SECTION 08 11 16

ALUMINUM DOORS AND FRAMES

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

ALUMINUM ASSOCIATION (AA)

AA DAF45	(2003; Reaffirmed 2009) Designation System for Aluminum Finishes

AMERICAN ARCHITECTURAL MANUFACTURERS ASSOCIATION (AAMA)

AAMA 2603	(2015) Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels
AAMA 2604	(2013) Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels

ASTM INTERNATIONAL (ASTM)

ASTM A36/A36M	(2014) Standard Specification for Carbon Structural Steel
ASTM B209	(2014) Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
ASTM B209M	(2014) Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric)
ASTM B221	(2014) Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
ASTM B221M	(2013) Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric)
ASTM E1300	(2016) Standard Practice for Determining Load Resistance of Glass in Buildings
ASTM E283	(2004; R 2012) Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
ASTM E331	(2000; R 2016) Standard Test Method for

	Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
ASTM F1642	(2012) Standard Test Method for Glazing and Glazing Systems Subject to Airblast Loadings
ASTM F2248	(2012) Standard Practice for Specifying an Equivalent 3-Second Duration Design Loading for Blast Resistant Glazing Fabricated with Laminated Glass

1.2 PERFORMANCE REQUIREMENTS

1.2.1 Structural

Exterior doors, frames and hardware shall be designed to resist equivalent static design loads in accordance with ASTM F1642. Frame deflections shall not exceed L/160 of the unsupported member lengths. Equivalent static design loads for connections of window or door frame to the surrounding walls or hardware and associated connections, and glazing stop connections shall be in accordance with ASTM F2248 and ASTM E1300. Design supporting elements and their connections based on their ultimate capacities. Provide calculations of a Professional Engineer that substantiates compliance with these requirements. Use frames that provide an equivalent level of performance. Shapes and thicknesses of framing members shall be sufficient to withstand a design wind load of not less than 30 pounds per square foot of supported area or the design wind load indicated 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. Provide glazing beads, moldings, and trim of not less than 0.050 inch nominal thickness.

1.2.2 Air Infiltration

When tested in accordance with ASTM E283, air infiltration shall not exceed 0.06 cubic feet per minute per square footof fixed area at a test pressure of 6.24 pounds per square foot (50 mile per hour wind).

1.2.3 Water Penetration

When tested in accordance with ASTM E331, there shall be no water penetration at a pressure of 8 pounds per square foot of fixed area.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Doors, windows and frames; G

Show elevations of each door type, size of doors and frames, metal gages, details of door and frame construction, methods of anchorage, glazing details, weatherstripping, provisions for and location of hardware, and details of installation.

SD-04 Samples

Finish sample

SD-05 Design Data

Structural calculations for deflection; G

SD-08 Manufacturer's Instructions

Doors and frames

Submit detail specifications and instructions for installation, adjustments, cleaning, and maintenance.

1.4 DELIVERY, STORAGE, AND HANDLING

Inspect materials delivered to the site for damage. Unload and store with minimum handling. Provide storage space in dry location with adequate ventilation, free from dust or water, and easily accessible for inspection and handling. Stack materials on nonabsorptive strips or wood platforms. Do not cover doors and frames with tarps, polyethylene film, or similar coverings. Protect finished surfaces during shipping and handling using manufacturer's standard method, except that no coatings or lacquers shall be applied to surfaces to which caulking and glazing compounds must adhere.

1.5 QUALITY CONTROL

1.5.1 Shop Drawing Requirements

Drawings shall indicate elevations of doors, windows and frames, full-size sections, thickness and gages of metal, fastenings, proposed method of anchoring, size and spacing of anchors, details of construction, method of glazing, details of operating hardware, mullion details, method and materials for weatherstripping, material and method of attaching subframes, trim, installation details, and other related items.

1.5.2 Sample Requirements

1.5.2.1 Finish Sample Requirements

Submit color chart of standard factory-finish color coatings.

PART 2 PRODUCTS

2.1 DOORS AND FRAMES

Swing-type aluminum doors and frames of size, design, and location indicated. Provide doors complete with frames, framing members , subframes , transoms , adjoining sidelights , adjoining window wall , trim, and accessories.

2.2 MATERIALS

2.2.1 Anchors

Stainless steel or steel with hot-dipped galvanized finish.

2.2.2 Weatherstripping

Continuous wool pile, silicone treated, or type recommended by door manufacturer.

2.2.3 Aluminum Alloy for Doors and Frames

ASTM B221, Alloy 6063-T5 for extrusions. ASTM B209, alloy and temper best suited for aluminum sheets and strips.

2.2.4 Fasteners

Hard aluminum or stainless steel.

2.2.5 Structural Steel

ASTM A36/A36M.

2.2.6 Aluminum Paint

Aluminum door manufacturer's standard aluminum paint.

2.3 FABRICATION

2.3.1 Aluminum Frames

Extruded aluminum shapes with contours approximately as indicated. Provide removable glass stops and glazing beads for frames accommodating fixed glass. Use countersunk stainless steel Phillips screws for exposed fastenings, and space not more than 12 inches on center. Mill joints in frame members to a hairline fit, reinforce, and secure mechanically.

2.3.2 Aluminum Doors

Of type, size, and design indicated and not less than 1-3/4 inch thick. Minimum wall thickness, 0.125 inch, except beads and trim, 0.050 inch. Door sizes shown are nominal and shall include standard clearances as follows: 0.093 inch at hinge and lock stiles, 0.125 inch between meeting stiles, 0.125 inch at top rails, 0.187 inch between bottom and threshold, and 0.687 inch between bottom and floor. Bevel single-acting doors 0.063 or 0.125 inch at lock, hinge, and meeting stile edges.

2.3.2.1 Full Glazed Stile and Rail Doors

Doors shall have medium or wide stiles and rails as indicated. Fabricate from extruded aluminum hollow seamless tubes or from a combination of open-shaped members interlocked or welded together. Fasten top and bottom rail together by means of welding or by 3/8 or 1/2 inch diameter cadmium-plated tensioned steel tie rods. Provide an adjustable mechanism of jack screws or other methods in the top rail to allow for minor clearance adjustments after installation.

2.3.3 Welding and Fastening

Where possible, locate welds on unexposed surfaces. Dress welds on exposed surfaces smoothly. Select welding rods, filler wire, and flux to produce a uniform texture and color in finished work. Remove flux and spatter from surfaces immediately after welding. Exposed screws or bolts will be permitted only in inconspicuous locations, and shall have

countersunk heads. Weld concealed reinforcements for hardware in place.

2.3.4 Weatherstripping

Provide on stiles and rails of exterior doors. Fit into slots which are integral with doors or frames. Weatherstripping shall be replaceable without special tools, and adjustable at meeting rails of pairs of doors. Installation shall allow doors to swing freely and close positively. Air leakage of a single leaf weatherstripped door shall not exceed 0.5 cubic feet per minute of air per square foot of door area when tested in accordance with ASTM E283.

2.3.5 Anchors

On the backs of subframes, provide anchors of the sizes and shapes indicated for securing subframes to adjacent construction. Anchor transom bars at ends and mullions at head and sill. Where indicated, reinforce vertical mullions with structural steel members of sufficient length to extend up to the overhead structural slab or framing and secure thereto. Place anchors near top and bottom of each jamb and at intermediate points not more than 25 inch apart.

2.3.6 Provisions for Hardware

Coordinate with Section 08 71 00 DOOR HARDWARE. Deliver hardware templates and hardware (except field-applied hardware) to the door manufacturer for use in fabrication of aluminum doors and frames. Cut, reinforce, drill, and tap doors and frames at the factory to receive template hardware. Provide doors to receive surface-applied hardware, except push plates, kick plates, and mop plates, with reinforcing only; drill and tap in the field. Provide hardware reinforcements of stainless steel or steel with hot-dipped galvanized finish, and secure with stainless steel screws.

2.3.7 Provisions for Glazing

Provide extruded aluminum snap-in glazing beads on interior side of doors. Provide extruded aluminum, theft-proof, snap-in glazing beads or fixed glazing beads on exterior or security side of doors. Glazing beads shall have vinyl insert glazing gaskets. Design glazing beads to receive glass of thickness indicated or specified.

2.3.8 Finishes

Provide exposed aluminum surfaces with factory finish of anodic coating or organic coating.

2.3.8.1 Anodic Coating

Clean exposed aluminum surfaces and provide an anodized finish conforming to AA DAF45. Finish shall be electrolytically deposited color-anodized, designation AA-M10-C22-A44, Architectural Class I 0.7 mil or thicker. Color shall be as indicated.

2.3.8.2 Organic Coating

Clean and prime exposed aluminum surfaces. Provide a high-performance finish in accordance with AAMA 2604 with total dry film thickness of not less than 1.2 mils. The finish color shall be as indicated.

PART 3 EXECUTION

3.1 INSTALLATION

Plumb, square, level, and align frames and framing members to receive doors , transoms, adjoining sidelights , and adjoining window walls. Anchor frames to adjacent construction as indicated and in accordance with manufacturer's printed instructions. Anchor bottom of each frame to rough floor construction with 3/32 inch thick stainless steel angle clips secured to back of each jamb and to floor construction; use stainless steel bolts and expansion rivets for fastening clip anchors. Hang doors to produce clearances specified in paragraph entitled "Aluminum Doors," of this section. After erection and glazing, adjust doors and hardware to operate properly.

3.2 PROTECTION FROM DISSIMILAR MATERIALS

3.2.1 Dissimilar Metals

Where aluminum surfaces come in contact with metals other than stainless steel, zinc, or small areas of white bronze, protect from direct contact to dissimilar metals.

3.2.1.1 Protection

Provide one of the following systems to protect surfaces in contact with dissimilar metals:

a. Paint the dissimilar metal with one coat of heavy-bodied bituminous paint.

b. Apply a good quality elastomeric sealant between the aluminum and the dissimilar metal.

c. Paint the dissimilar metal with one coat of primer and one coat of aluminum paint.

d. Use a nonabsorptive tape or gasket in permanently dry locations.

3.2.2 Drainage from Dissimilar Metals

In locations where drainage from dissimilar metals has direct contact with aluminum, provide protective paint to prevent aluminum discoloration.

3.2.3 Masonry and Concrete

Provide aluminum surfaces in contact with mortar, concrete, or other masonry materials with one coat of heavy-bodied bituminous paint.

3.2.4 Wood or Other Absorptive Materials

Provide aluminum surfaces in contact with absorptive materials subject to frequent moisture, and aluminum surfaces in contact with treated wood, with two coats of aluminum paint or one coat of heavy-bodied bituminous paint. In lieu of painting the aluminum, the Contractor shall have the option of painting the wood or other absorptive surface with two coats of aluminum paint and sealing the joints with elastomeric sealant.

3.3 CLEANING

Upon completion of installation, clean door and frame surfaces in accordance with door manufacturer's written recommended procedure. Do not use abrasive, caustic, or acid cleaning agents.

3.4 PROTECTION

Protect doors and frames from damage and from contamination by other materials such as cement mortar. Prior to completion and acceptance of the work, restore damaged doors and frames to original condition, or replace with new ones.

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