Pay Item	Pay Unit
Subgrade Preparation	Mile, Station, Square Yard
Aggregate Base or Surface Course	Ton or Cubic Yard
Water	M. Gallons

This payment will be full compensation for all labor, equipment, and materials necessary to complete the work.

When the average of the test results specified in Section 302.02 shows a larger percentage of shale than the maximum allowable specified, a one percent reduction in the unit price will be made for each 0.2% above the allowable percentage. If the percentage of shale exceeds the allowable limit by 3% or more, the material will be rejected unless the material is accepted under Section 105.07.

When a mixture is subject to pay reduction as described in both Sections 302.02 and 302.06, the Bid Price will be reduced by the sum of the price adjustments.

SECTION 304
PERMEABLE STABILIZED BASE COURSE

304.01 DESCRIPTION.

This work consists of constructing a permeable stabilized base course mixed in a central plant and placed on a prepared subbase. The Contractor shall have the option of using Portland Cement or Asphalt Cement as a stabilizing agent to stabilize the base course.

304.02 MATERIALS.

A. **Aggregate.** The aggregate shall be a Class 7 aggregate as specified in Section 816.03.

Each lot of aggregate will be sampled by the Contractor, under the observation of and at random locations determined by the Engineer. A lot is defined as one day's production if production is greater than 4,500 square yards per day. If production is less than 4,500 square yards per day, then a lot is as many days' production as necessary to place 4,500 square yards. If plan quantity is less than 4,500 square yards, a lot shall be equal to plan quantity. A day's production will not be split into more than one lot.

Three random samples for each lot will be obtained by the Contractor, under the observation of and at a location determined by the Engineer. The sampling procedures shall meet the requirements of AASHTO T–2. These samples will be tested and the material accepted if the average of the 3 samples meets the gradation specified. If the material from all 3 samples meets the gradation specified only one of

the 3 samples will be tested from each subsequent lot. If the sample tested does not meet the gradation requirements, the remaining 2 samples will be tested. The average gradation of these 3 samples will then be used to determine acceptance of the material. The testing of 3 samples per lot will continue until all 3 samples meet the gradation specified then only one of the 3 samples will be tested from each subsequent lot. When the aggregate does not meet the gradation specified, a reduction in the Contract Unit Price will be made. If the aggregate fails to meet the specified gradation on one or more sieves, the reduction will be the sum of the deductions as calculated below.

Unit Price Reduction:

Percent of Deduction = 5 × percent of deviation from range limits.

If material is produced that deviates from the specified gradation for 2 consecutive lots incorporation of additional material into the work will not be allowed until the Contractor takes the necessary corrective action to meet the specifications.

The physical properties of the aggregate will be determined from three random samples taken from the stockpile for each lot of 10,000 tons or fraction thereof. If a fraction of a lot is less than 2,500 ton, it will be included with the previous lot of 10,000 tons. If the material from all three samples is within the specified limits, only one of the three samples will be tested from each subsequent lot. If at anytime the sample tested fails to meet the specified limits, the remaining 2 samples will be tested and the physical properties of each lot will be determined by the average of these 3 test results. The testing of three samples per lot will continue until all three samples are within the specified limits then only one of the three samples will be tested from each subsequent lot. If the average exceeds the specified limits for shale, the unit price for aggregate will be adjusted according to Section 302.06. If the average does not meet the specified limits for fractured faces, the Contractor shall correct the stockpile so the material meets specifications.

The L.A. Abrasion loss percentage will be determined on the basis of one composite aggregate sample taken and tested during the beginning of the aggregate stockpiling. If the aggregate source has been tested previously by the Department and the material is within the allowable limits, the tests for the L.A. Abrasion loss percentage will not be required.

B. **Asphalt.** The asphalt cement shall be an AC 20 asphalt meeting the requirements of Section 818.02 A.2.

The bitumen shall be added to the aggregate uniformly at a rate of 2 1/2% by weight of the mix.

If the daily cutoff for the asphalt cement, as determined on the Mix Bitumen Cutoff Report, deviates from the target percentage specified by more than 0.24 percentage points, the pay factor will be determined as specified in Section 408.05 B.1.

C. **Portland Cement.** The Portland Cement shall meet the requirements of Section 804.01.

The Portland Cement content shall be 200 pounds per cubic yard. Batching of the cement shall be according to Section 802.04 B. Aggregates and bulk cement shall be proportioned by automatic batching equipment according to Section 153.01 B.

304.03 EQUIPMENT.

Equipment shall meet the following:

Item	Section
General	151.01
Rollers	151.02 C
Material Hauling Equipment	151.03 B
Bituminous Pavers	151.04
Scales	151.07
Hot Bituminous Equipment	152
Roadbed Planer	153.06
P.C.C. Equipment	153

304.04 CONSTRUCTION REQUIREMENTS.

A. **General.**

1. **Subbase.** Before placing the permeable base, the subbase shall be trimmed to the required grade and cross section by a roadbed planer. The finished surface of the subbase shall not vary by more than 0.04 foot from the prescribed elevation.

   A prime coat shall be applied to establish an impermeable layer below the permeable base. The prime coat shall be allowed to cure a minimum of 24 hours before the permeable base is placed.

2. **Finished Surface.** The surface of the permeable base shall be smooth and uniform, and shall not vary by more than 0.04 foot from the prescribed elevation. Trimming of the permeable base will not be permitted. Care shall be exercised to prevent contamination of the permeable base. Procedures that might produce fine material that would tend to clog or reduce drainage will not be permitted. Permeable base which, in the opinion of the Engineer, has been contaminated shall be removed and replaced at the Contractor's expense.

3. **Traffic.** Hauling on the permeable base will not be allowed. Traffic over the permeable base will be limited to the minimum necessary for succeeding or adjacent work. Damage to the permeable base shall be repaired promptly at the Contractors expense.

4. **Pavement Edge.** The outlet edge of the permeable base shall be kept open (daylighted) until the edge drain is placed so that water is free to exit.

5. **Placement.** The permeable base shall be placed in one lift at the specified thickness. The base will be placed with a mechanical spreader, except when placing the base in small areas that are not accessible to large equipment. In these areas the base may be hand placed and compacted with mechanical hand tampers. The mechanical spreader shall utilize automatic controls with a stringline to control the longitudinal profile.

   If approved by the Engineer, the permeable base may be placed without the stabilizing agent in small areas that are formed by hand.

6. **Tolerance in Base Thickness.** Immediately after compaction of the permeable base, the thickness will be determined. The depth checks will be at random locations determined by the Engineer. Depth checks will be conducted at a frequency of two sets per 4,500 square yards. A minimum of 2 sets of depth checks will be conducted for areas less than 4,500 square yards.

   A set of depth checks shall consist of placing three metal plates across the roadway at each random location. The plates shall be placed on top of the primed surface. The thickness will be determined by inserting a metal measuring device through the permeable base until the device contacts a metal plate. The depth of insertion shall be recorded.

   If the permeable base placed has an average thickness in excess of that specified, additional payment will not be made. If the average pavement thickness is deficient by more than one inch, the base will be removed and replaced at the Contractors expense. If deficient by less than one inch in thickness, price adjustments will be made to the Contract Unit Price for each lot of 4,500 square yards as provided in the following table:

Deficiency in Thickness (Inches)	**Pay Factor**
0.0 to 0.25	1.00
0.26 to 0.50	.90
0.51 to 0.75	.70
0.76 to 1.00	.50

B. **Asphalt Stabilized Base.**

1. **Material Production and Placement.** The permeable base shall be produced at a central hot mix plant according to Section 408.04 E and 408.04 F, paragraph one. The material produced shall be placed with a bituminous paver.

2. **Compaction.** Compaction of the permeable base shall be according to Section 302.04 E. except the roller shall be a 10 ton, double drum, steel wheeled roller. No vibration will be allowed. The Contractor is advised that it may be necessary to permit the permeable base to cool sufficiently before compaction rolling to prevent rutting and shoving. Cooling to 150°F. may be appropriate, but in no case shall the mix be less than 110°F. at time of compaction. Water may not be used to hasten the cooling process.

3. **Weather Limitations.** Weather limitations shall be as specified in Section 408.04 M.1.

C. **Portland Cement Treated Base.**

1. **Material Production.** The Permeable base shall be mixed at a stationary mixing plant capable of producing a uniform mixture and shall be equipped with feeding and/or weighing devices that are capable of proportioning the mixture as specified.

   The water/cement ratio shall provide for 100% cement (paste) coverage of aggregate. The intent is to add the minimum amount of water to obtain a uniform workable mix.

2. **Placement.** The cement stabilized base shall be placed with a slip form paver or a mechanical spreader capable of placing the material in one layer. The paver or spreader shall be equipped with automatic grade control that maintains the proper elevation at both sides by: (1) controlling the elevation of one side and the slope, or (2) controlling the elevation of each side independently. The grade reference shall be an erected string line or other approved method.

   The cement stabilized base shall be consolidated with surface pan type vibrators. The frequency of the surface pan type vibrators shall not be less than 4000 impulses per minute, unless modified by the Engineer.

   If the surface below the cement stabilized base is not primed, it shall be made uniformly moist prior to placing the base.

   The cement stabilized base shall be allowed to cure a minimum of 48 hours before placement of the surface course. Exceptions may be made, with the Engineer's approval, in areas where immediate access is necessary to accommodate traffic.

   Weather limitations shall be as specified in Section 602.03 G.3.

   When placing the stabilized base at bridge ends, ramp tapers or other areas where placement is not practical with a mechanical spreader, the base material may be placed with a loader and compacted with a 10 ton steel wheeled roller in the static mode.

304.05 METHOD OF MEASUREMENT.

Permeable Stabilized Base Course. Permeable Stabilized Base shall be measured by the square yard placed, and accepted by the Engineer.

304.06 BASIS OF PAYMENT.

The accepted quantity of permeable stabilized base will be paid for at the contract price bid per square yard. The price shall be full compensation for all materials (including the asphalt or portland cement binder), equipment, labor, and incidentals required to construct this item of work as specified.