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ADDENDUM NO. 2
August 4, 2025

To the
BID DOCUMENTS

For the
WASHINGTON COUNTY COURTHOUSE
PHASE II – EXTERIOR RESTORATION
Brenham, Texas

08.04.25

by
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This Addendum forms a part of the Proposal Documents and modifies the Phase II – Exterior Restoration Drawings and Project Manual dated July 11, 2025 as noted below. This Addendum consists of twenty-seven (27) pages, including attachments.

PROJECT MANUAL

AD2-01 **04905 – Masonry Restoration**

Under item 1.1.A, add item 10 as follows:
At base of building, where indicated on the Drawings, following coating removal, remove surface spalling to sound substrate, refinish/tool surface to closely match surface texture of undamaged adjacent stone, for bidding purposes assume 30% of total area will require refinishing/tooling. Apply mineral stain to base, three lowest stone courses entirely, to minimize appearance of repairs.

Renumber items 11-13.

Under item 1.1.B, add item 4 as follows:
Section 02075 – Paint Removal for coating removal at base of building.

Renumber items 5-11.

Under item 1.5.C, add items 6 and 7 as follows:
6. Refinishing/tooling: At base of building, at one full stone unit (minimum 5'x5') remove surface spalling to sound substrate, refinish/tool surface to closely match surface texture of undamaged adjacent stone. Demonstrate methods for surface spalling removal, resurfacing/tooling techniques and expected final appearance.

7. Staining: If refinishing/tooling of stone surface at mock-up is found visually unsatisfactory, as determined by the Architect, apply stain in pigments and opacity needed to blend and minimize appearance of repair areas.

Under PART 2, add item 2.8 as follows:
2.8 MINERAL STAIN
   A. Description: Sol-silicate based, vapor permeable, non-film forming mineral stain designed for exterior use on natural stone. Pigment and opacity level can be customized when diluted with thinner.
      1. Product: Restauro Stain Sol-Silicate pigmented Mineral Stain and Glaze System (Stain and Fixativ) as manufactured by Keim Mineral Coatings of America, Inc.

Replace Section 04905 entirely, see attached

AD2-02 **Section 08591 – Metal Window Restoration**

Under item 1.1.A., modify item 5 to add the following sentence:
Assume balance face plate and window frame will need to be modified to accept standard available tape balances.

Under item 2.4, modify item D to add the following sentence:
Assume balance face plate and window frame will need to be modified to accept standard available tape balances.

Replace Section 08591 entirely, see attached.

AD2-03 **Section 08800 – Glazing**

Under Item 2.1.A, modify item 1 as follows:

1. Provide ¼" thick Low-E laminated glass, Cardinal 272 RG 1900E as distributed by Hollander Glass or ClimaGuard 70/36 as manufactured by Guardian Glass, at exterior metal window sashes throughout except where noted.

Under item 2.1.A.1, modify items d and e as follows:
d. Visible light transmittance: 72% Minimum
e. Visible light reflectance: 11% Maximum

Replace Section 08800 entirely, see attached

CLARIFICATIONS

AD2-04 **Question:** Per general note 4. B and D on A-3.01, we are to remove stone veneer above windows to expose the lintel. However, on S2.13 the arrow points at level 2 and calls for all lintels and or shelf angles to be exposed, cleaned, paint removed and repainted. Since this lintel continues between windows, is the intent to remove all facade stone at these elevations to expose lintel? Or is it just above the windows?
Response: Per Sheets A-3.01 through A-3.04 and General Note 4.B, the base scope of work is to expose the lintel above the windows, remove rust and clean in order to determine structural

adequacy. If lintel requires replacement stone on either side of opening will need to be removed to provide minimum 1'-0" on each side of opening to install lintel. For bidding purposes, at the 1st, 2nd, and 3rd floors, assume 20% of lintels shall be replaced and the remaining restored. Per item 4.D., at the 4th floor, assume 30% of lintels shall be replaced and the remaining restored.

AD2-05 **Question:** Please confirm that the trees within the planters around the building are being removed. We assume only the trees outside the planters need to be protected.
Response: Correct, only trees/plantings within the planter beds at the perimeter of the building are scheduled for removal, all others to be protected.

AD2-06 **Question:** Is there a previously approved method for removing the existing coating at the ground level. This appears to be cementitious coating and may not be able to be removed without damaging the underlying stone. Would removing this stone, honing/refinishing and reinstalling be an acceptable option?
Response: No prior testing has been completed for removing the coating. Under Specification Section 02075 – Paint Removal, several paint removal systems are indicated for field testing. If coating removal is unsuccessful or exposes visually unacceptable surface damage that cannot be addressed by surface tooling in-place, stain bottom three courses of stone entirely to minimize appearance of repairs. Side walls of the north and south entry steps do not have a coating applied and are not part of the scope above. Refer to item AD2-01 for additional information.

AD2-07 **Question:** Where are the existing marble panels? So we can plan transportation back to site.
Response: The marble panels are in a storage facility owned by the County, located within 5 miles of the project site.

AD2-08 **Question:** Please disclose the vendor who has been approved for new cast stone pieces.
Response: There is no cast stone specified for the project, refer to Specification Section 04905 – Masonry Restoration, item 2.3 for description of each type of replacement stone, material source is provided.

END OF ADDENDUM

SECTION 04905

MASONRY RESTORATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Re-pointing exterior stone masonry joints 100%.
2. Removing and reinstalling and or replacing stone veneer as required to expose condition of window lintels throughout.
3. Removing and reinstalling and or replacing stone veneer as required to expose condition of continuous relieving angle above basement window openings 100%.
4. Removing temporary plywood panels and replacing lintels and installing salvaged marble spandrel panels removed in the prior Phase 1 Life Safety Repair work.
5. Removing and reinstalling remaining marble spandrel panels as required to replace lintels.
6. Replacement of damaged stone.
7. Resetting of displaced stone.
8. Stone repairs including stone Dutchman, injection grouting cracks, and patching.
9. Removal of surface spalling, tooling of stone surface to match adjacent undamaged surface, and application of consolidation and water repellent treatment, where surfaces have been tooled.
10. At base of building, where indicated on the Drawings, following coating removal, remove surface spalling to sound substrate, refinish/tool surface to closely match surface texture of undamaged adjacent stone, for bidding purposes assume 30% of total area will require refinishing/tooling. Apply mineral stain to base, three lowest stone courses entirely, to minimize appearance of repairs.
11. Stone anchors, fasteners, shims, weeps, etc…, as required to complete work of this Section.
12. Providing OSHA – compliant access for work of this Section.
13. Providing temporary shoring and bracing required to complete work of this Section.

B. Related Sections:

1. Division 1: Administrative, procedural, and temporary work requirements.
2. Section 01210 – Allowances.
3. Section 01226 – Unit Prices.
4. Section 02075 – Paint Removal for coating removal at base of building.
5. Section 04069 - Restoration Mortar.
6. Section 04931 - Masonry Cleaning.
7. Section 05100 – Structural Steel Framing.
8. Section 07620 – Sheet Metal Flashing for flashing steel lintels.
9. Section 07920 – Joint Sealers for lintel flashing and sealing joints between masonry and non-masonry materials.
10. Section 09910 – Painting and Finishing for painting steel lintels.
11. Refer to Structural Drawings, Sheet S100 and S1.01 for Cast-in Place Concrete, Concrete Reinforcing, Concrete Repair, Structural Masonry, Adhesive Anchors, Adhesive Dowels, Structural Steel, and Structural Steel Connections.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. C 97 - Absorption and Bulk Specific Gravity of Dimension Stone.
2. C 170 - Compressive Strength of Natural Building Stone.
3. C 295 - Petrographic Examination of Aggregates for Concrete.
4. ASTM C91-01: Standard ASTM C144-03: Standard Specification for Aggregate for Masonry.
5. ASTM C150-02ae1: Standard Specification for Portland Cement.
6. ASTM C207-97: Standard Specification for Hydrated Lime for Masonry Purposes.
7. ASTM C270-03: Standard Specification for Mortar for Unit Masonry.

B. IMIAC (International Masonry Industry All-Weather Council) - Recommended Practices and Guide Specifications for Cold Weather Masonry Construction.

C. Preservation Brief 2: Repointing Mortar Joints in Historic Brick Buildings, Robert C. Mack, FAIA, National Park Service, revised October, 1998.

1.3 DEFINITIONS AND GOALS

A. Defective/Deteriorated Joint: Joints in which mortar is missing, loose, eroded, cracked, powdered, unsound, or weathered more than 1/8 inch from original plane.

B. Dutchman: The removal of areas of unsound stone from a single unit and the installation of a piece of the same stone, cut, carved and tooled to match.

C. Patching: The goal of patching is to remove areas of deteriorated stone from individual units and recreate missing lines, forms and shapes with a compatible material that has the color and texture of the original stone.

D. Re-pointing: The process of raking out (removing) mortar and replacing it with new mortar.

E. Masonry Replacement: The process of removing masonry unit(s) and replacement with new unit(s) to match original in color, texture, finish, strength, etc.

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's technical data for each product indicated including recommendations for their application and use. Include test reports and certifications substantiating that products comply with specified requirements. Submit Material Safety Data Sheets for each product proposed for use.

B. Samples: Submit, for verification purposes, prior to mock-up erection, three samples each of the following:

1. For patching material, submit 6"x6"x1" samples of the mixed and cured material, showing the full range of expected color variations, and finish quality for each type of stone (limestone, each type, granite, and marble) patching required. Document each sample with manufacturer and stock number or other information necessary to order additional material.
2. Stone samples of limestone, marble, and granite in sufficient quantity to show full color and texture range, minimum four 6-inch x 6-inch samples.
3. Each type of anchor.
4. Each type of adhesive.

C. Shop Drawings:

1. The stone fabricator shall prepare and submit for approval complete cutting and setting drawings for all of the cut stonework. Drawings shall show in detail the sizes, sections, and dimensions of stone, the arrangement of joints, anchoring, setting marks, location of existing anchors and kerfs to remain, and other necessary details. The dimensions on the shop drawings shall represent field conditions and field measurements. Submit structural

calculations for proposed stone anchors, signed and sealed by a structural engineer licensed in the State of Texas.

D. Qualification Statement: Restorer qualifications, including previous projects.

1.5 QUALITY ASSURANCE

A. Restoration Specialist:

1. Work of this Section must be performed by an experienced stone restoration firm that has completed work similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance, having not less than 5 years comparable experience.
2. Field Supervision: Restoration specialist firm shall maintain an experienced full-time supervisor on the Project site during times that masonry restoration work is in progress.
3. When stone units are being patched, assign at least one worker per crew who is trained and certified by manufacturer of patching compound to apply its products.

B. Source of Materials: Obtain each type of material for masonry restoration (Stone, cement, sand, etc…) from one source with resources to provide material of consistent quality in appearance and physical properties.

C. Field-Constructed Mock-ups: Contractor shall prepare the following sample panels on the building, where directed by the Architect. Obtain Architect's acceptance of visual qualities before proceeding with the work. Retain accepted panels in undisturbed condition as a standard for judging completed work.

1. Removal and reinstallation of stone veneer at one continuous window lintel and one noncontinuous window lintel including paint removal at exposed steel, painting with specified high performance coating, application of lintel flashing, and weeps.
2. Dutchman repair for each type of stone demonstrating removal of deteriorated stone and installation of stone dutchman.
3. Stone patching for each type of stone (limestone, each type, granite, and marble) demonstrating removal of damaged stone and/or incompatible prior patch material and installation and curing of specified patching mortar.
4. Injection grouting/crack repair for each type of stone demonstrating preparation of typical crack and installation of grouting.
5. Re-pointing, each type of stone: Prepare two separate samples in-situ of approximately 3 feet high by 6 feet wide for each type of re-pointing required. One for demonstrating methods and quality of workmanship expected in removal of mortar from joints and the other for demonstrating visual qualities of pointing mortar and workmanship expected in pointing mortar joints.
6. Refinishing/tooling: At base of building, at one full stone unit (minimum 5'x5') remove surface spalling to sound substrate, refinish/tool surface to closely match surface texture of undamaged adjacent stone. Demonstrate methods for surface spalling removal, resurfacing/tooling techniques and expected final appearance.
7. Staining: If refinishing/tooling of stone surface at mock-up is found visually unsatisfactory, as determined by the Architect, apply stain in pigments and opacity needed to blend and minimize appearance of repair areas.

D. Field and Laboratory Testing of Consolidation Treatment

1. Prior to the start of masonry restoration work, provide field and laboratory testing by consolidation treatment manufacturer to determine the appropriate field application procedures.
2. Complete testing on minimum two existing stone units scheduled for removal at the base of the building that exhibit surface spalling.

3. Provide written report prepared by the manufacturer with recommendations for application procedures.
4. Expenses incurred for field and laboratory testing shall be paid for by the contractor.

1.6 PROJECT CONDITIONS

A. Environmental Requirements:

1. Hot weather requirements: If ambient temperature is over 95 degrees F or relative humidity is less than 50 percent, protect from direct sun and wind exposure for minimum 48 hours after installation.

B. Cold weather requirements:

1. In accordance with IMIAC requirements.
2. Do not use frozen materials or build upon frozen work.

1.7 SEQUENCING/SCHEDULING

A. Perform masonry restoration work in a logical sequence. Submit a plan sequencing for the following items of work:

1. Masonry cleaning, specified under Section 04905.
2. Re-pointing.
3. Window lintel repair and or replacement.
4. Relieving angle repair and or replacement.
5. Removal of deteriorated portions of existing stone masonry for the following repairs: stone dutchman, cementitious patching, and injection grouting.
6. Resealing open and or deteriorated sealant joints, specified under Section 07920.

1.8 DELIVERY, STORAGE AND HANDLING

A. Deliver masonry restoration materials to site in manufacturer's original and unopened containers and packaging, bearing labels as to type and names of products and manufacturer's.

B. Protect masonry restoration materials during storage and construction from wetting by rain, snow or ground water, and from staining or intermixture with earth or other types of materials.

C. Comply with manufacturer's recommendations for minimum and maximum temperature requirements for storage.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers – Stone Patching Mortar and Injection Grout:

1. Cathedral Stone Products, Inc., 410.782.9150.
2. Edison Coatings, Inc., 800.341.6621
3. U.S. Heritage Group, www.usheritage.com

B. Substitutions: Under provisions of Division 1.

2.2 STONE FOR DUTCHMAN REPAIR

A. Salvaged stone, where scheduled to be replaced at the building. Select pieces closest in color, graining, and face patterning to match stone where dutchman is to be installed.

B. Grout for Dutchman Seams: Jahn M-40 Crack and Void Injection Grout, as manufactured by Cathedral Stone Products, Inc., Hanover MD, (800) 684-0901.

2.3 REPLACEMENT STONE

A. General: Stone matching existing natural building stone of variety, color, texture, grain, veining, finish, size, and shape that match existing stone.

1. Limestone Building Stone Standard: ASTM C568, free of defects detrimental to durability.
2. Marble Building Stone Standard: ASTM C503, free of defects detrimental to durability.
3. Granite Building Stone Standard: ASTM C615, free of defects detrimental to durability.

B. Limestone at Building Base, Entry Steps and Side Walls: Carthage Limestone to match original in color and surface texture, as distributed Tennessee Marble Company, Friendsville, TN, 865-995-9500.

C. Limestone Above 1st Floor Level: Texas Cordova Cream Limestone to match original in color and surface texture, as distributed by Continental Cut Stone, Florence, TX, 254.793.2329.

D. Black Granite at Entry Base: Mesabi Black Granite to match original in color and surface texture, polished, as distributed by Coldspring, Cold Spring, MN, 800.328.5040.

E. Black Marble at Entries and Recessed Spandrel Panels:

1. Champlain Black Marble to match original in color and surface texture, satin finish (Less glossy) as distributed by Tennessee Marble Company, Friendsville, TN, 423.995.9500.

F. Anchor Setting Mortar: Single component, cementitious, non-shrink mortar for securing anchors in new or existing masonry structures.

1. Product: Jahn M-80 Anchor Setting Mortar, as manufactured by Cathedral Stone Products Inc., Hanover, MD, (800) 684-0901.

G. Fabrication

1. Stone shall be cut accurately to shapes and dimensions as required to match existing stone.
2. Cut and drill stones as required in the shop or field for supports and anchors.
3. Cutting for anchorage devices shall allow for expansion and contraction within the limits of the joint material. Comply with manufacturers recommendations.
4. Provide stone of thickness greater than that indicated, as required where stone thicknesses indicated on the drawings are insufficient for the sizes indicated or where extent of cutouts shown decreases effective strength of the remaining material, or for proper and sufficient anchorage.

2.4 STONE PATCHING MATERIALS

A. Stone Patching Compound: Premixed cementitious patching material formulated to match the color and texture of the existing masonry. One-component, non-sag, mineral-based mortar, containing no synthetic polymers or additives for repair and reconstruction of natural stone surfaces. The mortar must be vapor permeable, frost and salt resistant, shrink resistant, and be physically compatible with the substrate, including, but not limited to porosity, tensile and compressive strength.

1. Limestone: Jahn M70 – Limestone Repair Mortar, as manufactured by Cathedral Stone Products, Inc., Jessup, Maryland, or approved substitute.
2. Marble and Granite:
   a. Marble and Granite: BONSTONE Last Patch Dymond, as manufactured by BONSTONE Materials Corporation or approved substitute.

B. Provide variety of custom colors as required to match the color range found in the existing stone type.

C. Stain for patching mortar (if necessary):

1. General: Inorganic, breathable, color fast, mineral stain compatible with cementitious patching material specified.
    a. Silin Lasur Mineral Stain for Masonry, as manufactured by Cathedral Stone Products, Inc., Hanover, MD, (800) 684-0901.
    b. Epochrome S water-borne chemical toners for tinting unmatched mortar repairs, as manufactured by Cathedral Stone Products, Inc., Hanover, MD, (800) 684-0901.

2.5 INJECTION GROUT FOR STONE REPAIRS INSITU

A. Description: Single-component cementitious injection grout to be used in the stabilization and/or rehabilitation of cracked masonry.

1. Products:
    a. Jahn M31 Micro Injection Adhesive for hairline cracks up to 3/16” in width, using gravity feed or pressure injection for use on both non-structural void applications and structural load bearing situations.
    b. Jahn M40 Crack Injection Grout for cracks ranging from approximately 3/16” to 9/16” in width using low pressure mechanical or gravity feed equipment for use in repairing voids in non structural situations.
    c. Do not add any bonding agents, accelerators, or retarders to the grout.

2.6 MASONRY ACCESSORIES

A. Anchors:

1. Stainless steel threaded rods, ASTM A 580, Type 304, sizes as indicated on the Drawings, #177 Continuous Threaded Rod as manufactured by Heckmann Building Products or approved equal.
2. Stainless steel spring loaded dowel, ASTM A 167, A 666, A240/A240M, Type 304; Wire ties and anchors, ASTM A 580, Type 304. #355 Spring-Loaded Dowel as manufactured by Heckmann Building Products.
3. Various Stone Anchors, #143, 274, 275-U, 275Z, 276, Type 304 Stainless Steel, ASTM A666, as manufactured by Heckmann Building Products. Provide type and sizes as required by approved shop drawings.
4. Helical Wall Ties: Spira-Lok Wall Tie System, stainless steel, Type 304.
5. Anchors for thin marble and granite panels:
    a. Halfen Body Anchors, type HRM/HRC, BA, and DH, Stainless Steel A2 (AISI 304), or approved equal.
    b. Halfen Grout-In Anchor, type UMA support and UHA restraint Anchors, Stainless Steel A2 (AISI 304) or approved equal.
    c. Hafen Corner Reveal and Soffit Connections, Type SOF, LW-T, and LW-H, Stainless Steel A2 (AISI 304), or approved equal.

B. Fasteners, provide type and size as required for application

C. Termination Bar with lip, stainless steel, ASTM A 167, A 666, A 240/A240M, Type 304, 26 gauge, # 1050S826 termination bar as manufactured by Heckmann Building Products or approved equal.

D. Plastic Weeps, 3/8” diameter plastic tube #330STD or plain rectangle #330RSTD as manufactured by Heckmann Building Products or approved equal.

E. Plastic Shims at horizontal joints, where required to maintain uniform joint thickness, high impact multi-polymer plastic shims with up to 4500 PSI compressive strength, in sizes/thickness as required for application, as manufactured by Heckmann Building Products or approved equal.

F. Compressible filler: Closed cell neoprene sponge NS, placed horizontally beneath relieving angle, as manufactured by Hohmann & Barnard, Inc., in thickness and width indicated, or approved equal

G. Anchor Setting Mortar: Single component, cementitious, non-shrink mortar for securing anchors in new or existing masonry structures.

1. Product: Jahn M80 Anchor Setting Mortar, as manufactures by Cathedral Stone Products, Inc., Jessup, Maryland.

H. Bonding Agent (Epoxy for repairing full stone breaks): Two component modified epoxy resin.

1. Product: Flexi-weld 520, 520T Moisture-Insensitive 100% solids Ni-mod Epoxy Adhesive as manufactured by Edison Coatings, Inc.

2.7 CONSOLIDATION TREATMENT

A. Description: Two-step, waterborne treatment that protects and strengthens deteriorating carbonate building stones such as marble, limestone, and travertine. HCT reduces the vulnerability of treated stones to the ravages of air pollution, acid rain and normal weathering.

1. Product: CONSERVARE HCT and CONSERVARE HCT Finishing Rinse as manufactured by PROSOCO, Inc., 3741 Greenway Circle, Lawrence, KS 66046. Phone: (800) 255-4255; Fax: (785) 830-9797. E-mail: CustomerCare@prosoco.com

2.8 MINERAL STAIN

A. Description: Sol-silicate based, vapor permeable, non-film forming mineral stain designed for exterior use on natural stone. Pigment and opacity level can be customized when diluted with thinner.

1. Product: Restauro Stain Sol-Silicate pigmented Mineral Stain and Glaze System (Stain and Fixativ) as manufactured by Keim Mineral Coatings of America, Inc.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Inspection

1. Prior to work of this Section, carefully inspect the work of all other trades and verify that all such work is completed to the point where this installation may properly commence.
2. Verify that masonry may be completed in accordance with all pertinent codes and regulations, the referenced standards, and the original design.
3. Do not start work until mock-ups are accepted by the Architect.

B. In the event of discrepancy, immediately notify the Architect. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.2 CONSOLIDATION

A. Application procedures: Follow manufacturer's written instruction based on results of field and laboratory testing under item 1.5.D.

3.3 STONE REMOVAL AND REPLACEMENT

A. At locations indicated, remove stone to expose condition of underlying steel elements, stone that has deteriorated or is damaged beyond repair. Carefully remove entire unit from joint to joint, without damaging removed or surrounding stone, in a manner that permits reinstallation of removed stone. Where unit is damaged beyond repair, replace with full-size unit.

B. Support and protect remaining stonework that surrounds removal area. Maintain flashing, reinforcement, lintels, and adjoining construction in an undamaged condition.

C. Notify Architect of unforeseen detrimental conditions including voids, cracks, bulges, and loose masonry units in existing masonry backup, rotted wood, rusted metal, and other deteriorated items.

D. Remove in an undamaged condition as many whole stone units as possible.

1. Remove mortar, loose particles, and soil from stone by cleaning with hand chisels, brushes, and water.
2. Remove sealants by cutting close to stone with utility knife and cleaning with solvents.
3. Store stone for reuse, as indicated.

E. Clean stone surrounding removal areas by removing mortar, dust, and loose particles in preparation for replacement.

F. Replace removed stone with new stone matching existing stone, including size. Butter vertical joints for full width before setting and set units in full bed of mortar, unless otherwise indicated. Replace existing anchors with new anchors of size and type indicated.

1. Tool exposed mortar joints in repaired areas to match joints of surrounding existing stonework.
2. Rake out mortar used for laying stone before mortar sets and point new mortar joints in repaired area to comply with requirements for repointing existing stone, and at same time as repointing of surrounding area where deteriorated.

G. Contractor is responsible for repair or replacement of stone that is damaged during removal where the stone is indicated to be salvaged for re-use.

3.4 STONE DUTCHMAN REPAIR

A. Large Spalled Areas (3 inches or more in depth and 6 inches or more in diameter) and Severely Deteriorated Surfaces

B. Inspection: Prior to cutting out for the installation of new stone dutchman, the Contractor shall verify all locations and dimensions of stone to be removed by inspecting and sounding those areas indicated on the Contract Documents as requiring dutchmen. The Contractor shall submit shop drawings indicating the location, sizes, and anchoring detail of each dutchman unit. Obtain Architect's approval for locations, sizes and anchor details prior to cutting out stone. The Contractor shall notify the Architect in writing if conditions in the field differ from those indicated on the Contract Documents or stone shop drawings.

C. Carefully cut out by hand, for installation of dutchman stone scheduled for removal. Cutting out of stone shall be in the locations indicated on the approved shop drawings. Cut out without damaging surrounding masonry to remain. Where anchors are encountered at cutouts for Dutchman, provide new anchor in same side of existing stone. Obtain approval for cutting masonry anchors encountered at cut outs for dutchman. Cut sides and backs of stone reveals flat with 90 degree corners.

D. Remove mortar, loose particles, old patches and debris from existing surrounding masonry in preparation for replacement. Clean with stiff brushes or by flushing with water.

E. Stone Installation:

1. General: Dutchmen shall be installed level, plumb, square and true within the allowable tolerances. The units are to be positioned in such a manner that no dimensional error is allowed to occur. Horizontal and vertical seams shall be correctly aligned and of uniform width. Complete surface tooling, honing or dimensioning after stone dutchman units have been installed. Blend all finishes on dutchman units with finishes on adjacent stone.

2. Set dutchman with specified adhesive in the position to which it is assigned in accordance with the approved setting drawings.
3. Drill new holes into the new stone and into the existing masonry back-up. The drilled holes shall be cleaned with stiff nylon or natural bristle brushes or by flushing with water.
4. Tape around hole to prevent spillage of adhesive onto exposed face of masonry. Using tape or clay hold adhesive back from face of the stone at least one inch.
5. Install the Hilti HIT HY20 Fastener System per the Manufacturer's instructions.
6. The stainless steel threaded rod shall be cleaned and degreased as necessary to remove all contaminants, which may hinder the adhesive bond.
7. All surfaces that are in contact with adhesive must be free of dirt, dust, paint, glaze, grease, oil, rust, or other contaminant. Surface may be dry or damp (no free water). The adhesive shall come in contact with clean sound surfaces.
8. Grout face of dutchman seams with specified grout tinted to match the adjacent stone.

3.5 STONE PATCHING

A. Surface Preparation for Installation of Repair Mortar:

1. Using methods approved via submittals, remove loose mortar, patches, and damaged unsound masonry to sound and solid substrate. Remove sealant residue.
2. Anchors that are free of rust, solidly embedded, and do not project beyond the surface of the masonry unit may remain. All others should be removed.
3. Cut the edges of the repair area to provide a minimum depth of ¼". The edges of the repair should be square cut. Do not allow any feathered edged in the repair area.

B. Mixing, Application, and Curing of Repair Mortar:

1. Mixing:
   a. General: Mix patching mortar in accordance with manufacturer's printed instructions.
   b. Do not mix more material than can be used within 30 minutes. Discard any material that has been mixed for 30 minutes or more.
   c. Mixing ratios:
   d. Granite: Jahn M160; Approximately 5 parts dry material to 1 part water.
   e. Add water to dry ingredients and mix well. Adjust amount of water according to the weather and the porosity of the substrate.
2. Application:
   a. Apply the mortar mix using a trowel in a series of 1-inch lifts allowing mortar to dry approximately 10-20 minutes between lifts. If applied in layers, scrape off any cement skin that has formed and continue application. Dampen the surface before applying the next layer. Work mortar firmly into the surface of the masonry, including the corners, and under and around all mechanical anchors.
   b. Build up patching material so that it is slightly above adjacent masonry surface. Allow 15 to 30 minutes to set slightly (Wait time will vary with temperature and humidity-longer in cool weather), then scrape off excess material using a brush until the desired profile is reached. Do not press down or "float" the repair. Where patches occur at panel edges or corners, form mortar to match the profile of the surrounding masonry. In all cases, finish so that it is as indistinguishable as possible from the adjacent masonry.
3. Curing:
   a. Lightly mist patch with water to wet the entire surface of the finished patch approximately 30 minutes to 1 hour after completion on hot sunny days and approximately 2 hours or longer, on cool or cloudy days. Time will vary with temperature and humidity. Mist several times a day on the three days following the repair installation.

C. Finishing:

1. Upon initial cure, and in accordance with the manufacturer's printed instructions, patch shall be finished to match the existing adjacent masonry.
2. Clean any mortar residue form area surrounding the patch by sponging as many times as necessary with clean water. This should be done before patching material sets.
3. After the repair has been cured and allowed to dry for at least one week, if the appearance of a repair does not meet the specifications of the job, the surface color of the repair is to be enhanced by applying a vapor permeable, mineral based pigmented stain.
    a. Remove dust and loose particulate matter from surfaces to receive coatings immediately prior to coating application.
    b. Protect all non-masonry surfaces such as glass, wood, metal, etc….
    c. Cracks and spalls must be repaired and cured prior to coating application.
    d. Apply specified coating to vertical surfaces only.
    e. Substrate must be completely dry before coating. Do not work when precipitation is expected within 48 hours of installation. The coating needs adequate time to bond to the substrate; Moisture disrupts the curing process.

D. Mixing Coating System:

1. It is recommended that proper eye protection be worn during mixing in case of accidental splashing. Mix component A (colored paint) with component B (Silin AZ Fixative) in the desired proportions (see chart below) before installation.
2. Mixing ratios will depend on the desired coating effect and the substrate surface.
    a. Transparent finish:
        (1) Parts of colored coating: 1
        (2) Parts of Silin AZ Fixative: 3-100+
    b. Refer to manufacturers data sheets for more detail on transparent finishes.

E. Adjustment and Cleaning:

1. Remove and replace all unsatisfactory patches, at no additional cost to the Owner. Conditions deemed unacceptable include, but are not limited to:
    a. Separation or shrinkage at the edge of a patch,
    b. Separation of the patch from the substrate,
    c. Surface crazing or cracking,
    d. "Burned" surfaces (from overly quick drying),
    e. Discoloration, or mis-matched color (compared to existing adjacent stone), and
    f. Mis-matched surface quality and finish (compared to existing adjacent stone).
2. Repair adjacent surfaces or other elements that have been marred or otherwise damaged during the work of this Section.
3. Remove uncured mortar from the perimeter of the repair before it dries using clean water and a rubber sponge. Repeat several times with clean water to prevent a halo effect. Cured mortar may only be removed chemically or mechanically.
    a. Should removal of cured mortar be necessary, Contractor shall submit proposed method of removal and obtain Architect's approval prior to removal.
4. Once masonry patching work is complete, remove all unused materials, containers and equipment from the site, and dispose of all related debris.

3.6 STONE INJECTION GROUTING OF CRACKS

A. General: Strictly adhere to manufacturer's written instructions and recommendations regarding preparation, installation, finishing, and curing.

B. Surface Preparation:

1. Remove any existing patching material or unsound stone from crack to be injection grouted.
2. Transverse Cracks (perpendicular to the face of the wall): Drill a series of injection ports 1/8” in diameter and spaced 2 inches apart, into the heart of the transverse crack and throughout its length. Holes shall be angled slightly down. Seal crack between drill holes with non-staining clay, to prevent leaking of the injection mortar.
3. Lateral Cracks / Delamination (parallel to the face of the wall): Drill a series of injection ports 1/8” in diameter and spaced 2 inches apart, in a square configuration (90°) on the face of the substrate to create a “drill frame”. Ports should be drilled in a downward direction.
4. Wash the surface and interior of the crack using clean water to remove all dust, loose or deleterious material, which could prevent proper flow/or adhesion, thereby compromising the integrity of the cured injection grout.

C. Mixing:

1. It is recommended that safety goggles, gloves, and a dust mask be worn for protection. Do not mix more material than can be used within approximately 30 minutes. Discard any mixed material that has been unused for 30 minutes or more.
2. Mixing Ratio:
   a. Jahn M30: The mixing ratio is approximately 2 to 5 parts powder to 1 part water by volume.
   b. Jahn M40: The mixing ratio is approximately 2 to 2-1/2 parts powder to 1 part water by volume.
3. Mixing:
   a. For Jahn M30: Mix mechanically using, a high-speed drill (3,000 RPM or higher) equipped with a Jiffler type-mixing paddle. After mixing, the mortar should be poured into another clean container using a sieve. Continued agitation is necessary if the mortar is allowed to sit prior to use.
   b. For Jahn M40: Mix manually or mechanically using a slow speed drill (400-600 RPM) equipped with a Jiffler type-mixing paddle. The material should be mixed for a minimum of three minutes with continued agitation should the product be allowed to sit prior to use.
4. The percentage of water content varies depending on the width of the crack, the amount of moisture present within the crack, and the structural characteristics to be attained. Contractor shall determine the appropriate water content, as submitted for approval, and ensure consistency of the mix.

D. Application and Curing:

1. Substrate Preparation: Moisten the interior of the crack immediately before injection by flushing with clean water. If the surface is allowed to dry out before grout is injected, this step must be repeated.
2. Treatment of Transverse Cracks: Inject grout into lowest port and continue until it flows freely from this port and other ports at the same level. Seal ports using non-staining clay and proceed in identical fashion until the crack is filled. Clean up overflow immediately.
3. Treatment of Lateral (delamination) Cracks: Inject grout into lower left port and proceed until it flows freely from this port and other ports at the same level. Where necessary, insert threaded stainless steel dowels after some grout has been injected, agitate or tap several times to remove any voids or air pockets and inject remainder of the grout until port is full and grout flows freely from other ports at the same level. Seal ports using non-staining clay. Inject grout into lower right port and proceed in identical fashion. The order of injection is lower left, lower right, upper left, then upper right. Clean up overflow immediately.
4. Once the mortar has sufficiently set, the clay may be removed from the crack and the drill holes.

E. Finishing: Remove plugs after 24 to 48 hours and repair the ports and the crack surface with patching mortar in accordance with Section 04 01 41 - Masonry Patching.

F. Adjustment and Curing:

1. Remove and replace all installations that exhibit:
   a. Discoloration, or mis-matched color (compared to existing adjacent stone); or
   b. Mis-matched surface quality and finish (compared to existing adjacent stone).
2. Repair adjacent surfaces or other elements that have been marred or otherwise damaged during the work of this Section.
3. Remove uncured mortar from substrate before it dries using clean water and a rubber sponge. Cured mortar may only be removed chemically or mechanically.
4. Should removal of cured mortar be necessary, Contractor shall submit proposed method of removal and obtain Architect's approval prior to removal.
5. Once injection grouting work is complete, remove all unused materials, containers and equipment from the site, and dispose of all related debris.

3.7 ROUTING AND REPOINTING MORTAR JOINTS

A. Rake out and repoint mortar joints to the following extent:

1. All joints in areas indicated.
2. Joints where mortar is missing or where they contain holes.
3. Cracked joints, where mortar has separated from unit masonry.
4. Brick joints where they are worn back ¼-inch or more from surface of unit masonry.
5. Joints where they sound hollow when tapped by metal object.
6. Stone joints where beaded profile is damaged.
7. Joints where they are deteriorated to point that mortar can be easily removed by hand.
8. Joints, other than those indicated as sealant-filled joints, where they have been filled with substances other than mortar

B. Do not rake out and repoint joints where not required.

C. Rake out joints as follows:

1. Remove mortar from joints to depth equal to 2-1/2 times joint width, but not less than 1/2 inch or depth at which sound mortar is reached.
2. Remove mortar from masonry surfaces within raked-out joints to provide reveals with square backs and to exposed masonry for contact with pointing mortar. Brush, vacuum, or flush joints to remove dirt and loose debris.
3. Do not spall edges of masonry units or widen joints. Replace or patch damaged masonry units as directed by Architect.
   a. Cut out mortar by hand with chisel and mallet. Do not use power-operated grinders without Architect's written approval based on submission by Contractor of a satisfactory quality-control program and demonstrated ability of operators to use tools without damaging masonry units. Quality-control program shall include provisions for supervising performance and preventing damage due to worker fatigue.
   b. Cut out center of mortar joints using angle grinders with diamond-impregnated metal blades. Remove remaining mortar by hand with chisel and mallet. Strictly adhere to written quality-control program. Quality-control program shall include provisions for demonstrating ability of operators to use tools without damaging masonry, supervising performance, and preventing damage due to worker fatigue.

D. Notify Architect of unforeseen detrimental conditions including voids in mortar joints, cracks, loose masonry units, rotted wood, rusted metal, and other deteriorated items.

E. Allow for three mortar colors. One mortar color will be used at terra cotta materials, the second color on brick masonry, and the third color on granite material.

F. Point joints as follows:

1. Rinse masonry-joint surfaces with water to remove dust and mortar particles. Time rinsing application so, at time of pointing, joint surfaces are damp but free of standing water. If rinse water dries, dampen masonry-joint surfaces before pointing.
2. Apply pointing mortar first to areas where existing mortar was removed to depths greater than surrounding areas. Apply in layers not greater than 3/8 inch until a uniform depth is formed. Fully compact layer thoroughly and allow it to become thumbprint hard before applying next layer.
3. After low areas have been filled to same depth as remaining joints, point all joints by placing mortar in layers not greater than 3/8 inch. Fully compact each layer and allow to become thumbprint hard before applying next layer. Where existing masonry has worn or rounded edges, slightly recess finished mortar surface below face of masonry to avoid widened joint faces. Take care not to spread mortar over edges onto exposed masonry surfaces or to featheredge mortar.
4. When mortar is thumbprint hard, tool joints to match original appearance of joints. Remove excess mortar from edge of joint by brushing.
    a. Original stone mortar joints: Cove profile tooled to match original.
    b. Below grade masonry or masonry not exposed to view: Flush joint.

G. Cure mortar by maintaining in thoroughly damp condition for at least 72 hours, including weekends and holidays.

1. Acceptable curing methods include covering with wet burlap and plastic sheeting, periodic hand misting, and periodic mist spraying using system of pipes, mist heads, and timers.
2. Adjust curing methods to ensure that pointing mortar is damp throughout its depth without eroding surface mortar.
3. Where repointing work precedes cleaning of existing masonry, allow mortar to harden at least 30 days before beginning cleaning work.

3.8 ADJUST AND CLEAN

A. After mortar has hardened but before it has fully cured, thoroughly clean masonry surfaces of excess mortar using stiff nylon or natural bristle brushes and clean water; do not use metal brushes or scrapers.

B. Any masonry work that does not result in a consistent appearance with adjacent brickwork and stonework shall be considered defective and shall be corrected by the Contractor at no additional cost to the Owner.

3.9 FIELD QUALITY CONTROL

A. Architect's Project Representatives: Architect will assign Project representatives to help carry out Architect's responsibilities at the site, including observing progress and quality of portion of the Work completed. Allow Architect's Project representatives use of scaffolding, as needed, to observe progress and quality of portion of the Work completed.

B. Notify Architect's Project representatives two weeks in advance of times when lift devices and scaffolding are scheduled to be relocated. Do not relocate lift devices and scaffolding until Architect's Project representatives have had reasonable opportunity to make inspections and observations of work areas at lift device or scaffold location and only when the completed work is accepted in writing by the Architect.

END OF SECTION

SECTION 08591

METAL WINDOW RESTORATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes historic treatment of aluminum windows as follows:
1. Replace aluminum sash unit, where removed or modified for mechanical grilles, vents, etc…
2. Repair deteriorated frame at exterior surface behind perimeter sealant, for bidding purposes assume 15% of total frame area requires repair.
3. Replace window trim at perimeter of window on exterior surface where damaged or missing.
4. Replace glass 100%, remove glazing compounds, sealants, etc… 100% from glazing channels.
5. Replace tape balance system 100%, size for heavier glass. Assume balance face plate and window frame will need to be modified to accept standard available tape balances.
6. Provide new extruded aluminum glazing bead on interior side of window 100% at double hung windows.
7. Clean and polish exposed aluminum elements and components to remove harmful deposits and improve appearance.
8. Application of clear protective finish.
9. Inspect and resecure frame anchorage to building structure as needed.
10. Resecure loose and replace missing fasteners.
11. Repair, refinish, and replace hardware where damaged or missing. For bidding purposes replacement of approximately 3% of each type of hardware component, include hinges and handle locks at casement windows and sash locks at double hung windows.
12. Replace weatherstripping at operable units 100%.

B. Related Requirements:

1. Section 01210 – Allowances.

2. Section 01226 – Unit Prices for sash replacement.

3. Section 01230 – Alternates for replacement windows.

4. Section 05100 – Structural Steel Framing for replacement of steel lintel/relieving angle.

5. Section 07620 – Sheet Metal Flashing and Trim for concealed flashings at lintel/relieving angle.

6. Section 07920 – Joint Sealers for replacement of perimeter sealant.

7. Section 08800 – Glazing

8. Section 09910 – Painting and Finishing for painting steel lintel.

1.2 DEFINITIONS

A. Window: Includes window frame, sash, hardware, and insect screens unless otherwise indicated by context.

B. Subframe: Steel or aluminum anchorage, usually built into wall construction.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For each exposed product and for each color and texture specified.

1.5 QUALITY ASSURANCE

A. Historic Treatment Specialist Qualifications:

1. Repair Specialist: A qualified historic aluminum window specialist, experienced in repairing, refinishing, and replacing metal windows in whole and in part. Experience only in fabricating and installing new metal windows is insufficient experience for aluminum window historic treatment work.
2. Refinishing Specialist: A qualified historic aluminum window specialist, experienced in refinishing aluminum windows in whole and in part. Refinishing specialist shall coordinate with the work of the repair specialist.

B. Aluminum-Patching-Compound Manufacturer Qualifications: A firm regularly engaged in producing aluminum-patching compound that has been used for similar historic-metal-repair applications with successful results.

C. Mockups: Prepare mockups of historic treatment repair processes to demonstrate aesthetic effects, to set quality standards for materials and execution, and to set quality standards for fabrication and installation. Prepare mockups so they are as inconspicuous as practicable.

1. Locate mockups on existing windows, where directed by Architect in locations that enable viewing under same conditions as the completed Work.
2. Aluminum Window Restoration: Prepare one entire window unit to serve as mockup to demonstrate samples of each type of repair and or replacement of aluminum window members/components, including frame, sash, glazing, hardware, weatherstripping, cleaning and polishing, and application of protective finish.

PART 2 - PRODUCTS

2.1 REPLICATED ALUMINUM WINDOW UNITS

A. Replicated Aluminum Window Frames and Sash: Replacement aluminum units matching existing units; custom fabricated from salvaged windows, new aluminum extrusions and shapes,

or a combination thereof; and with operating and latching hardware; finished to match existing windows.

1. Exposed Hardware: Match existing exposed window hardware.
2. Weather Stripping: Full-perimeter weather stripping for each operable sash.

2.2 ALUMINUM-REPAIR MATERIALS

A. Aluminum: Aluminum extrusions or shapes from salvage sources or new extrusions, forgings, and castings. Use alloy and temper recommended in writing by aluminum producer and finisher for type of use and finish indicated.

B. Aluminum-Patching Compound: Two-part, metal-filled epoxy resin, aluminum-patching compound; knife-grade formulation as recommended in writing by manufacturer for types of repair indicated, tooling time required for the detail of work, and site conditions. Compound shall be produced for filling metal that has deteriorated from corrosion or abuse. Filler shall be capable of filling deep holes and spreading to featheredge.

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

2.3 GLAZING MATERIALS

A. Glass: See Section 08800 "Glazing.".

B. Glazing-Stop System: Provide new extruded aluminum window stops, finished to match window sash, and mechanically attached at equal intervals maximum 12 inches (300 mm) o.c.; with **mitered** corners and butyl glazing tape complying with ASTM C1281 and AAMA 800 on both sides of glass.

2.4 HARDWARE

A. Window Hardware: Provide complete sets of window hardware consisting of hinges, pulls, latches, and accessories indicated for each window or required for proper operation. Sets shall include replacement hardware to complement repaired and refinished existing hardware. Window hardware shall smoothly operate, tightly close, and securely lock aluminum windows and be sized to accommodate sash weight and dimensions.

B. Replacement Hardware: Replace existing damaged or missing hardware with hardware from salvage sources or newly manufactured hardware.

C. Material and Design:

1. Material: Cast or wrought aluminum.
2. Design: Match type and appearance of existing hardware.

D. Balances: Standard tape balance, side type, 2 per sash, as manufactured by Pullman Mfg. Corporation, Rochester, NY 14623. Size for weight of sash with specified glass. Assume balance face plate and window frame will need to be modified to accept standard available tape balances.

E. Hardware Finishes: Comply with BHMA A156.18 for base material and finish requirements indicated.

2.5 MISCELLANEOUS MATERIALS

A. Detergent Solution: Prepared by mixing 2 cups (0.5 L) of tetrasodium pyrophosphate (TSPP), 1/2 cup (125 mL) of laundry detergent that contains no ammonia, 5 quarts (5 L) of 5 percent sodium hypochlorite bleach, and 15 quarts (15 L) of warm water for each 5 gal. (20 L) of solution required.

~~B. Antirust Coating: Fast-curing, lead- and chromate-free, self-curing, universal modified alkyd primer according to **MPI #23 surface-tolerant, anticorrosive metal primer or SSPC-Paint 20 or SSPC-Paint 29**.~~

~~1. Surface Preparation: Use coating requiring no better than [**SSPC-SP 2, "Hand Tool Cleaning"**] [**SSPC-SP 3, "Power Tool Cleaning"**] [**or**] [**SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning"**] **<Insert standard>** surface preparation according to manufacturer's literature or certified statement.~~

C. Clear Sealer: 2-part, clear, durable, low VOC, air drying polyurethan with resistance to UV light, salt air environments, and most chemicals.
1. Product: Ever Clear Protective Coating as distributed by Sculpt Nouveau, 800.728.5787.
2. Application: Apply minimum two coats.

D. Wax Polish: High-quality blend of refined micro-crystalline waxes, which remain neutral, for preserving metal.
1. Product: Renaissance Micro-Crystalline Wax Polish.

E. Fasteners: Use fastener metals that are noncorrosive and compatible with each material joined.

1. Match existing fasteners in material and type unless otherwise indicated.
2. Use concealed fasteners to attach items to other work unless exposed fasteners are **unavoidable**.
3. For exposed fasteners, use Phillips-type machine screws of head profile flush with metal surface unless otherwise indicated.
4. Finish exposed fasteners to match finish of metal fastened unless otherwise indicated.

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

PART 3 - EXECUTION

3.1 HISTORIC TREATMENT OF ALUMINUM WINDOWS, GENERAL

A. Execution of the Work: In treating historic items, disturb them as minimally as possible and as follows:

1. Clean aluminum windows of mildew, algae, moss, plant material, loose paint, grease, dirt, and other debris by scrubbing with a natural bristle brush or sponge and detergent solution. After cleaning, rinse thoroughly with fresh water. Allow to dry before repairing or painting.
2. Stabilize and repair aluminum windows to maintain and reestablish structural integrity and weather resistance while maintaining the existing form of each item.
3. Repair items in place where possible unless otherwise indicated.

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

C. Repair and Refinish Existing Hardware: Dismantle window hardware; strip paint, repair, and refinish it to match finish samples; lubricate moving parts just enough to function smoothly.

D. Repair Aluminum Windows: Match existing materials and features, retaining as much original material as possible to perform repairs.

1. Unless otherwise indicated, repair aluminum windows by patching, splicing, or otherwise reinforcing aluminum with new or salvaged aluminum members.
2. Where indicated, repair aluminum windows by limited replacement matching existing material.

E. Replace Aluminum Units: Where indicated, duplicate and replace units with units made from salvaged, sound, aluminum windows and their components or with new aluminum extrusions and shapes matching size and form of existing extrusions and shapes.

F. Protection of Openings: Where sash or windows are indicated for removal, cover resultant openings with temporary enclosures so that openings are weathertight during repair period.

G. Identify removed windows, frames, sash, and components with numbering system corresponding to window locations to ensure reinstallation in same location.

3.2 REMOVING CHALKING APPEARANCE ON ANODIZED ALUMINUM

A. Perform cleaning as required in "Historic Treatment of Aluminum Windows, General" Article.

B. Perform additional cleaning at places where chalking remains. Perform this work as determined by preconstruction testing and demonstrated in mockup.

3.3 ALUMINUM WINDOW STRAIGHTENING

A. Remove glass, detachable weather stripping, and interfering hardware from sash. Remove dirt and paint buildup from between sash and frame.

B. Using shims and gentle pressure, align and straighten sash and frame to close completely and uniformly against each other, allowing for uniform thickness of detachable weather stripping, if any, around entire perimeter of sash.

C. Straighten and adjust hinges, latches, and other hardware so that sash and frame in closed and latched position will remain completely and uniformly against each other allowing for uniform thickness of detachable weather stripping, if any, around entire perimeter of sash.

D. Reinstall detachable weather stripping, and verify complete and continuous seal around entire perimeter of sash in closed and latched position.

3.4 ALUMINUM WINDOW PATCH-TYPE REPAIR

A. Description: Patch aluminum members that exhibit depressions, nonstructural holes, pitting, and deep corrosion.

B. Remove corrosion down to sound material.

C. Apply aluminum-patching compound to fill depressions, nicks, cuts, and other voids created by corroded, removed, or missing aluminum.

1. Apply patching compound in layers, as recommended in writing by manufacturer, until the void is completely filled.
2. Finish patch surface smooth and flush with adjacent aluminum, without voids in patch material, and matching contour of aluminum member.

D. Verify that patch repairs do not interfere with snug fit of sash and frame against each other along entire perimeter of sash in closed and latched position. If not, modify the patch repair or restraighten window as required.

3.5 ALUMINUM WINDOW MEMBER-REPLACEMENT REPAIR

A. Description: Replace parts of or entire aluminum window members at locations where damage is too extensive to patch.

1. Straighten window as specified in "Aluminum Window Straightening" Article.
2. Remove deep corrosion and broken members down to sound, corrosion-free material.
3. Cut out structurally weakened sections.
4. Custom fabricate new aluminum of same size, thickness, and shape as removed and cut-out material to replace missing aluminum; either replace entire aluminum member or splice new aluminum part into existing member.
5. Weld, braze, or mechanically fasten replacement material in place, and grind the repair smooth and flush with adjoining metal or filled metal as applicable. Use welding, brazing, or mechanical attachment that matches method of connecting original members.
6. If replacement metal sections of original cross section cannot be found from salvage sources, use custom extrusions or aluminum members welded together into a built-up section.

B. Repair remaining depressions, holes, or similar voids with patch-type repairs.

C. Glazing: Provide replacement glazing stops coordinated with glazing system indicated.

D. Reinstall units removed for repair into original openings.

E. Verify that member-replacement repairs do not interfere with snug fit of sash and frame against each other along entire perimeter of sash in closed and latched position. If not, modify the member-replacement repair or restraighten window as required.

3.6 GLAZING

A. Comply with combined written instructions of manufacturers of glass, glazing system, and glazing materials unless more stringent requirements are indicated.

B. Remove glass and glazing from openings and prepare surfaces for reglazing.

C. Prime aluminum, including glazing rabbets, with finish-paint primer before installing glass.

D. Size glass as required by Project conditions to provide necessary bite on glass and minimum edge and face clearances with reasonable tolerances.

E. Apply primers to joint surfaces where required for adhesion of glazing system, as determined by preconstruction testing.

F. Install setting bead, side beads, and back bead against stop in glazing rabbets before setting glass.

G. Install glass with proper orientation so that coatings, if any, face exterior or interior as required.

H. Disposal of Removed Glass: Remove from Owner's property and legally dispose of it unless otherwise indicated.

3.7 ALUMINUM WINDOW UNIT REPLACEMENT

A. Description: Replace existing window frame and sash units with replicated aluminum units to match existing at locations where damage is too extensive to repair.

B. Install units level, plumb, square, true to line, without distortion or impeding movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction.

C. Metal Protection: Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

D. Anchor Concealment: Fill screw head depressions flush and smooth with paintable putty after window installation, spot prime, and paint.

E. Disposal of Removed Units: Remove from Owner's property and legally dispose of them unless otherwise indicated.

END OF SECTION

SECTION 08800

GLAZING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Glass for other sections referencing this Section.

B. Related Sections:

1. Division 1: Administrative, procedural, and temporary work requirements.
2. Section 01230 – Alternates.
3. Section 08591 – Metal Window Restoration.

1.2 REFERENCES

A. ASTM International (ASTM):

1. C 864 - Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.
2. C 920 - Elastomeric Joint Sealants.
3. C 1036 - Flat Glass.
4. C 1048 - Heat-Treated Flat Glass-Kind HS, Kind FT, Coated and Uncoated Glass.
5. E 774 - Sealed Insulating Glass Units.

B. Glass Association of North America (GANA):

1. Sealant Manual.
2. Glazing Manual.

1.3 DEFINITIONS

A. Manufacturer: A firm that produces primary glass or fabricated glass as defined in referenced glazing publications.

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

C. Deterioration of Coated Glass: Defects developed from normal use that are attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in metallic coatings.

D. Deterioration of Laminated Glass: Defects developed from normal use that are attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstruction vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.

1.4 SYSTEM DESCRIPTION

A. Size glass to withstand positive and negative wind pressure acting normal to plane in accordance with Building Code as measured in accordance with ASTM E 330.

B. Limit glass deflection to 1/200 or flexure limit of glass with full recovery of glazing materials, whichever is less.

1.5 SUBMITTALS

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

1. Manufacturer's product literature and applicable technical bulletins.

B. Samples:

1. 12 inch square sample of each type of glass.
2. Sealant and glazing compound samples showing available colors.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: Single firm with minimum 5 years successful experience in the fabrication of glass.

1. Glass of type required for this project must be a certified product listed with the Insulating Glass Certification Council by firm, where applicable.

B. Installer Qualifications: An experienced installer who has completed glazing similar in material, design, and extent to that indicated for this Project; whose work has resulted in glass installations with a record of successful in-service performance.

C. Glass standards:

1. ASTM specification C1036 for glass.

D. Regulatory Requirements: Provide tempered safety glass where required by regulatory agencies or Code.

E. Perform Work in accordance with GANA Glazing Manual and GANA Sealant Manual for glazing installation methods.

1.7 PROJECT CONDITIONS

A. Perform glazing when ambient temperature is above 40 degrees F.

B. Perform glazing on dry surfaces.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Protect glazing materials according to manufacturer's written instructions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

1.9 WARRANTY

A. Manufacturer's Special Warranty on Laminated Glass: Written warranty, made out to Owner and signed by laminated-glass manufacturer agreeing to furnish replacements for laminated-glass units that deteriorate as defined in "Definitions" under item 1.3.

1. Warranty period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Low-E Laminated Glass: ASTM C1172. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.

1. Provide ¼" thick Low-E laminated glass, ~~Cardinal 272~~ RG 1900E as distributed by Hollander Glass or ClimaGuard 70/36 as manufactured by Guardian Glass, at exterior metal window sashes throughout except where noted. ~~Or approved equal such as RG 1900E as distributed by Hollander Glass or ClimaGuard 70/36 as manufactured by Guardian Glass (VLT and VLR must be approved by the Texas Historical Commission (THC).~~
   a. Inner lite: 1/8" thick clear glass, ASTM C 1036.
   b. Plastic interlayer: .03" clear interlayer
   c. Outer lite: 1/8" thick, clear glass, ASTM C 1036, with Low-E coating on #2 side
   d. Visible light transmittance: 72% Minimum
   e. Visible light reflectance: 11% Maximum

B. Low-E Laminated Glass with Patterned Glass: ASTM C1172. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.

1. Provide ¼" thick Low-E laminated glass, Cardinal 272, at exterior metal window sashes at restrooms and mechanical rooms, where noted in the window schedule.
   a. Inner lite: 1/8" thick clear patterned glass, ASTM C 1036, Type II, 1/8" Cross Reeded Pattern, #GL 680, as distributed by ArchitecturalGlass.com, provide where indicated in the Window Schedule. Texture shall be on room facing side.
   b. Plastic interlayer: .03" clear interlayer
   c. Outer lite: 1/8" thick, clear glass, ASTM C 1036, with Low-E coating on #2 side.
   d. Visible light transmittance: 72%
   e. Visible light reflectance: 11%

2.2 ACCESSORIES

A. Setting Blocks: ASTM C 864, neoprene or EPDM, or ASTM C 1115, silicone; 80 to 90 Shore A durometer hardness, length of 0.1 inch for each square foot of glazing or minimum 4 inch x width of glazing rabbet space minus 1/16 inch x height to suit glazing method and pane weight and area.

B. Spacer Shims: ASTM C 864, neoprene or EPDM, or ASTM C 1115, silicone; 50 to 60 Shore A durometer hardness, minimum 3 inches long x one half the height of the glazing stop x thickness to suit application.

C. Glazing Sealant: ASTM C 920, Type S, Grade NS, Class 25, Uses MT, N, G, and A; single component silicone, low modulus type, non sag, color to be selected from manufacturer's full color range.

D. Backer Rod and Primer: As recommended by glazing sealant manufacturer.

E. Glazing Clips: Manufacturer's standard.

2.3 FABRICATION

A. Tempered Glass:

1. Comply with ASTM C 1048 for type listed.
2. Process in horizontal position so that inherent roller distortion will run parallel to building floor lines after installation.

B. Fabrication Tolerances: ASTM C 1036 and C 1048.

C. Glass Identification:

1. Apply manufacturer's label indicating type and thickness to each light of glass. Show position of exterior face when installed, where applicable.
2. Etch manufacturer's label on each light of tempered glass.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean glazing rabbets; remove loose and foreign matter.

B. Remove protective coatings on metal surfaces.

C. Clean glass just prior to installation.

D. Seal porous rabbet surfaces with primer or sealer.

3.2 INSTALLATION - GENERAL

A. Install glass in accordance with glass manufacturer's instructions.

B. Maintain manufacturer's recommended edge and face clearances between glass and frame members.

3.3 INSTALLATION - SEALANT GLAZING METHOD

A. Apply sealant to full depth of permanent stops.

B. Press glass into sealant with slight lateral movement to ensure adhesion.

C. Apply sealant to full depth of removable stops. Secure stops in position, forcing contact with sealant bead and completely filling joint.

3.4 INSTALLATION - COMPOUND GLAZING METHOD (Not for insulated and laminated glass)

A. Locate and secure glass using glazing clips.

B. Fill voids between glass and stops with glazing compound; tool to straight line. Slope to exterior for watershed.

3.5 PROTECTION

A. After installation, mark glass with an 'X' using removable plastic tape.

END OF SECTION