REVOLVING DOORS AND AUTOMATIC DOOR FOR NEW BUILDING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Extent and configuration of revolving doors are indicated on drawings and in schedules.

1. Revolving doors consist of complete units fabricated, assembled and tested for proper operation at the factory. Units include wings, enclosure, lights, weather stripping, hardware (except lock cylinder), collapsing mechanism, speed control, and other components standard with manufacturer.

2. Automatic door consisting of complete unit including operator concealed in door head, door, threshold, finger guard and frame.

B. Types of revolving door units required include the following:

1. 4 wing power-assisted revolving doors.

C. Lock cylinders are specified elsewhere in Division 8, Section 08710, Door Hardware.

D. Glass and glazing, not included in revolving door units, is specified elsewhere in Division 8, Section 08800.

1.3 SYSTEM DESCRIPTION

A. Performance Requirements: Provide assemblies that have been designed and fabricated to comply with performance requirements specified. Each system shall be tested by a recognized testing laboratory or agency in accordance with specified test methods.

1. Air Infiltration: Door assemblies shall have an air infiltration rate of less than 11 cfm per linear foot of perimeter crack of operating panels which tested in accordance with requirements of ASTM 283.

1.4 SUBMITTALS
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A. Product Data: Submit manufacturer’s product data, standard details, and installation recommendations for revolving doors, including the following:
1. Fabrication methods.
2. Finishing.
3. Hardware.
4. Accessories and other components.

B. Shop Drawings: Submit shop drawings for fabrication and installation of revolving doors and automatic door and associated components. Indicate enclosures, speed control units, and other components not included in manufacturer’s product data. Include the following:
1. Elevations.
2. Hardware.
3. Anchors and reinforcements.

C. Templates and Diagrams: Furnish installation templates, diagrams, and other data to fabricators and installers of related work as necessary for coordination of the installation.

D. Samples: Submit samples of each required metal finish, on 12” long extrusions or 6” square sheet or plate.
Where color and texture variations are anticipated, include 2 or more units in each set of samples to indicate range of such variations.

1. The Contracting Officer reserves the right to require samples of typical fabricated sections, indicating joints, exposed fastenings, quality of workmanship, and finish, and including hardware and accessory items, before proceeding with fabrication.

E. Maintenance Instructions: Submit manufacturer’s maintenance and service instructions for adjustment, operation, and maintenance of revolving door units and automatic door units, including name, address, and telephone number of nearest services representative. Include instructions for maintenance of metal finishes.

F. Certification: Provide certified test results showing that revolving door units have been tested by a recognized testing laboratory or agency and comply with specified performance characteristics.

1.5 QUALITY ASSURANCE

A. Safety Glazing Standard: Where safety glass is indicated or required by authorities having jurisdiction, provide the type of products indicated that comply with ANSI Z97.1 and testing requirements of 16 CFR Part 1201 for category II materials.

1. Subject to compliance with requirements, provide safety glass permanently marked with a certification label of Safety Glazing Certification Council (SGCC) or other certification agency acceptable to authorities having jurisdiction.
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B. Single Source Responsibility: Provide revolving doors produced by a single manufacturer capable of showing prior production of revolving door assemblies similar to those required.

C. Manufacturer’s Qualifications: Provide revolving doors produced by a single manufacturer with not less than 5 years successful experience in fabrication of revolving doors of the type and quality required.

D. Installer’s Qualifications: Engage as installer an authorized representative of the manufacturer for both installation and maintenance of the type of revolving door or automatic door units required.

1. Experience: The installer shall have a minimum of 3 years experience in installation and service of revolving door and automatic door assemblies manufactured for the project.
2. Maximum Proximity: The installer shall maintain offices and repair or service facilities within 2 hours normal travel time from the project site (or 3 years from acceptance by The Fund).

E. Design Criteria: Drawings indicate sizes, profiles, and dimensions required. Minor deviations will be accepted in order to utilize manufacturer’s standard products when, in the Architect’s sole judgement, such deviations do not materially detract from the design concept of intended performance.

F. Design Criteria: Drawings are based on one manufacturer’s standard revolving door or automatic door system. Another manufacturer’s system of a similar and equivalent nature will be acceptable when, in the Contracting Officer’s sole judgement, differences do not materially detract from the design concept or intended performance.

G. Emergency Exits: Revolving doors serving as a required means of egress shall comply with requirements of authorities having jurisdiction. Provide manufacturer’s certification that doors comply with these requirements.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver revolving doors, automatic doors, and related components to the Project in manufacturer’s original, unopened protective packaging. Use padded blankets or other approved protective wrapping for glass, decorative metal work, and other exposed elements.

1. Do not deliver door units until Work is ready for their installation.
2. Inspect components for damage upon delivery. Unless minor defects can be repaired to the Architect’s satisfaction, remove and replace damaged components at no additional cost.

B. Storage: If temporary storage is necessary, store doors and related components inside the building in a dry protected area apart from construction traffic in their original shipping containers with protective wrapping or packaging securely in place.

C. Protect finish surfaces from damage during handling and installation.
1.7 PROJECT CONDITIONS

A. Field Measurement: Where possible, field measure openings before fabrication to ensure proper fit of work; show measurements on final shop drawings. Coordinate fabrication with construction progress to avoid delay. If necessary, proceed with fabrication without measurements, and coordinate tolerance to ensure proper fit.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturer: Drawings are based on the products of Horton Automatics. The following will also be considered of use:

1. Tajima Corporation.
2. Tubelite Architectural Products.

B. Revolving Doors: Horton Automatics, Series 9300 "Revolving Door with Power Assist".

C. Automatic Door: Horton Automatics, Series 4500 LE, Complete Door/Operator System.

2.2 MATERIALS

A. Aluminum Extrusions: Provide alloy and temper recommended by the producer or finisher for type of use and finish indicated, and with not less than the strength and durability properties specified in ASTM B 221 for 6063-T5. Provide main extrusions of not less than 0.125” wall thickness.

1. Provide extruded aluminum glazing stops and other applied trim extrusions with a minimum wall thickness of 0.062”.

B. Aluminum Sheets: Provide alloy and temper recommended by the producer or finisher for type of use and finish indicated, and with not less than the strength and durability properties specified in ASTM B 209 for 5005-H15.

C. Bronze: Comply with the following standards for forms and types of bronze required. Alloys listed refer to standards of the Copper Development Association.

2. Sheet: Provide 28000 alloy, Muntz metal.
4. Temper: Provide bronze materials in standard commercial tempers and hardness required for fabrication, strength, and durability.
D. Anchorages and Fastenings: Provide manufacturer’s standard, concealed anchors and fasteners. Finish heads of exposed fasteners to much adjacent metal surfaces.

1. Furnish insert and anchorage devices in ample time to avoid delays in other work.
2. Do not use exposed fasteners except where unavoidable for assembly of units and for application of hardware.

E. Glass and Glazing Materials: Glass and glazing materials shall comply with requirements of the “Glass and Glazing” Section 08800 of these specifications.

F. Weather stripping: Provide heavy duty, single-piece rubber and rubber-felt combinations.

2.3 REVOLVING DOOR

A. EQUIPMENT

1. Door Units:
   Horton Automatic Model 9300
   Power Assist Revolving Door
   In for wing construction, 10’ diameter, round construction.

2. Operator: The operator shall be supplied complete with 1/4 HP high torque, DC, UL recognized motor, gear box, and control panel. Control panel shall provide speed control.

   The double seal, corrosion-proof, cast iron gear case shall contain case hardened (60Rc) helical gears in oil bath lubrication. The operator shall allow manual operation when power is removed to serve as a safety precaution to prevent entrapment. A 1-1/2” solid steel shaft shall serve as a main linkage to connect the operator to the revolving door.

   a. Power Assist: Pushing the door shall turn on the operator and revolve the door at the rate of 4–8 RPM for one turn. Any subsequent pushing on the door will reinitiate one revolution.

B. SAFETY

1. Back Pressure Sensing Circuit: Should the door wings encounter an obstacle at any point in rotation that creates a back pressure on the door of 5–10 pounds (adjustable), the door shall go into emergency stop mode. The door will stop for four (4) seconds. During this time the door can be moved forward or backwards. It will then restart at reduced speed and gradually accelerate to normal speed.
2. Entrapment Protection: The operator shall revert to manual operation when power is off to prevent entrapment.
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C. FINISH

1. Door: Bronze
2. Frame and all other components: Aluminum with dark bronze organic finish as specified.

D. ENCLOSURE

1. The enclosure shall be constructed so that proper clearances shall be maintained and weather seal assured.

E. DOOR CONSTRUCTION

1. The Medium stile (3—3/4”) door wings to be constructed of bronze with 1/8” minimum wall thickness to ensure frame rigidity and high impact resistance. Horizontal rails on door wings shall have sloped stops. An intermediate muting bar is to be furnished on each wing for safety and division of glass.

F. CANOPY

1. Provide canopy in segmented or round design to match contour of the enclosure. Canopy sides to be furnished in opaque panel. Optional: Provide aluminum sheets, 0.090 minimum thickness, for roof panel.

G. HARDWARE/WEATHER STRIPPING

1. Provide locks with five pin cylinders and concealed bolts on two door wings. A sweep shall be affixed to each wing to provide adequate weather stripping.

H. CEILING LIGHTS

1. Furnish two flush ceiling lights.

I. GLASS (as specified in Section 08800)

1. Round Door. Wings: 1/4” clear laminated glass—glass Type 9
   Walls: 7/16” laminated safety glass
2.4 AUTOMATIC DOOR

A. Type: Equal to Horton Automatic Series 4500 LE, overhead operator complete package, including operator, threshold, finger guard, and frame.

B. Door and Frame, Series 4500: Door and frame shall be of heavy-duty construction suitable for continuous automatic door service. All structural members shall be of extrude tubular aluminum of thickness of 125 inch (3mm). Alloy shall be 6063 T5. Frame members shall be 1-3/4” X 4” (44.5mm X 101.6mm) dimensions. Swing panel shall be assembled by means of groove gussets that are bolted to prevent tracking. Lock and pivot rails shall have adjustable dual weather stripping. The following hardware will be provided:

1. Maximum security lock.
2. Push bars.
3. Pivots.
4. Finger guards.
5. Threshold.
6. Finish Frame and Door. Aluminum with organic paint finish as specified. Color to be dark bronze to match color in Contracting Officer’s office.
8. Glazing: 1/4” clear laminated glass as specified in Section 08800.

C. Electric Operator: Equal to Horton Automatic Series 4000 LE, extra heavy duty low energy operator. The Electric Operating Mechanism shall be Series 4000 LE. It shall be self-contained electromechanical construction. The operator shall be shock mounted and concealed in an extruded aluminum case 4-1/2” x 6” (1371.6mm x 152.4mm) bottom access or 6” x 6” (152.4mm x 152.4mm) side access header cover. The operator shall be readily convertible to any hand required. Opening force shall be accomplished by a 1/8 HP D.C. permanent magnet motor working through reduction gears to the output shaft. Gear train bearings shall be sealed ball bearing types. Closing force shall be supplied by a field replaceable Quadra-coil spring (four independent coil springs separated by fiber discs and enclosed in an external spring box). Close speed control shall be accomplished by dynamic braking of the motor and shall be fully adjustable.

Operator to act as a manual closer when power is off or when the master control unit is removed. An On/Off reset switch shall be supplied. The control circuit to the actuating switches shall be 24 VAC, Class II Circuit. The master control unit shall incorporate an adjustable time delay of 2 to 30 seconds. It shall provide infinite adjustment to opening and back check speeds. The master control unit shall provide for immediate reversal of door motion without undue strain on the drive train by supplying stepped voltage to the motor. A locked door motor protection circuit will be supplied that will shut off current to the motor if it is applied when the door is inadvertently locked or otherwise prevented from opening. Power to the motor is restored when the On/Off reset switch is turned back on.
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2. Automatic Operation: Automatic operation by pushbutton switch. The operator shall include the following variable adjustments to enable it to comply with Standard ANSI A 156.19.
   
   a) Opening speed–4 to 6 seconds.
   b) Closing speed–4 to 6 seconds.
   c) Time delay before closing–2 to 30 seconds (ANSI requirement is 5 second minimum time delay)

   Opening and closing force, measured 1” (50.8mm) out from the lock stile of the door, not to exceed 15 pounds (67 N) of force to stop the door when operating in either direction. The operator shall include “Time Out” feature. This feature will turn off the opening force when the door is stopped for one second. The door then beings to close. The operator immediately resets and will accept another opening signal. Soft Touch™ an optional feature reverses the door to the open position if is stopped during closing cycle (90°–10°). The operator shall be mounted and concealed in an extruded aluminum cover not less than 125 (3mm) thickness in organic finish to match door and frame.
   Cover shall run the full width of the door and be 4–1/1”x 6”(137.6mmx152.4mm) bottom access or 6”x6” (152.4mmx154mm) side access header cover.

3. Underwriters Laboratory Listed

D. Actuation Device:

1. Push–button switch automation – The most common actuating device is a push–button switch that can be located on the door or adjacent door jamb. Proper placement of the switch allows the general public to use the operator as a manual door, effectively conserving energy, or as an automatic door when push–button activated.
   The door automatically opens and then recluses after time–delay expiration.
2. Time out™ Feature – When an obstruction is met during the open cycle, the operator temporarily cuts power to the door allowing it to close. The door can be reactivated to open at any time during the closing mode or becomes automatic as soon as the door completely closes.
3. Switches: All activating door switches shall be WIKK narrow switches. Size shall be 1–3/4” wide x 4–1/2” high. Switch shall be push button type with bronze face. Furnish with manufacturers standard handicapped symbol. Catalog No. N/S–1.

2.5 FABRICATION

A. General: Sizes of door and frame units, and profile requirements, are indicated on the drawings. Variable dimensions are indicated with maximum and minimum dimensions required to achieve design requirements and coordination with other work.
B. Fabricate revolving door units to sizes and configurations indicated, with members closely fitted to hairline joints, reinforced and mechanically joined. Dress welds flush and finish to match adjacent surfaces.

1. Provide reinforcement for hardware and operating mechanism necessary to meet performance requirements and to withstand operating stresses without metal or glass failure.
2. Install weather stripping in stiles, head and sill rails to be adjustable and replacement without dismantling wings.

C. Dissimilar Metals: Separate dissimilar metals with zinc chromate primer, bituminous paint or other separator that will prevent corrosion.

D. Fasteners: Conceal fasteners wherever possible. Countersink head of exposed fasteners.

2.6 FINISHES

A. General: Comply with NAAMM "Metal Finishes Manual" for recommendations relative to application and designations of finishes.

B. High-Performance Organic Coating Finish: AA-C12C42R1x(Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid chromate–fluoride–phosphate conversion coating; Organic Coating; as specified below). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating resin manufacturer’s written instructions.

1. Fluoropolymer 3-Coat Coating System: Manufacturer’s standard 3-coat, thermo cured system composed of specially formulated inhibitive primer, fluoropolymer color coat, and clear fluorocarbon topcoat, with both color coat and clear topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA 605.2.
2. Color and Gloss: Match colors in Contracting Officer’s office. Provide dark bronze.

C. Bronze: For revolving door, match Horton Automatic finish Muntz #4.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install revolving doors and automatic doors in accordance with manufacturer’s printed instructions and recommendations.

B. Cut and trim framing during installation only with approval of the manufacturer and in accordance with manufacturer’s recommendations.
1. Restore finish and remove and replace members as directed where cutting and trimming has impaired strength or appearance.

2. Do not install members that are wrapped, bowed, deformed, or otherwise damaged or defaced to such extent as to impair strength or appearance. Remove and replace members as directed that have been damaged during installation.

C. Set units level, plumb, and true to line with uniform hairline joints. Support on metal shim and secure in place by bolting to clip angles and supports anchored to supporting structure.

D. Paint concealed contact surfaces of dissimilar materials, including metal in contact with masonry or concrete work, with a heavy coating of bituminous paint, or provide other separation as recommended by manufacturer.

3.2 ADJUSTING

A. Adjust doors to provide a tight fit at contact points and weather stripping for smooth operation and weather-tight closure and to operate smoothly with hardware and operators functioning properly.

   1. Lubricate hardware and other moving parts.

3.3 CLEANING

A. clean metal surfaces promptly after installation, exercising care to avoid damage to coatings.

B. Clean glass surfaces after installation complying with requirements contained in the “Glass and Glazing” Section for cleaning and maintenance. Remove excess glazing and sealant compounds, dirt, and other substances.

3.4 PROTECTION

A. Institute protective measures required throughout the remainder of the construction period to ensure that revolving door units will be without damage or deterioration, other than normal weathering, at time of acceptance.

(END OF SECTION)