Section 702. MORTAR AND GROUT

702.01. Description. This work consists of producing and furnishing mortars and grouts proportioned as required.

702.02. Materials. Provide material in accordance with the following:

Portland Cement Type I, Type IA	901
Masonry Cement Type N, Type S, Type M	901
Hydrated Lime Type S, Type SA	901
Fine Aggregate 2NS, 2MS	902
Air-Entraining Admixture	903
Water	911

A. **Standard Mortars and Grouts.** Proportion cement and fine aggregates, as specified in Table 702-1A and Table 702-1B, by weight for batches of at least 1 cubic yard, and by weight or volume for smaller batches. Add water to obtain a mortar or grout of the consistency required.

B. **Non-shrinking Mortar and Grout, Type H-1 (Non-metallic).** Provide Type H-1 non-shrinking mortar and grout, selected from the Qualified Products List, for filling post-tensioning stress pockets in fascia beams of prestressed box beams, under leveling plates supporting structures, and for grouting dowels.

C. **Expansive Grout, Type E-1.** Provide Type E-1 expansive grout for filling the void around post-tensioned tendons in precast concrete box beams. Proportion the grout as follows:

1. Type I portland cement, 94 pounds;
2. Water, no greater than 5 gallons; and
3. Expansive admixture, as recommended by the manufacturer.

Do not use sand in the grout mixture. Do not use grout containing aluminum or other components that produce hydrogen, carbon dioxide, or oxygen gas.

Ensure grout attains a 28-day minimum compressive strength of 3,000 psi, in accordance with ASTM C 942, except proportion the grout as specified in this subsection.

Do not use expansive admixtures, plasticizing, or water-reducing agents that contain chloride ions in excess of 0.50 percent by weight, fluorides, sulfides, nitrates, thixotropic additives, or chemicals that may contribute to stress corrosion in steel.

Provide admixtures in liquid or solid form. Use a gas-evolving material, well dispersed throughout the admixture. Provide grout with an unrestrained expansion from 5 percent to 10 percent, in accordance with ASTM C 940, except proportion the grout as specified in this subsection, and determine expansion at 3 hours.

702.03. Construction. The Contractor may remix mortars and grouts.

Do not retemper mortars and grouts or use grout and mortar after it begins to set.

Place mortar and grout when materials receiving the application of mortar and grout, maintain a temperature of at least 40 °F during the placement and curing period.

702.04. Measurement and Payment. The cost of producing and furnishing mortar or grout is included in the unit prices for other relevant pay items.

Table 702-1A
Proportioning Standard Mortars and Grouts by Dry Weight

Mortar or Grout Type	General Use	Materials				Mix Proportions by Dry Weight (lb/cyd)				
		Portland Cement	Masonry Cement	Hydrated Lime	Fine Aggregate	Portland Cement	Masonry Cement	Hydrated Lime	Fine Aggregate	Net Water
R-1 (Grout)	Bond or Primer Coat	Type I,IA	—	—	2NS	1,175	—	—	964	705
R-2 (Mortar) (a)	Patching Spalls; Filling Space Between Box Beams	—	Type M	—	2MS	—	930	—	2,137	415
		Type I	Type N	—	2MS	468	349	—	1,991	415
		Type I,IA	—	Type S,SA	2MS	828	—	75	2,016	415
		Type I,IA	—	—	2MS,2NS	930	—	—	1,966	415
R-3 (Mortar) (a)	Setting Precast Concrete Barriers; Filler Between Slope Protection Blocks and Riprap	Type I,IA	—	—	2NS	765	—	—	2,266	353

a. Provide an entrained air content of 14 percent ±4 percent for mortars by using masonry cement, Type IA portland cement, Type SA lime, or an air-entraining admixture. Do not combine masonry cement and Type IA portland cement, or Type IA portland cement and Type SA lime, unless tests indicate the air content is within acceptable limits.

Table 702-1B
Proportioning Standard Mortars and Grouts by Bulk Volume Parts

Mortar or Grout Type	General Use	Materials				Mix Proportions by Bulk Volume Parts			
		Portland Cement	Masonry Cement	Hydrated Lime	Fine Aggregate	Portland Cement	Masonry Cement	Hydrated Lime	Fine Aggregate
R-1 (Grout)	Bond or Primer Coat	Type I,IA	—	—	2NS	1	—	—	1
R-2 (Mortar) (a)	Patching Spalls; Filling Space Between Box Beams	—	Type M	—	2MS	—	1	—	2½
		Type I	Type N	—	2MS	(b)	(b)	—	(b)
		Type I,IA	—	Type S,SA	2MS	(b)	—	(b)	(b)
		Type I,IA	—	—	2MS,2NS	1	—	—	2½
R-3 (Mortar) (a)	Setting Precast Concrete Barriers; Filler Between Slope Protection Blocks and Riprap	Type I,IA	—	—	2NS	1	—	—	3½

a. Provide an entrained air content of 14 percent ±4 percent for mortars by using masonry cement, Type IA portland cement, Type SA lime, or an air-entraining admixture. Do not combine masonry cement and Type IA portland cement, or Type IA portland cement and Type SA lime, unless tests indicate the air content is within acceptable limits.
b. Do not proportion by volume if blending cementitious materials (portland cement, masonry cement, or lime).