

1.0 GENERAL

1.1 Scope

1.1.1 The work shall consist of the placement of granular base course materials to the grade lines and cross-sections as shown on the Plans or as designated by the Engineer.

1.2 Related Sections

1.2.1 Section 02130 – Subgrade Preparation

1.2.2 Section 02210 – Sub-drainage Sand

2.0 PRODUCTS

2.1 Gradation

2.1.1 When tested according to ASTM C135, Method of Test for Sieve Analysis, the material shall meet one of the following gradation requirements as specified by the Engineer:

SIEVE DESIGNATION	PERCENT PASSING BY WEIGHT	PERCENT PASSING BY WEIGHT
Size	Type 32	Type 33
25 mm	100	
20 mm	93 - 100	100
12.5 mm	72 - 93	75 - 100
5 mm	45 - 77	50 - 75
2 mm	29 - 56	32 - 52
800 µm	17 - 38	18 - 33
400 µm	13 - 26	15 - 25
160 µm	7 - 14	11 - 19
80 µm	7 - 11	7 - 11
Plasticity Index	0 - 6	0 - 6

2.1.2 The percentage passing the designated sieve sizes for any representative sample, when plotted on a semi-log grading chart, shall show a free flowing concave curve without sharp breaks, within the limits specified above. The material passing through the 400 µm sieve shall have a Liquid Limit not greater than 25 and a Plasticity Index not greater than six (6).

2.2 Aggregate

2.2.1 The aggregate shall consist of hard, durable particles free from injurious quantities of soft or flaky particles, loam or organic matter, or other deleterious material. The gravel shall be crushed gravel passing a 25 mm

sieve.

2.2.2 Granular material retained on the 5 mm sieve shall have a minimum average of forty-five percent (45%) of the aggregate with at least one fractured face. Average will be defined as the average all tests for each working shift.

2.2.3 Recycled granular aggregate such as crushed concrete, crushed asphalt concrete and recycled asphalt pavement free of deleterious materials **may** be used as a substitute for natural aggregate where the recycled aggregate meets all gradation and property requirements included within this specification and approved by the Engineer.

2.3 Clay Binder

2.3.1 Shall consist essentially of fine particles of sand, silt and clay containing no particles larger than will pass a 25 mm square opening screen, and shall be free from injurious amounts of organic matter or other deleterious material. It shall have a Plasticity Index of not more than 15. The clay shall be broken down by a shredder or pulverizer before being added to the mixture if required by the Engineer.

2.4 Filler

2.4.1 Filler material shall be fine sand (minimum 100% passing 630 μm sieve) and free from rocks or any deleterious material.

2.5 Water

2.5.1 Water shall be reasonably clean and free from substances which might render it unfit for use.

3.0 EXECUTION

3.1 Construction

3.1.1 The base course shall consist of an intimate mixture of course aggregate, sand, clay, and water. These materials shall be combined, compacted and finished in a true workmanship like manner on the previously prepared sub-base or subgrade to a compacted thickness as shown on cross-sections and plans, and in these specifications.

3.1.2 All tools, machinery, plant and equipment used in handling material and executing any part of the work, shall be subject to the approval of the Engineer. All such equipment shall be maintained in efficient working order, and where any machinery, plant or equipment is found to be unsatisfactory, it shall be improved or replaced.

3.1.3 Granular base course is to be supplied, placed and delivered by the Contractor. The method of processing and delivery must be satisfactory to the Engineer.

3.1.4 The final surface of the granular base course shall be compacted in such a

manner as to ensure the granular base course structure is stable and tightly knit throughout.

- 3.1.5 The surface of the granular base course shall be such that when tested with a 3 m straight edge placed on the surface of the roadway, the maximum deviation of the surface from the edge of the straight edge shall nowhere exceed 10 mm.
 - 3.1.6 The maximum un-compacted lift thickness shall not exceed 150 mm unless approved by the Engineer.
 - 3.1.7 Each layer of base course shall be compacted to at least one hundred percent (100%) of the maximum Standard Proctor dry density for the material comprising the layer. While spreading or rolling, water shall be applied to the base course if required to achieve optimum moisture content.
 - 3.1.8 Moisture content of granular base shall be sufficient to allow proper compaction.
 - 3.1.9 Traffic over base course will not be permitted except by permission of the Engineer. If hauling is permitted over base course, the Contractor will, at his own expense, maintain and repair the base course as to cross-section and compaction. The Contractor shall provide at his own expense, all necessary protection of works and the safety of the public.
 - 3.1.10 Construction shall be completed and trimmed to ± 10 mm vertically and ± 100 mm horizontally. Deviations shall be neither consistently high nor consistently low.
- 3.2 Materials Testing Requirement for Quality Control
- 3.2.1 A sample shall be taken every 500 tonnes and at least one per day to confirm the gradation according to ASTM D698 and Standard Proctor Density in accordance with ASTM D698 and ASTM D2216.
 - 3.2.2 Field density will be tested using one or more of the following methods as deemed appropriate by the testing agency.
 - .1 Nuclear methods testing for density and moisture content of material compacted in place in accordance with ASTM D6938.
 - .2 Standard test by the sand cone method for density and unit weight of material compacted in place in accordance with ASTM D1556.
 - 3.2.3 Perform a minimum of one test per 250 m² per compacted lift. Testing locations to be selected by the testing agency under the direction of the Engineer.