

State of Illinois
Department of Transportation

**CONSTRUCTION INSPECTOR'S CHECKLIST
FOR
STABILIZED SUBBASE, BAM, CAM, PAM & CAM II**

While its use is not required, 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 Stabilized Subbase, BAM, CAM, PAM & CAM II (Section 312 of the Standard Specifications). The following questions are based on information found in the Standard and Supplemental Specifications, appropriate sections of the Construction Manual and current policy memorandums and letters.

Have you reviewed the Contract Special Provisions, Standard Specifications, Supplemental Specifications and Plans? _____

GENERAL - THE FIRST 7 QUESTIONS APPLY TO ALL BAM, CAM, PAM & CAM II STABILIZED SUBBASES.

1. WIDTH DETERMINATION

Is the stabilized subbase constructed to the width shown on the plans? _____

Example: The width of the subbase will be shown on the Highway Standard Drawing or plan detail for the pavement being constructed. The table below provides an example to determine the maximum pay width. The table is using 24 ft (7.2 m) wide pavement as the example.

<u>METHOD OF PAVEMENT CONSTRUCTION</u>	<u>REQUIRED SUBBASE WIDTH</u>	<u>PAY WIDTH</u>
Paving forms	18" + 24' + 18" = 450 mm + 7.2 m + 450 mm =	27 ft 8.2 m
Slipform paver	out-to-out of paver tracks + 3" (75 mm) each side	27 ft (8.2m) max.

Note: The additional width of subbase required for slip form paving shall be provided at no additional cost to the Department. (Article 420.14)

2. SUBGRADE DENSITY

Are in-place density tests being taken in the completed subgrade at the frequency of at least 1/1500 ft (1/450 m) of subgrade (Sampling [Schedule 1](#), PPG) to ensure that not less than 95% density is being achieved? (Art. 301.04) _____

3. UNSTABLE SUBGRADE

In cut sections and if necessary, is the Contractor being required to make the determined effort of obtaining density as outlined in Article 301.04? _____

Sometimes it may be necessary to undercut the unstable area. Is the excavation for removal and replacement of material being paid for in accordance with Article 109.04? (Articles 301.04 & 301.12) _____

4. PAVING STAKES

Are paving stakes set prior to the fine grading of the earth subgrade left and right at 50 ft (15 m) intervals; 25 ft (7.5 m) intervals when any radius is less than 1000 ft (300 m)? _____

5. TRIMMING

Is the subgrade brought to true shape according to Article 301.07? _____

6. SUBGRADE FIELD CHECK

Is the fine-graded earth subgrade being checked for required grade and cross section before placing the stabilized subbase? _____

7. DRAINAGE

Is earth subgrade being kept drained by having lateral ditches cut through all adjacent berms of earth paralleling the subgrade? (Art. 301.08) _____

THE FOLLOWING IS A LISTING OF THE SPECIFIED FIELD REQUIREMENTS FOR EACH OF THE STABILIZING MATERIALS, BAM, CAM, PAM & CAM II.

8. HMA, HOT-MIX ASPHALT

Note: HMA is produced and tested according to the QC/QA specifications in Section 1030.

a. Delivery Temperature. Is the bituminous aggregate mixture being delivered at a temperature of 250 °F (120°C) to 350 °F (180°C) (Art. 312.05)? _____

b. Mechanical Spreader. Is the HMA mixture being deposited with a spreading and finishing machine? (Art. 312.05) _____

c. Transporting. Are you checking the temperature of the mixture behind the spreading and finishing machine? _____

Note: If the air temperature falls below 60° F, insulated and covered trucks will be required. (Art. 1030.08)

If the weather is inclement or if a mat temperature of 250° F (120° C) or higher cannot be maintained behind the paver screed, the truck shall be covered. (Article 1030.08)

e. Temperature Records. Is a record being kept of all temperature checks being made by the inspector? _____

f. Compaction Equipment. Is each lift being compacted to the required density with a vibratory roller and another type roller meeting the following requirements? (Art. 312.04) _____

(1) Vibrating rollers and vibrating compactors shall meet with the requirements of Article 1101.01(g).

(2) Three-wheel or tandem rollers: 6 tons (5.5 metric tons) to 12 tons (11 metric tons) total weight; 190 lbs. per inch (33N/mm) to 400 lbs. per inch (70 N/mm) of width of roller.

(3) Pneumatic-tired rollers: shall develop a compression of not less than 300 lbs. per inch (53 N/mm) width of tire tread.

(4) Trench rollers: 300 lbs. per inch (53 N/mm) to 400 lbs. per inch (70 N/mm) width on the compaction wheel.

g. Density Specimens. Are tests being taken at least once every 1/4 mile (0.4 km), per lift with a nuclear testing device? (Article 1030.05(d)(3)) _____

Note: The contractor and the engineer may agree density testing may be accomplished by cores.

Are all holes created by coring being refilled immediately with a bituminous mixture meeting the approval of the Engineer? _____

h. Density Requirements. Is the subbase being compacted to the following densities? (Art. 1030.05(d)(4)) _____

(1) 93% to 97.4% _____

(2) 92% to 97.4% if placed on an unimproved subgrade. _____

i. Thickness Test. Are you taking a thickness test at every 250 ft (75m)? ([Section A](#), Documentation Section of the Construction Manual) _____

9. CAM, CEMENT AGGREGATE MIXTURE

a. Air Temperature. Is the air temperature in the shade over 40 °F (4°C) when placing the CAM mixture? (Art. 312.09) _____

- b. Moisture Content. Is the moisture content of the delivered CAM mixture within 80% to 110% of the optimum moisture determined? (Art. 312.11) _____

- c. Placing. Is the CAM mixture being deposited, full subbase width, with a mechanical spreader or spreader box of a type approved by the Engineer, in a manner which will not cause segregation and which will require minimum blading or manipulation? (Art. 311.05(a) & 312.12) _____

- d. Time Limits. Is compaction started within 60 minutes from the time water is added to the mixture? _____

Is compaction started within 30 minutes from the time the material is deposited on the roadbed? (Art. 312.12) _____

- e. Thickness. Is the CAM subbase being constructed in one lift? _____

If the Contractor elects or if density cannot be complied with is the mixture being placed and compacted in two equal lifts? _____

If so, is the lower lift being maintained in a moist condition by means of a fine spray until the second lift is placed? _____

Just prior to placing the second lift, is the top 13 mm (1/2 inch) of the lower lift being scarified? (Art. 312.12) _____

- f. Compaction. Is each lift being fully compacted within 2 hours of the time that the water is added to the mixture with any of the compaction equipment meeting the following requirements? (Art. 312.12) _____
 - (1) Three-wheel and tandem rollers: 6 tons (5.5 metric tons) to 12 tons (11 metric tons) total weight; 190 lbs. per inch (33 N/mm) 400 lbs. per inch (70 N/mm) of width. (Article 1101.01(e)) _____
 - (2) Pneumatic-tired rollers: shall develop a compression of not less than 225 lbs. per inch (40 N/mm) width of tire tread.(Article 1101.01(c)) _____
 - (3) Vibratory rollers: shall meet the requirements of Article 1101.01(g). _____
 - (4) Tamping rollers: (Sheeps-foot type) shall not be less than 8 ft (2.4 m) in width constructed in two or more independent sections having a minimum weight of 90 lbs. per inch (16 N/mm) width of drum. Must penetrate within 1 inch (25 mm) of the prepared subgrade on the initial rolling. (Articles 1101.01(d) & 312.08 Note 2) _____
 - (5) Trench rollers: 300 lbs. per inch (53 N/mm) to 400 lbs. per inch (70N/mm) width of compaction wheel. (Article 1101.01(f)) _____

- g. Finishing. Is the surface of the compacted CAM being trimmed and finished when the initial compaction of the toplift is nearing completion? (Article 312.13) _____

Is the surface being sprayed with a fine mist to maintain the optimum moisture content during all finishing operations and until curing material is applied? (Art. 312.13) _____
- h. Density Test. Are you taking density tests in the finished subbase? (The test should be taken at least every 1000 ft (300m) of subbase, Sampling [Schedule 2](#), PPG) _____
- i. Density Requirement. Are all areas that are found to have densities less than 100% being corrected or replaced? (Article 312.12) _____
- j. Thickness Test. Are you taking a thickness test at every 250 ft (75m)? ([Section A](#), Documentation Section of the Construction Manual) _____
- k. Curing. Within 24 hours of the finishing operations, is the subbase surface being protected and covered 7 days by a uniform application of bituminous material at an application rate of approximately 1 L/m² (0.20 gal. per sq. yd)? (Art. 312.14) _____
- i. Construction Joints. Are straight and vertical transverse construction joints being formed by cutting into the completed work at the end of each day's construction? (Art. 312.15) _____

10. PAM, POZZOLANIC AGGREGATE MIXTURE (312.21- 312.28)

- a. Air Temperature. Is the PAM subbase being constructed within the dates shown in Article 312.18 of the Standard Specifications and only when the air temperature in the shade is above 40 °F (4°C)? (Article 312.18) _____
- b. Placing. Is the PAM mixture being deposited, full subbase width, with a mechanical spreader or spreader box of a type approved by the Engineer, in a manner which will not cause segregation and which will require minimum blading or manipulation? (Art. 312.21) _____
- c. Thickness. Is the PAM subbase being constructed in lifts of not more than 100 mm (4 inches) when compacted or as otherwise provided for in accordance with Article 312.21? _____

Is the lower lift being maintained in a moist condition by means of a fine spray until the second lift is placed? (Art. 312.21) _____
- d. Compaction. Is each lift being fully compacted within 3 hours of the time water is added to the mixture (90 minutes if using cement flyash) with any of the compaction equipment meeting the following requirements? (Art. 312.21) _____

- (1) Three-wheel and tandem rollers: 6 tons (5.5 metric tons) to 12 tons (11 metric tons) total weight; 190 lbs. per inch (33 N/mm) to 400 lbs. per inch (70 N/mm) of width. (Article 1101.01(e)) _____
- (2) Pneumatic-tired rollers: shall develop a compression of not less than 225 lbs. per inch (40N/mm) width of tire tread. (Article 1101.01(c)) _____
- (3) Vibratory rollers: shall meet the requirements of Article 1101.01(g). _____
- (4) Tamping rollers: (Sheeps-foot type) shall not be less than 8 ft (2.4 m) in width constructed in two or more independent sections having a minimum weight of 90 lbs. per inch (15 N/mm) width of drum. Must penetrate within 1 inch (25 mm) of the prepared subgrade on the initial rolling. (Articles 1101.01(d) & 312.17 Note 2) _____
- e. Finishing. Is the surface of the compacted PAM being trimmed and finished within the initial compaction is nearing completion? (Article 312.21) _____

Is the surface being sprayed with a fine mist to maintain the optimum moisture content during all finishing operations and until curing material is applied? (Article 312.21) _____
- f. Density Test. Are density tests being taken in the finished sub-base? (The test must be taken at least every 1500ft. (450m) of subbase, Sampling [Schedule 2](#), PPG) _____
- g. Density Requirements. Is the subbase being compacted to at least the following densities?
 - (1) If placed in one lift, 97% _____
 - (2) If placed in 2 lifts, 97% 1st lift; 100% 2nd lift. _____
- h. Thickness Test. Are you taking a thickness test at every 250 ft (75m)? ([Section A](#), Documentation Section of the Construction Manual) _____
- i. Curing. Within 24 hours of the finishing operations, is the subbase surface being protected and covered 7 days by a uniform application of bituminous material at an application rate of approximately 0.20 gallons per sq. yd. (1L/m²)? (Art. 312.22) _____
- j. Construction Joints. Are straight and vertical transverse construction joints being formed by cutting back into the completed work at the end of each day's construction? (Art. 312.23) _____

11. CAM II, PLASTIC PORTLAND CEMENT

a. Air Temperature. Is the air temperature in the shade above 40°F (4°C) when placing CAM II? (Article 312.27) _____

b. Placing. CAM II may be placed in one lift by the use of either forms or slipform methods. (Article 312.27)

If forms are used, are the requirements of Article 420.06 regarding base support, setting, alignment and forms being followed? (Article 312.27) _____

Note: When forms are used, strikeoff may be with a vibratory screed.

If slipform methods are used, are the requirements of Article 420.14(c), being met? _____

Note: The slipform paver shall meet the requirements of Article 1103.16(b)

c. Time Limits. Is the CAM II being deposited in place within 30 minutes after mixing when hauled in nonagitating trucks and within 60 minutes when hauled in agitator trucks? (Art. 1020.11(a)(7)) _____

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

d. Finishing and Testing. Are finishers checking the plastic CAM II with a 10 ft. (3 m) straightedge? _____

Are all surface variations greater than 3/16 inch (5 mm) being corrected? (Art. 312.28) _____

e. Air Content. Are you testing the delivered unconsolidated mixture for air (7 to 10%) at least every 1000 ft. (300 m) of subbase? Record and retain in job records. (Art. 312.26 & [Sampling Schedule 2](#) of the PPG) _____

f. Slump. Are you periodically testing the delivered unconsolidated material for slump 1 inch - 3 inches (25 mm - 75 mm) at least every 1000 ft. (300 m) of subbase (1 per day when slipforming)? Record and retain in job records. (Art. 312.26 & [Sampling Schedule 2](#) of the PPG) _____

g. Curing. Is the entire surface of the subbase being given two separate uniform applications, separated by at least one minute, of agitated Type III (white) membrane curing compound? Application rate = 1 gal/250 sq ft (0.16 L/ sq m) (Articles 312.29 & 1020.13(a)(4)) _____

Is the spraying equipment self-propelled and does it meet the additional requirements of Article 1101.09? _____

**GENERAL - THE LAST FOUR QUESTIONS APPLY TO ALL BAM, CAM, PAM & CAM II
STABILIZED SUBBASES:**

12. THICKNESS TEST

Are you cross sectioning or probing the stabilized subbase at intervals of at least every 250 ft. (75 m)? ([Section A](#), Documentation Section of the Construction Manual)

13. NOMINAL THICKNESS

Is the thickness of completed stabilized subbase constructed to the nominal plan thickness? If not, corrective action must be taken prior to the pavement construction. (312.31)

14. DOCUMENTATION OF CONTRACT QUANTITIES

a. If the Contractor and the Engineer agree in writing (Form [BC-981](#)) that the plan quantity of STABILIZED SUBBASE is accurate, no surface area measurements will be required. (Articles 312.32(a) & 202.07(a))

In the absence of the written agreement, documentation shall be provided as follows:

b. The subbase shall be measured in place and the area computed in square yards (square meters). The width dimension used shall not exceed the width determined in Question #1 of this checklist. (Article 312.32(b))

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