1. GENERAL

1.1 RELATED WORK

.1 Section 31 24 13 – Roadway Excavation, Embankment and Compaction.

1.2 DEFINITIONS

.1 Cement Stabilized Subgrade:
  .1 Soil immediately below a pavement structure or slab, mixed with Portland cement and compacted to a specified depth.

1.3 QUALITY ASSURANCE

.1 Maximum Density: the dry unit mass of a soil sample at optimum moisture content as determined in the laboratory according to ASTM D698 Method A.

.2 Required Density: a minimum of 100% of the maximum density for each 150mm lift of stabilized subgrade.

.3 Testing Frequency: The quality assurance laboratory will take a minimum of one field density test for each 1,000m^2 of compacted subgrade lift according to ASTM D2167 or ASTM D2922 for comparison with a maximum density determined according to ASTM D698 Method A or as directed by the Engineer.

.4 Proof-Rolling: a proof-roll of the subgrade will be required to confirm adequate bearing capacity of the subgrade soils. The proof-roll shall be supervised by the Engineer and must be performed in accordance with the Engineer's recommendations.

1.4 MEASURMENT AND PAYMENT

.1 Cement Stabilized Subgrade
  .1 The unit of measurement for cement stabilized subgrade will be by the square metre per the thickness and cement application rate specified in the Bid Forms. The unit price shall include the supply, preparation, loading, hauling, placing, mixing and compaction of all materials and for all labour, supervision, equipment, tools and incidentals necessary to complete the Work.
  .2 The decision to increase or decrease the amount of cement used during the cement stabilization process will be made by the Engineer during construction. Additional or decreased payment will be made based on the actual amount of cement used by prorating the unit rate price of cement applied at the rate specified in the Bid Form. Other than prorating the quantity, no additional claims will be considered.
  .3 No extra payment will be made for reworking the subgrade after rain.

2. PRODUCTS

2.1 MATERIALS

.1 Portland cement shall conform to CSA A3001, Type GU general use cement.

3. EXECUTION

3.1 EQUIPMENT

.1 Cement spreader capable of spreading cement uniformly.

.2 Mixing equipment designed for and capable of mixing the full depth of the subgrade in one pass, subject to the Engineer's approval.

3.2 PREPARATION

.1 Subgrade areas to be stabilized will be indicated on plans or designated by the Engineer.

.2 Pre-grade and shape soil to the designated grade and cross section.

3.3 STABILIZATION

.1 Loosen soil to the required depth of subgrade. Work soil with cultivating and mixing equipment until soil is pulverized into pieces no larger than 25mm, exclusive of stones.

.2 Contain cement dust within the Site. Do not spread cement during or when there is imminent danger of high winds or rain, unless otherwise specified by the Engineer.

.3 Spread and blend cement into the soil at a rate specified in the Bid Form per 150mm of compacted depth, or as reviewed by the Engineer.

.4 Add water to the blended soil and cement sufficient for best achieving the required compaction. Mix to a homogeneous mixture.

.5 Spread the mixture uniformly in lifts of 150mm compacted thickness. Compact each lift to the required minimum 100% of Standard Proctor Density (ASTM D698 and/or ASTM D558).

.6 Complete compaction and finishing on the same day of mixing.

.7 Water may be sprayed with a pressurized distributor for surface finishing.

.8 Leave the surface of the compacted subgrade slightly higher than the required elevation. Trim the compacted subgrade to the indicated crown and grade. Leave the finished surface even and free of depressions, humps, or loose material.

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 and/or ASTM D588.

.3 If a density test result is below the required density, three (3) more tests shall be taken for the area represented by the failed test, and the average of those three (3) tests shall represent that area. If such an average is below the required density, that area shall be reworked to the full depth of lift, the soil moisture altered or cement added as necessary, and recompacted to the required density.

3.5 PROTECTION OF FINISHED WORK

.1 Do not permit vehicular traffic over the stabilized subgrade.

.2 If the subgrade floods, drain immediately by natural flow or by pumping to catch basins, manholes, or ditches.

.3 Maintain finished surfaces in a condition conforming to this section until acceptance.

.4 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.

.5 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