ITEM 502.3201 10 M - DRILL AND ANCHOR DOWELS FOR CALCIUM CHLORIDE ACCELERATED FULL-DEPTH PCC PAVEMENT REPAIRS

DESCRIPTION.

Drill holes and anchor dowels into full-depth saw cut concrete faces that will become transverse joints.

MATERIALS AND EQUIPMENT.

Dowels. Obtain dowels from a supplier appearing on the Approved List for §705-15, Transverse Joint Supports. Use 460 mm long, 29 mm diameter, smooth, epoxy-coated, Grade 420 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". At least 7 days prior to drilling, provide the Engineer:

- The name and address of the joint support assembly supplier.
- Material certification from the supplier that dowels meet the "Tests" and "Material Requirements" portions of §705-15, except Grade 420 steel is supplied.
- Material certification from the rolling mill as to the 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.
- The brand of bond breaker and the name and address of the Manufacturer.
- Material certification from the epoxy coating applicator that the bars have been coated, tested, and meet the requirements of §705-14, Longitudinal Joint Ties.

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

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

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

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 drilled 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.

Grout Retention Disk. Use plastic grout retention disks, 3 mm thick, of sufficient diameter to prevent grout from entering the joint. The hole in the center of the disk must have the same diameter as the dowel.

CONSTRUCTION DETAILS.

Drilling Holes. Drill holes 300 mm apart on center across the full width of the repair. Locate end holes 150 - 300 mm from the longitudinal repair boundaries.

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Determine the location and length of 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 300 mm of the surface being drilled, drill the outer holes 75 - 100 mm from the end of the tie.
Drill holes such that:

- The hole diameters are in accordance with the anchoring material Manufacturer's written recommendations. Provide those recommendations to the Engineer before drilling any holes.
- The hole depth is 230 mm (+10 mm/- 0 mm).
- When the dowels are anchored, the longitudinal axes of the protruding dowels are parallel to the pavement centerline, the pavement surface, and each other, ± 3 mm, measured at the saw cut face and the dowel end.
- When the dowels are anchored, they protrude 220 - 230 mm from the saw cut face.

Extend the full depth repair boundaries as indicated in the contract documents if drilling cracks or damages pavement to remain in place. Replace worn bits when necessary to ensure the proper hole diameter is drilled.

Cleaning Holes. Follow the anchoring material Manufacturer's written recommendations for cleaning the holes. Provide those recommendations to the Engineer. As a minimum, clean the drilled holes with oil-free and moisture-free compressed air. The Engineer will check the compressed air stream purity with a clean white cloth. Use a compressor that delivers air at a minimum of 3.4 m^3 per minute and develops a minimum nozzle pressure of 0.63 MPa. Insert the nozzle to the back of the hole to force out all dust and debris.

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 mixed material extrudes. 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 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.

METHOD OF MEASUREMENT.

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

BASIS OF PAYMENT.

Include the cost of all labor, material, and equipment necessary to satisfactorily perform the work in the unit price bid for Drill and Anchor Dowels for Full-Depth PCC Pavement Repairs. No additional payment will be made for extra work required to repair damage to the adjacent pavement that occurred during drilling.