

WOOD WINDOW RESTORATION

GENERAL INFORMATION

- 1.1 It is Columbia's preference to restore existing historical wood windows, rather than replace them, where this is feasible.
- 1.2 The work of this section shall only be performed at the direction of Facilities, and all proposed specifications, details and procedures shall be thoroughly reviewed and approved in writing prior to commencement of this work.
- 1.3 Wood Window Restoration work generally includes but may not be limited to furnishing and installing new factory finished mahogany sashes; disassembly of window elements at openings to be restored, including window air conditioners; restoring wood window frames to receive new sashes; removal of existing wood window sills at openings to be restored and their replacement with new factory finished mahogany sills; removal of all existing window washer bolts and their replacement with new OSHA approved window washer bolts; furnishing and installing of historically accurate factory finished exterior trim elements, with caulking to the masonry; furnishing and installing new architectural window hardware; stripping, painting and repair of window frames and painting of new sashes; reinstallation of window air conditioners; and cleaning and adjustment of all windows.
- 1.4 Replacement sash, and other window components shall duplicate size, and profile of existing window components.
- 1.5 Unless more restrictive criteria or differing requirements are explicitly specified or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the following standards shall apply:
 - National Wood Window and Door Association (NWWDA)
 - National Woodwork Manufacturers Association (NWMA)
 - American Society for Testing and Materials (ASTM)
 - American Architectural Manufacturers Association (AAMA)

DESIGN REQUIREMENTS

- 2.1 Wood Window Restoration components shall be engineered, fabricated, and installed to withstand normal thermal movement, wind loading, and impact loading without failure, as demonstrated by testing manufacturer's standard window assemblies that represent window types, grades, and sizes required for the Project, in accordance with test methods indicated.
- 2.2 Performance requirements are those specified for Performance Grade DP 40 in AAMA/NWWDA I.S. 2-93, Industry Standard for Wood Window Units. Testing shall be performed by an AAMA accredited independent testing laboratory based on a design wind pressure of 40 psf, in accordance with ASTM E 283 for air infiltration, ASTM E 547 for water penetration, and ASTM E 330 structural performance.
- 2.3 Wood window components shall be constructed of Honduran mahogany (*Swietenia macrophylla*) obtained from a sustained, managed forest, unless otherwise directed by Facilities.
- 2.4 Wood shall be treated with water repellant preservative conforming to requirements of NWWDA Industry Standard I.S. 4-94 for Water Repellant Preservative Non-Pressure Treatment for Millwork.
- 2.5 Accessories: Fabricate window accessories of nonmagnetic stainless steel, sized to satisfy performance requirements.
- 2.6 Fasteners shall comply with NWWDA I.S. 2-93 for fabrication and with manufacturer's recommendations and standard industry practices for type and size.
- 2.7 Sash Fabrication: Comply with NWWDA I.S. 2-93. Fabricate window sashes with mortise and tenon construction. Sash joints shall be sealed and pinned using waterproof adhesive. Sash joints shall be flush at junctures of stiles and rails, sashes to be 2 1/4" thick.
- 2.8 Sash Glazing: All sashes shall be factory interior glazed, with removable wood stops using manufacturer's standard extruded, vinyl, or butyl glazing gasket or silicone sealant.
 - a. Unless otherwise directed by Facilities, wood windows shall be glazed with 7/8" insulating glass units (3/16" clear Low "E" glass - 1/2" air space – 3/16" clear Low "E" glass).
 - b. Glass shall comply with ASTM C 1036 requirements for type and quality.
 - c. Seal Failure: Window manufacturer to warrant insulated glass against seal failure for ten (10) years. Installer to warrant replacement of failed lites for ten (10) years from date of substantial completion of the Work.

DESIGN REQUIREMENTS

- 2.9 Weights for Counter Balance (if replacement is required):
- Provide galvanized sash weights, designed to properly balance sash and fit in existing pockets.
 - Provide counterbalance for both upper and lower sash so that they remain open in any position.
- 2.10 Weatherstripping: All sash shall have weatherstripping of zinc cut across the grain, compression type or sliding type singly or in combination.
- 2.11 Hardware:
- Sash Pulleys (if replacement is required): cast of red bronze (CDA Alloy C83600), US 10 finish with a 300 Series Stainless Steel Pulley Axle, coated with a clear electrostatically applied lacquer to protect finish. Sash Pulleys shall meet a 700 lb. structural load test. Pulley face plate: 5-1/2" x 1-1/8" solid bronze plate with rounded ends.
 - Sash Weights (if replacement is required): round or square shape cold rolled steel bar, designed to balance sash and operation of sash within permissible operating force; hot-dip galvanize weights after hook for chain is welded.
 - Sash Lifts (if replacement is required): Cast of red bronze (CDA Alloy C83600), having a burnished finish, coated with a clear electrostatically applied lacquer to protect finish.
 - Sash Chain (if replacement is required): stainless steel or red metal solid bronze chain; tensile strength 500 lbs. (min.).
 - Stop Adjusters (if replacement is required): Plated brass, slotted adjusters. Cup ribbed or lugged to prevent turning.
 - Double Hung Sash Locks (if replacement is required): Pole operated signal lock type, cast of red bronze (CDA Alloy C83600), having burnished finish, coated with a clear electrostatically applied lacquer to protect the finish.

CONSTRUCTION REQUIREMENTS

- 3.1 Remove and store all air conditioners, window shades, blinds, etc. for future re-installation.
- 3.2 Demolition: Remove and discard existing exterior brickmould casing; wood sills; all existing exterior hardware including, but not limited to brackets, air conditioner brackets, and wiring stand-offs and window washer bolts; existing window stops and parting strip. Remove existing

DESIGN REQUIREMENTS

sash, retain for temporary installation until ready to install new sash. Remove and discard all existing weather-stripping.

- 3.3 **Frame Restoration:** Strip all frame surfaces to bare wood. Consolidate all deteriorated frame elements using restoration compounds in accordance with the manufacturer's recommendations. Fabricate and replace any missing or deteriorated frame parts that cannot be restored with exact replicas. Install new wood sill, under jamb legs. Clean and lubricate sash pulleys, weights, lifts, chains, stop adjusters and sash lock; replace if so directed by Facilities. Clean out caulk joint between brick and frame. Sand frame to a smooth finish, taking accepted precautions to control dust dispersal. Prime exterior frame members as soon as practical after stripping. Comply with manufacturer's recommendations as specified in Division 9 "Finishes". Paint frame exterior with two (2) coats of exterior
- 3.4 **Sash Installation:** Fit new sashes to restored frames, planning where necessary. Install new metal weather-stripping. Hang upper sash as fixed. Secure sash with manufacturer supplied supporting blocks. Hang lower sash on new brass plated steel sash chain. Modify existing sash weights to accommodate new heavier sash, insuring proper balancing of sash. Install new sash stops. Install new sash hardware. Install new window washer bolts. Reinstall window air conditioners, using new brackets. Reinstall interior window accessories, shades, blinds etc. Test window for proper operation.
- 3.5 **Caulking:** Fill voids between brick and frame with backer rod. Install new exterior brickmould casing, using stainless steel nails. Countersink and fill all nail holes. Caulk between brick and new brickmould casing with one part nonacid curing silicone sealant: Type S Grade NS, Class 25.
- 3.6 **Touch up windows** with paint matching that applied in the factory. Finish cut edges, nail holes and exposed areas after window installation is completed.
- 3.7 **Clean interior and exterior surfaces** immediately after installation. Exercise care to avoid damage to protective coatings and finishes. Remove excess glazing and sealants, dirt, and other substances.
- 3.8 **Clean glazing on both faces.** Comply with glazing material manufacturer's recommendations for final cleaning and maintenance. Remove nonpermanent labels from glass surfaces.
- 3.9 **Remove and replace glazing** that has been broken, chipped, cracked, abraded, or damaged during the construction period. Protect restored windows from damage.



DESIGN REQUIREMENTS

REFERENCE

- 4.1 The applicable CSI Specification Section is 08 52 90.