SECTION 08 52 00

WOOD WINDOW RESTORATION

PART 1 GENERAL

1.01 QUALITY ASSURANCE

A. Window Restorer Qualifications:

1. The trade contractor shall have sucessfully completed three restoration projects of similar size, scope and complexity within the past five years.

2. The trade contractor shall be able to demonstrate that workmen performing restoration work have suitable skills for the work required.

B. Windows must be restored to proper operation and sound condition.

1.02 DEFINITIONS

A. Severe Deterioration: Deterioration of the whole or part of an element to include voids, cracks and gaps and where the structural integrity of the element or the assembly in which the element is located is jeopardized. Existing wear and/or mechanical damage to an element has reduced the profile of the element by more than 30%.

B. Moderate Deterioration: Deterioration of the whole or part of an element to include voids, cracks and gaps and where the element is deformed or penetrated under moderate pressure from a screwdriver, but where the structural integrity of the element or assembly in which the element is located is not jeopardized. Existing wear and / or mechanical damage to an element has reduced the profile of the element from 10% up to and including 30%.

C. Minor Deterioration: Deterioration of the whole or part of an element to the point where it feels soft but is not punctured under light pressure from a screwdriver, and voids do not exist.. Existing wear and/or mechanical damage to an element has reduced the profile of the element less than 10%.

D. Surface Restoration: All finished sash surfaces have been restored by stripping.

or sanding and then painted or refinished.

1.03 REFERENCE DOCUMENTS

A. National Park Service, Technical Preservation Services, Preservation Brief 9, The Repair of Historic Wooden Windows.

1.04 SUBMITTALS

A. Qualification Statement: Submit listing of a minimum of three projects of similar size and complexity which have been completed by the restorer in the past 5 years.

B. Samples: Submit two samples 12 inches in size illustrating each different replacement component, including samples of the proposed sash chain.

C. Prototype Restoration Samples: The A/E shall designate one or more specific windows that the Contractor shall restore per this Specification that shall demonstrate the quality of Work. The Contractor shall submit the(se) prototype restoration for approval by the A/E. The approved prototypes shall be used for comparison with all other work and shall be the basis for acceptance of the Work. The Contractor shall not proceed with the Work until the prototype(s) have been approved by the A/E and and DPS.

D. Drawings denoting the window numbering system prior to the window removal. The windows shall then be numbered prior to removal to match the approved numbering system.

E. The Contractor shall submit for approval the product data for chemical strippers that are intended for use to the A/E not less than ten days prior to the commencement of the Work. A/E approval of the stripping products is required.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

A. Provide window restoration by one of the following companies:

1. Front Range Home Improvement, Ltd.
2. Colorado Historic Millworks
3. Colorado Sash & Door
4. Rocky Mountain Window and Door
5. Phoenix Window Restoration
6. Spectrum

The above list will be adjusted to reflect the companies on the Term and Supply List.

2.02 MATERIALS:

A. Existing Materials shall be reused whenever possible in the repair and rehabilitiation of 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.

1. Wood: Wood used to replace deteriorated window members shall be of the same species as the original and AWI Premium Quality Grade, unless otherwise approved by DPS. Finger-jointed stock may be used for interior casing and trim only where scheduled to be painted. Fabricate new wood components with profiles and dimensions to match the existing using salvaged materials as a template. Moisture content of existing wood and new wood shall be not more than 7%.
2. Glass & Glazing: Existing intact original glass shall be reused in historic windows. Any removed lights shall be reused in their original frames and positions. New glass and glazing materials shall conform to section 08 80 00- this must be revised as 08 80 00 calls for ¼" glazing and those of section 08 51 00 whenever possible.
3. Hardware: Exisiting original hardware shall cleaned and re-set in its existing location. Replacement hardware, i.e. sash pulleys, sash lifts and sash locks, shall be provided by the Contractor and shall match original in design, material , and finish as much as possible without hindering ease of operation and security.
4. Fasteners: Fasteners shall be stainless steel, galvanized, or non-ferrous metal.
5. Glazing Compound: for single pane glass shall be oil-based, non-staining and non-bleeding, and shall pass the test requirements of ASTM C 741, and ASTM C 742.
6. Glazing Points: Shall be stainless steel or galvanized steel.
7. Epoxy Consolidants:
   a) Liquid wood consolidant shall consist of a two-part, low viscosity liquid epoxy.
   b) Epoxy paste shall consist of a two-part thixotropic paste.
   c) Wax mold epoxy
8. Window Weights: Reuse existing salvaged weights where possible. Provide new weights to match original in profile and weight where original weights are damaged, missing, or require alteration for proper balance because the weight of the sash has been changed. Replacement window weights shall be: cast iron, profile to fit available space, weight for proper operation.
9. Sash Chain: Replace all sash cords with sash chain. Replace all damaged or missing sash chains. Use copper-dipped steel as supplied by Phelps Company (802)257-4214 or stainless steel. The weight of the chain will be based upon job conditions. Generally the weight of chain will be not less than 35 pound chain nor more than 50 pound chain. The weight of chain shall be approved by the A/E prior to use. Sash chain shall be able to easily fit in the pulley.

10. Weather Stripping.

PART 3 EXECUTION

3.01 PREPARATION

A. Component window removal operations are not allowed in occupied spaces.

B. Prior to commencing work, place a tarp or reinforced poly drop cloth on the floor immediately adjacent to the windows and extending out to a minimum distance of ten (10) feet. In rooms or areas where the minimal clearance requirement cannot be met due to room dimensions, the floor covering shall extend the maximum distance to the adjoining wall.

C. Tape or secure 6-mil poly sheeting immediately under the windowsill extending a minimum of two feet laterally on each side of the window.

D. The poly sheeting shall be a single, continuous sheet extending at least six feet from the base of the wall.

3.02 EXTERIOR PROTECTION

A. Place a canvas or reinforced poly tarp at grade level on the exterior of the building under the windows being repaired.

B. The canvas or poly tarp shall extend from the base of the wall to a distance of at least ten feet in all directions.

C. The canvas or poly tarp shall be placed flush to the building and weighted or otherwise secured to prevent visible gaps between the tarp and the building and to prevent the canvas or poly tarp from being blown away.

D. If existing ground cover or other architectural or landscaping features exist that would preclude placement of exterior poly or tarps, coordinate with DPS to determine alternative methods of protection.

3.03 REPAIRS

A. Sash Removal:

1. Remove sash utilizing care to minimize damage to the frame and adjacent surfaces. All damage shall be repaired by the Contractor at no additional cost to DPS.

2. The interior stops shall be removed first in a method so as to not scar the wood. Connecting hardware and operating mechanism shall then be detached and the sash shall be removed from the frame.

3. Removed sashes and frames shall be identified as to location to assure reinstallation in their original positions. Refer to Paragraph 1.06.D for Submittal on numbering system and marking.

4. 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.

5. The parting bead shall be removed so as not to scar the wood.

6. Plastic covering or plywood shall be installed to cover the window opening during repairs so as to maintain building security and moisture damage.

7. This operation shall be made on a time schedule agreed to by the contractor and DPS.

8. All nail and/or screw holes shall be filled with wood putty prior to when any reinstallation work begins on the opening.

B. Paint Removal and Stain Removal:

1. Shall be done by a Hazmat specialist when lead paint is present.

2. Maching sanding or grinding, abrasive blasting or other mechanical methods of paint removal are not allowed. The use of a heat gun in conjunction with hand scraping is not allowed unless the heat gun is equipped with a thermostat that limits the discharge air temperature to less than 1,100 degrees F. If any heat is used, the glass shall be removed or protected from the sudden temperature change which can cause breakage. An overlay of aluminum foil on gypsum board can protect the glass from such rapid temperature change.

3. Protect all adjoining surfaces not being stripped. All damage shall be repaired to the satisfaction of the A/E and DPS.
4. Follow chemical stripper manufacturer's recommendations for the application and removal.
5. Contain all debris and runoff from stripping operations and do not allow debris to contaminate occupied areas or adjacent components. Perform daily clean-up activities of the stripping operation.
6. Allow stripper to dwell on the surface until the paint has lifted or dissolved. Do not allow stripper to dry on the surface being stripped.
7. Remove the stripper or residue utilizing the recommended methodology as identified by the manufacturer.
8. Use an approved container to accumulate paint removal debris for disposal determination. Follow all regulations with respect to handling the debris.
9. Perform a visual inspection of the area where the paint was removed. Reapply stripper to remove residual paint remaining after the first application.
10. Do not allow the stripper to dwell on the surface longer than is required to remove the paint. Care must be taken to minimize damage to the substrate. All damage to the substrates shall be repaired by the Contractor, at no additional cost to DPS, to the satisfaction of the A/E and DPS.
11. Allow substrate to dry thororughly before continuing restoration procedures.
12. Areas on frame, sill, sash and muntins where paint or varnish has peeled, alligatored, blistered or crazed shall have paint removed to bare wood or first sound paint layer, using non-destructive means such as a chemical stripper or scrapper tools.
13. If chemical strippers are used, wood shall be rinsed or neutralized after stripping, per the manufacturer's recommendations, to a litmus ph of 5 to 8.5. Contractor shall verify and document these amounts in a report provided to DPS. If chemical strippers are used, they shall be designed for use on the appropriate substrate.
14. Wood shall be allowed to dry to a moisture content of a maximum of 7 percent before repainting. Contractor shall verify and document these amounts in a report provided to DPS. The documentation shall include the window number and opening number, date and moisture content, at a minimum.

C. Wood Repair:

1. Severely deteriorated areas (with more than 30 percent of entire wood member decayed or profile reduced) shall be removed from wood sash, sill, frame, and trim assemblies and replaced.
2. Moderately deteriorated areas (less than 30 percent of entire member decayed), weathered, or gouged wood shall be patched with approved patching compounds, and shall be sanded smooth.
3. Minor deterioration of sash rails and stiles that are loose shall be repaired with glue and new dowels to make joints tight.

D. Epoxy Wood Repair:

1. Epoxy wood repair materials shall be applied in accordance with manufacturer's written instructions.
2. The source or cause of wood decay shall be identified and corrected prior to application of patching materials.
3. Wet wood shall be completely dried to a moisture content of a maximum of 7 percent to its full depth before patching.
4. Wood that is to be patched shall be clean of dust, grease, and loose paint.
5. 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.
6. Patching materials shall be completely cured before painting or reinstallation of patched pieces.

E. Epoxy Paste:

1. Epoxy paste shall be used to fill areas where portions of wood are missing such as holes, cracks, gaps, gouges, and other voids.
2. Areas to receive epoxy paste patching material shall be primed with compatible epoxy liquid wood consolidant or a primer recommended by the manufacturer.
3. Faux finish will be provided where stained or clear finsh may exist, and shall match color and graining.

F. Wood Replacement:

1. Joinery shall match that of existing.
2. Muntins shall have coped mortise and tenon joints. Molded members shall have mitered or coped joints.

G. Hardware:

1. Restore existing operable items to good working condition.
2. Replace damaged and missing hardware, including sash lifts, sash locks and pulleys.
3. Replace all sash cords with sash chains as well as replace damaged or missing sash chains.
4. Reattach loose sash weights. Replace missing sash weights with new to match.
5. Replace missing fasteners with new to match existing. Tighten existing fasteners.
6. Lubricate operable parts.
7. Adjust for smooth operation to the satisfaction of the A/E and DPS.
8. Existing hardware which is in good condition shall be reused unless otherwise noted.
9. Reused existing hardware shall be stripped down to bare metal.
10. New hardware shall be installed where original is missing, damaged, or unsuitable for new operation, per manufacturer's directions to provide a secure and smoothly operating window.

H. Surface Restoration:

1. All finished sash surfaces shall be stripped and repainted or restained.Surface damage and / or wear shall be sanded to eliminate all splintering and roughness. Sanding shall remove surface irregularities and shall be able to be rubbed by hand with a cotton glove without snagging.
2. Stripped areas shall be individually assessed for structural damage and joint integrity after the glass has been removed. Sashes that are out of square, demonstrate looseness or gaps in the stile to rail joints or that demonstrate the ability to be wracked shall have the stile to rail joints stabilized by glue injection or epoxy injection and cross joint doweling or screws. Nails shall not be used. Sashes requireing joint stabilization shall be securely clamped until the glue/epoxy has cured per the manufacturer’s recommended drying or curing times.

I. Wood Sills:

1. All finished sill surfaces shall be stripped and repainted or restained.
2. If the wood sill has minor or moderate deterioration and maintains a suitable pitch to drain, then repair wth epoxy. No feather edges shall be allowed. Square all edges and remove damage to sound wood by testing with a screw driver as described in the Definitions portion of this Standard. The minimum thickness of a repair shall be 1/8”.
3. If the wood sill has severe deterioration or is not pitched to drain, then the Contractor shall replace the sill with new wood to match the original in every manner, including wood species, grain and profiles.

J. Glazing:

1. Lights to be reused shall be reinstalled in their original frames and positions. Glass removed shall be numbered or identified in such a manner that the glass is traceable to the particular opening that it is removed from and shall be put back in its original opening.

2. Rabbeted integral glazing recesses shall be brushed with boiled linseed oil prior to the application of bed glazing compound.
3. Broken glass shall be replaced.
4. Replace all glazing putty.
5. Reuse salvaged glass in its original opening.
6. Replace all damaged or missing glass.

K. Operating System:

1. 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.
2. Missing weights and sash cords or chains shall be replaced. Missing or deteriorated sash cords shall be replaced with chains.
3. When new weights are required, they shall facilitate the operation of the window.
4. There shall be a minimum of eight inches between the bottom of the pulley and the top of the weight when the system is reinstalled and the window is in the closed position.

L. Weatherstripping:

1. Weatherstripping shall be installed on all operable windows.
2. Weatherstripping shall consist of galvanized steel, compression or interlocking weather strips designed for permanent sealing under bumper or wiper action.
3. Weatherstripping shall be provided at the perimeter of each sash including meeting rails and shall be installed per manufacturer's instructions.

M. Painting Preparation:

1. Areas where paint was removed or where existing paint shows crazing, wrinkling, and intercoat peeling shall be scraped, sanded, and shall have edges feathered. Paint shall be removed to bare wood or first sound paint layer.
2. All parts shall be cleaned by brush using bleach and/or trisodium phosphate (TSP) solution, and let dry.
3. Existing finish shall be deglossed.
4. Open joints and cracks shall be filled with epoxy repair materials. Perimeter of fixed sash shall be caulked.

N. Painting and staining: Wood elements shall be primed and finished in accordance with Section 09 91 00 Painting.

O. Reassembly: After repairs are completed, the window shall be reassembled with all parts tight, true and functioning properly. Wood surfaces shall match DPS Control Sample.

P. Adjustments: 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 weathertight performance when locked closed.

END OF SECTION 08 52 00