



## SECTION 304

### AGGREGATE BASE COURSE

**304.1 Description.** This work shall consist of furnishing and placing one or more courses of aggregate 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. The type of aggregate to be used will be specified in the contract.

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

Item	Section
Aggregate for Base	1007

#### 304.3 Construction Requirements.

**304.3.1 Field Laboratory.** When authorized by the engineer, the contractor shall provide a Type 2 Field Laboratory meeting the requirements of [Sec 601](#). Payment for the laboratory will be made as provided in [Sec 601](#).

**304.3.2 Subgrade.** All work on that portion of the subgrade on which the base is to be constructed shall be completed in accordance with the requirements of [Sec 209.3.1](#) prior to the placing of any base material on that portion. Aggregate base shall not be placed on a frozen subgrade.

**304.3.3 Mixing.** Unless otherwise specified, base material, any additional material required and sufficient water to obtain the desired compaction shall be thoroughly mixed and delivered to the road as a combined product.

**304.3.4 Placing.** The maximum compacted thickness of any one layer shall not exceed 6 inches (150 mm). If the specified compacted depth of the base course exceeds 6 inches (150 mm), the base shall be constructed in two or more layers of approximately equal thickness. The compacted depth of a single layer of the base course may be increased to 8 inches (200 mm) for shoulders and lightly traveled areas.

**304.3.4.1** The contractor shall be responsible for placing the correct quantity of base material on the roadbed to construct a base conforming with the contract. Excess material shall be hauled ahead and reused, or loaded into trucks and measured or weighed (measured or the mass determined) over scales furnished by the contractor. Only material incorporated in the completed base will be included in the quantity allowed for payment.

**304.3.4.2** If the contractor elects to construct concrete pavement by slip-form methods in accordance with [Sec 502.16](#), the width of the aggregate base shown on the plans shall be increased to provide a 3-foot (1 m) width outside the edge of the pavement being placed.

**304.3.4.3** Types 1, 2, 4 and 5 aggregate base used for shoulders adjacent to rigid or flexible type pavement, including pavement resurfacing, shall be simultaneously deposited and spread on the subgrade with an approved spreading machine. Aggregates shall not be deposited on the pavement and bladed or dozed into place.

**304.3.5 Shaping and Compacting.** Immediately before spreading the mixture, the subgrade shall be sprinkled as directed by the engineer. The mixture shall be uniformly spread in successive layers of such depth that when compacted, the base will have the approximate thickness specified. Each layer shall be compacted to the specified density before another layer is placed, with the following exception. If difficulty is encountered in obtaining the specified density after reasonable compactive effort has been expended on the first lift placed over Type 4 aggregate base, the engineer may permit placing another layer. The testing for density will then be made on the combined lifts or layers.

**304.3.5.1** Segregated surface areas constructed of Types 1 or 2 aggregate base may be corrected by adding and compacting limestone screenings of such gradation and quantity as required to fill the surface voids, and firmly bind the loose material in place. Screenings used in correcting segregated surface areas will be measured and paid for as base material. Type 5 aggregate base is intended to provide some drainage and shall not be segregated. Trimmed Type 5 aggregate base may not be reused until it is verified as meeting the required specifications. Base material contaminated to such an extent that it no longer complies with the specifications shall be removed and replaced with satisfactory material at the expense of the contractor.

**304.3.5.2** Shaping and compacting shall be performed until a true, even and uniform surface of proper grade, cross section and density is obtained. Types 1 and 2 aggregate base used for shoulders shall be compacted to not less than 95 percent of standard maximum density. Types 1 and 2 aggregate base used on other than shoulders and Type 5 aggregate base under both roadway and shoulders shall be compacted to not less than standard maximum density. The Standard Compaction Test will be made in accordance with AASHTO T 99, Method C, replacing any material retained on the 3/4-inch (19.0 mm) sieve, as provided therein. Field density will be determined in accordance with AASHTO T 191 or T 205, using the total material or AASHTO T 238, Method B Direct Transmission, for wet density. The volume of the test hole may be reduced as necessary to accommodate available testing equipment. If nuclear density test methods are used, moisture content will be determined in accordance with AASHTO T 239, except that a moisture correction factor will be determined for each aggregate in accordance with MoDOT Test Method T35. In lieu of the density requirements for Types 1 and 2 aggregate base used for shoulders with thicknesses less than 4 inches (100 mm), the aggregate shall be compacted by not less than three complete coverages with a 5 ton (4.5 Mg) roller. Rolling shall be continued until there is no visible evidence of further consolidation. In lieu of the density requirement, the compacting of Type 4 aggregate base shall continue until the material is sufficiently compacted and stabilized to permit adequate densification of the upper portion of the shoulder or base. During shaping and compacting operations the moisture content of the base shall be maintained at the level necessary for compaction by wetting or drying as required. Final rolling shall be accomplished by a self-propelled smooth-wheeled roller weighing not less than 5 tons (having a mass of not less than 4.5 Mg).

**304.3.5.3** Shaping of the completed surface of the aggregate base for flexible type surfacing shall be continued until the deviation from the required elevation does not exceed a roughly compensating maximum of 1/2 inch (13 mm). The surface of aggregate base for rigid type surfacing shall be brought to proper crown and elevation in accordance with the requirements of [Sec 502.6](#).

**304.3.5.4** The surface of the aggregate base shall be well drained at all times. If at any time the compacted aggregate base or subgrade becomes unstable, the contractor, at the contractor's expense, shall restore the earth subgrade and the aggregate base to the required grade, cross section and density.

**304.3.5.5** If measurement of aggregate base course by area, complete in place, is specified, thickness of the aggregate base will be determined from measurements through the finished base at approximately 1000-foot (300 m) intervals. When the measurement indicates the thickness is deficient in excess of 1/2 (13 mm) inch from the plan thickness, additional measurements will be taken at 100-foot (30 m) intervals parallel to centerline ahead and back of the affected location until the extent of the deficiency has been determined. It will be assumed that each measurement is representative of the base thickness for a distance extending one-half the distance to the next measurement, measured along centerline, or in the case of a beginning or ending measurement, the distance will extend to the end of the base section. Any deficient areas shall be corrected by reworking and adding material within the limits of the deficiency.

**304.3.6 Maintenance.** When the aggregate base is to be constructed in more than one layer, the contractor shall maintain each layer by wetting or drying, blading and rolling in a manner satisfactory to the engineer, until it is covered by the next layer. This maintenance, including necessary water, shall be entirely at the contractor's expense. If a prime coat is specified in the contract, the contractor will be required to apply the prime coat on any completed portion of the aggregate base as soon as practicable, or as otherwise specified. However, the contractor will not be permitted to apply prime if the moisture in the top 2 inches (50 mm) of the aggregate base exceeds the higher of either (1) the average of the optimum moisture as determined by the standard compaction test and the absorption of the plus No. 4 (4.75 mm) fraction, or (2) two-thirds of the optimum moisture as determined by the standard compaction test. The contractor shall maintain the required density and surface condition of any portion of the completed aggregate base until either the prime or a succeeding course or pavement is placed.

#### **304.4 Method of Measurement.**

**304.4.1 Measurement of Aggregate by Volume.** Measurement will be made in the vehicle at the point of unloading. The contractor shall strike off and level each load for inspection and checking. Measurement will be made to the nearest 1/4 cubic yard (0.1 m<sup>3</sup>) for each load and to the nearest cubic yard (cubic meter) for the total quantity of material accepted. Additional material required by [Sec 304.3.4.2](#) will be deducted from the total quantity of material accepted.

**304.4.2 Measurement of Aggregate by Weight (Mass).** Measurement will be made by weighing each truck load (determining the mass of each truck load) on scales conforming to the requirements of [Sec 310.4.3](#). Deductions for excess moisture will be made as follows:

(a) Types 1, 2, 3 and 5 Aggregate for Base. Deduction will be made for moisture in the total material in excess of one percentage point over optimum moisture as determined by the standard compaction test.

(b) Type 4 Aggregate for Base. Deduction will be made for any moisture in excess of 2 percent of the dry weight (mass) of the material.

(c) After deduction for excess moisture, measurement will be made to the nearest ton (megagram) for the total tonnage (mass) of material accepted. Additional material required by [Sec 304.3.4.2](#) will be deducted from the total quantity accepted.

**304.4.3 Measurement of Aggregate Base Course by Area .** Measurement of aggregate base course complete in place will be made to the nearest square yard (square meter), except that the area of additional material required by [Sec 304.3.4.2](#) will not be included. Separate measurement will be made for each type and each thickness of base course. Final measurement of the completed aggregate base course 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. Where the aggregate base course extends to the inslope of the shoulder, the pay limit of the aggregate base course will be measured from the mid-point of the sloped portion.

**304.5 Basis of Payment.** The accepted quantities of aggregate base course of the thickness and type specified will be paid for at the unit price for each of the pay items included in the contract. No direct payment will be made for water used in performing this work.