

ITEM 256 BONDED PATCHING OF PORTLAND CEMENT CONCRETE PAVEMENT

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256.01 Description. This work consists of bonded patching of PCC pavements at spall areas adjacent to cracks or joints or other areas of the pavement as designated by the Engineer. This work involves removing all loose and unsound concrete and asphalt material patches; removing sound concrete as directed; preparing the surface; applying a bonding grout if required; reconstructing the joint or crack; and mixing, placing, finishing, and curing of the patching material called out in the pay item description.

256.02 Materials. Furnish materials conforming to:

Portland cement.....	701.05
Fine aggregate	703.02
Coarse aggregate, No. 8 size	703.02
Curing material.....	705.07
Air-entraining admixture	705.10
Quick setting concrete mortar	705.21

256.03 Equipment. Use a milling machine, concrete saw, jackhammers, or other approved equipment to remove existing surface material. Provide oil and moisture free compressed air for cleaning and abrasive blasting the prepared area. Provide an on-site concrete mixer capable of mixing a minimum of 2-cubic foot (0.06 m³) batches of patching material. Provide chipping hammers not heavier than the nominal 35-pound (16 kg) class.

256.04 Removal of Unsound Concrete. The Engineer will locate and mark all areas to be repaired prior to concrete sawing. Provide the Engineer with aerosol spray paint to outline the areas for repair. Repair areas will be rectangular or square in shape with dimensions as required to envelope the surface deterioration.

Saw the perimeter of all areas designated for removal to a depth of 1 inch (25 mm) to produce a vertical or slightly undercut face. Make additional saw cuts as required to facilitate removal. Remove all unsound concrete, all asphalt material, and all obviously loose and disintegrated concrete within the patch area. Remove sound concrete where required to achieve the minimum depth within the patch area. Remove concrete by jack hammering or milling. The minimum depth of any partial depth repair is 1-1/2 inch (38 mm) except at the perimeter saw cuts. Operate chipping hammers at an angle of less than 45 degrees measured from the surface of the pavement. During removal of unsound concrete, remove all pavement reinforcing exposed in the patch areas using a cutting tool or a torch.

256.05 Preparation of Patch Area. Before applying bonding grout and/or the patching material, abrasive blast the exposed concrete surfaces to which the patching material is to bond until free of loose particles, oil, dust, traces of asphalt concrete and joint sealer, and other contaminants. Remove all sandblasting residue with compressed air just prior to placing the concrete bonding grout or the patching material. Do not begin abrasive blasting operations until implementing reasonably available engineering controls to limit fugitive dust that are acceptable to the Engineer. Conform to State, regional, and local government agency requirements regarding control of dust generated by the blasting operation. For Types B and C patching materials that do not use water as the activator, perform additional surface preparation according to the patching material manufacturer's recommendations.

Recreate joints in or along the patch using a joint board that extends below the prepared surface and has a width equal to the existing joint. One hour after placing the patching material, remove the joint board in a manner that does not damage the patch.

256.06 Bonding Grout Installation. For bonding Type A patches, use grout that consists of equal parts, by volume, of portland cement and sand, mixed with sufficient water to form a stiff slurry. Using a stiff brush or broom, apply a thin, uniform coating of grout to the prepared surface. Scrub the grout onto the dry surfaces of the prepared area to be patched immediately before placing the patching material. Do not allow excess grout to collect in low spots. Do not allow the grout to dry before placing the new concrete. Paint grout over all sawed joints between the new and existing concrete immediately after completing the finishing.

For bonding Types B and C patches, conform to the patching material manufacturer's recommendations.

256.07 Placement of Patch Material. Use Type A, B, or C patch material as follows:

A. Type A. Provide patch material consisting of one part high early strength portland cement, one and a half parts fine aggregate, and one and a half parts No. 8 coarse aggregate by volume. Add sufficient air-entraining admixture to maintain an air content of 8 ± 2 percent. Add enough water to obtain the minimum slump practical for placing, and do not allow slump to exceed 4 inches (100 mm). Mix the materials on site. Do not use ready-mixed concrete. Place the concrete mixture in the patch area while the bonding grout is still wet. Slightly overfill, vibrate, and strike off the concrete.

B. Type B. Provide patch material consisting of quick setting concrete mortar 705.21, Type 1 or 2. Mix and place the mortar according to the manufacturer's recommendations. Add coarse aggregate, as needed, according to the manufacturer's instructions. Place the concrete mixture in the patch area. If the manufacturer's requirements specify using bonding grout, place the concrete mixture while the bonding grout is still wet. Slightly overfill, vibrate, and strike off the concrete.

C. Type C. Provide patch material consisting of a blend of quick setting concrete mortar 705.21, Type 2 and selected aggregates with an activator. Mix and place these materials according to the manufacturer's recommendations. Add coarse aggregate, as needed, according to the manufacturer's instructions. Place the concrete mixture in the patch area. If the manufacturer's requirements specify using bonding grout, place the

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concrete mixture while the bonding grout is still wet. Slightly overfill, vibrate, and strike off the concrete.

Screed patches 12 feet (3.7 m) and less in length parallel to the centerline. Screed patches over 12 feet (3.7 m) in length perpendicular to the centerline.

While the concrete is still in a plastic state, test the surface for trueness and for being flush with the edges of the adjacent slabs using a 10-foot (3 m) straightedge. Place the straightedge parallel to the pavement centerline with the ends resting on the existing pavement and draw the straightedge across the patch. Where the straightedge does not remain in contact with the existing pavement while drawing it across the patch, correct all high or low areas exceeding 1/8 inch in 10 feet (3 mm in 3 m). Recheck the concrete surface after making corrections to assure that the patch area meets the surface tolerance before the patching material hardens.

Texture the new concrete surface similar to that of the surrounding pavement.

256.08 Curing and Opening to Traffic. Cure Type A patches according to 451.10, except allow the patch to attain a split tensile strength of 250 pounds per square inch (1.7 MPa), as tested per ASTM C496, before opening to traffic. Cure Types B and C patches according to the manufacturer's recommendations.

256.09 Method of Measurement. The City will measure the quantity of Bonded Patching of Portland Cement Concrete Pavement, Type ___ by the number of square feet (square meters) of the exposed surface of all patches, irrespective of the depth of the patch, repaired in the complete and accepted work. If the actual measured area of a patch is less than 2 square feet (0.2 m²), the Engineer will increase each such measurement to 2 square feet (0.2 m²).

256.10 Basis of Payment. The City will pay for accepted quantities at the contract price as follows:

Item	Unit	Description
256	Square Feet (Square Meter)	Bonded Patching of Portland Cement Concrete Pavement, Type ___