

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes the following:
1. Restoration of Wood windows including:
 - a. Paint removal from window sash and frames
 - b. Sash and frame component repairs and replacement
 - c. Rot remediation and prevention
 - d. Glass and glazing of wood windows
 - e. Window hardware cleaning, maintenance and installation
 - f. Weatherstripping
- B. Related Sections include the following:
1. Sheet metal flashing?
 2. Joint Sealants?
 3. Other new wood windows section?
 4. Painting or Paint Restoration?
 5. Faux Bois or other special finishes section?
 6. Glass and Glazing section?
 7. Architectural Paint Analysis?
 8. Window hardware repair, refinishing and replacement
- C. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 PRICE AND PAYMENT PROCEDURES

- A. Allowances
1. Include an allowance of \$ _____ for _____ as necessary.
- B. Unit Prices
1. Provide a unit price for restoration glass installed. \$ _____/sq ft.
- C. Alternates
1. Provide alternate for _____.

1.3 REFERENCES

- A. Abbreviations and Acronyms
1. DH = Double Hung Window
 2. CSMT = Casement window

- B. Definitions
 - 1. Window System Component Descriptions: Window component terminology shall be as identified in AWI's "Architectural Woodwork Quality Standards", Section 1000.
 - 2. Glazing includes glass, glazing points and glazing compounds.
 - 3. Adjacent components include transoms, mullions and side lights.

- C. Reference Standards
 - 1. AWI Quality Standard: Comply with applicable requirements in AWI's "Architectural Woodwork Quality Standards" for construction, finishes, grades of wood windows, and other requirements.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordination
 - 1. This contractor shall coordinate all work with _____ regarding phasing, staging, storage of materials and schedule.

- B. Pre-installation meetings
 - 1. This contractor shall attend on site construction meetings as necessary to coordinate his schedule with the job progress and as necessary according to the Owner.
 - 2. Contractor shall meet with historic preservation coordinator before beginning work.

- C. Sequencing
 - 1. See section 1.5 B 3

- D. Scheduling

1.5 SUBMITTALS

- A. Action Submittals
 - 1. Product Data
 - a. Submit product data for each type of product indicated.
 - 2. Shop Drawings
 - a. Provide shop drawings for any proposed deviation from methods of joinery observed in the existing conditions on the project.
 - b. Provide shop drawings for proposed moldings if recreations must be made identifying their exact match to original profiles.
 - 3. Samples
 - a. Provide owner with samples of replacement materials including:
 - (a) historic or restoration glass
 - (b) 12" sample of each type of weatherstripping to be used.

(c) Representative sample of each type of replacement hardware.

B. Informational Submittals

1. Qualification Statements

- a. Submit qualification data for historic treatment specialists including list of projects similar in scope, age, and type including contact information for owner's representatives sufficient to illustrate 5 years of full time involvement in projects of this type.
- b. Submit EPA RRP certification or EPA approved state Lead Based Paint Renovators Certification.

2. Field Quality Control Reports

- a. Provide wood moisture content measurements before painting and at other points as directed by the owner.

3. Special Procedure Submittals

- a. Provide a detailed, written description of the materials, methods, equipment, and sequence of operations to be used in the window restoration process including specific dry and cure time requirements.
- b. Provide a window / openings schedule integrating specific notes or deviations from standard process as described above for any openings.

C. Closeout Submittals

1. Operation and Maintenance Data

- a. Provide a written maintenance schedule for the owner's future maintenance requirements.
- b. Perform instruction for owner's maintenance personnel with regard to rope/chain replacement, hardware operation and finish touch-up if requested.

2. Warranty Documentation

- a. Provide written warranty as described in section 1.9.

3. Record Documentation

- a. Provide certification of restoration per applicable standards and regulations.
- b. Provide details of restoration steps undertaken as required by all authorities having jurisdiction and as may be required by the owner for historic record.

D. Maintenance Material Submittals

1. Parts and Paints

- a. Provide the owner with documentation of all transparent finishes types, paint colors and types.
- b. Provide owner with 1 pint of touch up paint / transparent finish for each color.

1.6 QUALITY ASSURANCE

- A. Regulatory Requirements
 - 1. Comply with all local, state and federal authorities having jurisdiction with regard to preservation regulations and hazardous materials and disposal regulations.
 - 2. Contractor must provide evidence of EPA Lead Based Paint Renovators Certification or an equivalent federally recognized state license.
- B. Qualifications
 - 1. Historic Treatment Specialist Qualifications: A firm or individual experienced in historic treatment of windows similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
 - 2. Contractor must be engaged full time in restoration of windows (replacement does not qualify) for a period of 5 years prior to the date of this project bid.
 - 3. Contractor must be able to provide examples of job specific architectural/engineering drawings of profiles, joinery and weatherstrip design that they've performed for previous projects.
- C. Preconstruction Testing
 - 1. Preconstruction testing for hazardous materials has been performed. Information is available from _____.
- D. Field Samples
- E. Mockups
 - 1. Prepare 1 existing window to serve as mockups to demonstrate historic treatment methods and procedures for aesthetic effects and qualities of materials and execution. Use materials and methods proposed for completed Work and prepare mockups under same weather conditions to be expected during remainder of Work.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Delivery and Acceptance Requirements
 - 1. Coordinate all deliveries with _____.
 - 2. This contractor must have personnel available to receive deliveries on site if necessary.
 - 3. Deliver patching and repair compounds to Project site in manufacturer's original containers, labeled with description of contents and name of manufacturer.
- B. Storage and Handling Requirements

1. Comply with all manufacturers' instructions with regard to storage and handling requirements.

C. Packaging Waste Management

1. This contractor is responsible for legal off site disposal of any hazardous waste.

1.8 FIELD CONDITIONS

A. This contractor is responsible to schedule work in a manner necessary to work within optimum temperatures and humidity levels and protect partially complete work from inclement weather.

1.9 WARRANTY

A. All work is to be warranted against defects in material or workmanship for a period of ____ year(s).

PART 2 – PRODUCTS

2.1 EXISTING PRODUCTS

A. Products being remanufactured, rebuilt and restored are existing elements of the owners building. Owner gives no representation as to their condition or that of the substrate. Contractor is to provide reasonable assumptions as to the conditions of the substrates based on their observations and experience with similar projects. Contractor is to include an assumption of rot and UV deterioration in the wood of the sash and visible members of the frame.

B. Existing materials shall be reused whenever possible in the repair and rehabilitation of historic wood windows. This includes all wood elements, hardware and glazing that are determined to be of historic significance. Replacement of window elements with new material shall be done only when originals are so deteriorated as to prohibit their useful function.

2.2 MANUFACTURERS

A. Subject to compliance with requirements, provide products by one of the manufacturers specified in section 2.3.

2.3 MATERIALS

A. Adhesives

1. Exterior grade wood Glue

a. Acceptable products/manufacturers include:

(a) Titebond III

2.

B. Paint Removers

1. Chemical Paint removers are to comply with all local, state, and federal authorities having jurisdiction. Dichloromethane / Methylene Chloride may not be used on any component of the project on or off site.
 2. The use of infrared stripping on site will be allowed.
 3. Mechanical stripping methods will be allowed if performed in compliance with EPA and OSHA regulations.
 4. No heat guns will be used on existing paint.
- C. Replacement wood materials
1. Any wood replaced shall be done so with the same species as original making every effort to match the age, grain direction and growth rate of the piece it is replacing.
- D. Glass
1. Existing intact original glass shall be reused. Any removed lights shall be reused in their original frames and positions.
 2. Replacement glass
 - a. (Glass specification)
 - b. Missing or broken glass shall be replaced with new glass matching the same degree of waviness as the existing or as appropriate for the time period of the original construction.
- E. Glazing Compound
1. Glazing compound for single pane glass shall be linseed oil-based, non-staining and non-bleeding.
 2. Acceptable manufacturers
 - a. Sarco Glaze Putty
- F. Glazing Points
1. Glazing points shall be stainless steel or galvanized steel.
- G. Epoxies – liquid consolidants
1. Liquid wood consolidants shall consist of a two-part, low-viscosity liquid epoxy designed for wood restoration. Design criteria standards and evaluations of acceptable alternates will be based on Abatron LiquidWood.
 2. Acceptable Manufacturers:
 - a. Abatron, Inc
 - b. Advanced Repair Technology
 - c. Gougeon Brothers, Inc
 - d. Polymeric Systems, Inc
 - e. Wood Care Systems
- H. Epoxies – Paste
1. Epoxy paste shall consist of a two-part, thixotropic paste epoxy designed for wood restoration. Design criteria standards and evaluations of acceptable alternates will be based on Abatron WoodEpox.

2. Acceptable Manufacturers:
 - a. Abatron, Inc
 - b. Advanced Repair Technology
 - c. Gougeon Brothers, Inc
 - d. Polymeric Systems, Inc
 - e. Wood Care Systems

I. Wood Preservative

1. Acceptable manufacturers and products include:
 - a. Nisus Corporation; Boracare

J. Hardware

1. Replacement hardware shall match original in design, material, and finish. Acceptable Manufacturers include:
 - a. Ball and Ball
 - b. Bronze Craft Corporation, The
 - c. Craftsmen Hardware Co., LTD
 - d. Phelps Company Architectural Specialties
 - e. Sun Valley Bronze - Hailey, ID

K. Weather Stripping

1. Acceptable manufacturers include:
 - a. Accurate Metal Weather Stripping
 - b. Pemko Manufacturing CO., Inc
 - c. Reese Enterprises, Inc
 - d. Schlegel

L. Sash Cord

1. 1/4" or 5/16" sash cord, solid braid 100% cotton.

M. Sash Chain

1. _____

2.4 FINISHES

A. Primer

1. _____ based Primer

B. Finish

1. Latex Exterior

C. Shop Finishing methods

1. Spray or brush applied

2.5 SOURCE QUALITY CONTROL

A. Tests

1. Document testing of all sash and wood materials before finishing confirming moisture content maximums.

B. Inspections

1. (Add progress point information)

PART 3 – EXECUTION

3.1 CONTRACTOR / INSTALLER

- A. The Contractor shall repair wood windows as indicated, and shall return them to proper operation and sound condition.
- B. Acceptable Wood Window Restoration Specialists include:
 - 1. Double Hung, LLC – Greensboro, NC 888-235-8956
 - 2.

3.2 REPAIRS

- A. Sash Removal - The interior stops shall be removed first in a method so as to not scar the wood. Connecting hardware and operating mechanisms shall then be detached and the sash shall be removed from the frame. Removed sashes and frames shall be identified as to location to assure reinstallation in their original positions. Windows with counter-weight systems shall have the sash cords detached from the sides of the sash and their ends pinned with a nail or tied in a knot to prevent them from falling into the weight pocket; the lower sash can then be removed. The parting bead shall be removed so as to not scar the wood. Plastic covering or plywood shall be installed to cover the window opening during repairs.
- B. Paint Removal – All paint is to be removed from each sash using non-destructive means such as steam, chemical stripper or heat gun. If chemical strippers are used, wood shall be neutralized after stripping to a litmus pH of 5 to 8.5. Wood shall be allowed to dry to a moisture content of 8 to 12 percent before repainting. If heat methods are used for paint removal, glass shall be protected from sudden temperature change to avoid breakage.
- C. Wood Repair - Badly decayed areas (with more than 30 percent wood decayed) shall be removed from wood sash, sill, frame, and trim assemblies. Moderately decayed areas (less than 30 percent decayed), weathered, or gouged wood shall be patched with approved patching compounds, and shall be sanded smooth. Intact sash rails and stiles that are loose shall be repaired with new dowels to make joints tight.
- D. Epoxy Wood Repair/Consolidation - Epoxy wood repair materials shall be applied in accordance with manufacturer's written instructions. Health and safety instructions shall be followed in accordance with the manufacturer's instructions. The source or cause of wood decay shall be identified and corrected prior to application of patching materials. Wet wood shall be completely dried to a moisture content of 8 to 12 percent to its full depth before patching. Wood that is to be patched shall be clean of dust, grease, and loose paint. Clean mixing equipment shall be used to avoid contamination. Mix and proportions shall be as directed by the manufacturer. Batches shall be only large enough to complete the specific job intended. Patching materials shall be completely cured before painting or reinstallation of patched pieces.

- E. Epoxy Liquid Wood Consolidant - Epoxy liquid wood consolidants shall be used to penetrate and impregnate deteriorated wood sections to reinforce wood fibers that have become softened or absorbent.
- F. Epoxy Paste - Epoxy paste shall be used to fill areas where portions of wood are missing such as holes, cracks, gaps, gouges, and other voids. Areas to receive epoxy paste patching material shall be primed with compatible epoxy liquid wood consolidants or a primer recommended by the manufacturer.
- G. Wood Replacement – Extensively decayed wood shall be replaced with new pieces that match originals in all respects. Joinery shall match that of existing. Muntins shall have coped mortise and tenon joints. Molded members shall have mitered or coped joints.
- H. Hardware - Existing hardware which is in good condition shall be reused unless otherwise noted. Reused existing hardware shall be stripped of paint down to bare metal. New hardware shall be furnished and installed where original is missing, damaged, or unsuitable for new operation, per manufacturer's directions to provide a secure and smoothly operating window assembly.
- I. Glazing - Lights to be reused shall be reinstalled in their original frames and positions. Rabbeted integral glazing recesses shall be brushed with boiled linseed oil or primed prior to the application of bed glazing compound. Broken glass shall be replaced as specified in Section _____.
- J. Operating System - Windows with counter-weight systems shall be repaired to original operating function. Original sash weights (and sash chains, if applicable) shall be reused wherever possible. Missing weights and sash cords or chains shall be replaced. Missing or deteriorated sash cords shall be replaced with new cotton-polypropylene cord rated for sash weight. When new weights are required, they shall match the originals in weight. Replacement weights shall be cast iron or square milled steel bar stock or weights salvaged from similar projects
- K. Weatherstripping and Moldings - Weatherstripping shall be installed on all operable sash. Weatherstripping shall consist of compression weather strips designed for permanent sealing under bumper or wiper action. Weatherstripping shall be provided at the perimeter of each sash including meeting rails and shall be installed per manufacturer's instructions. Weatherstripping shall be concealed when sash is closed..

3.3 PAINTING PREPARATION

- A. Areas where paint was removed or where existing paint shows crazing, wrinkling, and inter-coat peeling shall be scraped, sanded, and shall have edges feathered. Paint shall be removed to bare wood or first sound paint layer. All parts shall be cleaned by brush using bleach and/or tri sodium phosphate (TSP) solution, and let

dry. Existing finish shall be de-glossed. Open joints and cracks shall be filled with epoxy repair materials. Perimeter of fixed sash shall be caulked.

3.4 PAINTING

A. Wood elements shall be primed and painted in accordance with Section _____.

3.5 REASSEMBLY

A. After repairs are completed, the window shall be reassembled with all parts tight, true and functioning properly. Wood surfaces shall be free of blemishes.

3.6 ADJUSTMENTS

A. Final adjustment for proper operation of ventilating unit shall be made after reassembly. Adjustments shall be made to operating sash or ventilators to assure smooth operation and weather-tight performance when locked closed.

3.7 CLEANING

A. Windows shall be cleaned on both exterior and interior.