Payment will be made under:

Item No.	Pay Item	Pay Unit
5031000	Grinding and Texturing Existing Concrete Pavement	Square Yard

SECTION 504

CLEANING AND RESEALING OF JOINTS IN PORTLAND CEMENT CONCRETE PAVEMENT

504.01 Description. This work shall consist of the rehabilitation of joints and cracks in portland cement concrete pavements by cleaning, preparing for and placing the specified sealant.

MATERIALS

504.02 Materials. Materials used in this work shall meet the requirements of Section **501**. Selection of the sealant material shall be in accordance with the following table:

APPLICATION:	ASTM D 3405 Sealant	Silicone Sealants	
		Non-Sag	Self-Level
Old Concrete Pavement w/ transverse and lane longitudinal joints[1], uniform joint widths - no overlay		§	§
Old Concrete Pavement w/ transverse and lane longitudinal joints[1], non-uniform joint widths - no overlay		§	
Old Concrete Pavement w/ transverse and lane longitudinal joints[1], to be overlaid with hot mix asphalt	§		
Concrete Shoulders (with Concrete Pavement) w/ transverse and longitudinal joints, uniform joint widths - no overlay		§	§
Concrete Shoulders (with Concrete Pavement) w/ transverse and longitudinal joints, non-uniform joint widths - no overlay		§	
Concrete Shoulders (with Concrete Pavement) w/ transverse and longitudinal joints, to be overlaid with hot mix asphalt	§		
New HMA Shoulders (with Concrete Pavement) w/ longitudinal joints	§[2]		§
Old HMA Shoulders (with Concrete Pavement) w/ longitudinal joints	§[2]		

§ Denotes acceptable sealant for indicated application

Notes:

1 Not constructed with the plastic strip.

2 A bond breaker is not required.

504.03 Preparation of Joints. Joints shall be prepared by removing all joint material to include sealants, inserts, and any material that may have infiltrated the joint. The existing sealant shall be removed from the joint using a vertical edge-cutting tool. A power driven concrete saw with diamond or abrasive blades may be used to remove all old sealant from the joint faces and to expose clean concrete. If required, the faces of the joint shall be cut using a concrete saw with diamond or abrasive blades. The joints shall be cut to the depth and width necessary to provide for the specified dimensions of new joint sealant.

Immediately following the sawing operations, the joints shall be thoroughly flushed with a high-pressure water jet to remove the slurry and any loose material from the joint faces. Joint washing shall be performed in one direction to prevent recontamination of the joint.

Once the joint is dry and before final cleaning begins, the joint shall be sandblasted to remove contaminants. Sandblasting shall be performed in two passes, one for each face, with the nozzle held at an angle to the joint face and within 1 to 2 inches of the pavement. Additional sandblasting passes may be required if necessary to remove all traces of old sealant or other irregularities that may interfere with the bonding of the new sealant. Sandblasting shall be performed the same day as the sealing operation and shall be repeated if rain showers occur between initial sandblasting and sealing.

The blast material as well as dust and dirt deposited by wind and traffic shall be blown out of the joint and away from the surrounding area using a high-pressure air blast. The air compressor shall produce at least 90 psi and shall be equipped with traps capable of removing moisture and oil from the compressed air. As with the water jet, the air blast shall proceed in one direction to prevent recontamination of the joint.

Joints shall be inspected for proper width, depth, alignment, and preparation, and shall be approved by the Engineer before installation of sealant. All joints to be sealed must be sound, clean, dry, and frost free. Joints found to contain dust or that have become dirty or contaminated shall be re-cleaned.

504.04 Installation of Sealant. After cleaning has been completed, the bond breaker (bond breaker tape or backer rod) shall be placed at the proper depth to form the bottom of the seal. The bond breaker shall be compatible with the sealant. Installation methods and equipment shall be in accordance with the manufacturer's recommendations. Backer rods shall then be made leak proof where required by caulking with a silicone product compatible with the sealant to be used. This may be applied from tubes with a caulking gun device.

The sealant shall then be placed in the joint in accordance with the plan configuration by means of an appropriate pump equipped with a nozzle that is narrow enough to place the material from the bottom up in the joint. The material shall be placed to establish a surface profile in the desired depth below the surface of the pavement. All equipment for placing the seal and methods of placement shall be in accordance with the sealant manufacturer's recommendations.

Final cleaning, placing of the bond breaker, and placing of the sealant shall be performed in a continuous operation. Once the final cleaning and sealing operation has begun on a section of pavement, no traffic, construction vehicles, or other equipment will be allowed on the section of pavement for a minimum of 2 hours or until the seal material has cured.

As determined by the Engineer, joints not properly sealed shall have the sealant removed for the full sealant depth, be thoroughly cleaned, resealed in accordance with this specification, and all at no expense to the Department.

Any material spilled on the pavement shall be immediately removed. Solvents shall not be used to remove spills, because they generally carry the materials further into the porous concrete or spread them on the surface.

504.05 Hot Poured Sealants. When hot poured sealant, as specified in Subsection **501.07D** is used, it shall be handled and applied as follows:

A. Heating. During the sealing operation, the melter shall be operated as follows:

1. The initial charging of the melter shall be 1/2 the vat capacity with the other 1/2 being charged after the initial 1/2 charge has liquefied.

2. Continuous agitation shall be maintained once the sealant is liquefied.

3. Circulation pumping shall begin after the sealant has been initially liquefied.

4. Fresh unheated sealant shall be added in a way that the temperature of the heated sealant in the vat does not fall below the recommended application temperature range while the sealant is being applied.

5. The melter system shall be thoroughly clean at the start of work and the pump and sealing hose shall be flushed out at the end of each day or work period. Material may be left in the vat overnight and used the next day provided it has not exceeded the maximum heating time during the previous heating period.

6. Sealing will not begin until the liquefied sealant in the melter is at the approximate mid point of the recommended application temperature range and has been above the minimum side of the working temperature range for 1/2 hour or more.

7. The recorder shall be operated at all times when the melter is being used. The permanent record chart shall be dated and given to the Engineer each day or chart timing period as proper. The Engineer may waive the requirement for continuous temperature recording on new technology pump systems that reasonably assure low temperature material cannot be applied.

B. Application. During the sealing operation, the hot poured sealant material shall be handled and used as follows:

1. The ambient temperature and groove wall surface temperature shall be 45°F and rising before application begins.

2. The material shall not be heated beyond its safe heating temperature as recommended by the sealant manufacturer.

3. The sealant material shall not be applied when cooler or hotter than the recommended application temperature range.

4. The plastic wrap on the material, as shipped, may be dumped into the vat with the material.

5. The sealant material shall be continuously agitated and circulated once it is liquefied in the melter.

6. The sealant material shall not be stored in direct sunlight or in an ambient temperature over 100°F, such as under a tarp. It should be stored under cover or roof with adequate ventilation.

7. The wand tip shall be such that it will fit into the groove and the material will be placed from the bottom to the top of the groove. The tip shall be equipped with a depth gage to prevent the wand from traveling in the bottom of the groove.

8. The first gallon of material to flow out of the applicator wand at the beginning of the day shall be considered spoil, discharged into a container, and discarded.

9. Re-heating or prolonged heating at or above the safe heating temperature will cause the sealant to gel in the application equipment. A rapid increase in viscosity and stringiness of the material indicates the approach of gelation. When these conditions occur, sealing shall stop, and the remaining material shall be rapidly pumped from the kettle and discarded from the work.

10. The applicator wand shall be returned to the machine, and the material re-circulated immediately upon the completion of each joint sealing.

11. The joints shall not be overfilled. Overfilled joints shall be cleaned and resealed as directed by the Engineer. The correct level for the top of the seal is 1/4 inch below the lower top of joint surface.

504.06 Silicone Sealant. When silicone sealant is used, it shall conform to the requirements of Subsection **501.07B** and shall be handled and applied in accordance with Subsection **501.27**.

504.07 Method of Measurement. The quantity measured for payment under this section shall be to the nearest 0.1 linear foot of joint cleaning and resealing, complete and measured in place along the surface of the roadway, and accepted by the Engineer.

504.08 Basis of Payment. The length, measured as provided in Subsection **504.07**, will be paid for the contract unit price for the items as listed below, which price and payment shall be full compensation for cleaning and resealing of joints, satisfactory disposal of waste materials, and including all materials, equipment, tools, labor, and incidentals necessary to satisfactorily complete the work.

Payment for each item includes all direct and indirect costs and expenses required to complete the work.

Payment will be made under:

Item No.	**Pay Item**	**Pay Unit**
5041100	Clean and Seal Longitudinal Joints	Linear Foot
5041200	Clean and Seal Longitudinal Shoulder Joints	Linear Foot
5041300	Clean and Seal Transverse Joints	Linear Foot
5041400	Clean and Seal Transverse Joints at Bridge	Linear Foot