

**STATE OF OHIO
DEPARTMENT OF TRANSPORTATION**

**SUPPLEMENTAL SPECIFICATION 811
ASPHALT UNDERSEALING OF EXISTING CONCRETE PAVEMENT**

April 15, 2005

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811.01 Description. This work consists of drilling holes in existing portland cement concrete pavement; pumping asphalt through the holes to fill voids under the pavement; and filling the drilled holes with temporary and hardwood plugs.

811.02 Materials. Furnish asphalt conforming to ASTM D3141, except the flash point shall be a minimum of 500 °F (260 °C). Provide certified test data and a one (1) quart sample for acceptance.

811.03 Equipment. Use pressure distributor tanks that have a minimum capacity of 500 gallons (1.9 m³); are fully insulated; are equipped with a removable manhole cover; and have suitable strainers at the outlet to the pumps.

Heat the asphalt material in the distributor to the required temperature and circulate it during the entire heating process. Provide equipment to accurately determine the asphalt temperature. Equip the distributor with pumps capable of applying asphalt material at a pressure of 25 to 60 psi (120 to 420 kPa) and with a minimum 3/4-inch (19 mm) diameter sampling valve. Use metallic hoses for all connections and to a one inch (25 mm) nozzle. Furnish a return metallic hose connecting the nozzle to the asphalt distributor tank.

Use a tapered nozzle to pump the asphalt material under the pavement. Equip the nozzle with a three way valve designed to circulate the asphalt back to the distributor tank when pumping operations are not in progress. Attach a combination foot stand and shield to the nozzle so that after the nozzle is firmly wedged into the hole the operator can hold it in position by standing on the wings of the stand.

Provide air compressors for blowing air into cavities beneath the pavement capable of delivering a minimum of 100 cubic feet per minute (0.05 m³/s).

Keep storage tanks, pipes, booster tanks, and distributors used in storing and handling the asphalt keep clean and in good operating condition at all times.

811.04 Drilling Holes. Drill one asphalt injection hole on the leave side of joints and cracks selected by the Engineer. Locate each asphalt injection hole three feet (one meter) from the joint or crack, and at the middle of the lane, unless the Engineer requires something different. Make asphalt injection holes less than 1-1/2 inches (38 mm) in diameter. Drill round vertical holes to a depth sufficient to penetrate through any stabilized base. Do not penetrate a granular subbase more than 2 inches (50 mm). If there is an existing asphalt overlay on rigid pavement, drill the holes through both the overlay and the underlying concrete and use a nozzle long enough that it will snugly fit into the concrete slab without the upper part of the nozzle being below the elevation of the existing bituminous surface. Unsatisfactory or out-of-round holes will require new holes drilled at no cost to the Department. Start the undersealing operation immediately after the drilling operation.

811.05 Undersealing. Heat the asphalt material to a temperature of 400 to 450 °F(205 to 232 °C) before beginning pumping operations. When pumping asphalt under the pavement, ensure the asphalt temperature is not less than 350 °F (177 °C). Circulate the asphalt through the nozzle prior to pumping in order to free and warm the nozzle and hoses. Do not heat the asphalt above 450 °F(232 °C). Demonstrate to the Engineer all temperature measurement equipment is accurate and operating. Asphalt above 450 °F(232 °C) will be rejected.

Before pumping asphalt firmly wedge an air hose nozzle into the hole and blow compressed air at approximately 70 psi (500 kPa) into the hole for 15 seconds to 60 seconds. Sprinkle water, limewater or sand around the hole prior to pumping asphalt to prevent any leaks from around the nozzle sticking to the pavement. Insert the asphalt nozzle in the hole; drive to a snug fit; and pump asphalt until one of the three following criteria is met:

A. When the slab begins to rise at a constant rate.

Monitor the slab lift from a stable reference point and make measurements approximately 6 inches (150 mm) from the joint or crack being undersealed and 6 inches (150 mm) from the edge of the pavement. Provide measurement equipment acceptable to the Engineer. Do not raise the pavement more than 1/4 inch (6 mm). No payment will be made for undersealing material where the 1/4 (6 mm) tolerance is exceeded.

B. When hot asphalt begins to seep from openings in the pavement.

When this occurs, stop pumping until the extruded asphalt has congealed. Then restart pumping. If the hot asphalt seeps again onto the pavement surface, stop undersealing that joint or crack.

C When the total pumping time reaches 15 seconds.

After completing the pumping operation, remove the nozzle and drive a temporary plug into the hole without an excessive back-flow of asphalt. After the asphalt has hardened, remove the temporary plug and drive a hardwood plug flush with the surface of the concrete pavement. Use a hardwood plug at least 3 inches (75 mm) long and a minimum of 1/16 inch (2 mm) larger than the diameter of the drilled hole. Immediately clean and remove any asphalt extruded onto the pavement surface during the pumping operations.

Do not perform asphalt undersealing when the ambient temperature is below 40 °F(5 °C); if the subgrade or base material is frozen; or contains an abnormal amount of moisture.

811.06 Traffic. When traffic is maintained, take the necessary precautions to protect the traveling public. Permit traffic to use the pumped areas after the hardwood plugs are driven.

811.07 Method of Measurement. The Department will measure the number of Tons (metric tons) of asphalt used in the work. Weigh the asphalt on accurate scales. Provide the Engineer with recordings of the gross, tare, and net weight of each truck load of asphalt to the nearest 100 pounds (50 kg). Any partial used loads will be weighed to determine the quantity used. Provide the Engineer with certified weigh bills showing the actual weight used.

The Department will not pay separately for the drilling and filling asphalt injection holes, and the labor, materials, tools, equipment and incidentals for doing all work involved in asphalt undersealing of existing concrete pavement, in place, complete and accepted.

The Department will not pay for any Tons (metric tons) of asphalt that did not meet the acceptance criteria of 811.05

811.08 Basis of Payment. The Department will pay for accepted quantities at the contract prices as follows:

Item	Unit	Description
811	Ton (Metric ton)	Asphalt undersealing