DIVISION 400

2018 AMENDED SECTION 401

PAVEMENT SUBBASE COURSE

401.01 Description.

The work covered by this Section shall consist of furnishing, placing, watering, shaping, and compacting a course of crushed stone or crushed gravel, and an approved soil binder or natural filler, to provide a firm and stable foundation for subsequent construction. The subbase course shall be constructed on a previously prepared subgrade in accordance with the requirements in these Specifications and the typical cross-section shown on the plans.

401.02 Materials.

A. General. Before production of any of the following materials, all vegetation, topsoil, and overburden shall be removed from the pit area to be used. The composite materials shall be free from clay balls, vegetable matter, and other deleterious substances, and shall not contain an excess of thin or elongated pieces.

B. Crushed subbase shall be crushed stone or crushed gravel and an approved soil binder or natural filler, where required, conforming to the following requirements, unless otherwise designated on the plans or in the special provisions.

1. 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%.

2. Subbase material shall have a minimum Resistance (R) value of 60 when tested in accordance with ASTM D2844.

3. Fine aggregate shall consist of crushed stone, crushed gravel, or natural sand. The fraction passing the No. 200 (75*u*m) sieve shall not be greater than two-thirds (2/3) of the fraction passing the No. 40 (425*u*m) sieve. The fraction passing the No. 40 (425*u*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.

4. Crushed base shall meet one of the following gradation requirements, or as specified by the drawings:

Sieve Designation	Grading L	Grading GR	Grading J	Grading K	Grading W
2” (50 mm)	-	-	100	-	-
1-1/2” (37.5 mm)	100	-	90-100	100	100
1” (25 mm)	90-100	100	-	90-100	90-100
¾” (19 mm)	-	90-100	-	-	-
½” (12.5mm)	60-85	65-85	-	-	60-85
#4 (4.75 mm)	35-55	50-78	35-75	40-65	45-65
#8 (2.36 mm)	25-50	37-67	-	30-55	33-53
#30 (600µm)	10-30	13-35	-	-	-
#200 (75 µm)	3-15	4-15	0-15	3-15	3-12

C. Subbase shall be crushed stone or gravel meeting the wear, liquid limit, plasticity index and gradation requirements specified for crushed subbase.

D. Crusher run subbase shall be crushed material of the maximum size as called for on the plans or Special Conditions.

401.03 Subgrade Preparation.

The subgrade shall be prepared in accordance with Division 200, Section 201 of these Specifications. Immediately prior to placing the subbase material, the subgrade shall be true to line and grade and shall be smooth, dense, and free from ruts, depressions, and irregularities. The subbase course shall not be placed until the subgrade has been approved by the Engineer.

401.04 Placing.

The subbase course material shall be placed on previously prepared subgrade at the locations and in the proper quantities to conform to the typical cross- sections as shown on the plans and directed by the Engineer. The subbase material shall be placed in lifts not exceeding eight inches (8") (200mm) in final thickness. Placing and spreading shall be done by means of spreading machines, motor graders, or any other approved equipment and methods. The method of spreading and placing shall be such that segregation of the coarse and fine particles is avoided. If undue segregation occurs the method of spreading and placing shall be modified so that the placement is made to the satisfaction of the Engineer.

401.05 Laying and Compacting.

A. After the subbase course material has been placed and uniformly spread over the prepared subgrade, compaction shall be accomplished by means necessary to meet the density requirements herein. If additional water is needed to facilitate compaction and bonding of the 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.

B. Rolling shall be continued until the subbase material has been compacted to a density of at least 90% minimum dry density as determined by ASTM D1557 and a moisture content within plus 2% to minus 4% of optimum.

C. The finished subbase surface shall be smooth and free from ruts and irregularities and true to grade and crown as shown by the plans or as directed by the Engineer. Tolerance and smoothness shall be as specified in Division 200, Section 201.03. Any deviations in excess of these amounts shall be corrected by loosening, adding, or removing materials, reshaping, and recompacting by wetting and rolling. The subbase course material shall be maintained in this condition by watering, rolling, or blading as necessary and to the satisfaction of the Engineer until the base course is applied.

401.06 Quality Control.

A. Preconstruction Testing. All testing and sampling shall be done in accordance with the latest ASTM methods unless otherwise specified. At least two weeks in advance the Contractor shall:

1. Submit representative samples of the subbase 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 subbase materials to be used are in accordance with these Specifications.

B. Construction Testing. Prior to and during construction, the supplier/Contractor shall have performed by an AASHTO-accredited or otherwise approved testing laboratory, one gradation test including liquid limit and plasticity index per each two thousand square yards (2,000 sq. yds) (1,675 sq. m), and one moisture and density test per each five hundred square yards (500 sq..yds.) (418 sq..m.) placed, or portion thereof. Copies of the results of such tests shall be submitted by the laboratory to the City or their designated representative and Contractor within three business days. 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.