BERNARDON

ARCHITECTURE
INTERIOR DESIGN
LANDSCAPE ARCHITECTURE

ADDENDUM No.: 01

Project Name:	Renovations and Restoration of Stable Building and Greenhouse/Garage Building at Buena Vista Conference Center State of Delaware Contract Number: MJ2006000001
Project No.:	8306.00-15
Date of Issue:	September 29, 2016
Notice No. 1:	Attach this addendum to the Project Manual for this project. It modifies and becomes part of the Bidding Documents. Work or material not specifically mentioned herein is to be as described in the main body of the specification and as shown on the drawings.
Bids Due:	Thursday, October 6, 2016 by 11:00AM Division of Facilities Management Thomas Collins Building 540 South DuPont Highway, Suite 1, Dover, DE 19901

The purpose of the meeting was for a mandatory pre-bid meeting for the renovation of the existing fourth floor restrooms in the Carvel Building and to lay out the procedures that will be followed during the project.

Location:	Buena Vista Conference Center Pole Barn
Date of Meeting:	September 21, 2016, 10:00 AM
Present for:	<u>State of Delaware</u> Lynn Riley – Department of Historic and Cultural Affairs (DHCA) Courtney Lynahan – Department of Historic and Cultural Affairs (DHCA) Ed Gillespie – Department of Historic and Cultural Affairs (DHCA) Larry Schrock – Office of Management and Budget (OMB) Mike Travers – Office of Management and Budget (OMB) <u>Contractors</u> Shannon Gerardi – Gerardi Construction Inc. (GCI) Paul Steiner – Paul's Pointing Inc. (PPI) Rick Pearcy – Amakor, Inc. (AI) Larry Bathon – Bathon Builders Inc. (BBI) Brian Smith – BSS Contractors (BSS) Ryan Sarnecky – Tangent Cable Systems (TCS) Matt Papa – PGC Roofing Inc. (PRI) Stephen Jackson – Green Diamond Builders (GDB)

Frank Lerro – Whiting-Turner (W-T)
Matt Tarr – GES
Wayne Comegys – Delcollo Electrical (DE)
Jason Brown – Superior Electric (SE)
Jim Orga – First State Electrical (FSE)
Louis Deldeo – Deldeo Builders Inc. (DBI)
Bill Booth – Commonwealth Construction Co. (CCC)
B. Scott Schurman – BRS Consulting Inc. (BRS)

Baker, Ingram & Associates (BIA)
A. Paynter Ingram

DEDC
Matt Lano

Bernardon
Douglas A. Eriksen, AIA

The following items were discussed:

1.01 It was stated that bids are due Thursday, October 6, 2016 at 11:00am at Division of Facilities Management, Thomas Collins Building, Suite 1, 540 South DuPont Highway, Dover, DE 19901.

1.02 Besides those items listed in the project manual, Contractors must include a copy of their Delaware Business license, drug testing affidavit, and acknowledgement of addendum with their bids. Failure to do so will be grounds for immediate decline of the bid. A drug testing affidavit is required for the GC as well as each of their sub-contractors.

1.03 Contractors shall submit two copies of their bids, one original and one copy. They will only be required to submit one copy of the drug testing affidavit(s)

1.04 All work will be performed between 8:30am and 4:30pm when they have staff on site. Other accommodations may be reviewed on as needed basis.

1.05 Bernardon directed all contractors to review Section 01 14 00 – Work Restrictions included in the specifications.

1.06 The Contractor shall notify the State one (1) week prior to start of construction/demolition so that they have time to notify other tenants on the property.

1.07 Prior to mobilization the Contractor should submit shop drawings and cut sheets for review and approval.

1.08 DHCA requested that they be notified prior to scheduling of any excessively noisy work so that they may coordinate with events occurring at the adjacent "Pole Barn" and reschedule work if something important comes up.

1.09 It was determined that contractors shall list their sub-contractors for site, masonry, carpentry, painting, electrical, HVAC, and plumbing on the bid form.

1.10 1.15 The pre-bid meeting included a walk-thru of the stable, the garage, and the greenhouse.

1.11 Pre-Bid Meeting sign-in sheet is attached.

1.12 Insert into the Project Manual in their entirety the following attached specification sections:

Section 042199 Brick Masonry Restoration
Section 064013 Exterior Architectural Woodwork Restoration
Section 073129 Wood Shingle Roofing
Section 075216 SBS-Modified Bituminous Membrane Roofing
Section 076200 Sheet Metal Flashing
Section 079200 Joint Sealants
Section 080152 Wood Window Restoration
Section 088000 Restoration Glass and Glazing
Section 092250 Exterior Lime Plaster
Section 099113 Exterior Painting

1.13 Replace drawing ES-100 with the attached ES-100 dated 9/29/16 in the revision block.

The meeting was adjourned at 11:00.

SECTION 04 21 99 – BRICK MASONRY RESTORATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 DESCRIPTION

A. This Section includes the following:
   1. Stable:
      a. Repointing of existing brick masonry
      b. Repointing of existing stone masonry.
      c. Spot brick replacement using custom size, replicate bricks.
      d. Rebuilding of brick masonry.
      e. Removal of brick infill panels at existing masonry openings.
      f. Remove and salvage existing ground gutter bricks and rebuild ground gutters using salvaged and new replicate bricks.
      g. Crack repairs in existing brick masonry.
      h. Stone sill at existing masonry opening.
   2. Greenhouse:
      a. Repointing of existing brick masonry.
      b. Spot brick replacement.
      c. Crack repairs in existing brick masonry.
      d. Reset outer wythe of brick.

B. Related Sections include the following:
   1. Joint sealants are specified in Division 07 Section, “Joint Sealants.”

1.3 SUBMITTALS

A. Samples for the following:
   1. Repointing mortars: For each building and each mortar type, submit samples in advance of preparation of test panels. Samples may be cast in ½ -inch wide aluminum channels.

1.4 QUALITY ASSURANCE

A. Contractor Qualifications: Contractor performing the work of this section shall be a “Restoration Specialist,” defined as an individual or firm of established reputation in building restoration (or, if newly organized, whose personnel have previously established a reputation in the field), who or which is regularly engaged in, and which maintains a regular force of workmen skilled in either (as applicable) manufacturing or fabricating items required by the contract, installing items required by the contract, performing on-site treatment of existing historic materials, or otherwise performing work required by the contract. The individual or firm shall have recent and documented experience in spot brick replacement, rebuilding, and repointing of historic brick masonry of National Register-listed buildings, including the restoration types specified in this Section.

B. Test Panels: Prepare sample panels for the following work, to be used as a quality standard for the work of this Section. Do not remove approved test panels after acceptance by the Architect. Allow time in construction schedule to prepare, cure, and gain approval of sample panels. Allow time to repeat sample panels which are rejected or require adjustments.
   1. Repointing: Rake out and repoint joints at locations selected by the Architect, using materials and methods specified, to establish workmanship, mortar match, and tooling to be used. Prepare test panels consisting of 3' X 3' areas of brick repointing.
      a. Provide a minimum of 1 test panel per section of building.
      b. Provide as many test panels as required to match all specified mortar mixes, and all additional panels requested by the Architect.
   2. Each additional type of masonry restoration work: As determined by Architect.

C. Approved sample panels shall become part of the work, and shall serve as a quality standard for all other similar work. Rejected panels shall be removed and repeated as required until work matches existing, as determined by the Architect.

PART 2 - PRODUCTS

2.1 BRICK

A. Face brick: Provide custom-size sand-molded bricks matching the size, color and texture of existing face bricks, and comply with ASTM C216, Grade SW.

2.2 MASONRY ACCESSORIES, PRIMER, AND CLEANERS

A. Masonry cleaners for final cleaning: On the basis of approved test panels and as recommended by chemical cleaner manufacturer for each type of masonry and type of mortar, final clean exterior masonry using masonry cleaning compound specifically formulated to remove mortar laitance from new brick masonry and new pointing work, as made by one of the following:
   1. Basis-of-Design masonry cleaner: SureKlean 600 Detergent Cleaner as made by ProSoCo, Inc.

2.3 MORTAR MATERIALS AND MIXES

A. Mortar mixes and mortar materials - general: At each type of masonry, match existing or original mortar in color, texture, tooling.

B. Mortar materials - Standards:
   1. Portland Cement: ASTM C150, Type I or II, gray or white, as indicated in mortar schedule below. Where White Portland cement is required to match existing mortar, provide ASTM C150, Type I or II, except complying with the staining requirements of ASTM C91 for not more than .03% water soluble alkali.
   2. Hydrated Lime: ASTM C207, Type S or SA.
   3. Sand: ASTM C144, matching color and texture of existing mortar sand.
      a. Include in bid price the cost of providing a blend of mortar sands, as required to match existing mortars.

C. Mortar Mixes: Provide the following mortar mixes for initial test panels. Final mixes will be dependent on the Contractor's successful test panels, as judged by the Architect. Mixes apply to repointing mortars, setting of Dutchmen, and setting of existing or new masonry units.
   1. Mortar for repointing and setting replacement bricks:
   2. 1 part by volume white Portland cement
   3. 2 parts by volume lime
   4. 6 parts by volume sand consisting of brown and white bar sand in ratio required to match existing mortar

D. Mortar Mixing:
   1. Mix mortars in accordance with ASTM C270.
   2. Measure materials by volume or equivalent weight. Do not measure by shovel.
   3. Mix ingredients in clean mechanical batch mortar mixer 3-5 minutes.
   4. Let mortar sit 20 minutes prior to use to allow for initial shrinkage. Do not re-temper partially hardened material.

E. Composite patching mortar: For patching existing bricks, provide red-tinted composite mortar as specified in Division 04 Section, “Stone Masonry Restoration.”

PART 3 - EXECUTION

3.1 MORTAR CURING - GENERAL

A. Hot weather requirements - general: Provide all special precautions and procedures required to control mortar curing during hot weather. Comply with recommendations of "All-Weather Construction" Technical Note (Rev. March 1992) as published by the Brick Institute of America.
   1. No mortar shall be placed in full sun at surface temperatures above 80 degrees F unless shading of the walls is provided and the masonry wall temperature is kept below this point.
   2. Maintain temperature of mortar between 70 degrees F and 90 degrees F. Use all measures required to achieve this temperature range, including storing mortar sand under shaded cover, and chilling mixing water with ice.
   3. Wet salvaged stone units indicated to be rebuilt prior to installation, and wet stone units in place prior to repointing. However, do not repoint stone units with water puddled in joints.
   4. Place all masonry units within one minute of spreading mortar.
   5. Protect and cure new pointing and rebuilt walls as follows:
      a. For wall temperatures above 100 degrees F with no wind: Provide shading of walls prior to pointing or masonry unit setting, and fog spray and cover walls with canvas tarp or blue or white plastic tarp to control moisture evaporation during the day in which mortar is placed and during the following work day. Repeat fog spray as often as required, but not less than once per hour during the day in which mortar is placed.
      b. For wall temperatures 80 - 100 degrees F: Fog spray and cover walls with canvas tarp or blue or white plastic tarp to control moisture evaporation, but not less than once per hour during the day in which mortar is placed.
      c. For wall temperatures less than 80 degrees F: No special mortar curing procedures are required.

B. Cold Weather Requirements:

1. No work in this Section shall be executed when the ambient temperature is less than 40 degrees F. No pointing shall be executed when freezing temperatures are expected within 24 hours.

3.2 REMOVAL OF EXISTING MORTAR

A. General:
   1. Remove existing deteriorated mortar to a depth equal to 2 times the joint width, minimum 3/8" depth at south facade, and in all cases, down to sound, existing mortar.
   2. Do not damage existing masonry. If work is found unacceptable, all raking will cease without additional cost to the Owner until deficiencies in tools, workmanship, or methods have been corrected to the satisfaction of the Architect.
      a. Remove and replace all bricks damaged by raking operations, including all bricks which have 2 or more chips of 1/4" size in any direction, 1 single chip 3/8" in size in any direction, or which have been cut along the edge (arris) more than 1/16". Identification of damaged bricks will be at the sole judgment of the Architect.

B. Brush, vacuum, or flush joints to remove all dirt and loose debris.

3.3 GENERAL REPOINTING AND SPOT POINTING

A. Thoroughly flush area to be repointed to remove all dust and to reduce absorption of water from mortar into masonry.

B. Pack mortar into butter joints in layers not to exceed 1" depth, using a pointer that is ground to the narrow joint width. Where severely deteriorated joints are raked greater than 1" depth, apply pointing mortar in two applications. In the first application, pack joint to within 1" of masonry surface and allow to cure overnight. Apply second application as part of the overall pointing of the area.

C. When mortar reaches thumb-print hardness, tool joint to match existing joints selected by Architect. Strike to form a flat joint profile, slightly recessed from the face of bricks so that the full perimeter edge of each brick is visible.
   1. Do not overwork the face of the joint.
   2. Tool head joints first.
   3. All masons shall use identical jointing tools.
   4. Do not featheredge mortar joints on to face of brick, and do not form concave joints except where indicated.
   5. Pack mortar into joints and tool slightly recessed behind the face of masonry units to match weathered joints. Allow the front edges of masonry units to stand slightly clear of the pointing mortar, so the entire perimeter edge of each masonry unit is visible in the finished work.

D. Repointing shall closely match the existing cleaned pointing in color, texture, and tooling.

3.4 BRICK MASONRY REBUILDING

A. Fill in lower portion of brick masonry openings indicated on Drawings. Rebuild full thickness of wall.

B. Wet clay brick before installing, using wetting methods which ensure that units are nearly saturated but surface dry when laid.

C. Pattern Bond: Lay exposed masonry in bond pattern matching existing.
   1. Tooth brickwork into existing work at locations where walls are indicated to be rebuilt.
   2. Lay up brick masonry level and plumb except where matching existing plumbness and level where the existing construction is not level and plumb.

3.5 FINAL CLEANING OF EXTERIOR MASONRY

A. Remove large particles of mortar using wood or plastic scrapers as the work progresses.

B. Allow mortar to cure for 14 to 28 days and spot clean exterior masonry to remove all mortar staining. Extent of cleaning is dependent on neatness during installation.

C. Comply with chemical cleaner manufacturer's recommendations for mortar curing time prior to cleaning.

D. Protect glass, woodwork, and other building materials from cleaning run-off by means of pre-wetting, tarps, and other methods as required to protect from damage caused by cleaning operations. Protect building occupants, pedestrians, automobiles, and landscaping from cleaning-chemical drift.

END OF SECTION 04 21 99

SECTION 06 40 13 – EXTERIOR ARCHITECTURAL WOODWORK RESTORATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes:
   1. Stable:
      a. Remove existing and provide new replicate wood cornice.
      b. Repair or replacement of existing exterior woodwork indicated on Drawings.
      c. Custom board-and-batten doors and frames.
      d. Custom-profile, vertical-board siding.
      e. Exposed, white oak window lintels
      f. Board facing applied to exterior face of new hollow metal doors.
      g. Wood fencing.
      h. Custom exterior wood louvers.
      i. Diffusible wood preservative for exposed wood lintels.
   2. Greenhouse:
      a. Repairs to existing woodwork.

B. Related Sections include the following:
   1. Preservative pressure-treated wood cornice blocking is specified in Division 06 Section, “Rough Carpentry.”
   2. Exterior painting is specified in Division 09 Section, “Exterior Painting.”

1.3 SUBMITTALS

A. Product Data: Submit product data for each specified product.

B. Shop Drawings: For each exterior woodwork assembly.

C. Samples: 12-inch long section of each cornice and each molding profile.

1.4 QUALITY ASSURANCE

A. Contractor qualifications: Firm performing the work of this Section shall be a “Restoration Specialist,” defined as an individual or firm of established reputation in building restoration (or, if newly organized, whose personnel have previously established a reputation in the field), who or which is regularly engaged in, and which maintains a regular force of workmen skilled in either (as applicable) manufacturing or fabricating items required by the contract, installing items required by the contract, performing on-site treatment of existing historic materials, or otherwise performing work required by the contract. The individual or firm shall have recent and documented experience in the restoration, replication, cleaning and refinishing historic architectural woodwork in National Register-listed buildings.

B. The Quality Standards, latest edition of the Architectural Woodwork Institute, shall apply to the work of this Section. Comply with the following sections and grades:
   1. Standing and running Trim: AWI Section 300, Custom Grade.
   2. Ornamental Work: AWI Section 700, Custom Grade.

PART 2 - PRODUCTS

2.1 LUMBER

A. Lumber standards: To the extent applicable, all softwood lumber shall conform to the current published standards of WWPA and all hardwood lumber shall conform to the standards of the National Hardwood Lumber Association (NHLA).

B. Exposed lumber species:
   1. All exterior woodwork to receive painted finish: Spanish Cedar, South American mahogany, Douglas fir, or white oak.
   2. Exterior woodwork to remain unfinished: Eastern white cedar, western red cedar, or bald cypress.

C. Concealed framing lumber and fence posts, including all concealed furring, blocking, and sub-framing: Preservative-treated wood, Preservative Treatment by Pressure Process, AWPA, C31.

D. Exposed wood lintels: Air-dried white oak, antique or new.

E. Preservative-treated plywood: Preservative Treatment by Pressure Process, AWPA C9.

2.2 MISCELLANEOUS MATERIALS

A. Anchors and fasteners:
   1. Wood-to-wood fasteners: For all applications, provide stainless steel or galvanized steel fasteners complying with ASTM A153.
   2. Wood-to-masonry fasteners: Self-tapping stainless steel screws for installation in pre-drilled holes in stone masonry, equal to Tapcon Concrete Screw Anchors, size as indicated for application.
   3. Exposed/clinched nails at board-and-batten doors: Galvanized steel Fire Door Clinch Nails as made by Tremont Nail Company.

B. Epoxy adhesives and fillers:
   1. Basis-of-design manufacturer: West System products as made by Gougeon Brothers, Bay City, MI.
   2. Products:
      a. Epoxy resin: Low modulus, low-viscosity epoxy resin, West System 105/205.
      b. Epoxy adhesive: Specified resin mixed with micro-fibers.
      c. Wood fillers: Provide fillers recommended by epoxy manufacturer for mixing with epoxy resins for each application, including micro-ballons and micro-balloons.

C. Shop primer: Alkyd-based wood primer specified in Division 09 Section, “Exterior Painting.”

D. Insect screen: 16 x 18 mesh, black aluminum.

E. Door and Gate Hardware:
   1. Gate Hardware:
      a. Hinges: Galvanized steel lag pintles (screw hook) and strap hinges: Pair Stanley 951 Screw Hook and Strap Hinges or 952 Bolt Hook and Strap Hinges, 18-inch length.
      b. Safety Hasp (for mounting on back side of gate: Stanley Sc915BP Galvanized Steel Safety Hasp, 6-inch.
   2. Door hardware – Hinged Door:
      a. Hinges: Pair reproduction iron strap hinges with screw pintles, 24-inch length, 3/16-inch by 1-1/2-inch, Ball & Ball X1071-C24.
      b. Latch: Reproduction exterior door latch with interior bar keeper and drive retainer; Ball & Ball X505-B19 Exterior Door Latch with X505 Bar and Drive Retainer.
      c. Mortise Lockset: Schlage L460 Small Case Deadlock, with interchangeable core cylinder matching State system and interior thumbturn, 613 Finish.
   3. Door hardware – Sliding Barn Door:
      a. Track and trolleys Reuse existing.
      b. Pull: 2x5 wood block with reverse-beveled sides, field painted color of door.

2.3 DIFFUSIBLE WOOD PRESERVATIVES

A. Diffusible wood preservative: Provide disodium octaborate tetrahydrate (boric acid) type wood preservative.

B. Surface-applied type: Diffusible wood preservative formulated in water-borne carrier system containing penetrants designed for deep penetration into wood surfaces. Provide Bora-Care Termiticide, Insecticide, and Fungicide Concentrate as distributed by PRG, Inc., Rockville, MD, telephone 301-309-2222.
   1. Provide material in concentrated form, for dilution with warm or hot water, at rate specified by manufacturer.
   2. Application rate: Provide one gallon of concentrate for 800 board feet of exposed wood indicated to be treated.

C. Inserted rod type: Diffusible wood preservative molded into rod shapes for insertion into drilled holes in concealed timber members. Provide Impel Rods as distributed by PRG, Inc., Rockville, MD, telephone 301-309-2222.
   1. Rod size: ½-inch diameter by 2 inches long unless otherwise indicated on Drawings.

2.4 FABRICATION

A. To the extent applicable, fabricate architectural woodwork to comply with applicable section of AWI Architect Woodwork Quality Standards.

B. Where replicating historic woodwork detailing, match historic details directed by Architect.

C. Fabrication of board-and-batten doors: Fabricate using clinched nails. Bend nails in the direction of wood grain so that clinched end lays parallel with the grain.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Quality Standard: Install woodwork to comply with AWI Section 1700, custom grade, and as required to match existing woodwork.

B. Shop prime and back prime all exterior woodwork.

C. Install the work plumb, level, true, and straight, or as required to match and tie into existing work to remain. Shim as required using concealed shims. Install to a tolerance of 1/8" in 8'-0" for plumb and level for new work.

D. Anchor woodwork to masonry using specified concrete screws and to wood framing using galvanized steel fasteners. Secure exposed woodwork to grounds, blocking, or sub-framing with countersunk, concealed fasteners and blind nailing as required for a complete installation.

E. For all concealed blocking, furring, sub-framing, and shims, use preservative pressure-treated lumber.

F. Scribe and cut work to fit adjoining work, and refinish field-cut surfaces at joints.

G. Install standing and running trim with minimum number of joints possible, using full-length pieces to the greatest extent possible. Stagger joints in adjacent and related members. Make exterior joints water-resistant by careful fitting.

H. Door facing: Secure with stainless steel, square-head, trim screws. Recess heads and fill depression.

I. Fencing: Provide in pattern and layout shown Drawings.

3.2 CORNICE RECONSTRUCTION

A. Sub-framing: At portions of cornice indicated on Drawings to be removed and replaced with a new replicate assembly, rebuild all sub-framing, outriggers, and blocking as part of the work.
   1. Construct sub-framing using preservative pressure-treated lumber.
   2. Where required to anchor sub-framing to masonry, use specified concrete screws.

B. Build new cornice level and true, tying into existing rafters and new outriggers.
   1. Fabricate with continuous ventilation slot, as detailed. Fabricate new cornice woodwork to tie into existing sheet metal gutter liners. Attach sheet metal cleats to new woodwork as required without affecting the exposed sheet metal.

3.3 APPLICATION OF DIFFUSIBLE WOOD PRESERVATIVES

A. Surface applied type:
   1. Apply at the following locations:
      a. All replacement logs and wood sills: All surfaces, following fabrication but prior to installation in building wall.
      b. Existing in-place wood sills: Apply to top surface and front face of all wood sills exposed in order to replace siding.

B. Inserted rod type:
   1. Drill holes in existing wood members at angle and spacing indicated on Drawings.
   2. Insert rod and seal hole with specified joint sealant.

END OF SECTION 06 40 13

SECTION **07 31 29** - **WOOD SHINGLE ROOFING**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Stable:
      a. Cedar shingle roofing on new wood lath and solid sheathing.
   2. Greenhouse:
      a. Spot replace scalloped cedar shingle wall siding.

B. Related Sections:
   1. Sheet metal flashings, gutters and downspouts are specified in Division 07 Section, “Sheet Metal Flashings.”
   2. Waterproof underlayment where required by building code and indicated on Drawings is specified in Division 7 Section, “Sheet Metal Flashings.”

1.3 DEFINITIONS

A. CSSB: Cedar Shake & Shingle Bureau.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for Verification: For the following products, of sizes indicated, to verify color selected.
   1. Wood Shingles: 4 full-size.
   2. Shingle nails: 6 nails.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Wood Shingles: One unbroken bundle.

1.6 QUALITY ASSURANCE

A. Contractor Qualifications:
   1. Contractor for the work of this Section shall be a “Restoration Specialist,” defined as an individual or firm of established reputation in building restoration (or, if newly organized, whose personnel have previously established a reputation in the field), who or which is regularly engaged in, and which maintains a regular force of workmen skilled in either (as applicable) manufacturing or fabricating items required by the contract, installing

items required by the contract, performing on-site treatment of existing historic materials, or otherwise performing work required by the contract. The individual or firm shall have recent and documented experience in the replacement of cedar shingle roofing on National Register-listed buildings.

B. Source Limitations: Obtain wood shingles from single source from single manufacturer.

C. Pre-installation Conference: Conduct conference at Project site.

1.7 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit wood shingles and related work to be performed according to manufacturer's written instructions and warranty requirements.

1.8 WARRANTY

A. Special Warranty: CSSB's standard form in which CSSB agrees to repair or replace wood shingles that fail in materials within specified warranty period. Material failures include manufacturing defects that result in leaks.
   1. Materials-Only Warranty Period: 20 years for tapersawn shakes, from date of Substantial Completion.

B. Special Project Warranty: Roofing Installer's Warranty, on warranty form at end of this Section, signed by roofing Installer, covering Work of this Section, in which roofing Installer agrees to repair or replace components of wood shingle roofing that fails in materials or workmanship within the following warranty period:
   1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cedar Roof Shingles: Red Cedar Tapersawn Shakes, sawn both sides, Number One Premium Grade, 24-inch length by 5/8-inch thickness, 100% edge grain.

B. Scalloped cedar wall shingles: Red Cedar shingles, 18-inch length, 100% edge grain, width and pattern identical to existing.

C. Nails: Stainless steel nails, size recommended by CSSB.

D. Felt Underlayment (at solid roof decking only): ASTM D 4869, asphalt-saturated organic felt.

E. Spacer fabric (at solid sheathing only): Cedar Breather Ventilated Underlayment as made by Benjamin Obdyke, ¼-inch thickness.

F. Waterproof underlayment (at solid sheathing only): As specified in Division 7 Section, “Sheet Metal Flashings.”

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 UNDERLAYMENT INSTALLATION

A. General: Apply underlayment only at solid roof decking. Do not use underlayment or interlayment in conjunction with general shingling.

3.3 METAL FLASHING INSTALLATION

A. General: Install metal flashings and other sheet metal to comply with requirements in Division 07 Section, “Sheet Metal Roofing and Flashings.”

B. Step Flashings: Install with a head lap of 3 inches and extend both horizontally and vertically. Install with lower edge of flashing just upslope of, and concealed by, butt of overlying shingle or shake. Fasten to roof deck only.

3.4 ROOF-SHINGLE INSTALLATION

A. General: Install wood-shingle roofing according to manufacturer's written instructions and to recommendations in CSSB's "New Roof Construction Manual" and NRCA's "The NRCA Roofing and Waterproofing Manual."

B. Coordinate installation of shingles with flashings to ensure proper sequencing of work.

C. Install triple-layer wood-shingle starter course along lowest roof edge. Extend starter course 1-1/2 inch over fascia and 1-1/2 inches over rake edge.
   1. Offset joints of triple-layer starter course a minimum of 1-1/2 inches.

D. Install first course of wood shingles directly over starter course and in continuous straight-line courses across roof deck. Install second and succeeding courses of wood shingles in continuous straight-line courses across roof deck. Extend 1-1/2 inches over rake edge.
   1. Offset joints between shingles in succeeding courses a minimum of 1-1/2 inches. Limit alignment of vertical joints in every third course to not exceed 10 percent of joints.
   2. Space shingles a minimum of 1/4 inch and a maximum of 3/8 inch apart.
   3. Fasten each shingle with two nails spaced 3/4 to 1 inch from edge of shingle and 1-1/2 to 2 inches above butt line of succeeding course. Drive fasteners flush with top surface of shingles without crushing wood.

E. Ridge Type: Overlapping shingles with protected side facing east.

F. Cedar wall siding: Remove existing deteriorated shingles using a slate ripper or other means. Install new shingles, blending into existing coursing, using stainless steel ring-shank nails recommended by shingle manufacturer.

END OF SECTION 07 31 29

SECTION 07 52 16 - SBS-MODIFIED BITUMINOUS MEMBRANE ROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. SBS-modified bituminous membrane roofing.
   2. Vapor retarder.

B. Related Sections include the following:
   1. Division 07 Section "Flashing and Sheet Metal" for metal roof flashings, counterflashings, and built-in gutters.

1.2 DEFINITIONS

A. Roofing Terminology: Refer to ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to roofing work in this Section.

B. Design Uplift Pressure: The uplift pressure, calculated according to procedures in SPRI's "Wind Load Design Guide for Fully Adhered and Mechanically Fastened Roofing Systems," before multiplication by a safety factor.

1.3 PERFORMANCE REQUIREMENTS

A. General: Provide installed roofing membrane and base flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.

B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.

C. FMG Listing: Provide roofing membrane, base flashings, and component materials that comply with requirements in FMG 4450 and FMG 4470 as part of a roofing system and that are listed in FMG's "Approval Guide" for Class 1 or noncombustible construction, as applicable. Identify materials with FMG markings.
   1. Fire/Windstorm Classification: Class 1A-90.
   2. Hail Resistance: SH.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other Work.
   1. Base flashings, cants, and membrane terminations.
   2. Transition between asphalt shingle roofing and membrane roofing.

C. Samples for Verification: For the following products:

1. 12-by-12-inch base sheet.
2. 12-by-12-inch mineral-granule-surfaced roofing membrane cap sheet, of color specified.

D. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.

E. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
1. Submit evidence of meeting performance requirements.

F. Qualification Data: For Installer and manufacturer.

G. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of roofing system.

H. Maintenance Data: For roofing system to include in maintenance manuals.

I. Warranties: Special warranties specified in this Section.

J. Inspection Report: Copy of roofing system manufacturer's inspection report of completed roofing installation.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's warranty.

B. Manufacturer Qualifications: A qualified manufacturer that has FMG approval for roofing system identical to that used for this Project. Membrane roofing system shall be manufactured and marketed by a firm with a minimum of 20 years experience in the production and sales of cold applied SBS-modified bituminous membrane roofing. Manufacturers proposed for use but not named in these specifications shall submit evidence of ability to meet all requirements specified, and include a list of projects of similar design and complexity completed within the past 5 years.

C. Source Limitations: Obtain components for roofing system from or approved by roofing system manufacturer.

D. Fire-Test-Response Characteristics: Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.
1. Exterior Fire-Test Exposure: Class A; ASTM E 108, for application and roof slopes indicated.

E. Pre-installation Conference: Conduct conference at Project site. Comply with requirements in Division 1 Section "Project Management and Coordination." Review methods and procedures related to roofing system including, but not limited to, the following:

1. Meet with Project Engineer, Owner's insurer if applicable, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.
2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
5. Review structural loading limitations of roof deck during and after roofing.
6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storage.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
   1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.7 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

1.8 WARRANTY

A. Special Warranty: Manufacturer's standard form, without monetary limitation, in which manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period. Failure includes roof leaks.

1. Special warranty includes roofing membrane, base flashings, roofing membrane accessories, roof insulation, fasteners, cover boards, vapor retarder, walkway products and other components of roofing system.
2. Warranty Period: 20 years from date of Substantial Completion.

B. Special Installer's Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering Work of this Section, including all components of roofing system such as roofing membrane, base flashing, roof insulation, fasteners, cover boards, substrate boards, vapor retarders, roof pavers, and walkway products, for the following warranty period:
1. Warranty Period: Five years from date of Substantial Completion.

C. Guaranty: Submit Amtrak Guaranty on form provided in Section 00900, covering Work of this Section, including all components of system. Requirements of Amtrak Guaranty are in addition to the Special Manufacturer's Warranty and Special Installer's Warranty required in this Section.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. SBS-Modified Bituminous Membrane Roofing:

B. Basis-of-Design Roofing System: Stress-Ply Modified Bitumen System as manufactured by The Garland Company, Inc., Cleveland, Ohio or one of the following:
1. Siplast.
2. Tremco.

C. Roofing system:
1. Two plies of Type II base sheet
2. Substrate: Nailable.
3. Interply adhesive shall be manufactured by membrane manufacturer and be compatible with all components within the system.
4. System of SBS Cap Sheet: Dual Fiberglass reinforcement.
5. Surfacing: Granule surface.

2.2 SBS-MODIFIED ASPHALT-SHEET MATERIALS

A. Roofing Membrane Cap Sheet: ASTM D6163, Type III, Grade S, 80 mil thickness, glass-fiber-reinforced, black quartz granular surface.

Tensile Strength (ASTM D5147)		
2 in/min. @ 73.4 □ 3.6°F	MD 225 lbf/in	CMD 220 lbf/in
50 mm/min. @ 23 □ 3°C	MD 39.0 kN/m	CMD 38.5 kNm
Tear Strength (ASTM D5147)		
2 in/min. @ 73.4 □ 3.6°F	MD 280 lbf	CMD 250 lbf
50 mm/min. @ 23 □ 3°C	MD 1245 N	CMD 1105 N
Elongation at Maximum Tensile (ASTM D5147)		
2 in/min. @ 73.4 □ 3.6°F	MD 4.7%	CMD 5.0%

50 mm/min. @ 23 □ 3□°C
Low Temperature Flexibility (ASTM D5147): Passes -50°F (-46°C)

2.3 BASE-SHEET MATERIALS

A. Base Sheet: ASTM D 4601, Type II, nonperforated, asphalt-impregnated and -coated, glass-fiber sheet, dusted with fine mineral surfacing on both sides.

2.4 BASE FLASHING SHEET MATERIALS

A. Roofing Membrane Base Flashing Ply: ASTM D6163, Type III, Grade S, 40 mil thickness, glass-fiber-reinforced, modified bitumen sheet.

B. Roofing Membrane Cap Sheet: ASTM D6163, Type III, Grade S, 80 mil thickness, glass-fiber-reinforced, black quartz granular surface.

2.5 AUXILIARY ROOFING MEMBRANE MATERIALS

A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with roofing membrane.

B. Cold-Applied Adhesive: Roofing system manufacturer's standard asphalt-based, one- part, asbestos-free, cold-applied adhesive specially formulated for compatibility and use with roofing membrane and base flashings.

1. Cold Applied Membrane Adhesive: V.O.C. compliant ASTM D-3019. Performance Requirements:

a.	Non-Volatile Content	ASTM D-4479	70%
b.	Density	ASTM D-1475	7.89 lb./gal.
c.	V.O.C.	ASTM D-3960	300 gal/I max.
d.	Viscosity Stormer	ASTM D-562	16-20 sec. Special Blade
e.	Flash Point	ASTM D-93	100°F min.
f..	Slope		1:12 - 3:12

2. Brush Grade Flashing Adhesive Performance Requirements:

a..	Non-Volatile Content	ASTM D-4479	70 min.
b.	Density	ASTM D-1475	8.6 lb./gal.
c.	V.O.C.	ASTM D-3960	295 g/l max.
d.	Flash Point	ASTM D-93	100°F

C. Mastic Sealant: Polyisobutylene, plain or modified bitumen, nonhardening, nonmigrating, nonskinning, and nondrying.

D. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening roofing membrane components to substrate, tested by manufacturer for required pullout strength, and acceptable to roofing system manufacturer.

E. Metal Flashing Sheet: Metal flashing sheet is specified in Division 7 Section "Flashing and Sheet Metal."

F. Miscellaneous Accessories: Provide miscellaneous accessories recommended by roofing system manufacturer.

G. Non-shrink grout: Non-shrink, non-metallic grout complying with ASTM C1107.

2.6 VAPOR RETARDER

A. Self-Adhering Sheet Vapor Retarder: 40-mil-thick, polyethylene film laminated to layer of rubberized asphalt adhesive; maximum permeance rating of 0.1 perm; cold-applied, with slip-resisting surface and release paper backing. Provide primer when recommended by vapor-retarder manufacturer.
1. Products:
a. Carlisle Coatings & Waterproofing, Div. of Carlisle Companies Inc.; Dri-Start "A."
b. Grace, W. R. & Co.--Conn.; Grace Ice and Water Shield.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:
1. Verify that roof openings and penetrations are in place and set and braced and that roof drains are securely clamped in place.
2. Verify that wood cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
3. Verify that wood decking is securely fastened to wood joists and no nails or other irregularities are exposed.
4. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.

B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

3.3 VAPOR-RETARDER INSTALLATION

A. Self-Adhering Sheet Vapor Retarder: Nail base sheet to the wood deck when thickness of the deck is 1.5” or greater. Screw a base sheet to the deck for all thicknesses less that 1.5” Meet all FM wind uplift requirements for 1-90 wind uplift resistance.

B. Install self-adhering sheet vapor retarder directly to the nailed base sheet over area to receive vapor retarder, side and end lapping each sheet a minimum of 3-1/2 inches and 6 inches, respectively. Seal laps by rolling.

C. Completely seal vapor retarder at terminations, obstructions, and penetrations to prevent air movement into roofing system.

3.4 MODIFIED BITUMEN ROOFING MEMBRANE INSTALLATION, GENERAL

A. Install roofing membrane system to comply with Basis-of-Design system.

B. Start installation of roofing membrane in presence of roofing system manufacturer's technical personnel.

C. Cooperate with testing and inspecting agencies engaged or required to perform services for installing roofing system.

D. Coordinate installing roofing system so insulation and other components of the roofing membrane system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.
   1. Provide tie-offs at end of each day's work to cover exposed roofing membrane sheets and insulation with a course of coated felt set in roofing cement or hot roofing asphalt with joints and edges sealed.
   2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.
   3. Remove and discard temporary seals before beginning work on adjoining roofing.

E. Substrate-Joint Penetrations: Prevent roofing asphalt from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.

3.5 BASE-SHEET INSTALLATION

A. Install lapped base sheet course over the red rosin , extending sheet over and terminating beyond cants. Attach base sheet as follows:
   1. Mechanically fasten to substrate with cap nails installed as required for FM approval. If the deck is not thick enough to get an approval with cap nails, screw the base sheet to the deck with ¾” x 12 wood deck fasteners and 4” plates. Do not penetrate the deck.

B. Install two plies of Type II Base sheet over the nailed base. Use 18” starter strips and install shingle fashion. extending sheet over and terminating beyond cants. Adhere base sheet as follows:
   1. Cut base sheets in 15’ lengths and allow to relax a minimum of 1 hour prior to use.
   2. Adhere base sheets to substrate using 2 gallons per 100 sq. ft. of manufacturer’s interplay adhesive
   3. Be sure there is no bare membrane touching bare membrane. .

3.6 SBS-MODIFIED BITUMINOUS MEMBRANE INSTALLATION

A. Install modified bituminous roofing membrane sheet and cap sheet according to roofing manufacturer's written instructions and as required to achieve specified Class 1A-90 Fire/Windstorm Classification, starting at low point of roofing system. Extend roofing membrane sheets over and terminate beyond cants, installing as follows:
   1. Adhere to substrate in cold-applied adhesive applied at a rateof 2 ½ gallons per square.

B. Laps: Accurately align roofing membrane sheets, without stretching, and maintain uniform side and end laps. Stagger end laps. Completely bond and seal laps, leaving no voids.

C. Install roofing membrane sheets so side and end laps shed water.

3.7 FLASHING AND STRIPPING INSTALLATION

A. Install base flashing over cant strips and other sloping and vertical surfaces, at roof edges, and at penetrations through roof, and secure to substrates according to roofing system manufacturer's written instructions and as follows:
   1. Prime substrates with asphalt primer if required by roofing system manufacturer.
   2. Backer Sheet Application: Install backer sheet and adhere to substrate in brush grade cold-applied adhesive at rate required by roofing system manufacturer.
   3. Flashing Sheet Application: Adhere flashing sheet to substrate in cold-applied adhesive at rate of 2 gallons per 100 square feet

B. Extend base flashing up walls a minimum of 8 inches above roofing membrane and 4 inches onto field of roofing membrane.

C. Install roofing membrane cap-sheet stripping where metal flanges and edgings are set on membrane roofing according to roofing system manufacturer's written instructions.

3.8 SURFACE PREPARATION

A. Clean and prepare substrate according to manufacturer's written recommendations. Provide clean, dust-free, and dry substrate for waterproofing application. Be sure all rust is removed as well as loose paint of metal.

B. Mask off adjoining surfaces not receiving waterproofing to prevent spillage or overspray affecting other construction.

C. Close off deck drains and other deck penetrations to prevent spillage and migration of waterproofing fluids.

D. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.

3.9 PREPARATION AT TERMINATIONS AND PENETRATIONS

A. Prepare vertical and horizontal surfaces at terminations and penetrations through waterproofing and at expansion joints, drains, and sleeves according to ASTM C 898 and manufacturer's written instructions.

B. Prime substrate, unless otherwise instructed by waterproofing manufacturer.

C. Apply a double thickness of waterproofing and embed a joint reinforcing strip in preparation coat when recommended by waterproofing manufacturer.
   1. Provide sealant cants around penetrations and at inside corners of deck-to-wall butt joints when recommended by waterproofing manufacturer.

3.10 CURING, PROTECTING, AND CLEANING

A. Cure waterproofing according to manufacturer's written recommendations, taking care to prevent contamination and damage during application stages and curing.

B. Protect waterproofing from damage and wear during remainder of construction period.

C. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

3.11 FIELD QUALITY CONTROL

A. Testing Agency: Project Engineer will engage a qualified independent testing and inspecting agency to perform roof tests and inspections and to prepare test reports.

B. Test Cuts: Test specimens will be removed to evaluate problems observed during quality-assurance inspections of roofing membrane as follows:
1. Approximate quantities of components within roofing membrane will be determined according to ASTM D 3617.
2. Test specimens will be examined for interply voids according to ASTM D 3617 and to comply with criteria established in Appendix 3 of ARMA/NRCA's "Quality Control Guidelines for the Application of Polymer Modified Bitumen Roofing."

C. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation and submit report to Project Engineer as follows:.

D. Repair or remove and replace components of roofing system where test results or inspections indicate that they do not comply with specified requirements.

E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.12 PROTECTING AND CLEANING

A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Project Engineer.

B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

3.13 ROOFING INSTALLER'S WARRANTY

A. WHEREAS <Insert name> of <Insert address>, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:
1. Owner: <Insert name of Owner.>
2. Address: <Insert address.>
3. Building Name/Type: <Insert information.>
4. Address: <Insert address.>
5. Area of Work: <Insert information.>
6. Acceptance Date: <Insert date.>
7. Warranty Period: <Insert time.>
8. Expiration Date: <Insert date.>

B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,

C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.

D. This Warranty is made subject to the following terms and conditions:
   1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:
      a. lightning;
      b. peak gust wind speed exceeding <Insert wind speed> mph (m/sec);
      c. fire;
      d. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
      e. faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
      f. vapor condensation on bottom of roofing; and
      g. activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.
   2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
   3. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.
   4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
   5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
   6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
   7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall

not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

E. IN WITNESS THEREOF, this instrument has been duly executed this <Insert day> day of <Insert month>, <Insert year>.
   1. Authorized Signature: <Insert signature.>
   2. Name: <Insert name.>
   3. Title: <Insert title.>

END OF SECTION 07 52 16

SECTION 07 62 00 – SHEET METAL FLASHINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification sections, apply to this Section.

1.2 DESCRIPTION OF WORK

A. This Section includes the following:
   1. Stable:
      a. Metal counter flashings let into new reglets in brick walls.
      b. Half-round gutters.
      c. Smooth, round downspouts connected to existing underground drainage piping.
      d. Flashing of roof penetrations.
      e. Other flashing applications indicated on Drawings.
      f. Protection of building interiors from water damage during the course of the work.
   2. Greenhouse:
      a. Rehang existing gutter and adjust entire gutter to drain.
      b. Replace existing base and counter flashings indicated.
      c. Other flashing applications indicated on Drawings.

B. Related Sections include the following:
   1. Brick masonry restoration is specified in Division 04 Section, "Brick Masonry Restoration," for sawcutting and forming of reglets in brick masonry walls.
   2. Joint sealant for use in conjunction with flashing applications are specified in Division 07 Section, "Joint Sealants."

1.3 PERFORMANCE REQUIREMENTS

A. General: Sheet metal flashing and trim assemblies as indicated shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.

1.4 QUALITY ASSURANCE

A. Contractor Qualifications:
   1. Contractor for the work of this Section shall be a "Restoration Specialist," defined as an individual or firm of established reputation in building restoration (or, if newly organized, whose personnel have previously established a reputation in the field), who or which is regularly engaged in, and which maintains a regular force of workmen skilled in either (as applicable) manufacturing or fabricating items required by the contract, installing items required by the contract, performing on-site treatment of existing historic materials, or otherwise performing work required by the contract. The individual or firm shall have recent and documented experience in the restoration of sheet metal flashings in National Register-listed buildings.

B. Reference standards: Comply with recommended details for highest grade construction of the following:
   1. Copper and Common Sense by Revere Copper.
   2. Architectural Sheet Metal by SMACNA (referred to as SMACNA Manual).
   3. Sheet Copper Applications by the Copper Development Association.

1.5 SUBMITTALS

A. Product data for the following:
   1. Alloy-coated copper.
   2. Manufactured gutters and downspouts.

B. Shop Drawings: Show thickness and dimensions of all parts, fastenings, and anchoring methods, expansion joints and other pertinent information. Submit shop drawings for the following (copies of plates from referenced standards will be acceptable if applicable to job conditions):
   1. Metal base flashings and counterflashings let into new reglets.
   2. Hung-gutter and downspout support systems.
   3. Other details requested by the Architect.

C. Samples:
   1. 8" x 8" sample of each weight of copper.

1.6 JOB CONDITIONS

A. The Contractor shall examine all surfaces on which, or against which, work of this Section is to be applied, shall notify the Architect of all defects discovered, and shall verify that all defects have been corrected before proceeding with the installation.

PART 2 - PRODUCTS

2.1 SHEET METAL

A. Alloy-Coated Sheet copper: ASTM B370, temper H00 (cold-rolled), alloy-clad, “Freedom Gray” as made by Revere Copper.
   1. Flashings: 16 oz.
   2. Built-in gutters and diverters: 16 oz.
   3. Hung gutters and downspouts: 16 oz.

2.2 MISCELLANEOUS MATERIALS AND ACCESSORIES

A. Solder: As recommended by manufacturer of each type of sheet metal.

B. Fasteners:
   1. For use with copper: Brass or copper.
   2. For use with galvanized steel: Galvanized or stainless steel.

C. Roofing felt: #30 asphalt-saturated roofing felt, ASTM D4869.

D. Waterproof Underlayment: Self-Adhering Sheet Underlayment, Polyethylene Faced: ASTM D 1970, a minimum of 40-mil thick, slip-resisting, polyethylene-film-reinforced top

surface laminated to SBS-modified asphalt adhesive, with release paper backing; cold applied.

1. Basis-of-Design Product: "Ice and Water Shield" as made by W.R. Grace & Co. Subject to compliance with requirements, comparable product made by one of the following will also be acceptable:
   a. Carlisle Coatings & Waterproofing, Inc.
   b. Johns Manville.
   c. Owens Corning.

E. Metal accessories: Sheet metal clips, cleats, straps, anchoring devices, and similar accessory units as required for installation of work, size and gauge recommended by reference standard for required performance. Provide in the following materials:
   1. For accessories formed from sheet metal, match material of sheet metal being secured.

F. Roofing cement: ASTM D2822, asphaltic.

G. Downspout hangers: Concealed rack-and-pin type hangers fabricated from bronze or other non-ferrous metal, for anchoring into masonry wall and attaching to back side of downspout.

H. Gutter hangers: Circle-type hangers and shanks attached to retrofit brackets, as made by Berger Building Products or acceptable equal.

I. Metal accessories: Sheet metal clips, cleats, straps, anchoring devices, and similar accessory units as required for installation of work, size and gauge recommended by reference standard for required performance. Provide in the following materials:
   1. For accessories formed from sheet metal, match material of sheet metal being secured.
   2. For forged or cast items, use cast brass.
   3. For gutter hangers, use bronze or brass.

J. Downspout baskets: Factory-made wire baskets fabricated from minimum No. 14, stainless steel wire, for friction fit into outlet tubes of gutter, for all outlet tubes.

K. Downspout splash blocks: Precast concrete.

2.3 FABRICATION, GENERAL

A. Shop-fabricate work to greatest extent possible. Comply with details shown, and with applicable requirements of SMACNA *Architectural Sheet Metal Manual* and *Copper and Common Sense*.
   1. Fabricate for waterproof and weather-resistant performance; with expansion provisions for running work, sufficient to permanently prevent leakage, damage or deterioration of the work.
   2. Form work to fit substrates.
   3. Comply with material manufacturer's instructions and recommendations for forming material. Form exposed sheet metal work without excessive oil-canning, buckling and tool marks, true to line and levels indicated, with exposed edges folded back to form hems.
   4. Match original detailing except where more stringent requirements are detailed on the drawings, specified in this section, or recommended in applicable reference standard.
   5. For conditions and intersections not detailed or specified, fabricate work to maintain continuity of appearance and weather-resistant performance, in compliance with reference standards.

B. Seams: Fabricate nonmoving seams in sheet metal with flat-lock seams, formed to lap in direction of flow of water. Tin edges to be seamed, form seams, and solder.
   1. Lap seams where soldered: Finish not less than 1" wide.
   2. Lap seams, not soldered: Overlap 3" unless otherwise noted.

C. Expansion provisions: Where lapped or bayonet-type expansion provisions in work cannot be used, or would not be sufficiently water/weatherproof, form expansion joints of intermeshing hooked flanges, not less than 1" deep, filled with mastic sealant.

D. Sealant joints: Where movable, non-expansion type joints are indicated or required for proper performance of work, form metal to provide for proper installation of specified elastomeric sealant, in compliance with SMACNA standards.

PART 3 - EXECUTION

3.1 CONDITION OF SURFACES

A. Examine the sheathing, blocking, reglets, and other construction to receive the work. Do not proceed with installation of sheet metal work until unsatisfactory conditions have been corrected.

B. Substrates shall be clean, smooth and dry, with no projecting nail heads or other obstructions.

C. Saw cut reglets at all locations indicated. Use existing mortar joints and existing reglet where possible (unless otherwise indicated on the Drawings).

3.2 GENERAL REQUIREMENTS

A. Comply with details and profiles as shown, and comply with reference standards for installation of the work.

B. Anchor units of work securely in place by methods indicated, providing for thermal expansion of metal units. Conceal fasteners where possible, and set units true to line and level, or pitched to drain, fitting into existing conditions. Install work with laps, joints, and seams that will be permanently watertight and weatherproof.

C. Underlayments: As indicated on Drawings. .

D. Edge and Drip Strips: Provide where sheet metal extends over edges. Install strips in continuous, butted long lengths to allow metalwork to be hooked over lower edge not less than 3/4".

E. Seams:
   1. General: Form to lap in direction of flow of water.
   2. Flat-lock seams: Finish not less than 3/4" wide.
   3. Lap seams where soldered: Finish not less than 1" wide.
   4. Lap seams, not soldered: Overlap 3" unless otherwise noted.

3.3 FLASHINGS

A. Counter flashings:
1. Use counter flashings on vertical surfaces in conjunction with base flashing and lap base flashings a minimum of 3". Turn bottom edge 1/2" under itself. Crease center of exposed surface longitudinally to produce a spring action that will hold bottom edge against base flashing.
2. Form counter flashings in 8' or 10' lengths. Lap adjoining sheets 3" or join by a hook seam.
3. In masonry walls, build cap flashing into masonry joint at least 2" with inner edge turned up 1/4". In existing walls, rake out joints 1" deep. Insert sheets and secure with lead wedges at 12" on center.
4. Formed stepped counter flashings where existing are stepped, or follow existing sloped reglet where existing, unless otherwise indicated on the Drawings.

B. Stepped base and counterflashings for roofing abutting vertical surfaces:
1. Form stepped base and counter flashings at intersection of pitched roofs with vertical surfaces of separate pieces. Lap steps 3” and turn down 3” over base flashing.
2. Base flashing shall consist of separate pieces of sheet metal woven in each course. Extend out of roof 4” and up on wall 4”, and under counter flashings.
3. Extend each piece from top edge of shingle to within ½” of butt of overlying shingle.

3.4 HUNG GUTTERS

A. Form half-round gutters of sheets 8 or 10 feet in length, with ends lapped 2 inches in the direction of flow. Solder lapped seams inside and out.

B. Wherever possible, locate expansion joints midway between outlet tubes and no over 30 feet apart. Loose-lock expansion joints and fill with sealant to allow ½ inch movement.

C. Support gutters with circle type hangers spaced not more than 2 feet on center. Secure hangers to fascia with retrofit brackets.

D. Solder end caps and outlet tubes to gutters; extend tubes 3 inches into downspout.

3.5 DOWNSPOUTS

A. Form continuous outlet tubes extending through stone cornice assemblies without any internal unsoldered joints. Secure outlet tube to gutter lining using 2-inch wide flange ring, riveted and soldered to gutter lining.

B. Support downspouts in position clear of wall using concealed rack-and-pin assemblies spaced not more than 10 feet on center. Drive bracket into joint in masonry; secure racks to back side of downspout with rivets and solder, and attached with removable pin. At wood siding, use bracket with flange to allow screw-mounting into siding.

C. Fit downspouts into existing underground drain pipes where applicable. Provide splash blocks at all other downspout locations.

END OF SECTION 07 62 00

SECTION 07 92 00 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. Stable:
      a. Perimeter of all door and window frames.
      b. Flashing applications.
      c. Mildew-resistant sealant.
      d. Other applications indicated on Drawings.
   2. Greenhouse:
      a. Perimeter of all door and window frames.
      b. Flashing applications.
      c. Other applications indicated on Drawings.

B. Related Sections include the following:
   1. Flashings are specified in Division 07 Section, “Sheet Metal Flashings.”
   2. Brick masonry restoration is specified in Division 04 Section, “Brick Masonry Restoration.”

1.3 PERFORMANCE REQUIREMENTS

A. Provide joint sealants for exterior applications that establish and maintain airtight and water-resistant continuous joint seals without staining or deteriorating joint substrates.

1.4 SUBMITTALS

A. Product Data: For each joint sealant indicated.

B. Samples: For each type and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- wide joints formed between two 6-inch- long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

C. Compatibility and adhesion test reports.

1.5 QUALITY ASSURANCE

A. Preconstruction Compatibility and Adhesion Testing: Submit samples of materials that will contact or affect joint sealants to joint-sealant manufacturers for testing according to ASTM C 1087 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.

B. Preconstruction Field-Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to Project joint substrates according to the method in ASTM C 1193 that is appropriate for the types of Project joints.

1.6 WARRANTY

A. Special Installer's Warranty: Installer's standard form in which Installer agrees to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
   1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience.

B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range, except as otherwise indicated.

2.2 ELASTOMERIC JOINT SEALANTS

A. Elastomeric Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

B. Stain-Test-Response Characteristics: Where elastomeric sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

C. Single-component Nonsag Urethane Sealant:
   1. Products:
      a. Pecora Corporation; Dynatrol I.
      b. Tremco; Dymonic FC.
      c. Sika Corporation; LM-15.
   2. Type and Grade: S (single-component) and NS (nonsag).
   3. Class: 50.
   4. Use Related to Exposure: NT (nontraffic).
   5. Uses Related to Joint Substrates: M, A, and, as applicable to joint substrates indicated, O.

D. Single-Component Mildew-Resistant Silicone Sealant:
   1. Products:
      a. Dow Corning Corporation; 786 Mildew Resistant.
      b. GE Silicones; Sanitary SCS1700.
      c. Pecora Corporation; 898.
      d. Tremco; Tremsil 200/600.
      e. Approved equal.
   2. Type and Grade: S (single component) and NS (nonsag).

3. Class: 25.
4. Use Related to Exposure: NT (nontraffic).
5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.

2.3 LATEX JOINT SEALANTS

A. Latex Sealant: Comply with ASTM C 834, Type P, Grade NF.

B. Products:
1. Bostik Findley; Chem-Calk 600.
2. Pecora Corporation; AC-20+.
3. Schnee-Morehead, Inc.; SM 8200.
4. Sonneborn, Division of ChemRex Inc.; Sonolac.
5. Tremco; Tremflex 834.

2.4 JOINT-SEALANT BACKING

A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C 1330, Type B (bicellular material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.5 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants.

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant. Clean porous joint substrate surfaces by brushing and solvent cleaning to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air.

B. Joint Priming: Prime joint substrates based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
   1. Prime all joints unless requirement is waived by sealant manufacturer’s technical field representative on the basis of on-site adhesion testing.

C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.2 INSTALLATION

A. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

B. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
   1. Do not leave gaps between ends of sealant backings.
   2. Do not stretch, twist, puncture, or tear sealant backings.
   3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

C. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
   1. Place sealants so they directly contact and fully wet joint substrates.
   2. Completely fill recesses in each joint configuration.
   3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

F. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.3 JOINT-SEALANT SCHEDULE

A. All exterior joint sealant applications:
   1. Joint Sealant: Single-component nonsag urethane sealant
   2. Color: As selected by Architect from manufacturer's full range.

B. Interior joints in painted vertical surfaces and horizontal non-traffic surfaces:
   1. Joint Sealant: Latex sealant.
   2. Color: Similar to contiguous paint color.

END OF SECTION 07 92 00

SECTION 08 01 52 – WOOD WINDOW RESTORATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 DESCRIPTION

A. This Section includes the following:
   1. Stable:
      a. Repairs to existing wood window frames.
      b. New custom wood window sashes.
      c. New custom wood windows.
      d. Weatherstripping of all windows.
      e. New window hardware.
   2. Greenhouse:
      a. Repairs to existing wood window frames.
      b. New custom window sashes.
      c. New window hardware.

B. Types of windows included:
   1. Double-hung sash wood windows.
   2. Casement sash wood windows.
   3. Fixed sash wood windows.

C. Related Sections include the following:
   1. Sealing of joint between wood frames and masonry is specified in Division 07 Section, "Joint Sealants."
   2. Glass and glazing are specified in Division 08 Section, "Restoration Glass and Glazing."
   3. Painting of wood windows is specified in Division 09 Section, "Exterior Painting."

1.3 SUBMITTALS

A. Shop drawings: Submit shop drawings for fabrication and installation of all new wood window work, including new sashes in existing frames and new frames and sashes. Drawings shall include dimensioned elevations and sections as well as full size details of all typical members and joinery and shall show hardware and relationship to adjoining work.

B. Samples:
   1. Submit full size profiles of each component profile required, including but not limited to window types listed below. Submit actual wood samples of existing sash and frame components indicated to be replicated along with proposed replicate component section. Submit carefully sawn sections enabling evaluation of profiles by the Architect.
   2. Submit each type of new hardware required.

1.4 QUALITY ASSURANCE

A. The Quality Standards, latest edition of the Architectural Woodwork Institute, shall apply to the work of this section. Except as otherwise indicated, provide "Custom Grade" work as defined in the above-referenced standard for all wood window work.

B. Custom wood window fabricator qualifications: Fabrication of replicate windows and window components required as part of the Work of this Section shall be performed by a "Restoration Specialist," defined as an individual or firm of established reputation in building restoration (or, if newly organized, whose personnel have previously established a reputation in the field), who or which is regularly engaged in, and which maintains a regular force of workmen skilled in either (as applicable) manufacturing or fabricating items required by the contract, installing items required by the contract, performing on-site treatment of existing historic materials, or otherwise performing work required by the contract. The individual or firm shall have recent and documented experience in the restoration of wood windows and fabrication of replicate wood windows in National Register-listed buildings.

C. Window restoration Contractor qualifications: Work of this Section shall be performed by a "Restoration Specialist," defined as an individual or firm of established reputation in building restoration (or, if newly organized, whose personnel have previously established a reputation in the field), who or which is regularly engaged in, and which maintains a regular force of workmen skilled in either (as applicable) manufacturing or fabricating items required by the contract, installing items required by the contract, performing on-site treatment of existing historic materials, or otherwise performing work required by the contract. The individual or firm shall have recent and documented experience in the restoration of wood windows in National Register-listed buildings.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Wood window species:
   1. New window sash: South American mahogany or Spanish cedar, AWI Grade 1, quarter-sawn.
   2. Frame repair materials: South American mahogany, Spanish cedar, or white oak, AWI Grade 1, plain- or quarter-sawn.

B. Shop Primer: Alkyd based, exterior primer, manufactured by Benjamin Moore, Pratt & Lambert, PPG, or Sherwin-Williams.

C. Epoxies, Adhesives, Fasteners:
   1. Manufacturer: Provide products of one of the following:
      a. Abatron, Inc., Gilberts, IL.
      b. West System as made by Gougeon Brothers, Inc., Bay City, MI.
   2. Basis-of-design epoxy adhesives and consolidants:
      a. Epoxy resin: West System 105 Epoxy Resin
      b. Epoxy hardener: West System 205 Epoxy Hardener.
      c. Adhesive microfibers: West 403 Microfibers and Gap Filler.
   3. Wood filler: Provide one of the following:

a. West System 105/205 Resin/Hardener thickened with one of the following, as recommended by manufacturer for each type of application:
   1) West 403 Microfibers and Gap Filler.
   2) 407 Low Density Filling and Fairing Additive.
b. Woodepox #1 as made by Abatron, Inc.

2.2 WINDOW HARDWARE AND ACCESSORIES FOR NEW AND EXISTING WINDOWS

A. Double-hung or sing-hung windows:
   1. Sash balance for solid frames: Ultra-lift Spiral Balance as made by Caldwell Manufacturing Company, size to match weight of operable sash.
   2. Sash chains: Solid brass, size matching existing.
   3. Sash fast: Cam-type sash lock, cast brass, equal to Ives, No. 9, 613 finish.
   4. Weatherstripping at jambs, meeting rail, and bottom rail: Spring bronze weatherstripping as made by Accurate Metal Weatherstrip Company, Model B182.

B. Casement-sash windows:
   1. Hinges: 1 pair each unit, cast iron butt hinges, Ball & Ball H1051-020, 3 inches by 2-1/2 inches.
   2. Latch: I each unit, cast brass casement latch and surface strike, Model #3708 as made by Merit Metal Products.
   3. Weatherstripping at jambs, top rail, bottom rail: Spring bronze weatherstripping as made by Accurate Metal Weatherstrip Company, Model B182.

2.3 FABRICATION OF NEW SASHES AND FRAMES

A. Comply with AWI Section 1000, Custom Grade.
   1. Basis-of-design custom wood window fabricator: Woodstone Company, Westminster, VT
   2. Custom wood windows made by other architectural woodworking firms with minimum 10 years of experience in the fabrication of traditional wood windows will also be acceptable.

B. Fabricate work to designs, dimensions, and details shown on the Drawings and approved shop drawings, and replicate existing profiles except where specifically indicated otherwise.
   1. Drawings do not show every detail of every window. Verify all conditions at every window prior to fabrication of new components.

C. All millwork exposed to weather or in contact with masonry shall be given wood sealer as specified.

D. All work shall be primed and backprimed.

E. Provide bronze weatherstripping at new windows.

PART 3 - EXECUTION

3.1 FIELD CONDITIONS

A. Take all necessary field measurements and verify all installation conditions prior to ordering and fabrication of material.

B. Coordinate work with installation of new sashes to minimize length of time sashes are removed from frame.

C. Protect window openings with minimum ½-inch thick plywood panels during period of sash removal.

3.2 GENERAL RESTORATION SEQUENCE – EACH WINDOW WHERE SASH REMOVAL IS INDICATED

A. Label sashes indicated to be restored.

B. Remove inside stops and discard.

C. Remove sashes and parting beads for full access to frame.

D. Remove parting beads and discard.

E. Provide temporary protection at window opening consisting of minimum ½-inch thick plywood., screwed to exterior face of window frame.

F. Restore frame in place.

G. Prime new wood in frame.

H. Install weatherstripping.

I. Reinstall new or existing sashes, hung on new chains. Plane and adjust sashes to align at meeting rails.

J. Install new parting beads.

K. Install new sash lock.

L. Provide new inside stops.

M. Make final adjustments to weatherstripping and window operation.

3.3 WOOD WINDOW RESTORATION - GENERAL

A. General: Restore all frames, sills, and sashes shown on the Drawings using methods specified in this section. Restoration work includes all work necessary and is not limited to specific items noted on the Drawings.

B. Performance requirements for wood window restoration:

1. Condition of existing windows: The Contractor is required to inspect each window and report to the Architect any discrepancies between the Drawings and actual conditions.
2. Wood components, general: Replace all missing or otherwise defective rotted trim, stops, and parting beads of all windows. Finished windows shall be fully intact, structurally sound, weathertight windows. Patch holes, indentations, gouges, etc. using epoxy wood filler for holes less than 1" X 1" X 1/2" deep and wood Dutchmen for holes larger than 1" x 1" x 1/2" deep.
3. Rails and stiles: Replace rotted or structurally unsound rails or stiles with new members matching the profiles of the existing, matching joinery of existing. Contractor may, at his option, unless specifically indicated in the Window Schedule, epoxy consolidate rotted rails and rail/stile joinery to avoid rail replacement. Patch all holes in woodwork as described in subparagraph 3 above.
4. Sills: Sill work required is indicated on the Drawings. Replacement sills shall match existing design and profiles. Epoxy consolidate sills where indicated on Window Schedule.

3.4 FRAME RESTORATION

A. Preparation:
   1. Remove all dirt and debris from frame, including loose dirt inside window frames accessible from jamb access panels.
   2. Remove all extraneous nails, staples, bolts, hooks, etc. from windows and wood trim. Do not remove window washer's bolts unless specifically indicated otherwise.
      a. Inspect all window bolts. Report all loose, poorly anchored, missing, or otherwise defective window bolts to the Owner. Include in Base Bid the resetting of 12 existing window bolts.
   3. Protect frame and opening from weather. Dry all wood to moisture content below 17%.

B. Epoxy Repairs of Rotted Sills and Frame Components:
   1. For wood deterioration less than 3/4" deep (when penetrated with an ice pick using moderate hand pressure): Brush-apply epoxy resin on to clean wood surfaces. Protect adjacent masonry and other surfaces by masking entire area surrounding sill.
      a. Follow manufacturer's instructions for mixing of components, application temperatures, and material handling.
      b. Apply heavy coat of epoxy resin and allow to soak into wood. Apply additional coat while previous coat is uncured to completely saturate the deteriorated areas of wood.
      c. Fill depressions, voids, gouges, and cracks with epoxy filler as described in D.3 below.
   2. For wood deterioration greater than 3/4" deep:
      a. Drill 3/8" diameter holes through approximately 90% of thickness of wood sill from top. Holes shall be staggered, on approximately 3" centers.
      b. Protect all surrounding building elements from spillage of epoxy with polyethylene sheets and tape.
      c. Pour low modulus, low viscosity epoxy resin into each hole until hole has been filled. As epoxy is absorbed into the wood, top off holes with epoxy as required until all holes will accept no more. (If the wood being treated contains water, the water will be forced out by the epoxy without affecting the procedures.)

d. Brush the remaining weathered portions of the top and front of the sill with epoxy. Repeat brush application until all surfaces being treated are saturated with epoxy and are flush and smooth.
e. Finish to match original configuration. Thoroughly sand cured epoxy to provide proper surface for bond of paint. (Curing time varies with ambient temperature and product used.)
f. Protect epoxy from prolonged exposure to ultraviolet light. Prime paint shall be applied 48 hours after cure.

3. Filling of holes, cracks, depressions, and gouges with epoxy filler: Mix and apply epoxy wood filler in accordance with manufacturer's recommendations. Fill flush with surface of wood, matching profile of original wood. Sand to smooth surface after filler is completely cured.

C. Frame Repair Procedure:
1. Inspect all frame components for condition. Where frame repairs are indicated on the Window Schedule, disassemble frame to the extent required and remove deteriorated components, and replace with replicate components.
2. Dutchman Repairs: Where practicable, and at all locations indicated on the Window Schedule, repair deteriorated, split, or missing wood with Dutchman repairs.
a. Neatly cut out defective material and enough sound wood to bond Dutchman to sound substrate. Form a prismatic void in existing wood with square corners and edges. CutDdutchman to exactly fit void, with exposed portion matching original profile of woodwork, and grain of Dutchman insert parallel to original wood grain direction.
b. Secure Dutchman with waterproof adhesive and clamp in place until glue is set.
3. Tighten loose and open joints in frame using waterproof glue and finishing nails properly countersunk. Fill all joints which cannot be closed without dismantling the window and fill all other holes in wood with non-shrinking epoxy wood filler.
4. Fill miscellaneous holes, cracks, and open joints in woodwork with epoxy wood filler.
5. Sand to smooth surface.
6. Treat all unpainted exterior and concealed wood surfaces with wood preservative. Liberally apply two coats to all surfaces. Spray-treat concealed head and jamb members. Allow 24 hours between coats and 3 days prior to painting.
7. Prime paint all surfaces to be exposed to exterior with one coat of exterior undercoat.

3.5 INSTALLATION OF NEW WINDOWS

A. Install new custom windows as indicated on Drawings and final shop drawings. For installation procedures not addressed in final shop drawings, comply with installation requirements in ASTM E 2112.

B. Install windows level, plumb, square, true to line, without distortion, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction to produce weathertight construction.

3.6 ADJUST AND CLEAN

A. Adjust and check each operating item of hardware, and each window to ensure proper operation and function of every unit.

B. Lubricate moving parts including existing pulleys and hinges with machine oil. Replace elements which cannot be adjusted and lubricated to operate freely and smoothly for the application made.

C. Clean new and existing finish hardware.

END OF SECTION 08 01 52

SECTION 08 80 00 – RESTORATION GLASS AND GLAZING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following glazing applications:
   1. Stable:
      a. Glazing of new sashes with sealed insulating glass.
   2. Greenhouse:
      a. Replacement of broken panes in existing sashes.
      b. Glazing of new sashes with float glass.
      c. Replacement of putty glazing in existing window sashes to remain.
      d. Replacement of broken curved glass units in greenhouse glazing system.

B. Related Sections include the following:
   1. Window restoration is specified in Division 08 Section, “Wood Window Restoration.”

1.3 DEFINITIONS

A. Interspace: Space between lites of an insulating-glass unit that contains dehydrated air or a specified gas.

B. Deterioration of Insulating Glass: Failure of hermetic seal under normal use that is attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.

1.4 SUBMITTALS

A. Product Data: For each glass product and glazing material indicated.

B. Samples: 8-inch-square, for each type of glass and film product indicated.

1.5 QUALITY ASSURANCE

A. Contractor qualifications: Work shall be performed by a firm that qualifies as a "Restoration Specialist,” defined as an individual or firm of established reputation in building restoration (or, if newly organized, whose personnel have previously established a reputation in the field), who or which is regularly engaged in, and which maintains a regular force of workmen skilled in either (as applicable) manufacturing or fabricating items required by the contract, installing items required by the contract, performing on-site treatment of existing historic materials, or otherwise performing work required by the contract. The individual or firm shall have recent

and documented experience in the glazing of wood windows in National Register-listed buildings.

PART 2 - PRODUCTS

2.1 GLASS PRODUCTS

A. Annealed float glass: ASTM C 1036, Type I (transparent flat glass), Quality-Q3; Class 1.

B. Translucent float glass: Annealed float glass with medium sandblast pattern.

C. Laminated Glass: ASTM C 1172, and complying with other requirements specified and with the following:
   1. Interlayer: Ultraviolet light-filtering, 30-mil, polyvinyl butyral, with a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after laminating glass lites and installation.

D. Insulating-Glass Units, General: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, and complying with ASTM E 774 for Class CBA units.
   1. Overall Unit Thickness and Thickness of Each Lite: Dimensions indicated for insulating-glass units are nominal and the overall thicknesses of units are measured perpendicularly from outer surfaces of glass lites at unit's edge.
   2. Sealing System: Dual seal.
   3. Spacer Specifications: Manufacturer's standard spacer material and construction.

2.2 GLAZING MATERIALS

A. Face glazing of existing wood windows: Linseed oil or acrylic type glazing compound equal to Dap 33 acrylic, Sherwin-Williams Glazing Compound C66, or Type M Putty as made by Sarco Putty Company, Inc.

B. Sealant for setting of sealed insulating glass units: As recommended by sealed insulating glass fabricator for installation in primed wood sashes.

C. Glazing tape for setting of sealed insulating glass units: As recommended by sealed insulating glass fabricator for installation in primed wood sashes.

2.3 MISCELLANEOUS GLAZING MATERIALS

A. Glazing points: Triangle Glazier Points, zinc. If wood glazing bars are deep enough to conceal the units, Zinc Push Points may be used.

B. Glazing film: Vista Solar Control Film V-58, ultraviolet light filtering plastic film, for field application to the interior face of all operable and fixed sash glass, entire building.

2.4 SCHEDULE OF RESTORATION GLAZING TYPES

A. Glass Type 1: Salvaged or new float glass.
   1. Application: Replacement glazing at existing sashes and new sashes at Greenhouse:
   2. Overall unit thickness: 1/8 inch.

3. Thickness of each glass light: 1/8 inch.
4. Source of glass: Sashes removed from existing building.

B. Glass Type 2: Clear, sandblast-pattern, insulating glass
1. Application: New true-divided-light window sashes at restrooms.
2. Overall unit thickness: ½ inch unless otherwise determined by window fabricator.
3. Thickness of each glass light: 1/18 inch.
4. Outdoor lite: Heat-strengthened float glass, except that fully tempered glass shall be provided at all locations required by the IBC and the CPSC safety glazing requirements, with medium sandblast pattern on second surface.
5. Interspace content: Argon.
6. Indoor lite: Clear float glass, except that fully tempered glass shall be provided at all locations required by the IBC and the CPSC safety glazing requirements.

C. Glass Type 3: Clear insulating glass
1. Application: New true-divided-light window sashes at non-restroom spaces in Stable.
2. Overall unit thickness: ½ inch unless otherwise determined by window fabricator.
3. Thickness of each glass light: 1/8 inch.
4. Outdoor lite: Heat-strengthened float glass, except that fully tempered glass shall be provided at all locations required by the IBC and the CPSC safety glazing requirements.
5. Interspace content: Argon.
6. Indoor lite: Clear float glass, except that fully tempered glass shall be provided at all locations required by the IBC and the CPSC safety glazing requirements.

D. Glass Type 4: Clear, laminated, tempered safety glass:
1. Application: Curved glazing at greenhouse glazing system.
2. Overall unit thickness: ¼ inch.
3. Thickness of glass lite: ¼ inch.
4. Single lite: Laminated glass panels fabricated from clear, fully tempered glass to comply with IBC for overhead applications and the CPSC safety glazing requirements.

PART 3 - EXECUTION

3.1 PUTTY GLAZING

A. Replacement glass panes: After priming sash, apply a thin back-bed of putty to glazing rabbet. Press glass into putty and secure glass with zinc glazing points set 2 per side of pane. Apply glazing as specified below.

B. Repair of existing putty: Remove deteriorated putty by means of hand chisels, an oscillating-blade electric tool, and other hand tools that allow putty removal without damage to glass. Fill in missing putty as specified below.
1. Putty installation: Working from a ball of glazing compound, press glazing into rabbet with a putty knife, filling all voids and pressing against wood muntin. Strike to form a sharp bevel, with neat corner miters.

3.2 GLAZING OF SEALED INSULATING GLASS UNITS

A. General: Comply with instructions of manufacturers of glass, sealants, and other glazing materials.
   1. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site.
   2. Apply primers to joint surfaces where required for adhesion of sealants, as determined by sash fabricator/glazier.
   3. To the extent required, provide spacers and edge blocking, as recommended by sash fabricator/glazier.

B. Tape Glazing: Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
   1. Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.
   2. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
   3. Apply heel bead of elastomeric sealant.
   4. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
   5. Apply cap bead of elastomeric sealant over exposed edge of tape.

C. Sealant Glazing (Wet): Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
   1. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
   2. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.3 CLEANING AND PROTECTION

A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Remove nonpermanent labels, and clean surfaces. Protect glass from contact with contaminating substances resulting from construction operations. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended by glass manufacturer.

B. Remove and replace glass that is broken, chipped, cracked, or abraded or that is damaged from natural causes, accidents, and vandalism, during construction period.

END OF SECTION 08 80 00

SECTION 09 22 50 – EXTERIOR LIME PLASTER

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. Stable: Not applicable.
   2. Greenhouse:
      a. Repairs to lime plaster applied to existing brick masonry.

1.2 SUBMITTALS

A. Product data for hydraulic lime.

1.3 QUALITY ASSURANCE

A. Reference Standard: To the extent applicable, comply with ASTM C926-81, Standard Specification for Application of Portland Cement-based Plaster.

B. Mockup: Install a 2 foot by 2 foot mockup of plaster system, applied to wall location directed by Architect.

C. Pre-installation conference: Conduct conference at Project site to comply with requirements in Division 1 Section, “Project Management and Coordination.”

D. Job service by hydraulic lime manufacturer: Provide job service by technical representative from U.S. distributor, to provide technical recommendations at the following times:
   1. At application of mockup panel.

1.4 PROJECT CONDITIONS

A. Weather conditions and curing: Comply with ASTM C 926 and as specified in 3.1 of this Section.

PART 2 - PRODUCTS

2.1 MATERIALS AND PLASTER MIXING

A. Basis-of-design hydraulic lime: Natural Hydraulic Lime, as produced by St. Astiers Natural Hydraulic Lime and Lime Products, as distributed by Virginia Lime Works, Monroe, VA, or acceptable equal. Provide types of lime indicated Stucco Mix Schedule at the end of Part 2.

B. Sand: Mason's sand, ASTM C144, mixture of white bar sand and brown bar sand.

C. Water: Clean, potable, from city mains.

D. Mixing: Comply with recommendations of St. Astier Natural Hydraulic Lime and Lime Products for handling of hydraulic lime and mixing of stucco.

2.2 PLASTER MIX SCHEDULE

A. Lime Plaster on masonry substrate to matching adjacent plaster:
1. Base Coat:
1 part NHL3.5 hydraulic lime
2.5 parts sand
2. Finish Coat:
1 part NHL 3.5 hydraulic lime
3 parts sand.

PART 3 - EXECUTION

3.1 PLASTER CURING

A. General: Apply and cure plaster to prevent plaster drying out during curing period. Use procedures required by climatic conditions, including moist curing, providing shade coverings, and providing barriers to deflect sunlight and wind.

B. Hot weather requirements - general: Provide all special precautions and procedures required to control stucco curing during hot weather. Comply with recommendations of "All-Weather Construction" Technical Note (Rev. March 1992) as published by the Brick Institute of America.
1. No stucco shall be placed in full sun at temperatures above 80 degrees F unless shading of the walls is provided and the masonry wall temperature is kept below this point.

2. Maintain temperature of stucco between 60 degrees F and 100 degrees F. Use all measures required to achieve this temperature range, including storing sand under shaded cover.

C. Cold weather requirements: No work in this Section shall be executed when the ambient temperature is less than 40 degrees F. No exterior stucco work shall be executed when freezing temperatures are expected within 48 hours.

3.2 PLASTER APPLICATION

A. General: Comply with specifications of St. Astiers Natural Hydraulic Lime and Lime Product.

B. Preparation:

1. Masonry walls: Remove deteriorated plaster indicated using hand- or pneumatic chisels. Do not grit-blast clean.
   a. Scrub wall surfaces using a 1:10 mixture of household bleach and water, scrubbing with a Tampico bristle brush.
   b. Water-rinse walls using a pressure washer. Use minimum quantity of water, and direct tip downward at all times. After rinsing, remove excess water from dirt floor using a wet-vacuum.

D. Three-coat plaster work:
   1. System thickness: Provide total 1 inch thickness system over truing course, with coat thicknesses as follows. Adjust each coat thickness to match overall thickness of existing plaster.
      a. Base coat: 3/8 inch.
      b. Scratch coat: 3/8 inch.
      c. Finish coat: 1/4 inch.
   2. Base coat: Trowel apply with a steel trowel. After initial stiffening, scour back with a wood float and score surface with a metal comb, scored lightly in both directions to form a criss-cross pattern. Do not score deeply.
      a. Depending on weather conditions, as directed by hydraulic lime manufacturer's technical field representative, allow base coat to cure 2 days before applying scratch coat.

   3. Scratch coat: Trowel apply with a steel trowel. After initial stiffening, scour back with a wood float and score surface with a metal comb, scored lightly in both directions to form a criss-cross pattern. Do not score deeply.
      a. Depending on weather conditions, as directed by hydraulic lime manufacturer's technical field representative, allow base coat to cure 2 days before applying finish coat.
      b Do not proceed with finish coat until scratch coat is approved by hydraulic lime manufacturer's technical field representative.
   5. Finish coat: Trowel apply with a steel trowel and finish using a sponge float to form a sand float finish matching approved mockup panel and existing plaster.
      a. Apply finish coat in a continuous process from the bottom to the top of each wall panel. Do not allow cold joints in finish coat except at changes in plane. Plan work areas, scheduling, and staffing to meet this requirement.
   4. Wall planarity: The intent of the design is to match surrounding, variable-plane plaster finish.

3.3 CLEAN UP AND PROTECTION

A. Following completion of lime plaster work, remove all spilled material and spatters from all surrounding surfaces, floor slab, paving, and landscaping.

END OF SECTION 09 22 50

SECTION 09 91 13 – EXTERIOR PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. Stable: Preparation and field painting of exterior surfaces at existing building, including all exterior wood surfaces, steel and iron elements, and other painted exterior surfaces.
   2. Greenhouse:
      a. Exterior: Preparation and field painting of exterior surfaces at existing building, including wood windows, steel and iron elements of greenhouse glazing and structural system, exterior plaster/stucco, and other painted exterior surfaces.
      b. Interior: Preparation and field painting of interior surfaces of garage, including plaster walls, interior face of exterior doors and windows, interior wood surfaces, exposed iron and steel, and other painted interior surfaces.
      c. Not included:
         1) Painting of existing unpainted roof structure and underside of roof decking.
         2) Interior of headhouse office and work room.

B. Related Sections include the following:
   1. Division 06 Section, “Exterior Architectural Woodwork,” for shop priming of new exterior architectural woodwork.
   2. Division 08 Section, “Wood Window Restoration,” for coordination with window restoration.
   3. Abatement of lead-containing and asbestos-containing materials is completed under separate contract with Owner.

1.3 SUBMITTALS

A. Product Data: For each product indicated.

B. Samples: For each type and color of finish-coat materials indicated.

1.4 QUALITY ASSURANCE

A. Contractor qualifications: Work shall be performed by a firm that qualifies as a "Restoration Specialist,” defined as an individual or firm of established reputation in building restoration (or, if newly organized, whose personnel have previously established a reputation in the field), who or which is regularly engaged in, and which maintains a regular force of workmen skilled in either (as applicable) manufacturing or fabricating items required by the contract, installing items required by the contract, performing on-site treatment of existing historic materials, or otherwise performing work required by the contract. The individual or firm shall have recent

and documented experience in the preparation and painting of exterior surfaces in National Register-listed buildings.

B. Samples (mockups) for paint coatings: Provide a full-coat benchmark finish sample for each type of coating and substrate required. Comply with procedures specified in PDCA P5.
   1. Exterior face of one window, each building.
   2. Cornice: 6 linear feet.
   3. Final approval of colors will be from benchmark samples.

1.5 PROJECT CONDITIONS

A. Lead-based paints: The existing buildings were surveyed for lead-based paints. The results of that survey are contained in a Division 1 Section, "Lead-Based Paint Survey & Abatement Plan," hereinafter, "Consultant Report." The survey indicates the presence of lead-based paint on a number of exterior materials.
   1. Comply with requirements of the Consultant Report for the abatement of exterior lead-based paint.

B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F. Maintain storage containers in a clean condition, free of foreign materials and residue.

C. Apply waterborne paints only when temperatures of surfaces to be painted and surrounding air are between 50 and 90 deg F.

D. Apply solvent-thinned paints only when temperatures of surfaces to be painted and surrounding air are between 45 and 95 deg F.

E. Do not apply paint in snow, rain, fog, or mist; or when relative humidity exceeds 85 percent; or at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

1.6 EXTRA MATERIALS

A. Furnish extra paint materials from the same production run as the materials applied and in the quantities described below. Package with protective covering for storage and identify with labels describing contents. Deliver extra materials to Owner.
   1. Quantity: 3 percent, but not less than 1 gallon of each material and color applied.

PART 2 - EXECUTION

2.1 MANUFACTURERS

A. Paint products: Subject to compliance with requirements, provide products made by one of the following:
   1. Benjamin Moore & Co. (Benjamin Moore).
   2. ICI Dulux Paint Centers (ICI Dulux Paints).
   3. PPG Industries, Inc. (Pittsburgh Paints).
   4. Sherwin-Williams Co. (Sherwin-Williams).

2.2 MATERIALS, GENERAL

A. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

B. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint-material containers not displaying manufacturer's product identification will not be acceptable.

C. Colors: As selected from manufacturer's full range.

PART 3 - **EXECUTION**

3.1 PREPARATION, GENERAL

A. Comply with procedures specified in PDCA P4 for inspection and acceptance of surfaces to be painted.

B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.

C. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.
   1. Provide barrier coats over incompatible primers or remove and reprime.
   2. New Woodwork: Clean new wood surfaces of dirt, oil, and other foreign substances with mineral spirits and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
      a. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
      b. Prime, stain, or seal wood to be painted immediately on delivery. Prime edges, ends, faces, undersides, and back sides of wood, including cabinets, counters, cases, and paneling.
      c. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately on delivery.
   3. Existing woodwork not indicated to be stripped:
      a. Wash all exterior woodwork in advance of general preparation for painting. Wash with a dilute mix of household bleach in clean water (1 part bleach to 8 parts water). Scrub with a tampico brush to remove all mildew and soot. Water rinse using a garden hose or low-pressure water wash, and allow to dry thoroughly before proceeding with painting work.
      b. Brush off all dust and wash off all grease, oil, and dirt with paint thinner or other solvent cleaner.
      c. Fill cracks in woodwork not indicated elsewhere to be filled by means of epoxy consolidation and fillers using acrylic caulk. Fill nail holes, splits, and surface

defects with putty. Apply putty filler flush with surface and sand to smooth surface.

d. Sand paints not indicated to contain lead using sandpaper.

4. Ferrous Metals: Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with SSPC's recommendations.
   a. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer, and touch up with same primer as the shop coat.

D. Galvanized Surfaces: Clean galvanized surfaces with nonpetroleum-based solvents so surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.

3.2 APPLICATION

A. Material Preparation:
   1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
   2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.

B. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
   1. Omit primer over metal surfaces that have been shop primed and touchup painted.
   2. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance.

C. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.

D. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate. Provide total dry film thickness of the entire system as recommended by manufacturer.

E. Prime Coats: Before applying finish coats, apply a prime coat, as recommended by manufacturer, to material that is required to be painted or finished and that has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.

F. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.

3.3 CLEANING AND PROTECTING

A. At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from Project site.

B. Protect work of other trades, whether being painted or not, against damage from painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Architect.

C. Provide "Wet Paint" signs to protect newly painted finishes. After completing painting operations, remove temporary protective wrappings provided by others to protect their work.
1. After work of other trades is complete, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

3.4 EXTERIOR PAINT SCHEDULE

A. New and Existing Exterior Woodwork – Satin Finish:
1. Satin-Latex Finish: Two finish coats over alkyd primer.
a. Primer: S-W A-100 Exterior Alkyd Wood Primer.
b. 2 Finish Coats: S-W Duration Coating Exterior Latex Satin.

B. Ferrous Metal:
1. Alkyd-Enamel Finish: Two finish coats over a rust-inhibitive primer.
a. Primer: S-W Kromik Metal Primer.
b. Finish Coats: S-W Industrial Enamel.

C. Galvanized Steel:
1. Alkyd-Enamel Finish: Two finish coats over a galvanized metal primer.
a. Primer: SW Pro-Cryl Universal Primer,B66-310 Series
b. Intermediate Coat: SW Urethane Alkyd Primer, B54-150 Series
c. Finish Coat: SW Urethane Alkyd Enamel, B54-150 Series.

D. Exterior lime plaster and Portland cement plaster:
1. Flat finish: Two coats elastomeric coating over primer.
a. Primer: SW Loxon Surfacer.
b. Finish Coats: SW ConFlex XL Smooth Elastomeric High-Build Coating.

3.5 INTERIOR PAINT SCHEDULE (GARAGE ONLY)

A. Painted Wood (Interior Face of new window components and sashes that have been removed and reinstalled):
1. Semi-Gloss Finish:
a. 2 Finish Coats: S-W Duration Home Semi-Gloss A98-100 Series.

B. Painted lime plaster at garage:
1. Flat Finish: Two finish coats over latex primer.
a. Primer: Interior gypsum board primer.
b. 2 Finish Coats: Flat acrylic finish.

END OF SECTION 09 91 13