

DIVISION 400

2018 AMENDED SECTION 402

PAVEMENT BASE COURSE

402.01 Description.

The work covered by this Section shall consist of furnishing, placing, watering, shaping, and compacting a course or courses of crushed gravel to provide a firm and stable foundation for subsequent construction. The base course shall be constructed on a previously-constructed subbase or subgrade in accordance with the requirements of these specifications and in conformity with the lines, grades, quantity requirements, and the typical cross-sections shown on the plans.

402.02 Materials.

- A. Crushed Gravel. The crushed gravel for base course shall consist of clean, hard, durable particles which have been crushed to the following gradations:

Sieve Size	% Passing by Weight	
	Grading W	Grading GR
2" (50 mm)	-	-
1-1/2" (37.5 mm)	100	-
1" (25 mm)	90-100	100
3/4" (19 mm)	-	90-100
1/2" (12.5 mm)	60-85	65-85
#4 (4.75 mm)	45-65	50-78
#8 (2.36 mm)	33-53	37-67
#30 (600 µm)	-	13-35
#200 (75 µm)	3-12	4-15

1. The type of base course to be applied is the Contractor's option unless otherwise specified in the special provisions.
2. Base material shall have a minimum Resistance (R) value of 70 when tested in accordance with ASTM D2844, and the coarse aggregate shall have a maximum magnesium sulfate (MgSO₄) soundness loss of 18% when tested in accordance with ASTM C88.
3. Coarse aggregate shall consist of hard, durable particles, or fragments of stone or gravel. Materials that break up when alternately frozen and thawed or wetted and dried shall not be used. Unless otherwise specified, the coarse aggregate shall have a Los Angeles abrasion loss (ASTM C131) at 500 revolutions of not more than 50%.

4. Fine aggregate shall consist of crushed stone, crushed gravel, or natural sand. The fraction passing the No. 200 (75 μ m) sieve shall not be greater than two-thirds (2/3) of the No. 40 (425 μ m) sieve. The fraction passing the No. 40 (425 μ m) sieve shall have a liquid limit not greater than twenty-five (25) and a plasticity index not greater than six (6) except that, when the plasticity index is non-plastic, the liquid limit shall not be more than thirty (30) per ASTM D4318.
5. Of the particles retained on a No. 4 (425 μ m) sieve, at least 35% by weight shall have one (1) or more fractured faces as determined by ASTM D5821.

B. Recycled Aggregate Base. At the option of the Contractor, recycled aggregate base manufactured from asphalt concrete and/or Portland cement concrete may be used if it conforms to the following gradation requirements and has a minimum Resistance (R) value of 70 when tested in accordance with ASTM D2844.

Sieve Size	Percent Passing by Weight	
	Type 1 – Imported	Type 2 – Recycled On-site
2"	100	100
3/4"	70-100	-
No. 4	20-70	-
No. 200	0-12	0-12

C. Preconstruction Testing. All testing and sampling shall be done in accordance with latest ASTM methods, unless otherwise specified. At least two (2) weeks in advance (except for Type 2 Recycled Aggregate Base, for which samples and/or certifications shall be submitted within five (5) business days of the start of on-site recycling) of the beginning of base work, the Contractor shall:

1. Submit representative samples of the base material to the City’s materials testing laboratory, if one has been designated, for tests to determine the compliance of the proposed subbase material with these Specifications;
2. Or shall submit certification based on testing performed within the last 12 months by an AASHTO-accredited or otherwise-approved laboratory that the materials to be used are in conformance with these Specifications.

D. Construction Testing. During construction the supplier/Contractor shall have testing required by Subsection 402.05, Quality Control Testing, performed by an AASHTO-accredited or otherwise approved testing laboratory. The results of such tests shall be submitted by the laboratory to the City or their designated representative and Contractor within three business days.

402.03 Mixing.

Before production of base materials, all vegetation, topsoil, and overburden shall be removed from the pit area to be used. For recycled aggregate base, the asphalt concrete and/or Portland cement concrete shall be separated from any deleterious materials prior to processing. The crushing and screening plant shall be equipped with any combination crushing and screening devices which will produce the required material. The moisture content of base materials shall be between plus 2% and minus 4% of optimum prior to placement and compaction. Care shall be exercised in the operation of loading, hauling, and distributing the crushed material to avoid segregation of the coarse and fine particles of the total material. If segregation occurs, the method of spreading and placing shall be modified so that placement is made to the satisfaction of the Engineer. The base course shall be placed on the previously-prepared subbase or base course in the proper quantities to conform to the typical cross-section shown on the plans. The base course thickness specified by the plans is absolute minimum thickness. Where the subbase has been left low, the Contractor may, at his option, use base course material as covered in this section of specifications to bring the subbase up to the grade specified.

402.04 Shaping and Compaction.

After the base course material has been placed and uniformly spread over the prepared subbase, compaction shall be accomplished by means necessary to meet the density requirements herein. If additional water is needed to facilitate compaction and bonding of materials, it shall be applied in a controlled manner such that the moisture content requirements are met and with no adverse effects to the underlying or surrounding materials or facilities.. Rolling shall be continued until the entire base course has been compacted to the required density and moisture content.

- A. The finished base surface shall be smooth and free of ruts and irregularities and true to grade and crown and thickness as shown by the plans or directed by the Engineer.
- B. Each layer shall be compacted to a density of not less than 95% of maximum density and a moisture content of plus 2% to minus 4% of optimum moisture, as determined in accordance with ASTM D1557, unless otherwise called for on the plans. Compactions or field-in-place densities will be determined by sand cones (ASTM D1556) or nuclear density meters (ASTM D2922). The surface of each layer shall be maintained during the compaction operations in such a manner that a uniform texture and surface is produced and the aggregates firmly keyed. Water shall be uniformly applied over the materials during compaction in the amount necessary for proper consolidation.
- C. The maximum compacted thickness of any one layer shall not exceed eight inches (8" - 200 mm).

402.05 Quality Control Testing.

- A. Prior to commencement of base placement operations, the Contractor shall submit for approval the name and address of the AASHTO-accredited or otherwise-approved quality control laboratory proposed for use. The Contractor shall provide the following:

- B. A minimum of one density and moisture test for every five hundred square yards (500 sq. yds) (418 sq. m) of base course placed.
- C. A minimum of one gradation test, including liquid limit and plasticity index, for every two thousand square yards (2,000 sq. yds) (1,675 sq. m.) placed, or portion thereof.
- D. The quality control laboratory shall submit copies of the results of all required testing to the City or their designated representative and Contractor within three business days.
- E. The City reserves the right to test the material for conformance with these specifications. In the event of a dispute, the City's results shall govern. No single test result will represent more than 2,000 square yards.