

**SECTION 08 41 13
ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS**

SPEC WRITER NOTES:

1. Use this section only for NCA projects.
2. Delete between //-----// if not applicable to project. Also delete any other item or paragraph not applicable in the section and renumber the paragraphs.
3. Do not use this section for windows in psychiatric facilities; see Section 08 44 13, GLAZED ALUMINUM CURTAIN WALLS.

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section specifies aluminum entrance work including storefront construction, hung doors, and other components to make a complete assembly.

1.2 RELATED WORK

- A. Glass and Glazing: Section 08 80 00, GLAZING.
- B. Hardware: Section 08 71 00, DOOR HARDWARE.
- C. Automatic Door Operators: Section 08 71 13.11, LOW ENERGY POWER ASSIST DOOR OPERATORS.
- D. Texture and color of finish: Section 09 06 00, SCHEDULE FOR FINISHES.

1.3 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design aluminum-framed systems, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Accessible Entrances: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.
- C. Structural-Test Performance: Provide aluminum-framed systems tested according to ASTM E330 as follows:
 1. When tested at positive and negative wind-load design pressures, systems do not evidence deflection exceeding specified limits.
 2. When tested at 150 percent of positive and negative wind-load design pressures, systems, including anchorage, do not evidence material failures, structural distress, and permanent deformation of main framing members exceeding 0.2 percent of span.
 3. When tested at 150 percent of positive and negative wind-load design pressures, systems, including anchorage, do not evidence material

failures, structural distress, and permanent deformation of main framing members exceeding 0.2 percent of span.

- D. Shapes and thickness of framing members sufficient to withstand a design wind load of not less than //1.4// _____ kilopascals (//30// _____ pounds per square foot) of supported area with a deflection of not more than 1/175 times the length of the member and a safety factor of not less than 1.65 (applied to overall load failure of the unit).
- E. Provide glazing beads, moldings, and trim of not less than 1.25 mm (0.050 inch) nominal thickness.
- F. Air Infiltration: When tested in accordance with ASTM E283, air infiltration not to exceed 2.63×10^{-50} cm per square meter (0.06 cubic feet per minute per square foot) of fixed area at a test pressure of 0.30 kPa (6.24 pounds per square foot) 80 kilometers (50 mile) per hour wind.
- G. Water Penetration: When tested in accordance with ASTM E331, there must be no water penetration at a pressure of 0.38 kPa (8 pounds per square foot) of fixed area.

1.4 SUSTAINABILITY REQUIREMENTS

- A. Materials in this section may contribute towards contract compliance with sustainability requirements. See Section 01 81 11, SUSTAINABLE DESIGN REQUIRMENTS, for project // local/regional materials, // low-emitting materials, // recycled content, // _____// requirements.

1.5 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Shop Drawings: Provide 1/2 scale drawings showing construction, anchorage, reinforcement, and installation details.
 - 1. Must be prepared qualified engineer; structural analysis data and shop drawings to be signed and sealed by professional engineer.
 - 2. For entrance doors, include hardware schedule and indicate operating hardware types and locations.
- C. Delegated-Design Submittal: For aluminum-framed systems indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- D. Manufacturer's Literature and Data:
 - 1. Doors and Windows, each type.
 - 2. Entrance and Storefront construction.

E. Samples:

1. Door corner section, 450 mm x 450 mm (18 x 18 inches), of each door type specified, showing vertical and top hinge edges, // door closer reinforcement // internal reinforcement // and insulation, of flush panel door. //
- //2. Two samples of anodized aluminum of each color showing finish and maximum shade range. //

F. Manufacturer's Certificates:

1. State that aluminum has been given specified thickness of anodizing.
2. Indicate manufacturer's qualifications specified.
3. Submit written certification, signed by entrance and storefront system manufacturer, attesting that the entrance and storefront system installed conforms to the requirements specified in the "Performance Requirements" article and that the manufacturer's standard system has been tested in accordance with specified tests, meeting all specified requirements.

1.6 QUALITY ASSURANCE

- A. Approval by Contracting Officer is required of products of proposed manufacturer, or supplier, and will be based upon submission by Contractor certification.
- B. Certify manufacturer regularly and presently manufactures aluminum entrances and storefronts as one of their principal products.
- C. Pre-Installation Conference: Convene a meeting on site, after submittals are received and approved but before any work, to review drawings and specifications, submittals, schedule, manufacturer instructions, site logistics and pertinent matters of coordination, temporary protection, governing regulations, tests and inspections; participants to include RE/COR and all parties whose work is effected or related to the work of this section.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver aluminum entrance and storefront material to the site in packages or containers; labeled for identification with the manufacturer's name, brand and contents.
- B. Store aluminum entrance and storefront material in weather-tight and dry storage facility.
- C. Protect from damage from handling, weather and construction operations before, during and after installation.

1.8 APPLICABLE PUBLICATIONS

- A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by the basic designation only. Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.

SPEC WRITER NOTES:

1. Remove reference citations that do not remain in Part 2 or Part 3 of edited specification.
2. Verify and make dates indicated for remaining citations the most current at date of submittal; determine changes from date indicated on the TIL download of the section and modify requirements impacted by the changes.

- B. American Architectural Manufacturer's Association (AAMA):
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| 2605-11 | High Performance Organic Coatings on Architectural Extrusions and Panels |
|---------|--|
- C. National Association of Architectural Metal Manufacturers (NAAMM):
- | | |
|----------------|-----------------------|
| AMP 500 Series | Metal Finishes Manual |
|----------------|-----------------------|
- D. American National Standards Institute (ANSI):
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|--------------------|--|
| ICC/ANSI A117.1-03 | Guideline for Accessible and Usable Buildings and Facilities-Providing Accessibility and Usability for Physically Handicapped People |
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- E. American Society for Testing and Materials (ASTM):
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|------------------|---|
| A36/A36M-12 | Carbon Structural Steel |
| A123/A123M-12 | Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products |
| A153/A153M-09 | Zinc Coating (Hot Dip) on Iron and Steel Hardware |
| A1008/A1008M-12a | Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable |
| A1011/A1011M-12b | Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength |
| B209-10 | Aluminum and Aluminum-Alloy Sheet and Plate |
| B221-13 | Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes |

E283-04(2012)	Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
E330-02(2010)	Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference
E331-00(2009)	Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference
F468-12	Nonferrous Bolts, Hex Cap Screws, Socket Head Cap Screws, and Studs for General Use
F593-13	Stainless Steel Bolts, Hex Cap Screws, and Studs

PART 2 - PRODUCTS

SPEC WRITER NOTES:

1. Make material requirements agree with applicable requirements specified in the referenced Applicable Publications. Update and specify in both only which applies to the project.

2.1 MATERIALS GENERAL

- A. Aluminum, ASTM B209 and B221: Alloy and temper recommended by manufacturer for type of use and finish indicated.
- B. Steel Reinforcement:
 1. Structural Shapes, Plates, and Bars: ASTM A36.
 2. Cold-Rolled Sheet and Strip: ASTM A1008.
 3. Hot-Rolled Sheet and Strip: ASTM A1011.
- //C. Thermal Break: Manufacturer standard low conductive material retarding heat flow in the framework, where insulating glass is scheduled. //
- D. Fasteners:
 1. Aluminum: ASTM F468, Alloy 2024.
 2. Stainless Steel: ASTM F593, Alloy Groups 1, 2 and 3.
- E. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts, complying with ASTM A123 or ASTM A153.

2.2 DOORS

- A. Manufacturers standard glazed doors for manual swing.
- B. Doors: 44 mm (1-3/4 inches) overall thickness with minimum 3 mm (0.125 inch) thick extruded aluminum tubular rail and style member.

- C. Door Design: 89 mm (3-1/2 inch) wide style
- D. Glazing Stops and Gaskets: Square, snap on, extruded aluminum stops and preformed gaskets.
- E. Provide non-removable stops on outside of door.

2.3 PROTECTION OF ALUMINUM

- A. Isolate aluminum from contact with dissimilar metals other than stainless steel, white bronze, or zinc by any of the following:
 - 1. Coat the dissimilar metal with two coats of heavy-bodied alkali resistant bituminous paint.
 - 2. Place caulking compound, or non-absorptive tape, or gasket between the aluminum and the dissimilar metal.
 - 3. Paint aluminum in contact with mortar, concrete and plaster, with a coat of aluminum paint primer.

2.4 FRAMES

- A. Fabricate window and transom frames with a minimum of 3 mm (0.125 inch) thick extruded aluminum.
- B. Provide integral stops and glass rebates and applied snap-on type trim.
- C. Use concealed screws, bolts and other fasteners. Secure cover boxes to frames in back of all lock strike cutouts.
- D. Fabricate framework with thermal breaks in frames where insulating glass is scheduled and specified under Section 08 80 00, GLAZING.

2.5 FABRICATION

- A. Form aluminum shapes before finishing.
- B. Weld in concealed locations to minimize distortion or discoloration of finish.
- C. Framing Members: Fabricate with the following characteristics:
 - 1. Sharp, straight profiles free of defects and deformations.
 - 2. Accurately fitted joints with ends coped or mitered.
 - 3. Physical or thermal isolation of glazing from framing members.
 - 4. Allow for thermal expansion between all system materials.
 - 5. Conceal all fasteners and anchors.

2.6 REINFORCEMENT FOR BUILDERS HARDWARE

- A. Fabricate from stainless steel plates.
- B. Hinge and pivot reinforcing: 4.55 mm (0.1793 inch) thick.
- C. Reinforcing for lock face, flush bolts, concealed holders, concealed or surface mounted closers: 2.66 mm (0.1046 inch) thick.
- D. Reinforcing for all other surface mounted hardware: 1.5 mm (0.0598 inch) thick.

2.7 FINISH

- A. In accordance with NAAMM AMP 500 series.
- B. Finish exposed aluminum surfaces as follows:
 - 1. Anodized Aluminum:
 - a. Finish in accordance with AMP 501 letters and numbers.
 - b. Clear anodized Finish: AA-C22A41 Medium matte, clear anodic coating, Class 1 Architectural, 0.7 mils thick.
 - c. Colored anodized Finish: AA-C22A42 (anodized) or AA-C22A44 (electrolytically deposited metallic compound) medium matte, integrally colored coating, Class 1 Architectural, 0.7 mils thick.
 - 1) Dyes not accepted.
 - 2. Coated Aluminum:
 - a. Variation of more than 50 percent of maximum shade range approved will not be accepted in a single window or in adjacent windows and mullions on a continuous series.
 - b. AMP 501 and 505.
 - c. Fluorocarbon Finish: AAMA 2605, superior performing organic coating.

PART 3 - EXECUTION**3.1 INSTALLATION**

- A. Allowable Installation Tolerances: Install work plumb and true, in alignment and in relation to lines and grades shown. Variation of 3 mm (1/8 inch) in 2400 mm (eight feet), non-accumulative, is maximum permissible for plumb, level, warp, bow and alignment.
- B. Anchor aluminum frames to adjoining construction at heads, jambs and bottom and to steel supports, and bracing; anchor frames with stainless steel or aluminum countersunk flathead, expansion bolts or machine screws, as applicable.
- C. Use aluminum clips for internal connections of adjoining frame sections.
- D. Where work is installed within masonry or concrete openings, place no parts other than built-in anchors and provision for operating devices located in the floor, until after the masonry or concrete work is completed.
- E. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or applying sealant or

tape, or by installing nonconductive spacers as recommended by manufacturer for this purpose.

- F. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
- G. Set continuous sill members and flashing in full sealant bed.
- H. Install hardware specified under Section 08 71 00, DOOR HARDWARE.
- //I. Install hung door operators specified under Section 08 71 13.11, LOW ENERGY POWER ASSIST DOOR OPERATORS. //

3.2 ADJUSTING

- A. After installation of entrance and storefront work is completed, adjust and lubricate operating mechanisms to insure proper performance.

3.3 PROTECTION, CLEANING AND REPAIRING

- A. Remove all mastic smears and other unsightly marks, and repair any damaged or disfiguration of the work. Protect the installed work against damage or abuse.

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