

ITEM 14

MINERAL AGGREGATE BASE

14.01 SCOPE OF WORK

This work shall consist of furnishing and placing one or more courses of aggregate, plus additives if required, on a prepared subgrade in accordance with these specifications and in reasonably close conformity with the lines, grades, thicknesses and typical cross-sections shown on the Plans or established by the Engineer.

Mineral aggregate base shall be Type A or Type B, whichever is shown on the Plans and called for in the Bid Schedule.

14.02 MATERIALS

(a) Aggregate

The mineral aggregate shall meet the requirements of Item 73.05 for Class A or Class B aggregate, depending upon whether Type A or Type B base is required in the construction. Type A Base will require the use of Class A aggregate, Grading D. Either Class A or Class B aggregate may be used for Type B Base.

When the stationary plant method for mixing is used, the aggregate will be accepted immediately following mixing or immediately prior to mixing, based on periodic samples taken from the pugmill output, or from the belt feeding the pugmill.

When two or more materials are blended on the road by means of mechanical mixers, the aggregate will be accepted after mixing and before compaction, based on samples taken from each layer of base material. Aggregate that does not require blending will be accepted at the aggregate production plant, based on samples taken from stockpiles or plant production immediately prior to delivery to the road.

(b) Calcium Chloride

Calcium chloride shall meet the requirements of Item 74.02 for Type 1 or Type 2, except that the requirements for "total alkali chlorides" and "impurities" shall not apply.

(c) Sodium Chloride

Sodium chloride shall meet the requirements of Item 74.03.

14.03 EQUIPMENT

All equipment necessary for satisfactory performance of this construction shall be on the project and approved before work will be permitted to begin. Such equipment shall include a stationary mixing plant or mechanical road mixers, whichever is applicable to the type of work to be performed, as specified under Item 14.04(b).

(a) Stationary Mixing Plant

The mixing unit shall be an approved twin-shaft pugmill capable of producing a constant, uniform mixture. The mixer shall be equipped with a suitable truck-loading hopper with gate which will prevent segregation of the material when dumped into the truck. A spray bar capable of assuring an even wetting of the aggregate shall be mounted at the entrance of or above the pug-mill. The flow of water through the spray bar shall be controlled by a meter, valve or other approved type of regulating device to maintain a uniform moisture content in the mixture. The mixing plant shall be equipped with adjustable feeders for each size material capable of regulating a constant, uniform flow of material.

(b) Mechanical Mixer (for Road Mixing)

The mechanical mixer shall be of the pugmill or rotary type capable of producing a uniform blend of all materials to the full depth of the course being placed. The mixer shall be either a self-propelled or trailer type.

14.04 CONSTRUCTION REQUIREMENTS

(a) General

1. Mineral aggregate base, Type A or Type B, shall be constructed in layers, the compacted thickness of which shall be as shown on the Plans.
2. The subgrade shall be checked and approved by the Engineer not more than five hundred feet (500') in advance of spreading any mineral aggregate. This distance may be shortened by the Engineer to as little as two hundred feet (200') between November first and April first or during periods of prolonged wet weather.
3. Mineral aggregate shall not be spread on a subgrade that is frozen or contains frost.
4. Hauling over material already placed will not be permitted until it has been spread, mixed, shaped and compacted.

(b) Mixing

1. Unless otherwise specified, Contractor shall mix the base course material, including an additive if required, on the Plans, by one of the following methods:

- a. For mineral aggregate base, Type A, the stationary plant method will be required.
- b. For mineral aggregate base, Type B, requiring the blending of two or more materials, either the stationary plant method or the road mix method (mechanical mixer) shall be used.
- c. For mineral aggregate base, Type B, requiring additive, stationary plant mixing or mechanical road mixing shall be used.
- d. For mineral aggregate base, Type B, requiring neither blending of materials nor additives, either stationary plant mixing, mechanical road mixing or mixing by motor grader on the road may be used.

2. Detailed requirements for the three types of mixing operation are as follows:

a. Stationary Plant Method

The base course material and water shall be mixed in an approved stationary mixing plant as described in Item 14.03(a). Water shall be added during the mixing operation in the amount necessary to provide a moisture content satisfactory for compacting. If combining materials is required to meet the grading requirements, the blending shall be performed as provided for in Item 73.05, prior to mixing.

b. Road Mix Method (Mechanical Mixer)

After the material for each layer of base course has been placed through an aggregate spreader or windrow-sizing device, the material shall be mixed by means of approved mechanical mixing machines as described in Item 14.03(b).

c. Road Mix Method (Motor Grader)

After material for each layer of base course has been deposited and spread uniformly, it shall be sprinkled with water in sufficient quantity to moisten all particles, but not in such quantity that segregation of sizes or softening of subgrade will occur. Immediately following the application of water, the material shall be thoroughly mixed by windrowing and spreading with motor graders until the mixture is uniform throughout.

(c) Spreading

1. Stationary Plant Mixing

After mixing, material for each layer of base shall be transported to the job site while it contains the proper moisture content, and shall be spread to the required thickness and cross-section by means of an approved mechanical spreader.

2. Road Mixing (Mechanical Mixer)

Material to be mixed by mixing method b shall be spread prior to mixing with an approved mechanical spreader. If the blending of two or more materials is to be performed on the road, each material shall be spread separately with an approved mechanical spreader capable of being adjusted to spread the materials in the proper proportions.

3. Road Mixing (Motor Grader)

a. After the aggregate and water have been thoroughly mixed, the base material shall be spread while at optimum moisture content in layers of specified thickness and cross-section by means of approved motor graders.

b. If the required compacted depth of base course exceeds six inches (6"), the base shall be constructed in two or more layers of approximate equal thickness. The maximum compacted thickness of any one layer shall not exceed six inches except when vibrating or other approved types of special compacting equipment are used, the compacted depth of a single layer of base course may be increased to eight inches upon approval of the Engineer.

c. In some cases, the plans show the base as extending for the full width of the roadbed. In other cases, the edges of the base are shown as coinciding with the inside edges of the shoulders. In the latter case, shoulder material shall be placed to a minimum width of three feet (3') prior to the spreading of each layer of base material in order to confine the base material and to permit proper compaction.

d. Any base material used for constructing detours, for maintenance of traffic, for backfilling rock cuts and capping rock fills may be spread and mixed using this method.

(d) Shaping and Compaction

1. Except where mechanical aggregate spreading equipment is used to place the base material, final shaping of each layer prior to compaction shall be accomplished by motor grader. In the event that mechanical spreading equipment fails to shape the base material properly, final shaping shall be done by motor grader or other approved means.

2. Immediately following spreading and final shaping, each successive layer shall be compacted with pneumatic-tire rollers described under Subsection 205.02 of Tennessee Department of Transportation Standard Specifications and any other types of compacting equipment, provided the required density and the required degree of uniformity and smoothness are attained. If the density requirement does not apply as provided for below, the base may be compacted with pneumatic-tire rollers meeting the requirements of Subsection 205.03 of Tennessee Department of Transportation Standard Specifications as directed by the Engineer. Compaction shall progress gradually from the edges of the base to the center, parallel with the center-line of the road, and shall continue until the base layer has been compacted to its full width. Where lifts of shoulder materials are placed to confine the base material, the initial pass of the compacting equipment shall overlap the shoulder to a width of not less than twelve inches (12").

3. Compaction of each layer shall continue until a density of not less than eighty-three percent (83%) of the solid volume has been achieved. The density determination will be based on the bulk specific gravity, AASHTO Designation T 84, "Standard Method of Test for Specific Gravity and Absorption of Fine Aggregate," and T 85, "Standard Method of Test for Specific Gravity and Absorption of Coarse Aggregate," and the dry weight of the aggregate. Unless otherwise specified, density requirements will not apply to base construction on projects that do not include the construction of a surface upon the base. The compaction of each layer shall be approved before material for the next successive layer is placed. Placing and compacting areas shall be kept separate.

4. The surface of each layer shall be so constructed that the aggregates become firmly keyed and a uniform texture produced and shall be maintained in that condition until covered by the following stage of construction or until final acceptance of the project. Any irregularities that develop shall be corrected by loosening the material at those places and adding or removing material as required.

5. Approved distributors shall be used to apply water uniformly over the base materials during compaction in sufficient quantity for proper compaction. Softening of the underlying subgrade resulting from the use of excess water is especially to be avoided.

(e) Maintenance

After construction of the base has been completed satisfactorily, it shall be maintained, under traffic if required, smooth and uniform until covered by the following stage of construction or until the project has been completed and accepted.

(f) Thickness Requirements

The thickness of the completed base shall be in reasonably close conformity to the thickness shown on the Plans. The thickness shall be measured at such frequency as established by the Engineer by means of test holes or other approved methods.

(g) Surface Requirements

The surface of the finished base shall be in reasonably close conformity to the lines, grades and cross-sections shown on the Plans or established by the Engineer and shall have a satisfactorily smooth riding quality.

14.05 COMPENSATION (IF APPLICABLE)

(a) Method of Measurement

Mineral aggregate base, unless otherwise stipulated, shall refer to Type A, Grading D mineral aggregate meeting the requirements of Item 73.05. Mineral aggregate base shall be measured by the unit(s) specified in the bid schedule.

(b) Basis of Payment

The accepted quantities of mineral aggregate base of the type specified will be paid for at the contract unit price specified in the bid schedule.

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