UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated July 2023
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08/09

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USACE / NAVFAC / AFCEC / NASA **UFGS-08 01 52 (August 2009)**

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SECTION 08 01 52

OPERATION AND MAINTENANCE OF WOOD WINDOWS
08/09

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NOTE: This guide specification covers the requirements for repair and rehabilitation of wood windows in historic buildings.

Adhere to UFC 1-300-02 Unified Facilities Guide Specifications (UFGS) Format Standard when editing this guide specification or preparing new project specification sections. Edit this guide specification for project specific requirements by adding, deleting, or revising text. For bracketed items, choose applicable item(s) or insert appropriate information.

Remove information and requirements not required in respective project, whether or not brackets are present.

Comments, suggestions and recommended changes for this guide specification are welcome and should be submitted as a Criteria Change Request (CCR).

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PART 1 GENERAL

1.1 REFERENCES

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NOTE: This paragraph is used to list the publications cited in the text of the guide specification. The publications are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title.

Use the Reference Wizard's Check Reference feature when you add a Reference Identifier (RID) outside of the Section's Reference Article to automatically place the reference in the Reference Article. Also use the Reference Wizard's Check Reference feature

to update the issue dates.

References not used in the text will automatically be deleted from this section of the project specification when you choose to reconcile references in the publish print process.

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The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM C1184	(2023) Standard Specification for Structural Silicone Sealants

U.S. GREEN BUILDING COUNCIL (USGBC)

LEED BD+C	(2009; R 2010) Leadership in Energy and Environmental Design(tm) Building Design and Construction (LEED-NC)

1.2 SYSTEM DESCRIPTION

Repair wood windows as indicated, and return them to proper operation and sound condition.

1.3 SUSTAINABILITY REPORTING

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NOTE: The bracketed items are representative of LEED material documentation and requirements that may apply to this project. These items should be edited to reflect the project requirements.

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Materials in this technical specification may contribute towards contract compliance with sustainability requirements. See Section 01 33 29 SUSTAINABILITY REQUIREMENTS AND REPORTING for project LEED BD+C [local/regional materials,] [low-emitting materials,] [recycled content,] [_____] [and][rapidly renewable materials] and LEED documentation requirements.

1.4 SUBMITTALS

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NOTE: Review submittal description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list, and corresponding submittal items in the text, to reflect only the submittals required for the project. The Guide Specification technical editors have classified those items that require Government approval, due to their complexity or criticality, with a "G." Generally, other submittal items can be reviewed by the Contractor's Quality Control System. Only add a “G” to an item, if the submittal is sufficiently important or complex in context of the project.

For Army projects, fill in the empty brackets following the "G" classification, with a code of up to three characters to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy, Air Force, and NASA projects.

The "S" classification indicates submittals required as proof of compliance for sustainability Guiding Principles Validation or Third Party Certification and as described in Section 01 33 00 SUBMITTAL PROCEDURES.

Choose the first bracketed item for Navy, Air Force and NASA projects, or choose the second bracketed item for Army projects.

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Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are [for Contractor Quality Control approval.][for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government.] Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Shop Drawings; G[, [_____]]

SD-03 Product Data

Hardware

Weatherstripping

Qualifications

SD-04 Samples

Hardware

Moldings

Weatherstripping

SD-11 Closeout Submittals

LEED Documentation

1.5 QUALITY ASSURANCE

a. Provide qualified workers trained and experienced in repairing, restoring, replicating, and replacing windows in historic buildings;

submit documentation of their Qualifications during 5 consecutive years of work of this type; and a list of installations made identifying when, where and for whom the installations were made.

b. Submit Shop Drawings indicating elevations of units, full-size sections, fastenings, methods of installation and anchorage, method of glazing, locations of operating hardware, mullion details, method and material for weatherstripping, insect screen, details, connections with other work and window schedules showing location of each window unit.

1.6 DELIVERY, STORAGE, AND HANDLING

Store materials out of contact with the ground and under weathertight covering.

PART 2 PRODUCTS

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NOTE: Deteriorated historic windows should be repaired rather than replaced wherever possible. In the event replacement is necessary, the new windows should match the historic ones in design, color, size, configuration, reflective qualities, shadow lines, detail, and material. Only when it is not feasible to match the historic fabric should substitute window material be considered.

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2.1 MATERIALS

Reuse existing materials 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. Replace window elements with new material only when originals are so deteriorated as to prohibit their useful function.

2.2 WOOD

Use wood of the same species and grade as the original to replace deteriorated window members, unless otherwise noted. Finger-jointed stock may be used for interior casing and trim only where scheduled to be painted.

2.3 GLASS AND GLAZING

Reuse existing intact original glass. Reuse removed lights in their original frames and positions. New glass and glazing materials must conform to Section 08 81 00 GLAZING.

2.4 HARDWARE

Reuse existing original hardware, when it is salvageable. Replacement hardware must match original in design, material, and finish. Submit Manufacturer's installation instructions for each type of hardware and weatherstripping; see paragraph WEATHERSTRIPPING in PART 3. Submit representative sample of each type of hardware with identifying tags.

2.5 FASTENERS

Provide stainless steel, galvanized, or non-ferrous metal fasteners.

2.6 GLAZING COMPOUND

Provide glazing compound for single pane glass which is oil-based, non-staining and non-bleeding. Reglaze existing insulated glass units with silicone sealant complying with ASTM C1184 and compatible with the unit seal on the glass unit.

2.7 GLAZING POINTS

Provide stainless steel or galvanized steel glazing points.

2.8 EPOXY CONSOLIDANTS

2.8.1 Liquid Consolidant

Provide liquid wood consolidant consisting of a two-part, low-viscosity liquid epoxy that meets the criteria of Table A.

2.8.2 Epoxy Paste

Provide epoxy paste consisting of a two-part, thixotropic paste that meets the criteria of Table A.

TABLE A		
	LIQUID CONSOLIDANT	EPOXY PASTE
Properties	Low-Viscosity Liquid	No-Slump, Thixotropic Paste
Toxicity	Low	Very Low
Toxicity Cured	Non-Toxic	Non-Toxic
Ratios	1:1 by Volume	1:1 by Volume
Pot Life @ Room Temp.	30 minutes minimum	50 minutes minimum
Hardening @ Room Temp.	1 hr. or longer	1 hr. or longer
Hardening @ 60 deg. C 140 deg. F	16 min. or less	18 min. or less
Viscosity Poises @ 22 deg C 72 deg F	4.7 max.	Thixotropic paste
Solids	95% minimum	98% minimum
Tensile Strength	26 MPa 4000 psi	16.2 MPa 2500 psi
Elongation (percent)	50	4

PART 3 EXECUTION

3.1 EVALUATION

Perform a complete evaluation survey of the existing conditions of each wood window to determine the extent of repairs necessary. The evaluation survey may be in the form of a schedule and must note at a minimum:

a. Window location.

b. Condition of the paint.

c. Condition of the frame and sill.

d. Condition of the interior and exterior trim.

e. Condition of the sash (including rails, stiles, and muntins).

f. Glazing problems.

g. Window hardware and operating system.

h. The overall condition of the window.

3.2 REPAIRS

3.2.1 Example Window

Prepare an existing window of each type to serve as an example of the quality of repairs to be provided for inspection and approval by the Contracting Officer.

3.2.2 Sash Removal

Remove the interior stops first, in a method so as to not scar the wood. Detach connecting hardware and operating mechanisms and remove the sash from the frame. Identify removed sashes and frames as to location to assure reinstallation in their original positions. For windows with counter-weight systems, detach the sash cords from the sides of the sash and pin their ends with a nail or tie in a knot to prevent them from falling into the weight pocket; the lower sash can then be removed. Remove the parting bead so as to not scar the wood. Install plastic covering or plywood to cover the window opening during repairs.

3.2.3 Paint Removal

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NOTE: When testing determines that paint on windows contains lead, the following sentence will be added to the beginning of the paragraph: "Paint removal must comply with the procedures described in Section 02 83 00 LEAD REMEDIATION."

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Remove paint from areas on frame, sill, sash and muntins where paint or varnish has peeled, alligatored, blistered or crazed, to bare wood or first sound paint layer, using non-destructive means such as a chemical stripper or heat gun. If chemical strippers are used, neutralize wood after stripping to a litmus pH of 5 to 8.5. Allow wood to dry to a

moisture content of 8 to 12 percent before repainting. If heat methods are used for paint removal, protect glass from sudden temperature change to avoid breakage.

3.2.4 Wood Repair

Remove badly decayed areas (with more than 30 percent wood decayed) from wood sash, sill, frame, and trim assemblies. Patch moderately decayed areas (less than 30 percent decayed), weathered, or gouged wood with approved patching compounds, and sand smooth. Repair intact sash rails and stiles that are loose with new dowels to make joints tight.

3.2.5 Epoxy Wood Repair

Apply epoxy wood repair materials in accordance with manufacturer's written instructions. Follow health and safety instructions in accordance with the manufacturer's instructions. Identify the source or cause of wood decay and correct prior to application of patching materials. Dry wet wood to a moisture content of 8 to 12 percent to its full depth before patching. Clean dust, grease, and loose paint from wood that is to be patched. Use clean mixing equipment to avoid contamination. Provide mix and proportions as directed by the manufacturer. Provide batches large enough to complete the specific job intended. Cure patching materials before painting or reinstalling patched pieces.

3.2.5.1 Epoxy Liquid Wood Consolidant

Use epoxy liquid wood consolidant to penetrate and impregnate deteriorated wood sections to reinforce wood fibers that have become softened or absorbent.

3.2.5.2 Epoxy Paste

Use epoxy paste to fill areas where portions of wood are missing such as holes, cracks, gaps, gouges, and other voids. Prime areas to receive epoxy paste patching material with compatible epoxy liquid wood consolidant or a primer recommended by the manufacturer.

3.2.6 Wood Replacement

Replace pieces decayed beyond repair with new pieces that match originals in all respects. Match joinery to existing. Provide muntins consisting of coped mortise and tenon joints. Provide molded members that have mitered or coped joints.

3.2.7 Hardware

Reuse existing hardware, which is in good condition, unless otherwise noted. Strip reused existing hardware of paint down to bare metal. Install new hardware where original is missing, damaged, or unsuitable for new operation, in accordance with manufacturer's directions to provide a secure and smoothly operating window assembly.

3.2.8 Glazing

Reinstall lights to be reused in their original frames and positions. Brush rabbeted integral glazing recesses with boiled linseed oil prior to the application of bed glazing compound. Replace broken glass as specified in Section 08 81 00 GLAZING.

3.2.9 Operating System

Repair windows with counter-weight systems to original operating function. Reuse original sash weights (and sash chains, if applicable) wherever possible. Replace missing weights and sash cords or chains. Replace missing or deteriorated sash cords with new cotton-polypropylene cord rated for sash weight. When new weights are required, match the originals in weight. Provide cast iron or square milled steel bar stock replacement weights.

3.2.10 Weatherstripping and Moldings

Install Weatherstripping on all operable windows. Provide weatherstripping consisting of brass, compression or interlocking weather strips designed for permanent sealing under bumper or wiper action. Provide weatherstripping at the perimeter of each sash including meeting rails and install in accordance with manufacturer's instructions. Submit a 300 mm 12 inch long sample of each type of weatherstripping required with fasteners. Weatherstripping must be completely concealed when sash is closed. Install moldings in accordance with manufacturer's instructions. Submit a 300 mm 12 inch long piece of each molding type required for each window and casing with specified finish.

3.3 PAINTING PREPARATION

Scrape, sand, and feather edges in areas where paint was removed or where existing paint shows crazing, wrinkling, and intercoat peeling. Remove paint to bare wood or first sound paint layer. Clean all parts by brush using bleach and/or trisodium phosphate (TSP) solution, and let dry. Degloss existing finish. Fill open joints and cracks with epoxy repair materials. Caulk perimeter of fixed sash.

3.4 PAINTING

Prime and paint wood elements in accordance with Section 09 90 00 PAINTS AND COATINGS.

3.5 REASSEMBLY

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

3.6 ADJUSTMENTS

Make final adjustment, for proper operation of ventilating unit, after reassembly. Make adjustments to operating sash or ventilators to assure smooth operation and weathertight performance when locked closed.

3.7 CLEANING

Clean windows on both exterior and interior sides.

-- End of Section --