

**CITY OF WHITEHORSE SERVICING STANDARDS MANUAL**  
**PART 3 - SPECIFICATION**  
**SECTION 3.12 - GRANULAR BASE COURSE**

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## **SECTION 3.12 – GRANULAR BASE COURSE**

### **3.12.1 SCOPE**

The work described in this section pertains to base course gravel for roadway construction.

### **3.12.2 MATERIALS**

#### **3.12.2.1 SAMPLES**

Before any granular material is used in the work, the Developer shall obtain and ship to an approved testing laboratory, representative samples containing not less than 25 kg. Sampling shall be done in accordance with the current issue of ASTM D75. The laboratory shall provide the Engineer, Consultant, and Developer with a report on the suitability of the material as a granular base, and a sieve analysis.

#### **3.12.2.2 GRADATION**

The following gradation shall apply to the base course aggregate sub-base course when tested to ASTM C136 and C117, (AASHTO T11 and T27).

**TABLE 3.12.2.2**  
**PHYSICAL REQUIREMENTS OF GRANULAR BASE COURSE**

<b>SIEVE NO. (mm)</b>	<b>PASSING BY MASS (%)</b>
20.00	100
12.500	64 -100
5.000	36 - 72
1.250	12 - 42
0.315	4 - 22
0.080	3 - 6

A tolerance of 3% in the amount passing the maximum screen size will be allowed if all the material passes a sieve with 6 mm larger opening. A minimum of 60% by weight of the material retained on the 5.000 sieve shall have at least one freshly crushed face. The material shall have a liquid limit not greater than 25 (ASTM D423-66) and a plastic limit not greater than six (ASTM D424-59).

Base course aggregate with a length to thickness ratio of greater than five should be limited to 15% by mass.

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A minimum of 60% by weight of the material retained on the 5,000 sieve shall have at least two freshly crushed faces. Other properties shall be as follows:

Liquid limit	Maximum 25, ASTM D423-66
Plasticity Index	Maximum 6, ASTM D424-59
Los Angeles Abrasion	ASTM C131-76
Gradation "B"	35% maximum loss by mass
Sand Equivalent	Minimum of 35% ASTM D2419-74

A tolerance of 3% in the amount passing the maximum screen size will be allowed if all the material passes a sieve with 6 mm openings

### **3.12.2.3 APPROVAL**

Preliminary approval of the material as represented in the test results shall not constitute general acceptance of all material in the deposit or source of supply, and acceptance shall be subject to field tests taken at the discretion of the Consultant.

Materials may be considered unsuitable even though particle sizes are within the limits of the gradation sizes required, if particle shapes are thin or elongated, if any other characteristic precludes satisfactory compaction, or if the material fails to provide a roadway suitable for traffic.

The Consultant will determine the acceptability of the final material.

### **3.12.2.4 QUALITY**

Granular base material shall consist of durable crushed rock and/or crushed gravel and sand consisting of hard, clean, durable material, free from coatings of silt, clay, or other deleterious materials, and containing no organic matter.

The material shall have a minimum California Bearing Ratio of 55%, as determined by the current issue of ASTM D1883 at the specified compaction.

## **3.12.3 CONSTRUCTION**

### **3.12.3.1 PLACEMENT**

The granular base course material shall not be placed until the underlying course has been inspected and approved by the Engineer. Unless otherwise specified, the granular material shall be placed in uniform layers not exceeding a 150 mm compactive depth. The material shall be placed by mechanical spreaders or deposited in windrows and levelled with a suitable motor grader.

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**3.12.3.2 COMPACTION**

The material shall be compacted by rolling with a pneumatic-tired or vibrating roller of a type approved by the Consultant. The material shall be compacted near the optimum moisture content to 98% Standard Proctor Density.

If the moisture content exceeds the optimum during compaction, the material shall be aerated by mechanical means until the material has dried sufficiently. If the moisture content is below the optimum, water shall be added by an acceptable applicator to achieve the specified compaction.

**3.12.3.3 SHAPING AND FINISHING**

If the moisture content exceeds the optimum during compaction, the material shall be aerated by mechanical means until it has dried sufficiently. If the moisture content is below the optimum, water shall be added by an acceptable applicator to achieve the specified moisture content. A motor grader shall be used in conjunction with compaction equipment to keep the finished surface of each layer even and uniform.

The finished surface of the granular base course shall conform to the required cross-section and grade as shown on the drawings and as staked by the Consultant, within a tolerance of plus or minus 30 mm.

**3.12.4 TESTS**

The Consultant or their representative will carry out field density, moisture content, and sieve analysis tests to ensure that the material is satisfactory.

The frequency of field density and moisture content tests shall be one test per approximately 100 meters of constructed roadway and at various locations offset left and right of centerline, or as directed by the Engineer.

The frequency of sieve analysis tests shall be one test every 3 hours during crushing. All tests should comply with the gradation limits as stated in Section 3.12.2.2. If not, an additional test shall be taken directly thereafter. If the second test fails to comply with the gradation limits, the Developer shall be directed to shut down and adjust the contracting operation as to comply with the tests and specifications.