

SECTION 310: BASE COURSE

310.1 DESCRIPTION

This work shall consist of providing, hauling, spreading, compacting and finishing base course in conformance with the Contract, plan set and City Standard Drawings or as directed by the City Engineer or designee.

310.2 MATERIALS

310.2.1 General

Base Course shall consist of crushed stone, crushed or screened gravel, caliche, sand, reclaimed asphalt pavement (RAP), or a combination of such materials. Use of glass aggregate in base course will require written approval by the City Engineer or designee and shall be considered on a case by case basis. Base course shall be free from organic matter or other deleterious materials, including silt and clay balls.

The aggregate materials shall be combined in such proportions that the resulting composite blend meets the requirements of Table 310.2.1:1, “Base Course Gradation” unless otherwise specified.

**Table 310.2.1:1
Base Course Gradation**

Sieve Size	% Passing
1 in	100
3/4 in	80 – 100
No. 4	30 – 60
No. 10	20 – 45
No. 200	3.0 – 10.0

At least 50% of the Materials retained on the No. 4 sieve shall have at least two (2) Fractured Faces (FF) when evaluated by NMDOT Method FF-1, Fractured Face Determination for Course Aggregate. Base course shall have a maximum Aggregate Index (AI) of 35, a maximum Liquid Limit (LL) of 25, and a maximum Plasticity Index (PI) of 6. The aggregate index shall be determined in accordance with Section 910, “Aggregate Index” of the NMDOT Standard Specifications for Highway and Bridge Construction, current edition.

310.2.2 Aggregate Acceptance

Aggregate source acceptance will be based on certification of material conformance to the requirements of Section 310.2.1 above.

A Base Course Certification Letter shall be submitted by the Contractor to the City Engineer or designee at a minimum of five (5) working days prior to the beginning of base course placement operations. The Base Course Certification Letter shall be signed, dated and stamped by a Professional Engineer licensed in the State of New Mexico certifying conformance to the specifications and shall be dated within one (1) year of material use on the project. The Base Course certification Letter must

reference conformance of the aggregate material source and aggregate combination to the specification requirements as listed in Section 310.2.1 above and shall include a copy of all associated test results. All acceptance testing of materials shall be performed by an AASHTO Materials Reference Laboratory (AMRL) or NMDOT accredited testing laboratory.

Submittal of a current approved base course aggregate material source by the NMDOT may substitute for the above.

Failure to provide a current Base Course Certification Letter dated within one (1) year of material use on the project prior to the Contractor's placement of any base course material on the project may result in removal and replacement of placed material with material conforming to specification requirements at the Contractor's own expense.

310.3 CONSTRUCTION REQUIREMENTS

310.3.1 Preparation of Subgrade

The subgrade upon which the base course is to be placed shall be prepared in accordance with Section 207, "Subgrade Preparation" of the NMDOT Standard Specifications for Highway and Bridge Construction, current edition, and shall conform to the line, grade, cross section and density requirements of the plans or City Standard Details. The subgrade shall be cleaned of all loose and deleterious material.

Prime Coat shall be applied to the base course surface in conformance with Section 420, "Prime Coat" of these Standard Specifications or as directed by the City Engineer or designee.

310.3.2 Mixing and Placing

Base Course Material shall be mixed to a homogenous mixture. The Contractor shall spread and place base course in lifts not exceeding 6 inches (compacted) unless otherwise directed by the City Engineer or designee. Base course shall not be placed on frozen subgrade. Density requirements shall be determined in accordance with AASHTO T 180 Method D (ASTM D 1557).

Base course shall be compacted to not less than 95% of maximum density or as otherwise specified in the plans, City Standard Drawings or as directed by the City Engineer or designee. Field density tests shall be taken at random locations or at locations shown in the Contractor's quality control plan if required. Densities shall be determined using nuclear testing methods in accordance with AASHTO T 238 and T 239. Moisture content in the base course shall be plus or minus two (2) percent of optimum moisture. Nuclear moisture contents shall be corrected for residual hydrocarbons before computing in-place dry densities when using RAP.

310.3.3 Surface Tolerance

The final surface of base course shall not deviate in excess of ½ inch in ten (10) feet when measured with a ten (10) foot straight edge. All deviations from this tolerance shall be corrected by the Contractor at no additional cost to the City.

310.3.4 Plan Base Course Depths

The Contractor shall monitor and record compacted base course depths during the placement operation. Measurements shall be taken at randomly selected locations. The depth shall be determined

by removing all of the in-place compacted Material, placing a straight edge tool across the hole, measuring the depth to the nearest 1/4 inch using a measuring tape, and then replacing and recompacting the removed material. The depth checks shall be submitted to the City Engineer or designee on a weekly basis. The placement depth of base course shall be in accordance with the plans or City Standard Drawings. There shall be no deviation in depth greater than minus one half (1/2) inch when paid by the square yard. There shall be no deviation in depth greater than plus or minus (+/-) one half (1/2) inch when paid by the ton or cubic yard. If the placement thickness does not meet requirements, the contractor shall correct the thickness deficiency and recompact the surface at no additional cost to the City.

310.3.5 Sampling and Testing

310.3.5.1 Contractor Quality Control

The Contractor is responsible for the quality of materials and construction. The City reserves the right to obtain samples of any portion of any material at any point of the operation for the City’s use. The Contractor shall administer a Quality Control Plan to provide and place base course in accordance with the City’s Standard Specifications, Standard Details, Plans, and Contract unless otherwise specified by the City Engineer or designee. The Quality Control Plan shall be provided in accordance with Section 423.3.6.1, “Contractor Quality Control” and Section 901.2, “Contractor Quality Control” of the NMDOT Standard Specifications for Highway and Bridge Construction, current edition. Any reference to “Project Manager” or “District Laboratory Supervisor” shall be substituted with the words, “City Engineer or designee.”

Quality Control sampling, testing and inspection shall be performed by the Contractor in accordance with Table 310.3.5.1:1, “Minimum Process Control Guidelines for Base Course.”

**Table 310.3.5.1:1
Minimum Process Control Guidelines for Base Course**

Item	Property	Testing Frequency	Test Method
Aggregate For Base Course	Gradation		AASHTO T 11, 27, 146
	Fractured Faces Sand Equivalent	1 per 1000 Ton	NMDOT Method FF 1 AASHTO T 176
	Aggregate Index	1 per source	Per Section 910, NMDOT Std Specs, current Edition
	Moisture Content	As needed to control operations	AASHTO T255
Base Course	Moisture Content		AASHTO T255
	Density	1 per 300 Ton	AASHTO T180
	Gradation		AASHTO T 11,27
	Depth	1 per 300 Ton	Section 310.3.4 above

310.3.6 Acceptance

Quality acceptance sampling, testing and inspection of base course shall be performed by the City or a City representative at the direction of the City Engineer or designee unless otherwise specified and shall conform to the requirements of Table 310.3.6:1, “Minimum Acceptance Testing Tolerances for Base Course.”

The City may base acceptance of base course on submitted Contractor test results conforming to the acceptance requirements of this Section for development or subdivision work.

The Contractor shall control base course operations such that the tolerances of Table 310.3.6:1 are met.

**Table 310.3.6:1
Minimum Acceptance Testing Tolerances for Base Course**

Property	Point of Acceptance	Testing Frequency (minimum of)	Tolerance	Test Method
Sampling	As Specified			AASHTO T 2, 248
Gradation	Processed	1 per 300 Ton	Table 310.2.1:1	AASHTO T 11, 27
	Material from Roadway	1 per 1500 SY 1 per Street or Site 2 per Day		
FF, LL*, PI*	Process Material from Roadway	1 per 300 Ton 1 per 1500 SY	Section 310.2.1	NMDOT Method FF1 AASHTO T 176
Density	Roadway After Compaction	1 per 500 Ton 1 per 2400 SY 1 per Street or Site 2 per Day	95% of Maximum	AASHTO T 180 AASHTO T 238, 239
Depth	Roadway After Compaction	3 per 1000LF per lane 3 per 1300 SY 3 per Street or Site	Target Value +/- ½ inch	Section 310.3.4
Surface Tolerance	Roadway After Compaction	Continuous over Surface	Target Value +/- ½ inch	Section 310.3.3

*If the percent passing the No. 10 sieve is less than 10% of AASHTO T-27 test procedure, this test does not need to be performed.

Acceptance Testing shall be performed by an independent Testing Laboratory obtained by the Contractor or as designated by the City Engineer or designee. Test results shall be submitted to the City Engineer or designee and the Contractor within two working days of taking the test or sample.

310.4 METHOD OF MEASUREMENT -

Base course will be measured by the square yard, ton or cubic yard.

When base course is to be measured by the square yard, the average width of base course will be used in computing quantities. The length used in computing the area shall be station to station along the centerline of the roadway. All dimensions shall be as shown on the typical section of the plans or City Standard Drawings.

When base course is to be measured by the ton, the City will deduct the weight of moisture that exceeds the optimum moisture content plus 2%.

Base course testing by the Contractor will be measured by the lump sum.

310.5 BASIS OF PAYMENT

Pay Item	Pay Unit
Base Course	Ton or Cubic Yard
Base Course _____in Depth	Square Yard
Base Course Testing by the Contractor	Lump Sum