Special Specification 7183
Repair of Ultra-Thin and Thin White Topping

1. DESCRIPTION

Repair damaged Ultra-thin and Thin White topping concrete panels in accordance with the details shown on the plans or as directed.

2. MATERIALS

2.1. Hydraulic Cement Concrete. Provide Class K hydraulic cement concrete in accordance with Item 421, "Hydraulic Cement Concrete." Unless otherwise shown on the plans or as directed, design the concrete mix with a maximum water cement ratio of *0.45,* Grade No.4 coarse aggregate, and a minimum average compressive strength of 3,000 psi at 24 hr. Test in accordance with Tex-4l8-A, "Compressive Strength of Cylindrical Concrete Specimens."

2.2. Joint Sealants and Fillers. Provide joint sealants and fillers in accordance with Section 360.2.7, "Joint Sealants and Fillers."

2.3. Curing Materials. Provide membrane curing compound conforming to Section 360.2.4, "Curing Materials."

2.4. Reinforcing Fibers. When shown on the plans, provide fibers as follows, unless otherwise approved:

2.4.1. Synthetic Fibers. ASTM C 1116-03 Type III, Polypropylene or Nylon, 3/4" to 1 1/2" in length. Mix 3 lb. synthetic fibers for each cubic yard concrete as per manufactures recommendation.

2.4.2. Steel Fibers. ASTM C 1116-03 Type I, and certified to meet ASIM A 820-01 Type I, cold-drawn crimped-end wire, 1½" to 2" in length, collated into bundles to facilitate handing and mixing. Mix 30 lb. steel fibers for each cubic yard concrete as per manufactures recommendation. Do not use steel fibers where deicing salts may be used.

3. EQUIPMENT

Provide tools and equipment necessary for proper execution of the work.

4. CONSTRUCTION

Submit a repair plan for approval before beginning operations. Include details of repair method and sequence, joint layout, sawing plan, curing, other details and description of all equipment.

4.1. Outline Sawing of Repair Area. Saw cut the perimeter of repair areas as shown on the plans or as directed. Saw cut to the depth of concrete panels. The repair area should be a minimum of 6 feet in length and a half lane in width or as directed.

4.2. Removing Damaged Panels. After outline sawing, remove the damaged panels from the center of repair area without disturbing surrounding panels. Additional saw cuts may be required within the repair area to facilitate removal of the concrete.

4.3. Prepare Asphalt Support Layer. Unless otherwise directed, mill 1 in into the asphalt layer. If the asphalt at the interface raveled, perform additional milling to expose a solid asphalt surface for bonding to the repair.

Use hammers to remove the ridges which may cause stress concentrations in the concrete overlay. Remove any debris and use compressed air to thoroughly clean the surface.

4.4. When repairing panels with reflective cracks and if after milling, a crack still propagates down into the asphalt layer, place duct tape over the cracks and 2 in beyond each side of the crack to act as bond breaker.

4.5. Concrete Placement. Immediately prior to concrete placement, prepare the pavement surface such that the surface is free of all contaminants and material detrimental to achieving an adequate bond between the asphaltic surface and the concrete overlay.

4.6. When needed, place and remove forms in accordance with Section 360.4.5, "Placing and Removing Forms." Deliver concrete in accordance with Section 360.4.6, "Concrete Delivery." Place concrete at temperatures in accordance with Section 360.4.7.3, "Temperature Restrictions." Spread and finish concrete in accordance with Section 360.4.8, "Spreading and Finishing."

4.7. Construction Joints. Saw and seal all construction joints using a Class *5* joint seal, in accordance with Section 360.4.4, "Joints." When placing of concrete is stopped, install a bulkhead of sufficient cross sectional area at a planned transverse contraction joint location and remove the excess of concrete. Place the bulkhead at right angles to the centerline of the pavement, perpendicular to the surface and at the required elevation. Saw and seal this joint.

4.8. Curing. Cure concrete in accordance with Section 360.4.9, "Curing," except apply curing compound at a rate of not more than 120 sq. ft. per gallon.

4.9. Saw Cutting Contraction Joints. Unless otherwise shown on the plans, saw joints to a minimum depth of one-third the concrete thickness or for dry, early saw cuts, saw to a minimum depth of 1 in. Saw cuts in lines that are perpendicular and parallel to the centerline of the travel lanes. Saw cuts perpendicular to the surface of the overlay. Saw joints for radii as detailed in the plans. Use a chalk line, offset string line, sawing template or other approved methods to provide a true joint alignment. Do not seal the saw cuts; remove all debris after sawing. The Contractor is fully responsible for the timing and order of the saw cutting to prevent uncontrolled cracking, spalling, or raveling. If excess spalling or raveling occurs at the top of the saw cuts or the intersection of saw cuts, or if uncontrolled cracking occurs before opening to traffic, remove and replace all damaged concrete panels without any additional compensation.

4.10. Deficient Thickness. The Engineer will determine the overlay thickness in accordance with Test Method Tex-423-A, "Determining Pavement Thickness by Direct Measurement," at selected locations. If the thickness of the overlay measured is deficient by more than 0.40 in. of the plan thickness, the Contractor may verify the thickness by cores taken in accordance with Test Method Tex-424-A, "Obtaining and Testing Drilled Cores of Concrete," at the locations selected by the Engineer. Remove and replace any concrete panel deficient by more than 0.40 in. of plan thickness without any additional compensation.

4.11. Opening to Traffic. The completed overlay may be opened to traffic after the concrete has been cured for 36 hr and has obtained a minimum compressive strength of 2,800 psi or as directed. Determine the compressive strength in accordance with Tex-4l 8-A, "Compressive Strength of Cylindrical Concrete Specimens" using concrete cylinders cured at the job site under the same conditions as the pavement, or in accordance with Tex-426-A, "Estimating Concrete Strength by the "Maturity Method".

4.12. Ride Quality. When shown on the plans, achieve ride quality in accordance with Item 585, "Ride Quality for Pavement Surfaces, Type A."

5. MEASUREMENT

This Item will be measured by the square yard of surface area in place.

6. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Repair of Ultra-Thin and Thin Whitetopping" of the thickness specified. This price is full compensation for materials, equipment, labor, tools, and incidentals.