

02015 Subgrade Compaction

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02015-1 General**1.1 Description**

This section specifies requirements for shaping and compacting the subgrade to the required grade, cross section and density. This shall include scarifying, blading, spreading, shaping, trimming, compacting, adding water, drying and repairing subgrade failures before placement of subbase.

1.2 Related Work Elsewhere

Excavation and Embankment Construction: Section 02005

02015-2 Equipment

All tools, machinery, plant and equipment used in executing any part of the work shall be suitable for the work to be carried out and shall be maintained in efficient working order and where any of the machinery, plant or equipment is found to be unsatisfactory, it shall be improved or replaced, by the contractor, to the satisfaction of the Engineer.

02015-3 Construction

Field densities and moisture content tests will be taken by the Engineer to ensure that the subgrade is compacted to the specified density.

Subgrade compaction (150 mm) includes scarifying, shaping and compacting the top 150 mm of the subgrade to the required grade, cross section and density.

Subgrade compaction (300 mm) includes shaping and compacting the top 300 mm of the subgrade to the required grade, cross section and density. The compaction procedure shall consist of removing the top 150 mm of material below the finished grade, compacting and scarifying the bottom 150 mm to the specified density and thereafter placing and compacting the top 150 mm of subgrade.

The following table indicates the required compaction effort per road type:

Table 1: Required Compaction Effort per Road Type

Roadway Group	Road Class	Subgrade Compaction Depth
Residential	Locals	150 mm
	Collectors	300 mm
	Arterials	300 mm
Commercial	Locals	300 mm
	Collectors	300 mm
	Arterials	300 mm
Industrial	Locals	300 mm
	Collectors	300 mm
	Arterials	300 mm
Freeways and Ramps		300 mm
Boundary Roads		300 mm

Final compaction of the subgrade surface shall be done with pneumatic tire rollers to give a smooth tight finish. Rolling shall be continued until all loose soil is properly compacted true to within 10 mm of design elevations but not uniformly high or low. This requirement must be fulfilled before the work will be accepted.

Sub grade compaction shall meet the following requirements as determined by the Standard Proctor Compaction Test:

1. The average of the test results shall not be less than 100% of the maximum density; and,
2. All individual tests results shall be greater than 98% of the maximum density; and,
3. The frequency of the test shall be two tests per 50 lineal metres of grade or one test per block.

The finished subgrade shall be proof-rolled with a piece of heavy equipment such as a fully loaded single or tandem axle truck of sufficient axle load to expose any soft spots in the subgrade. There will be no direct payment for proof-rolling, and it shall be an integral part of subgrade acceptance. If there is any visual movement in the subgrade the soft spots detected by proof-rolling shall be repaired at the Contractor's expense. If the movement is due to the *in situ* soils below the subgrade preparation the Engineer

will provide direction. Condition of soils below the subgrade preparation layer are the responsibility of the Engineer.

If excess moisture exists in the soil, the top 300 mm of the subgrade shall be dried on all roadways, to the optimum moisture content as determined by the Standard Proctor Compaction Test. In order to expedite compaction, the subgrade shall be aerated. Aerating shall be carried out at the expense of the Contractor.

If the moisture existing in the soil is insufficient for compacting to the specified density and for finishing, the Contractor shall add water. The proper moisture content shall be $\pm 2\%$ of the optimum moisture content as determined by the Standard Proctor Compaction Test. The water shall be added uniformly by a pressure water sprayer.

The cost of adding water will be considered incidental to compaction and shall be included in the contract price for compaction.

Inaccessible areas by large compaction equipment shall be compacted by mechanical hand tampers.

3.1 Geotextile

The use of Geotextile may be needed to act as a platform to place the granular material on the roadway. This material will be placed on the subgrade and covered with a minimum of 300mm of granular material.

The woven Geotextile shall have a minimum grab tensile strength of 1.4kN and a minimum puncture resistance of 0.7kN.

Measurement and payment for the Geotextile will be on a unit price basis per square metre of finished horizontal placement area and include all material, labour, equipment and superintendence to supply and place as per the manufacturer's recommendations.

02015-4 Subgrade Protection

After the subgrade is compacted and finished, all unnecessary traffic shall be kept off. Should it be necessary to haul material over the completed subgrade, subgrade failures shall be repaired by the Contractor before placing the subbase.

02015-5 Measurement

Subgrade compaction to the specified depth will be measured in square metres. The finished trimmed top surface of the subgrade, as staked by the Engineer, will be the basis of measurement.

02015-6 Payment

Payment for subgrade compaction to the specified depth will be at the contract unit price per square metre. The unit price will be full compensation for scarifying, blading, spreading, shaping, trimming, compacting, adding water, drying, repairing subgrade failures before placing subbase and finishing the subgrade to the required grade, cross-section and density.

End of Specification 02015