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3.1 SUBGRADE PREPARATION

3.1.1 GENERAL

3.1.1.1 Description

Subgrade shall be considered as the soil surface on which a subsequent layer or layers of base course, gravel surfacing, surface treatment, pavement or other material is to be placed. Prior to the deposition of any material on the subgrade, it shall be prepared to the satisfaction of the Consultant in accordance with the provisions hereinafter specified.

3.1.1.2 Test Methods

Unless otherwise specified, the test methods used shall be the same as specified in Section 2.3.4.7.3.2, Test Methods of Specification 2.3, Grading.

3.1.2 CONSTRUCTION

3.1.2.1 Subgrade Excavation

Subgrade soil or previously existing, failed surfacing materials designated as undesirable by the Consultant shall be excavated, removed and disposed of at a time and place as directed by the Consultant. The disposal sites shall be levelled and trimmed to leave a neat and tidy appearance. The excavated areas shall be immediately backfilled with material as designated by the Consultant.

3.1.2.2 Granular Fill

Where designated by the Consultant, the Contractor shall place and compact granular fill on the prepared subgrade or within the subgrade excavated areas. This work shall be done in accordance with the provisions of Specification 3.8, Granular Fill.

3.1.2.3 **Preparing Subgrade Surface**

The subgrade shall be scarified to a depth of 150 mm, unless otherwise specified. The loosened material shall be windrowed to the side, and the exposed surface shall be thoroughly compacted. The windrowed material shall then be uniformly mixed, shaped to conform to the dimensions, lines, grades and cross-section as established by the Consultant, and compacted to obtain an average of one hundred percent, and with no test results being less than ninety-seven percent of the maximum dry density at optimum moisture content established by the Moisture-Density Relation tests using Standard Compaction. Approved material shall be added or removed to restore true grade and cross-section as directed by the Consultant.

When material varies from optimum moisture content, it shall be treated in the following manner. When a deficiency in moisture content exists, the material shall be watered and thoroughly mixed until optimum moisture content is attained. When an excess in moisture content exists, the material shall be worked and aerated until optimum moisture content is attained.

Any large rocks encountered during the subgrade preparation process which constitute a hazard to traffic, due to size or protrusion from the finished subgrade, shall be removed and disposed of as directed by the Consultant.

The finished subgrade surface shall be firm and uniform, true to grade and cross-section, and shall be approved by the Consultant before placing subsequent material thereon. Subgrade that does not conform to the requirements as to grade, cross-section, moisture content or density shall be reworked until such requirements are met.

Where required, the subgrade shall be prepared to a depth exceeding 150 mm on sections of the roadway as designated by the Consultant. When such work has been ordered, it shall be carried out in layers, each of which do not exceed 150 mm in depth, and requirements for density and optimum moisture as specified above shall apply for each layer.

Subgrade ramps of whatever nature at approaches to railway crossings, bridge structures, or adjacent to fixed obstructions, shall be removed to the lines and grades as directed by the Consultant. When the surplus material has been removed, the subgrade shall then be prepared in accordance with these specifications.

The Contractor shall, at his own expense, repair any damages to a prepared subgrade surface as well as repair damages done to culverts by his equipment, and shall remove any obstructions he may have placed which will interfere with the normal function of a drainage system.

3.1.2.4 Preparing Subgrade Surface on Combined Grading and Surfacing Projects

Where the Contract specifies grading and subsequent base course and/or paving work on the same project area, subgrade preparation shall be performed as required between the separate phases as determined and directed by the Consultant. Subgrade preparation work, when so ordered by the Consultant, will be performed according to the specified requirements of Section 3.1.2.3, Preparing Subgrade Surface.

Subgrade preparation bid units included in the tender for combined projects shall not relieve the Contractor of completing the initial grading construction totally to the specified profile, cross-section, moisture content and compaction standards.

3.1.3 MEASUREMENT AND PAYMENT

3.1.3.1 Subgrade Excavation

Subgrade excavation will be measured in cubic metres based on the actual number of cubic metres excavated, as measured in its original position. Payment will be made at the unit price bid for "Subgrade Excavation". This payment will be full compensation for excavating, hauling and disposing of the material at a location suitable to the Consultant.

Removal of ramps of whatever nature at approaches to railway crossings, bridges, or adjacent to fixed obstructions, will be paid for at the unit price bid for "Subgrade Excavation".

3.1.3.2 Granular Fill

Granular fill, placed were required, will be paid for in accordance with the provisions of Specification 3.8, Granular Fill .

3.1.3.3 **Preparing Subgrade Surface**

Preparing subgrade surface will be paid for at the price or prices bid per square metre for "Preparing Subgrade Surface", for the top surface area and the top surface area of successive layers of 150 mm in depth, prepared in accordance with these specifications, which payment shall be compensation in full for all equipment, labour and tools necessary to complete the work and shall include scarifying the subgrade, blading, mixing, watering or drying, shaping and compacting.

When the Consultant directs the Contractor to prepare subgrade surface for a layer or successive layers of 150 mm depth below the layer or layers specified in the Contract, preparation of such layers will be paid for at the unit price bid per square metre for "Preparing Subgrade Surface" of the nearest upper layer and shall be compensation in full for all equipment, labour and tools necessary to complete the work as specified.

3.1.3.4 **Preparing Subgrade Surface on Combined Grading and Surfacing Projects**

On combined projects, the Contractor shall complete the grading construction to required profile, crosssection, moisture content and compaction standards in accordance with Specification 2.3, Grading, and payment for this will be made in accordance with Specification 2.3, Grading.

On areas where the grading has been approved as acceptable and the condition of the subgrade has subsequently deteriorated, the Consultant may direct that subgrade preparation be performed before the subsequent application of base or surfacing materials. For these areas as designated by the Consultant, the Contractor shall perform the subgrade preparation work in accordance with Section, and payment for these specified areas will be made at the unit price bid per square metre for "Preparing Subgrade Surface". Payment will be made only once for preparing subgrade on the designated areas and layers.

Payment for subgrade preparation will be made only for those areas and layers specified by the Consultant for preparing subgrade surface and where such is fully completed in accordance with Section 3.1.2.3. Separate payment will not be made for minor levelling, removing ruts or blading the subgrade surface required between the time of grading and the base or surfacing work, this being considered incidental to the grading operation.