

SECTION 08 4113
ALUMINUM ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Aluminum framed entrances and storefronts.

B. Related Requirements:

1. Division 01 - General Requirements.
2. Section 07 2719 – Plastic Sheet Air Barriers.
3. Section 07 9200 - Joint Sealants.
4. Section 08 7100 - Door Hardware.
5. Section 08 8000 - Glazing.

1.2 REFERENCES

A. ASTM International (ASTM):

1. ASTM B221 – Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and tubes.
2. ASTM E283 - Standard Test Method for Determining Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors by Uniform or Cyclic Static Air Pressure Difference.
3. ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
4. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
5. ASTM E783 - Standard Test Method for Field Measurement of Air Leakage through Installed Windows and Doors.
6. ASTM E1105 Standard test Method for Field Determination of Water Penetration of Installed Exterior Windows, Curtain Walls, and Doors by Uniform or Cyclic Static Air Pressure Difference.

B. American Architectural Manufacturers Association (AAMA):

1. AAMA 611 – Voluntary Specification for Anodized Architectural aluminum.

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2. AAMA 2605 – Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
- C. National Fenestration Council Rating (NFRC):
 1. Component Modeling Approach (CMA), CMA Software Tool (CMAST).
 2. NFRC-100- Standard Procedure for Determining Fenestration Product U-factors.
 3. NFRC-200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence.
- D. Code of Federal Regulations, Title 16, Part 1201 (16 CFR 1201):
 1. Consumer Product Safety Commission Safety Standard for Architectural Glazing Materials.

1.3 PERFORMANCE REQUIREMENTS

- A. Water-Resistance test: In accordance with ASTM E331. No water leakage when tested at 8 PSF (pounds per square foot) static pressure differential.
- B. Air-Infiltration: In accordance with ASTM E283. Air infiltration shall not exceed 0.06 cfm/SF at a static air pressure difference of 6.24 psf.
- C. Structural Performance: In accordance with ASTM E330. Deflection under design load shall not exceed L/175 of the clear span.
- D. Energy-Related Performance Ratings:
 1. Thermal Performance U-Factor: 0.41
 2. Solar Heat Gain Coefficient (SHGC): 0.26
 3. Visible Transmittance (VT): 0.46

1.4 SUBMITTALS

- A. Shop Drawings: Submit Shop Drawings for the Work of this section, prepared and reviewed before fabrication. Include plans, elevations, opening, identification symbols, sizes, and complete details for materials, finishes, sizes, profiles, moldings, dimensioned locations of hardware items with reinforcement, methods of anchoring, assembly, installation, isolation, glazing procedure as well as reglazing procedures, materials, flashing, and caulking.
- B. Product Data: Submit manufacturer's Product Data.
- C. Test Reports: Submit test reports from AAMA accredited laboratories certifying the performance requirements of Article 1.03.

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- D. Material Samples: Submit the following:
1. Storefront, door and frame sections with specified finish, fasteners, and accessories.
 2. Cured sealant colors.
- E. Energy Performance: Submit a report or calculation for each system and glass type listing the frame, glazing and spacer components and indicating the U-Factor, solar heat gain coefficient (SHGC) and visible transmittance (VT) of the storefront assembly demonstrating conformance to project energy calculations.
1. Insulated Storefronts: Submit NFRC CMAST Fenestration Calculation Report / Bid Report:
 2. Non-Insulated Storefronts: Submit energy calculations.
- F. CxSP will review the Submittals of this Section as part of the Commissioning of Thermal and Moisture Protection.

1.5 QUALITY ASSURANCE

- A. Regulatory Requirements:
1. Except for more stringent requirements specified in this Section, manufactured aluminum windows shall comply with the requirements of the CBC Part 6, California Energy Code, Section 110.6, Mandatory Requirements for Fenestration Products and Exterior Doors.
 2. Windows shall be designed to withstand the minimum loads prescribed in CBC Section 1609A.
- B. Field applied products that release VOC's, such as sealants, caulking, adhesives, primers, and paints, shall be approved by the OWNER's Office of Environmental Health and Safety (OEHS).
- C. Installer Qualifications:
1. Minimum five-year experience installing windows of the type specified by this Section.
 2. Installer shall be approved by the window manufacturer as an approved installer.
- D. Manufacturer Qualifications: Minimum 5-year experience in producing aluminum windows of the type specified. Window manufacturer technical representative shall provide field services to verify window installation is in accordance with manufacturer's written instructions.

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- E. Mock-ups: Provide mock-up of one typical door and window unit for review by the ARCHITECT.
- F. Pre-Installation Conference: CONTRACTOR shall coordinate and conduct pre-installation conference in accordance with Section 01 3119, Project Meetings, to review the progress of construction activities and preparations for the installation of storefronts and other related work of this Section.

1.6 WARRANTY

- A. Manufacturer shall provide a 10-year material warranty for aluminum storefront.
- B. Manufacturer shall provide a 10-year material warranty for doors.
- C. Anodized finish of storefronts, doors and related components shall be warranted for 10 years against cracking, crazing, flaking, or blistering,

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Centered Glazing:
 - 1. Arcadia AG-601T Series.
 - 2. EFCO Series 406 (T).
 - 3. Kawneer Co. Trifab VersaGlaze 601T.
 - 4. Equal.

2.2 MATERIALS

- A. Extrusions shall be 6063-T6 alloy and temper, per ASTM B221.
- B. Fasteners: Aluminum, stainless steel, or zinc-plated steel at exposed conditions. Perimeter anchors shall be aluminum or steel. Steel anchors shall be isolated from aluminum members.
- C. Glazing Gaskets: EPDM elastomeric extrusions or vinyl reinforced with fiberglass cord.
- D. Glazing Sealants: As recommended by manufacturer for joint type.
- E. Spacers and Setting Blocks: Manufacturer's standard elastomeric type.
- F. Joint Sealants: For installation at perimeter of storefront system shall be as specified in Section 07 9200, Joint Sealants.

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- G. Hardware: Finish hardware shall be as specified in Section 08 7100 - Door Hardware.
- H. Glazing: Glazing shall be as specified in Section 08 8000, Glazing.

2.3 FABRICATION

- A. Framing sections must match existing 2 inches by 4-inch thermally broken by one inch glazing; contractor to field verify size prior to ordering framing.
 - 1. Major portions of door sections, except glazing beads, shall be nominal 0.125 inch.
 - 2. Wall thickness of frame members shall be nominal 0.093 inch.
- B. Framing system shall provide continuous head and sill channels spliced together with formed brake metal sleeves at center of vertical mullions. The framing system shall provide for flush glazing on sides with no projecting stops. Vertical and horizontal framing members shall have a nominal face dimension and overall depth as noted above. Diverters shall be provided to collect water infiltration and divert them to the exterior.
- C. Door framing members shall match storefront framing appearance. Door stiles and rails shall be tubular sections, accurately joined at corners with heavy concealed reinforcement brackets secured with bolts and screws and shall be metal inert gas (MIG) welded. Doors shall be furnished with snap-in stops with bulb glazing gasket both sides of glass. Exposed screws are not permitted. Each door leaf shall be furnished with an adjusting mechanism, located in the top rail near the lock stile, which provides for minor clearance adjustments after installation. A hard-backed poly-pile weatherstrip shall be installed in both stiles of center hung single doors.
- D. Doors with panic hardware shall be provided with a mid-rail. Panel below mid rail shall consist of a composite infill panel with a polystyrene core and 0.032 aluminum sheet on each side, by Mapes Architectural Panels, Alucabond, or equal.

2.4 FINISH

- A. Storefronts and accessories shall be furnished with an electronically deposited color anodic finish-Class AAM10C22A44. Thickness shall be 0.7 mil minimum thickness conforming to AAMA 611.
- B. Color: Black Anodize to match existing. Contractor to field verify color prior to purchasing it.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine openings, substrates, structural support, anchorage, and conditions, for compliance with requirements for installation tolerances and other conditions

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affecting performance of work. Verify rough opening dimensions, levelness of sill plate and operational clearances. Examine wall flashings, air barriers, and other built-in components to ensure a coordinated, weather tight aluminum framed storefront installation.

3.2 INSTALLATION

- A. Install storefronts in accordance with approved shop drawings and manufacturers installation instructions. Installation shall be level, square, plumb and in proper relation to wall flashing and adjacent construction.
- B. Apply sealants to provide a weather tight installation at joints, intersections, and opening perimeters. Tool sealants to fill the joint and provide a smooth finished surface.
- C. Install security glazing with Dow 795 sealant as required by Security Glazing.

3.3 FIELD QUALITY CONTROL

- A. CONTRACTOR shall retain and pay a testing agency to conduct on-site air and water infiltration tests. On-site tests shall be conducted with CONTRACTOR, storefront manufacturer's representative, OWNER, Project Inspector and ARCHITECT present. The Owner will select the units to be tested.
- B. Ten percent of installed storefront panels will be selected for air and water testing. If one or more windows fail, an additional ten percent of windows (not including the ones previously tested) will be selected for further testing. Selection of additional ten percent of units and retesting will be performed until no leaks occur.
- C. Water-Infiltration Test: Test will be conducted according to requirements of ASTM E1105. No water leakage is permitted. Windows will be tested at 6 pounds per square foot test pressure differential.
- D. Air-Infiltration Test: Test will be conducted according to requirements of ASTM E783. Allowable infiltration shall not exceed 0.9 cfm/SF when tested at 6.24 pounds per square foot field test pressure differential.
- E. Windows within storefronts will be tested per the requirements of Section 08 5113, Aluminum Windows.
- F. Field Test report will be submitted to the OWNER, CONTRACTOR, and ARCHITECT. Field Test report will include the following:
 - 1. Name of the testing agency and testing agency's credentials.
 - 2. Date of test.
 - 3. Standards complied with during testing.
 - 4. Number and locations of specimens tested.

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- 5. Thorough analysis of test result indicating passing or failing of specimens at pressures specified.
- 6. Photos illustrating conditions of failed compliance at pressures required.
- G. CONTRACTOR shall perform field adhesion tests of sealants in accordance with manufacturer's instructions and ASTM C1521, Method A, Tail Procedure. Remove sealants that fail adhesion testing; clean substrates, reapply sealants, and re-test. Test sealants adjacent to failed sealants. Submit field adhesion test report indicating tests, locations, dates, results, and remedial actions taken. Number of tests shall be per ASTM C1521, Destructive Procedure.

3.4 PROTECTION

- A. Protect the Work of this section until Substantial Completion.

3.5 CLEAN UP

- A. Remove rubbish, debris and waste materials and legally dispose of them off the Project site.

END OF SECTION