

be placed on the base until the curing period has been completed. After completion of the curing period, construction traffic on the OGBB shall be held to a minimum; the OGBB shall not be used as a haul road, unless the Engineer has approved the Contractor's written plan. Any damages to the base as a result of the Contractor's operation shall be repaired at his expense to the satisfaction of the Engineer. The contractor shall be responsible to see that soil, mud, or other materials are not tracked or spilled on the base that would compromise its hydraulic efficiency.

- (e) **Hydraulic efficiency.** The hydraulic efficiency of any segment of the base will be measured by the flow of water through it. Approximately one quart (one liter) of water will be doused on the surface of the open-graded base. The water shall be totally absorbed into the base within 15 seconds with no water remaining on the surface. Failure to achieve this performance standard will indicate a contaminated base whose hydraulic efficiency has been severely impaired.

NOTE: Such contaminated OGBB whose hydraulic efficiency has been severely impaired shall be removed by the contractor and replaced at no cost to the Department. The extents of the replacement will be determined by the Engineer. Hauling equipment shall not be operated on the OGBB during the placement of the overlying pavement.

319.05. METHOD OF MEASUREMENT.

Open-graded bituminous base, including the aggregate, liquid asphalt, and other ingredients as specified in the job mix formula, will be measured by the ton (metric ton) of combined mixture.

Tack coat will be measured and paid for in accordance with Section 407.

319.06. BASIS OF PAYMENT.

The accepted quantities, measured as provided above, will be paid for at the Contract unit price as follows:

OPEN GRADED BITUMINOUS BASE TON (METRIC TON)

Such payment shall be full compensation for furnishing all materials, equipment, labor, and incidentals to complete the work as specified.

SECTION 3 0

OPEN-GRADED PORTLAND CEMENT CONCRETE BASE

320.01. DESCRIPTION.

This work shall consist of the construction of a permeable base course of aggregate, Portland Cement concrete, and water mixed in a central plant and spread and compacted on a prepared surface in accordance with the lines, grades, thicknesses, and typical cross section shown on the Plans or established by the Engineer.

320.02. MATERIALS.

Material shall meet the requirements specified in the following Subsections of Section 700 - Materials:

Aggregate	701.16
Water	701.04
Fly Ash	702
Portland cement	701.02

NOTE: The water actually used shall be determined by the water measured into the batch plus the free water on wet aggregate minus the water absorbed by dry aggregate. The exact water-cement ratio shall be as approved by the Engineer.

320.03. EQUIPMENT.

The equipment used for producing, mixing, hauling spreading, compacting, and finishing the Open-Graded Portland Cement Concrete Base (OGPCCB) shall meet the requirements of Subsections 301.03 and 414.03.

320.04. CONSTRUCTION METHODS.

The construction methods shall comply with the following requirements:

- The mix shall have a minimum cement content of 200 pounds per cubic yard (118 kg/m³).
- Fly ash may be substituted for up to 25 percent of the required cement, with this substitution in the ratio of 1 pound (1.0 Kg) of fly ash for each 1 pound (1.0 Kg) of cement. Flyash shall not be used November 1st through April 1st.
- The water-cement ratio shall be a maximum of 0.45 and shall be calculated as follows:

$$W/C = (\text{weight of water})/(\text{weight of cement} + \text{weight of fly ash})$$

- (a) **Mixing and Placing.** The mixing and placing of the OGPCCB will conform to the requirements for mixing and placing concrete pavement, Subsections 414.04(e), (f) and (g).
- (b) **Weather Limitations and Maintenance Quality.** Do not mix OGPCCB when either the aggregate or subgrade is frozen. The air temperature shall be at least 40°F (5°C) in the shade and rising.

From the time work starts until it is completed and approved, protect the quality of the base and maintain it within limits of the Contract so that it is in good condition to the satisfaction of the Engineer. This maintenance shall be done at no additional charge and repeated as often as necessary to keep the area continuously intact. Make repairs in a manner that insures a uniform surface and the durability of the part repaired. Replace faulty work for the full depth of the base. Remedy low areas by replacing the material for the full depth of the treatment rather than by adding a thin layer of base to complete the work.

- (c) **Base.** The surface below the OGPCCB shall be uniformly moist at the time the base is placed.
- (d) **Consolidation of Mixture.** Consolidation of the mixture shall be performed by vibratory equipment during laydown operations, resulting in a minimum of 95% of AASHTO T121. Roadway consolidation of the finished base shall be determined on the fresh mixture fifteen to thirty minutes after laydown using nuclear gauge testing devices prescribed in AASHTO T238.
- (e) **Water Curing.** The completed OGPCCB shall be cured by sprinkling the surface with a fine spray of water every two hours for a period of eight hours. Curing shall start the morning after the base has been placed.

- (f) **Construction Joint.** At the start of the day-or in the case of an unavoidable interruption of operations that would form a joint in the base-cut back the edge of the base to leave a vertical face as is necessary to secure a satisfactory surface. Replace all removed base without additional charge to the Department.
- (g) **Traffic Restrictions and Curing Period.** Construction traffic shall not be allowed on the OGPCCB for at least three days after it has been placed. No overlying pavement shall be placed on the base until this curing period has been completed. After completion of the curing period, construction traffic on the OGPCCB shall be held to a minimum; the OGPCCB shall not be used as a haul road, unless the Engineer has approved the Contractor's written plan. Any damages to the base as a result of the Contractor's operations shall be repaired to the satisfaction of the Engineer at the Contractor's expense. The contractor shall be responsible to see that soil, mud, or other materials are not tracked or spilled on the base that would compromise its hydraulic efficiency.
- (h) **Hydraulic Efficiency.** The hydraulic efficiency of any segment of the base will be measured by the flow of water through it. Approximately one quart (one liter) of water will be doused on the surface of the open-graded base. The water shall be totally absorbed into the base with 15 seconds with no water remaining of the surface. Failure to achieve this standard will indicate a contaminated base whose hydraulic efficiency has been severely impaired.
- NOTE: Such contaminated OGPCCB whose hydraulic efficiency has been severely impaired shall be removed by the contractor and replaced at no cost to the Department. The extents of the replacement will be determined by the Engineer. Hauling equipment shall not be operated on the OGPCCB during the placement of the overlying pavement.*
- (i) **Tolerances.** Tolerances for surface, width, and thickness shall be in conformity with Subsection 301.04.

320.05. METHOD OF MEASUREMENT.

Open-graded portland cement concrete base will be measured by the square yard (square meter) of completed and accepted base.

320.06. BASIS OF PAYMENT.

The accepted quantities, measured as provided above, will be paid for at the Contract unit price as follows:

OPEN GRADED PORTLAND CEMENT CONCRETE BASE

(4 inch (100 mm) thick) SQUARE YARD (SQUARE METER)

Such payment shall be full compensation for furnishing all materials, equipment, labor, and incidentals to complete the work as specified.