SECTION 080351.23 - HISTORIC TREATMENT OF STEEL WINDOWS

Revise this Section by deleting and inserting text to meet Project-specific requirements.

1. GENERAL
	* + 1. SUMMARY
				1. Section Includes:

Historic treatment of steel windows in the form of the following:

Repairing steel windows.

Retain first subparagraph below only if window frames require removal from openings before repair.

Repairing steel subframes uncovered by removal of window frames.

Replacing steel window units with custom-fabricated replicated units.

Reglazing.

Repairing, refinishing, and replacing hardware.

Repairing insect screens.

Replacing insect-screen units with salvaged or custom-fabricated replicated units.

Providing new storm windows.

* + - * 1. Related Requirements:

Retain subparagraphs below to cross-reference requirements Contractor might expect to find in this Section but are specified in other Sections.

Section 013591 "Historic Treatment Procedures" for general historic treatment requirements.

Section 024296 "Historic Removal and Dismantling" for historic removal and dismantling work.

* + - 1. ALLOWANCES

Retain this article if products and Work included in this Section are covered by lump-sum, unit-cost, quantity, or testing and inspection allowances.

Quantity allowances require a Schedule of Quantity Allowances coordinated with a Unit-Price Schedule. See "Planning the Work" Article in the Evaluations for discussion of the bidding method.

* + - * 1. See Section 012100 "Allowances" for description of allowances for historic treatment of steel windows.

If using quantity allowances, retain three subparagraphs below or include similar language in Section 012100 "Allowances" to clarify how work covered by quantity allowances is to be authorized.

Perform historic treatment of steel windows under quantity allowances and only as authorized. Authorized Work includes [**work required by Drawings and Specifications and**] [**only**] work as directed in writing by Director’s Representative.

Retain first subparagraph below to suit Project.

Notify Director’s Representative [**weekly**] <**Insert time interval**> of extent of work performed that is attributable to quantity allowances.

Perform work that exceeds quantity allowances only as authorized by Change Orders.

Both paragraphs below are examples only; revise to suit Project. Insert additional allowances in accordance with retained types of work and allowances established. If there are multiple drawing designations for types of work, establish separate allowances for each drawing designation.

* + - * 1. Replace steel sash in Window No. 1 as part of <**Insert name of allowance**>.
				2. Repair <**Insert item description**> as part of <**Insert name of allowance**>.
			1. UNIT PRICES

Retain this article if products and Work specified in this Section are measured and paid for under the provisions of unit prices.

Retain this article with "Allowances" Article above for unit-price adjustments to quantity allowances.

Retain this article without "Allowances" Article above if using a single Unit-Price Schedule with a column of estimated quantities on which bids are priced and evaluated.

* + - * 1. See Section 012200 "Cost Computations”" for description of unit prices affecting Work of this Section.

Unit prices apply to authorized Work covered by [**quantity allowances**] [**estimated quantities**].

Unit prices apply to authorized additions to and deletions from Work as authorized by Change Orders.

* + - 1. DEFINITIONS

Retain terms that remain after this Section has been edited for a project.

* + - * 1. Glazing: Includes glass, glazing clips, glazing tapes, glazing sealants, and glazing compounds.
				2. Window: Includes window frame, sash, hardware, and insect screens unless otherwise indicated by context.
				3. Steel Window Component Terminology: Steel window components for historic treatment work are welded together from steel shapes and include the following classifications:

Revise list below to suit Project.

Subframe: Steel anchorage, usually built into wall construction.

Window-Frame Members: Head, jambs, and sill.

Sash Members: Stiles, rails, and muntins.

Insert, in subparagraph below, other components that are related items, such as exterior or interior trim.

<**Insert item**>.

* + - 1. PREINSTALLATION MEETINGS

Retain "Preinstallation Conference" paragraph below if Work of this Section is extensive or complex enough to justify a conference.

* + - * 1. Preinstallation Conference: Conduct conference at [**Project site**] <**Insert location**>.

Retain subparagraphs below if additional requirements are necessary; include information about conference.

Review minutes of Preliminary Historic Treatment Conference that pertain to historic treatment of steel windows.

Review methods and procedures related to historic treatment of steel windows including, but not limited to, the following:

Historic treatment specialist's personnel, equipment, and facilities needed to make progress and avoid delays.

Materials, salvage materials, material application, sequencing, tolerances, and required clearances.

Fire-protection plan.

Steel window historic treatment program.

Coordination with building occupants.

* + - 1. SEQUENCING AND SCHEDULING

Paragraph below is an example only; revise to suit Project. Insert other sequences for different areas of building or types of work if needed.

* + - * 1. Perform historic treatment of steel windows in the following sequence, which includes Work specified in this and other Sections:

Retain subparagraphs below and insert others if required; revise to suit Project. If adjacent materials are to be replaced, consider inserting them in sequence to ensure that restored and new materials are not damaged by the work.

Label each window frame with permanent opening-identification number in inconspicuous location.

Tag existing window sash and detachable insect screens with opening-identification numbers.

Remove window sash, dismantle hardware, and tag hardware with opening-identification numbers.

Retain first subparagraph below if required. If only some window frames are required to be removed, indicate location of each on Drawings or by inserts.

Remove window frames, if required, and tag with opening-identification numbers.

Remove caulking and sealant residue from perimeter masonry and concrete.

Dismantle unused window accessory hardware from masonry or concrete and repair holes in accordance with requirements in other Sections.

Install temporary protection and security at window openings.

In the shop, label each removed item with permanent opening-identification number in inconspicuous location and remove site-applied tags.

Sort units by condition, separating those that need extensive repair.

Clean surfaces.

General Steel-Repair Sequence:

Remove rust and paint to bare steel. Prime immediately. Verify and strip lead-based paint in accordance with regulatory requirements.

Align and straighten sash and frame to close completely and fit snugly around entire perimeter of sash.

Repair steel by patching or removing severely corroded areas and welding or brazing steel of matching cross section. Spot prime immediately.

If thicker-than-original glass is required, provide modified glazing clips to secure glass.

Repair and refinish hardware; replace missing hardware.

Replace[**torn**] screening and repair broken screen frames and attachment bracket clips.

Apply second coat of primer on surfaces that will be concealed when window is reinstalled.

Remove temporary protection and security at window openings.

Reinstall and adjust units.

Sequence of first two subparagraphs may be reversed if baked-enamel or powder-coated finishes are required.

Install glazing.

Apply finish coats.

Install hardware.

Install weather stripping if any.

Install screens on windows.

Seal perimeter joints between frames and masonry or concrete in accordance with requirements in other Sections.

* + - 1. SUBMITTALS

Action submittals are submittals requiring responsive action and return of reviewed documents to Contractor.

* + - * 1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
				2. Manufacturer’s installation instructions shall be provided along with product data.
				3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
				4. Product Data: For each type of product.

Include recommendations for product application and use.

Generally, retain "Shop Drawings" paragraph below for large projects or revise to suit Project. Alternatively, delete paragraph and rely on mockups alone to show how work fits together.

* + - * 1. Shop Drawings:

Include plans, elevations, and sections showing locations and extent of repair and replacement work, with enlarged details of replacement parts indicating materials, profiles, connections, reinforcing, method of splicing into or attaching to existing steel window, accessory items, and finishes.

Include field-verified dimensions and the following:

Schedule of window and sash repairs, using same reference number for openings as those on Contract Drawings.

Full-size shapes and profiles with complete dimensions for replacement components and their connections, showing relationship of existing components to new components.

Details of temporary protection and security at window openings.

Templates and directions for installing storm windows if any.

Identification of each new unit and its corresponding window locations in the building on annotated plans and elevations.

Hardware schedule using same reference numbers for openings.

Provisions for [**sealant joints**] [**flashing**] [**and**] <**Insert item**> as required for location.

<**Insert requirements**>.

Retain "Samples for Initial Selection" or "Samples for Verification" paragraph below, or both.

* + - * 1. Samples for Initial Selection: Manufacturer's standard color sheets, showing full range of available colors for each type of exposed finish including hardware and accessories.
				2. Samples for Verification: Actual sample of finished products for the following, in manufacturer's standard sizes unless otherwise indicated:

Retain and revise subparagraphs below and insert others to suit Project.

Replacement Units: 12-inch- long, full-size [**frame mullion**] [**sash**] [**and**] [**insect screen**] <**Insert item**> sections with shop-applied finish.

Repaired Steel Window Members: Prepare Samples using steel window members from salvage sources, repaired and prepared for refinishing.

Additional Samples that show welding or brazing techniques, materials, and finishes as requested by Director’s Representative.

Refinished Steel Window Members: Prepare Samples using steel window members from salvage sources, repaired and refinished.

Hardware: Full-size units with each shop-applied or restored finish.

Weather Stripping: 12-inch- long section of mated steel members with weather stripping.

Glass: [**Full-size**] <**Insert dimensions**> units of each type and appearance.

Consider "Qualification Statements" and "Steel Window Historic Treatment Program" paragraphs below as they relate to Project goals and importance. To require responsive action by Architect after submittal review, relocate one or both paragraphs to "Action Submittals" Article.

* + - * 1. Qualification Statements: For [**historic treatment specialist**] [**and**] [**steel-repair-material manufacturer**].
				2. Steel Window Historic Treatment Program: Submit before work begins.

If required, insert "Maintenance Material Submittals" Article for extra materials or replacement components that match products applied or installed.

* + - 1. QUALITY ASSURANCE

In "Historic Treatment Specialist Qualifications" paragraph below, insert additional, specific requirements for demonstrating unique skills of firm and personnel to suit Project. See Section 013591 "Historic Treatment Procedures" for general qualifications of historic treatment specialist.

* + - * 1. Historic Treatment Specialist Qualifications: A qualified historic steel window specialist, experienced in repairing, refinishing, and replacing steel windows in whole and in part. Experience only in fabricating and installing new steel windows is insufficient experience for steel window historic treatment work.
				2. Steel-Patching-Compound Manufacturer Qualifications: A firm regularly engaged in producing steel-patching compound that has been used for similar historic-metal-repair applications with successful results.
				3. Steel Window Historic Treatment Program: Prepare a written, detailed description of materials, methods, equipment, and sequence of operations to be used for historic treatment work, including protection of surrounding materials and Project site.

If materials and methods other than those indicated are proposed for any phase of historic treatment work, add a written description of such materials and methods, including evidence of successful use on comparable projects, and demonstrations to show their effectiveness for this Project.

* + - 1. BENCHMARKS

Retain required mockups in this article; insert others to suit Project. Test areas that were prepared or are required as part of a separate contract to evaluate and establish historic treatment materials and processes are not mockups.

* + - * 1. Prepare benchmarks of historic treatment repair processes to demonstrate aesthetic effects, to set quality standards for materials and execution, and to set quality standards for fabrication and installation. Prepare benchmarks so they are inconspicuous.

Locate benchmarks [**on existing windows where directed by** Director’s Representative] [**in locations that enable viewing under same conditions as the completed Work**] <**Insert requirement**>.

Mockup in "Steel Window Repair" subparagraph below is an example only; revise to suit Project or insert others if necessary, such as for storm windows or insect screens.

Steel Window Repair: Prepare one entire window unit to serve as mockup to demonstrate samples of each type of repair of steel window members, including frame, sash, glazing, and hardware.

Approval of benchmarks does not constitute approval of deviations from the Contract Documents contained in benchmarks unless director ‘representative specifically approves such deviations by Change Order.

* + - 1. DELIVERY, STORAGE, AND HANDLING
				1. Pack, deliver, and store products in suitable packs, heavy-duty cartons, or wooden crates; surround with sufficient packing material to ensure that products will not be deformed, broken, or otherwise damaged.
				2. Store products inside a well-ventilated area and protected from weather, moisture, soiling, abrasion, extreme temperatures, and humidity, and where environmental conditions comply with manufacturer's requirements.
			2. FIELD CONDITIONS

Usually, retain this article; revise to suit Project.

* + - * 1. Weather Limitations: Proceed with historic treatment of steel windows only when existing and forecasted weather conditions are within the environmental limits set by each manufacturer's written instructions and specified requirements.
1. PRODUCTS

Manufacturers and products listed in this Section are neither recommended nor endorsed by the AIA or Deltek. Before selecting manufacturers and products, verify availability, suitability for intended applications, and compliance with minimum performance requirements.

Product options commonly available from manufacturers are included in square brackets throughout the Section Text. Not every manufacturer listed can provide every option offered; verify availability with manufacturers.

* + - 1. REPLACEMENT STEEL WINDOW UNITS

Retain this article if custom-fabricated replacement steel window frames and sash made to match existing windows are required for historic treatment of steel windows. If replacing steel windows or sash with entirely new steel windows, replacements can be replicas of the existing windows and should be specified as new construction in another Section.

* + - * 1. Replacement Steel Window Units: Replicated, welded-steel units custom fabricated from salvaged windows, new steel shapes, or a combination thereof; and with operating and latching hardware.

Manufacturers: Subject to compliance with requirements, provide products fabricated by historic treatment specialist firms.

Steel Window Components: Replace [**frames**] [**and**] [**sash**].

Revise "Steel Window Members" subparagraph below to suit Project for special profiles and detailing.

Steel Window Members: Match profiles and detail of existing window members.

Revise or delete "Exposed Hardware" subparagraph below to suit Project if existing exposed hardware cannot be reused and matching hardware is unavailable.

Exposed Hardware: [**Reuse**] [**Match**] existing exposed window hardware.

Retain "Weather Stripping" subparagraph below if weather stripping is required. Formed in-place, sealant-bead weather stripping is included in the Section Text. See "Weather Stripping" Article in the Evaluations.

Weather Stripping: [**None**] [**Full-perimeter weather stripping for each operable sash**] [**Where indicated**] <**Insert requirement**>.

Retain "Date Identification" subparagraph below for historic treatment projects where differentiation of new materials from original materials is required.

Date Identification: Emboss on a concealed surface of each replaced window frame and sash, in easily read characters, "WINDOW MADE <**Insert year**>" or "SASH MADE <**Insert year**>." Manufacturer's name may also be embossed.

* + - 1. STORM WINDOWS

Retain this article if separate storm windows, fitted to the window opening, are required for historic treatment of steel windows. They should be specified as new construction in this Section or in a separate Section for new storm windows, and details should be included on Drawings. Revise this article if storm windows on the exterior are required.

* + - * 1. General: Custom fabricated, tight fitting to opening, and with operating and latching hardware.

Fabricate storm windows for installation [**inside of primary window**] [**and**] [**where indicated on Drawings**] <**Insert requirement**>.

Hardware: [**Match design reference sample**] [**As indicated on Drawings**] <**Insert requirement**>.

Glazing Material: [**Uncoated clear float glass**] [**Plastic glazing**] <**Insert requirement**>.

"Interior Aluminum Storm Windows" paragraph below describes separate, nonhistoric storm windows added on interior to improve energy efficiency and reduce sound transmission; revise to suit Project.

* + - * 1. Interior Aluminum Storm Windows: Fabricated from extruded aluminum to fit inside the window opening; finish as indicated; storm window frames not easily visible from exterior side of primary window.

Retain "Aluminum Finish" or "Baked-Enamel or Powder-Coated Finish" subparagraph below. Finish availability varies with manufacturer; verify availability of finish before specifying. If retaining more than one finish, indicate location of each on Drawings or by inserts.

Aluminum Finish: Manufacturer's standard [clear anodized] [light bronze anodized] [medium bronze anodized] [dark bronze anodized] [anodized color matching design reference sample] [anodized color matching Director’s Representative's sample] [anodized color as selected by Director’s Representative from manufacturer's full range] <Insert color>.

Baked-Enamel or Powder-Coated Finish: [**Color as indicated by manufacturer's designations**] [**Color matching design reference sample**] [**Color matching Director’s Representative's sample**] [**Color as selected by Director’s Representative from manufacturer's full range**] <**Insert color**>.

Third option in "Hardware" subparagraph below is available from one manufacturer.

Hardware: [**As indicated on Drawings**] [**As required to secure storm window to window opening**] [**Magnetic mounting**] [**Extruded-aluminum track slides at head and sill**] <**Insert requirement**>.

* + - 1. INSECT SCREENS

Retain this article if clip-on, replacement insect screens are required. These are interior-mounted screens for outward-operating sash, replacing screens that are missing or damaged beyond repair, and they are generally salvaged from old steel windows or custom manufactured to match appearance of existing screens.

First option in "Insect-Screen Frames" paragraph below describes historic-type steel window insect screens.

* + - * 1. Insect-Screen Frames: [**Formed sheet steel, custom fabricated or salvaged**] [**Custom-fabricated, extruded-aluminum**] unit, replicating appearance of existing insect-screen frames, that fits over and aligns with interior surface of steel window frame and screens the entire operable-sash opening; tight fitting against surface of window frame and removable; with a minimum of exposed fasteners and latches; and with wire fabric screening indicated below; finish as indicated; concealed from exterior view.

Frame Cross Section: [**Matching existing**] [**Rectangular**] [**As indicated on Drawings**] <**Insert requirement**>.

Connections: [**Matching existing**] [**Welded**] [**Splined**] <**Insert requirement**>.

Retain "Baked-Enamel or Powder-Coated Finish" subparagraph below for steel or aluminum frames. If retaining more than one finish, indicate location of each on Drawings or by inserts.

Baked-Enamel or Powder-Coated Finish: [**Color as indicated by manufacturer's designations**] [**Color matching design reference sample**] [**Color matching** Director’s Representative**'s sample**] [**Color as selected by Director’s Representative from manufacturer's full range**] <**Insert color**>.

Retain "Aluminum Finish" subparagraph below only for aluminum frames. If retaining more than one finish, indicate location of each on Drawings or by inserts.

Aluminum Finish: Manufacturer's standard [**light bronze anodized**] [**medium bronze anodized**] [**dark bronze anodized**] [**anodized color matching design reference sample**] [**anodized color matching Director’s Representative's sample**] [**anodized color as selected by** Director’s Representative **from manufacturer's full range**] <**Insert color**>.

* + - * 1. Screening:

Retain "Copper Wire Fabric," "Bronze Wire Fabric," or "Aluminum Wire Fabric" subparagraph below; revise or insert other screening material to suit Project.

Copper Wire Fabric: 16-by-16 count per sq. in. mesh of 0.011-inch- diameter, copper wire.

Bronze Wire Fabric: 18-by-14 count per sq. in. mesh of [**0.009-inch-** ] [**0.011-inch-** ] diameter, bronze wire with a clear varnish finish.

Aluminum Wire Fabric: 18-by-16 count per sq. in. mesh of 0.011-inch- diameter, coated aluminum wire; [**natural bright**] [**charcoal gray**] [**black**] finish.

* + - 1. STEEL-REPAIR MATERIALS

Revise option in "Steel Shapes" paragraph below if required. Where available, salvaged steel shapes from on-site or off-site sources are generally less expensive than making accurate shapes from new steel material.

* + - * 1. Steel Shapes: [**Use available salvage sources before using new steel materials**] <**Insert requirement**>.

Salvage Sources: Sound steel with no rust or only surface rust, straight, and with cross-sectional shapes matching existing steel shapes.

New Steel Plate, Shapes, and Bars: ASTM A36.

Revise "Steel-Patching Compound" paragraph below to suit Project. Depending on use and strength required, polyester-based patching compounds may be acceptable.

* + - * 1. Steel-Patching Compound: Two-part, metal-filled epoxy resin, steel-patching compound; knife-grade formulation as recommended in writing by manufacturer for types of repair indicated, tooling time required for detail of work, and site conditions. Compound to be produced for filling metal that has deteriorated due to corrosion. Filler to be capable of filling deep holes and spreading to featheredge.

Source Limitations: Obtain steel-patching compound from single source from single manufacturer.

* + - 1. GLAZING MATERIALS
				1. Glass:

Retain one of three subparagraphs below if required; revise to suit Project. Retain first subparagraph if requirements for glass in steel windows are specified entirely in Section 088000 "Glazing." Retain second if type of glass is specified in this Section by referencing glass types in Section 088000 "Glazing" and terms are coordinated. Retain third to specify glass and glazing materials entirely in this Section. If more than one type of glass is required, indicate location of each on Drawings or by inserts.

See Section 088000 "Glazing."

[**Uncoated, clear float-glass units**] [**Uncoated, clear laminated glass units with two float-glass plies of 3.0 mm and an interlayer thickness of 0.030 inch** ] [**Clear insulating-glass units**] [**Low-E, clear insulating-glass units**] [**Glass Type GL-xx units**] <**Insert description**> in accordance with Section 088000 "Glazing."

<**Insert requirements**>.

Retain "Plastic Glazing" paragraph below if plastic glazing is required.

* + - * 1. Plastic Glazing: [**Uncoated, monolithic acrylic**] [**Coated, monolithic acrylic**] [**Uncoated, monolithic polycarbonate**] [**Abrasion- and UV-resistant, monolithic polycarbonate**] [**UV-resistant, monolithic polycarbonate**] <**Insert description**> sheet in accordance with Section 088400 "Plastic Glazing."

Retain "Glazing Systems" paragraph below with "Glass" or "Plastic Glazing" paragraph above; revise to suit Project.

* + - * 1. Glazing Systems:

Retain "Traditional Glazing Products" subparagraph below for a historic method of securing glass in frames. The "GANA Glazing Manual" advises that "putty or glazing compound should not be used to glaze laminated or insulating glass." Some manufacturers also limit product use to exclude plastic glazing, stained glass (leaded), and panes measuring more than 48 inches.

Traditional Glazing Products: Glazing clips and oil-based glazing putty or latex glazing compound.

Source Limitations: Obtain glazing materials from single source from single manufacturer.

Retain "Modern Glazing Products" or "Modern Glazing with Stops" subparagraph below for modern methods of securing glass in frames; revise to suit Project.

Modern Glazing Products: Glazing clips and single-component polyurethane glazing compound; ASTM C920, Type S, Grade NS, Class 25, Use G; struck uniformly to match taper of existing glazing putty (removed); colored as required to match painted sash.

Modern Glazing with Stops: Custom-retrofitted, wedge-shaped, galvanized-steel stops (matching taper of existing glazing putty); painted to match painted sash; and mechanically attached at equal intervals maximum 12 inches o.c.; with mitered corners and butyl glazing tape on both sides of glass.

Primers and Cleaners for Glazing: As recommended in writing by glazing material manufacturer.

* + - 1. HARDWARE
				1. Window Hardware: Provide complete sets of window hardware consisting of hinges, pulls, latches, and accessories indicated for each window or required for proper operation. Sets to include replacement hardware to complement repaired and refinished existing hardware. Window hardware to smoothly operate, tightly close, and securely lock steel windows and be sized to accommodate sash weight and dimensions.
				2. Other Hardware: Provide complete sets of hardware for each type of [**insect screen**] [**and**] [**storm window**] consisting of catches, pulls, latches, and accessories indicated or required for proper operation. Hardware to smoothly operate, tightly close, and secure units appropriately for unit weight and dimensions.
				3. Replacement Hardware: Replace existing damaged or missing hardware with [**hardware from salvage sources**] [**or**] [**newly manufactured hardware**].
				4. Material and Design:

Revise "Material" and "Design" subparagraphs below to suit Project. If retaining more than one material or design, indicate location of each on Drawings or by inserts.

Material: [**Solid bronze of alloy indicated**] [**Cast or wrought aluminum**] [**Nonmagnetic stainless steel**] <**Insert material**> unless otherwise indicated.

Retain one of two options in "Design" subparagraph below, or both. If retaining both, indicate location of each on Drawings or by inserts. First option is more restrictive and expensive.

Design: [**Custom hardware to replicate**] [**Match type and appearance of**] existing hardware.

Replacement Window Hardware: Match existing window hardware of the following types:

Revise first four subparagraphs below to suit Project.

Casement window hinges.

Projected window hinges.

Window latch.

Handle.

<**Insert hardware type**>.

Retain "Date Identification" subparagraph below for historic treatment projects where differentiation of new manufactured materials from original materials is required.

Date Identification: Emboss on a concealed surface of the metal body of each new hardware item, in easily read characters, "MADE <**Insert year**>." Manufacturer's name may also be embossed.[**For cast iron or other brittle metals, add the identification to the mold pattern before casting.**][**For malleable metals, stamp identification with an imprinting tool.**]

* + - * 1. Hardware Finishes: Comply with BHMA A156.18 for base material and finish requirements indicated by the following:

Retain one or more finish designations from subparagraphs below. If retaining more than one, indicate location of each on Drawings or by inserts.

BHMA 605: Bright brass, clear coated; brass base metal.

BHMA 606: Satin brass, clear coated; brass base metal.

BHMA 611: Bright bronze, clear coated; bronze base metal.

BHMA 612: Satin bronze, clear coated; bronze base metal.

BHMA 613: Dark-oxidized satin bronze, oil rubbed; bronze base metal.

BHMA 624: Dark-oxidized statuary bronze, clear coated; bronze base metal.

BHMA 628: Satin aluminum, clear anodized; aluminum base metal.

BHMA 630: Satin stainless steel; stainless steel base metal.

BHMA 689: Aluminum painted; over any base metal.

<**Insert finish or special custom finish**>.

* + - 1. WEATHER-STRIPPING MATERIALS

Retain this article if formed-in-place, sealant-bead weather stripping is required. Revise for other weather-stripping materials, such as spring-metal-type, vinyl weather stripping or compressible foam tape if required. See "Weather Stripping" Article in the Evaluations.

* + - * 1. Sealant: Multicomponent, nonsag, neutral-curing silicone joint sealant; ASTM C920, Type M, Grade NS, for Use NT; color to match window frame.
				2. Bond-Breaker Strip: Polyethylene tape or other plastic tape to which sealant does not adhere, as recommended in writing by sealant manufacturer; width as required to fully cover mating joint between sash and frame.
			1. MISCELLANEOUS MATERIALS
				1. Detergent Solution: Prepared by mixing 2 cups of tetrasodium pyrophosphate, 1/2 cup of laundry detergent that contains no ammonia, 5 quarts of 5 percent sodium hypochlorite bleach, and 15 quarts of warm water for each 5 gal. of solution required.

Product in "Rust Remover" paragraph below is commonly used to convert reddish-brown iron oxide into a water-soluble, black, iron phosphate compound that is easier to remove and resists further corrosion. Other rust removal products are also available; revise to suit Project.

* + - * 1. Rust Remover: [**Manufacturer's standard phosphoric acid-based gel formulation, also called "naval jelly," for removing corrosion from iron and steel**] <**Insert requirement**>.

Retain "Antirust Coating" paragraph below if removing window frame and painting steel subframe in place. Retain first option if using MPI standards to specify paints. MPI #23 is a performance-based alkyd coating that may or may not contain zinc. SSPC-Paint 20 and SSPC-Paint 29 are zinc-rich coatings.

* + - * 1. Antirust Coating: Fast-curing, lead- and chromate-free, self-curing, universal modified-alkyd primer in accordance with [**MPI #23 (surface-tolerant, anti-corrosive metal primer)**] [**or**] [**SSPC-Paint 20 or SSPC-Paint 29**] <**Insert requirement**>.

Coordinate surface-preparation standard in "Surface Preparation" subparagraph below with surface-preparation standard in "Shop Repair of Windows Frames and Subframe Repair" Article. If known, consider inserting manufacturer's name and product name.

Surface Preparation: Use coating requiring no better than [**SSPC-SP 2, "Hand Tool Cleaning"**] [**SSPC-SP 3, "Power Tool Cleaning"**] [**or**] [**SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning"**] <**Insert surface-preparation standard**> surface preparation in accordance with manufacturer's literature or certified statement.

Limit in "VOC Limit" subparagraph below is the EPA limit for rust-preventive architectural coatings.

VOC Limit: Use coating with a VOC content of [**400 g/L**] <**Insert VOC limit**> or less when calculated in accordance with 40 CFR 59, Subpart D (EPA Method 24).

* + - * 1. Fasteners: Use fastener metals that are noncorrosive and compatible with each material joined.

Match existing fasteners in material and type unless otherwise indicated.

Use concealed fasteners to attach items to other work unless exposed fasteners are [**unavoidable**] [**or**] [**the existing fastening method**].

For fastening metals, use fasteners of same basic metal as fastened metal unless otherwise indicated.

Revise first subparagraph below if another type of head is required.

For exposed fasteners, use Phillips-type machine screws of head profile flush with metal surface unless otherwise indicated.

Finish exposed fasteners to match finish of metal fastened unless otherwise indicated.

* + - * 1. Anchors, Clips, and Accessories: Fabricate anchors, clips, and window accessories of nonmagnetic stainless steel or hot-dip zinc-coated steel complying with requirements in ASTM B633 for SC 3 (Severe) service condition.
			1. STEEL WINDOW FINISHES

Retain one of or more paragraphs in this article; revise to suit Project. If retaining more than one, indicate location of each on Drawings or by inserts.

Retain "Shop-Primed Replacement Units" paragraph below if prime-coated replacement window frames or sash are required.

* + - * 1. Shop-Primed Replacement Units: [**Manufacturer's standard**] <**Insert requirement**> shop-prime coat on exposed surfaces; compatible with indicated finish coating.

Retain "Site-Finished Units" paragraph below if site-finished replacement window frames or sash are required. Copy paragraph and revise for multiple finishes on the same project; indicate locations of each on Drawings or by inserts.

* + - * 1. Site-Finished Units: [**High-performance, pigmented, polyurethane-over-epoxy**] [**Alkyd**] [**Latex**] <**Insert system type**> finish system consisting of [**primer and two finish coats**] <**Insert requirement**> on exposed exterior and interior surfaces.

Retain second option in "Finish Coats" subparagraph below if shop-finished windows are adjacent to site-finished windows and identical coating materials are required as a means to ensure similar weathering characteristics.

Finish Coats: [**Manufacturer's standard.**] [**Match intermediate coat and topcoat products used for adjacent, repaired steel windows, as specified in Section 090391 "Historic Treatment of Plain Painting."**] <**Insert requirement.**>

Retain "Shop-Finished Units" paragraph below if shop-finished replacement window frames or sash are required. Copy paragraph and revise for multiple finishes on the same project; indicate locations of each on Drawings or by inserts.

* + - * 1. Shop-Finished Units: [**Baked-enamel or powder-coated**] [**High-performance, pigmented, polyurethane-over-epoxy**] [**Alkyd**] [**Latex**] <**Insert system type**> finish system consisting of [**primer and two finish coats**] <**Insert requirement**> on exposed exterior and interior surfaces.

Retain second option in "Finish Coats" subparagraph below if shop-finished windows are adjacent to site-finished windows and identical coating materials are required as a means to ensure similar weathering characteristics.

Finish Coats: [**Manufacturer's standard.**] [**Match intermediate coat and topcoat products used for adjacent, repaired steel windows, as specified in Section 090391 "Historic Treatment of Plain Painting."**] <**Insert requirement.**>

Munsell Color and Plochere Color System numbers in "Color and Gloss" subparagraph below are examples only. Munsell Color and Plochere Color Systems are discussed in the Evaluations in Section 090391 "Historic Treatment of Plain Painting."

Color and Gloss: Match [**Munsell Color 10 G 8/2**] [**Plochere Color System #8da399**] [**colors indicated on Historic Structure Report**] [**colors indicated on Drawings**] <**Insert color(s) or requirement**>.

1. EXECUTION
	* + 1. HISTORIC TREATMENT SPECIALIST

Retain this article if list of preapproved firms is used as quality-control procedure.

If retaining second option in "Historic Treatment Specialist Firms" paragraph below, include procedure for approving other firms in Document 002213 "Supplementary Instructions to Bidders.

* + - * 1. Historic Treatment Specialist Firms: Subject to compliance with requirements, [**provide historic treatment of steel windows by one of the following**] [**firms that may provide historic treatment of steel windows include, but are not limited to, the following**]:

<**Insert, in separate subparagraphs, names of historic treatment specialist firms**>.

* + - 1. PREPARATION
				1. Protect adjacent materials from damage by historic treatment of steel windows.
				2. Clean steel windows of mildew, algae, moss, plant material, loose paint, grease, dirt, and other debris by scrubbing with bristle brush or sponge and detergent solution. After cleaning, rinse thoroughly with fresh water. Allow to dry before repairing or painting.
			2. HISTORIC TREATMENT OF STEEL WINDOWS, GENERAL

Retain "Historic Treatment Appearance Standard" paragraph below to control overall appearance from a distance.

* + - * 1. Historic Treatment Appearance Standard: Completed work is to have a uniform appearance as viewed by Architect from the window interior at [**5 ft.** ] [**10 ft.** ] <**Insert distance**> away and from the window exterior at [**20 ft.** ] [**50 ft.** ] <**Insert distance**> away.
				2. General: In treating historic items, disturb them as minimally as possible and as follows:

Stabilize and repair steel windows to reestablish structural integrity and weather resistance while maintaining the existing form of each item.

Remove coatings from accessible surfaces in accordance with Section 090391 "Historic Treatment of Plain Painting" unless otherwise indicated.

Repair items in place where possible unless otherwise indicated.

Repaint historic steel windows in accordance with Section 090391 "Historic Treatment of Plain Painting" unless otherwise indicated.

* + - * 1. Mechanical Abrasion: Do not use abrasive methods, such as sanding, wire brushing, or power tools, except as indicated as part of historic treatment program and as approved by Architect.

Retain "Repair and Refinish Existing Hardware" paragraph below if required; revise to suit Project.

* + - * 1. Repair and Refinish Existing Hardware: Dismantle window hardware; strip paint, repair, and refinish it to match finish samples; and lubricate moving parts just enough to function smoothly.
				2. Repair Steel Windows: Match existing materials and features, retaining as much original material as possible to perform repairs.

Unless otherwise indicated, repair steel windows by patching, splicing, or otherwise reinforcing steel with new or salvaged steel members.

Where indicated, repair steel windows by limited replacement matching existing material.

* + - * 1. Replace Steel Units: Where indicated, duplicate, and replace units with units made from salvaged, sound, steel windows and their components or with new steel shapes matching size and form of existing shapes.

Retain one of two subparagraphs below. Indicate on Drawings or in the Historic Steel Window Schedule where substitute materials may or may not be used. If retaining second subparagraph, insert requirements for substitute materials in Part 2.

Do not use substitute materials unless otherwise indicated.

Compatible substitute materials may be used.

* + - * 1. Protection of Openings: Where sash or windows are indicated for removal, cover resultant openings with temporary enclosures so that openings are weathertight during repair period.
				2. Identify removed windows, frames, sash, and components with numbering system corresponding to window locations to ensure reinstallation in same location. Key windows, frames, sash, and components to Drawings showing location of each removed unit. Permanently label units in a location that will be concealed after reinstallation.
			1. STEEL WINDOW STRAIGHTENING
				1. Remove glass, weather stripping, and interfering hardware from sash. Remove paint buildup from between sash and frame.
				2. Using shims and gentle pressure, align and straighten sash and frame to close completely and snugly against each other, around entire perimeter of sash.
				3. Straighten and adjust hinges, latches, and other hardware so that sash and frame remain snugly against each other along entire perimeter of sash in closed and latched position.
			2. RUST REMOVAL

Method in "Chemical Rust Removal" paragraph below is commonly used to convert reddish-brown iron oxide (rust) into a water-soluble, black, iron phosphate compound that is easier to remove and resists further corrosion.

* + - * 1. Chemical Rust Removal:

Remove loose rust scale with tools and abrasives to sound metal or firmly adhered rust residue. Vacuum debris from cavities.

Apply rust remover with brushes or as recommended in writing by manufacturer.

Allow rust remover to remain on surface for period recommended in writing by manufacturer or as determined by preconstruction testing. Do not allow extended dwell time.

Wipe off residue with mineral spirits and steel wool or soft rags, or clean with method recommended in writing by manufacturer to remove residue.

Dry immediately with clean, soft cloths. Follow direction of grain in metal.

Prime immediately to prevent rust. Do not touch cleaned metal surface until primed.

Method in "Mechanical Rust Removal" paragraph below is labor intensive but avoids the use of harsh chemicals.

* + - * 1. Mechanical Rust Removal:

Remove rust with tools and abrasives. Vacuum debris from cavities.

Wipe off residue with mineral spirits and steel wool or soft rags.

Dry immediately with clean, soft cloths. Follow direction of grain in metal.

Prime immediately to prevent rust. Do not touch cleaned metal surface until primed.

Methods in "In-Shop Rust and Paint Removal" paragraph below are performed in the controlled environment of a workshop; methods can be quicker and more thorough at removing both rust and paint.

* + - * 1. In-Shop Rust and Paint Removal: Remove rust and paint in shop by [**chemical or mechanical methods**] [**sandblasting**] [**dipping in chemical bath**] [**or**] [**methods indicated in the historic treatment program and as approved by** Director’s Representative].

Dry immediately with clean, soft cloths. Follow direction of grain in metal.

Prime immediately to prevent rust. Do not touch cleaned metal surface until primed.

* + - 1. STEEL WINDOW PATCH-TYPE REPAIR

Indicate on Drawings where steel windows are to be patched; otherwise, the historic treatment specialist generally decides.

* + - * 1. General: Patch steel members that exhibit depressions, nonstructural holes, and corrosion.

Revise first subparagraph below to suit Project.

Remove sash and screens from frame before performing patch-type repairs at meeting surfaces unless otherwise indicated.

Verify that surfaces are sufficiently clean and free of paint residue in accordance with steel-patching-compound manufacturer's written instructions prior to patching.

* + - * 1. Remove rust down to sound, rust-free material.
				2. Apply steel-patching compound to fill depressions, nicks, cuts, and other voids created by rusted, removed, or missing steel.

Mix only as much patching compound as can be applied in accordance with manufacturer's written instructions.

Apply patching compound in layers as recommended in writing by manufacturer until void is completely filled.

Finish patch surface smooth and flush with adjacent steel, without voids in patch material, and matching contour of steel member.

Clean spilled compound from adjacent materials immediately.

* + - * 1. Verify that patch repairs do not interfere with snug fit of sash and frame against each other along entire perimeter of sash in closed and latched position. If they do, modify the patch repair or restraighten window as required.
			1. STEEL WINDOW MEMBER-REPLACEMENT REPAIR

Indicate on Drawings or in the Historic Steel Window Schedule where steel windows are to have parts or entire steel window members replaced; otherwise, the historic treatment specialist generally decides.

* + - * 1. General: Replace parts of or entire steel window members at locations [**indicated on Drawings**] [**indicated in the Historic Steel Window Schedule**] [**and**] [**where damage is too extensive to patch**] <**Insert requirement**>.

Revise subparagraphs below to suit Project.

Remove sash and screens from window frames before performing member-replacement repairs unless otherwise indicated.

Verify that surfaces are sufficiently clean and free of paint residue prior to repair.

Straighten window as specified in "Steel Window Straightening" Article.

Remove rust and broken steel down to sound, rust-free material.

Cut out structurally weakened sections.

Custom fabricate new steel of same size, thickness, and shape as cut-out material to replace missing steel; either replace entire steel member or splice new steel part into existing member.

Weld or braze replacement material in place and grind the repair smooth and flush with adjoining metal or filled metal as applicable.

If replacement metal sections of original cross section cannot be found from salvage sources, weld flat plates into a built-up section.

* + - * 1. Repair remaining depressions, holes, or similar voids with patch-type repairs.
				2. Clean spilled materials from adjacent surfaces immediately.

Revise "Glazing" paragraph below to suit Project. Glazing clips may need to be modified from existing historic design profile to accommodate insulating glass.

* + - * 1. Glazing: Provide replacement glazing clips coordinated with glazing system indicated.
				2. Reinstall units removed for repair into original openings.
				3. Verify that member-replacement repairs do not interfere with snug fit of sash and frame against each other along entire perimeter of sash in closed and latched position. If they do, modify the member-replacement repair or restraighten window as required.
			1. SHOP REPAIR OF WINDOW FRAMES AND SUBFRAME REPAIR

Retain this article if window frames are to be removed during the Work; revise to suit Project. It is best to indicate where or under what conditions the frames are to be removed; otherwise, the historic treatment specialist may not remove window frames.

* + - * 1. Remove window frames[**where indicated**] and sash from wall before performing window straightening, rust removal, patch-type repairs, and member-replacement repairs as required.
				2. Remove rust in shop.
				3. Perform other required historic treatment work.
				4. Subframe: On-site, examine subframe exposed by window frame removal. Protect adjacent materials and remove rust from exposed subframe.

Prepare and paint exposed subframe on-site as follows:

Surface Preparation: Remove paint, rust, and other contaminants in accordance with [**SSPC-SP 2, "Hand Tool Cleaning,"**] [**SSPC-SP 3, "Power Tool Cleaning,"**] [**or**] [**SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning,"**] <**Insert surface-preparation standard,**> as applicable in accordance with coating manufacturer's written instructions.

Antirust Coating: Immediately paint exposed steel with two coats of antirust coating, following coating manufacturer's written instructions and without exceeding manufacturer's recommended rate of application (dry-film thickness per coat).

Clean spilled materials from adjacent surfaces immediately.

Consult Project structural engineer about option in paragraph below; revise to suit Project.

* + - * 1. If on inspection and rust removal, the thickness of a steel member is found to be reduced from rust by more than [**1/16 inch** ] <**Insert dimension**>, notify Director’s Representative before proceeding.
			1. GLAZING
				1. Comply with combined written instructions of glass, glazing system, and glazing material manufacturers, unless more stringent requirements are indicated.

Retain one of first three paragraphs below; revise to suit Project. Retain first paragraph if some window lites will not be reglazed and Contractor will make the evaluation. Retain second if some window lites will not be reglazed and replacements are indicated on Drawings or scheduled. Retain third if all windows are to be reglazed with new glass. Historic glass is often replaced with laminated or insulating glass for energy savings. Determine if historic glass, whether sound or cracked, is to be removed and disposed of.

* + - * 1. Remove cracked and damaged glass and glazing materials from openings and prepare surfaces for reglazing.
				2. Remove existing glass and glazing where indicated [**on Drawings**] [**in the Historic Steel Window Schedule**], and prepare surfaces for reglazing.
				3. Remove glass and glazing from openings and prepare surfaces for reglazing.
				4. Prime steel, including glazing rabbets, with finish-paint primer before installing glass.
				5. Size glass as required by Project conditions to provide necessary bite on glass and minimum edge and face clearances with reasonable tolerances.
				6. Apply primers to joint surfaces where required for adhesion of glazing system, as determined by preconstruction testing.
				7. Install setting bead, side beads, and back bead against stop in glazing rabbets before setting glass.

Retain first paragraph below; revise to suit Project. Insert additional paragraphs below if required for special glass types, such as irregular blown glass, stained glass, and curved glass, and for unusual installation conditions.

* + - * 1. Install glass with proper orientation so that coatings, if any, face exterior or interior as required.
				2. Install glazing clips or stops as required for glazing system.
				3. Disposal of Removed Glass: [**Remove from** Director ‘Representative**'s property and legally dispose of it**] [**Protect unbroken lites and deliver as salvage to** Director ‘Representative  **for storage where directed**] <**Insert requirement**> unless otherwise indicated.
			1. STEEL WINDOW UNIT REPLACEMENT

Retain this article if window frames or sash units are to be replaced with replicated steel window frames or sash units to match existing units.

* + - * 1. General: Replace existing [**window frame**] [**and**] [**sash**] units with replicated steel units to match existing at locations [**indicated on Drawings**] [**indicated in the Historic Steel Window Schedule**] [**and**] [**where damage is too extensive to repair**] <**Insert requirement**>.
				2. Install units, hardware, accessories, and other components[**as indicated on Drawings**].
				3. Install units level, plumb, square, true to line, without distortion or impeding movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction.
				4. Metal Protection: Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

Retain "Anchor Concealment" paragraph below if required to match existing windows; revise to suit Project.

* + - * 1. Anchor Concealment: Fill screw head depressions flush and smooth with paintable putty after window installation, spot prime, and paint.
				2. Disposal of Removed Units: [**Remove from** Director ‘Representative**'s property and legally dispose of**] [**Deliver as salvage to** Director ‘Representative  **for storage where directed**] <**Insert requirement**>.
			1. INSTALLATION OF STORM WINDOWS

Retain this article for storm windows; revise to suit Project.

* + - * 1. Install interior aluminum storm windows at each window opening[**indicated**].
				2. Install units by mounting to window opening[**as indicated on Drawings and**] in accordance with manufacturer's written instructions.
			1. INSTALLATION OF INSECT SCREENS

Retain this article if applicable; revise to suit Project. If retaining second option in first paragraph below, indicate on Drawings where insect screens are required.

* + - * 1. Install insect screen [**for each outward-acting sash**] [**where indicated**] <**Insert requirement**>.

Locate insect-screen frames on inside of window.

Install insect-screen frames by securing with metal twist clips to window frame.

Retain first paragraph below if required; revise to suit Project.

* + - * 1. Replace existing insect screening; remove it from Director ‘Representative's property.
				2. Install insect screening to be smooth, flat, and uniformly taut.
			1. INSTALLATION OF WEATHER STRIPPING

Retain this article if formed-in-place, sealant-bead weather stripping is required. Revise for other weather-stripping materials, such as spring-metal-type, vinyl weather stripping or compressible foam tape if required. See "Weather Stripping" Article in the Evaluations.

* + - * 1. General: Install weather stripping for tight seal between sash and frame as determined by preconstruction testing and demonstrated in benchmark.
				2. Application: Apply continuous bead of sealant to window frame surface against which sash frame closes. Cover applied sealant with bond-breaker strip, fully close sash, and latch in closed position. Remove extruded sealant if any.
				3. Curing: Allow sealant to cure in closed-window joint for [**28 days**] <**Insert requirement**> unless otherwise recommended in writing by sealant manufacturer.
				4. Removing Bond-Breaker Strip: After curing time, gently open window and remove bond-breaker strip. Verify that weather stripping is continuous and neat, without spillage on other surfaces. Remove spillage if any. Wipe down joint sides with damp cloth and close sash. Verify full closure.
			1. ADJUSTMENT
				1. Adjust existing and replacement operating sash, insect screens, hardware, weather stripping,[**storm windows,**] and accessories for a tight fit at contact points and weather stripping for smooth operation and weathertight closure. Lubricate hardware and moving parts.
			2. CLEANING AND PROTECTION
				1. Protect window surfaces from contact with contaminating substances resulting from construction operations. Monitor window surfaces adjacent to and below exterior concrete and masonry during construction for presence of dirt, scum, alkaline deposits, stains, or other contaminants. If contaminating substances contact window surfaces, remove contaminants immediately.
				2. Clean exposed surfaces immediately after historic treatment of steel windows. Avoid damage to coatings and finishes. Remove excess sealants, glazing and repair materials, dirt, and other substances.
				3. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.
			3. HISTORIC STEEL WINDOW SCHEDULE

This schedule demonstrates a method to indicate historic treatment requirements for steel windows. A schedule helps to prevent confusion where Project includes several items of varying sizes, characteristics, and complexities; where extensive drawing notations would otherwise be needed; and where direction by a historic treatment specialist is considered insufficient. The design professional must decide what to include in a schedule and what should be indicated on Drawings. This schedule is an example only; revise to suit Project. See the Evaluations for another form of schedule and discussion of photographic details annotated with the required historic treatments.

Insert drawing designation for each window and item to be treated and indicate the methods of treatment that apply to the item. Include window number in each drawing designation. Use these designations on Drawings to identify locations of each window.

"Historic Steel Window( HWS-1)" paragraph below is for a variety of steel window repairs; revise to suit Project. Copy paragraph and re-edit for different windows and types of repairs at each window.

* + - * 1. Historic Steel Window[**HSW-1**] <**Insert drawing designation**>: Combination [**casement**] [**dual casement**] [**hopper**] [**awning**] [**and**] [**fixed**] <**Insert description**> window assembly.

Retain one or more of 13 subparagraphs below if required; revise to suit Project.

General: Repair window assembly using indicated treatments. Repair windows [**on-site**] [**or**] [**off-site**] <**Insert requirement**>.

Paint Removal for Dismantled Units: Dip dismantled units in chemical bath off-site.

Paint Removal in Place: [**Alkaline-paste paint remover**] [**Covered or skin-forming alkaline paint remover**] [**Solvent-type paste paint remover**] [**Low-odor, solvent-type paint remover**] [**Covered, low-odor, solvent-type paint remover**] <**Insert method**> as specified in Section 090391 "Historic Treatment of Plain Painting."

Rust Removal: [**Chemical**] [**Mechanical**] <**Insert method**>.

"Window Subframe Repair" subparagraph below is for on-site repair of steel subframe, which is visible only when window frame is removed from window opening. Delete if window frame is repaired in place. Option is typical for most conditions; other repairs may be covered by a unit price or require Contract modification.

Window Subframe Repair: [**Remove rust and prime**] <**Insert repair description**>.

"Window Frame Repair" subparagraph below is for repairing steel frame treated as a unit. Revise if steel frame repair is by treatment of individual parts.

Window Frame Repair: [**Patch-type repairs**] [**Whole or partial member-replacement repairs**] [**and**] [**tighten remaining bolts and replace missing bolts to secure frame to subframe**] <**Insert repair description**>.

"Window Frame Member Repair" subparagraph below is for repairing steel frame parts treated individually; copy and revise as needed for each part. Delete if repairing window frame as a unit.

Window Frame Member Repair: Repair [**head**] [**jambs**] [**sill**] [**and**] [**intermediate mullions**] with [**patch-type repairs**] [**and**] [**whole or partial member-replacement repairs**]. Re-anchor the [**head**] [**jambs**] [**sill**]. <**Insert repair description**>.

First subparagraph below is for repairing sash or other items treated as a unit. Delete if sash or item repair is by treatment of individual parts.

[**Sash**] <**Insert item**> Repair: [**Patch-type repairs with sash removed from opening**] [**Patch-type repairs in place**] [**and**] [**whole or partial member-replacement repairs**] <**Insert repair description**>.

First subparagraph below is for repairing sash or other item's parts treated individually; copy and revise as needed for each part. Delete if repairing window sash or other items as whole units.

[**Sash**] <**Insert item**> Member Repair: Repair [**stile**] [**rails**] [**and**] [**muntins**] <**Insert component**> with [**patch-type repairs**] [**and**] [**whole or partial member-replacement repairs**].

First subparagraph below is for replacing sash or other item; revise if only one of two or more sash or other items in Project is to be replaced. Delete if all window sashes or other items are repaired.

[**Sash**] <**Insert item**> Replacement: Remove existing sash units for replacement with custom-fabricated replicated units.

Straightening: [**Straighten sash and frame for snug fit**] <**Insert repair description**>.

Repair and Refinish Hardware: [**Projected window hinge**] [**Window latch**] [**Handle**] <**Insert hardware type**>.

Replace Hardware: [**Window latch**] [**Handle**] [**Projected window hinge**] <**Insert hardware type**>.

"Historic Steel Window( HWS-2)" paragraph below is for steel windows to be removed and replaced with replicated steel windows or with new, replacement steel windows; revise to suit Project. Copy paragraph and re-edit for different windows and types of replacements at each window location.

* + - * 1. Historic Steel Window[**HSW-2**] <**Insert drawing designation**>: Combination [**casement**] [**dual casement**] [**hopper**] [**awning**] [**and**] [**fixed**] <**Insert window description**> window assembly.

Retain one or more of five subparagraphs below if required; revise to suit Project.

General: Remove steel window completely, including window frame and sash, and replace with custom-fabricated [**replicated**] [**new replacement**] window.

Retain "Replicated Window" or "New Replacement Steel Window" subparagraph below.

Replicated Window: As specified in this Section.

New Replacement Steel Window: See [**Section 085123.13 "Hot-Rolled Steel Windows."**] [**Section 085123.23 "Cold-Rolled Steel Windows."**]

Finishing: See [**Section 090391 "Historic Treatment of Plain Painting."**] <**Insert Section number and title.**>

Hardware: [**Window latches**] [**Handle**] [**Projected window hinge**] <**Insert hardware type**>.

END OF SECTION 080351.23