

ACCELERATED PORTLAND CEMENT CONCRETE PAVEMENT PATCHING (Tollway BDE)

Effective: July 16, 2010

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DESCRIPTION

This work shall consist of the removal of existing concrete pavement, restoration of the subbase material, the replacement with type of patch specified at designated locations, and the sealing of joints at locations designated by the Engineer, or as shown in the Plans, or described in the Special Provisions. The removal and replacement patching shall be performed within weekend lane closures or within lane closures as specified in the contract to allow for the specified minimum cure time..

For this work, it shall be the Contractor's option to use either precast concrete slabs or an approved high early strength Portland cement concrete mix. Where contract maintenance of traffic plans allow for only nighttime lane closures, the type of patch used shall only be precast and constructed in accordance with the Tollway Special Provision for Precast Replacement of Concrete Pavement Slabs. The precast slab system used for any repairs shall be the Tollway's generic system or an alternate system approved by the Tollway based on compliance with the Special Provision for Precast Concrete Pavement Slab Systems.

MATERIALS

The materials for any precast slabs must meet the requirements of the Special Provision for Precast Concrete Pavement Slab Systems or the requirements of the designer of the approved system. The high early strength Portland cement concrete shall be in accordance with the Performance Related Special Provision for High Early Strength Cast-In-Place Concrete. All other materials for cast-in-place patching shall comply with Article 442.02 of the Standard Specifications except as modified herein.

Add the following to Article 442.02 of the Standard Specifications:

- “(k) Chemical Adhesive Resin System (Note 5) 1027.01
- (l) Calcium Chloride (Note 6)..... 1013.01

Note 5. A plastic or nylon adhesive retention disk that fits tightly over the dowel and effectively seals the gap around the hole is required to prevent flowable adhesive from running out of the hole. This disk is essential to successful anchoring of a dowel bar. This disk may be about 2 inches larger in diameter than the dowel being used and should be manufactured to fit snugly over the bar and slide up against the face of the slab when the bar is being inserted into the hole. The retaining disk is inserted over the dowel bar and pushed to flush against the PCC surface to retain the adhesive. The disk will keep most of the material in the dowel hole and provide an excellent bearing surface at the face of the slab.

Note 6. The calcium chloride accelerator, when permitted by the Tollway, shall be Type L (Liquid) with a minimum of 32.0 percent by weight of calcium chloride.”

EQUIPMENT

Equipment for any precast patching shall meet the requirements established by the approved precast system designer. Equipment for any cast-in-place patching shall be in accordance with Article 442.03 of the Standard Specifications.

CONSTRUCTION REQUIREMENTS

The construction requirements for any precast patching shall be in accordance with the Special Provision for Precast Replacement of Concrete Pavement Slabs. The construction requirements for any cast-in-place patching shall be in accordance with Section 442 of the Standard Specifications for Class B patching except as modified herein.

Revise the second paragraph of Article 442.05(c) of the Standard Specification to read:

“Non-reinforced pavement shall be scored by saw cutting. The scoring shall be at least 6 in. from the marked face of the patch. Marginal bars and tie bars shall be cut in a manner satisfactory to the Engineer.”

Revise the fourth paragraph of Article 442.05(c) of the Standard Specification to read:

“The existing pavement shall be removed as shown on the plans. Ends of the patch shall be squared straight and perpendicular to the centerline of the pavement.”

Add the following to Article 442.05 of the Standard Specifications:

(d) Patching Barricades

The openings resulting from concrete removal for pavement repair shall be protected with Type 1 barricades for the period beginning immediately after removal is completed and until the curing period for the new concrete has elapsed and all debris is cleared away.

A minimum of 2 barricades for each lane, in front of each opening, shall be provided. Where an opening is adjacent to a traffic lane, the barricade(s) shall be placed in the opening, (along the edge of the adjacent traffic lane) with a minimum of one barricade for every 12 feet of open excavation.

Add the following to Article 442.05 of the Standard Specifications:

(e) Penalties

(1) Non-compliance with Specifications

The Contractor will be subject to a penalty of \$500 per incident, to be deducted from the next pay estimate due the Contractor, for each occurrence when the Engineer determines that the Contractor or his Subcontractor is not in full compliance with Article 442.05(d).

(2) Failure to Respond

The Contractor shall be required to respond within ½ hour to any request from the Engineer for realigning, replacing or moving barricades or otherwise reestablishing compliance with Article 442.05(d). "Respond" is interpreted to mean on the job preparing to make repairs.

Failure by the Contractor to so respond shall be grounds for a penalty of \$500 for each and every occurrence, to be deducted from the next pay estimate due the Contractor.

Revise the fourth sentence of the fourth paragraph of Article 442.06(a)(2) of the Standard Specifications to read:

"After the material has been positioned at the back of the hole, the dowel shall be fully inserted into the drill holes with retention disks against the face of the slab, using a back-and-forth twisting motion, leaving the proper length exposed as shown on the plans."

Revise the first paragraph of Article 442.06(d) of the Standard Specifications to read:

"(d) Concrete Placement. For Class A, Class B and Class C Patches, concrete shall be placed according to Article 420.07 and governed by the limitations set forth in Article 1020.14, except that the maximum temperature of the mixed concrete immediately before placing shall be 90 °F, the required use of an approved retarding admixture when the plastic concrete reaches 85 °F shall not apply."

Revise the first paragraph of Article 442.06(g) of the Standard Specifications to read:

"(g) Curing and Protection. Concrete patches shall be cured by the Wetted Burlap or Wetted Cotton Mat Method according to Article 1020.13 (a)(3). The curing period shall be from the time of final setting of the mix until the patch is exposed to traffic no less than 20 hours after placement for concrete. In addition to Article 1020.13, when the air temperature is less than 55 °F, the Contractor shall cover the patch with minimum R12 insulation until opening strength is reached. Insulation is optional when the air temperature is 55 °F - 90 °F. Concrete shall not be placed when the air temperature is greater than 90 °F."

METHOD OF MEASUREMENT

When specified, pavement removal and replacement with accelerated Portland cement concrete patching using high early strength Portland cement concrete or optional precast concrete will be measured for payment and computed in square feet.

When removal and replacement only by precast concrete is specified in the contract, the repair will be measured for payment and computed in square feet.

If additional pavement, subbase, or subgrade material is removed due to negligence on the part of the Contractor, the additional quantity of pavement removal and replacement or subgrade material will not be measured for payment. Shoulder removal and replacement resulting from edge forming will not be measured for payment.

When expansion joints are to be included in Class B patches, as shown on the plans or as directed by the Engineer, the expansion joint will be measured for payment in place in feet.

Reinforcement bars will be computed in square yards of surface area of the pavement patch in which the pavement reinforcement is installed, and no allowance will be made for laps, splices, or portions of bars not used.

Pavement fabric will be computed in square yards of the surface area of the pavement patch in which the pavement reinforcement fabric is installed.

All mandatory saw cuts for removal operations for Class A or Class B patches will be measured for payment in place in feet. Optional saw cuts with a concrete saw or wheel saw to aid the Contractor's removal operation will not be measured for payment. Optional wheel saw cuts allowed in lieu of mandatory saw cuts will be measured for payment as though the mandatory saw cuts were performed.

BASIS OF PAYMENT

Where the Contractor has the option of using either high early strength Portland cement concrete or precast concrete patches, this work will be paid for at the contract unit price per square feet-foot for ACCELERATED PORTLAND CEMENT CONCRETE PAVEMENT PATCHING, of the type and thickness specified.

Where the Contractor has no option but to use precast concrete for patching, this work will be paid for at the contract unit price per square feet-foot for PRECAST CONCRETE SLABS, as of the type, size and thickness specified.

When expansion joints are included in Class B patches, the expansion joint will be paid for at the contract unit price per foot for CLASS B PATCH – EXPANSION JOINT. The deformed bars will be paid for at the contract unit price per each for DEFORMED BARS – EXPANSION JOINT.

Where unsuitable material is encountered in the subgrade or subbase and its removal and replacement is required by the Engineer, such removal and replacement will be paid for according to Article 109.04 of the Tollway Supplemental Specifications.

When additional pavement removal due to unsound concrete or deteriorated steel is directed by the Engineer, the additional quantities will be paid for according to Article 109.04 of the Tollway Supplemental Specifications.

Dowel bars will be paid for at the contract unit price per each for DOWEL BARS, of the diameter and length specified.

Pavement tie bars for Class A and Class B patches will be paid for at the contract unit price per each for TIE BARS, of the diameter and length specified.

Reinforcement bars will be paid for at the contract unit price per square yard for PATCHING REINFORCEMENT.

Mandatory saw cuts for Class A and Class B patches will be paid for at the contract unit price per foot for SAW CUTS.

When pavement reinforcement fabric is included in the contract it will be paid for at the contract unit price per square yard for PAVEMENT FABRIC. When pavement reinforcement fabric is required for patching, and a pay item is not included in the contract, the cost of the fabric will be paid for according to Article 109.04 of the Tollway Supplemental Specifications.