
PART 1 GENERAL**1.1 RELATED DOCUMENTS**

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Manual revolving door entrances.
- B. Related Sections:
 - 1. Division 1 Section "Sustainable Design Requirements".
 - 2. Division 8 Section "All Glass Entrances and Storefronts".
 - 3. Division 8 Section "Glazing".

1.3 QUALITY ASSURANCE

- A. The work of this section shall be performed by a company which specializes in the type of revolving door entrances work required for this Project, with a minimum of 10 years of documented successful experience and shall be performed by skilled workmen thoroughly experienced in the necessary crafts.
 - 1. Work shall be performed in compliance with Owner's insurance underwriters' requirements and UL approvals and testing for materials, assemblies and procedures.
- B. Manufacturer shall specialize in manufacturing the type of revolving door entrances specified in this section, with a minimum of 10 years of documented successful experience, and have the facilities capable of meeting all requirements of Contract Documents as a single-source responsibility and warranty.
- C. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
- D. Regulatory Requirements: Wings shall be capable of collapsing into a book-fold position to provide minimum aggregate parallel width of 36 inches (914 mm) when breakaway force of no more than 180 lbf (801N) is applied within 3 inches (76 mm) of outer edges. Set maximum turning speed to comply with requirements of authorities having jurisdiction.
- E. Safety Glass: Category II materials complying with testing requirements in 16 CFR 1201.
 - 1. Safety-Glass Labeling: Where safety-glass labeling is indicated, permanently mark glass with certification label of the SGCC, another certification agency acceptable to authorities having jurisdiction, or the manufacturer. Label shall indicate manufacturer's name, type of glass, thickness, and safety-glass standard with which glass complies. Locate label at bottom corner of glass panel, typical.
- F. Revolving Door Entrance Standard: BHMA A156.27.
- G. Preinstallation Conference: Conduct conference at Project site.
- H. Manufacturer's identification tags or marks are not acceptable on surfaces which will remain exposed to view after installation.
 - 1. Evidence of "patching" after removal of tags or marks is not acceptable.

1.4 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Division 01 Section "Quality Requirements," to design revolving door entrances.
- B. General Performance: Comply with performance requirements specified, as determined by testing of revolving door entrances representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.

- C. Provide systems, including anchorage, capable of withstanding loads indicated without structural failure, deflection exceeding specified limit, support components transferring stresses to glazing, and glazing-to-glazing or glazing-to-support contact as determined by structural analysis.
1. Structural Loads:
 - a. Wind Load:
 - 1) As specified in Division 8 Section "Glazed Aluminum Curtain Wall".
 - 2) As required in Transbay Tower Wind Cladding Pressures Report.
 2. Deflection Normal to Glazing Plane: As specified in Division 8 Section "Glazed Aluminum Curtain Wall".
- D. Thermal Movements: As specified in Division 8 Section "Glazed Aluminum Curtain Wall".

1.5 SUBMITTALS

- A. Submit the following according to Conditions of the Construction Contract and Division 1 Specification Sections.
- B. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for revolving door entrances.
- C. LEED Submittal: EQc4.1 for adhesive and sealants used inside the waterproofing system, include printed statement of VOC content.
- D. Shop Drawings: For revolving door entrances. Include plans, elevations, sections, details, and attachments to other work. Indicate enclosures, speed-control units, and other components not in manufacturer's product data.
1. Provide structural calculations signed and sealed by a professional structural engineer.
- E. Samples:
- | Item No. | Quantity | Size | Description |
|----------|----------|---------|---|
| S1 | 5 | 8"x8" | Specified finish on actual base metal. |
| S2 | 5 | 8" long | Push bar stock with required finish. |
| S3 | 5 | 8"x8" | Glass for revolving doors - each type and kind. |
| S4 | 5 | 8" long | Weatherstripping - each type. |
- F. Delegated-Design Submittal: For revolving door entrances to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- G. Qualification Data: For qualified Installer, manufacturer, testing agency.
- H. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for revolving door entrances.
- I. Operation and Maintenance Data: For revolving door entrances to include in operation and maintenance manuals.
- J. Warranties: Samples of special warranties.
- K. Hazardous Materials Notification: In the event no product or material is available that does not contain asbestos, PCB or other hazardous materials as determined by the Owner, a "Material Safety Data Sheet" (MSDS) equivalent to OSHA Form 20 shall be submitted for that proposed product or material prior to installation.
- L. Asbestos and PCB Certification: After completion of installation, but prior to Substantial Completion, Contractor shall certify in writing that products and materials installed, and processes used, do not contain asbestos or polychlorinated biphenyls (PCB), using format in Article 3 of General Conditions.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Comply with General Conditions and Division 1 Section "Product Requirements".

- B. Deliver revolving door entrance glass, decorative metalwork, and other exposed elements in padded blankets or other approved protective wrapping.
- C. Protect finish surfaces from damage during handling and installation.

1.7 COORDINATION

- A. Recesses: Coordinate size and location of recesses in floor construction for recessed, floor-mounted speed-control units and recessed mats including anchorages for frames and supports. Furnish setting drawings, templates, and directions for installing anchorages that are to be embedded into concrete. Deliver these items to Project site in time for installation. Concrete, reinforcement, and formwork requirements are specified in Division 3 Sections.

1.8 WARRANTY

- A. Comply with General Conditions and Division 1 Section "Product Requirements", agreeing to repair or replace specified materials or Work that has failed within the warranty period. Failures include but are not limited to the following:
 - 1. Failure in operation of doors and hardware.
 - 2. Rough, difficult, or noisy operation.
 - 3. Loose or missing parts.
 - 4. Noticeable deterioration or unevenness of finish.
 - 5. Spontaneous glass breakage.
 - 6. Excessive leakage or air infiltration beyond specified limits.
 - 7. Excessive deflections of metals.
 - 8. Defects in accessories, weatherstripping, and other components.
- B. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of revolving door entrances that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Lateral deflection of glass lite edges in excess of 1/175 of their length or 3/4 inch (19 mm), whichever is less.
 - b. Excessive air leakage beyond specified limits.
 - c. Faulty operation of speed-control unit and hardware.
 - d. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 2. Warranty Period for Revolving Door Entrances: Three years from date of Substantial Completion.
 - 3. Warranty Period for Speed-Control Units: Five years from date of Substantial Completion.
 - 4. Warranty Period for Finishes: 20 years from date of Substantial Completion.

1.9 MAINTENANCE SERVICE

- A. Initial Maintenance Service: Beginning at Substantial Completion, provide 12 months' full maintenance by skilled employees of revolving door entrance Installer. Include monthly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper revolving door entrance operation at rated speed and capacity. Provide parts and supplies same as those used in the manufacture and installation of original equipment.
- B. Continuing Maintenance Proposal: From Installer to Owner, in the form of a standard yearly maintenance agreement, starting on date initial maintenance service is concluded. State services, obligations, conditions, and terms for agreement period and for future renewal options.
 - 1. Perform maintenance, including emergency callback service, during normal working hours.

PART 2 PRODUCTS

2.1 UNAUTHORIZED MATERIALS

- A. Materials and products required for work of this section shall not contain asbestos, polychlorinated biphenyls (PCB) or other hazardous materials identified by the Owner.

2.2 ACCEPTABLE MANUFACTURERS

- A. Products of the manufacturers specified in this section establish the minimum functional, aesthetic and quality standards required for work of this section.

- B. Substitutions: Comply with General Conditions using form in Division 1 Section "Substitution Request Form".

2.3 REVOLVING DOOR ENTRANCES

- A. Air Infiltration and Exfiltration: Maximum air leakage of 1.25 cfm/sq. ft. (6.4 L/s x sq. m) of wing area when tested according to ASTM E283 at a minimum static-air-pressure difference of 1.57 lbf/sq. ft. (75 Pa).
- B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.
1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
- C. Seismic Performance: Revolving door 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 and as indicated on Structural drawings.
- D. VOC Content: Adhesive and sealants used inside the waterproofing system and applied onsite shall have VOC content equal to or less than the applicable VOC limits. Refer to Section 01 81 13 / Sustainable Design Requirements for additional information.

2.4 MANUAL REVOLVING DOOR ENTRANCES

- A. Description: Provide manufacturer's all glass four-wing manual revolving door entrance, complete with center shaft, speed-control unit, wings, enclosure walls, canopy, hardware, glass and glazing, and accessories as indicated.
- * 1. Basis-of-Design Product: Subject to compliance with requirements, provide Boon Edam Tomsed, Inc.; Model
* "Crystal TQ Manual Revolving Door" or comparable product by the following:
* a. Crane Revolving Door Co., Inc. – 4000 Series.
- B. Materials: Stainless-steel-clad, extruded aluminum.
1. Main Extrusions and Tubing: Minimum wall thickness of 0.125 inch (3.2 mm).
 2. Cladding: Minimum 0.06 inch (1.5 mm) thick.
- C. Fabrication: Fabricate revolving door entrance components to designs, sizes, thicknesses, and configurations indicated with profiles that are sharp, straight, and free of defects or deformations. Accurately fit joints with ends coped or mitered to produce hairline joints free of burrs and distortion. Prefit all hardware at the factory. Provide anchorage and alignment brackets for concealed support of assembly from the building structure.
1. Wings: Factory fabricated and assembled in profiles indicated. Reinforce as required to support imposed loads and for installing hardware.
 - a. Glaze wings at the factory. Comply with glazing requirements specified in this Section and in Division 8 Section "Glazing." Provide minimum clearances for thickness and type of glass indicated according to GANA's "Glazing Manual."
 - b. Provide sliding weather stripping, mortised into stiles and rails of wings, to be adjustable and replaceable without dismantling wings.
 - c. Welded Construction: Weld reinforcement firmly in place. Weld corners. Grind and polish welds to produce an invisible joint. Mechanically finish exposed surfaces after fabrication to eliminate surface blemishes caused by welding, rolling, bending, and forming.
- D. Stainless-Steel Finishes: No. 4 directional satin finish.

2.5 DOOR CONSTRUCTION

- * A. Curved Side Walls: Shall have a standard inside diameter of 8'-0" and be manufactured from curved laminated
* safety glass, thickness per manufacturer's requirements, Glass Type GL-10B.
- B. Door Wings: Three or four door wings as designed and manufactured from 1/2" tempered safety glass, Glass Type GL-10A, with stainless steel clad Poly-Carbonate channels and removable horsehair weather stripping on three sides. Door wings must be capable of folding forward or backward allowing for emergency egress.
- * C. Ceiling: Shall be fabricated from tempered laminated safety glass, thickness per manufacturer's requirements,
* Glass Type GL-10C.
- D. Stainless Steel Connectors: Polished stainless steel connectors between sidewalls and ceiling.

2.6 EQUIPMENT

- A. Speed Control: Floor-mounted manual speed control attaches to the center rotating shaft and limits the rotation speed of the door to a preset RPM not to exceed 8 revolutions per minute. Operating in an oil bath, the centrifugal braking unit can be adjusted for lower maximum speeds to meet code requirements.
- B. Emergency Collapsing Mechanism: Precision-engineered door hangers and disks to allow the door wings to be collapsed, or folded, and stored in a bookfold position. Hangers and disks are finished in black and provide tension to hold the door wings in position until a strong force, not to exceed 180 pounds, is applied to the outer stile of the door wing to meet NFPA, BOCA code requirements.
- C. Recessed Slide Bolt Locks: Two (2) standard recessed deadbolt locks with removable, keyed cylinders that lock into the floor on the two interior door wings. Stainless steel to match adjacent finishes.

2.7 MATERIALS

- A. Tempered Glass: All flat glass in door wings shall be 1/2" clear tempered safety glass.
- * B. Laminated Glass: All curved glass in sidewalls shall be clear curved laminated safety glass
- * C. Ceiling Glass: All flat ceiling glass shall be tempered laminated safety glass.
- D. Weather Stripping: On all required edges of door wings to provide a seal between door wings and drum that meets ASTM E-283.
- E. Bumpers: rigid, rubber-tipped bumper located on the top upper right hand corner of each door wing to prevent door wings from contacting one another when in the bookfold position.
- F. Pivot: Ceiling mounted pivot above the center shaft to provide smooth rotation.
- G. Center Shaft: Stainless steel shaft with connections to the speed control and pivot.
- H. Push Bars: Provide 1" diameter vertical stainless steel push bars.
- I. Speed Control Cover: Provide round stainless steel floor mounted cover over recessed speed control.
- J. Matwell Ring: Stainless Steel tube embed frame required to be installed in floor prior to the installation of the door.
- K. Stainless-Steel Sheet: ASTM A240/A 240M, austenitic stainless steel, Type 316.
- L. Fasteners: Manufacturer's standard, of same basic metal as fastened metal, unless otherwise indicated.
- M. Glazing Materials: Comply with requirements in Division 8 Section "Glazing."
- N. Nonshrink, Nonmetallic Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout; complying with ASTM C1107/C 1107M; of consistency suitable for application.
- O. Corrosion-Resistant Coating: Cold-applied asphalt mastic, compounded for 15-mil (0.4-mm) dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.8 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

2.9 STAINLESS-STEEL FINISHES

- A. General: Remove tool and die marks and stretch lines or blend into finish. Grind and polish surfaces to produce uniform, directionally textured, polished finish indicated, free of cross scratches. Run grain with long dimension of each piece.
- B. Drawing Designation: **SS-5**.
 - 1. Brushed; finish level and grain orientation to be determined by sample submittal.
- C. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

PART 3 EXECUTION**3.1 EXAMINATION**

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Do not install damaged components. Fit frame joints to produce hairline joints free of burrs and distortion. Rigidly secure nonmovement joints. Seal joints watertight.
- B. Recessed, Floor-Mounted Speed-Control Unit: Insert control unit in rough-in floor opening set on level bed of nonshrink, nonmetallic grout. Fill annular space between control unit and sides of recess with nonshrink, nonmetallic grout. Mix and place grout to comply with grout manufacturer's written instructions.
- C. Install revolving door entrances according to manufacturer's written instructions, plumb and true, without warp or rack of framing members and wings. Anchor securely in place.
 - 1. Install surface-mounted hardware using concealed fasteners to greatest extent possible.
 - 2. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within the assembly to exterior.
 - 3. Cut and trim framing during installation only with approval of manufacturer.
 - a. Restore finish and remove and replace members, as directed, where cutting and trimming have impaired strength or appearance.
 - b. Do not install members that are warped, bowed, deformed, or otherwise damaged or defaced to such an extent as to impair strength or appearance. Remove and replace members that have been damaged during installation.
- D. Activation and Safety Devices: Adjust devices to provide detection field and functions indicated.
- E. Sealants: Comply with requirements specified in Division 7 Section "Joint Sealants" to provide weathertight installation.
 - 1. Set continuous sill members and flashings in full sealant bed.
 - 2. Seal perimeter of framing members with sealant to achieve air and water tight seals to adjacent construction.

3.3 ADJUSTING

- A. Adjust wings to provide an even, tight fit at contact points and weather stripping for smooth operation and weathertight closure. Adjust wings to operate smoothly and rotate evenly, with hardware and operators functioning properly.
 - 1. Lubricate operating hardware and other moving parts.
 - 2. Adjust speed-control unit for specified rpm.
 - 3. Adjust pressure for collapse of wings for specified breakaway force.
- B. Readjust wings and speed-control units after repeated operation of completed installation equivalent to three days' use by normal traffic (100 to 300 cycles). Lubricate hardware and other moving parts.

3.4 CLEANING AND PROTECTION

- A. Clean glass and aluminum surfaces promptly after installation. Remove excess glazing and sealant compounds, dirt, and other substances. Repair damaged finish to match original finish.
- B. Limit construction traffic during remainder of construction period.

3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain revolving door entrances. Refer to Division 1 Section "Closeout Procedures".

END OF SECTION