

**CITY OF WHITEHORSE SERVICING STANDARDS MANUAL
PART 3 - SPECIFICATIONS
SECTION 3.13 - GRANULAR SUB-BASE**

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SECTION 3.13 – GRANULAR SUB-BASE

3.13.1 SCOPE

The work described in this sub-section pertains to granular sub-base material for roadway construction.

3.13.2 MATERIALS

3.13.2.1 GRANULAR SUB-BASE

Granular Sub-base is that course of material lying above the subgrade and below the base course. The gradation to be utilized is to be as designated by the Consultant.

3.13.2.2 SAMPLES

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

3.13.2.3 GRADATION

The following gradations are to apply to the crushed granular sub-base course.

TABLE 3.13.2.3a
PHYSICAL REQUIREMENTS OF GRANULAR SUB-BASE

SIEVE SIZE (mm)	PASSING BY MASS (%)
50.000	100
25.000	55-100
12.500	42-84
5.000	26-65
1.250	11-47
0.315	3-30
0.080	0-8

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TABLE 3.13.2.3b
PHYSICAL REQUIREMENTS OF PIT RUN GRANULAR SUB-BASE

SIEVE SIZE (mm)	PASSING BY MASS (%)
200.000	100
80.000	75-100
25.000	55-100
12.500	42-84
5.000	26-65
1.250	11-47
0.315	3-30
0.080	0-8

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

The depth of granular sub-base is to be as noted on the drawings. Alternate depths for granular sub-base will be used to replace unsuitable subgrade. Prior to placing granular sub-base material in such areas, it may be necessary to install a Geotextile fabric.

3.13.2.4 APPROVAL

Preliminary approval of the material, as represented in the test results, is not to constitute general acceptance of all material in the deposit or source of supply, and acceptance is to 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 any 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.

3.13.2.5 QUALITY

Material is to consist of durable rock or gravel. The granular sub-base is not to contain any organic or other deleterious material. The material is to have a minimum California Bearing Ratio of 55% at the specified compaction as determined by the current issue of ASTM D1883.

3.13.2.6 FILTER FABRIC

The synthetic filter fabric is to be as specified and shown on the cross-section drawing. The material selected is to be suitable to the task and is to be approved by the Consultant.

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3.13.3 INSTALLATION

3.13.3.1 PLACEMENT

The granular sub-base material not to be placed until the Engineer has inspected the underlying course. Unless otherwise specified, the granular material is to be placed in uniform layers not exceeding 150 mm in thickness before compaction. The material is to be placed by mechanical spreaders or deposited in windrows and levelled with a suitable motor grader. Materials are not to be placed or worked so that the aggregate becomes segregated.

3.13.3.2 COMPACTION

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

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

3.13.3.3 SHAPING AND FINISHING

A motor grader is to be used in conjunction with the compaction equipment to keep the finished surface of each layer even and uniform.

The finished surface of the granular sub-base is to conform to the required cross-section and grades as shown on the Consultant's drawings and as staked, within a tolerance of 30mm.

3.13.3.4 PLACEMENT OF FILTER FABRIC

The areas to be covered by the synthetic filter fabric is to be trimmed and dressed to the lines and grades shown on the Consultant's drawings, or as required by the Consultant. The synthetic filter fabric is to be placed on the dressed surfaces to cover the areas that are to receive the granular sub-base. The fabric is to be overlapped a minimum of 500 mm at all joints to provide a full, continuous mat, and is to be laid smooth and free of tension, stress, folds, wrinkles or creases. Securing pins and washers are to be inserted through both strips of overlapped fabric at not greater than 1-metre intervals to prevent slippage of the fabric on down slopes. Each securing pin is to be pushed through the fabric until the washer bears against the fabric firmly and secures it to the foundation. The filter fabric is also to be overlapped as specified or welded at the seams.

The fabric is to be placed with the longer dimension parallel to the centerline of the roadway, and is to be laid smooth and free of tension, stress, folds, wrinkles, or creases. The strips are to be placed to provide a minimum width of 500 mm overlap for each joint.

The first layer of fill is to be applied using the end-dump method on firm ground and should be spread by a low ground pressure vehicle. The first layer should be evenly distributed in a thickness up to 500 mm and should not contain large rocks or other foreign objects. Type or class of filter fabric is to be as specified by the Consultant.

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3.13.4 TESTS

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

The frequency of field density and moisture content tests is to 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 Consultant.

The frequency of sieve analysis tests are to be one test every 3 hours. All tests should comply with the gradation limits as stated in Section 3.13.2.3. If not, an additional test is to be taken directly thereafter. If the second test fails to comply with the gradation limits, the Developer is to be directed to shut down and adjust his equipment in such a way as to comply with the tests.

As required by the Engineer, The Developer is to provide a loaded gravel truck with operator for visual checks of soft spots.