

Saw initial or "control" transverse contraction joints at 54 foot (16.5 m) intervals or another multiple of the specified joint spacing that reduces uncontrolled cracking with the least number of initial contraction joints. Saw initial contraction joints as soon as possible after the concrete is placed. Do not permit the saw to tear or ravel the adjacent concrete. Saw the remaining contraction joints typically within 24 to 48 hours after concrete is placed.

Be responsible for determining joint-sawing methods, sequences, and timing to prevent random cracking. Immediately revise methods that cause random cracking. Repair or replace concrete defects resulting from errors in the work methods at Contractor expense.

Repair or replace broken slabs, random cracks, nonworking contraction joints near cracks, and spalls along joints and cracks under Subsection 501.03.15.

Protect saw cuts in concrete 60 hours old or less from rapid drying using twisted paper, fiber or rope cords, waterproof covering, or other approved methods.

Have at least one stand-by saw in good condition and additional saw blades at the job site during sawing operations.

Cut curbs and gutters to the required depth to prevent erratic cracking.

Immediately after the joints are sawed, flush the groove with pressurized water and blow the groove out with compressed air to remove all dust, water, and slurry. Clean the groove using compressed air just before filling with joint filler.

Place hot-poured joint sealer in sawed joints to within 1/4-inch (6 mm) to 3/16-inch (5 mm) of the pavement surface when the pavement temperature is at least + 40 °F (4 °C).

Do not use polyethylene strips to form transverse contraction joints.

- E. Longitudinal Joints.** Saw longitudinal joints to the specified width and depth within three days of placing the concrete.

Do not use plastic tape as a joint sealer.

Saw and apply hot-poured joint sealer meeting Subsection 501.03.13(D) requirements.

Assure the finished joint alignment is parallel to the centerline of the pavement and does not have irregularities exceeding 0.04 foot (12 mm), measured by a 12 foot (3.6 m) straightedge, except for normal centerline curvature.

- F. Key-way Longitudinal Joints.** Construct key-way joints as specified when adjacent pavement slabs are constructed separately.

501.03.14 Surface Test

Test pavement surfaces exceeding 300 feet (91.5 m) long under (A) Profilograph. Test surfaces 300 feet (91.5 m) and shorter under (B) Straightedge.

- A. Profilograph.** Furnish a 25 foot (7.6 m) wheel base California type profilograph and a competent operator to measure the surface smoothness before joint sealing. Do not exceed a maximum 3 mph (4.8 km/h) operational speed. Calibrate, adjust, and operate the profilograph following the manufacturers instructions and California Test Method 526. Provide the Project Manager 24 hours advance notice before using the profilograph. The Project Manager will witness all profilograph recordings. The profilogram must record a scale of 1 inch (25 mm) to 25 feet (7.6 m) longitudinally and 1 inch (25 mm) to 1 inch (25 mm) vertically. Take a profile on a line parallel to and 3 feet (0.9 m) inside the outside edge of each traffic lane. Run the profilograph parallel to the pavement edge at all times. Additional profiles may be taken to define the limits of an out-of-tolerance surface. End the profiles 50 feet (15.2 m) from existing pavements, bridge ends, and intersections. The

acceptable lane section profile is an average profile index of 12 inches (305 mm) per mile (1.6 km) or less with each lane section being 0.1 mile (161 m) long. The Project Manager will determine the profile index using California Test Method 526. Remove all high points in excess of 0.3-inch (8 mm) in 25 feet (7.6 m) or less within each 0.1 mile (161 m) section using a method approved by the Project Manager. Re-profile corrected sections. Acceptable sections are those having an average profile index not exceeding 15 inches (380mm) per mile (1.61km). Re-profile corrected areas to determine if the section has an average profile index of 15.

Contract unit price adjustments are made following Table 501-1. The Contractor may elect to perform corrective work to reduce the average profile index when it is less than the corrective index but greater than the incentive index. Incentive will not be paid on sections with an initial index exceeding 15.

**TABLE 501-1
CONTRACT UNIT PRICE ADJUSTMENTS**

ENGLISH	
Lane Average Profile Index (Inches per Mile-per 0.1 Mile)	Contract Unit Price Adjustment
Less than 6	\$0.50 per square yard incentive pay
6 to 10	Contract Unit Price
10 to 15	\$1.00 per square yard deduction
Over 15	Corrective work required
METRIC	
Lane Average profile Index (mm per 1.6 km-per 161 m)	Contract Unit Price Adjustment
Less than 150 mm	\$0.60 per 1 square meter incentive pay
150 mm to 255 mm	Contract Unit Price
255 mm to 380 mm	\$1.20 per 1 square meter deduction
Over 380 mm	Corrective work required

The price adjustment applies to the entire area of concrete for the 0.1-mile (161 m) lane segment. The area is computed using plan width for the 0.1-mile (161 m) lane segments. Sections of pavement less than 0.1 miles (161 m) are added to subsequent paving to provide a 0.1-mile (161 m) section.

No payment is made for any section with an average profile index exceeding 15 until it is re-worked and re-profiled to an average profile index of 15 or less. Re-work all areas not profilographed (50 feet (15.2 m) from bridge ends and intersections) with high points exceeding 0.3-inch (8 mm) in 25 feet (7.6 m) to 0.3-inch (8 mm) or less per 25 feet (7.6 m).

Complete all corrective work before measuring the pavement thickness.

Include all profilographing costs in the contract unit price for portland cement concrete pavement.

- B. Straightedge.** Use straightedge tests for sections of pavement less than 300 feet (91.5 m) in length. Once the concrete has hardened, test the pavement surface with a 10 foot (3 m) straightedge placed parallel to the pavement centerline.

Span each low spot and touch each high spot with the testing edge revealing all irregularities.

Correct all pavement showing a variation from the testing edge exceeding 1/16-inch per foot (2 mm per 305 mm) from the nearest contact point with the testing edge or showing a total variation exceeding 1/4-inch (6 mm) from the 10 foot (3 m) straightedge by grinding until the areas are within the above limits.

Where the grinding methods would result in an unsatisfactory surface or in a slab thickness less than specified, the affected pavement may require an adjustment in the contract unit price or removal and replacement under Subsection 501.03.20.

Perform all pavement corrections including removing and replacing of pavement at Contractor expense.

501.03.15 Correcting Spall and Cracks

Remove and replace pavement slabs cracked through the full depth into three or more parts.

Repair pavement slabs containing a single diagonal crack intersecting the transverse and longitudinal joints within 1/3 of the width and length of the slab from the corner by removing and replacing the smaller portion of the slab. Repair broken slabs as directed.

Groove and seal random cracks that penetrate the full depth of the pavement. Groove the top of the crack to 3/4-inch (19 mm) minimum depth and a width between 3/8-inch (10 mm) to 5/8-inch (16 mm) using an approved grooving machine. Use a vertical rotary-cutting machine that can follow the crack path and widen the top of the crack to the required section without spalling or damaging the concrete. Remove all loose and fractured concrete, and thoroughly clean and seal the groove with the sealant specified in the contract.

The Project Manager will determine what random cracks are tight, don't penetrate the full depth of the pavement and will be left undisturbed. When requested by the Project Manager, determine the crack depth penetration by drilling and inspecting cores at Contractor expense.

When a transverse random crack terminates in or crosses a transverse contraction joint, fill the un-cracked portion of the joint with epoxy-resin mortar or grout, and route and seal the crack.

When a transverse random crack nearly parallels the planned contraction joint and is within 5 feet (1.5 m) from a contraction joint, route, seal, and fill the crack with epoxy-resin grout or mortar.

When a transverse random crack is more than 5 feet (1.5 m) from the nearest contraction joint in the pavement, seal both the joint and the crack. Thoroughly clean the joints before filling with epoxy-resin mortar or grout.

Repair spalls by making a saw cut at least 1 inch (25 mm) outside the spalled area and to a minimum depth of 2 inches (50 mm). When the spalled area abuts a joint, make a saw-cut 2 inches (50 mm) deep or 1/6 the slab thickness, whichever is greater. Chip out the concrete between the saw cut and the joint or primary crack to solid concrete. Thoroughly clean the resulting cavity of all loose material. Apply a prime coat of epoxy-resin binder to the dry, cleaned surface of all cavity sides, except the working joint faces to be retained. Apply the prime coat by scrubbing it into the surface with a stiff bristle brush. Place portland cement concrete or epoxy-resin concrete or mortar immediately following the prime coat application.

For spalled areas abutting working joints or working cracks penetrating full depth, place an insert or other bond breaker to maintain the joint or crack during the patch repair.

501.03.16 Opening to Traffic

Do not permit traffic or Contractor equipment, excluding joint sawing and sealing equipment, on the concrete until flex beam test results indicate the concrete has developed a minimum 350 psi (2,415 kPa) modulus of rupture.

Prepare the concrete flex beams meeting AASHTO T-23 and test for modulus of rupture using AASHTO T-97.