SECTION 04 0513
CEMENT AND LIME MASONRY MORTARING

PART 1 - GENERAL

1.1 SUMMARY
A. Includes But Not Limited To:
   1. Quality of masonry mortar used on Project.

B. Related Sections:

1.2 REFERENCES
A. American Society For Testing And Materials:

1.3 SUBMITTALS
A. Quality Assurance / Control:
   1. If pre-mixed wet mortar or pre-blended dry mortar mix are to be used, provide certification from
      Manufacturer or Supplier verifying that mixes meet specification requirements.
   2. If site mixed / blended mortar is to be used, provide written description of proposed method of
      measuring and mixing of materials.

1.4 PROJECT CONDITIONS
A. Project Environmental Requirements:
   1. Cold Weather Requirements:
      a. Cold weather, as referred to in this Section, is four hours with ambient temperature below 40
deg F 4 deg C in 24-hour period. Do not lay masonry in cold weather unless authorized by
      Architect.
      b. Heat mixing water and sand as required during cold weather to produce mortar temperatures
         at application of between 70 and 120 deg F 21 and 49 deg C.
      c. Heat masonry units to 40 deg F 4 deg C minimum when ambient temperature is below 20
deg F minus 7 deg C.
      d. Provide windbreaks during construction if ambient temperature is 35 deg F 2 deg C or below
         and wind velocities exceed 15 mph 24 kph.
      e. If ambient temperature is 20 deg F minus 7 deg C or below, provide enclosure for masonry
         under construction with heat sources and maintain temperature in enclosure at 40 deg F 4
deg C minimum.
      f. Keep materials free of ice and snow. Do not lay masonry on frozen material.
   2. Hot Weather Requirements:
      a. Hot weather, as referred to in this Section, is ambient air temperature above 100 deg F 38
deg C or ambient air temperature above 90 deg F 32 deg C with wind velocity 8 mph 13 kph
         or greater.
      b. In hot weather, cool mixing water as necessary to maintain mortar and grout temperatures
         below 90 deg F 32 deg C.
      c. In hot weather, prevent rapid drying of walls by using fog spray or by covering wall with
         plastic or wet canvas or burlap.
PART 2 - PRODUCTS

2.1 MATERIALS

A. Portland Cement: Meet requirements of ASTM C 150, Type II Low Alkali unless approved otherwise in writing by Architect.

B. Hydrated Lime: Meet requirements of ASTM C 207, Type S.

C. Aggregate:
   1. Natural or manufactured sand meeting requirements of ASTM C 144 and following:
      a. Fineness modulus: 1.6 to 2.5 percent
      b. Water demand, ratio by weight: 0.65 percent maximum
      c. Grading:

<table>
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<tr>
<th>Sieve</th>
<th>Natural Sand</th>
<th>Manufactured Sand</th>
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<tbody>
<tr>
<td>No. 4</td>
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<tr>
<td>No. 50</td>
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<td>10 to 25</td>
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<table>
<thead>
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<th>Percent Passing</th>
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<tbody>
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D. Water: Clean and free of acids, alkalis, and organic materials.

E. Admixtures: Use no admixtures, except for color pigments specified below, without Architect's written permission. Use of any admixture to meet cold weather requirements and admixtures that increase air entrainment are expressly forbidden under all circumstances.

F. Mortar Color Pigment:
   1. High purity, chemically inert, unfading, alkali-fast mineral oxides, finely ground and especially prepared for mortar.
   2. Color Standard: <Insert Product> by <Insert Manufacturer>.
   3. Type One Acceptable Products:
      c. Equal as approved by Architect before bidding. See Section 01 6000.

2.2 MIXES

A. Unit Masonry Mortar:
   1. Minimum Compressive Strength at 28 Days:
      a. Type N: 750 psi 5.2 MPa.
      b. Type S: 1800 psi 6.9 MPa.
2. Parts by Volume:
   Type       N       S
   Portland Cement   1       1
   Hydrated Lime   1       1/2
   a. Damp Loose Sand: 2-1/4 minimum to three maximum, times sum of volumes of cement and lime used. Maintain sand piles in damp, loose condition.

3. Parts by Weight:
   Type       N       S
   Portland Cement   94 lbs  94 lbs
   Hydrated Lime   40 lbs   20 lbs
   Dry Sand         360 lbs minimum to 480 lbs maximum.
   Portland Cement   43 kg   43 kg
   Hydrated Lime   18 lbs   9 kg
   Dry Sand         163 kg minimum to 218 kg maximum

PART 3 - EXECUTION: Not Used

END OF SECTION