SECTION 09 24 00 – EXTERIOR CEMENT PLASTER REPAIRS

PART 1 - GENERAL

1.1 SECTION INCLUDES
A. Cement Plaster repair mockups. Mockups include patching of cracked, spalled, missing, and mismatched exterior portland cement plaster and plaster patches.

1.2 RELATED REQUIREMENTS
A. Section 04 01 25 – Masonry Cleaning
B. Section xx xx xx – Paint Removal

1.3 REFERENCE STANDARDS
B. ASTM C150 — Standard Specification for Portland Cement
E. ASTM C897 — Aggregate for Job-Mixed Portland Cement Based Plasters
F. ASTM C932 – Surface-Applied Bonding Agents for Exterior Plastering
G. ASTM C926 — Application of Portland Cement Based Plaster

1.4 SUBMITTALS
A. Evidence of contractor’s experience including project identification.
B. Product Data for all materials to be used.
C. Manufacturer’s installation instructions: Indicate preparation required and installation procedures.
1.5 QUALITY ASSURANCE

A. Contractor Qualifications: Must have a minimum of ten (10) years of experience in the construction and supervision of cement plaster repair work.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver products until operations that could damage product have been completed in installation areas. If products must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified by the Owner.

B. Store materials in their manufacturers’ containers, and protect materials in a dry, covered location. Store materials above the ground, and protect from damage or replace before use.

1.7 FIELD CONDITIONS

A. Environmental Conditions: Do not apply materials in the rain; or when surface and ambient temperatures are outside the temperature ranges required by the manufacturer.

1.8 COORDINATION

A. Attend a pre-construction conference to be held with the Engineer, Contractor, cement plaster foreman, and all other involved trades to discuss the Work covered under this Section.

B. Plan, schedule, and execute the Work in coordination with the other trades. Perform work on time and according to schedule so as not to interfere with or delay the Work of other trades. Make arrangements with the other trades and with the Owner to minimize the disruption to building occupants.

1.9 MOCK-UPS

A. Provide in-place mock-ups, as shown on the drawings for verification of component compatibility and appearance as specified in the Drawings. Engineer, Owner, and Product Manufacturer should be notified of mock-up prior to execution. Reconstruct the mock-ups as many times as necessary to meet the Engineer’s approval, without additional cost to the Owner. The approved mock-ups will establish both a technical and aesthetic standard for the remainder of the project including the mixing and application of the cement plaster (for color and texture), the curing of the cement plaster (for crack control) and required admixtures/additive. The approved mock-up shall become part of the finished work. Remove unaccepted mock-up and do not incorporate into the Work, and replace it with approved mock-up method.

B. Use two different plaster mixes at locations shown on drawings.
1. Plaster Mix 1 (Traditional): Base coat and finish coat as specified to match existing conditions.

PART 2 - PRODUCTS

2.1 PLASTER MATERIALS

A. Hydrated Lime: ASTM C207, Type S, non-air-entrained or special hydrated lime for masonry purposes.

B. Cement
   1. Finish Coat: White Portland Cement, ASTM C 150
   2. Base Coat: Grey Portland Cement. ASTM C150, Type I; non-staining without air entrainment; low-alkali per ASTM C150, Table 2

C. Sand: manufactured or natural sand to match original sand in color and texture. Existing plaster sand is composed primarily of quartz and feldspar mineral grains and rock fragments of chert and igneous rocks. Provide clean, damp sand conforming to ASTM C897, free of organics or other deleterious materials.

D. Water: Potable and free from impurities that affect setting of portland cement plaster.

E. Thickness: Match thickness of each coat of existing plaster.

F. Finish coat pigment: ASTM C979. Integral coloring material shall consist of inert, nonfading, finely ground, alkali-fast mineral oxides made especially for cement/lime mortars. Limit coloring additive so as not to exceed 10% of the weight of portland cement. Do not use carbon black as a coloring additive.
   1. Finish Coat: Yellow mineral pigment
   2. Base Coat: no pigment required

G. Bonding Agent (Mix 2 only): Weld-Crete, Larsen Products Corp. or acceptable equal conforming to ASTM C932.

H. Acrylic Admixture (Mix 2 only): Acryl 60 by Thoro/BASF

I. Lime substitute (Mix 2 only): Gibco PRF

J. Fibers (Mix 2 only): Forta Stucco-Bond or equivalent

K. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Engineer.

L. Plaster finish coat is to match existing original plaster in color and texture.
2.2 MIX PROPORTIONS

A. Traditional plaster mix to match existing (Mix 1)
   1. Base Coat
      a. 1 part grey Portland Cement
      b. 5 parts sand
   2. Finish Coat
      a. 1 part white Portland Cement
      b. \( \frac{1}{2} \) part lime
      c. 6 parts sand

B. Enhanced plaster mix (Mix 2)
   1. Base Coat:
      a. 1 part grey portland cement
      b. 5 parts sand
      c. Lime substitute: per manufacturer’s instructions
      d. Fibers: per manufacturer’s instructions
      e. Acrylic admixture: 1 part Acrylic admixture to 3 parts water as the mixing liquid
   2. Finish Coat:
      a. 1 part white portland cement
      b. 1/2 part lime
      c. 6 parts sand

2.3 CEMENT PLASTER MIXES

A. General
   1. Mix and proportion cement plaster
   2. Mix only as much plaster as can be used prior to initial set.
   3. Mix materials dry, to uniform color and consistency, before adding water.
   4. Protect mixtures from freezing, frost, contamination, and evaporation.
   5. Do not retemper mixes after initial set has occurred.
   6. Apply base coat to entire wall or panel.
   7. Do not apply cement plaster in temperatures less than 40 degrees F.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Before starting work in a given area, examine the substrate and report any condition to the Engineer that does not appear properly prepared, or may otherwise interfere with proper installation of cement plaster.

B. Verify all site conditions and dimensions by field measurement in consideration of the special conditions associated with repairs to existing construction. Notify the Engineer immediately of any inconsistency between the conditions found and those shown in the contract drawings.
3.2 INSTALLATION

A. Except as modified in this section, perform Work in accordance with:
   1. ASTM C926.
   2. CBC.
   3. Preservation Brief No. 22
   4. Applicable recommendations by manufacturers of all materials for workmanship and handling.

B. General Cutting And Patching
   1. Cut, patch, point, and repair plaster as necessary to accommodate other Work and to restore cracks, dents, and imperfections.
   2. The area to be patched may be irregular in shape and should have irregular roughened edges.
   3. When patching the plaster, replace it in layers to the same thickness as the existing plaster.
   4. When patching, cut each succeeding coat back further than the preceding coat with the base coat being the smallest area and the finish coat being the largest area to be patched.
   5. Repair or replace Work to eliminate blisters, buckles, crazing, check cracking, dryouts, efflorescence, sweat-outs, and similar defects.
   6. Finish cutting and patching to match undamaged plaster; patching shall not be visible in finished installation.

3.3 SPALL PATCHING

A. Existing Surface Preparation
   1. Remove all loose material. Tap all surfaces with wood mallet and remove hollow, unsound, or cracked materials. Leave substrate with a roughened surface. Do not feather edges.
   2. Remove any corroded metal found under loose plaster.
   3. Rout out all cracks wider than 10 mils to a minimum 1/4 in. wide and 1/4 in. deep.
   4. Clean all surface to be patched with stainless steel wire brushes and power air blowers.
   5. Where concrete substrate is damaged, check with the Engineer for repair procedures.

B. Application of Base Coat:
   1. At Mix 1 mockup, pre-wet concrete substrate.
   2. At Mix 2 mockup, apply bonding agent to substrate surfaces to be patched including adjacent plaster edges, in accordance with manufacturer's recommendations.
   3. Install base coat with sufficient pressure to ensure continuous bond with the substrate.
   4. Base coat shall be left rough to assure adequate bond for finish coat. Apply base coat to same thickness and texture as the base coat of the existing sound plaster in surrounding wall.
   5. Moist cure base coat continuously for 48 hours minimum then let dry.

C. Application of Finish Coat:
1. Apply finish coat with sufficient pressure to ensure continuous bond with base coat.
2. Finish finish coat in plane with adjacent plaster.
3. Finish finish coat to match texture of surrounding plaster.

3.4 CRACK REPAIRS

A. Immediately prior to patching, create a saturated surface dry surface with no glistening water.
B. Hand-apply finish coat plaster working material into corners of groove.
C. Finish flush with and to match existing wall surface.

3.5 PROTECTION

A. Protect new Work from direct sun and wind exposure for 28 days minimum after installation, using tarped scaffolding or similar means.
B. Protect Work from damage or repair/replace until the date of Substantial Completion by Engineer.

END OF SECTION 09 24 00
Figure 1. Locations for Plaster Repair Mockups at the West Elevation

KEY
a. Clean dirt, soil stains general wall location (water wash, +2 chemicals)
b. Clean metal staining (water wash, +2 chemicals)
c. Clean white staining (water wash, +2 chemicals)
d. Clean dirt, soil stains garden wall location (water wash, +2 chemicals)
e. Paint removal (2 chemicals)
f. Patching repair at general wall location

(Note: Patch after paint is removed)
g. Patching repair at painted base location
h. Patching repair at garden wall location
i. Crack repair at general wall location
j. Plaster replacement at general wall location
k. Patch repair after paint removal
l. Patching repair at wall location with enhanced cement plaster (Mix 2)
m. Patching repair of sample removal
Figure 2. Additional/Alternate Locations for Mockups of Removal of Paint and Mismatched Patches, and Plaster Cleaning at the West Elevation

KEY

a. Clean dirt, soiling stains general wall location (water wash, +2 chemicals)
b. Clean metal staining (water wash, +2 chemicals)
c. Clean white staining (water wash, +2 chemicals)
d. Clean dirt, soiling stains garden wall location (water wash, +2 chemicals)
e. Paint removal (2 chemicals)
f. Patching repair at general wall location
g. Patching repair at painted base location
h. Patching repair at garden wall location
i. Crack repair at general wall location
j. Plaster replacement at general wall location
k. Patch repair after paint removal
l. Patching repair at wall location with enhanced cement plaster (Mix 2)
m. Patching repair of sample removal
Figure 3. Locations for Plaster Repair Mockups and Additional Investigation at the North Elevation

KEY
a. Clean dirt, soiling stains general wall location (water wash, +2 chemicals)
b. Clean metal staining (water wash, +2 chemicals)
c. Clean white staining (water wash, +2 chemicals)
d. Clean dirt, soiling stains garden wall location (water wash, +2 chemicals)
e. Paint removal (2 chemicals)
f. Patching repair at general wall location
  g. Patching repair at painted base location
  h. Patching repair at garden wall location
  i. Crack repair at general wall location
  j. Plaster replacement at general wall location
  k. Patch repair after paint removal
  l. Patching repair at wall location with enhanced cement plaster (Mix 2)
m. Patching repair of sample removal

(Note: Clean area prior to installing patch mockup)