

1. GENERAL

1.1 RELATED WORK

- .1 Section 31 24 13 – Roadway Excavation, Embankment and Compaction.
- .2 Section 32 11 23 – Granular Base.

1.2 PROTECTION OF EXISTING FACILITIES/STRUCTURES

- .1 The Contractor shall be responsible for locating and protecting all existing underground and surface structures, utility pipelines, overhead lines and poles, fences, water and sewer mains, building services, cables, culverts, sidewalks and other works.
- .2 The size, depth and location of the existing utilities and facilities/structures shown on the Plans are for illustrative and guidance purposes only; verification of completeness and accuracy are the responsibility of the Contractor.
- .3 Maintain and protect from damage, all water, sewer, gas, electric, telephone and other utility lines and fixtures and appurtenances that may be encountered. Any pipeline or utility line and their fixtures and appurtenances that may be damaged shall be repaired at the Contractor's entire expense to the satisfaction of the Owner, the Engineer and the Owner of the pipeline or utility.

1.3 MEASUREMENT FOR PAYMENT

- .1 Subgrade preparation will be measured for payment by the square metre of subgrade for the thickness specified, as shown in the Bid Form. The unit price shall include all equipment, labour, and supervision required for scarifying, windrowing, compaction of the sub-grade base, breaking up, mixing and blending the materials, laying out and shaping the material true to grade and cross-section, moisture adjustments, compacting, proof-rolling, and all other related or incidental tasks.
- .2 Imported granular or clay material will be measured in cubic metres of material in place after compaction, as shown in the Bid Form. Payment shall be compensation for the supply, loading, hauling, placing and compacting the material to a minimum of 100% Standard Proctor Density, or as otherwise specified.
- .3 Crushed concrete will be measured in cubic metres of material in place after compaction, as shown in the Bid Form. Payment shall be compensation for loading, hauling, placing and compacting the material to the Engineer's satisfaction, to be verified through proof-rolling, and must be approved by the Engineer prior to placing the granular base.
- .4 There shall be no payment to the Contractor for drying or adding water to the material for compaction purposes; all moisture adjustment shall include in the unit price for sub-grade preparation within the Bid Form.
- .5 There shall be no payment to the Contractor for proof-rolling the sub-grade surface.

2. PRODUCTS

2.1 IMPORTED GRANULAR MATERIAL

- .1 Granular material shall be in accordance with Section 32 11 23 – Granular Base.

3. EXECUTION

3.1 UNSTABLE SUBGRADE

- .1 Where the subgrade is unstable, or where it contains materials such as ashes, cinders, refuse, vegetable or organic material, the Contractor shall excavate such material to the width, depth and length reviewed by the Engineer and dispose of the material as required. The subgrade shall then be made by backfilling with approved native material or imported granular or clay material as required by the Engineer. Material shall be placed in successive layers not exceeding 150mm in depth when compacted to a minimum of 100% Standard Proctor Density or otherwise Specified. The material in each layer shall be within $\pm 3\%$ of optimum moisture content.

3.2 SUBGRADE PREPARATION

- .1 The subgrade of 300mm depth (unless otherwise specified) shall be scarified and compacted to a minimum of 100% Standard Proctor Density within $\pm 3\%$ of optimum moisture content, over the full width of the cross-section. The material shall be worked to ensure as much uniformity as possible in the material.
 - .1 In the case of crushed concrete, the clay subgrade shall be scarified and compacted to a minimum of 98% Standard Proctor Density as per Part 3.2.1. Where a Standard Proctor Density of the crushed concrete is not feasible, sufficient compaction must be performed to the Engineer's satisfaction and must be approved by the Engineer prior to placing the granular base.
- .2 Water shall be added, or the material shall be aerated to bring the moisture content to the optimum value. The supply of water shall be the responsibility of the Contractor.

3.3 COMPACTION

- .1 Field tests for density and moisture content shall be taken by the Independent Inspection/Testing Agency(ies) engaged by the Owner. The cost of this testing shall be borne by the Owner. Non-conformity with the specified density or moisture content shall constitute sufficient grounds for rejection of the work. The costs of retests due to failure of the initial test shall be borne by the Contractor.
- .2 Trench backfill encountered in the preparation of the subgrade which has not been compacted sufficiently shall be excavated and recompacted.
- .3 The Contractor shall be responsible for any repair required to roadworks arising from subsidence of trenches after the completion of the maintenance period of the underground services contractor.

3.4 TESTING COMPACTION

- .1 Compaction results shall be based on a minimum of three (3) density tests per 1000 square metres of road. Additional tests may be called for by the Engineer as deemed necessary.
- .2 Field density tests shall conform to ASTM D1556, ASTM D2167, or ASTM D6938 for comparison with a maximum density determined according to ASTM D698.

3.5 TOLERANCES

- .1 The finished surface of the subgrade shall conform to grades approved by the Engineer and shall show no depression more than 15mm under a straightedge 3.0m long when placed parallel to the centreline. Subgrade higher than the approved grades shall be cut to the required grades.
- .2 The tolerance for subgrade construction shall be ± 30 mm.

3.6 MAINTENANCE

- .1 If the subgrade floods, drain immediately by natural flow or by pumping to catch basins, manholes, or ditches.
- .2 Maintain finished surfaces in a condition conforming to this section until acceptance.
- .3 The Contractor shall, at its own expense, repair any damages to a prepared subgrade surface as well as repair damages done by its equipment, and shall remove any obstructions it may have placed which will interfere with the normal function of a drainage system.
- .4 The Contractor shall, at all times and at its entire cost, be responsible for protecting the Work site against the entry of surface water into the Work area, including, as may be required, the pumping and removal of such surface water with the discharge of such surface water to a location and in a manner acceptable to the Engineer.

END OF SECTION