

**CONSTRUCTION INSPECTOR'S CHECKLIST
FOR
PORTLAND CEMENT CONCRETE PAVEMENT**

This checklist has been prepared to provide the field inspector a summary of easy-to-read step-by-step requirements relative to the proper construction of PCC Pavement (Section 420). The following questions are based on information found in Standard and Supplemental Specifications, Highway Standards, Construction Manual and current policy memorandums and letters.

Have you checked the contract Special Provisions, Supplemental Specifications and plans to see if any modifications have been made to the requirements listed herein? _____

1. DRAINAGE

Is the subgrade being kept drained during all operations? Are all berms of earth deposited adjacent to the grade being kept drained by cutting lateral ditches through the berms? (Article 301.09) _____

2. SUBGRADE/SUBBASE TRIMMING

Has the subgrade and/or subbase been trimmed prior to paving? (Article 420.04) _____

When forms are used to pave, is the trimming being done with a subgrade planer (Article 1103.08) or subgrade machine (Article 1103.09) prior to paving? (Articles 420.04 & 301.07) _____

When a slipform paver is used, is the trimming being done with a subgrade machine (Article 1103.09) prior to paving? (Articles 420.04 & 301.07) _____

3. SUBBASE THICKNESS TEST

After trimming, is the thickness of the subbase being checked by any method at every 250 ft (75 m) location or less? (Section A of the Documentation Section of the Construction Manual) _____

Are all these job control thickness tests being recorded and retained as part of the job records? (Table 1 & 7, PPG) (Articles 311.07 or 312.31) _____

If locations of subbase have a deficient thickness, are they being corrected according to Articles 311.07 or 312.31 for the type of construction involved? _____

4. PAVING FORMS

If paving forms are used do they meet the following requirements:

Are the forms: metal, not less than 10 feet (3 m) in length, equipped with both pin locks and joint locks. (Article 1103.05)

Are the forms straight according to the following? (Article 1103.05) _____

- a. The form shall not deviate more than $\frac{1}{16}$ inch (2 mm) from a straight line along the length of its upper edge.
- b. The longitudinal axis of the upstanding leg of the form shall not deviate from a straight line more than $\frac{1}{4}$ inch (6 mm) in 10 ft of length along the length of its front face.

Is the height of form face not less than edge thickness of proposed pavement, the base width equal to or greater than the height, and are 3 steel pins being used to secure each section? (Articles 1103.05 & 420.06) _____

Are the forms being set on a hard and true grade, built up in $\frac{1}{2}$ inch (10 mm) maximum lifts of granular material in low areas (without using wooden shims) set not less than required for at least one days paving in front of the paver, and cleaned and oiled prior to the placing of concrete? (Article 420.06) _____

When wooden forms are allowed, are they full depth, smooth, free of warp, not less than 2 inches (50 mm) thick when used on tangent, and securely fastened to line and grade? (Article 1103.05) _____

Are curved forms of metal or wood being used on curves of 100 foot (30 m) radius or less? (Article 1103.05) _____

Note: Forms shall stay in place a minimum of 12 hours after concrete placement.

5. FORM ALIGNMENT

Is the contractor checking the forms for line and grade and making necessary adjustments prior to concrete placement? (Article 420.06) _____

7. LONGITUDINAL CONSTRUCTION JOINT

Are you marking the beginning and ending stations where adjacent curb, median, or pavement will necessitate the placement of deformed steel tie bars in the edge of the proposed pavement? _____

8. SUPERELEVATION STAKING

Are you examining the plan curve data for all curves to determine where to stake the beginning and ending stations for all superelevation transitions? _____

By giving the contractor these points and intermediate points, a smooth transition from crown to super can be constructed.

9. PLANT & MATERIALS APPROVAL

Has the plant where the concrete is to be produced been approved?
(Article 1103.02) _____

Has the contractor notified you of his/her proposed sources of materials prior to delivery? (Article 106.01) _____

Has all material been inspected, tested and approved before incorporation in the work? (Article 106.03) _____

Is this project set up as Quality Control/Quality Assurance (QC/QA)? _____

If so, are you reviewing the latest version of the QC/QA documents for information regarding quality control procedures by the contractor and quality assurance by the department? _____

Note: Most PCC paving projects will be QC/QA. The QC/QA requirements will apply to both the PCC pavement and the CAM II Stabilized subbase. Contact your Materials department for concrete testing equipment and mixture design approval.

10. TEMPERATURE LIMITATIONS (Article 1020.14(a))

Is the outside air temp in the shade at least 35 °F (2°C) and ascending before allowing the contractor to start mixing and placement operations? _____

Are you discontinuing the contractor's operations when a descending air temp reaches 40 °F (5°C)? _____

Is the temp of the concrete between 50 °F (10°C) and 90 °F (32°C) at the time of placement? _____

11. MIXING CONCRETE (Article 1020.11(c))

Is the contractor producing the concrete in conformance with one of the following methods? Check each article for a review of requirements and restrictions for each: _____

a. Stationary mixer. (Articles 1103.01(a) & 1020.11(a)(1)) _____

b. Truck mixed concrete. (Articles 1103.01(b) & 1020.11(a)(2)) _____

12. TRUCK REQUIREMENTS

Is all concrete which is mixed in a stationary mixer being deposited within 30 minutes when hauled in nonagitating trucks and within 60 minutes when hauled in agitator trucks? (Article 1020.11(d)(8)) _____

Is truck mixed concrete being delivered and deposited within 60 minutes from the time stamped on the ticket? (Article 1020.11(d)(8)) _____

Note: Haul time may be increased to 90 minutes if the air temperature is between 50 °F and 64 °F (10 °C and 17.5 °C) or if a retarder is used.

If the contractor plans to use previously placed pavement as a haul road, are you checking truck weights to assure compliance with maximum weights as permitted by state law? (Articles 107.01 & 701.17(c)(5)) _____

13. SEQUENCES OF FORM TYPE PAVING

Is all of the required concrete finishing equipment on the job and in acceptable working condition? Are the following sequences for form type paving being properly followed:

a. Placing concrete (Article 420.07). Is the concrete being unloaded into a mechanical concrete spreader? (Article 1103.12) _____

Note: Use of a mechanical concrete spreader may be waived if the concrete hauling equipment is equipped with a discharge system capable of distributing the concrete without segregation. (Article 1103.13)

b. Strike-off (Article 420.09). Is the concrete being struck off to the approximate cross section of the pavement? _____

c. Consolidation (Article 420.09). Is one pass of an approved surface vibrator (minimum of 3500 VPM) or internal vibrator (Article 1103.12) (minimum of 7000 VPM) being made? Are you checking the vibrator frequency at the start of each day with a contractor furnished reed tachometer? _____

d. Finishing (Article 420.09(a))

(1) Is the concrete being finished by an approved finishing machine? (Article 1103.13(b)) _____

or;

(2) When breakdowns occur, hand methods will be permitted to finish up deposited concrete. (420.09(a)(2)) _____

or;

- (3) When pavement width varies or is less than 10 ft (3 m) in width, vibrating screed may be used for strike-off and consolidation. (Article 420.09(a)(3)) _____
- e. Longitudinal floating (Article 420.11(b))
 - (1) Is the form riding mechanical float (Article 1103.15) making 2 passes over all areas? (Article 420.09(b)(1)) _____
 - or;
 - (2) Form riding finisher float (Article 1103.14) suspended on rigid frame? (Article 420.09(b)(2)) _____
 - or;
 - (3) (In emergency or for pavements with a speed limit posted at 40 m.p.h. or less), 12 ft x 6 inches (3.5 m x 150 m) hand operated longitudinal float (Article 1103.17(e)). (Articles 420.09(b)(3)) _____
- f. Straightedging (Article 420.09(c)) - At least two 10 ft (3 m) long straight edges shall be supplied. (Article 1103.17(h)) _____
- g. Edging (Article 420.09(d)) - At least two 1/4 inch (6 mm) radius edging tools (Article 1103.17(j)). _____
- h. Final Finish (Article 420.09(e)) – For a type A finish, is the surface of the concrete textured with a turf drag followed by a mechanically operated metal comb transverse grooving device (tining)? _____

A type B finish only requires a turf drag.
- i. Does the contractor have available at all times a covering material such as polyethylene sheeting for the protection of the pavement in case of rain? (Article 420.07) _____

14. SEQUENCES OF SLIPFORM PAVING

When the contractor uses this optional method for the construction of the pavement are the following sequences being properly followed:

- a. Is the self propelled formless paver (Article 1103.16) capable of spreading, striking off, consolidating internally, and finishing the newly placed concrete in one pass to the required line and grade? (Article 420.14) _____
- b. Are you checking the vibrator frequency at the start of each day with a contractor furnished reed tachometer? (Article 1103.12) _____
- c. Is the pavement being straightedged, edged and textured as required in the previous question? (Article 420.09) _____

- d. Does the contractor have available at all times metal or wooden sideforms and a covering material such as polyethylene sheeting for the protection of the pavement in case of rain? (Article 420.07) _____
- e. Is the contractor immediately repairing all slumping edges in excess of 1/2 inch (13 mm) or 1/4 inch (6 mm) if additional concrete work is required adjacent to the pavement lane being placed? (Article 420.14(c)) _____

15. THICKNESS TEST

Are you checking the thickness of the pavement at least at every 250 ft (75 m) location? (Documentation Section of the Construction Manual (Before and after rod and level, before and after stringline, or direct probing measurements are all acceptable.) Record and retain in job records. (Articles 420.15 & 407.10) _____

16. AIR CONTENT

Are you testing the concrete for air (5 - 8%) at least every 250 foot (75 m) of pavement? (Sampling Schedule 3 of the PPG) Record and retain in job records. (Articles 1020.08 & 1020.04 Table 1) _____

17. SLUMP

Are you testing the concrete for slump (2 to 4 inches (50 to 75 mm), 3/4 to 1 1/2 inch (20 mm to 40 mm) for slipforming) at least once each day? (Sampling Schedule 3 of the PPG) Record and retain in job records. (Articles 1020.07 & 1020.04 Table 1) _____

18. STRENGTH

Are test specimens being cast at the site of work at the following frequency: _____

- a. Modulus of Rupture 6" x 6" x 30" beam (150 mm x 150 mm x 750 mm) (Manual of Test Procedures for Materials, Standard Method of Test for Making and Curing Concrete Test Specimens in the Field and Appendix C)
 - 4 beams first day; 2 per day thereafter (Sampling Schedule 3 of the PPG or Special Provisions))
 - Break @ 3, 5, 7 and 14 days.
 - Strength requirement = 650 psi (4.5 MPa) in 14 days (Article 701.17(c)(5))
 - Report on Form MI 655, "Field Record Book of Modulus of Rupture Tests of Concrete Beams" _____

or,

- b. Compressive Strength 6" dia. x 12" cylinder (150 mm dia. x 300 mm cylinder). (Manual of Test Procedures for Materials, Standard Method of Test for Making and Curing Concrete Test Specimens in the Field and Appendix C)

Make 2 cylinders in lieu of each beam (Sampling Schedule 3 of the PPG or Special Provisions)

Strength requirement = 3500 psi (24 MPa) in 14 days (Article 701.17(c)(5))

Note: For QC/QA projects, see sampling frequency for the contractor's quality control and the Departments quality assurance in the Recurring Special Provision.

19. SAWED LONGITUDINAL JOINT (Std. 420001)

- a. Is the longitudinal joint strengthened by 30 inch (750 mm) #6 tie bars at 30 inch (750 mm) centers at t/2 depth perpendicular to the joint? (Article 420.05(a))
- b. Is the longitudinal joint being sawed to a depth of t/3 of the pavement thickness according to Article 420.05(a)?

20. TRANSVERSE EXPANSION JOINTS

- a. Is the preformed joint filler continuous from form to form and shaped to the subgrade or subbase? (Article 420.05(d))
- b. Are the smooth dowel bars positioned parallel to the grade @ t/2 depth and @ 12 inch (300 mm) centers? (Standard 420001)
- c. Are the capped ends of the bar oiled? (420.05(d)(2))

21. TRANSVERSE CONTRACTION JOINTS

- a. Are the load transfer assemblies of the size and positioning shown on Std. 420001 being pinned to the grade at the spacing shown on the applicable Standard? (Article 420.05(c)(2), Standard 420101 or 420106)
- b. Is a 2 3/4 inch (70 mm) or t/3 deep groove being sawed over each assembly 4 to 24 hours after concrete placement? (Article 420.05(c)(1), Standard 420001)

22. TRANSVERSE CONSTRUCTION JOINTS (Article 421.04(b))

- a. Is a transverse construction joint constructed when there is an interruption of more than 30 minutes in the concreting operations? (Article 420.05(e)) _____
- b. Is the transverse construction joint located at a transverse contraction joint? (Article 420.05(e)) _____
- c. Are joints formed by means of a suitable header board conforming to the cross section of the pavement and drilled for the tie bars? (Article 420.05(e)) _____

23. SURPLUS - DEFICIENCY DETERMINATION

Is a daily check being made on the yield of produced concrete? A deficiency computation is serious; it usually indicates thin pavement. _____

$$D \text{ or } S = \frac{\text{Difference between required volume \& volume used}}{\text{Required volume}} \times 100$$

Where - Required volume = $L' \times W' \times D' \times \frac{1}{27} (L_{\text{meter}} \times W_{\text{meter}} \times D_{\text{meter}})$

Used volume = Number of batches x cy (m³/batch)

24. PAVEMENT STATIONING

Are stations being stamped in the pavement surface every 250 feet (100 m) at the location specified by your construction office? Are station equations being stamped where they occur? _____

25. CURING (1020.13(a))

Are the pavement surface and edges being cured for 3 days (1020.13(a)) by one of the following methods:

- a. Waterproof Paper Method. (Article 1020.13(a)(1)) _____
- b. Polyethylene Sheeting Method. (Article 1020.13(a)(2)) _____
- c. Wetted Burlap Method. (Article 1020.13(a)(3)) _____
- d. Membrane Curing Method. As soon as water sheen has disappeared, are 2 separate applications, separated by at least one minute, of agitated Type III (white) curing compound (Article 1022.01) being uniformly applied at a rate of One gallon/250 sf (0.16 L/m²)? (Article 1020.13(a)(4)) _____

Note: Not allowed between November 1 & April 15 (Article 1020.13 Note 5). Not allowed if protective coat is to be applied. (Article 1020.13(a)(4))

- e. Wetted Cotton Mat Method. (Art. 1020.13(a)(5))

26. PROTECTION

Is the contractor providing protection of the pavement from low temperatures as follows: (Article 1020.13(c))

<u>Min. Temp. Forecast</u>	<u>Protection</u>
25°F - 32° F (-4°C - 0°C) (or if drops below 32° F (0°C) during first 72 hours)	1 layer of poly & 1 layer burlap, or 2 layers of polyethylene, or 2 layers of waterproof paper
Below 25°F (-4°C)	6 inches (150 mm) of straw covered with 1 layer of poly or waterproof paper

27. SURFACE VARIATIONS (420.12 & 407.09)

When the concrete has cured sufficiently to permit the testing, are you profilographing or straightedging each wheel lane for surface variations? (Articles 420.10 & 407.09)

Is the required corrective work being performed? (Articles 420.10 & 407.09))

28. OPENING TO TRAFFIC

Is the pavement being closed to traffic until:

- a. The curing and protection period has elapsed? (Article 701.17(c)(5))
- b. All joints have been sealed? (Article 420.12)

Note: The pavement shall also be closed to construction traffic until the joints are sealed.

- c. The required strength has been achieved by test specimen? (Article 701.17(c)(5))

If the contractor wishes to open the pavement to traffic prior to the date of your first routine beam break, are additional specimens being cast and then allowed to cure out in the open the same as the pavement? (701.17(c)(5)), Manual of Test Procedures for Materials, Standard Method of Test for Making and Curing Concrete Test Specimens in the Field)

29 PROTECTIVE COAT

- a. Is a protective surface treatment being applied when pavement is constructed after October 15, and will be opened to traffic prior to the following April 15; or when directed by the Engineer? (Article 420.18) _____
- b. Are 2 coats at 50 sy/gal (11 m²/L)/coat being applied to 14 day old minimum pavement? Is air temperature above 40 °F (4°C)? (Article 420.18) _____

30. FIELD RECORDS

Are all tests, measurements, observations and computations required in the foregoing being maintained in a hard back field book? _____

31. DOCUMENTATION OF FINAL CONTRACT QUANTITIES

PORTLAND CEMENT CONCRETE PAVEMENT (JOINTED), SY (m²)
 PORTLAND CEMENT CONCRETE PAVEMENT, SY (m²)
 PAVEMENT FABRIC, SY (m²)
 PROTECTIVE COAT, SY (m²)

- a. Measured Quantities: Computations based on measured lengths and measured variable width segments. (Article 420.19(b)) Use plan width for all constant width pavement. (Article 109.01) _____
- or:
- b. Contract Quantities: Jointly signed Form **BC 981** required. (Articles 420.19(a) & 202.07(a)) _____

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