SECTION 08 52 00

COMPOSITE ALUMINUM/WOOD WINDOWS

Display hidden notes to specifier. (Don't know how? [Click Here](https://www.arcat.com/sd/display_hidden_notes.shtml))

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\*\* NOTE TO SPECIFIER \*\* H Window Company; Aluminum-Clad Wood Windows.  
This section is based on the products of H Window Company, which is located at:401 17th Ave. W.Ashland, WI 54806Toll Free Tel: 800-843-4929Tel: 715-685-2793Fax: 715-685-9441Email: [request info ()](https://arcat.com/rfi?action=email&company=H%252BWindow%252BCompany&message=RE%253A%2520Spec%2520Question%2520(08520hwn)%253A%2520&coid=32903&spec=08520hwn&rep=&fax=715-685-9441)  
Web: <http://www.hwindow.com>   
 [ [Click Here](https://arcat.com/company/h-window-company-32903) ] for additional information.  
Beautiful. Enduring. Revolutionary.  
The beauty of H Windows arises from exceptional materials in the hands of skilled craftsmen. The elegant aesthetics of our windows and doors are rooted in highly intentional engineering that has made us the provider of choice for architects and building owners throughout the United States.  
The robust engineering behind our windows and doors has resulted in unmatched thermal and structural performance. We believe longevity is sustainability and the material durability and ease of maintenance ensures our products will last through the harshest environments.  
Each of our products contains innovative features allowing us to achieve possibilities once thought out of reach. Our team of experts is well equipped to partner with owners, architects, and builders to push the boundaries and drive new levels of design achievement.

1. GENERAL
   1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.

* + 1. Aluminum and Wood Composite Windows: Series 204.
       1. Awning windows.
       2. Casement windows.
       3. Direct set windows.
       4. Fixed sash windows.
       5. Tilt and turn windows.
  1. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. Applicable Division 01 Sections.
    2. Section 06 10 00 - Rough Carpentry.
    3. Section 07 27 00 - Air Barriers.
    4. Section 07 92 00 - Joint Sealers.
    5. Section 08 14 23 - Aluminum/Wood Composite Out-Swing Doors.
    6. Section 08 32 19 - Aluminum/Wood Composite Lift & Slide Doors.
    7. Section 08 44 11 - Glazed Timber Curtain Walls.
    8. Section 08 80 00 - Glazing.
    9. Section 09 90 00 - Paints and Coatings.
  1. REFERENCES

\*\* NOTE TO SPECIFIER \*\* Delete references from the list below that are not actually required by the text of the edited section.

* + 1. ASTM International (ASTM):
       1. ASTM A386 - Standard Specification or Zinc Hot-Dip Galvanized Coatings on Iron and Steel Products.
       2. ASTM E283-04 - Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors.
       3. ASTM E330-02 - Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
       4. ASTM E331-00 - Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Door by Uniform Static Air Pressure Difference.
       5. ASTM F588-07 - Forced Entry Resistance Test Grade 40.
    2. American Architectural Manufacturers Association (AAMA):
       1. AAMA 502 - Voluntary Specifications for Field Testing of Windows and Sliding Glass Doors.
       2. AAMA 611 - Voluntary Specifications for Anodized Architectural Aluminum.
       3. AAMA 910 - Voluntary Life Cycle Specifications and Test Methods for Architectural Grade Windows and Sliding Glass Doors.
       4. AAMA 2604 and 2605 - Specifications for High Performance Organic Coatings on Architectural Extrusions.
    3. AAMA/WDMA/CSA 101/I.S.2/A440-08 - Standard Specification for Windows, Doors, and Unit Skylights.
    4. Refer to the Fenestration and Glazing Industry Alliance (FGIA) Glossary Document AAMA AG-13 for industry standard terminology and definitions.
    5. National Fenestration Rating Council (NFRC).
    6. American National Standards Institute (ANSI).
  1. SUBMITTALS
     1. Submit under provisions of Section 01 30 00.
     2. Product Data:
        1. Manufacturer's data sheets on each product to be used.
        2. Storage and handling requirements and recommendations.
        3. Manufacturer's installation instructions.

\*\* NOTE TO SPECIFIER \*\* Delete if not applicable to product type. Delete operable or fixed option not applicable.

* + 1. Verification Samples: Two representative units of each material type, pattern, and color.
       1. Include two 12 x 12 inch (305 x 305 mm) samples of each type of glazing.
    2. Shop Drawings: Include dimensions, relationship to construction of adjacent Work, air and vapor barrier seal to adjacent construction, component anchorage, type of caulking, window locations, installation methods, materials, and finish.
    3. Test Reports: Certification by a recognized independent testing laboratory demonstrating each type of window unit complies with performance requirements for air infiltration, water resistance, uniform structural loads, life cycle testing and thermal performance at AAMA gateway sizes.
    4. Warranty: Manufacturer's standard warranty issued in Owner's name.
  1. QUALITY ASSURANCE

\*\* NOTE TO SPECIFIER \*\* Delete manufacturer qualification not applicable to product type. Ten years documented experience applies to fixed, direct set windows.

* + 1. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum of five years documented experience.
    2. Fixed Direct Set Windows: Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum of ten years documented experience.
    3. Installer Qualifications: Company specializing in performing Work of this section with minimum two years documented experience with projects of similar scope and complexity.
    4. Source Limitations: Provide each type of product from a single manufacturing source to ensure uniformity.
    5. Pre-installation Window Test: The Owner reserves the right to randomly select one window of each type at 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 will be paid by the Owner.
       1. Deficiencies discovered by the testing, and deficiencies in any similar models used in the Project will be corrected by the Contractor at no cost to the Owner.

\*\* NOTE TO SPECIFIER \*\* When deciding on the extent of the mock-up, consider all the major different types of work on the project.

* + 1. Mock-Up: Construct a mock-up with actual materials in sufficient time for Architect's review and to not delay construction progress. Locate mock-up as acceptable to Architect and provide temporary foundations and support.
       1. The intent of a mock-up is to demonstrate quality of workmanship and visual appearance.
       2. If the mock-up is not acceptable, rebuild the mock-up until satisfactory results are achieved.
       3. Retain mock-up during construction as a standard for comparison with completed work.
       4. Do not alter or remove mock-up until work is completed or removal is authorized.
  1. PRE-INSTALLATION CONFERENCE
     1. Convene a conference approximately two weeks before scheduled commencement of the Work. Attendees shall include Architect, Contractor and trades involved. Agenda shall include schedule, responsibilities, critical path items and approvals.
  2. DELIVERY, STORAGE, AND HANDLING
     1. Delivery, store, protect and handle windows in strict compliance with manufacturer's written instructions and recommendations, and under provision of Section 01 60 00.
     2. Window units must be securely stored, upright, and protected from the environment.
     3. Protect from damage due to weather, excessive temperature, and construction operations.
     4. Protect materials and finishes during handling and installation.
  3. PROJECT CONDITIONS
     1. Maintain environmental temperature, humidity and ventilation conditions within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.
  4. WARRANTY
     1. Window Warranty: Written warranty executed by the window manufacturer against defects in material and workmanship of the windows under normal use.
        1. Glazing: 10 years from date of manufacture printed on insulated glass spacer.
           1. Warranty covers obstruction of vision between interior glass surfaces and seal failure.
        2. Hardware: Hinges and Handles: 10 years from date of manufacture.
        3. Exterior Finishes: 10 years from date of manufacture.

\*\* NOTE TO SPECIFIER \*\* Delete interior factory applied finish warranty not applicable.

* + - 1. Interior Factory Applied Finishes: 1 year from date of manufacture.
      2. Interior Factory Applied Finishes: 2 years from date of manufacture.
      3. Materials and Workmanship: 10 years from date of manufacture.

1. PRODUCTS
   1. MANUFACTURERS
      1. Acceptable Manufacturer: H Window Company, which is located at:401 17th Ave. W.Ashland, WI 54806Toll Free Tel: 800-843-4929Tel: 715-685-2793Fax: 715-685-9441Email: [request info ()](https://arcat.com/rfi?action=email&company=H%252BWindow%252BCompany&message=RE%253A%2520Spec%2520Question%2520(08520hwn)%253A%2520&coid=32903&spec=08520hwn&rep=&fax=715-685-9441);Web: <http://www.hwindow.com>

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
    2. Requests for substitutions will be considered in accordance with the provisions of Section 01 60 00.
  1. PERFORMANCE AND DESIGN REQUIREMENTS

\*\* NOTE TO SPECIFIER \*\* Delete design and performance requirements not applicable to product type. Krypton gas fill or coating in smaller airspace or low-e coating on interior exposed glass surface interior exposed glass surface is unacceptable.

* + 1. General: Aluminum and wood composite window units that meet or exceed performance requirements specified when tested through a recognized independent testing laboratory or agency:
       1. Awning, Casement, and Fixed Windows:
          1. Forced Entry Resistance: ASTM F588: Fixed and Operable: Gr. 40.
          2. Sound Transmission Data: Glass Value Only:

2 Pane Operable and Fixed: STC: 35. OITC: 28.

2 Pane Laminated Operable and Fixed: STC: 39. OITC: 31.

3 Pane Operable and Fixed: STC: 39. OITC: 31

* + - * 1. Structural performance: 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. Design requirements are based on AAMA gateway sizes.

AAMA/WDMA/CSA 101/I.S. 2/A440-08, rating shall be: AP-AW70 or FW-AW70 based on AAMA gateway sizes. Windows must meet AW testing requirements including life cycle testing.

Air Infiltration: ASTM E283-04. Exterior windows will not exceed 0.01 cfm/ sq ft (0.05 L/s/sq m) of sash crack at a uniform pressure of 6.24 psf (298.77 Pa).

Water Resistance: ASTM E331-00 No water leakage at a static pressure equaling 20 percent of the specified design pressure up to a maximum of 10.00 psf (478.80 Pa).

Uniform Load Deflection Test: ASTM E330-02. No glass breakage, permanent damage to fasteners, hardware parts, or damage to make window inoperable or deflection of any unsupported span in 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 (3351.6 Pa).

Uniform Structural Load: ASTM E330-02. Tested at 1.5 x design wind pressure, both positive and negative at 105 psf. (5027.43 Pa), with no glass breakage, permanent damage to fasteners, hardware parts or any other damage to make window inoperable. There must be no permanent deformation of any main frame or sash member in excess of 2 percent of its span.

* + - * 1. Thermal U-Factor: NFRC 102-2020. Window Size (WxH): 23.6 x 59.1 inches (600 x 1500 mm). Glazing Composition: 1-3/8 inches (34.9 mm) thick insulating glass unit using three 1/8 inch (3.19 mm) lites of clear glass, with low-e coatings on surface 2 and surface 5, air filled cavities, and warm edge spacer. NFRC total unit U-Factor maximum of 0.28 Btu/hr.sq ft.F (1.589 W/sq m.K).

Alternative Thermal U-Factor test: NFRC 100-2023 Simulated performance.

Triple Pane Glazing Composition: 1-3/8 inch (34.9 mm) thick insulating glass unit using three 1/8 inch (3 mm) lites of clear glass, with low-e coatings on surface 2 and surface 5, 1/2 inch (13 mm) deep warm edge spacers, with 90 percent argon filled cavities. NFRC total unit U-Factor maximum of 0.26 Btu/hr.sq ft.F (1.476 W/ sq m.K).

Alternate Double Pane Glazing composition: 1 inch (25.4 mm) thick insulating glass unit using two 0.15 inch (4 mm) lites of clear glass, with low-e coating on surface 2, 0.669 inch (17 mm) deep warm edge spacers, with 90 percent argon filled cavities. NFRC total unit U-Factor maximum of 0.33 btu/hr.sq ft.F (1.873 W/sq m.K).

* + - * 1. Condensation Resistance: NFRC 500-2017. Test window size according to NFRC gateway sizes.

Triple Pane Glazing composition: 1-3/8 inch (34.9 mm) thick insulating glass unit using three 1/8 inch (3 mm) lites of clear glass, with low-e coatings on surface 2 and surface 5, 1/2 inch (13mm) deep warm edge spacers, with 90 percent argon filled cavities.

CR: Minimum 66 for both frame and glass overall.

Alternate Double Pane Glazing composition: 1 inch (25.4 mm) thick insulating glass unit using two 0.15 inch (4 mm) lites of clear glass, with low-e coating on surface 2, 0.669 inch (17 mm) deep warm edge spacers, with 90 percent argon filled cavities.

CR: Minimum 55 for both frame and glass overall.

* + - 1. Direct Set Windows:
         1. Forced Entry Resistance: ASTM F588: Fixed and Operable: Gr. 40
         2. Sound Transmission Data: Glass Value Only:

2 Pane Operable and Fixed: STC: 35. OITC: 28.

2 Pane Laminated Operable and Fixed: STC: 39. OITC: 31.

3 Pane Operable and Fixed: STC: 39. OITC: 31.

* + - * 1. Structural Performance: 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. Design requirements are based on AAMA gateway sizes.

AAMA/WDMA/CSA 101/I.S. 2/A440-08, Rating Shall Be: AP-AW70 or FW-AW70 based on AAMA gateway sizes. Windows must meet AW testing requirements including life cycle testing.

Air Infiltration: ASTM E283-04. Exterior windows will not exceed 0.01 cfm/sq ft (0.05 L/s/sq m) of sash crack at a uniform pressure of 6.24 psf (298.77 Pa).

Water Resistance: ASTM E331-00 No water leakage at a static pressure equaling 20 percent of the specified design pressure up to a maximum of 10.00 psf (478.80 Pa).

Uniform Load Deflection Test: ASTM E330-02. No glass breakage, permanent damage to fasteners, hardware parts, or damage to make window inoperable or deflection of any unsupported span in 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 (3351.6 Pa).

Uniform Structural Load: ASTM E330-02. Tested at 1.5 x design wind pressure, both positive and negative at 105 psf. (5027.43 Pa), with no glass breakage, permanent damage to fasteners, hardware parts or any other damage to make window inoperable. There must be no permanent deformation of any main frame or sash member in excess of 2 percent of its span.

* + - * 1. Thermal U-Factor: NFRC 102-2020. Window Size (WxH): 47.2 x 59.1 inches (1200 x 1500 mm), Glazing Composition: 1-3/8 inch (34.9 mm) thick insulating glass unit using three 1/8 inch (3.19 mm) lites of clear glass, with low-e coatings on surface 2 and surface 5, air filled cavities, and warm edge spacer. NFRC total unit U-Factor maximum of 0.18 Btu/hr.sq ft F (1.022 W/sq m.K).

Alternative Thermal U-Factor Test: NFRC 100-2023 Simulated performance.

Triple Pane Glazing Composition: 1-3/8 inch (34.9 mm) thick insulating glass unit using three 1/8 inch (3 mm) lites of clear glass, with low-e coatings on surface 2 and surface 5, 1/2 inch (13 mm) deep warm edge spacers, with 90 percent argon filled cavities. NFRC total unit U-Factor maximum of 0.19 Btu/hr.sq ft.F (1.078 W/ sq m.K).

Alternate Double Pane Glazing composition: 1 inch (25.4 mm) thick insulating glass unit using two 0.15 inch (4 mm) lites of clear glass, with low-e coating on surface 2, 0.669 inches (17 mm) deep warm edge spacers, with 90 percent argon filled cavities. NFRC total unit U-Factor maximum of 0.30 btu/hr.sq ft.F (1.703 W/sq m.K).

* + - * 1. Condensation Resistance: NFRC 500-2017. Test window size according to NFRC gateway sizes.

Triple Pane Glazing composition: 1-3/8 inch (34.9 mm) thick insulating glass unit using three 1/8 inch (3 mm) lites of clear glass, with low-e coatings on surface 2 and surface 5, 1/2 inch (13 mm) deep warm edge spacers, with 90 percent argon filled cavities CR: Minimum 65 for both frame and glass overall.

Alternate Double Pane Glazing composition: 1 inch (25.4 mm) thick insulating glass unit using two 0.15 inches (4 mm) lites of clear glass, with low-e coating on surface 2, 0.669 inches (17 mm) deep warm edge spacers, with 90 percent argon filled cavities. CR: Minimum 55 for both frame and glass overall.

* + - 1. Tilt and Turn Windows:
         1. Forced Entry Resistance: ASTM F588: Operable: Gr. 10.
         2. Sound Transmission Data: Glass Value Only:

2 Pane Operable and Fixed: STC: 35. OITC: 28.

2 Pane Laminated Operable and Fixed: STC: 39. OITC: 31.

3 Pane Operable and Fixed: STC: 39. OITC: 31.

* + - * 1. Structural performance: 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. Design requirements are based on AAMA gateway sizes.

AAMA/WDMA/CSA 101/I.S. 2/A440-08, Rating: CW-PG50.

Air Infiltration: ASTM E283-04. Exterior windows will not exceed 0.01 cfm/sq ft (0.05 L/s/sq m) of sash crack at a uniform pressure of 6.24 psf (298.77 Pa).

Water Resistance: ASTM E331-00. No water leakage when tested at a static pressure equaling 20 percent of the specified design pressure up to a maximum of 12.00 psf (574.56 Pa).

Uniform Load Deflection Test: ASTM E330-02. No glass breakage, permanent damage to fasteners, hardware parts, or damage to make window inoperable or deflection of any unsupported span in meeting rails, muntins, frames, mullions, or other appurtenances in excess of L/175 at both a positive and a negative load in minimum of 50 psf (2394.0 Pa).

Uniform Structural Load: ASTM E330-02. Tested at 1.5 x design wind pressure, both positive and negative at 75 psf. (5027.43 Pa), with no glass breakage, permanent damage to fasteners, hardware parts or any other damage to make window inoperable. There must be no permanent deformation of any main frame or sash member in excess of 2 percent of its span.

* + - * 1. Thermal U-Factor: NFRC 102-2020. Window Size (WxH): 23.6 x 59.1 inches (600 x 1500 mm). Glazing Composition: 1-3/8 inch (34.9 mm) thick insulating glass unit using three 1/8 inch (3.19 mm) lites of clear glass, with low-e coatings on surface 2 and surface 5, air filled cavities, and warm edge spacer. NFRC total unit U-Factor maximum of 0.18 Btu/hr.sq ft.F (1.022 W/sq m.K).

Alternative Thermal U-Factor test: NFRC 100-2023 Simulated performance.

Triple Pane Glazing composition: 1-3/8 inch (34.9 mm) thick insulating glass unit using three 1/8 inch (3 mm) lites of clear glass, with low-e coatings on surface 2 and surface 5, 1/2 inch (13 mm) deep warm edge spacers, with 90 percent argon filled cavities. NFRC total unit U-Factor maximum of 0.18 Btu/hr.sq ft.F (1.022 W/sq m.K).

Alternate Double Pane Glazing composition: 1 inch (25.4 mm) thick insulating glass unit using two 0.15 inch (4 mm) lites of clear glass, with low-e coating on surface 2, 0.669 inches (17 mm) deep warm edge spacers, with 90 percent argon filled cavities. NFRC total unit U-Factor maximum of 0.28 btu/hr sq.ft.F (1.589 W/sq m.K).

* + - * 1. Condensation Resistance: NFRC 500-2017. Test window size according to NFRC gateway sizes.

Triple Pane Glazing composition: 1-3/8 inch (34.9 mm) thick insulating glass unit using three 1/8 inch (3 mm) lites of clear glass, with low-e coatings on surface 2 and surface 5, 1/2 inch (13 mm) deep warm edge spacers, with 90 percent argon filled cavities CR: Minimum 71 for both frame and glass overall.

Alternate Double Pane Glazing composition: 1 inch (25.4 mm) thick insulating glass unit using two 5/32 inch (4 mm) lites of clear glass, with low-e coating on surface 2, 0.5 inch (12.7 mm) deep warm edge spacers, with 90 percent argon filled cavities. CRF: Minimum 57 for both frame and glass overall.

\*\* NOTE TO SPECIFIER\*\* Delete product types not required. Roll formed aluminum for extruded aluminum components is not acceptable.

* 1. PRODUCT TYPES
     1. Basis of Design: Series 204 Windows; as supplied by H Window.

\*\* NOTE TO SPECIFIER \*\* Delete window types not required.

* + - 1. Window Types:
         1. Awning: Outward projected reversing
         2. Casement: Outward projecting 180 degree reversing.
         3. Fixed sash.
         4. Direct set.
         5. Tilt and turn.
         6. Window Type: Configure windows as indicated on the Drawings
      2. Materials:
         1. Extruded Aluminum: Exterior: 6063-T6 aluminum frame, sash, and glazing stops. Wall Thickness: 0.059 inch (14.99 mm).

Exterior Window Finish:

\*\* NOTE TO SPECIFIER \*\* Delete exterior window finishes and colors not required.

Exterior windows and components finished with electrolytically deposited finish as follows:

Clear Anodized, Medium Matte: AAMA 611-98, AA-M12-C22-A41, Class 1.

Color Anodized, Medium Matte: AAMA 611-98, AA-M12-C22-A44, Class 1.

Color: Extra Dark Bronze.

Color: Dark Bronze.

Color: Medium Bronze.

Color: Light Bronze.

Color: Champagne.

Color: Black.

Exterior windows and components finished with factory applied coating as follows:

Powder Coat: AAMA 2604, AA-M12-C41-R1X, powder coat.

Color: Black.

Color: Brown.

Color: Hartford Green.

Color: Redwood.

Color: Tan.

Color: Cream.

Color: White.

Polyvinylidene Fluoride: AAMA 2604, AA-M12-C41-R1X, Kynar based, 50 percent resin.

Custom Color \_\_\_\_\_\_\_\_.

Polyvinylidene Fluoride: AAMA 2605, AA-M12-C41-R1X, Kynar based, 70 percent resin.

Custom Color \_\_\_\_\_\_\_\_.

* + - * 1. Interior Wood: Clear solid wood free of finger joints and veneers.

Kiln dried to 6 to 12 percent moisture content; preservative treated.

Frame and Sash: 1-1/4 inch (31.75 mm) thick.

Wood Surfaces: Smooth and free of surface defects.

\*\* NOTE TO SPECIFIER \*\* Delete wood species not required. Delete FSC option if not required.

Species Selected:

Species: Pine

Species: Poplar

Species: Alder (Superior Grade).

Species: American Cherry (90 percent heartwood).

Species: Brazilian Cherry.

Species: Hickory

Species: White Ash.

Species: Birch.

Species: Hard Maple.

Species: Douglas Fir.

Species: Mahogany.

Species: Cedar.

Species: Walnut (90 percent heartwood).

Species: White Oak.

Species: Red Oak.

Species: Laminated Bamboo (Lamboo).

Species: FSC Certified Mixed Credit Pine.

Species: FSC Certified Mixed Credit Poplar.

Species: FSC Certified Mixed Credit Alder (Superior Grade).

Species: FSC Certified Mixed Credit American Cherry (90 percent heartwood).

Species: FSC Certified Mixed Credit Brazilian Cherry.

Species: FSC Certified Mixed Credit Hickory.

Species: FSC Certified Mixed Credit White Ash.

Species: FSC Certified Mixed Credit Birch.

Species: FSC Certified Mixed Credit Hard Maple.

Species: FSC Certified Mixed Credit Douglas Fir.

Species: FSC Certified Mixed Credit Mahogany.

Species: FSC Certified Mixed Credit Cedar.

Species: FSC Certified Mixed Credit Walnut (90 percent heartwood).

Species: FSC Certified Mixed Credit White Oak.

Species: FSC Certified Mixed Credit Red Oak.

Species: FSC Certified Mixed Credit Laminated Bamboo.

Interior Wood Finish: Exposed interior wood components in window, including extension jambs and mull covers, factory pre-finished with a three-coat pre-catalyzed post-catalyzed, sprayed conversion varnish by window manufacturer prior to window assembly. Field finishing is not acceptable.

Finish Selection:

Clear coat.

Stain Color: \_\_\_\_\_\_\_\_.

Paint Color: \_\_\_\_\_\_\_\_.

* + - * 1. Glazing, General: Factory-installed with dry-glazed system. Wet glazed systems will not be acceptable.

\*\* NOTE TO SPECIFIER \*\* Delete insulated glazing composition not required or referenced in another specification section. Krypton gas fill in smaller airspace or low-e coating on interior exposed glass surface is not unacceptable.

* + - * 1. Insulated Glazing: 3-pane glass, 1-3/8 inches (34.9 mm) thick O.A. with low-e on number 2 and number 5 surfaces with argon gas fill and warm edge spacer, 2.9 lbs. ft. (Ug=0.13).
        2. Alternate for \_\_\_\_\_\_\_\_ glass, thickness \_\_\_\_\_\_\_\_, glazing makeup \_\_\_\_\_\_\_\_ with argon gas fill and warm edge spacer.

\*\* NOTE TO SPECIFIER \*\* Delete weather strip option not required. Triple weather strip option is for tilt and turn windows.

* + - * 1. Weather Stripping: Full perimeter high performance weather gasket, with double weather-strip at sill above and below operator for crank and push bar hardware.
        2. Weather Stripping: Full perimeter high performance weather gasket, with triple weather-strip around entire perimeter of operable window.

\*\* NOTE TO SPECIFIER \*\* Delete screen and/or grille options not required. Roll form aluminum screen frames or screens with wicket access are not acceptable.

* + - * 1. Screen: Extruded 6063-T6 aluminum screen frame with fiberglass mesh screen cloth.

Frame Color: White.

Frame Color: Champagne.

Frame Color: Brown.

Frame Color: Black.

* + - * 1. Exterior Grilles: 1 inch (25 mm) wide taped-on extruded aluminum.
        2. Interior Grilles: 1 inch (25 mm) wide taped-on wood grilles.

Finishes: To match window frames and sashes.

* + - * 1. Simulated Divided Lite: Spacers in IGU aligning with grilles.
      1. Hardware:

\*\* NOTE TO SPECIFIER \*\* Delete hardware types and finishes not required. No screens are available for Euro Lever Handle and Keyed Custodial Operator options. Delete hinge option for fixed direct set windows.

* + - * 1. Hinges: Steel, zinc electroplated, horizontal, 180-degree pivot.

Finish: Yellow chromate, with hard clear lacquer topcoat.

Awning Front Arm: Painted to match exterior color.

* + - * 1. Sash Operators: As selected by the Architect from the following:

Push Bar.

Color: White.

Color: Brown.

Color: Champagne.

Color: Black.

Roto Operator:

Color: White.

Color: Gloss Black.

Color: Oil Rubbed Bronze.

Color: Antique Brass.

Color: Antique Chrome.

Color: Brushed Brass.

Color: Satin Nickel.

Color: Satin Chrome.

ADA Compliant Accessible Knob.

Euro Lever Handle.

Finish: Chrome.

Finish: Brass

Keyed Custodial Operator.

Finish: Chrome.

* + - 1. Fabrication:
         1. Corner Joinery: Sash and Frame:

Wood Fabrication: Mortise and tenor joints. Glued, stapled, and caulked.

Aluminum fabrication:

Sash: 45-degree mitered corners, double crimped to extruded aluminum corner keys.

Frame: Butt jointed corners sealed with gaskets and silicone.

* + - * 1. Composite Frame Construction: Fabricate window units with a continuous butyl tape or closed cell foam thermal-moisture barrier located between exterior aluminum and interior wood. Aluminum is nailed to wood with stainless steel ring-shanked nails on 6 inch (152 mm) spacing around perimeter of frame and sash.
        2. Insulated Glass: Unless noted otherwise, glazing shall be factory-installed.
        3. Weep Holes: Processed into each sill for water drainage to exterior.
      1. Bituminous Coating: Apply one coat to concealed aluminum and steel surfaces in contact with cementitious or dissimilar materials.
      2. Concealed Steel Items: ANSI/ASTM A386, galvanized to 2.0 oz/sq. ft. (0.06 L/304.8 sq mm) or primed with iron oxide paint.
    1. Accessories:

\*\* NOTE TO SPECIFIER \*\* Delete accessories not required.

* + - 1. Positioning Fin: Vinyl, attached with pre-punched holes.
      2. Mull Covers: Exterior aluminum in same finish as aluminum frame, interior wood in same finish as wood frame.
      3. Divided Lite Grilles: As selected by the Architect from manufacturers range.
      4. Screens: Fiberglass fabric on extruded aluminum frame, attached to frames with ABS latch clips.
      5. Extension Jambs: Factory-applied, wood extension jambs at depth indicated on the Drawings.
         1. Species Selected:

\*\* NOTE TO SPECIFIER \*\* Delete species not required. Delete FSC option if not required.

Species: Pine.

Species: Poplar.

Species: Alder (Superior Grade).

Species: American Cherry (90 percent heartwood).

Species: Brazilian Cherry.

Species: Hickory.

Species: White Ash

Species: Birch

Species: Hard Maple.

Species: Douglas Fir

Species: Mahogany.

Species: Cedar.

Species: Walnut (90% heartwood).

Species: White Oak

Species: Red Oak.

Species: Laminated Bamboo (Lamboo).

Species: FSC Certified Mixed Credit Pine.

Species: FSC Certified Mixed Credit Poplar.

Species: FSC Certified Mixed Credit Alder (Superior Grade).

Species: FSC Certified Mixed Credit American Cherry (90 percent heartwood).

Species: FSC Certified Mixed Credit Brazilian Cherry.

Species: FSC Certified Mixed Credit Hickory.

Species: FSC Certified Mixed Credit White Ash.

Species: FSC Certified Mixed Credit Birch.

Species: FSC Certified Mixed Credit Hard Maple.

Species: FSC Certified Mixed Credit Douglas Fir.

Species: FSC Certified Mixed Credit Mahogany.

Species: FSC Certified Mixed Credit Cedar.

Species: FSC Certified Mixed Credit Walnut (90% heartwood).

Species: FSC Certified Mixed Credit White Oak.

Species: FSC Certified Mixed Credit Red Oak.

Species: FSC Certified Mixed Credit Laminated Bamboo.

* + - * 1. Extension Jamb Finish: Match window frame interior wood finish.

1. EXECUTION
   1. EXAMINATION
      1. Remodel: Bidder must visit job site and make complete survey of Project prior to bid and measure all window openings for sizing of new windows. Failure to do so does not relieve Successful Bidder from furnishing all materials required in accordance with specifications without additional cost to the Owner.
      2. New Construction: Verify wall openings and adjoining air and vapor seal materials are clean, dry, and ready to receive Work of this Section. Verify rough openings are correct and sill plate is level.
      3. Do not begin installation until the substrates have been properly constructed and prepared.
      4. If substrate preparation is the responsibility of another installer, notify Architect in writing of unsatisfactory preparation before proceeding.
   2. PREPARATION
      1. Remove new windows from crating and packaging. Verify all parts and accessories are included.
      2. Remove old windows and accessories from window openings. Scrape and remove existing sealants from openings which will interfere with installation of new windows.
      3. Clean surfaces thoroughly prior to installation.
      4. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
      5. For liners and blocking install preservative treated lumber only. Shim space must be of adequate depth to shim the entire depth of the new window frame.
   3. INSTALLATION
      1. Install window frames, glazing and reinforcement in accordance with manufacturer's instructions, approved submittals, and in proper relationship with adjacent construction.
         1. Align window frame plumb and level, free of warp or twist. Maintain dimensional tolerances, aligning with adjacent work.
         2. Coordinate attachment and seal of air and vapor barrier materials. Install under sill and sill flashing.
         3. Use low expanding foam intended for window installation, or pack fibrous insulation in shim spaces at perimeter to maintain continuity of thermal barrier.
         4. Install vapor barrier, perimeter sealant and backing materials in compliance with Section 07 90 00.
   4. FIELD QUALITY CONTROL
      1. Field Inspection: Coordinate field inspection in accordance with appropriate sections in Division 01.

\*\* NOTE TO SPECIFIER \*\* Include if manufacturer provides field quality control with onsite personnel for instruction or supervision of product installation, application, erection, or construction. Delete if not required.

* + 1. Manufacturer's Services: Coordinate manufacturer's services in accordance with appropriate sections in Division 01.
  1. ADJUSTING, CLEANING AND PROTECTION
     1. Remove protective material from pre-finished aluminum surfaces.
     2. Wash exposed surfaces with mild detergent in warm water applied with a soft, clean cloth. Remove soil from corners and remove window label.
     3. Remove excess sealant by moderate use of solvent acceptable to sealant manufacturer.
     4. Protect exterior finishes until cleaning of exterior building is completed.
     5. Adjust operable hardware for smooth operation and tight fit of sash.
     6. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION