A. PART 1—GENERAL

1.01 SUMMARY

A. This procedure includes guidance on repointing stone masonry using lime mortar.

B. Repointing is the process of removing deteriorated mortar from a masonry joint and replacing old mortar with new, sound mortar.

C. This process is sometimes referred to as "tuck pointing", though "tuck pointing", is actually a decorative treatment rather than a method of repair. True tuck pointing is the process of adding a finish layer of mortar, occasionally tinted, to the outer portion of a newly laid joint.

D. Major reasons for mortar joint failures include:
   1. Weathering action
   2. Settling
   3. Temperature cycles
   4. Poor original design and materials
   5. Lack of exterior maintenance

E. See 01100-07-S for general project guidelines to be reviewed along with this procedure. These guidelines cover the following sections:
   1. Safety Precautions
   2. Historic Structures Precautions
   3. Submittals
   4. Quality Assurance
   5. Delivery, Storage and Handling
   6. Project/Site Conditions
   7. Sequencing and Scheduling
   8. General Protection (Surface and Surrounding)
      These guidelines should be reviewed prior to performing this procedure and should be followed, when applicable, along with recommendations from the Regional Historic Preservation Officer (RHPO).

F. For guidance on preparing lime mortar, see 04100-03-S.

B. 1.02 SUBMITTALS

A. Manufacturers' literature describing packaged items.
B. Source and screen analysis of bulk aggregate.

C. Mortar sample: Submit, for verification and approval, a sample of each type of mortar used, in form of 6" long by 1/2" wide sample strips of mortar set in aluminum or plastic channels.
   1. Provide record of mortar mix, composition and field procedures to be followed.

C. 1.03 QUALITY ASSURANCE

A. Mock-ups: Raking and Repointing Sample Work:
   1. Test/Sample Area and RHPO Approval:
      a. Initially perform sample joint raking and repointing on each of a 100 sq. ft. test of stone, brick, and terra cotta areas as approved by FM.
      b. Demonstrate proficiency with joint raking tools and ability to not damage masonry units with either hand or power tools.
      c. Mix and cure test batch of repointing mortar and place in joints; repeat test mix until mortar color is approved. Test mortar should be matched, dried and approved before placing in joints.
      d. Demonstrate workmanship of repointing procedures and joint finishing.
      e. Gain written approval from OBO/OPS/CH for test area before proceeding with remaining work.
   3. Repointing Method: Repoint joints by hand ONLY using approved pointing trowels. NO "BAGGING" OR CAULKING GUN POINTING METHODS APPROVED.

D. 1.04 PROJECT/SITE CONDITIONS

A. Environmental Conditions: Perform repointing only when the temperature is between 40 degrees Fahrenheit and 80 degrees Fahrenheit. If the temperature is below 40 degrees, the mortar sets too slowly, and there is a good chance of freezing before it fully sets. If the temperature is above 80 degrees, the mortar will set too quickly, and there is a strong chance of excessive loss of water prior to adequate setting.

E. PART 2—PRODUCTS

F. 2.01 MANUFACTURERS

A. Repointing Tools: Available from good hardware stores, building material suppliers or mail-order catalogues.
1. The Stanley Gold-blatt Tool Co.

2. Marshalltown Trowel Co.

G. 2.02 MATERIALS

A. Lime mortar (See 04100-03-S for materials and procedures in preparing lime mortar)

B. Clean, potable water

H. 2.03 EQUIPMENT

A. Trowels: range in length from 10-12 inches

B. Chisels:
   1. Joint chisels or a standard mason's chisel with a 1-1/2 in. blade and a long narrow handle
   2. Floor chisels

C. Hammers:
   1. 5# stone dressing hammer
   2. 2# striking hammer
   3. "No-Bounce" hammer
   4. Full size and one half size brick hammers

D. Joint Tools: (see 2.01 MANUFACTURERS above)
   1. 3/8"-1/4" raised beaded tool
   2. 3/8"-1/4" beaded striking tool
   3. 1/2" raised beaded tool with offset handle
   4. 1/2" flat joint iron
   5. Pointing tool should be about 1/16" narrower than the joint being filled to achieve good compaction

E. Hawks: Plywood or steel hawk (mortar board)

F. Brushes:
   1. Natural bristle brushes
   2. Stiff bristle brushes (no wire)

G. Spray bottle

I. 2.03 MIXES
J. See 04100-03-S for lime mortar mixes

K. PART 3---EXECUTION

L. 3.01 EXAMINATION

A. Examine all existing exterior mortar joints. If the answer to any of the following questions is yes, then the building's joints are deteriorated and need repointing:

1. Are mortar joints eroded back more than 1/4" from the masonry face?
2. Are there cracks running vertically or horizontally through the mortar?
3. Are mortar bonds broken or pulled away from the masonry?
4. Has mortar fallen out of joints?
5. Is mortar excessively soft, powdery or crumbling?
6. Is pointing badly-stained?

B. Typical exterior damage due to mortar deterioration includes open joints, efflorescence, spalling and loosened masonry units.

C. Typical interior damage due to mortar deterioration includes failing plaster and stained wall paper.

D. A professional pointer experienced in old masonry is required for any of the following areas or conditions:

1. Chimneys need repointing
2. Window lintels must be rebuilt.
3. Masonry is loose or missing.
4. Work must be done from scaffolds or extension ladders.
5. The original mortar joints were "beaded"-tooled with a raised, round-profiled joint that projects out from the wall.

M. 3.02 PREPARATION

A. Preparing the Joints:

1. Clean area of loose dirt and debris using a stiff bristle brush and remove all extraneous fastenings and devices.
2. Install necessary protection of adjacent building materials, property and persons from joint cleaning work and dirt.
3. Control dust and dirt from raking work; dampen area being worked; and use curtains to limit spread of dust from joint raking and cutting operations.
B. Joint Cutting and Raking:

1. Cut and rake old mortar from existing joints by hand using a hammer and chisel. 
   NOTE: POWER CHISELS AND POWER SAWS SHOULD NOT BE USED.

2. Place the chisel in the center of the joint and pound it with a striking hammer or 
   "No-Bounce" hammer until the mortar disintegrates.

3. Rake out the loose material to a depth of about 1 inch and never to a depth less 
   than their width. Leave a clean, square face at the back of the joint to provide 
   optimum contact with the new mortar. 
   CAUTION: AVOID OVERCUTTING ENDS OF VERTICAL JOINTS, 
   WIDENING JOINTS OR CUTTING INTO BEDDING FACES OF MASONRY 
   UNITS.

4. While raking out joints, remove all metal fittings such as nails, brackets and clips 
   on both horizontal and vertical surfaces.

5. Carefully clean out the prepared face with a soft or stiff bristle brush, or blow the 
   joints clean with low-pressure compressed air (40-60 psi).

6. Thoroughly flush out joint with clean, clear water.

N. 3.03 ERECTION, INSTALLATION, APPLICATION

A. Filling Joints:

1. Dampen masonry surfaces and joints to control suction and evaporation before 
   placing repointing mortars. 
   NOTE: THERE SHOULD BE NO FREE WATER PRESENT WHICH MAY 
   CAUSE VOIDS IN THE MORTAR.

2. Using a pointing tool, push the mortar into the joint from a board and iron with 
   the maximum possible pressure; The mortar should be applied in layers, each to a 
   maximum thickness of 3/8".  
   NOTE: THE POINTING TOOL SHOULD BE ABOUT 1/16" NARROWER 
   THAN THE JOINT BEING FILLED TO ACHIEVE GOOD COMPACTION. IN 
   SOME CASES, THE JOINTS WILL BE SO THIN THAT A STANDARD 
   POINTING TOOL WILL NEED TO BE GROUND DOWN TO FIT THE 
   JOINT.

3. Thoroughly compact each layer of mortar and allow to set until thumb-print hard 
   before applying the next layer of mortar.

4. Fill the joints so that they are slightly recessed from the masonry face. Avoid 
   leaving a joint which is visually wider than the actual historical appearance.

5. Continuously keep all excess and spilled mortar brushed off the faces of masonry 
   units, ledges and other surfaces before it sets or stains the work.
B. Joint Finishing:

1. Begin when mortar attains "thumb print" hardness.

2. Tool the joint to match the old mortar.
   NOTE: IT IS IMPORTANT TO TOOL THE JOINT AT THE RIGHT STAGE; IF THE JOINT IS TOO SOFT, THE COLOR WILL BE LIGHTER THAN EXPECTED AND HAIRLINE SHRINKAGE CRACKS ARE LIKELY TO OCCUR; IF THE JOINT IS TOO HARD WHEN TOOLED, DARK STREAKS MAY APPEAR (TOOL BURNING) AND GOOD CLOSURE OF THE MORTAR AGAINST THE MASONRY WILL NOT BE ACHIEVED.
   EXCESSIVE TOOLING MAY BRING LIME AND FINE AGGREGATES TO THE SURFACE, CREATING A VISUAL CHANGE IN THE TEXTURE AND A SURFACE SUBJECT TO EARLY DETERIORATION.

3. To produce a roughened texture, lightly spray the mortar with water after the initial set, stipple the mortar with a stiff bristle brush or dab the mortar with coarse sacking.

4. Protect finished work from direct sun and rain until the face has dried and hardened.

O. 3.04 ADJUSTING/CLEANING

A. Cleaning Up:

1. Use masking and drop cloths to prevent mortar stains on adjacent work and ledges.

2. Keep work areas clean and free from mortar drips, spills and residue of waste mortars or wash-off.

3. Clean off excess mortar as work proceeds using masonry brushes before mortar sets.

4. Wash completed repointing work when finished mortar joints are set with clean water and masonry brushes, scrubbing only as required to clean mortar stains off masonry without scouring the units and joint faces.

5. Do not use acid or detergent cleaning agent to aid mortar removal and clean-up without written approval from FM.

B. Curing:

1. Schedule work only when moderate weather is forecast.

2. Protect completed work from adverse weather, heavy rainfall, freezing, and drying by direct sunlight and winds until cured.
3. Sprinkle or mist repointed work as required to achieve cure in mortar joints for a minimum of 72 hours after completion.

4. Lime Mortar: Cures by drying and crystallization, not by hydration; and can be washed out of joints if not protected before it cures.

C. Final Cleaning:

1. After mortar has fully hardened, thoroughly clean exposed masonry surfaces of excess mortar and foreign matter using stiff nylon or bristle brushes and clean water spray applied at low pressure. NOTE: USE OF METAL SCRAPERS OR BRUSHES IS NOT PERMITTED. USE OF ACID OR ALKALI CLEANING AGENTS IS NOT PERMITTED.

D. Some efflorescence, called new construction "bloom," occasionally appears on the surface within the first few months following a repointing project. These deposits normally are harmless and are removed by the natural washing of the rain. If not removed by natural weathering, they can be removed with dry brushing with a bristle brush. The use of chemical cleaners to remove this type of efflorescence normally is not necessary. AVOID USING ACIDS, PARTICULARLY MURIATIC ACID.
GENERAL NOTES

1.) DO NOT SCALE OFF OF DRAWINGS. DIMENSIONS NOT SHOWN SHOULD BE COORDINATED WITH THE STRUCTURAL ENGINEER OF RECORD.

2.) BUILDING CODE: IBC 2015 AMENDED PER 2018 OBO-ICS

3.) BASIC DESIGN WIND SPEED: 59 m/s (132mph) AT EXPOSURE CATEGORY C

4.) SEISMIC LOADING:
   S1 - 1.77g
   S2 - 0.845g
   OBO SEISMIC ZONE - VERY HIGH
   IMPORTANCE FACTOR - 1.0

5.) SEE ACCOMPANYING CALCULATION PACKAGE FOR LIVE AND DEAD LOADING INFORMATION

CONCRETE

1.) ALL CONCRETE COVER FOR REINFORCEMENT STEEL IS TO BE 2in U.N.O.

2.) ALL REINFORCEMENT STEEL IS TO MEET OR EXCEED REINFORCEMENT BAR STANDARDS AND YIELD STRENGTH SET BY EITHER ASTM 706M OR ASTM A615M STANDARDS.

3.) ALL CONCRETE IS TO PROVIDE A MINIMUM COMPRESSIVE STRENGTH OF 30MPa. MAXIMUM AGGREGATE SIZE IS TO BE 19mm AND A SLUMP BETWEEN 75-125.

4.) VERIFY ALL EXISTING FIELD CONDITIONS THAT MAY AFFECT THE INSTALLATION OF THE NEW CONCRETE BEAM. CONTACT ENGINEER OF RECORD IF CONDITIONS DO NOT MATCH THOSE IN THE DRAWINGS.

5.) ALL CONCRETE SHALL BE NORMAL WEIGHT CONCRETE.

6.) IF BAG MIX CONCRETE IS NOT USED, IT IS REQUIRED TO HAVE CONCRETE CYLINDERS TESTED, TO CONFIRM COMPRESSIVE STRENGTH AND FAILURE MODES. SEE ACI 318-18 FOR TESTING REQUIREMENTS.

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>EXPOSURE</th>
<th>ACI EXPOSURE CLASS</th>
<th>CLEAR COVER (mm)</th>
<th>F'c (MPa)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXTERIOR BEAMS</td>
<td>EXPOSED TO WEATHER</td>
<td>C2</td>
<td>50</td>
<td>30</td>
</tr>
</tbody>
</table>

STRUCTURAL STEEL

1.) ALL I-BEAM STEEL IS TO MEET ASTM A992M (EQUAL OR GREATER PROPERTIES)

2.) ALL ANGLE MATERIAL IS TO MEET ASTM A36M STANDARDS (EQUAL OR GREATER PROPERTIES).

4.) ALL BOLTS ARE TO MEET ASTM A325M STANDARDS (EQUAL OR GREATER PROPERTIES).

5.) ALL STRUCTURAL STEEL IS TO BE PRIMED AND PAINTED WITH A RUST INHIBITING COATING. PAINT SHOULD NOT BE APPLIED AT WELD LOCATIONS UNTIL AFTER WELDING IS COMPLETE. DO NOT WELD OVER PAINTED LOCATIONS. ANY COATING DAMAGED BY THE WELDING PROCESS SHOULD BE TOUCHED UP PRIOR TO USAGE.

MASONRY

1.) SEE MASONRY SPECIFICATIONS FOR DETAIL ON MASONRY REQUIREMENTS.
1.) THE VERTICAL SHORING LOAD IS EQUAL TO 25kN AT EACH BEAM END. POST AND SPREADER BEAM SHOULD BE ABLE TO RESIST THE PRESCRIBED LOADING. THE CONFIGURATION AND SECTIONS USED FOR THE SHORING (POST AND BEAM) ARE TO BE DESIGNED AND PROVIDED BY THE CONTRACTOR, SUBMIT CALCULATIONS FOR REVIEW BY OBO.

2.) THE HORIZONTAL SHORING LOAD IS EQUAL TO 1.25kN AT EACH BEAM END. POST SHOULD BE ABLE TO RESIST THE PRESCRIBED LOADING. THE CONFIGURATION AND SECTIONS USED FOR THE SHORING ARE TO BE DESIGNED AND PROVIDED BY THE CONTRACTOR, SUBMIT CALCULATIONS FOR REVIEW BY OBO.

3.) WOOD CRIBBING IS TO BE PROVIDED AT THE BASE OF THE VERTICAL SHORING ELEMENTS TO DISTRIBUTE THE LOAD ALONG THE GROUND SLAB. CONTRACTOR TO TAKE CARE NOT TO DAMAGE EXISTING SLAB, SUBMIT CALCULATIONS FOR REVIEW BY OBO

4.) ALL SHORING IS TO BE IN PLACE PRIOR TO BEAM REPLACEMENT WORKS, AND UNTIL CONCRETE REACHES IT’S 28 DAY STRENGTH.

---

S-101
SHORING PLAN & NOTES

BID DOCUMENTS
ALGIERS CMR - PSU STRUCTURAL UPGRADES

- Salvage existing PSU light for use in re-build.
- Demo existing parapet, salvage the brick for use in re-build.
- Salvage existing parapet, railing for use in re-build.
- Demo (2) existing steel beams.
- Provide shoring of corbel prior to beam removal.

Details:
- Detail A: Brick corbel
- Detail A (Sim)
- Elevator view

- Remove all plaster from all interior and exterior walls of the PSU structure.
- Provide temporary shoring of existing steel beams w/ post supports prior to demo and during installation of new concrete beam.
- Provide shoring support drawings for review by Embassy structural engineer.