SECTION 32 11 34

CEMENT STABILIZATION OF MATERIAL IN PLACE

PART 1 - GENERAL

1.1 DESCRIPTION

A. This item consists of cement stabilizing existing granular type soil by pulverizing, adding Portland cement, mixing, wetting and compacting to the required lines, grades, and typical.

1.2 MEASUREMENT AND PAYMENT

A. Payment for measured cement stabilization base will be made at the unit price bid in the Proposal. The bid price includes full compensation for loosening, preparation of secondary grade, furnishing, distributing, and mixing the cement and for all labor, material, tools, equipment and incidentals necessary to complete the work. Payment will not be made for unauthorized work.

1.3 SUBMITTALS

- Supplier's certification showing specification compliance of Portland cement
- Asphaltic material for sealing
- Traffic Control Plan

PART 2 – PRODUCTS

2.1 MATERIALS

A. Portland cement shall be Type I and shall conform to the requirements of ASTM Designation C 150.

2.2 TESTING REQUIREMENTS

A. A compaction curve (ASTM D698) shall be performed for each type of material which is to be stabilized.

B. In-place field density shall be determined by Nuclear Methods (ASTM D 2922) immediately upon completion of compaction. The cement treated material shall be tested for moisture content and density at locations selected by the Engineer. The frequency of tests is at least one every 100 lineal feet or a minimum of three (3) tests, whichever is greater.

PART 3 – EXECUTION

3.1. GENERAL:

A. The completed course shall be uniformly treated, free from loose or segregated areas, and have uniform density and moisture content its full depth. The surface shall be smooth and suitable for placing subsequent courses. The Contractor has the responsibility to regulate the sequence and continuity of work, to use the proper amount of cement, and maintain the work as necessary to meet the requirements of this specification.

B. The Contractor shall insure that cement is adequately stored and protected from moisture before usage.

C. All machinery, tools and equipment necessary for the proper prosecution of the work shall be on the project and available for inspection and approval by the Engineer prior to the beginning of construction operations.

3.2. PREPARATION AND PULVERIZATION

A. The roadbed shall be shaped to conform to the lines, grades and typical sections shown on the Plans prior to beginning any cement treatment.

B. The material to be treated shall be spread uniformly to the required cross-section, mixed and pulverized so that at least 80 percent passes the No. 4 sieve. This pulverization requirement may be waived when the material contains a substantial amount of aggregate and is approved by the Engineer.

C. The Contractor may elect to use a cutting and pulverizing machine that will process the material to be stabilized in-place rather than excavate and windrow. This method will be permitted only if a machine is provided which will insure that the material is cut uniformly to the proper depth and which has cutters that will plane the secondary grade to a uniform surface over the entire width of the cut. The machine shall provide a visible indication of the depth of cut at all time. If this method is used the Contractor will be required to roll the subgrade prior to pulverization and correct any soft or unstable areas as directed by the Engineer.

3.3. APPLICATION

A. Portland cement shall be spread uniformly on the soil at the specified rate. Cement shall be applied only on an area where the mixing, compacting, and finishing operations can be completed during the same working day.

B. The cement shall be spread by an approved spreader or by bag distribution. Cement distribution shall be at a uniform rate and in a manner to minimize scattering by wind.

3.4. MIXING

A. Single or multiple soil stabilizer mixers shall be used. The cement shall be dry-mixed with the soil prior to the addition of water. Immediately after dry-mixing, water shall be uniformly applied. After mixing, the cement treated soil shall be in a loose, evenly spread state ready for compaction. The soil and cement mixture shall not remain undisturbed for more than 30 minutes before compacting.

3.5. COMPACTION

A. The mixture shall be wetted or dried to provide a moisture content within +4- percent of optimum and compacted until the entire depth is at a uniform density of at least 98 percent of maximum as determined by ASTM D698.

B. Compaction shall be completed within 2 hours of the addition of water to the dry-mixed material. If the material fails to meet the moisture and density requirements within the 2 hour time frame, or for any reason or cause, lose the required stability, density and finish before the next course is placed. The treated material shall be removed and replaced unless otherwise approved by the Engineer. Removal and replacement with acceptable treated material will be at the Contractor's expense.

3.6. FINISHING AND CURING

A. Immediately after compaction, the surface shall be bladed to a depth of 1/4 inch, removing all loosened materials. The loosened materials shall be disposed of at the Contractor's expense and at a location approved by the Engineer. The surface shall then be rolled with a pneumatic tire roller, adding small increments of moisture as needed during rolling.

B. The completed section shall be moist cured for three (3) days or prevented from drying by addition of an asphaltic material at a rate of 0.10 to .030 gallons per square yard. The Contractor will be responsible for protecting any asphalt membrane from being picked up by traffic.

C. The completed sections of soil cement may be opened immediately to local traffic and construction equipment, and to all traffic after the three (3) day curing period, provided the soil cement has hardened to prevent rutting and surface marring.

END OF SECTION