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MASONRY RESTORATION AND CLEANING

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of contract, including general and supplementary conditions and Division-1 specifications sections, apply to work of this section.

1.02 DESCRIPTION OF WORK

- A. Extent of masonry restoration work is indicated on drawings and in schedules.
- B. Masonry Restoration Work Includes the Following:
 - 1. Chemical cleaning of exposed exterior masonry surfaces.
 - 2. Repairing and rebuilding damaged stonework.
 - 3. Re-pointing of masonry joints as required.

NOTE: The chemical cleaning of exterior surfaces should be accomplished before new windows are installed.

- C. Masonry construction is specified in other Division 4 sections.
- D. Joint sealers are specified in a Division 7 section.

1.03 QUALITY ASSURANCE

- A. Restoration Specialist: Work must be performed by a firm with not less than 5 years successful experience in masonry restoration projects employing skilled personnel for execution of the work.
 - B. Job Mock-Ups: Prior to start of general masonry restoration, conduct the following procedures. Obtain Architect's acceptance of visual qualities before proceeding with the work.
 - 1. Cleaning: Prepare a 4 ft. by 6 ft. sample area on the building where directed by architect, showing materials and methods to be used for cleaning exterior masonry surfaces.

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- 2. Re-pointing: Prepare a 4 ft. by 6 ft. sample area on the building where directed by architect, showing routing and repointing including mortar, type of joint, and workmanship for masonry in project.
- 3. Stonework Restoration: Prepare a 2' x 2' sample area on the building, where directed by Architect for stonework restoration. Use anchorage, bonding, mortar and workmanship expected in completed work. The restoration patching mix shall match the existing brownstone in texture and color. Acceptable panel shall be used as a standard for judging completed work.
- C. Source of Materials: Obtain materials for masonry restoration from a single source for each type material required (face brick, cement, sand, etc.) to ensure match quality, color, pattern, and texture.

1.04 SUBMITTALS:

- A. Product Data: Submit manufacturer's specifications and other data for each manufactured product, including certification that each product complies with specified requirements. Include instructions for handling, storage, installation and protection of each product.
- B. Samples: Sample areas shall be used to exhibit the cleaning performance of the restoration cleaner on brick work. Test areas shall be selected by Architect and shall be approximately 20 sq. ft. Multiple tests of varying concentrations shall determine composition of cleaning solution required. Provide written certification by manufacturer that restoration cleaner is compatible with brownstone.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Protect masonry materials during storage and construction from wetting by rain, snow or ground water, and from staining or intermixture with earth or other types of materials.
- B. Protect grout and mortar materials from deterioration by moisture and temperature. Store in a dry location or in waterproof 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.

1.06 JOB CONDITIONS

- A. Materials Protection: Do not use metal reinforcing or ties having loose rust or other coatings, including ice, which will reduce or destroy bond.
- B. Protection of Work: During restoration cover wall with heavy waterproof sheeting at end of each day's work, if precipitation is expected.

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- C. Staining: Prevent grout or mortar from staining face of masonry to be left exposed. Remove immediately grout or mortar in contact with masonry.
- D. Protect sills, ledges and projections from droppings of mortar.
- E. Cold Weather Protection:
 - 1. Remove ice or snow formed on masonry bed by carefully applying heat until top surface is dry to the touch.
 - 2. Remove masonry determined to be frozen or damaged by freezing conditions.
- F. Perform the following construction procedures while the work is in progress:
 - 1. When air temperature is from 40 deg. F (4 C) to 32 Deg. F (0 C), heat sand or mixing water to produce mortar temperatures between 40 deg. F (4 C) and 120 deg. F (49 C).
 - 2. When air temperature is below freezing, do not undertake tuckpointing or stone restoration.
- G. Perform the following protections for completed masonry and masonry not being worked on:
 - 1. Protect masonry from rain or snow for at least 24 hours by covering with water-resistive membrane

PART 2 PRODUCTS

2.01 BRICK:

A. Rebuild and/or repair existing masonry to be exposed, using bricks salvaged from selective demolition or new bricks to match existing.

2.02 MORTAR MATERIALS

- A. Mortar for Face Brick and Accessories: Provide mortar for face brick and accessories to match original mortar in texture, color, strength, and hardness (density and porosity).
 - 1. Determining existing mortar mix constituents and ratios by analysis. Review laboratory evaluations with Architect before proceeding with the work.
 - 2. Match color of existing mortar by use of aggregates matching original aggregate color where possible. Use inorganic coloring pigments if satisfactory color match cannot be attained with natural materials.
 - 3. Mortar mix to be in accordance with New York City Landmarks Preservation Commission Row House Manual page 44 1 part Portland cement, 2 parts lime, 8 parts sand mix, then add pigments and water- (Type O).

2.03 MASONRY CLEANING (BRICKWORK)

- A. A sample patch of cleaning must be reviewed and approved by architect before work is begun.
- B. Cleaning Agent: Blended organic and inorganic acids combined with special wetting systems and inhibitors; as manufactured by ProSoCo, Inc., Type 1 Restoration cleaner or approved equal for the removal of atmospheric carbon and dirt, paint oxidation, and embedded clay and mud stains from brick and other masonry surfaces.

2.04 RESTORATION MATERIALS

- A. Epoxy Mortar: Conproco "mimic" trowel applied color matched, or approved equal.
- B. Primer: Conproco "mimic" bonding agent or approved equal.
- C. Stone Restoration Mix: Mix as per mortar manufacture's recommendations.

PART 3 EXECUTION

3.01 CLEANING EXISTING MASONRY:

- A. Preparation of Surfaces: Cleaners specified herein are highly concentrated products, and to the extent established by job site tests, shall be diluted with clean water before application.
 - 1. Cleaners specified herein are harmful to glass, aluminum, painted, surfaces, foliage, and human skin and eyes.
 - 2. Protect all surrounding areas as recommended by the literature of the manufacturer and as requested by the architect.
 - 3. Windows shall be protected from contact with materials by masking with polyethylene, or by using Sure Klean Acid Stop, as manufactured by ProSoCo, Inc. South Plainfield, NJ or approved equal.
 - 4. All polished stone, metal or non-masonry surfaces shall be protected from contact with the material by masking with polyethylene or approved protective material.
 - 5. Adjacent shrubs, lawn, plants and sidewalks should be covered with polyethylene and protected from direct contact with the material.
 - 6. Necessary routing of joints and replacement of damaged masonry units shall have been completed, with exception of final pointing, prior to beginning cleaning operation.
 - 7. Adequate water supply shall be made available to assure thorough pre-soaking and thorough rinsing of the wall before undertaking general cleaning. All surfaces shall be thoroughly pre-soaked with clean water to prevent the absorption of the cleaning solution within the pores of the masonry.

B. Cleaning Process: Brick, unpolished granite, sandstone, terra cotta and/or exposed aggregate shall be spray or brush coated with Type I restoration cleaner, and left on the surface two or three minutes. A second application shall follow if deemed necessary by preliminary tests. Coated area shall then be rinsed from bottom up with clear water using high pressure rinsing equipment. Equipment shall be adjusted so that rinse water, either warm or cold, is applied at a pressure not to exceed 500 P.S.I. Attempts shall be made during the testing stage to determine if effective cleaning can be achieved with rinse water applied at pressures not to exceed 500 P.S.I. Flow of water shall be 10 gallons per minute. Gun used to apply water shall be equipped with not less than a 15" spray tip. All tips shall be fan type.

3.02 REPAIRING EXISTING MASONRY

- A. Routing of Joints: Remove defective mortar joints to solid material or a depth of 1.0" whichever is greater, using hand tools. Take care to avoid damaging existing masonry or enlarging width of joints.
 - 1. A sample of pointing must be reviewed and approved by architect before work is begun.
 - 2. Mechanical tools will be permitted only on specific written approval of architect and demonstrated ability by operators to use without damage to masonry.
 - 3. Remove and repair damage to existing masonry by cutting, spalling and chipping as caused by routing operations.
 - 4. Thoroughly remove loose material from joints using a hose stream under normal pressure or by low pressure compressed air.
- B. Mortar Mixing: Add only enough water to dry mix ingredients to produce a damp, workable mix. Keep mortar in dampened condition for 1 to 2 hours, and then add sufficient to bring it to proper consistency.
- C. Replacing Brick: Lay brick and accessories to match existing bond, unless otherwise indicated
 - 1. Match existing course height (one brick and one joint) for both face brick and backup brick.
 - 2. Provide bonding between face brick and back-up brick as indicated.
 - 3. Provide joints to match existing, unless otherwise indicated. Delay final tooling of joints until mortar is thumb print hard. Take care to not spread mortar over the edges of face brick onto exposed surfaces.
 - 4. Wet brick before laying. Do not use brick which are saturated with water, or which have been unduly exposed to moisture or rain at site, or which have been in contact with ground.
 - 5. Lay brick with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not slush head joints. Do not furrow bed joint; strike mortar flat with trowel.

- 6. Lay up brickwork with full or half brick, as required. Do not fill in concealed work with spalls, small bats, or excess mortar.
- 7. Lay up brickwork level and plumb, or as otherwise required to match existing.

D. Re-pointing:

- 1. After careful routing and cleaning joints, wet joints thoroughly and then apply fresh, pre-hydrated mortar. Allow water to soak into joints, but joints should not be visibly wet with standing water during tuckpointing.
- 2. Fill mortar joints in layers not over 1/4" thick, with each layer applied with pressure as soon as previous layer has partially dried. Do not tool each layer smooth: Leave surface rough to help bond of subsequent layers. Compress the final packing as much as possible to completely fill joint. Compact joints solidly before final tooling.
- 3. Tool joints to match existing work which has not been repointed, or oldest joints found, unless otherwise indicated. Take care to not spread mortar over edges of brick onto exposed surfaces. Do not featheredge mortar. Cure mortar by maintaining in a damp condition for 5 days.

3.03 FINAL CLEANING

- A. All mortar to fully harden for approximately 30 days after completion of work, then thoroughly clean exposed masonry surfaces of excess mortar and foreign matter using stiff nylon or bristle brushes and clean water under normal pressure.
 - 1. Use of metal scrapers or brushes will not be permitted.
 - 2. Use of acid or alkali cleaning agents will not be permitted.

- END OF SECTION -





































