

**STATE OF OHIO
DEPARTMENT OF TRANSPORTATION**

**SUPPLEMENTAL SPECIFICATION 812
GROUT SUBSEALING OF EXISTING CONCRETE PAVEMENT**

June 14, 1995

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812.01 Description. This item of work shall consist of drilling holes in portland cement concrete pavement as directed, and pumping a portland cement/fly ash grout through the holes to fill voids under the pavement, and filling the drilled holes with mortar.

812.02 Materials. Portland cement shall meet the requirements of 701.04.

Fly Ash shall meet the requirements of ASTM C 618. High range water reducing admixture shall meet the requirements of ASTM C 494, Type F.

The mix design for subsealing grout shall be as follows:

One 42.6 kg (94 pound) sack of portland cement;
Three 31.8 kg (70 pound) sacks of fly ash;
355 mL (12 ounces) of high range water reducing admixture;
water to achieve required fluidity.

If ambient temperatures are below 13°C (55°F), an accelerator acceptable to the Engineer shall be used.

Fluidity of the grout slurry shall be measured by Corps of Engineers Flow Cone Method, ORD-C 79-77. Time of efflux for cement/fly ash grouts shall range from 16 to 25 seconds. The Contractor shall furnish a flow cone for this test and shall perform a minimum of three tests per day, or per shift, in the presence of the Inspector. More tests will be performed is deemed necessary by the Engineer. Adjustments to the grout mixture will be made during the subsealing operation to meet flow requirements.

The Contractor shall submit in advance a mix design for materials and additives meeting the above requirements. Submittals shall include physical and chemical analyses and

specific gravity of the fly ash, and tests of the grout slurry by an approved laboratory showing 1-day, 3-day, and 7-day compressive strengths, flow cone times, and time of initial set. An approved laboratory is defined as a laboratory which is regularly inspected by the Cement and Concrete Reference Laboratory. The 7-day strength shall not be less than 2.8 MPa (400 psi) as measured by AASHTO T 106.

812.03 Equipment. The grout plant shall consist of a positive displacement cement injection pump and mixing equipment that is capable of providing a thoroughly mixed and homogenous mixture.

Rock drills or other devices capable of drilling the grout injection holes through the pavement and base material will be permitted. The equipment shall be in good condition. The rock drill shall not be heavier than 27 kg (60 pounds) and the downfeed pressure whether by hand or mechanical means shall not damage the bottom portion of the slab.

The Contractor shall supply equipment capable of detecting the lift of the pavement near the hole being grouted. These devices shall make lift measurements from a stable reference point and shall be of a design satisfactory to the Engineer.

The Contractor shall also furnish all necessary hoses; valving; valve manifolds; positive cut-off; bypass provisions to control pressure and volume; pressure gauges with gauge protectors; and expanding packers or hose for positive seal during grout injection.

812.04 Drilling Holes. The hole pattern for joints or transverse cracks shall require one hole in the approach panel or slab, 0.5 m (1-1/2 feet) from the fissure and 2 m (6 feet) from the centerline; and two leave panel holes, one meter (3 feet) from the fissure and one meter (3 feet) from the pavement edge and centerline. When full depth repairs were made under previous contracts, the hole pattern for grouting shall be two approach panel holes and two leave panel holes, 0.5 m (1-1/2 feet) from the rigid replacements and one meter (3 feet) from the pavement edge and centerline. Full depth repairs made under this contract shall not be grouted.

Grout holes shall not be larger than 65 mm (2-1/2 inches) in diameter. Holes shall be drilled vertically and round, and to a depth sufficient to penetrate through any stabilized base; but they shall not penetrate into a granular subbase more than 25 to 50 mm (1 to 2 inches). Holes may be washed or blown out, if necessary to obtain thorough distribution of the injected grout.

812.05 Subsealing. The Contractor shall grout one hole at a time using an expanding rubber packer or hose on the nozzle connected to the discharge of the grout pump. When grout appears at any longitudinal or transverse crack or adjacent holes, or when the monitoring device indicates slab movement of 4.5 mm (3/16-inch), grouting shall be stopped. Immediately, after the nozzle is removed, the grout hole shall be temporarily

sealed with a round tapered wooden plug. The plug shall remain in place until the grout in the hole is not disturbed by adjacent grouting.

Pavement which has been raised in excess of 6 mm (1/4-inch) shall be deemed unacceptable. No payment for any subsealing material at the subject location shall be made when this tolerance is exceeded.

Grout holes shall be filled full-depth and flush with the surface of the pavement with a stiff mortar consisting of one part portland cement to three parts of fine aggregate. The surface shall be troweled and painted with curing membrane conforming to 705.07.

Grout subsealing shall not be performed when ambient temperatures are below 2°C (35°F). In addition, subsealing operations shall not be performed if the subgrade or base course material is frozen.

Mixed grout held in the mixer or injection sump for more than one hour after mixing shall not be used.

In the event the Engineer determines that continued grout injection at any specific location is no longer practical, he may direct the Contractor to cease grout injection at that location.

812.06 Opening to Traffic. No traffic will be permitted on the grouted slabs for at least 2 hours after grouting or the initial set time provided in 812.02, unless otherwise approved.

812.07 Method of Measurement. Grout will be measured by the number of metric tons (tons) of portland cement used in the work.

The contract unit price paid for metric tons (tons) of portland cement shall include drilling and filling grout holes; full compensation for furnishing all labor, materials, tools, equipment and incidentals; and, for doing all work involved in grout subsealing of existing concrete pavement, in place, complete and accepted.

812.08 Basis of Payment. Payment will be made at the contract price for:

| Item | Unit | Description |
|-------------|------------------|--------------------|
| 812 | Metric ton (Ton) | Portland cement |