

VAMC COATESVILLE, PA
INSTALL BACKFLOW PREVENTER SOUTH PUMP BLDG 25
PROJECT NUMBER: 542-15-121

SECTION 04 05 13

MASONRY MORTARING

PART 1 GENERAL

1.1 DESCRIPTION

Section specifies mortar materials and mixes.

1.2 RELATED WORK

Mortar used in Section:

Section 04 05 16, MASONRY GROUTING.

Section 04 20 00, UNIT MASONRY.

1.3 TESTING LABORATORY-CONTRACTOR RETAINED

1.3.1 Laboratory

Engage a commercial testing laboratory approved by Contracting Officer Representative to perform tests specified below.

1.3.2 Laboratory Qualifications

Submit information regarding testing laboratory's facilities and qualifications of technical personnel to Contracting Officer Representative.

1.4 TESTS

1.4.1 Sampling

Take at least three specimens of mortar each day. Spread a layer of mortar 1/2 to 5/8 inch thick on the masonry units and allowed to stand for one minute. Prepare and test the specimens for compressive strength in accordance with ASTM C780. Submit test results.

1.4.2 Reports

Certified test reports.

1.4.3 Identification

Identify materials by type, brand name and manufacturer or by origin.

1.4.4 Approval

Do not use materials until laboratory test reports are approved by Contracting Officer Representative.

1.4.5 Changes

After tests have been made and materials approved, do not change without additional test and approval of Contracting Officer Representative.

1.4.6 Testing

1.4.6.1 Test materials proposed for use for compliance with specifications in accordance with test methods contained in referenced specifications and as follows:

1.4.6.2 Mortar

- a. Test for compressive strength and water retention; ASTM C270.
- b. Mortar compressive strengths 28 days as follows:
Type M: Minimum 17230 kPa (2500 psi) at 28 days.
Type S: Minimum 12400 kPa (1800 psi) at 28 days.
Type N: Minimum 5170 kPa (750 psi) at 28 days.

1.4.6.3 Cement

- a. Test for water soluble alkali (nonstaining) when nonstaining cement is specified.
- b. Nonstaining cement shall contain not more than 0.03 percent water soluble alkali.

1.4.6.4 Sand: Test for deleterious substances, organic impurities, soundness and grading.

1.4.6.5 High Bond Mortar: Test for compressive strength, tensile strength, flexural strength, and brick bond strength.

1.5 SUBMITTALS

1.5.1 Certificates

1.5.1.1 Testing laboratory's facilities and qualifications of its technical personnel.

1.5.1.2 Indicating that following items meet specifications:

- a. Portland cement.
- b. Masonry cement.
- c. Mortar cement.
- d. Hydrated lime.
- e. Fine aggregate (sand).
- g. Color admixture.

1.5.2 Laboratory Test Reports:

- a. Mortar, each type.
- b. Admixtures.

1.5.3 Manufacturer's Literature and Data:

- a. Cement, each kind.
- b. Hydrated lime.
- c. Admixtures.
- d. Liquid acrylic resin.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

1.6.1 Deliver masonry materials in original sealed containers marked with name of manufacturer and identification of contents.

1.6.2 Store masonry materials under waterproof covers on planking clear of ground, and protect damage from handling, dirt, stain, water and wind.

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1.7 APPLICABLE PUBLICATIONS

Publications listed below form a part of specification to extent referenced. Publications are referenced in text by basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM C40-04	Organic Impurities in Fine Aggregates for Concrete
ASTM C91-05	Masonry Cement
ASTM C109-08	Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or 50-MM Cube Specimens)
ASTM C144-04	Aggregate for Masonry Mortar
ASTM 150-09	Portland Cement
ASTM C207-06	Hydrated Lime for Masonry Grout
ASTM C270-10	Mortar for Unit Masonry
ASTM C307-03	(R2008) Tensile Strength of Chemical-Resistant Mortar, Grouts, and Monolithic Surfacing
ASTM C321-00	(R2005) Bond Strength of Chemical-Resistant Mortars
ASTM C348-08	Flexural Strength of Hydraulic Cement Mortars
ASTM C595-10	Blended Hydraulic Cement
ASTM C780-10	Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry
ASTM C979-10	Pigments for Integrally Colored Concrete
ASTM C1329-05	Mortar Cement

PART 2 PRODUCTS

2.1 HYDRATED LIME

ASTM C207, Type S.

2.2 AGGREGATE FOR MASONRY MORTAR

2.2.1 ASTM C144 and as follows:

- a. Light colored sand for mortar for laying face brick.
- b. White plastering sand meeting sieve analysis for mortar joints for pointing.

2.2.2 Test sand for color value in accordance with ASTM C40. Sand producing color darker than specified standard is unacceptable.

2.3 BLENDED HYDRAULIC CEMENT

ASTM C595, Type IS, IP.

2.4 MASONRY CEMENT

2.4.1 ASTM C91. Type N, S, or M.

2.4.2 Use white masonry cement whenever white mortar is specified.

2.5 MORTAR CEMENT

ASTM C1329, Type N, S or M.

2.6 PORTLAND CEMENT

2.6.1 ASTM C150, Type I.

2.6.2 Use white Portland cement wherever white mortar is specified.

2.7 LIQUID ACRYLIC RESIN

Formulation of acrylic polymers and modifiers in liquid form designed for use as an additive for mortar to improve physical properties.

2.8 WATER

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

2.9 POINTING MORTAR

For Cast Stone or Precast Concrete: Proportion by volume; One part white Portland cement, two parts white sand, and 1/5 part hydrated lime.

2.10 MASONRY MORTAR

2.10.1 Conform to ASTM C270.

2.10.2 Admixtures

2.10.2.1 Do not use mortar admixtures, except for high bond mortar, and color admixtures unless approved by Contracting Officer Representative.

2.10.2.2 Submit laboratory test report showing effect of proposed admixture on strength, water retention, and water repellency of mortar.

2.10.2.3 Do not use antifreeze compounds.

2.10.3 Colored Mortar

2.10.3.1 Maintain uniform mortar color for exposed work throughout.

2.10.3.2 Match mortar color in approved sample.

2.10.3.3 Color of mortar for exposed work in alteration work to match color of existing mortar.

2.10.4 Color Admixtures

Proportion as specified by manufacturer.

2.11 HIGH BOND MORTAR

2.11.1 Mixture by volume, one-part Portland cement, 1/4-part hydrated lime, three-parts sand, water, and liquid acrylic resin.

2.11.2 Mortar properties when tested in accordance with referenced specifications.

2.11.2.1 Compressive Strength, ASTM C109: Minimum 19,305 kPa (2800 psi), using 50 mm (2 inch) cubes.

2.11.2.2 Tensile Strength, ASTM C307: 3861 kPa Minimum (560 psi), using the 25mm (1 inch) briquettes.

2.11.2.3 Flexural Strength, ASTM C348: Minimum 6067 kPa (880 psi), using flexural bar.

2.11.2.4 Bond Strength, ASTM C321: Minimum 2965 kPa (430 psi), using crossed brick.

2.12 COLOR ADMIXTURE

2.12.1 Pigments: ASTM C979.

2.12.2 Use mineral pigments only. Organic pigments are not acceptable.

2.12.3 Pigments inert, stable to atmospheric conditions, nonfading, alkali resistant and water insoluble.

PART 3 EXECUTION

3.1 MIXING

3.1.1 Mix in a mechanically operated mortar mixer.

3.1.1.1 Mix mortar for at least three minutes but not more than five minutes.

3.1.2 Measure ingredients by volume. Measure by the use of a container of known capacity.

3.1.3 Mix water with dry ingredients in sufficient amount to provide a workable mixture which will adhere to vertical surfaces of masonry units.

3.1.4 Mortar that has stiffened because of loss of water through evaporations:

3.1.4.1 Re-tempered by adding water to restore to proper consistency and workability.

3.1.4.2 Discard mortar that has reached its initial set or has not been used within two hours.

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3.1.5 Pointing Mortar:

- 3.1.5.1 Mix dry ingredients with enough water to produce a damp mixture of workable consistency which will retain its shape when formed into a ball.
- 3.1.5.2 Allow mortar to stand in dampened condition for one to 1-1/2 hours.
- 3.1.5.3 Add water to bring mortar to a workable consistency prior to application.

3.2 MORTAR USE LOCATION

- 3.2.1 Use Type M mortar for precast concrete panels, and waterproof parging below grade.
- 3.2.2 Use Type S mortar for masonry containing vertical reinforcing bars (non-engineered), masonry below grade, and engineered reinforced unit masonry work.
- 3.2.3 For brick veneer over frame back up walls, use Type N portland cement-lime mortar or Type S masonry cement or mortar cement mortar.
- 3.2.4 Use Type N mortar for other masonry work, except as otherwise specified.
- 3.2.5 Use Type N mortar for tuck pointing work
- 3.2.6 Use pointing mortar for items specified.

-- End of Section --