

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

SPEC WRITER NOTE:

- 1. Delete text between // // not applicable to project. Edit remaining text to suit project.
- 2. Use Section 08 44 13, GLAZED ALUMINUM CURTAIN WALLS for glazed openings/assemblies in behavioral health, psychiatric, dependence rehabilitation areas.

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

- 1. Aluminum-framed entrances // and storefronts //.

1.2 RELATED REQUIREMENTS

SPEC WRITER NOTE: Update and retain references only when specified elsewhere in this section.

- A. Door Finish and Color: Section 09 06 00, SCHEDULE FOR FINISHES.
- B. Glass and Glazing: Section 08 80 00, GLAZING.
- C. Hardware: Section 08 71 00, DOOR HARDWARE.
- D. Automatic Door Actuators: Section 08 71 13, AUTOMATIC DOOR OPERATORS.
- E. Aluminum Finish and Color: Section 09 06 00, SCHEDULE FOR FINISHES.

1.3 APPLICABLE PUBLICATIONS

- A. Comply with references to extent specified in this section.
- B. American Architectural Manufacturers Associations (AAMA):
 - 2603-15.....Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels
 - 2604-13.....Performance Requirements and Test Procedures or High Performance Organic Coatings on Architectural Extrusions and Panels
 - 2605-13.....Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels
- C. American Welding Society (AWS):
 - D1.2/D1.2M-14.....Structural Welding Code - Aluminum
- D. ASTM International (ASTM):

- A240/A240M-20.....Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
- B209-14.....Aluminum and Aluminum-Alloy Sheet and Plate.
- B209M-14.....Aluminum and Aluminum-Alloy Sheet and Plate (Metric)
- B221-14.....Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
- B221M-13.....Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric)
- D1187/D1187M-97(2018)...Asphalt-Base Emulsions for Use as Protective Coatings for Metal
- E283/E283M-19.....Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
- E330/E330M-14.....Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference
- E331-00(2016).....Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference
- E1886-19.....Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missiles and Exposed to Cyclic Pressure Differentials
- E1996-17.....Performance of Exterior Windows, Curtain Walls, Doors, and impact Protective Systems Impacted by Windborne Debris in Hurricanes
- F468-16.....Nonferrous Bolts, Hex Cap Screws, and Studs for General Use
- F593-17.....Stainless Steel Bolts, Hex Cap Screws, and Studs
- E. National Association of Architectural Metal Manufacturers (NAAMM):
AMP 500-06.....Metal Finishes Manual
- F. National Fenestration Rating Council (NFRC):
500-14(E1A0).....Determining Fenestration Product Condensation Resistance Values
- G. Department of Veterans Affairs (VA):

1. VA Physical Security and Resiliency Design Manual October 1, 2020

1.4 PREINSTALLATION MEETINGS

- A. Conduct preinstallation meeting // at project site // minimum 30 days before beginning Work of this section.

SPEC WRITER NOTE: Edit participant list to ensure entities influencing outcome attend.

- 1. Required Participants:

- a. Contracting Officer's Representative.
- b. // Architect/Engineer. //
- c. Contractor.
- d. Installer.
- e. // Manufacturer's field representative. //
- f. Other installers responsible for adjacent and intersecting work, including // _____ //.

SPEC WRITER NOTE: Edit meeting agenda to incorporate project specific topics.

- 2. Meeting Agenda: Distribute agenda to participants minimum 3 days before meeting.

- a. Installation schedule.
- b. Installation sequence.
- c. Preparatory work.
- d. Protection before, during, and after installation.
- e. Installation.
- f. Terminations.
- g. Transitions and connections to other work.
- h. Other items affecting successful completion.

- 3. Document and distribute meeting minutes to participants to record decisions affecting installation.

1.5 SUBMITTALS

- A. Submittal Procedures: Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

- B. Submittal Drawings: // Minimum 1 to 2 (half size) scale. //

- 1. Show size, configuration, and fabrication and installation details.
- 2. Show anchorage and reinforcement.
- 3. Show interface and relationship to adjacent work, including thermal, air, and water barrier continuity.

- C. Manufacturer's Literature and Data:

1. Description of each product.
2. Doors, each type.
3. Entrance and Storefront construction.
4. Installation instructions.
5. Warranty.

D. Samples:

1. Door Corner Section: Minimum 450 mm x 450 mm (18 x 18 inches) for each specified door type, showing head rail and hinge stile, // door closer reinforcement, // internal reinforcement // and insulation in flush panel door //.
2. Aluminum Anodized Finish: // wo sample extrusions minimum 150 mm (6 inches) long for each specified color in sets of three showing maximum color range. //
3. Aluminum Paint Finish: // wo sample extrusions minimum 150 mm (6 inches) long for each specified color. //

E. Sustainable Construction Submittals:

SPEC WRITER NOTE: Retain sustainable construction submittals appropriate to product.

1. Recycled Content: Identify post-consumer and pre-consumer recycled content percentage by weight.

F. Test reports: Certify // each product complies // products comply // with specifications.

G. Certificates: Certify // each product complies // products comply // with specifications.

1. Certify anodized finish thickness.

H. Qualifications: Substantiate qualifications comply with specifications.

1. Manufacturer // with project experience list //.
2. Installer // with project experience list //.
3. Welders and welding procedures.

I. Delegated Design Drawings and Calculations: Signed and sealed by responsible design professional.

1. Show location and magnitude of loads applied to building structural frame.
2. Identify deviations from details shown on drawings.
3. Blast Design Calculations
 - a. Submit calculations for review and approval prepared by qualified blast consultant, with a minimum of 5 years of experience in

design of blast resistant window systems, verifying storefront assembly including anchors comply with specified blast resistance performance. The magnitudes of the design threats W1,W2 and GP1,GP2 are defined in the Physical Security and Resiliency Design Standards Data Definitions which is a document separate from the referenced VA Security and Resiliency Design Manual. The Physical Security and Resiliency Design Standards Data Definitions are provided on a need to know basis by the structural engineer blast specialist performing the blast design on VA projects. It is the responsibility of the delegated engineer responsible for the design of blast resistant entrances and storefronts to request and obtain the Physical Security and Resiliency Design Data Standard Data Definitions from the VA Office of Construction and Facilities Management (CFM). Any associated delays or increased costs due to failure to obtain this information will be borne by the contractor.

J. Operation and Maintenance Data:

1. Care instructions for each exposed finish product.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications:

1. Regularly manufactures specified products.
2. Manufactured specified products with satisfactory service on five similar installations for minimum five years.
 - a. // Project Experience List: Provide contact names and addresses for completed projects. //

B. Installer Qualifications: // Product manufacturer.// // Manufacturer authorized representative. //

1. Regularly installs specified products.
2. Installed specified products with satisfactory service on five similar installations for minimum five years.
 - a. // Project Experience List: Provide contact names and addresses for completed projects. //

C. Welders and Welding Procedures Qualifications: AWS D1.2/D1.2M.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver products in manufacturer's original sealed packaging.
- B. Mark packaging, legibly. Indicate manufacturer's name or brand, type, // color, // production run number, and manufacture date.

- C. Before installation, return or dispose of products within distorted, damaged, or opened packaging.
- D. Store products indoors in dry, weathertight // conditioned // facility.
- E. Protect products from damage during handling and construction operations.

1.8 WARRANTY

SPEC WRITER NOTE: Always retain construction warranty. FAR includes Contractor's one year labor and material warranty.

- A. Construction Warranty: FAR clause 52.246-21, "Warranty of Construction."

SPEC WRITER NOTE: Specify extended manufacturer's warranties for materials only.

- B. Manufacturer's Warranty: Warrant painted finish against material and manufacturing defects.

SPEC WRITER NOTE: Specify customarily available warranty period for specified products. AAMA 2605 painted finish is available with 20 year warranty.

- 1. Warranty Period: // 20 // years.

PART 2 - PRODUCTS

2.1 SYSTEM PERFORMANCE

- A. Delegated Design: Prepare submittal documents including design calculations and drawings signed and sealed by registered design professional, licensed in state where work is located.
 - 1. Minor deviations to details shown on drawings to accommodate manufacturer's standard products may be accepted by Contracting Officer's Representative when deviations do not affect design concept and specified performance.
- B. Design aluminum framed entrances and storefronts complying with specified performance:

SPEC WRITER NOTE: Retain seismic load option when required by Project location.

- 1. Wind // and Seismic // Load Resistance: ASCE/SEI 7; Design criteria as indicated on Drawings when tested according to ASTM E330/E330M.

SPEC WRITER NOTE: Specify actual loads when known for project.

- a. Wind Load: // 1.4 // _____ // kPa (// 30 // _____ // psf)
positive // and // negative, minimum.
 - b. Maximum Deflection: 1/175 of span, maximum with minimum 1.65
safety factor.
2. Thermal Movement: Accommodate ambient temperature range of
67 degrees C (120 degrees Fahrenheit).

SPEC WRITER NOTE:

- 1. Determine whether facility is mission critical or life safety protected as listed in the Physical Security and Resiliency Design Manual (VAPSRDM).
- 2. Ensure glass is specified as laminated or laminated insulated type.

3. Blast Resistance:

- a. Life Safety Protected Facilities: W1 design threat level located at standoff distance not to exceed pressures and impulses associated with GP1.
 - 1) Standoff Distance: 25 feet.
 - 2) Mullion deformation not to exceed deformation limits shown in Table 6-4 of the referenced Physical Security and Resiliency Design Manual.
 - 3) Glass shall be restrained within the mullions with ½" bite and minimum of 3/8" wide continuous bead of structural silicone adhesive attaching the inner lite of the glass to the frame
- b. Mission Critical Protected Facilities: W1 design threat level located at standoff distance not to exceed pressures and impulses associated with GP2.
 - 1) Standoff Distance: 50 feet
 - 2) Mullion deformation not to exceed deformation limits shown in Table 6-4 of the referenced Physical Security and Resiliency Design Manual.
 - 3) Glass shall be restrained within the mullions with ½" bite and 3/8" wide continuous bead of structural silicone adhesive attaching the inner lite of the glass to the frame

SPEC WRITER NOTES: Retain

windborne-debris impact resistance for hurricane prone regions in regions where ultimate wind speed is 58 m/s (130 mph) or greater within 1.61 km (1 mile) of coastal mean high water line, and where ultimate wind speed is 64 m/s (140 mph), and Hawaii.

4. Windborne-Debris Impact Resistance: Pass ASTM E1886.
 - a. Openings within 9144 mm (30 feet) of Grade: ASTM E1996 large missile test.
 - b. Other Openings: ASTM 1996 small missile test.

SPEC WRITER NOTE: CRF requirement is dependent on local climatic conditions. Edit required values to suit project location and condensation probability.
5. Condensation Resistance: NFRC 500.
 - a. Fixed Framing: 45 CRF, minimum.
6. Water Resistance: ASTM E331; No uncontrolled penetration at 380 Pa (8 pounds/square foot), minimum, pressure differential.
7. Fixed Framing Air Infiltration Resistance: ASTM E283; 0.30 liter/second/square meter (0.06 cubic foot/minute/square foot), maximum at 300 Pa (6.24 pounds/square foot), minimum, pressure differential.
8. Entrance Doors Air Infiltration Resistance: ASTM E283; maximum allowable at 75 Pa (1.57 pounds/square foot), minimum, pressure differential.
 - a. Single Doors: 2.5 liter/second/square meter (0.5 cubic foot/minute/square foot).
 - b. Paired Doors: 6 liter/second/square meter (1.2 cubic foot/minute/square foot).

SPEC WRITER NOTE: Determine the Facility Type as listed in the Physical Security and Resiliency Design Manual.

2.2 MATERIALS

- A. Aluminum:
 1. Sheet Metal: ASTM B209M (ASTM B209), minimum 1.6 mm (0.063 inch) thick.
 2. Extrusions: ASTM B221M (ASTM B221).
 - a. Framing: Minimum 3 mm (0.125 inch) wall thickness.
 - b. Glazing Beads, Moldings, and Trim: Minimum 1.25 mm (0.050 inch) thick.
 3. Alloy 6063 temper T5 for doors, door frames, // fixed glass sidelights // storefronts // and transoms //.
 4. Alloy 6061 temper T6 for guide tracks for sliding doors and other extruded structural members.

- a. Color Anodized Aluminum: Provide aluminum alloy required to produce specified color.
- B. Stainless Steel: ASTM A240/A240M; Type 302 or Type 304.
- C. // Thermal Break: Manufacturer standard low conductive material retarding heat flow in the framework, where insulating glass is scheduled. //

2.3 PRODUCTS - GENERAL

- A. Basis of Design: Section 09 06 00, SCHEDULE FOR FINISHES.
- B. Provide aluminum framed entrances and storefronts from one manufacturer // and from one production run //.

SPEC WRITER NOTE: Retain single source requirement when aluminum entrances are installed within other framed openings.

- C. Provide aluminum entrances, // storefront, // windows, // curtain wall // systems from same manufacturer.
- D. Sustainable Construction Requirements:

SPEC WRITER NOTE:

1. Specify products containing greatest recycled content practicable to maximize material recovery. See EPA Comprehensive Procurement Guidelines (CPG) for guidance about individual products and available recycled content. Section 01 81 13 sets overall project recycled content requirements.
2. Aluminum Association (AA) reports 2008 industry average 85 percent recycled content for aluminum in building construction industry. Retain 50 percent when specifying anodized aluminum.

1. Aluminum Recycled Content: // 80 // 50 // percent total recycled content, minimum.

2.4 FRAMES

SPEC WRITER NOTE: Include thermal break option when insulating glass is specified in Section 08 80 00, GLAZING.

- A. Framing Members: Extruded aluminum, // thermally broken //.
- B. Stops: Provide integral fixed stops and glass rebates and snap-on removable stops.
- C. Provide concealed screws, bolts and other fasteners.
- D. Secure cover boxes to frames in back of lock strike cutouts.

2.5 STILE AND RAIL DOORS

- A. Stiles and Rails: Extruded aluminum, // thermally broken //.
 - 1. Thickness: 45 mm (1-3/4 inch).
 - 2. Stiles and Head Rails: 90 mm (3-1/2 inches) wide.
 - 3. Bottom Rails: 250 mm (10 inches) wide.
- B. Single-Acting Doors:
 - 1. Bevel: 3 mm (1/8 inch) at lock, hinge, and meeting stile edges.
 - 2. Clearances: 2 mm (1/16 inch) at hinge stiles, 3 mm (1/8 inch) at lock stiles and top rails, and 5 mm (3/16 inch) at floors and thresholds.
- C. Glass Rebates: Integral with stiles and rails.
- D. Glazing Beads: Extruded aluminum, 1.3 mm (0.050 inch) thick. Integral with stiles and rails or applied type, snap-fit secured.
- E. Stile and Rail Joints: Welded or interlocking dovetail joints between stiles and rails.
 - 1. Clamp door together through top and bottom rails with 9 mm (3/8 inch) primed steel tie rod extending into stiles, and having self-locking nut and washer at both ends.
 - 2. Reinforce stiles and rails to prevent door distortion when tie rods are tightened.
 - 3. Provide compensating spring-type washer under each nut for stress relief.
 - 4. Construct joints to remain rigid and tight when door is operated.
- F. Weather-stripping: Removable, woven pile type (silicone-treated) weather-stripping attached to aluminum or vinyl holder.
 - 1. Make slots for applying weather-stripping integral with doors and door frame stops.
 - 2. Apply continuous weather-stripping to heads, jambs, bottom, and meeting stiles of doors and frames so doors swing freely and close positively.

2.6 FLUSH PANEL DOORS

- A. Frames: Aluminum extrusions.
- B. Doors: 45 mm (1-3/4 inches) thick.
 - 1. Door Edges and Internal Reinforcing: Extruded aluminum tubes, single piece full height and width, welded joints.
 - 2. Core: Manufacturer's standard non-combustible insulation.
 - 3. Faces: Aluminum sheet metal with internal impact reinforcement, laminated to the door edges and core.

2.7 COLUMN COVERS AND TRIM

- A. Column Covers and Trim: Sheet aluminum fabrications shown from sheet aluminum of longest available lengths.
- B. Provide concealed fasteners.
- C. Provide aluminum stiffeners and supporting members shown on drawings and as required to maintain component integrity and shape.

2.8 FABRICATION

- A. Form metal parts and fit and assemble joints, except joints designed to accommodate movement. Seal joints to resist air infiltration and water penetration.
- B. Welding:
 - 1. Make welds without distorting and discoloring exposed surfaces.
 - 2. Clean and dress welds. Remove welding flux and weld spatter.
- C. Prepare and reinforce doors and frames for hardware and accessories.
 - 1. Coordinate preparation with specified hardware. See Section 08 71 00, DOOR HARDWARE.
 - 2. Fabricate reinforcement from stainless steel plates.
 - a. Hinge and pivot reinforcing: Minimum 4.5 mm (0.179 inch) thick.
 - b. Lock Face, Flush Bolts, Concealed Holders, Concealed and Surface Mounted Closers Reinforcing: Minimum 2.6 mm (0.104 inch) thick.
 - c. Other Surface Mounted Hardware Reinforcing: Minimum 1.5 mm (0.059 inch) thick.
 - 3. Where concealed hardware is specified, provide space, cutouts, and reinforcement for installation and secure fastening.
- D. Factory assembled doors.

2.9 FINISHES

- A. Aluminum Anodized Finish: NAAMM AMP 500.
 - 1. Clear Anodized Finish: AA-C22A41; Class I Architectural, 0.018 mm (0.7 mil) thick.
 - 2. Color Anodized Finish: AA-C22A42 or AA-C22A44; Class I Architectural, 0.018 mm (0.7 mil) thick.
 - 3. Clear Anodized Finish: AA-C22A31; Class II Architectural, 0.01 mm (0.4 mil) thick.
 - 4. Color Anodized Finish: AA-C22A32 or AA-C22A34; Class II Architectural, 0.01 mm (0.4 mil) thick.
- B. Aluminum Paint finish:

SPEC WRITER NOTE: AAMA 2603 is rated one-year South Florida exposure and is appropriate for interior use. AAMA 2604

is rated five-years exposure and
 AAMA 2605 is rated ten-years exposure.
 Both are appropriate for exterior use.

1. Baked Enamel or Powder Coat: AAMA 2603; polyester resin, minimum 0.4 mm (1.5 mil) film thickness.
2. Fluorocarbon Finish: AAMA 2604; 50 percent fluoropolymer resin, // 2-coat // 2-coat mica // 3-coat metallic // system.
3. Fluorocarbon Finish: AAMA 2605; 70 percent fluoropolymer resin, // 2-coat // 2-coat mica // 3-coat metallic // system.

2.10 ACCESSORIES

- A. Dielectric Tape: Plastic, non-absorptive, with pressure sensitive adhesive; 0.18 to 0.25 mm (7 to 10 mils) thick.

SPEC WRITER NOTE: Retain barrier coating to separate dissimilar metals and to separate metals from cementitious materials.

- B. Barrier Coating: ASTM D1187/D1187M.
- C. Welding Materials: AWS D1.2/D1.2M, type to suit application.
- D. Fasteners:
1. Aluminum: ASTM F468, Alloy 2024.
 2. Stainless Steel: ASTM F593, Alloy Groups 1, 2 and 3.
- E. Anchors: Aluminum or stainless steel; type to suit application.
- F. Galvanizing Repair Paint: MPI No. 18.
- G. Touch-Up Paint: Match shop finish.

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

PART 3 - EXECUTION

3.1 PREPARATION

- A. Examine and verify substrate suitability for product installation.
1. Coordinate floor closer installation recessed into concrete slabs.
 2. Coordinate anchor installation built into masonry and concrete.
- B. Protect existing construction and completed work from damage.
- C. Clean substrates. Remove contaminants capable of affecting subsequently installed product's performance.

- D. Apply dielectric tape or barrier coating to aluminum surfaces in contact with // dissimilar metals // and cementitious materials // to minimum 0.7 mm (30 mils) dry film thickness.

3.2 INSTALLATION - GENERAL

- A. Install products according to manufacturer's instructions // and approved submittal drawings //.
 - 1. When manufacturer's instructions deviate from specifications, submit proposed resolution for Contracting Officer's Representative consideration.
- B. Install aluminum framed entrances and storefronts plumb and true, in alignment and to lines shown on drawings.
- C. Anchor frames to adjoining construction at heads, jambs and sills.
- D. Provide concealed aluminum clips to connect adjoining frame sections.
- E. Install door hardware and hang doors. See Section 08 71 00, DOOR HARDWARE.
- F. // Install door operators. See Section 08 71 13, AUTOMATIC DOOR OPERATORS. //
- G. Adjust doors and hardware uniform clearances and proper operation.
- H. Touch up damaged factory finishes.
 - 1. Repair galvanized surfaces with galvanized repair paint.
 - 2. Repair painted surfaces with touch up primer.
- I. Tolerances:
 - 1. Variation from Plumb, Level, Warp, and Bow: Maximum 3 mm in 3 meters (1/8 inch in 10 feet).
 - 2. Variation from Plane: Maximum 3 mm in 3.65 meters (1/8 inch in 12 feet); 6 mm (1/4 inch) over total length.
 - 3. Variation from Alignment: Maximum 1.5 mm (1/16 inch) in-line offset and maximum 3 mm (1/8 inch) corner offset.
 - 4. Variation from Square: Maximum 3 mm (1/8 inch) diagonal measurement differential.

3.3 PROTECTION, CLEANING AND REPAIRING

- A. Clean exposed aluminum and glass surfaces. Remove contaminants and stains.
- B. Protect aluminum-framed entrances and storefronts from construction operations.
- C. Remove protective materials immediately before acceptance.
- D. Repair damage.

- - - E N D - - -