

834 - UNDERSEALING

SECTION 834

UNDERSEALING

834.1 DESCRIPTION

Fill existing voids under portland cement concrete pavement (PCCP) by drilling injection holes and pumping a cement/fly ash grout under the pavement slab as shown in the Contract Documents.

BID ITEMS

Fly Ash (Undersealing)
Injection Holes

UNITS

Ton
Each

834.2 MATERIALS

Provide materials that comply with the applicable requirements.

Water	DIVISION 2400
Portland Cement (Type I or II)	DIVISION 2000
Fly Ash	DIVISION 2000
Admixtures	DIVISION 1400

Mix the water, portland cement (not less than 25% by volume of solids) and fly ash (not less than 50% by volume of solids) into a cement/fly ash grout complying with the following requirements:

Fluidity (efflux time)	ASTM C939	9 to 15 seconds
7-Day Compressive Strength	ASTM C942	600 psi minimum

Use admixtures only with written approval from the Engineer.

834.3 CONSTRUCTION REQUIREMENTS

a. Weather and Seasonal Limitations. Do not underseal the PCCP if the pavement surface temperatures are below 35°F, if the subgrade or base course is frozen, or if the subgrade is saturated from recent rainfall, as evidenced by standing water on the pavement or in the joints or cracks.

Undersealing operations may start when the pavement surface temperature is above 35°F, the ambient air temperature is 35°F and rising and is expected to exceed 40°. Discontinue paving when the ambient air temperature falls below 40°F. Do not place when it is raining or snowing.

b. Drilling Holes. Submit a hole pattern and pumping sequence to the Engineer for approval. Do not damage the existing reinforcing steel in the pavement. Before drilling the holes, determine the location of reinforcing steel.

Drill holes vertically and round a maximum of 2 inches in diameter to a depth sufficient to penetrate the base and into the subgrade material. Holes may be washed to create a small cavity, allowing initial spread of grout. Drill the holes in a manner preventing breakout at the bottom of the pavement. Do not put downward force on the drill that exceeds 200 lbf.

c. Pavement Undersealing. Use monitoring equipment capable of accurately measuring pavement slab movement of 0.001 inch. Do not allow vertical movements exceeding 1/8 inch in the slabs. Replace all slabs raised more than 1/2 inch. Unless the pavement is to be overlaid, grind (at the Contractors expense) all slabs raised more than 1/8 inch and less than 1/2 inch. Grade tolerances are applicable to both transverse and longitudinal grades.

Begin the grout injection as soon as practicable after mixing the grout. Do not use material held in the mixer or injection sump pump for more than 1 hour after mixing. Do not add water to the grout after the initial mixing.

Connect an expanding rubber packer, or other approved device, to the end of the grout plant discharge hose. Place the expanding rubber packer in the injection hole, being careful not to extend the discharge end of the rubber packer below the lower surface of the PCCP.

Inject the grout in the pre-approved pattern, and in the quantity required to fill voids under the PCCP.

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Produce grout slurry to a 12 second flow cone time. Pump the grout into the holes using an injection pump with a pressure capability of 250 to 300 psi when pumping grout slurry mixed to a 12 second flow cone time.

Cease injection of grout when grout appears at any joint, crack or adjacent hole, or when monitoring devices indicate slab movement.

Cease injection at a hole when grout flow does not occur after 7 seconds of sustained 150 psi gauge pressure, and there is no indication of slab movement.

Prevent grout from being injected into any drainage facility or other open structure.

Prevent excessive loss of grout through cracks, joints, other drilled holes or back pressure. KDOT will not pay for wasted material.

Prior to grout drying on the drilled holes, fill the holes with a fast setting sand/cement mixture or other patching material approved by the Engineer

Replace slabs in which cracks emanate radially from the grout injection holes and in slabs where cracks develop between adjacent grout injection holes at no additional cost to KDOT. The Engineer may approve cross-stitching of the cracks if the cracking is minor.

d. Deflection Testing. KDOT may use the Falling Weight Deflectometer (FWD) at sample locations to determine the effectiveness of the undersealing operation. Voids detected under the slabs using this procedure will be filled a second time by the Contractor at no additional cost to KDOT.

834.4 MEASUREMENT AND PAYMENT

The Engineer will measure fly ash by the ton.

The Engineer will measure each injection holes. Monitoring for pavement lift is subsidiary to the injection holes.

"Fly Ash (Undersealing)" and "Injection Holes" will be paid for at the contract unit prices which is full compensation for the specified work. No adjustment in contract unit prices will be made regardless of the amount of underruns or overruns.