

SECTION 085413 - FIBERGLASS WINDOWS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following fiberglass framed window and door product types:
 - 1. Single-hung windows.
 - 2. Casement windows.
 - 3. Fixed windows.

1.2 DEFINITIONS

- A. C: Commercial.
- B. HC: Heavy Commercial.
- C. LC: Light Commercial.
- D. R: Residential.
- E. Performance grade number, included as part of the AAMA/WDMA product designation code, is actual design pressure in pounds force per square foot (pascals) used to determine structural test pressure and water test pressure.
- F. Structural test pressure, for uniform load structural test, is equivalent to 150 percent of design pressure.
- G. Minimum test size is smallest size permitted for performance class (gateway test size). Products must be tested at minimum test size or at a size larger than minimum test size to comply with requirements for performance class.

1.3 PERFORMANCE REQUIREMENTS

- A. General: Provide windows capable of complying with performance requirements indicated, based on testing manufacturer's windows that are representative of those specified and that are of test size indicated below:
 - 1. Minimum size required by gateway performance requirements for determining compliance with AAMA/WDMA/CSA 101/I.S.2/A440-08 for both gateway performance requirements and optional performance grades.
- B. AAMA/WDMA Performance Requirements: Provide wood windows of the performance class and grade indicated that comply with AAMA/WDMA/CSA 101/I.S.2/A440-08.
 - 1. Minimum Performance Class and Grade:

- a. Single-Hung Windows: LC40.
- b. Awning Windows: LC40.
- c. Fixed Windows: LC40 or CW40.

1.4 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, fabrication methods, dimensions of individual components and profiles, hardware, finishes, and operating instructions for each type of wood window indicated.
- B. Shop Drawings: Include plans, elevations, sections, details, hardware, attachments to other Work, operational clearances, and the following:
 - 1. Mullion details, including reinforcement and stiffeners.
 - 2. Joinery details.
 - 3. Expansion provisions.
 - 4. Flashing and drainage details.
 - 5. Weather-stripping details.
 - 6. Thermal-break details.
 - 7. Glazing details.
 - 8. Window cleaning provisions.
- C. Samples for Selection: Submit color samples with factory-applied color finishes.
- D. Product Test Reports: Based on evaluation of comprehensive tests performed within the last four years by a qualified testing agency, for each type, grade, and size of window. Test results based on use of down-sized test units will not be accepted.
 - 1. Provide manufacturer's literature or certification that each window type and size indicated for this project meets the minimum performance class and grade.
- E. Maintenance Data: For operable window sash, operating hardware, weather stripping, and finishes to include in maintenance manuals.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An installer acceptable to window manufacturer for installation of units required for this Project.
- B. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548.
- C. Source Limitations: Obtain wood windows through one source from a single manufacturer.
- D. Product Options: Drawings indicate size, profiles, and dimensional requirements of windows and are based on the specific system indicated. Refer to Division 1 Section "Product Requirements."

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1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.
- E. Fenestration Standard: Comply with AAMA/WDMA/CSA 101/I.S.2/A440-08, "NAFS North American Fenestration Standard/Specification for windows, doors and skylights," for minimum standards of performance, materials, components, accessories, and fabrication unless more stringent requirements are indicated.
1. Provide WDMA-certified wood windows with an attached label.
- F. Glazing Publications: Comply with published recommendations of glass manufacturers and GANA's "Glazing Manual" unless more stringent requirements are indicated.
- G. Mockups: Before installing window and door units, build mockups to demonstrate installation procedure. Build mockups to comply with the following requirements, using materials indicated for the completed Work:
1. Build mockup of typical mulled window installation.
 2. Coordinate the presence of Architect, Owner, window manufacturer representative, and air infiltration manufacturer representative.
 3. Review, discuss, and coordinate the interrelationship of doors and windows with other exterior wall components. Include provisions for structural anchorage, glazing, flashing, weeping, sealants, and protection of finishes.
 4. Review process for sealing joints in top, sides and bottom of mulled units.
 5. Review and discuss the sequence of work required to construct a watertight and weathertight exterior building envelope.
 6. Inspect and discuss the condition of substrate and other preparatory work performed by other trades.
 7. Approval of mockups is for relationship of door and window with air barrier installation; and aesthetic qualities of workmanship.
 8. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify window 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 wood windows without field measurements. Coordinate wall construction to ensure that actual opening dimensions correspond to established dimensions.

1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace windows that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, the following:

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1. Failure to meet performance requirements.
 2. Structural failures including excessive deflection.
 3. Water leakage, air infiltration, or condensation.
 4. Faulty operation of movable sash and hardware.
 5. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 6. Insulating glass failure.
- B. Warranty Period: 10 years from date of Substantial Completion.
- C. Warranty Period for Glass: 20 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. Fiberglass Windows:
 - a. Integrity All-Ultrex Windows from Marvin Windows and Doors.
 - b. Impervia Windows from Pella.

2.2 MATERIALS, GENERAL

- A. Fiberglass Pultrusions: Manufacturer's standard fiber reinforced material consisting of glass fibers and polyester resin pultruded into required hollow and channel shapes with factory applied finish.
1. Factory Finish: Manufacturer's standard impermeable finish.
 - a. Exterior Color: Color as selected by Architect from manufacturer's standard color range.
 - b. Interior Color: White.
- B. Trim and Glazing Stops: Pultrusion material and finish to match clad frame members.
- C. Fasteners: Aluminum, nonmagnetic stainless steel, epoxy adhesive, or other materials warranted by manufacturer to be noncorrosive and compatible with window members, cladding, trim, hardware, anchors, and other components.
1. Exposed Fasteners: Unless unavoidable for applying hardware, do not use exposed fasteners. For application of hardware, use fasteners that match finish of member or hardware being fastened, as appropriate.
- D. Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions; provide sufficient strength to withstand design pressure indicated.

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- E. Reinforcing Members: Aluminum, nonmagnetic stainless steel, nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions; provide sufficient strength to withstand design pressure indicated.
- F. Compression-Type Weather Stripping: Provide compressible weather stripping designed for permanently resilient sealing under bumper or wiper action, and completely concealed when window is closed.
 - 1. Weather-Stripping Material: Manufacturer's standard system and materials complying with AAMA/WDMA/CSA 101/I.S.2.
- G. Sliding-Type Weather Stripping: Provide woven-pile weather stripping of wool, polypropylene, or nylon pile and resin-impregnated backing fabric. Comply with AAMA 701/702.
 - 1. Weather Seals: Provide weather stripping with integral barrier fin or fins of semirigid, polypropylene sheet or polypropylene-coated material.
- H. Replaceable Weather Seals: Comply with AAMA 701/702.

2.3 GLAZING

- A. Glass: Manufacturer's standard factory-glazing system of Clear, insulating-glass with low-e coating or film, argon-gas filled units. Tempered where required by Code.

2.4 HARDWARE

- A. General: Provide manufacturer's standard hardware fabricated from aluminum, stainless steel, carbon steel complying with AAMA 907, or other corrosion-resistant material; designed to smoothly operate, tightly close, and securely lock windows and sized to accommodate sash or ventilator weight and dimensions. Do not use aluminum in frictional contact with other metals. Where exposed, provide die-cast zinc with special coating finish.
- B. Projected Window Hardware:
 - 1. Gear-Type Rotary Operators: Complying with AAMA 901 when tested according to ASTM E 405, Method A. Provide operators that function without requiring the removal of interior screens or using screen wickets.
 - 2. Hinges: Manufacturer's standard type for sash weight and size indicated.
 - 3. Single-Handle Locking System: Operates positive-acting arms that pull sash into locked position. Provide one arm on sashes up to 29 inches tall and two arms on taller sashes.
- C. Hung Window Hardware:
 - 1. Counterbalancing Mechanism: Complying with AAMA 902, concealed, of size and capacity to hold sash stationary at any open position.
 - 2. Locks and Latches: Allow unobstructed movement of the sash across adjacent sash in direction indicated and operated from the inside only.

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3. Tilt Hardware: Releasing tilt latch allows sash to pivot about horizontal axis to facilitate cleaning exterior surfaces from the interior.
4. Handles: Applied sash lift on bottom rail of forward placed operating sash; one per sash.

2.5 INSECT SCREENS

- A. General: Design windows and hardware to accommodate half-screens in a tight-fitting, removable arrangement, with a minimum of exposed fasteners and latches. Locate screens on outside of double-hung windows.
- B. Aluminum Insect Screen Frames: Manufacturer's standard aluminum alloy complying with SMA 1004. Fabricate frames with mitered or coped joints, concealed fasteners, and removable PVC spline/anchor concealing edge of frame.
 1. Aluminum Tubular Framing Sections and Cross Braces: Roll-formed from aluminum sheet with minimum wall thickness as required for class indicated.
 2. Finish: Baked-on organic coating in color selected by Architect from manufacturer's full range.
- C. Glass-Fiber Mesh Fabric: 18-by-14 or 18-by-16 mesh of PVC-coated, glass-fiber threads; woven and fused to form a fabric mesh resistant to corrosion, shrinkage, stretch, impact damage, and weather deterioration in the following color. Comply with ASTM D 3656.
 1. Mesh Color: Charcoal gray.

2.6 ACCESSORIES

- A. Grilles and Simulated Divided Lites: Not required.

2.7 FABRICATION

- A. General: Fabricate windows, in sizes indicated, that comply with AAMA/WDMA 101/I.S.2 for performance class and performance grade indicated. Include a complete system for assembling components and anchoring windows.
 1. Provide windows sizes of standard available sizes without fabricating custom sizes, unless indicated otherwise. Provide windows with dimensions of not less than 2 inches smaller than indicated on the drawings or provide next size larger.
- B. Weather strip each operable sash to provide weathertight installation.
- C. Factory machine windows for openings and hardware that is not surface applied.
- D. Factory Mullions: Provide mullions and cover plates as shown, matching window units, complete with anchors for support to structure and installation of window units. Allow for erection tolerances and provide for movement of window units due to thermal expansion and building deflections, as indicated. Provide mullions and cover plates capable of withstanding design loads of window units.

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1. Seal joints between mulled units and provide a full-width vinyl flashing cap at the head of the mulled unit to prevent air and water infiltration.
- E. Factory-Glazed Fabrication: Except for light sizes in excess of 100 unites inches, glaze windows in the factory where practical and possible for applications indicated. Comply with requirements in Division 8 Section "Glazing" and with AAMA/WDMA/CSA 101/I.S.2.
- F. Glazing Stops: Provide nailed or snap-on glazing stops coordinated with Division 8 Section "Glazing" and glazing system indicated. Provide glazing stops to match sash and ventilator frames.
- G. Complete fabrication, assembly, finishing, hardware application, and other work in the factory to greatest extent possible. Disassemble components only as necessary for shipment and installation. Allow for scribing, trimming, and fitting at Project site.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances; rough opening dimensions; levelness of sill plate; coordination with wall flashings, vapor retarders, and other built-in components; and other conditions affecting performance of work.
 1. Wood Frame Walls: Dry, clean, sound, well nailed, free of voids, and without offsets at joints. Ensure that nail heads are driven flush with surfaces in opening and within 3 inches (76 mm) of opening.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Install membrane strip flashing in accordance with manufacturer's recommendations and details on the drawings.

3.3 INSTALLATION

- A. General: Comply with manufacturer's written instructions for installing windows, hardware, accessories, and other components; Drawings; and Shop Drawings.
- B. Install windows level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction.
- C. Set sill members in bed of sealant or with gaskets, as indicated, for weathertight construction.
- D. Field Mulled Units: Follow manufacturer's guidelines for mulled units along with manufacturer's recommendations for reinforcing of units.

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1. Seal joints between mulled units and provide a full-width vinyl flashing cap at the head of the mulled unit to prevent air and water infiltration.

3.4 ADJUSTING

- A. Adjust operating sashes and ventilators, screens, hardware, and accessories for a tight fit at contact points and weather stripping for smooth operation and weathertight closure. Lubricate hardware and moving parts.

3.5 PROTECTION AND CLEANING

- A. Protect window surfaces from contact with contaminating substances resulting from construction operations. In addition, monitor window surfaces adjacent to and below exterior concrete and masonry surfaces during construction for presence of dirt, scum, alkaline deposits, stains, or other contaminants. If contaminating substances do contact window surfaces, remove contaminants immediately according to manufacturer's written recommendations.
- B. Clean exposed surfaces immediately after installing windows. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.
- C. Clean factory-glazed glass immediately after installing windows. Comply with manufacturer's written recommendations for final cleaning and maintenance. Remove nonpermanent labels and clean surfaces.
- D. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

END OF SECTION 085413