

SECTION 1017—PRESSURE MORTAR POINTING AND SURFACING

1017.1 DESCRIPTION—This work is the pointing and the surfacing of areas of structures.

1017.2 MATERIAL—

(a) **Cement.** [Section 701](#)

(b) **Fine Aggregate.** Type A, [Section 703.1](#)

(c) **Water.** [Section 720.1](#)

(d) **Reinforcement Bars.** [Section 709.1](#)

(e) **Fabric Reinforcement.** AASHTO M 55 ([ASTM A 185](#)). Use fabric reinforcement, consisting of galvanized, welded straight-line fabric, conforming to one of the following:

- 2.68 mm (No. 12 gage) wire, spread 50 mm (2 inches) in each direction;
- 3.43 mm (No. 10 gage) wire, spaced 75 mm (3 inches) in each direction; or
- as indicated.

Certify as specified in [Section 106.03\(b\)3](#).

(f) **Burlap.** [Section 711.1\(d\)](#)

(g) **Liquid Membrane-Forming Curing Compound, Clear.** [Section 711.2\(a\)](#)

(h) **Expansion Bolts.** From a manufacturer listed in [Bulletin 15](#).

Certify as specified in [Section 106.03\(b\)3](#).

1017.3 CONSTRUCTION—

(a) **Preparation of Structure.** Thoroughly clean the surfaces and voids of rust, scale, grease, loose and disintegrated particles, and material that might impair the bond between the surfaces to be covered and the mortar mixture. Remove unsound concrete and mortar, as directed. Clean by means of compressed air and waterblasting, by handscraping, and by sandblasting, if necessary.

(b) **Placing Reinforcement.** Lap adjacent sheets of fabric at least 100 mm (4 inches) for 50 mm (2-inch) mesh and at least 150 mm (6 inches) for 75 mm (3-inch) mesh. Fasten fabric together with wire ties at intervals of not more than 450 mm (18 inches).

1. Steel Surfaces. Place fabric on the top, sides, and bottom of steel members. Bend the fabric to conform to the outlines of the members and hold approximately 20 mm (3/4 inch) away from the surface of the members, or as directed. Place 6 mm (1/4-inch) diameter bars vertically on each side of the webs, then tie in place, using holes in the webs or clip plates. Space on 900 mm (3-foot) centers, or as indicated. Tie the fabric outside of and to the bars, on approximately 300 mm (12-inch) centers. Place the fabric or bars clear of the surface of the members.

2. Masonry Surfaces. In areas of buildup for the replacement of disintegrated material, unless otherwise indicated or directed, place a layer of fabric for each 75 mm (3-inch) layer of mortar or fraction thereof. More than one layer of fabric may be attached to an anchor bolt, provided the bolt is long enough.

Hold the fabric in place by means of lead-collared expansion bolts, either 6 mm x 75 mm (1/4 inch by 3 inches), or 10 mm x 100 mm (3/8 inch by 4 inches). Use longer bolts, where necessary. Space 6 mm (1/4-inch) diameter bolts approximately 500 mm (20 inches) center-to-center in each direction, starting 75 mm (3 inches) from the outside edges of the areas to be pressure-mortared. Space 10 mm (3/8-inch) diameter bolts approximately 750 mm (30 inches) center-to-center in each direction, starting 150 mm (6 inches) from the outside edges of the areas to be pressure mortared. Fasten the fabric to the expansion bolts away from the prepared surface, with 25 mm (1 inch) clear below the finished surface of the repair.

Where existing reinforcement is exposed due to removal of deteriorated concrete, fabric may be tied to this reinforcement at 450 mm (18-inch) intervals, to form a cage to position and support the fabric within 25 mm (1 inch) of the finished surface of repair.

Avoid excessive fabric layers, which may create planes of weakness or internal stresses.

(c) Mixing Mortar. Mix the mortar of one part cement and 3 1/2 parts fine aggregate. Thoroughly dry-mix the mortar in a batch mixer. Screen the dry-mix and remove material retained on a 4.75 mm (No. 4) sieve, before placing the mixture in the hopper of the mortar pressure gun. Do not mix more than 1 hour's supply of mortar at a time. Keep the mixture in the gun bin thoroughly stirred.

(d) Pressures. At the gun, supply air pressure of at least 240 kPa (35 pounds per square inch) when shooting the mixture. Increase the air pressure, as necessary, when the lift is greater than 7600 mm (25 feet), or when using more than 30 m (100 feet) of hose. Maintain uniform air pressure. At the nozzle, maintain a uniform water pressure of at least 100 kPa (15 pounds per square inch) greater than the air pressure at the gun. Supply pressure in the lower gun chamber to produce a nozzle velocity of 115 m/s to 140 m/s (375 feet per second to 450 feet per second), with a 32 mm (1 1/4-inch) tip opening. Vary these pressures and velocities only when directed. Determine the nozzle pressure and velocity from the nozzle velocity meter attached to the gun.

(e) Moisture Content of Mortar. Use approximately 8% to 10% moisture, by mass (weight), when shooting, of approximately 0.31 L of water per kilogram (3 1/2 gallons of water per bag) of cement. Do not use a greater quantity of water than necessary to produce a proper mixture. When using reinforcement fabric, supply a moisture content of approximately 8%, for mortar below the fabric, and approximately 9% to 10% above the fabric.

(f) Application. Perform pressure mortar work under the continuous supervision of an experienced pressure-gun foreperson, using only experienced personnel as gun and nozzle operators. When pointing masonry, saturate the surfaces with clean water before applying mortar. When surfacing structural steel, keep the outer edges of the mortar at the flanges and stiffeners square and true to line by using shooting strips, placed to maintain the specified dimensions without trapping the rebound.

Use guide strips at corners and other places, where necessary, to ensure true lines, corners, and the placement of specified thickness, dimensions, and designs. Bring mortared surfaces to a reasonably true plane, then finish the entire mortared area with a pressure-gun finish. Apply the main body of the mortar in at least two coats. Apply bottom surfaces in at least two coats to obtain proper adhesion and to avoid sagging. Bring the last main coat to within 3 mm (1/8 inch) of the proposed surface, then correct irregularities and remove high spots with trowels. Give the entire surface a thin coat of mortar, but do not trowel or float. If directed, give the final surfaces a finish using a long-bristled brush, saturated with clean water, then dragged over the surfaces. Do not work the surfaces with the brush.

For masonry pointing, or pointing and surfacing, fill voids with mortar, making the surface flush with the adjacent face of the structure. After completing the pointing, clean the face of the masonry.

Shoot mortar at right angles to the surface, holding the gun nozzle approximately 900 mm (3 feet) from the surface, when using a 20 mm (3/4-inch) or a 25 mm (1-inch) nozzle, or 1200 mm (4 feet) from the surface, when using a 32 mm (1 1/4-inch) nozzle. Use a shorter distance only where working space requires closer shooting. Remove deposits of loose fine aggregate. If any deposit of loose, fine aggregate is covered by succeeding layers of mortar, remove the surfacing and replace with suitable mortar. At the end of a day's work or at other required stopping periods, slope off the mortar to a thin edge. Do not use square joints. Before shooting the adjacent section, joining new work to old work, or placing additional coats, clean this sloped portion, old work, or previous coat.

Saturate the previous coat by a combination of air and water blasting. Do not place mortar unless the air temperature or the surface on which it is placed is 10 °C (50F) or higher.

(g) Curing. Immediately after initial hardening, saturate mortar and keep wet for a period of at least 96 hours. Protect pressure mortar pointing and surfacing on masonry surfaces, and where practical on structural steel, with burlap. Keep burlap wet during this curing period.

If allowed as an alternative to burlap curing, apply Liquid Membrane Forming Curing Compound, Clear, as specified in [Section 1001.3\(p\)3.a.](#)

Cure in cool and cold weather, as specified in [Section 1001.3\(p\).](#)

(h) Backfilling. For spaces excavated around areas being pointed and surfaced, backfill with acceptable embankment material in layers no more than 100 mm (4 inches) in depth. Thoroughly compact mechanically, as specified in [Section 202.3\(f\).](#)

1017.4 MEASUREMENT AND PAYMENT—

(a) Pressure Mortar Surfacing. Square Meter (Square Yard)

(b) Pressure Mortar Pointing. Meter (Linear Foot)