchless Switch: Hands-free-activation door-control switch with flat motion sensor faceplate[**, with contrasting-colored, engraved message**].

Insert mounting height for wall switches if not indicated on Drawings.

Configuration: [**6-inch round**] [**4.56-by-4.56-inch (double gang) square**] [**2.77-by-4.56-inch (single gang) rectangular**] [**1.68-by-4.56-inch jamb-style**] faceplate.

Mounting: [**As indicated on Drawings**] [**Recess mounted in wall**] [**Recess mounted in doorjamb**] [**Surface mounted on wall**].

Faceplate Material: [**Stainless steel**] [**Plastic**] [**Stainless steel with backlight acrylic window**], as selected by Director’s Representative from manufacturer's full range.

Message: [**"Wave to Open"**] [**"Wave to Open" and wave symbol**] [**International symbol of accessibility**] [**International symbol of accessibility, "Wave to Open," and wave symbol**].

* + - * 1. Push-Button Switch: Momentary-contact door-control switch with one red-button actuator; enclosed in nominal [**2-by-4-inch**] [**4-by-4-inch**] junction box.

Provide faceplate engraved with "Press to Open" letters[**and international symbol of accessibility**] in contrasting color.

Provide blue plastic cover engraved with "Press Button to Open" in white letters and international symbol of accessibility.

Mounting: [**As indicated on Drawings**] [**Surface mounted on wall**] [**Surface mounted on post**] [**Surface mounted on guide rail**] [**Recess mounted in wall**].

Faceplate Material: [**Stainless steel**] [**Painted metal**], as selected by Director’s Representative from manufacturer's full range.

* + - * 1. 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.

Faceplate Material: [**Stainless steel**] [**Painted metal**], as selected by Director’s Representative from manufacturer's full range.

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**].

Mounting: [**As indicated on Drawings**] [**Recess mounted, semiflush in wall**] [**Recess mounted in doorjamb**] [**Surface mounted on wall**] [**Surface mounted on post**].

* + - * 1. Wireless or Remote Radio Control Switch: Auxiliary radio control system consisting of header-mounted receiver and [**wall-mounted**] [**hand-held, battery-operated**] transmitter switch[**for each entrance**] <**Insert requirement**>.

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.

If required, insert another type of sensing device, switch, or access-control device. Verify availability with manufacturers.

* + - * 1. 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.
      1. HARDWARE

Before revising this article, verify requirements for accessible entrances, emergency-exit doors, and other requirements of authorities having jurisdiction.

Consult with Door Hardware Consultant to coordinate hardware requirements.

If various door and hardware combinations are needed, insert requirements in "Folding Automatic Entrances" Article.

* + - * 1. 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**].
        2. 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 is as stipulated in "Performance Requirements" Article. Interrupt powered operation of door operator while in breakaway mode.

Include [**one adjustable detent device mounted at the top of each breakaway panel**] [**two adjustable detent devices mounted in each breakaway panel; one top mounted and one bottom mounted**] to control breakaway force.

Retain "Panel Closer" or "Limit Arms" subparagraph below for detent device.

Panel Closer: Factory-installed concealed hydraulic door closer.

Limit Arms: Limit swing to 90 degrees, spring loaded with adjustable friction damping.

If required, retain "Hinges" paragraph below. Center pivots are typically provided by manufacturers at hinge stile. Offset hinges are used between panels of folding doors. Other types of hinges for folding automatic doors are uncommon or nonexistent.

* + - * 1. Hinges:

Center-Pivot Sets: BHMA A156.4, Grade 1, with exposed parts of cast-aluminum alloy.

Offset Pivots: BHMA A156.4, Grade 1, with exposed parts of cast-aluminum alloy.

* + - * 1. Deadlocks: Deadbolt operated by exterior cylinder and interior thumb turn, with minimum 1-inch- long throw bolt; BHMA A156.5, Grade 1.

Cylinders and Keying: As specified in Section 087100 "Door Hardware."

Deadbolts: Laminated-steel hook, mortise type, BHMA A156.5, Grade 1.

Retain one or both of "Two-Point Locking for Single-Folding Doors" and "Two-Point Locking for Biparting-Folding Doors" subparagraphs below for doors. Delete both if flush bolts are prohibited or if exit devices are required. Verify requirements of authorities having jurisdiction.

Two-Point Locking for Single-Folding Doors: BHMA A156.5, Grade 1, mortise-type, laminated-steel hookbolt mounted in stile of active door panel that engages strike jamb when operated by cylinder; and with concealed, vertical flush bolt mounted in hinge stile that engages header when operated by cylinder.

Two-Point Locking for Biparting-Folding Doors: BHMA A156.5, Grade 1, mortise-type, laminated-steel hookbolt mounted in stile of active door panel that engages active panel of opposite door when operated by cylinder; and with concealed, vertical flush bolts mounted in each hinge stile that engage header when operated by cylinders.

* + - * 1. 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.
        2. Weather Stripping: Replaceable components.

Sliding Type: AAMA 701/702, made of wool, polypropylene, or nylon woven pile with nylon-fabric or aluminum-strip backing.

Compression Type: Made of ASTM D2000 molded neoprene or ASTM D2287 molded PVC.

Weather Sweeps: Nylon brush sweep mounted to underside of door bottom.

* + - * 1. Finger Guards: Collapsible neoprene or PVC gasket.
      1. ACCESSORIES
         1. Guide Rails:

Generally, retain one of two subparagraphs below.

[**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 doorjamb for distance as indicated, but not less than that required by BHMA A156.10 for type of door and direction of travel; with filler panel.

Filler Panel: [**Expanded aluminum mesh**] [**Clear polycarbonate sheet**] [**Colored polycarbonate sheet**] <**Insert material**>.

Retain first subparagraph below if required; delete if shown on Drawings.

Orient expanded aluminum mesh with long dimension of diamonds [**parallel to top rail**] [**perpendicular to top rail**].

Color: [**Match Director’s Representative's sample**] [**As selected by Director’s Representative from manufacturer's full range**] <**Insert color**>.

Mounting: [**As indicated on Drawings**] [**Jamb and floor**] [**Floor, freestanding**].

Retain "Aluminum Finish" or "Stainless Steel Finish" subparagraph below; revise to suit Project.

Aluminum Finish: [**Clear anodic finish**] [**Color anodic finish**] [**Baked-enamel or powder-coat finish**] [**High-performance organic finish**] [**Superior-performance organic finish**] [**Finish matching door and frame**] <**Insert finish**>.

Stainless Steel Finish: [**No. 4 directional-satin-finish stainless steel**] [**Finish matching door and frame**] <**Insert finish**>.

If retaining subparagraph below, verify that guide-rail design and layout complies with BHMA A156.10.

See [**Section 055213 "Pipe and Tube Railings."**]

* + - 1. FABRICATION
         1. General: Factory fabricate automatic entrance components to designs, sizes, and thicknesses indicated and to comply with indicated standards.

Form aluminum shapes before finishing.

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.

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**].

Where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration, use self-locking devices.

Reinforce members as required to receive fastener threads.

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.

* + - * 1. Framing: Provide automatic entrances as prefabricated assemblies. Complete fabrication, assembly, finishing, hardware application, and other work before shipment to Project site.

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.

Perform fabrication operations in manner that prevents damage to exposed finish surfaces.

Form profiles that are sharp, straight, and free of defects or deformations.

Provide components with concealed fasteners and anchor and connection devices.

Fabricate components with accurately fitted joints, with ends coped or mitered to produce hairline joints free of burrs and distortion.

Fabricate exterior components to drain water passing joints, condensation occurring within framing members, and moisture migrating within system to exterior.

Provide anchorage and alignment brackets for concealed support of assembly from building structure.

Allow for thermal expansion of exterior units.

* + - * 1. Doors: Factory fabricated and assembled in profiles indicated. Reinforce as required to support imposed loads and for installing hardware.

Retain "Metal Cladding" paragraph below only for metal-clad finishes.

* + - * 1. Metal Cladding: Factory-fabricated and -installed metal cladding, completely covering all visible surfaces as part of prefabricated entrance assembly before shipment to Project site.

Perform fabrication operations in manner that prevents damage to exposed finish surfaces.

Form profiles that are sharp, straight, and free of defects or deformations.

Provide components with concealed fasteners and anchor and connection devices.

Fabricate components with accurately fitted joints, with ends coped or mitered to produce hairline joints free of burrs and distortion.

Fabricate exterior components to drain water passing joints, condensation occurring within framing members, and moisture migrating within system to exterior.

Allow for thermal expansion at exterior entrances.

* + - * 1. Door Operators: Factory fabricated and installed in headers, including adjusting and testing.
        2. Glazing: Fabricate framing with minimum glazing edge clearances for thickness and type of glazing indicated, in accordance with GANA's "Glazing Manual."

Insert requirements for factory glazing if available from manufacturers. Automatic entrances are generally field glazed.

* + - * 1. 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.

Provide sliding-type weather stripping, mortised into door, at perimeter of doors.

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.

Provide weather sweeps mounted to underside of door bottoms of exterior doors.

BHMA A156.10 requires finger guards at the hinge side of center-pivoted folding doors within the dimensional limits given in subparagraph below. Consult manufacturers for availability of finger guards for other types of hinge configurations if required.

Provide finger guards at each folding-door panel 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.

* + - * 1. Controls:

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.

* + - 1. GENERAL FINISH REQUIREMENTS
         1. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

Retain first paragraph below for coatings and anodic finishes.

* + - * 1. Apply organic and anodic finishes to formed metal after fabrication unless otherwise indicated.
        2. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. 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.
      1. ALUMINUM FINISHES

Some manufacturers of folding automatic entrances use different systems of finish designation than the Aluminum Association finishes below; verify with manufacturers. See the Evaluations.

Retain finishes in paragraphs below to suit Project. If retaining more than one finish, indicate location of each on Drawings or by inserts.

Retain one of two options in "Clear Anodic Finish" paragraph below. Verify availability with manufacturers.

* + - * 1. Clear Anodic Finish: AAMA 611, [**AA-M12C22A41, Class I, 0.018 mm**] [**AA-M12C22A31, Class II, 0.010 mm**] or thicker.

Retain one of two options in "Color Anodic Finish" paragraph below. Verify availability with manufacturers.

* + - * 1. Color Anodic Finish: AAMA 611, [**AA-M12C22A42/A44, Class I, 0.018 mm**] [**AA-M12C22A32/A34, Class II, 0.010 mm**] or thicker.

Options in "Color" subparagraph below are examples only and may vary in color range and availability among manufacturers.

Color: [**Light bronze**] [**Medium bronze**] [**Dark bronze**] [**Champagne**] [**Black**] [**Match Director’s Representative's sample**] [**As selected by Director’s Representative from full range of industry colors and color densities**] <**Insert color**>.

"Baked-Enamel or Powder-Coat Finish" paragraph below references AAMA standard for pigmented organic coating on aluminum extrusions and panels.

* + - * 1. Baked-Enamel or Powder-Coat Finish: AAMA 2603. Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

Color and Gloss: [**As indicated by manufacturer's designations**] [**Match Director’s Representative's sample**] [**As selected by Director’s Representative from manufacturer's full range**] <**Insert color and gloss**>.

Retain "High-Performance Organic Finish, Two-Coat PVDF," "Superior-Performance Organic Finish, Three-Coat PVDF," "Superior-Performance Organic Finish, Four-Coat PVDF," "Superior-Performance Organic Finish, Single-Coat FEVE," or "Superior-Performance Organic Finish, Two-Coat FEVE" paragraph below; if more than one is required, indicate location of each system on Drawings, in schedules, or by inserts. Coordinate finish system selected with special finish warranty period specified in Part 1 "Warranty" Article.

In "High-Performance Organic Finish, Two-Coat PVDF" paragraph below, retain AAMA 2604 with 50 percent resin content by weight in color coat or AAMA 2605 with 70 percent resin content by weight in color coat for high-performance organic coatings on extrusions and panels. If specific products are required, name coating manufacturers and products.

* + - * 1. High-Performance Organic Finish, Two-Coat PVDF: 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 [**for seacoast and severe environments**].

Color and Gloss: [**As indicated by manufacturer's designations**] [**Match Director’s Representative's sample**] [**As selected by Director’s Representative from manufacturer's full range**] <**Insert color and gloss**>.

* + - * 1. Superior-Performance Organic Finish, Three-Coat PVDF: Fluoropolymer finish complying with AAMA 2605 and containing not less than 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 [**for seacoast and severe environments**].

Color and Gloss: [**As indicated by manufacturer's designations**] [**Match Director’s Representative's sample**] [**As selected by Director’s Representative from manufacturer's full range**] <**Insert color and gloss**>.

* + - * 1. Superior-Performance Organic Finish, Four-Coat PVDF: Fluoropolymer finish complying with AAMA 2605 and containing not less than 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 [**for seacoast and severe environments**].

Color and Gloss: [**As indicated by manufacturer's designations**] [**Match Director’s Representative's sample**] [**As selected by Director’s Representative from manufacturer's full range**] <**Insert color and gloss**>.

"Superior-Performance Organic Finish, Single-Coat FEVE" paragraph below is not suitable for seacoast and severe environments.

* + - * 1. Superior-Performance Organic Finish, Single-Coat FEVE: Fluoropolymer finish complying with AAMA 2605.

Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

Color and Gloss: [**As indicated by manufacturer's designations**] [**Match Director’s Representative's sample**] [**As selected by Director’s Representative from manufacturer's full range**] <**Insert color and gloss**>.

* + - * 1. Superior-Performance Organic Finish, Two-Coat FEVE: Fluoropolymer finish complying with AAMA 2605.

Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions for seacoast and severe environments.

Color and Gloss: [**As indicated by manufacturer's designations**] [**Match Director’s Representative's sample**] [**As selected by Director’s Representative from manufacturer's full range**] <**Insert color and gloss**>.

1. EXECUTION
   * + 1. EXAMINATION
          1. Examine conditions, with Installer present, for compliance with requirements for installation tolerances, header support, and other conditions affecting performance of automatic entrances.
          2. Examine roughing-in for electrical systems to verify actual locations of power connections before automatic entrance installation.
          3. Proceed with installation only after unsatisfactory conditions have been corrected.
       2. INSTALLATION
          1. General: Install automatic entrances in accordance with manufacturer's written instructions and BHMA A156.10 for direction of pedestrian travel, including signage, controls, wiring, and connection to the building's power supply.

Do not install damaged components. Fit frame joints to produce hairline joints free of burrs and distortion. Rigidly secure nonmovement joints. Seal joints watertight.

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.

Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous coating.

* + - * 1. 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.

Retain first subparagraph below for field-installed hardware items.

Install surface-mounted hardware using concealed fasteners to greatest extent possible.

Set headers, carrier assemblies, tracks, operating brackets, and guides level and true to location with anchorage for permanent support.

Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within system to exterior.

Provide thresholds [**at exterior doors**] [**and**] [**where indicated**].

* + - * 1. Door Operators: Connect door operators to electrical power distribution system.

Retain "Access-Control Devices" paragraph below only if inserting access-control devices in Part 2.

* + - * 1. Access-Control Devices: Connect access-control devices to access-control system, as specified in Section 281300 "Access Control Software and Database Management."
        2. Controls: Install and adjust activation and safety devices in accordance with manufacturer's written instructions and cited BHMA standard for direction of pedestrian travel. Connect control wiring in accordance with Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

Retain "Guide Rails" paragraph below if specifying guide rails in Part 2. Delete if specifying guide rails in another Section.

* + - * 1. Guide Rails: Install rails in accordance with BHMA A156.10, including Appendix A, and manufacturer's written instructions unless otherwise indicated.

Retain "Glazing" paragraph below unless requiring factory glazing in Part 2.

* + - * 1. Glazing: Install glazing as specified in [**Section 088000 "Glazing."**]
        2. Sealants: Comply with requirements specified in Section 079200 "Joint Sealants" to provide weathertight installation.

Set [**thresholds,**] [**bottom-guide-track system,**]framing members and flashings in full sealant bed.

Seal perimeter of framing members with sealant.

* + - * 1. Signage: Apply signage on both sides of each door, as required by cited BHMA standard for direction of pedestrian travel.
        2. 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.
      1. FIELD QUALITY CONTROL

Retain "Certified Inspector" and "Perform the following tests and inspections" paragraphs below to identify who performs tests and inspections. Retain "Field quality-control reports" paragraph in "Informational Submittals" Article.

* + - * 1. Certified Inspector: Engage a Certified Inspector to test and inspect components, assemblies, and installations, including connections.

Retain "Perform the following tests and inspections" paragraph below to require Contractor to perform tests and inspections.

* + - * 1. Perform the following tests and inspections[**with the assistance of a Company Service Advisor**]:

Test and inspect each automatic entrance, using AAADM inspection forms, to determine compliance of installed systems with applicable BHMA standards.

* + - * 1. Automatic entrances will be considered defective if they do not pass tests and inspections.
        2. Prepare test and inspection reports.
      1. ADJUSTING
         1. Adjust hardware, moving parts, door operators, and controls to function smoothly, and lubricate as recommended by manufacturer; comply with requirements of applicable BHMA standards.

Retain subparagraph below for exterior doors.

Adjust exterior doors for tight closure.

* + - * 1. Readjust door operators and controls after repeated operation of completed installation equivalent to three days' use by normal traffic (100 to 300 cycles).
        2. 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.
      1. CLEANING
         1. 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.

Comply with requirements in [**Section 088000 "Glazing"**] [**Section 088853 "Security Glazing"**] for cleaning and maintaining glass.

* + - 1. MAINTENANCE SERVICE

Verify with Director’s Representative that maintenance service is required for Project.

* + - * 1. Initial Maintenance Service: Beginning at Substantial Completion, maintenance service includes [**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 are manufacturer's authorized replacement parts and supplies.

Engage a Certified Inspector to perform safety inspection after each adjustment or repair and at end of maintenance period. Furnish completed inspection reports to Director’s Representative.

Retain one of two subparagraphs below. Generally retain second subparagraph, which adds appreciable cost, only for critical locations.

Perform maintenance, including emergency callback service, during normal working hours.

Include 24-hour-per-day, 7-day-per-week emergency callback service.

* + - 1. DEMONSTRATION
         1. Engage a Company Service Advisor to train Facility maintenance personnel to adjust, operate, and maintain automatic entrances.

END OF SECTION 084229.13