SECTION 08 12 16 - ALUMINUM FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Provide the requirements of this Section in accordance with requirements of the Contract Documents

B. Section Includes: Interior aluminum doors, door frames, and glazing frames.

1.2 COORDINATION

A. Coordinate anchorage installation for aluminum frames. Furnish setting drawings, templates, and directions for installing anchorages, including anchor bolts and items with integral anchors that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, fire-resistance rating, and finishes.

B. Sustainable Design Submittals:

1. Product Data: For sealants, indicating VOC content.
2. Product Data: For recycled content, indicating postconsumer and preconsumer recycled content and cost.
3. Building Product Disclosure and Optimization - Sourcing of Raw Materials:

    a. Leadership Extraction Practices

        1) Extended Producer Responsibility (EPR): Submit documentation indicating that manufacturers have a take back or recycling program for the product purchased.
        2) Recycled Content: For products having recycled content, indicate percentages by weight of post-consumer and pre-consumer recycled content.
            a) Include statement indicating costs for each product having recycled content.

    b. Sourcing of Raw Materials: For products that are required to comply with requirements for regional materials, indicating location of material manufacturer and point of extraction, harvest, or recovery for each raw material.

        1) Include statement indicating distance to Project, cost for each regional material and the fraction by weight that is considered regional.

4. Indoor Environmental Quality, Low Emitting Materials: Building Products must be tested and compliant with the California Department of Public-Health (CDPH) Standard Method V1.1-2010, using the applicable exposure scenario.
    a. Adhesives and Sealants: For wet applied on-site products, submit printed statement showing compliance with the applicable chemical content requirements of SCAQMD Rule 1168, effective July 1, 2005 and rule amendment date of January 7, 2005.
    b. Alternative tests for VOC above include ASTM D2369-10; ISO 11890 part 1; ASTM D6886-03; or ISO 11890-2

C. Methylene Chloride and perchloroethylene may not be added to paints, coating, adhesive or sealants. Shop Drawings: For aluminum frames:
1. Include elevations, sections, and installation details for each wall-opening condition.
2. Include details for each frame type, including dimensioned profiles and metal thicknesses.
3. Include locations of reinforcements and preparations for hardware.
4. Details of each different opening condition.
5. Include details of anchorages, joints, field splices, connections, and accessories.
6. Include details of moldings, removable stops, and glazing.

D. Coordination Drawings: Drawings of each opening, including door and frame, drawn to scale and coordinating door hardware. Show elevations of each door design type, indicating dimensions, locations of door hardware, and preparations for power, signal, and electrified control systems.

E. Samples: For each exposed product and for each color and texture specified, in manufacturer's standard sizes.

F. Samples for Initial Selection: For each type of exposed factory-applied color finish.
1. Include Samples of seals, gaskets, and accessories involving color selection.

G. Samples for Verification: For each type of the following products:
1. Framing Member and Finish: 12 inches long. Include trim.
2. Corner Fabrication and Finish: 12-by-12-inch-long, full-size corner, including full-size sections of extrusions with factory-applied color finish.
3. Door Finish: Manufacturer's standard-size unit, but not less than 3 inches square.

H. Product Schedule: For aluminum frames, prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings Coordinate with final door hardware schedule and glazing.

1.5 INFORMATIONAL SUBMITTALS

A. Informational Sustainable Design Submittals:
1. Building Product Disclosure and Optimization - Environmental Product Declarations
    a. Submit product specific type III EPDs or Industry wide (generic) EPDs, USGBC approved program declaration or products with a publicly available, critically reviewed life-cycle assessment conforming to ISO 14044 that have at least a cradle to gate scope.
2. Building Product Disclosure and Optimization - Material Ingredients

a. Material Ingredient Reporting: Submit documentation confirming chemical inventory of products to at least 0.1 % (1000pm) with at least one of the following:
   1) Submit published manufacturer inventory of ingredients identified by name and Chemical Abstract Service Registration Number (CASRN)
   2) Submit documentation that product has been certified as Cradle-to-Cradle v3 at the Bronze Level or better
   3) Submit Declare product label indicating that all ingredients have been disclosed down to 1000 ppm or designated as Red List Free or Declared
   4) Living Product Challenge
   5) Product Lens Certification
   6) USGBC approved program.

b. Material Ingredient Optimization: Submit documentation confirming chemical inventory of products to at least 0.01 % (100pm) and/or that has a compliant material ingredient optimization report with at least one of the following:
   1) Submit GreenScreen V1.2 Benchmark: Third party report prepared by a licensed GreenScreen List Translator, or a full GreenScreen Assessment.
   2) Submit third-party verified documentation that product has been certified as Cradle-to-Cradle v3 at the Bronze Level or better
   3) Submit third-party verified Cradle to Cradle v3 Material Health certificate at the Bronze Level or better
   4) Submit third-party verified Declare product label indicating that all ingredients have been disclosed down to 100 ppm
   5) Submit third-party verified documentation that product is Living Product Challenge certified with a Red List Free or LBC Red List Free Declare label.
   6) Submit documentation that product has a manufacturer prepared action plan with material inventory to at least 1000 ppm.

B. Qualification Data: For door manufacturer, door installer, and door inspector.
   1. Fire-Rated Door Inspector: Submit documentation of compliance with NFPA 80, Section 5.2.3.1.
   2. Egress Door Inspector: Submit documentation of compliance with NFPA 101, Section 7.2.1.15.4.
   3. Submit copy of DHI Fire and Egress Door Assembly Inspector (FDAI) certificate.

C. Product Test Reports: For each type of fire-rated door and frame assembly for tests performed by a qualified testing agency indicating compliance with performance requirements.

D. Oversize Construction Certification: For assemblies required to be fire-rated and exceeding limitations of labeled assemblies.

E. Field quality control reports.

1.6 CLOSEOUT SUBMITTALS

A. Record Documents: For fire-rated doors, list of door numbers and applicable room name and number to which door accesses.

B. Maintenance Data: For aluminum frames to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and approved by manufacturer.

B. Mockups: Build mockup to demonstrate quality standards and function for fabrication and installation of security door controls and hardware.

1. Mockup shall consist of single security door and frame with all door hardware and security devices including conduits for security device(s) wiring and be fully operational for testing of security systems.
2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Owner specifically approves such deviations by Change Order.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

C. Fire-Rated Door Inspector Qualifications: Inspector for field quality control inspections of fire-rated door assemblies shall meet the qualifications set forth in NFPA 80, section 5.2.3.1 and the following:

1. Door and Hardware Institute Fire and Egress Door Assembly Inspector (FDAI) certification.

D. Egress Door Inspector Qualifications: Inspector for field quality control inspections of egress door assemblies shall meet the qualifications set forth in NFPA 101, Section 7.2.1.15.4 and the following:

1. Door and Hardware Institute Fire and Egress Door Assembly Inspector (FDAI) certification.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver aluminum doors and frames palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic coverings.

1. Provide additional protection to prevent damage to factory-finished units.
2. Store aluminum doors and frames vertically under cover at Project site with head up. Place on minimum 4-inch-high wood blocking. Provide minimum 1/4-inch space between each stacked door to permit air circulation.

1.9 PROJECT CONDITIONS

A. Field Measurements: Verify openings by field measurements before fabrication and indicate measurements on Shop Drawings.

1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish opening dimensions and proceed with fabricating aluminum frames without field measurements. Coordinate wall construction to ensure that actual opening dimensions correspond to established dimensions.

1.10 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of aluminum frames that do not comply with requirements or that fail in materials or workmanship within specified warranty period.

B. Failures include, but are not limited to, the following:

1. Structural failures, including, but not limited to, excessive deflection.
2. Deterioration of metals and metal finishes.

3. Failure of operating components.
4. Warranty Period: Two years from date of Substantial Completion.

C. Special Finish Warranty, Factory-Applied Finishes: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of factory-applied finishes within specified warranty period.

1. Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Delta E units when tested according to ASTM D2244.
b. Chalking in excess of a No. 8 rating when tested according to ASTM D4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Warranty Period: 10 years from date of Substantial Completion.

D. Special Finish Warranty, Anodized Finishes: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of anodized finishes within specified warranty period.

1. Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Delta E units when tested according to ASTM D 2244.
b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
c. Cracking, peeling, or chipping.

2. Warranty Period: 10 years from date of Substantial Completion

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Avalon International Aluminum, Inc.; a WBE Company.
2. Frameworks, Inc.; an ASSA ABLOY Group company.
3. HMI.
4. Modulex Products, Inc.
5. RACO Interior Products, Inc.
6. Versatrac Frames; a division of American Door Products Inc.
7. Wilson Partitions; a division of Acradia, Inc.

B. Source Limitations: Obtain aluminum frames from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Fire-Rated Frames: Frames for fire-rated door assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.

1. Oversize Fire-Rated Frames: For units exceeding sizes of tested assemblies, provide certification by a qualified testing agency that frames comply with standard construction requirements for tested and labeled fire-rated frames except for size.
2. Frames for Smoke- and Draft-Control Assemblies: Tested according to UL 1784 and installed in compliance with NFPA 105.

a. Air Leakage Rate: Maximum air leakage of 0.3 cfm/sq. ft. at the tested pressure differential of 0.3-inch wg.

B. Low-Emitting Materials:

1. Adhesives and Sealants wet-applied inside the weather-proofing system must meet the VOC general emissions testing criteria of CDPH Standard Method v1.2.
2. All adhesives and sealants wet-applied inside the weather-proofing system must have VOC content in compliance with the applicable VOC limits (g/L) found in tables in Division 01 Section 01 81 13.14 "Sustainable Design Requirements - LEED v4 BD+C."

2.3 INTERIOR ALUMINUM DOORS, DOOR FRAMES, AND GLAZING FRAMES

A. Recycled Content of Aluminum Components: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

B. Aluminum Framing: ASTM B221, with alloy and temper required to suit structural and finish requirements, and not less than 0.062 inch thick.

C. Door Frames: Extruded aluminum, reinforced for hinges, strikes, and closers.

D. Frame and Trim Finish: Clear-anodized aluminum or Factory-applied, baked-enamel or powder-coat finish.

1. Color: Match Architect's sample.

2.4 ACCESSORIES

A. Fasteners: Aluminum, nonmagnetic, stainless steel or other noncorrosive metal fasteners compatible with frames, stops, panels, reinforcement plates, hardware, anchors, and other items being fastened.

B. Door Silencers: Manufacturer's standard continuous mohair, wool pile, or vinyl seals in black color.

C. Smoke Seals: Intumescent strip or fire-rated gaskets in black.

D. Glazing Gaskets: Manufacturer's standard extruded or molded rubber or plastic, to accommodate glazing thickness indicated; in black.

E. Glazing: As specified in Division 08, Section 08 80 00 “Glazing.”

F. Door Hardware: As specified in Division 08, Section 08 71 00 "Door Hardware."

G. Polyamide Epoxy Coating: Two-part, high-build, fast curing epoxy.

1. Solids: 83 percent +/- 2 percent by weight.
2. VOC: <100 g/L.

2.5 FABRICATION

A. General: Fabricate aluminum frames to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with sharp arrises. Where practical, fit and assemble units in manufacturer's plant.

1. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.

B. Provide concealed corner reinforcements and alignment clips for accurately fitted hairline joints at butted and mitered connections.

C. Factory prepare aluminum frames to receive templated mortised hardware; include cutouts, reinforcements, mortising, drilling, and tapping, according to the Door Hardware Schedule and templates furnished as specified in Division 08, Section 08 71 00 "Door Hardware."

1. Locate hardware cutouts and reinforcements as required by fire-rated label for assembly.

D. Fabricate frames for glazing with removable stops to allow glazing replacement without dismantling frame.

1. Locate removable stops on the inside of spaces accessed by keyed doors.

E. Fabricate components to allow secure installation without exposed fasteners.

2.6 GENERAL FINISH REQUIREMENTS

A. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.7 ALUMINUM FINISHES

A. Clear Anodic Finish: AAMA 611, AA-M12C22A31, Class II, 0.010 mm or thicker.

B. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils. Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Verify that wall thickness does not exceed standard tolerances allowed by throat size of indicated aluminum frame.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install aluminum frames plumb, rigid, properly aligned, and securely fastened in place, according to manufacturer's written instructions.

1. At fire-protection-rated openings, install fire-rated frames according to NFPA 80 and NFPA 105.

B. Metal Protection:

1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape or installing nonconductive spacers as recommended by manufacturer for this purpose.
2. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with polyamide epoxy coating.

C. Install frame components in the longest possible lengths with no piece less than 48 inches; components 96 inches or shorter shall be one piece.

1. Use concealed installation clips to produce tightly fitted and aligned splices and connections.
2. Secure clips to extruded main-frame components and not to snap-in or trim members.
3. Do not leave screws or other fasteners exposed to view when installation is complete.

D. Glass: Install glass according to Section 08 80 00 "Glazing" and aluminum-frame manufacturer's written instructions.

E. Door Hardware: Install according to Section 08 71 00 "Door Hardware" and aluminum-frame manufacturer's written instructions.

F. Erection Tolerances:

1. Plumb: 1/8 inch in 10 feet; 1/4 inch in 40 feet.
2. Level: 1/8 inch in 20 feet; 1/4 inch in 40 feet.
3. Alignment:
    a. Where surfaces abut in line or are separated by reveal or protruding element up to 1/2 inch wide, limit offset from true alignment to 1/16 inch.
    b. Where surfaces are separated by reveal or protruding element from 1/2 to 1 inch wide, limit offset from true alignment to 1/8 inch.
    c. Where surfaces are separated by reveal or protruding element of 1 inch wide or more, limit offset from true alignment to 1/4 inch.
4. Location: Limit variation from plane to 1/8 inch in 12 feet; 1/2 inch over total length.

G. Diagonal Measurements: Limit difference between diagonal measurements to 1/8 inch.

3.3 ADJUSTING

A. Inspect installation, correct misalignments, and tighten loose connections.

B. Clean exposed frame surfaces promptly after installation, using cleaning methods recommended in writing by frame manufacturer and according to AAMA 609 & 610.

C. Touch Up: Repair marred frame surfaces to blend inconspicuously with adjacent unrepaired surface so touchup is not visible from a distance of 48 inches as viewed by Architect. Remove and replace frames with damaged finish that cannot be satisfactorily repaired.

END OF SECTION