SECTION 309

PORTLAND CEMENT CONCRETE BASE

309.1 Description. This work shall consist of constructing a portland cement concrete base, with or without reinforcement as specified, on a prepared subgrade in accordance with these specifications and in conformity with the lines, grades, thicknesses and typical cross sections shown on the plans or established by the engineer.

309.2 Material. All material shall conform to Division 1000, Materials Details, and specifically as follows:

Item	Section
Emulsified Asphalt (SS-1, SS-1H, CSS-1 or CSS-1H)	1015
Steel Wire Fabric for Concrete Pavement	1036.2
Concrete Curing Material	1055
Material for Joints	1057.1

All material, proportioning, air-entraining, mixing, slump and transporting for portland cement concrete shall be in accordance with Sec 501, as applicable to portland cement pavement concrete.

309.3 Equipment. Except as revised in Sec 309.4, the equipment requirements of Sec 502, including field laboratory, shall apply to the construction of this work. Approved sliding form construction methods may be used at the contractor's option.

309.4 Construction Requirements. The construction of concrete base shall be performed in accordance with the requirements of Sec 502 with the following modifications:

(a) Belting, brooming or mechanical floating will not be required for the surface finish. The surface of the base shall be finished so that it will not vary more than 1/4 inch (6 mm) from a 10-foot (3 m) straightedge.

(b) Membrane curing shall not be used. In addition to any of the other methods permitted by Sec 502.12, emulsified asphalt may be used to cure the concrete base if the surface course is to be of a bituminous type.

(c) Sawed joints may have a minimum width of 1/8 inch (3 mm) and shall not be sealed with joint sealing material.

(d) Widening an existing pavement. Either mechanical or approved manual methods may be used in preparing the subgrade and for grading and tamping the forms. The type and spacing of transverse joints will be designated in the contract. A batch-type mixer having a rated capacity of not less than 10 cubic feet (0.3 m^3) of mixed concrete may be used if approved by the engineer. Either manual or mechanical methods may be used for finishing the concrete after thorough compaction by tamping or vibrating.

309.5 Tolerance in Base Thickness. It is the intent of these specifications that concrete base shall be constructed strictly in accordance with the thickness shown on the plans. The

thickness of the concrete base will be measured, and where any base is found deficient in thickness, it may be compensated for at an adjusted unit price per square yard (square meter), or shall be removed and replaced with satisfactory concrete base.

309.5.1 Metal plates will be placed on the subgrade at points selected by the engineer in areas where the planer has cut or leveled off the subgrade or at any points where conditions are conducive to deficient base thickness. When the surface of the base has been finished to final grade, the engineer will, for informational purposes, check the thickness of the completed base by measuring the distance from the surface of the base to the metal plates by use of a calibrated rod. The surface of the base shall be satisfactorily restored by the contractor after thickness measurements have been made. The contractor shall, if necessary, furnish a bridge to facilitate the taking of the measurements. The engineer reserves the right to core drill the finished base to determine the thickness of the base. Cores may be drilled at the same locations as rod measurements or at any other locations. The contractor may require check cores to verify thicknesses determined by the engineer, and all costs of check core drilling shall be borne by the contractor. If the check cores requested by the contractor indicate that the engineer's measurement would have erroneously resulted in deductions for, or removal of, thin base, the cost of drilling the check cores will not be charged to the contractor.

309.5.2 The thickness of the base will be determined by average caliper measurement of cores in accordance with the procedure established by the Commission.

309.5.3 For the purpose of determining the constructed thickness of the base, ten cores per mile (6 cores per kilometer) will be taken at random intervals in each traffic lane. In addition, cores will be taken at all locations where thickness measurements taken during construction indicate a thickness deficiency sufficient to justify a deduction from the contract unit price, or at any other locations as may be determined by the engineer. If the measurement of any core is deficient in excess of 2/10 inch (5 mm) from the plan thickness, additional cores will be taken at 20-foot (6 m) intervals parallel to centerline ahead and back of the affected location until the extent of the deficiency has been determined.

309.5.4 It will be assumed that each core is representative of the base thickness for a distance extending one-half the distance to the next core, measured along centerline, or in the case of a beginning or ending core, the distance will extend to the end of the base section.

309.5.5 The drilling of cores in small, narrow or irregular areas, or on projects involving less than 2500 square yards (2000 m^2) of concrete base, may be waived by the engineer. In this case the designed thickness will be considered as the measured thickness.

309.6 Method of Measurement. Final measurement of the completed concrete base will not be made except for authorized changes during construction, or where appreciable errors are found in the contract quantity. The revision or correction will be computed and added to or deducted from the contract quantity. Concrete base areas will be computed to the nearest 1/10 square yard (0.1 m^2).

309.7 Basis of Payment.

309.7.1 If any core measurement of thickness is deficient, the contractor will have the option of removing and replacing the base at the contractor's expense or of leaving the base in place and receiving the following deductions in payment.

Deficiency in Thickness	Deductions, Percent of Contract Price
0 to 2/10 inch (5 mm)	None
Over 2/10 inch (5 mm) and not over 4/10 inch (10 mm)	15
Over 4/10 inch (10 mm) and not over 6/10 inch (15 mm)	60
Over 6/10 inch (15 mm)	100

309.7.1.1 The above deductions will be applied to a section of base 20 feet (6 m) long and extending from the edge of the base to a longitudinal joint or between longitudinal joints in that section of base in which the deficient measurement was found. Deductions for deficient thickness may be entered on any estimate after the information becomes available.

309.7.2 If base which is deficient in thickness in excess of 6/10 inch (15 mm) may in the judgment of the engineer, seriously impair traffic service of the base, the contractor will be required to remove the base and to replace it with one of a satisfactory quality and thickness which, when accepted, will be included in the pay quantity. No payment will be made for any costs incurred in the removal of the base deficient in thickness. If, in the judgment of the engineer, there is no probability of immediate failure, the engineer may allow the contractor the choice of leaving the deficient base in place and receiving no payment or of removing and replacing the base as provided herein.

309.7.3 In removing concrete base, it shall be removed from the edge to a longitudinal joint, or between longitudinal joints, and on each side of the deficient measurement until no portion of the exposed cross sections is more than 2/10 inch (5 mm) deficient, except that there shall not be less than 10 linear feet (3 m) of base removed. If there remains less than 10 feet (3 m) of acceptable base between the section that has been removed and a transverse contraction, expansion or construction joint, the contractor shall remove the base to the joint.

309.7.4 The contract unit price for portland cement concrete base will be considered as full compensation for all material and other items including reinforcement entering into the construction of the base, and no additional compensation will be allowed for any excess thickness. No direct payment will be made for liquid asphalt used as a curing agent.

309.7.5 The accepted quantities of portland cement concrete base will be paid for at the contract unit price per square yard (square meter), with proper allowance made for any deductions for deficiency in thickness.