

SECTION 300 BASES



Section 304 - Aggregate Base or Surface Course

DESCRIPTION

304.01
Work
This work shall consist of furnishing, hauling, and placing aggregate base or surface course on the subgrade or base or stockpile site approved by the Engineer. Work may include additive mineral filler, or binder as specified in the SPECIAL PROJECT SPECIFICATIONS. Aggregate production shall be by pit-run, grid-rolling, screening, or crushing methods or furnished by the Government, as shown in the SCHEDULE OF ITEMS.

MATERIALS

304.02
Source
Materials shall be obtained from sources or stockpiles SHOWN ON THE DRAWINGS or other approved sources. Grid-rolling shall utilize all suitable material that can be reduced to maximum size as shown in the SCHEDULE OF ITEMS.

Development and utilization of government-furnished sources shall be in accordance with Section 611.

304.03
Gradation
Grading requirements for crushing or screening operations shall meet the requirements of Subsection 703.06.

No gradation other than maximum size will be required for pit-run or grid-rolled material. After processing on the road, all oversize material shall be removed from the road and disposed of as SHOWN ON THE DRAWINGS.

304.04
Quality
All aggregate except Government-furnished stockpiles or from designated sources shall meet the quality requirements of Subsection 703.06 unless otherwise required in the SPECIAL PROJECT SPECIFICATIONS.

304.05
Additives
Chemical additives, if required, shall meet the requirements of the following subsections:

Magnesium Chloride	712.11
Calcium Chloride	712.02
Sodium Chloride	712.02
Hydrated Lime	712.03

304.06
Water
Water development, hauling, and application shall be in accordance with Section 207.

304.07
Mineral Filler
or Binder
Mineral filler or binder shall be added, as specified in the SPECIAL PROJECT SPECIFICATIONS, to meet quality and/or gradation requirements. Mineral filler or binder shall be added and uniformly blended on the road when pit-run, grid-rolling, or screening methods are used or when aggregate is being furnished by the Government. Mineral filler or binder shall be uniformly blended during crushing when a crusher operation is used.

CONSTRUCTION

304.08
Preparation of
Roadbed
The roadbed shall be completed in accordance with Section 203 or 306 and approved in writing by the Engineer before placing base or surface course.

304.09
Mixing & Placing
The contractor may mix the aggregate and any required additives, water, mineral filler, and binder by any one of the three following methods unless a required method is SHOWN ON THE DRAWINGS:

(a) Stationary Plant Method. The aggregate shall be mixed with other required materials in an approved mixer. Water shall be added during the mixing operation in the amount necessary to provide the moisture content for compacting to the specified

density. After mixing, the aggregate shall be transported to the jobsite while it contains the proper moisture content and shall be placed on the subgrade or base course by means of an aggregate spreader.

(b) Travel Plant Method. After the aggregate for each layer has been placed with an aggregate spreader or windrow sizing device, it shall be uniformly mixed with other required materials by a traveling mixing plant. During mixing, water shall be added to provide the necessary moisture content for compacting.

(c) Road Mix Method. After the aggregate for each layer has been placed, it shall be mixed with other required materials at the required moisture content until the mixture is uniform throughout.

The aggregate shall be spread in a uniform layer, with no segregation of size, and to a loose depth that shall have the required thickness when compacted.

If the required compacted depth of any aggregate base or surface course exceeds 6 inches, it shall be placed in two or more layers of approximately equal thickness. If the nominal maximum particle size exceeds 3 inches, the aggregate shall be placed in layers that do not exceed twice the maximum size of the aggregate size specified.

Hauling equipment shall be operated over the surface of the previously constructed layer in a dispersed manner to minimize rutting or uneven compaction.

304.10
Compaction

The aggregate shall be compacted by one of the following methods as specified on the SCHEDULE OF ITEMS:

Compaction A. Aggregate shall be compacted by operating spreading and hauling equipment over the full width of each layer of the aggregate.

Compaction B. Aggregate shall be moistened or dried to a uniform moisture content suitable for compaction. Rollers meeting the requirements of Subsection 212.02(b), (c), or (d) shall be operated over the full width of each layer until visual displacement ceases, but not fewer than three complete passes.

Compaction C. Each layer of aggregate shall be compacted to a density of at least 95 percent of the maximum density, as determined by AASHTO T 99, Method C or D.

Compaction D. Each layer of aggregate shall be compacted to a density of at least 95 percent of the maximum density, as determined by AASHTO T 180, Method C or D.

Compaction E. Each layer of aggregate shall be compacted to at least 95 percent of the target density as determined by the control strip in Subsection 212.03.

Compaction F. Pit-run and grid-rolled produced materials shall be visually moist and compacted by operating compaction equipment defined in Subsection 212.02 over the full width of each layer until visual displacement ceases.

The surface of each layer shall be bladed during the compaction operations to remove irregularities and produce a smooth, even surface. When a density requirement is specified, the density of each layer will be determined in accordance with ASSHTO T 191, T 205 or T 238; T 217, T 239 or T 255; and T 224.

304.11
Stockpiling

If shown in the SCHEDULE OF ITEMS or if the contractor elects to produce and stockpile aggregates prior to placement, the aggregates shall be handled and stockpiled in accordance with the requirements of Subsection 105.01. Stockpile sites shall be at locations as SHOWN ON THE DRAWINGS or approved by the Engineer.

Clearing and grubbing of stockpile sites, if required, shall be in accordance with Section 201.

304.12
Thickness
Requirements

The thickness of the compacted nominal aggregate shall not vary more than 1/2 inch for aggregates with a maximum particle size of 1 inch or less, nor more than 1 inch for aggregates with a nominal maximum particle size greater than 1 inch from the thickness SHOWN ON THE DRAWINGS. The compacted thickness shall not be consistently above or below the specified thickness.

304.13
(Reserved)

MEASUREMENT

304.14
Method

The method of measurement as described in Section 106 will be DESIGNATED in the SCHEDULE OF ITEMS.

Aggregate quantities will include mineral filler or binder.

PAYMENT

304.15
Basis

The accepted quantities will be paid for at the contract unit price for each pay item shown in the SCHEDULE OF ITEMS.

<u>Pay Item</u>	<u>Pay Unit</u>
304(01) Pit Run Aggregate, Maximum Size _____, Compaction _____	C.Y.
304(02) Pit Run Aggregate, Maximum Size _____, Compaction _____	TON
304(03) Pit Run Aggregate, Maximum Size _____, Compaction _____	L.S.
304(04) Grid-Rolled Aggregate, Maximum Size _____, Compaction _____	C.Y.
304(05) Grid-Rolled Aggregate, Maximum Size _____, Compaction _____	TON
304(06) Grid-Rolled Aggregate, Maximum Size _____, Compaction _____	L.S.
304(07) Screened Aggregate, Grading _____, Compaction _____	C.Y.
304(08) Screened Aggregate, Grading _____, Compaction _____	TON
304(09) Screened Aggregate, Grading _____, Compaction _____	L.S.
304(10) Crushed Aggregate, Type _____, Grading _____, Compaction _____	C.Y.
304(11) Crushed Aggregate, Type _____, Grading _____, Compaction _____	TON
304(12) Crushed Aggregate, Type _____, Grading _____, Compaction _____	L.S.

304(13)	Furnishing and Applying Calcium Chloride, Type _____	TON
304(14)	Furnishing and Applying Hydrated Lime	TON
304(15)	Furnishing and Applying Sodium Chloride	TON
304(16)	Placing Aggregate, Compaction _____	C.Y.
304(17)	Placing Aggregate, Compaction _____	TON
304(18)	Placing Aggregate, Compaction _____	L.S.
304(19)	Furnishing and Applying Magnesium Chloride	TON
304(20)	Furnishing and Applying Magnesium Chloride	M. GALS.
304(21)	Stockpiled Aggregate, Type _____, Grading _____	C.Y.
304(22)	Stockpiled Aggregate, Type _____, Grading _____	TON

When materials are produced and furnished by the Forest Service, the note "Government furnished materials" will be added to the description of the pay item. This applies only to pay items 304(16), 304(17) and 304(18).

Section 306 - Reconditioning Existing Road

DESCRIPTION

306.01

This work shall consist of reconditioning the traveled way and shoulders of an existing road; cleaning ditches and culverts, including inlets and outlets; removing slide material; scarifying and shaping the traveled way and shoulders, parking areas, turnouts, and approach road connections.

CONSTRUCTION

306.02

Performance

The traveled way and shoulders shall be scarified and shaped at locations and to the depth and width SHOWN ON THE DRAWINGS. Any rock larger than 4 inches in its greatest dimension brought to the surface during scarification shall be removed, except as provided below.

When a base or surface course is required, provisions of (a) or (b) shall apply:

(a) Rocks larger than 4 inches that do not protrude above the existing surface or the subgrade more than one-third of the depth of the base or surface course or 3 inches, whichever is less, may be left in place.

(b) Rocks with exposed surface area exceeding 2 square feet shall be removed to at least 6 inches below subgrade.

Excess materials removed shall be disposed of in areas SHOWN ON THE DRAWINGS.

Existing bituminous surfaces, SHOWN ON THE DRAWINGS, shall be scarified and pulverized until all lumps are reduced to the maximum size SHOWN ON THE DRAWINGS. The bituminous pulverized aggregate shall be incorporated into the traveled way and shoulders.

The traveled way and shoulders of intersecting roads shall be similarly treated to provide a smooth transition for the distance SHOWN ON THE DRAWINGS.

The ditches shall be graded to the typical sections and at the locations SHOWN ON THE DRAWINGS. Culverts shall be cleaned to drain.

Excess and unsuitable materials removed from the roadbed, slides, culverts, and ditches shall be disposed of as SHOWN ON THE DRAWINGS.

The traveled way and shoulders shall be shaped after scarification and compacted by one of the following, as shown in the SCHEDULE OF ITEMS.

Compaction A. By operating equipment over full width.

Compaction B. 95 percent of AASHTO T 99, Method C or D.

Compaction C. 95 percent of AASHTO T 180, Method C or D.

Compaction D. Subsection 203.15, Method 3

When compaction B or C is specified, the in-place density of the material shall be determined in accordance with AASHTO T 191, T 205, or T 238; T 217, T 239, or T 255; and T 224.

306.03

(Reserved)

MEASUREMENT

306.04
Method

The method of measurement, as described in Section 106, will be DESIGNATED in the SCHEDULE OF ITEMS.

Removal of slide material in excess of 10 cubic yards per station will be measured as provided in Section 203.

PAYMENT

306.05
Basis

The accepted quantities will be paid for at the contract unit price for each pay item shown in the SCHEDULE OF ITEMS.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
306(01) Reconditioning of Roadbed, Compaction_____	MI.
306(02) Reconditioning of Roadbed, Compaction_____	STA.
306(03) Reconditioning of Roadbed, Compaction_____	L.S.

Section 308 - Portland Cement Treated Base

DESCRIPTION

308.01
Work This work shall consist of constructing one or more courses of a mixture of aggregate, Portland cement, and water on a prepared surface. Road mix, travel plant, or central plant methods may be used as described below.

MATERIALS

308.02
Requirements Materials shall meet the requirements of the following Subsections:

Portland Cement	701.01
Water	712.01
Aggregate	703.06
Liquid Asphalt	702.02
Emulsified Asphalt	702.03

The type of cement shall be as SHOWN ON THE DRAWINGS.

CONSTRUCTION

308.03
Road Mix or Travel
Plant Method Where in-place aggregate is to be used for the mixture, aggregate shall be scarified to the depth SHOWN ON THE DRAWINGS. The scarified materials shall be windrowed or spread to a uniform thickness for mixing. Any material that would be retained on a 2-inch sieve and other unsuitable materials shall be removed. If additional aggregate is required, it shall be blended with the existing material. All butt joints at existing pavement or structures shall be cleaned and trimmed, if necessary, prior to mixing.

The subgrade shall support all equipment required in the construction of the base. Soft or yielding areas shall be subexcavated and replaced with suitable materials prior to mixing in accordance with Section 203.

The specified quantity of Portland cement shall be applied uniformly in a trench on top of the windrow or spread uniformly over the aggregate. Cement that is lost shall be replaced before mixing is started, without additional compensation.

Mixing shall be accomplished by means of a blade-grader, traveling mixer, or other equipment approved by the Engineer that will thoroughly blend the aggregate with the required quantity of cement and water. Cement and aggregate shall be mixed before water is added. The required quantity of water shall then be introduced, and mixing shall continue until the Portland cement and water are uniformly distributed.

308.04
Central Plant
Method The aggregate shall be proportioned and mixed with cement and water in a central mixing plant. The plant shall be equipped with feeding and metering devices that will introduce the cement, aggregate, and water into the mixer in the quantities specified. Mixing shall continue until a uniform mixture of aggregate, cement, and water has been obtained.

Mixed material shall be spread on a moistened subgrade or base in a uniform layer by equipment approved by the Engineer.

308.05
Compaction &
Finishing After the cement-treated mixture has been spread, the mixture shall be compacted to at least 95 percent of the maximum density, as determined by AASHTO T 134 or control strips, as specified in Subsection 212.03. The in-place density will be determined in accordance with AASHTO T 191, T 205, or T 238; T217, T 239, or T 255; and T 224. Any mixture of aggregate, cement, and water that has not been compacted shall not be left undisturbed for more than 30 minutes. The percentage of moisture in the completed mixture

shall not vary from the optimum by more than plus or minus 2 percentage points as determined by AASHTO T 134. The compaction shall be completed within 2 hours of the time water is added to the mixture. The compacted surface shall be finished to the required cross section. All irregularities shall be removed and the surface recompacted.

308.06
Protection & Curing

After the cement treated base has been finished, it shall be kept moist continuously until a protective film of bituminous curing material has been applied. Application rates for bituminous curing seal shall be as SHOWN ON THE DRAWINGS. This film shall be maintained until the treated base is protected by a subsequent course. Application of bituminous material shall be in accordance with Section 410 at the rate SHOWN ON THE DRAWINGS.

308.07
Weather Limitations

Mixing shall not be done when the aggregate or subgrade is frozen. The air temperature shall be at least 40 °F in the shade during all operations. The finished course shall be protected from freezing for 7 days after construction.

308.08
(Reserved)

MEASUREMENT

308.09
Method

The method of measurement, as described in Section 106, will be DESIGNATED in the SCHEDULE OF ITEMS.

The contractor shall furnish calibrated tanks, distributors, or accurate meters as necessary for measuring water. Only water used in the mix will be included in the quantities.

PAYMENT

308.10
Basis

The accepted quantities will be paid for at the contract unit price for each pay item shown in the SCHEDULE OF ITEMS.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
308(01) CTB - Central Plant Method	TON
308(02) CTB - Central Plant Method	STA.
308(03) CTB - Central Plant Method	S.Y.
308(04) CTB - Traveling Plant or Road Mix	MI.
308(05) CTB - Traveling Plant or Road Mix	STA.
308(06) CTB - Traveling Plant or Road Mix	S.Y.
308(07) Portland Cement for CTB	TON
308(08) Imported Aggregate for CTB*	TON
308(09) Imported Aggregate for CTB*	C.Y.
308(10) Water for CTB	M. GALS.
308(11) Liquid Asphalt Curing Seal for CTB	TON
308(12) Liquid Asphalt Curing Seal for CTB	GAL.
308(13) Emulsified Asphalt Curing Seal for CTB	TON
308(14) Emulsified Asphalt Curing Seal for CTB	GAL.

*For Traveling Plant or Road Mix Only