SECTION 040120.91

MASONRY RESTORATION

PART 1. GENERAL

1.1 GENERAL REQUIREMENTS

A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

B. Work shall comply with local building codes and governing agencies having jurisdiction. Where governing codes are in conflict with these specifications, comply with the more stringent requirements.

1.2 SCOPE OF WORK SUMMARY

A. Work of this Section includes all labor, materials, equipment, and services necessary to perform operations in conjunction with the exterior wall restoration work covered by this Contract, complete, in accordance with the Specifications, General and Supplementary Conditions, and codes of governing agencies having jurisdiction, including but not limited to the following:

1. Repoint deteriorated brick masonry mortar joints.

2. Remove and replace deteriorated, missing, and cracked face brick with new brick masonry.

3. Helical anchor installation at unsound and/or unreinforced masonry.

1.3 REFERENCES

A. All work shall comply with the codes and standards referenced below, unless a more stringent requirement is given in the specification. In the event of conflict, the most stringent requirements shall govern. The most recent codes and standards shall apply, unless otherwise noted:

1. Latest standards and recommendations of ASTM, ACI, The Brick Industry Association, and The New York State Building Code.

2. National Park Service Cultural Resources Preservation Briefs 2, “Repointing Mortar Joints in Historic Masonry Buildings,” revised edition October 1998.

1.4 SUBMITTALS

A. Product Data: Submit manufacturers' technical data for each product required, including instructions for preparation and application.

1.5 QUALITY ASSURANCE

A. Source of Materials: Obtain materials from a single manufacturer for each different product.

1.6 PROJECT CONDITIONS

A. Environmental Conditions:

1. Cold Weather Requirements: Cold weather brick work shall be performed in accordance with Brick Industry Association guidelines.

2. Hot Weather Requirements: Protect repair mortar from direct sunlight and wind using protection measures submitted and approved when the ambient air temperature exceeds 70º F. Do not use or prepare mortar when ambient air temperature is above 90º F at the location of the work.

B. Unanticipated Conditions: Where conditions are uncovered that are not anticipated by the Specifications, notify the Owner and Engineer immediately before repairs are initiated.

C. Contractor is not to perform repairs at areas of discrepancies until receipt of appropriate repair for the location in writing from the Engineer. Proceeding with repairs at these locations without description from the Engineer is entirely at the risk and cost of the Contractor.

D. Protection of work:

1. Provide protection and cover for work area during rain. No work will be allowed to proceed if protective coverings are not provided.
2. Cover area being worked on with strong waterproof membrane at the end of each day or shutdown
3. Cover open and partially completed areas when work is not in progress.
4. Extend protective covering a minimum of 24 inches beyond work area in all directions
5. Staining: Prevent grout or mortar from staining the face of masonry to be left exposed or adjacent surfaces of existing construction. Remove immediately grout and mortar that come in contact with such surfaces. Protect all sills, ledges and projections from mortar droppings.

E. Protection Of Fresh Mortar Repairs:

1. Mist new mortar repairs with water for a duration of at least 3 minutes at the end of the day of initial installation.
   a) During hot weather (greater than 70 degrees Fahrenheit) thoroughly dampen the repair area with water mist a minimum of two or three times per day for the first 3 days following installation.

2. Protect newly repaired areas from direct sun and winds for the first (3) days after installation.
   a) During hot weather (greater than 70 degrees Fahrenheit) protect freshly

repaired areas with burlap or plastic sheeting for the first 24 hours after installation.

b) If plastic sheeting is used, it should never come into direct contact with the mortar during initial curing and until fully set. It can be hung 3-4" clear of the work.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store and cover bricks as required preventing deterioration due to moisture, temperature changes, contaminants, or other causes.

B. Follow manufacturer's recommendations for delivery, storage, and handling of materials.

1.8 SEQUENCING

A. Coordinate with requirements of other repair systems and materials. Defer installation at obstructed areas, and install materials when obstructions are removed.

1.9 RESPONSIBILITY

A. Contract Documents define design intent and performance requirements. Elevations and details show approximate dimensions only. Contractor is responsible for field measurements and verification of existing conditions, certificates, permits, filing, and related documentation.

B. Quantities for masonry repairs have been estimated only. Contractor to submit unit prices for each type of repair in Section 1.2. Repair type and unit prices shall be determined prior to commencement of work.

1.10 WARRANTY

A. Provide written warranty agreeing to repair or replace, at no cost to Owner, defective materials and workmanship for one (1) year from the Date of Substantial Completion. Defective materials and workmanship shall include, but are not limited to:

1. Discoloration of existing substrates.

2. Defective repairs; Areas that become loose, crack, or otherwise fail to perform as required.

3. Deterioration of adjacent surfaces including glass, gaskets, sealants aluminum substrates, etc.

4. Water and/or Air Leakage as a result of such deterioration.

5. Efflorescence at areas of repair.

PART 2. PRODUCTS

2.1 GENERAL

A. Obtain materials from a single source for each type of material required (brick, sand, cement, etc.) to ensure match of quality, color, pattern and texture.

B. Compatibility: Select materials of proven compatibility with other materials with which they will be in contact with, under conditions of installation and service, as demonstrated by testing and field experience. Where requested, submit manufacturer certification that materials are compatible.

2.2 MATERIALS:

Materials shall be the following unless otherwise requested or specified.

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

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

C. Sand: Natural, clean, hard particles conforming to ASTM C-144.

D. Water: Potable.

C. Brick: Match existing and shall conform to the requirements of ASTM C-216, Grade SW. Brick that may be exposed on top or bottom shall not be cored.

G. Reinforcement:

1. Anchors: Provide 304 stainless steel helical ties anchored to existing back up as required.
2. Acceptable Products:
   a. Heli-Tie by Simpson Strong Tie
   b. Spira-Lok by Hohmann & Barnard

H. Mortar Types:

1. Mixing: Measure materials in a dry condition by volume or equivalent weight. Mix material in a clean mechanical batcher.

2. Re-pointing: Use Type N mix; 1 part Portland Cement, 1 part Type S hydrated lime, and 6 parts aggregate measured in a damp, loose condition. Provide color to match existing.

3. Masonry Replacement: Use Type N mix; 1 part Portland Cement, 1 part Type S hydrated lime, and 6 parts aggregate measured in a damp, loose condition. Provide color to match existing.

PART 3. EXECUTION

3.1 GENERAL REQUIREMENTS

A. Inspection: Contractor shall inspect areas prior to work commencement and report conditions, which may be detrimental to work, specified to be performed. Do not proceed until directed by Owner.

3.2 WORKMANSHIP FOR BRICK REPOINTING

A. Remove mortar from joints to a uniform depth equal to 2 times joint width but not less than 3/4" or less than that required to expose sound, un-weathered mortar.

B. Remove all loose mortar by brushing, blowing with air, or rinsing with water.

C. Do not damage or spall edges of adjacent masonry units or widen joints. Replace all masonry units that become damaged at no additional cost to Owner.

D. Rinse masonry joint surfaces with water to remove any remaining debris. Time rinsing so that excess water evaporates, leaving surface damp but without standing water, prior to pointing.

E. Apply mortar in tightly packed thin layers (1/4" max). Allow each layer to become "thumbprint" hard before applying next layer.

F. When final layer is "thumbprint" hard, tool joints to match existing appearance.

G. Clean all work in accordance with The Brick Industry Association recommendations prior to moving scaffolding to other areas

3.3 WORKMANSHIP FOR BRICK REPLACEMENT

A. Remove existing brick units in a manner which will not disturb adjacent masonry to remain. Prevent debris from falling into masonry cavities.

B. Support protect all existing construction that surrounds the work area.

C. Remove loose dirt and debris.

D. Dampen brick surfaces before new masonry units are placed, but the masonry should absorb all surface moisture to ensure a good bond.

E. Lay new brick masonry in a bed of mortar. Butter ends of units with sufficient mortar to completely fill in head joints and shove into place. Avoid deeply furrow bed joints or slush head joints.

F. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

H. Masonry bonds, coursing, jointing, and tooling shall match existing.

I. Clean all work in accordance with The Brick Industry Association recommendations prior to moving scaffolding to other areas.

3.4 THROUGH-FACE ANCHORS

A. Install anchors at least 12" below existing roof edge. Anchors shall be spaced maximum 24" o.c. both horizontally and vertically, but should include at least two (2) layers of anchors along the face of wall. Anchors shall be installed perpendicular to the wall through mortar joints in order to bond the exterior brick wythe to the backup wall.

B. Do not place holes for anchors at or within three inches (3”) of existing voids, heavy veins, cracks, or edges in units. Take necessary precautions to ensure that spalls or other distress do not occur during stone drilling or anchor installation operations. Report such occurrences if possible.

C. Notify Owner/Architect/Engineer if distress occurs during drilling.

D. Helical face anchors:

1. Diameter and length of anchors to be ¼" x 8" long.
2. At each anchor location, carefully drill a pilot hole through the mortar joint and into brick backup wall at embedment depth specified by manufacturer.
3. Diameter of pilot hole as recommended by manufacturer.
4. Insert helical anchor using manufacturer’s setting tool.
5. Recess anchor in from face of masonry, at depth per manufacturer's standard guidelines. Plug holes in masonry units with specified mortar.

3.5 CLEANING

A. Leave applications clean and premises free from residue and debris from work of this Section.

B. Masonry Cleaner: Prosoco, Inc.; Sure Klean Light Duty Restoration Cleaner Perform pressure washing from the bottom of cleaning area to the top, and down again covering each section of the surface.

END OF SECTION