

## **PRECAST REPLACEMENT OF CONCRETE PAVEMENT SLABS (Tollway)**

**Effective: March 30, 2009**

**Revised: October 19, 2012**

**DESCRIPTION.** This work shall consist of the removal of existing concrete pavement, restoration of the subbase material, the installation of precast concrete pavement slabs in accordance with the contract documents, and the sealing of joints at locations designated by the Engineer, or as shown in the Plans, or described in the Special Provisions. The precast slab system shall be the Tollway's generic system or an alternate system approved by the Tollway based on compliance with the Tollway special provision for Precast Concrete Pavement Slab Systems.

**MATERIALS.** The materials must meet the requirements of the Tollway special provision for Precast Concrete Pavement Slab Systems and the requirements of the designer of the approved system.

### **CONSTRUCTION REQUIREMENTS.**

1. General. For replacements using the Tollway's generic precast system, the pavement areas to be repaired will be initially delineated by the Engineer on shoulder pavement using spray paint furnished by the Contractor and noted to qualify for either a 12'-6" or 13'-6" standard slab repair or require a custom slab repair. Standard slab placement shall only be allowed where the length of the patch is no longer than 6'-0", the width between existing longitudinal joints is measured at a right angle to the joints to be either between 11'-6" and 12'-6" or between 12'-6" and 13'-6", and if on-site saw cutting of the slabs is possible to be performed. At all locations initially marked to possibly receive a standard precast slab, the widths between existing longitudinal joints shall be measured by the Contractor under maintenance of traffic provided by the Contractor. The Contractor's width measurements shall be used to determine the need for any on-site sawcuts of the longitudinal edges of standard slabs to fit the opening and to align the saw cut edge(s) with any existing longitudinal joints. The longitudinal edges of any standard slab shall not be sawed cut more than 6 inches off the original edge. No new longitudinal joint shall, of a cut standard slab, be allowed inside of the existing longitudinal joint by more than ¼ inch. If the tolerances for Tollway standard slabs can not be met, then a custom slab shall be required at the location. The locations designated to receive a custom precast slab shall be fully surveyed by the Contractor under maintenance of traffic provided by the Contractor to determine the specific dimensions and diagonals required by the system manufacturer to fabricate the precast slab. The dimension requirements for fabrication of all custom slabs shall be summarized in a table that complies with the example table shown on the Tollway's Standard Drawing A18 and submitted to the Engineer for review and approval before any fabrication work proceeds.

For replacements using any Tollway approved alternate (non-generic) precast system, the pavement areas to be repaired will be initially delineated by the Engineer on shoulder pavement using spray paint furnished by the Contractor. It shall be the Contractor's responsibility to survey all slab locations and mark saw cut locations that comply with the alternate system requirements for alignment. The locations designated to receive an alternate system slab shall be fully surveyed by the Contractor to determine the specific dimensions and diagonals required by the system manufacturer to fabricate the precast slab.

For replacements using any precast system, the slab lengths of any designated repair area shall comply with the menu for precast concrete slabs as identified on the design detail drawings unless concrete deterioration that occurred since the initial design survey was performed requires a modified length to the repair area. Any areas of pavement removed and replaced outside the final limits established by the Engineer shall be done entirely at the Contractor's expense. After removal of the concrete pavement and any aggregate subbase in a repair area, the Engineer shall determine the suitability of the existing subbase material and the steps necessary to restore the subbase in accordance with the Tollway special provision for "Aggregate For Base Course Restoration, Special".

2. Quality Control Plan. The Contractor's Quality Control Plan (QCP) shall include a detailed back up plan for temporary filling of any removed repair location where the precast slab cannot be set before the time for peak hour traffic arrives. Any placement and removal of temporary fill material to allow for the pavement to be opened to traffic during peak hours shall be at the Contractor's expense. The backfill material shall be cement or asphalt treated material approved by the Engineer that will support traffic for 24 hours or more until the precast pavement is able to be placed.
3. Meetings. Convene a pre-placement meeting within 14 calendar days of the planned start of slab installation with the Engineer, manufacturer, supplier, system designer of an alternate precast slab system, and any relevant subcontractors to review and coordinate all aspects of pavement removal, placement and inspection including equipment and personnel requirements to install slabs to the line and grade depicted in the contract documents  $\pm \frac{1}{4}$  inch.
4. Technical Assistance for Alternate Precast Systems. Several processes in this specification are performed in accordance with the system designer's instructions. The system designer must supply on-site technical assistance at the beginning of the installation until the Engineer determines the assistance is no longer required. Provide approved system designer instructions to the Engineer at least 30 calendar days before starting work associated with slab installation.
5. Weather Limitations. Article 420.07 of the Standard Specifications shall apply.
6. Pavement Removal. Removal of existing pavement shall be in accordance with Section 440 of the Standard Specifications except as modified herein.

The outer limits of the repair area will be sawcut full depth and transverse cuts shall not extend (overcut) by more than 10 inches into the adjacent concrete that is to remain in place. Overcuts shall be filled with a product acceptable to the Tollway Materials Engineer. The outer limits for repair shall be marked out by the Contractor and approved by the Engineer prior to any sawcutting. Removal of concrete within the perimeter sawcuts shall be by the lift-out method, and any concrete removed between sawcuts for dowel bar retrofits shall be removed using the jackhammer and hand tool equipment specified in the Tollway special provision for Dowel Bar Retrofit.

Equipment and methods used for removing old pavement shall be such as to prevent cracking, shattering or spalling of the pavement remaining in place. Should the remaining pavement be damaged by this operation the Contractor shall immediately change equipment and/or methods to prevent damage to any more pavement. Care shall be

exercised in the removal of the pavement to prevent damage to load transfer devices, tie bars, or adjacent concrete surfaces or edges in portions of the pavement that are to remain in place. Adjacent pavement or bars damaged as a result of the removal process shall be replaced at the Contractor's expense to the satisfaction of the Engineer.

7. Disposal of Excavated Materials. Materials resulting from the removal of concrete pavement and materials removed for base course restoration, as required, shall be disposed of by the Contractor at his expense, in accordance with the applicable portions of Article 202.03 of the Standard Specifications.
8. Subbase Course. The subbase shall be prepared to the requirements of Tollway special provision "Subgrade Aggregate, 12-inch" for new construction and add-on lanes. For pavement repair over dense graded capping aggregates, any areas of a dense graded subbase that are below the required elevation of the finished subbase, due to the Contractor's operations in breaking or removing old pavement, shall be built up to meet the level of the surrounding subbase to the satisfaction of the Engineer in accordance with the contract documents at the Contractor's expense. For repairs over porous granular subbase or if the Engineer determines that the existing granular subbase is unsuitable for the intended purpose, the Contractor shall remove the unsuitable material in the pavement removal areas to the depth specified by the Engineer and no less than 2 inches and replace the material removed with an equal thickness of new material placed and compacted in accordance with the requirements of the Tollway special provision for "Aggregate For Base Course Restoration, Special". Follow the system designer's instruction for any final subbase preparation prior to slab installation. Do not disturb the prepared surface before installation.
9. Slab Installation. Install the slabs in accordance with the approved system instructions. Set grade-supported slabs to achieve maximum contact with the prepared subbase.
10. Joints for an Alternate Precast System. Submit a proposed joint layout with the Fabricator Working Drawings, in accordance with the Tollway special provision for "Precast Concrete Pavement Slab Systems." Align joints both transversely and longitudinally between abutting precast slabs, i.e., do not stagger joints, except where approved on the joint layout. When tying precast slabs to existing concrete pavement, such as an add-on lane, joint alignment is not required. However, do not drill and anchor longitudinal joint ties within 24 inches of a transverse joint in the existing pavement.
11. Joint Widths. Install slabs such that the joint widths on the remaining concrete surfaces are less than  $\frac{1}{2}$  inch, regardless of joint orientation. These dimensions apply to joints between adjacent precast slabs or joints between precast slabs and existing pavement.
12. Bed and Level Slabs. Bed and level slabs in accordance with the system instructions such that the vertical differential across any corner is  $\frac{1}{4}$  inch or less.
13. Backfill Pavement Hardware. Backfill around pavement hardware in accordance with the approved system instructions.
14. Smoothness (Pavement's Remaining Concrete Surface). Where profile grinding of a precast repair is required by design, the Tollway special provision for Profile Diamond Grinding of Concrete Pavements shall apply for pavement smoothness.

15. Corrective Action for Smoothness. Immediately after the slab has been set and leveled, survey the vertical elevation across all corners to verify that the vertical difference between adjacent slabs across any corner does not exceed  $\frac{1}{4}$  inch. If the difference exceeds  $\frac{1}{4}$  inch, then the slab shall be removed and reset or the surface shall receive a corrective diamond grind at the contractor's expense after any required bedding grout or leveling material has been placed.

Upon completion of any corrective work, the surface of the patch shall be resurveyed. Corrective work shall be at no additional cost to the Tollway.

16. Opening to Traffic shall be per the approved system requirements

**METHOD OF MEASUREMENT.** This work will be measured for payment in square feet of area of slab delivered and placed, and accepted in accordance with the Contract.

Reinforcement and other such items incidental and necessary to provide complete assemblies, as shown on the Plans, will not be measured separately for payment.

**BASIS OF PAYMENT.** This work will be paid for at the contract unit price per square foot for STANDARD PRECAST CONCRETE PAVEMENT SLABS of the width specified, and CUSTOM PRECAST CONCRETE PAVEMENT SLABS.

The work for any required profile grinding of precast slabs will be paid at the contract unit price per square yard for PROFILE DIAMOND GRINDING OF CONCRETE PAVEMENT.

The work for any necessary restoration to the existing subbase will be paid at the contract unit price per ton for AGGREGATE FOR BASE COURSE RESTORATION, SPECIAL.