

ARCHITECTURAL SPECIFICATIONS

Section 08570

H Window Series 204 Aluminum/Lamboo® Composite Windows

PART 1: GENERAL

1.01 WORK INCLUDED

- A. Provide all labor, materials, tools, equipment and services to furnish and install architectural-grade aluminum/Lamboo® composite windows and related components as shown on the drawings and specified in this Section.
- B. All windows are to be H Window Series 204, as manufactured by the H Window Company, LLC. Other manufacturers requesting approval to bid their product will be viewed as alternate bids and for consideration must submit a request for approval 10 days prior to bid.

1.02 RELATED SECTIONS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- B. Section 06100-Rough Carpentry: Wood perimeter shims and blocking
- C. Section 07900-Joint Sealers: Perimeter sealant and backer materials
- D. Section 08800-Glazing
- E. Section 09900-Painting

1.03 REFERENCES

- A. AAMA/WDMA/CSA 101/I.S. 2/A440-08 "Standard/Specification for Windows, Doors and Unit Skylights."
- B. ASTM E 283-04 "Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors"
- C. ASTM E 330-02 "Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference"
- D. ASTM E 331-00 "Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference"
- E. AAMA 910-93, "Voluntary Life Cycle Specifications and Test Methods for Architectural Grade Windows and Sliding Glass Doors."
- F. ASTM F 588-07 Forced Entry Resistance Test Grade 40
- G. AAMA 2604/2605 "Specifications for High Performance Organic Coatings on Architectural Extrusions and Panels"

- H. AAMA 502-08 “Voluntary Specifications for Field Testing of Windows and Sliding Glass Doors

1.04 SYSTEM PERFORMANCE

- A. General: Provide aluminum/Lamboo® composite window units that meet or exceed performance requirements specified:
1. AAMA/WDMA/CSA 101/I.S. 2/A440-08, rating shall be: AP-AW70 or FW-AW70. Windows must meet AW testing requirements including life cycle testing.
- B. Design Requirements: Comply with structural performance, air infiltration, and water penetration indicated in AAMA/WDMA/CSA 101/I.S. 2/A440-08 for type, grade, and performance class of window units required.
- C. Testing: Test each type and size of required window unit through a recognized Independent Testing Laboratory or Agency, in accordance with ASTM E283 for air infiltration, and with ASTM E331 for water penetration.
1. Air Infiltration: Exterior windows will not exceed 0.10 CFM per lineal foot of sash crack when tested in accordance with ASTM E 283-04 at a uniform pressure of 6.24 PSF.
 2. Water Resistance: No water leakage will occur when tested in accordance with ASTM E 331-00 at a static pressure equaling 20% of the specified design pressure up to a maximum of 12.00 PSF.
 3. Uniform Load Deflection Test: No glass breakage, permanent damage to fasteners, hardware parts, or damage to make window inoperable or deflection of any unsupported span (meeting rails, muntins, frames, mullions, or other appurtenances) in excess of L/175 at both a positive and a negative load in minimum of 70 PSF when tested in accordance with ASTM E330-02.
 4. Uniform Structural Load: Unit is to be tested at 1.5 x design wind pressure, both positive and negative at 105 PSF in accordance with ASTM E 330-02. There shall be no glass breakage, permanent damage to fasteners, hardware parts or any other damage to make the window inoperable. There shall be no permanent deformation of any main frame or sash member in excess of 2% of its span.
 5. Condensation Resistance Factor (CRF): Test in accordance with AAMA 1503-98. Glass makeup: 1-inch clear low-e (#2 surface) insulating glass using two 1/4-inch lites of clear glass with argon gas. CRF to be a minimum of 65 for frame and glass overall. [Alternates: CRF to be a minimum of 65 for frame and glass overall for 3-pane glass]
 6. Thermal U-value: Test in accordance with AAMA 1503-98. Window size, configuration and glass makeup to be the same as for CRF Test. Thermal transmittance for total unit (Total Unit U-value) to be a maximum of 0.35 Btu/hr-sq. ft.-degree F @ 15 mph exterior wind velocity. [Alternates: Maximum of 0.28 Btu/hr-sq. ft.-degree F @ 15 mph exterior wind velocity for 3-pane glass]

1.05 SUBMITTALS

- A. Shop drawings: Submit drawings and product data under provisions of Section 01300. Include dimensions, relationships to construction of adjacent work, air and vapor barrier seal to adjacent construction, component anchorage, type of caulking, window locations, installation methods and installation materials.
- B. Submit manufacturer’s installation instructions under provisions of Section 01300.
- C. Submit color samples under provisions of Section 01300.

- D. Submit samples illustrating operable window and fixed window frame sections, corner section and mullion section.
- E. Submit two 12 x 12 inch samples of each type of glazing.
- F. Test Reports: Provide certification by a recognized Independent Testing Laboratory showing that each type, grade, and size of window unit complies with performance requirements for air infiltration, water resistance, uniform structural loads, life cycle testing and thermal performance.

1.06 QUALITY ASSURANCE

- A. Qualifications: Window Manufacturer must certify that the products supplied under this specification have been manufactured for a period of not less than 10 years.
- B. Pre-installation Window Test: The owner reserves the right to randomly select one window at the time of delivery and submit it to an Independent Laboratory for testing. Testing will verify compliance of the production run with these specifications. The cost for pre-installation testing shall be paid by the Owner. Any deficiencies discovered on the window by the testing, and deficiencies in any similar models used in the project, will be corrected by the Window Contractor at no cost to the Owner.
- C. Post Installation Field-Testing: Shall be in accordance with AAMA 502-08.
 - 1. After installation and before final payment, up to 2%, but not less than 2 windows shall be tested for air infiltration and water infiltration as specified. Windows will be randomly selected by the Owner on the day of testing.
 - 2. Conduct air infiltration tests at a uniform static pressure of 6.24 PSF. The maximum rate of air leakage will not exceed 1.5 times the specified air leakage of 0.10 CFM per lineal foot of sash crack for operating windows.
 - 3. Conduct water penetration tests at a static pressure equaling 2/3 of the specified design pressure.
 - 4. All costs associated with the Post Installation Field Testing shall be born by the Owner, and required repair or replacements shall be born by the Window Contractor. All tests are to be conducted by an accredited Testing Laboratory in the presence of the Owner or the Owner's Representative.
 - 5. Failure of the window unit or installation to pass these tests shall require the contractor and/or manufacturer to pay costs necessary for correction, including removal of windows and providing new windows from the same or another manufacturer.
 - 6. If one of the two units fails either test, three additional units shall be tested. If one or more of the three additional units fails either test, three more units shall be tested. This procedure shall continue until all unit tests are passed.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and handle window units under provisions of Section 01600.
- B. Store and protect window units under provisions of Section 01600.

1.08 WARRANTY

- A. Window Warranty: Submit a written warranty, executed by the Window Manufacturer, against defects in material and workmanship of the windows under normal use.

- B. Glass: Warranty period starts from the date of manufacture printed on the insulated glass spacer. Insulating glass shall be warranted against obstruction of vision between interior glass surfaces (seal failure) for a period of 10 years.
- C. Hardware: 10 years on hinges and handle assembly from the date of manufacture.
- D. Exterior Finishes: 10 years from the date of manufacture.
- E. Interior Factory Applied Finishes: 1 year from the date of manufacture.
- F. Materials and Workmanship: 10 years from the date of manufacture.

PART 2: PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. H Window Company, LLC.
401 17th Avenue West
Ashland, WI 54806
Phone: (800) 843-4929 Fax: (715) 685-9441
- B. Alternates: Under provision of Section 01600

2.02 MATERIALS

- A. Extruded Aluminum: (Exterior) 6063-T6 tempered aluminum frame, sash and glazing stop. Minimum wall thickness to be 0.059 inches. Roll-formed aluminum is not acceptable.
- B. Interior Bamboo: Engineered laminated bamboo frame and sash, free of finger joints manufactured by Lamboo® Inc. Kiln dried to a moisture content of 6-12 percent and preservative treated. Bamboo frame and sash will be a minimum of 1-1/4" thick.
[Alternates: Alternate for [species] interior wood. Alternate for FSC certified wood for LEED® credit.]
- C. Insulating Glass: CBA rated dual seal clear insulating 2-pane glass, 1" thick O.A.; DSB glass interior and exterior with High Performance Low-E on surface #2, argon gas filled and warm edge spacer technology.
[Alternates: Alternate for 3-pane glass, 1-3/8" thick O.A. with Low-E on #2 and #5 surfaces with argon gas fill and warm edge spacer technology.]
- D. Weather-stripping: Full perimeter high performance weather gasket. Double weather-strip at sill (above and below operator) for crank and push bar hardware.
- E. Screen: Extruded aluminum screen frame, 6063-T6 tempered, with fiberglass mesh screen cloth. Roll-form aluminum screen frames are not acceptable.
- F. Exterior and Interior Grilles: Exterior 1" wide taped-on extruded aluminum grilles and interior 1" wide taped-on wood grilles. Finishes to match window frames and sashes.

2.03 WINDOW TYPE

- A. Window Type: Provide horizontally hinged, outward projecting 180 degree reversing windows, fixed sash or direct set windows.
- B. Configure as indicated on the elevation drawings and window details.

2.04 HARDWARE

- A. Hinges: Horizontal, 180-degree pivot. Zinc electroplated steel, yellow chromate and finished with a hard clear lacquer. Front arm to be painted to match exterior color.
- B. Operators: Provide one or more of the following sash operators as selected by Architect.
 - 1. Push bar operator in white, bronze or champagne
 - 2. Roto operator in white, bronze, champagne or brass
 - 3. Euro lever handle in chrome (no screen available)
 - 4. Keyed custodial operator in chrome (no screen available)

2.05 FABRICATION

- A. Corner Joinery: Sash and Frame
 - 1. Bamboo fabrication: Mortise and tenon joints. Glued, stapled and caulked.
 - 2. Aluminum fabrication: Sash: 45 degree mitered corners, double crimped to extruded aluminum corner keys. Frame: Butt jointed corners sealed with gaskets and silicone.
- B. Composite Frame Construction: Fabricate window units with a continuous butyl tape or closed cell foam thermal/moisture barrier, located between exterior aluminum and interior bamboo. Aluminum is nailed to bamboo with stainless steel ring-shanked nails on 6 inch spacing around perimeter of frame and sash.
- C. Weep holes: Weep holes shall be processed into each sill to allow water drainage to exterior.
- D. Bamboo Surfaces: Bamboo shall be smooth and free of surface defects.
- E. Insulated Glass: Glazing shall be factory-installed utilizing dry-glazed system for ease of glass replacement. Wet-glazed systems will not be acceptable.

2.06 FINISHES

- A. Anodic (Anodized Finish)

Finish all exterior windows and components with electrolytically deposited color in accordance with the following Aluminum Association Designation:

AA Designation	Architectural Class	Description	AAMA Guide Specification
AA-M12-C22-A41	1	Clear Anodized	AAMA 611-98
AA-M12-C22-A44	1	Color Anodized	AAMA 611-98

- B. Organic (Painted Finish)

Finish all exterior windows and components with a factory-applied coating in accordance with the following Aluminum Association Designation:

AA Designation	Description	AAMA Guide Specification
AA-M12-C41-R1X	Powder Coat or Kynar based 50% resin	AAMA 2604
AA-M12-C41-R1X	Kynar based 70% resin	AAMA 2605

- C. Interior Bamboo: All visible interior bamboo components in the window including extension jambs and mull covers shall be factory pre-finished. Utilize a 3-coat post-catalyzed conversion varnish sprayed finish by the window manufacturer prior to window assembly. Finish must be within acceptable levels for HAPS and VOC for LEED® credits. Field finishing is not acceptable.
- D. Apply one coat of bituminous paint to concealed aluminum and steel surfaces in contact cementitious or dissimilar materials.
- E. Concealed Steel Items: Galvanized in accordance with ANSI/ASTM A386 to 2.0 oz/sq. ft. or primed with iron oxide paint.

2.07 ACCESSORIES

- A. Positioning Fin: Attach vinyl positioning fin with pre-punched installation holes.
- B. Mull Covers: Exterior aluminum, interior bamboo.
- C. Extension Jambs: Provide factory applied bamboo extension jambs at a depth of [xx] WT. Alternate for [species] interior wood. Alternate for FSC certified wood for LEED® credit.

PART 3: EXECUTION

3.01 EXAMINATION

- A. Re-window: Bidders are expected to visit the job-site and make a complete survey of the Project prior to bid. The Bidder will measure all window openings for proper sizing of new windows. Failure to do so does not relieve the Successful Bidder from the need to furnish any and all materials, which may be required, in accordance with the specifications, without any additional costs to the Owner.
- B. New Construction: Verify wall openings and adjoining air and vapor seal materials are clean, dry and ready to receive work of this Section. Verify that rough opening and masonry openings are correct and the sill plate is level.

3.02 PREPARATION

- A. Remove new windows from crating and packaging material. Verify that all parts and accessories are included. All window units shall be securely stored, upright and protected from the environment.
- B. Remove old windows and accessories from the window opening. Scrape and remove existing sealants from the opening, which will interfere with the installation of the new windows.
- C. Install only preservative treated lumber for liners and blocking. The shim space will be adequate in depth to shim the entire depth of the new window frame.

3.03 INSTALLATION

- A. Install window frames, glazing and reinforcement in strict accordance with manufacturer's instruction and shop drawings.
- B. Align window frame plumb and level, free of warp or twist. Maintain dimensional tolerances, aligning with adjacent work.
- C. Coordinate attachment and seal of air and vapor barrier materials. Install undersill and sill flashing.

- D. Use low expanding foam intended for window installation only or lightly pack fibrous insulation in shim spaces at perimeter to maintain continuity of thermal barrier.
- E. Install vapor barrier and perimeter sealant and backing materials in accordance with Section 07900.

3.04 ADJUST AND CLEAN

- A. Remove protective material from pre-finished aluminum surfaces.
- B. Wash down exposed surfaces using a solution of mild detergent in warm water applied with soft, clean wiping cloth. Take care to remove dirt from corners. Remove dirt and window label. Wipe surfaces clean.
- C. Remove excess sealant by moderate use of solvent acceptable to sealant manufacturer.
- D. Protect exterior finishes until cleaning of the exterior building is completed.
- E. Adjust operable hardware for smooth operation and tight fit of the sash.