

1. DESCRIPTION:

- 1.01 This work shall consist of furnishing and installing dowel load transfer devices into full-depth saw cut concrete faces that will become transverse joints.

2. MATERIALS AND EQUIPMENT:

- 2.01 **Dowels:** Obtain dowels from a supplier appearing on the Approved List for §705-15, Transverse Joint Supports. Use 18 inch long, 1 ¼ inch diameter, smooth, epoxy-coated, Grade 60 steel dowels coated with a bond breaker. Use an epoxy coating appearing on the Approved List for “Epoxy Coatings for Longitudinal Joint Ties” or “Epoxy Coatings for Steel Reinforcing Bars” that is applied by an applicator appearing on the Approved List for “Applicators for Steel Reinforcing Bars”. The Contractor shall provide the Engineer with the following information 10 working days prior to drilling.

- The name and address of the joint support assembly suppliers.
- Material certification from the supplier that dowels meet the “Test” and “Material Requirements” portion of §705-15, except Grade 60 steel is supplied.
- Material certification from the rolling mill as to type and grade of steel used.
- The brand of epoxy coating and the name and address of the manufacturer.
- The name and address of the epoxy coating applicator.
- Material certification from the epoxy coating applicator that the bars have been coated, tested, and meet the requirements of § 705-14, Longitudinal Joint Ties.
- The brand of bond breaker and the name and address of the manufacturer.

Epoxy coating field repairs are not permitted. The Authority may perform supplementary sampling and testing of the dowels to ensure conformance with §705-14 and §705-15.

- 2.02 **Anchoring Material and Dispensing Equipment.** Use a pourable, 2 component, 100% solids structural epoxy meeting §701-07, Anchoring Materials – Chemical Curing, dispensed:

- From side-by-side cartridge by manual or pneumatically powered injection guns.
- Through a static nozzle that homogeneously mixes the material without hand mixing.

- 2.03 **Drills.** Use hydraulic gang drills with a minimum of 2 independently powered and driven drills. Use tungsten carbide drill bits. Control the forward and reverse travel of the drills by mechanically applied pressure. Mount the drill on a suitable piece of equipment such that it is quickly transported and positioned. Rest and reference the drill rig frame on and to the pavement surface such that the drill holes are cylindrical, perpendicular to the surface being drilled, and repeatable in terms of position and alignment on the surface being drilled. Hand held drills are not permitted.

- 2.04 **Grout Retention Disk.** Use plastic grout retention disks, 1/8 inch thick, of sufficient diameter to prevent grout from entering the joint. The hole in the center of the disk shall have the same diameter as the dowel.

3. CONSTRUCTION DETAILS:

- 3.01 **Drilling Holes.** Drill eleven (11) holes per transverse repair face (12 foot wide typical) spaced at 12 inches. Pavement slabs of that have a width other than 12 feet will require an adjustment in the number of required holes based on a maximum spacing of 12 inches. Determine the location and length of existing longitudinal joint ties in the concrete to remain in place outside the repair area. Use a pachometer or other device capable of locating steel embedded in concrete.

If a longitudinal joint tie is within 12 inches of the surface being drilled, drill the outer holes 3 – 4 inches from the end of the tie. If no ties are within 12 inches of the surface being drilled, drill the outer holes 18 inches from a longitudinal joint between 2 travel lanes and 12 inches from a longitudinal joint between travel lanes and a shoulder.

For slabs of nonstandard widths, or pavements with longitudinal joints offset from permanent longitudinal pavement markings that define travel lanes, drill the outer hole 18 inches from the nearest edge of the permanent longitudinal marking between 2 travel lanes and 12 inches from the markings between a travel lane and a shoulder. In any case do not drill within 3 inches of the end of a longitudinal joint.

Drill holes such that:

- The hole diameters are in accordance with the anchoring materials Manufacturer's written recommendations. Provide those recommendations to the Engineer before drilling any holes.
- The hole depth is 9 inches (+/- 3/8 inch).
- When the dowels are anchored, the longitudinal axes of the protruding dowels are parallel to the pavement centerline, the pavement surface, and each other, the maximum misalignment in either direction shall not be greater than 1/8 inch, measured from the saw cut face and the dowel end.

When the dowels are anchored, they protrude 8 5/8 – 9 inches from the saw cut face. The Contractor shall replace worn bits when necessary to ensure the proper diameter hole is drilled.

If the drilling operation cracks or damages the pavement to remain, the Contractor shall extend the repair boundary to sound concrete. The resulting cost of concrete removal, concrete placement and drilling new holes shall be borne by the Contractor.

- 3.02 **Cleaning Holes.** Follow the anchoring material Manufacturer's written recommendations for cleaning the holes. Provide these recommendations to the Engineer. As a minimum, clean the drilled holes with oil-free and moisture-free compressed air. The Engineer shall check the compressed air stream purity with a clean white cloth. Use a compressor that delivers air at a minimum of 120 cfm and develops a minimum nozzle pressure of 90 psi. Insert the nozzle to the back of the hole to force out all dust and debris.
- 3.03 **Dowel Installation.** When using new cartridges of anchoring material, ensure that the initial material exiting the nozzle appears uniformly mixed. If it is not uniformly mixed, waste the material until, uniformly material exits the nozzle. Place the anchoring material at the back of the hole using a nozzle of sufficient length. Push the dowel into the hole while twisting such that the air pocket within the hole is heard to burst and the anchoring material is evenly distributed around the dowel. Use sufficient amounts of anchoring material such that it slightly extrudes out of the hole as the dowel is inserted. Place a grout retention disk over the dowel and tight against the exposed concrete face such that the anchoring material does not enter the joint.

4. METHOD OF MEASUREMENT:

4.01 The work will be measured for payment as the number of dowels satisfactorily installed.

5. BASIS OF PAYMENT:

5.01 The price bid per each shall include the cost of all labor, material and material necessary to satisfactory complete the work. No additional payment will be made for extra work require to repair damage to the adjacent pavement