

SECTION 04 05 11

MASONRY MORTARING AND GROUTING

PART 1 – GENERAL

1.1 PURPOSE

- A. This guideline is intended to provide useful information to the Professional Service Provider (PSP) to establish a basis of design. PSP is to apply the principles of this section such that the University of Texas at Arlington (UTA) may achieve a level of quality and consistency in the design and construction of their facilities. Deviations from these guidelines must be approved by UTA and may require justification through Life Cycle Cost (LCC) analysis and submitted to UTA for approval.

1.2 LESSONS LEARNED AND DESIGN CONSIDERATIONS

- A. **Grout color(s) to match existing on building (if expansion); otherwise, as selected by Architect to complement masonry.**
- B. **Mock-ups may require multiple samples of mortar/grout to be selected by Architect and UTA.**

1.3 WORK INCLUDED

- A. Mortar for masonry/stone.

1.4 RELATED WORK

- A. Section 04 21 00 – Brick Masonry
- B. Section 04 22 00 – Concrete Masonry Units

1.5 REFERENCE STANDARDS

- A. ACI 530/530.1/ERTA – Building Code Requirements and Specification for Masonry Structures and Related Commentaries; American Concrete Institute International; current edition.
- B. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; current edition.
- C. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; current edition.
- D. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; current edition.
- E. ASTM C270 - Standard Specification for Mortar for Unit Masonry; current edition.
- F. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; current edition.
- G. ASTM C476 - Standard Specification for Grout for Masonry; current edition.
- H. ASTM C780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry; current edition.
- I. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete; current edition.
- J. ASTM C1019 - Standard Test Method for Sampling and Testing Grout; current edition.
- K. ASTM C1072 - Standard Test Method for Measurement of Masonry Flexural Bond Strength; current edition.
- L. ASTM C1314 - Standard Test Method for Compressive Strength of Masonry Prisms; current edition.
- M. ASTM E518/E518M - Standard Test Methods for Flexural Bond Strength of Masonry; current edition.

1.6 SUBMITTALS

- A. See Division 01 for submittal procedures.
- B. Product Data: Include design mix and indicate whether the Proportion or Property specification of ASTM C270 is to be used.
- C. Submit (2) samples of mortar, illustrating mortar color and color range.

1.7 DELIVERY, STORAGE AND HANDLING OF MATERIALS

- A. Deliver, store, and handle materials to prevent inclusion of foreign materials and damage by water or weather. Store packaged materials in their original packages. Damaged or deteriorated materials shall be removed from the premises.

1.8 ENVIRONMENTAL CONDITIONS

- A. Cold and Hot Weather Requirements: Comply with requirements of ACI 530/530.1/ERTA or applicable building code, whichever is more stringent.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Portland Cement: ASTM C150, Type 1 – normal; color as required to produce approved color sample.
- B. Hydrated Lime: ASTM C207, Type S.
- C. Mortar Aggregate: ASTM C144.
- D. Grout Aggregate: ASTM C404.
- E. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with ASTM C979/C979M.
 - 1. Color(s): To match Architect's sample(s) when incorporated into specified mix design(s).
- F. Water: Clean and potable.

2.2 MORTAR MIXES

- A. Mortar for Unit Masonry: ASTM C270, Property Specification, pre-blended SPEC Mix.
 - 1. Exterior, masonry/stone: Type N.
- B. Special shape cast face bricks shall be as detailed and at locations as indicated on the drawings.
- C. Furnish special non-cored face brick in locations where cores would be exposed in finish work.

2.3 MORTAR MIXING

- A. Thoroughly mix mortar ingredients using mechanical batch mixer, in accordance with ASTM C270 and in quantities needed for immediate use.
- B. Maintain sand uniformly damp immediately before the mixing process.
- C. Colored Mortar: Proportion selected pigments and other ingredients to match Architect's sample, without exceeding manufacturer's recommended pigment-to-cement ratio; mix in accordance with manufacturer's instructions, uniform in coloration.
- D. Add mortar color in accordance with manufacturer's instructions. Provide uniformity of mix and coloration.
- E. Add admixtures in accordance with manufacturer's instructions; mix uniformly.
- F. Do not use anti-freeze compounds to lower the freezing point of mortar.
- G. If water is lost by evaporation, re-temper only within two hours of mixing.

2.4 GROUT MIXES

- A. Bond beams: 3,500 psi strength at 28 days; 8-10 inches slump; mix in accordance with ASTM C476.
 - 1. Fine grout for spaces with smallest horizontal dimension of 2 inches or less.
 - 2. Coarse grout for spaces with smallest horizontal dimension greater than 2 inches.

2.5 GROUT MIXING

- A. Mix grout in accordance with ASTM C94/C94M.
- B. Thoroughly mix grout ingredients in quantities needed for immediate use in accordance with ASTM C476 for fine and coarse grout.
- C. Add admixtures in accordance with manufacturer's instructions; mix uniformly.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. Install mortar to requirements of section(s) in which masonry is specified.
- B. Work grout into masonry cores and cavities to eliminate voids.
- C. Do not install grout in lifts greater than 32 inches without consolidating grout by rodding.
- D. Do not displace reinforcement while placing grout.
- E. Remove excess mortar from grout spaces.

3.2 GROUTING

- A. Perform all grouting by means of low-lift technique. Do not employ high-lift grouting.
- B. Low-Lifting Grouting:
 - 1. Limit height of pours to 24 inches.
 - 2. Limit height of masonry to 8 inches above each pour.
 - 3. Pour grout only after vertical reinforcing is in place; place horizontal reinforcing as grout is poured. Prevent displacement of bars as grout is poured.

GUIDE SPECIFICATIONS FOR DESIGN AND CONSTRUCTION DOCUMENTS

4. Place grout for each pour continuously and consolidate immediately; do not interrupt pours for more than 1-1/2 hours.
- 3.3 FIELD QUALITY CONTROL
- A. An independent testing agency will perform field test, in accordance with provisions of Section 01 40 00.
 - B. Test and evaluate mortar in accordance with ASTM C780 procedures.
 1. Test with same frequency as specified for masonry units.
 - C. Test and evaluate grout in accordance with ASTM C1019 procedures.
 1. Test with same frequency as specified for masonry units.
 - D. Prism Test: Test masonry and mortar panels for compressive strength in accordance with ASTM C1314, and for flexural bond strength in accordance with ASTM C1072 or ASTM E518; perform tests and evaluate results as specified in individual masonry sections.
- 3.4 SCHEDULES
- A. Mortar Color:
 1. Stone: Selected from manufacturer's full mortar color line.
 2. Ground Face Concrete Masonry Units: Selected from manufacturer's full mortar color line.

END OF SECTION