SECTION 040514

MASONRY MORTARING AND GROUTING

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

**NOTE TO SPECIFIER**

*Use this Specification Section for Mail Processing Facilities.*

***This is a Type 1 Specification with completely editable text; therefore, any portion of the text can be modified by the A/E preparing the Solicitation Package to suit the project.***

*For Design/Build projects, do not delete the Notes to Specifier in this Section so that they may be available to Design/Build entity when preparing the Construction Documents.*

*For the Design/Build entity, this specification is intended as a guide for the Architect/Engineer preparing the Construction Documents.*

*The MPF specifications may also be used for Design/Bid/Build projects. In either case, it is the responsibility of the design professional to edit the Specifications Sections as appropriate for the project.*

*Text shown in brackets must be modified as needed for project specific requirements.* *See the “Using the USPS Guide Specifications” document in Folder C for more information.*

*The last date that USPS revised this standard specification section occurs in two places, at the end of this section and in the Table of Contents. If the date in this section matches the date in the Table of Contents, then you are using the latest version. Do not delete or revise the “last revised” date at the end of the section during the development of the Project Manual.*

*The footer in this section should be edited to replace the text, “USPS MPF SPECIFICATION” with the project name, and the blank date in the center should be replaced with the submission date, for interim design reviews, or the issue date of the completed Project Manual.*

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

1. GENERAL
	1. SUMMARY
		1. Section Includes:
			1. Mortar and for unit masonry.
			2. Grout for unit masonry.
		2. Related Sections:
			1. Section 042100 - Clay Unit Masonry: Installation of mortar and grout, reinforcement and anchorages.
			2. Section 042200 - Concrete Unit Masonry: Installation of mortar and grout, reinforcement and anchorages.
	2. REFERENCES
		1. American Society for Testing and Materials (ASTM):
			1. ASTM C 94 - Specification for Ready-Mixed Concrete.
			2. ASTM C 143 - Test Method for Slump of Hydraulic Cement Concrete.
			3. ASTM C 144 - Specification for Aggregate for Masonry Mortar.
			4. ASTM C 150 - Specification for Portland Cement.
			5. ASTM C 207 - Specification for Hydrated Lime for Masonry Purposes.
			6. ASTM C 270 - Specification for Mortar for Unit Masonry.
			7. ASTM C 387 - Specification for Packaged, Dry, Combined Materials for Mortar and Concrete.
			8. ASTM C 404 - Specification for Aggregates for Masonry Grout.
			9. ASTM C 476 - Specification for Grout for Masonry.
			10. ASTM C 1019 - Method of Sampling and Testing Grout.
			11. ASTM C 1142 - Specification for Extended Life Mortar for Unit Masonry.
		2. IMIAC - International Masonry Industry All-Weather Council: Recommended Practices and Guide Specifications for Cold Weather Masonry Construction.
	3. SUBMITTALS
		1. Section 013300 - Submittal Procedures: Procedures for submittals.
			1. Samples: Submit two samples 3 inch x 3 inch in size illustrating mortar color and color range.
			2. Assurance/Control Submittals:
				1. Design Data: Design mix in accordance with the Proportion specification of ASTM C 270 and required environmental conditions.
				2. Test Reports: Submit the following reports directly to Contracting Officer from Testing Laboratory, with copy to Contractor. Prepare reports in conformance with Section 014000 - Quality Requirements.

Conformance to Proportion specification of ASTM C 270.

Test and evaluation reports to ASTM C 780.

* + - * 1. Certificates: Submit manufacturer's certificate that Products meet or exceed specified requirements.
	1. QUALITY ASSURANCE
		1. Installer Qualifications: Company specializing in performing the Work of this Section with minimum 5 years documented experience.
	2. DELIVERY, STORAGE AND HANDLING
		1. Section 016000 - Product Requirements: Transport, handle, store, and protect Products.
		2. Store sand for mortar on plastic sheeting to prevent contamination by extraneous chemicals in earth beneath.
	3. PROJECT CONDITIONS OR SITE CONDITIONS
		1. Environmental Requirements:
			1. Cold Weather Requirements: IMIAC - Recommended Practices and Guide Specifications for Cold Weather Masonry Construction.
			2. Specific Cold Weather Requirements: When the ambient air temperature is below 40 degrees F, heat mixing water to maintain mortar temperature between 40 degrees F and 120 degrees F until placed. When the ambient air temperature is below 32 degrees F, heat the sand and water to maintain this mortar temperature.
1. PRODUCTS
	1. MATERIALS
		1. Portland Cement: ASTM C 150, normal‑Type I or Type II; gray color. Fly ash, slag, and pozzolans not permitted as substitutes for Portland cement.
		2. Mortar Aggregate: ASTM C 144, standard masonry type; clean, dry, protected against dampness, freezing, and foreign matter.
		3. Grout Aggregate: ASTM C 404; use of blast furnace slag is not permitted. Maximum coarse aggregate size, 3/8 inch.
		4. Calcium chloride is not permitted in mortar or grout. Admixtures or other chemicals containing Thyocyanates, Calcium Chloride or more than 0.1 percent chloride ions are not permitted.
		5. Hydrated Lime: ASTM C 207, Type S.
		6. Water: Potable.
		7. Admixtures: Not permitted unless approved by Contracting Officer prior to construction.
	2. MIXES - MORTAR
		1. Mortar: Type "N" or Type "S", as recommended by manufacturer, in accordance with the Proportion specification of ASTM C 270.
			1. Mixing of components on-site is acceptable.
			2. Mixing on-site water and packaged dry blended mix for mortar (ASTM C 387), that contains no masonry cement, is acceptable.
		2. Pointing Mortar: Duplicate original mortar proportions. Add aluminum tristearate, calcium stearate, or ammonium stearate equal to 2 Percent of Portland cement weight.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

**NOTE TO SPECIFIER**

Edit below for mortar color:

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

* + 1. Mortar Color: [ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ].
	1. MIXING - MORTAR
		1. Thoroughly mix mortar ingredients in accordance with ASTM C 270, in quantities needed for immediate use.
			1. Maintain sand uniformly damp immediately before the mixing process.
			2. Provide uniformity of mix and coloration.
			3. Do not use anti-freeze compounds.
			4. If water is lost by evaporation, retemper only within 2 hours of mixing. Do not retemper mortar more than 2 hours after mixing.
	2. MIXES - GROUT FILL
		1. Grout fill is for concrete masonry unit bond beams, lintels, and reinforced cells with reinforcing bars and embedded plates.
			1. Compressive Strength: 2000 psi minimum at 28 days, as determined in accordance with the provisions of ASTM C 1019.
			2. Slump: 8 inches, minimum; 10 inches, maximum, taken in accordance with ASTM C 143.
			3. Use coarse grout when grout space is equal to or greater than 4 inches in both directions.
			4. Use fine grout when grout space is smaller than 4 inches in either direction.
			5. Do not use air-entrainment admixtures.
	3. MIXING - GROUT
		1. Grout: Batch and mix grout in accordance with ASTM C 94 or ASTM C476 for site batched and mixed grout. Do not use anti-freeze compounds to lower the freezing point of grout.
1. EXECUTION
	1. EXAMINATION
		1. Section 017300 - Execution: Verification of existing conditions before starting work.
		2. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive Work.
		3. Report in writing to Contracting Officer prevailing conditions that will adversely affect satisfactory execution of the Work of this Section. Do not proceed with Work until unsatisfactory conditions have been corrected.
		4. By beginning Work, Contractor accepts conditions and assumes responsibility for correcting unsuitable conditions encountered at no additional cost to the United States Postal Service.
	2. INSTALLATION
		1. After reinforcing of masonry is securely tied in place, plug cleanout holes with masonry units. Brace against wet grout pressure.
		2. Install mortar and grout under provisions of Section 042200
	3. FIELD QUALITY CONTROL
		1. Section 014000 - Quality Requirements: Procedures for testing.
		2. Testing - Masonry Grout: Conduct strength tests in accordance with ASTM C 1019.
			1. Take two strength samples for each 5000 square feet of masonry wall surface for each type of grout placed each day.
			2. Create test samples by forming with wood surface on bottom and concrete block on sides. The samples shall be 3 inches square and 6 inches high.
			3. Initial cure during first 48 hours. Protect samples from loss of moisture by covering with wet cloth and keeping moist. Protect from freezing and variations in temperature. Record maximum and minimum temperatures by using a max/min thermometer.
			4. Remove masonry units that form samples after 48 hours and transport grout samples to laboratory. Keep samples protected from vibration, freezing, and moisture loss during transportation.
			5. Test samples with test method ASTM C 39 at 28 days. Compressive strength shall be the average of the two samples and shall be adequate if it equals the designated compression strength as defined on the Drawings, but not less than 2000 psi.
		3. Testing - Masonry Mortar: Conduct strength tests in accordance with the following:
			1. Spread mortar on the masonry units 1/2 inch to 5/8 inch thick, and allow to stand for one minute.
			2. Remove mortar and place in a 2-inch by 4-inch cylinder in two layers, compressing the mortar into the cylinder using a flat-end stick or fingers. Lightly tap mold on opposite sides, level off and immediately cover molds and keep them damp until taken to the laboratory.
			3. After 48 hours' set, have the laboratory remove molds and place them in the fog room until tested in damp condition.

END OF SECTION

USPS MPF Specification Last Revised: 10/1/2022