



2220 -SPECIFICATION FOR LIME MODIFIED SUBGRADE

2220- 1 DESCRIPTION

- 1.01 The work shall consist of a mixture of earth material, quicklime and water, constructed at the locations and in conformity with the lines, grades and dimensions shown on the plans or as designated by the Engineer.

2220 - 2 MATERIALS

- 2.01 The earth embankment to be modified shall conform to the requirements for Earth Embankments (Specification 2300). The Department will supply and pay for the Quicklime. The Contractor shall be responsible for unloading quicklime at the storage silo(s) and/or mixing plant and shall arrange with the supplier regarding the time and quantity of quicklime shipments. The Contractor shall be responsible for demurrage charges caused by his delay in unloading quicklime.
- 2.02 Water shall conform to the requirements for Watering (Specification 2500).

2220 - 3 CONSTRUCTION

GENERAL

- 3.01 The earth embankment to be modified may be the upper horizon of an existing sub-grade, or it may be imported earth material placed on a prepared surface. The plans or special provisions will indicate which method will be used. When imported earth material is used, the excavation and placement shall be done in accordance with the requirements for Earth Excavation (Specification 2200) and Embankments (Specification 2300).
- 3.02 The total depth of lime modified soil shall be as indicated on the plans or in the special provisions.
- 3.03 Lime modified subgrade shall be constructed in lifts not exceeding fifteen centimetres (15 cm) compacted depth.
- 3.04 Lime modified subgrade may be constructed with any machine, combination of machines, or equipment that will produce the results meeting the requirements for soil pulverization, lime application, water application, wet mixing, compaction and finishing as controlled by these specifications, except that rotary action mechanical mixers shall be used to perform the wet mixing operation.

PULVERIZATION

- 3.05 The quantity of earth material required for (1) lift shall be pulverized. Pulverization shall continue until all lumps of soil have been reduced to a dimension of not more than five centimetres (5 cm) when measured in any direction.

LIME APPLICATION, MIXING AND SPREADING

3.06 After pulverization, the surface shall be loose trimmed to the required grade and cross-section.

- (a) Lime shall be applied, in the dry or slurry form, uniformly over the surface at the rate designated by the Engineer. The rate shall be generally two (2) per cent lime by weight. The rate of application shall be controlled within plus or minus one-half (1 /2) of one (1) per cent.
- (b) Lime shall not be applied when the wind velocity on the road surface is greater than twenty-five kilometres (25 km) per hour unless a higher limit is approved by the Engineer.
- (c) Immediately following application of the lime, it shall be mixed with the soil to the full depth of the lift being treated. Rotary action mechanical mixers shall be used.
- (d) The lime and soil shall be dry-mixed by one (1) complete pass of the mixing unit.
- (e) Water shall be applied by means of pressure distributing equipment. Water shall be added to raise the moisture content of the mixture to within plus or minus two (2) per cent of optimum as determined by Test 9200.
- (f) Mixing shall continue, during and after the application of water, until the lime is uniformly distributed throughout the soil. Generally two (2) complete passes of the mixing equipment will be required, including the one (1) dry-mix pass. The number and manner of passes shall be as directed by the Engineer. The moisture content of the mixture shall be maintained within the specified tolerance until mixing has been completed.
- (g) Each lift shall be constructed on:
 - (i) One-half the width of the road at a time where the Contractor is required to accommodate traffic.
 - (ii) The full width of the road where the Contractor is not required to accommodate traffic.

COMPACTION

3.07 After mixing has been completed, the treated lift shall be processed, with respect to compaction and finishing, in accordance with the requirements for Subgrade Preparation and Compaction (Specification 3000).

SAFETY

3.08 Due to the chemically active nature of quicklime when exposed to moisture, the Contractor shall ensure that every employee exposed to contact with, or who is required to work in close proximity with this material, is suitably protected at all times.

2220-4 MEASUREMENT

- 4.01 Lime modified subgrade will be measured in square metres for a specified depth. Measurement will be based on the specified width of the surface, multiplied by the total length of grade modified to the full specified depth.
- 4.02 Applying Lime to the Earth Material will be measured in tonnes.

2220 - 5 PAYMENT

- 5.01 Payment for LIME MODIFIED SUBGRADE IN PLACE will be made at the unit price per square metre for depths as specified in the tender form. The unit price will be full compensation for pulverizing the soil; and mixing, spreading, shaping, compacting, and finishing the lime modified subgrade.
- 5.02 Payment for APPLYING LIME TO THE EARTH MATERIAL will be at the contract unit price per tonne as specified in the tender form. The unit price will be full compensation for unloading, handling, storing, hauling, and spreading the lime.
- 5.03 Payment for watering will be made in accordance with the requirements for Watering (Specification 2500).
- 5.04 When imported earth material is used, payment for importing the earth material will be made in accordance with the requirements for Earth Excavation (Specification 2200) and Haul (Specification 2400).