

SECTION: 085200 – HISTORIC WOOD WINDOWS

PART 1–GENERAL

1.01 SUMMARY

- A. This procedure includes general information relating to the fabrication and installation of wood windows and includes the following window types:
1. Double-Hung Window Units.
 2. Single-Hung Window Units.
 3. Decorative Window Units.
 4. Non-Operative (Fixed) Window Units.
- B. This Section outlines the scope of work, which may involve repairing, restoring, and/or custom-fabricating wood windows or components to match the original historic windows.
- C. References: List of applicable standards and guidelines, including:
1. The Secretary of the Interior’s Standards for Rehabilitation: For general preservation principles.
 2. National Park Service Preservation Brief #9: The Repair of Historic Wooden Windows.
- D. Restoration and Repair vs Replacement: Refer Drawings for Results of Window Condition Survey including identification of Window Types per Elevation to be either Repair or receive extensive Restoration as well as **selected Windows which condition is beyond repair/restoration. These windows or components thereof will be documented (size, design, details, photographs, etc.) prior to identifying extent of items to be salvaged and tagged. These items will be used to repair/restore other similar windows.** Said documentation and data will be used to prepare Shop Drawings for submission and approval. Upon completion of documentation period, secure and protect the window opening. Report any concerns with the Opening.
- E. Submittals, Fabrication and Replication/Construction: Require shop drawings showing fabrication details, product data, and samples of wood, finishes and hardware for review and approval. **New or replacement windows to precisely match existing historic windows in dimensions, profile and detail including sash thickness, rail, and stile**

widths, and muntin configuration. Repairs and partial reconstruction should incorporate traditional joinery methods to match the existing window type.

F. Refer to general project guidelines addressing the following sections:

1. Safety Precautions; Project/Site Conditions; General Protection of Surface and Surroundings; and Delivery, Storage and Handling.
2. Historic Structures Precautions
3. Submittals; Sequencing and Scheduling.
4. Quality Assurance

These guidelines should be reviewed prior to performing this procedure and should be followed, when applicable, along with recommendations from entities having jurisdiction with coordination and administration of the Architect.

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM),
100 Barr Drive, West Conshohocken, PA 19428
[610-832-9585](tel:610-832-9585)
[610-832-9555](tel:610-832-9555).
- B. American National Standards Institute, Inc. (ANSI),
1430 Broadway, New York, NY 10018.
Flat Glass Marketing Association (FGMA),
National Wood Window and Door Association (NWWDA),

1.03 SYSTEM DESCRIPTION

- A. Performance Grade Classification: Provide wood windows that comply with requirements of NWWDA I.S. 2 for performance grade 40.
- B. Performance Grade Classification: Provide wood windows that comply with requirements of NWWDA I.S. 2 for performance grade 60.
- C. Standards: Performance requirements for structural performance, air infiltration, and water penetration for wood windows are those specified in NWWDA I.S. "Industry Standard for Wood Window Units".

- D. Testing: Manufacturer's stock units of each grade of required wood window shall have been tested by a recognized testing laboratory or agency, in accordance with ASTM E330 for structural performance. Test samples shall comply with requirements in NWWDA I.S. 2 for test sample sizes and methods.
- E. Performance Requirements (Grade 60 Windows): Each required window unit shall comply with the following performance requirements:
1. Air Infiltration: Not more than 0.10 cfm per sq. ft. of overall frame area at an inward test pressure of 1.57 lbf per sq. ft.
 2. Water Penetration: No water penetration as defined in the test method at an inward test pressure of 6.24 lbf per sq. ft.
 3. Structural Performance: No glass breakage, damage to hardware, or permanent deformation that would impair operation of the unit or residual deflection greater than 0.4 percent of the span at a positive (inward) and negative (outward) test pressure of 60 lbf per sq. ft.
 4. Forced Entry Resistance: Windows shall comply with requirements for Grade 40 level of resistance to forced entry when tested in accordance with ASTM F588.

1.04 SUBMITTALS

- A. Product Data: Submit product data for each type of wood window specified, including standard construction details, dimensions of individual components, profiles, finishes, hardware, and accessories.
- B. Shop Drawings: Submit shop drawings for each type of window specified, including 1/4-inch scale wall elevations, typical unit elevations at 3/4-inch scale, glazing details, and full-size details of typical composite members.

1.05 QUALITY ASSURANCE

- A. Wood Window Standard: Comply with provisions of NWWDA I.S. 2 for standards of performance and fabrication workmanship for wood windows.
- B. Glazing Standards: Comply with recommendations of the Flat Glass Marketing Association (FGMA) "Glazing Manual" and "Sealant Manual" except where more

stringent requirements are indicated. Refer to those publications for definitions of glass and glazing terms not otherwise defined in this section or referenced standards.

- C. Safety Glass Standard: Where safety glass is indicated or required by authorities having jurisdiction, provide the type of products indicated which comply with ANSI Z97.1 and testing requirements of 16 CFR Part 1201 for category II materials.
- D. Insulating Glass Certification Program: Provide insulating glass units permanently marked either on spacers at least one component pane of units with the appropriate certification label of inspecting and testing organization indicated below.
 - 1. Insulating Glass Certification Council (IGCC)
 - 2. Associated Laboratories, Inc. (ALI)
- E. Single Source Responsibility: Provide wood windows produced by a single fabricator who is capable of indicating prior successful production of units similar to those required.

1.06 PROJECT/SITE CONDITIONS

- A. Field Measurements:
 - 1. Check actual window openings in construction work by accurate field measurement before fabrication of custom window units. Show recorded measurements on final shop drawings.
 - 2. Coordinate fabrication with construction progress to avoid delay. Where necessary, proceed with fabrication without measurements, and coordinate tolerances to ensure proper fit of window units.

1.07 WARRANTY

- A. Submit a written warranty signed by the Manufacturer, agreeing to repair or replace wood window units that fail in materials or workmanship within the specified warranty period.
 - 1. Failures include, but are not limited to, structural failures, including excessive deflection, excessive leakage, air infiltration, failure of weatherstripping, faulty operation of window sash or hardware, and deterioration of metals, finishes, and other materials beyond normal weathering.

2. Warranty period for wood windows is 3 years after the date of substantial completion.
3. This warranty shall be in addition to and not a limitation of other rights the Government may have against the Contractor under the Contract Documents.

PART 2–PRODUCTS

2.01 MANUFACTURERS

- A. **Marvin Windows / Guido Materials**, 8526 Vidor Ave, San Antonio TX 78216 Contact: James Otremba, 210-34-8321 email: jotremba@guidoco.com
- B. The Cavallini Co., Inc. 4719 Blanco Rd, San Antonio TX 78212 Contact: Adrian J. Cavallini, 210-733-8161 email: adrianj@cavalliniartglass.com

2.02 MATERIALS

- A. General: Comply with requirements of NWWDA I.S. 2.
- B. **Marvin Ultimate Double Hung G2 Historic Casing option to match existing window(s). Casing detail with subsill to match existing window(s). Extruded aluminum cladding at exterior side to protect wood windows and match the profile and details of the historic wood detaining and provide superior durability. Provide exterior Sash Lugs, Cord/Chain Pulley, Hardware and Divided Lites to match the existing Historic Window(s).**
- C. Wood: Clear, fine-grained lumber, kiln-dried to an appropriate moisture content of species to **match existing wood or be historically appropriates**. Wood should be free of visible defects.
- D. Wood for Replacement Windows: **Clear Ponderosa Pine or other suitable fine-grained lumber** that has been kiln-dried to a moisture content of 6 to 12 percent at time of fabrication and is free of visible finger-joints, blue stain, knots, pitch-pockets and surface checks larger than 1/8-inch deep by 2-inches wide.
 1. Lumber shall be water-repellent preservative treated after machining in accordance with NWWDA I.S. 4.
- E. Wood for Repair and Restoration of existing Historic Windows: **Reclaimed Longleaf Pine or species to match existing per material testing.**

- F. **Aluminum Cladding:** Provide manufacturer's standard aluminum formed sheet or extruded cladding mechanically bonded to exterior wood sash and frame members.
1. Trim members: Aluminum clad wood trim.
 2. Finish: Provide factory-applied baked-on enamel finish, **color to match historic color(s) of existing window(s) as per material testing.**
 3. Color: Custom color as selected by the Architect from the manufacturer's standard color range.
 4. Finish for existing: **submit primer and paint systems appropriate for historic wood.** Note that original finishes may need to be matched. If color is not specified, require the architect's selection from the manufacturer's range and based on historic paint analysis.
- G. Anchors, Clips, and Accessories: Fabricate anchors, clips and window accessories of aluminum, non-magnetic stainless steel, or hot-dip zinc coated steel complying with ASTM A123; provide strength sufficient to withstand design pressure indicated.
- H. Fasteners: Comply with NWWDA I.S. 2 for fabrication and with manufacturer's recommendations and standard industry practices for type and size of installation fasteners.
1. Use zinc-coated or nonferrous nails and screws for window fabrication and installation.
 2. Use brass screws for hardware and accessory installation.
- I. Hardware: **Use hardware that matches the original in material, operation and design.** For example, use traditional ropes and pulleys for double-hung windows instead of modern tilt sashes. Provide the manufacturer's standard hardware, necessary to properly operate, tightly close, and securely lock windows. Do not use aluminum in frictional contact with other metals.
1. Provide solid bronze hardware, with plated steel or brass/bronze operating bars and rods.
- J. Compression Weatherstripping: Provide compressible weatherstripping, designed for permanently resilient sealing under bumper or wiper action, completely concealed when sash is closed.

- K. **Original (wavy) glass should be retained if possible on window units being repaired and/or restored. Avoid modern high-reflectivity glass that changes the building's appearance.**
- L. Glass and Glazing Materials: Provide the manufacturer's standard clear sealed insulating safety glazing material that complies with ANSI Z97.1.
 - 1. Insulating glass unit shall have metal spacers, sealed between the panes, behind each muntin bar.
- M. Glazing Seal: Provide the manufacturer's standard extruded vinyl or butyl glazing gasket providing weathertight seal.
- N. Sliding Weatherstripping: Provide woven pile weatherstripping of polypropylene, wool, or nylon pile, with resin-impregnated backing fabric, and aluminum backing strip; comply with AAMA 701.2.

2.03 EQUIPMENT

- A. General: Comply with minimum operating requirements of NWWDA I.S. 2.
- B. Double-Hung Windows: Provide units containing 2 balanced, vertically-sliding sash with the following equipment and hardware. 2 pair concealed counterbalancing mechanism.
 - 1. Latch at meeting rail.
 - 2. Lift handle on the lower rail.

2.04 FABRICATION

- A. General: Except to the extent that more stringent requirements are indicated, provide the manufacturer's standard fabrication of units. Comply with indicated standards. Include a complete system for assembly of components and anchorage of window units.
 - 1. Comply with requirements of referenced standards for moisture content of lumber at time of fabrication and for relative humidity conditions in the installation areas.
- B. **Fabricate windows to produce units that are re-glazable without dismantling sash framing.** Provide openings and mortises precut, where possible, to receive hardware and other items.

- C. Each window unit includes sash, frame, stops, sill (including under sill or nosing), and moldings, integral mullions and muntins, hardware, and accessories
- D. Provide weatherstripping at perimeter of each operating sash.
 - 1. Provide weatherstripping at perimeter of each operating sash.
 - a. For double/single-hung sash, provide weatherstripping only at horizontal rails of operable sash.
 - 2. Provide glazing stops, nailed or snap-on, coordinated with glass selection and glazing system indicated
 - 3. Pre-glazed Window Units: Pre-glaze window units at the shop before delivery.
- E. Complete fabrication, assembly, finishing, hardware application, and other work before shipment to the project site, to the maximum extent possible. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
- F. Wood Finish: Provide the following finish on interior exposed wood in units:
 - 1. Shop-Primed Units: Provide the fabricator's standard shop prime coat on exterior wood surfaces only.

PART 3–EXECUTION

3.01 EXAMINATION

- A. Preparation to include inspection. Contractor should examine existing openings for conditions that could affect the installation or fabrication of partial components or entire unit replacement, such as structural issues, masonry issues, plumbness or movement as it relates to either head, jamb or sill.
- B. Lead Paint: Include specific procedures for safely handling and abating lead paint if present. Coordinate with Material Testing and Results.
- C. Weathertightness: Ensure windows are installed level, plumb, and square, with proper flashing and sealing to be weathertight. Specify appropriate, non-moisture-retaining weatherstripping.
- D. Inspect openings before beginning installation. Verify that the rough or masonry opening is correct and the sill plate is level. Do not proceed with installation of window units until unsatisfactory conditions have been corrected.

1. Masonry surfaces shall be visibly dry, and free of excess mortar, sand, and other construction debris.
2. Wood frame walls shall be dry, clean, sound and well-nailed, free of voids, and without offsets at joints. Ensure that nail heads are driven flush with surfaces in the opening and within 3 inches of the opening.

3.02 ERECTION, INSTALLATION, APPLICATION

- A. Comply with manufacturer's instructions and recommendations for installation of window units, hardware, operators, accessories, and other window components.
- B. Set units plumb, level, true to line, without warp or rack of frames or sash. Provide proper support and anchor securely in place.
- C. Set sill members in a bed of compound or with joint fillers or gaskets as indicated, to provide weathertight construction. Coordinate window installation with wall flashings and other built-in components.

3.03 ADJUSTING/CLEANING

- A. Adjust operating sash and hardware to provide a tight fit at contact points and weatherstripping, and to provide smooth operation and a weathertight closure. Lubricate hardware and moving parts.
- B. Clean interior and exterior surfaces promptly after installation of windows. Take care to avoid damage to protective coatings and finishes. Remove excess glazing and sealants, dirt, and other substances.
- C. Clean glass of pre-glazed window units promptly after installation. Wash and polish glass on both faces not more than 4 days prior to date scheduled for final inspection. Comply with manufacturer's recommendations for final cleaning and maintenance.
- D. Remove and replace glass that is broken, chipped, cracked, abraded or damaged in other ways during construction period, including natural causes, accidents, and vandalism.

3.04 PROTECTION

- A. Institute and maintain protection and other precautions required through remainder of construction period to ensure that, except for normal weathering, window units
- B. will be without damage or deterioration at the time of substantial completion.

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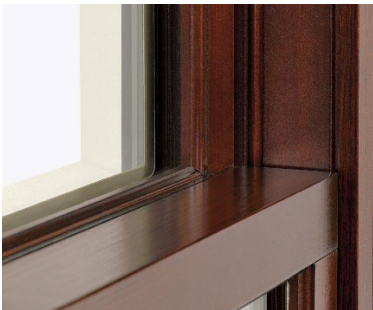
MARVIN WINDOWS FEATURES



**EXTRUDED ALUMINUM EXTERIOR
WITH STANDARD AAMA 2605 EXTERIOR FINISH**



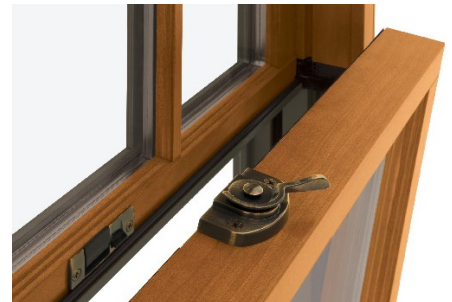
**EXTRUDED ALUMINUM BRICKMOULDS
STANDARD PROFILES & CUSTOM**



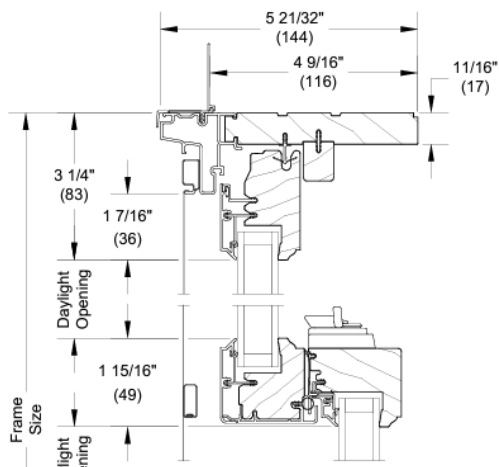
INTERIOR FACTORY STAINS



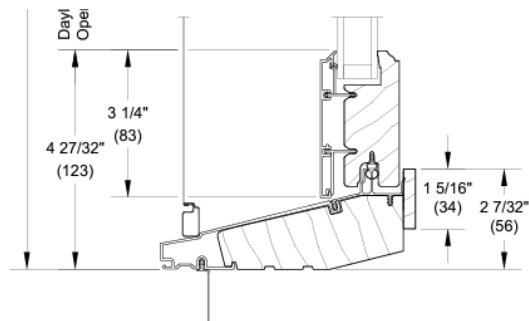
**7/8" SIMULATED DIVIDED LITES
WITH SPACER BAR IN AIRSPACE**



TILT SASH LOCK HARDWARE



HEAD & CHECKRAIL DETAIL



SILL DETAIL