SECTION 04 05 13
MASONRY MORTARING

SPEC WRITER NOTE: Delete text between // ______// not applicable to project.
Edit remaining text to suit project.

PART 1 - GENERAL

1.1 SUMMARY
A. Section Includes:
   1. Masonry mortar installed by other // concrete and // masonry // sections.

1.2 RELATED REQUIREMENTS

SPEC WRITER NOTE: Update and retain references only when specified elsewhere in this section.

A. Mortar used in Section:
   1. Section 03 45 00, PRECAST ARCHITECTURAL CONCRETE.
   2. Section 04 01 00, MAINTENANCE OF MASONRY.
   3. Section 04 05 16, MASONRY GROUTING.
   4. Section 04 20 00, UNIT MASONRY.
   5. Section 04 72 00, CAST STONE MASONRY.

B. Mortar Color: Section 09 06 00, SCHEDULE FOR FINISHES.

1.3 APPLICABLE PUBLICATIONS

A. Comply with references to extent specified in this section.

B. ASTM International (ASTM):
   1. C40/C40M-11 - Organic Impurities in Fine Aggregates for Concrete.
   2. C91/C91M-12 - Masonry Cement.
   3. C144-11 - Aggregate for Masonry Mortar.
   6. C270-14a - Mortar of Unit Masonry.
   9. C979/C979M-10 - Pigments for Integrally Colored Concrete.
1.4 **SUBMITTALS**

A. Submittal Procedures: Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Manufacturer's Literature and Data:
   1. Description of each product.

   SPEC WRITER NOTE: Testing is not required on station level projects, or small alteration projects. Coordinate with Section 01 45 29, TESTING LABORATORY SERVICES.

C. Test Reports: Certify each product complies with specifications.
   1. Mortar.
   2. Admixtures.

D. Certificates: Certify each product complies with specifications.
   1. Portland cement.
   4. Hydrated lime.
   5. Fine aggregate.

E. Qualifications: Substantiate qualifications comply with specifications.
   1. Testing laboratory.

1.5 **QUALITY ASSURANCE**

A. Preconstruction Testing:
   1. Engage independent testing laboratory to tests and submit reports.
      a. Deliver samples to laboratory in number and quantity required for testing.
   2. Test mortar and materials specified.
   3. Mortar:
      a. Test for compressive strength and water retention according to ASTM C270.
      b. Minimum Mortar compressive strengths 28 days:
         1) Type M: 17.2 MPa (2,500 psi).
         2) Type S: 12.4 MPa (1,800 psi).
         3) Type N: 5.1 MPa (750 psi).
   4. Non Staining Cement: Test for water soluble alkali.
      a. Water Soluble Alkali: Maximum 0.03 percent.
5. Sand: Test for deleterious substances, organic impurities, soundness and grading.

1.6 DELIVERY
   A. Deliver products in manufacturer's original sealed packaging.
   B. Mark packaging, legibly. Indicate manufacturer's name or brand, type, color, production run number, and manufacture date.
   C. Before installation, return or dispose of products within distorted, damaged, or opened packaging.

1.7 STORAGE AND HANDLING
   A. Store masonry materials under waterproof covers on planking clear of ground.
      1. Protect loose, bulk materials from contamination.
   B. Protect products from damage during handling and construction operations.

1.8 WARRANTY

   SPEC WRITER NOTE: Always retain construction warranty. FAR includes Contractor's one year labor and material warranty.

   A. Construction Warranty: FAR clause 52.246-21, "Warranty of Construction."

PART 2 - PRODUCTS

2.1 MATERIALS
   A. Hydrated Lime: ASTM C207, Type S.
   B. Aggregate for Masonry Mortar: ASTM C144 and as follows:
      1. Light colored sand for mortar for laying face brick.
      2. White plastering sand meeting sieve analysis for mortar joints for pointing and laying of structural facing tile units except that 100 percent passes No. 8 sieve, and maximum 5 percent retained on No. 16 sieve.
      3. Test sand for color value according to ASTM C40/C40M. Sand producing color darker than specified standard is unacceptable.
   C. Blended Hydraulic Cement: ASTM C595/C595M, Type IS, IP.
   D. Masonry Cement: ASTM C91/C91M. Type N, S, Or M.
      1. Use white masonry cement whenever white mortar is specified.
   E. Mortar Cement: ASTM C1329/C1329M, Type N, S or M.
F. Portland Cement: ASTM C150/C150M, Type I.
   1. Use white Portland cement wherever white mortar is specified.

G. Pigments: ASTM C979/C979M; inorganic, inert, mineral pigments only, 
   unaffected by atmospheric conditions, nonfading, alkali resistant, and 
   water insoluble.

H. Water: Potable, free of substances that are detrimental to mortar, 
   masonry, and metal.

2.2 PRODUCTS – GENERAL

A. Basis of Design: Section 09 06 00, SCHEDULE FOR FINISHES.

B. Provide each product from one manufacturer // and from one production 
   run //.

2.3 MIXES

A. Pointing Mortar for New Work:
   1. For Cast Stone or Precast Concrete: Proportion by volume; one part 
      white Portland cement, two parts white sand, and 1/5 part hydrated 
      lime.
   2. Pointing Mortar for Glazed Structural Facing Tile:
      a. Proportion by volume: One part white Portland cement, two parts 
         of graded white sand passing Number 50 sieve, and 1/8 part 
         hydrated lime.

B. Tuck Pointing Mortar for Repair Work: Tuck pointing mortar specified in 
   Section 04 01 00, MAINTENANCE OF MASONRY.

C. Masonry Mortar: ASTM C270.
   1. Admixtures:
      a. Do not use mortar admixtures, and color admixtures unless 
         approved by Contracting Officer’s Representative.
      b. Do not use antifreeze compounds.

D. Colored Mortar:
   1. Maintain uniform mortar color for exposed work, throughout.
   2. Match mortar color in approved sample // or sample panel specified 
      in Section 04 20 00, UNIT MASONRY. //
   3. Alteration Work Mortar Color: Match existing mortar unless specified 
      otherwise in Section 09 06 00, SCHEDULE FOR FINISHES.

   SPEC WRITER NOTE: Use following paragraph 
   when colored admixtures are used.

E. Color Admixtures:
   1. Proportion as specified by manufacturer.
PART 3 - EXECUTION

3.1 PREPARATION
A. Examine and verify substrate suitability for product installation. 
B. Protect existing construction and completed work from damage.

3.2 MIXING
A. Measure ingredients by volume using known capacity container.
B. Mix for 3 to 5 minutes in a mechanically operated mortar mixer.
C. Mix water with dry ingredients in sufficient amount to provide a workable mixture which will adhere to vertical surfaces of masonry units.
D. Mortar Stiffened Because of Water Loss Through Evaporation:
   1. Re-temper by adding water to restore to proper consistency and workability.
   2. Discard mortar reaching initial set or unused within two hours of mixing.
E. Pointing Mortar:
   1. Mix dry ingredients with enough water to produce damp mixture of workable consistency retaining shape when formed into ball.
   2. Allow mortar to stand in dampened condition for 60 to 90 minutes.
   3. Add water to bring mortar to a workable consistency before use.

3.3 MORTARING
A. Type M Mortar: Use for precast concrete panels, parging below grade.
B. Type S Mortar: Use for masonry containing vertical reinforcing bars (non-engineered) masonry below grade masonry solar screens and setting cast stone and engineered reinforced unit masonry work.
C. Brick Veneer Over Frame Back Up Walls: Use Type S Portland cement-lime mortar.
D. Type N Mortar: Use for other masonry work.
E. Type N Mortar: Use for pointing items and tuck pointing specified.

3.4 FIELD QUALITY CONTROL

SPEC WRITER NOTE: Section 01 45 29, TESTING LABORATORY SERVICES includes VA provided testing for large projects and
contractor provided testing for small projects. Coordinate testing responsibility.

A. Field Tests: Performed by testing laboratory specified in Section 01 45 29, TESTING LABORATORY SERVICES.

1. Take and test samples during progress of work according to ASTM C780.

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