

## 500 STRUCTURES

### ITEM 519 - PATCHING CONCRETE STRUCTURES

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**519.01 Description.** This item consists of the removal of all loose and disintegrated concrete, the preparation of the surface, the furnishing and placing of the reinforcing steel including welded steel wire fabric, dowels and expansion bolts/forms and the placing of concrete patches, including curing of same.

**519.02 Materials.** Materials shall conform to the following:

Concrete, Class S.....	499, 511*
Dowels .....	709.01, 709.03 or 709.05
Reinforcing steel.....	509
Welded steel wire fabric .....	709.10, 709.12

\* Aggregates for superstructure shall meet the requirements of 703.02 and shall be No. 57 or 8 size.

**519.03 Removal of Disintegrated Concrete.** All loose and disintegrated concrete shall be removed from the areas to be repaired in such a manner and to such an extent as to expose a sound concrete surface. The depth of a patch shall be not less than 4 inches (102 mm), except on top horizontal surfaces, on which it shall be not less than 3 inches (76 mm). Sound concrete (beneath the disintegrated concrete) shall be removed for a depth of not less than 1/4 inch (6.4 mm) and not more than 1 inch (25 mm) provided that the above minimum depth of patch is maintained. Square or preferably slightly undercut shoulders, having a depth not less than the specified minimum depth of the patch, shall be made at the edges of all patches.

Only pneumatic or hand tools that will give results satisfactory to the Engineer shall be used in the removal of the disintegrated concrete and in preparing and shaping the areas to be patched.

Care shall be used in working around reinforcing steel so as not to damage or debond the steel, or to shatter the concrete around it, beyond the area to be patched.

Reinforcement which is loose shall be adequately supported and tied back into place. Reinforcement that is damaged during the Contractor's operations shall be replaced at no cost to the City.

**519.04 Preparation of Surface.** After all disintegrated and loose concrete has been removed, the area to be patched has been properly shaped, and any dowels or expansion bolts necessary to hold the wire fabric to be used in the patch shall be installed. The surface of the area to be patched and exposed reinforcing steel shall be thoroughly cleaned of all dirt, dust or other foreign materials by the use of water, air under pressure, or any other method that produces satisfactory results. The surface shall be thoroughly drenched with clean water. Before placing the concrete, the surface shall be allowed to dry to a damp condition.

**519.05 Placing of Reinforcing Steel.** Reinforcement will not be required for patches on top horizontal surfaces. The reinforcement for patches on other surfaces shall consist of welded steel wire fabric either 2 inch (50 mm) by 2 inch (50 mm) using wire size Number W 0.9 or 3 inch (76 mm) by 3 inch (76 mm) using wire size Number W 1.4. This fabric shall cover the entire area of the patch and shall be placed and held approximately 1 inch (25 mm) from the completed exposed surface of the patch. It shall preferably be securely fastened to the reinforcing steel in the original structure exposed in removing the disintegrated concrete, but when there is no such steel exposed or it is not practicable to fasten the fabric to this steel, it shall be fastened to dowels or expansion bolts, installed by the Contractor, at a distance not to exceed 18 inch (0.5 m) centers in both directions.

**519.06 Placing, Finishing and Curing of Concrete.** The concrete shall be Class S and shall be proportioned, mixed, placed and finished in accordance with Items 499 and 511.

Forms shall be removed within 24 hours after placement of the concrete and all exposed surfaces shall be finished by rubbing so as to match as nearly as practicable the surrounding concrete. Membrane curing material shall be applied immediately after rubbing the surfaces as noted in Section 511.14 Method (b).

After curing and before final acceptance, all patched areas shall be sounded. All unsound or visibly cracked areas shall be removed and replaced at the Contractor's expense.

**519.07 Method of Measurement.** The quantity shall be the actual area in square feet (square meters) of the exposed surfaces of all completed patches, irrespective of the depth or thickness of the patch; if a patch includes corners or edges of such members as beams, curbs, columns, etc., all of the exposed surfaces shall be included, or if a patch extends completely through a member or a slab, both exposed surfaces shall be measured.

**519.08 Basis of Payment.** Payment will be made at the contract price for:

<b>Item</b>	<b>Unit</b>	<b>Description</b>
519	Square Foot (Square Meter)	Patching Concrete Structures