Payment at the contract lump sum price for *Surface Testing Concrete Pavement* will be full compensation for all work of surface testing including, but not limited to, furnishing, maintaining and operating the profilograph and towing equipment; for furnishing graph paper and any other materials and supplies for performing the surface testing; and for repairing membrane curing compound damaged during surface testing.

(F) Pay Items

Payment will be made under:

Pay Item	Pay Unit
__" Portland Cement Concrete Pavement, Through Lanes (with dowels)	Square Yard
__" Portland Cement Concrete Pavement, Ramps (with dowels)	Square Yard
__" Portland Cement Concrete Pavement, Miscellaneous (without dowels)	Square Yard
Surface Testing Concrete Pavement	Lump Sum

SECTION 720
CONCRETE SHOULDERS

720-1 DESCRIPTION

Perform the work covered by this section including, but not limited to, the construction of Portland cement concrete shoulders in accordance with this section and with the lines, grades and dimensions shown on the plans; designing the mix; furnishing and placing the concrete shoulders; furnishing maturity testing equipment; furnishing all admixtures and additives; constructing joints; furnishing joint materials; curing the shoulder and furnishing curing materials; coring and patching core holes; taking actions to prevent or repair cracking; and removing and replacing unsatisfactory shoulder.

720-2 MATERIALS

Refer to Division 10.

Item	Section
Curing Agents	1026
Dowels and Tie Bars	1070-6
Joint Filler	1028-1
Low Modulus Silicone Sealant	1028-3
Portland Cement Concrete	1000
Water	1024-4

720-3 COMPOSITION OF CONCRETE

Design the concrete mix in accordance with Section 1000.

720-4 ACCEPTANCE OF CONCRETE

The Engineer will test concrete shoulders for acceptance with respect to compressive strength and thickness on a lot by lot basis. A “lot” is defined in Article 710-4.

720-5 EQUIPMENT

Use equipment in the production and placement of the concrete shoulders in accordance with Section 700 and Section 1000.

720-6 CONSTRUCTION METHODS

Place the concrete shoulders only in the presence of an authorized representative of the Engineer. Construct concrete shoulders in accordance with Section 700.

Place the full width of the shoulder in a single operation.

720-7 FINISHING

Finish the shoulder surface with approved equipment. Hand finishing will be permitted when the use of mechanical finishing equipment is impractical.

Perform the final finishing of the shoulder surface by burlap dragging, brooming or other acceptable methods that will produce a similar surface texture acceptable to the Engineer.

720-8 JOINTS

Construct and seal all joints in accordance with Articles 700-11 and 700-12 except as provided in this article. Saw all joints in the concrete shoulder and seal with joint sealer as shown in the plans.

Dowels will not be required at the transverse joints in the concrete shoulder. Use tie bars between the concrete pavement and the concrete shoulder.

Match the transverse joints in the concrete shoulder with the transverse joints in the adjacent concrete pavement.

720-9 THICKNESS TOLERANCES

The Engineer will determine the thickness of the shoulder by measurement of cores in accordance with AASHTO T 148. A lot for thickness acceptance testing is defined in Article 710-4.

Take one 4" core from each lot at a random location as directed. Core each location in the presence of the Engineer. The Engineer will take immediate possession of the cores. Take cores with a diameter of 4" and deliver them to the Engineer for measurement. When the required thickness for the shoulder varies, each core will be measured and compared to the required thickness for the shoulder at the location of the core. The deviation of the measured core thickness from the required thickness will be recorded as a plus or minus value for each core. Thickness tolerances in Article 710-9 apply for concrete shoulders.

720-10 MEASUREMENT AND PAYMENT

(A) General

Concrete Shoulders Adjacent to __" Pavement will be measured and paid as the actual number of square yards of shoulders completed and accepted. In measuring this quantity, the width of the shoulders will be as called for on the plans or as directed by the Engineer. The length will be the actual length constructed, measured along the surface of the shoulders at the centerline of each shoulder.

(B) Shoulder Deficient in Thickness

Pay factors are determined in accordance with Subarticle 710-10(B). When the shoulder is deficient in thickness by more than 1", the Engineer will determine if the shoulder can be left in place or be removed and replaced. Where the Engineer determines the shoulder can be left in place, the shoulder will be accepted at a reduced unit price not to exceed 50% as provided in Article 105-3.

(C) Concrete Shoulder Varying In Strength

Concrete shoulders shall meet the strength requirements of Subarticle 710-10(C).

The quantities of concrete shoulder that fail to meet 4,500 psi, measured as provided in Article 710-10, will be paid for at an adjusted unit price per square yard completed in place and accepted. The adjusted contract unit price will be determined by multiplying the contract unit price by the pay factor level in Subarticle 710-10(C).

Where concrete shoulder deficient in strength is removed and replaced, the replacement pavement, if acceptable, will be paid at the contract unit price for *Concrete Shoulders Adjacent to __" Pavement*, which price and payment will be full compensation for all work of placement, removal and replacement.

(D) Multiple Adjustments in Price

Concrete shoulder found deficient in both thickness and strength will be evaluated by the Engineer to determine if it may be permitted to remain in place. Concrete shoulder permitted to remain in place will be paid at a reduced price determined by successively multiplying the contract price by the appropriate factor indicated for each deficiency.

(E) Pay Items

Payment will be made under:

Pay Item	Pay Unit
Concrete Shoulders Adjacent to __" Pavement	Square Yard

SECTION 725
FIELD LABORATORY FOR PORTLAND CEMENT CONCRETE PAVEMENT

725-1 DESCRIPTION

Perform the work covered by this section including, but not limited to, providing and maintaining the building or trailer and the curing shelter for the exclusive use of the Engineer at concrete plants producing Portland cement concrete for use in pavement to be constructed on the project; furnishing water, heat, electricity and other utility services; and any other equipment that may be necessary.

725-2 GENERAL REQUIREMENTS

Furnish and maintain for the exclusive use of the Engineer a field office and laboratory in which to house and use all testing equipment needed. Only Department representatives will have unattended access to these facilities.

Provide a field office that is dust and water tight, floored, and has an adequate foundation so as to prevent excessive floor movement. Provide a field office that contains 6 or more 110 V electrical double outlets properly grounded and spaced; a telephone; at least 2 windows, satisfactory locks on all doors and windows; adequate lighting, heating and air conditioning; sink; running water to sink; and satisfactory exhaust fan. Provide a field office that meets the following approximate minimum requirements: 200 sf of floor space; 9 ft interior width; 6.5 ft interior height; 20 sf of counter space, 2.5 ft to 3 ft high and 2 ft deep with cabinets or drawers below the counter top; and 6 sf of desk space not enclosed with cabinets. Locate the office in a position that will permit full view of the plant from the interior of the office. At or near the office, furnish toilet facilities, with waste disposal, available for use of the Department personnel. Maintain these toilets in a neat and clean condition.

Provide a laboratory trailer adjacent to the field office that is at least 400 sf in area, approximately 20 ft wide, 20 ft long and 7 ft in height. Provide a laboratory trailer that contains 6 or more 110 V electrical double outlets properly grounded and spaced; satisfactory locks on all doors and windows; adequate lighting, heating and air conditioning; sink; running water to sink; and satisfactory exhaust fans. Provide two workbenches that are approximately 10 ft long, 2 ft wide and 2.5 ft high. One workbench shall be installed inside the trailer and the other across the end of the trailer. Provide a shelter or roof over the outside workbench to provide protection from weather. Provide, in the laboratory, an adequate number of water storage tanks to hold all acceptance beams and cylinders and any additional beams and cylinders made for the purpose of determining early strengths.