

STATE

OF

TENNESSEE

Rev. 09-30-2013

January 1, 2015

**SPECIAL PROVISION****REGARDING****FULL DEPTH AND PARTIAL DEPTH CONCRETE PAVEMENT REPAIR****(HIGH EARLY STRENGTH)**

**Description.** This work shall consist of performing full depth or partial depth concrete pavement repair in accordance with this Special Provision and in reasonably close conformity with the design set out on the plans or established by the Engineer. The provisions of Section 501 shall apply except as herein revised.

**Materials.** Coarse aggregate shall be crushed stone, crushed slag, or washed gravel meeting the requirements of 903.03 and the grading requirements of Subsection 903.22 for size #57 aggregate; all other materials shall conform to Subsection 501.02 of the Standard Specifications for Road and Bridge Construction.

The cement used in this construction shall be a type I, Type III or a rapid setting cement. A test section will be required for cements that have not been preapproved by the Department.

Chemical admixtures shall meet the requirements of Subsection 918.09(A) and be approved by the Department.

Partial Depth patching material shall be a concrete mixture meeting the requirements below or an approved non-shrink grout or epoxy concrete.

Dowel bars and tie bars shall be epoxy coated in accordance with ASTM D 3963 and Section 907.01. The bar sizes shall be determined from the Standard Drawings. Epoxy used to adhere dowel and tie bars shall be approved by the Department.

**Proportioning.** A workable concrete mix utilizing an approved cement, #57 aggregate and natural sand conforming to Subsection 501.02, and having a slump not greater than 63 mm (2-1/2 inches) shall be required. The slump may be increased to a maximum of 150 mm (6 inches) when using an approved high range admixture. The mixture shall have a maximum water to cement ratio of 0.40 including admixtures. The percentage of air entrained in the mix shall be five percent, with a tolerance of plus three or minus two percentage points.

The mixture shall have a minimum compressive strength of 17.2 MPa (2500 psi) within 6 hours. However, the time frame of 6 hours may be reduced depending on the Contractor's mode of operation. The Contractor shall submit to the Engineer in writing the time frame in which the minimum compressive strength will be attained. The Contractor shall be responsible for attaining the minimum compressive strength prior to opening the pavement to traffic.

Equipment. Equipment and tools necessary for handling materials and performing all parts of the work shall conform to Subsection 501.04.

Construction Requirements. The construction shall conform to the requirements of Section 501 in so far as the requirements do not conflict with the requirements herein specified unless otherwise directed by the Engineer.

Full depth and partial depth concrete pavement repair shall be performed as shown on the plans. If the depth of partial depth concrete pavement repair (Spall Repair) exceeds 100 mm (4 inches), the pavement area to be repaired shall be removed and replaced full depth, to the dimensions shown on the plans for Concrete Pavement Replacement, or as directed by the Engineer.

The slabs shall be removed by lifting, unless the slab is deteriorated such that lifting is not possible. An adequate lifting machine will be required to minimize damage to the sub-base. Any soft base material shall be removed and replaced. All loose base material shall be compacted. The method of removal shall not spall or damage any existing concrete pavement.

The area adjacent to the spall area shall be sounded to determine the limits of partial depth repair. The hammer for chipping shall be a minimum of 14 kg (30 lbs).

Patching material for partial depth repairs may be mixed on site in small mobile drums or paddle mixers.

Joints. Joints shall be constructed for full depth repair and shall conform to subsection 501.15. Dowel and tie bar holes shall be drilled in the locations shown on the Plans or reference drawings. After drilling, the hole shall be cleaned either pneumatically or with a wire brush. A sufficient amount of epoxy shall be inserted at the back of the drill hole and the bar inserted with a twisting motion to assure uniform distribution of epoxy. Excess epoxy shall be removed.

Finishing and Curing. After properly vibrating the concrete in place, the patch shall be finished using a vibratory screed parallel to the centerline such that it meets the existing grade and profile. Curing shall be completed in accordance with Subsection 501.18(c).

Partial depth repairs shall be finished from the center outwards to the edges.

Opening to Traffic. Traffic shall not be allowed on the newly placed concrete until a test cylinder break of at least 17.2 MPa (2500 psi) is attained.

Sampling and Testing. The concrete shall be tested in accordance with Section 501. The Engineer also will perform tests for slump and air content as often as deemed necessary to maintain uniform, quality concrete. In addition, prior to the start of the project and before any concrete is placed, the contractor shall batch, and mix a one-cubic meter (yard) trial batch of mix. The trial batch shall be made using the same equipment and procedures as is to be used on the project. An approved TDOT representative will test the trial batch for slump and air content

and test cylinders shall be made. A minimum strength of 17.2 MPa (2500 psi) within the designated time frame shall be required on the test cylinders. If the trial batch does not produce the required results, adjustments shall be made by the Engineer and a new trial batch shall be required. During the progress of the job, if the Engineer deems necessary, additional trial batches may be required. No direct payment will be made for the trial batching.

Unsatisfactory Work. Repaired areas which do not produce a relatively smooth riding surface, show excessive shrinkage, cracking, or do not produce an adequate bond to the adjacent slab shall be removed and replaced at the contractor's expense.

Method of Measurement. Full and partial depth Portland cement concrete pavement repair shall be measured by the cubic meter (cubic yard) in accordance with Section 109. Spall Repair shall be measured by the square meter (square yard) in accordance with Section 109. Spall Repair which becomes full depth repair because the depth of repair exceeds 100 mm (4 inches) shall be measured by the cubic meter (cubic yard) as full and partial depth Portland cement concrete pavement repair.

Sawing Concrete Pavement (Full Depth) will be measured by the linear meter (foot). The Load Transfer Dowels and the Transverse Tie Bars will be measured by the unit, per each.

No measurement for payment will be made for removing and disposing of the existing Portland cement concrete pavement, drilling holes, grouting, joint materials, etc., required in conjunction with the specified concrete pavement repair; and the cost for this work shall be included in the price bid for other items.

Basis of Payment. The accepted quantities will be paid for per unit of measurement, respectively, for each of the pay items that is shown on the bid schedule, which price shall be full compensation for performing all operations incidental thereto; and for furnishing all materials, equipment, tools, labor and incidentals necessary to complete the work.