



**SPECIAL PROVISIONS
FOR
DOWEL BAR RETROFIT**

Pottawattamie County

Project No.
ESL-1642(658)—7S-78

Effective Date
10/20/09

THE STANDARD SPECIFICATIONS, SERIES 2009, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

094001.01 DESCRIPTION

Install epoxy coated dowel bars in the through driving lanes and on transverse joints as shown in the plans. The dowels shall be placed after the concrete repair operations and prior to the diamond grinding operation.

094001.02 MATERIALS

Contractor shall furnish the following:

A. Epoxy Coated Dowel Bars

Epoxy coated dowel bars, 1-1/2 x 18 inches, shall conform to the requirements of Section 4151 of the Standard Specifications. The dowel bars shall be uniformly coated with an approved bond breaker according to Article 4151.02, B of the Standard Specifications.

The dowel bars shall have tight fitting end caps made of nonmetallic material that allow for at least 1/4 inch bar movement at each end of the bar.

Chair devices for supporting the dowel bars shall be either epoxy coated or made of nonmetallic material. The chair devices shall provide a minimum clearance of 1/2 inch between the bottom of the bar and the surface upon which the bar is placed, and between the bar and the walls of the slot. The chairs shall be designed to prevent movement of the bar during placement of the grout. Samples of the end caps and chairs shall be submitted to the Engineer for approval before installation.

B. Caulking Filler

Acceptable caulking filler used for sealing the existing transverse joint or crack at the bottom and sides of the slot includes any commercial caulk designed as a concrete sealant that is compatible with the patch material being used.

C. Foam Core Inserts

The foam core board filler material shall be a closed-cell foam faced with plastic film, foil or poster board material on each side. The foam core board filler shall be $3/8 \pm 1/8$ inch thick. The foam core board filler shall be approved by the Engineer before installation.

D. Grout

The non-shrink grout placed around the dowel bars shall be one of the materials listed in the Approved Products List below, or equal approved by the Engineer.

MANUFACTURER	BRAND NAME
Conspec Marketing & Mfg.	Pave Patch 3000
Degussa Building Systems	ThoRoc 10-60- Repair Mortar Set 45
Five Star Products, Inc.	Highway patch
L & M Construction Chemicals	Durapatch Hiway
Universal Form Clamp Company	Uni Road Repair DOT

The grout shall be extended as the manufacturer recommends. The aggregate for extending the grout shall be pea gravel with a minimum durability Class 2 approved by the Engineer and meeting the following gradation.

Sieve Size	Percentage Passing
1/2 inch	100
3/8 inch	85 - 100
No. 8	0 - 8

If not from the approved list above, an ASTM C 928 shrinkage compensated grout, with maximum aggregate extension shall meet the following strength requirements:

- 4-hour minimum compressive strength of 3000 psi, ASTM C 39
- 24-hour minimum compressive strength of 4500 psi, ASTM C 39
- 24-hour bond to dry PCC, 1000 psi, ASTM C 882

The Contractor shall furnish a list of materials for use in making the grout and the mix design to the Engineer 30 calendar days prior to installation.

Testing of the grout by the Engineer may be done anytime during the grout production.

094001.03 CONSTRUCTION REQUIREMENTS

Slots shall be cut in the pavement with a gang saw capable of cutting at least three slots in each wheel path at a time. The slots shall be cut to the depth required to place the centers of the dowels at mid-depth in the concrete slab. Multiple saw cuts parallel to the centerline may be required to remove the material from the slot.

Jackhammers used to remove the concrete from the slots shall not be larger than the 30-pound class. Care shall be taken to prevent any damage to the pavement or to vehicles traveling in the adjoining lane.

All exposed surfaces and cracks in the slots shall be sandblasted and cleaned before bar installation. The transverse contraction joint on the bottom and sides shall be filled with non-sag caulking filler.

Chair devices shall be used to support the dowel bars at the depth shown on the plans. Place the dowel bars parallel to the centerline of the pavement and parallel to the pavement surface. Dowel bars shall be placed within $\pm 1/4$ inch of the desired alignment. Dowel bars shall be centered over the transverse joint or crack so that a minimum of 7 inches of the dowel bar extends into the adjacent panel.

Cut a piece of foam core board material (angled if joints are skewed) to fit tightly around the dowel bar. The foam core board shall be placed at the center of the dowel bar flush with the surface of the concrete pavement, or slightly recessed. The foam board shall also cover the existing transverse joint or crack and shall be maintained in a vertical position, tight to all edges, during grout placement operations. The joint or crack above the foam board insert shall be reestablished within 8 hours of grout placement by means of sawing when the grout has attained sufficient strength. If the foam board is flush with the pavement or visible, sawing of the slots will not be required. If the foam board is not tight fitting, grout may leak, causing a portion of the grout to pop out.

The grout shall be produced with a portable mixer approved by the Engineer. All grout shall be placed immediately after mixing and before the grout has attained initial set. The grout shall not be re-tempered with water.

The Contractor shall thoroughly moisten all surfaces of the sawed slot immediately prior to filling with grout. All excess water shall be removed with compressed air.

Immediately after placement, the grout shall be thoroughly coated with white pigmented curing compound.

The grout shall be placed according to the manufacturer's recommendations. The grout shall be thoroughly consolidated with a hand held vibrator so the grout completely surrounds the dowel bars and support chairs. The grout shall be placed so that the material is at least $1/8$ inch higher than the pavement if the pavement is to be diamond ground. If the pavement is not to be ground, the grout shall be finished flush with the surface. Dowel bars that must be removed due to poor workmanship and/or material failure, must be replaced with new bars. The repair work shall include diamond grinding. Any additional traffic control needed due to required retrofit repairs shall be performed at no additional cost to the Contracting Authority.

094001.04 PROCESS CONTROL PLAN

The Contractor shall provide the Engineer with a process control plan one week prior to the beginning of any retrofit work. This plan shall include:

- A description of the materials and process to be used to achieve the required dowel bar alignment.
- A description of the materials and processes to be used to prevent grout from enter existing joints
- A description of the materials and processes to be used to place and align foam core inserts.
- The mix design and proportion control for the grout mixture.

094001.05 METHOD OF MEASUREMENT

Dowel Bar Retrofit will be measured by each bar satisfactorily placed.

094001.06 BASIS OF PAYMENT

Payment for Dowel Bar Retrofit will be paid at the contract unit price per each for the item "Dowel Bar Retrofit." Payment shall be full compensation for furnishing all labor, equipment, and materials necessary to perform the work in this specification.