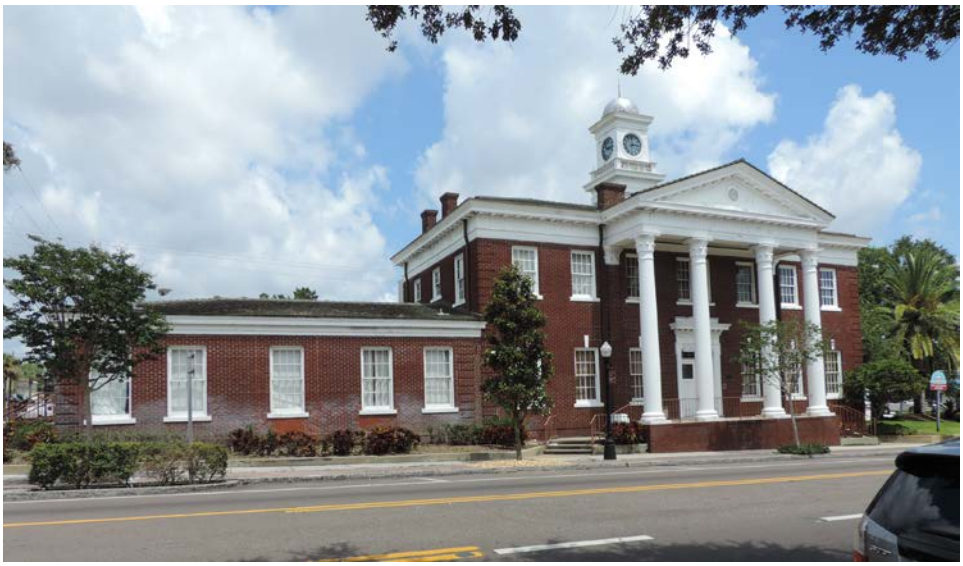

Technical Specifications

September 25, 2017

Tarpon Springs Cultural Center
Exterior Rehabilitation and Window Replacement

101 S. Pinellas Avenue
Tarpon Springs, Florida 34689

for

City of Tarpon Springs
324 E. Pine Street
Tarpon Springs, Florida 34689

ATELIER
ARCHITECTURE
ENGINEERING
CONSTRUCTION
INCORPORATED

Fl Reg AA 0002431
5102 N. Central Avenue, Tampa, Florida 33603 Tel: 813-223-1948

TARPON SPRINGS CULTURAL CENTER
REHABILITATION AND WINDOW REPLACEMENT

TABLE OF CONTENTS
September 25, 2017

SECTION 01230 - ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for alternates.

1.3 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to or deducted from the Base Bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.

1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.

B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.

C. Execute accepted alternates under the same conditions as other work of the Contract.

D. Schedule: A Schedule of Alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. Alternate No. 01: Refinish interior wood trim at windows and interior trim of exterior doors to match existing. Refer to Section 06200, “Finish Carpentry” for repair or replacement of any rotted or damaged wood; and Section 09912 for finishes. Finishes are both stained wood and paint.

B. Alternate No. 02: Provide new handrails and guardrails (except at handicapped ramp) as shown on the Drawings. Refer to Section 05720, “Ornamental Handrails and Railings”.

C. Alternate No. 03: Provide new downspouts throughout at locations of all existing downspouts. Refer to Section 07620, “Flashing and Sheet Metal, Gutters and Downspouts”.

END OF SECTION 01230

SECTION 01270 - UNIT PRICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for unit prices.

1.3 DEFINITIONS

A. Unit price is an amount proposed by bidders, and stated on the Bid Form, as a price per unit of measurement for materials or services added to or deducted from the Contract Sum by appropriate modification, if estimated quantities of Work required by the Contract Documents are increased or decreased.

1.4 PROCEDURES

A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.

B. Standards and Quality: Refer to individual Specification Sections for work that requires establishment of unit prices.

C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.

D. List of Unit Prices: A list of unit prices is included at the end of this Section. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 LIST OF UNIT PRICES

A. Unit Price No. 01: Repair or replacement and finishing of exterior wood trim beyond extent included in Base Bid. Refer to Section 06200, “”Finish Carpentry” and Section 09912, “Pointing”.

1. Unit of Measurement: Square foot.

END OF SECTION 01270

SECTION 04051 - MASONRY MORTARING

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 DESCRIPTION

A. Section specifies mortar materials and mixes.

1.3 RELATED WORK

A. Section 04052, “Masonry Tuck Pointing”.

1.4 TESTING LABORATORY-CONTRACTOR RETAINED

A. Engage a commercial testing laboratory approved by Architect to perform tests specified below.

B. Submit information regarding testing laboratory’s facilities and qualifications of technical personnel to Architect.

1.5 TESTS

A. Test existing mortar and new mortar materials specified.

B. Provide written certified test reports.

C. Identify materials by type, brand name and manufacturer or by origin.

D. Do not use materials until laboratory test reports are approved by Architect.

E. After tests have been made and materials approved, do not change without additional test and approval of Architect.

F. Testing:

1. Existing mortar analysis:

    a. Provide laboratory analysis of existing mortar samples using either a wet-chemical method as acid digestion, or an instrumental method such as thin-section microscopy, to evaluate the composition of historic mortar.
    b. Reference: ASTM C1324-96, “Test Method for Examination and Analysis of Hardened Mortars”.
    c. Provide a report of the composition of existing mortar by proportion of each constituent material.

d. Test new materials proposed for use for compliance with specifications in accordance with test methods contained in referenced specifications and as follows:

2. Mortar:

a. Test for compressive strength and water retention; ASTM C270.
b. Mortar compressive strengths 28 days as follows:
(1) Type M: Minimum 17230 kPa (2500 psi) at 28 days
(2) Type N: Minimum 5170 kPa (750 psi) at 28 days.

3. Cement:

a. Test for water soluble alkali (nonstaining) when nonstaining cement is specified.
b. Nonstaining cement shall contain not more than 0.03 percent water soluble alkali.

4. Sand: Test for deleterious substances, organic impurities, soundness and grading.

G. During progress of work, testing laboratory to perform testing procedures in ASTM C780.

1.6 SUBMITTALS

A. Submit in accordance with Section 01330, “Shop Drawings, Product Data, and Samples”.

B. Provide a mortar composition that matches the historic properties as documented in the Test Report.

1. Certificates:

a. Testing laboratory’s facilities and qualifications of its technical personnel.
b. Indicating that following items meet specifications:
(1) Mortar cement.
(2) Hydrated lime.
(3) Fine aggregate (sand).

2. Laboratory Test Reports:

a. Mortar, each type.
b. Admixtures.

3. Manufacturer’s Literature and Data:

a. Cement, each type.
b. Hydrated lime.

1.7 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver masonry materials in original sealed containers marked with name of manufacturer and identification of contents.

B. Store masonry materials under waterproof covers on planking clear of ground, and protect damage from handling, dirt, stain, water and wind.

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

D. Protect grout, mortar and other materials from deterioration by moisture and temperature. Store in a dry location or in waterproof containers. Keep containers tightly closed and away from open flames. Protect liquid components from freezing. Comply with manufacturer's recommendations for minimum and maximum temperature requirements for storage.

1.8 APPLICABLE PUBLICATIONS

A. Publications listed below form a part of specification to extent referenced. Publications are referenced in text by basic designation only.

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

1.	C40-04	Organic Impurities in Fine Aggregates for Concrete
2.	C91-07	Masonry Cement
3.	C109-05	Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or 50-MM Cube Specimens)
4.	C144-04	Aggregate for Masonry Mortar
5.	C150-05	Portland Cement
6.	C207-06	Hydrated Lime for Masonry Purposes
7.	C270-07	Mortar for Unit Masonry
8.	C307-03	Tensile Strength of Chemical–Resistant Mortar, Grouts, and Monolithic Surfacing
9.	C321-00/R05	Bond Strength of Chemical-Resistant Mortars
10.	C348-02	Flexural Strength of Hydraulic Cement Mortars
11.	C780-06	Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry
12.	C1329-05	Mortar Cement

PART 2 - PRODUCTS

2.1 HYDRATED LIME

A. ASTM C207, Type S.

2.2 AGGREGATE FOR MASONRY MORTAR

A. ASTM C144 and as follows: Light colored sand for mortar for laying face brick.

B. Test sand for color value in accordance with ASTM C40. Sand producing color darker than specified standard is unacceptable.

2.3 WATER

A. Potable, free of substances that are detrimental to mortar, masonry, and metal.

2.4 POINTING MORTAR

A. For Precast Concrete: Proportion by volume; one part white Portland cement, two parts white sand, and 1/5 part hydrated lime.

2.5 MASONRY MORTAR

A. Conform to ASTM C270.

B. Admixtures: Do not use mortar admixtures.

C. Colored Mortar:

1. Maintain uniform mortar color for exposed work throughout.
2. Mortar color to match existing.
3. Color of mortar for exposed work to match color of existing mortar.

D. Color admixtures: Proportion as specified by manufacturer.

2.6 HIGH BOND MORTAR

A. Mixture by volume, one-part Portland cement, 1/4-part hydrated lime, three-parts sand, water and liquid acrylic resin.

B. Mortar properties when tested in accordance with referenced specifications.

1. Compressive Strength, ASTM C109: Minimum 19,305 kPa (2800 psi), using 50 mm (2 inch) cubes.
2. Tensile Strength, ASTM C307: 3861 kPa Minimum (560 psi), using the 25 mm (1 inch) briquettes.
3. Flexural Strength, ASTM C348: Minimum 6067 kPa (880 psi), using flexural bar.
4. Bond Strength, ASTM C321: Minimum 2965 kPa (430 psi), using crossed brick.

2.7 ADMIXTURE

A. Pigments: ASTM C979.

B. Use mineral pigments only. Organic pigments are not acceptable.

C. Pigments inert, stable to atmospheric conditions, nonfading, alkali resistant and water insoluble.

PART 3 - EXECUTION

3.1 MIXING

A. Mix in a mechanically operated mortar mixer.

1. Mix mortar for at least three minutes but not more than five minutes.

B. Measure ingredients by volume. Measure by the use of a container of known capacity.

1. Mix water with dry ingredients in sufficient amount to provide a workable mixture which will adhere to vertical surfaces of masonry units.

C. Mortar that has stiffened because of loss of water through evaporations:

1. Re-tempered by adding water to restore to proper consistency and workability.
2. Discard mortar that has reached its initial set or has not been used within two hours.

D. Pointing Mortar:

1. Mix dry ingredients with enough water to produce a damp mixture of workable consistency which will retain its shape when formed into a ball.
2. Allow mortar to stand in dampened condition for one to 1-1/2 hours.
3. Add water to bring mortar to a workable consistency prior to application.

3.2 MORTAR USE LOCATION

A. Use Type M mortar for precast concrete panels.

B. Use Type N mortar for tuck pointing work.

END OF SECTION 04051

This page is blank.

SECTION 04052 - MASONRY TUCK POINTING

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 DESCRIPTION OF WORK

A. This Section specifies requirements for tuck pointing of existing masonry. Field verify extent of work with Owner and Architect.

1.3 APPLICABLE PUBLICATIONS

A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in the text by basic designation only.

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

   a. C67-07 Brick and Structural Clay Tile, Sampling and Testing.
   b. C216-07 Facing Brick (Solid Masonry Units Made from Clay or Shale).

2. International Masonry Institute: Recommended Practices and Guide Specifications for Cold Weather Masonry Construction.

PART 2 - PRODUCTS

2.1 TUCK POINTING MORTAR

A. Refer to Section 04051, Masonry Mortaring.

2.2 REPLACEMENT MASONRY UNITS

A. Face Brick:

1. ASTM C216, Grade SW, Type FBS. Brick shall be classified slightly efflorescent or better when tested in accordance with ASTM C67.
2. Face brick shall match facing brick of the existing building(s) that is being tuck pointed.
3. Other units to match existing.

PART 3 - EXECUTION

3.1 CUT OUT OF EXISTING MORTAR JOINTS

A. Cut out existing mortar joints (both bed and head joints) and remove by traditional means using hand chisels and mash hammers, or rubbing bars, to produce the best possible effect with the least possible damage to historic masonry units. Remove existing mortar to a uniform depth up to 19mm (3/4-inch), or until sound mortar is reached. Take care to not damage edges of existing units to remain. Provide test sections on areas to be coordinated for review with Owner and Architect prior to proceeding with full scope of work.

B. Remove dust and debris from the joints by brushing, blowing with air or rinsing with water. Do not rinse when temperature is below freezing.

3.2 JOB CONDITIONS

A. Protection: Protect newly pointed joints from rain, until pointed joints are sufficiently hard enough to prevent damage.

3.3 INSTALLATION OF TUCK POINTING MORTAR

A. Immediately prior to application of mortar, dampen joints to be tuck pointed. Prior to application of pointing mortar, allow masonry units to absorb surface water. Mortar color to match existing.

B. Tightly pack mortar into joints in thin layers, approximately 6mm (1/4-inch) thick maximum.

C. Allow layer to become “thumbprint hard” before applying next layer.

D. Pack final layer flush with surfaces of masonry units. When mortar becomes “thumbprint hard”, tool joints.

3.4 TOOLING JOINTS

A. Tool joints with a jointing tool to produce a smooth, compacted, concaved joint.

B. Tool joints in patch work with a jointing tool to match the existing surrounding joints.

3.5 REPLACEMENT OF MASONRY UNITS

A. Cut out mortar joints surrounding existing brick units that are to be removed and replaced.

1. Units removed may be broken and removed, providing surrounding units to remain are not damaged.
2. Once the units are removed, carefully chisel out the old mortar and remove dust and debris. Units are located at exterior wythe of a cavity wall. Exercise care to prevent debris falling into cavity

B. Dampen surfaces of the surrounding units before new units are placed.

1. Allow existing masonry to absorb surface moisture prior to starting installation of new replacement units.
2. Butter contact surfaces of existing masonry and new replacement masonry units with mortar.
3. Center replacement brick masonry units in opening and press into position.
4. Remove excess mortar with a trowel.
5. Point around replacement masonry units to ensure full head and bed joints.
6. When mortar becomes “thumbprint hard”, tool joints.

3.6 CLEANING

A. Clean exposed brick masonry surfaces on completion.

B. Remove mortar droppings and other foreign substances from wall surfaces.

C. First wet surfaces with clean water, then wash down with a solution of soapless detergent specially prepared for cleaning brick.

D. Brush with stiff fiber brushes while washing, and immediately thereafter hose down with clean water.

E. Free clean surfaces from traces of detergent, foreign streaks or stains. Protect materials during cleaning operations including adjoining construction.

F. Use of muriatic acid for cleaning is prohibited.

END OF SECTION 04052

This page is blank.

SECTION 04054 - MASONRY RESTORATION CLEANING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DESCRIPTION OF WORK

A. Extent of exterior masonry work is indicated on drawings.

B. Masonry restoration work includes the following: All exposed surfaces of existing face brick, precast concrete trim and architectural concrete.

1. Repairing damaged masonry.
2. Heavy wire brushing of steel lintels that are to remain to remove scale and rust and prime with rust inhibitive primer.
3. Cleaning all exposed exterior masonry, architectural concrete surfaces of exterior stairs, concrete eyebrows, brick and stucco surfaces, etc., exposed to view.
4. Repointing mortar joints, as indicated on Drawings.

C. Joint sealers are specified in Section 07920.

D. Painting as specified in Section 09900.

1.3 RELATED WORK

A. Section 04052, Masonry Tuck Pointing.

B. Section 04051, Masonry Mortaring.

C. Section 07190, Water Repellents.

D. Section 07920, Joint Sealants.

1.4 QUALITY ASSURANCE

A. Restoration Specialist: Work must be performed by a firm having not less than 5 years successful experience in comparable masonry restoration and employing personnel skilled in the restoration processes and operations indicated.

B. Field-Constructed Mock-ups: Prior to start of general masonry restoration, prepare sample panels on building where directed by Architect. Obtain Architect’s acceptance of visual qualities before proceeding with the overall work. Retain acceptable panels in undisturbed condition, suitably marked, during construction as a standard for judging completed work. 10’x 10’ area required.

1. Test adjacent non-masonry materials for possible reaction with cleaning materials.

C. Cleaning: Follow procedures for cleaning on mock-ups and allow waiting period of not less than 7 calendar days, after completion of sample cleaning to permit study of panels for negative reactions.

D. Repointing: Prepare 2 separate sample areas of approximately 10’ high by 10’ wide for each type of repointing required, one for demonstrating methods and quality of workmanship expected in removal of mortar from joints and the other for demonstrating quality of materials and workmanship expected in pointing mortar joints, verify with Architect.

E. Masonry Repair: Prepare sample panels approximately 10’ x 10’ for brick masonry indicated to be patched, rebuilt or replaced. Erect mock-up panels into an existing wall, unless otherwise indicated, to demonstrate quality of materials and workmanship, verify with Architect.

F. Cleaning and Sealing: Prepare sample panel approximately 10’ x 10’ for brick masonry, cleaning and sealing. Erect mock-up panels into an existing wall unless otherwise indicated, to demonstrate quality of materials and workmanship, and verify with Architect.

1.5 SUBMITTALS

A. Product Data: Submit manufacturer’s technical data for each type of product indicated including recommendations for their application and use. Include test reports and certification substantiating that products comply with requirements.

B. Restoration Program: Submit written program for each phase of restoration process including protection of surrounding materials on building and site during operations. Describe in detail materials, methods and equipment to be used for each phase of restoration work.

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

1. Provide straps or panels containing not less than 4 full brick units.
2. Provide mortar for pointing and masonry rebuilding and repair, in form of 6” long by 1/2“ wide sample strips of mortar set in aluminum or plastic channels.
3. Each type of chemical cleaning material.
4. Each type of adhesive.
5. Each type of anchor.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Carefully pack, handle, and ship masonry units and accessories strapped together in suitable packs or pallets or in heavy cartons. Unload and handle to prevent chipping and breakage.

B. Deliver other materials to site in manufacturer's original and unopened containers and packaging, bearing labels as to type and name of products and manufacturers.

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

D. Protect grout, mortar and other materials from deterioration by moisture and temperature. Store in a dry location or in waterproof containers. Keep containers tightly closed and away from open flames. Protect liquid components from freezing. Comply with manufacturer’s recommendations for minimum and maximum temperature requirements for storage.

1.7 PROJECT CONDITIONS

A. Clean masonry surfaces only when air temperatures are 40 deg.F (4 deg.C) and above and will remain so until masonry has dried out, but for not less than 7 days after completion of cleaning.

B. Do not repoint mortar joints or repair masonry unless air temperatures and between 40 deg.F (4 deg.C) and 80 deg.F (27 deg.C) and will remain so for at least 48 hours after completion of work.

C. Prevent grout or mortar used in repointing and repair work from staining face of surrounding masonry and other surfaces. Immediately remove grout and mortar in contact with exposed masonry and other surfaces.

D. Protect sills, ledges and projections from mortar droppings.

1.8 SEQUENCING AND SCHEDULING

A. Perform masonry restoration work in the following sequence:

1. Protect all areas as required.
2. Pressure wash exterior brick masonry, trim, stucco, and exposed concrete.
3. Spray surfaces with bleach solution.
4. Repair existing brick masonry including replacing existing masonry with new masonry materials in areas no longer used as wall openings, grilles, louvers, etc.
5. Rake out existing mortar from joint required to be repointed.
6. Point existing mortar joints of masonry indicated.
7. Clean existing masonry surfaces.

B. Contractor to protect new and existing windows and all entrances from damage during this process.

PART 2 - PRODUCTS

2.1 MASONRY MATERIALS

A. Face Brick and Accessories: Provide face brick and accessories, including units for lintels, corners, and other special ground, cut, or sawed shapes where required to complete masonry restorations work.

B. Brick shall match existing brickwork. Mix salvaged brick with new brick as required to provide a good mix or new and existing.

C. Building Brick: Provide building brick complying with ASTM C 216.

2.2 MORTAR MATERIALS

A. Portland Cement: ASTM C 150, Type I.

B. Hydrated Lime: ASTM C 207, Type S.

C. Aggregate for Mortar: ASTM C 144, unless otherwise indicated. Match size, texture and gradation of existing mortar as closely as possible.

D. Water: Clean, free of oils, acids, alkalis and organic matter.

2.3 CLEANING MATERIALS AND EQUIPMENT FOR BRICK-LIMESTONE, AND EXPOSED CONCRETE SURFACES

A. Pressure Wash: Surfaces with bleach and water solution. Do Not Sand Blast any areas.

B. Masonry Spray: Upon completion of pressure washing, spray all surfaces with a mixture of bleach and water, mixed 1 to 3 parts water to kill all mildew spores.

C. Water for Cleaning: Clean, potable, free of oils, acids, alkalis, salts, and organic matter.

D. Brushing: Use a stiff bristle brush to brush surface of brick and mortar prior to applying masonry cleaner.

2.4 MASONRY CLEANER

A. Basis of Design: “Sure-Klean” restoration cleaners by Prosoco, Inc., Lawrence, KS.

B. Spray Equipment: Provide equipment for controlled spray application of water and chemical cleaners, at rates recommended by manufacturers for pressure, measured at spray tip, and for volume.

2.5 MISCELLANEOUS MATERIALS

A. Concrete Anchors: Type and size to match existing in size and type. Fabricate anchors and dowels from AISI Type 302/304 stainless steel.

B. Primer for Existing Steel Lintels: Clean surfaces and brush two coats of rust inhibitive paint as per manufacturer’s specifications.

1. 4160 Devguard Alkyd; ICI Dulux.
2. Iron Clad 163 Lowlustre Alkyd; Benjamin Moore.
3. B50Z KEM Kromik Alkyd; Sherwin Williams/

2.6 MORTAR MIXES

A. General: See Section 04053, Repair Mortar.

B. Mortar Color: To match existing.

C. Do not use admixtures of any kind in mortar, unless otherwise indicated.

D. Basis of Design:

1. Mortar Material: Pre-mixed blended mortar matching color of existing mortar joints and applied by troweling or using a large caulking type gun. Mortar type to be standard, type

N, with 2100 psi compressive strength after 28 days, applied to surfaces in accordance with the manufacturer's latest specifications and recommendations.

2.7 CHEMICAL CLEANING SOLUTIONS

A. Unless otherwise indicated, dilute chemical cleaning materials with water to produce solutions of concentration indicated but not greater than that recommended by chemical cleaner manufacturer.

PART 3 - EXECUTION

3.1 PREPARATION

A. General: Comply with recommendations of masonry cleaner manufacturer for protecting building surfaces against damage from exposure to their products.

B. Protect persons, motor vehicles, surrounding surfaces of building whose masonry surfaces are being restored, building site, and surrounding buildings from injury resulting from masonry restoration work.

1. Prevent chemical cleaning solutions from coming into contact with pedestrians, motor vehicles, landscaping, buildings and other surfaces which could be injured by such contact by collection and proper disposal. Dispose of run-off from cleaning operations by legal means and in manner which prevents soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors.
2. Do not clean masonry during winds of sufficient force to spread cleaning solutions to unprotected surfaces.
3. Erect temporary protection covers over pedestrian walkways and at points of entrance and exit which must remain in operation during course of masonry restoration work.

C. Protect glass, unpainted metal trim and polished stone from contact with acidic and alkali chemical cleaners by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape. Apply masking agent to comply with manufacturer's recommendations. Do not apply liquid masking agent to painted or porous surfaces.

3.2 CLEANING EXISTING MASONRY, STUCCO, AND EXPOSED CONCRETE, GENERAL

A. Proceed with cleaning in an orderly manner, work from top to bottom of each scaffold width and from one end of each elevation to the other.

B. Use only those cleaning methods indicated for masonry material and location.

C. Perform each cleaning method in a manner which results in uniform coverage of all surfaces, including corners, moldings, interstices and which produces as even effect without streaking or damage to masonry surfaces.

D. Rinse off chemical residue and soil by working upwards from bottom to top of each treated area at each stage or scaffold setting.

E. Chemical Cleaner Application Methods:

1. General: Apply chemical cleaners to masonry surfaces to comply with chemical manufacturer's recommendations using spray application methods. Do not allow chemicals to remain on surface for periods longer than that indicated or recommended by manufacturer.
2. Spray Application: Apply to pressures not exceeding 50 psi, unless otherwise indicated.
3. Reapplication of Chemical Cleaners: Do not apply chemical cleaners to same masonry surfaces more than twice. If additional cleaning is required use steam wash.

3.3 BRICK REMOVAL AND REBUILDING

A. Brick Removal: If during the course of the restoration work, loose brick or deteriorated brick is found, comply with following:

B. Carefully remove brick work by hand at locations. Cut out full units from joint to joint and in manner to permit replacement with new matching full size units.

C. Support and protect masonry indicated to remain which surrounds removal area.

D. Salvage as many whole, undamaged bricks as possible.

E. Remove mortar, loose particles and soil from salvaged brick by cleaning with brushes and water. Store brick for reuse.

F. Clean remaining brick at edges of removed areas by removing mortar, dust, and loose debris in preparation for rebuilding.

G. Brick Rebuilding:

1. Install new and salvaged brick to replace removed brick for a good match of new and existing. Install steel lintels and flashings. Fit replacement units into bonding and coursing pattern of existing brick. If cutting is required use motor driven saw designed to cut masonry with clean, sharp unchipped edges.
2. Lay replacement brick with completely filled bed, head and collar joints. Butter ends with sufficient mortar to fill head joints and shove into place. Wet clay brick which have ASTM C 67 initial rates of absorption (suction) of more than 30 gram per sq.in. per minute. Use wetting methods which ensure that units are nearly saturated but surface dry when laid. Maintain joint width for replacement units to match existing.
3. Tool exposed mortar joints in repaired areas to match joints of surrounding existing brickwork.

3.4 REPOINTING EXISTING MASONRY

A. Rake out all deteriorated mortar from joints throughout to depths equal to one times their widths but not less than 1/8" nor less than that required to expose sound unweathered mortar, and see repair mortar specification requirements.

B. Remove mortar from masonry surfaces within raked-out joints to provide reveals with square backs and to expose masonry for contact with pointing mortar. Brush, vacuum or flush joints to remove dirt and loose debris.

C. Do not spall edges of masonry units or widen joints. Replace any masonry units which become damaged.

1. Cut out old mortar by means of a toothing chisel, rubbing bar or special pointers grinder or masonry router bit to a uniform depth, unless otherwise indicated. The use of power tools and blades subject to damage existing brick will require great care. Damaged units shall be replaced.

D. Joint Pointing:

1. Rinse masonry joint surfaces with water to remove any dust and mortar particles. Time applications of rinsing so that, at time of pointing, excess water has evaporated or run off, and joint surfaces are damp but free of standing water.
2. Apply first layer of pointing mortar to areas where existing mortar was removed to depths greater than surrounding areas. Apply in layers not greater than 3/8" until a uniform depth is formed. Compact each layer thoroughly and allow to become thumbprint hard before applying next layer.
3. After joints have been filled to a uniform depth, place remaining pointing mortar in 3 layers with each of first and second layers filling approximately 2/3 of joint depth and third layer the remaining 1/3. Fully compact each layer and allow to become thumbprint hard before applying next layer. Where mortar bricks have rounded edges recess final layer slightly from face. 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, unless otherwise indicated. Remove excess mortar from edge of joint by brushing.
5. Cure mortar by maintaining in a damp condition for not less than 72 hours.

END OF SECTION 04054

This page is blank.

SECTION 04901 - CLAY MASONRY RESTORATION AND CLEANING

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 restoration and cleaning of [**brick**] [**and**] [**terra cotta**] as follows:

1. Repairing clay masonry, including replacing damaged units.
2. Reanchoring veneers.
3. Repointing mortar joints.
4. Removing plant growth.
5. Cleaning exposed clay masonry surfaces.

B. Related Sections include the following:

1. Division 4 Section "Unit Masonry Assemblies" for new clay masonry construction.
2. Division 4 Section "Stone Restoration and Cleaning."
3. Division 7 Section "Water Repellents" for water repellents applied to clay masonry.
4. Division 7 Section "Sheet Metal Flashing and Trim" for metal flashing installed in or on restored clay masonry.
5. Division 7 Section "Joint Sealants" for sealing joints in restored clay masonry.

C. Allowances: Quantity allowances for clay masonry restoration and cleaning are specified in Division 1 Section "Allowances."

1. Perform clay masonry restoration and cleaning work included in quantity allowances only as authorized. Authorized work includes [**work required by specifications and**] [**only**] work authorized in writing by Architect.
2. Notify Architect [**weekly**] <**Insert time interval**> of extent of work performed that is attributable to quantity allowances.
3. Perform work that exceeds quantity allowances only as authorized by Change Orders.

D. Unit Prices: Unit prices for clay masonry restoration and cleaning are specified in Division 1 Section "Unit Prices."

1. Unit prices apply to authorized work covered by quantity allowances.
2. Unit prices apply to additions to and deletions from Work as authorized by Change Orders.

1.3 DEFINITIONS

A. Low-Pressure Spray: 100 to 400 psi (690 to 2750 kPa); 4 to 6 gpm (0.25 to 0.4 L/s).

B. Medium-Pressure Spray: 400 to 800 psi (2750 to 5500 kPa); 4 to 6 gpm (0.25 to 0.4 L/s).

C. High-Pressure Spray: 800 to 1200 psi (5500 to 8250 kPa); 4 to 6 gpm (0.25 to 0.4 L/s).

1.4 SUBMITTALS

A. Product Data: For each type of product indicated. Include recommendations for application and use. Include test data substantiating that products comply with requirements.

B. Shop Drawings: Full-size patterns for [**terra cotta units**] [**specially molded brick shapes**] [**and**] [**brick arches**].

C. Samples for Verification: Before erecting mockup, submit samples of the following:

1. Each type of exposed masonry unit to be used for replacing existing units.

   a. For each brick type, provide straps or panels containing at least four bricks.

2. Each type of sand used for pointing mortar.

   a. For blended sands, provide samples of each component and blend.
   b. Identify sources, both supplier and quarry, of each type of sand.

3. Each type of pointing mortar in the form of sample mortar strips, 6 inches (150 mm) long by 1/2 inch (13 mm) wide, set in aluminum or plastic channels.

   a. Include with each sample a list of ingredients with proportions of each. Identify sources, both supplier and quarry, of each type of sand and brand names of cementitious materials and pigments if any.

4. Each type of masonry patching compound in the form of briquettes, at least 3 inches (75 mm) long by 1-1/2 inches (38 mm) wide. Document each sample with manufacturer and stock number or other information necessary to order additional material.

D. Qualification Data: For [**restoration specialists**] [**including field supervisors**] [**terra cotta manufacturer**] [**and**] [**chemical manufacturer**].

E. Restoration Program: For each phase of restoration process, provide detailed description of materials, methods, equipment, and sequence of operations to be used for each phase of restoration work including protection of surrounding materials on building and Project site.

1. Include methods for keeping pointing mortar damp during curing period.
2. If materials and methods other than those indicated are proposed for any phase of restoration work, provide a written description, including evidence of successful use on comparable projects, and a testing program to demonstrate their effectiveness for this Project.

F. Cleaning Program: Describe cleaning process in detail, including materials, methods, and equipment to be used and protection of surrounding materials on building and Project site, and control of runoff during operations.

1. If materials and methods other than those indicated are proposed for cleaning work, provide a written description, including evidence of successful use on comparable projects, and a testing program to demonstrate their effectiveness for this Project.

1.5 QUALITY ASSURANCE

A. Restoration Specialist Qualifications: Engage an experienced[**, preapproved**] masonry restoration and cleaning firm to perform work of this Section. Firm shall have completed work similar in material, design, and extent to that indicated for this Project with a record of successful in-service performance.

1. At Contractor's option, work may be divided between two specialist firms: one for cleaning work and one for repair work.
2. Field Supervision: Restoration specialist firms shall maintain experienced full-time supervisors on Project site during times that clay masonry restoration and cleaning are in progress. Supervisors shall not be changed during Project except for causes beyond the control of restoration specialist firm.
3. Restoration Worker Qualifications: Persons who are experienced[**and specialize**] in restoration work of types they will be performing.[**When masonry units are being patched, assign at least one worker among those performing patching work who is trained and certified by manufacturer of patching compound to apply its products.**]

B. Terra Cotta Manufacturer Qualifications: A firm regularly engaged in manufacturing architectural terra cotta units of similar size and complexity as those required for the Work.

C. Chemical Manufacturer Qualifications: A firm regularly engaged in producing masonry cleaners that have been used for similar applications with successful results, and with factory-trained representatives who are available for consultation and Project-site inspection and assistance at no additional cost.

D. Source Limitations: Obtain each type of material for masonry restoration (face brick, cement, sand, etc.) from one source with resources to provide materials of consistent quality in appearance and physical properties.

E. Preconstruction Testing Service: [**Owner will engage**] [**Engage**] a qualified independent testing agency to test the following. Provide test specimens and assemblies as indicated.

1. Replacement Brick: For each proposed type of replacement brick, according to sampling and testing methods in ASTM C 67 for compressive strength, 24-hour cold-water absorption, 5-hour boil absorption, saturation coefficient, and initial rate of absorption (suction).
2. Existing Brick: For each type of existing brick indicated for replacement, according to testing methods in ASTM C 67 for compressive strength, 24-hour cold-water absorption, 5-hour boil absorption, saturation coefficient, and initial rate of absorption (suction). Carefully remove existing bricks from locations designated by Architect.

F. Mockups: Prepare mockups of restoration and cleaning as follows to demonstrate aesthetic effects and qualities of materials and execution. Prepare mockups on existing walls under same weather conditions to be expected during remainder of the Work.

1. Repair an area [**approximately 36 inches (900 mm) high by 48 inches (1200 mm) wide**] [**as indicated**] for each type of masonry material indicated to be rebuilt or replaced.
2. Patch three small areas [**at least 1 inch (25 mm) in diameter**] [**as directed**] for each type of masonry material indicated to be patched.
3. Clean an area [**approximately 25 sq. ft. (2.3 sq. m) in area**] [**as indicated**] for each type of clay masonry and surface condition.

a. Test cleaners and methods on samples of adjacent materials for possible adverse reactions unless cleaners and methods are known to have deleterious effect.

b. Allow a waiting period of not less than seven days after completion of sample cleaning to permit a study of sample panels for negative reactions.

4. Rake out joints in two separate areas [**approximately 36 inches (900 mm) high by 72 inches (1800 mm) wide**] [**as indicated**] for each type of repointing required and repoint one of the two areas.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver masonry units to Project site strapped together in suitable packs or pallets or in heavy-duty cartons.

B. Deliver other materials to Project site in manufacturer's original and unopened containers, labeled with manufacturer's name and type of products.

C. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

D. Store hydrated lime in manufacturer's original and unopened containers. Discard lime if containers have been damaged or have been opened for more than two days.

E. Store lime putty covered with water in sealed containers.

F. Store sand where grading and other required characteristics can be maintained and contamination avoided.

1.7 PROJECT CONDITIONS

A. Repoint mortar joints and repair masonry only when air temperature is between and 40 and 90 deg F (4 and 32 deg C) and is predicted to remain so for at least 7 days after completion of work.

B. Cold-Weather Requirements: Comply with the following procedures for masonry repair and mortar-joint pointing:

1. When air temperature is below 40 deg F (4 deg C), heat mortar ingredients, masonry repair materials, and existing masonry walls to produce temperatures between 40 and 120 deg F (4 and 49 deg C).
2. When mean daily air temperature is below 40 deg F (4 deg C), provide enclosure and heat to maintain temperatures above 32 deg F (0 deg C) within the enclosure for 7 days after repair and pointing.

C. Hot-Weather Requirements: Protect masonry repair and mortar-joint pointing when temperature and humidity conditions produce excessive evaporation of water from mortar and repair materials. Provide artificial shade and wind breaks and use cooled materials as required. Do not apply mortar to substrates with temperatures of 90 deg F (32 deg C) and above.

D. Patch masonry only when air and surface temperatures are between and 55 and 100 deg F (13 and 38 deg C) and are predicted to remain above 55 deg F (13 deg C) for at least 7 days after completion of work. On days when air temperature is predicted to go above 90 deg F (32 deg C), schedule patching work to coincide with time that surface being patched will be in shade or during cooler morning hours.

E. Clean masonry surfaces only when air temperature is 40 deg F (4 deg C) and above and is predicted to remain so for at least 7 days after completion of cleaning.

1.8 SEQUENCING AND SCHEDULING

A. Order replacement materials at earliest possible date, to avoid delaying completion of the Work.

B. Order sand for repointing mortar immediately after approval of [**Samples**] [**mockups**]. Take delivery of and store at Project site a sufficient quantity of sand to complete Project.

C. Perform masonry restoration work in the following sequence:

1. Remove plant growth.
2. Repair existing masonry, including replacing existing masonry with new masonry materials.
3. Rake out joints that are to be repointed.
4. Point mortar joints.
5. Inspect for open mortar joints and repair before cleaning to prevent the intrusion of water and other cleaning materials into the wall.
6. Remove paint.
7. Clean masonry surfaces.
8. Rake out joints that are to be repointed.
9. Point mortar joints.

D. As scaffolding is removed, patch anchor holes used to attach scaffolding. Patch holes in masonry units to comply with Part 3 "Masonry Unit Patching" Article. Patch holes in mortar joints to comply with Part 3 "Repointing Masonry" Article.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply for product selection:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products specified.
2. Products: Subject to compliance with requirements, provide one of the products specified.
3. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the manufacturers specified.
4. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

2.2 MASONRY MATERIALS

A. Face Brick and Accessories: Provide face brick and accessories, including specially molded, ground, cut, or sawed shapes where required to complete masonry restoration work.

1. Provide units with colors, surface texture, size, and shape to match existing brickwork and with physical properties not less than those determined from preconstruction testing of selected existing units.

    a. For existing brickwork that exhibits a range of colors, provide brick that matches that range rather than brick that matches an individual color within that range.

2. Provide units with colors, surface texture, and physical properties to match Architect's sample. Match existing units in size and shape.

    a. For sample that exhibits a range of colors, provide brick that matches that range rather than brick that matches an individual color within that range.

3. Provide specially molded shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.
4. Provide specially ground units, shaped to match patterns, for arches and where indicated.

B. Building Brick: Provide building brick complying with ASTM C 62, of same vertical dimension as face brick, for masonry work concealed from view.

1. Grade SW where in contact with earth.
2. Grade SW, MW, or NW for concealed backup.

C. Terra Cotta: Provide new terra cotta units to match existing terra cotta units in compressive strength, color, gloss, surface texture, thickness and composition of surface glaze, composition of body, profile, and dimensions.

1. [**Available**]Manufacturers:

    a. Boston Valley Terra Cotta.
    b. Gladding, McBean.
    c. Studio S. Pottery.
    d. Superior Clay Corporation.
    e. Virtue, W. D. Co.
    f. <**Insert manufacturer's name.**>

2.3 MORTAR MATERIALS

A. Portland Cement: ASTM C 150, Type I or Type II.

1. Provide white cement containing not more than 0.60 percent total alkali when tested according to ASTM C 114.

B. Hydrated Lime: ASTM C 207, Type S.

C. Quicklime: ASTM C 5, pulverized lime.

D. Factory-Prepared Lime Putty: Screened, fully-slaked lime putty, prepared from pulverized lime complying with ASTM C 5.

E. Mortar Sand: ASTM C 144, unless otherwise indicated.

1. Color: Provide natural sand[**or ground marble, granite, or other sound stone**]; of color necessary to produce required mortar color.
2. For pointing mortar, provide sand with rounded edges.
3. Match size, texture, and gradation of existing mortar sand as closely as possible. Blend several sands, if necessary, to achieve suitable match.

F. Mortar Pigments: Natural and synthetic iron oxides, compounded for mortar mixes. Use only pigments with a record of satisfactory performance in masonry mortars.

G. Water: Potable.

2.4 PAINT REMOVERS

A. Alkaline Paste Paint Remover: Manufacturer's standard alkaline paste formulation for removing paint coatings from masonry.

1. [**Available**]Products:

a. American Building Restoration Products, Inc.; 800 Brush Grade.
b. Diedrich Technologies Inc.; 606/606X Extra Thick Multi-Layer Paint Remover.
c. Hydrochemical Techniques, Inc.; Hydroclean Heavy Duty Paint Remover (HT-716).
d. Price Research, Ltd.; Price Heavy Duty Paint Stripper.
e. ProSoCo; Sure Klean Heavy-Duty Paint Stripper.
f. <**Insert manufacturer's name; product name or designation.**>

B. Covered or Skin-Forming Alkaline Paint Remover: Manufacturer's standard covered or skin-forming alkaline formulation for removing paint coatings from masonry.

1. [**Available**]Products:

a. American Building Restoration Products, Inc.; Grip 'N Strip 800 F.A.
b. Diedrich Technologies Inc.; 404 Rip-Strip.
c. Dumond Chemicals, Inc.; Peel Away 1 System.
d. ProSoCo; Enviro Strip #2.
e. <**Insert manufacturer's name; product name or designation.**>

C. Solvent-Type Paint Remover: Manufacturer's standard water-rinsable, solvent-type gel formulation for removing paint coatings from masonry.

1. [**Available**]Products:

a. American Building Restoration Products, Inc.; No. 3 Grip 'N Strip.
b. Diedrich Technologies Inc.; 505 Special Coatings Stripper.
c. Dominion Restoration, Inc.; Dominion Multi-Layer Paint & Graffiti Remover.
d. Dumond Chemicals, Inc.; Peel Away 2.
e. Hydrochemical Techniques, Inc.; Hydroclean Solvent Paint Remover (HT-300).
f. Price Research, Ltd.; Price Strip-All.
g. ProSoCo; Sure Klean Fast Acting Paint Stripper.
h. <**Insert manufacturer's name; product name or designation.**>

D. Low-Odor, Solvent-Type Paint Remover: Manufacturer's standard low-odor, water-rinsable solvent-type gel formulation, containing no methanol or methylene chloride, for removing paint coatings from masonry.

1. [**Available**]Products:

    a. American Building Restoration Products, Inc.; [**800 No Lye Grip 'N Strip**] [**Super Bio Strip Gel**] [**or**] [**Super Bio Strip Paste**].
    b. Dumond Chemicals, Inc.; Peel Away 6.
    c. ProSoCo; [**Enviro Klean NMC**] [**or**] [**Enviro Strip #3**].
    d. <**Insert manufacturer's name; product name or designation.**>

2.5 CLEANING MATERIALS

A. Water for Cleaning: Potable.

B. Hot Water: Heat water to a temperature of 140 to 160 deg F (60 to 71 deg C).

C. Job-Mixed Detergent Solution: Solution prepared by mixing 2 cups (0.5 L) of tetrasodium polyphosphate (TSPP), 1/2 cup (125 mL) of laundry detergent, and 20 quarts (20 L) of hot water for every 5 gal. (20 L) of solution required.

D. Job-Mixed Mold, Mildew, and Algae Remover: Solution prepared by mixing 2 cups (0.5 L) of tetrasodium polyphosphate (TSPP), 5 quarts (5 L) of 5 percent sodium hypochlorite (bleach), and 15 quarts (15 L) of hot water for every 5 gal. (20 L) of solution required.

E. Nonacidic Gel Cleaner: Manufacturer's standard gel formulation, with pH between 6 and 9, that contains detergents and chelating agents and is specifically formulated for cleaning masonry surfaces.

1. [**Available**]Products:

    a. Price Research, Ltd.; Price Marble Cleaner-Gel.
    b. ProSoCo; Sure Klean 942 Masonry Cleaner.
    c. <**Insert manufacturer's name; product name or designation.**>

F. Nonacidic Liquid Cleaner: Manufacturer's standard mildly alkaline liquid cleaner formulated for removing mold, mildew, and other organic soiling from ordinary building materials, including polished stone, brick, aluminum, plastics, and wood.

1. [**Available**]Products:

    a. Dominion Restoration, Inc.; Bio-Cleanse.
    b. Dumond Chemicals, Inc.; Safe n' Easy Architectural Cleaner/Restorer.
    c. Price Research, Ltd.; Price Non-Acid Masonry Cleaner.
    d. ProSoCo; Enviro Klean Restoration Cleaner.
    e. <**Insert manufacturer's name; product name or designation.**>

G. Mild Acidic Cleaner: Manufacturer's standard mildly acidic cleaner containing no hydrochloric, hydrofluoric, or sulfuric acid; or chlorine bleaches.

1. [**Available**]Products:

    a. Diedrich Technologies Inc.; Envirorestore 100.
    b. Dominion Restoration, Inc.; DR-60 Stone and Masonry Cleaner.
    c. Dumond Chemicals, Inc.; Safe n' Easy Heavy Duty Restoration Cleaner.
    d. ProSoCo; Sure Klean Light-Duty Restoration Cleaner.
    e. <**Insert manufacturer's name; product name or designation.**>

H. Acidic Cleaner: Manufacturer's standard acidic masonry restoration cleaner composed of hydrofluoric acid blended with other acids, detergents, wetting agents, and inhibitors.

1. [**Available**]Products:

a. American Building Restoration Products, Inc.; 801 Heavy Duty Masonry Cleaner.
b. Diedrich Technologies Inc.; [**101 Masonry Restorer**] [**or**] [**101G Granite, Terra Cotta, and Brick Cleaner**].
c. Hydrochemical Techniques, Inc.; Hydroclean Brick, Granite, Sandstone and Terra Cotta Cleaner (HT-626).
d. Price Research, Ltd.; [**Price Heavy Duty Restoration Cleaner**] [**or**] [**Price Restoration Cleaner**].
e. ProSoCo; [**Sure Klean Heavy-Duty Restoration Cleaner**] [**Sure Klean 1028 Restoration Cleaner**] [**or**] [**Sure Klean Restoration Cleaner**].
f. <**Insert manufacturer's name; product name or designation.**>

I. Two-Part Chemical Cleaner: Manufacturer's standard system consisting of potassium or sodium hydroxide based, alkaline prewash cleaner and acidic afterwash cleaner that does not contain hydrofluoric acid.

1. [**Available**]Products:

a. ProSoCo; Sure Klean 766 Limestone & Masonry Prewash and Afterwash.
b. <**Insert manufacturer's name; product name or designation.**>

2.6 MISCELLANEOUS MATERIALS

A. Masonry Patching Compound: Factory-mixed cementitious product that is custom manufactured for patching masonry, is vapor- and water permeable, exhibits low shrinkage, and develops high bond strength to all types of masonry.

1. Formulate patching compound used for patching brick in colors and textures to match brick being patched. Provide [**number of colors needed**] [**not less than three colors**] to enable matching each brick.
2. Formulate patching compound used for patching unglazed terra cotta in colors and textures to match terra cotta being patched.
3. [**Available**]Products:

a. Cathedral Stone Products, Inc.; Jahn Restoration Mortar.
b. Edison Coatings, Inc.; Custom System 45.
c. <**Insert manufacturer's name; product name or designation.**>

B. Terra Cotta Glaze Replacement: A high-solids, waterborne polyurethane coating intended for exterior use as terra cotta glaze replacement. Product is custom mixed by manufacturer to match color and gloss of existing terra cotta glaze.

1. [**Available**]Products:

a. Edison Coatings, Inc.; Aquathane UA-210.
b. <**Insert manufacturer's name; product name or designation.**>

C. Liquid Strippable Masking Agent: Manufacturer's standard liquid, film-forming, strippable masking material for protecting glass, metal, and polished stone surfaces from damaging effects of acidic and alkaline masonry cleaners.

1. [**Available**]Products:

    a. American Building Restoration Products, Inc.; LM 130 Acid Shield.
    b. Diedrich Technologies Inc.; Diedrich Acid Guard.
    c. Price Research, Ltd.; Price Mask.
    d. ProSoCo; Sure Klean Strippable Masking.
    e. <**Insert manufacturer's name; product name or designation.**>

D. Terra Cotta Anchors: Type and size indicated or, if not indicated, to match existing anchors in size and type. Fabricate anchors and dowels from Type 304 stainless steel.

E. Masonry Repair Anchors, Expansion Type: Mechanical fasteners designed for masonry veneer stabilization consisting of 1/4-inch- (6-mm-) diameter, Type 304 stainless-steel rod with brass expanding shells at each end and water-shedding washer in the middle. Expanding shells shall be designed to provide positive mechanical anchorage to veneer on one end and backup masonry on the other.

1. [**Available**]Products:

    a. Dur-O-Wal, a Dayton Superior Company; Mechanical Repair Anchors.
    b. Hohmann & Barnard, Inc.; #521RA Repair/Restoration Anchor.
    c. <**Insert manufacturer's name; product name or designation.**>

F. Masonry Repair Anchors, Spiral Type: Type 304 stainless-steel spiral rods designed to anchor to backing and veneer. Anchors are flexible in plane of veneer but rigid perpendicular to it.

1. Provide adhesive-installed anchors complete with manufacturer's standard epoxy adhesive and injection tubes, screens, sleeves, or other devices required for installation.
2. Provide driven-in anchors designed to be installed in drilled holes and relying on screw effect rather than adhesive to secure them to backup and veneer.
3. [**Available**]Products:

    a. Dur-O-Wal, a Dayton Superior Company; Dur-O-Flex.
    b. Heckmann Building Products, Inc.; #391 Spiro Remedial Tie.
    c. Helifix Ltd.; [**Helifix HRT60**] [**or**] [**Helifix HRT80**].
    d. <**Insert manufacturer's name; product name or designation.**>

2.7 MORTAR MIXES

A. Preparing Lime Putty: Slake quicklime and prepare lime putty according to appendix to ASTM C 5 and manufacturer's written instructions.

B. Measurement and Mixing: Measure cementitious materials and sand in a dry condition by volume or equivalent weight. Do not measure by shovel; use known measure. Mix materials in a clean, mechanical batch mixer.

1. Mixing Pointing Mortar: Thoroughly mix cementitious materials and sand together before adding any water. Then mix again adding only enough water to produce a damp, unworkable mix that will retain its form when pressed into a ball. Maintain mortar in this dampened condition for 15 to 30 minutes. Add remaining water in small portions until mortar reaches desired consistency. Use mortar within one hour of final mixing; do not retemper or use partially hardened material.

C. Colored Mortar: Produce mortar of color required by using selected ingredients. Do not alter specified proportions without Architect's approval.

1. Mortar Pigments: Where mortar pigments are indicated, do not exceed a pigment-to-cement ratio of 1:10 by weight.

D. Do not use admixtures of any kind in mortar, unless otherwise indicated.

E. Mortar Proportions: Mix mortar materials in the following proportions:

1. Pointing Mortar for Brick: [**1 part portland cement, 2 parts lime, and 6 parts sand**] [**1 part portland cement, 6 parts lime, and 12 parts sand**] <**Insert required proportions**>.

a. Add mortar pigments to produce mortar colors required.

2. Pointing Mortar for Terra Cotta: 1 part white portland cement, 1 part lime, and 6 parts sand.

a. Add mortar pigments to produce mortar colors required.

3. Rebuilding (Setting) Mortar: Same as pointing mortar.
4. Rebuilding (Setting) Mortar: Comply with ASTM C 270, Proportion Specification, Type N, unless otherwise indicated; with cementitious material content limited to portland cement and lime.

2.8 CHEMICAL CLEANING SOLUTIONS

A. Dilute chemical cleaners with water to produce solutions not exceeding concentration recommended by chemical cleaner manufacturer.

B. Acidic Cleaner Solution for Brick: Dilute with water to produce hydrofluoric acid content of 3 percent or less, but not greater than that recommended by chemical cleaner manufacturer.

C. Acidic Cleaner Solution for Terra Cotta: Dilute with water to concentration demonstrated by testing that does not etch or otherwise damage terra cotta surface, but not greater than that recommended by chemical cleaner manufacturer.

PART 3 - EXECUTION

3.1 RESTORATION SPECIALISTS

A. Available Restoration Specialist Firms: Subject to compliance with requirements, firms that may provide clay masonry restoration and cleaning include, but are not limited to, the following:

B. Restoration Specialist Firms: Subject to compliance with requirements, provide clay masonry restoration and cleaning by one of the following:

1. <**Insert, in separate subparagraphs, names of preapproved restoration specialist firms.**>

3.2 PROTECTION

A. Protect persons, motor vehicles, surrounding surfaces of building being restored, building site, plants, and surrounding buildings from harm resulting from masonry restoration work.

1. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during course of restoration and cleaning work.

B. Comply with chemical cleaner manufacturer's written instructions for protecting building and other surfaces against damage from exposure to its products. Prevent chemical cleaning solutions from coming into contact with pedestrians, motor vehicles, landscaping, buildings, and other surfaces that could be harmed by such contact.

1. Cover adjacent surfaces with materials that are proven to resist chemical cleaners used unless chemical cleaners being used will not damage adjacent surfaces. Use materials that contain only waterproof, UV-resistant adhesives. Apply masking agents to comply with manufacturer's written instructions. Do not apply liquid masking agent to painted or porous surfaces. When no longer needed, promptly remove masking to prevent adhesive staining.
2. Keep wall wet below area being cleaned to prevent streaking from runoff.
3. Do not clean masonry during winds of sufficient force to spread cleaning solutions to unprotected surfaces.
4. Neutralize and collect alkaline and acid wastes for disposal off Owner's property.
5. Dispose of runoff from cleaning operations by legal means and in a manner that prevents soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors.

C. Prevent mortar from staining face of surrounding masonry and other surfaces.

1. Cover sills, ledges, and projections to protect from mortar droppings.
2. Keep wall area wet below rebuilding and pointing work to discourage mortar from adhering.
3. Immediately remove mortar in contact with exposed masonry and other surfaces.
4. Clean mortar splatters from scaffolding at end of each day.

D. Remove[**gutters and**] downspouts adjacent to masonry and store[**where indicated**] during masonry restoration and cleaning. Reinstall when masonry restoration and cleaning is complete.

1. Provide temporary rain drainage during work[**as indicated**] to direct water away from building.

3.3 UNUSED ANCHOR REMOVAL

A. Remove masonry anchors, brackets, wood nailers, and other extraneous items no longer in use unless identified as historically significant or indicated to remain.

1. Remove items carefully to avoid spalling or cracking masonry.
2. If item cannot be removed without damaging surrounding masonry, cut off item flush with surface and core drill surrounding masonry and item as close around item as practical.
3. Patch holes where items were removed unless directed to remove and replace units.

3.4 BRICK REMOVAL AND REPLACEMENT

A. At locations indicated, remove bricks that are damaged, spalled, or deteriorated. Carefully demolish or remove entire units from joint to joint, without damaging surrounding masonry, in a manner that permits replacement with full-size units.

1. When removing single bricks, remove material from center of brick and work toward outside edges.

B. Support and protect remaining masonry 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 bricks as possible.

1. Remove mortar, loose particles, and soil from brick by cleaning with hand chisels, brushes, and water.
2. Store brick for reuse, as indicated.
3. Deliver cleaned brick not required for reuse to Owner, unless otherwise directed.

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

F. Install replacement brick into bonding and coursing pattern of existing brick. If cutting is required, use a motor-driven saw designed to cut masonry with clean, sharp, unchipped edges.

G. Lay replacement brick with completely filled bed, head, and collar joints. Butter ends with sufficient mortar to fill head joints and shove into place. Wet both replacement and surrounding bricks that have ASTM C 67 initial rates of absorption (suction) of more than 30 g/30 sq. in. per min. (30 g/194 sq. cm per min.). Use wetting methods that ensure that units are nearly saturated but surface is dry when laid. Maintain joint width for replacement units to match existing joints.

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

3.5 TERRA COTTA REMOVAL AND REPLACEMENT

A. At locations indicated, remove terra cotta units that are damaged, spalled, or deteriorated. Carefully demolish or remove entire units from joint to joint, without damaging surrounding masonry, in a manner to permit replacement with full-size units.

B. Support and protect remaining masonry that was supported by removed units. 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. Clean masonry surrounding removal areas by removing mortar, dust, and loose particles in preparation for replacement.

E. Set replacement units in a full bed of mortar with both horizontal and vertical joints of same width as existing units. Replace existing anchors with new anchors of size and type indicated.

1. Embed anchors in and fill voids behind units with grout.
2. Tool exposed mortar joints in repaired areas to match joints of surrounding existing terra cotta.
3. Rake out mortar used for laying terra cotta before mortar sets and point new mortar joints in repaired area to comply with requirements for repointing existing masonry, and at same time as repointing of surrounding area.

3.6 REANCHORING VENEERS

A. Install masonry repair anchors in horizontal mortar joints and according to manufacturer's written instructions. Install at not more than 16 inches (400 mm) o.c. vertically and 32 inches (800 mm) o.c. horizontally, unless otherwise indicated. Install at locations to avoid penetrating flashing.

B. Recess anchors at least 5/8 inch (16 mm) from surface of mortar joint and fill recess with pointing mortar.

3.7 MASONRY UNIT PATCHING

A. Patch the following masonry units:

1. Units indicated to be patched.
2. Units with holes.
3. Units with chipped edges or corners.
4. Units with small areas of deep deterioration.

B. Remove and replace existing patches, unless otherwise indicated or approved by Architect.

C. Patching Bricks:

1. Remove loose material from brick surface. Remove additional material so patch will not have feathered edges and will be at least 1/4 inch (6 mm) thick, but not less than recommended by patching compound manufacturer.
2. Mask or remove surrounding mortar joints if patch will extend to edge of brick.
3. Mix patching compound in individual batches to match each unit being patched. Combine one or more colors of patching compound, as needed, to produce exact match.
4. Rinse surface to be patched and leave damp, but without standing water.
5. Brush-coat surfaces with slurry coat of patching compound according to manufacturer's written instructions.
6. Place patching compound in layers as recommended by patching compound manufacturer, but not less than 1/4 inch (6 mm) or more than 2 inches (50 mm) thick. Roughen surface of each layer to provide a key for next layer.
7. Trowel, scrape, or carve surface of patch to match texture and surface plane of surrounding brick. Shape and finish surface before or after curing, as determined by testing, to best match existing brick.
8. Keep each layer damp for 72 hours or until patching compound has set.

D. Patching Terra Cotta:

1. Remove deteriorated material as determined by sounding with a small hammer. Use chisel or saw to produce square or undercut edges on area to be patched. Remove additional material so patch will not have feathered edges and will be at least 1/4 inch (6 mm) thick, but not less than recommended by patching compound manufacturer.
2. Where mortar joints adjacent to patch are open, fill back of joints with pointing mortar and allow to cure before patching terra cotta. Leave space for pointing joints according to "Repointing Masonry" Article.
3. Mask surrounding mortar joints or rake out for repointing if patch will extend to edge of unit.
4. Rinse surface to be patched and leave damp, but without standing water.
5. Brush-coat surfaces with slurry coat of patching compound according to manufacturer's written instructions.
6. Place patching compound in layers as recommended by patching compound manufacturer, but not less than 1/4 inch (6 mm) or more than 2 inches (50 mm) thick. Roughen surface of each layer to provide a key for next layer.
7. Do not apply patching compound over mortar joints. If patching compound bridges mortar joints, cut out joints after patching compound hardens.
8. Trowel, scrape, or carve surface of patch to match texture, details, and surface plane of surrounding terra cotta. Shape and finish surface before or after curing, as determined by testing to best match existing terra cotta.
9. Keep each layer damp for 72 hours or until patching compound has set.
10. After final layer of patching compound has cured, apply glaze replacement according to manufacturer's written instructions. Apply two or more coats, as needed, to match glaze of adjacent terra cotta units.

3.8 CLEANING MASONRY, GENERAL

A. Proceed with cleaning in an orderly manner; work from top to bottom of each scaffold width and from one end of each elevation to the other.

B. Use only those cleaning methods indicated for each masonry material and location.

1. Do not use wire brushes or brushes that are not resistant to chemical cleaner being used. Do not use plastic-bristle brushes if natural-fiber brushes will resist chemical cleaner being used.
2. Use spray equipment that provides controlled application at volume and pressure indicated, measured at spray tip. Adjust pressure and volume to ensure that cleaning methods do not damage masonry.

    a. Equip units with pressure gages.

3. For chemical cleaner spray application, use low-pressure tank or chemical pump suitable for chemical cleaner indicated, equipped with cone-shaped spray tip.
4. For water spray application, use fan-shaped spray tip that disperses water at an angle of 25 to 50 degrees.
5. For high-pressure water spray application, use fan-shaped spray tip that disperses water at an angle of at least 40 degrees.
6. For heated water spray application, use equipment capable of maintaining temperature between 140 and 160 deg F (60 and 71 deg C) at flow rates indicated.
7. For steam application, use steam generator capable of delivering live steam at nozzle.

C. Perform each cleaning method indicated in a manner that results in uniform coverage of all surfaces, including corners, moldings, and interstices, and that produces an even effect without streaking or damaging masonry surfaces.

D. Removing Plant Growth: Completely remove plant, moss, and shrub growth from masonry surfaces. Carefully remove plants, creepers, and vegetation by cutting at roots and allowing to dry as long as possible before removal. Remove loose soil and debris from open masonry joints to whatever depth they occur.

E. Preliminary Cleaning: Before beginning general cleaning, remove extraneous substances that are resistant to cleaning methods being used. Extraneous substances include paint, calking, asphalt, and tar.

1. Carefully remove heavy accumulations of material from surface of masonry with a sharp chisel. Do not scratch or chip masonry surface.
2. Remove paint and calking with alkaline paint remover.

    a. Comply with requirements for paint removal.
    b. Repeat application up to two times if needed.

3. Remove asphalt and tar with solvent-type paint remover.

    a. Apply only to asphalt and tar by brush without prewetting.
    b. Allow paint remover to remain on surface for 10 to 30 minutes.
    c. Rinse off with [**cold**] [**hot**] water using low-pressure spray.
    d. Repeat application if needed.

F. Water Spray Applications: Unless otherwise indicated, hold spray nozzle at least 6 inches (150 mm) from surface of masonry and apply water in horizontal back and forth sweeping motion, overlapping previous strokes to produce uniform coverage.

G. Steam Wash: Apply steam to masonry surfaces at pressures not exceeding 80 psi (550 kPa). Hold nozzle at least 6 inches (150 mm) from surface of masonry and apply steam in horizontal back and forth sweeping motion, overlapping previous strokes to produce uniform coverage.

H. Chemical Cleaner Application Methods: Apply chemical cleaners to masonry surfaces to comply with chemical cleaner manufacturer's written instructions; use brush or spray application methods, at Contractor's option. Do not spray apply at pressures exceeding 50 psi (345 kPa). Do not allow chemicals to remain on surface for periods longer than those indicated or recommended by manufacturer.

I. Rinse off chemical residue and soil by working upward from bottom to top of each treated area at each stage or scaffold setting. Periodically during each rinse, test pH of rinse water running off of cleaned area to determine that chemical cleaner is completely removed.

1. Apply neutralizing agent and repeat rinse, if necessary, to produce tested pH of between 6.7 and 7.5.

J. After cleaning is complete, remove protection no longer required. Remove tape and adhesive marks.

3.9 PAINT REMOVAL

A. Paint Removal with Alkaline Paste Paint Remover:

1. Apply paint remover to dry, painted masonry with brushes.
2. Allow paint remover to remain on surface for period recommended by manufacturer.
3. Rinse with [**cold**] [**hot**] water applied by [**low**] [**medium**] [**high**]-pressure spray to remove chemicals and paint residue.
4. Repeat process, if necessary, to remove all paint.
5. Apply acidic cleaner to masonry, while surface is still wet, using low-pressure spray equipment or soft-fiber brush. Let cleaner remain on surface for period recommended by chemical cleaner manufacturer.
6. Rinse with cold water applied by [**low**] [**medium**] [**high**]-pressure spray to remove chemicals and soil.

B. Paint Removal with Covered or Skin-Forming Alkaline Paint Remover:

1. Apply paint remover to dry, painted masonry with trowel, spatula, or as recommended by manufacturer.
2. Apply cover, if required by manufacturer, per manufacturer's written instructions.
3. Allow paint remover to remain on surface for period recommended by manufacturer or as determined in test panels.
4. Scrape off paint and remover and collect for disposal.
5. Rinse with [**cold**] [**hot**] water applied by [**low**] [**medium**] [**high**]-pressure spray to remove chemicals and paint residue.
6. Use alkaline paste paint remover according to "Paint Removal with Alkaline Paste Paint Remover" Paragraph, if necessary, to remove remaining paint.
7. Apply acidic cleaner to masonry, while surface is still wet, using low-pressure spray equipment or soft-fiber brush. Let cleaner remain on surface for period recommended by chemical cleaner manufacturer.
8. Rinse with cold water applied by [**low**] [**medium**] [**high**]-pressure spray to remove chemicals and soil.

C. Paint Removal with Solvent-Type Paint Remover:

1. Apply thick coating of paint remover to painted masonry with natural-fiber cleaning brush, deep-nap roller, or large paint brush.
2. Allow paint remover to remain on surface for period recommended by manufacturer. Agitate periodically with stiff-fiber brush.
3. Rinse with cold water applied by [**low**] [**medium**] [**high**]-pressure spray to remove chemicals and paint residue.

3.10 CLEANING BRICKWORK

A. Cold-Water Wash: Use cold water applied by [**low**] [**medium**] [**high**]-pressure spray.

B. Cold Water Soak:

1. Apply cold water by intermittent soaking.
2. Use perforated hoses or other means that will apply a fine water mist to entire surface being cleaned.
3. Apply water in cycles with at least 30 minutes between cycles.
4. Continue water application until surface encrustation has softened sufficiently to permit its removal by water wash, as indicated by cleaning tests.
5. Remove soil and softened surface encrustation from masonry with cold water applied by low-pressure spray.

C. Hot-Water Wash: Use hot water applied by [**low**] [**medium**] [**high**]-pressure spray.

D. Steam Cleaning: Apply steam at pressures not exceeding 80 psi (550 kPa).

E. Detergent Cleaning:

1. Wet masonry with [**cold**] [**hot**] water applied by low-pressure spray.
2. Scrub masonry with detergent solution using medium-soft brushes until soil is thoroughly dislodged and can be removed by rinsing. Use small brushes to remove soil from mortar joints and crevices. Dip brush in solution often to ensure that adequate fresh detergent is used and that masonry surface remains wet.
3. Rinse with [**cold**] [**hot**] water applied by [**low**] [**medium**] [**high**]-pressure spray to remove detergent solution and soil.
4. Repeat cleaning procedure above where required to produce cleaning effect established by mockup.

F. Mold, Mildew, and Algae Removal:

1. Wet masonry with [**cold**] [**hot**] water applied by low-pressure spray.
2. Apply mold, mildew, and algae remover by brush[**or low-pressure spray**].
3. Scrub masonry with medium-soft brushes until mold, mildew, and algae are thoroughly dislodged and can be removed by rinsing. Use small brushes for mortar joints and crevices. Dip brush in mold, mildew, and algae remover often to ensure that adequate fresh cleaner is used and that masonry surface remains wet.
4. Rinse with [**cold**] [**hot**] water applied by [**low**] [**medium**] [**high**]-pressure spray to remove mold, mildew, and algae remover and soil.
5. Repeat cleaning procedure above where required to produce cleaning effect established by mockup.

G. Nonacidic Gel Chemical Cleaning:

1. Wet masonry with [**cold**] [**hot**] water applied by low-pressure spray.
2. Apply nonacidic gel cleaner in 1/8-inch (3-mm) thickness by brush, working into joints and crevices. Apply quickly and do not brush out excessively so area will be uniformly covered with fresh cleaner and dwell time will be uniform throughout area being cleaned.
3. Let cleaner remain on surface for period indicated below:

    a. As recommended by chemical cleaner manufacturer.
    b. As established by mockup.

4. Remove bulk of nonacidic gel cleaner by squeegeeing into containers for disposal.
5. Rinse with [**cold**] [**hot**] water applied by [**low**] [**medium**] [**high**]-pressure spray to remove chemicals and soil.
6. Repeat cleaning procedure above where required to produce cleaning effect established by mockup. Do not repeat more than once. If additional cleaning is required, use steam wash.

H. Nonacidic Liquid Chemical Cleaning:

1. Wet masonry with [**cold**] [**hot**] water applied by low-pressure spray.
2. Apply cleaner to masonry[**in two applications**] by brush[**or low-pressure spray**]. Let cleaner remain on surface for period indicated below:

    a. As recommended by chemical cleaner manufacturer.
    b. As established by mockup.
    c. Two to three minutes.

3. Rinse with [**cold**] [**hot**] water applied by [**low**] [**medium**] [**high**]-pressure spray to remove chemicals and soil.
4. Repeat cleaning procedure above where required to produce cleaning effect established by mockup. Do not repeat more than once. If additional cleaning is required, use steam wash.

I. [**Mild Acidic**] [**Acidic**] Chemical Cleaning:

1. Wet masonry with cold water applied by low-pressure spray.
2. Apply cleaner to masonry[**in two applications**] by brush[**or low-pressure spray**]. Let cleaner remain on surface for period indicated below:

    a. As recommended by chemical cleaner manufacturer.
    b. As established by mockup.
    c. Two to three minutes.

3. Rinse with cold water applied by [**low**] [**medium**] [**high**]-pressure spray to remove chemicals and soil.
4. Repeat cleaning procedure above where required to produce cleaning effect established by mockup. Do not repeat more than once. If additional cleaning is required, use steam wash.

3.11 CLEANING TERRA COTTA

A. Hot-Water Wash: Use hot water applied by [**low**] [**medium**] [**high**]-pressure spray.

B. Steam Cleaning: Apply steam at pressures not exceeding 80 psi (550 kPa).

C. Nonacidic Gel Chemical Cleaning:

1. Wet terra cotta with [**cold**] [**hot**] water applied by low-pressure spray.
2. Apply nonacidic gel cleaner in 1/8-inch (3-mm) thickness by brush, working into joints and crevices. Apply quickly and do not brush out excessively so area will be uniformly covered with fresh cleaner and dwell time will be uniform throughout area being cleaned.
3. Let cleaner remain on surface for period indicated below:

    a. As recommended by chemical cleaner manufacturer.
    b. As established by mockup.

4. Remove bulk of nonacidic gel cleaner by squeegeeing into containers for disposal.
5. Rinse with [**cold**] [**hot**] water applied by [**low**] [**medium**] [**high**]-pressure spray to remove chemicals and soil.
6. Repeat cleaning procedure above where required to produce cleaning effect established by mockup. Do not repeat more than once. If additional cleaning is required, use steam wash.

D. Nonacidic Liquid Chemical Cleaning:

1. Wet terra cotta with [**cold**] [**hot**] water applied by low-pressure spray.
2. Apply cleaner to terra cotta[**in two applications**]. Let cleaner remain on surface for period indicated below:

    a. As recommended by chemical cleaner manufacturer.
    b. As established by mockup.

c. Two to three minutes.

3. Rinse with [**cold**] [**hot**] water applied by [**low**] [**medium**] [**high**]-pressure spray to remove chemicals and soil.
4. Repeat cleaning procedure above where required to produce cleaning effect established by mockup. Do not repeat more than once. If additional cleaning is required, use steam wash.

E. Mild Acidic Chemical Cleaning:

1. Wet terra cotta with cold water applied by low-pressure spray.
2. Apply cleaner to terra cotta[**in two applications**]. Let cleaner remain on surface for period indicated below:

a. As recommended by chemical cleaner manufacturer.
b. As established by mockup.
c. Two to three minutes.

3. Rinse with cold water applied by [**low**] [**medium**] [**high**]-pressure spray to remove chemicals and soil.
4. Repeat cleaning procedure above where required to produce cleaning effect established by mockup. Do not repeat more than once. If additional cleaning is required, use steam wash.

F. Two-Part Chemical Cleaning:

1. Wet terra cotta with [**cold**] [**hot**] water applied by low-pressure spray.
2. Apply alkaline prewash cleaner to terra cotta by brush or roller. Let cleaner remain on surface for period recommended by chemical cleaner manufacturer.
3. Rinse with [**cold**] [**hot**] water applied by medium-pressure spray to remove chemicals and soil.
4. Apply acidic afterwash cleaner to terra cotta[**in two applications**], while surface is still wet, using low-pressure spray equipment, deep-nap roller, or soft-fiber brush. Let cleaner remain on surface for period recommended by chemical cleaner manufacturer.
5. Rinse with cold water applied by medium-pressure spray to remove chemicals and soil.
6. Repeat cleaning procedure above where required to produce cleaning effect established by mockup. Do not repeat more than once. If additional cleaning is required, use steam wash.

3.12 REPOINTING MASONRY

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 cracks can be penetrated at least 1/4 inch (6 mm) by a knife blade 0.027 inch (0.7 mm) thick.
4. Cracked joints where cracks are 1/8 inch (3 mm) or more in width and of any depth.
5. Joints where they sound hollow when tapped by metal object.
6. Joints where they are worn back 1/4 inch (6 mm) or more from surface.
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 of [**joint width plus 1/8 inch (3 mm)**] [**2 times joint width**] [**2-1/2 times joint width**], but not less than 1/2 inch (13 mm) or not less than that required to expose sound, unweathered mortar.
2. Remove mortar from masonry surfaces within raked-out joints to provide reveals with square backs and to expose 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. Quality-control program shall include provisions for supervising performance and preventing damage due to worker fatigue.
    b. Cut out center of mortar bed 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. 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 (9 mm) until a uniform depth is formed. Fully compact each 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 (9 mm). Fully compact each layer and allow to become thumbprint hard before applying next layer. Where existing bricks have 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.

F. 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.

G. Where repointing work precedes cleaning of existing masonry, allow mortar to harden at least 30 days before beginning cleaning work.

3.13 FINAL CLEANING

A. After mortar has fully hardened, thoroughly clean exposed masonry surfaces of excess mortar and foreign matter; use wood scrapers, stiff-nylon or -fiber brushes, and clean water, spray applied at low pressure.

1. Do not use metal scrapers or brushes.
2. Do not use acidic or alkaline cleaners.

B. Wash adjacent woodwork and other nonmasonry surfaces. Use detergent and soft brushes or cloths.

C. Clean masonry debris from roof; remove debris from gutters and downspouts. Rinse off roof and flush gutters and downspouts.

D. Sweep and rake adjacent pavement and grounds to remove masonry debris. Where necessary, pressure wash surfaces to remove mortar, dust, dirt, and stains.

3.14 FIELD QUALITY CONTROL

A. Inspectors: Owner will engage qualified independent inspectors to perform inspections and prepare test reports. Allow inspectors use of lift devices and scaffolding, as needed, to perform inspections.

B. 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.

C. Notify [**inspectors**] [**and**] [**Architect's Project representatives**] in advance of times when lift devices and scaffolding will be relocated. Do not relocate lift devices and scaffolding until [**inspectors**] [**and**] [**Architect's Project representatives**] have had reasonable opportunity to make [**inspections**] [**and**] [**observations**] of work areas at lift device or scaffold location.

END OF SECTION 04901

SECTION 05720 - ORNAMENTAL HANDRAILS AND RAILINGS (ALTERNATE NO. 2)

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:

1. Steel and iron ornamental handrails and railings.

1.3 PERFORMANCE REQUIREMENTS

A. General: In engineering handrails and railings to withstand structural loads as required by Code, determine allowable design working stresses of materials based on the following:

1. Cold-Formed Structural Steel: AISI SG-673, Part I, "Specification for the Design of Cold-Formed Steel Structural Members."

B. Structural Performance of Handrails and Railings: Provide handrails and railings capable of withstanding the following structural loads without exceeding allowable design working stress of materials for handrails, railings, anchors, and connections:

1. Top Rail of Guards: Capable of withstanding the following loads applied as indicated:

a. Concentrated load of 200 lbf (890 N) applied at any point and in any direction.
b. Uniform load of 50 lbf/ft. (730 N/m) applied horizontally and concurrently with uniform load of 100 lbf/ft. (1460 N/m) applied vertically downward.
c. Concentrated and uniform loads above need not be assumed to act concurrently.

2. Handrails Not Serving As Top Rails: Capable of withstanding the following loads applied as indicated:

a. Concentrated load of 200 lbf (890 N) applied at any point and in any direction.
b. Uniform load of 50 lbf/ft. (730 N/m) applied in any direction.
c. Concentrated and uniform loads above need not be assumed to act concurrently.

3. Infill Area of Guards: Capable of withstanding a horizontal concentrated load of 200 lbf (890 N) applied to 1 sq. ft. (0.09 sq. m) at any point in system, including panels, intermediate rails, balusters, or other elements composing infill area.

a. Load above need not be assumed to act concurrently with loads on top rails in determining stress on guard.

C. Thermal Movements: Provide handrails and railings that allow for thermal movements in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of

components, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

D. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1.4 SUBMITTALS

A. Product Data: For manufacturer's product lines of handrails and railings assembled from standard components.

1. Include Product Data for grout, anchoring cement, and paint products.

B. Shop Drawings: Show fabrication and installation of handrails and railings. Include plans, elevations, sections, details, and attachments to other Work.

C. Samples for Verification: For each type of exposed finish required, prepared on components indicated below and of same thickness and metal indicated for the Work. If finishes involve normal color and texture variations, include sample sets showing the full range of variations expected.

1. 6-inch- (150-mm-) long sections of each different linear railing member, including handrails, top rails, posts, and balusters.

1.5 PROJECT CONDITIONS

A. Field Measurements: Verify handrail and railing dimensions by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Steel and Iron Handrails and Railings:

a. Southeastern Ornamental Iron Co. Inc. (Basis of Design.)

2.2 METALS

A. General: Provide metal free from pitting, seam marks, roller marks, stains, discolorations, and other imperfections where exposed to view on finished units.

B. Steel and Iron: Comply with the following requirements for each form required:

1. Steel Tubing: Cold-formed steel tubing, ASTM A 500, Grade A, unless another grade is indicated or required by structural loads.
2. Steel Rails and Bars: Hot-rolled, carbon steel complying with ASTM A 29/A 29M, Grade 1010.
3. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
4. Iron Castings: Malleable iron complying with ASTM A 47, Grade 32510.

C. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails, unless otherwise indicated.

1. Provide formed or cast brackets with predrilled hole for exposed bolt anchorage.

2.3 FASTENERS

A. Fasteners for Anchoring Handrails and Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring handrails and railings to other types of construction indicated and capable of withstanding design loads.

1. For steel handrails, railings, and fittings, use plated fasteners complying with ASTM B 633, Class Fe/Zn 25 for electrodeposited zinc coating.

B. Fasteners for Interconnecting Handrail and Railing Components: Use fasteners fabricated from same basic metal as fastened metal, unless otherwise indicated. Do not use metals that are corrosive or incompatible with materials joined.

1. Provide concealed fasteners for interconnecting railing components and for attaching them to other Work, unless exposed fasteners are unavoidable or are standard fastening method for handrail and railing indicated.

C. Postinstalled Anchors: Anchors of type indicated below, fabricated from corrosion-resistant materials with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and equal to four times the load imposed when installed in concrete, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.

1. Chemical anchors.
2. Expansion anchors.

2.4 GROUT AND ANCHORING CEMENT

A. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

B. Erosion-Resistant Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended by manufacturer for exterior use.

2.5 FABRICATION

A. Assemble handrails and railings in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.

B. Form changes in direction of railing members as follows:

1. By bending.

C. Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required; maintain profile of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of handrail and railing components.

D. Welded Connections: Fabricate handrails and railings for connecting members by welding. Cope components at perpendicular and skew connections to provide close fit, or use fittings designed for this purpose. Weld connections continuously to comply with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove flux immediately.
4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.

E. Mechanical Connections: Fabricate handrails and railings by connecting members with railing manufacturer's standard concealed mechanical fasteners and fittings, unless otherwise indicated. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.

F. Brackets, Flanges, Fittings, and Anchors: Provide manufacturer's standard wall brackets, flanges, miscellaneous fittings, and anchors to connect handrail and railing members to other construction.

G. Provide inserts and other anchorage devices to connect handrails and railings to concrete or masonry. Fabricate anchorage devices capable of withstanding loads imposed by handrails and railings. Coordinate anchorage devices with supporting structure.

H. For railing posts set in concrete, provide preset sleeves of steel not less than 6 inches (150 mm) long with inside dimensions not less than 1/2 inch (12 mm) larger than outside dimensions of post, and steel plate forming bottom closure.

I. Shear and punch metals cleanly and accurately. Remove burrs from exposed cut edges.

J. Ease exposed edges to a radius of approximately 1/32 inch (1 mm), unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing the Work.

K. Cut, reinforce, drill, and tap components, as indicated, to receive finish hardware, screws, and similar items.

L. Provide weep holes or another means to drain entrapped water in hollow sections of railing members that are exposed to exterior or to moisture from condensation or other sources.

M. Fabricate joints that will be exposed to weather in a watertight manner.

N. Close exposed ends of railing members with prefabricated end fittings.

O. Provide wall returns at ends of wall-mounted handrails. Close ends of returns, unless clearance between end of railing and wall is 1/4 inch (6 mm) or less.

2.6 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipment.

C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.7 STEEL AND IRON FINISHES

A. Galvanized Handrails and Railings: Hot-dip galvanize exterior steel and iron handrails and railings to comply with ASTM A 123. Hot-dip galvanize hardware for exterior steel and iron handrails and railings to comply with ASTM A 153/A 153M.

B. Galvanizing: Hot-dip galvanize items as indicated to comply with applicable standard listed below:

1. ASTM A 123 for galvanizing steel and iron products.

C. Fill vent and drain holes that will be exposed in finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.

D. For galvanized handrails and railings, provide galvanized fittings, brackets, fasteners, sleeves, and other ferrous components.

E. High-Performance Organic Coating: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid-chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturer's written instructions.

1. Fluoropolymer Three-Coat System: Manufacturer's standard three-coat, thermocured system consisting of specially formulated inhibitive primer, fluoropolymer color coat, and clear fluoropolymer topcoat, with both color coat and clear topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA 605.2.

a. Color and Gloss: Semi-gloss black.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Fit exposed connections together to form tight, hairline joints.

B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing handrails and railings. Set handrails and railings accurately in location, alignment, and elevation, measured from established lines and levels and free from rack.

1. Do not weld, cut, or abrade surfaces of railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
2. Set posts plumb within a tolerance of 1/16 inch in 3 feet (2 mm in 1 m).
3. Align rails so variations from level for horizontal members and from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet (5 mm in 3 m).

C. Adjust handrails and railings before anchoring to ensure alignment at abutting joints. Space posts at interval indicated, but not less than that required by structural loads.

D. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing handrails and railings and for properly transferring loads to in-place construction.

3.2 RAILING CONNECTIONS

A. Nonwelded Connections: Use mechanical or adhesive joints for permanently connecting railing components. Use wood blocks and padding to prevent damage to railing members and fittings. Seal recessed holes of exposed locking screws using plastic cement filler colored to match finish of handrails and railings.

B. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article whether welding is performed in shop or in field.

3.3 ANCHORING POSTS

A. Use steel pipe sleeves preset and anchored into concrete for installing posts. After posts have been inserted into sleeves, fill annular space between post and sleeve with the following anchoring material, mixed and placed to comply with anchoring material manufacturer's written instructions:

B. Form or core-drill holes not less than 5 inches (125 mm) deep and 3/4 inch (20 mm) greater than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with the following anchoring material, mixed and placed to comply with anchoring material manufacturer's written instructions:

1. Nonshrink, nonmetallic grout or anchoring cement.

C. Cover anchorage joint with a flange of same metal as post, attached to post as follows:

1. By set screws.

3.4 ATTACHING HANDRAILS TO WALLS

A. Attach handrails to wall with wall brackets. Provide bracket with 1-1/2-inch (38-mm) clearance from inside face of handrail and finished wall surface.

B. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.

C. Secure wall brackets to building construction as follows:

1. For wood anchorage, use hanger or lag bolts set into wood backing between studs. Coordinate with carpentry work to locate backing members.
2. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.

3.5 PROTECTION

A. Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in field to shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION 05720

This page is blank.

SECTION 06100 - ROUGH CARPENTRY

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:

1. Framing with dimension lumber.
2. Wood blocking and nailers.

B. Related Sections include the following:

1. Division 6 Section “Finish Carpentry" for nonstructural carpentry items exposed to view and not specified in another Section.

1.3 DEFINITIONS

A. Rough Carpentry: Carpentry work not specified in other Sections and not exposed.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of lumber grading agencies certified by the American Lumber Standards Committee Board of Review.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
3. Provide dressed lumber, S4S, unless otherwise indicated.
4. Provide dry lumber with 15 percent maximum moisture content at time of dressing for 2-inch nominal (38-mm actual) thickness or less, unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

A. Preservative Treatment by Pressure Process: AWPA C2 (lumber).

B. Kiln-dry material after treatment to a maximum moisture content of 15 percent for lumber. Do not use material that is warped or does not comply with requirements for untreated material.

C. Mark each treated item with the treatment quality mark of an inspection agency approved by the American Lumber Standards Committee Board of Review.

D. Application: Treat all rough carpentry.

2.3 MISCELLANEOUS LUMBER

A. General: Provide lumber for support or attachment of other construction, including the following:

1. Blocking.
2. Nailers.
3. Grounds.

B. For items of dimension lumber size, provide Construction, Stud, or No. 2 grade lumber with 15 percent maximum moisture content.

2.4 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.

1. Provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

2.5 MISCELLANEOUS MATERIALS

A. Building Paper: Asphalt-saturated organic felt complying with ASTM D 226, Type I (No. 15 asphalt felt), unperforated.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds**,** and similar supports to comply with requirements for attaching other construction.

B. Do not use materials with defects that impair quality of rough carpentry or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

C. Apply field treatment complying with AWPA M4 to cut surfaces of preservative-treated lumber and plywood.

3.2 WOOD GROUND**,** SLEEPER**,** BLOCKING, AND NAILER INSTALLATION

A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated.

C. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches (38 mm) wide and of thickness required to bring face of ground to exact thickness of finish material.

END OF SECTION 06100

This page is blank.

SECTION 06200 - FINISH CARPENTRY

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:

1. Miscellaneous replacement trim, both interior and exterior, required for the replacement of windows and repair of exterior finish wood trim including clock tower.

B. Related Sections include the following:

1. Division 6 Section "Rough Carpentry" for furring, blocking, and other carpentry work not exposed to view.
2. Division 9 Section "Painting" for priming and back priming of finish carpentry.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Protect materials against weather and contact with damp or wet surfaces. Provide for air circulation within and around stacks and under temporary coverings.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Lumber: DOC PS 20 and applicable grading rules of inspection agencies certified by the American Lumber Standards' Committee Board of Review.

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

A. Preservative Treatment by Pressure Process: AWPA C2 (lumber), except that lumber that is not in contact with the ground and is continuously protected from liquid water may be treated according to AWPA C31 with inorganic boron (SBX).

1. Do not use chemical formulations that require incising.
2. For exposed items indicated to receive transparent finish, do not use chemical formulations that contain colorants or that bleed through or otherwise adversely affect finishes.
3. Kiln-dry material after treatment to levels required for untreated material. Do not use material that is warped or does not comply with requirements for untreated material.
4. Application: All new exterior trim.

2.3 EXTERIOR STANDING AND RUNNING TRIM

A. Lumber Trim for Painted Applications: Kiln-dried, finger-jointed or solid lumber with surfaced (smooth) face and of the following species and grade:

1. Grade Finish or 1 Common (Colonial) eastern white pine, eastern hemlock-balsam fir-tamarack, eastern spruce, or white woods; NELMA, NLGA, WCLIB, or WWPA.

B. Moldings: Made to match existing moldings. Wood moldings made from kiln-dried stock and graded under WMMPA WM 4.

1. Moldings for Opaque Finish (Painted): P-grade eastern white, Idaho white, lodge pole, ponderosa, or sugar pine.

2.4 INTERIOR STANDING AND RUNNING TRIM

A. Softwood Lumber Trim for Transparent Finish (Stain or Clear Finish): Kiln-dried finished lumber (S4S) of one of the following species and grades:

1. Grade C Select eastern white pine; NELMA or NLGA.

B. Moldings: Made to match existing trim to be replaced.

2.5 MISCELLANEOUS MATERIALS

A. Fasteners for Exterior Finish Carpentry: Provide nails or screws of the following materials, in sufficient length to penetrate minimum of 1-1/2 inches (38 mm) into substrate, unless otherwise recommended by manufacturer:

1. Stainless steel.

B. Fasteners for Interior Finish Carpentry: Nails, screws, and other anchoring devices of type, size, material, and finish required for application indicated to provide secure attachment, concealed where possible.

1. Where finish carpentry materials are exposed in areas of high humidity, provide fasteners and anchorages with hot-dip galvanized coating complying with ASTM A 153/A 153M.

C. Flashing: Comply with requirements in Division 7 Section "Sheet Metal Flashing and Trim" for flashing materials installed in finish carpentry.

D. Sealants: Comply with requirements in Division 7 Section "Joint Sealants" for materials required for sealing siding work.

2.6 FABRICATION

A. Wood Moisture Content: Comply with requirements of specified inspection agencies and with manufacturer's written recommendations for moisture content of finish carpentry at relative humidity conditions existing during time of fabrication and in installation areas.

B. Back out or kerf backs of the following members, except members with ends exposed in finished work:

1. Exterior standing and running trim wider than 5 inches (125 mm).
2. Interior standing and running trim, except shoe and crown molds.

C. Ease edges of lumber less than 1 inch (25 mm) in nominal thickness to 1/16-inch (1.5-mm) radius and edges of lumber 1 inch (25 mm) or more in nominal thickness to 1/8-inch (3-mm) radius.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrates of projections and substances detrimental to application.

B. Before installing finish carpentry, condition materials to average prevailing humidity in installation areas for a minimum of 24 hours, unless longer conditioning is recommended by manufacturer.

C. Prime lumber for exterior applications to be painted, including both faces and edges. Cut to required lengths and prime ends. Comply with requirements in Division 9 Section "Painting."

3.3 INSTALLATION, GENERAL

A. Do not use materials that are unsound, warped, improperly treated or finished, inadequately seasoned, or too small to fabricate with proper jointing arrangements.

1. Do not use manufactured units with defective surfaces, sizes, or patterns.

B. Install finish carpentry level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.

1. Scribe and cut finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
2. Countersink fasteners, fill surface flush, and sand where face fastening is unavoidable.
3. Install to tolerance of 1/8 inch in 96 inches (3 mm in 2438 mm) for level and plumb. Install adjoining finish carpentry with 1/32-inch (0.8-mm) maximum offset for flush installation and 1/16-inch (1.5-mm) maximum offset for reveal installation.
4. Coordinate finish carpentry with materials and systems in or adjacent to it. Provide cutouts for mechanical and electrical items that penetrate finish carpentry.

3.4 STANDING AND RUNNING TRIM INSTALLATION

A. Install with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Do not use pieces less than 24 inches (610 mm) long, except where necessary. Stagger joints in adjacent and related standing and running trim. Cope at returns

and miter at corners to produce tight-fitting joints with full-surface contact throughout length of joint. Use scarf joints for end-to-end joints. Plane backs of casings to provide uniform thickness across joints, where necessary for alignment.

1. Match color and grain pattern across joints.
2. Install trim after gypsum board joint finishing operations are completed.
3. Drill pilot holes in hardwood before fastening to prevent splitting. Fasten to prevent movement or warping. Countersink fastener heads on exposed carpentry work and fill holes.
4. Fit exterior joints to exclude water. Apply flat grain lumber with bark side exposed to weather.

3.5 ADJUSTING

A. Replace finish carpentry that is damaged or does not comply with requirements. Finish carpentry may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing. Adjust joinery for uniform appearance.

3.6 CLEANING

A. Clean finish carpentry on exposed and semi-exposed surfaces. Touch up factory-applied finishes to restore damaged or soiled areas.

END OF SECTION 06200

SECTION 07190 - WATER REPELLENTS

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 clear water-repellent coatings for the following vertical and nontraffic horizontal surfaces:

1. Concrete (unpainted).
2. Brick masonry.

B. Related Sections include the following:

1. Division 4 Sections for brick restoration and cleaning.

1.3 SUBMITTALS

A. Product Data: Include manufacturer's specifications, surface preparation and application instructions, recommendations for water repellents for each surface to be treated, and protection and cleaning instructions. Include data substantiating that materials are recommended by manufacturer for applications indicated and comply with requirements.

B. Applicator Certificates: Signed by manufacturer certifying that the applicator complies with requirements.

C. Certification by water repellent manufacturer that products supplied comply with local regulations controlling use of VOCs.

1.4 QUALITY ASSURANCE

A. Applicator Qualifications: Engage an experienced applicator who employs only persons trained and approved by water repellent manufacturer for application of manufacturer's products, and with not less than 5 years of successful experience in application of water repellents of types required on substrates of this project.

1. Obtain Architect's approval of field samples before applying water repellents.
2. Maintain field samples during construction in an undisturbed condition as a standard for judging the completed Work.

B. Field Samples: Architect will select one representative surface for each substrate to receive water repellents. Apply water repellent to each substrate, with either partial or full coverage, as directed. Comply with application requirements of this Section.

1.5 PROJECT CONDITIONS

A. Weather and Substrate Conditions: Proceed with application of water repellents in accordance with written recommendation of the manufacturer relative to weather and substrate conditions. Do not proceed with application of water repellent under any of the following conditions, except with written instruction of manufacturer:

1. Ambient temperature is less than 40 deg F (4.4 deg C).
2. Mortar has cured for less than 28 days.
3. Rain or temperatures below 40 deg F (4.4 deg C) are predicted within 24 hours.
4. Application is earlier than 24 hours after surfaces have been wet.
5. Surface temperature is less than 40 deg F (4.4 deg C).
6. Windy condition exists that may cause water repellent to be blown onto vegetation or surfaces not intended to be coated.

B. Protect all existing shrubbery, trees and plantings from damage during application of water repellents.

1.6 WARRANTY

A. General Warranty: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

B. Special Warranty: Submit a written warranty, executed by the applicator and water repellent manufacturer, covering materials and labor, agreeing to repair or replace materials that fail to provide water repellency within the specified warranty period.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Product to be: Penetrating silicone rubber water repellent for use on vertical exposed to view, new and existing exterior masonry, and architectural cast stone trim. Product to penetrate without altering the natural appearance of the substrate and will not form a surface film or gloss. Product is not be affected by UV rays, salt, acid rain, etc. Breathable, it allows moisture vapor to escape while preventing liquid penetration. Flexible, it bridges hairline cracks and allows for building movement.

B. Products: Subject to compliance with requirements, provide the following:

1. Basis of Design: Professional Products of Kansas, Inc., Professional Water Sealant.

a. Form: Liquid.
b. Color Clear.
c. Active Substance: RTV Silicone Rubber.
d. Percent Active Material: 8%.
e. Flash Point: 105º F.

C. Water sealant product listed above is to be considered a standard quality and based on manufacturer's recommendation for execution. Application procedure and coverage rates must be in conformance with effectiveness of testing samples submitted, recommendation of application rates suggested, approved manufacturer's standards and as a minimum, that specified herein.

D. If alternate products are considered by CM, they must be equal in terms of chemical composition and performance standards. Products must be a penetrating, permanent waterproofing treatment using silicone rubber base and not contain any paraffin waxes, urethanes or polysiloxanes. Silane and siloxane based products will be considered because of their lack of elongation (400%), allowing for thermal expansion and contraction.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean substrate of substances that might interfere with penetration or performance of water repellents. Test for moisture content, according to repellent manufacturer's written instructions, to ensure surface is sufficiently dry.

1. Formed Concrete: Remove oil, curing compounds, laitance, and other substances that could prevent adhesion or penetration of water repellents.
2. Clay Brick Masonry: Clean clay brick masonry per ASTM D 5703.

B. Test for pH level, according to water repellent manufacturer's written instructions, to ensure chemical bond to silicate minerals.

C. Protect adjoining work, including sealant bond surfaces, from spillage or blow-over of water repellent. Cover adjoining and nearby surfaces of aluminum and glass if there is the possibility of water repellent being deposited on surfaces. Cover live plant materials with drop cloths. Clean water repellent from adjoining surfaces immediately after spillage. Comply with manufacturer's recommendations for cleaning.

D. Coordination with Sealants: Do not apply water repellent until sealants for joints adjacent to surfaces receiving water-repellent treatment have been installed and cured.

E. Test Application: Before performing water-repellent work, including bulk purchase and delivery of products, prepare a small application in an unobtrusive location and in a manner approved by Architect to demonstrate the final effect (visual, physical, and chemical) of planned application. Proceed with work only after Architect and Owner approve test application or as otherwise directed.

1. Revisions of planned application, if any, as requested by Architect, will be by Change Order if they constitute a departure from requirements of Contract Documents at the time of contracting.

3.2 APPLICATION

A. Apply a heavy-saturation spray coating without runs of water repellent on surfaces indicated for treatment using low-pressure spray equipment. Comply with manufacturer's written instructions for using airless spraying procedure, unless otherwise indicated.

B. Apply a second saturation spray coating, repeating first application. Comply with manufacturer's written instructions for limitations on drying time between coats and after rainstorm wetting of surfaces between coats. Consult manufacturer's technical representative if written instructions are not applicable to Project conditions.

3.3 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Provide services of a factory-authorized technical service representative to inspect and approve the substrate before application and to instruct the applicator on the product and application method to be used.

3.4 CLEANING

A. Protective Coverings: Remove protective coverings from adjacent surfaces and other protected areas.

B. Immediately clean water repellent from adjoining surfaces and surfaces soiled or damaged by water-repellent application as work progresses. Repair damage caused by water-repellent application. Comply with manufacturer's written cleaning instructions.

END OF SECTION 07190

SECTION 07321 - CLAY ROOF TILES

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 for replacement of broken tiles as indicated in Roof Report included in Division 7; and other miscellaneous roof repair work as indicated in the said Roof Report:

1. Clay roof tiles.
2. Tile accessories (as may be applicable).
3. Felt underlayment (as may be applicable).
4. Self-adhering sheet underlayment (as may be applicable).
5. Valley re-grouting.

B. Related Sections include the following:

1. Division 6 Section "Finish Carpentry" for wood.
2. Division 7 Section "Sheet Metal Flashing and Trim" for metal not part of this Section.
3. Roof Report prepared by Roof Consulting Services, Inc. appended to Division 7.

1.3 DEFINITIONS

A. Roofing Terminology: Refer to ASTM D 1079, glossaries in RTI/WSRCA's "Concrete and Clay Roof Tile Design Criteria Installation Manual for Moderate Climate Regions," and NRCA's "The NRCA Roofing and Waterproofing Manual" for definitions of terms related to roofing work in this Section.

1.4 SUBMITTALS

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

B. Samples for Initial Selection: For each type of clay tile and clay tile accessory indicated.

1. Include similar Samples of trim involving color selection.

C. Samples for Verification: For the following products, of sizes indicated, to verify color selected:

1. Clay Tile: Full size.
2. Clay Tile Accessories: Full size.
3. Fastenings: Wire-tie system components, 12 inches (300 mm) long.
4. Self-Adhering Underlayment: 12 inches (300 mm) square.

D. Maintenance Data: For clay tile roofing to include in maintenance manuals.

E. Warranties: Special warranties specified in this Section.

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain clay tiles and clay tile accessories through one source from a single manufacturer.

B. Installer Qualifications: Manufacturer‘s authorized installer who is approved for installation requirements of this Project, who demonstrates a minimum of 5 years’ experience in the application of the types of materials required and who agrees to employ skilled tradesmen in the work.

C. Preinstallation Conference: Conduct conference at Project.

1.6 PROJECT CONDITIONS

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

1. Where applicable, install self-adhering sheet underlayment within the range of ambient and substrate temperatures recommended by manufacturer.

B. Protect existing roof tiles as much as possible. Only a limited number of tiles are indicated to be replaced. If should be anticipated that some (5-10%) of the existing clay tiles would be damaged when removed.

1.7 WARRANTY

A. Special Clay Roof Tile Manufacturer's Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace tile that fails in materials within specified warranty period. Material failures include manufacturing defects that result in leaks.

1. Material Warranty Period: 50 years from date of Substantial Completion.

B. Special Roofing Installer's 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 clay tile roofing that fail in materials or workmanship within the following warranty period:

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

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Products: Subject to compliance with requirements to match existing files in color, shape, thickness and composition, provide one of the products specified.
2. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 CLAY TILES

A. Products:

1. Altusa/Interclay, Corp.
2. Ameri-Clay Roof Tile.
3. Claymex Brick & Tile Co.
4. Deleo Clay Tile.
5. D'Hanis Brick & Tile Company.
6. Gladding, McBean, Div. of Pacific Coast Building Products, Inc.
7. International Roofing Products, Inc.
8. Ludowici Roof Tile, Inc.
9. MCA Tile.
10. US Tile Co.
11. Zion Tile Corp.

B. Clay Tile: ASTM C 1167, molded- or extruded-clay flat roof tile units of shape and configuration to match existing, kiln fired to vitrification, and free of surface imperfections. Provide with fastening holes prepunched at factory before firing.

2.3 ACCESSORIES

A. Asphalt Roofing Cement: ASTM D 4586, Type II, asbestos free.

B. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied.

C. Elastomeric Sealant: ASTM C 920, polyurethane, polysulfide or silicone-based joint sealant; of Type M or S, Grade NS, Class 25, Use NT related to exposure, and, as applicable to joint substrates indicated, Use O, as recommended by the tile manufacturer.

D. Cold-Applied Adhesive: Manufacturer's standard asphalt-based, one- or two-part, asbestos-free, cold-applied adhesive specially formulated for compatibility, use with underlayments and as recommended for this application by the tile manufacturer.

E. Foam Adhesive: Two-component polyurethane expanding adhesive recommended for application by tile manufacturer.

F. Mortar: ASTM C 270, Type M, natural color for concealed-from-view mortar.

1. Mortar Pigment: ASTM C 979. Produce mortar matching the color of tile selected for exposed-to-view mortar, and to match existing.

2.4 FASTENERS AND UNDERLAYMENT MATERIALS

A. Provide fasteners and underlayment materials as recommended by manufacturer for this application.

2.5 SHEET METAL FLASHING AND TRIM

A. Sheet Metal Flashing and Trim: Comply with requirements in Division 7 Section "Sheet Metal Flashing and Trim."

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 work.

1. Examine roof sheathing to verify that sheathing joints are supported by framing and blocking or metal clips and that installation is within flatness tolerances.
2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and completely anchored; and that provision has been made for flashings and penetrations through roof.
3. For the record, prepare written report, with photo documentation, endorsed by Installer, listing conditions detrimental to performance of work.

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

3.2 TILE INSTALLATION

A. General: Install roof tiles according to manufacturer's written instructions and recommendations in RTI/WSRCA's "Concrete and Clay Roof Tile Design Criteria Installation Manual for Moderate Climate Regions," and to NRCA's "The NRCA Roofing and Waterproofing Manual."

3.3 ADJUSTING AND CLEANING

A. Remove and replace damaged or broken tiles.

B. Remove excess tile and debris from Project site.

3.4 ROOFING INSTALLER'S WARRANTY

A. WHEREAS _____ of _____ _____ _____ (**Insert address)**, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:

1. Owner:
2. Address:
3. Building Name/Type:
4. Address:
5. Area of Work:
6. Acceptance Date:
7. Warranty Period:
8. Expiration Date:

B. AND WHEREAS Roofing Installer has contracted 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 160 mph;
    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, 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 _____ day of _____, 20__.

1. Authorized Signature: _____
2. Print Name: _____
3. Title: _____

END OF SECTION 07321

SECTION 07620 - SHEET METAL FLASHING AND TRIM

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 sheet metal flashing and trim:

1. Re-cladding of the clock tower surrounding coping.
2. Formed roof drainage system.
3. Formed low-slope roof flashing and trim.
4. Formed wall flashing and trim.

B. Related Sections include the following:

1. Division 7 Section “Clay Roof Tiles” for installing sheet metal flashing and trim integral with roofing.
2. Division 7 Section "Joint Sealants" for field-applied sheet metal flashing and trim sealants.

1.3 PERFORMANCE REQUIREMENTS

A. General: Install sheet metal flashing and trim to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failing, rattling, leaking, and fastener disengagement.

B. Water Infiltration: Provide sheet metal flashing and trim that do not allow water infiltration to building interior.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: Show layouts of sheet metal dome flashing and trim, including plans and elevations. Distinguish between shop- and field-assembled work. Include the following:

1. Identify material, thickness, weight, and finish for each item and location in Project.
2. Details for forming sheet metal flashing and trim, including profiles, shapes, seams, and dimensions.
3. Details for fastening, joining, supporting, and anchoring sheet metal flashing and trim, including fasteners, clips, cleats, and attachments to adjoining work.

C. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:

1. Sheet Metal Flashing: 12 inches (300 mm) long. Include fasteners, closures, and other attachments.
2. Trim: 12 inches (300 mm) long. Include fasteners and other exposed accessories.

1.5 QUALITY ASSURANCE

A. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual." Conform to dimensions and profiles shown unless more stringent requirements are indicated.

1. Copper Standard: Comply with CDA's "Copper in Architecture Handbook."

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver sheet metal flashing materials and fabrications undamaged. Protect sheet metal flashing and trim materials and fabrications during transportation and handling.

B. Unload, store, and install sheet metal flashing materials and fabrications in a manner to prevent bending, warping, twisting, and surface damage.

1.7 COORDINATION

A. Coordinate installation of sheet metal flashing and trim with interfacing and adjoining construction to provide a leak-proof, secure, and noncorrosive installation.

PART 2 - PRODUCTS

2.1 SHEET METALS

A. Copper Sheet: ASTM B 370, Temper H00 or H01, cold-rolled copper sheet.

B. Stainless-Steel Sheet: ASTM A 240/A 240M, Type 304.

1. Finish: No. 2B (bright, reflective).

2.2 UNDERLAYMENT MATERIALS

A. Polyethylene Sheet: 6-mil- (0.15-mm-) thick polyethylene sheet complying with ASTM D 4397.

B. Felts: ASTM D 226, Type II (No. 30), asphalt-saturated organic felt, nonperforated.

C. Slip Sheet: Rosin-sized paper, minimum 3 lb/100 sq. ft. (0.16 kg/sq. m).

2.3 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation.

B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads.

1. Nails for Copper Sheet: Copper or hardware bronze, 0.109 inch (2.8 mm) minimum and not less than 7/8 inch (22 mm) long, barbed with large head.
2. Exposed Fasteners: Heads matching color of sheet metal by means of plastic caps or factory-applied coating.
3. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws, gasketed, with hex washer head.
4. Blind Fasteners: High-strength aluminum or stainless-steel rivets.

C. Solder for Copper: ASTM B 32, Grade Sn50, 50 percent tin and 50 percent lead.

D. Solder for Stainless Steel: ASTM B 32, Grade Sn60, with acid flux of type recommended by stainless-steel sheet manufacturer.

E. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane, polysulfide or silicone polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

F. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.4 FABRICATION, GENERAL

A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated. Shop fabricate items where practicable. Obtain field measurements for accurate fit before shop fabrication.

B. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.

C. Fabricate sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.

1. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.

D. Conceal fasteners and expansion provisions where possible on exposed-to-view sheet metal flashing and trim, unless otherwise indicated.

2.5 ROOF DRAINAGE SHEET METAL FABRICATIONS

A. Downspouts: Fabricate rectangular downspouts to match existing complete with mitered elbows. Furnish with metal hangers, from same material as downspouts, and anchors.

1. Fabricate downspouts from the following material:

a. Copper: 16 oz./sq. ft. (0.55 mm thick).

2.6 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

A. Copings: Shop fabricate as much as possible to minimize field forming and seams.

1. Fabricate from the following material:

a. Stainless Steel: 0.0250 inch (0.65 mm) thick.

B. Roof and Roof to Wall Transition; Roof to Sheet Metal Roof Edging Transition: Fabricate from the following material:

1. Copper: 16 oz./sq. ft. (0.55 mm thick).

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions and other conditions affecting performance of work.

1. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.

1. Torch cutting of sheet metal flashing and trim is not permitted.

B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by fabricator or manufacturers of dissimilar metals.

1. Coat side of stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim will contact wood, ferrous metal, or cementitious construction.
2. Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet or install a course of polyethylene underlayment.
3. Bed flanges in thick coat of asphalt roofing cement where required for waterproof performance.

C. Install exposed sheet metal without excessive oil canning, buckling, and tool marks.

D. Install sheet metal true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder and welds.

E. Install sheet metal to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.

F. Fasteners: Use fasteners of sizes that will penetrate substrate not less than 1-1/4 inches (32 mm) for nails and not less than 3/4 inch (19 mm) for wood screws.

1. Copper Use copper or stainless-steel fasteners.
2. Stainless Steel: Use stainless-steel fasteners.

G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pretin edges of sheets to be soldered to a width of 1-1/2 inches (38 mm) except where pretinned surface would show in finished Work.

1. Stainless-Steel Soldering: Pretin edges of uncoated sheets to be soldered using solder recommended for stainless steel and phosphoric acid flux. Promptly wash off acid flux residue from metal after soldering.
2. Copper Soldering: Tin uncoated copper surfaces at edges of sheets using solder recommended for copper work.
3. Do not use open-flame torches for soldering. Heat surfaces to receive solder and flow solder into joints. Fill joints completely. Completely remove flux and spatter from exposed surfaces.

3.3 ROOF DRAINAGE SYSTEM INSTALLATION

A. General: Install sheet metal roof drainage items to complete the existing roof drainage system according to SMACNA recommendations and as indicated.

B. Built-in Gutters: Solder existing gutter as required for a watertight system.

C. Downspouts: Extend existing downspouts at the one story building as shown in the drawings. Join sections with 1-1/2-inch (38-mm) telescoping joints. Provide fasteners designed to hold downspouts securely 1 inch (25 mm) away from walls; locate fasteners at top and bottom and at approximately 60 inches (1500 mm) o.c. in between.

1. Provide elbows at base of downspout to direct water away from building.

3.4 ROOF FLASHING INSTALLATION

A. General: Install sheet metal roof flashing and trim as required to replace missing or deteriorated flashing as referred in the Roof Condition Report attached to this Specification Section. Where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight.

3.5 CLEANING AND PROTECTION

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean and neutralize flux materials. Clean off excess solder and sealants.

C. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed. On completion of installation, clean finished surfaces, including removing unused

fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain in a clean condition during construction.

D. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 07620

SECTION 07920 - JOINT SEALANTS

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 joint sealants for the following applications:

1. Joints in the following vertical surfaces and horizontal surfaces:

a. All expansion and control joints in foot traffic concrete bearing surfaces including joint next to building wall.
b. Across top of all metal cap/counter flashings.
c. Control and expansion joints in unit masonry.
d. Joints in sheet metal and flashing joins.
e. Joints between all metals and other material.
f. Joints between different materials listed above.
g. Perimeter joints between masonry and plaster and frames of doors, windows and louvers. (Interior Plaster as Alternate #1.)
h. Control and expansion joints in portico ceiling.
i. Other joints as may be indicated.

1.3 PERFORMANCE REQUIREMENTS

A. Provide joint sealants that have been produced and installed to maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

1.4 SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Product Certificates: Submit certificates for each type of joint sealant and accessory, signed by product manufacturer, attesting that their products comply with specification requirements and are suitable for the use indicated.

C. Qualification Data: For Installer.

D. Warranties: Special guarantees specified in this Section.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized Installer who is approved or licensed for installation of sealants required for this Project, who demonstrates a minimum of 5 years'

experience in the application of the types of materials required, and who agrees to employ only skilled tradesmen in the work.

B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

C. Preinstallation Conference: Conduct conference at Project site.

1.6 PROJECT CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F (5 deg C).
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.7 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to project site in original containers or bundles with labels informing about manufacturer, product and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multi-component materials.

B. Store and handle materials to prevent their deterioration or damage due to moisture, temperature changes, contaminants or other causes.

1.8 GUARANTEE

A. Submit two (2) copies of written guarantee to repair or replace sealants which fail to perform as air-tight and water-tight joints; or fail in joint adhesion, cohesion, abrasion resistance, weather resistance, extrusion resistance, migration resistance, stain resistance, or general durability; or appear to deteriorate in any other manner not clearly specified by submitted manufacturer's data, as an inherent quality of the material for the exposure indicated. Provide 2 year guarantee signed by the Installer and Contractor.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles.

2.2 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: Provide color of exposed joint sealants to match adjacent finishes, as selected by Architect from manufacturer's full range that will generally match or blend with adjacent finished surfaces.

2.3 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. Modulus of Elasticity: For joints subject to movement, either thermal expansion or dynamic movement, provide elastomeric sealants which have the lowest modulus of elasticity which is consistent with the exposure to abrasion or vandalism. For horizontal joints subject to traffic provide sealants with high modulus of elasticity, as required to withstand indentation by stiletto heels. Comply with manufacturer’s recommendations wherever no other requirements are indicated.

D. Compatibility: Before purchase of each specified sealants, investigate its compatibility with the joint surfaces, joint fillers and other materials in the joint system. Provide only materials (manufacturer’s recommended variation of the specified materials) which are known to be fully compatible with the actual installation condition, as shown by the manufacturer’s published data or certification.

E. Exterior Use T: Exterior joints in horizontal traffic surfaces. Control, expansion and isolation joints in concrete slabs and stairs at building entrances.

1. One-Part Pourable Polyurethane:

a. Vulcan 45; Mameco International, Inc.
b. Sonoclastic SL-1; Sonneborn Building Products.

F. Exterior Use NT: Control and expansion joints in unit masonry; joints between different materials; perimeter joints between different materials and frames of doors, windows and louvers.

1. One-Part Non-Sag Polyurethane:

a. Dymonic FC; Tremco Sealants.
b. Chem Caulk 915; Bostik, Inc.

G. Interior Use NT (Alternate #1): Door and Window Frames.

1. Acrylic Latex Sealant: Manufacturer’s standard one-part, acrylic latex-gun grade, formulated to be paintable and recommended for exposed interior applications.

a. Sonolac; BASF Chemicals Co.
b. Chem Caulk 600; Bostik, Inc.
c. Admark Acrylic Latex; ADCO Products.
d. Tremflex 834; Tremco Sealants.

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. Sealant Backer Rod: Compressed closed cell rod stock polyethylene foam. Provide size and shape of rod which will control the joint depth for sealant placement, break bond of sealant at bottom of joint, form optimum shape of sealant bead on backside and provide a highly compressible backer to minimize the possibility of sealant extrusion when joint is compressed.

1. Basis of Design: SOF ROD as manufactured by NMC of North America, Inc.

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 substrate surfaces to be primed or sealed.

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 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

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

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out all joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt.
2. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods 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. Porous joint substrates include the following:

    a. Concrete.
    b. Masonry.

3. Remove laitance and form-release agents from concrete.
4. For elastomeric sealants, do not proceed with installation of sealant over joint surfaces which have been painted, lacquered, waterproofed or treated with water repellent or other treatment or coating.

B. Joint Priming: Prime joint substrate as recommended by joint-sealant manufacturer. 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.

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.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions applicable to products and applications indicated, unless more stringent requirements apply. Prime or seal the joint surfaces as recommended by the sealant manufacturer. Do not allow primer/sealer to spill or migrate onto adjoining surfaces.

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

C. Install sealant backer rods for liquid elastomeric sealants, except where recommended to be omitted by manufacturer for application shown. Install joint fillers 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.

D. Install bond-breaker tape between sealants and joint fillers, compression seals or back of joints where required to prevent third side adhesion of sealant to back of joint.

E. Employ only proven installation techniques, which will ensure that sealants will be deposited in uniform, continuous ribbons without gaps or air pockets, with complete “wetting” of the joint bond surfaces equally on opposite sides. Except as otherwise indicated, fill sealant rabbet to a

slightly concave surface, slightly below adjoining surfaces. Where horizontal joints are between a horizontal surface and a vertical surface, fill joint to form a slight cove, so that joint will not trap moisture and dirt.

F. Install sealants to depths as recommended by the sealant manufacturer but within the following general limitations, measured at the center (thin) section of the bead.

1. For normal moving joints sealed with elastomeric sealants, but not subject to traffic, fill joints to a depth equal 25% of joint width, but neither more than 3/8" deep nor less than 1/8" deep.
2. For joint sealants with non-elastomeric sealants, fill joints to a depth in the range of 75% to 125% of joint width.

G. Spillage: Do not allow sealants or compounds to overflow or spill onto adjoining surfaces, or to migrate into the voids of adjoining surfaces including rough textures such as exposed brick. Use masking tape or other precautionary devices to prevent staining of adjoining surfaces, by either the primer/sealer or the sealant/caulking compound.

3.4 CLEANING

A. 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.

3.5 CURE AND PROTECTION

A. Cure sealants and caulking compounds in compliance with manufacturer's instructions and recommendations, to obtain high early bond strength, internal cohesive strength and surface durability.

B. The installer shall advise the sub-contractor of procedures required for the curing and protection of sealants and caulking compounds during the construction period, so that they will be without deterioration or damage (other than normal wear and weathering) at the time of acceptance by the Contractor.

C. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.6 JOINT-SEALANT SCHEDULE

A. Exposed joints to be caulked are, but not limited to, the following:

1. All expansion and control joints foot traffic concrete bearing surfaces including joint next to building wall (traffic sealant).
2. Across top of all metal cap/counter-flashings.
3. Between all metals and other materials.
4. Between window and masonry and stucco.
5. Sheet metal and flashing joints.

6. Between masonry and other materials
7. Control joints in masonry walls.

END OF SECTION 07920

This page is blank.

SECTION 08110 - STEEL DOORS

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:

1. Steel doors, installed in an existing frame.
2. Louvers in doors.

1.3 DEFINITIONS

A. Steel Sheet Thicknesses: Thickness dimensions, including those referenced in ANSI A250.8, are minimums as defined in referenced ASTM standards for both uncoated steel sheet and the uncoated base metal of metallic-coated steel sheets.

1.4 SUBMITTALS

A. Product Data: For each type of door indicated, include door designation, type, level and model, material description, core description, construction details, label compliance, sound and fire-resistance ratings, and finishes.

B. Shop Drawings: Show the following:

1. Elevations of each door design.
2. Details of doors including vertical and horizontal edge details.
3. Frame details for each frame type including dimensioned profiles.
4. Details and locations of reinforcement and preparations for hardware.
5. Details of louvers.
6. Details of anchorages, accessories, joints, and connections.

C. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available for factory-finished doors.

D. Samples for Verification: For each type of exposed finish required, prepare a sample not less than 3 by 5 inches (75 by 125 mm) and of same thickness and material indicated for final unit of Work.

E. Door Schedule: Use same reference designations indicated on Drawings in preparing schedule for doors.

1.5 QUALITY ASSURANCE

A. Steel Door Standard: Comply with ANSI A 250.8, unless more stringent requirements are indicated.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver doors cardboard-wrapped or crated to provide protection during transit and job storage. Provide additional protection to prevent damage to finish of factory-finished doors and frames.

B. Inspect doors on delivery for damage, and notify shipper and supplier if damage is found. Minor damages may be repaired provided refinished items match new work and are acceptable to Architect. Remove and replace damaged items that cannot be repaired as directed.

C. Store doors at building site under cover. Place units on minimum 4-inch- (100-mm-) high wood blocking. Avoid using non-vented plastic or canvas shelters that could create a humidity chamber. If door packaging becomes wet, remove cartons immediately. Provide minimum 1/4-inch (6-mm) spaces between stacked doors to permit air circulation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Steel Doors:

a. Amweld Building Products, Inc.
b. Benchmark Commercial Doors; a division of General Products Co., Inc.
c. Ceco Door Products; a United Dominion Company.
d. Copco Door Co.
e. Curries Company.
f. Deansteel Manufacturing, Inc.
g. Kewanee Corporation (The).
h. Mesker Door, Inc.
i. Pioneer Industries Inc.
j. Republic Builders Products.
k. Steelcraft; a division of Ingersoll-Rand.

2.2 MATERIALS

A. Hot-Rolled Steel Sheets: ASTM A 569/A 569M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.

B. Cold-Rolled Steel Sheets: ASTM A 366/A 366M, Commercial Steel (CS), or ASTM A 620/A 620M, Drawing Steel (DS), Type B; stretcher-leveled standard of flatness.

C. Metallic-Coated Steel Sheets: ASTM A 653/A 653M, Commercial Steel (CS), Type B, with an A40 (ZF120) zinc-iron-alloy (galvannealed) coating; stretcher-leveled standard of flatness.

2.3 DOORS

A. General: Provide doors of sizes, thicknesses, and designs indicated, to fit in existing frames.

B. Exterior Doors: Provide doors complying with requirements indicated below by referencing ANSI A250.8 for level and model and ANSI A250.4 for physical-endurance level:

1. Level 2 and Physical Performance Level B (Heavy Duty), Model 1 (Full Flush) [2 (Seamless)].

C. Door Louvers: Provide louvers for exterior doors, where indicated, that comply with SDI 111C, with blades or baffles formed of 0.020-inch- (0.5-mm-) thick, cold-rolled steel sheet set into 0.032-inch- (0.8-mm-) thick steel frame; one louver in each door matching the size of the existing, centered in the width and matching the existing dimension in inches above the bottom of the door.

2.4 FABRICATION

A. General: Fabricate steel door units to comply with ANSI A250.8 and to be rigid, neat in appearance, and free from defects including warp and buckle. Where practical, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory assembled before shipment, to assure proper assembly at Project site.

B. Exterior Door Construction: For exterior locations and elsewhere as indicated, fabricate doors, panels, and frames from metallic-coated steel sheet. Close top and bottom edges of doors flush as an integral part of door construction or by addition of 0.053-inch- (1.3-mm-) thick, metallic-coated steel channels with channel webs placed even with top and bottom edges.

C. Core Construction: Manufacturer's standard core construction that produces a door complying with SDI standards.

D. Single-Acting, Door-Edge Profile: Square edge.

E. Tolerances: Comply with SDI 117, "Manufacturing Tolerances for Standard Steel Doors and Frames."

F. Fabricate concealed stiffeners, reinforcement, edge channels, louvers, and moldings from either cold- or hot-rolled steel sheet.

G. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat or oval heads for exposed screws and bolts.

H. Hardware Preparation: Prepare doors to receive mortised and concealed hardware as indicated below and templates provided by hardware supplier. Comply with applicable requirements in ANSI A250.6 and ANSI A115 Series specifications for door and frame preparation for hardware.

I. Reinforce doors and frames to receive surface-applied hardware. Drilling and tapping for surface-applied hardware may be done at Project site.

J. Locate hardware as indicated on Shop Drawings or, if not indicated, according to ANSI A250.8.

K. Astragals: As required by NFPA 80 to provide fire ratings indicated.

2.5 FINISHES

A. Factory-Applied Paint Finish: Manufacturer's standard, factory-applied paint finish complying with ANSI A250.3 for performance and acceptance criteria.

1. Color and Gloss: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Install steel doors and accessories according to Shop Drawings, manufacturer's data, and as specified into and existing frame.

B. Door Installation: Comply with ANSI A250.8. Fit hollow-metal doors accurately in existing frames, within clearances specified in ANSI A250.8. Shim as necessary to comply with SDI 122 and ANSI/DHI A115.1G.

3.2 ADJUSTING AND CLEANING

A. Finish-Coat Touchup: Immediately after installation, sand smooth any rusted or damaged areas of finish coat and apply touch up of compatible air-drying paint.

B. Protection Removal: Immediately before final inspection, remove protective wrappings from doors.

END OF SECTION 08110

SECTION 08212 - EXISTING WOOD DOORS

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:

1. Removal of existing exterior doors, refinishing per Section 09912 and reinstallation.
2. Door hardware and security systems shall be removed for refinishing process and reinstalled.
3. Existing door hardware shall be polished and reinstalled.

B. Related Sections include the following:

1. Division 9 Section "Painting" for requirements for refinishing doors.

1.3 SUBMITTALS

A. Samples for Verification: Door #3 shall be refinished in its entirety as a sample for verification and approval prior to refinishing the remaining doors under this Contract.

B. Upon acceptance, Door #3 shall serve as the quality control comparison for acceptable work on all other doors.

1.4 QUALITY ASSURANCE

A. Operation: Contractor shall test the proper operation of both the reinstalled hardware and the security system. System operations shall be to the satisfaction of the Owner.

B. All openings shall be protected and secured while doors are removed for refinishing. Building must remain accessible to staff and the public where doors are being refinished.

C. Doors # 2 and 5 have leaded glass lites. Extreme care shall be taken to protect these lites during the refinishing process. Broken or cracked leaded glass lites shall be replced at Contractor's expense.

1.5 PROJECT CONDITIONS

A. Building security shall be maintained throughout the process of refinishing the doors.

B. Building will be occupied by City Staff and the public. Access in and out of the building shall be maintained throughout the process of refinishing the doors.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine and document existing conditions prior to removal of doors.

1. Coordinate disconnection of security system with Owner.

B. Proceed with reinstallation of doors only after door frames have been refinished sufficiently to accept the doors.

3.2 ADJUSTING AND PROTECTING

A. Operation: Rehang doors that do not swing or operate freely.

B. Finished Doors: Refinish doors damaged during installation.

C. Protect doors to ensure that doors are without damage or deterioration at the time of Substantial Completion.

D. Reinstall hardware and test for proper operation to the satisfaction of the Owner.

E. Reinstall security system and test for proper operation to the satisfaction of the Owner.

END OF SECTION 08212

SECTION 09912 - PAINTING

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 surface preparation and field painting of exposed exterior and interior items and surfaces.

1. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections.

B. Paint exposed surfaces, except where these Specifications indicate that the surface or material is not to be painted or is to remain natural. If an item or a surface is not specifically mentioned, Contractor shall verify such surface with the Architect prior to painting. If a color of finish is not indicated, Architect will select from standard colors and finishes available.

C. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.

1. Prefinished items include the following factory-finished components:

a. Window sash.
b. Metal louvers.
c. Metal handrails (Alternate #2).
d. Electric room doors (Door #6).

2. Labels: Do not paint over UL, FMG, or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.

D. Related Sections include the following:

1. Division 5 Section “Metal Fabrications for shop priming ferrous metal.
2. Division 8 Section "Steel Doors" for factory finished steel doors.

E. Alternates: Refer to Division 1 Section "Alternates" for description of Work in this Section affected by alternates.

1.3 DEFINITIONS

A. General: Standard coating terms defined in ASTM D 16 apply to this Section.

1. Flat refers to a lusterless or matte finish with a gloss range below 15 when measured at an 85-degree meter.

2. Eggshell refers to low-sheen finish with a gloss range between 20 and 35 when measured at a 60-degree meter.
3. Semigloss refers to medium-sheen finish with a gloss range between 35 and 70 when measured at a 60-degree meter.
4. Full gloss refers to high-sheen finish with a gloss range more than 70 when measured at a 60-degree meter.

1.4 SUBMITTALS

A. Product Data: For each paint system indicated. Include primers.

1. Material List: An inclusive list of required coating materials. Indicate each material and cross-reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.
2. Manufacturer's Information: Manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material.

B. Samples for Initial Selection: Architect will furnish color chips for surfaces to be coated.

C. Samples for Verification: For each color and material to be applied, with texture to simulate actual conditions, on representative Samples of the actual substrate.

1. Provide stepped Samples, defining each separate coat, including block fillers and primers. Use representative colors when preparing Samples for review. Resubmit until required sheen, color, and texture are achieved.
2. Provide a list of materials and applications for each coat of each Sample. Label each Sample for location and application.
3. Submit samples on the following existing substrates for Architect's review of color and texture only:

    a. Concrete: 4-inch- (100-mm-) square. Samples for each color and finish.
    b. Painted Wood: 8-inch- (200-mm-) square. Samples for each color and material on hardboard.
    c. Stained: 4-by-8-inch (100-by-200-mm). Samples of stained-wood finish on representative surfaces.
    d. Ferrous Metal: 4-inch- (100-mm-) square. Samples of flat metal and 8-inch- (200-mm-) long. Samples of solid metal for each color and finish.

D. Qualification Data: For Applicator.

1.5 QUALITY ASSURANCE

A. Applicator Qualifications: A firm or individual experienced in applying paints and coatings similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.

B. Source Limitations: Obtain primers for each coating system from the same manufacturer as the finish coats.

C. Benchmark Samples (Mockups): Provide a full-coat benchmark finish sample for each type of coating and substrate required. Comply with procedures specified in PDCA P5. Duplicate finish of approved sample Submittals.

1. Architect will select one surface to represent surfaces and conditions for application of each type of coating and substrate.

2. Apply benchmark samples, according to requirements for the completed Work, after permanent lighting and other environmental services have been activated. Provide required sheen, color, and texture on each surface.

   a. After finishes are accepted, Architect will use the surface to evaluate coating systems of a similar nature.

3. Final approval of colors will be from benchmark samples.

1.6 PREINSTALLATION CONFERENCE

A. Before beginning painting, conduct conference at Project site to comply with requirements of Division 1 Section “Project Meetings”. Notify participants at least 5 working days before conference.

B. Meet with Owner, Architect, Painting Subcontractor, Manufacturer’s Representative for each type of paint, and installers whose work interfaces with or affects painting.

C. Review all submittals including Manufacturer’s literature, sample submittals and room mockup.

D. Review all methods and procedures related to painting including Manufacturer’s written instructions.

E. Examine substrate conditions and finishes for compliance with requirements for finish painting.

F. Review construction schedule including availability of materials suitability of substrate to receive paint and other items affecting the work.

G. Construction Manager shall document proceedings including corrective measures or actions required and furnish copies of record to each party.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the following information:

1. Product name or title of material.
2. Batch number.
3. Contents by volume, for pigment and vehicle constituents.
4. Thinning instructions.
5. Application instructions.
6. Surface preparation.
7. Color name and number.
8. VOC content.
9. Environmental issues.

B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F (7 deg C). Maintain storage containers in a clean condition, free of foreign materials and residue.

1. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing and application.

1.8 PROJECT CONDITIONS

A. Apply waterborne paints only when temperatures of surfaces to be painted and surrounding air are between 50 and 90 deg F (10 and 32 deg C).

B. Apply solvent-thinned paints only when temperatures of surfaces to be painted and surrounding air are between 45 and 95 deg F (7 and 35 deg C).

C. 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 (3 deg C) above the dew point; or to damp or wet surfaces.

1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by manufacturer during application and drying periods.

1.9 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: Furnish Owner with an additional 2 gal. extra paint or stain of each material and color applied.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles.

B. Manufacturers' Names: Basis of Design in Sherwin Williams. Shortened versions (shown in parentheses) of the following manufacturers' names are used in other Part 2 articles:

1. Benjamin Moore & Co. (Benjamin Moore).
2. ICI Dulux Paint Centers (ICI Dulux Paints).
3. Sherwin-Williams Co. (Sherwin-Williams).

2.2 PAINT 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.

1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance for proposed substitutions.

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

2.3 PAINT FINISHES

A. Exterior Concrete:

1. Primer: Factory-formulated alkali-resistant acrylic-latex primer for exterior application, applied at spreading rate recommended by the Manufacturer to achieve a total dry film thickness of not less than 3.2 mils DFT. 1 coat. **Proper surface preparation is required prior to painting. Surfaces should be clean, dull and dry with no residual chalking.**

   a. Benjamin Moore: Benjamin Moore's High Build Acrylic Masonry Primer No. 068: Applied at a dry film thickness of not less than 2.0 mils; 9.0 mils wet.
   b. ICI Dulux Paints: Prep and Prime Gripper WB Primer, 3210-1200. Applied at a dry film thickness of not less than 3.8 mils; 8.0 mils wet.
   c. Sherwin-Williams: Loxon Exterior Masonry Acrylic Primer A24W300: Applied at a dry film thickness of not less than 3.2 mils; 8.0 mils wet.

2. Finish: Semi-gloss, exterior, acrylic-latex enamel applied at spreading rate recommended by the Manufacturer to achieve a total dry film thickness of not less than 1.6 mils DFT per coat. 2 coats.

   a. Sherwin Williams: Loxon XP applied at a dry film thickness of not less than 6.4-8.3; 14-18 mils wet.

B. Exterior Wood:

1. Primer for Acrylic Enamels: Factory-formulated alkyd or latex wood primer for exterior application. Applied at spreading rate recommended by the Manufacturer. 1 coat. **Proper surface preparation is required prior to painting. <u>All</u> wood shall be scraped, stripped and sanded to bare wood as much as possible, including all four (4) edges of doors. Surfaces shall be clean, dull and dry with no residual chalking.**

   a. Benjamin Moore: Moorcraft Super Spec Alkyd Exterior Primer No. 176. Applied at a dry film thickness of not less than 1.8 mils (0.046mm).
   b. ICI Dulux Paints: 2000-1200 Dulux Professional Exterior 100 Percent Acrylic Latex Primer. Applied at a dry film thickness of not less than 1.6 mils (0.041mm).
   c. Sherwin-Williams: A-100 Exterior Latex Wood Primer B42W41. Applied at a dry film thickness of not less than 1.4 mils (0.036mm).

2. Finish: Semi-gloss, exterior, acrylic-latex enamel applied at spreading rate recommended by the Manufacturer. 2 coats.

   a. Benjamin Moore: Moorcraft Super Spec Latex House & Trim Paint No. 170. Applied at a dry film thickness of not less than 1.1 mils (0.028mm).

b. ICI Dulux Paints: 2406-XXXX Dulux Professional Exterior 100 Percent Acrylic Semi-Gloss Finish. Applied at a dry film thickness of not less than 1.3 mils (0.033mm).
c. Sherwin-Williams: A-100 Latex Gloss A8 Series. Applied at a dry film thickness of not less than 1.3 mils (0.033mm).

C. Exterior Ferrous-Metal: Factory-formulated rust-inhibitive products for exterior application. **Proper surface preparation is required prior to painting. Spot prime areas where there was surface rust. Surfaces should be clean, dull and dry. Sherwin Williams products**

1. Spot Prime: B58T00101 - Macropoxy® 920 Pre-Prime Rust Penetrating Epoxy Pre-Primer Transparent Part A.
2. Macropoxy® 646 Fast Cure Epoxy Part A Mill White.
3. First Coat: B58W00610 – Bond-Plex Waterbased Acrylic Coating Extra White/Tint Base.
4. Second Coat: B71W00211 – Bond-Plex Waterbased Acrylic Coating Extra White/Tint Base.

2.4 INTERIOR PRIMERS

A. Interior Wood Primer for Acrylic-Enamel Semigloss Finishes (Alternate #1): Factory-formulated acrylic-latex-based interior wood primer. 1 coat. Proper surface preparation is required prior to painting. Surface should be clean, dull and dry.

1. Benjamin Moore; Moorcraft Super Spec Alkyd Enamel Underbody and Primer Sealer No. 245: Applied at a dry film thickness of not less than 1.5 mils (0.038 mm).
2. ICI Dulux Paints; 3210-1200 Ultra-Hide Aquacrylic GRIPPER Stain Killer Primer Sealer: Applied at a dry film thickness of not less than 1.8 mils (0.046 mm).
3. Sherwin Williams; PrepRite Wall and Wood Primer B49W200 Series: Applied at a dry film thickness of not less than 1.6 mils (0.041 mm).

2.5 INTERIOR FINISH COATS

A. Interior Semigloss Alkyd Enamel (Alternate #1): Factory-formulated semigloss alkyd enamel for interior application. 2 coats.

1. Benjamin Moore; Moorcraft Super Spec Alkyd Semi-Gloss Enamel No. 271: Applied at a dry film thickness of not less than 1.4 mils (0.036 mm).
2. ICI Dulux Paints; 1516-XXXX Ultra-Hide Alkyd Semi-Gloss Interior Wood & Trim Enamel: Applied at a dry film thickness of not less than 1.7 mils (0.043 mm).
3. Sherwin Williams; ProMar 200 Interior Alkyd Semi-Gloss Enamel B34W200 Series: Applied at a dry film thickness of not less than 1.7 mils (0.043 mm).

2.6 INTERIOR WOOD STAINS AND VARNISHES (Alternate No. 1)

A. For use on interior faces of all exterior doors and all main building interior window trim. Shown on drawings as Alternate #1. Color to match existing. **Proper surface preparation is required prior to paining. All surfaces shall be stripped and sanded prior to refinishing. Surface shall be clean, dull, dry and properly abraded.**

B. Open-Grain Wood Filler: Factory-formulated paste wood filler applied at spreading rate recommended by manufacturer.

1. Benjamin Moore; Benwood Paste Wood Filler No. 238.
2. ICI Dulux Paints; none required.
3. Sherwin-Williams; Sher-Wood Fast-Dry Filler.

C. Interior Wood Stain: Factory-formulated alkyd-based penetrating wood stain for interior application applied at spreading rate recommended by manufacturer.

1. Benjamin Moore; Benwood Penetrating Stain No. 234.
2. ICI Dulux Paints; 1700-XXX WoodPride Interior Solventborne Wood Finishing Stain.
3. Sherwin-Williams; Wood Classics Interior Oil Stain A-48 Series.

D. Clear Sanding Sealer: Factory-formulated fast-drying alkyd-based clear wood sealer applied at spreading rate recommended by manufacturer.

1. Benjamin Moore; Moore's Interior Wood Finishes Quick-Dry Sanding Sealer No. 413.
2. ICI Dulux Paints; 1902-0000 WoodPride Interior Satin Polyurethane Varnish.
3. Sherwin-Williams; Wood Classics Fast Dry Sanding Sealer B26V43.

E. Interior Alkyd- or Polyurethane-Based Clear Satin Varnish: Factory-formulated alkyd- or polyurethane-based clear varnish.

1. Benjamin Moore; Benwood Interior Wood Finishes Polyurethane Finishes Low Lustre No. 435.
2. ICI Dulux Paints; 1902-0000 WoodPride Interior Satin Polyurethane Varnish.
3. Sherwin-Williams; Wood Classics Fast Dry Oil Varnish, Satin A66-300 Series.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Use of the term “paint” in this Section refers generically to all coatings.

B. **Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for paint application**. Comply with procedures specified in PDCA P4.

1. Proceed with paint application only after unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.
2. **Start of painting will be construed as Applicator's acceptance of surfaces and conditions within a particular area.**

C. 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.

1. Notify Architect about anticipated problems when using the materials specified over substrates primed or painted by others.

3.2 PREPARATION

A. General: All surfaces in this Contract have been previously painted. Remove hardware and hardware accessories, plates, machined surfaces, and similar items already installed that are

not to be painted. If removal is impractical or impossible because of size or weight of the item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, reinstall items removed using workers skilled in the trades involved.

B. Cleaning: Before applying paint or other surface treatments, clean all substrates of substances that could impair bond of the various coatings. Remove oil and grease before cleaning.

1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.

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. Cementitious Materials: Prepare concrete and cement surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze.

    a. Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause the finish paint to blister and burn, correct this condition before application. Do not paint surfaces if moisture content exceeds that permitted in manufacturer's written instructions.

3. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off. All exterior wood shall be scraped to bare wood as much as possible and sanded smooth. Feather all exposed edges.

    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, Bondo 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.

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. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.
    b. 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.

5. 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.

D. Material Preparation: Mix and prepare paint materials according to manufacturer's written instructions.

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.
3. Use only thinners approved by paint manufacturer and only within recommended limits.

E. Tinting: Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.3 APPLICATION

A. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.

1. Paint colors, surface treatments, and finishes are indicated in Section 2.3 “Paint Finishes”.
2. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
3. Provide finish coats that are compatible with primers used.
4. Uniformly apply coatings without runs, drips or sags, without brush marks and with consistent sheen.
5. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, grilles and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.
6. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before final installation of equipment, paint surfaces behind permanently fixed equipment with prime coat only.
7. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.
8. Sand doors lightly between each succeeding enamel or varnish coat.

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. The number of coats and film thickness required are the same regardless of application method. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer. If sanding is required to produce a smooth, even surface according to manufacturer's written instructions, sand between applications.
2. Omit primer over metal surfaces that have been shop primed and touchup painted.
3. 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. Give special attention to ensure that edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
4. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm, and does not deform or feel sticky under moderate thumb pressure, and until application of another coat of paint does not cause undercoat to lift or lose adhesion.

C. Application Procedures: Apply paints and coatings by brush and roller to Manufacturer's written instructions.

1. Brushes: Use brushes best suited for type of material applied. Use brush of appropriate size for surface or item being painted.
2. Rollers: Use rollers of carpet, velvet-back, or high-pile sheep's wool as recommended by manufacturer for material and texture required.

D. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate to achieve dry film thickness indicated. 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.

G. Transparent (Clear) Finishes: Use multiple coats to produce a glass-smooth surface film of even luster. Provide a finish free of laps, runs, cloudiness, color irregularity, brush marks, orange peel, nail holes, or other surface imperfections.

1. Provide satin finish for final coats.

H. Stipple Enamel Finish: Roll and redistribute paint to an even and fine texture. Leave no evidence of rolling, such as laps, irregularity in texture, skid marks, or other surface imperfections.

I. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements.

3.4 FIELD QUALITY CONTROL

A. Paint Manufacturer shall visit the Project site a minimum of 8 times over the duration of the Project to inspect the work. Manufacturer’s representative shall provide a written report of observations that the work is being applied properly and in accordance with the Manufacturer’s recommendations. Copies of the report shall be issued to the Construction Manager, Owner and Architect. Work not in conformance shall be repaired and replaced at no cost to the Owner.

B. Owner reserves the right to invoke the following test procedure at any time and as often as Owner deems necessary during the period when paint is being applied:

1. Owner will engage a qualified independent testing agency to sample paint material being used. Samples of material delivered to Project will be taken, identified, sealed, and certified in the presence of Contractor.
2. Testing agency will perform appropriate tests for the following characteristics as required by Owner:

a. Abrasion resistance, appropriate reflecting, flexibility, washability, absorption, accelerated weathering, dry opacity, accelerated yellowness, recoating, skinning, color retention, alkali resistance and quantitative materials analysis.

3. Owner may direct Contractor to stop painting if test results show material being used does not comply with specified requirements. Contractor shall remove noncomplying paint from Project site, pay for testing, and repaint surfaces previously coated with the noncomplying paint. If necessary, Contractor may be required to remove noncomplying paint from previously painted surfaces if, on repainting with specified paint, the two coatings are incompatible.

3.5 CLEANING

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

1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping without scratching or damaging adjacent finished surfaces.

3.6 PROTECTION

A. 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.

B. Particular care must be taken to avoid paint splatters on to the adjacent historic brick. Any paint so splattered must be removed immediately.

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.

END OF SECTION 09912

This page is blank.

SECTION 10200 - LOUVERS

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:

1. Fixed, extruded-aluminum louvers, to replace existing wood louvers in clock tower.

B. Related Sections include the following:

1. Division 7 Section "Joint Sealants" for sealants installed in perimeter joints between louver frames and adjoining construction.
2. Division 8 Section "Steel Doors" for louvers in hollow-metal doors and frames.

1.3 DEFINITIONS

A. Louver Terminology: Definitions of terms for metal louvers contained in AMCA 501 apply to this Section unless otherwise defined in this Section or in referenced standards.

1.4 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide louvers capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated without permanent deformation of louver components, noise or metal fatigue caused by louver blade rattle or flutter, or permanent damage to fasteners and anchors. Wind pressures shall be considered to act on vertical projection of louvers.

1. Wind Loads: Determine loads based on pressures as required by the Florida Building Code.

B. Thermal Movements: Provide louvers that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

C. Weather louvers shall have a minimum of 50 percent free area and shall pass 152 meters per minute free area velocity at a pressure drop not exceeding .02 mm (inch) water gage and carry

not more than .02 (ounces) of water per m² (square foot) of free area for 15 minutes when tested per AMCA Standard 500-L.

D. Louvers shall bear AMCA certified rating seals for air performance and water penetration ratings.

1.5 SUBMITTALS

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

B. Shop Drawings: For louvers and accessories. Include plans, elevations, sections, details, and attachments to other Work. Show blade profiles, angles, and spacing.

C. Samples for Initial Selection: For units with factory-applied color finishes.

1.6 QUALITY ASSURANCE

A. Source Limitations: Obtain louvers through one source from a single manufacturer where indicated to be of same type, design, or factory-applied color finish.

B. Welding: Qualify procedures and personnel according to the following:

1. AWS D1.2, "Structural Welding Code--Aluminum."

C. SMACNA Standard: Comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" for fabrication, construction details, and installation procedures.

1.7 PROJECT CONDITIONS

A. Field Measurements: Verify louver openings and operation by field measurements before fabrication and indicate measurements on Shop Drawings. One louver is side hinged for roof access.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Louvers:

a. Airline Products Co.
b. Airolite Company (The).
c. American Warming and Ventilating, Inc.
d. Arrow United Industries.
e. Carnes Company, Inc.
f. Cesco Products.
g. Construction Specialties, Inc.
h. Dowco Products Group; Safe-Air of Illinois, Inc.

i. Greenheck.
j. Industrial Louvers, Inc.
k. Louvers & Dampers, Inc.
l. Metal Form Manufacturing Company, Inc.
m. NCA Manufacturing, Inc.
n. Nystrom Building Products.
o. Reliable Products; Hart & Cooley, Inc.
p. Ruskin Company; Tomkins PLC.
q. Vent Products Company, Inc.

B. In other Part 2 articles where titles below introduce lists, the following requirements apply for product selection:

1. Products: Subject to compliance with requirements, provide one of the products specified.

2.2 MATERIALS

A. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), alloy 6063-T5 or T-52.

B. Aluminum Sheet: ASTM B 209 (ASTM B 209M), alloy 3003 or 5005 with temper as required for forming, or as otherwise recommended by metal producer for required finish.

C. Aluminum Castings: ASTM B 26/B 26M, alloy 319.

D. Fasteners: Of same basic metal and alloy as fastened metal or 300 Series stainless steel, unless otherwise indicated. Do not use metals that are incompatible with joined materials.

1. Use types and sizes to suit unit installation conditions.

2.3 FABRICATION, GENERAL

A. Assemble louvers in factory to minimize field splicing and assembly. Disassemble units as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

B. Maintain equal louver blade spacing, including separation between blades and frames at head and sill, to produce uniform appearance.

C. Fabricate frames, including integral sills, to fit in existing openings at the clock tower, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints.

1. Heads, sills and jamb sections shall have formed caulking slots or bed designed to retain caulking.
2. Head sections shall have exterior drip lip, and sill sections an integral water stop.
3. Furnish louvers with sill extension or separate sill.
4. Frame shall be mechanically fastened or welded construction with welds dressed smooth and flush.
5. One louver is side hinged for roof access.

D. Include supports, anchorages, and accessories required for complete assembly.

2.4 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Finish louvers after assembly.

2.5 ALUMINUM FINISHES

A. Finish designations prefixed by AA comply with system established by the Aluminum Association for designating aluminum finishes.

B. Baked-Enamel Finish: AA-C12C42R1x; Organic Coating: as specified below). Apply baked enamel complying with paint manufacturer's written instructions for cleaning, conversion coating, and painting.

1. Organic Coating: Thermosetting, modified-acrylic enamel primer/topcoat system complying with AAMA 2603, except with a minimum dry film thickness of 1.5 mils (0.04 mm), medium gloss.
2. Color: White.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and openings, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

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

3.2 PREPARATION

A. Coordinate setting drawings, diagrams, templates, instructions, and directions for installation of anchorages that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to Project site.

3.3 INSTALLATION

A. Locate and place louvers level, plumb, free of rack and twist, and at indicated alignment with adjacent work. One louver shall be side hinged (as existing) to allow for roof access.

B. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.

C. Form closely fitted joints with exposed connections accurately located and secured.

D. Provide perimeter reveals and openings of uniform width for sealants and joint fillers.

E. Repair finishes damaged by cutting, welding, soldering, and grinding. Restore finishes so no evidence remains of corrective work. Return items that cannot be refinished in the field to the factory, make required alterations, and refinish entire unit or provide new units.

F. Protect galvanized and nonferrous-metal surfaces from corrosion or galvanic action by applying a heavy coating of bituminous paint on surfaces that will be in contact with concrete, masonry, or dissimilar metals.

G. Protect finished surfaces from damage during fabrication, erection and after completion of work.

H. Install concealed gaskets, flashings, joint fillers, as louver installation progresses, where weathertight louver joints are required. Comply with Division 7 Section "Joint Sealants" for sealants applied during louver installation.

3.4 ADJUSTING AND CLEANING

A. Clean exposed surfaces of louvers and vents that are not protected by temporary covering, to remove fingerprints and soil during construction period. Do not let soil accumulate until final cleaning. Protect from damage until completion of project.

B. Before final inspection, clean exposed surfaces with water and a mild soap or detergent not harmful to finishes or as recommended by manufacturer. Thoroughly rinse surfaces and dry.

C. Restore louvers damaged during installation and construction so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by Architect, remove damaged units and replace with new units.

1. Touch up minor abrasions in finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating.

END OF SECTION 10200

This page is blank.

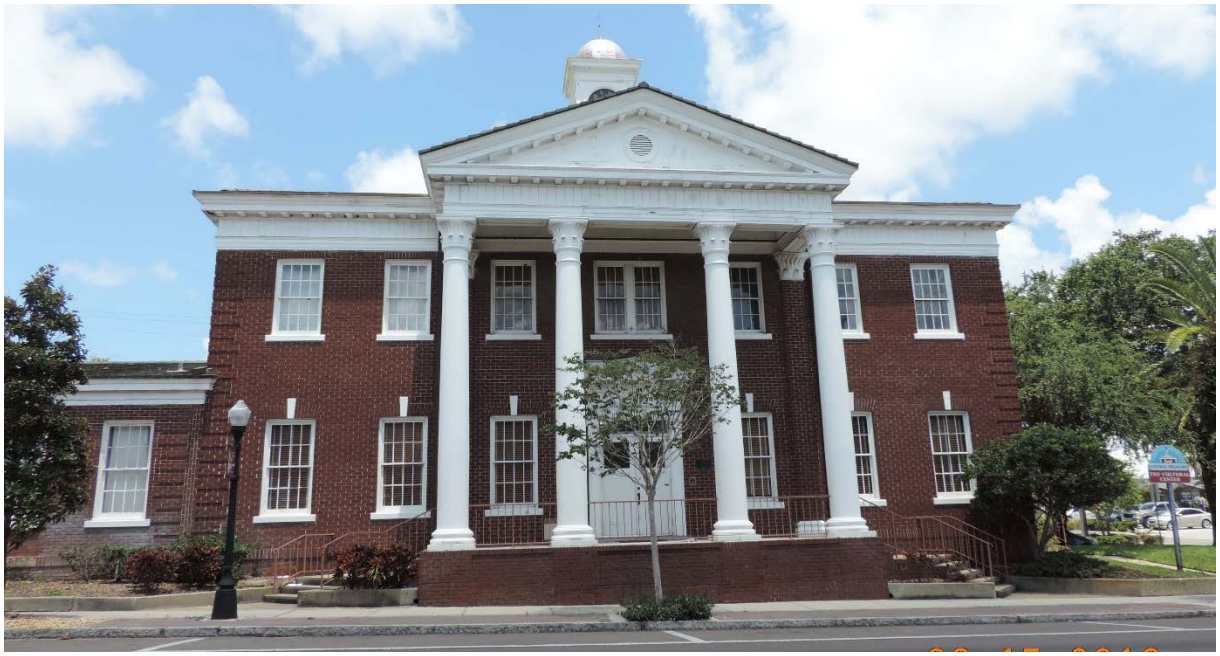

Photo 1: Main Front Entrance – West Elevation

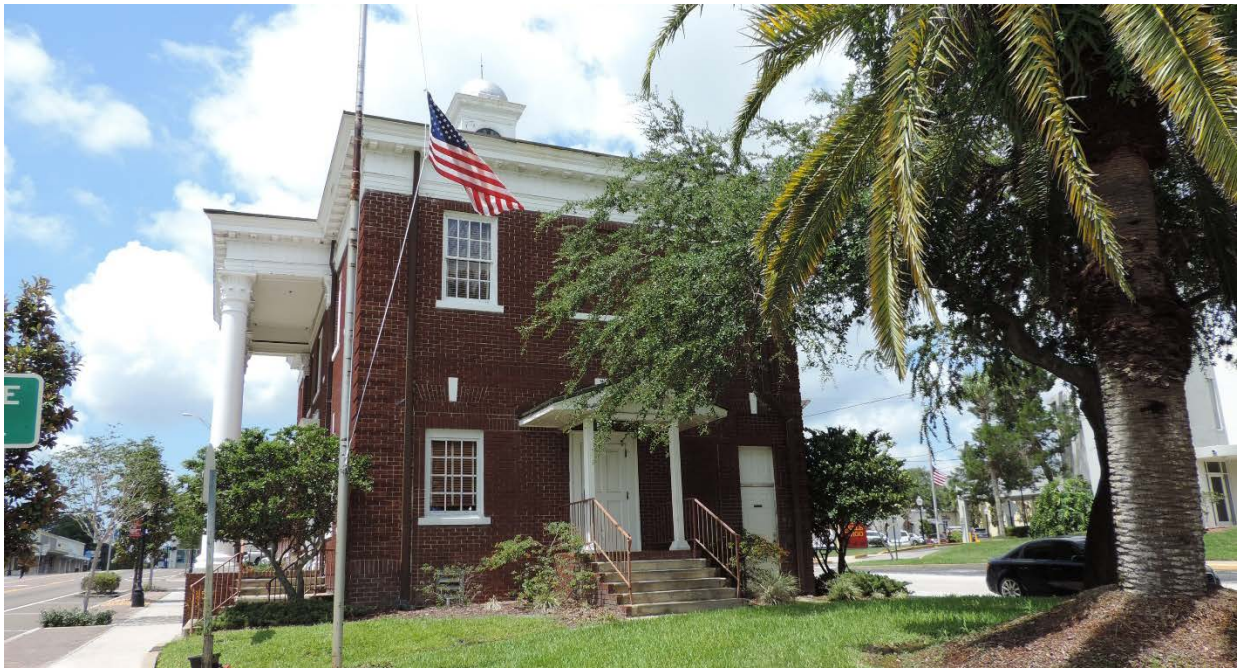

Photo 2: South Elevation – Looking northeast

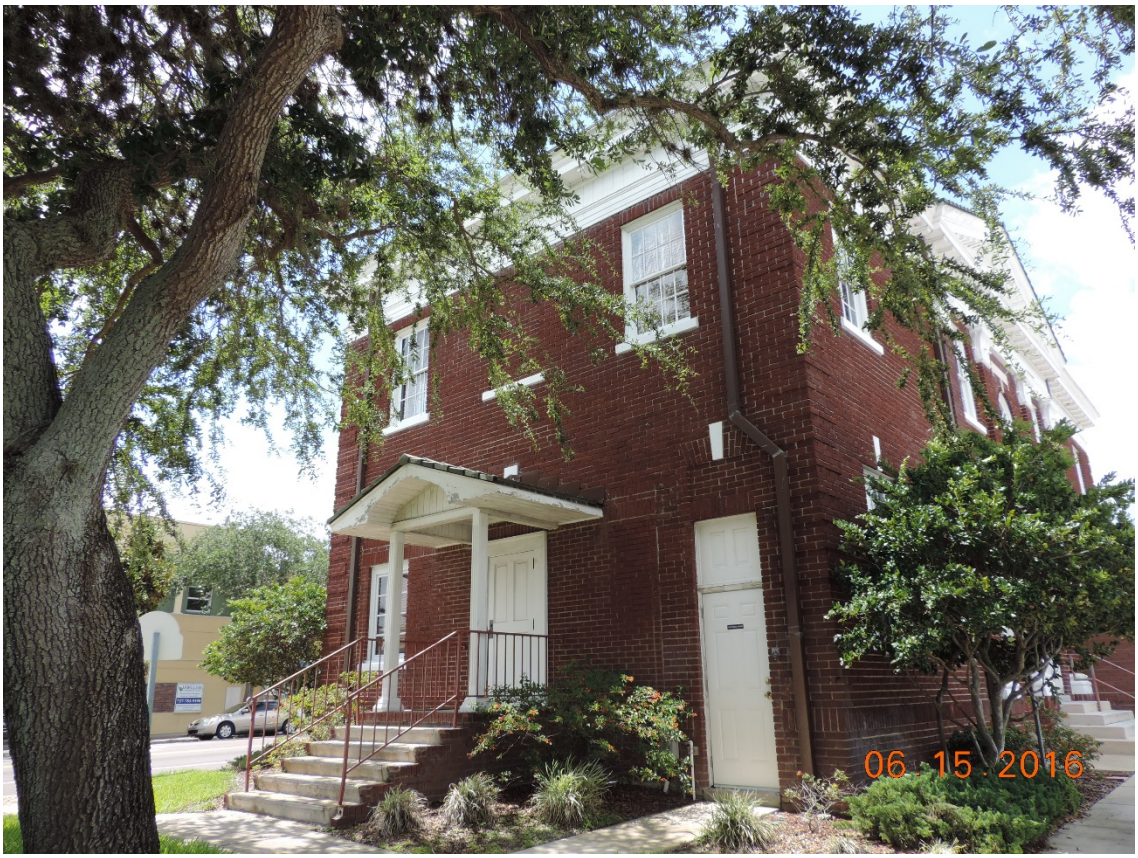

Photo 3: South Elevation – Looking northwest

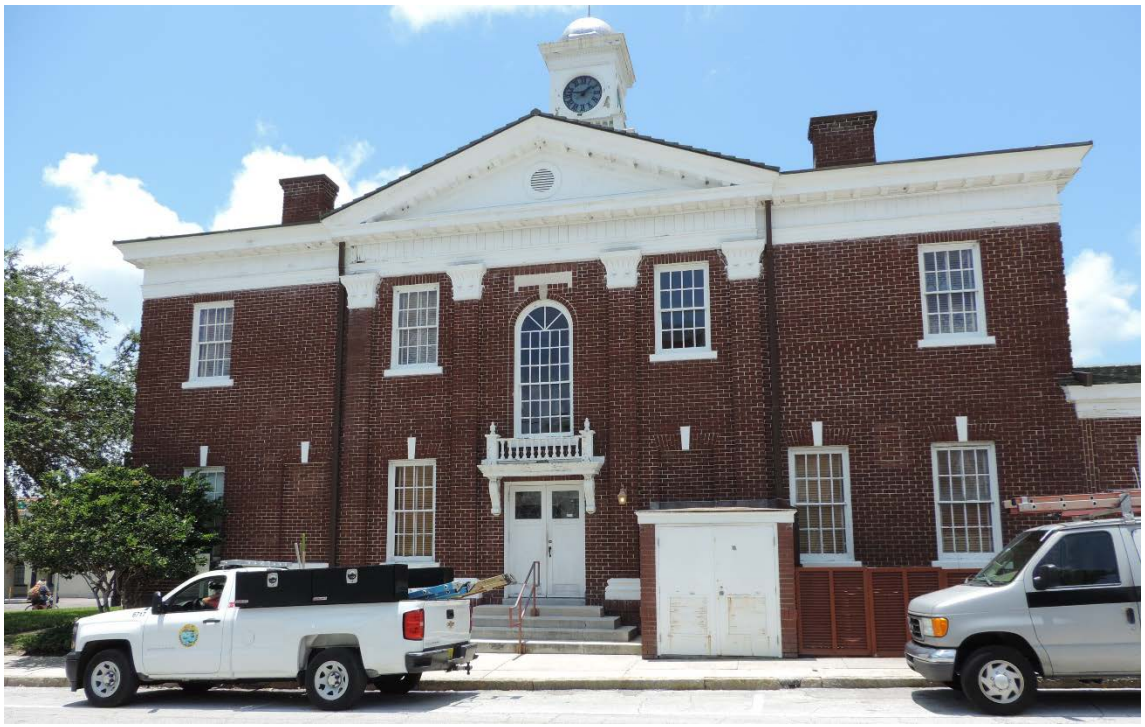

Photo 4: East (rear) Elevation

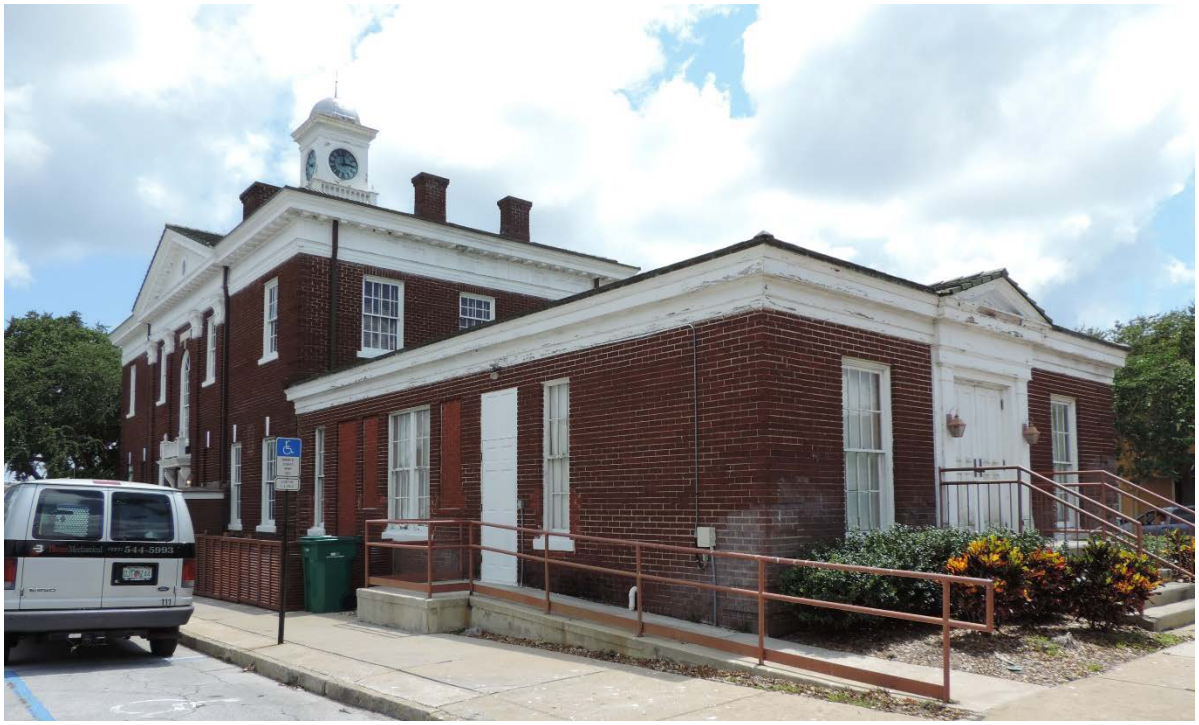

Photo 5: North and East Elevations – one story addition

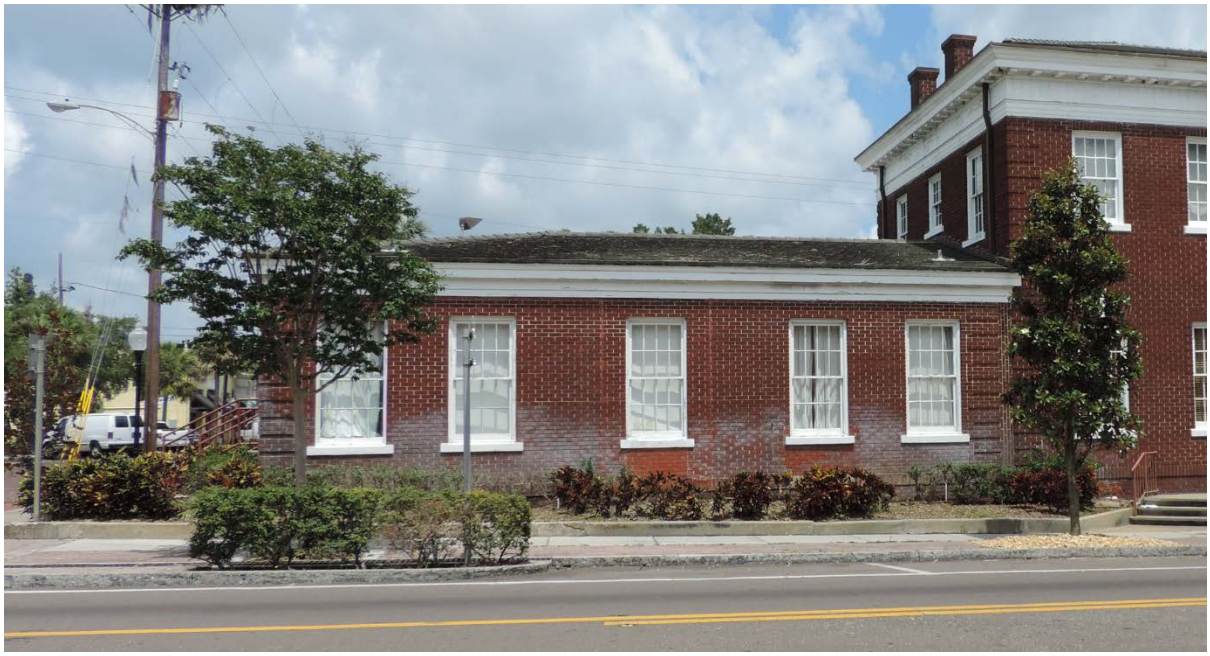

Photo 6: West Elevation – one story addition

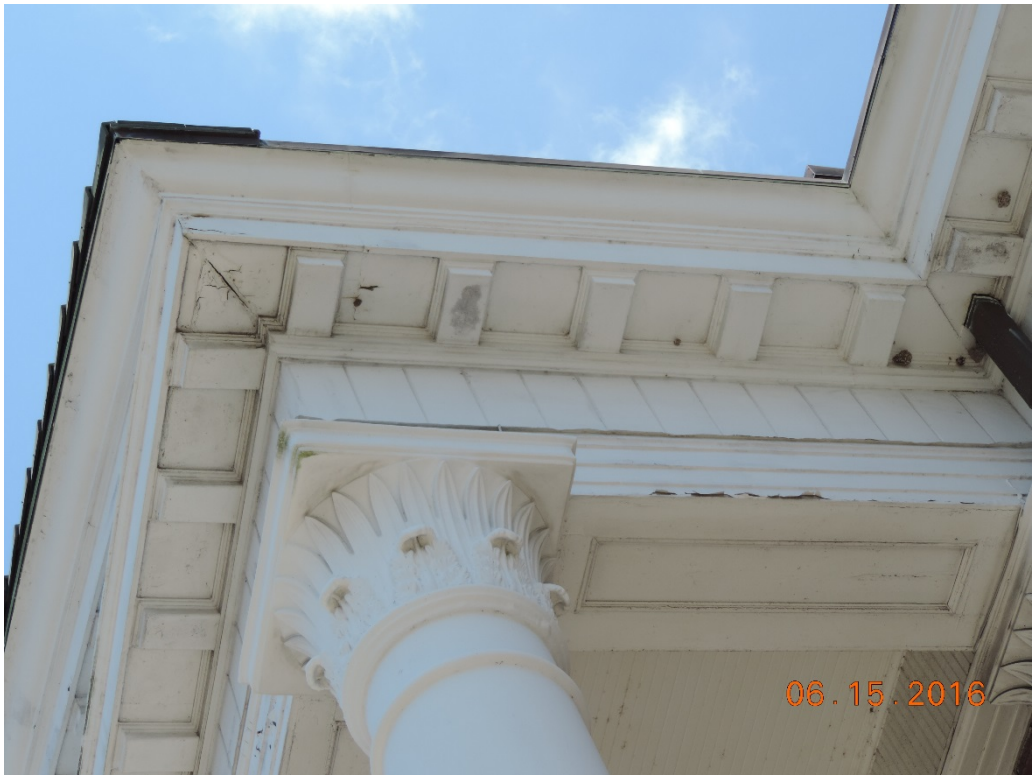

Photo 7: Cornice at front two-story portico – column capital, wood ceiling and trim

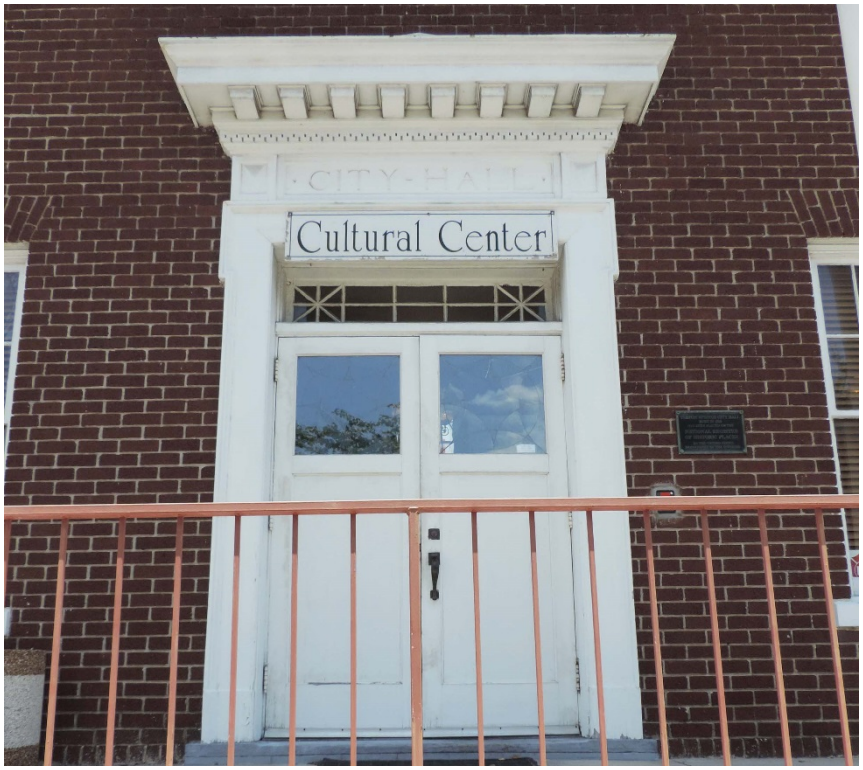

Photo 8: Front (west) entrance door and surround

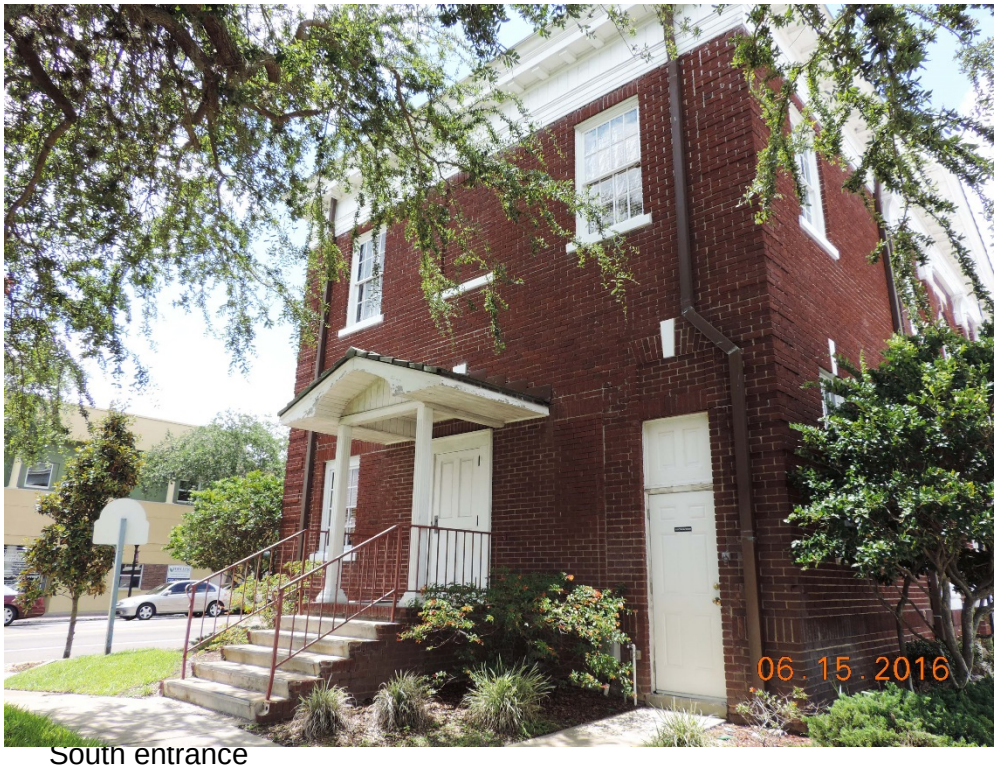

Photo 9: South entrance

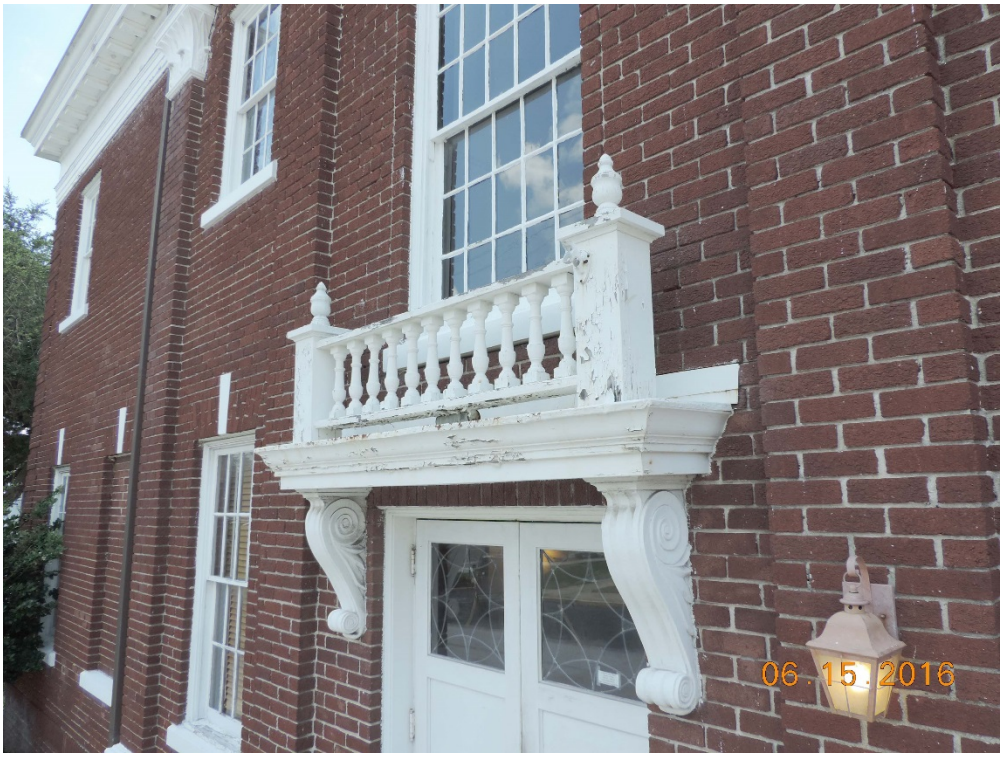

Photo 10: East entrance door hood with balustrade above

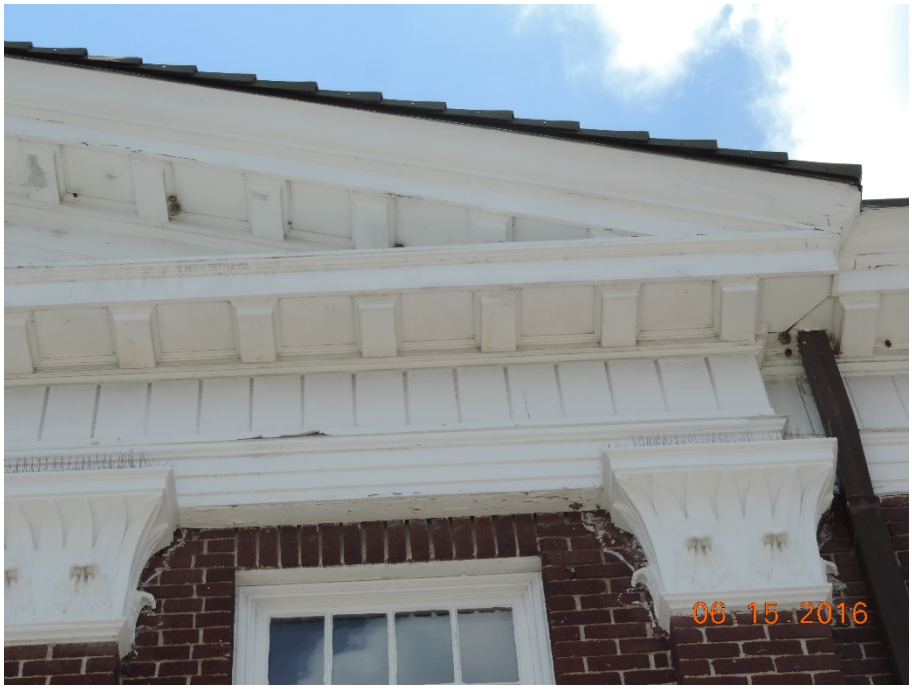

Photo 11: Cornice, pilasters capitals, and pediment at east elevation

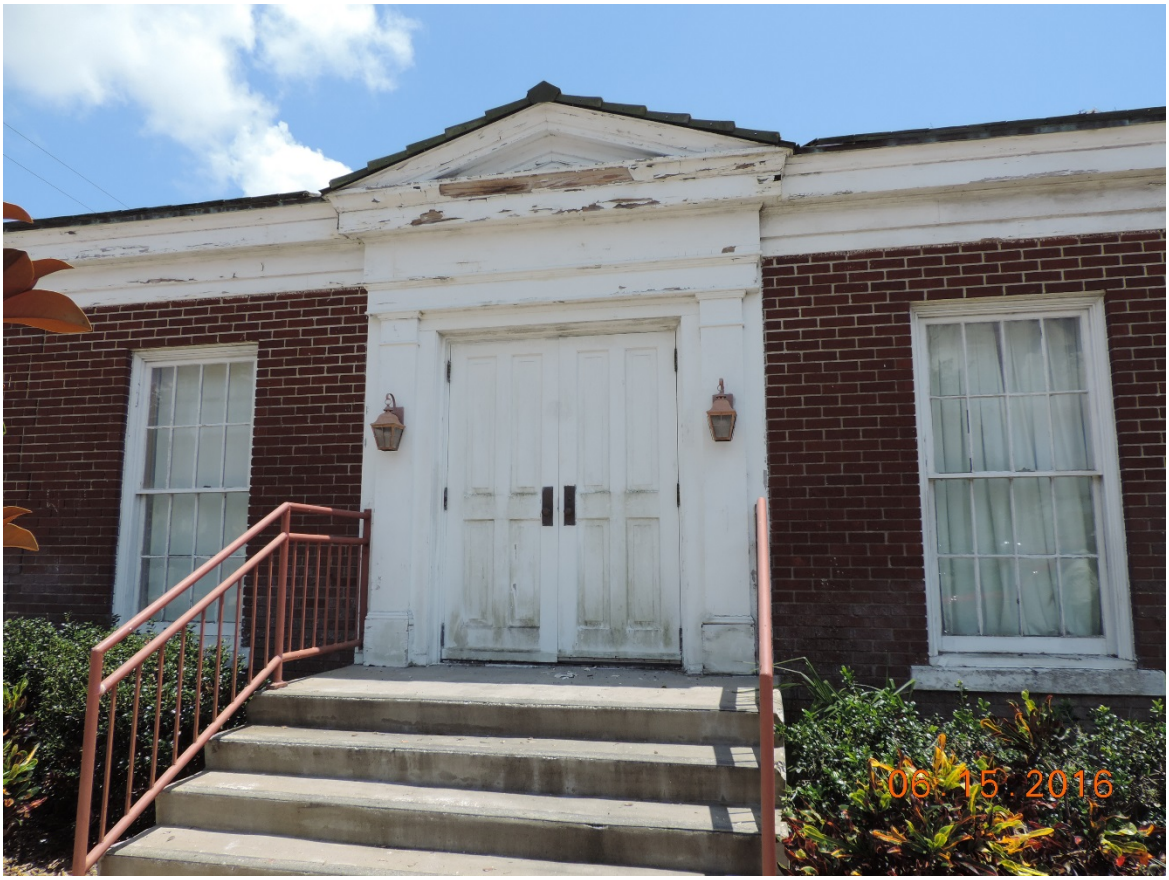

Photo 12: North entrance at one story addition, rotted woodwork to be replaced to match existing.

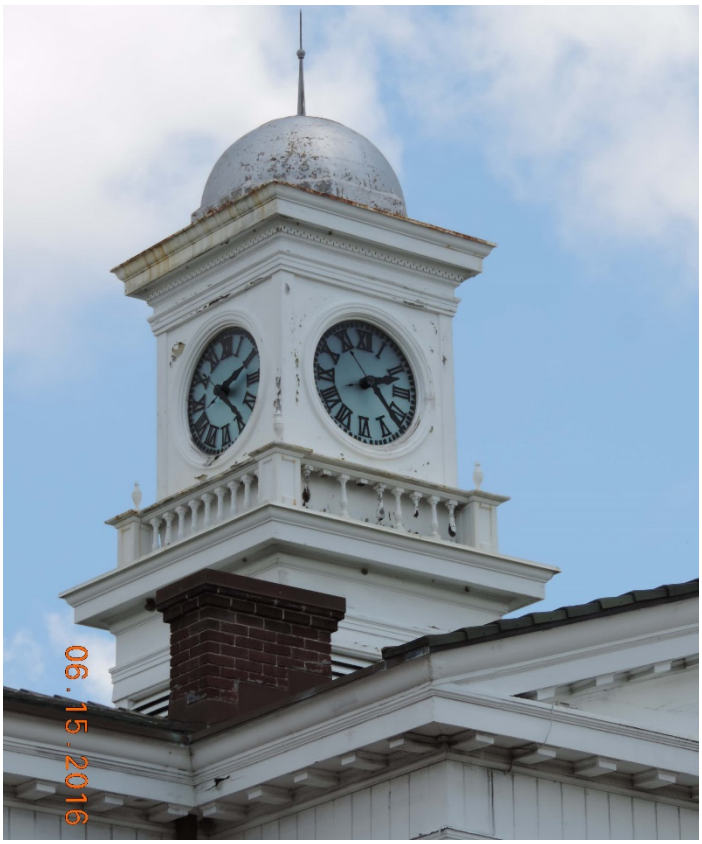

Photo 13: Clock tower with balustrade, capped chimney, main building cornice, looking southeast

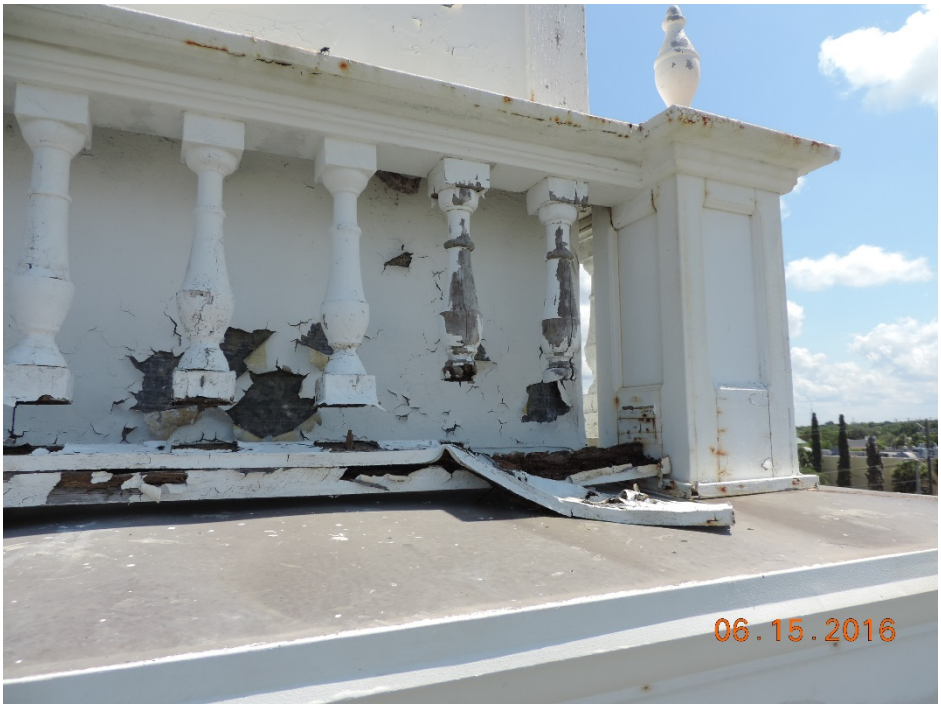

Photo 14: Clock tower balustrade

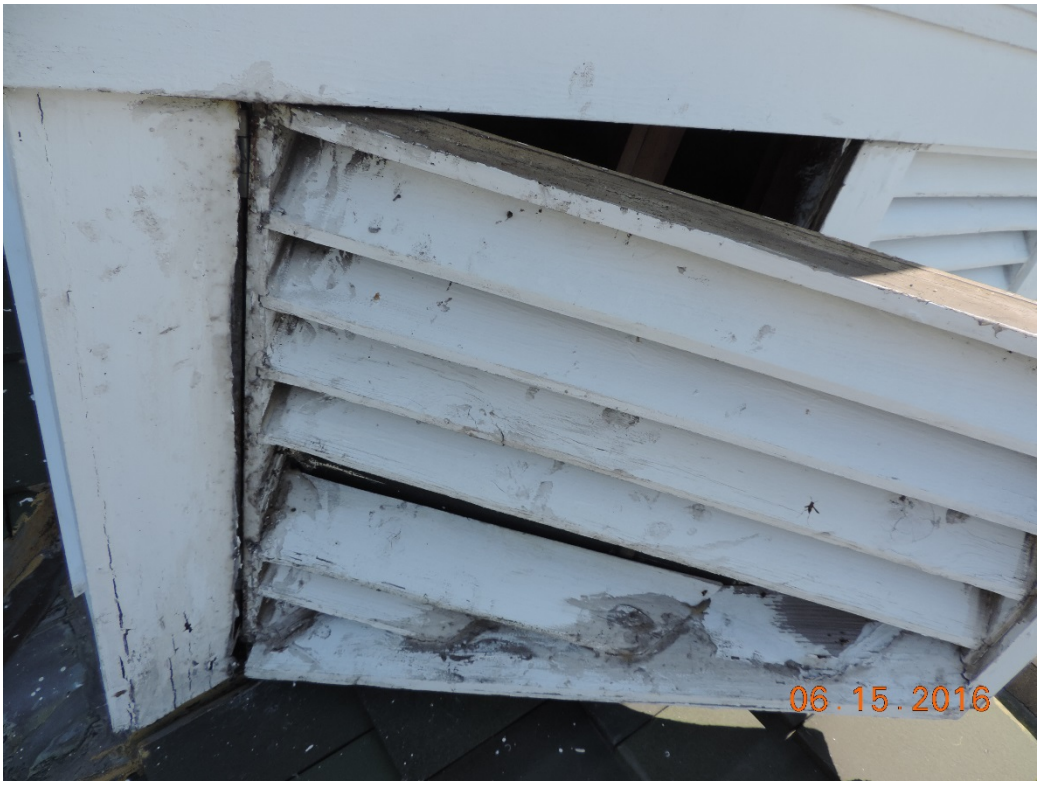

Photo 15: Clock tower hinged louver access door

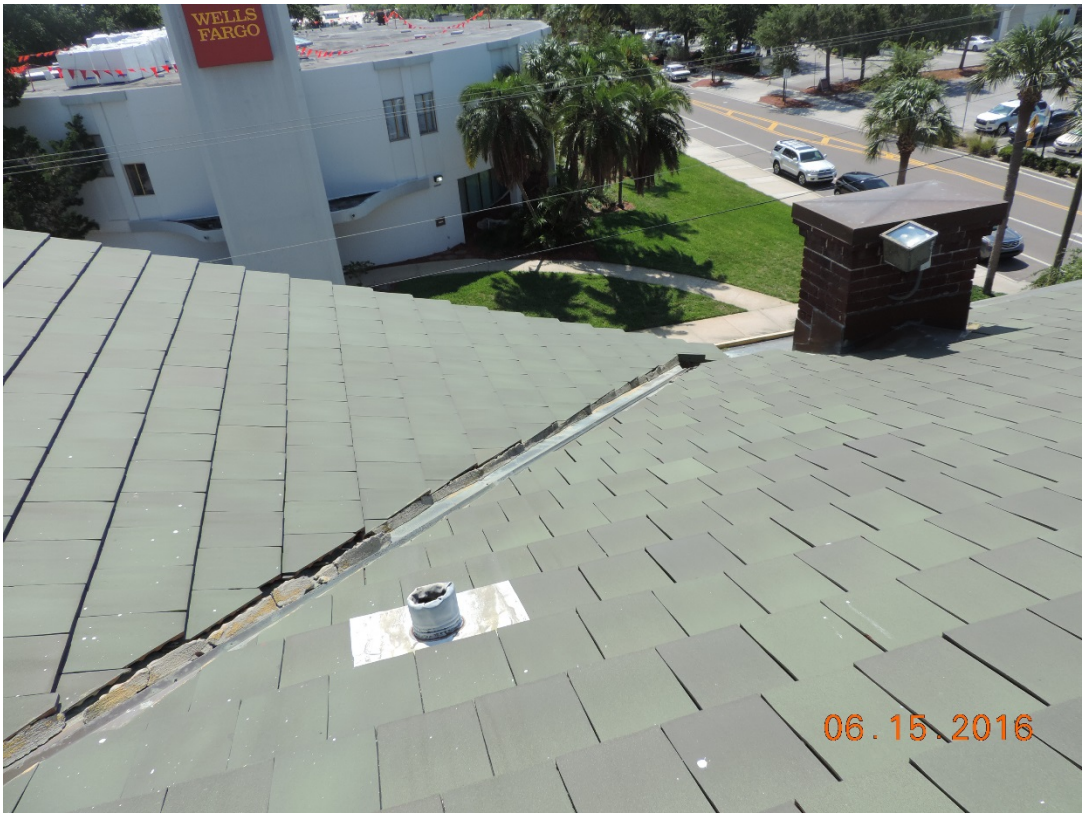

Photo 16: Valley at tile roof, capped chimney

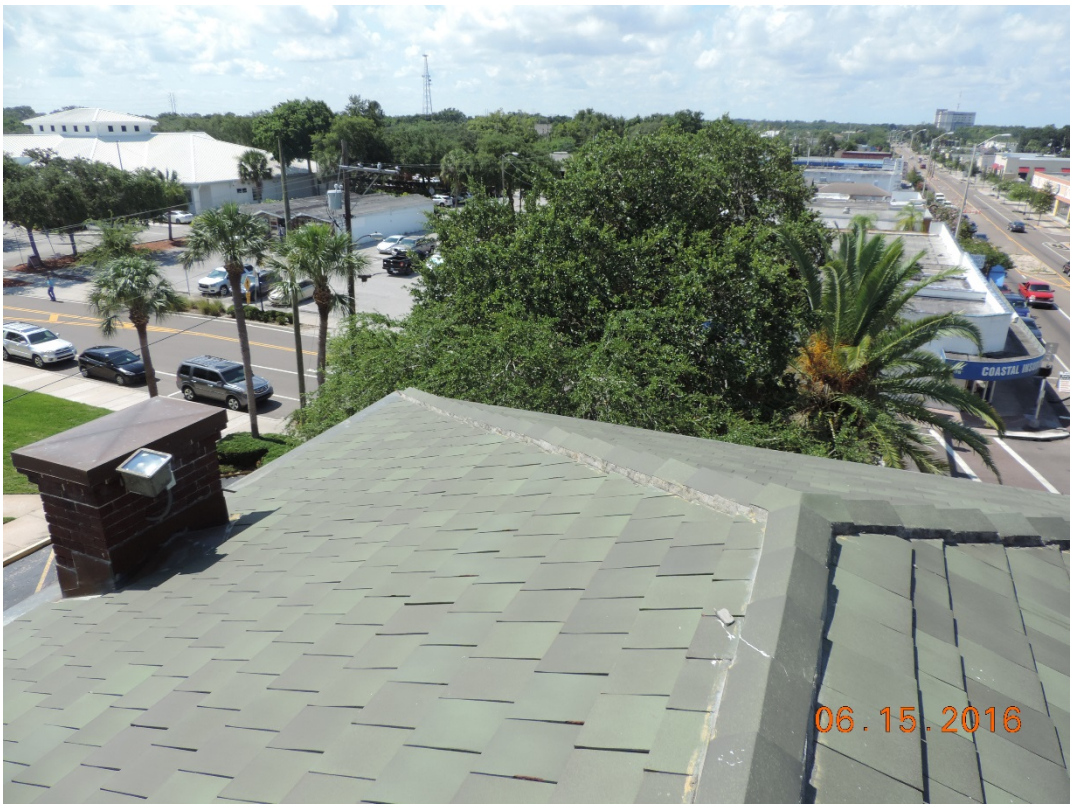

Photo 17: Hip and ridge tiles at roof, looking southeast