TABLE 502-3 JOINT SEALING ALTERNATIVES

Joint Type	Sealing Alternative	First-Stage Saw Cut Required	Second-Stage Saw Cut and Bevel Required
Transverse Contraction	Silicone or Preformed	Yes	Both
	Highway Joint Sealant	Yes	Neither
Transverse Expansion and Isolation	Silicone or Preformed	No	Bevel Only
Transverse Construction	Silicone or Preformed	No	Both
	Do Nothing1	No	Neither
Longitudinal - Between Lanes Placed Simultaneously	Silicone or Preformed	Yes	Second-Stage Only
	Do Nothing1	Yes	Neither
Longitudinal - Between Lanes Placed Separately and Untied Joints With Keyway	Silicone or Preformed	No	Second-Stage Only
	Do Nothing1	No	Neither

NOTE:
1. Do nothing if highway joint sealants are specified for transverse contraction joints.

502-3.13 Pavement Protection. Protect the pavement and appurtenances from traffic and construction operations. Protect the work and provide for traffic as indicated in the contract documents.

502-3.14 Damaged or Defective Concrete. Repair or replace all damaged or defective concrete which occurs prior to final acceptance. Perform these repairs as described in the contract documents at no cost to the State. Damage and defects include, but are not limited to, cracking, spalling, honeycombing, or imperfections caused by inadequate pavement protection, traffic, and/or construction practices. Slipformed concrete with inadequate plastic thickness as described in §502-3.08, Plastic Thickness Determination, will be rejected in 50 m segment lengths.

502-3.15 Hardened Surface Test (Nonprofilographed Concrete). After the concrete has hardened sufficiently, test the entire longitudinal center of each travel lane, including ramps, with a 3 m, minimum, long straight edge laid longitudinally. The Engineer will mark high and low deviations in the pavement surface exceeding 3 mm in 3 m. Diamond grind these deviations such that they do not exceed 3 mm in 3 m when retested with the straight edge.

502-3.16 Profilograph. This section applies to profilographed concrete (and nonprofilographed concrete when a full-width finishing pan or triple transverse screed paving operation is not employed). The Engineer will divide each travel lane into reporting segments that are 160 m long. The Engineer will group segments shorter than 160 m with previous or subsequent segments. Provide survey stationing and develop a reference system that allows the Engineer to readily associate profilograph data to the corresponding reporting segment.

Develop a profile trace for each wheelpath in each reporting segment in accordance with Materials Method 24, PCC Pavement Profilograph Operations. Determine an initial profile index (PI) for each reporting segment by averaging the PIs of the wheelpaths. Provide the traces and initial PIs to the Engineer. The Engineer will identify bumps exceeding 10 mm in 7.6 m on each profile trace. Locate and diamond grind these bumps, if any, to 10 mm or less in 7.6 m. If no grinding is required for a given reporting segment, the initial PI may be used to determine the payable Quality Units of Smoothness Quality Adjustment per reporting segment.

Production diamond grinding equipment can be used to increase the amount of Quality Units payable as discussed in §502-3.17, Diamond Grinding. Whether diamond grinding was required through profile trace analysis, or performed as a Contractor option, reprofilograph each reporting segment that was

diamond ground and determine a final PI. Give the Engineer the final profile traces and final PI determined by using both the 5 mm and zero blanking bands.

502-3.17 Diamond Grinding. Diamond grind the pavement longitudinally, beginning and ending at lines normal to the pavement centerline, and in full travel lane width increments. Provide surface drainage by maintaining the proper cross slope on the finished surface and by blending adjacent passes. Continuously vacuum the slurry from the pavement when production grinding. If roadside slurry discharge is not allowed by the contract documents, transfer the slurry into equipment capable of transporting it from the contract site without spills. Dispose of slurry in conformance with all Federal, State, and local regulations.

In any case, do not allow slurry to enter:

- Occupied travel lanes.
- Drainage structures.
- Wetlands, streams, estuaries, or sensitive environmental resources.
- Areas where it will become a public nuisance.

Use of bump grinding equipment is restricted to grinding bumps that exceed 10 mm in 7.6 m in profilographed concrete and bump grinding non-profilographed concrete. Production grinding equipment can be used to grind bumps or increase the amount of Quality Units payable subject to the following:

- For pavements textured with longitudinal tining or artificial turf drag, any amount of a reporting segment surface area may be diamond ground to increase the amount of Quality Units payable.
- For transverse tined pavements, Quality Units are payable if less than 20% or more than 95% of the reporting segment surface area is ground. If more than 20% of the reporting segment area is ground for any reason, diamond grind 95%, minimum, of the entire reporting segment.

502-3.18 Opening to Traffic

A. Construction Traffic. Class C concrete may be opened to construction traffic and paving equipment 7 days after placement. With the Engineer's approval, this time frame may be shortened to 3 days if cylinders achieve a compressive strength of 17 MPa in accordance with §502-3.18C, Project Strength Determination. Any pavement damaged from opening to construction traffic in a reduced time frame will be treated in accordance with §502-3.14, Damaged or Defective Concrete.

B. General Traffic. Class C concrete placed between June 1 and September 15 may be opened to general traffic 10 days after placement. Class C concrete placed outside this interval may be opened to general traffic 15 days after placement. With the Engineer's approval, these time frames may be shortened to 4 days if cylinders achieve a compressive strength of 21 MPa in accordance with §502-3.18C, Project Strength Determination, and the joints are addressed in accordance with §502-3.12, Sealing Joints.

If Project Strength Determination testing for construction traffic opening indicates the concrete has achieved a compressive strength in excess of 21 MPa, the concrete may be opened to general traffic after 4 days. Any pavement damaged from opening to general traffic in a reduced time frame will be treated in accordance with §502-3.14, Damaged or Defective Concrete.

C. Project Strength Determination. Provide an ACI Certified Concrete Field Testing Technician, Grade I, or higher, to cast all cylinders. Unless otherwise noted in the contract documents, use an agency accredited by the AASHTO Accreditation Program (AAP) in the field of construction materials testing of portland cement concrete to perform compressive strength testing.

Cast and test in the presence of the Engineer, or the Engineer's representative. Provide acceptable proof of ACI Certification and AASHTO Accreditation to the Engineer before placing any concrete.

The Engineer, or the Engineer's representative, will complete the Concrete Cylinder Report as cylinders are cast and tested.

Cast a minimum of 3 cylinder pairs (6 total) from each 300 m of paving length, or fraction thereof, in accordance with Materials Method 9.2, Field Inspection of Portland Cement Concrete. Cast each pair from different delivery trucks. Develop an Engineer-approved marking system that

allows a cylinder to be readily associated with the corresponding placement location and placement time. Mark the cylinders and place them adjacent to the pavement under similar curing conditions. Determine the concrete compressive strength at the desired time in accordance with ASTM C39, Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens. The pavement may be opened to construction (or general) traffic if all the following apply:

- Average compressive strength of all cylinder pairs exceed 17 MPa (or 21 MPa).
- Average compressive strength of each cylinder pair exceeds 14 MPa (or 17 MPa).
- Appropriate time frame has elapsed for the entire area to be opened.

If these conditions are not met, test 3 additional cylinder pairs at a later time, provided the appropriate numbers of additional cylinders were cast. If the above conditions are not met after additional testing, or, if the required number of additional cylinders were not cast, open the pavement in accordance with the nonreduced time frames of §502-3.18A, Construction Traffic, and §502-3.18B, General Traffic.

D. HES Concrete. HES concrete may be opened to construction traffic when it has achieved a compressive strength of 17MPa and to general traffic when it has achieved compressive strength of 21 MPa, in accordance with §502-3.18C, Project Strength Determination, and the joints are addressed in accordance with §502-3.12, Sealing Joints.

502-4 METHOD OF MEASUREMENT. The Engineer will measure the following quantities for items incorporated into the finished pavement:

502-4.01 Portland Cement Treated Permeable Base. The work will be measured for payment as the number of cubic meters of portland cement treated permeable base satisfactorily placed based on the payment lines shown in the contract documents. No deductions will be made for catch basins, manholes, or other similar pavement obstructions.

502-4.02 PCC Pavement, Unreinforced. The work will be measured for payment as the number of cubic meters of unreinforced PCC pavement satisfactorily placed based on the payment lines shown in the contract documents. Deductions in 50 m segment lengths will be made for areas that do not meet minimum plastic thickness requirements. Deductions (and separate payment) will be made for catch basins, manholes, or other similar pavement obstructions requiring either mesh reinforced or heavily reinforced placements.

502-4.03 PCC Pavement, Mesh or Heavily Reinforced. The work will be measured for payment as the number of cubic meters of reinforced concrete satisfactorily placed. No deductions will be made for drainage and utility structures or other similar pavement obstructions being isolated from the surrounding pavement.

502-4.04 Smoothness Quality Adjustment (Profilographed Items Only). The work will be measured for payment as the number of Quality Units of Smoothness Quality Adjustment, if any, payable for each reporting segment determined by the following:

Quality Units (Per Segment) = (SAF - 1.00) x PCC Cubic Meters (Per Segment)

The Smoothness Adjustment Factor (SAF) from Table 502-4, Smoothness Adjustment Factors, is based on the final PI obtained for each reporting segment using a 5 mm blanking band. No Quality Units are computed for pavements specified as nonprofilographed.

TABLE 502-4 SMOOTHNESS ADJUSTMENT FACTORS

Final Profile Index (mm/km.)	Level 1 SAF	Level 2 SAF
0.0 - 16.0	1.05	1.05
16.1 - 32.0	1.04	1.04
32.1 - 48.0	1.03	1.03
48.1 - 64.0	1.02	1.02
64.1 - 79.9	1.01	1.01
80	1.00	1.00
80.0 +	Grind	1.00
190.0 +	Not Applicable	Grind

502-4.05 Constructing Transverse Joints. The work will be measured for payment as the number of meters of transverse joints satisfactorily constructed.

502-4.06 Constructing Longitudinal Joints. The work will be measured for payment as the number of meters of longitudinal joints satisfactorily constructed.

502-4.07 Sealing Transverse Joints. The work will be measured for payment as the number of meters of transverse joints satisfactorily sealed, excluding preformed sealers turned down at the pavement edges.

502-4.08 Sealing Longitudinal Joints. The work will be measured for payment as the number of meters of longitudinal joints satisfactorily sealed.

502-5 BASIS OF PAYMENT

502-5.01 Portland Cement Treated Permeable Base. Include the cost of all labor, material, and equipment necessary to satisfactorily perform the work in the unit price bid for Portland Cement Treated Permeable Base.

502-5.02 PCC Pavement, Unreinforced, Nonprofilographed. Include the cost of all labor, material, and equipment necessary to satisfactorily perform the work in the unit price bid for PCC Pavement, Unreinforced, Nonprofilographed. No payment will be made for areas that do not meet minimum plastic thickness requirements. No additional payment will be made for Contractor-requested HES concrete mixes.

Also include the cost of all labor, material, and equipment necessary to profilograph and diamond grind the pavement to meet the Level 2 smoothness requirements of Table 502-4, Smoothness Adjustment Factors, if paving equipment other than a paver equipped with a full-width finishing pan or triple transverse screeds is used. In this case, no payment will be made for SAF Quality Units.

PCC Pavement, Unreinforced, Nonprofilographed will be eligible for progress payments in accordance with the following:

- 80% upon satisfactory completion of all work up to, and including, first-stage saw cutting.
- An additional 10% upon satisfactory completion of diamond grinding, if any.
- The remaining 10% upon satisfactory completion of the work.

502-5.03 PCC Pavement, Unreinforced, Profilographed. Include the cost of all labor, material, and equipment necessary to satisfactorily perform the work in the unit price bid for PCC Pavement, Unreinforced, Profilographed. No payment will be made for areas that do not meet minimum plastic thickness requirements. No additional payment will be made for Contractor-requested HES concrete mixes.

PCC Pavement, Unreinforced, Profilographed will be eligible for progress payments in accordance with the following:

- 80% upon satisfactory completion of all work up to, and including, first-stage saw cutting.