

SECTION 08 51 13
ALUMINUM WINDOWS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Operable and fixed aluminum window systems, project-in type with factory glazed components, complete with insect screens, reinforcing, shims, anchors, and attachment devices.
2. Glass and glazing accessories.
3. Accessories necessary to complete Work.

B. Related Sections:

1. Section 04 20 00, UNIT MASONRY.
2. Section 04 72 00, CAST STONE.
3. Section 07 92 00, JOINT SEALANTS.
4. Section 08 41 13, ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS.
5. Section 08 80 00, GLAZING.

1.2 REFERENCES

A. Reference Standards: In addition to requirements shown or specified, comply with applicable provisions of following for design, materials, fabrication, and installation of component parts:

1. ANSI/AAMA 101/I.S.2-97 - Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors.

1.3 SYSTEM REQUIREMENTS

A. Design Requirements: Manufacturer responsible for designing system, including anchorage to structural system and necessary modifications to meet specified requirements and maintain visual design concepts.

1. Employ registered professional engineer, licensed to practice structural engineering, to engineer each component of window system.
2. Drawings: Diagrammatic and do not purport to identify nor solve problems of thermal or structural movement, glazing, anchorage, or moisture disposal.
3. Requirements Shown by Details: Establish basic dimension of units, sight lines and profiles of members.
4. Assemblies: Free from rattles, wind whistles and noise due to thermal and structural movement and wind pressure.

5. Attachments: Account for site peculiarities and expansion and contraction movements so there is no possibility of loosening, weakening and fracturing connection between units and building structure or between units themselves.
 6. Provide for expansion and contraction due to structural movement without detriment to appearance or performance.
 7. System: Drain exterior face of wall, water entering joints and condensation occurring within windows by drain holes and gutters of adequate size to evacuate water without infiltration to interior.
 8. Provide concealed fastening wherever possible.
- B. Performance Requirements:
1. Air Infiltration: Not exceed 0.15 CFM per SQ FT of surface area for fixed units, 0.37 CFM for double hung windows, and 0.10 CFM all other types per foot of sash crack, ASTM E283 at differential static pressure of 1.57 PSF.
 2. Water Infiltration: No uncontrolled leakage, ASTM E331 at test pressure of 6.24 PSF, or 15 percent of full positive design wind load, whichever is greater.
- C. Structural Requirements:
1. Uniform Load Structural Test: ASTM E330 at 150 percent of design pressure, maximum permanent deformation of any component shall not exceed 0.4 percent, AAMA 101.
- D. Thermal Requirements: Framing systems shall accommodate expansion and contraction movement due to surface temperature differential of 180 F without causing buckling, stress on glass, failure of joint seals, excessive stress on structural elements, reduction of performance or other detrimental effects.
- E. Glazing Requirements: Comply with CPSC 16 CFR 1201 and ANSI Z97.1 for safety requirements of glazing materials.
1. Glass Thickness, Where Indicated: Minimum requirements to be confirmed by glass manufacturer.
- F. Interface With Adjacent Systems: Integrate design and connections with adjacent construction.
1. Accommodate allowable tolerances and deflections for structural members in installation.

1.4 SUBMITTALS

- A. Product Data: Submit for windows.
1. Include information for factory finishes, glass, glazing components, perimeter sealants, accessories, and other required components.

2. Include information on hardware and operators.
 3. Include sample of warranty customized for this Project.
- B. Shop Drawings: Indicate elevations, detailed design, dimensions, member profiles, joint locations, arrangement of units, member connections, and thickness of various components.
1. Stamp with seal and signature of professional engineer responsible for design.
 2. Indicate:
 - a. Anchorage system.
 - b. Interfacing with building construction.
 - c. Provisions for expansion and contraction.
 - d. Thermal breaks.
 3. Indicate glazing details and internal sealant requirements.
- C. Samples: Indicate quality of finish on alloys used for work, 12 inches long for extrusions and 6 inches square for sheet materials.
1. Submit 12 by 12 inch screen mesh.
- D. Thermal Analysis: Submit thermal analysis identifying that framing and glazing system and components will not exhibit condensation based on winter design temperatures of 10 degrees F outside temperature, 70 degrees F inside temperature, and 35 percent inside relative humidity. Coordinate with glass and glazing requirements; see Section 08800.
- E. Informational Submittals: Submit following packaged separately from other submittals:
1. Test Reports: Certified copies of previous tests reports by independent laboratory substantiating performance of system. Include other supportive data as necessary.
 2. Certifications specified in Quality Assurance article.
 3. Qualification Data: Engineer's qualification data.
 4. Qualification Data: Manufacturer's qualification data.
 5. Qualification Data: Installer's qualification data.
 6. Manufacturer's instructions.
- F. Closeout Submittals: Submit specified warranty.

1.5 QUALITY ASSURANCE

- A. Single Source Responsibility: Window Systems: Products of single manufacturer.
1. Glass, glazing, and perimeter sealants for window systems are required as Work of this Section for single source responsibility.

- B. Engineer Qualifications: Registered professional engineer licensed to practice structural engineering, with minimum of five years documented experience in design of aluminum window systems.
- C. Manufacturer Qualifications: Company specializing in manufacturing Products specified in this Section with minimum five years documented experience.
- D. Installer Qualifications: Certified in writing by manufacturer with documented experience on at least five projects of similar nature in past five years.
- E. Certifications: Submit following:
 - 1. Certificates verifying AWS qualifications for each welder employed on Project.
 - 2. Engineering certifications.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver units preglazed with manufacturer's labels intact on interior side of glass. Ensure labels indicate glass thickness, unit location, glass strength and orientation of units in vertical position.
- B. Protect glass to prevent chipping, cracking, and other similar damages.
- C. Store windows in upright position, off ground.
- D. Protect finished surfaces to prevent damage.
- E. Do not use adhesive papers or sprayed coatings which become firmly bonded when exposed to sun.
- F. Do not leave coating residue on surfaces.

1.7 PROJECT CONDITIONS

- A. Environmental Requirements: Ensure ambient and surface temperatures and joint conditions are suitable for installation of materials.

1.8 WARRANTY

- A. Special Warranty:
 - 1. Warrant that work is watertight, free from defective materials, defective workmanship, glass breakage due to defective design, and agreeing to replace components which fail within three years.
 - 2. Warranty agreeing to replace defective units and stating insulating glass units will be free from condensation, fogging and obstruction of vision due to film on internal surfaces for 10 [five] years. Replacement includes labor and materials.

PART 2 - PRODUCTS

2.1 FRAMING MATERIALS AND ACCESSORIES

- A. Aluminum:
 - 1. Extrusions: ASTM B221, alloy 6063-T5.
 - 2. Sheets: ASTM B209, alloy and temper recommended by manufacturer appropriate for specified finish.
- B. Thermal Break: Manufacturer's standard non-metallic urethane insulating core, isolator spacers, or clip system to provide thermal separation between exterior and interior components.
- C. Fasteners: Non-magnetic stainless steel or cadmium plated steel, compatible with materials being fastened.
 - 1. Sash and Exposed Locations: ASTM A167 Series 300 stainless steel
 - 2. Concealed Locations: ASTM B633 zinc coated steel.
 - 3. At locations where securing dissimilar metals, provide dual alloy fasteners.
 - 4. Provide nuts or washers of design having means to prevent disengagement; deforming of fastener threads is not acceptable.
 - 5. Provide concealed fasteners wherever possible.
 - 6. Exposed Locations: Countersunk flathead fasteners with finish matching item fastened.
- D. Expansion Anchor Devices: Drilled-in, expansion bolt anchors.
- E. Shims: Non-staining, non-ferrous, type as recommended by system manufacturer.
- F. Protective Coatings: Cold applied asphalt mastic complying with SSPC-Paint 12, compounded for 30 mil thickness for each coat; or alkyd type zinc chromate primer complying with FS TT-P-645.
- G. Hardware: Manufacturer's standard operating and locking hardware.
 - 1. Provide manufacturer's standard tilt-in hardware for operating sash.
- H. Weatherstripping: Two rows of manufacturer's standard weatherstripping, continuous and replaceable type.
 - 1. Provide woven pile weatherstripping for sliding units with wool, polypropylene, or nylon pile and resin impregnated backing fabric and backing strip complying with AAMA 701.
- I. Insect Screen:
 - 1. Frames: Extruded or tubular aluminum, mitered and reinforced corners secured by corner keys, finished to match window frame.
 - 2. Screen Cloth: 18 by 16 fiberglass mesh complying with FS L-S-125.
 - 3. Splines: Extruded vinyl.

- J. Glazing Gaskets: Provide type of glazing gaskets recommended and tested by window manufacturer for each type window specified.
 - 1. Compression type design preshimmed butyl tapes; or molded or extruded neoprene or ethylene propylene diene monomer (EPDM).
 - 2. Profile and hardness as necessary to maintain uniform pressure for watertight seal.
 - 3. Manufacturer's standard black color.
- K. Concealed Sealants: Types recommended by system manufacturer to remain permanently elastic, tacky, non-drying, non-migrating and weathertight.

2.2 GLASS AND GLAZING ACCESSORIES

- A. Insulating Glass Units: Refer to Section 08 80 00.

2.3 ALUMINUM WINDOW TYPES

- A. Fixed Aluminum Windows: AAMA 101 F-HC45 performance criteria.
 - 1. Interior glazed with extruded glazing bead.
 - 2. Match fixed units to operable units where indicated.
- B. Projected Aluminum Windows: AAMA 101 AP-HC45 performance criteria.
 - 1. Provide project-in units with applicable hardware, counterbalance arms, pivots, and friction shoes, and stoppers that prevent windows from opening more than 9 inches.
 - 2. Provide exterior mounted screens.

2.4 ALUMINUM WINDOW FABRICATION

- A. Fabricate components in accordance with manufacturer's tested assemblies. Remove burrs and ease edges. Shop fabricate and glaze to greatest extent practicable to minimize field assembly. Disassemble only to extent necessary for shipping and handling limitations.
 - 1. Fabricate components true to detail and free from defects impairing appearance, strength or durability. Include provisions for thermal-breaks.
 - 2. Reinforce components at anchorage and support points, at joints, and at attachment points for interfacing work.
 - 3. Separate dissimilar metals with protective coating or preformed separators to prevent contact and corrosion.
- B. Insect Screens: Provide insect screen for each operable unit.
 - 1. Fabricate window unit and operable hardware to accommodate screens in tight fitting removable arrangement.

2.5 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. Hardware:
 - 1. Finish hardware exposed when window is in the closed position: Match window color.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions and proceed with Work.
 - 1. Verify dimensions, tolerances, and method of attachment with other Work.

3.2 ALUMINUM WINDOWS INSTALLATION

- A. Install in accordance with manufacturer's instructions and approved Shop Drawings.
 - 1. Align assemblies plumb and level, free of warp or twist, aligning with adjacent Work.
 - 2. Provide attachments and shims to permanently fasten system to building structure.
 - 3. Anchor securely in place, allowing for required movement, including expansion and contraction.
 - 4. Separate dissimilar materials at contact points, including metal in contact with masonry or concrete surfaces, with protective coating or preformed separators to prevent contact and corrosion.
 - 5. Pack fibrous insulation in shim spaces at perimeter to maintain continuity of thermal barrier.
- B. Glazing: Install glazing gaskets and sealants in accordance with Section 08800.

3.3 ADJUSTING

- A. Adjust operating sash and hardware to provide tight fit at contact points and weatherstripping for smooth operation and weathertight closure.
 - 1. Lubricate hardware and moving parts as necessary.

3.4 CLEANING

- A. General: Clean surfaces in compliance with manufacturer's recommendations; remove excess mastic, mastic smears, foreign materials and other unsightly marks.
- B. Clean metal surfaces exercising care to avoid damage.

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Restroom Building 846CM3040

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