

SECTION 524—THIN BONDED PORTLAND CEMENT CONCRETE OVERLAY

524.1 DESCRIPTION—This work is the construction of a thin bonded Portland cement concrete overlay, or inlay, including surface preparation and joint sawing and sealing.

524.2 MATERIAL—

(a) **Cement Concrete, Class AA.** [Section 704](#) and as follows:

- Maximum water-cement mass (weight) ratio: 0.40
- If overlay thickness is less than 75 mm (3 inches), use No. 8 coarse aggregate instead of No. 57 coarse aggregate.

(b) **Concrete Admixtures.** [Section 711.3](#)

(c) **Concrete Covering Material.** [Section 711.1\(a\)](#)

(d) **Concrete Curing Materials.** [Section 711.1\(b\)](#) or [711.2\(a\)](#), Type 2

(e) **Joint Backing Material.** [Section 705.9](#)

(f) **Joint Sealing Material.** [Section 705.4\(a\)](#), (b), or (c)

(g) **Tape Bond Breaker.** An acceptable self-adhesive tape the width of the sealant reservoir.

(h) **Grout.** Use the following initial mass (weight) proportions:

Cement	Water
2	1

Adjust as necessary.

524.3 CONSTRUCTION—Construct concrete overlay as specified in [Section 501.3](#) and as follows:

(a) **Surface Preparation.** Prepare the existing concrete surface as follows:

1. Equipment.

1.a Scarifying Equipment. Provide a self-propelled mechanical scarifier capable of uniformly removing the old surface, to the depth indicated, in a satisfactory manner.

1.b Shot Blasting, Sand Blasting, or Water Blasting Equipment. Provide equipment capable of removing any loose concrete and rust from exposed reinforcement.

1.c Power Tools. Provide concrete saws, 6.6 kg (15-pound) chipping hammers, air compressors, and any other tools necessary to perform this work.

2. Scarification of the Existing Pavement Surface. Scarify the existing pavement surface as indicated. Cut off and remove any reinforcement that is exposed and loose.

3. Extra-Depth Surface Preparation. After scarifying, remove any deteriorated concrete or asphalt materials that extend below the level of the scarification, as indicated or directed. Use either 6.6 kg (15-pound) chipping hammers, operated at an angle of no more than 45 degrees measured from the pavement surface, or approved scarifying equipment.

Sound the pavement to ensure that all deteriorated and delaminated concrete has been removed.

Remove all loose material from the pavement surface before cleaning.

4. Steel Plates. If inlaying and the existing transverse pavement joints have steel plates, remove exposed steel plates.

5. Cleaning the Surface. Clean the scarified pavement surface after removing deteriorated and delaminated concrete, and before placing grout. Use shot blasting or water blasting.

Clean pavement to be overlaid the day before paving operations are planned. Do not clean more pavement than will be overlaid that day. Cover the cleaned surface with polyethylene sheeting. Keep the surface covered until ready to pave. Do not remove sheeting more than 30 m (100 feet) in front of the grouting operation.

Immediately ahead of the grouting operation, air blast the pavement surface to remove any shot, dust, or other debris. Use a compressed air stream of at least 700 kPa (100 pounds per square inch) measured at the source. Use compressed air free of oil, moisture, and other contaminants.

Keep the prepared surface free of all contaminants.

Protect the cleaned and prepared surface from oil or grease drippings from compressors, concrete trucks, spreaders, pavers, etc. by using protective covers. Remove all deleterious materials before overlay/inlay.

(b) Overlay Transition. Construct paving notches, as indicated.

(c) Transverse Joint Location. Accurately mark the location of all transverse joints so that they can be located after the overlay has been placed. Submit the proposed method of location marking for approval before the start of construction.

(d) Grout. Adjust the grout proportions, as directed, at no cost to the Department. Furnish grout having the consistency of latex paint. If the coarse aggregate in the prepared surface is visible through the grout, the grout is too thin.

Mix grout in an approved mobile mixer on the job site. Do not use grout mixed for more than 90 minutes.

(e) Grout Application. After the surface has been cleaned, spray or scrub a coating of grout into the dry, prepared surface immediately ahead of the paver. Exercise extreme care to ensure that all areas receive a thorough, even coating and that no excess grout collects in pockets.

Place new concrete before the grout begins to dry. If grout exhibits signs of drying, by a whitish appearance to the surface, remove the grout by sand blasting or shot blasting. Regrout the cleaned pavement surface before placing new concrete.

(f) Bond Strength. Bond strength testing will be performed at 7 days, according to [PTM No. 610](#), on the area represented by each day's placement. Obtain three drilled cores for each test in the presence of the Inspector. The Inspector will select coring locations at random, according to [PTM No. 1](#). When directed, supply the Department with a minimum of three additional 100 mm or 150 mm (4-inch or 6-inch) diameter cores. Provide a testing apparatus conforming to [PTM No. 610](#). Minimum acceptable bond strength is 14 kPa (200 pounds per square inch) at 7 days.

If the average of the test results on the three cores is below minimum acceptable bond strength, the area represented will be considered defective. If this occurs, obtain additional cores at 30 m (100-foot) intervals in both directions longitudinally from the defective cores to determine the limits of defective work. Each set of three defective cores will represent the condition in the same traffic lane for a distance of 15 m (50 feet) in both directions longitudinally.

(g) Concrete Slump. Provide concrete with a slump within the following ranges when tested according to AASHTO T 119:

- Slipform Paving 25 mm to 50 mm (1 inch to 2 inches)

- Fixed Form Paving 50 mm to 75 mm (2 inches to 3 inches)

(h) Curing Concrete. Use only burlap-backed white polyethylene, white membrane forming curing compound, or burlap for normal curing.

If specified, apply curing material as specified in [Section 501.3\(l\)](#).

(i) Transverse Joints. Clean to a depth sufficient to place the new backer rod material. Place joint backing material in the existing transverse joint before overlaying. Cement this material in place so that it cannot be dislodged by the paving operation.

Saw cut all transverse joints as specified in [Section 501.3\(i\)2](#).

Saw cut all transverse joints to the full depth of the overlay, including any extra depth concrete placed at the joint, directly over the existing transverse joint and the width of the existing transverse joint. Include transverse joints created by concrete pavement patching within the overlay area.

When inlaying, saw cut transverse joints to the full depth of the inlay, including any extra depth concrete placed at the joint, directly over the existing transverse joint and a minimum of 13 mm (1/2 inch) wide.

Construct a sealant reservoir as shown on the Standard Drawing for Cement Concrete Pavement Joints. The Contractor may saw cut the overlay, full depth, the width of the sealant reservoir. After sawing, immediately flush with water.

Place backing material to the proper depth.

Seal joints as specified in [Section 501.3\(n\)](#).

(j) Longitudinal Joints. Accurately reference the location of existing longitudinal joints within the overlay area and between the adjacent lane and the overlay area, so that they can be accurately located after paving. After paving, saw cut a sealant reservoir, 6 mm (1/4 inch) wide, and the full depth of the overlay, directly over the existing longitudinal joint.

Seal joints as specified in [Section 501.3\(n\)](#).

Provide a neat vertical edge face, free of honeycomb and segregation, longitudinally along both sides of the overlaid pavement.

(k) Edge Slump. Maximum edge slump permitted in the outside 150 mm (6 inches) next to the shoulder is 6 mm (1/4 inch). Maximum edge slump permitted in the outside 150 mm (6 inches) next to an adjacent lane is 3 mm (1/8 inch).

(m) Opening to Traffic. Before opening to traffic, sound the newly placed bonded overlay/inlay as directed by and in the presence of the Inspector. Remove and replace unbonded areas as directed.

Do not open to any traffic until the overlay/inlay develops a minimum compressive strength of 21 MPa (3,000 pounds per square inch), according to [PTM No. 604](#), and the minimum acceptable bond strength as specified in [Section 524.3\(f\)](#).

(n) Surface Tolerance. [Section 506.3\(p\)](#)

(p) Defective Work. Unless otherwise directed in writing, remove and replace pavement overlay that is defective in depth, as specified in Table A; defective in air content, as specified in [Section 704.1\(c\)3](#); defective in bond strength, as specified in [Section 524.3\(f\)](#); or showing surface defects resulting from the effects of rain, improper final finish, or honeycombing which, in the Representative's opinion, cannot be repaired.

Replace defective pavement overlay as specified in [Section 501.3\(t\)](#); except, provide a minimum pavement removal and replacement length between transverse joints of 1.8 m (6 feet).

524.4 MEASUREMENT AND PAYMENT—

(a) Surface Preparation. Square Meter (Square Yard)

(b) Extra-Depth Surface Preparation. Square Meter (Square Foot)

(c) Thin-Bonded Portland Cement Concrete Overlay. Square Meter (Square Yard)

The unit price includes saw cutting and sealing of existing and new transverse and longitudinal joints.

1. Adjustment for Deficiencies. If a lot, as specified in [Section 506.3\(v\)](#), contains depth deficiencies, the Department will determine the contract price paid for the lot as follows:

TABLE A
Adjustment in Contract Price for Depth

Deficiency in Depth Determined by Cores mm (inches)	Payment Percent of Contract Price by Lot
0.00 to 6.5 (0.00 to 0.25)	100%
6.6 to 7.7 (0.26 to 0.30)	95%
7.8 to 8.9 (0.31 to 0.35)	85%
9.0 to 10.1 (0.36 to 0.40)	75%
10.2 to 11.3 (0.41 to 0.45)	50%
11.4 to 12.5 (0.46 to 0.50)	25%
Over 12.5 (Over 0.50)	Defective Work

2. Defective Pavement Left in Place. The Department will not make any payment.

(d) Evaluation of Concrete Pavement Ride Quality and Payment of Incentive. [Section 507.4](#)