
SECTION 08410 - ALUMINUM ENTRANCES AND STOREFRONTS

PART 1 GENERAL

1.01 SUMMARY

- A. Provide all labor materials, tools, equipment, and services to furnish and install the exterior aluminum/glass window system, window units, entrances and related components as shown on Drawings and specified herein.
- B. Section Includes:
1. Aluminum framework for fixed glass panel wall and window systems consists of:
 - a. Exterior aluminum/glass window system.
 - b. Exterior aluminum/glass window units.
 - c. Interior aluminum/glass window units.
 - d. Aluminum frame swinging glass doors.
 - e. Glazing in accordance with applicable requirements of the specifications referenced below.
 2. Glazing in accordance with applicable requirements of the specifications referenced below.
- C. Related Sections:
1. Section 07920 - Sealants and Caulking
 2. Section 08810 – Glass and Glazing

1.02 REFERENCE STANDARDS

- A. Except as otherwise specified herein or shown on the Drawings, comply with the latest editions of all applicable codes and regulations including the applicable requirements of the following reference Standards and Codes, which are hereby made a part of this Section, as they relate to the exterior aluminum/glass window system:
1. BOCA Building Code, latest Edition and state and local wind resistance design requirements.
 2. Design Wind Loads: Meet requirements of the BOCA Building Code, latest Edition.
 3. The Occupational Health and Safety Administration (OSHA)Code of Federal Regulations(CFR),Volume 29.
 4. American Society for Testing and Materials (ASTM) Test Methods and specifications:
 - a. ASTM A36 – Structural Steel.
 - b. ASTM A386 – Zinc Coating (hot dip) or Zinc Chromate paint on assembled steel products.
 - c. ASTM C794 – Test method for adhesion-in-peel of elastomeric joint sealants.
 - d. ASTM C1036-85 - Standard Specification for Flat Glass.

- e. ASTM C1048-88 - Standard Specification for Heat Treated Flat Glass.
 - f. ASTM E90-90 - Sound Transmission Class Rating.
 - g. ASTM E283-84 - Test Method for Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors.
 - h. ASTM E330-84 - Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors By Uniform Static Air Pressure Difference.
 - i. ASTM E330-90 - Uniform Load Deflection Test.
 - j. ASTM E331-86 - Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors By Uniform Static Air Pressure Difference.
 - k. ASTM E413-87 - Sound Transmission Class Rating.
- 5. National Association of Architectural Metal Manufacturers (NAAMM)
 - 6. Architectural Aluminum Manufacturers Association (AAMA).
 - a. AAMA 605.2-92 - Voluntary Specification for High Performance Organic Coatings on Architectural Extrusions and Panels.
 - b. AAMA – Aluminum Curtain Wall Design Guide Manual 1989.
 - c. AAMA – Curtain Wall Manual #10.
 - d. AAMA – Series No. 13 Structural Sealant Glazing Systems
 - e. AAMA 501-83 – Test method for water penetration of Exterior Windows, Curtain Walls, and Doors by dynamic air pressure differential.
 - f. AAMA 1503.1-88 – Test Method for condensation Resistance Factor (CRF) and Test Method for Thermal Transmission Coefficient (U Value).
 - 7. American National Standards Institute (ANSI).
 - 8. ASCE-7, latest available edition.
 - 9. SSPC – Steel Structures Painting Council.

1.03 SUBMITTALS

- A. Submit properly identified product data including manufacturer's specifications and installation directions before commencing work.
- B. Shop drawings with complete layout, erection details, dimensions, anchorage details, integration of systems provided by different manufacturers, and work required by other trades which interfaces with the installation. Do not proceed with any fabrication until all details are approved.
 - 1. Shop drawings shall be produced and submitted by the window system manufacturer.
- C. Drawings and engineering calculations showing compliance with wind load requirements, plus rigidity and weather tightness criteria contained in this Section, signed and sealed by an Engineer registered in the State of Maine.
- D. Certificates - Provide the following:
 - 1. Certification of the manufacturer showing that each type, grade and size of window unit complies with requirements where the manufacturer's standard window units have been tested in accordance with specified tests and meet performance requirements specified. Where such testing has not been accomplished, perform required tests through a recognized testing laboratory or agency and provide certified test results.

- E. Manufacturer's literature, detailed specifications and data as required.
- F. Samples of aluminum finish, glass, gaskets, sealant and other components.
- G. Submit samples of aluminum finish custom colors and textures as selected by the Resident.
- H. Closeout Submittals:
 - 1. Operation and Maintenance Data: Submit operation and methods for maintaining installed products, and precautions against cleaning materials and methods detrimental to finishes and performance.
 - 2. Warranty: Submit warranty documents specified herein.
 - 3. Certificates: Manufacturer's certification that materials and components meet specification requirements and certified test results reflect design criteria compliance.

1.04 SYSTEM DESCRIPTION

- A. Extruded aluminum frame members reinforced internally where required to withstand vertical and horizontal live loading, including wind and negative pressure, in addition to the dead weight of the components; incidental moldings or sheet metal covers between the system and other finished elements; swinging doors forming part of the framework or framed in solid walls; glazing, including structural silicone glazing; sealing of joints between the system and adjacent construction; compliance with applicable life safety and fire resistive standards, and hardware, anchorage and accessories.

1.05 QUALITY ASSURANCE

- A. Perform work under this Section under a single subcontract to insure unified responsibility for the installation as an integrated system. Coordinate interface of separate systems, with special attention to uniformity of appearance (aesthetic compatibility).
- B. Individual Component Systems: Produced by a single fabricator/installer, designed as a coordinated installation conforming to detailed requirements of the drawings and produce a uniform appearance, integrated function, and single responsibility.
- C. Installer Qualifications: Certified by window system manufacturer.

1.06 PROJECT CONDITIONS

- A. Field Measurements: Before fabrication check actual window openings in construction work by accurate field measurement; show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delay of work.

1.07 WARRANTY

- A. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under the Contract Documents.

1. Beneficiary: Issue warranty in the legal name of the project Owner.
2. Warranty Period: 2 years commencing on Date of Shipment.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. For all exterior aluminum/glass window system and window units and glazing systems unless otherwise noted, specifications in this Section are based on 1600 Wall System as manufactured by Kawneer Company, Norcross, Georgia and are intended as a guide. Equivalent systems of the following manufacturers are also acceptable subject to meeting the requirements of the Drawings and specifications in this Section:
 1. YCW-750 System as manufactured by YKK Architectural Products, Atlanta, Georgia.
- B. For interior aluminum/glass window units unless otherwise noted, specifications in this Section are based on TRI-Fab 450 system as manufactured by Kawneer Company, Norcross, Georgia, and are intended as a guide. Equivalent systems of the following manufacturers are also acceptable subject to meeting the requirements of the Drawings and specifications in this Section.
 1. YES-45F-S system as manufactured by YKK Architectural Products, Atlanta, Georgia.
 2. SG601 series system as manufactured by U.S. Aluminum, Waxahachie, Texas.
- C. For aluminum frame swinging glass doors, unless otherwise noted, specifications in this Section are based on entrance units as manufactured by Kawneer Company, Norcross, Georgia. Entrance units as manufactured by YKK Architectural Products, Atlanta, Georgia are also acceptable subject to meeting pre-requirements of the Drawings and specifications in this Section.
- D. Products of other manufacturers, which meet the requirements of the Drawings of this Section and the Kawneer 1600 Wall System published specifications may be provided if approved by the Resident.

2.02 GENERAL REQUIREMENTS

- A. Finish for Aluminum Surfaces:
 1. For exterior surfaces, use Kynar 500 applied coating, medium gloss, shop applied, custom colors to be selected by the Resident, tested and certified by the entrance manufacturer.
 2. For interior surfaces, use electrostatically applied organic coating, medium gloss, shop-applied, custom colors to be selected by the Resident, tested and certified by the entrance manufacturer to comply with AAMA 605.2-95, applied to buffed and etched surfaces equal to AAC22M22.
 3. Submit samples of finish and custom color for selection by the Resident.
- B. Sealants: High strength silicone structural glazing sealant with a modulus of rupture and adhesive properties not less than 6 times the maximum design stress of the joint, approved by the aluminum frame and glass manufacturers, equal to Dow Corning 795 or General Electric Construction 1200. Comply with the requirements of Section 07920 and the recommendations of the sealant

manufacturer. Colors to be selected by the Resident.

- C. Glazing: Size per Drawings. As manufactured by PPG or Viracon, 1-inch thick, Low-E insulating glass, with a shading coefficient of .50 or less, tempered where indicated on the Drawings. Comply with the requirements of Section 08810. Color to be clear.
- D. Glazing Gaskets: EPDM or neoprene, black.
- E. Fasteners: Where exposed, aluminum, stainless steel, or zinc plated steel, finished to match framework members.
 - 1. Perimeter Anchors: Aluminum, stainless steel, or steel, providing the steel is properly isolated from the aluminum and primed in accordance requirements of Section 05500.
- F. Performance Requirements:
 - 1. Air Infiltration: Tested in accordance with ASTM E283, not to exceed .06 cfm per sq. ft. of fixed area.
 - 2. Water Infiltration: Tested in accordance with ASTM E331. No water penetration at a test pressure of 6.24 psf.
 - 3. Structural Performance: Maximum deflection of 1/175 of the span without exceeding allowable stress and a safety factor of 1.50 under wind loads prescribed by BOCA Building Code and other referenced standards.
 - a. Minimum Wind Load: Aluminum entrances and storefront system shall be designed to meet or exceed wind pressures of 60 lbf/sq.ft., acting inward or outward.

2.03 ALUMINUM FRAME SWINGING GLASS DOORS

- A. Kawneer entrance units, offset pivot action on single acting doors, center pivot on double acting, beveled glass stops, complete with hardware required except lock cylinder, which will be provided by the finish hardware supplier but installed by the door manufacturer, concealed overhead closers finished to match door and frame, tubular type pull and push bars on each side of each leaf to be selected by Resident, lock, threshold, 1-3/4" x 4-1/2" aluminum frames or size to match storefront sections, and the following requirements:
 - 1. Type: Medium stile. 3-1/2 inch vertical stiles and top rail; 6-1/2 inch bottom rail.
 - 2. Manual locking to prevent entry from outside and for passenger and visitor traffic control.
 - 3. Glazing: To match storefront system as specified.
 - 4. Major portions of the door members to be .125" nominal in thickness and glazing molding to be .050" thick.
 - 5. Glazing gaskets shall be either EPDM elastomeric extrusions or a thermoplastic elastomer.
 - 6. Standard Entrance Hardware:
 - a. Weather-stripping:

- (1). Meeting stiles on pairs of doors shall be equipped with an adjustable astragal utilizing wool pile with polymeric fin.
 - (2). The door weathering on a single acting offset pivot or butt hung door and frame (single or pairs) shall be Kawneer Sealair® weathering. This is comprised of a thermoplastic elastomer weathering on a tubular shape with a semi-rigid polymeric backing.
- b. Sill Sweep Strips: EPDM blade gasket sweep strip in an aluminum extrusion applied to the interior exposed surface of the bottom rail with concealed fasteners. (Necessary to meet specified performance tests).
- c. Threshold: Extruded aluminum, one piece per door opening, with ribbed surface.
7. Panic Guard Entrance Hardware:
- a. Weather-stripping:
- (1). Meeting stiles on pairs of doors shall be equipped with an adjustable astragal utilizing two polymeric fins.
 - (2). The door weathering on a single acting offset pivot or butt hung door and frame shall be Kawneer Sealair® weathering. This is comprised of a thermoplastic elastomer weathering on a tubular shape with a semi-rigid polymeric backing.
 - (3). Sill sweep strips: EPDM blade gasket sweep strip in an aluminum extrusion applied to the interior exposed surface of the bottom rail with concealed fasteners. (Necessary to meet specified performance tests.)
 - (4). The guard device of the Panic Guard exit system shall have a 1" x 1-3/4" retractable aluminum astragal bar with 1/2-inch locking throw extending full height of the doors.
 - (5). Threshold: Panic Guard Threshold.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Site Verification of Conditions: Verify substrate conditions (which have been previously installed under other sections) are acceptable for product installation in accordance with manufacturer's instructions. Verify openings are sized to receive entrance system and sill is level in accordance with manufacturer's acceptable tolerances.
1. Field Measurements: Verify actual measurements/ openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements, fabrication schedule with construction progress to avoid construction delays.
- B. Examine surfaces and conditions to which this work is to be attached or applied, and notify the Resident if conditions or surfaces exist which are detrimental to the proper and expeditious

installation of the work. Commencement of work shall imply acceptance of the surfaces and conditions to perform the work as specified.

1. Masonry surfaces shall be visibly dry and free of excess mortar, sand and other construction debris.
 2. Metal surfaces shall be dry, clean, free of grease, oil, dirt, rust and corrosion, and welding slag, without sharp edges or offsets at joints.
- C. Examine openings before beginning installation. Verify that rough opening is correct and the sill plate is level. Verify by measurements taken at the job site, those dimensions affecting the work. Bring field dimensions, which are at variance with those on the approved shop drawings, to the attention of the Resident. Obtain decision regarding corrective measures before the start of installation.
- D. Do not proceed with the work of this Section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 FABRICATION

- A. General:
1. Fabricate components per manufacturer's installation instructions and with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
 2. Accurately fit and secure joints and corners. Make joints flush, hairline and weatherproof.
 3. Prepare components to receive anchor devices. Fabricate anchors.
 4. Arrange fasteners and attachments to conceal from view.
- B. Fabricate components at the shop whenever possible, in accordance with approved shop drawings.

3.03 INSTALLATION

- A. Examine surfaces for conditions that will adversely affect execution, permanence and quality of work.
- B. Do not proceed until unsatisfactory conditions have been corrected.
- C. Set glass framing in locations shown in the details, level, square, plumb and in alignment with other work in accordance with the manufacturer's installation instructions, approved shop drawings and section 08810.
- D. Seal joints between framing and the building structure in order to secure a watertight installation. Apply sealants in accord with approved shop drawings and section 07920.
- E. Isolation of Aluminum from Dissimilar Materials: Protect aluminum in contact with non-compatible materials by separation with non-reactive materials. Isolate all dissimilar metals including metals exposed in roughed-in openings and paint contact surfaces.
- F. Hardware:

1. Install finish hardware to hardware templates.
2. Adjust hardware for proper function and smooth operation in accord with manufacturer's instructions.

3.04 FIELD QUALITY CONTROL

- A. Site Tests (Post Installation Testing): Conduct project site tests for air and water infiltration with manufacturer's representative present. Resident will select curtain walls units to be tested. Test not meeting specified performance requirements and units having deficiencies shall be corrected as part of the contract amount.
1. Testing: Testing shall be performed by a qualified independent testing agency. Refer to Division 1 Testing Section for payment of testing and testing requirements.
 - a. Air Infiltration Tests: Conduct tests in accordance with ASTM E 783. Allowable air infiltration shall not exceed 1.5 times the amount indicated in the performance requirements or 0.09 cfm/ft², which ever is greater.
 - b. Water Infiltration Tests: Conduct tests in accordance with ASTM E 1105. No uncontrolled water leakage is permitted when tested at a static test pressure of two-thirds the specified water penetration pressure but not less than 10 psf.

3.05 PROTECTION AND CLEANING

- A. After installation, protect exposed portions of aluminum surfaces from damage by grinding and polishing compounds, plaster, lime, acid, cement or other contaminants.
- B. At the completion of the project, clean all surfaces and adjust all operating parts to leave the work free of defects or blemishes and in good operating condition.

END OF SECTION